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Project Manual – Specifications

Divisions 00 to 14

Almaguin Highlands Outdoor Community Hub

Township of Strong

Issued for Permit, Tender and Construction
Architectural Project No. 2503
August 2026



1 Consultants

- .1 The following are the consultants and sub-consultants who have prepared the Contract Documents.

PRIME CONSULTANT / ARCHITECT

Bertrand Wheeler Architecture Inc.
528 Cassells Street
North Bay, Ontario P1B 3Z7
Phone: (705) 472-0988

Marcus Wheeler, OAA
Architect

2 Sub-Consultants

STRUCTURAL, MECHANICAL & ELECTRICAL ENGINEERS

Greener Earth Engineering & Design
322 Ripple Lane
Huntsville, Ontario P1H 2K6
Phone: (705) 571-1751

END OF SECTION

1.1 List of Documents

- .1 The following is a list of all documents issued for Tender, excluding addenda issued during bidding period. The Bidder is responsible for reviewing the documents received and ensuring that all documents are complete.

.2 DRAWINGS:

Drawing No. Title

Architectural

A0.0 COVER SHEET, KEY PLAN, LEGENDS AND GENERAL NOTES
A0.1 OBC MATRIX, ASSEMBLY SCHEDULES, DOOR, FRAME AND WINDOW SCHEDULE
AND ELEVATIONS, ROOM FINISH SCHEDULE, AND TYPICAL WASHROOM
INTERIOR ELEVATIONS
A1.0 OVERALL SITE PLAN
A1.1 PARTIAL SITE PLANS
A2.0 FOUNDATION PLAN, FLOOR PLAN, REFLECTED CEILING PLAN AND ROOF PLAN
A2.1 ELEVATIONS AND SECTIONS

Structural

S1 FOUNDATION PLAN

Mechanical and Electrical

M1 PLUMBING PLAN, DETAILS & SPECIFICATIONS
ME2 HVAC/ELECTICAL PLANS & DETAILS

.3 PROJECT MANUAL – SPECIFICATIONS

Division 00 No. Pages

00025 Consultant Team List..... 1
00050 List of Documents 3
00100 Instructions to Bidders 8
00300 Tender Form 4
00710 Contract Form (CCDC 2 to be inserted upon Contract Issuance)..... 1
00800 Supplementary General Conditions 20

Division 01 - General Requirements No. Pages

01001 General Requirements 3
01011 Summary of Work 3
01021 Allowances 1
01310 Project Management and Coordination 3
01320 Construction Progress Documentation 1
01330 Submittal Procedures 3
01450 Quality Control 3
01520 Construction Facilities 10
01610 Basic Product Requirements 4
01730 Execution 2

01740	Cleaning.....	2
01770	Closeout Procedures	3
01780	Closeout Submittals	5

Division 02 – Sitework No. Pages

02225	Sitework Demolition & Removals	2
02743	Asphalt Concrete Paving	2
02761	Painted Traffic Lines and Markings	3
02770	Concrete Walks, Curbs & Gutters	4
02785	Unit Paving	3
02922	Hydraulic Seeding	3

Division 03 – Concrete..... No. Pages

03213	Tactile Warning Surfacing	4
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Division 04 – Masonry No. Pages

Not used.

Division 05 – Metals No. Pages

Not used.

Division 06 – Wood & Plastics No. Pages

06100	Rough Carpentry	4
06200	Finish Carpentry	3

Division 07 – Thermal & Moisture Protection No. Pages

07100	Air & Vapour Barriers.....	7
07212	Board Insulation.....	4
07213	Loose, Batt & Blanket Insulation	2
07270	Fire Stopping & Smoke Seals	10
07481	Preformed Metal Cladding.....	3
07900	Joint Sealers	6

Division 08 – Doors & Windows No. Pages

08110	Steel Doors & Frames	7
08552	Vinyl Windows	3
08710	Door & Finishing Hardware	4
08712	Power Door Operators.....	6
08800	Glazing.....	6

Division 09 – Finishes..... No. Pages

09250	Gypsum Board.....	5
09900	Painting.....	7

Division 10 – SpecialtiesNo. Pages

10800 Toilet, Bath & Laundry Accessories4

Division 11 – 14No. Pages

Not used

Division 15 & 16 – Mechanical & ElectricalNo. Pages

See Drawings

END OF SECTION

1 GENERAL

1.1 Invitation

- .1 The **Township of Strong** shall receive tenders from General Contractors for the supply of all goods and/or services specified in this tender call.
 - .1 Sealed tenders clearly marked “**2503 – Almaguin Highlands Outdoor Community Hub**” shall be delivered prepaid to the Consultant at the following address.

Bertrand Wheeler Architecture Inc.
528 Cassells Street,
North Bay, ON P1B 3Z7

Attention: Marcus Wheeler

before 3:00:00 p.m. local time on Thursday, September 10, 2026.
- .2 Closing time will be taken from the Universal Time Clock (UTC) at [<http://www.time.gov>]. Offers submitted after the above time will be returned to the bidder unopened.
- .3 Tender submission envelopes or containers that are not properly identified as such may be rejected and returned to the proponent if they are inadvertently opened as regular mail prior to the closing date and time.
- .4 Tenders must be submitted on the Tender Form issued with Tender Documents.
- .5 Tenders may be submitted by email.
 - .1 Bidders are solely responsible for timely delivery.
 - .2 Bidders shall govern themselves accordingly and accept all risks with submitting Tenders and/or amendments via email. The Owner and Consultant accepts no liability to ensure that tenders and amendments have been successfully received.
 - .3 Contractors are encouraged to submit tender forms early. Time recorded on the Consultant's equipment shall determine time of submission.
 - .4 Hardcopies of all Bid proposals, including all required submittals, shall be couriered promptly upon request from the Consultant or Owner.
 - .5 Tenders shall be emailed to tenders@bertrandwheeler.ca.
- .6 All tender submissions will be opened privately.
- .7 All blanks on Tender Forms must be filled in.
- .8 Bidders shall be solely responsible for the delivery of Tender in the manner and time prescribed.
- .9 All prices (unless otherwise specifically requested in Tender Documents) shall be for “Complete Job” prices and shall be understood to include for all materials, labour and other expenses as herein outlined in these contract documents including but not limited to fees, insurances, permits, compensation and other items required by governing regulations as well as overhead and profit for the work concerned.

1.2 Intent

- .1 The intent of this bid call is to obtain an offer to perform the **Almaguin Highlands Outdoor Community Hub** located at **28 Municipal Lane, Sundridge, Ontario**, for the **Township of Strong**.
- .2 The work shall be performed within a Stipulated Price contract, in accordance with the Contract Documents.

1.3 Contract Documents and Owner Identification

- .1 The Contract Documents are identified as the:

**Almaguin Highlands Outdoor Community Hub
Township of Strong
Arch. Project No. 2503**

- .2 The Owner of the Project:

**Township of Strong
28 Municipal Lane
Sundridge, ON P0A 1Z0
Attn: Derek Hnatiuk
P: 705-384-5819 ext. 215**

1.4 Contract / Bid Documents

- .1 Form of Contract

- .1 The CCDC Document 2, Stipulated Price Contract, 2020, will be used to form the Construction Contract. This document will be appended to this document to form the Contract Documents for the project. A digital sample of this document will be made available to Bidders upon individual request to the Consultant.

- .2 Definitions

- .1 Contract Documents: Defined in CCDC 2 - 2020 Edition, Definitions.
.2 Bid Documents: Contract Documents supplemented with Instructions to Bidders, Soils Investigation Data, Bid Form, Bid Securities, and Bid Supplementary Forms identified herein.
.3 Bid, Offer, or Bidding: Act of submitting an offer under seal.
.4 Bid Price: Monetary sum identified by the Bid Form.

- .3 Availability

- .1 Electronic Bid Documents, in PDF format, may be obtained at the office of the Consultant.
.2 CAD documents will not be made available.
.3 Hardcopy Bid Documents will not be made available.
.4 Bid Documents are made available only for the purpose of obtaining offers for this project. Their use does not confer a license or grant for any purpose.

- .4 Examination

- .1 Upon receipt of Bid Documents verify that documents are complete. Notify Consultant should the documents be incomplete.
.2 Immediately notify the Consultant upon finding discrepancies or omissions in the Bid Documents.

- .5 Queries / Addenda

- .1 Direct questions to the Consultant at the following address:

Marcus Wheeler
c/o Bertrand Wheeler Architecture Inc.
528 Cassells Street, North Bay, Ontario P1B 3Z7
Tel: 705-472-0988 Fax: 705-472-2486
email: tenders@bertrandwheeler.ca

- .2 Addenda may be issued during the bidding period. All addenda become part of the Contract Documents. Include costs for all related work within the Bid Price.
- .3 Verbal answers are only binding when confirmed by written addenda.
- .4 Clarifications requested by bidders must be in writing not less than seven (7) days before date set for receipt of bids. The reply will be in the form of an addendum, a copy of which will be forwarded to known bidders no later than two (2) working days before receipt of bids.

.6 Product/System Options

- .1 Where the Bid Documents stipulate a particular product, alternative will be considered by the Consultant up to ten (10) days before receipt of bids.
- .2 When a request to substitute a product is made, the Consultant may approve the substitution and will issue an Addendum to known bidders. The request shall include sufficient information to enable the Consultant to determine acceptability of such products.
- .3 In submission of substitutions to products specified, bidders shall include in their bid, any changes required in the work to accommodate such alternatives. A later claim by the bidder for an addition to the contract price because of changes in work necessitated by use of alternatives shall not be considered.
- .4 Unless alternatives are submitted in this manner and subsequently accepted, provide products as specified.
- .5 Alternative products will not be considered if submitted as an attachment to the Bid Form.

1.5 Site Assessment and Investigations

.1 Site Examination

- .1 Carefully examine and study all of the Contract Documents and inspect the Site of the work in order to determine all conditions affecting the work and associated costs.
- .2 Each bidder shall visit the site of the work before submitting a Bid and shall by personal examination be satisfied as to the local conditions that may be encountered during construction. Each Bidder shall make its own estimate of the available facilities and any difficulties that may be encountered and the nature of the sub surface materials and conditions.
- .3 In connection with the place of Work, each Bidder shall examine the surroundings and adjacent public and private properties for existing conditions and limitations including but not limited to the rights and interest of other parties that may be interfered with during the construction.
- .4 Bidder Site Reviews:
- .1 There will be a **Mandatory Meeting** for Bidders on **Thursday, August 27, 2026 at 10:00 am**. Bidders shall meet at the front of the municipal office.

- .2 Bidders are required to carefully review the facility, quantify, inspect on site conditions and ensure themselves of the actual qualities to complete the work.
- .3 The act of submitting a tender is confirmation that the Bidder has visited the project site and surrounding properties and has become familiar with the place of work and related documents.
- .4 No Bidder shall claim, at any time after submission of its Bid, that there was any misunderstanding of the terms and conditions of the Contract Documents relating to site conditions.
- .5 No adjustment to the Progress Schedule or to the Bid price will be made for difficulties encountered due to conditions, features, and peculiarities of the site that were evident at the time of the close of Bids.
- .5 A Geotechnical Investigation or a Hazardous Materials Survey was not completed for this project. Report all issues regarding the existing conditions of the site promptly to the Consultant.
- .6 A Hazardous Materials Survey was not completed for this project.

1.6 Qualifications

- .1 All work shall be performed diligently and to a high standard of professional competence by all parties.
- .2 Bidders may be asked to provide detailed information on the professional qualifications of all staff who are expected to be involved with the work.
- .3 Bidders may be asked to identify a single senior individual who shall co-ordinate the work from beginning to end.
- .4 Subcontractors
 - .1 All Contractors shall carefully consider the suitability of all sub-contractors.
 - .2 The Owner reserves the right to reject a proposed subcontractor for reasonable cause.
 - .3 Refer to CCDC 2 Article GC 10 of General Conditions.

1.7 Bid Submission

- .1 Bid Ineligibility
 - .1 Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetic errors, erasures, alterations, or irregularities of any kind, may at the discretion of the Owner, be declared informal.
 - .2 Bids with Bid Forms and enclosures which are improperly prepared may at the discretion of the Owner, be declared informal.
 - .3 Bids that fail to include security deposit, bonding or insurance requirements shall at the discretion of the Owner, be declared informal.
 - .4 Bids that are submitted by general contractors that are not prequalified or that did not attend the mandatory site visit shall be disqualified and returned to the Bidder without further consideration
 - .5 Submitted that do not include all requested values for each separate price, add-on price or take-out price shall at the discretion of the Owner, be declared informal.
 - .6 Bids may not be submitted by telecommunications.
 - .7 The Owner shall not be held responsible for any such equipment malfunctions, printing malfunctions, power failures or any other such instances that would otherwise prohibit the tender form from being submitted.

.2 Submissions

- .1 Bidders shall be solely responsible for the delivery of their bids in the manner and time prescribed.
- .2 Submit one copy of the executed offer on the Bid Forms provided, signed together with the required security in a closed opaque envelope, clearly identified with bidder's name, project name and Owners name on the outside. Alternatively, if submitting by e-submission, attach all required documents as outlined in 1.1.1 above.
- .3 Improperly completed information, irregularities in bid bond, may be cause not to open the bid envelope and declare the bid informal.

1.8 Bid Enclosures/Requirements

.1 Security Deposit

- .1 Each tender shall be submitted with a Bid Bond in the name of an approved surety, made payable to owner in an amount equal to the lesser of **10% (ten percent) of the Tender Price or \$15,000**, as a guarantee that the Bidder will, if the tender is accepted, execute a general construction contract as specified herein and provide the specified Performance and Labour and Materials Bonds within ten (10) days of acceptance.
- .2 Endorse the Bid Bond in the name of the Owner as obligee, signed and sealed by the principal Contractor and surety.
- .3 Use Bid Bond form CCDC 220.
- .4 The security deposit will be returned after delivery to the Owner of the required Performance and Labour and Materials Payment Bond (s) by the accepted bidder.
- .5 If no contract is awarded, all security deposits will be returned.

.2 Agreement to Bond

- .1 **Bonding will not be required for this project.**
 - .1 Where Bonding is required, submit with the Bid Form and Bid Bond, an Agreement to Bond, stating that the surety providing the Bid Bond is willing to supply the Performance and Labour and Materials Payment Bond required.
 - .2 Include the cost of bonds in the Bid Price.

.3 Performance Assurance

- .1 **Bonding will not be required for this project.**
 - .1 Where Bonding is required, the accepted bidder shall provide a 50% Performance Bond and 50% of Construction Cost Labour and Materials Payment Bond.

.4 Insurance

- .1 Provide a signed "Undertaking of Insurance" on a standard form provided by the insurance company stating their intention to provide insurance to the bidder in accordance with the insurance requirements of the Contract Documents.

.5 Bid Form Requirements

- .1 State in the Bid Form, the time required to complete the work. The Substantial Completion date in the Agreement shall be calculated based on the number of weeks of construction indicated in the Bid Form commencing from the date of Intent to Award. The commencement date of the construction schedule in the agreement will be the date of Award of Contract.

- .2 Verify the receipt and inclusion of all Addenda.
- .3 Verify the inclusion of all Allowances.
- .4 Include the names of all Subcontractors and the portion(s) of the work the Bidder will perform as per the list provided within the Bid Form.
- .6 Bid Signing
 - .1 The Bid Form shall be signed under seal by the bidder.
 - .2 Sole Proprietorship: Signature of sole proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under the signature. Affix seal.
 - .3 Partnership: Signature of all partners in the presence of a witness who will also sign. Insert the word partner under each signature. Affix seal to each signature.
 - .4 Limited Company: Signature of a duly authorized signing officer (s) in their normal signatures. Insert the officer's capacity in which the signing officer acts, under each signature. Affix the corporate seal. If the bid is signed by officials other than the President and Secretary of the company, or the President and Secretary of the company, or the President-Secretary-Treasurer of the company, a copy of the by-law resolution of the Board of Directors authorizing them to do so, must also be submitted with the bid in the bid envelope.
- .7 Taxes
 - .1 Base Bid Price (Tender Price) excludes required Harmonized Sales Tax (HST).
- .8 Cash Allowances
 - .1 Cash Allowances shall be included in the Base Bid in accordance with Part 4 of the General Conditions of the Contract. Cash Allowances are identified in Division 01.

1.9 Offer Acceptance/Rejection

- .1 Duration of Offer.
 - .1 Bids shall remain open to acceptance and shall be irrevocable for a period of **forty-five (45) days** after the bid closing date.
- .2 Bid Evaluation and Acceptance
 - .1 The Owner will first evaluate bids based upon the completion of the bid submission, including the submission of all required documents conforming to Bid Submission and Bid.
 - .2 Enclosures/Requirements will deem a bid complete. All incomplete submissions shall at the discretion of the Owner, be deemed informal and disqualified.
 - .3 After completion of the bids has been evaluated the bidders submitting complete tenders will be evaluated for the offer which represents "best value"; the interpretation of which will be made by the Owner.
 - .4 The Owner reserves the right to reject all bids.
 - .5 Tender opening will be closed to the public. The company name of the successful bidder will be made available after Award.
 - .6 Except as otherwise indicated within this document all other bid evaluation procedures shall follow the guidelines as addressed in 'CCDC Document 23 – 2005 A Guide to Calling Bids and Awarding Contracts' as indicated for a Stipulated Price Contract.

1.10 Conflict of Interest

- .1 Bidders shall declare in the Tender Form any situation that may be a conflict of interest or a potential or perceived conflict of interest of the Bidder, including but not limited to its obligations to the Owner, the contract, the contract price or any customer.

1.11 No Influence

- .1 The Owner prohibits its representatives from using their official position for personal financial gain, or from accepting any personal advantage from anyone under circumstances which might reasonably be interpreted as an attempt to influence the recipient in the conduct of their duties, extend any gratuity or special favor to the proponent, or to influence the outcome of any proposal.
- .2 The Owner reserves the right to disqualify the tender of any bidder who engages in any acts or practices which are either directly or indirectly or may reasonably be perceived.

1.12 Broader Public Sector Procurement Directive

- .1 not applicable

1.13 Inappropriate Conduct

- .1 The Owner may disqualify a bidder's tender and give it no further consideration based on past performance or based on inappropriate conduct in a prior procurement process, and such inappropriate conduct shall include but not be limited to:
 - .1 The submission of proposals or quotations containing misrepresentations or any other inaccurate, misleading or incomplete information;
 - .2 The refusal of the proponent to honor its previous commitments; or
 - .3 Any other conduct constituting a conflict of interest. For the purposes of this section, "conflict of interest" shall have the meaning ascribed to it on the Proposal Submission Form.

1.14 Agreement to Abide by the Established Tender Process

- .1 No proponent can be seen to be deriving, intentionally or otherwise, an advantage, information or benefit which is not available to all other Bidders or from any special or personal relationships or contacts or seeking or obtaining any advantage or information from any staff and representatives of the Owner, whether authorized or not. The Tender Form includes a clause which confirms concurrence with the Tender Process. In signing the Tender Form, Bidders are agreeing to abide by the established process.

1.15 DEFINITIONS SUPPLEMENTARY TENDER FORM:

.1 SEPARATE PRICES:

A separate price as tendered under section 00310 Supplementary Tender Form is an amount which is **INCLUDED** in the base bid. At the owners discretion any or all of the separate prices may be deleted from the work and the base bid in establishing the Contract Value. Separate prices do include all overhead and profit for the work associated with the Separate Price.

.2 ADDITIONAL PRICES:

Additional prices are prices offered as additions to the base bid. Additional prices are **NOT INCLUDED** in the base bid. Additional prices include all overhead and profit for the work. As per the instructions to bidders, the Owner at their discretion may select any or all alternate prices upon evaluation of the bid submission.

END OF SECTION

Tender Form Submitted By Name: _____
Address: _____
Telephone: _____
Email: _____

Tender Submitted to Attention: _____

Marcus Wheeler
Bertrand Wheeler Architecture Inc.
528 Cassells Street,
North Bay, ON P1B 3Z7
E: tenders@bertrandwheeler.ca

Base Bid We offer to enter into a Contract to perform the Work required by the Tender Documents for the stipulated price of:

_____ (\$ _____)

The above Base Bid offer does not include value added taxes (HST).

Construction Time We agree to complete the Work in accordance with the Tender Documents, including Section 01011, Summary of Work. We agree to Substantial Performance of the Work within _____ weeks from the date of notification of acceptance of Tender.

Confirmation of Documents We acknowledge our compliance with the Instructions to Bidders and the Tender Documents relating to the Work, including all Addenda as follows.

We acknowledge receipt of Addenda No's. _____ to _____.

Allowances We have included all allowances as Specified under Specification Section 01021, Allowances, within our Base Bid price. List the total amount of all Allowances on the following List of Sub-Contractors.

Insurances We have appended a Certificate of Insurance and a WSIB Certificate to this tender in accordance with the Instructions to Bidders.

Bid Bond We have appended an acceptable Tender Bid Bond and a Consent of Surety to this tender in accordance with the Instructions to Bidders.

Bid Evaluation Information We have appended information relating to the Bid Evaluation procedure as prescribed by the Owner and understand that the selection will be based upon the procedure described therein.

Tender We agree and acknowledge that the lowest or any of the submitted Tenders will not necessarily be accepted.

We agree and acknowledge that this Bid is irrevocable and open to acceptance for a period of **45 days** from the date of Bid Closing.

Signed, sealed and submitted for and on behalf of:

Company Name

Address

Name and Title

Witness Name and Title

Signature

Witness Signature

Date

(Affix Corporate Seal over signature)

List of Sub-Contractors

The following are the Sub-Contractors we propose to use for the divisions or sections of the Work (name all subcontractors to perform work). Value added taxes for the sections of Work are not included in the following amounts.

Division / Section	Name of Sub-Contractor	Amount
Allowances	See Specification Section 01021 (insert full amount of both Cash & Contingency Allowances)	\$
Excavation & Backfill		
Septic Bed		
Asphalt Paving		
Unit Paving		
Hydroseed		
Landscaping		
Fencing		
Concrete		
Carpentry and Framing		
Drywall		
Doors		
Windows		
Flooring & Bases		
Painting		
Washroom Accessories		
Exterior Cladding and Trims		
Roofing		
Eavestrough / Downspouts		
Plumbing		
Ventilation		

Almaguin Highlands Outdoor Community Hub
Township of Strong
Project No. 2503
August 2026

00300
TENDER FORM

Electrical Power			
Electrical Lighting			

1 Contract Form

- .1 This section of the final Contract Documents shall contain a copy of CCDC Document 2, Stipulated Price Contract, 2020 edition.
- .2 A copy of the noted CCDC document is available from the Consultant upon request from the Bidder.
- .3 By submitting a tender, the Bidder acknowledges that the Bidder and all related Sub-Contractors are fully aware of the proposed CCDC document.
- .4 The balance of the Contract Form will be completed upon acceptance of a Bid.

The Standard Construction Document for a Stipulated Price Contract, 2020 English version, consisting of the Agreement between the *Owner* and the *Contractor*, Definitions and General Conditions of the Stipulated Price Contract, Parts 1 to 13 inclusive, governing same is hereby made part of these *Contract Documents*, with the following amendments, additions and modifications. Where these amendments, additions, and modifications specifically reference a change to the Agreement, Definitions, or General Conditions, these amendments, additions and modifications shall govern.

Where a General Condition or paragraph of the General Conditions of the Stipulated Price Contract is deleted by these Supplementary Conditions, the numbering of the remaining General Conditions or paragraphs shall remain unchanged, and the numbering of the deleted item will be retained, unused.

1 AGREEMENT BETWEEN OWNER AND CONTRACTOR

1.1 ARTICLE A-5 – PAYMENT

1.1.1. Amend paragraph 5.1.3, in the first line, by deleting the words "...the issuance of the..." and replacing them with "...receipt of the Consultant's..."

1.1.2. In paragraph 5.1.1 of Article A-5 add the following words to the end:

"...or, where there is no *Payment Certifier*, jointly by the *Owner* and *Contractor*"

1.2 ARTICLE A-6 – RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING

1.2.1. Delete the text of ARTICLE A-6 RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING (retaining the provision for the addresses of the Owner, Contractor and Consultant) and replace it with the following:

"6.1 *Notices in Writing* between the parties or between them and the *Consultant* shall be considered to have been received by the addressee on the date of receipt if delivered by hand or by commercial courier or if sent during normal business hours by fax and addressed as set out below. Such *Notices in Writing* will be deemed to be received by the addressee on the next business day if sent by fax after normal business hours or if sent by overnight commercial courier. Such *Notices in Writing* will be deemed to be received by the addressee on the fifth *Working Day* following the date of mailing, if sent by pre-paid registered post, when addressed as set out below. An address for a party may be changed by *Notice in Writing* to the other party setting out the new address in accordance with this article."

The Owner at: **Township of Strong
28 Municipal Lane
Sundridge, ON P0A 1Z0
P: 705-384-5819**

The Contractor at: if not listed herein, as otherwise noted in the CCDC 2.

The Consultant at: **Marcus Wheeler, OAA
Bertrand Wheeler Architecture Inc.
528 Cassells Street, North Bay, On**

2 DEFINITIONS

2.1.1. Add the following definition: *Proper Invoice*

"Proper Invoice means a "proper invoice" as defined in the *Payment Legislation*, if any, and as may be modified by written agreement between the parties to the extent permitted by such *Payment Legislation*."

2.1.2. Add the following definition: *Submittals*

"Submittals are documents or items required by the *Contract Documents* to be provided by the *Contractor* such as:

- *Shop Drawings*, samples, models, mockups to indicate details or characteristics, before the portion of the *Work* that they represent can be incorporated into the *Work*, and
- As-built drawings and manuals to provide instructions to the operation and maintenance of the *Work*."

2.1.3. Amend Definition "Consultant" by adding the following to the end of that Definition:

"For purposes of the *Contract*, the terms "Consultant", "Architect" and "Engineer" shall be considered synonymous."

2.1.4. Amend Definition "Owner", by adding the following to the end of that Definition:

"For purposes of the *Contract*, the terms "Owner", and "**Township of Strong**" shall be considered synonymous."

2.1.5. Add the following definition: *Provide*

"Provide means to supply and install. *Provide* has this meaning whether or not the first letter is capitalized."

2.1.6. Add the following definition: *by others*

"The words '*By Others*' when used in the *Specifications* or on the *Drawings* means a person performing part of the *Work*, other than the *Contractor*. For greater certainty, the only means by which work or services shown or specified shall be indicated as not being in the *Contract* is by use of the initials 'N/C' or the words 'Not in Contract' or the words 'by *Owner*'."

2.1.7. Add the following definition: *Exposed*

"Exposed means visible by the *Owner* at the completion of the *Work*, unless otherwise indicated in the *Contract Documents*. *Exposed* items include all items on roof areas, mechanical and service rooms, inside of cupboards, cabinets and similar items."

2.1.8. Add the following definition: *Install*

"Install means install and connect. *Install* has this meaning whether or not the first letter is capitalized."

2.1.9. Add the following definition: *Labour Dispute*

"Labour Dispute means any lawful or unlawful labour problems, work stoppage, labour disruption, strike (including lockouts decreed or recommended for its members by a recognized contractor's association of which the *Contractor* is a member or to which the *Contractor* is otherwise bound), job action, slow down, picketing, refusal to work or continue to work, refusal to supply materials, cessation or work or other labour controversy which does, or might, affect the *Work*."

2.1.10. Add the following definition: *OHSA*

"OHSA means the Occupational Health and Safety Act (Ontario)"

2.1.13. Add the following definition: *Request for Information*

"*Request for Information* or '*RFI*' means written documentation sent by the *Contractor* to the *Owner* or to the *Owner's* representative or to the *Consultant* requesting written clarification(s) and/or interpretation(s) of the *Drawings* and/or *Specifications*, *Contract* requirements and/or other pertinent information required to complete the *Work* of the *Contract* without applying for a change or changes to the *Work*."

2.1.15. Add the following definitions: *reviewed, instructed, required, directed, permitted, inspected, ordered*

"Wherever the words '*reviewed*', '*instructed*', '*required*', '*directed*', '*permitted*', '*inspected*', '*ordered*' or similar words are used they shall mean, unless the context provides otherwise, '*reviewed by the Consultant*', '*instructed by the Consultant*', '*required by the Consultant*', '*directed by the Consultant*', '*permitted by the Consultant*' and '*ordered by the Consultant*'."

2.1.16 Add the following definition: *satisfactory*

"Wherever the word '*satisfactory*' or similar words or phrases are used in the Contract Documents, it means, unless the context provides otherwise, '*satisfactory to the Owner and the Consultant*'."

3 AMENDMENTS TO THE GENERAL PROVISIONS OF THE STIPULATED PRICE CONTRACT

3.1 GC 1.1 CONTRACT DOCUMENTS

3.1.1. Delete paragraphs 1.1.3 and 1.1.4 in their entirety and replace them with the following:

"1.1.3 The *Contractor* shall review the *Contract Documents* for the purpose of facilitating and coordination and execution of the *Work* by the *Contractor*. The *Contractor* shall report promptly to the *Consultant* any ambiguities, design issues or other matters requiring clarification made known to the *Contractor* or that the *Contractor* may discover from such a review. Such review by the *Contractor* shall comply with the standard of care described in paragraph 3.9.1 of the *Contract*."

"1.1.4 Except for its obligation to review the *Contract Documents* and report the result pursuant to paragraph 1.1.3, the *Contractor* is not responsible for ambiguities, design issues or other matters requiring clarification in the *Contract Documents* and does not assume any responsibility to the *Owner* or to the *Consultant* for the accuracy of the *Contract Documents*. Without limiting the foregoing, the *Contractor* shall not be liable for any damages or costs resulting from any ambiguities, design issues or other matters requiring clarification in the *Contract Documents* which the *Contractor* could not reasonably have discovered from such a review in accordance with the standard of care. If the *Contractor* does discover any ambiguities, design issues or other matters requiring clarification in the *Contract Documents*, the *Contractor* shall not proceed with the work affected until the *Contractor* has received modified or additional information from the *Consultant*. The impacts of any ambiguities, design issues or other matters requiring clarification in the *Contract Documents*, including to the *Contract Price* and *Contract Time*, shall be addressed by the parties in accordance with Part 6 - CHANGES. "

3.1.2. Amend paragraph 1.1.6. by adding the following to the end of that paragraph:

"The *Specifications* are divided into divisions and sections for convenience but shall be read as a whole and neither such division nor anything else contained in the *Contract Documents* will be construed to place responsibility on the *Consultant* to settle disputes among the *Subcontractors* and *Suppliers* in respect to such divisions. The *Drawings* are, in part, diagrammatic and are intended to convey the scope of the *Work* and indicate general and appropriate locations, arrangement and sizes of fixtures, equipment and outlets. The *Contractor* shall obtain more accurate information about the locations, arrangement and sizes from study and coordination of the *Drawings*, including *Shop Drawings* and shall become familiar with conditions and spaces

affecting these matters before proceeding with the *Work*. Where site conditions require reasonable minor changes in indicated locations and arrangements, the *Contractor* shall make such changes at no additional cost to the Owner. Similarly, where known conditions or existing conditions interfere with new installation and require relocation, the *Contractor* shall include such relocation in the *Work*. The *Contractor* shall arrange and install fixtures and equipment in such a way as to conserve as much headroom and space as possible. The schedules are that portion of the *Contract Documents* wherever located and whenever issued, compiling information of similar content and may consist of drawings, tables and/or lists.”

3.1.3. Amend paragraph 1.1.7 by adding subparagraphs 1.1.7.5, 1.1.7.6, 1.1.7.7, 1.1.7.8, and 1.1.7.9 as follows:

- “5 Annotations on the *Drawings* shall govern over the graphic representation of the *Drawings*.
- .6 Finishes in the room finish schedules shall govern over those shown on the *Drawings*.
- .7 Schedules of Division 01 – General Requirements of the *Specifications* shall form part of and be read in conjunction with the technical specification section as listed in the table of contents of the *Specifications*.
- .8 Architectural drawings shall have precedence over structural, plumbing, mechanical, electrical and landscape drawings insofar as outlining, determining and interpreting conflicts over the required design intent of all architectural layouts and architectural elements of construction, it being understood that the integrity and installation of the systems designed by the *Consultant* or its sub-*Consultants* are to remain with each of the applicable drawing disciplines. Fixturing drawing provided by the *Owner* shall have precedence over architectural drawings insofar as outlining, determining and interpreting conflicts over the required design intent of all architectural layouts.”

3.1.4. Add a new paragraph 1.1.11 as follows:

- “1.1.11 One set of signed and sealed *Contract Documents* shall be retained by each of the *Owner* and the *Contractor*.”

3.2 GC 2.2 ROLE OF THE CONSULTANT

3.2.1. In paragraph 2.2.3 add the following to the end:

“Without limiting the foregoing, the *Consultant* may appoint one or more authorized representatives in writing who may fulfill the obligations of the *Consultant* under this *Contract*.”

3.2.2. In paragraph 2.2.8 add the words “, written statements” after the word “interpretations” in both the first and second sentences; and,

- i. Add the following to the end of paragraph 2.2.8:

The *Owner* and the *Contractor* shall waive any claims against the *Consultant* arising out of its making of any interpretations, written statements or findings in accordance with paragraphs 2.2.6, 2.2.7, 2.2.8, 7.1.2, but only to the extent that any such interpretations, written statements, and findings are made by the *Consultant's* professional standard of care at law.

3.2.3. Amend paragraph 2.2.13 by adding the following to the end of that paragraph:

“If, in the opinion of the *Contractor*, the Supplemental Instruction involves an adjustment in the *Contract Price* or in the Contract Time, it shall, within ten (10) *Working* days of receipt of a Supplemental Instruction provide the *Consultant* with a written notice to that effect. In the event that the *Contractor* needs additional information to determine whether a Supplemental Instruction involves an adjustment of the *Contract Price* or in the Contract Time, it may issue a written request to the *Consultant* seeking such additional information. Following receipt of such information, the *Contractor* shall, within ten (10) *Working* days of receipt of such additional information provide the *Consultant* with the written notice described in the first sentence of this paragraph 2.2.13. Failure to provide written notification within the time stipulated in this paragraph 2.2.13 shall be deemed an acceptance of the Supplemental Instruction by the *Contractor* without adjustment in the *Contract Price* or Contract Time.”

3.2.4 Add new paragraphs 2.2.19 and 2.2.20 as follows:

"2.2.19 The *Consultant's* services will be performed solely for the benefit of the *Owner* and no *Contractor*, Subcontractor, Supplier or other third party shall have any claim against the *Consultant* as a result of the performance or non-performance of the *Consultant's* services. The *Contractor* shall include this provision in any contracts it makes with its *Subcontractors*, *Suppliers* and others and shall require such *Subcontractors*, *Suppliers* and others to include the same term in their contracts with sub-*Subcontractors*, sub-*Suppliers* and others.

2.2.20 The *Specifications* are divided into divisions and sections for convenience but shall be read as a whole and neither such division nor anything else contained in the *Contract Documents* will be construed to place responsibility on the *Consultant* to settle disputes among *Subcontractors* and *Suppliers* in respect to such divisions."

3.3 GC 2.4 DEFECTIVE WORK

3.3.1. In paragraph 2.4.1:

- i. Add after the words "shall promptly correct" the phrase "in a manner acceptable to the *Owner* and the *Consultant*"; and
- ii. Add after the words "*Contract Documents*" the phrase "or work that the *Contractor* discovers to be defective, whether or not the defective work had been identified by the *Consultant*, and".

3.3.2 Add new paragraph 2.4.4 as follows:

"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*."

3.4 GC 3.1 CONTROL OF THE WORK

3.4.1 Add new paragraph 3.1.3 as follows:

"3.1.3 Prior to commencing individual procurement, fabrication and 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 contradictions exist, 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*."

3.5 GC 3.2 CONSTRUCTION BY OWNER AND OTHER CONTRACTORS

3.5.1. Delete subparagraphs 3.2.2.1 and 3.2.2.2 in their entirety and substitute "intentionally left blank".

3.5.2. Delete paragraph 3.2.3.2 and replace it with the following:

"3.2.3.2 Co-ordinate and schedule the activities and work of other contractors and *Owner's* own forces with the *Work* of the *Contractor* and connect as specified or shown in the *Contract Documents*,"

3.5.3 Add a new paragraph 3.2.3.4 as follows:

"3.2.3.4 Subject to GC9.4 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 of the *Place of the Work*, including all the responsibilities of the "constructor" under OHSA."

3.5.4 Add new paragraph 3.2.7 as follows:

“3.2.7 At the commencement of the *Work*, the *Contractor* prepare for the review and acceptance of the *Owner* and the *Consultant*, a schedule indicating the times, within the construction schedule referred to in GC 3.4, that items that are specified to be *Owner* purchased and *Contractor* installed or hooked up are required at the site to avoid delaying the progress of the *Work*.

3.6 GC 3.4 CONSTRUCTION SCHEDULE

3.6.1 Further amend paragraph 3.4.1 by adding a new subparagraph 3.4.1.2 as follows:

“3.4.1.2 provide the expertise and resources, such resources including manpower and equipment, as are necessary to maintain progress under the construction schedule referred to in paragraph 3.4.1.1 or any successor or revised schedule approved by the *Owner* pursuant to this GC3.4.”

3.6.2 Delete existing paragraph 3.4.1.2 and replace it with a new paragraph which is numbered 3.4.1.3 and reads as follows:

“3.4.1.3 continuously monitor the progress of the *Work* and provide a monthly progress schedule covering all of the baseline activities and including the actual start, actual finish and percentage completion of those activities. Each month, the *Contractor* shall submit, for the *Owner*’s approval, any changes made to the baseline logic and activity durations.”

3.6.3 Delete existing paragraph 3.4.1.3 and replace it with a new paragraph which is numbered 3.4.1.4 and reads as follows:

“3.5.1.4 if after applying the expertise and resources required under paragraph 3.5.1.2, the *Contractor* forms the opinion that the slippage in 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* if the *Contractor* intends to apply for an extension of Contract Time as provided in PART 6 — CHANGES IN THE WORK.”

3.6.4 Add a new paragraph 3.4.2 as follows:

“3.4.2 Without limiting the other obligations of the *Contractor* under GC3.4, the *Contractor* shall not amend the baseline schedule described in paragraph 3.5.1.1 without the prior written consent of the *Owner*. In addition, at each site construction meeting, the *Contractor* shall provide to the *Owner* and the *Consultant* a two (2) week look-ahead schedule indicating the major activities to be undertaken or constructed in such two (2) week period.”

3.7 GC 3.5 SUPERVISION

3.7.1 Delete paragraph 3.5.2 in its entirety and replace it with the following:

“3.5.2 The supervisor, and any project manager appointed by the *Contractor*, shall represent the *Contractor* at the Place of *Work* and shall have full authority to act on written instructions given by the *Consultant* and/or the *Owner* and the *Owner*’s representative. Instructions given to the supervisor or the project manager shall be deemed to have been given to the *Contractor* and both the supervisor and any project manager shall have full authority to act on behalf of the *Contractor* and bind the *Contractor* in matters related to this Contract.”

3.7.2 Add a new paragraph 3.5.3 as follows:

“3.5.3 The *Owner*, acting reasonably, shall have the right to order the *Contractor* to remove from the *Project* any representative or employee of the *Contractor*, *Subcontractors* or *Suppliers* who, in the opinion of the *Owner*, are a detriment to the *Project*.”

3.8 GC 3.6 SUBCONTRACTORS AND SUPPLIERS

3.8.1 Add a new paragraph 3.6.7 as follows:

“3.6.7 Where provided in the Contract, the *Owner* may assign to the *Contractor*, and the *Contractor* agrees to accept, any contract procured by the *Owner* for *Work* or services required on the *Project* that has been pre-tendered or pre-negotiated by the *Owner*.”

3.9 GC 3.7 LABOUR AND PRODUCTS

3.9.1. Add the following paragraphs below paragraph 3.7.1:

“3.7.1.1 The *Contractor* represents that it has sufficient skilled employees to replace, subject to the *Owner's* approval, acting reasonably, its designated supervisor and project manager in the event of death, incapacity, removal or resignation.

3.7.1.2 The *Contractor* represents and warrants that the *Products* provided for in accordance with the Contract are not subject to any conditional sales contract and are not subject to any security rights obtained by any third party which may subject any of the *Products* to seizure and/or removal from the *Place of the Work*.”

3.9.2. Delete paragraph 3.7.2 and replace it with the following:

“3.7.2 *Products* provided shall be new and shall conform to all current applicable specifications of the Canadian Standards Association, Canadian Standards Board or General Standards Board, ASTM, National Building Code, Ontario Building Code, National Fire Prevention Association, the Technical Standards and Safety Authority (also known as TSSA) and all governmental authorities having jurisdiction at the *Place of the Work*, unless otherwise specified. *Products* which are not specified shall be of a quality consistent with those specified and their use acceptable to the *Consultant*. *Products* brought on to the *Place of the Work* by the *Contractor* shall be deemed to be the property of the *Owner*, but the *Owner* shall be under no liability for loss thereof or damage thereto arising from any cause whatsoever. The said *Product* shall be at the sole risk of the *Contractor*.”

3.9.3. Amend paragraph 3.7.3 by adding the words, “..., agents, Subcontractors and Suppliers. . .” after the “employees” toward the end of line one.

3.9.4. Also with respect to paragraph 3.7.3, add three new sentences to the end of this paragraph which read as follows:

“Without in any way limiting the generality of the foregoing, the *Contractor* shall prepare and implement the job site rules more particularly described in the tender documents. If no job site rules are described in the tender documents, the *Contractor* shall draft job site rules for the review and approval of the *Owner*. Any such job site rules prepared by the *Contractor* shall be consistent with the *Contractors* duties and obligations under the OHSA and shall also include provisions making smoking and the consumption of alcohol or non-prescription drugs on the *Project* site the subject of discipline proceedings and/or termination of employment.”

3.9.5 Add new paragraphs 3.7.4, 3.7.5, 3.7.6, 3.7.7 and 3.7.8 as follows:

“3.7.4 The *Owner* shall provide the *Contractor* in a timely manner with all relevant information (including storage, protection, and installation requirements) regarding *Products* to be supplied by the *Owner* or other contractors and, prior to delivery of any such *Products* to the *Place of the Work*, the *Owner* shall obtain the *Contractor's* written approval of the delivery date and proposed storage, protection and installation requirements.

3.7.5 Once the *Contractor* has accepted delivery of *Products*, the *Contractor* shall be responsible for the safe storage and protection of *Products* as required to avoid dangerous conditions or contamination to the *Products* or other persons or property. *Products* shall be stored in locations and at the *Place of the Work* to the satisfaction of the *Owner* and the *Consultant* as agreed and approved by the

Contractor pursuant to paragraph 3.7.4.”

Notwithstanding the foregoing, the *Contractor* shall not be responsible for any *Products* supplied by the *Owner* or other contractors unless:

- (i) the *Contract Documents* expressly stipulate that such *Product* is to be the *Contractor* as part of the *Work*;
- (ii) the *Contractor* has or has received from the *Owner* proof of insurance coverage sufficient, at a minimum, to cover the replacement cost of such *Product*; and
- (iii) the *Owner* obtained the *Contractor's* approval as required by paragraph 3.7.4.

“3.7.6 Upon receipt of a written notice from the *Consultant*, the *Contractor* shall dismiss from the *Place of the Work* tradesmen and labourers whose *Work* is unsatisfactory to the *Consultant* or who are considered by the *Consultant* to be unskilled or otherwise objectionable.

3.7.7 The *Contractor* shall not employ any persons on the *Work* whose labour affiliation, or lack thereof, is incompatible with other labour employed in connection with the *Work*. Any costs arising from Labour Disputes, as a result of the employ of any such person by the *Contractor*, its Subcontractor or *Suppliers* shall be the sole expense of the *Contractor*.

3.7.8 The *Contractor* shall cooperate with the *Owner* and its representatives and shall take all reasonable and necessary actions to maintain stable and harmonious labour relations with respect to the *Work* at the *Place of the Work*, including cooperation to attempt to avoid *Work* stoppages, trade union jurisdictional disputes and other Labour Disputes.”

3.10 GC 3.8 SHOP DRAWINGS

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

3.10.2 Add the words “and *Submittals*” after the words “*Shop Drawings*” in all paragraphs of Part 3.8.

3.10.3 Delete paragraph 3.8.2 in its entirety and replace it with new paragraph 3.8.2 as follows:

“3.8.2 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 *Submittals* in an orderly sequence.”

3.10.4. Add new paragraphs as follows:

“3.8.8. Reviewed *Shop Drawings* shall not authorize a change in the *Contract Price* and/or the *Contract Time*.

3.8.9. The *Contractor* shall prepare a *Shop Drawings* schedule acceptable to the *Owner* and the *Consultant* prior to the first application for payment. A draft of the proposed *Shop Drawings* schedule shall be submitted by the *Contractor* to the *Consultant* and the *Owner* for approval. The draft *Shop Drawings* schedule shall clearly indicate the phasing of *Shop Drawings* submissions.

3.8.10. Except where the parties have agreed to a different *Shop Drawings* schedule pursuant to paragraph 3.8.3, the *Contractor* shall comply with the requirements for *Shop Drawings* submissions stated in the *Specifications*, Section *Submittals*.

3.8.11. The *Contractor* shall not use the term “by others” on *Shop Drawings* or other *Submittals*. The related trade, Subcontractor or Supplier shall be stated.

3.8.12 Certain *Specifications* sections require the *Shop Drawings* to bear the seal and signature of a professional engineer. Such professional engineer must be registered in the jurisdiction of the *Place of the Work* and shall have expertise in the area of practice reflected in the *Shop Drawings*.

- 3.8.13 The *Consultant* will review and return *Shop Drawings* and *Submittals* in accordance with the Schedule agreed upon in 3.8.3, or, in the absence of such a schedule, with reasonable promptness. If, for any reason, the *Consultant* cannot process the *Shop Drawings* and/or *Submittals* within the agreed-upon schedule or with reasonable promptness, 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 correspondence to changes in the construction schedule. Changes in the *Contract Price* or *Contract Time* may be made only as provided in the *Contract*."

3.11 GC 3.9 PERFORMANCE BY CONTRACTOR

- 3.11.1. Add new General Condition GC 3.9 as follows:

"GC 3.9 PERFORMANCE BY CONTRACTOR

- 3.9.1 In performing its services and obligations under the *Contract*, the *Contractor* shall exercise a standard of care, skill and diligence that would normally be provided by an experienced and prudent contractor supplying similar services for similar projects. The *Contractor* acknowledges and agrees that throughout the *Contract*, the *Contractor's* obligations, duties and responsibilities shall be interpreted in accordance with this standard. The *Contractor* shall exercise the same standard of due care and diligence in respect of any *Products*, personnel, or procedures which it may recommend to the *Owner*.

4 ALLOWANCES

4.1 GC 4.1 CASH ALLOWANCES

- 4.1.1 Delete paragraph 4.1.7 in its entirety and replace it with the following:

- "4.1.7 At the commencement of the *Work*, the *Contractor* shall prepare for the review and acceptance of the *Owner* and the *Consultant* a schedule indicating the times within the construction schedule referred to in GC 3.4 that items called for under cash allowances are required to be delivered to the *Place of Work* to avoid delaying the progress of the *Work*."

- 4.1.2 Add new paragraph 4.1.8 as follows:

- "4.1.8 The *Owner* reserves the right to call, or to have the *Contractor* call, for competitive bids for portions of the *Work* to be paid for from cash allowances."

5 PAYMENT

5.1.1 GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

- 5.1.1 Delete GC5.1 in its entirety and replace it with "Intentionally left blank."

5.2 GC 5.2 APPLICATIONS FOR PAYMENT

- 5.2.1 Delete the word "first" in paragraph 5.2.7 and replace it with the word "second".

- 5.2.2. Add new paragraphs 5.2.9 and 5.2.10 as follows:

- "5.2.9 The *Contractor* shall submit Workplace Safety & Insurance Board Clearance Certificate, with each application for progress payment.

- 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 application for progress payment. The *Consultant* reserves the right to retain a reasonable amount for the value of the as-built *Drawings* not presented for review."

5.3 GC 5.4 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

- 5.3.1 Delete all paragraphs of GC 5.4 in their entirety and replace them with the following paragraphs:

- "5.4.1 When the *Contractor* considers that the *Work* is substantially performed, or if permitted by the lien legislation applicable to the *Place of the Work* a designated portion thereof which the *Owner* agrees to accept separately is substantially performed, the *Contractor* shall, within five (5) *Working Days*, deliver to the *Consultant* and to the *Owner* a comprehensive list of items to be completed or corrected, together with a written application for a review by the *Consultant* to establish *Substantial Performance of the Work* or substantial performance of the designated portion of the *Work*. Failure to include an item on the list does not alter the responsibility of the *Contractor* to complete the *Contract*.
- 5.4.2 The *Consultant* will review the *Work* to certify or verify the validity of the application and shall promptly, and in any event, no later than 10 calendar days after receipt of the *Contractor's* application:
- .1 advise the *Contractor* in writing that the *Work* or the designated portion of the *Work* is not substantially performed and give reasons why, or
 - .2 state the date of *Substantial Performance* of the *Work* or a designated portion of the *Work* in a certificate and issue a copy of that certificate to each of the *Owner* and the *Contractor*.
- 5.4.3 Where the holdback amount required by the applicable lien legislation has not been placed in a separate lien holdback account, the *Owner* shall, no later than 10 calendar days prior to the expiry of the holdback period stipulated in the lien legislation applicable to the *Place of the Work*, place the holdback amount in a bank account in the joint names of the *Owner* and the *Contractor*.
- 5.4.4 Subject to the requirements of any *Payment Legislation*, all holdback amounts prescribed by the applicable lien legislation for the *Place of the Work* shall become due and payable to the *Contractor* no later than 10 *Working Days* following the expiration of the holdback period stipulated in the lien legislation applicable to the *Place of the Work*, as certified or verified by the *Consultant* when permitted by any *Payment Legislation*.
- 5.4.5 The *Contractor* shall submit an application for release of the lien holdback amount in accordance with the lien legislation applicable to the *Place of the Work*. Except to the extent required by any *Payment Legislation*, such application for release of the holdback shall not constitute and application for payment that is subject to *Proper Invoice* requirements.
- 5.4.6 Where legislation permits progressive release of the holdback for a portion of the *Work* and the *Consultant* has certified or verified that the part of the *Work* has been performed prior to *Substantial Performance of the Work*, the *Owner* hereby agrees to release, and shall release the holdback for such portion of the *Work* to the *Contractor* in accordance with such legislation.
- 5.4.7 Notwithstanding any progressive release of the holdback, the *Contractor* shall ensure that such parts of the *Work* are protected pending the issuance of a final certificate for payment or until the *Owner* takes early occupancy in accordance with GC12.2, whichever comes first, and shall be responsible for the correction of defects or work not performed regardless of whether or not such was apparent when the holdback was released."

5.4 GC 5.5 FINAL PAYMENT

- 5.4.1 Add to the end of paragraph 5.5.1 the following sentence:

"The application for final payment shall meet the requirements of a *Proper Invoice*."

- 5.4.2 Add the following to the end of paragraph 5.5.3:

"Subject to any *Payment Legislation*, when the *Consultant* finds the *Contractor's* application for final payment to be not valid, the *Contractor* shall revise and resubmit the application when the *Contractor* has addressed the reasons given by the *Consultant*."

6 CHANGES IN THE WORK

6.1 GC 6.1 CHANGES

- 6.1.1 Amend paragraph 6.1.2 by adding the following to the end of that paragraph:

"This requirement is of the essence and it is the express intention of the parties that any claims by the *Contractor* for a change in the *Contract Price* and/or *Contract Time* shall be barred unless there has been strict compliance with PART VI CHANGES IN THE WORK. No course of conduct or dealing between the parties, no express or implied acceptance of alterations or additions to the *Work* and no claims that the *Owner* has been unjustly enriched by any alteration or addition to the *Work*, whether in fact there is any such unjust enrichment or not, shall be the basis of a claim for additional payment under this Contract or a claim for any extension of the *Contract Time*."

- 6.1.2 Add a new paragraph 6.1.3 as follows:

"The *Contractor* agrees that changes resulting from construction coordination including but not limited to site surface conditions, site coordination, Subcontractor and Supplier coordination are included in the *Contract Price* and shall not entitle the *Contractor* to claim in addition to the *Contract Price* in relation to coordination."

6.2 GC 6.2 CHANGE ORDER

- 6.2.1 Add new paragraph 6.2.3 as follows:

"6.2.3 The value of a change shall be determined in one or more of the following methods as directed by the Owner:

- .1 by estimate and acceptance of a lump sum.
- .2 by unit prices established in the Contract or subsequently agreed upon. Unit Prices shall include overhead, profit, and other reasonable charges of the *Contractor* and shall be the total cost to the Owner. Adjustment to the *Contract Price* shall be based on a net quantity difference from the original quantity.
- .3 by the amount, net of all credits, of time, materials and *Products* expended:
 - (1) by a Subcontractor applying the labour charge out rates set out in the wage schedule in the *Contract Documents* together with the actual costs, without mark-up of materials and *Products* utilized in the change, plus the Subcontractor's mark-up disclosed in the table below which applies to material and Product costs only;
 - (2) by the *Contractor* applying the labour charge out rates set out in the wage schedule in

the *Contract Documents* together with the actual costs, without mark-up, of materials and products plus the mark-up disclosed in the table below which applies to material and Product costs only;

- (3) the *Contractor* shall be entitled to the *Contractor* mark-up in the table below on the value of Subcontractor *Work* even where the Subcontractor is not entitled to a mark-up on its labour charge out rates pursuant to paragraph 6.2.3.3(1).

Change in the <i>Contract Price</i>	Subcontractor Mark-Up (%) (includes overhead and profit)	Contractor Mark-Up (%) On Subcontractor <i>Work</i> (includes overhead and profit)
\$0 to no more than \$5,000	10	10
\$5,001, or more	5	5

Interpretive Note: The mark-ups disclosed in the above table are flat not graduated.

- .4 where the *Contractor* self performs a change pursuant to paragraph 6.2.3.3(2), it shall be entitled to the mark-ups described in the "Subcontractor Mark-Up (%)" column above, subject to the limitation on the mark-up of labour costs described in paragraph 6.2.3.3(2).
- .5 "The mark-ups described in paragraph 6.2.3.3 include all necessary supervision, travel, accommodations, subsistence, general account items, general clean-up, small tools, as-built drawings and job safety necessary to perform the change. Additional bonding cost is excluded from the mark-ups but may be included as a cost, using the value declared for bonding by the *Contractor* in its bid to the Owner, unless otherwise agreed by the parties."

GC 6.3 CHANGE DIRECTIVE

- 6.3.1 Further amend paragraph 6.3.6.3 by adding the following to the end of that paragraph:

"Such allowance for overhead and profit shall be as described in paragraphs 6.2.3.3 and 6.2.3.4."

- 6.3.2 Delete paragraph 6.3.7.1 the introductory language and replace it with the following:

- .1 salaries, wages and benefits paid to personnel in the direct employ of the *Contractor*, applying the labour rates set out in the wage schedule in the *Contract Documents* or as otherwise agreed between the *Owner* and *Contractor* for personnel..."

- 6.3.3 Delete paragraphs 6.3.7.1(1), (2), (3) and (4) and replace them with the following:

- "(1) carrying out the *Work*, including necessary supervisory services;
- (2) intentionally left blank;
- (3) engaged in the preparation of *Shop Drawings*, fabrication drawings, coordination drawings and project record drawings: or...
- (4) including clerical staff engaged in processing changes in the *Work*."

6.3.4 Delete the word “and” from the end of subparagraph 6.3.7.18.

6.3.5 Delete the period from the end of subparagraph 6.3.7.19 and replace it with “; and”.

6.3.6 Add new subparagraph 6.3.7.20 as follows:

“.20 safety measures and requirements.”

6.3.7 Add new paragraph 6.3.14 as follows:

“6.3.14 Without limitation, the cost of performing the *Work* attributable to the Change Directive does not include:

- .1 head office salaries and benefits and all other overhead or general expenses, except only for the salaries, wages and benefits of personnel described in paragraph 6.3.4.2 and the contributions, assessments or taxes referred to in paragraphs 6.3.4.3;
- .2 capital expenses and interest on capital;
- .3 general clean-up, except where the performance of the *Work* in the Change Directive causes specific additional clean-up requirements;
- .4 wages paid for field supervision of *Subcontractors*;
- .5 wages, salaries, rentals, or other expenses that exceed the rates that are standard in the locality of the *Place of the Work* that are otherwise deemed unreasonable by the *Consultant*;
- .6 any costs or expenses attributable to the negligence, improper *Work*, deficiencies, or breaches of contract by the *Contractor* or Subcontractor; and
- .7 any cost of quality assurance, such as inspection and testing services, charges levied by authorities, and any legal fees unless any such costs or fees are pre-approved in writing by the Owner.”

6.4 GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

6.4.1 Add new paragraph 6.4.5 as follows:

“6.4.5 The *Contractor* confirms that, prior to bidding the *Project*, it carefully reviewed the *Place of the Work* and applied to that review the degree of care and skill described in paragraph 3.9.1, given the amount of time provided between the issue of the bid documents and the actual closing of bids, the degree of access provided to the *Contractor* prior to submission of bid, and the sufficiency and completeness of the information provided by the *Owner*. 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 review undertaken in accordance with this paragraph 6.4.5.”

6.5 GC 6.5 DELAYS

6.5.1 Amend paragraphs 6.5.1 by adding the following sentence to the end of the paragraph:

“...Reasonable costs shall only include costs directly flowing from the delay but excluding any consequential, indirect or special damages.”

6.5.2 Delete paragraph 6.5.3 and replace it with the following:

- “6.5.3 If the *Contractor* is delayed in the performance of the *Work* by Force Majeure, then the Contract Time shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The extension of time shall not be less than the time lost as a result of the event causing the delay, unless the *Contractor* agrees to a shorter extension. The *Contractor* shall not be entitled to payment for costs incurred by such delays unless such delays result from the actions of the Owner.”

6.5.3 Add new paragraphs 6.5.6, 6.5.7 and 6.5.8 as follows:

- “6.5.6 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 *Contract Time* shall be extended for such reasonable time as the *Consultant* may decide in consultation with the *Contractor*. The *Owner* shall be reimbursed by the *Contractor* for all reasonable costs incurred by the *Owner* as the result of such delay, including 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 provisions of these General Conditions and any later, actual date of *Substantial Performance of the Work* achieved by the *Contractor*.
- 6.5.7 The *Contractor* shall be responsible for the care, maintenance and protection of the *Work* in the event of any suspension of construction as a result of the delay described in paragraph 6.5.1, 6.5.2 or 6.5.3. In the event of such suspension, the *Contractor* shall be reimbursed by the *Owner* for the reasonable costs incurred by the *Contractor* for such protection, but excluding the costs of the *Contractor's* head office personnel, for such care, maintenance and protection. The *Contractor's* entitlement to costs pursuant to this paragraph 6.5.6, if any, shall be in addition to amounts, if any, to which the *Contractor* is entitled pursuant to paragraph 6.5.1, 6.5.2 or 6.5.3.
- 6.5.8 Without limiting the obligations of the *Contractor* described in GC3.2 or GC9.4, the *Owner* may, by notice in writing, direct the *Contractor* to stop the *Work* where the *Owner* determines that there is an imminent risk to the safety of persons or property at the Place of *Work*. In the event that the *Contractor* receives such notice, it shall immediately stop the *Work* and secure the site. The *Contractor* shall not be entitled to an extension of the Contract Time or to an increase in the *Contract Price* unless the resulting delay, if any, would entitle the *Contractor* to an extension of the Contract Time or the reimbursement of the *Contractor's* costs as provided in paragraph 6.5.1, 6.5.2 or 6.5.3.

6.6 GC 6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE

- 6.5.1 Add the words “as noted in paragraph 6.6.3” after the words “of the claim” in paragraph 6.6.5 and add the words “and the *Consultant*”, at the end of paragraph 6.6.5.

7.1 GC 7.1 OWNER'S RIGHT TO PERFORM THE WORK, STOP THE WORK OR TERMINATE THE CONTRACT

- 7.1.1. Amend paragraph 7.1.2 by adding the words “.....fails or neglects to maintain the latest schedule provided pursuant to GC3.5...”. Immediately following the word “properly” in line one.

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

- 7.2.1. Amend paragraph 7.2.2, in line 1, by deleting “20 *Working Days*” and replacing it with “45 days”.
- 7.2.2. Delete paragraph 7.2.3.1 and replace it with “Intentionally left blank”.
- 7.2.3. Delete paragraph 7.2.3.3 and replace it with the following:

"7.2.3.3 The *Owner* fails to pay the *Contractor* when due the amounts certified by the *Consultant* or awarded by arbitration or a Court, except where the *Owner* has a *bona fide* claim for setoff, or..."

7.2.4. Amend paragraph 7.2.3.4 by deleting the comma toward the end of the first line. Further amend paragraph 7.2.3.4 by deleting the phrase beginning with the word "except" and ending with the word "Owner".

7.2.5. Renumber paragraph 7.2.5 as 7.2.6. Add a new paragraph 7.2.5 as follows:

"7.2.5 If the default cannot be corrected within the five *Working Days* specified in paragraph 7.2.4, the *Owner* shall be deemed to have cured the default if it:

- .1 commences correction of the default within the specified time;
- .2 provides the *Contractor* with an acceptable schedule for such correction; and
- .3 completes the correction in accordance with such schedule.

7.2.6. Delete renumbered paragraph 7.2.6 in its entirety and replace it with the following:

"7.2.6 If the *Contractor* terminates the Contract under the conditions described in this GC7.2, the *Contractor* shall be entitled to be paid for all *Work* performed to the date of termination. The *Contractor* shall also be entitled to recover the direct costs associated with termination, including the costs of demobilization, losses sustained on *Products* and construction machinery and equipment. The *Contractor* shall not be entitled to any recovery for any special, indirect or consequential losses."

8 DISPUTE RESOLUTION

8.1 GC 8.2 ADJUDICATION

8.1.1 Delete the word "prescribed" from paragraph 8.2.1 and substitute the words "provided for".

3.28 GC 8.3 NEGOTIATION, MEDIATION & ARBITRATION

3.28.1 Delete GC 8.3 in its entirety.

3.29 GC 8.4 RETENTION OF RIGHTS

3.29.1. Delete GC 8.4 in its entirety.

9 PROTECTION OF PERSONS AND PROPERTY

9.1 GC 9.1 PROTECTION OF WORK AND PROPERTY

9.1.1 Delete subparagraph 9.1.1.1 in its entirety and replace it with the following:

“9.1.1.1 errors or omissions in the *Contract Documents* which the *Contractor* could not have discovered applying the standard of care described in paragraph 3.9.1;”

9.1.2 Delete paragraph 9.1.2 in its entirety and replace it with the following:

“9.1.2 Before commencing any *Work*, the *Contractor* shall determine the locations of all underground utilities and structures indicated in 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 3.9.1.”

9.1.3. Add a new paragraph 9.1.5 as follows:

“9.1.5 Without in any way limiting the Contractor’s obligations under this GC9.1, should the Contractor or any Subcontractor or Supplier cause loss or damage to trees or other plantings, whether owned by the Owner or third parties, the Contractor shall be liable for the replacement cost of the trees or other plantings damaged, including the cost of any arborist or other Consultant, and such costs may be deducted by the Owner from amounts otherwise owing to the Contractor.”

9.2 GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

9.2.1 Add a new paragraph 9.2.5.5 as follows:

“.5 In addition to the steps described in subparagraph 9.2.5.3, take any further steps it deems necessary to mitigate or stabilize any conditions resulting from encountering toxic or hazardous substances or materials.”

9.2.2 Add the following words to paragraph 9.2.6 after the word “responsible”:

“...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,”

9.3 GC 9.4 CONSTRUCTION SAFETY

9.3.2 Add new paragraphs 9.4.6, 9.4.7 and 9.4.8 as follows:

“9.4.6 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.

- 9.4.7 The *Contractor* shall indemnify and save harmless the *Owner*, its 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.
- 9.4.8 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, will comply with directions and instructions from the *Contractor* with respect to occupational health and safety and related matters. The text of such instruction is attached to these Supplementary Conditions as Appendix 1."

9.4 GC 9.5 MOULD

- 9.4.1. Delete paragraph 9.5.3.3 in its entirety and replace it with the following:

"9.5.3.3 Extend the *Contract Time* for such reasonable time as the *Consultant* may recommend on consultation with the *Contractor* and the *Owner*. 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 the reasonable costs incurred as a result of the delay and as a result of taking those steps, and..."

- 9.4.2 Add the words "and the *Consultant*" after the word "*Contractor*" in subparagraph 9.5.3.4.

10.1 GC 10.1 TAXES AND DUTIES

- 10.1.1 Amend paragraph 10.1.2 by adding the following sentence at the end of the existing paragraph:

"For greater certainty, the *Contractor* shall not be entitled to any mark up for overhead or profit on any increase in such taxes and duties and the *Owner* shall not be entitled to any credit relating to mark up for overhead or profit on any decrease in such taxes."

10 GOVERNING REGULATIONS

10.1 GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

- 10.1.1 Amend paragraph 10.2.2 by replacing the word, "Owner" with "Contractor".
- 10.1.2 Delete from the first line of paragraph 10.2.5 the word, "The" and substitute the words: "Subject to paragraph 3.9.1, the".
- 10.1.3 Further amend paragraph 10.2.5 by adding the following to the end of the second sentence:
- "...and no further *Work* on the affected components of the *Contract* shall proceed until these changes to the *Contract Documents* have been obtained by the *Contractor* from the *Consultant*."
- 10.1.4 Further amend paragraph 10.2.5 by adding the following sentence to the end of the paragraph, as amended:
- "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.”

- 10.1.5. Amend paragraph 10.2.6 by adding the following sentence at the end of that paragraph:

“In the event the *Owner* suffers loss or damage as a result of the *Contractor’s* failure to comply with paragraph 10.2.5, and notwithstanding any limitations described in paragraph 12.1.1, the *Contractor* agrees to indemnify and to hold harmless the *Owner* and the *Consultant* from and against any claims, demands, losses, costs, damages, actions, suits or proceedings resulting from such failure by the *Contractor*.”

12 OWNER TAKEOVER

12.1 GC 12.1 READY-FOR-TAKEOVER

- 12.1.1 After the second occurrence of the term “Ready-for-Takeover” insert before the term “Ready-for-Takeover” in paragraph 12.1.3 the words “determination of”.

12.2 GC 12.2 EARLY OCCUPANCY BY THE OWNER

- 12.2.1 Delete the word “achieve” in paragraph 12.2.4 and replace it with the words “have achieved”.

12.3 GC 12.3 WARRANTY

- 3.41.1 Amend paragraph 12.3.1 by adding the following sentence at the end of that paragraph:

“Where the *Contractor* has been permitted to make use of permanent equipment or systems, as provided in GC3.16, prior to the issuance of the certificate of Substantial Performance of the *Work*, such permanent equipment or system shall be subject to the same warranty as described in this GC12.3 and shall be judged, for purposes of assessing compliance with the warranty, as though the equipment or system was new, clean and unused by the *Contractor*, except for normal commissioning and startup activities, prior to the date of Substantial Performance of the *Work*.”

- 3.41.3. Add a new paragraph 12.3.7 as follows:

“12.3.7 Where required by the *Contract Documents*, provide a maintenance bond as security for the performance of the *Contractor’s* obligations as set out in GC 12.3-Warranty.”

- 3.41.4 Add a new paragraph 12.3.8 as follows:

“12.3.8 The *Contractor* shall assign to the *Owner* all warranties, guarantees or other obligations for *Work*, services or *Products* performed or supplied by any Subcontractor, Supplier or other person in connection with the *Work* and such assignment shall be with the consent of the assigning party where required by law or by the terms of that party’s contract. Such assignment shall be in addition to, and shall in no way limit, the warranty rights of the *Owner* under the *Contract Documents*. Until the expiry of the relevant warranty periods enforceable against the *Contractor*, the *Owner* shall have in its custody all warranties, guarantees and other obligations to third parties respecting the *Work*.”

13 INDEMNIFICATION AND WAIVER

13.1 GC 13.1 INDEMNIFICATION

- 13.1.1 Add new paragraph 13.1.0 as follows:

“13.1.0 The *Contractor* shall indemnify and hold harmless the *Consultant*, its agents and employees from

and against all claims, demands, losses, costs, damages, actions, suits, or proceedings by third parties that arise out of, or are attributable to the *Contractor's* performance of the *Contract*, provided such claims are:

- .1 attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property, and
- .2 caused by negligent acts or omissions of the *Contractor* or anyone for whose negligent acts or omissions the *Contractor* is liable, and
- .3 made by Notice in Writing within a period of 6 years from the *Ready-for-Takeover* date or within such shorter such period as may be prescribed by any limitation statute or the Province or Territory of the *Place of the Work*.

13.1.2 Add the words "13.1.0," after the word "paragraphs" in paragraph 13.1.3.

14 PART 14- OTHER PROVISIONS

14.1.1 Add **GC 14.1 OWNERSHIP OF MATERIALS** as follows:

"14.1 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*, *Products* and materials delivered by the *Contractor* which form part of the *Work* shall be considered the property of the Owner but the *Contractor* shall remove all surplus or rejected materials as its property when notified in writing to do so by the *Consultant*."

14.1.2. Add **GC14.2 CONTRACTOR DISCHARGE OF LIABILITIES** as follows:

"14.2.1 In addition to the obligations assumed by the *Contractor* pursuant to GC3.7, 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*, on the date upon which each such liability becomes due.

14.2.2 The *Contractor* shall cause every Subcontractor and Supplier engaged in the performance of the *Work* to discharge all liabilities incurred by them for labour, materials, services and *Products* used or reasonably required for use in the performance of the *Work*. *Workmen* employed by a Subcontractor or Supplier shall be paid in full at intervals not less frequently than required by the governing law and all liabilities of the *Subcontractors* and *Suppliers* shall be discharged on the date upon which each becomes due. At the request of the Owner, the *Contractor* shall furnish the Owner with satisfactory evidence that its liabilities and those of its *Subcontractors* and *Suppliers* have been discharged."

14.1.2 Add **GC 13.3 AS-BUILT OR RECORD DRAWINGS** as follows:

"13.3 Unless otherwise provided in the *Contract Documents*, the *Contractor* shall prepare as-built or record drawings and provide them to the *Consultant* for review."

14.1.4 Add **GC 13.4 DAILY REPORTS/DAILY LOGS** as follows:

"13.4.1 The *Contractor* shall cause its supervisor, or such competent person as he or she 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*.

- 13.4.2 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 GC3.5, and comparing that resourcing to the resourcing anticipated when the most recent version of the schedule was prepared pursuant to GC3.5.
- 13.4.3 Upon request by the *Owner* or the *Consultant*, the *Contractor* shall make available for inspection and copying all of the records generated pursuant to this GC13.4 along with any other routine *Project* records ordinarily maintained by the *Contractor*."

14.1.5 Add **GC 13.5 CONSTRUCTION LIENS** as follows:

- "13.5 In the event that any construction lien is registered against the *Project* by or through a *Subcontractor* or *Supplier*, and provided the *Owner* has paid all amounts properly due under the *Contract*, and has otherwise complied with its material obligations under the *Contract*, the *Contractor* shall, at its own expense, post the security necessary to vacate or discharge such lien, as the case may be. In the event that a lien action is commenced and a Statement of Claim is issued and served, the *Contractor* shall take all reasonable steps to remove the *Owner* from the main action and to indemnify it and hold it harmless in such action, except where the Statement of Claim makes substantial claims against the *Owner* beyond the recovery of holdback under the *Act*."

14.1.6 Add **GC 13.7 FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY ACT** as follows:

- "13.7.1 Throughout the term of this *Contract*, and for a period of seven years thereafter, the *Owner* and the *Contractor* will protect the confidentiality of all proprietary and confidential information of the other that is disclosed to it and will protect such information with the same standard of care as such party would use to protect the confidentiality of its own proprietary and confidential information which shall be, at a minimum, a reasonable standard, and, in any event, each party shall protect the confidentiality of all such proprietary and confidential information as may be required by law, including, without limitation, as may be required under the *Freedom of Information and Protection of Privacy Act*.
- 13.7.2 Notwithstanding the obligations of the *Owner* described in paragraph 13.7.1, the *Contractor* acknowledges that the *Owner* is subject to the *Freedom of Information and Protection of Privacy Act*, as amended, and may be required to release, in whole or in part, this *Contract* and any other documents or information in the *Owner's* possession or control that relate to this *Contract*."

END OF SUPPLEMENTARY CONDITIONS

1.1 Contract Method

- .1 Single Contract: Construct work under single contract for stipulated price CCDC 2 - 2020, with Supplementary General Conditions.

1.2 Division 01 Requirements

- .1 All Sections of Division 01 apply to all sections of Division 02 to Division 16.

1.3 Regulatory Requirements

- .1 Ontario Building Code: Comply with Ontario Building Code 2012 including all amendments. Maintain one copy at the site.
- .2 Construction Safety: Comply with occupational Health and Safety Act and Ontario Fire Code Ontario Regulation 388/97 and amendments.
- .3 Referenced Standards: Comply with specifications standards produced by various organizations, included in the sections. Use latest edition.
- .4 Comply with local bylaws and regulations.

1.4 Examination

- .1 Examine the site of the project. Investigate the complete extent of work which is indicated in the contract documents. No allowance will be made for any error or negligence to fully understand the work and conditions.
- .2 Examine work of other sections before commencing work of any section. Commencement of new work shall imply acceptance of work by other sections upon which the new work depends.
- .3 Verify dimensions of work prepared by other sections before fabrication of new work.

1.5 Project Coordination

- .1 Coordinate progress of the work, progress schedules, submittals, use of site, temporary utilities, construction facilities and controls.
- .2 Provide information required for preparation of coordination drawings. Prepare interference drawings to properly coordinate the work.
- .3 Check and verify all dimensions referring to the work.

1.6 Utilities & Existing Services

- .1 Before commencing work, establish location and extent of service lines in area of work and notify Consultant of findings.
- .2 Where work involves breaking into existing services to remain, protect existing and carry out work at lines approved by owner and with minimum disturbance to user groups and pedestrian/vehicular traffic.
- .3 Where unknown service lines are encountered, immediately advise Consultant and confirm findings in writing.
- .4 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal off lines at cut-off points as directed by Consultant.
- .5 Arrange and pay for any connection charges.
- .6 Record locations of maintained, rerouted and abandoned service lines.

1.7 New and Modified Service Connections

- .1 All costs associated with the connections to municipal services, electrical services, and communications services are the responsibility of the General Contractor unless noted otherwise in the Cash Allowance Section 1021.

1.8 Permits

- .1 All permit costs will be the responsibility of the General Contractor including permits, inspections, certification etc. associated with either partial occupancy of the project, as per the summary of work, or full occupancy of the project.
- .2 The Owner will submit the application for building permit. The general contractor shall be responsible for all costs associated with the building permit fee and application.

1.9 Air Leakage, Expansion Control and Air/Vapour Barrier

- .1 The General Contractor and all Sub-contractors shall conform to the following requirements to maintain and protect the continuity and integrity of the building air/vapour barrier system.
- .2 Make provisions for expansion, contraction and differential movement between structural frame and wall and roof assemblies.
- .3 Make assembly joints and connections air/vapour tight and provide flexible sealant joints.
- .4 Coordinate installation of all pipes, ducts, conduits and outlets to prevent occurrence of air/vapour leaks in exterior walls. Adequately insulate and provide continuous air/vapour seal at frames and openings at windows, doors, louvres, grilles, ducts, steel members and other openings or projections through walls and roof.
- .5 The vapour barrier is an integral part of the building thermal enclosure and must be maintained intact and continuous on the interior (warm) side of all exterior insulated walls, soffits, overhangs, roofs.
- .6 The vapour barrier membrane is a moisture impermeable sheet and must be maintained in tight physical contact with the interior (warm) side of the insulation and must be sealed air and vapour tight to all designed openings and penetrations and to all other building vapour barrier systems. The vapour barrier is not an air barrier.
- .7 The air barrier is a physically strong and sound barrier designed to resist air movement into or out of a building enclosure and must be able to resist high air pressures without tearing, rupturing or breaking away from its fastening.
- .8 The vapour barrier must be maintained across all expansion and control joints whether indicated and designed or not.
- .9 All Contractors and Sub-contractors and any persons on the site must take all necessary precautions not to puncture, tear, weaken or damage in any way the air/vapour barrier membranes. Any damage shall be sealed to the Architect's approval.
- .10 The vapour barrier membrane must always be protected from the cold in the final building by insulation.

1.10 Materials, Fitments Supplied by Owner

- .1 Include installation of materials, fitments supplied by owner where indicated.
- .2 Provide protected storage on site for materials, fitments and furniture.

1.11 Exterior Wind Load

- .1 Design and install framing, hangers, supports and all accessories required to withstand local wind loads, snow loads and uplifts.

1.12 Concealing Mechanical and Electrical Items

- .1 Drawings are diagrammatic and intended to show general arrangement only.
- .2 Arrange to fully conceal pipes, ducts, conduit components and fitments in finished spaces.

END OF SECTION

1 GENERAL

1.1 Section Includes

- .1 General Description of the Work
- .2 Work by others
- .3 Timing and sequencing of the Work
- .4 Owner occupancy

1.2 Work Covered by Contract Documents

- .1 Work of this Contract comprises of the construction **of a New Outdoor Community Hub and related redevelopment of the existing grounds around the existing municipal office and megadome for the Township of Strong.**
- .2 **The project encompasses the construction of a new 47m² single-storey building using slab-on-grade, wood frame and metal siding clad construction. The new structure primarily consists of three (x3) washrooms, an office and a storage space. Connecting the new structure to existing site services, installation and connection to a new septic system, preparing new and repair existing walkways and parking area as well as site improvements are included in the work.**
- .3 The project site is located at **28 Municipal Lane, Sundridge, Ontario.**

1.3 Work by Others

- .1 The Owner advises that the following work will be completed under separate contract to the Owner. Work of this Project must include provisions for coordinating additional related work, identified in Contract Documents, for following principal items.
 - .1 Supply and installation of signage and graphics.
- .2 For items furnished by the Owner, the responsibilities of the Contractor and Owner are as follows.
 - .1 Owner Responsibilities:
 - .1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.
 - .2 Deliver supplier's bill of materials to Contractor.
 - .3 Arrange and pay for delivery to site in accordance with Progress Schedule.
 - .4 Inspect deliveries jointly with Contractor.
 - .5 Submit claims for transportation damage.
 - .6 Arrange for replacement of damaged, defective or missing items.
 - .7 Arrange for manufacturer's field services; arrange for and deliver manufacturer's warranties and bonds to Contractor.
 - .2 Contractor Responsibilities:
 - .1 Designate submittals and delivery date for each product in progress schedule / Quality Control schedule.
 - .2 Review shop drawings, product data, samples, and other submittals. Submit to Consultant notification of any observed discrepancies or problems anticipated due to non conformance with Contract Documents.
 - .3 Receive and unload products at site.

- .4 Inspect deliveries jointly with Owner; record shortages, and damaged or defective items.
- .5 Handle products at site, including uncrating and storage.
- .6 Protect products from damage, and from exposure to elements.
- .7 Assemble, install, connect, adjust, and finish products.
- .8 Provide installation inspections required by public authorities.
- .9 Repair or replace items damaged by Contractor or Subcontractor on site (under his control).

1.4 Contractor Use of Premises

- .1 Contractor has restricted use of site as strictly defined by extent of contract.
- .2 Preserve safe egress from the building at all times during the execution of the Work and do not impede required exits and access to occupied areas at any time.
- .3 Supply and install temporary signage required to demarcate temporary exit paths to the satisfaction of the Consultant, local building and fire departments.
- .4 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .5 Assume full responsibility for the protection and safekeeping of products under this Contract.
- .6 The Contractor shall preserve all survey coordinates and demarcations for the property.
- .7 Existing Utilities
 - .1 The Contractor shall take every precaution to prevent or minimize disruption to utilities/services including gas, electrical, communications, water, sanitary and storm services.
 - .2 Accidental disruptions must be attended to immediately. Provisions and procedures for such instances should be put in place in anticipation of them occurring and is especially for the gas, electrical, communication and water services to the building.
 - .3 Planned disruptions shall be coordinated with the Owner, the Municipal authorities, the Consultant and the respective utility service provider. All disruptions will be scheduled to best suit the Owner's operations and may need to be carried out during the evening and weekend hours.
- .8 The Contractor shall maintain safe and continuous flow of traffic for nearby buildings. The Contractor will be responsible to provide and delineate detours for traffic to, from and in the vicinity of the site as required.
- .9 Trucks hauling loose materials from or to the site shall have their loads trimmed and their bodies tight to prevent spillage of loads.
- .10 In the event of the contractor's operation causing delay and inconvenience to the flow of traffic on existing roads, the Consultant may restrict the number of trucks driving into the roads during certain hours. The Contractor will have no claim for additional payment as a result of such restrictions.
- .11 Road Closing
 - .1 No existing Provincial Highway or Municipal streets shall be occupied or closed without permission of the governing authority. The Contractor shall notify the Consultant in writing of proposed road closing at least 96 hours in advance of such action, and shall not detour nor restrict traffic until he has received the governing authority's written approval. All traffic restriction shall comply with Municipal and Ministry of Transportation of Ontario Regulations, whichever govern. All work which restricts or detours traffic shall be carried out systematically and expeditiously so as to minimize the inconvenience to vehicular and pedestrian traffic.
 - .2 Any road closure shall be carried out systematically following the sequence of the underground utility installation and the direction of the Consultant.

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- .3 The Contractor will be responsible for the setting up of and maintenance of signage of all traffic routes for local vehicular and pedestrian traffic within the Contract limits in accordance with the requirements of Section 01501.

1.5 Timing of Work

- .1 Time is of the essence in this contract.
- .2 Start construction immediately following the acceptance of the tender by the Owner and permission of Authorities.
- .3 **The proponent will advise of the schedule in the tender form.**
- .4 If any upgrades are required that will require disruption to the facility (for example, but not limited to, fire alarms, heating, ventilation and electrical), the Contractor shall perform such Work during off-hours (ie. evenings and weekends) to accommodate typical facility functions and schedules.
- .5 All remaining Work shall be performed as indicated within the Tender Form.
- .6 The Contractor may work between the hours of 8am to 5pm on all typical weekdays (Monday to Friday). Extended hours and weekend work may be permitted pending prior approval by the Owner. The Contractor shall coordinate work within adjacent occupied areas with the Owner.
- .7 Perform work continuously toward completion. Periods of inactivity on site will not be permitted without prior consent of the Owner.

1.6 Work Sequence and Phasing

- .1 Where owner Occupancy is required, the sequence of the Work must provide for the uninterrupted safe operation, access and use of the facility, by the Owner, staff, residents and visitors.
- .2 Coordinate the sequence of the Work with the Owner's representative to minimize disruption and inconvenience.

1.7 Owner Occupancy

- .1 Cooperate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.8 Partial Owner Occupancy

- .1 Schedule and substantially complete designated portions of Work for Owner's occupancy prior to Substantial Performance of entire Work.
- .2 Owner will occupy designated areas for purpose of storage of furnishings and equipment, installation of equipment.

1.9 Reference Codes, Standards and Regulations

- .1 Where relevant documents applicable to this work exist, follow these criterion, recommendations, and requirements as minimum standards.
- .2 In event of conflict between Codes, Regulations, or Standards, or where work shown is in conflict with these documents, obtain interpretation before proceeding. Failure to clarify any ambiguity will result in an interpretation requiring application of most demanding requirements.

END OF SECTION

11 GENERAL

1.1 Section Includes

- .1 Cash allowances.
- .2 Contingency allowance.

1.2 References

- .1 CCDC 2, 2020, Stipulated Price Contract.
- .2 Project Supplementary Conditions

1.3 Cash Allowances

- .1 Refer to CCDC 2, GC 4.1.
- .2 Include in Contract Price, cash allowances stated herein.
- .3 Cash allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage installation and other authorized expenses incurred in performing Work.
- .4 The Contract Price, and not cash allowance, includes Contractor's overhead and profit in connection with such cash allowance.
- .5 The Contract Price will be adjusted by written order to provide for an excess or deficit to each cash allowance.
- .6 Where costs under a cash allowance exceed amount of allowance, Contractor will be compensated for any excess incurred and substantiated plus an allowance for overhead and profit as set out in Contract Documents.
- .7 Progress payments on accounts of work authorized under cash allowances shall be included in Consultant's monthly certificate for payment.
- .8 A schedule shall be prepared jointly by Consultant and Contractor to show when items called for under cash allowances must be authorized by Consultant for ordering purposes so that progress of Work will not be delayed.
- .9 The overall amount of the cash allowances shall be **\$5,000.00**. This shall include Work specified in respective specification Sections is as follows:
 - .1 Supply of Door Hardware as per Section 08710. Installation to be included in Base Bid.
 - .2 Testing, Inspection and Field Engineering.

1.4 Contingency Allowance

- .1 Refer to CCDC 2, GC 4.2.
- .2 Include in Contract Price a contingency allowance of**\$ 5,000.00**
- .3 Expenditures under contingency allowance will be authorized in accordance with procedures provided in CCDC 2, GC 6.1 Changes CCDC 2, 6.2 Change Order and CCDC 2, 6.3 Change Directive.

END OF SECTION

1 General

1.1 Section Includes

- .1 Coordination Work with other contractors under administration of Architect.
- .2 Scheduled progress meetings.

1.2 Related Sections

- .1 Section 01810, Commissioning.
- .2 Section 01770, Closeout Procedures

1.3 Description

- .1 Coordination of progress schedules, submittals, use of site, temporary utilities, construction facilities and construction Work, with progress of Work of other contractors, under instructions of Consultant.

1.4 Project Meetings

- .1 Schedule and administer bi-weekly project meetings throughout progress of Work as determined by Consultant.
- .2 The Consultants shall prepare for agenda of all meetings. Agenda to include, but not limited to, the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Review of off site fabrication delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Revision to construction schedule.
 - .8 Progress schedule, during succeeding work period.
 - .9 Review submittal schedules: expedite as required.
 - .10 Maintenance of quality standards.
 - .11 Review proposed changes for effect on construction schedule and on completion date.
 - .12 Other business.
- .3 Distribute written notice of each meeting four days in advance of meeting date to Consultant and Owner.
- .4 The client will provide physical space for meetings. The Contractor shall provide a table with adequate furnishings for each meeting.
- .5 Preside at meetings.
- .6 The Consultant shall record minutes. Minutes shall include significant proceedings and decisions, with identification of action by parties.
- .7 Reproduce and distribute copies of minutes promptly after each meeting and transmit to meeting participants and affected parties not in attendance.

1.5 Construction Organization and Start up

- .1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

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- .2 Senior representatives of the Owners, Tenants, Engineers, Consultant, Contractor, major Subcontractors, field inspectors and supervisors shall be in attendance.
 - .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
 - .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
 - .5 Agenda to include following:
 - .1 Appointment of official representative of participants in Work.
 - .2 Schedule of Work, progress scheduling in accordance with Section 01320, Construction Progress Documentation.
 - .3 Schedule of submission of shop drawings, samples, colour chips in accordance with Section 01330, Submittal Procedures.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01510, Temporary Utilities.
 - .5 Delivery schedule of specified equipment in accordance with Section 01320, Construction Progress Documentation.
 - .6 Site security in accordance with Section 01520, Construction Facilities.
 - .7 Proposed changes, change orders, procedures, approvals required, mark up percentages permitted, time extensions, overtime, and administrative requirements (GC).
 - .8 Record drawings in accordance with Section 01780, Closeout Submittals.
 - .9 Maintenance in accordance with Section 01780, Closeout Submittals.
 - .10 Take over procedures, acceptance, and warranties in accordance with Section 01770 Closeout Procedures and 01780 Closeout Submittals.
 - .11 Monthly progress claims, administrative procedures, photographs, and holdbacks (GC).
 - .12 Appointment of inspection and testing agencies or firms in accordance with Section 01450 Quality Control.
 - .13 Insurances and transcript of policies (GC).
 - .6 Comply with Consultant's allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.
 - .7 During construction coordinate use of site and facilities through Consultant's procedures for intra project communications: Submittals, reports and records, schedules, coordination of drawings, recommendations, and resolution of ambiguities and conflicts.
 - .8 Comply with instructions of Consultant for use of temporary utilities and construction facilities.
 - .9 Coordinate field engineering and layout work with Consultant.

1.6 On Site Documents

- .1 Maintain at job site, one copy each of the following:
 - .1 Contract drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed shop drawings.
 - .5 Change orders.
 - .6 Other modifications to Contract.
 - .7 Field test reports.
 - .8 Copy of approved Work schedule.
 - .9 Manufacturer's installation and application instructions.
 - .10 Labour conditions and wage schedules.
 - .11 Building Permit

1.7 Construction Progress & Schedules

- .1 Submit preliminary construction progress schedule in accordance with Section 01320, Construction Progress Documents to Consultant. Schedule shall be coordinated with project schedule established by Contract and Consultant.
- .2 After review, revise and resubmit schedule to comply with revised project schedule.
- .3 During progress of Work revise and resubmit as directed by Consultant.

1.8 Submittals

- .1 Make submittal to Consultant for review.
- .2 Submit preliminary shop drawings, product data and samples in accordance with Section 01330 for review for compliance with Contract Documents; for field dimensions and clearances, for relation to available space, and for relation to Work of other contracts. After review, revise and resubmit for transmittal to Consultant.
- .3 Submit requests for payment for review, and for transmittal to Consultant.
- .4 Submit requests for interpretation of Contract Documents, and obtain instructions through Consultant.
- .5 Process substitutions through Consultant.
- .6 Process change orders through Consultant.
- .7 Deliver closeout submittals for review and preliminary inspections, for transmittal to Consultant.

1.9 Coordination Drawings

- .1 Provide information required by Consultant for preparation of coordination drawings.
- .2 Review and approve revised drawings for submittal to Consultant

1.10 Closeout Procedures

- .1 Notify Consultant when Work is considered ready for Substantial Performance.
- .2 Accompany Consultant on preliminary inspection to determine items listed for completion or correction.
- .3 Comply with Consultant's instructions for correction of items of Work listed in executed certificate of Substantial Performance and for access to Owner occupied areas.
- .4 Notify Consultant of instructions for completion of items of Work determined in Consultant's final inspection.

END OF SECTION

1 GENERAL

1.1 Section Includes

- .1 Schedule, form, content.
- .2 Scheduled revisions.

1.2 Related Sections

- .1 Section 01770 Closeout Procedures.

1.3 Schedules Required

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

1.4 Format

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

1.5 Submission

- .1 Submit initial format of schedules within 15 working days after award of Contract.
- .2 Submit schedules in electronic format through email as pdf files.
- .3 Submit 3 hardcopies to be retained by Consultant and Owner.
- .4 Consultant will review schedule and provide comments within 15 days after receipt.
- .5 Resubmit finalized schedule within 7 days after return of review copy.
- .6 Submit revised progress schedule with each application for payment.
- .7 Distribute copies of revised schedule to:
 - .1 Job site office.
 - .2 Subcontractors.
 - .3 Other concerned parties.
- .8 Instruct recipients to report to Contractor within 10 days, any problems anticipated by timetable shown in schedule.

1.6 Submittals Schedule

- .1 Include schedule for submitting shop drawings, product data and samples.
- .2 Indicate dates for submitting, review time, re-submission time, last date for meeting fabrication schedule.

END OF SECTION

1 General

1.1 Section Includes

- .1 Shop drawings and product data.
- .2 Samples.
- .3 Certificates and transcripts.

1.2 Related Sections

- .1 Section 01320 - Construction Progress Documentation.
- .2 Section 01450 - Quality Control.
- .3 Section 01820 - Demonstration and Training.
- .4 Section 01780 - Closeout Submittals.
- .5 Section 15075 - Mechanical Identification.

1.3 References

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2, 2020, Stipulated Price Contract.

1.4 Administrative

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

1.5 Contract Security.

- .1 Contractor shall acquire at his expense the following bonds:
 - .1 50% Performance Bond
 - .2 50% Labour and Materials Bond
- .2 Submit required Bonds prior to commencing work on site.

- .3 Bonds shall be issued by a surety company acceptable to the Consultant and kept in force until expiration of the Contract.

1.6 Certificates and Transcripts

- .1 Prior to commencing work on site, and with each application for progress payment submit Clearance Certificate from Workplace Safety & Insurance Board.
- .2 Prior to commencing work on site, in accordance with GC 11.1, submit:
 - .1 Certificate of General Liability Insurance.
 - .2 Certificate of "All Risk" Property and Boiler Insurance.
- .3 Re-submit insurance certificates prior to expiration dates of certificates submitted.

1.7 Contract Cost Breakdown

- .1 Refer to GC 5.2.
- .2 Submit a breakdown of the Contract Price into items related to components of the Work. Items must be small enough to permit analysis of percentage of completion.
- .3 Submit breakdown a minimum of two weeks prior to first application for payment, for approval of the Consultant.
- .4 Include in the breakdown, a line item in the value of **\$2,000** for the submission of administrative documents required under Divisions 00 to 14 (e.g. construction schedule, shop drawing schedule, maintenance manuals, as-built drawings, etc.) by the Contract Documents. This cost is included in the Base Bid and is not a cash allowance.
- .5 Where Phases are involved, the Price Breakdown shall be broken out per phase of construction.

1.8 Building Permit

- .1 Arrange, acquire and pay for all permits and fees required.
- .2 Submit copy of building permit to Consultant, prior to commencing work on Site.
- .3 The Contractor shall submit to the Consultant the original copy of the reviewed Building Permit application contract documents for review within 48 hours of receipt of the Building Permit.

1.9 Shop Drawings and Product Data

- .1 Refer to CCDC 2 GC 3.11.
- .2 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.

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- .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
-
- .3 After Consultant's review, distribute copies.
 - .4 Submit 6 prints of shop drawings for each requirement requested in specification Sections and as consultant may reasonably request.
 - .5 Delete information not applicable to project.
 - .6 Supplement standard information to provide details applicable to project.
 - .7 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and re-submission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

1.10 Samples

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

1.11 Mock-ups

- .1 Erect mock-ups in accordance with 01450 - Quality Control.

END OF SECTION

1 GENERAL

1.1 Section Includes

- .1 Inspection and testing, administrative and enforcement requirements.
- .2 Tests and mix designs.
- .3 Mock ups.
- .4 Mill tests.
- .5 Equipment and system adjust and balance.

1.2 Related Sections

- .1 Section 01021 Allowances.
- .2 Section 01330 Submittal Procedures.
- .3 Section 01780 Closeout Submittals.

1.3 References

- .1 CCDC 2, Stipulated Price Contract.

1.4 Inspection

- .1 Refer to CCDC 2, GC 2.3.
- .2 Allow Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant instructions, or law of Place of Work.
- .4 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .5 Consultant may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Owner shall pay cost of examination and replacement.

1.5 Independent Inspection Agencies

- .1 Independent Inspection/Testing Agencies will be engaged by Consultant for purpose of inspecting and/or testing portions of Work.
- .2 Allocated costs: to Section 01021, Allowances.
- .3 Provide equipment required for executing inspection and testing by appointed agencies.
- .4 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .5 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant at no cost to Consultant. Pay costs for retesting and re-inspection.

1.6 Access to Work

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

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- .2 Cooperate to provide reasonable facilities for such access.

1.7 Procedures

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

1.8 Rejected Work

- .1 Refer to CCDC, GC 2.4.
- .2 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re execute in accordance with Contract Documents.
- .3 Make good other Contractor's work damaged by such removals or replacements promptly.
- .4 If in opinion of Consultant it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner may deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Consultant.

1.9 Reports

- .1 Submit (4) copies of inspection and test reports to Consultant.
- .2 Provide copies to Subcontractor of work being inspected or tested manufacturer or fabricator of material being inspected or tested.

1.10 Tests and Mix Designs

- .1 Furnish test results and mix designs as may be requested.
- .2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Consultant and may be authorized as recoverable.

1.11 Mock ups

- .1 Prepare mock ups for Work as indicated. Include for Work of all Sections required to provide mock ups.
- .2 Construct in all locations acceptable to Consultant as specified in specific Section.
- .3 Prepare mock ups for Consultant review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.
- .4 Failure to prepare mock ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 If requested, Consultant will assist in preparing a schedule fixing dates for preparation.
- .6 Remove mock up at conclusion of Work or when acceptable to Consultant.

1.12 Mill Tests

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- .1 Submit mill test certificates as requested required of specification Sections.

1.13 Equipment and Systems

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

END OF SECTION

1 General

1.1 Requirements Included

- .1 Barriers
- .2 Environmental Controls
- .3 Construction Aids
- .4 Use of the work
- .5 Traffic controls
- .6 Utilities
- .7 Protection
- .8 Office and sheds
- .9 Project identification
- .10 Progressive cleaning

1.2 Related Requirements

- .1 Section 01450: Site construction mock-ups.

1.3 Installation/Removal

- .1 Provide construction facilities and temporary controls in order to execute the work expeditiously and as may be required by health and safety legislation.
- .2 Remove from site all such work after use.

1.4 Hoarding

- .1 Provide rigid hoarding, protecting occupants, public and private property from injury or damage. Provide lockable gates within hoarding for access to site by workers and vehicles.
- .2 Erect fencing around perimeter of site to protect the public, workers, public and private property from injury or damage as required.
- .3 Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to building.
- .4 Provide barriers around trees and plants designated to remain. Protect from damage.

1.5 Guard Rails and Barricades

- .1 Provide secure, rigid guard railings and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.
- .2 Provide a protection as required by governing authorities.

1.6 Weather Enclosures

- .1 Provide weathertight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs. Close off floor areas where walls are not finished; seal off other openings; enclose building interior work area for temporary heat.

1.7 Weather Protection of Existing Building

- .1 Conduct the Work at all times in such a manner as to prevent the ingress of precipitation into the existing building space or existing building elements, and repair promptly any damage which results from any ingress of precipitation in areas adjacent to the Work.
- .2 Ensure that existing roof drains are functional and not obstructed during the course of the Work and make temporary provision for harmless drainage of water from the roof, should the flow to roof drains be unavoidably obstructed.
- .3 Protect the existing PVC roofing membrane from damage during the course of the Work, with a complete covering of rigid panels such as plywood, over the roof surface, laid in such a manner as to facilitate movement of workers and materials on the existing roof while preventing damage to the existing membrane.
- .4 Prior to removal of the existing roofing membrane, cover and seal against water penetration all new vertical elements including but not limited to load-bearing masonry walls, during periods of precipitation and at all times when not required to be uncovered to advance the Work.
- .5 Ensure that materials installed to protect against water infiltration are installed to withstand the effects of high winds and other foreseeable weather conditions.
- .6 Monitor weather protection installations periodically, in response to weather conditions, and not less than once per day including during periods of inactivity on site such as weekends and holidays, and repair any damage to weather protection immediately.
- .7 Provide the Owner with contact names and phone numbers of one person and one alternate person who will, upon notification by a representative of the Owner of the ingress of water into the building, at any time, take immediate and appropriate action to stop any such ingress.

1.8 Dust, Sound and Access Barriers

- .1 Construct rigid temporary barriers complete with sound attenuating batt insulation in stud wall cavity to protect adjacent areas from dust, sound and access between occupied portions of the building and all construction activity, which provide for the security and safety of residents, staff and visitors at all times. Install sealed, lockable doors c/w required hardware as required to keep areas secure and airtight.
- .2 All plenums, attics, HVAC and similar ductwork and openings shall be sealed to prevent dust accumulation and travel into occupied areas.
- .3 In addition to the above, provide dust tight screens or partitions to localize dust generating activities, and for the protection of workers, finished areas of work, residents, staff and visitors.
- .4 Maintain and relocate barriers and screens until such work is complete.

1.9 Scaffolding

- .1 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, temporary stairs and other such equipment as may be required in a manner which meets the requirements of governing authorities.

1.10 Hoisting

- .1 Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
- .2 Hoists and cranes shall be operated by qualified operator.

1.11 Elevators and Lifts

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- .1 Provide protective coverings for finish surfaces of all lifts, cars and entrances, during construction operations.

1.12 Dewatering

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.13 Site Storage/Loading

- .1 Confine the Work and the operations of employees to limits indicated by the Contract Documents. Do not unreasonably encumber the premises with products.
- .2 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger the Work.
- .3 A limited portion of the site will be made available for use by the Contractor during each Phase. The Contractor must restrict the storage of materials and equipment to these areas.
- .4 During all phases, deliveries to and waste removal from the building, required for the operation of the facility, must pass through the area designated for Contractor's use during the current Phase. Facilitate safe passage of such vehicles and personnel through the zone of construction activity, and do not unreasonably restrict deliveries or pick-ups.

1.14 Access to Site

- .1 Provide, maintain and repair existing parking lots, roads, sidewalk crossings.
- .2 Provide and maintain temporary ramps and construction runways as may be required for access to the Work, and for use by Owner and public.

1.15 Streets and Traffic Control

- .1 The Contractor shall provide all necessary flagmen, detour signs, warning lights, signs and barricades necessary to notify, direct and protect pedestrian and vehicular traffic en route to and from and within the project limits, and shall conduct his operations to ensure the safety and avoid inconvenience to the travelling public and nearby residents and facility users.
- .2 The Contractor shall maintain access streets to the site clean of dust, mud and debris. The Consultant may request that the Contractor sweep such access streets, if in the opinion of the Consultant the Contractor's operations have created the need. No payment to the Contractor for such demands will be made.

1.16 Construction Parking

- .1 **Parking** will be permitted on site provided it does not disrupt performance of Work or Occupancy.
- .2 Provide and maintain adequate access to project site.
- .3 If authorized to use existing roads for access to project site, make good damage resulting from Contractors' use of roads.

1.17 Sanitary Facilities

- .1 Unless otherwise noted, provide sufficient sanitary facilities for workers in accordance with local health authorities.

- .2 Use of the existing building facilities is permitted within the basement washroom of the facility, pending that the Contractor maintains in clean and working conditions to the approval of the Owner.
- .3 Maintain in clean condition. Repair all damage as needed if caused by Contractor.

1.18 Water Supply

- .1 Water required for construction will be provided at no cost by the Owner from the existing building pending that water not be wasted. The Owner reserves the right to require the Contractor to pay the cost of water if water is found to be wasted.

1.19 Temporary Heating & Ventilation

- .1 Temporary heating for the work area (interior only) will be provided at no cost by the Owner.
- .2 Ventilation maybe limited during construction period, including attendance, maintenance, and fuel, in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against dampness and cold.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
 - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .2 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress, unless indicated otherwise in specifications and ensure that the comfort of residents and staff in adjacent occupied spaces is not adversely affected by temperature.
- .3 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .4 Maintain strict supervision of operation of temporary ventilating equipment to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct fired combustion units to outside.
- .5 On completion of Work for which the permanent heating system is used, replace filters, and turn over equipment in new condition.
- .6 Date of Substantial Performance and Warranties for heating system do not commence until entire system is in as near original condition as possible and is so certified by Consultant.
- .7 Pay costs for maintaining temporary heat, when using permanent heating system.
- .8 The existing or the new permanent heating and ventilating systems of the building or portions thereof, may be used when available and when approved by the Consultant and the Owner. Be responsible for damage to permanent heating system.
- .9 Be responsible for damage to the Work due to failure in providing adequate heat and protection during construction.

1.20 Temporary Power and Light

- .1 Within reason, the Contractor may use the power readily supplied within the area of Work.
- .2 Pay all costs for the installation and distribution of temporary power and lighting.
- .3 Arrange for connection with appropriate utility company. Pay all costs for installation, maintenance and removal.
- .4 Interruption of electrical power supply to the building, for purpose of service upgrading and transformer installation must be minimized and under no circumstances may power to the building be interrupted for more than 12 consecutive hours.
- .5 Provide and maintain temporary lighting throughout the project. The level of illumination on all floors and stairs shall not be less than 15 foot candles.

1.21 Temporary Telephone and Communications

- .1 Provide and pay for the temporary communication services for own use and use of Consultant and Owner.
- .2 Provide Site Superintendent with mobile telephone to be carried on his person during normal working hours complete with message recording service.
- .3 Provide one email service, printer, and fax for direct electronic communication to Site.

1.22 Utilities, Fences and Private Property

- .1 The Contractor shall be responsible for the protection of all utilities, fences and private property at the job site during the time of construction.
- .2 Utilities
 - .1 General
 - .1 The Contractor shall pay all costs deemed necessary by the Utility authorities to provide all protective measures within the limits of the Contract. The Contractor shall remain responsible for any unauthorized disruptions of service and any damage to utilities arising out of the Contractor's work, notwithstanding such protection. The Utility authorities will carry out all the work of temporary rearranging and shielding of lines deemed necessary. The cost of all such protective measures, together with the cost of restoring the lines to their original state and location, will be at the expense of the Contractor, and will be billed to the Contractor by the Utility authority.
 - .2 Whenever, in the opinion of the Utility authority, standby crews are necessary during blasting operations, the Contractor shall make the necessary arrangements with the Utility authority and the cost of such crews and equipment shall be billed to the Contractor by the Utility authority. These measures will apply to those utilities located within all blasting areas.
 - .3 The Contractor shall notify in writing the appropriate Utility Companies of construction commencement, with a copy submitted to the Contract Administrator within 3 business days of being granted permission to start work.
 - .4 The Contractor shall notify the appropriate Utility Companies one week in advance of any rock blasting, with a copy submitted to the Contract Administrator within 3 business days.
 - .2 Adjacent Structures and Utilities

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- .1 Perform temporary and permanent support and temporary relocation and replacement of underground or overhead utilities.
 - .2 Permanent relocation of underground or overhead utilities will be carried out by others, if necessitated by coincidence of lines or grades.
 - .3 Existing Drainage and Water Supply
 - .1 Maintain temporary and permanent flow in all sewers, watermains, drains, gutters, ditches, watercourses, house and inlet connections.
 - .2 Maintain the flow in and from the existing utility mains and services by whatever means or material that is necessary until the Consultant permits the use of the constructed main. Include all cost for maintaining flow in the tender prices for sewer and water pipe construction related items.
 - .4 Support of Permanent Underground Utilities
 - .1 Where permanent pipes are uncovered or during the construction of new systems, it is found that the pipes cross each other, the Consultant may direct that concrete be placed to provide support for the pipes. The concrete shall be placed as directed and in locations as determined by the Consultant. The concrete shall be measured in place and payment made in accordance with the allowances of the contract.
 - .2 Where permanent existing services have been uncovered during excavation of trenches for installation of utility mains the Consultant may require a 50 mm x 150 mm creosote wood plank be placed under each pipe on a thoroughly compacted bed throughout the entire width of excavation so that this pipe is fully supported by the timber. Sand cushion material shall be surrounding each pipe and be of no less than 150 mm thickness from the outside diameter of the pipe, hand compacted and backfilled as directed by the Contract Administrator. Wooden planks to be provided by the Town.
 - .3 Place concrete in accordance with the direction of the Consultant. Supply and place concrete in accordance with OPSS 904.
 - .5 Support of Gas Pipelines
 - .1 General
 - .1 The following applies to all excavations of gas company underground plant.
 - .2 Gas pipelines shall be supported at all times to prevent damage to the pipeline from deflection due to its own weight plus any other load that may be imposed on it.
 - .2 Temporary Support
 - .1 A suitable method of supporting gas pipelines shall be used when an excavation will result in unsupported pipe spans exceeding the maximum spans permitted by the gas company. Provide suitable, temporary support acceptable to the gas company.
 - .2 Temporary support shall remain in place until permanent support is provided and shall be inspected at least every three weeks by personnel from the gas company.
 - .3 Permanent Support
 - .1 Permanent support of a gas pipeline shall be provided by either a properly compacted backfill method or a structural method. A properly compacted backfill method is preferred.
 - .2 Where proper support cannot be provided with backfill material, permanent structural supports shall be installed. The appropriate gas authority shall provide some typical designs. Where these designs are not suitable, the Engineer shall be consulted for a custom design.
 - .6 Protection and Locations
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- .1 Prior to commencing any excavation work, notify applicable utility authorities, establish location and state of use of buried services. Clearly mark such locations to prevent disturbances during work.
 - .2 Maintain and protect from damage, water, sewer, gas electric or other utilities encountered.
 - .3 Obtain direction of Owner of utility and Consultant before moving or otherwise disturbing utility.
 - .4 Utilities that require permanent relocation will be the responsibility of the utility company concerned at no expense to the Contractor. Cooperate with the utility companies who shall have free access to their plant at all times.
 - .5 Where existing pipes, ducts, or other underground services intersect the pipe trench, support the pipe trench to the approval of the Consultant and the utility company.
 - .6 Where existing overhead poles are adjacent to the excavation, temporarily support them to the approval of the Consultant and the utility company concerned.
 - .7 Notify Fire Department of any planned or accidental interruption of water supply to hydrants.
 - .8 The position of all pole lines, conduits, watermains, sewers and other underground and overground utilities and structures is not necessarily shown on the contract drawings, and, where shown, the accuracy of the position of such utilities and structures is not guaranteed and the Owner disclaims, on behalf of himself and those responsible for such drawings, all liability with respect to same. Before starting work, the Contractor shall inform himself of the exact locations of such utilities and structures, and shall be liable for damages to them as a result of any act or omission, whether or not the result of negligence, by those for whom he is responsible. The Contractor waives any claim and releases the Owner and the agents of the Owner from all liability for damages suffered as a result of such contract drawings. Size, depth and location of existing utilities as shown is for guidance only; completeness and accuracy of information is not guaranteed.
 - .9 Protect existing buildings, trees and other plants, lawns, fencing, service poles, wires or paving located within right of way or adjoining properties from damage while work is in progress and repair damage resulting from work.
 - .10 Where excavation necessitates root or branch cutting, do so only under direct control of the Consultant.
 - .11 Whenever shoring, sheeting, timbering and bracing of excavations is required, engage services of a Professional Engineer to design and assume the responsibility for adequacy of shoring and bracing. Professional Engineer to be registered in province or territory in which work is to be carried out.
 - .12 When requested, submit for review, drawings and calculations signed and stamped by Professional Engineer responsible for their preparation. Close sheeting, when required, to be designated and constructed to prevent adjacent soil or water from entering excavation.
 - .13 Maintain unobstructed access to fire and police appurtenances, telephone, electric, water, sewer, gas, or other public utilities and private properties.
 - .14 Immediately take all necessary action for the repair of damaged utilities and pay all cost for the repair work.
 - .15 Refer to existing utility information that may be contained in this Contract.
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- .7 Private Lands
 - .1 The Contractor shall not enter upon or occupy with men, equipment or materials of any nature or store any materials on any private property unless he has obtained a consent from the property owner and a copy of such consent has been furnished to the Consultant.
 - .2 Any resulting costs for occupying private lands shall be at the Contractor's expense.

1.23 Fire Protection

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.
- .2 Open fires and burning of rubbish are not permitted on the site.
- .3 Fire Routes: Maintain access to property including overhead clearances for use by emergency response vehicles.

1.24 First Aid

- .1 The Contractor shall provide and maintain on the site where construction is being carried out, completely equipped first aid facilities in a clean orderly condition, which shall be readily accessible at all times to all his employees and the Consultant and his staff.
- .2 The Contractor shall designate certain employees who are properly instructed to be in charge of first aid. At least one such employee shall always be available on the site while work is being carried on.
- .3 A telephone call list for summoning aid such as doctors, ambulances, and rescue squads from outside sources shall be conspicuously posted.

1.25 Protection of Building Finishes & Equipment

- .1 Provide protection for the existing facility and for new finished and partially finished building components and equipment during performance of Work.
- .2 Provide necessary screens, covers, hoardings as required.
- .3 Be responsible for damage incurred due to lack of or improper protection.

1.26 Security

- .1 Provide and pay for responsible security personnel to guard the site and contents of the site after working hours and during holidays as required. Decision to provide security personnel resides solely with the Contractor.

1.27 Spills Reporting

- .1 Spills or discharges of pollutants or contaminants under the control of the Contractor, and spills or discharges of pollutants or contaminants that are a result of the Contractor's operations that cause or are likely to cause adverse effects shall forthwith be reported to the Engineer. Such spills or discharges and their adverse effects shall be as defined in the Environmental Protection Act R.S.O. 1980.
- .2 All spills or discharge of liquid, other than accumulated rain water, from luminaries, internally illuminated signs, lamps, and liquid type transformers under the control of the Contractor, and all spills or discharges from this equipment that are a result of the Contractor's operations shall, unless otherwise indicated in the Contract, be assumed to contain PCB's and shall forthwith be reported to the Consultant.
- .3 This reporting will not relieve the Contractor of his legislated responsibilities regarding such spills or discharges.

1.28 Protection of Water Quality

- .1 At all times, the Contractor shall maintain existing stream flows and shall control all construction work so as not to allow sediment or other deleterious materials to enter streams.

- .2 No waste or surplus organic material including topsoil is to be stored or disposed of within 30 metres of any watercourses. Run-off from excavation piles will not be permitted to drain directly into watercourses but shall be diffused onto vegetative areas a minimum of 30 metres from the watercourse. Where this measure is not sufficient or feasible to control sediment entering the watercourses, sedimentation traps or geotextile coverage will be required.
- .3 If dewatering is required, the water shall be pumped into a sedimentation pond or diffused onto vegetated areas a minimum of 30 metres from the watercourses and not pumped directly into the watercourses.
- .4 No machinery shall enter the creek bed of any watercourse. Movement of construction equipment in the vicinity of any creek shall be limited to the minimum required for construction.
- .5 The Contractor shall not carry out equipment maintenance or refueling or store fuel containers within 100 metres of any watercourse. The Contractor shall not stockpile construction debris or empty fuel/pesticide containers within the Contract limits.

1.29 Offices

- .1 Provide and maintain in clean condition during progress of Work, adequately lighted, heated and ventilated Contractor's office with space for filing and layout of Contract Documents and contractors normal site office staff, and site meetings.
- .2 Provide adequate required first aid facilities.
- .3 Subcontractors may provide their own offices upon approval from Owner.
- .4 The Owner shall review and govern locations of all offices. If relocation is required by the sole discretion of the Owner, the Contractor shall relocate as required.

1.30 Equipment/Tool/Materials Storage

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

1.31 Construction Signs

- .1 Erect Owner and Consultant project signs, in location(s) as designated by the Consultant.
- .2 Provide lumber framing as required to provide secure, wind resistant installation. Brace as required.
- .3 Maintain sign in good condition for the duration of Work. Clean periodically.

1.32 Project Cleanliness

- .1 Maintain the Work in tidy condition, free from the accumulation of waste products and debris.
- .2 Remove waste material and debris from the site and deposit in waste container at the end of each working day.
- .3 Clean interior areas prior to start of finish work, maintain areas free of dust and other contaminants during finishing operations.

1.33 Workplace Hazardous Material Information System (WHMIS)

- .1 Prior to the commencement of work, the Contractor shall provide, to the Consultant, a list of those products controlled under the WHMIS, which he expects to use on the contract. Related Material

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- Safety Data Sheets shall accompany the submission. All containers used in the application of products controlled under WHMIS shall be labelled.
- .2 The Contractor shall notify the Consultant of changes to the list in writing and provide relevant material Safety Data Sheets.

END OF SECTION

1 GENERAL

1.1 Section Includes

- .1 Product quality, availability, storage, handling, protection, and transportation.
- .2 Manufacturer's instructions.
- .3 Quality of Work, coordination and fastenings.

1.2 Related Sections

- .1 Section 01450, Quality Control.
- .2 Section 01730, Execution.

1.3 Reference Standards

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2 2020, Stipulated Price Contract.
- .2 Within the text of the specifications, reference may be made to the following standards:

ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
ASTM	American Society of Testing and Materials
AWMAC	Architectural Woodwork Manufacturers Association of Canada
CEC	Canadian Electrical Code including Ontario Supplement (published by CSA)
EEMAC	Electrical and Electronic Manufacturers Association of Canada
CGSB	Canadian General Standards Board
CISC	Canadian Institute of Steel Construction
CLA	Canadian Lumberman's Association
CPCA	Canadian Painting Contractors' Association
CPCI	Canadian Prestressed Concrete Institute
CRCA	Canadian Roofing Construction Association
CSA	Canadian Standards Association
FM	Factory Mutual Engineering Corporation
IEEE	Institute of Electrical and Electronic Engineers
IPCEA	Insulated Power Cable Engineers Association
NAAMM	National Association of Architectural Metal Manufacturers
NBC	National Building Code
NEMA	National Electrical Manufacturers Association
OPSD	Ontario Provincial Standards for Roads & Municipal Services
TTMAC	Terrazzo, Tile and Marble Association of Canada
ULC	Underwriters' Laboratories of Canada
- .3 Conform to these standards, in whole or in part as specifically requested in specifications.
- .4 If there is question as to whether any product or system is in conformance with applicable standards, Consultant reserves right to have such products or systems tested to prove or disprove conformance.
- .5 The cost for such testing will be born by Owner in event of conformance with Contract Documents or by Contractor in event of non-conformance.

- .6 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.

1.4 Quality

- .1 Refer to CCDC 2, GC 3.9.
- .2 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of Products provided.
- .3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .4 Should any dispute arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.
- .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.5 Availability

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

1.6 Storage, Handling and Protection

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

1.7 Transportation

- .1 Pay costs of transportation of products required in performance of Work.

1.8 Manufacturer's Instructions

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant may establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Consultant to require removal and re installation at no increase in Contract Price or Contract Time.

1.9 Quality of Work

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

1.10 Coordination

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

1.11 Concealment

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

1.12 Remedial Work

- .1 Refer to CCDC 2, GC 3.13 and Section 01730 Execution.
- .2 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.
- .3 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.13 Location of Fixtures

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

1.14 Fastenings

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use non corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.15 Fastenings and Equipment

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

1.16 Protection of Work in Progress

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

1.17 Existing Utilities

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

END OF SECTION

1 GENERAL

1.1 Section Includes

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

1.2 Related Sections

- .1 Section 01110 Summary of Work.
- .2 Section 01330 Submittal Procedures.
- .3 Individual product Sections: cutting and patching incidental to work of section. Advance notification to other sections required.

1.3 Submittals

- .1 Submit written request in advance of cutting or alteration which affects:
 - .1 Structural integrity of any element of Project.
 - .2 Integrity of weather exposed or moisture resistant elements.
 - .3 Efficiency, maintenance, or safety of any operational element.
 - .4 Visual qualities of sight exposed elements.
 - .5 Work of Owner or separate contractor.
- .2 Include in request:
 - .1 Identification of Project.
 - .2 Location and description of affected Work.
 - .3 Statement on necessity for cutting or alteration.
 - .4 Description of proposed Work, and products to be used.
 - .5 Alternatives to cutting and patching.
 - .6 Effect on Work of Owner or separate contractor.
 - .7 Written permission of affected separate contractor.
 - .8 Date and time work will be executed.

1.4 General

- .1 Execute cutting, fitting, and patching including excavation and fill, to complete the Work.
- .2 Fit the several parts together, to integrate with other work.
- .3 Uncover work to install ill-timed work.
- .4 Remove and replace defective and non-conforming work.
- .5 Remove samples of installed work for testing.
- .6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical work.

1.5 Preparation

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

- .5 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

1.6 Execution

- .1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.
- .5 Remove samples of installed Work for testing.
- .6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .7 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .8 Employ original installer to perform cutting and patching for weather exposed and moisture resistant elements, and sight exposed surfaces.
- .9 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .10 Restore work with new products in accordance with requirements of Contract Documents.
- .11 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .12 At penetration of fire rated walls, ceilings, or floor constructions, completely seal voids with firestopping material, full thickness of the construction element.
- .13 Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.
- .14 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.7 Materials

- .1 Required for original installation.
- .2 Change in Materials: Submit request for substitution in accordance with Section 01330, Submittal Procedures.

END OF SECTION

1 GENERAL

1.1 Section Includes

- .1 Progressive cleaning.
- .2 Final cleaning.

1.2 Related Section

- .1 Section 01770 Closeout Procedures.

1.3 Reference Standards

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2, Stipulated Price Contract.

1.4 Project Cleanliness

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

1.5 Final Cleaning

- .1 Refer to CCDC 2, GC 3.14.
- .2 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .3 Remove waste products and debris other than that caused by others and leave Work clean and suitable for occupancy.
- .4 Prior to final review, remove surplus products, tools, construction machinery and equipment.
- .5 Remove waste products and debris.
- .6 Remove waste materials from site at regularly scheduled times. Do not burn waste materials on site.

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- .7 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
 - .8 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
 - .9 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors and ceilings.
 - .10 Clean lighting reflectors, lenses, and other lighting surfaces.
 - .11 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
 - .12 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
 - .13 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
 - .14 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
 - .15 Remove dirt and other disfiguration from exterior surfaces.
 - .16 Clean and sweep roofs, gutters, areaways, and sunken wells.
 - .17 Sweep and wash clean paved areas.
 - .18 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.
 - .19 Clean roofs, downspouts, and drainage systems.
 - .20 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
 - .21 Remove snow and ice from access to building.

END OF SECTION

1 GENERAL

1.1 Section Includes

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

1.2 Related Sections

- .1 Section 01320 Construction Progress Submittals.
- .2 Section 01810 Commissioning.

1.3 References

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2 2020, Stipulated Price Contract.
- .2 OAA/OGCA Take-Over Procedures, Document 100
- .3 Construction Act

1.4 Substantial Performance Procedures

- .1 Project takeover procedures will generally follow the "OAA/OGCA Take-Over Procedures", Document 100, except as augmented herein.
- .2 Refer to General Conditions Article GC5.4 to 5.7.
- .3 Prior to making application for certification of Substantial Performance, the Contractor shall undertake a formal inspection of the Work. Following this inspection, the Contractor shall produce a complete list of all uncompleted or unsatisfactory work. This list shall identify uncompleted or unsatisfactory work by room number for all interior spaces and by exterior location. This list shall be distributed to the appropriate sub-contractors for immediate action. This list will also be submitted to the Consultant on paper, and in digital format using Microsoft Word software.
- .4 Make written application to the Consultant for Substantial Performance at least 3 weeks prior to the anticipated date of Certification of Substantial Performance. Such application shall include:
 - .1 A statement that the Contract is substantially performed.
 - .2 A statement that the balance of the work is in progress and the date upon which completion is scheduled. Where the balance of the Work, or a portion thereof, cannot be performed forthwith, and the Contractor wishes to propose a deferral of some component of the Work, the application must include an explanation of the proposed deferral and completion dates for all components to be deferred.
 - .3 An itemized invoice for payment which substantiates the application for Substantial Performance.
 - .4 A statement of the cost value of
 - .1 Work yet to be completed including unsatisfactory work
 - .2 Work which, if agreed by the Owner, will not be completed expeditiously.
- .5 The application for Substantial Performance will not be considered or acted upon by the Consultant until such time as the Consultant has been provided with the following:
 - .1 A complete deficiency list prepared by the General Contractor and circulated for action to sub-contractors as specified above.
 - .2 Project Documentation to be provided at Substantial Performance shall include:
 - .1 Letter requesting a review for Substantial Performance

- .2 Application for Payment that reflects the completion of Contract Value required for Substantial Performance. Submit as per Section 01330, Submittals Procedures.
- .3 All safety certificates, air balancing reports, manuals and binders required for occupancy.
- .6 An Inspection for Substantial Performance will be conducted within 10 days of Application for Substantial Performance and satisfaction of the requirements of .5 above.
- .7 The Inspection for Substantial Performance must include representatives of:
 - .1 The Consultant
 - .2 The Sub-Consultants as deemed necessary by Consultant
 - .3 The Owner
- .8 At the Inspection for Substantial Performance, the Consultant will compile a list of deficiencies and defects. The Consultant reserves the right to refuse to complete an Inspection for Substantial Performance and a deficiency list, if in the Consultant's opinion the incomplete or unsatisfactory work far exceeds that required to achieve Substantial Performance.
- .9 If, in the judgement of the Consultant, the requirements of the Construction Act for Substantial Performance have been achieved, the Consultant will issue a Certificate of Substantial Performance within 7 days of the inspection.
- .10 If, in the judgement of the Consultant, the requirements of the Construction Act for Substantial Performance have not been achieved, the Consultant shall notify the Contractor and the Contractor shall expedite the correction of incomplete or unsatisfactory work required to achieve Substantial Performance, and, within two weeks of initial inspection, make written application for re-inspection for Substantial Performance.
- .11 The Consultant, shall provide only one re-inspection for Substantial Performance within his fee for Basic Services. Inspections beyond this, required to achieve Substantial Performance, will be charged to the Owner as Additional Services as per the terms of the Client Architect Agreement. The Owner shall be entitled to deduct from any money owing to the Contractor the cost of such additional inspections.
- .12 Upon issuance of the Certificate of Substantial Performance, the Contractor will, in accordance with the Construction Act, promptly publish the Certificate of Substantial Performance and provide the Consultant with proof of its publication.
- .13 Upon publication of the Certificate of Substantial Performance, the Contractor shall submit to the Consultant an invoice for the value of holdback monies to be released at the expiration of the lien period. This submission must include a Statutory Declaration and a Clearance Certificate issued by the Workplace Safety & Insurance Board.
- .14 The Consultant shall immediately issue a Certificate for the release of holdback dated one day following the expiration of the lien period. The Consultant will present this to the Owner with instructions to satisfy himself that no liens are registered and no notice of Lien filed against the title of the property, and only if such is the case, to pay holdback monies identified as due by the Certificate.
- .15 The Contractor and sub-contractors shall continue to work to complete all work and repair all deficiencies and defects promptly.

1.5 Final Inspection Procedures

- .1 Project takeover procedures will generally follow the "OAA/OGCA Take-Over Procedures", Document 100, except as augmented herein.
- .2 Upon completion of the Work and deficiencies and defects such that value of outstanding work does not exceed \$1,000, verified by the Contractor's own inspection, the Contractor shall make written application to the Consultant for Final Inspection. Such application shall include:
 - .1 A statement that the Contract is totally performed.

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- .2 An itemized invoice for payment which substantiates the application for Total Performance, including a statement of the holdback monies for finishing work.
 - .3 The application for Final Inspection will not be considered or acted upon by the Consultant until such time as the Consultant has been provided all Project Documentation to be provided before issuance of Final Payment Certificate - see Specification Section 01320.
 - .4 The Final Inspection must include representatives of:
 - .1 The Consultant
 - .2 The Sub-Consultants as deemed necessary by Consultant
 - .3 The Owner
 - .5 At the Final Inspection, the Consultant will review the work indicated by the list of deficiencies and defects.
 - .6 If, in the judgement of the Consultant, the Work is satisfactorily completed, the Consultant will issue a Certificate for Payment for the value of the work, less 10% holdback. The date of this certificate shall be deemed the date of completion and the commencement of the lien period for finishing holdback.
 - .7 If, in the judgement of the Consultant, the Work is not satisfactorily completed, the Consultant shall notify the Contractor of outstanding deficiencies and the Contractor shall expedite the correction of incomplete or unsatisfactory work as soon as possible and make written application for re-inspection. No certificate of payment will be issued until Total Performance has been achieved.
 - .8 The Consultant, shall provide only one Final Inspection following Substantial Performance within his fee for Basic Services. Inspections beyond this, required to achieve a Final Payment Certificate, will be charged to the Owner as Additional Services as per the terms of the Client Architect Agreement. The Owner shall be entitled to deduct from any money owing to the Contractor the cost of such additional inspections.
 - .9 Upon issuance of this payment certificate, the Contractor shall submit to the Consultant an invoice for the value of finishing holdback monies to be released at the expiration of the lien period. This submission must include a Statutory Declaration and a Workers Compensation Board Certificate of Good Standing.
 - .10 The Consultant shall prepare a Certificate for the release of holdback dated one day following the expiration of the lien period. The Consultant will present this to the Owner with instructions to satisfy himself that no liens are registered and no notice of Lien filed against the title of the property, and only if such is the case, to pay holdback monies identified as due by the Certificate.

1.6 Warranty Inspection Procedures

- .1 Refer to requirements of GC 12.3.
- .2 Near the end of the warranty period, an inspection meeting will be convened to be attended by representatives of:
 - .1 The Consultant
 - .2 The Sub-Consultants as deemed necessary by Consultant
 - .3 The Owner
- .3 The Consultant will prepare and issue to the Contractor a list of observed defects required to be corrected.
- .4 The Contractor shall promptly correct all observed defects.

END OF SECTION

1 GENERAL

1.1 Section Includes

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

1.2 Related Sections

- .1 Section 01320, Construction Progress Documentation
- .2 Section 01330, Submittal Procedures.
- .3 Section 01450, Quality Control.
- .4 Section 01770, Closeout Procedures.

1.3 Submission

- .1 Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- .2 Copy will be returned, with Consultant comments.
- .3 Revise content of documents as required prior to final submittal.
- .4 Two weeks prior to Substantial Performance of the Work, submit to the Consultant, (3) final copies of operating and maintenance manuals in English.
- .5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
- .6 If requested, furnish evidence as to type, source and quality of products provided.
- .7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .8 Pay costs of transportation.
- .9 **Refer to Section 01330 for Values associated with accepted Close-Out Documentation.**

1.4 Format

- .1 Organize data in the form of an instructional manual. Also provide digital copy of all material within a single, labeled and organized file.
- .2 A digital submission, in an organized, well-documented and bound pdf format will be acceptable.
- .3 Binders, if desired: vinyl, hard covered, 3 D-ring, loose leaf 219 x 279 mm with spine and face pockets.
 - .1 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
- .4 Cover Sheet and Table of Contents: Identify each binder with type or printed title "Project Record Documents"; list title of project and identify subject matter of contents.
- .5 Arrange content by systems and subtrades, under Section numbers and sequence of Table of Contents.
- .6 Provide physical or digital tabs for each separate product and system, with typed description of product and major component parts of equipment.

- .7 Text: provide Manufacturer's printed data, or typewritten data.
- .8 Shop Drawings: provide copies of all reviewed and noted shop drawings and submissions.
- .9 Provide written Contractor General Warranty and other Warranties as indicated. Refer to 1.7 below.

1.5 Contents, Each Volume

- .1 Table of Contents: provide title of project;
 - .1 date of submission; names,
 - .2 addresses, and telephone numbers of Consultant and Contractor with name of responsible parties;
 - .3 schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01450 Quality Control.
- .6 Training: Refer to Section 01820 Demonstration and Training.

1.6 As-Builts and Samples

- .1 In addition to requirements in General Conditions, maintain at the site for Consultant and Owner, one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to the Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Consultant.

1.7 Warranties and Bonds

- .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

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

1.8 Recording Actual Site Conditions

- .1 Record information on set of opaque drawings, provided by Consultant.
- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 References to related shop drawings and modifications.
- .5 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.9 Final Survey

- .1 All site work shall be performed to suit the site grading as designed. The Owner reserves the right to perform a final site survey to determine the accuracy of the Work. The Contractor shall correct to suit.

1.10 Equipment and Systems

- .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, within data and tests, and complete nomenclature and commercial number of replaceable parts.

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- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
 - .3 Include installed colour coded wiring diagrams.
 - .4 Operating Procedures: include start up, break in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut down, and emergency instructions. Include summer, winter, and any special operating instructions.
 - .5 Maintenance Requirements: include routine procedures and guide for trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
 - .6 Provide servicing and lubrication schedule, and list of lubricants required.
 - .7 Include manufacturer's printed operation and maintenance instructions.
 - .8 Include sequence of operation by controls manufacturer.
 - .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
 - .10 Provide installed control diagrams by controls manufacturer.
 - .11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
 - .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
 - .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
 - .14 Include test and balancing reports as specified in Sections 01450, Quality Control and 01810, Commissioning.
 - .15 Additional requirements: As specified in individual specification sections.

1.11 Materials and Finishes

- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for reordering custom manufactured products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture protection and Weather exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional Requirements: as specified in individual specifications sections.

1.12 Spare Parts

- .1 Provide spare parts, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.13 Maintenance Materials

- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to site location as directed; place and store.

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- .4 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit prior to final payment.

1.14 Special Tools

- .1 Provide special tools, in quantities specified in individual specification section.
- .2 Provide items with tags identifying their associated function and equipment.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

1.15 Storage, Handling and Protection

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

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01561, Environmental Protection.
- .2 Section 02315, Excavation, Trenching & Backfill

1.2 REFERENCES

- .1 Canadian Federal Legislation
 - .1 Canadian Environmental Protection Act (CEPA), 1988.
 - .2 Canadian Environmental Assessment Act (CEAA), 1995.
 - .3 Transportation of Dangerous Goods Act (TDGA), 1992.
 - .4 Motor Vehicle Safety Act (MVSA), 1995.

1.3 STORAGE AND PROTECTION

- .1 Perform all work in accordance with Section 01561, Environmental Protection.
- .2 Protect in accordance with Section 02315, Excavation, Trenching & Backfill
- .3 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Consultant and at no cost to Owner.
- .4 In all circumstances ensure that demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
- .5 Do not dispose of waste of volatile materials such as, mineral spirits, oil, petroleum-based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers. Ensure proper disposal procedures are maintained throughout the project.
- .6 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.
- .7 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities.
- .8 Protect trees, plants and foliage on site and adjacent properties.

1.4 REGULATORY REQUIREMENTS

- .1 Ensure all work is performed in compliance with CEPA, CEAA, TDGA, MVSA, and all applicable provincial regulations.

2 PRODUCTS

2.1 EQUIPMENT

- .1 Equipment and heavy machinery used to meet or exceed all applicable emission requirements operate in compliance with EPA CFR 86.098 10 and EPA CFR 86.098 11 and MVSA.

- .2 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

3 EXECUTION

3.1 PREPARATION

- .1 Inspect site with Consultant and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Notify and obtain approval of utility companies before starting demolition. Locate and protect utilities. Preserve active utilities traversing site in operating condition.

3.2 SEQUENCES OF OPERATION

- .1 Removal
 - .1 Remove items as indicated.
 - .2 Do not disturb items designated to remain in place.
 - .3 In removal of pavements, curbs and gutters:
 - .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Consultant.
 - .2 Protect adjacent joints and load transfer devices.
 - .3 Protect underlying and adjacent granular materials.
 - .4 When removing asphalt pavement for subsequent incorporation into hot mix asphalt concrete paving, prevent contamination with base course aggregates.
 - .5 When removing pipes under existing or future pavement area, excavate at least 300 mm below pipe invert.
 - .6 Remove only designated trees during demolition. Obtain written approval of Consultant prior to removal of any trees not designated.
- .2 Backfill
 - .1 Backfill in excavated areas with non-native soils, as indicated.

3.3 RESTORATION

- .1 Restore areas and existing works outside areas of demolition and removals to conditions that existed prior to commencement of work.
- .2 Use only soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

3.4 CLEANUP

- .1 Upon completion of work, remove debris, trim surfaces and leave work site clean.
- .2 Use only cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

END OF SECTION

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 The General Conditions of the Contract, Supplementary Conditions, and the General Requirements of Division 1, form part of this section, and must be read in conjunction with the requirements of this section, and all related sections.
- .2 The work of this section, and related work specified in other sections shall comply with all requirements of Division 1 – General Requirements

1.2 RELATED SECTIONS

- .1 Section 01610, Basic Product Requirements
- .2 Section 02315, Excavating, Trenching & Backfilling
- .3 Section 02311, Site Grading
- .4 Section 02761, Painted Traffic Lines and Markings

1.3 REFERENCE STANDARDS

- .1 OPSS 313, OPSS 1001, OPSS 1103, OPSS 1149 and OPSS 532

1.4 SAMPLES

- .1 Submit samples in accordance with Section 01330, Submittal Procedures.
- .2 Deliver samples to the Laboratory designated by the Consultant. Samples of material for sieve analysis and hot mix design shall be submitted at least two (2) weeks before commencing production.

1.5 QUALITY ASSURANCE

- .1 Plant requirements: Facilities for production and transportation or asphaltic mixture shall conform to OPSS Form 310.
- .2 Equipment Requirements: Self-powered mechanical pavers conforming to OPSS Form 310.
- .3 Rollers conforming to OPSS Form 310.

1.6 TEMPERATURE REQUIREMENTS

- .1 Prior to placing asphalt, air temperature at the base surface shall be a minimum of 7° C and rising.
- .2 Temperature of mixture shall not be less than 118° C immediately after spreading prior to initial rolling.
- .3 The asphalt cement shall be heated at the mixing plant only to the temperature required for satisfactory mixing and shall not exceed 162° C.

2 PRODUCTS

2.1 MATERIALS

- .1 Aggregates General to: OPSS 1001
- .2 Emulsified Asphalt: to OPSS 1103
- .3 Asphalt Pavement: HL4 to OPSS 1149. Performance Graded Asphalt Cement (PGAC) Grade of PG 58-34 shall be used. The mix design mixture for both surface and binder courses shall have a Marshall Stability of 8000 minimum N at 600 degrees C.
- .4 Pavement Marking: per section 02761 Painted Traffic Lines and Markings.
- .5 Asphalt cement: conform to OPSS Form 1101.
- .6 Aggregates: conform to OPSS Form 1000 and 310.
- .7 Emulsified Asphalt: SS-1 emulsion conforming to OPSS Form 1103.

2.2 ASPHALT MIXES

- .1 Superpave (SP) 12.5 Surface Course.

PART 3 EXECUTION

3.1 PAVEMENT CONSTRUCTION

- .1 Asphalt pavement shall not be placed until such time that the granular A base has been brought up to the designed grade and inspected and approved by the Consultant.
- .2 Construction of the asphalt pavement shall conform to OPSS 313.

3.2 PAVEMENT THICKNESS

- .1 Pavements for roadways:
 - .1 Base course: 50mm HL4.
 - .2 Surface course: 60mm Superpave (SP) 12.5
- .2 Pavements for parking lots and entrances:
 - .1 Surface course: 60mm Superpave (SP) 12.5

END OF SECTION

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 The General Conditions of the Contract, Supplementary Conditions, and the General Requirements of Division 1, form part of this section, and must be read in conjunction with the requirements of this section, and all related sections.
- .2 The work of this section, and related work specified in other sections shall comply with all requirements of Division 1 – General Requirements

1.2 RELATED WORK

- .1 Section 02743, Asphalt Concrete Paving

1.3 REFERENCES

- .1 CAN/CGSB 1.5 M91, Low Flash Petroleum Spirits Thinner.
- .2 CGSB1 GP 12c 68, Standard Paint Colours.
- .3 CGSB1 GP 71 83, Method, of Testing Paints and Pigments.
- .4 CGSB1 GP 74M 79, Paint, Traffic, Alkyd.
- .5 LEED Reference Guide v1.1 (as published by the Canadian Green Building Council).

1.4 SAMPLES

- .1 Submit samples in accordance with Section 01330 Submittal Procedures.
- .2 Submit to Consultant following material sample quantities at least 2 weeks prior to commencing work.
 - .1 Two 1L samples of each type of paint.
 - .2 One 1kg sample of glass beads.
 - .3 Sampling to CGSB1 GP 71.
- .3 Mark samples with name of project and its location, paint manufacturer's name and address, name of paint, CGSB specification number and formulation number and batch number.

2 PRODUCTS

2.1 MATERIALS

- .1 Paint:
 - .1 To CGSB1 GP 74M, alkyd traffic paint.
 - .2 Colours: to CGSB1 GP 12C
 - .1 Parking lines, markings & non-regulatory lines: white 513 301.
 - .2 Road lines & regulatory markings: yellow 505 308

- .3 Upon request, Consultant will supply a qualified product list of paints applicable to work. Qualified paints may be used but Consultant reserves right to perform further tests.
- .2 Thinner: to CAN/CGSB 1.5.
- .3 Thinner to CAN/CGSB-1.5
- .4 All paint to confirm to OPSS #1712 and be supplied by one of the following suppliers.

	Yellow Paint Code	White Paint Code
Niagara Paint and Chemical Co. Ltd.	#87935	#87932
Ibis Products Ltd.	#40-3057	#40-2478
CIL	#7612-26757 or #7612-26993	#7612-26992
Sherwin Williams	#C97YG52	#C97WG129
Sico Paints	#3007640Y	#3007649W

- .5 Glass beads:
 - .1 Overlay type: to CGSB1 GP 74M.

3 EXECUTION

3.1 EQUIPMENT REQUIREMENTS

- .1 Paint applicator to be an approved pressure type distributor capable of applying paint in single, double and dashed lines. Applicator to be capable of applying marking components uniformly, at rates specified, and to dimensions as indicated, and to have positive shut off.
- .2 Distributor to be capable of applying reflective glass beads as an overlay on freshly applied paint.

3.2 CONDITION OF SURFACES

- .1 Remove all existing markings that do not comply with new design.
- .2 Pavement surface to be dry, free from ponded water, frost, ice, dust, oil, grease and other foreign materials.

3.3 TRAFFIC CONTROL

- .1 Work to follow staging plan. General Contractor to provide workflow plan acceptable to Owner for approval before commencing work.

3.4 APPLICATION

- .1 Lay out pavement markings for review and acceptance by owner.

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- .2 Unless otherwise approved by Consultant, apply paint only when air temperature is above 10 degrees C, wind speed is less than 60km/h and no rain is forecast within next 4h.
 - .3 Apply traffic paint evenly at rate of 3m²/L.
 - .4 Do not thin paint unless approved by Consultant.
 - .5 Symbols and letters to conform to be confirmed with client, Consultant before commencement of work.
 - .6 Paint lines to be of uniform colour and density with sharp edges.
 - .7 Thoroughly clean distributor tank before refilling with paint of different colour.
 - .8 Apply glass beads at rate of 200g/m² of painted area immediately after application of paint.

3.5 TOLERANCE

- .1 Paint markings to be within plus or minus 12mm (1/2") of dimensions indicated.
- .2 Remove incorrect markings.

3.6 PROTECTION OF COMPLETED WORK

- .1 Protect pavement markings until dry.

3.7 PROJECT COMPLETION

- .1 Clean all surfaces and apply a second coat to all markings and symbols at total completion of project.

END OF SECTION

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 The General Conditions of the Contract, Supplementary Conditions, and the General Requirements of Division 1, form part of this section, and must be read in conjunction with the requirements of this section, and all related sections.
- .2 The work of this section, and related work specified in other sections shall comply with all requirements of Division 1 – General Requirements

1.2 RELATED SECTIONS

- .1 Section 01610, Basic Product Requirements
- .2 Section 02315, Excavating, Trenching and Backfilling.
- .3 Section 02743, Asphalt Concrete Paving
- .4 Section 03300, Cast in Place Concrete
- .5 Section 03213, Tactile Surface Warning Indicators

1.3 REFERENCE

- .1 CSA A23.1-94, Concrete Materials and Methods of Concrete Construction.
- .2 Ontario Provincial Standard Specifications:
 - OPSS 351- Concrete Sidewalk
 - OPSS 353 – Concrete Curb and Gutter System
 - OPSS 1308 – Joint Filler
 - OPSS 1315- Curing Compounds for Concrete
 - OPSS 1350 – Concrete (Material and Production)
 - OPSS 1440 – Steel Reinforcement for Concrete
 - OPSS Special Provisions

1.4 SUBMITTALS

- .1 Furnish the Consultant with a certificate prepared by the Ready-Mix concrete suppliers stating that all requirements regarding strength, slump, air entrainment, mix, materials and ratio have been maintained.

1.5 QUALITY ASSURANCE

1. All materials must conform to CSA A23.1/A23.2, latest edition (metric).
2. Have all concrete tested for compressive strength, slump and air content, in accordance with CAN A23.2-M. Submit test reports in duplicate and pay all costs incurred.
3. On site mockup of natural and coloured concrete paving to be provided. If approved may remain as part of the completed work. Modify as necessary to obtain approval.

1.6 DELIVERY, STORAGE & HANDLING

1. Store all materials in accordance with CSA A23.1-M.
2. Store forms off the ground and sufficiently supported to prevent warping or distortion. Protect from contamination by oil, grease, water, earth, etc.
3. All concrete is to be ready-mixed at plant and transported to the site by truck in accordance with A.23.1-M. Hand mixed concrete is not allowed.

2 PRODUCTS

2.1 MATERIALS

- .1 Concrete mixes and materials: to Section 03300 – Cast in Place Concrete OPSS 1350.
- .2 Reinforcing steel: to Section 03200 –Concrete Reinforcements OPSS 1440.
- .3 Joint filler and Curing Compound: to Section 03300-Cast in Place Concrete and OPSS 1308 and OPSS 1315.
- .4 Granular Base: Granular A as indicated.
- .5 Non –staining mineral type form release agent: Chemically active release agents containing compounds that react with free lime to provide water-soluble soap.
- .6 Sealant: one component self levelling polyurethane sealant to CAN/CGSB 19.13.
- .7 Coloured concrete mix: as required to maintain colour consistency with sample submitted. Colour: to be selected by Consultants. Concrete mix as manufactured by Davis Colors or approved alternative by Elements.
- .8 Tinted Concrete – incorporate colour loading up to a maximum 3% based upon dry cementitious mix weight. Colour added to mix on job site 20 minutes prior to pour. Cement and aggregate to produce concrete matching sample submitted and approved. Actual loading as necessary to obtain selected concrete colour.
- .9 Tactile Surface Indicators – as indicated.

3 EXECUTION

3.1 GRADE PREPARATION

- .1 Do grade preparation work in accordance with Section 02315, Excavating, Trenching and Backfilling.
- .2 Construct embankments using excavated material free from organic matter or other objectionable materials. Dispose of surplus and unsuitable excavated material in approved location on site.
- .3 Place fill in maximum 150mm layers and compact to at least 95% of maximum density to ASTM D698.

3.2 GRANULAR BASE

- .1 Obtain Consultant approval of subgrade before placing granular base.
- .2 Place granular base material to lines, grades widths, and depths as per contract plans.
- .3 Compact granular base to at least 100% of maximum density to ASTM D698.

3.3 CONCRETE

- .1 Obtain Consultant approval of granular base and reinforcing steel prior to placing concrete.
- .2 Do concrete work in accordance with Section 03300-Cast in Place Concrete OPSS 1350.
- .3 Install concrete curb and gutter, and concrete curb to OPSD 600.040 and OPSD 600.110 as indicated on the contract plans, and conforming to OPSS 353. Include placement of curb terminations to OPSD 608.01 and curb outlets to OPSD 605.01.
- .4 Construct concrete sidewalk to OPSD 310.010 and OPSS 351 at locations as detailed on the contract plans.
- .5 Immediately after floating, give sidewalk surface uniform broom finish to produce regular corrugations not exceeding 2mm deep, by drawing broom in direction normal to centre line.
- .6 Provide edging as indicated with 10mm radius edging tool.
- .7 Slip-form pavers equipped with string line system for line and grade control may be used if quality of work acceptable to Consultant can be demonstrated. Hand finish surfaces when directed.
- .8 Locate expansion joints as per detail and between new concrete and all new or existing structures. Joints must be cast in place. Sawcut joints will not be allowed.
- .9 Ensure finished surface is true to line and level as shown on the drawings. Slopes not to exceed 1.5% and ensure positive draining unless otherwise noted.
- .10 Immediately after stripping form work, obtain the approval of the Consultant before commencing patching, finishing or curing operations.
- .11 For coloured concrete no patching is allowed. Contractor required to replace entire section from expansion joint to expansion joint.

3.4 EXPANSION AND CONTRACTION JOINTS

- 1. Install tooled transverse contraction joints after floating, when concrete is stiff, but still plastic, at intervals of 1.5m.
- 2. Install expansion joints at intervals of 6m.
- 3. Install expansion joints around manholes and catch basins and along length adjacent to concrete curbs, buildings, or permanent structure.

4. Execute control joints as detailed on the details and drawings. Ensure control joints are to a minimum depth of 1/4 the thickness of the concrete. Make sawed joints. Saw cut joints before concrete has reached final set when aggregate will not be displaced.
5. No offsets will be allowed between adjacent sections of joint fillers and no plugs of concrete will be permitted anywhere within an expansion joint.
6. Pattern for control joints and expansion joints to be laid out on site for approval by Consultant.

3.5 CURING

- .1 Cure concrete by adding moisture continuously in accordance with CAN/CSA-A23.1 to exposed finished surfaces for at least 1 day after placing or sealing moisture in by curing compound approved by the Consultant.
- .2 Where burlap is used for moist curing, place two pre-wetted layers on concrete surface and keep continuously wet during curing period.
- .3 Apply curing compound evenly to form continuous film, in accordance with manufacturer's recommendations.

3.6 BACKFILL

- .1 Allow concrete to cure for 7 days prior to backfilling
- .2 Backfill to the designated elevations with material approved by the Consultant. Compact and shape backfill material to the required contours as indicated on the contract plans or as directed by the Consultant.

END OF SECTION

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 The General Conditions of the Contract, Supplementary Conditions, and the General Requirements of Division 1, form part of this section, and must be read in conjunction with the requirements of this section, and all related sections.
- .2 The work of this section, and related work specified in other sections shall comply with all requirements of Division 1 – General Requirements

1.2 RELATED SECTIONS

- .1 Section 01330 - Submittal Procedures.
- .2 Section 01610 - Basic Product Requirements
- .3 Section 02315 - Excavation, Trenching & Backfilling

1.3 REFERENCES

- .1 CSA-A231.1-99, Precast Concrete Paving Slabs.
- .2 CSA-A231.2-95, Precast Concrete Pavers.
- .3 ASTM C902-99b, Specification for Pedestrian and Light Traffic Paving Brick
- .4 ASTM D698-91(1998), Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600kN-m/m³).
- .5 ASTM D1557-91(1998), Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (2,700kN-m/m³).

1.4 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01330 Submittal Procedures.
- .2 Indicate layout, pattern and relationship of paving joints to fixtures and project formed details.

1.5 SAMPLES

- .1 Submit samples in accordance with Section 01330 Submittal Procedures.
- .2 Submit full size sample of each type paving unit.

1.6 PROTECTION

- .1 Prevent damage to buildings, landscaping, curbs, sidewalks, trees, fences, roads and adjacent property. Make good any damage.
- .2 Provide access to building at all times. Coordinate paving schedule to minimize interference with normal use of premises.

2 PRODUCTS

2.1 MATERIALS

- .1 Unit Pavers
 - .1 Uniform in material, colour, size and from one manufacturer to sizes and patterns indicated.
 - .2 Type A: Modular Unit Pavers
 - .1 Sizes: 60 x 100 x200
 - .2 Colours: as later selected from manufacturer's full standard range.
 - .3 Patterns: herringbone pattern, with stacked bond edges, unless otherwise indicated
 - .4 Modify products to suit transition at all ramp and stair terminations as per AODA requirements – as indicated.
 - .5 Acceptable Products: Nordic Stone by Brown's Concrete Supply, Hollandstone by Unilock, or approved equal.
- .2 Crushed stone or gravel base: consisting of hard, durable, angular particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
 - .1 Gradations: within limits specified when tested to ASTM C136. Sieve sizes to CAN/CGSB 8.1 rather than ASTM E11.
- .3 Sand for bedding: hard, durable, crushed stone particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials CAN/CSA A23.1, Section 5.3.2.
 - .1 Gradations: within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB 8.1 rather than ASTM E11.
- .4 Joint sand: to CSA A179, hard, durable, angular particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
- .5 Edger:
 - .1 PVC edge restraints, complete with concealed fastening stakes.

3 EXECUTION

3.1 SUBGRADE

- .1 Ensure that subgrade preparation conforms to levels and compaction required to allow for installation of granular base.

3.2 GRANULAR BASE

- .1 Base minimum thickness: as indicated.
- .2 Spread and compact crushed stone or gravel base in uniform layers not exceeding 100 mm compacted thickness.
- .3 Compact base to a density of not less than 95% Standard Modified Density in accordance with ASTM D698.

-
- .4 Shape and roll alternately to obtain a smooth, even and uniformly compacted granular base and ensure conformity of grades with finish surface.
 - .5 Apply water as necessary during compaction to obtain specified density. If granular base is excessively moist, remove it and install more granular material to rid it of sponginess.
 - .6 In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.
 - .7 Ensure top of granular base does not exceed plus or minus 10 mm over a 3 m straightedge.

3.3 EDGING

- .1 Install edging true to grade, in location, layout and pattern as indicated.

3.4 BEDDING SAND

- .1 Place and spread bedding sand to thickness as indicated.
- .2 Maximum thickness after compaction: 40 mm.
- .3 Use material other than bedding sand to compensate for depressions that exceed specified tolerances in surface of base.
- .4 Do not use joint sand for bedding sand.

3.5 SURFACE COURSE

- .1 Ensure bedding sand and granular base are not saturated prior to placement of unit pavers.
- .2 Install unit paving true to grade on the bedding sand, in location, layout and pattern as indicated.
- .3 Where required, cut units accurately without damaging edges.
- .4 Paver Installation:
 - .1 Install pavers with 2mm joints or as indicated.
 - .2 Compact and level pavers with mechanical plate vibrator use minimum 19 mm thick plywood or neoprene pad under plate compactor and over until pavers are true to grade and free of movement.
 - .3 Do not compact unit paving within 1 m of unrestrained edges.
 - .4 Fill voids in pavers by installing topsoil mixture for seeding.
 - .5 Pass mechanical plate vibrator over unit paving to achieve compaction of sand in joints. Ensure joints are full at completion of compaction. For vehicular traffic surfaces, tamp and level pavers with rubber tired roller after compaction with plate compactor.
 - .6 Surface of finished pavement: free from depressions exceeding 3 mm as measured with 3 m straight edge.
 - .7 Sweep surface clean and check final elevations for conformance to drawings.

END OF SECTION

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 The General Conditions of the Contract, Supplementary Conditions, and the General Requirements of Division 1, form part of this section, and must be read in conjunction with the requirements of this section, and all related sections.
- .2 The work of this section, and related work specified in other sections shall comply with all requirements of Division 1 – General Requirements

1.2 SECTION INCLUDES

- .1 Provision of all labour, materials, equipment and incidental services necessary to provide hydraulic seeding.
- .2 Comply with requirements of Division 01, General Requirements.

1.3 RELATED WORK

- .1 Section 01610 - Basic Product Requirements
- .2 Section 02311 – Site Grading.
- .3 Section 02911 – Topsoil and Finish Grading.

1.4 PRODUCT DATA

- .1 Submit product data in accordance with Section 01330 – Submittal Procedures.
- .2 Provide product data for: Seed, Mulch, Tackifier, Fertilizer.
- .3 Submit in writing to Consultant fifteen (15) days prior to commencing work:
 - .1 Volume capacity of hydraulic seeder in litres.
 - .2 Amount of material to be used per tank based on volume.
 - .3 Number of tank loads required per hectare to apply specified slurry mixture per hectare.

1.5 SCHEDULING

- .1 Schedule hydraulic seeding to coincide with preparation of soil surface.
- .2 Schedule hydraulic seeding between dates recommended by the Provincial Agriculture Department.

1.6 WARRANTY

- .1 Warrant work of this Section against defects and deficiencies for a period of 1 year from Date of Acceptance, or date of planting whichever is later. During the warranty period replace seeded areas which have died or failed to grow satisfactorily as determined by Consultant and at no extra cost to Owner. During warranty period maintain all seeded areas.

2 PRODUCTS

2.1 MATERIALS

-
- .1 Lawn Grass mixture: "Certified" "Ecolawn" by Wildflower Farm Inc., Schomberg, ON. Tel: 905-859-0286". All mixtures shall conform to Government of Canada "Seeds Act" and "Seeds Regulations".
 - .2 Mulch: especially manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring, free of germination and growth inhibiting factors with following properties:
 - .1 Type 1 mulch:
 - 1. Made from wood cellulose fibre.
 - 2. Organic matter content: 95% plus or minus 0.5%.
 - 3. Value of pH: 6.0.
 - 4. Potential water absorption: 900%.
 - .2 Type 2 mulch:
 - .1 Made from newsprint, new cotton fibre and straw, processed to produce fibre lengths of 15 mm minimum and 25 mm maximum. Greater proportions of ingredients to be straw.
 - .3 Tackifier: water dilutable, liquid dispersion.
 - .4 Water: free of impurities that would inhibit germination and growth.
 - .5 Fertilizer:
 - .1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
 - .2 Complete synthetic, slow release with equal portions of nitrogen, phosphorus and potassium content in water-insoluble form.
 - .6 Inoculants: inoculant containers to be tagged with expiry date.

3 EXECUTION

3.1 PREPARATION

- .1 Till as required during the months prior to Ecolawn installation in September. Fine grade subgrade to eliminate uneven areas, low spots and ensure positive drainage. Remove debris, roots, branches, stones in excess of 50mm diameter and deleterious materials. Obtain review before placing topsoil.

3.2 TOPSOIL

- .1 Spread topsoil evenly over area(s) to be seeded to minimum thickness 100mm and to finished grades shown on Drawings allowing for topsoil settlement.

3.3 FERTILIZING

- .1 Apply fertilizer prior to seeding.
- .2 Spread fertilizer with mechanical spreaders over area(s) to be seeded according to manufacturer's specifications.
- .3 Mix fertilizer thoroughly into upper 50mm of topsoil.

3.4 FINISH GRADING

- .1 Fine grade entire topsoil to finished grades. Eliminate uneven areas and low spots. Ensure positive drainage and provide a uniform, smooth finish.
- .2 Roll Topsoil with 50kg roller, minimum 900mm wide to compact and retain surface.

3.5 SEEDING

- .1 Obtain review of finished grading and seed mixture before seeding.
- .2 Seed between April 1 to June 1 or between August 15 to September 15.
- .3 Apply seed using mechanical seeder such as "Brillion" type, or approved equal, calibrated to ensure even and uniform distribution. Seed in calm weather on ground free from frost, snow and ice. Cover seed. Ensure seed is in firm contact with soil. Blend applications 150mm into adjacent grass areas/previous applications to form uniform surfaces.
- .4 Water seeded area(s) with fine spray to avoid seed wash-out. Water to ensure penetration of minimum 50mm.
- .5 Fence seeded area(s) against damage. Remove fencing after seeded area(s) accepted.

3.6 MAINTENANCE

- .1 Water seeded areas as required to maintain optimum soil moisture level for continued growth.
- .2 Pick-up debris, papers, construction material from seeded area(s) and remove from Site.
- .3 Maintenance period for seeded area(s) shall be until the seeded areas are fully established and accepted by Consultant. Make good grass not properly established or washed out, by preparing soil and reseeding at no extra cost to Owner. Established seeded area(s) shall have uniform, close, dense grass with no more than 2 broadleaf weeds or 10 other weeds per 40m². Weeds to be removed manually.
- .4 Cut seeded area only in late autumn after several frosts.

3.7 ACCEPTANCE

- .1 Seeded areas will be considered acceptable by the Consultant provided the seeded areas are properly established.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01610 - Basic Product Requirements
- .2 Section 02770, Concrete Walks, Curbs & Gutters
- .3 Section 03300, Cast in Place Concrete
- .4 Division 09, Flooring & Floor Finishes (for related tactile warning indicators)

1.2 References

- .1 AODA, Ontario Building Code or the National Building Code of Canada,
- .2 CAN/CSA B651 Accessible Design for the Built Environment,
- .3 ISO/FDIS 21542 Building Construction – Accessibility and Usability of the Built Environment and ISO 23599.

1.3 Submittals

- .1 Product Data: Submit manufacturer's literature describing products, AODA/OBC certifications, installation procedures and maintenance instructions in accordance with Section 01330, Submittal Procedures.
- .2 Shop Drawings: Submit shop drawings in accordance with Section 01330 - Submittal Procedures. Indicate all characteristics of the composite cast-in-place Tactile Warning Indicator, including material, profile, thicknesses, colours, options and installation methods.
- .3 Samples: Submit samples in accordance with Section 01330 - Submittal Procedures. Submit two (2) samples of each product to be used. Submit to Departmental Representative material samples at least four weeks prior to commencing work.
- .4 Material Test Results: Submit current test reports from qualified, accredited independent testing laboratory in accordance with ASTM guidelines and indicating that materials proposed for use are in compliance with specification requirements and meet the properties indicated. All test reports submitted shall be representative.
- .5 Closeout Submittals: Provide manufacturer's operation and maintenance data for each type of Tactile Warning Indicator and accessories.

1.4 Quality Assurance

- .1 Provide composite cast-in-place Tactile Warning Indicator as produced by a single manufacturer with a minimum of five years' experience in manufacturing Tactile Warning Indicator.
- .2 Installer's Qualifications: Engage an experienced installer certified in writing by the Tactile Warning Indicator manufacturer, who has successfully completed Tactile Warning Surface Installations similar in material, design, and extent to that indicated for the Contract.
- .3 Cast-in-place Tactile Warning Indicators must be compliant with all Canadian and AODA standards for barrier-free design.

- .4 Cast-in-place Tactile Warning Indicators shall meet or exceed the following test criteria using the most current test methods:
 - .1 Compressive Strength: 28,000 psi minimum, when tested in accordance with ASTM D695.
 - .2 Flexural Strength: 29,000 psi minimum, when tested in accordance with ASTM D790.
 - .3 Water Absorption: Not to exceed 0.10%, when tested in accordance with ASTM D570.
 - .4 Slip Resistance: 1.00 minimum wet/dry static coefficient of friction when tested in accordance with ASTM C1028.
 - .5 Flame Spread: 25 maximum when tested in accordance with ASTM E84.
 - .6 Salt and Spray Performance of Tactile Warning Indicator: No deterioration or other defects after 200 hours of exposure, when tested in accordance with ASTM B117.
 - .7 Chemical Stain Resistance: No reaction to 1% hydrochloric acid, motor oil, calcium chloride, gum, soap solution, bleach, and antifreeze, when tested in accordance with ASTM D543.
 - .8 Abrasion resistance: 500 minimum, when tested in accordance with ASTM C501.
 - .9 Accelerated Weathering of Tactile Warning Indicator when tested by ASTM G155 or ASTM G151 shall exhibit the following result: $\Delta E < 5.0$ at 2,000 hours minimum exposure.
 - .10 Tensile Strength: 11,000 psi minimum, when tested in accordance with ASTM D638.
 - .11 Freeze/Thaw/Heat: No deterioration when tested in accordance with ASTM C1026.

1.5 Delivery, Storage and Handling

- .1 Cast-in-place Tactile Warning Indicators shall be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces shall be protected by sturdy wrappings.
- .2 Store Tactile Warning Indicators in an area that is within an acceptable temperature range (4-32 degrees C).
- .3 Maintain storage facility in a clean dry condition to prevent contamination or damage to Tactile Warning Surfaces.

1.6 Guarantee

- .1 Tactile Warning Indicators shall be guaranteed in writing for a period of five (5) years from date of Contract's final completion. The guarantee includes manufacturing defects, breakage and deformation.

2 PRODUCTS

2.1 Materials

- .1 Tactile Warning Indicators
 - .1 Manufactured using a matte finish exterior grade (uniform color throughout thickness of product) with reinforced truncated domes. Slip resistant finishes.
 - .2 Colour: Colour shall be homogeneous throughout Tactile Warning Indicator.
 - .1 Colour to be later selected by Consultant from manufacturer's full colour range.

- .2 Safety yellow shall be a colour option at no additional cost.
- .3 Truncated Domes: Square grid pattern of raised truncated domes of 5 mm nominal height, base diameter of 23 mm and top diameter of 11 mm.
- .4 Dimensions: 305(12") mm wide x maximum practical length.
- .5 Supply and install product model appropriate for application method.
 - .1 Exterior unit paver areas:
 - .1 Modular Paver model.
 - .2 Model Product: Armor-Tile Modular Paver (ADA-M) or approved equal.
 - .4 Exterior concrete sidewalks and depressed curbs:
 - .1 Cast in place model.
 - .2 Material: Cast iron.
 - .3 Model Product: Advantage Cast Iron (ADV-CI) or approved equal.
 - .8 Surface applied for applications not otherwise noted.
 - .1 Surface fastened model.
 - .2 Seal around perimeter with caulking.
 - .3 Model Product: Armor-Tile Surface Applied (ADA-S) or approved equal.
- .6 Acceptable Manufacturer and Product:
 - .1 Armour-Tile Tactile Systems by Kinesik,
 - .2 or approved equal.

3 EXECUTION

3.1 Equipment Requirements

- .1 Provide all tools, equipment and services required for satisfactory installation per manufacturer's instruction.

3.2 Preparation

- .1 During all concrete pouring and Warning Indicators installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.
- .2 Coordinate installation with Section 03300, Cast in Place Concrete where applicable.
- .3 The concrete shall be poured and finished, true and smooth to the required dimensions and sloped prior to Warning Indicator placement.

3.3 Installation

- .1 Tactile Warning Indicator will not be allowed to be installed until all submittals have been reviewed and approved by the Consultant.
- .2 Warning Indicators shall be installed as per manufacturer's written instructions.
- .3 To the maximum extent possible, the Warning Indicators shall be oriented such that the rows of

- in-line truncated domes are parallel with the direction of the ramp. When multiple Warning Indicators regardless of size are used, the truncated domes shall be aligned between the tactile warning surface tiles and throughout the entire Tactile Warning surface installation.
- .4 The Warning Indicators shall be tamped or vibrated into the fresh concrete to ensure that there are no voids or air pockets, and the field level of the Tactile Warning Indicator is flush to the adjacent concrete surface to permit proper water drainage and eliminate tripping hazards between adjacent finishes.
 - .5 On Continuous Runs: leave a 3 mm nominal gap between successive Tactile Warning Indicators. As part of the concrete finishing operation, apply 3 mm - 6 mm edge treatment around the perimeter of the Tactile Warning Indicators to facilitate future replacement of the Warning Indicator. A Urethane Sealant such as Sikaflex 1a, BASF NP1, or approved alternate shall be applied to the edge treatment for a watertight installation.

3.4 Cleaning and Protection

- .1 Protect Warning Indicators against damage during construction period to comply with manufacturer's written specifications.
- .2 During and after the Warning Indicator installation and the concrete curing stage, it is imperative that there are no walking, leaning or external forces placed on the Warning Indicators to rock the Warning Indicator, causing a void between the underside of the Warning Indicator and the concrete substrate.
- .3 Remove Protective Plastic Sheeting from Warning Indicator within 24 hours of installation. Particularly under hot weather conditions (27 degrees C or higher), plastic sheeting will adhere strongly (resulting in difficult removal of same) to Tactile Warning Indicator when not removed quickly.
- .4 Clean Warning Indicators not more than four (4) days prior to date of substantial completion in each area of project. Clean Warning Indicators by method specified by Tactile Warning Indicators manufacturer.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01610 - Basic Product Requirements
- .2 Insulation - Section 07213

1.2 References

- .1 ANSI A208.1, Particleboard, Mat Formed Wood.
- .2 CAN/CGSB-11.3-M87, Hardboard.
- .3 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
- .4 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .5 CSA-B111-1974, Wire Nails, Spikes and Staples.
- .6 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .7 CSA O121-M1978, Douglas Fir Plywood.
- .8 CAN/CSA-O141-91, Softwood Lumber.
- .9 CSA-O151-M1978, Canadian Softwood Plywood.
- .10 CSA-O153-M1980, Poplar Plywood.
- .11 CAN/CSA-O325.0-92, Construction Sheathing.
- .12 CAN3-O437 Series-93, Standards on OSB and Waferboard.
- .13 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber.

1.3 Quality Assurance

- .1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

2 PRODUCTS

2.1 Framing and Structural Materials

- .1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:
 - .1 CAN/CSA-O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
- .2 Glued end-jointed (finger-jointed) lumber NLGA Special Products Standard
- .3 Glulam in accordance with Structural Glued-Laminated Timber CAN/CSA-O122.
- .4 Structural Composite Lumber (SCL) in accordance with Evaluation of Structural Composite Lumber Products ASTM D 5456.
- .5 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:

- .1 S2S is acceptable.
- .2 Board sizes: "Standard" or better grade.
- .3 Dimension sizes: "Standard" light framing or better grade.
- .4 Post and timbers sizes: "Standard" or better grade.
- .6 At all exposed wood provide concealed fastenings. Concealed fastenings to be engineered by Professional Engineer registered in Ontario.

2.2 Panel Materials

- .1 Douglas fir plywood (DFP): to CSA-O121, standard construction.
- .2 Canadian softwood plywood (CSP): to CSA-O151, standard construction.
- .3 Interior mat-formed wood particleboard: to ANSI 208.1.

2.3 Accessories

- .1 Nails, spikes and staples: to CSA-B111.
- .2 Bolts: 12.5 mm (1/2") diameter unless indicated otherwise, complete with nuts and washers.
- .3 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer. Explosive activated fasteners are not approved.

2.4 Fastener Finishes

- .1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for exterior work interior highly humid areas pressure-preservative fire-retardant treated lumber.
- .2 Stainless steel: use stainless steel 304 alloy for exposed work.

2.5 Wood Preservative

- .1 Treat lumber and plywood to CSA 080.
- .2 Dry material to maximum moisture content of 19%.
- .3 Surface apply coloured preservative to manufacturer's directions.

2.6 Fire Treated Wood

- .1 Fire retardant treated lumber and plywood: Pressure treat timber and plywood with fire retardant chemicals to meet ULC FR-5 rating.
- .2 Flame Spread: Max. 25 in 30 min. to ULC S102.
- .3 Moisture Content: 19% max.

- .4 Provide material bearing Canadian Wood Preservers Bureau and ULC stamp or label.
- .5 Acceptable Products:
 - .1 Koppers Company Inc.
 - .2 Dricon (Hickson Building Products)
 - .3 Timber Specialties Flame Proof LHC

3 EXECUTION

3.1 Installation

- .1 Comply with requirements of OBC/NBC Part 9 supplemented by following paragraphs.
- .2 Install members true to line, levels and elevations, square and plumb.
- .3 Construct continuous members from pieces of longest practical length.
- .4 Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.
- .5 Install subflooring and combined subfloor and underlay with panel end-joints located on solid bearing, staggered at least 800 mm.
 - .1 In addition to mechanical fasteners, floor panels secure floor subflooring to floor joists using glue screws. Place continuous adhesive bead in accordance with manufacturer's instructions, single-bead on each joist and double-bead on joists where panel ends butt.
- .6 Install wall sheathing in accordance with manufacturer's printed instructions.
- .7 Install roof sheathing in accordance with requirements of NBC.
- .8 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding electrical equipment mounting boards, and other work as required.
- .9 Install furring to support siding applied vertically where there is no blocking and where sheathing is not suitable for direct nailing.
 - .1 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .10 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .11 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.
- .12 Install sleepers as indicated.

- .13 Use caution when working with particle board. Use dust collectors and high quality respirator masks.

3.2 Erection

- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .2 Countersink bolts where necessary to provide clearance for other work.
- .3 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

3.3 Schedules

- .1 Roof sheathing:
 - .1 Plywood, DFP or CSP sheathing grade or PP standard sheathing grade, T&G square edge, 15.9 mm (5/8") thick.
- .2 Exterior wall sheathing:
 - .1 Plywood, DFP or CSP sheathing grade or PP standard sheathing grade, T&G square edge, thickness noted on drawings.
- .3 Interior wall sheathing:
 - .1 Plywood CSP sheathing grade or PP standard sheathing grade square edge 12.7 mm (1/2") thick or to thickness noted on drawings.
- .4 Electrical equipment mounting boards:
 - .1 Plywood, DFP G1S square edge, 15.9 mm (5/8") thick.
- .5 Solid wood blocking:
 - .1 38mm wide solid wood or Plywood, square edge, 19 mm (3/4") thick. Sizes to suit anchoring for products.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01610 - Basic Product Requirements
- .2 Section 06200 - Rough Carpentry
- .3 Section 06400 - Architectural Woodwork
- .4 Section 08710 - Door & Finishing Hardware
- .5 Section 10800 - Toilet, Bath and Laundry accessories

1.2 References

- .1 AWMAC Quality Standards for Architectural Woodwork 1991.
- .2 National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber 1996.
- .3 National Hardwood Lumber Association (NHLA) Rules for the Measurement and Inspection of Hardwood and Cypress January 1986.

1.3 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01330 - Submittal Procedures.
- .2 Indicate details of construction, profiles, jointing, fastening and other related details.
- .3 Indicate all materials, thicknesses, finishes and hardware.

1.4 Samples

- .1 Submit samples in accordance with Section 01330 - Submittal Procedures.

1.5 Delivery, Storage, and Handling

- .1 Deliver, handle, store and protect materials in accordance with Section 01610 - Basic Product Requirements.
- .2 Protect materials against dampness during and after delivery.
- .3 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

2 PRODUCTS

2.1 Lumber Material

- .1 Softwood lumber: unless specified otherwise, S4S, moisture content 19% or less in accordance with following standards:
 - .1 CAN/CSA O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
 - .3 AWMAC custom premium grade, moisture content as specified.
- .2 Hardwood lumber: moisture content 7% or less in accordance with following standards:
 - .1 National Hardwood Lumber Association (NHLA).
 - .2 AWMAC premium grade, moisture content as specified to species noted.

2.2 Panel Material

- .1 Douglas fir plywood (DFP): to CSA O121, standard construction.
- .2 Canadian softwood plywood (CSP): to CSA O151, standard construction.
- .3 Hardwood plywood: to CSA O115. Type 11 exposed faces architectural grade.
- .4 Poplar plywood (PP): to CSA O153, standard construction.
- .5 Interior mat-formed wood particleboard: to CAN3-O188.1.
- .6 Hardboard: to CAN/CGSB-11.3.
- .7 Medium density fibreboard (MDF): to ANSI A208.2, density 769 kg/m³.

2.3 Accessories

- .1 Nails and staples: to CSA B111; galvanized to CAN/CSA-G164 for exterior work, interior humid areas and for treated lumber; plain copper stainless steel finish elsewhere.
- .2 Wood screws: to CSA B35.4 plain stainless steel, type and size to suit application.
- .3 Splines: wood plastic metal.
- .4 Adhesive: recommended by manufacturer.

3 EXECUTION

3.1 Installation

- .1 Do finish carpentry to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.
- .2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.
- .3 Form joints to conceal shrinkage.

3.2 Construction

- .1 Fastening.
 - .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
 - .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
 - .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round cleanly cut hole and plug with wood plug to match material being secured.
 - .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.
- .2 Standing and running trim.
 - .1 Butt and cope internal joints of baseboards to make snug, tight, joint. Cut right angle joints of casing and base with mitred joints.
 - .2 Fit backs of baseboards and casing snugly to wall surfaces to eliminate cracks at junction of base and casing with walls.
 - .3 Make joints in baseboard, where necessary using a 45° scarf type joint.
 - .4 Install door and window trim in single lengths without splicing.
- .3 Interior and exterior frames.

-
- .1 Set frames with plumb sides and level heads and sills and secure.
 - .4 Panelling.
 - .1 Secure panelling and perimeter trim using adhesive recommended for purpose by manufacturer. Fill nail holes caused by temporary fixing with filler matching wood in colour.
 - .2 Secure panelling and perimeter trim using concealed fasteners.
 - .3 Secure panelling and perimeter trim using counter sunk screws plugged with matching wood plugs.
 - .5 Shelving.
 - .1 Install shelving on shelf brackets, at coat racks.
 - .2 Provide 3 mm solid edge-banding on exposed edges.
 - .6 Hardware.
 - .1 Install all hardware and accessories to locations required. See drawings for accessories.

3.3 Schedules

- .1 n/a

END OF SECTION

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Section 01001, General Requirements

1.2 DESCRIPTION

- .1 Work Included:
 - .1 Supply and installation of membrane air/vapour barrier to walls, roofs, and floors. Includes patching as required.
- .2 Related Work Specified Elsewhere:
 - .1 Excavation and backfill - Section 02200 Earthwork
 - .2 Concrete surfaces - Section 03300 Cast -in-Place Concrete
 - .3 Masonry surfaces - Section 04220 Concrete Unit Masonry
 - .4 Brick ties and accessories - Section 04160 Masonry Reinforcing And Connectors
 - .5 Board insulation - Section 07212 Board Insulation
 - .6 Sealants - Section 07900 Sealants

1.3 SUBMITTALS

- .1 Upon request, submit certified copy of test data from recognized independent testing laboratory confirming performance properties of air vapour and dampproofing specified.
- .2 Submit appropriately sized samples of each membrane, 305mm x 305mm (12" x 12"), for verification of compliance with material specified.

1.4 QUALITY ASSURANCE

- .1 Review work of this section while it progresses with a view to identifying weaknesses or gaps in the air/vapour barrier systems.
- .2 Coordinate the timing and installation of the various air/vapour barrier systems and cladding systems to ensure a complete and integral system of air/vapour barriers.
- .3 Review and ensure continuity of air and vapour retardent membranes at junction of cladding and substrate systems and other construction details.
- .4 If the possibility of discontinuity is discovered bring to the attention of the Consultant for further direction and do not conceal.
- .5 All membranes and accessories shall be applied by a contractor acceptable to the manufacturer. Provide written evidence of such endorsement from the manufacturer when requested.
- .6 Installation of membrane systems shall be inspected prior to, periodically during and upon completion by a representative of the manufacturer to ensure compliance with the specifications and the manufacturers published guidelines. Submit written copies of inspection reports prepared by the representative of the manufacturer to the Consultant prior to concealing membrane.
- .7 Notify Consultant of timing of the work of this section and do not conceal work of this section until work reviewed by Consultant and identified defects corrected.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver all membranes and accessory materials to the project site in original and unopened packaging with manufacturer's labels intact.

- .2 Membrane and accessory materials shall be stored on site in such a manner so as to protect them from precipitation and ground moisture.
- .3 Accessory materials including; sealants, mastics, adhesives and primers, shall be stored at temperatures appropriate to those materials. Consult precautionary statements on product labels for storage and usage instructions before use and make reference to applicable material safety data sheets.
- .4 Pallets of membranes shall not be double stacked.

1.6 JOB CONDITIONS

- .1 The membranes and accessory materials shall be applied at ambient temperatures satisfactory to the manufacturer and under dry conditions only.
- .2 Concrete shall be cured a minimum of 7 days and be free of surface moisture prior to the installation of the dampproofing system. Allow adequate drying time following precipitation as recommended by Manufacturer.
- .3 Prior to the installation, inspect those areas to receive the dampproofing to ensure that they are clean, dry, sound, smooth and continuous.

1.7 REFERENCES

- .1 The membranes as specified herein and their installation, shall conform to and proceed in accordance with any and all codes, standards and practices governing work of the nature described throughout this specification.

2 PRODUCTS

2.1 MANUFACTURERS

- .1 Supply only those membrane systems specified herein.
- .2 Alternate systems will only be considered upon written submission during the tender period.
- .3 Verify with all manufacturers the compatibility of products one to the other and report any conflicts to the Consultant.

2.2 MATERIALS

- .1 Vapour barrier under slab-on-grade: Polyethylene film to CAN2-51.33-M80, Type 1, 0.253 mm (10 mil) thick, in largest sheets practical.
- .2 Sheet Air Barrier for framed walls: sheet material fabricated from spun-bonded olefin fibres, permeance rating of 1723 ng/PA-S-m2, Tyvek 2 by Dupont Canada, Typar by Remmay or Air-Gard by Fabrene Inc. complete with joint tape, Contractor's Sheathing Tape, Type Y-8086 as manufactured by 3M.
- .3 Air/vapour barrier membrane for cavity walls: "Blueskin T.G." thermofusible air and vapour barrier membrane as manufactured by Monsey Bakor:
 - .1 Membrane: SBS modified bitumen membrane reinforced with non-woven fibreglass specifically designed to be fused to the substrate by heating the lower surface with a propane torch. Membrane shall maintain a minimum thickness of 2.5mm (100 mils) after heat application.
 - .2 Thru-wall flashing membrane: same material as air/vapour barrier membrane.
 - .3 Surface Conditioner: As recommended by the Manufacturer.

- .4 Complimentary tapes/mastics for sealing around penetrations, etc.: as recommended by manufacturer.
- .4 Thru-wall flashing membrane: "Blueskin TWF" by Monsey Bakor self adhesive thru-wall flashing membrane composed of a SBS modified bitumen membrane which is integrally laminated to a yellow cross laminated polyethylene film.
- .5 Polyethylene vapour barrier where indicated:
 - .1 General: Polyethylene film to CAN2-51.33-M80, Type 1, 0.152 mm (6 mil) thick, in largest sheets practical.
 - .2 Around Frame Connections: Polyethylene film to CAN2-51.33-M80, Type 1, (10 mil) thick
 - .3 Vapour Barrier Joint Sealing Tape: Tape with an aggressive permanent adhesive, min. 75 mm wide, Contractors Tape by 3M Company.
 - .4 Sealant: in accordance with Section 07900 - Sealants
 - .5 Moulded box vapour barrier: factory-moulded polyethylene box for use with recessed electric switch and outlet device boxes, use Sylvania Electric Equipment No. 1004-VB and 5254-VB, or approved equal coordinate with Division 16.
 - .6 Elastic Flashing: Black artificial rubber flashing not less than 1 mm thick complete with expansion joints, control joints, edge bindings, pipe flashings and other standard accessories. Acceptable Suppliers: Miner Butyl Membrane, or Lexsuko Canada, or Tremco or Dunlop, or Goodyear.
- .6 Foundation wall dampproofing below grade: "Black Knight Foundation Coating and Primer" as manufactured by U.S.E. Hichcon Products Limited; with Drainage Board.
 - .1 Complimentary tapes/mastics for sealing around penetrations, etc.: as recommended by manufacturer.
 - .2 Apply dampproofing to all new and existing foundations to be excavated.
 - .3 Install Drainage Board in front of rigid insulation. Acceptable product shall be drainage board as manufactured Platon or equal.

3 EXECUTION

3.1 VAPOUR BARRIER UNDER SLAB-ON-GRADE

- .1 Use sheets of largest practical size to minimize joints.
- .2 Inspect sheets for continuity. Repair punctures and tears with sealing tape before work is concealed.
- .3 Seal lap joints of sheet vapour barrier as follows:
 - .1 Attach first sheet to substrate.
 - .2 Apply continuous bead of sealant over solid backing at joint.
 - .3 Lap adjoining sheet minimum 150 mm and press into sealant bead.
 - .4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.2 AIR/VAPOUR BARRIER PERIMETER CAVITY WALLS

.1 General

- .1 Examine all areas to receive the membrane to ensure that they are suitably prepared for its installation. Have deficiencies addressed and corrected prior to commencement of the installation.
- .2 Surfaces shall be smooth, clean, dry and free of any foreign matter that would otherwise hinder either the adhesion or regularity of the installation.
- .3 The membrane and accessory materials shall be installed only in suitable weather and where there is no threat of precipitation. For ambient temperatures below 0 deg C (32 deg F), consult manufacturer and obtain approval of Consultant.
- .4 Primer selection shall be consistent with temperature range expected during installation and the type of membrane. Consult manufacturer.
- .5 Accessory materials shall be stored at temperatures no less than 4 deg C (40 deg F) and no greater than 38 deg C (100 deg F). Containers shall be resealed after usage.

.2 Preparation

.1 Inspection and Repair

- .1 Inspect all surfaces to receive the membrane to ensure that they are continuous and free of voids and excessive gaps. Blockwork shall be complete and laid up tight to all framed openings. Report and have corrected any deficiencies.

.2 Priming/Surface Conditioning

- .1 Apply primer/conditioner to poured concrete and other surfaces as recommended by the Manufacturer. Apply in accordance with mixing and application instructions on product labels.
- .2 Allow primer to dry adequately before proceeding. Allow one (1) hour drying period for primer.
- .3 To avoid excess pick up of air borne dust once priming has been completed, prime only as much area as can be covered with membrane the same working day, If not covered in the same working day, re-prime.

.3 Membrane Installation

- .1 For ease of application cut membrane in lengths of 2-3m (7-10ft).
- .2 Apply membrane horizontally to the primed blockwork between projecting masonry reinforcing, beginning at the base of the wall area.
- .3 Each length of membrane shall be installed such that its upper edge runs continuously along the underside of the line of masonry reinforcing. Subsequent sheets applied above shall overlap the sheet below an average of 51mm (2in) immediately below the line of reinforcing. Minimum overlaps shall be 38mm (1 1/2in), for lap deviations below this width please contact manufacturer.
- .4 An alternate method of installation for the membrane can be employed where the membrane is positioned along the top side of the masonry reinforcing and smoothed upward and into place. By continuing in this manner, the next sheet above will overlap the cuts made in the lower sheet immediately above the line of reinforcing.
- .5 Since the membrane width appropriate for this application, 450mm, is wider than the typical spacing between the lines of reinforcing, 400mm, it will be necessary to cut the membrane at the location of the tie wires projecting from the wall to enable the membrane to be laid into place.
- .6 End laps in the membrane as will be incurred in the subsequent lengths that follow, shall

maintain a minimum overlap of 50mm.

- .7 Apply heat to the underside of membrane by propane torch, at the point where the membrane is in contact with the substrate. Apply sufficient heat to make the membrane tacky and press membrane onto the substrate, using a masonry trowel to apply light pressure.
- .8 Cut membrane at ties, heat around tie and use a trowel to form a tight seal around projection.
- .9 All detail work shall be carefully carried out to ensure continuous air tightness of the membrane. Reinforce corners with a piece of membrane and use heated trowel to ensure joints are tight.
- .10 The membrane installation shall continue to a point, which as outlined in the plans and specifications, interfaces with other elements designated as integral to the overall air/vapour barrier system. Ensure compatibility with those components and consult manufacturer for assistance on proper tie-ins.

.4 Details

- .1 Fit membrane tightly around all penetrations through it and seal using mastic.
- .2 Continue the membrane into all openings in the wall area, i.e.: windows, doors, etc., and terminate at a point that will ensure that it will not be visible from the interior and will facilitate continuous seal at windows doors etc.
- .3 The membrane installation shall be tied into and made continuous with all framed openings. Due to the wide range of frame profiles, closures and transitions, a standard detail is not practical, consult manufacturer for assistance on these detail locations.
- .4 Co-ordinate the installation of the membrane with the roofing trade to ensure continuity of the air/vapour seal membrane with the roofing system.
- .5 At the end of each working day apply a bead of mastic along the exposed top edge of the incompleated membranes. Tool the mastic to ensure that it is worked into the surface of the block work.
- .6 Before covering in the membrane, inspect and repair as necessary any punctures, damaged areas or inadequately lapped seams. Repairs shall be made using the membrane appropriately sized to extend a minimum of 102mm (4in) in all directions from the perimeter of the affected area.

3.3 FOUNDATION WALL DAMPPROOFING BELOW GRADE

.1 General

- .1 Examine all areas to receive membrane to ensure that they are suitably prepared for its installation. Have deficiencies addressed prior to the commencement of the installation.
- .2 Concrete surfaces shall be smooth, clean, dry and free of any foreign matter that would otherwise hinder the adhesion or installation procedure.
- .3 Ensure compatibility of membrane and accessories with: curing compounds, preservative treatments, dissimilar membrane systems and adjoining materials. Consult manufacturer's representative for further assistance.

.2 Preparation

- .1 Before applying dampproofing: Seal exterior joints between foundation walls and footings, joints between concrete floor slabs and foundation and around penetrations through dampproofing with sealing compound.

- .3 Application
 - .1 Apply primer to surface at rate of 0.5 l/m²
 - .2 Apply dampproofing in accordance with applicable CGSB standard as follows:
 - .1 Material: CGSb 37-GP-2M use Application CGSB 37-GP-3M
 - .2 Material: CGSb 37-GP-16M use Application CGSB 37-GP-36M
 - .3 Apply continuous uniform coating of dampproofing to foundation walls from 50mm below finished grade, down foundation, over mortar fillet and down footing.
 - .4 Clean-up
 - .1 Promptly as the work proceeds and on completion, clean up and remove from the premises all rubbish and surplus materials resulting from the foregoing work.

3.4 POLYETHYLENE VAPOUR BARRIER

- .1 Install sheet vapour barrier on warm side of exterior wall, ceiling and floor assemblies prior to installation of gypsum board to form continuous barrier.
- .2 Use sheets of largest practical size to minimize joints.
- .3 Inspect sheets for continuity. Repair punctures and tears with sealing tape before work is concealed.
- .4 During framing installation, wrap header tracks, slab ends and other constructions requiring installation during framing, using 10 mil polyethylene sheets for later sealing to larger sheets. Seal these connecting pieces to membrane air vapour barrier where required.
- .5 For windows and other wall openings:
 - .1 Cut sheet vapour barrier to form openings and ensure material is lapped and sealed to window frame or other opening frame to form continuous seal.
 - .2 Seal vapour barrier to air barrier and/or membrane air/vapour barrier at all openings.
- .6 Seal perimeter of sheet vapour barrier as follows:
 - .1 Apply continuous bead of sealant to substrate at perimeter of sheets.
 - .2 Lap sheet over sealant and press into sealant bead.
 - .3 Install staples through lapped sheets at sealant bead into wood substrate.
 - .4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.
- .7 Seal lap joints of sheet vapour barrier as follows:
 - .1 Attach first sheet to substrate.
 - .2 Apply continuous bead of sealant over solid backing at joint.
 - .3 Lap adjoining sheet minimum 150 mm and press into sealant bead.
 - .4 Install staples through lapped sheets at sealant bead into wood substrate.
 - .5 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.
- .8 Seal electrical switch and outlet device boxes that penetrate vapour barrier as follows:
 - .1 For sheet-type vapour barriers, install moulded box vapour barrier.
 - .2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

3.5 SHEET AIR BARRIER

- .1 Attach sheet air barrier vertically to exterior face of sheathing as recommended by manufacturer.
- .2 Lap all horizontal and vertical joints 200mm minimum.

- .3 Ensure continuous placement of sheet air barrier.
- .4 Seal all joints in sheet air barrier with specified sealing tape.
- .5 Where air barrier contacts other insulation or air barrier type, lap a minimum of 200mm and seal with tape.
- .6 Seal air barrier and vapour barrier to each other at all openings.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01610 - Basic Product Requirements
- .2 Section 02223 - Excavation and Backfill
- .3 Section 03300 – Cast-In-Place Concrete
- .4 Section 04080 - Masonry Reinforcement & Connectors
- .5 Section 04420 - Concrete Masonry Units
- .6 Section 07160 - Sheet Vapour Retarder
- .7 Section 07271 - Thermofused Membrane Air Vapour Barriers
- .8 Section 07410 - Preformed Aluminum Panels
- .10 Section 07620 - Sheet Metal Flashing & Trim
- .11 Section 07930 - Foamed in Place Insulating Sealant

1.2 REFERENCES

- .1 ASTM E96-96, Test Methods for Water Vapor Transmission of Materials.
- .2 ASTM C591-94, Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal
- .3 CGSB 71-GP-24M-77, Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.
- .4 CAN/ULC-S701-97, Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
- .5 CAN/ULC-S702-97, Thermal Insulation, Mineral Fibre, for Buildings.

1.3 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01330 - Submittal Procedures.
 - .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01330 - Submittal Procedures. Indicate VOC's insulation products and adhesives.
- .2 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Co-ordinate with other building subtrades.
- .3 Review manufacturer's installation instructions and warranty requirements.

2 PRODUCTS

2.1 INSULATION

- .1 Extruded polystyrene: to CAN/ULC S701-97, Type 2 thickness as indicated on drawings with shiplapped edges unless otherwise noted. Only polystyrene insulations listed on CGSB Qualified Products List (41 GP Series) are acceptable for use on this project.
 - .1 Acceptable materials:
 - .1 Below Grade: Styrofoam SM (Type 4) by Dow Chemicals Canada Inc. or approved equal.
 - .2 Exterior walls (Steel Stud/Masonry), (Steel stud/ girts/metal cladding): Styrospan (Type 3) squared edges by Dow Chemicals Canada Inc. or approved equal.
 - .3 Exterior walls (Masonry Cavity Wall): Cavitymate (Type 3) squared edges by Dow Chemicals Canada Inc. or approved equal.
 - .2 Insulating sealant: Foam in place to section 07930

2.2 ADHESIVES

- .1 Type A: for polystyrene below grade insulation against foundation walls:
 - .1 to CGSB 71-GP-24.
- .2 Type C: Trowel consistency solvent type adhesive for rigid insulation:
 - .1 to CGSB 71-GP-24 Type 2.
 - .2 Acceptable Product: Bakor 230-21

2.3 ACCESSORIES

- .1 Insulation clips: impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self-locking type.

3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 WORKMANSHIP

- .1 Install insulation after building substrate materials are dry.
- .2 Install insulation to maintain continuity of thermal protection to building elements and spaces.
- .3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

- .4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50mm from vents.
- .5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
- .6 Offset both vertical and horizontal joints in multiple layer applications. On wall applications offset vertical joints to facilitate installation of masonry reinforcement and girt systems..
- .7 Do not enclose insulation until it has been inspected and approved by Consultant.

3.3 EXAMINATION

1. Examine substrates and immediately inform Consultant in writing of defects.
2. Prior to commencement of work ensure substrates are firm, straight, smooth, dry, clean, and free of snow, ice or frost and clean of dust and debris.

3.4 RIGID INSULATION INSTALLATION

1. Install insulation board to thickness shown at locates indicated on Drawings and Details.
2. Apply adhesive to polystyrene, insulation board in accordance with manufacturer's recommendations.
3. Imbed insulation boards into vapour barrier type adhesive, applied as specified, prior to skinning of adhesive.
4. Leave insulation board joints unbonded over line of expansion and control joints. Bond a continuous 150 mm wide 0.15 mm polyethylene strip over expansion and control joints using compatible adhesive before application of insulation.

3.5 PERIMETER FOUNDATION INSULATION

- .1 Interior application: extend boards vertically below bottom of finish floor slab as indicated on drawings, installed on inside face of perimeter foundation walls. Install on interior face of perimeter foundation wall with adhesive.
- .2 At intersection of perimeter foundation wall and interior foundation walls turn insulation onto one side of the interior wall, as indicated on drawings.
- .3 Under slab application: extend layers of boards from perimeter foundation wall as indicated on drawings. Install layer below underslab area as indicated.

3.6 WALL INSTALLATION

- .1 Install polystyrene insulation boards on outer surface of inner wythe of wall cavity over impaling clips on bed of adhesive. Each layer of insulation shall receive insulation adhesive and joint seal

installed as indicated. Apply insulation adhesive to insulation boards with 50 mm daubs of adhesive spaced approximately 305 mm o.c. Both ways on inside face of insulation board.

- .2 Apply a minimum 6 mm wide application of adhesive to board edges by trowel buttering. Seat insulation edge into adhesive and press insulation firmly in place over masonry ties.
- .3 Fit insulation between wall ties and other obstructions with joints staggered and edges butted tightly.
 - .1 Press units firmly against inside wythe of masonry or other construction.
 - .2 Wedge insulation from outside wythe of construction with small fragments of masonry materials spaced 600mm o.c. both ways.
 - .3 Make insulation continuous. Fill all voids with low expansion foam.

3.7 STEEL STUD/MASONRY AND STEEL STUD/CLADDING INSTALLATION

- .1 For installation of insulation boards on gypsum substrates with masonry ties. Supply 50 mm (2") daubs of adhesive spaced approximately 305 mm o.c. both ways on inside face of insulation board and apply a minimum 6 mm wide application of adhesive to board edges. Install insulation over masonry ties and press firmly into place ensuring that insulation edges are firmly seated into joint sealant. Seal around masonry tie using foamed in place insulating sealant and install insulation supports and V-ties onto masonry tie. To further fasten insulation to gypsum board substrate, install a minimum of 2 insulation washers horizontally at midpoint of each insulation board with galvanized screws.
- .2 For installation of insulation boards on gypsum substrates with horizontal system and paneled or metal, install insulation between horizontal girts. Insulation should sit flat against gypsum sheathing with no air gaps. Seal insulation to horizontal girts system. Cut inner layer of insulation board tight around clips and fill voids with foamed in place insulating sealant. Supply 50 mm daubs of adhesive spaced approximately 305 mm o.c. both ways on inside face of insulation board and using minimum 6 mm wide application of Air-Bloc 21 to board edges. Fasten insulation board to metal studs using 4 (four) specified insulation fasteners per sheet.

3.8 PROTECTION

- .1 After installation of board insulation and prior to installation of exterior wall finish, protect insulation from physical damage and exposure to ultra violet sun damage per manufacturer's instructions.

3.9 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01610 - Basic Product Requirements
- .2 Section 06100: Rough Carpentry
- .3 Section 09250: Gypsum Board
- .4 Division 23: Insulation for mechanical work.

1.2 REFERENCES

- .1 ASTM C 665, Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction.
- .2 CAN/ULC S702 1997 Thermal Insulation Mineral Fibre for buildings.
- .3 Underwriters Laboratories of Canada (ULC).
 - .1 CAN/ULC•S702, Standard for Mineral Fibre Insulation.

1.3 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01330 - Submittal Procedures.
 - .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01330 - Submittal Procedures. Indicate VOC's insulation products and adhesives.
- .2 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.

2 PRODUCTS

2.1 INSULATION

- .1 Batt and blanket mineral fibre: to ASTM C 665, Type 1 and 2,
 - .1 Acceptable material for Acoustic Insulation:
 - .1 Owens Corning: Quietzone
 - .2 John Mansville: Sound-Sheild Fibreglass Insulation
 - .3 or approved equal
 - .2 Acceptable material for Thermal Insulation: all insulation batts to suit full wall cavity as per Wall/Partition Type.
 - .1 Owens Corning: Ecotouch Thermal Insulation
 - .2 Roxul: ComfortBatt Thermal Insulation
 - .3 John Manville: Thermal Insulation
 - .4 or approved equals.
- .2 Acoustic Blanket Insulation for above ceiling applications (as indicated)

- .1 Acceptable material:
 - .1 Owens Corning: SelectSound Black Acoustic Blanket Insulation
 - .2 or approved equal

3 EXECUTION

3.1 INSULATION INSTALLATION

- .1 Install insulation to maintain continuity of thermal and acoustic protection to building elements and spaces unless specifically indicated on drawings all acoustic batt insulation shall extend from the floor to underside of structure floor or roof deck above.
- .2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .3 Do not compress insulation to fit into spaces.
- .4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures.
- .5 Do not enclose insulation until it has been inspected and approved by Consultant

3.2 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 The General Conditions of the Contract, Supplementary Conditions, and the General Requirements of Division 1, form part of this section, and must be read in conjunction with the requirements of this section, and all related sections.
- .2 The work of this section, and related work specified in other sections shall comply with all requirements of Division 1 – General Requirements.

1.2 SECTION INCLUDES

- .1 Provision of all labour, materials, equipment and incidental services necessary to provide firestop products and systems intended to act as a firestop and smoke seal within fire resistive wall and floor assemblies.
- .2 Firestop systems shall be used in locations including, but not limited to, the following:
 - .1 Penetrations through fire resistance rated floor and roof assemblies including both empty openings and openings containing penetrants.
 - .2 Penetrations through fire resistance rated wall assemblies including both empty openings and openings containing penetrants.
 - .3 Membrane penetrations in fire resistance rated wall assemblies where items penetrate on side of the barrier.
 - .4 Joints between fire resistance rated assemblies.
 - .5 Perimeter gaps between rated floors/roofs and an exterior wall assembly.
- .3 Firestops and smoke seals within mechanical and electrical assemblies (i.e. inside ducts, dampers and bus ducts) shall be provided as part of the work of Divisions 15 and 16 respectively.
- .4 Firestops and smoke seals around the outside of such mechanical and electrical assemblies, where they penetrate fire separations, shall form part of the work of this section.
- .5 Firestop systems provide for the Work must be from one manufacturer only, whether provided by Divisions 15, 16, or by this section

1.3 RELATED SECTIONS

- | | | |
|-----|---|----------------|
| .1 | Cast-in-Place Concrete | Section 03300 |
| .2 | Unit Masonry | Section 04200 |
| .3 | Structural Steel for Building | Section 051223 |
| .4 | Sprayed Fireproofing | Section 07811 |
| .5 | Intumescent Thin Film Fire Resistive Material | Section 07814 |
| .6 | Sealants | Section 07900 |
| .7 | Aluminum Frame Curtain Wall | Section 08900 |
| .8 | Gypsum Board | Section 09250 |
| .9 | Mechanical; Pipe and Duct | Division 15 |
| .10 | Electrical Lighting, Power, Alarms, and Communication | Division 16 |

1.4 QUALITY ASSURANCE

- .1 Applicator Qualifications
 - .1 Work of this section shall be performed by applicators having a minimum of 2 years documented experience in the installation of firestop products and systems. Submit proof of experience to Consultant.
- .2 Installation
 - .1 Work shall be performed in strict accordance with manufacturer's printed instructions, and in accordance with all warranty requirements.
- .3 Pre-installation Meeting
 - .1 Convene a pre-installation meeting for the Products specified in this section. Attendees must include, as a minimum, representatives of the following:
 - .1 Contractor (Site Superintendent & Project Manager),
 - .2 Installation Subcontractor (Site Foreman & Project Manager),
 - .3 Product Manufacturer and Distributor (Technical Representatives),
 - .4 Related Subcontractors (ie. Mechanical and/or Electrical), and
 - .5 Consultant.

1.5 REFERENCE STANDARDS

- .1 ASTM E84-01; Standard Test Method for Surface Burning Characteristics of Building Materials.
- .2 ASTM E119; Methods of Fire Tests of Building Construction and Materials.
- .3 ASTM E814-00; Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
- .4 ASTM E1399-97 (2000); Test Method for Cyclic Movement and Measuring Minimum and Maximum Joint Width.
- .5 ASTM E1966-00; Test Method for Resistance of Building Joint Systems
- .6 UL 263; Fire Tests of Building Construction and Materials.
- .7 UL 723; Surface Burning Characteristics of Building Materials.
- .8 UL 1479; Fire Tests of Through-Penetration Fire Stops.
- .9 UL 2079; Tests for Fire Resistance of Building Joint Systems.
- .10 ULC-S115-1995 (R2001); Fire Tests of Firestop Systems.
- .11 CAN/ULC-S102-1988 (R2000); Surface Burning Characteristics of Building Materials and Assemblies.
- .12 Underwriters Laboratories of Canada; List of Equipment and Materials - Fire Resistance.
- .13 Underwriters Laboratories Inc.; Fire Resistance Directory – Volume 2.
- .14 Intertek Testing Services; Directory of Listed Building Products.
- .15 Factory Mutual Research (FM); FM Approval Standard of Firestop Contractors – Class 4991.
- .16 Omega Point Laboratories (OPL); Building Products, Materials & Assemblies – Volume II.

1.6 DEFINITIONS

- .1 Firestop: The use of a material or combination of materials in a fire-rated structure (wall or floor) where it has been breached, so as to restore the integrity of the fire rating on that wall or floor.
- .2 System: The use of a specific firestop material or combination of materials in conjunction with a specific wall or floor construction type and specific penetration(s).
- .3 Barrier: Any bearing or non-bearing wall or floor that has an hourly fire and smoke rating.
- .4 Through-Penetration: Any penetration of a fire-rated wall or floor that completely breaches the

barrier.

- .5 Membrane-Penetration: Any penetration in a fire-rated wall that breaches only one side of the barrier.
- .6 Fire Resistive Joint: Any gap, joint, or opening, whether static or dynamic, between two fire rated barriers including where the top of a wall meets a floor; wall edge to wall edge applications; floor edge to floor edge configurations; floor edge to wall.
- .7 Perimeter Barrier: Any gap, joint, or opening, whether static or dynamic, between a fire-rated floor assembly and a non-rated wall assembly.

1.7 PERFORMANCE REQUIREMENTS

- .1 Penetrations: Provide through-penetration firestop systems that are produced and installed to resist the spread of fire, passage of smoke and other hot gases according to requirements indicated, to restore the original fire-resistance rating of assembly penetrated.
- .2 Provide and install complete penetration firestop systems that have been tested and approved by nationally accepted testing agencies per ASTM E814, UL 1479, or ULC-S115 fire tests in a configuration that is representative of field conditions.
- .3 F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, to ASTM E814, UL 1479, or ULC-S115 but not less than one (1) hour or the fire resistance rating of the assembly being penetrated.
- .4 FT-Rated Systems: Provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, to ASTM E814, UL 1479, or ULC-S115, where required by the Building Code.
- .5 FH-Rated Systems: Provide through-penetration firestop systems with H-ratings indicated, as well as F-ratings, to ASTM E814, UL 1479, or ULC-S115, where required by the Building Code.
- .6 FTH-Rated Systems: Provide through-penetration firestop systems with H-ratings indicated, as well as F-ratings and T-ratings, to ASTM E814, UL 1479, or ULC-S115, where required by the Building Code.
- .7 For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
- .8 For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.
- .9 Fire Resistive Joints: Provide joint systems with fire resistance assembly ratings indicated, as determined by UL 2079 (ASTM E1399 and E1966), but not less than the fire resistance assembly rating of the construction in which the joint occurs. Firestop assemblies must be capable of withstanding anticipated movements for the installed field conditions.
- .10 For firestop assemblies exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.
- .11 For floor penetrations exposed to possible loading and traffic, provide firestop systems capable of

supporting floor loads involved either by installing floor plates or by other means.

- .12 Firestop products shall have flames spread ratings less than 25 and smoke-developed ratings less than 450, to ASTM E 84 or CAN/ULC-S102.
- .13 Where there is no specific third party tested and classified firestop system available for an installed condition, the firestop contractor shall obtain from the firestop material manufacturer an Engineering Judgment (EJ) to be submitted to the Consultant and authorities having jurisdiction for approval prior to installation. The EJ shall follow International Firestop Council (IFC) guidelines.

1.8 MOCK-UP

- .1 Prepare sample joints for approval by the Consultant, representative of each type of firestop condition in accordance with Section 01300.
- .2 Where not approved by the Consultant, remove and replace sample joints to the satisfaction of the Consultant.
- .3 Approved installations may become part of the finished work.

1.9 SUBMITTALS

- .1 Product Data: For each type of firestop product selected. Certify that firestop materials are asbestos free and contain volatile organic compounds (VOC's) within limits of the local jurisdiction.
- .2 Design Listings: Submit system design listings, including illustrations, from a qualified testing and inspecting agency that is applicable to each firestop configuration.
- .3 Where there is no specific third party tested and classified firestop system available for a particular configuration, the firestop contractor shall obtain from the firestop material manufacturer an Engineering Judgment (EJ) for submittal.
- .4 Qualification Data: For firms and persons specified under Quality Assurance to demonstrate their capabilities and experience. Submit document from manufacturer wherein manufacturer recognizes the installer as qualified.

1.10 ENVIRONMENTAL CONDITIONS

- .1 Install firestops when ambient or substrate temperatures are within limits permitted by the manufacturer's written instructions. Do not install firestops when substrates are wet due to rain, frost, condensation, or other causes.
- .2 Ventilate per the manufacturers written instructions on the product's Material Safety Data Sheet.

1.11 COORDINATION

- .1 Coordinate construction of openings and penetrating items to ensure that firestop assemblies are installed according to specified requirements.
- .2 Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.

- .3 Do not conceal firestop installations until the Owner's inspection agency or Authorities Having Jurisdiction have examined each installation.
- .4 Schedule firestop work after installation of penetrants but prior to concealing the openings.

1.12 EXTENDED WARRANTY

- .1 Submit a warranty of the firestop installation specified in this Section covering a period of an additional two years beyond the expiration of the warranty period specified in the General Conditions of the Contract, including materials and application. Replacement of firestop shall include removal of defective materials, preparation for and application of new material, and the repair and making good of damaged adjacent materials.
- .2 "Defective" firestop installation shall include; joint leakage, hardening, cracking, crumbling, melting, bubbling, shrinkage, running, sagging, loss of adhesion, loss of cohesion, and staining of adjacent finished materials or surfaces.

2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- .1 3M Fire Protection Products
- .2 A/D Fire Protection
- .3 Hilti Firestop Systems
- .4 Grace Construction Products
- .5 TREMstop Firestopping Systems

2.2 MATERIALS

- .1 Firestop And Smoke Seal Systems: in accordance with ASTM E814, UL 1479, or ULC-S115, asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke, and gases to ASTM E814, UL 1479, or ULC-S115, and not to exceed opening sizes for which they are intended.
- .2 Service Penetration Assemblies: certified in accordance with ASTM E814, UL 1479, or ULC-S115 and listed in testing laboratory directory.
- .3 Service Penetration Firestop Components: certified in accordance with ASTM E814, UL 1479, or ULC-S115 and listed in testing laboratory directory.
- .4 Fire resistance rating of installed firestop assemblies shall be in accordance with design requirements, and requirements of Ontario Building Code.
- .5 Primers: to Firestop manufacturer's recommendation for specific material, substrate, and end use.
- .6 Intumescent Firestop Sealants and Caulks
 - .1 Grace FlameSafe FS1900.
 - .2 Hilti FS-One.
 - .3 A/D FIREBARRIER Intumescent Caulk.
 - .4 3M Fire Barrier CP 25WB+ Caulk.

- .5 TREMstop IA by, TREMstop Firestopping Systems.
- .7 Elastomeric Sealant
 - .1 Grace FlameSafe FS1900, FS900+.
 - .2 Hilti CP601S.
 - .3 A/D FIREBARRIER Seal/Seal NS.
 - .4 3M Fire Barrier Sealant 2000 and 2000N/S.
 - .5 Fyre-Sil/Fyre-Sil S/L by, TREMstop Firestopping Systems.
- .8 Joint Spray
 - .1 Grace FlameSafe FS3000.
 - .2 Hilti CP672.
 - .3 A/D FIREBARRIER SprayMastic.
 - .4 3M FireDam Spray 100.
 - .5 TREMstop Acrylic SP by, TREMstop Firestopping Systems.
- .9 Firestop Putty
 - .1 Grace FlameSafe FSP1000 Putty & FSP1077 Putty Pads.
 - .2 Hilti CP617/617L Putty Pads, & CP618 Putty Stick.
 - .3 A/D FIREBARRIER Putty.
 - .4 3M Fire Barrier Moldable Putty+.
 - .5 TREMstop MP by, TREMstop Firestopping Systems.
- .10 Firestop Devices
 - .1 Grace FlameSafe FSWS Collar, FSIS Intumescent Sleeve.
 - .2 Hilti CP642/643 Collar.
 - .3 A/D FIREBARRIER Collar/Sleeve.
 - .4 3M Fire Barrier RC-1 Restricting Collar.
 - .5 Fyre-Can/Fyre-Can Sleeve by, TREMstop Firestopping Systems.
- .11 Wrap Strips
 - .1 Grace FlameSafe FSWS 100/150.
 - .2 Hilti CP645.
 - .3 AD FIREBARRIER Wrap Strip.
 - .4 3M FS-195+.
 - .5 TREMstop WS by, TREMstop Firestopping Systems.
- .12 Firestop Mortars
 - .1 Grace FlameSafe FSM Mortar.
 - .2 Hilti FS635 Trowelable Compound.
 - .3 A/D FIREBARRIER Mortar.
 - .4 3M Fire Barrier Mortar.
 - .5 TREMstop Fire Mortar by, TREMstop Firestopping Systems.
- .13 Firestop Bags/Pillows/Blocks
 - .1 Grace FlameSafe Bags, FlameSafe Pillows.
 - .2 Hilti FS657 Fire Block.
 - .3 AD FIREBARRIER Pillows.
 - .4 3M Fire Barrier Pillows.
 - .5 TREMstop PS by, TREMstop Firestopping Systems.
- .14 Forming/Damming Materials: Mineral Wool or other type as per manufacturer's recommendations.

- .15 Accessories: Provide components for each firestop system that are needed to install fill materials and to comply with Performance Requirements. Use only approved components specified by the firestop manufacturer for the firestop systems indicated. Accessories include, but are not limited to the following items:
 - .1 Permanent forming/damming/backing materials, including the following:
 - .2 Mineral wool fiber insulation.
 - .3 Foams or sealants used to prevent leakage of fill materials in liquid state.
 - .4 Fire-rated form board.
 - .5 Polyethylene/polyurethane backer rod.
 - .6 Rigid polystyrene board, and other temporary forming materials.
 - .7 Substrate primers.
 - .8 Steel sleeves.
- .16 All firestop products and systems shall be designed and installed so that the basic sealing system will allow the full restoration of the thermal and fire resistance properties of the barrier being penetrated with minimal repair if penetrants are subsequently removed.

2.3 MIXING

- .1 For those products requiring mixing before application, comply with firestop manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

3 EXECUTION

3.1 EXAMINATION

- .1 Examine substrates and conditions for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance.
- .2 Proceed with installation only after unsatisfactory conditions have been corrected.
- .3 Verify that all pipes, conduits, cables, and/or other items which penetrate fire-rated construction have been permanently installed prior to installation of firestops.

3.2 PREPARATION

- .1 Surface Cleaning: Clean out openings immediately before installing firestop systems to comply with written recommendations of firestop manufacturer and the following requirements:
 - .1 Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of firestop systems.
 - .2 Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestop systems. Remove loose particles remaining from cleaning operation.
 - .3 Remove laitance and form-release agents from concrete.
- .2 Firestop shall be installed before fireproofing where bonding of firestop to metal deck is required.

- .3 Firestop must precede installation of insulation around pipes and ducts penetrating fire separation.
- .4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces.

3.3 INSTALLATION

- .1 General
 - .1 Install firestop and smoke seal material and components in accordance with certification and manufacturer's instruction.
 - .2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separations.
 - .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength to maintain their integrity.
 - .4 Tool or trowel exposed surfaces to a neat smooth finish.
 - .5 Remove excess compound promptly as work progresses and upon completion.
- .2 Penetration Firestop Systems
 - .1 Install through-penetration firestop systems to comply with Performance Requirements in Part 1 and firestop manufacturer's written installation instructions and published drawings for products and applications indicated.
 - .2 Apply firestops in accordance with listed system designs or manufacturer's EJ per the manufacturer's installation instructions.
 - .3 Install forming/damming/backing materials and other accessories required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire resistance ratings required.
 - .4 Install fill materials for firestop systems by proven techniques to produce the following results:
 - .1 Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
 - .2 Apply materials so they fully contact and adhere to substrates formed by openings and penetrating items.
 - .3 For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.
- .3 Joint Firestop Systems
 - .1 Install fire resistive joint firestop systems to comply with Performance Requirements in Part 1 and firestop manufacturer's written installation instructions and published drawings for products and applications indicated.
 - .2 Apply firestops in accordance with listed system designs or manufacturer's EJ per the manufacturer's installation instructions.
 - .3 Install joint forming/damming materials and other accessories required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths of installed firestop material relative to joint widths that allow optimum movement capability and achieve fire resistance ratings required.
 - .4 Install fill materials for firestop systems by proven techniques to produce the following results:
 - .1 Fill joint as required to achieve fire-resistance ratings indicated.
 - .2 Apply materials so they fully contact and adhere to substrates forming the openings.
 - .3 Completely fill recesses provided for each joint configuration.
 - .4 Tool non-sag firestop materials after their application and prior to the time

skinning begins. Use tooling agents approved by the firestop manufacturer.

- .4 Perimeter Barrier Firestop Systems
 - .1 Install perimeter barrier firestop systems to comply with Performance Requirements in Part 1 and firestop manufacturer's written installation instructions and published drawings for products and applications indicated.
 - .2 Apply firestops in accordance with listed system designs or manufacturer's EJ per the manufacturer's installation instructions.
 - .3 Install metal framing, curtain wall insulation, mechanical attachments, safing materials and firestop materials as applicable within the system design.

3.4 INSPECTION

- .1 Notify Consultant when installation is complete and ready for inspection, and prior to concealing or enclosing firestop materials and service penetration assemblies.

3.5 TOLERANCES

- .1 The following shall regulate sizing of service penetrations:
 - .1 Divisions 15 and 16 shall sleeve single, circular penetrants, except in fire resistance rated gypsum board.
 - .2 Multiple penetrations of circular penetrants shall be considered such if the penetrants are not further than 102mm apart.
 - .3 Forming of multiple penetrations and single penetrants in fire resistance rated gypsum board assemblies shall be created by respective trades by forming a square or rectangular opening around the penetrants. The edges of the opening shall be covered in gypsum board
 - .4 Perimeter clearance shall be 13mm to 25mm for single penetrants, or 13mm to 25mm around outer penetrants in multiple penetrations.
 - .5 Penetrations of square or rectangular configuration shall be constructed as specified above. Perimeter clearance shall be 40 to 50mm.

3.6 SCHEDULE

- .1 Non-Service Penetrations Through Vertical Fire Separations Consisting of Masonry, Concrete, Or Gypsum Board/Stud Construction;
 - .1 Elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **F**.
- .2 Edge of Floor Slabs At Curtain Wall Or Precast Concrete Panel Assemblies;
 - .1 Self-leveling elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **F**.
- .3 Voids at Perimeter Edges of Vertical Fire Separations Consisting Of Masonry, Concrete, Or Gypsum Board/Steel Stud Construction;
 - .1 Elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **F**.
- .4 Intersection of Masonry and Gypsum Board/Steel Stud Fire Separations;
 - .1 Elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **F**.

- .5 Control and Deflection Joints in Fire Separations;
 - .1 Elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **F**.
- .6 Non-Service Penetrations Through Horizontal Fire Separations And Fire-Resistance Rated Floor Slabs.
 - 1 Self-leveling elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **F**.
- .7 Openings and Sleeves Installed for Future Use in Fire Separations;
 - .1 Elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **FH**.
- .8 Service Penetrations Around Mechanical Ductwork And Noncombustible Piping, Rigid Electrical Conduit And Other Assemblies Penetrating Fire Separations;
 - .1 Elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **F**.
- .9 Service Penetrations Around Combustible Piping Penetrating Fire Separations;
 - .1 Intumescent mastic collar.
 - .2 Firestop system rating: **F**.
- .10 Service Penetrations Around Multiple Flexible Cables Penetrating Fire Separations;
 - .1 Removable intumescent bags/pillows, or intumescent cable sleeve systems.
 - .2 Firestop system rating: **FT**.

3.7 CLEANUP

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

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01610 - Basic Product Requirements

1.2 REFERENCES

- .1 CSSBI 20M-99 Sheet Steel for Architectural, Industrial and Commercial Building Applications.
- .2 CSSBI 16-94 Pre-finished Sheet Steel for Building Construction
- .3 CSSBI S10-97 Insulated Sheet Steel Wall Assemblies
- .4 ASTM A653M-99 Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .5 CAN/CGSB-19.18-M87 Sealing Compound, One-Component, Silicone Base, Solvent Curing.

1.3 DESIGN CRITERIA

- .1 Design metal panel wall to provide for thermal movement of component materials caused by ambient temperature range of 80° C without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.
- .2 Include expansion joints to accommodate movement in wall system and between wall system and building structure, caused by structural movements, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration.
- .3 Design members to withstand dead load and wind loads calculated in accordance with NBC applicable local regulations, to maximum allowable deflection of 1/180th of span.
 - .1 Components shall not vibrate and shall be free of all noise when exposed to design wind loads.
- .4 Provide for positive drainage of condensation occurring within wall construction and water entering at joints, to exterior face of wall.
- .5 Design wall system to accommodate specified erection tolerances of structure.
- .6 Appearance:
 - .1 All exposed surfaces shall be free of distortion, twist, waves, kinks and buckles.
 - .2 Colour shall be uniform hue, tint, shade and gloss.

1.4 SAMPLES

- .1 Submit duplicate 100 x 100 mm samples of wall system, representative of materials, finishes and colours, in accordance with requirements of Section 01330.

1.5 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with requirements of Section 01330

- .2 Indicate dimensions, profiles, schedule of wall elevations, wall openings, head, jamb, sill and mullion detail, trim and closure pieces, materials and finish, attachment methods, anchor details, interface with adjacent construction, isolation coatings, compliance with design criteria and requirements of related work.
- .3 Each shop drawing submitted shall bear stamp of qualified professional engineer registered in province of Ontario.

2 PRODUCTS

2.1 MATERIALS

- .1 Prefinished Metal Cladding Systems
 - .1 Acceptable Manufacturer(s): Vicwest, Agway Metals, Ideal Roofing, or approved equal. The following spec is intended to be based upon Vicwest product. All approved manufacturer's must conform to the acceptable standards as indicated, including available colour selections.
 - .2 Wall Cladding Profiles:
 - .1 Siding A: 2-2/3" x 7/8" Corrugated
 - .2 Siding B, C & D: AD300R (varying colours).
 - .3 Soffit Profiles: AD300R
 - .4 Fabricated from Z275 galvanized sheet steel conforming to ASTM A653M Grade 230 or AZ150 Galvalume, sheet steel conforming to ASTM A792M Grade 230.
 - .5 Sub-girts: Minimum 1.21 mm (0.048") thick formed galvanized steel, ASTM A653M Grade 230 with Z275 zinc coating. Full depth of wall system, factory notched and formed to match liner.
 - .6 Fasteners: Galvanized, with exposed accessories and fasteners colour matched to cladding
 - .7 Cladding coating: Prepainted with Baycoat 8000 Series or approved equal.
 - .8 Colours: Up to (4) colours as later selected by Consultant. Colour selection from manufacturer's standard colour ranges, including white, off white, earth tones, or historical colour ranges.
- .2 Sealants:
 - .1 Concealed locations: tape or compound, non-skinning, non-drying butyl rubber.
 - .2 Exposed locations: one part silicone to CAN/CGSB-19.18M
 - .3 Primers and surface conditioners: as recommended by sealant manufacturer.

3 EXECUTION

3.1 PREPARATION

- .1 Protect metal surfaces in contact with concrete, masonry mortar, plaster or other cementitious surface with specified isolation coating.

3.2 INSTALLATION

- .1 Install siding system in accordance with manufacturer's instruction and CSSBI S10.
- .4 Install exterior finish siding with concealed fasteners.
- .3 Provide alignment bars, brackets, clips, inserts, shims as required to securely and permanently anchor wall system to building structure.
- .4 Wall cladding framing system:
 - .1 Install sub-girts. Frame all openings in the cladding.
 - .2 Flashing: Install starter flashing, drip and other flashing, and corners, edgings, window and door flashing as shown on the drawings.
 - .3 Exterior Cladding: Install exterior cladding in accordance with manufacturer's standard installation procedures, providing proper laps and detailing to ensure a weathertight face.
 - .4 Install finishing flashing and cap flashing.
 - .5 Sealants: Install sealants at junctions with adjoining work, and where shown on the drawings.

3.3 CLEANING

- .1 Wash down exposed interior and exterior surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths. Wipe interior surfaces clean as part of final clean-up.
- .2 Remove excess sealant with recommended solvent.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01610 - Basic Product Requirements

1.2 References

- .1 ASTM C 1193 Standard guide for use of joint sealants.
- .2 CGSB 19-GP-5M-76, Sealing Compound, One Component, Acrylic Base, Solvent Curing.
- .3 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
- .4 CGSB 19-GP-14M-76, Sealing Compound, One Component, Butyl-polyisobutylene Polymer Base, Solvent Curing.
- .5 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
- .6 CAN/CGSB-19.18-M87, Sealing Compound, One Component, Silicone Base, Solvent Curing.
- .7 CAN/CGSB-19.21-M87, Sealing and Bedding Compound Acoustical.
- .8 CAN/CGSB-19.22-M89, Mildew Resistant, Sealing Compound for Tubs and Tiles.
- .9 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.

1.3 Samples

- .1 Submit samples in accordance with Section 01330 - Submittal Procedures.

1.4 Delivery, Storage, and Handling

- .1 Deliver, handle, store and protect materials in accordance with Section 01610 - Basic Product Requirements.
- .2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.5 Environmental and Safety Requirements

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada.
- .2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
- .3 Ventilate area of work by use of approved portable supply and exhaust fans.

1.6 Quality Assurance

- .1 Installation of sealants shall be performed by a firm with minimum of five (5) years' experience.

1.7 Warranty

- .1 Submit written warranty against leaks, cohesive failure, staining of adjacent materials, in accordance with GC 12.3 but for five (5) years.
- .2 The warranty shall be issued by the Contractor and the Sealant Manufacturer.

2 PRODUCTS

2.1 Sealant Materials

- .1 Sealants and caulking compounds must:
 - .1 meet or exceed all applicable governmental and industrial safety and performance standards; and
 - .2 be manufactured and transported in such a manner that all steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, by laws and regulations including, for facilities located in Canada, the fisheries Act and the Canadian Environmental Protection Act (CEPA).
 - .3 Use products of a single manufacturer for each different product and required recommended primers.
- .2 Sealant and caulking compounds must not be formulated or manufactured with: aromatic solvents, fibrous talc or asbestos, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium, barium or their compounds, except barium sulfate.
- .3 Sealant and caulking compounds must not contain a total of volatile organic compounds (VOCs) in excess of 5% by weight as calculated from records of the amounts of constituents used to make the product;
- .4 Sealant and caulking compounds must be accompanied by detailed instructions for proper application so as to minimize health concerns and maximize performance, and information describing proper disposal methods.
- .5 Caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant shall not be used in air handling units.
- .6 When low toxicity caulks are not possible, confine usage to areas which offgas to the exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off-gas time.
- .7 Sealants acceptable for use on this project except CAN/CGSB-19.1 and CAN/CGSB-19.18 must be listed on CGSB Qualified Products List issued by CGSB Qualification Board for Joint Sealants. Where sealants are qualified with primers use only these primers.

2.2 Sealant Material Designations

- .1 Polyurethane One Part.
 - .1 Self-Levelling and Non Sag to CAN/CGSB-19.13, Type 1 and 2,
 - .2 Acceptable material: Tremco: Dymonic
Sonneborn: NP1, SL1
Sikaflex 1A
- .2 Polyurethane Two Part.
 - .1 Self-Levelling and Non Sag to CAN/CGSB-19.24, Type 1 and 2
 - .2 Acceptable material: Tremco: Dymeric
Sonneborn: NP2
Sikaflex: 2C or 2CSL.
- .3 Acrylic Latex One Part.
 - .1 To CAN/CGSB-19.17.
 - .2 Acceptable material: Tremco: Tremflex 834
General Electric (G.E. Supply): Acrylasil AL1300 (RC520)
Sonneborn: Sonolac.
- .4 Silicone Sanitary Sealant
 - .1 To CAN/CGSB-19.22 one part mildew resistant paintable..
 - .2 Acceptable material: Tremco - Tremsil 200
General Electric (G.E. Supply): 1700
Dow Corning: 786.
- .5 Acoustical Sealant - Synthetic Rubber
 - .1 To CGSB 19.21
 - .2 Acceptable material: Tremco - Acoustical Sealant.

2.3 Preformed Compressible and Non-compressible Back Up Materials

- .1 Polyethylene, Urethane, Neoprene or Vinyl Foam.
 - .1 Extruded open closed cell foam backer rod.
 - .2 Size: oversize 30 to 50 %.
- .2 Neoprene or Butyl Rubber.
 - .1 Round solid rod, Shore A hardness 70.
- .3 High Density Foam.
 - .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m³ density, or neoprene foam backer, size as recommended by manufacturer.
- .4 Bond Breaker Tape.
 - .1 Polyethylene bond breaker tape which will not bond to sealant.

2.4 Joint Cleaner

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.
- .2 Primer: as recommended by manufacturer.

3 EXECUTION

3.1 Protection

- .1 Protect installed work of other trades from staining or contamination.

3.2 Preparation of Joint Surfaces

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

3.3 Priming

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 Backup Material

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 Mixing

- .1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 Application

- .1 Sealant.
 - .1 Apply sealant in accordance with manufacturer's written instructions.
 - .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
 - .3 Apply sealant in continuous beads.
 - .4 Apply sealant using gun with proper size nozzle.
 - .5 Use sufficient pressure to fill voids and joints solid.
 - .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

- .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
- .8 Remove excess compound promptly as work progresses and upon completion.
- .2 Curing.
 - .1 Cure sealants in accordance with sealant manufacturer's instructions.
 - .2 Do not cover up sealants until proper curing has taken place.
- .3 Cleanup.
 - .1 Clean adjacent surfaces immediately and leave work neat and clean.
 - .2 Remove excess and droppings, using recommended cleaners as work progresses.
 - .3 Remove masking tape after initial set of sealant.

3.7 Sealant Schedule

- .1 Interior Sealants - Non Elastomeric (acrylic latex)
 - .1 Perimeter of built in architectural wood work
 - .2 Junction: of casework gables and flooring.
 - .3 Perimeter of pressed steel frames and adjacent finishes, including bottom at floor.
 - .4 Interior perimeter of exterior openings.
- .2 Interior Sealants Elastomeric: Polyurethane One Part
 - .1 Interior side of expansion and control joints of concrete, masonry and precast concrete walls.
 - .2 Interior control and expansion joints in floor and deck surfaces (self-levelling) sealant.
 - .3 Joints at underside of precast beams or slabs.
 - .4 Interior joints of precast concrete walls.
 - .5 Joints or tops of non load bearing masonry walls at underside of poured concrete.
 - .6 Exposed interior control joints in drywall.
 - .7 Interior perimeter of exterior openings
- .3 Interior Sealants - Silicone Sanitary
 - .1 Perimeter of bath fixtures (sinks, tubs, showers, urinals, water closets, basins, showers, vanities, stools)
 - .2 Junction of ceramic wall tile and finished flooring
- .4 Interior Sealants - Acoustical
 - .1 Joints at tops of drywall and underside of structure.
- .5 Exterior Sealants – Elastomeric: Polyurethane Two Part
 - .1 Perimeter of exterior openings where frames connect exterior facade of building (ie. brick, block, precast, masonry).
 - .2 Expansion and control joints in exterior surfaces of poured in place concrete, precast concrete, unit masonry, and architectural wall panels.
 - .3 Coping joints and coping to facade joints.
 - .4 Cornice and wash or horizontal surface joints.
 - .5 Exterior control expansion and joints in concrete decks and horizontal traffic surfaces (use self levelling sealants).
- .6 Self Levelling Sealants
 - .1 Sealant Control joints in concrete decks.

-
- .2 Exterior joints in horizontal traffic surfaces.
 - .3 Exterior control and expansion joints in decks.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01610 - Basic Product Requirements
- .2 Section 07900 - Joint Sealers
- .3 Section 08710 - Door Hardware
- .4 Section 08800 - Glazing
- .5 Division 16: Wiring for electronic hardware.

1.2 REFERENCES

- .1 ASTM A 653M-95, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 CSA A101-M1983, Thermal Insulation, Mineral Fibre, for Buildings.
- .3 CAN/CSA-G40.21-M92, Structural Quality Steels.
- .4 CSA W59-M1989, Welded Steel Construction (Metal Arc Welding).
- .5 CSDFMA, Specifications for Commercial Steel Doors and Frames, 1990.
- .6 CSDFMA, Recommended Selection and Usage Guide for Commercial Steel Doors, 1990.
- .7 CAN4-S104M- M80 (R1985), Fire Tests of Door Assemblies.
- .8 CAN4-S105M-M85, Fire Door Frames.

1.3 DESIGN REQUIREMENTS

- .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35EC to 35EC.
- .2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

1.4 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01330.
- .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed louvred, arrangement of hardware and fire rating and finishes.
- .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing finishes.

- .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
- .5 Submit test and engineering data, and installation instructions.
- .6 Indicate all special conditions.

1.5 REQUIREMENTS OF REGULATORY AGENCIES

- .1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104M NFPA 252 for ratings specified or indicated.
- .1 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4-S104.

1.6 WARRANTY

- .1 Provide a written warranty for work of this section from manufacturer for failure due to defective materials and from contractor for failure due to defective installation workmanship, for two (2) years, respectively.

2 PRODUCTS

2.1 MATERIALS

- .1 Hot dipped galvanized steel sheet: to ASTM A 653M, ZF75, minimum base steel thickness in accordance with CSDFMA Table 1 - Thickness for Component Parts. (Paintable Galvanneal)
- .2 Reinforcement channel: to CAN/CSA-G40.21, Type 44W, coating designation to ASTM A 653M, ZF75.

2.2 DOOR CORE MATERIALS

- .1 Honeycomb construction:
 - .1 Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m³ minimum sanded to required thickness.
- .2 Stiffened: face sheets laminated welded, honeycomb uninsulated insulated core.
 - .1 Fibreglass: to CSA A101, semi-rigid Type 1A3 density 24 kg/m³.
 - .2 Expanded polystyrene: CAN/CGSB-51.20, density 16 to 32 kg/m³ fire retardant.
 - .3 Polyurethane: to CGSB 51-GP-21M rigid, modified poly/isocyanurate, closed cell board. Density 32 kg/m³.
- .3 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250 degrees C at 30-60 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, ASTM E 152 or NFPA 252, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.

2.3 ADHESIVES

- .1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement or ULC approved equivalent.
- .2 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.
- .3 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.4 PRIMERS

- .1 Touch-up prime CAN/CGSB-1.181.

2.5 ACCESSORIES

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Exterior and interior top caps: rigid polyvinyl chloride extrusion conforming to CGSB 41-GP-19Ma.
- .3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .4 Door bottom seal.
- .5 Metallic paste filler: to manufacturer's standard.
- .6 Fire labels: metal rivetted.
- .7 Sealant: to Section 07900.
- .8 Glazing: to Section 08800.
- .9 Make provisions for glazing as indicated and provide necessary glazing stops.
 - .1 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws dry glazing of snap-on type.
 - .2 Design exterior glazing stops to be tamper proof.

2.6 FRAMES FABRICATION GENERAL

- .1 Fabricate doors and frames in accordance with CSDFMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Exterior frames: 1.6mm thermally broken type construction.
- .4 Interior frames: 1.6 mm welded construction.

- .5 Blank, reinforce, drill and tap frames for mortised, template hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .6 Protect mortised cutouts with steel guard boxes.
- .7 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .8 Manufacturer's nameplates on frames and screens are not permitted.
- .9 Conceal fastenings except where exposed fastenings are indicated.
- .10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .11 Insulate exterior frame components with polyurethane insulation.

2.7 FRAME ANCHORAGE

- .1 Provide appropriate anchorage to floor and wall construction.
- .2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.

2.8 FRAMES: WELDED TYPE

- .1 Welding in accordance with CSA W59.
- .2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
- .3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.
- .4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
- .5 Securely attach floor anchors to inside of each jamb profile.
- .6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.
- .7 Securely attach lead to inside of frame profile from return to jamb soffit inclusive on door side of frame only at lead lined door assembly

2.9 DOOR FABRICATION GENERAL

- .1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Exterior doors: honeycomb construction. Interior doors: honeycomb construction.

- .3 Fabricate doors with longitudinal edges locked seamed, adhesive assisted welded. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
- .4 Blank, reinforce, drill doors and tap for mortised, template hardware and electronic hardware.
- .5 Factory-prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .6 Reinforce doors where required, for surface mounted hardware. Provide flush PVC top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
- .7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .8 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN4-S104, ASTM E 152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.
- .9 Manufacturer's nameplates on doors are not permitted.

2.10 DOORS: HONEYCOMB CORE CONSTRUCTION

- .1 Form each face sheet for exterior doors from 1.6 mm sheet steel with honeycomb polystyrene polyurethane core laminated under pressure to face sheets.
- .2 Form each face sheet for interior doors from 1.6 mm sheet steel with honeycomb - temperature rise rated core laminated under pressure to face sheets.

2.11 HOLLOW STEEL CONSTRUCTION

- .1 Form each face sheet for exterior doors from 1.6 mm sheet steel.
- .2 Form each face sheet for interior doors from 1.6 sheet steel.
- .3 Reinforce doors with vertical stiffeners, securely welded to each face sheet at 150 mm on centre maximum.
- .4 Fill voids between stiffeners of exterior doors with fiberglass core.
- .5 Fill voids between stiffeners of interior doors with fiberglass core.

2.12 THERMALLY BROKEN DOORS AND FRAMES

- .1 Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.
- .2 Thermal break: rigid polyvinyl chloride extrusion conforming to CGSB 41-GP-19Ma.

- .3 Fabricate thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.
- .4 Apply insulation to frame.

2.13 ACOUSTIC DOORS

- .1 Completely fill voids, sound deaden core.
- .2 Mechanically interlock longitudinal edges.
- .3 Provide all acoustic seals as required at doors.

3 EXECUTION

3.1 INSTALLATION GENERAL

- .1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
- .2 Install doors and frames to CSDFMA Installation Guide.

3.2 FRAME INSTALLATION

- .1 Set frames plumb, square, level and at correct elevation.
- .2 Secure anchorages and connections to adjacent construction.
- .3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
- .4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
- .5 Caulk perimeter of frames between frame and adjacent material.
- .6 Maintain continuity of air vapour barrier per section 07271.

3.3 DOOR AND FRAME HARDWARE PREPARATION

- .1 All doors and frames shall be prepared to receive typical hardware such as cylindrical locks, closers, exit devices and hinges. The number of hinges shall be suitable to the sizing of the doors. Suppliers shall also refer to the Door and Screen Schedule for notes on other specialized hardware requirements such as, but not limited to electronic requirements and concealed hardware. Suppliers shall coordinate hardware preparations with the hardware supplier upon selection as per Section 01013, Allowances.

3.4 DOOR INSTALLATION

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08710 - Door Hardware.
- .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
 - .1 Hinge side: 1.0 mm.
 - .2 Latch side and head: 1.5 mm.
 - .3 Finished floor, top of carpet noncombustible sill and thresholds: 13 mm.
- .3 Adjust operable parts for correct function.
- .4 Install louvres.

3.5 FINISH REPAIRS

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

3.6 GLAZING

- .1 Install glazing for doors and frames in accordance with Section 08800 - Glazing.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 07900 Joint Sealers - Caulking of joints between frames and other building components
- .2 Section 07100 Air and Vapour Barriers - Joining of air, vapour and waterproof membranes to window frames

1.2 References

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-79.1-M91, Insect Screens.
- .2 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A440-M90, Windows.
 - .2 CAN/CSA-Z91-M90, Safety Code for Window Cleaning Operations.

1.3 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01330 - Submittal Procedures.
- .2 Indicate materials and details in scale full size for head, jamb and sill, profiles of components, interior and exterior trim, junction between combination units, elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finishes fasteners, and caulking. Indicate location of manufacturer's nameplates.

1.4 Test Reports

- .1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:
 - .3 Windows classifications A3, B7, C5, D2.
 - .4 Weathering characteristics.
 - .5 Insect screens.
 - .6 Air tightness.
 - .7 Water tightness.
 - .8 Wind load resistance.
 - .9 Condensation resistance.
 - .10 Block operation - sliding windows only.
 - .11 Sash strength and stiffness - Operable Casement Projecting.
 - .12 Ease of operation - windows with operable lights.
 - .13 Sash pull-off - vinyl windows.
 - .14 Forced entry resistance.
 - .15 Mullion deflection - combination and composite windows.

1.5 Maintenance Data

- .1 Provide operation and maintenance data for windows for incorporation into manual specified in Section 01780 - Closeout Submittals.

2 PRODUCTS

2.1 Materials

- .1 Materials: to CAN/CSA-A440 supplemented as follows.
- .2 Manufacturer - Seymour Windows and Doors, or approved equal
- .3 Sash: vinyl thermally broken.
- .4 Main frame: vinyl thermally broken.
- .5 Glass: insulated double glazed sealed units, E-film, Argon gas filled.
- .6 Screens: to CAN/CGSB-79.1.
 - .1 Insect screening mesh: count 18 x 14, 18 x 16.
 - .2 Fasteners: tamper proof.
 - .3 Screen frames: aluminum, colour to match window frames.
 - .4 Mount screen frames for interior replacement.
- .7 The manufacturing process must adhere to Lifecycle Assessment (LCA) Standards as per ISO 14040/14041 LCA Standards (to be published by 1998), CSA Z760-94 LCA Standards.

2.2 Window Type and Classification

- .1 Window Types: as indicated on Drawings.
 - .1 Awning: tilt up single operating unit with removable insulating glass storms.
 - .1 Acceptable material: solid vinyl.
 - .2 Casement: push out single operating unit with removable insulating glass storms.
 - .1 Acceptable material: solid vinyl.
 - .3 Fixed: with insulating glass.
 - .1 Acceptable material: solid vinyl.
- .2 Insect Screens: removable for cleaning; on all ventilating portions of windows.
- .3 Classification rating: to CAN/CSA-A440:
 - .1 Air tightness: A3.
 - .2 Water tightness: B7.
 - .3 Wind load resistance: C5.
 - .4 Condensation resistance: Temperature Index, I D2.
 - .5 Forced Entry: F1.
 - .6 Insect Screens: S1.
 - .7 Glazing: G1.

2.3 Fabrication

- .1 Fabricate in accordance with CAN/CSA-A440 supplemented as follows:
- .2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.
- .3 Face dimensions detailed are maximum permissible sizes.
- .4 Brace frames to maintain squareness and rigidity during shipment and installation.
- .5 Fabricate with integrated vinyl channels to receive 19mm wide returns at jambs, sill and headers.

2.4 Vinyl Finishes

- .1 Vinyl finishes: Custom Colour, to be selected by Consultant at a later date; Finish to be in accordance with CAN/CSA-A440, including appendices, supplemented.

2.5 Glazing

- .1 Glaze windows in accordance with CAN/CSA-A440.

2.6 Hardware

- .1 Hardware: prefinished metal sash locks and retractable handles to provide security and permit easy operation of units. Handles shall be removable for safety.
- .2 Locks: provide operating sash with spring loading locking device, to provide automatic locking in closed position.

2.7 Air Barrier and Vapour Retarder

- .1 Equip window frames with site installed air barrier and vapour retarder material for sealing to building air barrier and vapour retarder as follows:
 - .1 Material: identical to, or compatible with, building air barrier and materials to provide required air tightness and vapour diffusion control throughout exterior envelope assembly.
 - .2 Material width: adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder from interior.

3 EXECUTION

3.1 Window Installation

- .1 Install in accordance with CAN/CSA-A440.
- .2 Arrange components to prevent abrupt variation in colour.

3.2 Caulking

- .1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.
- .2 Apply sealant in accordance with Section 07900 - Joint Sealers. Conceal sealant within window units except where exposed use is permitted by Consultant.

END OF SECTION

1 GENERAL

1.1 WORK INCLUDED

- .1 Supply finish hardware.
- .2 It is intended that the following list of hardware will cover all finish hardware to complete the project. Omissions and discrepancies shall be brought to the architect's attention during the bidding period.

1.2 RELATED SECTIONS

- .1 01610 Basic Product Requirements
- .2 06200 Finish Carpentry
- .3 08110 Metal Door & Frames
- .4 08120 Aluminum Doors and Frames
- .5 Division 16: Electrical wiring for magnetic locks, electric strikes, electric locks, electric releases and power supplies.

1.3 PRODUCTS SUPPLIED BUT NOT INSTALLED IN THIS SECTION

- .1 Power supplies, compressor/control boxes, junction boxes, magnetic locks, electric locks, electric strikes, door status switches and electric releases installed by 16000.

1.4 REQUIREMENTS REGULATORY AGENCIES

- .1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Provide permanently attached labels for all hardware required to be rated as part of a fire-resistant door and frame assembly.

1.5 REFERENCES

- .1 Recommended locations for Architectural Hardware for Standard Steel Doors and Frames - Door and Hardware Institute
- .2 Recommended locations for Architectural Hardware for Flush Wood Doors – Door and Hardware Institute
- .3 NFPA 80-Standard for Fire Doors and Windows
- .4 Sequence Format for Hardware Schedule – Door and Hardware Institute
- .5 Key Systems and Nomenclature - Door and Hardware Institute
- .6 Abbreviations and Symbols used in Architectural Door and Hardware Schedules and

Specifications – Door and Hardware Institute.

- .7 Ontario Building Code 2012 Standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.

1.6 WARRANTY

- .1 Provide a written manufacturer's warranty for work of this Section for failure due to defective materials for ten (10) years, dated from substantial completion.
- .2 Provide a written Contractor's warranty for work of this Section for failure due to defective installation workmanship for one (1) year, dated from substantial completion.

2 PRODUCTS

2.1 MATERIAL

- .1 Refer to the hardware allowance as per Section 01021.
- .2 Installation cost associated with the hardware must be included in the tender bid.
- .3 All work associated with section 06400 Architectural Woodwork shall be excluded from this section and shall be included in the base bid.

3 EXECUTION

3.1 EXAMINATION

- .1 Ensure that doors and frames are properly prepared and reinforced to receive finish hardware prior to installation.
- .2 Ensure that door frames and finished floor are sufficiently plumb and level to permit proper engagement and operation of hardware.
- .3 Submit in writing a list of deficiencies determined as part of inspection required in 3.1.1 and 3.1.2 to supervising consultant prior to installation of finished hardware.

3.2 INSTALLATION

- .1 Hardware Installers must have a minimum of five (5) years' experience in installation of hardware. Provide verification of installer's qualification to Consultant for approval. All installers to attend review meetings with the hardware distributor.
- .2 Install hardware at mounting heights as specified in the manufacturer's templates or specific references in approved hardware schedule or approved elevation drawings.
- .3 Where mounting height is not otherwise specified, install hardware at mounting heights as indicated in above referenced standards.

- .4 Install hardware using only manufacturer supplied and approved fasteners in strict adherence with manufacturers published installation instructions.
- .5 Ensure that all locksets / latchsets / deadlocks are of the correct hand before installation to ensure that the cylinder is in the correct position. **Handing is part of installation procedure.**
- .6 Ensure that all exit devices are of the correct hand and adjust device cam for proper outside trim function prior to installation. **Handing is part of installation procedure.**
- .7 Follow all manufactures installation instructions. Adjustment is inclusive of spring power, closing speed, latching speed and back-check at the time of installation.
- .8 Install head seal prior to installation of "PA"-parallel arm mounted door closers and push side mounted door stops/holders.
- .9 Counter sink through bolt of door pull under push plate during installation.
- .10 Mount all closers, automatic operators and hold-open devices with through bolts, as indicated in the finish hardware schedule.

3.3 FIELD QUALITY CONTROL

- .1 Perform bi-monthly on-site inspections during hardware installation and provide inspection reports listing progress of work, unacceptable work and corrective measures. Repair or replace as directed by the Consultant.
- .2 Before completion of the work but after the hardware has been installed, a certificate to the architect will be submitted stating that final inspection has been made and that hardware has been checked for installation and operation by a technician from the manufacturer and hardware consultant.

3.4 ADJUSTING AND CLEANING

- .1 Check and make final adjustments to each operating item of hardware on each door to ensure proper operation and function.
- .2 All hardware to be left clean and free of disfigurements.
- .3 Instruct/demonstrate to Consultant and Owner's staff in the proper operation, adjustment, maintenance of hardware and finishes.
- .4 Check all locked doors against approved keying schedule.
- .5 Remove protective coatings prior to final inspection.
- .6 Prior to date of substantial completion, adjust hardware. Repair or replace defective hardware or installation.

3.5 PROTECTION

- .1 Protect hardware from damage during construction period by removing and reinstalling or where necessary, using temporary hardware to maintain finish in new condition and maintain manufacturer's warranty.

3.6 HARDWARE GROUPS

- .1 Under separate cover. Schedules to be provided by Hardware Supplier by Allowance.

END OF SECTION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 The General Conditions of the Contract, Supplementary Conditions, and the General Requirements of Division 1, form part of this section, and must be read in conjunction with the requirements of this section, and all related sections.
- .2 The work of this section, and related work specified in other sections shall comply with all requirements of Division 1 – General Requirements.

1.2 SECTION INCLUDES

- .1 Provision of all labour, materials, equipment and incidental necessary to provide automatic power door operator systems including the following:
 - .1 Operator equipment
 - .2 Control system
 - .3 Activation devices

1.3 RELATED SECTIONS

- .1 Section 04420 Concrete Unit Masonry
- .2 Section 05500 Metal Fabrications
- .3 Section 08110 - Steel Doors and Frames
- .4 Section 08120 - Aluminum Doors & Frames
- .5 Section 08920 Glazed Aluminum Curtain Wall
- .6 Section 09250 Gypsum Board.
- .7 Division 16- Power Supply
- .8 Appendix- Door Schedule

1.4 REFERENCE STANDARDS

- .1 Aluminum Association (AA); DAF-45, Designation System for Aluminum Finishes.
- .2 American Architectural Manufacturers Association (AAMA); Aluminum Curtain Wall Design Guide Manual.
- .3 ASTM B209-01; Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .4 CSA-G40.21; Structural Quality Steels
- .5 CAN/CSA G164-M92 (R1998); Hot Dip Galvanizing of Irregularly Shaped Articles.
- .6 CAN3-S157-M83 (R2001); Strength Design in Aluminum.
- .7 CSA W59.2-M1991 (R1998); Welded Aluminum Construction.
- .8 CAN/CGSB-69.26-96/ANSI/BHMA A156.10-1991; Power-Operated Pedestrian Doors.
- .9 CAN/CGSB-69.35-M89/ANSI/BHMA A156.19-1984; Power Assist and Low Energy Power-Operated Doors.

- .10 CAN/ULC-S533-2002; Egress Door Securing and Releasing Devices.
- .11 LEED Reference Guide v4.0 (as published by the Canadian Green Building Council).

1.5 SYSTEM DESCRIPTION

- .1 Designed for low energy applications, surface mounted, automatic swing door operator consists of aluminum operator housing, A.C. electro-hydraulic motor, operator assembly, wiring harnesses, swing arm and electronic control.
- .2 Power Open: Automatic door operator powers the door open by forces transmitted hydraulically to the drive shaft and maintains a constant engagement throughout the opening cycle. Both opening and closing speed are field adjusted per current ANSI 156.19. Automatic door system is self-contained, requiring no remote pumps, exterior piping or compressors. The operator shall be equipped with a hydraulic bypass (relief valve), to divert fluid back to a reservoir to prevent motor overload if the door is restricted during opening cycle. Automatic door system functions as a manual door closer in the event of a power failure. Manual opening force is unaffected by opening speed adjustment. Manual force to open the door will not exceed 15 pounds, measured 25mm in from latch edge of door.
 - .1 Provide programmable remote control for each overhead dor.
- .3 Spring Close: The automatic door operator is spring closed. The spring is non-handed and returns the door to full close.
- .4 Automatic sensors.
 - .1 Provide light beam sensors at each door for auto re-open.

1.6 SUBMITTALS

- .1 Shop Drawings
 - .1 Submit shop drawings in accordance with Section 01330.
 - .2 Indicate on shop drawings, layout, dimensions, elevations, detail sections of members, materials, finishes, hardware including mounting heights, anchors and reinforcement, provisions for expansion, and other pertinent information.
- .2 Maintenance Data
 - .1 Provide complete operation and maintenance data for inclusion in Operations and Maintenance Manual. Include spare parts list.
 - .2 Include manufacturer's parts lists, servicing frequencies, instructions for adjustment and operation applicable to each component.
 - .3 Include name, address and telephone number of nearest authorized service representative.

1.7 QUALITY ASSURANCE

- .1 Installation
 - .1 Installation of power door operators shall be performed by a company which is a certified installer of the manufacturer, for both installation and maintenance, and with minimum five (5) years documented servicing and installing experience. Submit documentation.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver materials to site protected from damage.
- .2 Store materials in clean, dry area indoors in accordance with manufacturer's instructions.
- .3 Protect materials and finish from damage during handling and installation.

1.9 MAINTENANCE SERVICE

- .1 Manufacturer shall provide central-dispatch maintenance service available 24 hours per day, 365 days per year for maintenance service during the Contract Warranty period.
- .2 Toll free phone number shall be prominently displayed on header of each operator.

1.10 WARRANTIES

- .1 Manufacturer's Warranty: Units to be warranted against defect in material and workmanship for a period of one year from the Date of Substantial Completion. Manufacturer's warranty is in addition to, and not a limitation of, other rights owner may have under Contract Documents.

2 PRODUCTS

2.1 ACCEPTABLE PRODUCTS AND MANUFACTURERS

- .1 The following products and manufacturers are acceptable:
 - .1 Series 7000, by Horton Automatics
 - .2 Dorma ED400
 - .3 Series SW100, by Besam
 - .4 Stanley Magic Access"
- .2 Push Button Bollard: 152mm x 152mm x 1067mm tall surface mount with concealed wedge anchor fastened mounting base, prepped at 195mm for wall switch, to come with colour matching ABS cap. Provide "Wikk Industries Inc" part no. BPS SM-PRP36 or approved alternate product. Anodized finish to consultants later selection.

2.2 MATERIALS

- .1 Aluminum: Extrusions of minimum 3mm thick, Alcan 6061-T6 alloy for structural members, 6063-T5 for non-structural members.
- .2 Screws, bolts and fasteners: where used with aluminum shall be of 300 series stainless steel or 400 series stainless steel cadmium plated.
- .3 Steel Reinforcement: to CAN/CSA-G40.21, grade 300W.

2.3 AUTOMATIC SWING DOOR OPERATORS

- .1 Operator: Electro-hydraulic type, self-contained operator, powered by a 1/6 HP motor. Operator is non-handed. The operator housing provides a seal against dust, dirt and moisture.
- .2 Electronic Control: A self-contained, solid-state integrated circuit controls the operation and switching of the swing power operator. The electronic control provides low voltage power supply for all means of actuation. No external or auxiliary low voltage power source will be allowed. The controls include time delay (5 to 30 seconds) for normal cycle.
- .3 Connecting Hardware: Surface-mounted operator is connected to the door by means of a steel door arm. Door arm is secured to the top rail of the swing door using one piece threaded tubular inserts for aluminum doors, 1/4-20 binding head and post screws (sex bolts) for wood and hollow metal doors. Knurled door arm adaptor is broached for positive engagement with shaft.
- .4 Activation
 - .1 Wall Switches: Recessed push-button wall switches, with steel back-boxes and stainless steel push buttons engraved with standard barrier-free logo. Provide buttons both sides of doors as noted on drawings.
- .5 Provide back plate with dark bronze anodized finish at operators that are exposed at glazing.

2.4 ELECTRICAL CHARACTERISTICS

- .1 Nominal current draw 222 watts (1.85 amps at 120V AC). Motor shall draw 672 watts maximum. Electric motor shall be equipped with a built-in thermal overload protection, and shall not exceed 10 amps current draw.
- .2 Provide two low-voltage 18 gauge stranded wires (per operator) from each automatic operator to remote activation devices.
- .3 All power door operators which are interfered with a card reader/electric strike must include a "Strike Interface"

2.5 FINISHES

- .1 Standard Bronze Anodized Finish to match Aluminum frames: Class II to AA-M12C22A3.

2.6 FABRICATION

- .1 Fabricate units square and true with maximum tolerance of plus or minus 1.5mm for units with a diagonal measurement of 1800mm or less and plus or minus 3mm for units with a diagonal measurement over 1800mm.
- .2 Provide all internal reinforcing as required for the proper structural design and support of the framing system.
- .3 All joints shall be accurately machined, and assembled to provide neat joints.

3 EXECUTION

3.1 INSTALLATION

-
- .1 Install power door operators in accordance with reviewed shop drawings and manufacturer's printed instructions, including controls, wiring, and all activation devices.
 - .2 Coordinate installation of components with related and adjacent work.
 - .3 Set work plumb, square, level, free from warp, twist and superimposed loads.
 - .4 Securely anchor work in required position.
 - .5 Apply isolation coating to separate aluminum and primed or galvanized steel surfaces at points of contact with cementitious materials.
 - .6 Install push button bollard to location as indicated on the drawings and to manufactures instructions to rigidly anchor bollard into concrete floor structure through finished flooring. Apply sealant neatly between base of bollard and finished floor.
- 3.2 SEALANT APPLICATION**
- .1 Comply with requirements of Section 07900 for sealants, fillers and gaskets to be installed during installation of doors and frames.
 - .2 Conceal sealant within aluminum work except where exposed use is permitted by Consultant.
 - .3 Set sill members in bed of sealant.
- 3.3 ADJUSTING**
- .1 After repeated operation of completed installation equivalent to three days of use by normal traffic (100 to 300 cycles), readjust door operators and controls for optimum, smooth operating condition and safety and for weather tight closure. Lubricate hardware, operating equipment and other moving parts.
 - .2 Adjust doors to provide tight fit at contact points with enclosure.
- 3.4 PROTECTION OF FINISHED WORK**
- .1 Protect finished installation until time of final cleaning and inspection.
 - .2 Leave all factory installed protective films in place until time of final cleaning.
- 3.5 FINAL CLEANING**
- .1 Clean aluminum surfaces promptly after installation. Exercise care to avoid damage to coatings.
 - .2 Remove protective material from prefinished aluminum surfaces.
 - .3 Wash exposed surfaces with mild solution of detergent and warm water, using soft, clean wiping cloths. Remove dirt from corners. Wipe surfaces clean.
 - .4 Remove excess sealant by moderate use of solvent, of type acceptable to sealant manufacturer.
-

3.6 DEMONSTRATION

- .1 Demonstrate operation, operating components, adjustment features, and lubrication requirements to Owner.

END OF SECTION

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Conform to Sections of Division 1 as applicable.

1.2 RELATED WORK

- .1 Section 08110 Steel Doors and Frames
.2 Section 08210 Wood Doors

1.3 REFERENCES

- | | | |
|--------------------|---|---|
| ASTM C509-91 | - | Specification for Elastomeric Cellular Preformed Gasket and Sealing Material |
| ASTM C542-90 | - | Specification for Lock-Strip Gaskets |
| ASTM D1044-90 | - | Test Method for Resistance of Transparent Plastics to Surface Abrasion |
| ASTM D1925-70 | - | Test Method for Yellowness Index of Plastics |
| ASTM E90-90 | - | Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions |
| CAN/CGSB-12.1 | - | M90 -Tempered or Laminated Safety Glass |
| CAN2-12.3-M76 | - | Glass, Polished Plate or Float, Flat, Clear |
| CAN2-12.4-M76 | - | Glass, Heat Absorbing |
| CAN/CGSB-12.5-M86 | - | -Mirrors, Silvered |
| CAN2-12.6-M76 | - | Mirrors Transparent (One-Way) |
| CAN/CGSB-12.8-M90 | - | - Insulating Glass Units |
| CAN2-12.9-M76 | - | Glass, Spandrel |
| CAN2-12.10-M76 | - | Glass, Light and Heat Reflecting |
| CAN/CGSB-12.11-M90 | - | -Wired Safety Glass |
| CAN/CGSB-12.12-M90 | - | -Plastic Safety Glazing |
| CAN2-12.13-M79 | - | Glass, Patterned |
| CAN/CGSB-19.2-M87 | - | -Glazing Compound Non-hardening Modified Oil Type |
| CAN/CGSB-19.13-M87 | - | -Sealing Compound, One-Component, Elastomeric, Chemical Curing |
| CAN/CGSB-19.18-M87 | - | -Sealing Compound, One-Component, Silicone Base, Solvent Curing |
| CAN/CGSB-19.21-M87 | - | -Sealing and Bedding Compound Acoustical |
| CAN/CGSB-19.24-M90 | - | -Multicomponent, Chemical-Curing Sealing Compound |
| Glazing Manual 90 | - | Flat Glass Marketing Association |

1.4 SUBMITTALS

- .1 Samples: Submit samples of materials if required by Consultant before commencing work. Ensure samples are clearly labelled with manufacturer's name and type.

2 PRODUCTS

2.1 GLASS MATERIALS

- .1 Float Glass: CAN2-12.3-M; 6mm thick shall conform to the latest Ontario Building Code unless otherwise noted.
- .2 Tempered Safety Glass: CAN/CGSB 12.1-M, "Herculite" clear tempered safety glass by PPG Canada Inc. Thickness 6mm unless otherwise indicated.

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- .3 Wired Glass (GWG, Fire Rated): For interior doors and screens shall be clear, 6 mm (1/4") thick with 13 mm (1/2") mesh of at least .4 mm (.016") diameter centrally embedded in glass during manufacture and welded or intertwined at each intersection.
- .4 Safety Glass (Fire Rated):
1. Acceptable product and Manufacturer:
 - .1 FireLite NT as manufactured by Nippon Electric Glass Company, Ltd.
 - .2 Approved alternative product will be considered by the consultant prior to tender close only.
 - .2 Performance Requirements
 1. Fire-rated glass ceramic clear and wireless glazing material with surface-applied film listed for use in impact safety-rated locations such as doors, transoms and borrowed lites with fire rating requirements ranging from 20 minutes to 3 hours with required hose stream test.
 - .2 Passes positive pressure test standards UL 10C.
 - .3 Material Standards:
 1. Thickness: 5 mm
 2. Film: Fire-rated surface film as approved by manufacturer.
 3. Weight: 2.4 lbs./sq. ft.
 4. Approximate Visible Transmission: 88 percent.
 5. Approximate Visible Reflection: 9 percent.
 6. Hardness (Vicker's Scale): 700.
 7. Fire-rating: 20 minutes to 3 hours for doors; 20 minutes to 90 minutes for other applications. See door and frame schedule.
 8. Impact Safety Resistance: ANSI Z97.1 and CPSC 16CFR1201 (Cat. I and II).
 9. Positive Pressure Test: UL 10C; passes.
 10. Surface Finish: Premium Grade is finish ground and polished on both surfaces to provide superior surface quality, improving overall clarity and providing a surface that is unmatched by alternative products.
 4. Fire Rating: Fire rating classified and labelled by ULC for fire rating scheduled at opening locations on drawings, when tested in accordance with ULC Standards CAN4 S-104 and CAN4 S-106 NPFA 252 and NFPA 257. Permanently label each piece of glazing with the manufacturer's logo, ULC logo and fire rating.
- .5 Laminated Safety Glass:
- .1 clear Laminated 030 glazing.
 - .2 thickness: 10mm unless otherwise indicated.
- .6 Insulating Glass Units:
- .1 CAN/CGSB-12.8-M patented sealed double-glazed units by PPG Industries Ltd., AFG Glass Inc., or Canada Glass Industries.
 - .2 PPG Solarban coatings have been identified however equivalent solar coatings by AFG or Canada Glass Industries will be accepted.
 - .3 Insulated Glass Unit Description:
 - .1 Glass to CAN/CGSB-12.1, float glass per schedule
-

- .2 Outer Panel: 6mm thick tempered glass
- .3 Air Space: to be 13mm hermetically sealed argon gas filled.
- .4 Inner Pane: 6mm thick tempered glass. Apply Solarban 60 (3) to inner pane as indicated.
- .5 Overall system thickness: 25 mm, or to suit manufacturers detail.
- .7 Spandrel Glass: to CAN/CGSB-12-10, 6 mm thick
- .8 Mirror: Custom mirrors to sizes indicated in drawings. Silver mirror to CAN/CGSB-12-5, 3mm thick, adhered to wall surface and pencil edged.
- .9 Decorative Glazing films: Self-adhesive, non-patterned frosted glazing film with integrated artwork as indicated. Acceptable product: 3M Fasara or approved equal.

2.2 GLAZING AND SEALING COMPOUND MATERIALS AND ACCESSORIES

- .1 Sealant Compound: CAN/CGSB-19.24-M, multi-component chemical curing, Type 2 Class A. Colour to match adjacent surfaces.
- .2 Glazing Tape: 440 polyisobutylene-butyl tape manufactured by Tremco Manufacturing Co. Canada Ltd., or 3M ribbon sealer butyl tape manufactured by Minnesota Mining and Manufacturing Co. Ltd.
- .3 Gaskets: ASTM C509 cellular, elastomeric, preformed, black.
- .4 Glazing Splines: Polyvinylchloride manufacturer's standard dry glazing splines to suit aluminum extrusions. Colour to match adjacent surfaces unless indicated otherwise.
- .5 Spacer Shims and Setting Blocks: Neoprene, Shore "A" Durometer hardness 70-90, 100 mm long, wide enough to extend from fixed stop to opposite face of glass and of height suitable to provide adequate glazing "bite" for setting blocks. Neoprene, Shore "A" 40 to 50 Durometer hardness, of adequate thickness to provide correct glass to face clearance of at least 3 mm for spacer shims.
- .6 Primer Sealers and Cleaners: To glass and plastic glazing manufacturer's standards.
- .7 Breather Tubes: To manufacturer's recommendations.

2.3 FABRICATION

- .1 Label each light of glass and/or plastic glazing with registered name of product and weight and quality of glass and/or plastic glazing.
- .2 Check dimensions on Job Site before cutting materials.
- .3 Ensure minimum bite or lap of glass and/or plastic glazing on stops and rabbets as recommended by glass and/or plastic glazing manufacturer.

3 EXECUTION

3.1 INSTALLATION

- .1 Glazing - General
 - .1 Conform to recommendation of Glazing Manual 1990, Flat Glass Marketing Association, except as specified herein.
 - .2 Glaze hollow metal doors, screens, borrowed lights, windows and other work, scheduled to be glazed.
 - .3 Check frames are plumb, within tolerance for size and joints, connectors, screws or bolt heads are effectively sealed.
 - .4 Check compatibility of glazing materials and framing sealants with each other.
 - .5 Do not field cut or abrade tempered glass.
 - .6 Install glazing within temperature limits recommended by glazing manufacturer.
 - .7 Check to ensure openings and stops to be painted have been primed before commencing installation.

3.2 WORKMANSHIP

- .1 Ensure openings are free from moisture, frost, rust, dirt and foreign matter.
- .2 Remove protective coatings. Clean glass surface to receive sealant with clean cloth dampened with Xylol or 50-50 mixture of Acetone and Xylol. Wipe dry with clean, dry cloth.
- .3 Clean plastic glazing with cleaning agents and follow procedures recommended by glazing manufacturer.
- .4 Apply primer-sealer to contact surfaces.
- .5 Place setting block in accordance with manufacturer's instructions.
- .6 Install glass by resting on setting blocks. Ensure full contact and adhesion at perimeter. Do not impact glass against framing during installation.
- .7 Install removable stops without displacing tape, sealant or gasket.
- .8 Provide edge clearance of 3 mm minimum.
- .9 Apply cap bead of sealant at exterior void. Apply sealant to uniform and level line, flush with sightline and tool or wipe with solvent to smooth appearance.
- .10 Apply tape to clean dry surface not more than 24 hrs prior to glazing. Do not remove release paper until glass is ready to be installed. Joints shall be squared and tightly and neatly butted. Do not overlap. Do not stretch tape to make it fit. Lightly daubed joints with compatible gunnable sealant to assure positive seal. Only joints in tape shall be at corners.
- .11 Lateral shims if not continuous shall be spaced uniformly at 450 mm to 600 mm centres.
- .12 Interior Glazing
 - .1 Fire Rated Hollow Metal Doors and Screens:
 - Set glass in fire rated metals doors and screens on continuous setting block with 3 mm 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.

2. Dry Method-Tape/Tape:
 - Cut glazing tape to proper length and install against permanent stop projecting 1.5 mm above sightline.
 - Place glazing tape on free perimeter of glass projecting 1.5 mm above sightline.
 - Trim off excess tape to sightline.
3. Combination Method-Tape/Sealant:
 - Cut glazing tape to proper length and install against permanent stop projecting 1.5 mm above sightline.
 - Fill gap between glass and applied stop with sealant to depth equal to bite of frame on glass to uniform and level line.
 - Trim off excess tape to sightline.
 - Fill gaps between glass and stops with compound until flush with sightline and tool to smooth straight line.

.13 Exterior Glazing

1. Dry Method Lock Strip and Compression Gaskets:
 - Unpack and layout gaskets on flat warm area to permit recovery of shape.
 - Install gaskets under compression from corners inward.
 - Place setting blocks in accordance with manufacturer's instructions.
 - Provide continuous interior air seal between glass and sash.
 - Drain infiltrated moisture to exterior through drain holes in sill. Provide minimum 3 vents for each sill separated by setting blocks. Follow manufacturer's recommendation for size and placement.
 - Apply sealant cap bead over exterior gasket to provide watershed.
2. Combination Method-Tape/Gasket:
 - Cut glazing tape to proper length and set against permanent stops, approximately 0.8 mm (1/32") below sightline. Install horizontal strips first, extend over entire width of opening before applying vertical strips. Weld corners together by butting tape and dabbing with sealant.
 - Remove backing paper from tape prior to setting glass.
 - Apply continuous heel bead between glass and sash.
 - Place setting blocks 2 on each sill member at quarter points.
 - Drain infiltrated moisture to exterior through drain holes in sill. Provide minimum 3 vents for each sill separated by setting blocks. Follow manufacturer's recommendations for size and placement.
 - Take care not to plug up vent holes in sill with sealant.
 - Centre on setting blocks and press firmly against tape.
3. Combination Method-Tape/Sealant:
 - Cut glazing tape to proper length and set against permanent stops approximately 0.8 mm (1/32") below sightline. Install horizontal strips first, extend over entire width of opening before applying vertical strips. Weld corners together by butting tape and dabbing with sealant.
 - Remove backing paper from tape prior to setting glass.
 - Apply continuous heel bead between glass and sash.
 - Place setting blocks 2 on each sill member at quarter points.
 - Drain infiltrated moisture to exterior through drain holes in sill. Provide minimum 3 vents for each sill separated by setting blocks. Follow manufacturer's recommendations

for size and placement.

- Take care not to plug up vent hole in sill with sealant.
- Centre on setting blocks and press firmly against tape.
- Place intermittent shims or spacers at 600 mm o.c. between exterior stop and glass or panel where glass exceeds 2540 mm (100 united inches).
- Apply continuous space shim with rubber set elastomeric sealant cap bead over top between interior light and removable stop.

3.3 FINISHING

- .1 Remove sealant and compound droppings from finished surface.
- .2 Periodically clean installed glass during construction to avoid permanent etching and staining.
- .3 Mark glass lights with temporary, easily removable large safety markings after glass installation. Maintain safety markings until final cleanup. Remove markings at time of final clean-up.
- .4 Avoid storing materials adjacent to glass.
- .5 Protect glass from other trades.
- .6 At completion of Work, replace any damaged or broken glass provided under this Section with similar glass.

3.4 GLAZING SCHEDULE

- .1 Co-ordinate glazing schedule with door and frame schedule and elevations/windows schedule.
- .2 All interior glazing shall be tempered safety glass unless noted otherwise.
- .3 All interior fire rated screens & doors shall use clear fire rated safety glass unless noted otherwise. Refer to Door and Frame schedule and Fire Rated Glass specification for conditions of interior glass in fire separations.
- .4 All glazing at exterior entrance doors are to be tempered both sides of insulated glass units.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01610 - Basic Product Requirements
- .2 Section 09110 - Non-Load Bearing Wall Framing
- .3 Section 09900 - Painting

1.2 REFERENCES

- .1 ASTM C 36-95, Specification for Gypsum Wallboard.
- .2 ASTM C 475-94, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- .3 ASTM C 630-93, Specification for Water-Resistant Gypsum Backing Board.
- .4 ASTM C 840-95, Specification for Application and Finishing of Gypsum Board.
- .5 ASTM C 954-93, Specification for Steel Drill Screws for the Application of Gypsum Board.
- .6 ASTM C 1002-93, Specification for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases.
- .7 ASTM C 1047-94, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
- .8 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .9 CAN/ULC-S102-1988, Building Materials and Assemblies, Standard Method of Test for Surface Burning Characteristics of.

1.3 SITE ENVIRONMENTAL REQUIREMENTS

- .1 Maintain temperature minimum 10 degrees C, maximum 21 degrees C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours after completion of joint treatment.
- .2 Apply board and joint treatment to dry, frost free surfaces.

2 PRODUCTS

2.1 MATERIALS

- .1 Metal furring runners, hangers, tie wires, inserts, anchors: to CSA A82.30 galvanized.
- .2 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.

-
- .3 Resilient clips drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
 - .4 Nails: to ASTM C 514.
 - .5 Steel drill screws: to ASTM C 1002.
 - .6 Laminating compound: as recommended by manufacturer, asbestos-free.
 - .7 Casing beads, corner beads, control joints and edge trim: to ASTM C 1047, metal, zinc-coated by hot-dip process, zinc coated by electrolytic process, 0.5 mm base thickness, perforated flanges, one piece length per location.
 - .8 Sealants: in accordance with Section 07900 - Joint Sealers.
 - .9 Acoustic sealant: Tremco Acoustical Sealant.
 - .10 Polyethylene: to CAN/CGSB-51.34, Type 2.
 - .11 Acoustic Insulation Batts: Mineral wool batts minimum density 48 kg/m3 size to fit stud spacing to thickness indicated.
 - .1 Acceptable Materials: AFB by Roxul
 - .12 Acoustic Blanket Anchors: Hot dipped galvanized steel strips pre-punched for screw fasteners and arrows for blanket impalement, minimum 2 arrows per stud height, depth of arrow to suit wall and insulation thickness.
 - .13 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self-sticking permanent adhesive on one face, lengths as required.
 - .14 Joint compound: to ASTM C 475, asbestos-free.
 - .15 Joint Tape to ASTM C475. Use fiberglass at areas of reinforced corner board in washrooms, showers, lockers and humid areas. Elsewhere use paper tape.
 - .16 Glass Mat Gypsum Panel: use sheet panels at wet areas / humid areas.
 - .1 Acceptable Material: 13mm DensArmour Plus Interior Guard or approved alternate.
 - .17 Standard Board: to ASTM C36, Type X to E119, 16mm thick, 1220mm wide x maximum practical length, ends square cut, edges tapered.
 - .18 Abuse resistant gypsum panels: to CAN/ULC-S102-M88 16mm thick Type 'X' 1,200 mm wide x practical length, ends square cut, edges squared. Fiberrock VHI by C.G.C. or approved equal. To locations as noted on drawings
 - .19 Exterior Sheathing Board: Glass mat water-resistant gypsum backing board: to ASTM C 1177, 13mm thick, 1,200 mm wide x maximum practical length.
 - .1 As DensGlass Gold Exterior Guard or approved equal.
-

3 EXECUTION

3.1 ERECTION

- .1 Do work in accordance with ASTM C 840 except where specified otherwise.
- .2 Do application of gypsum sheathing in accordance with ASTM C 1280.
- .3 Install work level to tolerance of 1:1200.
- .4 Support light fixtures by providing additional ceiling suspension hangers within 150mm of each corner and at maximum 600mm around perimeter of fixture.
- .5 Install work level to tolerance of 1:1200.
- .6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles, ceiling devices.
- .7 Install 19 mm x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .10 Install wall furring for gypsum board wall finishes in accordance with ASTM C 840, except where specified otherwise.
- .11 Furr openings and around built-in equipment, cabinets, access panels, fitments, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .13 Erect drywall resilient furring where indicated transversely across studs between the layers of gypsum board, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw
- .14 Install 150 mm continuous strip of 16 mm gypsum board along base of partitions where resilient furring installed.

3.2 APPLICATION

- .1 Do not apply gypsum board until bucks, anchors, blocking, electrical and mechanical work are approved.
- .2 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, and other penetrations, in partitions where perimeter sealed with acoustic sealant.

3.3 INSTALLATION

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm oc using contact adhesive for full length.
- .2 Install casing beads around perimeter of suspended ceilings.
- .3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .5 Splice corners and intersections together and secure to each member with 3 screws.
- .6 Install access doors to electrical and mechanical fixtures specified in respective Sections.
 - .1 Rigidly secure frames to furring or framing systems.
- .7 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.
- .8 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .9 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.
- .10 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .11 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .12 Install sand and finish bulkheads completely as indicated in drawings. Both face and soffit of bulkhead prior to installation of casework.

3.4 ACOUSTICAL INSULATION

- .1 Install insulation in partitions and other locations indicated. Secure using strip clips, staple or impale clips.
- .2 Maintain continuity of acoustical protection.
- .3 Fit insulation closely around electrical boxes, pipes, ducts, frames and objects in or passing through insulation.
- .4 Do not compress insulation to fit.
- .5 Keep insulation 75mm away from heat emitting devices such as recessed lights.

- .6 Do not cover insulation until reviewed by Consultant.

3.5 SCHEDULES

- .1 Construct fire rated assemblies where indicated.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01330 Submittal Procedures.
- .2 Section 01610 - Basic Product Requirements
- .3 Section 06200 - Finish Carpentry

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM D 3960- 93, Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.36- 97, General Purpose Interior Varnish.
 - .2 CAN/CGSB-1.38- M91, Interior Enamel Undercoater.
 - .3 CAN/CGSB-1.57- 96, Alkyd, Interior, Semigloss, Enamel.
 - .4 CAN/CGSB-1.60- 97, Interior Alkyd Gloss Enamel.
 - .5 CAN/CGSB-1.100- 95, Interior Latex Type, Flat Paint.
 - .6 CAN/CGSB-1.119- 95, Primer-Sealer, Wall, Interior Latex Type.
 - .7 CAN/CGSB-1.121- 93, Vinyl Pretreatment Coating for Metals (Vinyl Wash Primer).
 - .8 CAN/CGSB-1.145- 97, Solvent-Based Pigmented Stain.
 - .9 CAN/CGSB-1.150- M91, Clear Lacquer for Wood Furniture.
 - .10 CAN/CGSB-1.175- 97, Polyurethane Interior Coating, Oil Modified, Clear, Gloss and Satin.
 - .11 CAN/CGSB-1.188- 96, Emulsion Type Filler Masonry Block.
 - .12 CAN/CGSB-1.195- 95, Interior Semigloss Latex Paint.
 - .13 CAN/CGSB-1.198- 95 , Cementitious Primer (for Galvanized Surfaces).
 - .14 CAN/CGSB-1.209- 93, Low Sheen Latex Interior Paint.
 - .15 CGSB 85-GP-16M- 79, Painting Galvanized Steel.
 - .16 CGSB 85-GP-20M- 79, Painting copper and Copper Alloys.
 - .17 CGSB 85-GP-33M- 79, Painting Interior Plaster and Wallboard.
 - .18 CAN/CGSB-85.100- 93, Painting.
- .3 Painting Specifications Manual 1993.
- .4 National Fire Code of Canada 1995.
- .5 Steel Structures Painting Council (SSPC).
 - .1 Systems and Specifications Manual 1989.

1.3 PRODUCT DATA

- .1 Submit product data in accordance with Section 01330 - Submittal Procedures.
- .2 Submit full records of all products used. List each product in relation to finish formula and include the following:
 - .1 Finish formula designation.
 - .2 Product type and use.
 - .3 CGSB number.
 - .4 Manufacturer's product number.
 - .5 Colour numbers.
 - .6 Manufacturer's Material Safety Data Sheets (MSDS).
 - .7 Maximum VOC classification.
 - .8 Eco-Logo certification.
- .3 Submit manufacturer's installation application instructions for each product specified.

1.4 SAMPLES

- .1 Submit samples in accordance with Section 01330 - Submittal Procedures.
- .2 Submit duplicate 300 mm x 200 mm sample panels of each paint stain coating specified.
- .3 Submit full range of available colours where colour availability is restricted.
- .4 Use 3 mm plate steel for finishes over metal surfaces. Use 12.5 mm birch plywood for finishes over wood surfaces. Use 12.5 mm concrete board for finishes over concrete or concrete masonry surfaces. Use 12.5 mm gypsum board for finishes over gypsum board and other smooth surfaces.

1.5 QUALITY ASSURANCE

- .1 Standard of Acceptance:
 - .1 Walls: No defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Ceilings: No defects visible from floor at 45 degrees to surface when viewed using final lighting source.
 - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver and store materials in original containers, sealed, with labels intact.
- .2 Indicate on containers or wrappings:
 - .1 Manufacturer's name and address.
 - .2 Type of paint.
 - .3 Compliance with applicable standard.
 - .4 Colour number in accordance with established colour schedule.
- .3 Remove damaged, opened and rejected materials from site.
- .4 Provide and maintain dry, temperature controlled, secure storage.
- .5 Observe manufacturer's recommendations for storage and handling.
- .6 Store materials and supplies away from heat generating devices.
- .7 Store materials and equipment in a well ventilated area with temperature range 7 to 30 EC.
- .8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Consultant. After completion of operations, return areas to clean condition to approval of Consultant.
- .10 Provide minimum one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.
- .11 Remove only in quantities required for same day use.
- .12 Fire Safety Requirements:
 - .1 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
 - .2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.7 ENVIRONMENTAL REQUIREMENTS

- .1 Environmental Choice Program (ECP)
 - .1 Provide paint products certified to meet the requirements of the Environmental Choice Program, Department of the Environment.

- .2 Submit CSA Certification Reports that products proposed for use are certified under the Environmental Choice Program. Water based paints to be certified to ECP-07. All other surface coatings to be certified to ECP-12.
- .2 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
- .3 Ventilate enclosed spaces during all painting activities.
- .4 Apply paint finishes only when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.
- .5 Substrate and ambient temperature must be within limits prescribed in paint standard and by manufacturer to approval of Engineer.
- .6 Maintain minimum substrate and ambient air temperature of 5 degrees C for Alkyd and 7 degrees C for latex paints. Maximum relative humidity 85%. Maintain supplemental heating until paint has cured sufficiently.
- .6 Provide temporary heating where permanent facilities are not available to maintain minimum recommended temperatures.
- .7 Apply paint finish only in areas where dust is no longer being generated by related construction operations such that airborne particles will not affect the quality of the finished surface.
- .8 Apply paint only when surface to be painted is dry, properly cured, adequately prepared and cleaned.
- .9 Provide minimum 270 lx on surfaces to be painted.

1.8 EXTRA MATERIALS

- .1 Submit maintenance materials in accordance with Section 01780 - Closeout Submittals.
- .2 Submit one - one four litre can of each type and colour of primer finish coating. Identify colour and paint type in relation to established colour schedule and finish formula.
- .3 Deliver to Owner and store where directed.

2 PRODUCTS

2.1 MATERIALS

- .1 Qualified products: only paint materials listed on the CGSB Qualified Products List are acceptable for use on this project.
- .2 Qualified products: only paint materials listed to meet the requirements of the environmental choice program, Department of the Environment are acceptable for use on this project.
- .3 Paint materials for each coating formula to be products of a single manufacturer.
- .4 Low odour products: Whenever possible, select products exhibiting low odour characteristics. If two products are otherwise equivalent, select the product with the lowest odour.

2.2 COLOURS

- .1 Consultant will provide Colour Schedule. Notify Consultant 10 working days before colour schedule required.
- .2 Colour schedule will be based upon the selection of eight base colours and three accent colours. No more than three colours will be selected per room / or walls and ceilings.
- .3 Selection of colours will be from manufacturers full range of colours.
- .4 Where specific products are available in a restricted range of colours, selection will be based on the limited range.
- .5 Perform all colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials allowed only with Consultant's permission.

- .6 Second coat in a three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

3 EXECUTION

3.1 GENERAL

- .1 Perform all painting operations in accordance with CAN/CGSB-85.100 except where specified otherwise.
- .2 Apply all paint materials in accordance with paint manufacturer's written application instructions.
- .3 Paint all wall surfaces in each room as per finish schedules. Wall surfaces/types may vary in each room. Paint all surfaces as required to meet painting specification for surface type to produce homogenous product.
- .4 General Contractor to finish paint all flush mounted electrical panels to match the adjoining wall colour.

3.2 PREPARATION

- .1 Remove electrical cover plates, light fixtures, surface hardware on doors, door stops, bath accessories and all other surface mounted fittings and fastenings prior to undertaking any painting operations. Store for re-installation after painting is completed.

3.3 PROTECTION

- .1 Protect existing building surfaces not to be painted from paint spatters, markings and other damage. If damaged, clean and restore such surfaces as directed.
- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products, fixtures, finishes and equipment.

3.4 EXISTING CONDITIONS

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Consultant all damage, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Investigate moisture content of surfaces to be painted. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
 - .1 Plaster and wallboard: 12%.
 - .2 Masonry/Concrete: 12%.
 - .3 Concrete Block/Brick: 12%.
 - .4 Wood: 15%.

3.5 CLEANING

- .1 Remove all dust, dirt, and other surface debris.
- .2 Wash surfaces with solution of T.S.P. bleach and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
- .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
- .4 To prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.

- .5 Clean new metal surfaces to be painted by removing rust, loose mill scale, dirt, grease, oil, or other foreign substances.

3.6 SURFACE PREPARATION

- .1 Prepare new wood surfaces to CGSB 85-GP-1M.
- .2 Where possible, prime all surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
- .3 Prepare previously painted wood surfaces to CGSB 85-GP-2M.
 - .1 Apply vinyl sealer to CAN/CGSB-1.126 over knots, pitch, sap and resinous areas.
 - .2 Apply wood filler to nail holes and cracks.
 - .3 Tint filler to match stains for stained woodwork.
- .4 Prepare stucco, brick, concrete masonry and concrete surfaces to CGSB 85-GP-31M.
- .5 Prepare concrete floors to CGSB 85-GP-32M. Prepare new concrete floor by acid etching. Rinse with clean water and thoroughly dry.
- .6 Prepare plaster and wallboard surfaces to CGSB 85-GP-33M.

3.7 SURFACE PREPARATION – METAL

- .1 Touch-up shop primer to CGSB 85-GP-10M with primer as specified in applicable section. Touch-up to include cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas.
- .2 Prepare galvanized steel and zinc coated steel surfaces to CGSB 85-GP-16M.
- .3 Prepare copper and copper alloys surfaces to CGSB 85-GP-20M.
- .4 Prepare new steel surfaces exposed normally to dry conditions to CGSB 85-GP-14M.
- .5 Prepare previously painted steel surfaces exposed normally to dry conditions to CGSB 85-GP-15M.
- .6 Do not apply paint until prepared surfaces have been accepted by Consultant.

3.8 MIXING PAINT

- .1 Mix ingredients in container before and during use and ensure breaking up of lumps, complete dispersion of settled pigment, and uniform composition.
- .2 Thin paint for spraying according to manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Engineer.
- .3 Do not use kerosene or any such organic solvents to thin water-based paints.

3.9 APPLICATION

- .1 Apply paint to CAN/CGSB-85.100. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Apply each coat of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .3 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .4 Sand and dust between each coat to remove visible defects.
- .5 Finish tops of cupboards, cabinets and projecting ledges, both above and below sight lines as specified for surrounding surfaces.
- .6 Finish inside of cupboards and cabinets as specified for outside surfaces.
- .7 Finish closets and alcoves as specified for adjoining rooms.
- .8 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.10 MECHANICAL ELECTRICAL EQUIPMENT

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

3.11 RESTORATION

- .1 Clean and re-install all hardware items that were removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of Engineer. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

4 PAINT SCHEDULE

4.1 PAINT SCHEDULE INTERIOR PAINTING

- .1 Formula 1 (Latex): eggshell for gypsum board, plaster, hardboard walls, existing wall surfaces
 - .1 one coat latex primer sealer CAN/CGSB - 1.119
 - .2 two coats eggshell enamel CAN/CGSB - 1.195
- 2. Formula 2 (Latex): flat for gypsum board, plaster, hardboard ceilings.
 - .1 one coat latex primer sealer CAN/CGSB - 1.119
 - .2 two coats flat enamel CAN/CGSB - 1.209
- 3. Formula 3 (Latex): Flat for acoustic tile and textured ceilings:
 - .1 two coats latex flat CAN/CGSB-1.100
- 4. Formula 4 (Latex): Eggshell for concrete block and concrete walls:
 - .1 one coat block filler CAN/CGSB-1.188.
 - .2 one coat primer-sealer CAN/CGSB-1.119.
 - .3 two coats eggshell enamel CAN/CGSB-1.195.

- .5 Formula 5 (Latex): Semi Gloss for hollow metal doors and frames:
 - .1 primer-sealer touch up
 - .2 two coats latex semigloss CAN/CGSB-1.195.
- .6 Formula 6 (Alkyd): Semi Gloss for primed ferrous metal:
 - .1 two coats semigloss enamel CAN/CGSB-1.57.
- .7 Formula 7 (Alkyd): semi gloss for galvanized and zinc coated metal:
 - .1 one coat cementitious primer CAN/CGSB-1.198.
 - .2 two coats semigloss enamel CAN/CGSB-1.57.
- .8 Formula 8 (Latex): flat for galvanized metal deck:
 - .1 one coat cementitious primer CAN/CGSB-1.198.
 - .2 two coats flat paint CAN/CGSB-1.100.
- .9 Formula 9 (Alkyd): for insulation covering :
 - .1 one coat latex primer-sealer CAN/CGSB-1.119.
 - .2 two coats low gloss enamel CAN/CGSB-1.57.
- .10 Formula 10 (Alkyd): for copper piping and fittings:
 - .1 one coat vinyl wash primer CAN/CGSB-1.121.
 - .2 two coats low gloss enamel CAN/CGSB-1.202.
- .11 Formula 11 (Polyurethane): for woodwork to receive stain finish :
 - .1 one coat wood filler.
 - .2 one coat solvent based stain CAN/CGSB-1.145. Type 2.
 - .3 one coat polyurethane CAN/CGSB-1.175 thinned.
 - .4 two coats polyurethane CAN/CGSB-1.175 Type 2.
- .12 Formula 12 (Polyurethane): for wood floors:
 - .1 one coat wood filler.
 - .2 one coat solvent based stain CAN/CGSB-1.145.
 - .3 three coats, two-component polyurethane CGSB1-GP-180Ma.
- .13 Formula 13 (Latex): Interior painted wood work.
 - .1 one coat primer sealer.
 - .2 two coats paint.
- .14 Formula 14 (Stain and Varnish finish): (Stain for Decking) glulam columns and beams.
 - .1 Provide Sansin SDF, one coat enviro stain - standard - or equal, colour to later selection
- .15 Formula 15 (Alkyd): Semi Gloss for concrete block at shower walls and ceilings
 - .1 two coats semigloss enamel CAN/CGSB-1.57.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01330 - Submittal Procedures.
- .2 Section 01610 - Basic Product Requirements
- .3 Section 06200 - Finish Carpentry
- .4 Section 07900 - Sealants
- .5 Section 08800 - Glazing for custom mirrors
- .6 Division 16 - Electrical Hand Dryers

1.2 References

- .1 CAN/CGSB-12.5-M86, Mirrors, Silvered.
- .2 CAN/CSA-B651-95, Barrier-Free Design.
- .3 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01330 - Submittal Procedures.
- .2 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars.

1.4 Samples

- .1 Submit samples in accordance with Section 01330 - Submittal Procedures.
- .2 Samples to be returned for inclusion into work.

1.5 Closeout Submittals

- .1 Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01780 - Closeout Submittals.

1.6 Extra Materials

- .1 Provide special tools required for accessing, assembly/disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01780 - Closeout Submittals.
- .2 Deliver special tools to Owner.

1.7 Warranty

- .1 Submit warranty against defects in accordance with GC 12.3 but for (5) five years.

2 PRODUCTS

2.1 Materials

- .1 Sheet steel: to ASTM A653/A653M with ZF001 designation zinc coating.
- .2 Stainless steel sheet metal: to ASTM A167, Type 304, with No. 4 finish.
- .3 Stainless steel tubing: Type 304, commercial grade, seamless welded, 1.2 mm wall thickness.

- .4 Fasteners: concealed screws and bolts hot dip galvanized, exposed fasteners to match face of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.
- .5 Solid Acrylic: Homogenous sheet material composed of acrylic resins, fire-retardant filler materials and colouring agents.
- .6 Manufacturer's or brand names on face of units is not acceptable.

2.2 Acceptable Products and Manufacturer's

- .1 Products listed are based on Watrous Inc., Bobrick Washroom Equipment of Canada Ltd. and Elcano Inc.
- .2 Corresponding products from Frost Products Ltd. and Dunleavy Cordun Associates Inc. are acceptable.
- .3 Provide products for the work of this section from a single manufacturer and keyed alike.

2.3 Components

- .1 Toilet tissue dispenser: single, double roll type, surface mounted, stainless steel, satin finish
 - .1 Acceptable material: Bobrick - 76867
- .2 Surface mounted Paper Towel Disposal.
 - .1 Acceptable Material: Bobrick B-43699
- .3 Grab bars: 1.2 mm thick 30 mm diameter tubing of stainless steel, 80 mm diameter wall flanges; concealed screw attachment; Knurl bar at area of hand grips. Grab bar material and anchorage to withstand downward pull of 2.2 kN.
 - .1 Acceptable material: Bobrick Model Series 5806 to profiles indicated.
- .4 Robe hook: wall surface mounted, stainless steel, satin finish
 - .1 Acceptable material: Bobrick – B-76717
- .5 Fixed Mirror: Stainless steel one piece tamper proof with 6mm thick mirror tempered glass (10 year warranty). Install 1000mm above finished floor.
 - .1 Acceptable material: Bobrick Model B-1658. Size 24"x36" unless otherwise indicated.
- .6 Liquid Soap Dispenser: Type 304 stainless steel with satin finish
 - .1 Acceptable material: Bobrick Model, Contura Series B-4112
- .7 Freestanding Garbage: supplied by owner
- .8 Sanitary Napkin Disposal:
 - .1 Acceptable material: Bobrick – B-270
- .9 Stainless steel shelf:
 - .1 Acceptable material: Bobrick – B-295 x 18"

2.4 Fabrication

- .1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.
- .2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.
 - .1 Brake form sheet metal work with 1.5 mm radius bends.
 - .2 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
 - .3 Back paint components where contact is made with building finishes to prevent electrolysis.
 - .4 Hot dip galvanize concealed ferrous metal anchors and fastening devices to CSA G164.
 - .5 Shop assemble components and package complete with anchors and fittings.
 - .6 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.
 - .7 Provide steel anchor plates and components for installation on studding and building framing.

2.5 Finishes

- .1 Chrome and nickel plating: to ASTM B456, satin finish.
- .2 Baked enamel: condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by Consultant.
- .3 Manufacturer's or brand names on face of units not acceptable.

3 EXECUTION

3.1 Installation

- .1 Install and secure accessories rigidly in place as follows:
 - .1 Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.
 - .2 Hollow masonry units or existing plaster/drywall: use toggle bolts drilled into cell/wall cavity.
 - .3 Solid masonry, marble, stone or concrete: use bolt with lead expansion sleeve set into drilled hole.
 - .4 Toilet/shower compartments: use male/female through bolts.
- .2 Install grab bars on built-in anchors provided by bar manufacturer.
- .3 Use tamper proof screws/bolts for fasteners.
- .4 Fill units with necessary supplies shortly before final acceptance of building.
- .5 Install mirrors in accordance with Section 08800 - Glazing.

3.2 Schedule of Washroom Accessories

- .1 Barrier-Free Washroom (x1 universal washroom)
 - .1 Toilet tissue dispenser – 1
 - .2 Paper Towel Dispenser – 1
 - .3 Grab Bars – (x1) 760mm x 760mm L-shaped grab bar and (x1) rear 610mm grab bar, as indicated
 - .4 Robe Hook – x2 (mount one at 1100mm AFF)
 - .5 Fixed Mirror – 1
 - .6 Stainless Steel Shelf – 1

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- .7 Sanitary Napkin Disposal - 1
 - .8 Liquid soap dispenser – by Owner
 - .9 Waste Receptacles – by Owner

 - .2 Unisex Washroom (x2)
 - .1 Toilet tissue dispenser – 1
 - .2 Paper Towel Dispenser – 1
 - .3 Robe Hook – x2 (mount one at 1100mm AFF)
 - .4 Fixed Mirror – 1
 - .5 Sanitary Napkin Disposal - 1
 - .6 Liquid soap dispenser – by Owner
 - .7 Waste Receptacles – by Owner

3.3 General

- .1 Locate accessories where indicated on drawings and as per OBC Barrier Free requirements. Coordinate exact locations with consultant if not otherwise indicated.

END OF SECTION