ALDERVILLE SENIOR'S RESIDENCE RENOVATIONS

8465 County Road,
Roseneath, ON

ISSUED FOR TENDER

2026 03 13
project no 2596

ARCHITECTS
3RDLINE.STUDIO

CIVIL
CROZIER CONSULTING ENGINEERS

STRUCTURAL
A2S CONSULTING ENGINEERS

MECHANICAL / ELECTRICAL
SUPPA ENGINEERING

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3RDLINE.STUDIO INC. HAVE PREPARED THE FOLLOWING SPECIFICATION EXCEPT WHERE NOTED

specification index **page no**

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00 21 00 – INSTRUCTION TO BIDDERS - BIDS&TENDERS

1. GENERAL

1. The Owner is seeking the services of qualified contractors to supply labour, materials and equipment to construct the interior renovations for **ALDERVILLE SENIOR'S RESIDENCE RENOVATIONS, 8465 County Road 45, Roseneath, ON.**
2. The Owner hereby invites you to submit quotations for the construction work as described in the contract documents.

2. CONTRACT DOCUMENTS

1. Bidders to consult the Contract Documents.
   - .1 Agreement between Owner and Contractor - CCDC-2 2020
   - .2 Definitions
   - .3 Supplemental General Conditions
   - .4 General Conditions of the Contract - CCDC-2 2020
   - .5 Division 00/01 of the Specifications
   - .6 technical specifications
   - .7 material and finishing schedules
   - .8 the drawings.
2. Bidders must familiarize themselves with the requirements of the contract documents **prior** to tender submission. No consideration will be given to a Bidder's failure to comply with the requirements of the contract documents.
3. Examine the Tender Documents upon receipt thereof, and should you discover any errors, contradictions, or omissions therein, immediately notify the Consultant so that further instructions in writing may be issued to Bidders before the Tender Closing Date.
4. Bidders are advised that, in addition to the statutory holdback prescribed by applicable lien legislation, the Owner shall retain a 2% deficiency/closeout holdback from progress draw from the total contract value. This holdback is addressed in the Supplementary General Conditions and shall be released only upon full correction of all deficiencies and submission of the closeouts, as determined by the Consultant.
5. If there is a conflict within the Contract Documents:
   - .1 The order of priority of documents, from highest to lowest, to be;
     - .1 the Agreement between the Owner and the Contractor
     - .2 the Definitions
     - .3 Supplementary General Conditions
     - .4 the General Conditions
     - .5 Divisions 00/01 of the Specifications
     - .6 Divisions 02 to 32 of the Specifications
     - .7 Material, Room Finish, Door and Window Schedules
     - .8 the Drawings
   - .2 Drawings of larger scale to govern over those of smaller scale of the same date.
   - .3 Dimensions shown on Drawings to govern over dimensions scaled from Drawings.
   - .4 Amended or later dated documents shall govern over earlier documents of the same type.
   - .5 Noted materials and annotations shall govern over graphic indications.
   - .6 Bidders are advised that a fee will apply for requests for electronic AutoCAD drawing files, as outlined in the Supplementary General Conditions. A flat service charge of $750.00 per drawing will apply. PDF copies of the drawings will be provided at no charge to assist in the preparation of as-built drawings.

3. EXAMINATION OF THE SITE

1. Bidders are required to submit their bids upon the following express conditions:
   - .1 The bidder and trade contractors to examine the bid documents and make personal examination of the site(s) in order to become acquainted with the conditions under which the bidder will be obliged to work.
   - .2 The bidder shall make the investigations necessary to become thoroughly informed regarding facilities for access to the site(s) such as may be required to execute the work.
   - .3 The bidder shall be wholly responsible for the completeness and accuracy of the information obtained by the bidder's personal examination and study. No plea for ignorance of conditions that exist, or that may exist hereafter, or of conditions, or difficulties that may be encountered in the execution of the work under the resulting contract as a result of

failure to make the necessary examinations and investigation, or ascertaining the required information will be accepted as an excuse for any failure or omission on the part of the bidder to fulfil in every detail the requirements of the said contract documents, or will be accepted as a basis for any claims whatsoever for extra compensation, or for an extension of time.

4. LOCAL CONTENT CONDITIONS

1. The Bidders shall be responsible for determining the availability of community members and must negotiate rates directly with them.
2. It is the expectation for contractors/bidders to post positions with the Admin office. Contractor to preferentially hire Community member if available. Should the contractor hire someone outside the community, they will have to report to the AFN the reasons for looking beyond the community.

5. QUESTIONS

1. Matters and inquiries relating to the execution of this Contract to be submitted **online on Bids&Tenders.**

6. COPIES OF CONTRACT DOCUMENTS

1. Electronic copies (pdf format only) of drawings and specifications will be provided to each bidder through **Bids&Tenders**

7. ADDENDA / AMENDMENTS

1. If necessary, written instructions or explanations in the form of Addenda or Amendments will be sent to bidders through **Bids&Tenders.**
2. Bidders to state on the Tender Form in the space provided, the numbers of Addenda and/or Amendments received and included by Bidders in the preparation of their Tender.
3. Bidders are to follow the instructions on **Bids&Tenders** to acknowledge Addenda Received.

8. PRETENDER SITE MEETING

1. A pre-tender site tour and meeting will be conducted by the Owner and Consultant, Bidders are requested to attend. The date and time is established as follows: **10am (local time), Wednesday, March 25rd, 2026.**
   .1 Pre-tender Site Meeting shall be located at the site of proposed construction.

9. QUESTION DEADLINE DURING TENDER

1. All questions or requests for clarification during the tender period must be submitted online on **Bids&tTenders**. The deadline for submitting questions is **April 2, 2026** no later than five (5) calendar days prior to the tender closing date. Responses to all questions received before the deadline will be issued to all bidders by way of addendum. Questions received after the deadline may not be responded to.

10. TENDERS

1. All bids are to be submitted through Bids &Tenders Portal, no later than 2:00pm on Wednesday, April 8, 2026. NO EXCEPTIONS.
1. All questions are to be submitted through Bids&Tenders. NO EXCEPTIONS.
2. Tender Submission Requirements. Bidders are to provide the following 2-part bid submission:
   .1 Envelope 1 - PART A- Technical Submission
   .2 Envelope 2 - PART B – Financial Submission
3. Bidders must familiarize themselves with the requirements of the contract documents **prior** to tender submission. No consideration will be given to a Bidder's failure to comply with the requirements of the contract documents.
4. **TENDER EVALUATION AND AWARD PROCESS**
   .1 EVALUATION PROCESS
      1. The evaluation of the Proposals will be conducted by the evaluation team (the "Evaluation Team") in two (2) PARTS, as described below.
      2. The Tenderer must meet the requirements of each Part of the evaluation process to proceed to the next Part.

3. Alderville First Nation shall determine, in its sole discretion, the membership of the Evaluation Team, which may include external consultants and advisors to the Alderville First Nation.

.2 PART A TECHNICAL SUBMISSION

1. PART A- Technical Submission is to include the following:
    1. Fully completed and executed CCDC 11-2019 (enclosed in APPENDIX B). Tenderers are to include a minimum of 5 comparable projects.
    2. Project Schedule
    3. On the tender's Letterhead provide: A list of past First Nations projects completed by the tenderer including dates and references were possible.

3. EVALUATION PART A TECHNICAL SUBMISSION:

Evaluation Criteria	Score
CCDC 11-2019 Document Submission a) Completeness of Document; b) Document Content	60
Project Schedule a) Clarity; b) Construction Duration; c) Projected Occupancy Date	15
First Nations Project Experience a) Project Type; b) Location;	15
Local Content	10
TOTAL	**100**

4. EVALUATION METHODOLOGY PART A: Each of the evaluation criteria in the Evaluation Process will be given a score as indicated in the table below:

Rating (% of possible Weight)	Description
100	Excellent - Addresses all requirements within the Evaluation Criteria fully and completely. Required capability is available and aligned with the needs of Alderville First Nation. Quantitative values provided where required and value exceeds minimum requirements.
80	Good - Substantially meets the Alderville First Nation requirement by addressing requirements within the Evaluation Criteria. Quantitative values provided where required and value exceeds minimum requirements.
60	Satisfactory - Meets only the basic requirements of Alderville First Nation where required, quantitative values provided and value meets minimum requirements.
40	Fair – Falls short of meeting the basic requirement of Alderville First Nation. Quantitative values provided where required and value does not meet minimum requirements.
20	Poor – Minimal relevant response. Quantitative values provided where required and value significantly below minimum requirements.
0	Non-Relevant - No relevant response or simple statement of compliance with no substantiation. Quantitative values are not provided where required.

1. PART A Technical Submissions that do not score greater than 60 may not, at the discretion of the Alderville First Nation evaluation team, advance to the PART B Financial submission. The PART B Financial Submission will be returned, unopened, to proponents who do not score 60 or higher.
2. Submissions that do not comply with all of the mandatory requirements will be deemed to be non-responsive and will NOT receive any further consideration.

5. PART B FINANCIAL TENDER SUBMISSION

1. PART B- Financial Submission is to include the following in a sealed envelope in accordance with Specification Section 00 Procurement + Contracting:
    1. Fully completed and executed Tender Form (Including Appendix A – Sub-Contractor and Major Supplier List / Cost Breakdown / Separate Prices).
    2. Bid Bond;
    3. Proof of Insurance;
    4. Agreement to Bond;

5. All bids to be Stipulated Lump Sum in Canadian currency, and to reflect the bidder's total proposed price for the work including, without limitation, labour, materials, coordination, management, supervision, expediting, administration of work of the Contract, work of trades and subcontracts, taxes (including HST), assessments, levies and custom duties, overhead and profit. Bids to be without qualification and in complete compliance with the Contract Documents.
6. Bidders finding any discrepancies in, or omissions from the Tender Documents, or having any doubt as to the meaning or intent of any part thereof, to at once notify the Architect through **Bids&Tenders.** Neither the Owner, nor the Architect will be
7. It is agreed and understood by each bidder that the Owner and/or the Architect reserve the right to reject any or bids, to waive informalities or to accept any proposal that is deemed desirable without regard to whether such bid is the low bid. Of particular importance to the Owner and the Architect will be a Bidder's reputation for quality workmanship and proven ability to perform work on schedule.
8. Alternate, itemized, separate and unit prices, where required by the Tender Documents, must include, without limitation, taxes (except HST) assessments, levies and custom duties, overhead and profit.
9. In the case of a Provincial Sales Tax, levy or custom duty revision effective prior to the acceptance of this proposal, it is assumed that Contractors have taken into account any notice of such revision and have included for any such revision in their contract price.

11. TENDER VALIDITY

1. Tenders to remain valid and open for acceptance for a period of **SIXTY (60) DAYS** from the Tender Closing Date. General Contractors to ensure that sub-trade and supply quotations are valid for a sufficient length of time to accommodate the above validity period for General Contract Tenders.

12. SUBCONTRACTORS

1. Each bidding Contractor is encouraged to maximize the utilization of qualified local labour and suppliers for the execution of this project.
2. Each bidding Contractor to list, in the appropriate place in the Tender Form, the name of the individual Subcontractor or major supplier he proposes to use in the execution of the Contract, and whose sub-trade or supply quotation he has used in compiling the Stipulated Sum quoted in his Tender.
3. Should the Owner be unable to approve of a Subcontractor recommended by a Tenderer, then another subcontractor may be selected by the Owner, and the Stipulated Sum Tender Figure adjusted accordingly. If no changes are required by the Owner to the list of subcontractors proposed by the Successful Tenderer then those subcontractors named by the successful Tenderer in his subcontractors list to be employed on the work, unless express written approval is received from the Owner for a proposed change.

13. BONDING

1. Bonding; The Contractor to provide the following bonds;
2. **Bid Bond;** The Contractor to provide a bid bond valued at 10% of the contract value issued by a recognized insurer and to the satisfaction of the Owner. The bid bond to be submitted with the tender form prior to the close of the tender and to be valid for a period of **SIXTY (60) DAYS** from the tender closing date.
3. **Agreement to Bond;** The Contractor to provide an 'agreement to bond' prepared by a recognized insurer and to the satisfaction of the Owner, that confirms the ability of the Contractor to obtain performance and labour / material bonds required for the project. The agreement to bond to be submitted with the tender form prior to the close of the tender and to be valid for a period of **SIXTY (60) DAYS** from the tender closing date.

4. All Bid Bonds submitted, with the exception of the three (3) lowest Bidders, will be returned within ten (10) days of the Tender Closing Date. The Tender Deposits of the three (3) lowest bidders will be retained by the Owner until a formal Contract has been executed with the successful Bidder, and the successful Bidder has furnished any required documents such as Performance and Labour and Material Payment Bonds, and Insurance Certificates, or until the expiry of the time limit for tender validity, whichever is sooner.
5. If a Bidder whose Bid is accepted by the Owner refuses or fails, within ten (10) days after a Contract is offered for acceptance, to enter in a formal Contract with the Owner for the performance of the Work or to furnish such Performance of Labour / Material Bonds or Insurance Certificates as may be required, and a Contract for the Work is entered into with another bidder for a greater amount, the Bidder is liable to the Owner for the difference between the two bids up to the amount of the Bid Bond and the Owner may forthwith take proceedings under the Bid Bond.
6. **Performance Bond;** The Contractor to provide a performance bond valued at 50% of the contract value issued by a recognized insurer and to the satisfaction of the Owner.
7. **Labour / Material Bond;** The Contractor to provide a labour and material valued at 50% of the contract value issued by a recognized insurer and to the satisfaction of the Owner.
8. Performance and Labour / Material Bonds to be made out in favor of the Owner and to be submitted within 10 days of the acceptance of the Tender.
9. Cost of bonds to be included in the Contract Price.

14. INSURANCES

1. The Contractor to provide, maintain and pay for insurances as specified in the General Conditions of the Stipulated Price Contract CCDC 2-2020.
2. The Contractor is responsible for paying insurance deductible and uninsured losses as applicable to their operations.
3. The Owner and members of the Consultant Team to be named as additional named insured under the Contractor's insurance policies. Each insurance policy to be endorsed to waive rights of subrogation or cross-claim against the Owner and the Consultant. Each policy to state that it cannot be cancelled, lapsed, or materially altered without at least thirty (30) days prior written notice to the Owner.
4. Prior to commencing work on site, the Trade Contractor to submit to Owner / Architect, a letter of good standing from the Workplace Safety & Insurance Board (WSIB), a form 1000, and a current Health and Safety Policy and Procedures document.

15. PERMITS

1. The Building Permit will be obtained and paid for by the Owner. Permit to be picked up by the Contractor and posted on site
2. The Contractor to obtain and pay for other permits required to complete the work of this Contract.
3. The Contractor is responsible for coordinating all required inspections associated with the building permit and ensuring the permit is properly closed upon project completion.

16. ACCEPTANCE PERIOD

1. The Tender to be valid and subject to acceptance by the Owner for a period of **SIXTY (60) DAYS** from the date of closing Tenders.

17. CONSTRUCTION SCHEDULE + COMPLETION OF THE WORK

1. Work under this Contract to commence immediately upon receipt of written acceptance of tender and to be continued, without interruption, to completion no later than date noted on the tender form.
2. The completion date assumes that the Owner to award the contract within 4 weeks of the close of the tender. Should the award of the tender occur after this time frame the completion date with be extended to match the delay in award of the tender.

18. COMMENCEMENT OF THE WORK

1. The submission of a Tender constitutes the bidder's agreement to commence work promptly and to execute the work without interruption until completion, in accordance with the schedule prepared by Owner.
2. As time is of the essence, the successful Contractor to immediately upon receipt of a letter of acceptance proceed with the preparation of shop drawings and/or samples and procurement of major component materials and equipment to avoid delay to the work.

19. ASSIGNMENT OF THE CONTRACT

1. The successful bidder to not assign the whole or any part of the resulting contract without the prior written consent of the Owner, which consent may be withheld by the Owner in its sole discretion or may be given subject to such terms and conditions that the Owner may impose.

20. DISCREPANCIES AND / OR OMISSIONS

1. If the Contractor finds discrepancies in, or omissions from the Drawings, Specifications or other Contract Documents or has any doubt as to the meaning or intent of any part thereof the Consultant to be notified at once. The Consultant will send written instructions or explanations. Neither the Owner nor the Consultant will be responsible for oral instructions.

21. EXAMINATION

1. Make a careful examination of the site of the project, and investigate and be satisfied as to matters relating to the nature of the work to be undertaken, as to the means of access and egress thereto and there from, as to the obstacles to be met with, as to the rights and interests which may be interfered with during the construction of the work, as to the extent of the work to be performed and any and matters which are referred to in the Drawings, Specifications and other Contract Documents, or which are necessary for the full and proper understanding of the work and the conditions under which it will be performed. No allowance to be made subsequently in this connection on behalf of the Contractor for any error or negligence on its part. Before commencing the work of any Section, the work of other Sections upon which it may depend, to be carefully examined. Report any defects which might affect the new work in writing to the Consultant. Commencement of new work to imply acceptance of work by other Sections upon which the new work depends. Verify dimensions of prepared work before fabrication of that work which is dependent on the prepared work.

22. EXISTING CONDITIONS

2. Make good surfaces and finishes damaged or disturbed due to Work of this Contract to match existing. Ensure that material used to repair damage is compatible with existing work. Term "make good" to mean repairing or filling operations performed on existing floors, walls, ceiling, or any other exposed surfaces. Perform cutting and patching where applicable as specified herein. It is intended that finished surfaces match and line with existing adjoining surfaces. Restore Site to condition equal to or, if specified elsewhere, to condition better than existing conditions. Restore lands outside of limits of Work which are disturbed due to Work to original condition in addition to complying with requirements of General Conditions of the Contract.

00 41 13 - TENDER FORM

To: **Alderville First Nation, 11696 Second Lind Road, Roseneath,**

Herein referred to as the "OWNER".
The UNDERSIGNED, herein referred to as the "CONTRACTOR"

With the legal company name of _____

A company duly incorporated under the laws of _____

And having its Head Office at _____

.1 HEREBY UNDERTAKES AND AGREES WITH THE OWNER AS FOLLOWS:
Having examined the Tender Documents, entitled **ALDERVILLE SENIOR'S RESIDENCE RENOVATIONS, 8465 County Road 45 Roseneath, Ontario** and including:

.1 All Drawings dated: **2026 03 13**
.2 Specifications dated: **2026 03 13**
.3 Addenda Numbers _____
Issued _____
And having visited the site, and having examined and become familiar with conditions affecting the proposed work,

WE UNDERTAKE TO DO WORK, AND SUPPLY MATERIALS AND SERVICES IN ACCORDANCE WITH THE TENDER DOCUMENTS, FOR THE **CONTRACT PRICE**, WHICH ***EXCLUDES*** HARMONIZED SALES TAX (HST),
OF _____

_____**and**_____**/100 DOLLARS ($**_____**).**

VALUE ADDED TAXES (HST) OF 13% PAYABLE BY THE OWNER TO THE CONTRACTOR IS:

_____

_____**and**_____**/100 DOLLARS ($**_____**).**

TOTAL AMOUNT PAYABLE BY THE OWNER TO THE CONTRACTOR FOR THE CONSTRUCTION OF THE WORK IS:
_____

_____**and**_____**/100 DOLLARS ($**_____**).**

.2 The UNDERSIGNED hereby submits that amounts are in Canadian funds and that these amounts to be subject to adjustments as provided in the Contract documents.
.3 The UNDERSIGNED further submits that costs for supervision, administration, co-ordination, handling, management, expediting, scheduling, overhead and profit and assuming full responsibility and warranty for the assigned work are included in the Contract Price Tendered.
.4 That the UNDERSIGNED, if notified of proposal acceptance within **THIRTY (30) DAYS** of Tender Closing Date agrees to enter into a formal Contract with the Owner for the work, in the form of the Canadian Standard Construction Document, CCDC 2-2020, Stipulated Price Contract.
.5 The UNDERSIGNED undertakes to commence the work under the Contract forthwith after execution of the formal Contract and when notified so to do by the Owner and to carry out work without interruption to completion of the Contract.
.6 The UNDERSIGNED declares that the above quoted Contract Price includes the Cash Allowances in the amount of **$165,000.00** as indicated in section 01 21 00 Cash Allowances.
.7 The UNDERSIGNED agrees to complete the work in accordance with the construction schedule in Division 00, item 17, that articulates a phased completion schedule with all work complete in _____ weeks.
.8 The Undersigned submits herewith the Bid Bond and Agreement to Bond for the project.

.9 The UNDERSIGNED will include the following unit cost. All unit costs include profit and overhead and shall not fluctuate for the duration of this Contract.

.10 All rates are firm and shall not fluctuate for the duration of this Contract. There shall be no additional charges for overhead and profit.

Item	Standard Rate/Hour	Overtime Rate/Hour
Foreman		
Tradesman		
Labourer		

.11 **Separate Prices (All separate prices to exclude HST)**

.1 Should all the work associated in the room 92 Stair-2 and 109 Stair-2 including excluding the doors and frames, but not limited to the Barrier Free Lift, floor infill, new handrails, new paint, new flooring be included (please note that all the work associated with the exterior door and frame 92X and interior doors and frames 92 and 109 are part of the base bid contract) be added to the contract, **add**

_____

_____**and**_____**/100 DOLLARS ($**_____**). From** the Contract Price.

.2 Should all the work associated with Canopy Roof above new basement exit sidewalk be added to the contract, **add**

_____

_____**and**_____**/100 DOLLARS ($**_____**). From** the Contract Price.

.3 Should all the work associated with new windows be added to the contract, **add**

_____

_____**and**_____**/100 DOLLARS ($**_____**). From** the Contract Price.

.4 Should all the work associated with replacing and upgrading existing generator to suit new project (please note that a second generator to support additional loads is part of the base bid and would be obsolete with a full upgraded unit) be added to the contract, **add**

_____

_____**and**_____**/100 DOLLARS ($**_____**). From** the Contract Price.

.12 **I/WE DECLARE** that this tender is made without collusion, knowledge, comparison of figures or arrangement with any other company, firm or person submitting a tender for the same work and is in all respects fair and without collusion or fraud.

IN WITNESS WHEREOF THE UNDERSIGNED CONTRACTOR HAS HERETO set its Corporate Seal and the hands of its' proper officers in that behalf at

_____ (Province),
(City)

This _____DAY OF_____ (Month), 20____ (Year).

_____
COMPANY NAME

_____
ADDRESS, POSTAL CODE, PHONE

Corporate
Seal (or)

_____
SIGNATURE

_____
WITNESS

_____
PRINTED NAME AND TITLE

APPENDIX A – SUB-CONTRACTOR AND MAJOR SUPPLIER LIST / COST BREAKDOWN / SEPARATE PRICES
Submit a completed hardcopy of this appendix at time of tender close.

The UNDERSIGNED lists herein the individual Sub-contractors and Major Supplier for the trades listed below (provide only one name for each) and who he proposes to employ on the Project, and upon whose sub-trade or supply quotation he has based the Contract Price quoted herein, and agrees that no change shall be made in the list, as regards such Sub-contractor or Supplier actually employed on the Work, except under conditions set out in Division 00 – Procurement + Contracting, in the item entitled 'Subcontractors'.

The UNDERSIGNED lists herein the costs associated with each part of the work as described below. Please note that the cash allowance is included in the summary and that all costs must add up to match the CONTRACT PRICE

TRADE	SUB-CONTRACTOR OR MAJOR SUPPLIER	COST
GENERAL CONDITIONS INCLUSIVE OF O/H AND PROFIT		
DEMOLITION		
CONCRETE SLAB ON GRADE, CONCRETE SLABS, CONCRETE FINISHING AND HARDENERS / SEALERS.		
MASONRY		
STRUCTURAL STEEL + MISCELLANEOUS METALS		
ROUGH CARPENTRY		
FINISH CARPENTRY		
BUILDING INSULATION, WEATHER BARRIERS		
FIRESTOPPING+SEALANTS		
HOLLOW METAL DOORS, FRAMES AND HARDWARE		
GLAZING / GLASS SYSTEMS		
GYPSUM BOARD / METAL STUD FRAMING SYSTEMS		
RESILIENT SHEET FLOOR		
CERAMIC WALL + FLOOR TILE		
ACOUSTIC CEILING SYSTEMS		
PAINTING AND FINISHING		
BLINDS		
WASHROOM ACCESSORIES		
ELEVATOR – BARRIER-FREE LIFT		
MECHANICAL SYSTEMS		
ELECTRICAL SYSTEMS		
CASH ALLOWANCES AS PER SECTION 01 21 00		
	CONTRACT PRICE	
	HST	
	TOTAL AMOUNT PAYABLE TO THE CONTRACTOR	

00 73 00 -SUPPLEMENTAL GENERAL CONDITIONS

Part 1. General

1. The General Conditions of the Stipulated Price Contract Canadian Standard Construction Document – CCDC 2-2020, Articles GC1 through GC13 inclusive, form part of this Contract.
2. The following Supplementary Conditions modify, change, delete from and/or add to the Articles of Agreement, the Definitions, and the General Conditions of the Stipulated Price Contract, Standard Construction Document CCDC 2-2020.
3. Where any Article, Paragraph or Sub-paragraph in the Agreement and/or General Conditions is supplemented by one of the following paragraphs, the provisions of such Article, Paragraph or Sub-paragraph to remain in effect and the supplemental provisions to be considered as added thereto.
4. 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 to remain unchanged, and the numbering of the deleted item will be retained, unused.
5. Where any article, paragraph, or sub-paragraph in the Agreement and/or General Conditions is amended, voided, or superseded by any of the following paragraphs, the provisions of such article, paragraph, or sub-paragraph not so amended, voided, or superseded to remain in effect.
6. The term "provide" as used in the Contract Documents, to mean the furnishing of labour, materials, equipment, transportation and other services required, including costs in connection therewith, to complete the Work.
7. Wherein the word "submit" is used in the Contract Documents, it to be followed by the words "to the Consultant" unless the context provides otherwise. Wherein the words "approved", "designated", "directed", "inspected", "instructed", "permitted", "required", "satisfactory", and "selected" are used in the Contract Documents, they to be followed by the words "by the Consultant" unless the context provides otherwise.
8. Articles, Definitions, General Conditions, paragraphs, subparagraphs, or clauses thereof have been modified in these Supplementary General Conditions as described in this section

Part 2. Modifications to Agreement Between Owner and Contractor

ARTICLE A-5 PAYMENT

1. 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*"

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

1. Delete paragraph 6.5 of Article A-6 in its entirety and replace it with the following:
   6.5 Contact information for a party may be changed by *Notice in Writing* to the other party setting out the new contact information in accordance with this Article.

Part 3. Modifications to Definitions

1. Add the following to, "Value Added Taxes"
   .1 "Value Added Taxes to be as levied by the Federal Government and is computed at **Thirteen (13)** percent of the Contract Price. The payment or collection of which is by the legislation imposing such tax an obligation of the Contractor".
2. Add the following definition: Proper Invoice
   .1 *"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*."
3. Add the following definition:
   .1 "*Submittals* are documents or items required by the *Contract Documents* to be provided by the *Contractor* such as:
      .1 *Shop Drawings,* samples, models, mock ups to indicate details or characteristics before the portion of the *Work* that they represent can be incorporated into the *Work,* and
      .2 As-built drawings and manuals to provide instructions to the operation and maintenance of the *Work.*"

MODIFICATIONS TO GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT

Part 4. **General Provisions**

GC 1.1 CONTRACT DOCUMENTS

1. Delete paragraphs 1.1.3 and 1.1.4 in their entirety and replace them with the following:
   .1 "1.1.3 The *Contractor* shall review the *Contract Documents* for the purpose of facilitating and co-ordination 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*.
   .2 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."
2. Add the following to the end of subparagraph 1.1.6.2:
   .1 Except to the extent the *Consultant* is indemnified as a third party beneficiary as provided in subparagraphs 9.2.7.4 and 9.5.3.4 and in paragraph 13.1.3.
3. Add paragraph 1.1.12 as follows:
   .1 The Contractor to be provided with an electronic PDF copy of Architectural, Structural, Mechanical and Electrical Drawings for the purpose of assisting in the preparation as-built drawings. A service charge of $750.00 (Seven Hundred and Fifty-Five and xx/100 Dollars) will apply for each/any electronic AUTOCAD drawing file requested. The Contractor is responsible for distribution of files and recovery of costs from subcontractors.
4. Add paragraph 1.1.13 as follows;
   .1 The digital data supplied by the Consultant will be provided to the Contractor as a matter of courtesy and convenience and is in no way to be taken as appurtenant to, associated with, or in placement of the officially signed and sealed contract documents. The data contained will be provided "as is" without warranty of any kind either expressed or implied and to be relied upon as such. Although every care and diligence is taken to ensure the accuracy and correctness of supplied data, any and liabilities for damage, direct or indirect, however caused and resulting in any from the use of the supplied digital data will be the full responsibility of the Contractor. The Contractor accepts these conditions upon acceptance of the digital data.

Part 5. **Administration Of the Contract**

GC 2.2 ROLE OF THE CONSULTANT

1. In paragraph 2.2.3 add the following to the end:
   .1 "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*."
2. In paragraph 2.2.8 add the words ", written statements" after the word "interpretations" in both the first and second sentences; and
   add the following to the end of paragraph 2.2.8:
   .1 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, and 7.1.2, but only to the extent that any such interpretations, written statements, and findings are made by the Consultant in an unbiased manner, and in accordance with the Consultant's professional standard of care at law.
3. In paragraph 2.2.13 add the words "which are provided" before the words "by the *Contractor*".

GC 2.4 DEFECTIVE WORK

1. In paragraph 2.4.1:
   .1 Add after the words "shall promptly correct" the phrase "in a manner acceptable to the Owner and the Consultant"; and

.2 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".

2. Add new paragraph 2.4.4 as follows:
   .1 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*.

Part 6. **Execution of the Work**

GC 3.1 CONTROL OF THE WORK

1. Add new paragraph 3.1.3 as follows:
   .1 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.

GC 3.2 CONSTRUCTION BY OWNER AND OTHER CONTRACTORS

1. Add new paragraph 3.2.7 as follows:
   .1 3.2.7 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 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.

GC 3.4 CONSTRUCTION SCHEDULE

1. Add sentence .4 to paragraph 3.4.1:
   .1 ".4 clearly indicate and communicate materials/products procurement and delivery dates paying particular attention to schedule."

GC 3.5 SUPERVISION

1. Add the following paragraphs:
   .1 3.5.3 The Owner may, with reasonable cause, at any time during the course of the Work, request the replacement of the supervisor or the representative. Upon receipt of such request, the Contractor will immediately make arrangements to appoint an acceptable replacement. Costs associated with any removal(s) or replacement(s) of these individuals to be the responsibility of the Contractor.
   .2 3.5.4 The Contractor shall employ an "Office Representative/Manager of the Work", in addition to the Superintendent of the Work, for the entire duration of the project.
      .1 Coordinating, managing and expediting control of the project relating to matters of the project including, but not limited to authorities having jurisdiction, product suppliers, subtrades, Owner and Consultant etc.
      .2 Project scheduling and management (i.e. trades, products, etc.)
      .3 Work with the Site Superintendent of the Work as required to ensure compliance of the Work with the intent of the Construction Documents including but not limited to projects scheduling, coordination of subtrades, quality control and performance of the Work.
   .3 3.5.5 The Site Superintendent of the Work shall perform duties and responsibilities at the Place of Work until completion of the work has been achieved and as issued by the Consultant.
   .4 3.5.6 Both the Site Superintendent of the Work and the Office Representative/Manager of the Work shall have relevant and verifiable experience with undertaking and completing projects of this nature.

GC 3.6 SUBCONTRACTORS AND SUPPLIERS

1. Revise Paragraph 3.6.2 as follows:
   .1 After the word "if" in the first line add "when requested at the time of tender and within five (5) working days".
2. Add the following paragraph 3.6.7:
   .1 The contractor shall not change subcontractors and/or suppliers and agrees not to do so without the prior written consent of the Owner and the Consultant. The Contractor must substantiate cause for change.

GC 3.7 LABOUR AND PRODUCTS

1. Add the following to the end of paragraph 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.

2. Add new paragraphs 3.7.4 and 3.7.5 as follows:
   .1 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.
   .2 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:
      .1 the *Contract Documents* expressly stipulate that such *Product* is to be the *Contractor*'s responsibility and to be installed by the *Contractor* as part of the *Work*;
      .2 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
      .3 the *Owner* obtained the *Contractor*'s approval as required by paragraph 3.7.4.

GC 3.8 SHOP DRAWINGS

1. Add the words "AND OTHER SUBMITTALS" to the title of GC 3.8 after the words "SHOP DRAWINGS".
2. Add the words "and Submittals" after the words "Shop Drawings" in paragraphs 3.8.1, 3.8.2, 3.8.3, 3.8.3.2, 3.8.5, 3.8.6, and 3.8.7.
3. Delete paragraph 3.8.2 in its entirety and replace it with new paragraph 3.8.2 as follows:
   .1 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
4. Delete the words "with reasonable promptness so as to cause no delay in the performance of the Work" and replace them with the words "within 10 *Working Days* or such longer period as may be reasonably required" in paragraph 3.8.7.

GC 3.9 PERFORMANCE BY CONTRACTOR

1. Add new General Condition GC 3.9 as follows
   .1 GC 3.9 PERFORMANCE BY CONTRACTOR
      .1 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.

Part 7. **Allowances**

GC 4.1 CASH ALLOWANCE

1. Delete paragraph 4.1.7 in its entirety and replace it with the following:
   .1 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 the Work* to avoid delaying the progress of the *Work*.
2. Add new paragraph 4.1.8 as follows:
   .1 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.

Part 8. **Payment**

GC 5.2 APPLICATIONS FOR PAYMENT

1. Revise Delete the word "first" in paragraph 5.2.7 and replace it with the word "second."
2. Add new paragraph 5.2.9 as follows:
   .1 5.2.9 In addition to the statutory holdback required under the Construction Act, the Owner shall retain a deficiency/closeout document holdback in the amount of 2% of the Contract Price. This deficiency holdback is intended to cover incomplete or deficient work identified during progress reviews and shall be held until all such deficiencies are rectified to the satisfaction of the Consultant and closeout documents are submitted in their entirety.
   .2 The deficiency holdback shall be separate from, and in addition to, the statutory lien holdback and shall not be released as part of Substantial Performance or interim draws.

.3 This deficiency holdback shall not be construed as a waiver of any other rights of the Owner under the Contract, including warranty obligations.

GC 5.3 PAYMENT

1. Delete the word "calendar" and substitute the word "business" in sentence 5.3.1.1:
2. Delete the word "calendar" and substitute the word "business" in sentence 5.3.1.2:

GC 5.4 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

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

.1 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*.

.2 5.4.2 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 a 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*.

.3 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*.

.4 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 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 an application for payment that is subject to *Proper Invoice* requirements.

.6 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.

.7 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.

.8 5.4.8 The Contractor to co-operate with the Consultant and Owner in establishing a Deficiency List before Substantial Performance of the Work. The Contractor to complete the Work noted on the Deficiency List expeditiously and at the discretion and convenience of the Owner. If more than one (1) inspection is required to review deficiency completion each subsequent site visit will be charged at $500.00 per visit per consultant required to attend the visit.

GC 5.5 FINAL PAYMENT

1. Add to the end of paragraph 5.5.1 the following sentence:
   .1 The application for final payment shall meet the requirements of a *Proper Invoice*.
2. Add the following to the end of paragraph 5.5.3:
   .1 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*.

Part 9. **Changes in the Work**

GC 6.2 CHANGE ORDER

1. Add the following paragraph 6.2.3: 'The value of a change shall be determined in one or more of the following methods:
   .1 By estimate and acceptance in a lump sum substantiated by an itemized cost breakdown satisfactory to the consultant with the applicable overhead and profit percentage fees applied.;
   .2 By unit prices set out in the contract or subsequently agreed upon;
   .3 By cost and a fixed or percentage fee.'
2. Add the following paragraph 6.2.4: 'In the case of changes in the Work to be paid for under methods (.1) and (.3) of paragraph 6.2.3, the Contractor and Subcontractor, respectively, may add to the reasonable net cost of additional work a fee, or mark-up, inclusive of overhead and profit, limited to the following:
   .1 The Subcontractor may add to the total net cost of labour and materials, a fee, or mark-up, equal to ten percent (10%) of such cost for Work done by the Subcontractor.
   .2 The Contractor may add to the net cost of additional work by a Subcontractor, a fee, or mark-up, equal to ten percent (10%) of the total sum quoted by such Subcontractor.
   .3 The Contractor may add to the total net cost of labour and materials of additional work to be carried out by his own forces a fee, or mark-up equal to fifteen percent (15%) of such cost.
   .4 For Owner requested substitution of building material(s) and/or building component(s) with *no additional labour content* by the Contractor, a total mark-up of five (5%) percent to be allowed on such changes regardless of the value of the change
   .5 For Owner requested substitution of building material(s) and/or building component(s) with *no additional labour content* by Subcontractor(s), the Subcontractor(s) to be allowed a total mark-up of five (5%) percent and the Contractor to be allowed an additional total mark-up of five (5%) percent regardless of the value of the change.
   .6 Such fee or mark-up, by Contractor and Sub-contractor respectively, to be based on net additional cost for any one change in the Work, such net additional cost being derived by deducting credits for labour and materials involved in deleted work from the cost of labour and materials involved in additional work. When quantities of the same product or material are changed in the same Change in the Work, the change in the Contract Price to be based on the net difference in quantity between the product or material deleted and the same product or material added. The procedure of crediting deleted material at a certain unit cost and then charging the aggregate quantity of the same material at a higher unit cost will not be accepted.
   .7 The Consultant alone to determine the scope of change
   .8 Consideration for Unusual Changes: unusual and/or peculiar changes requiring consideration to be reviewed on an individual basis. The consultant alone to determine what constitutes an unusual and/or peculiar change.
   .9 Changes for Cause and/or Changes for Convenience: The Contractor and sub-contractors must demonstrate, by way of their submissions that any/all products and/or substitutions are made as substitutions for 'cause' in support of the intent of the contract documents.
   .10 Changes and/or Substitutions deemed 'for convenience' will not be considered and allowed. The Consultant alone will determine the acceptance of a change or Substitution.'
3. Add the following paragraph: 6.2.5: 'In the case of a Change in the Work to be paid for under method (.2) of Paragraph 6.2.3, involving a class of work for which a unit price was required to be quoted in the Tender proposal, the cost to be paid for such class of work, derived by deducting quantity of deleted work involved in such change from the quantity of additional work involved in such change, multiplied by the applicable unit prices quoted.'
4. Add the following paragraph 6.2.6: 'Overhead to include any additional charges and/or premiums for Permits, Bonds, Insurance, Site Supervision, Office Administration and the like, which may result from Changes in the Work, whether calculated on the basis of quoted Unit Prices, or on the basis of Cost Plus Fee or Mark-up.'
5. Add the following paragraph 6.2.7: 'Except where Unit Prices have been quoted, the value of a change in the Work to be determined by method (3) of Paragraph 6.2.3.'
6. Add the following paragraph 6.2.8: 'Where the additional cost of a change in the Work has been quoted by the Contractor and accepted by the Owner in the form of a lump sum as evidenced by the issuance of a Change Order, such quoted cost to be deemed to have included costs, including any costs for delay of work, which are or may be occasioned by such change. No later claims for additional costs will be considered.'
7. Add the following paragraph 6.2.9: 'The Contractor's fee, or mark-up, inclusive of overhead and profit, is understood to include, without limitation, the following:
   .1 The Contractor's head office and administration expenses, associated travelling /
   .2 Accommodation / meals costs, financing costs including holdback, bonding and insurance costs;
   .3 All supervision, co-ordination, administration, margin and risk of undertaking within stipulated a mount;
   .4 The salaries of superintendents, project managers, engineers, timekeepers, accountants,
   .5 Clerks, and other Site supervision staff above foreperson level employed directly on the Work;

.6 The Contractor's mark-up and profit;
.7 Use of temporary offices, sheds and other general temporary Site support facilities and utilities used therein;
.8 Miscellaneous additional costs related to:
.1 Licenses, building permit and statutory fees, except when these are
.2 Special for a particular item of Work;
.3 Purchase of rental material, plant and equipment;
.4 Purchase of small tools and supplies;

GC 6.3 CHANGE DIRECTIVE

1. Delete the word "and" from the end of subparagraph 6.3.7.17.
2. Delete the period from the end of subparagraph 6.3.7.18 and replace it with "; and".
3. Add new subparagraph 6.3.7.19 as follows:
.1 .19 safety measures and requirements.

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

1. Add new paragraph 6.4.5:
.1 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.

GC 6.5 DELAYS

1. Amend paragraph 6.5.1 by delete the period at the end of the paragraph and adding: 'but excluding any consequential, indirect or special damages.'
2. Amed paragraph 6.5.2 by deleting the period at the end of the paragraph and adding: 'but excluding any consequential, indirect or special damages.'
3. Add new subparagraph 6.5.6: 'If the Contractor is delayed in the performance of the Work by an act or omission of the Contractor or anyone directly or indirectly employed or engaged by the Contractor, 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 reasonable costs incurred by the Owner as the result of such delay, including, but not limited to, the cost of additional services required by the Owner from the Consultant or any sub consultants, project managers, or others employed or engaged by the Owner. 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 directly or indirectly, or by stop work order or by a court or public authority as the result or an act of the contractor, or by unusual delay by common carriers or unavoidable casualties or, without limit to any of the forgoing, by any cause within the Contractor's control.'

GC 6.6 CLAIMS FOR CHANGE IN CONTRACT PRICE

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.

Part 10. **Dispute Resolution**

GC 8.3 ADJUDICATION

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

Part 11. **Protection of Persons and Property**

GC 9.1 PROTECTION OF WORK AND PROPERTY

1. Delete subparagraph 9.1.1.1 in its entirety and replace it with the following:
.1 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;
2. Delete paragraph 9.1.2 in its entirety and replace it with the following:

.1 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.

GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

1. Add the following words to paragraph 9.2.6 after the word "responsible":
   .1 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,
   .2 Add the words "and the *Consultant*" after the word "*Contractor*" in subparagraph 9.2.7.4.
   .3 Add the following words to paragraph 9.2.8 after the word "responsible":
      .1 or that 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,

GC 9.5 MOULD

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

Part 12. **Governing Regulations**

GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

1. Delete from the first line of paragraph 10.2.5 the word, "The" and substitute the words: "Subject to paragraph 3.9.1, the".

Part 13. **Insurance and Contract Security**

GC 11.1 INSURANCE

1. Delete paragraph 11.1.1.3; 'Unmanned aerial vehicle aircraft, manned aircraft or watercraft liability' insurance is not required for the project.
2. Paragraph 2 of CCDC 41 – CCDC Insurance Requirements to be amended by replacing the amount of $10,000,000 with the amount of $5,000,000 for the automobile liability insurance.

Part 14. **Owner Takeover**

GC 12.1 READY-FOR-TAKEOVER

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".

GC 12.2 EARLY OCCUPANCY BY THE OWNER

1. Delete the word "achieve" in paragraph 12.2.4 and replace it with the words "have achieved".

GC 12.3 WARRANTY

1. Delete the word "The" from the first line of paragraph 12.3.2 and replace it with the words "Subject to paragraph 3.9.1, the".

Part 15. **Indemnification, Waiver of Claims and Warranty**

GC 13.1 INDEMNIFICATION

1. Add new paragraph 13.1.0 as follows:
   .1 13.1.1 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 Work.*

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

DIVISION 01 - GENERAL REQUIREMENTS

01 11 00 – SUMMARY OF WORK

Part 1. General

1. THE CONTRACT DOCUMENTS

.1 Division 1 General Requirements, of the Specification generally specify work and coordination of the work that is the direct responsibility of the Contractor but shall not be interpreted to define absolutely the limits of responsibility that must be established between the Contractor and his Subcontractors by their separate agreements.

.2 Ensure that all Subcontractors understand that the General Conditions of the Contract, and Division 1 General Requirements, apply to Sections of the Specification governing their work.

.3 Ensure that the work includes all labour, equipment and products required, necessary or normally recognized as necessary for the proper and complete execution of the work of each trade.

.4 Work in this Specification is divided into descriptive Sections which are not intended to identify absolute contractual limits between Subcontractor, nor between the General Contractor and his Subcontractors. The Contractor shall organize division of labour and supply of materials essential to complete the Project in all its parts and provide a total enclosure and protection from weather of interior spaces, as established in the General Conditions of the Contract.

.5 As a result, the Consultant shall not be required to decide on questions arising with regard to agreements or contracts between the Contractor and Subcontractors or Suppliers, nor to the extent of the parts of the Work assigned thereto. Division of the work among the subcontractors and suppliers is solely the Contractor's responsibility. The Architect and Owner assume no responsibility to act as an arbiter to establish subcontract limits between sections or Division of the work.

.6 Further, no extra will be allowed as a result of the failure to coordinate and allocate the Work such that the Work is provided in accordance with the Contract Documents.

.7 Wherever the word "building" occurs in the Contract Documents it shall be taken to mean all the buildings included in the Contract.

.8 Wherever in the Contract Documents the words "approval", "approved", "direction", "directed", "selection", "selected", "request", "requested", "report", and similar words are used, such approvals, directions, selections, requests and reports shall be given by the Consultant in writing unless specifically stated otherwise.

.9 Wherever in the Contract Documents the word "supply" is used in any form, it shall mean that the work specified to be supplied includes delivery to site and unloading at location directed.

.10 Wherever in the Contract Documents the word "installed" issued in any form, it shall mean that the Work specified for installation includes uncrating, unpacking, etc; moving from stored location to place of installation; and installing to meet specified requirements.

.11 Wherever in this Specification it is specified that work is to proceed or to meet approval, direction, selection or request of authorities having jurisdiction or others, such approval, direction, selection or request shall be in writing.

.12 Wherever in this Specification or as directed by the Consultant it is specified that work shall be repaired, made good or replaced, it shall be performed without any additional cost to the Owner.

.13 Whenever in the Specifications the term "and/or" is used, the Consultant shall decide which of the possible meanings, to be derived at from the sentence where this term occurs shall govern.

2. DIVISION 1. GENERAL REQUIREMENTS

.1 The provisions of all Sections of Division 01 shall apply to each Section of this Specification.

3. STANDARDS AND CODES

.1 Contract forms, codes, specifications, standards, manuals and installation, application and maintenance instructions referred to in these specifications, unless otherwise specified, amended or date suffixed, shall be latest published editions at Contract date.

.2 Minimum Standard: Unless reference is made in the Contract Documents to other standards, work to conform to or exceed the minimum applicable standards of The Ontario Building Code, and/or the governing Jurisdictional Authorities.

4. ABBREVIATIONS AND ACRONYMS

.1 Many words or expressions that are repeated frequently on the drawings are abbreviated to reduce the amount of wording that might obscure the detailing. In some instance and to avoid misinterpretation, these abbreviations are listed, with their full meaning, on a tables / legends located on the drawings or near schedules where the abbreviations are used.

5. LAWS, NOTICES, PERMITS AND FEES

.1 Comply with codes, by-laws, and regulations of authorities having jurisdiction over the Place of the Work. Codes and regulations form an integral part of the Contract Documents.

.2 Permits:

.1 The Owner shall apply for, obtain and pay for the building permit.

.2 The Contractor shall obtain and pay for all other permits, licenses, deposits and certificates of inspection as part of the Work, including permits for road closures.

.3 The Owner has initiated the permit application process for the following, but responsibility for closing the permit, including all associated costs and responsibilities, rests with the Contractor and is included as part of the Work:

.4 Obtain permits required to execute work on municipal rights of way. Obtain damage deposits for sidewalks, roads and services, unless otherwise indicated.

.3 Arrange for inspection, testing and acceptance of the Work required by the authorities having jurisdiction. Be responsible for necessary preparations, provisions and pay costs.

.4 It is the responsibility of the Contractor to schedule notifications and inspections required by authorities having jurisdiction such that notifications can be properly received and that inspections can be properly undertaken without causing a delay in the Work. The Contractor, at no additional cost to the Owner, shall be solely responsible for any delay in the Work caused by failure to properly schedule required notifications and inspections.

6. WORK PERFORMED UNDER SEPARATE CONTRACTS

.1 Work not to be included in the Contract, as noted "NIC" on the Drawings.

7. WORK BY OWNER

.1 Permit the Owner and/or their contractors to inspect the work at any reasonable time, and to perform such work and install such equipment or items as the Owner may require.

8. CONSTRUCTION PROGRESS SCHEDULE

.1 Meet with Owner and Consultant within five (5) working days of Contract award, to discuss proposed approach for undertaking the Work, inclusive of methodology, sequencing, Construction Equipment, and labour resources to be utilized.

.2 Submit a preliminary as-planned schedule as indicated in Section 01 32 16 Construction Progress Schedule, within fifteen (15) working days after Contract award.

.3 Once preliminary as-planned schedule is approved and the final as-planned schedule is created, record "progress to date" on a copy of schedule to be available at the Site. Inspect Work with the Owner and the Consultant at least bi-weekly to establish progress on each current activity.

.4 The Contractor's schedule is to be updated and resubmitted to the Consultant as a progress schedule at least once per month, on a date to be mutually agreed by the Contractor and the Consultant

9. SITE PROGRESS RECORDS

.1 Maintain at site a permanent written record of progress of work. Make the record available at all times with copies provided when requested. Include in record each day:

.1 Weather conditions with maximum and minimum temperatures.

.2 Conditions encountered during excavation. Record quantities pumped for dewatering.

.3 Commencement and completion dates of the work of each trade in each area of Project.

.4 Erection and removal dates of formwork in each area of Project.

.5 Dates, quantities, and particulars of each concrete pour.

.6 Dates, quantities, and particulars of waterproofing installation.

.7 Dates, quantities, and particulars of roofing installation.

.8 Attendance of Contractor's and Subcontractor's work forces at Project and a record of the work they perform.

.9 Dates, status and particulars of submissions, i.e. shop drawings, samples, mock-ups and the like.

.10 Dates, status and particulars of deliveries, i.e. manufacturing dates, delivery and installation dates.

.11 Visits to site by Owner, Consultant, authorities having jurisdiction, testing companies, Contractor, Subcontractors, and suppliers.

.2 Maintain a progress chart in approved format. Show on chart proposed work schedule and progress of work by Contractor and Subcontractor. The status of delivery items, i.e. shop drawings status, manufacture dates - delivery and installation dates.

10. DOCUMENTS AT THE PLACE OF THE WORK

.1 Maintain at the Place of the Work, one copy of each of following:

.1 Contract Documents including 'Issued for Construction' drawings, specifications, addenda, and other modifications to the Contract, including copies of standards and codes referenced in the Contract Documents.

.2 'Reviewed' or 'Reviewed as Modified' shop drawings. Refer to Section 01 33 00 for details of schedules required.

.3 Construction, inspection and testing, and submittal schedules.

.4 Supplemental Instructions, proposed Change Orders, Change Orders, and Change Directives.

.5 Field Test Reports.

.6 Consultant's field review reports and deficiency reports.
.7 Reports by authorities having jurisdiction.
.8 Building and other applicable permits, and related permit documents entailing a complete full sized colour approved stamped Building Permit Documents which are not to have any notation nor are to be used except for reference by the Building Inspector.
.9 construction progress schedule,
.10 meeting minutes
.11 manufacturer's certifications, installation and application instructions.
.12 material safety data sheets (MSDS) for all controlled products.
.13 Ontario Building Code and Guide to the Ontario Building Code, 2012 edition.
.14 Daily log of the Work.
.15 As-built drawings recording as-built conditions, instructions, changes, and the like, as called for in Section 01 33 00, prior to being concealed.

.2 Make above material available to Consultant upon request.

11. TRADEMARK AND LABELS

.1 Trademarks and labels, including applied labels, shall not be visible in finished work in finished areas, unless otherwise accepted or indicated by Consultant.

12. EXAMINATION

.1 Examine site, and ensure that each Section performing work related to site conditions has examined it, so that all are fully informed on all particulars which affect the Project Work (thereon and at the place of the building, and in order that construction proceeds competently and expeditiously).
.2 Ensure by examination that all physical features at the work, and working restrictions and limitations which exist are known, so that the Owner is not restricted in his use of the premises for his needs.
.3 Previously Completed Work:
.1 Where dimensions are required for proper fabrication, verify dimensions of completed work in place before fabrication and installation of work to be incorporated with it.
.2 Verify that previously executed work and surfaces are satisfactory for installation or application, or both, and that performance of subsequent work will not be adversely affected.
.3 Ensure that work installed in an unsatisfactory manner is rectified by those responsible for its installation before further work proceeds.
.4 Commencement of work will constitute acceptance of site conditions and previously executed work as satisfactory.
.5 Defective work resulting from application to, or installation on, or incorporation with, unsatisfactory previous work will be considered the responsibility of those performing the later work.
.4 Construction Measurements:
.1 Take site dimensions of completed work before installation of work to be incorporated commences.
.2 Before commencing installation of work, verify that its layout is accurately in accordance with intent of Drawings, and that positions, levels, and clearances to adjacent work are maintained. Provide setting out drawings as part of the submittal process with verification by an Ontario Land Surveyor or field engineer.
.3 Before commencing work, verify that all clearances required by authorities having jurisdiction can be maintained.
.4 If work is installed in wrong location, rectify it before construction continues.
.5 Where dimensions are not available before fabrication commences, the dimensions required shall be agreed upon between the trades concerned.
.6 All measurements shall be Metric.

13. EXISTING CONDITIONS

.1 Make good surfaces and finishes damaged or disturbed due to Work of this Contract to match existing. Ensure that material used to repair damage is compatible with existing work. Term "make good" to mean repairing or filling operations performed on existing floors, walls, ceiling or any other exposed surfaces. Perform cutting and patching where applicable as specified herein. It is intended that finished surfaces match and line with existing adjoining surfaces. Restore Site to condition equal to or, if specified elsewhere, to condition better than existing conditions. Restore lands outside of limits of Work which are disturbed due to Work to original condition in addition to complying with requirements of General Conditions of the Contract.

14. PROTECTION OF WORK, PROPERTY AND PERSONS

.1 Include in work necessary methods, materials, and construction to ensure that no damage or harm to work, materials, property and persons results from the work of this Contract. Temporary facilities relating to protection are specified in Section 01 50 00.
.2 Comply with all instructions and/or orders issued by authorities having jurisdiction.

.3 Ensure that compulsory wearing of hard hats, safety glasses, safety vests, safety boots and other safety clothing is observed by all persons employed on the work. Provide spare hard hats for visitors, refuse admission to the premises to any not complying to safety clothing and equipment requirements.

.4 Keep excavations, and pits free of rainwater, ground water, backing up of drains and sewers, and all other water. Pump dry as required.

.5 Protect adjacent private and public property from damage and, if damaged, make good immediately. Make good private property to match in all details its original condition in material and finishes as approved, and public property in accordance with requirements specified and/or instructed by its Owner or as directed by the Consultant.

.6 Keep surfaces, on which finish materials will be applied, free from grease, oil, and other contamination which would be detrimental in any way to the application of finish materials.

.7 Do not apply visible markings to surfaces exposed to view in finished state or that receive transparent finishes.

.8 Protect surfaces of completed work exposed to view from staining, disfigurement and all other damage by restriction of access or by use of physical means suitable to the material and surface location. Establish with each Subcontractor the suitability of such protection in each case.

.9 Brace and shore masonry walls until their designed lateral support is incorporated at both top and bottom, in accordance with safe construction practices.

.10 Enforce fire prevention methods at site for new work maintain existing in accordance with local authorities having jurisdiction. Do not permit bonfires, open flame heating devices or accumulation of debris. Use flammable materials only if proper safety precautions are taken, both in use and storage.

.11 Do not store flammable materials in the building. Take all necessary measures to prevent spontaneous combustion. Place cloths and other disposable materials that are a fire hazard in closed metal containers and remove them from the building every night.

.12 Where flammable materials are being applied, ensure that adequate ventilation is provided, spark-proof equipment is used, and smoking and open flames are prohibited.

.13 Ensure that volatile fluid wastes are not disposed of in storm or sanitary sewers or in open drain courses.

.14 Public Utilities and Services:

- .1 Verify location of and limitations imposed by, existing mechanical, electrical, telephone and similar services, and protect them from damage. If necessary, relocate active services to ensure that they function continuously wherever possible in safety and without risk of damage or down time to the existing buildings.
- .2 Cap off and remove unused utility services encountered during work after approval is given by the utilities concerned or authorities having jurisdiction, which ever may apply. Relocation, removal, protection, and capping of existing utility services shall be performed only by the applicable utility, and of other services by licensed mechanics.
- .3 Make arrangements and pay for connection charges for services required for the Work.
- .4 Keep excavations, and pits free of rainwater, ground water, backing up of drains and sewers, and all other water. Pump dry as required.

.15 Ensure that precautions are taken to prevent leakage and spillage from plumbing and mechanical work that may damage surfaces and materials finished or unfinished.

.16 Give constant close supervision to roofing/waterproofing membranes following their installation, during the time they are temporarily protected or exposed, to ensure that no damage occurs to them before completion of building.

.17 Prevent spread of dust beyond the construction site by wetting, or by other approved means, as required or as directed by the Consultant and/or authorities having jurisdiction.

.18 Make good roads, soft landscaping, walkways, curbs, sidewalks, possessions and property, soiled or damaged due to the Work, to requirements of authorities having jurisdiction and requirements of and Making Good, as applicable

15. WORK ON PUBLIC PROPERTY

.1 Include curb cuts and making good of existing property to provide fully paved and finished approaches to requirements of authorities having jurisdiction.

.2 Include making good of existing curbs, walks, paving and soft landscaping on adjacent property.

16. SLEEVING:

.1 Assess requirements for sleeving the structural elements for passing of pipes, conduits and other mechanical or electrical components, and include work required for approved interfacing between the structure, mechanical and electrical work, and other components of the work. Confirm and coordinate sleeving locations with mechanical and electrical trades as required during the construction of the work.

17. **CONCEALING OF MECHANICAL AND ELECTRICAL COMPONENTS**:

.1 Include work required to modify indicated location of pipes, ducts, conduits, and other mechanical or electrical components to fully conceal such components from view in finished spaces, except where indicated otherwise.

18. INSERTS, ANCHORS AND FASTENINGS

.1 Include in the work of each Section necessary fastenings, anchors, inserts, attachment accessories, and adhesives. Where installation of devices is in work of other Sections, deliver devices in ample time for installation, locate devices for other Sections and co-operate with other Sections as they require.

.2 Do not install wood plugs or blocking for fastenings in masonry, concrete, or metal construction, unless specified or indicated on the drawings.

.3 Do not use fastenings which cause spalling or cracking of materials in which they are installed. Do not use powder actuated fastening devices unless specified or prior written approval is given by the Consultant for each specific use.

.4 Use only approved driven fasteners.

.5 Install metal-to-metal fastenings fabricated of the same metal or of a metal which will not set up electrolytic action causing damage to fastenings or components, or both. Use non-corrosive or galvanized steel fastenings for exterior work, and were attached to, or contained within, exterior walls and slabs. Leave steel anchors bare where cast in concrete.

.6 Install work with fastenings or adhesives in sufficient quantity to ensure permanent secure anchorage of materials, components, and equipment. Space anchors within limits of load bearing or shear capacity.

.7 Space exposed fastenings evenly and in an organized pattern. Keep number to a minimum. Provide exposed metal fastenings of same material, texture, colour, and finish as metal on which they occur.

.8 At fastenings that penetrate metal roof deck, ensure that penetrations are sealed airtight with approved sealant.

.9 Galvanize steel anchors in masonry and at exterior of building, unless otherwise specified elsewhere. Leave steel anchors bare where cast in concrete.

19. DRAINAGE

.1 Ensure that positive drainage is provided to roof, floor, site drains and catch basins, as set in their final positions, and at other locations to prevent water infiltration into the building. Provide constant slopes for drained surfaces to drains and drainage courses.

.2 Verify the extent of each area served by a drain, or drainage course, to eliminate possible undrained surfaces. Co-ordinate the work of involved Subcontractors before each of their work proceeds.

.3 If water is found to be ponding on roof areas due to improperly placed drains, install additional drains to alleviate water ponding at no cost to the Owner. If extra drains are required co-ordinate the location of rainwater leaders with the Consultant.

20. CUTTING AND PATCHING:

.1 Do not cut, drill or sleeve load-bearing members without obtaining Consultant's written approval for each condition.

.2 Schedule and coordinate Work to minimize cutting and patching. Cut and patch as required to make work fit. Use workers qualified in work being cut and patched to ensure that it is correctly done.

.3 Cut, patch, and make good to accommodate Work and to leave Work in finished condition. Cutting in this sense to mean actual cutting of components to allow new components to pass through or to provide new openings. Cutting to not mean mere drilling of holes to accommodate screws, anchors, bolts or other fasteners as such. Such drilling is part of Section's installation function.

.4 Use workers qualified in work being cut and patched to ensure that it is correctly done.

.5 Make cuts with clean, true, smooth edges to tolerances required and in conformance with industry practice for applicable class of work. Make patches undetectable in finished work.

21. COLD WEATHER CONSTRUCTION:

.1 Work of this Contract to be carried forward to completion with possible speed for the full twelve (12) months of every year and to commence when the Contract is awarded.

.2 The Contractor to be deemed to have included in his pricing ample funds for the provision of necessary temporary heating, temporary enclosures, and other cold weather measures during cold weather construction period from September 15th of each year to May 31st of the following year.

.3 Provide labour, plant, equipment, and services to provide and maintain adequate heat for work of trades within the building. The use of open fires or salamanders is not permitted. Temperatures attained to not be injurious to materials or finishes of any trade.

.4 During cold weather periods, maintain the ambient air temperature at working areas at or above 5° Celsius for trades requiring above freezing temperatures to ensure specified quality of work and workmanship. Erect and maintain temporary enclosures as required.

.5 The use of the permanent heating plant for temporary heat in areas of the building not occupied by the public will not be permitted unless authorized by the Consultant in writing and then only under conditions set out in the mechanical sections of these Specifications and in a manner which guarantees and warrantees on equipment will not be affected.

.6 Maintain adequate venting, ventilation, and humidity to ensure proper curing of materials, safeguard finishes and to prevent build-up of combustion gases within enclosures.

.7 In cold weather, the Contractor to provide ambient minimum protection as follows:

Outdoor Air Temperature		Type of Heat	Enclosure
5 degC to 2 degC	(41 degF to 36 degF)	None	None
2 degC to -4 degC	(36 degF to 25 degF)	Vented heater	Windbreak tarpaulin or plastic / canvas enclosure
-4 degC to -8 degC	(25 degF to 18 degF)	Vented heater	Windbreak tarpaulin or plastic / canvas enclosure
-8 degC to -18 degC	(18 degF to 0 degF)	Temporary heating	Full enclosure of approved type
below -18 degC	(below 0 degF)	Temporary heating	Full enclosure of approved type

22. LABELS AND NAMEPLATES

.1 Do not install permanent or permanently attached labels, trademarks, and nameplates in visible locations on materials and components, unless required for operating instructions or by Jurisdictional Authorities.

23. WORK OF OTHER CONSULTANTS:

.1 Refer also to the work of other consultants included in this package and / or retained by the Owner. Coordinate requirements defined by others as required.

24. AIR LEAKAGE AND EXPANSION CONTROL:

.1 Recognizing that wall and roof materials are not dimensionally stable, and that they move differentially from the structural frame, the location of cracks should be anticipated, and an airtight barrier and tapes shall be used incorporated to maintain air-tightness of the building.

.2 The manner of installation of pipes, ducts, conduits, and electrical outlets to be thoroughly coordinated to prevent the occurrence of air leaks and thermal breaks: When pipes or conduits run adjacent to exterior walls and are to be furred in, not only to the exterior wall be airtight, but it to be adequately insulated to prevent cold spots on which condensation could occur in the cold space. Provide a continuous air seal between the airtight part of a wall or ceiling and the frames of openings such as windows, doors, hatches, ducts, grilles, louvres, or any other penetration.

.3 In addition to the specific requirements in each technical section of the Specification, make allowance for expansion control throughout the construction. Ensure that poured paving and slabs, exterior to the building structure, together with applied materials are not tight to building face, and that expansion control joints are left to accommodate movement.

25. CLEANING

.1 Ensure that spatters, droppings, soil, labels, and debris are removed from surfaces to receive finishes before they set up. Leave work and adjacent finished work in new condition.

.2 Use only cleaning materials which are recommended for the intended purpose by both the manufacturer of the surface to be cleaned and by the cleaning material supplier.

.3 Maintain areas "broom clean" at all times during the work. Vacuum clean interior areas immediately before finish painting commences.

.4 Do not burn or bury waste material at site. Remove as often as required to avoid accumulation.

.5 Do not allow waste material and debris to accumulate in an unsightly or hazardous manner. Spray dusty accumulations with water or other approved materials during removal of same.

.6 Control lowering of materials. Use as few handlings as possible. Do not drop or throw materials from storeys above grade.

.7 Ensure that cleaning operations are scheduled to avoid deposit of dust or other foreign matter or surfaces during finishing work and until wet or tacky surfaces are cured.

.8 Each Section shall supply the Contractor with instructions for final cleaning of his work, and for inclusion in Project Data Book as specified in each trade Section and in Section 01 33 00.

.9 Final cleaning is to be performed one (1) week prior to opening the project to the public and shall include cleaning of all work as required by each trade. Co-ordinate final cleaning with Owner's maintenance staff.

26. ADJUSTING

.1 Ensure that all parts of work fit snugly, accurately and in true planes, and that moving parts operate positively and freely, without binding and scraping.

.2 Verify that work functions properly and adjust it accordingly to ensure satisfactory operation.

.3 Lubricate products as recommended by the supplier.

27. SALVAGE

.1 Unless otherwise specified, surplus material resulting from construction, and construction debris shall become the property of Contractor, who shall dispose of it away from site.

.2 Treasure, such as coins, bills, papers of value, and articles of antiquity, discovered during digging, demolition and cutting at the site shall remain property of Owner, and shall be delivered immediately into his custody.

28. SIGNAGE

.1 All site signage prior to fabrication or installation shall have written approval by the Owner.

.1 The Contractor shall submit to the owner a layout of all required signage, show types, sizes and locations.
.2 Provide 2440mm x 1220mm project sign supported by wood post sufficient in size to make the sign stable and structurally sound.

Part 2. Products - Not Used

Part 3. Execution - Not Used

01 21 00 – CASH ALLOWANCES

1. Selection of Products:

.1 Provide the following services and/or information:

.1 Determine qualified and/or acceptable suppliers. The consultant will assist the contactor in determining qualified and/or acceptable suppliers.

.2 Obtain proposals from suppliers and/or sub-contractors.

.3 Make appropriate recommendations for consideration of Consultant.

.4 Notify Consultant of any effect anticipated by selection of product or supplier under consideration, on construction schedule and contract sum.

.2 On notification of selection, enter into purchase agreement / contract with designated suppliers and/or sub-contractors.

2. General:

.1 All testing and inspection work will be paid for by the Owner through a cash allowance. Refer to the requirements of specification Section 01 45 00, Quality Control and specific sections in the specifications.

.2 The Cash Allowances shall be expended as the Owner directs and only through the Consultant's written instructions.

.3 If a test made proves that the material or system is not in accordance with the Documents, then the subsequent testing including Owner's testing of replacement materials or systems shall be Contractor's expense.

.4 Add or deduct any variation in cost from the Cash Allowance. No adjustment will be made to Contractor's expense.

.5 Cash Allowances do not include Harmonized Sales Tax (HST).

.6 Cash Allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage and other authorized expenses incurred in performing Work.

.7 The Contract Price includes the allowance amount listed below including the Contractor's overhead and profit. Expenditures from the cash allowance through the Contractor will be at a cost with no mark-up. Individual subtrade pricing for each allowance item as required will be permitted an allowance for overhead and profit as outlined by the contract.

.8 Cash allowances include supply and installation unless otherwise indicated.

.9 Supply only allowances include:

.1 Net cost of Products.

.2 Delivery to the Place of the Work.

.3 Applicable taxes and duties (excluding HST).

.10 Supply only cash allowances do not include mark-ups and installation costs. Include such costs elsewhere in Contract Price.

.11 Supply and install, or provide allowances include:

.1 Net cost of Products.

.2 Delivery to the Place of the Work.

.3 Unloading, storing, handling of Products on the Place of the Work.

.4 Installation, finishing, and commissioning of Products.

.5 Applicable taxes and duties (excluding HST).

.12 Inspection and testing allowances include:

.1 Net costs of inspection/testing services.

.2 Applicable taxes (excluding HST).

.13 The cash allowance amount will be decreased on a continuous basis by way of CAD – Cash Allowance Directive, issued by the consultant to confirm cash allowance monies are to be spent by the contractor.

.14 Progress payments on accounts of work authorized under cash allowances shall be included in Consultant's monthly certificate for payment.

.15 The allowance money as included within the contract can be expended by the consultant as required on any item. Upon total depletion of the allowance amount, any further expenditure will be completed by way of change order, as per CCDC 6.1, 6.2 and 6.3 as required.

.16 Should the entire contingency amount not be spent during the contract, a credit change order shall be issued by the consultant, including an amount of 5% for Contractors overhead and profit.

.17 The contractor shall provide services to call for competitive bids for portions of the work to be paid for by cash allowances, if requested by the Consultant.

3. Cash Allowances:

.1 Include in Contract Price a cash allowance of **$ 165,000.00.**

.2 Expenditures under 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, and item 2.8, above by way of CAD as required and directed by the consultant.

.3 Unused amounts of the cash allowance can be interchanged with other divisions of the cash allowance.

A	B	C
ITEM NO.	**DESCRIPTION OF WORK**	**SCHEDULED VALUE**
1	*Miscellaneous Requirements*	*$30,000.00*
2	*Door Hardware*	*$120,000.00*
3	*Testing*	*$15,000.00*

01 25 00 – PRODUCT SUBSTITUTION PROCEDURES

Part 1. GENERAL

1. APPROVED ALTERNATES AND APPROVED EQUALS

.1 Named Products alternates or equals, indicated by the phrases "or approved alternate by XYZ Manufacturing" or "or approved equal by XYZ Manufacturing", shall be interpreted to mean that named Product alternate or equal, if selected for use in place of indicated or specified Product, meets or exceeds performance, appearance, general arrangement, dimensions, availability, code and standards compliance, and colour of specified Product.

.2 Be responsible for costs and modifications associated with the inclusion of named Product alternate or equal at no additional cost to the Owner.

.3 The process for proposing and approving alternates or equals, including alternate design solutions, shall be the same process as for proposing and approving substitutions (refer to paragraph 1.2 below).

.4 Confirm delivery of specified items prior to proposing alternates or equals.

2. SUBSTITUTIONS

.1 Submission of substitutions:

.1 Proposals for substitutions of Products and materials must be submitted in accordance with procedures specified in this section.

.2 Consultant may review submissions, if directed by Owner, but in any case with the understanding that the Contract Time will not be altered due to the time required by the Consultant to review the submission and by the Contractor to implement the substitution in the Work.

.3 Alternates will only be considered if in the judgement of the Consultant there is a legitimate 'çause' for the substitution.

.1 Substitution(s) for 'Cause" not 'Convenience':

1. The Contractor (and all sub-contractors) must demonstrate, by way of their submissions that any/all products and/or substitutions are made as substitutions for 'cause' and meet the intent of the contract documents. Substitutions deemed as substitutions for 'convenience' will not be considered or allowed.
2. The distinction made regarding substitution for 'cause' or 'convenience' identified for substitution is intended to allow the contractor to access the marketplace for legitimate options and it is intended to discourage frivolous, inadequately researched or untimely substitutions.
3. Should the 'çause' be that the specified item is not available. Proof of lack of availability must be provided in writing including order date validation.
4. Requests for alternates for 'convenience' will not be considered.
5. The difference in value will be credited to the Contract Value.
6. Consultant time to review substitution requests and time required to modify the Contract Documents to accommodate the substitution will be charged against the Contract Value on a per diem basis.

.4 During bidding, the Consultant will consider written requests from prime bidders for substitutions, received at least seven (7) working days prior to bid closing date; requests received after that time will not be considered. Refer to form in section 01 25 01

.5 All considerations/requests for product options and /or, for substitution be it during bidding or at construction stage shall include complete data substantiating compliance with the Contract Documents. The onus and responsibility resides with the contractor to demonstrate product compliance.

.6 Submission requirements for 'çause' shall demonstrate rational/reason for substitution and/or Product Option proposed. Submit in writing.

.1 Description of proposed substitution, including detailed comparative specification of proposed substitution with the specified Product validating comparability.

.2 Respective costs of items originally specified and the proposed substitution.

.3 Confirmation of proposed substitution delivery, in writing by Product manufacturer.

.4 Compliance with the building codes and requirements of authorities having jurisdiction.

.5 Affect concerning compatibility and interface with adjacent building materials and components.

.6 Compliance with the intent of the Contract Documents.

.7 Effect on Contract Time.

.8 Reasons for the request.

.7 <u>For Products</u>, submission shall include

.1 Product identification, including manufacturer's name and address.

.2 Manufacturer's literature / project data sheets:

1. Product description.
2. Performance test data.
3. Reference standards.

.3 Samples.

.4 Name and address of similar projects on which product was used, and date of installation, where possible.

.5 Any 'Exceptions' status acceptance documentation.

.8 For Construction Methods:

.1 Detailed description of proposed method.

.2 Drawings illustrating methods.

.3 Itemized comparison of proposed substitution with product or method specified.

.9 For Construction Schedule: Support documentation vis a vis any impact on project schedule.

.10 For Cost Consideration (s): Indicate whether Product Option or a proposed substitution is cost saving, cost neutral or a cost increase. Submit cost back-up. Provide additional information as requested by consultant.

.11 Relation to (any) separate contracts.

.2 In making request for substitution and/or Product Options, the Contractor represents:

.1 That the substitution is for 'Cause'

.2 He/she has thoroughly investigated proposed product or method,and determined that it is equal or superior in all respects to that specified.

.3 He/she will provide the substitution with the same guarantee as that for product or method specified.

.4 He/she will coordinate installation of accepted substitution into work, making such changes as may be required for work to be complete in all respects.

.5 Requests for substitutions during construction shall state what cost difference if any, will be made in the Contract Price for each substitution, should it be accepted.

.3 Substitutions and/or Product Options will not be considered if:

.1 Substitution for 'Cause' is not demonstrated, whereupon the consultant will reject the proposed substitution

.2 They are indicated or implied on shop drawings or project data submittals without formal request.

.3 Acceptance will require revision to Contract Documents.

.4 Proposed substitutions shall include costs associated with modifications necessary to other adjacent and connecting portions of the Work.

.5 Consultant's decision concerning acceptance or rejection of proposed substitutions is final.

.6 Should it appear to the Consultant that the value of services required to evaluate the substitution exceeds the potential reduction, the Consultant will advise the Owner that the substitution does not merit consideration before proceeding with a full evaluation. If the substitution will produce a reduction commensurate with or exceeding the value of the Consultant's services to evaluate the substitution, the Consultant will request the Owner's direction to proceed with evaluation.

Part 2. PRODUCTS

1. Not Applicable

Part 3. EXECUTION

1. Not Applicable

01 25 01 – PRODUCE SUBSTITUTION PROCEDURES DURING BID PERIOD

The following information is required before Bid Closing for the approval of a non-specified or alternative material / assembly / method:

Attach product literature, specification, independent testing data, full warranty/guarantee information, detail sheets as well as full range of product samples as required and provide the following information.

Specification Section: _____ Page No. _____ Item No. _____

Specified Material / Product:_____

Assembly / Method:_____

_____

_____

Proposed Material / Assembly / Method:_____

_____

_____

Where proposed material / method / assembly varies from specification requirements particularly in performance characteristics, testing standards, quality of materials, change in dimensions, weights, etc., list below: (Note that this must be done to ensure pre-approval before Bid Closing)

Specification requirement: *Non-Specified or Alternative product characteristic:*

_____

_____

_____

_____

If space above is not adequate, please provide separate documentation.

Acceptance of the above non-specified or alternative material / assembly / method is subject to the Consultant's review and recommendations and the Owner's approval before Bid Closing. No material / assembly / method will be approved after Bid Closing unless specifically requested by the Consultant.

We ensure that a comparison has been made between the specified material / assembly / method and the proposed non-specified or alternative material / assembly / method particularly noting specified testing standards and minimum specified performance requirements and also ensure that the non-specified or alternative material / assembly / method does not appreciably alter the intent of the drawings and specifications.

_____

Submitted by (please print): *Company name:*

_____

Telephone number: *Email number:*

_____

Date (DD/MM/YYYY): Website:

01 26 13 - REQUESTS FOR INFORMATION

Part 1. GENERAL

1. REQUEST FOR INFORMATION - RFI

.1 A request for information (RFI) is a formal process used during the Work to obtain an interpretation of the Contract Documents.

.2 Submittal procedures:

.1 RFI submission:

.1 Submit an RFI to the Consultant.

.2 Submit with RFI's necessary supporting documentation.

.2 RFI log:

.1 Maintain log of RFIs of sent to and responses received from the Consultant, complete with corresponding dates.

.2 Submit updated log of RFIs at weekly meeting with consultant / owner and with each progress draw submittal.

.3 Submit RFIs sufficiently in advance of affected parts of the Work so as not to cause delay in the performance of the Work. Costs resulting from failure to do this will not be paid by the Owner.

.4 RFIs shall be submitted only to the Consultant.

.5 RFIs shall be submitted only by Contractor. RFIs submitted by Subcontractors or Suppliers shall not be accepted.

.6 Number RFIs consecutively in one sequence in order submitted.

.7 Submit one distinct RFI per RFI submission. Aggregate information requests will be rejected.

.8 Consultant shall review RFIs from the Contractor submitted in accordance with this section, with the following understandings:

.1 Consultant's response shall not be considered as a Change Order or Change Directive, nor does it authorize changes in the Contract Price or Contract Time or changes in the Work.

.2 Only the Consultant shall respond to RFIs. Responses to RFIs received from entities other than the Consultant shall not be considered.

.9 Allow ten (10) Working Days for review of each RFI by the Consultant.

.1 Consultant's review of RFI commences on date of receipt by the Consultant of RFI submittal and extends to date RFI returned by Consultant.

.2 When the RFI submittal is received by Consultant before noon, review period commences that day; when RFI submittal is received by Consultant after noon, review period begins on the next Working Day.

.10 Contractor shall satisfy itself that an RFI is warranted by undertaking a thorough review of the Contract Documents to determine that the claim, dispute, or other matters in question relating to the performance of the Work or the interpretation of the Contract Documents cannot be resolved by direct reference to the Contract Documents. Contractor shall describe in detail this review on the RFI form as part of the RFI submission. RFI submittals that lack such detailed review description, or where the detail provided is, in the opinion of the Consultant, insufficient, shall not be reviewed by the Consultant and shall be rejected.

.1 RFI's which are unclear will be returned for "Resubmission with Adequate Description".

.2 RFI's that are obvious on the Contract Documents will be returned with reference to the documents. Continued RFIs of this form will be recorded as Contractor Delay of Project.

Part 2. PRODUCTS

1. Not Applicable

Part 3. EXECUTION

1. Not Applicable

01 26 63 – CHANGE ORDER PROCEDURES

Part 1. GENERAL

1. REFERENCES

.1 Canadian Construction Documents Committee (CCDC)
- .1 Forms for Contract Administration:
  - .1 Form 3.3 Proposed Change
  - .2 Form 3.4 Change Order
  - .3 Form 3.6 Change Directive
  - .4 Form CCDC 2 Supplementary Conditions

2. CHANGES IN THE WORK

.1 The following procedures shall govern changes in the work.

.2 Written instructions, with or without revised Drawings, or drawings additional to the Contract Documents, or both will be issued to the Contractor for proposed changes in the work. The written instructions will indicate whether the changes in the work are to be performed immediately or after the cost of changes is agreed upon. Work which is to proceed immediately shall have a mutual agreed to budget figure where applicable.

.3 The Contractor shall submit his quotation within ten (10) working days with full documentation for the changes in a detailed breakdown showing all material and labour costs (supervisor costs are not accepted), time expenditure, equipment rentals etc. as will allow the Consultant to ascertain the accuracy of amounts involved.

.4 The Contractor shall review all cost submissions to ensure their accuracy and/or conformance to unit costs if applicable prior to submission to the Consultant.

.5 Profit for changes in the work is the remuneration to the Contractor and the Subcontractors and is to apply to the sum of the actual cost and overhead.

.6 Where provided for, unit prices for additions and deletions to the work shall be those as approved by the Owner. Unit prices include all overhead and profit changes.

.7 Where the Contractor or any Subcontractor proceeds with any change on a time and material basis, daily time sheets and material slips shall be submitted. The application for a final change order must be accompanied by these time sheets, materials slips, and a breakdown.

.8 Where the Owner and Contractor cannot mutually agree upon the cost or evaluation of a given change, the Contractor, upon receiving written directions from the Owner, shall proceed with the required change without delaying the work and the evaluation of the change will be submitted for arbitration at the completion of the Project.

.9 Owner and Consultant shall have twenty-one (21) working days in which to review and approve Contractor's quotations for changes to the work. Signing of change order is Architect first; Contractor / Construction Manager second; Owner last.

.10 The Consultants at time to time may issue job instructions solely for the purposes of clarifying drawings and specifications. As such Contractor shall not be permitted to apply costs against these job instructions.

.11 In the event of large scope changes, the Contractor and Subcontractors agree to negotiate the unit prices to a lesser amount than those previously tendered.

.12 All markups on changes to include insurances and bonds, no additional sub guard or insurance or bonding cost will be accepted by the Owner in addition to the markups.

.13 No Owner approved changes will be granted for material cost increase or decrease.

Part 2. PRODUCTS

1. Not Applicable

Part 3. EXECUTION

1. Not Applicable

01 31 13 – PROJECT COORDINATION

Part 1. GENERAL

1. DESCRIPTION

.1 Coordination of the work of all Sections of the Specification is the responsibility of the Contractor.

.2 The Contractor will be deemed to possess the necessary technical skills to carefully evaluate all requirements of the Contract, and to have included in the Price all costs for the proper implementation of these requirements.

.3 The Contractor's responsibility includes, but is not restricted to, co-ordination specified in this Section, except where otherwise specified.

2. RELATED MECHANICAL AND ELECTRICAL WORK

.1 Coordinate the installation of systems specified in Divisions 20 through 26, including the interrelating operation and functioning between components of a system and between systems, is the responsibility of those performing the work of Divisions 20 and 26, with final coordination the responsibility of the Contractor.

.2 Provide interference drawings as herein specified to ensure proper co-ordination of subtrade work. No extras will be considered for work not properly coordinated prior to installation.

.3 Ensure that service poles, pipes, conduit, wires, fill-pipes, vents, regulators, meters and similar Project service work is located in inconspicuous locations. If not indicated on Drawings, verify location of service work with Consultant before commencing installation.

3. RELATED LANDSCAPE AND CIVIL WORK

.1 Coordinate the installation of all work and systems specified in Divisions 30 through 34, including coordination of all levels, inverts and connections at municipal services.

4. QUALITY ASSURANCE

.1 Requirements of Regulatory Agencies:

.1 Coordinate requirements of authorities having jurisdiction.

.2 Quality Control:

.1 Ensure that work meets specified requirements.

.2 Schedule, supervise and coordinate inspection and testing as specified in Section 01 45 00.

.3 Job Records:

.1 Maintain job records and ensure that such records are maintained by Subcontractors.

5. SUPERINTENDENCE

.1 Provide superintendent and necessary supporting staff personnel who shall be in attendance at the Place of the Work while Work is being performed, with proven experience in erecting, supervising, testing and adjusting projects of comparable nature and complexity.

.2 The Contractor shall appoint a superintendent at the Place of the Work who shall have overall authority at the Place of the Work and shall speak for the Contractor and represent the Contractor's interest and responsibilities at meetings at the Place of the Work and in dealings with the Consultant and the Owner.

.3 Supervise, direct, manage and control the work of all forces carrying out the Work, including subcontractors and suppliers. Carry out daily inspections to ensure compliance with the Contract Documents and the maintenance of quality standards. Ensure that the supervisory staff includes personnel competent in supervising all Sections of Work required.

.4 Arrange for sufficient number of qualified assistants to the supervisor as required for the proper and efficient execution of the Work.

6. PRODUCT DELIVERY, STORAGE AND HANDLING

.1 It is the responsibility of the Contractor to ensure that the supplier or distributor of materials specified or accepted alternatives, which have been bid, has materials on the site when required. The Contractor shall obtain confirmed delivery dates from the supplier, and ensure no delay in the progress of the work.

.2 Provide equipment delivery schedule, coordinated with construction and submittals schedule, showing delivery dates for major and/or critical equipment. Provide delivery access and unloading areas.

.3 Make available areas for storage of products and construction equipment to meet specified requirements, and to ensure a minimum of interference with progress of the work and relocation.

.4 Make access available for transference of stored products and construction equipment to work areas.

.5 The Contractor shall contact the Consultant immediately upon receipt of information indicating that any material or item, will not be available on time, in accordance with the original schedule, and similarly it shall be the responsibility of all subcontractors and suppliers to so inform the Contractor.

.6 The Consultant reserves the right to receive from the Contractor at any time, upon request, copies of actual purchase or work orders of any material or products to be supplied for the work.

.7 If materials and products have not been placed on order, the Consultant may instruct such items to be placed on order, if direct communication in writing from the manufacturer or prime suppliers is not available indicating that delivery of said material will be made in sufficient time for the orderly completion of the Work.

.8 The Consultant's review of purchase orders or other related documentation shall in no way release the Contractor, or his subcontractors and suppliers from their responsibility for ensuring the timely ordering of all materials and items required, including the necessary expediting, to complete the work as scheduled in accordance with the Contract Documents.

7. JOB CONDITIONS

.1 Ensure that conditions within the building are maintained and that work proceeds under conditions meeting specified environmental requirements.

.2 Ensure that protection of adjacent property and the work is adequately provided and maintained to meet specified requirements.

8. WARRANTIES

.1 Ensure that warranties are provided, as indicated in Section 01 78 00 Warranties.

.2 Coordinate warranty conditions of interconnected work to ensure that full coverage is obtained.

9. BUILDING DIMENSIONS

.1 Ensure that necessary job dimensions are taken and trades are co-ordinated for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions, and for co-ordination.

.2 Verify that work, as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent work, as set out by requirements of the drawings, and ensure that work installed in error is rectified before construction resumes.

.3 Check and verify dimensions referring to the work and the interfacing of services. Verify dimensions, with the trade concerned when pertaining to the work of other trades. Be responsible to see that Subcontractors for various trades cooperate for the proper performance of the Work.

.4 Avoid scaling directly from the drawings. If there is ambiguity or lack of information, immediately inform the Consultant. Be responsible for any change through the disregarding of this clause.

.5 All details and measurements of any work which is to fit or to conform to work installed to be taken at the building.

.6 Advise Consultant of discrepancies and if there are omissions on drawings, particularly reflected ceiling plans and jointing patterns for paving, ceramic tile, or carpet tile layouts, which affect aesthetics, or which interfere with services, equipment or surfaces. DO NOT PROCEED without direction from the Consultant.

.7 Ensure that each Subcontractor communicates requirements for site conditions and surfaces necessary for the execution of the Subcontractor's work, and that he provides setting drawings, templates and other information necessary for the location and installation of material, holes, sleeves, insets, anchors, accessories, fastenings, connections and access panels. Inform other Subcontractors whose work is affected by these requirements and preparatory work.

.8 Prepare interference drawings to properly coordinate the work where necessitated. Refer to Section 01 33 00.

.9 Where work incorporates metric modular components, the following rules apply:

.1 Actual opening dimensions in masonry including doors, windows, walls, louvres and actual room sizes are 10mm (3/8") greater than nominal dimensions given on Drawings. Actual thicknesses of walls, piers and overall lengths of walls or buildings are 10mm (3/8") less than nominal dimensions given on Drawings unless indicated otherwise.

.2 Unless indicated otherwise drawing details at scales of 1/2" = 1'-0" (1:10) or larger indicate "actual" rather than "nominal" dimensions.

10. CO-ORDINATION

.1 Review Contract Documents and advise the Consultant of possible conflicts between parts of the work before preparation of shop drawings, ordering of products or commencement of affected work.

.2 Provide survey support and setting out locates for all work.

.3 Coordinate and be responsible for layout of all work in each area and work on which subsequent work depends to facilitate mutual progress, and to prevent conflict between parts of the work.

.4 No addition to the Total Price will be allowed because of interference between the parts of the work of a trade or between the work of different trades unless such interference was brought to the attention of the consulting team in writing prior to the start of construction.

.5 Ensure that each Section makes known, for the information of the Contractor and other Sections, the environmental and surface conditions required for the execution of its work; and that each Section makes known the sequences of others' work required for installation of its work.

.6 Ensure that each Section, before commencing work, knows requirements for subsequent work and that each Section is assisted in the execution of its preparatory work by Sections whose work depends upon it.

.7 Ensure that work to be enclosed within ceiling and/or wall spaces can be so accommodated without interference and with other parts of the work.

.8 Ensure that setting drawings, templates, and all other information necessary for the location and installation of materials, holes, sleeves, inserts, anchors, accessories, fastenings, connections, and access panels are provided by each Section

whose work requires cooperative location and installation by other Sections, and that such information is communicated to the applicable installer.

.9 Deliver materials supplied by one Section to be installed by another well before the installation begins, as per Construction Progress Schedule.

.10 Sections giving installation information in error, or too late to incorporate in the work, shall be responsible for having additional work done which is thereby made necessary.

.11 Remove and replace work installed in error which is unsatisfactory for subsequent work.

.12 Prepare interference and equipment placing drawings to ensure that all components will be properly accommodated within the spaces provided.

.13 Prepare drawings to indicate coordination and methods of installation of a system with other systems where their relationship is critical. Ensure that all details of equipment apparatus, and connections are coordinated.

.14 Ensure that clearance required by authorities having jurisdiction and for proper maintenance are indicated on Drawings.

.15 Distribute coordination drawings well in advance of fabrication and installation of work affected. Place no orders for affected equipment without submission of coordination drawings to the supplier.

11. COOPERATION

.1 Provide forms, templates, anchors, sleeves, inserts and accessories required to be fixed to or inserted in the Work and set in place or instruct separate Subcontractors as to their location.

.2 Supply items to be built in, as and when required together with templates, measurements, shop drawings and other related information and assistance.

.3 Pay the cost of extra work and make up time lost as a result of failure to provide necessary information and items to be built in.

.4 Facilitate and ensure cooperation between subtrades regarding scheduling and shared Work.

12. PROJECT RECORD DRAWINGS

.1 Record, as the work progresses, work constructed differently than shown on Contract Documents. Record all changes in the work caused by site conditions; by Owner, Consultant, sub-consultants, Contractor, and Subcontractor originated changes; and by site instructions, supplementary instructions, field orders, change orders, addendums, correspondence, and directions of authorities having jurisdiction. Accurately record location of concealed structure, and mechanical and electrical services, piping, valves, conduits, pull boxes, junction boxes and similar work not clearly in view, the position of which is required for maintenance, alteration work, and future additions. Do not conceal critical work until its location has been recorded.

.2 Dimension location of concealed work in reference to building walls, and elevation in reference to floor elevation. Indicate at which point dimension is taken to concealed work. Dimension all terminations and offsets of runs of concealed work.

.3 Make records in a neat and legibly printed manner with a non-smudging medium.

.4 Identify each record drawing as "Project Record Copy". Maintain drawings in good condition and do not use them for construction purposes.

.5 After completion of the work, purchase a complete set of white prints from the Consultant and transfer the information recorded on the white prints accurately, neatly in red ink with dimensions, as applicable. Return these marked-up as-built white prints plus two additional sets of white prints to the Consultant for his review. Any subsequent changes found by the Consultant shall remain the responsibility of the contractor and new white prints will be issued for these changes and re-submitted back to the Consultant at no charge to the Owner.

.6 Maintain Project record drawings in a state current to Project. Such state will be considered a condition precedent for validation of applications for payment. The Consultant's visual inspection will constitute proof that record drawings are current.

.7 Provide Consultant with accurate red-marked record drawings for review. Provide for their transfer to latest version of AutoCAD IFC drawings with application for Certificate of Substantial Performance. Final acceptance of the Work will be predicated on receipt and approval of record drawings.

13. CUTTING AND PATCHING

.1 Before cutting, drilling, or sleeving structural load-bearing elements, obtain approval of location and methods from the Structural Engineer and the General Contractor.

.2 Do not endanger work or property by cutting, digging, or similar activities. No Section shall cut or alter the work of another Section unless such cutting or alteration is approved by the latter Section and the General Contractor.

.3 X-ray floor assemblies, walls and structures, locate all services prior to cutting, drilling or digging.

.4 Cut and drill with true smooth edges and to minimum suitable tolerances.

.5 Fit construction tightly to ducts, pipes and conduits to stop air movement completely. The Section performing work that penetrates a fire, air, vapour, moisture, thermal or acoustic separation of the building shall pack voids tightly with rock wool, fibreglass or fire stop material as may be required; seal air, vapour and moisture barriers; and caulk joints as may be required to ensure that no air movement through the penetration is possible.

.6 Cutting, drilling and sleeving of work shall be done only by the Section who has installed it. The Section requiring drilling and sleeving shall inform the Section performing the work of the location and other requirements for drilling and sleeving.

.7 Replace, and otherwise make good, all damaged work, as identified by the Consultant or Contractor.

.8 Cutting and Patching for Holes Required by Mechanical and Electrical work:

.1 Include under work of Divisions 20 and 26 cutting or provision of holes up to and including 400 square cm and related patching, except as otherwise indicated.

.2 Include under work of this Division holes and other openings larger than 400 square cm, and chases, bulkheads, furring and required patching. This Section shall be responsible for determination of work required for holes in excess of 400 square cm.

.9 This Section shall be responsible for all cutting and patching in addition to that specified for mechanical and electrical work, and shall directly supervise performance of cutting and patching by other Sections.

.10 Patching or replacement of damaged work shall be done by the Subcontractor under whose work it was originally executed, and at the expense of the Subcontractor who caused the damage.

.11 Make patches as invisible as possible in final assembly to the approval of the Consultant/Owner. Unacceptable work will be replaced at no charge to the Owner.

Part 2. PRODUCTS

1. Not Applicable

Part 3. EXECUTION

1. Not Applicable

01 31 19 - PROJECT MEETINGS

1. Construction Start up Meeting:

.1 After contract award, the Contractor shall coordinate, attend, chair, record and distributes minutes of a construction start up meeting to review administrative procedures and responsibilities of the project

.2 The agenda shall include the following items;

.1 Introduction of official representatives of the Owner, Contractor, Subcontractors, consultant and subconsultants.
.2 Project communications,
.3 Contract documents,
.4 Documents at site
.5 Contractor's use of promises,
.6 Owner supplied products
.7 Work restrictions
.8 Cash allowances
.9 Payment procedures
.10 Construction progress meetings
.11 Construction schedule
.12 Submittals schedules and procedures
.13 Inspection and testing requirements
.14 Contractor mobilizations plans
.15 Temporary utilities
.16 Existing utilities
.17 Construction facilities
.18 Temporary barriers and enclosures
.19 Temporary controls
.20 Layout of work,
.21 Site safety
.22 Site security

2. Construction Progress Meetings

.1 Schedule and provide space for regular biweekly construction progress meetings for the duration of the work. The Contractor will chair the meeting, prepare agendas, record and distribute minutes.

.2 Contractor shall record significant decisions, actions items, action dates by attendees or the parties they represent.

.1 Contractor shall distribute minutes within three (3) working days of the meeting date.

.2 Contractor shall ensure attendance of relevant subcontractors when appropriate.

.3 Agenda for each meeting shall include the following at a minimum;

.1 Approval of minutes of previous meeting
.2 Work progress since previous meeting
.3 Field observations, including any problems, difficulties, or concerns,
.4 Construction progress schedule,
.5 Submittals schedule,
.6 Proposed changes in the work,
.7 Requests for information,
.8 Site safety issues,
.9 Other business

01 32 16 – PROJECT SCHEDULE

Part 1. General

1. PLANNING, SCHEDULING AND MONITORING - GENERAL

.1 This section includes requirements for the preparation, monitoring and revision of construction schedules.

.2 The purpose of the schedules and reports mandated in this section is to:

- .1 Ensure adequate planning and execution of the Work by the Contractor;
- .2 Establish the standard against which satisfactory completion of the project will be judged;
- .3 Assist the Owner and the Consultant in monitoring progress;
- .4 Assess the impact of changes to the Work.

.3 The Contractor has the obligation and responsibility at all times to plan and monitor all of its activities, anticipating and scheduling its staff, materials, plant and work methods in a manner that is likely to ensure completion of the Work in accordance with the terms and conditions of the Contract and at a rate that will allow the Work to be completed on time.

.4 All schedules shall be prepared using the latest version of one of the following software; Microsoft Project or Primavera**.**

2. CRITICAL PATH METHOD SCHEDULING REQUIREMENTS

.1 The schedules required by this section shall take the form of time-scaled diagrams prepared using a computerized scheduling system, capable of producing resource-and/or cost-loaded Critical Path Method (CPM) schedules.

.2 General requirements applicable to all schedules include the ability to:

- .1 Easily summarize, group, sort and filter activities by area, phase or other categorization as applicable, or any combination thereof;
- .2 Electronically compare any given schedule with any previous or subsequent update;
- .3 Generate monthly progress claims and cash flow projections through resource and cost loading activities;
- .4 Show schedules in bar chart, network diagram and time scaled logic diagram formats;
- .5 Apply different calendars to applicable activities; and
- .6 Transmit schedules electronically via e-mail attachments.

.3 Provide level of detail for project activities such that sequence and interdependency of Contract tasks are demonstrated and allow coordination and control of project activities. Show continuous flow from left to right.

.4 Float is defined as the amount of time between the earliest start date and the latest start date of an activity or chain of activities on the CPM schedule. Ensure activities with no float are calculated and clearly indicated on logical CPM construction network system as being, whenever possible, continuous series of activities throughout Contract Time to form "Critical Path".

.5 Use of float suppression techniques such as software constraints, preferential sequencing, special lead/lag logic restraints, extended activity times, or imposed dates, other than as required by the Contract, shall be cause for the rejection of any schedule submitted by the Contractor.

3. SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00 - Submittals.

.2 Schedules shall be submitted to the Consultant in both hard copy and electronic forms.

.3 Electronic schedule submissions shall be in an original scheduling software data file type that permits modification of the layouts and data. In case of a discrepancy between an electronic copy of the schedule and the corresponding hard-copy schedule, the hard copy of the schedule that has been formally submitted and reviewed in accordance with the requirements of Section 01 33 00 shall govern.

.4 Include costs for execution, preparation and reproduction of schedule submittals in tendered price.

.5 Submission of the schedules referred to in this Section shall constitute the Contractor's representation that:

- .1 Contractor and its Sub-Contractors intend to execute the Work in the sequence indicated on such schedule;
- .2 Contractor has distributed the proposed schedule to its Sub-Contractors for their review and comment, and has obtained their concurrence;
- .3 All elements of the Work required for the performance of the Contract are included. Failure to include any such element shall not excuse the Contractor from completing the Work within the Contract Time and within any other constraints specified in the Contract;
- .4 Seasonal weather conditions have been considered and included in the planning and scheduling of the Work influenced by high and low ambient temperatures and/or precipitation;
- .5 Contractor has thoroughly inspected the Site and has incorporated any other special conditions in planning the Work such as specified or required non-work periods, etc.

4. QUALITY ASSURANCE

.1 Use experienced personnel, fully qualified in planning and scheduling to provide services from the commencement of the Work through to the issuance of the Completion Payment Certificate.

5. PRELIMINARY AS-PLANNED SCHEDULE

.1 Meet with Owner and Consultant within five (5) working days of Contract award, to discuss proposed approach for undertaking the Work, inclusive of methodology, sequencing, Construction Equipment, and labour resources to be utilized.

.2 Prepare a detailed CPM schedule (the preliminary as-planned schedule), illustrating the Contractor's plan for executing the Work, indicating the times for starting and completing the various stages of the Work and any applicable constraints. The preliminary as planned schedule should refine and amplify the Contractor's tender schedule and must provide sufficient detail of the critical events and their interrelationship to demonstrate that the Work will be performed within the Contract Time.

.3 The preliminary as-planned schedule shall cover all phases of the Work, and shall represent a practical plan to complete the Work, considering restrictions of access and availability of Work areas, and availability and use of manpower, materials and equipment. The preliminary as-planned schedule shall show the activity duration, sequencing and interdependencies for the following:

- .1 Preparation of Shop Drawings and material samples;
- .2 Review and approval of Shop Drawings and material samples;
- .3 Permitting;
- .4 Material procurement;
- .5 Fabrication;
- .6 Temporary works;
- .7 Installation;
- .8 Inspection/testing; and
- .9 Handover.

.4 Each activity shall be coded by the performing entity such as a particular Sub-Contractor, supplier, the Consultant, etc.

.5 The activities defined in the preliminary as-planned schedule shall represent the planned durations in anticipation of normal manpower and equipment utilization in durations of whole working days. Except for non-construction activities, such as procurement, delivery or submittals, no activity durations shall exceed fifteen (15) working days unless approved by the Consultant. The durations shall be determined based upon resource planning under contractually-defined on-site work conditions. In calculating activity durations, normal inclement weather shall be considered. The Contractor shall schedule the Work to minimize the effect of adverse weather, and to allow for protection of the Site from such effects.

.6 The total number of activities and the distribution of activities shall reflect the complexity of the Work and shall be finite, measurable, identify a specific function and identify a trade responsible for its completion.

.7 Prepare a narrative to accompany the preliminary as-planned schedule that provides a detailed description of the labour, materials, plant, means and methods that the Contractor intends to utilize in carrying out the Work to achieve the planned rates of production required to support the activity durations shown in the schedule. The narrative shall also provide explanations supporting the use of lead-lag relationships and, where permitted, constrained dates.

6. PRELIMINARY AS-PLANNED SCHEDULE SUBMISSION AND REVIEW

.1 Within fifteen (15) working days after Contract award, submit to the Consultant:

- .1 One (1) electronic copy of the preliminary as-planned schedule, clearly labelled with data date, specific update, and person responsible for update.
- .2 Two (2) hard copies of bar chart identifying coding, activity durations, early/late and start/finish dates, total float, completion as percentile, current status and budget amounts.
- .3 Two (2) hard copies of network diagram showing coding, activity sequencing (logic), total float, early/late dates, current status and durations.
- .4 Two (2) hard copies of written narrative as described in paragraph 1.5.7 above.

.2 The Owner and the Consultant will review and return the preliminary as-planned schedule within five (5) working days after receipt.

.3 The preliminary as-planned schedule must be acceptable in principle to the Owner and the Consultant, prior to the release of the first progress payment.

7. FINAL AS-PLANNED SCHEDULE

.1 The Contractor shall submit all revisions and/or additional information requested by the Owner or the Consultant pursuant to their review of the preliminary as-planned schedule if the Consultant considers that these additions are necessary for the preliminary as planned schedule to comply with the requirements of this section. The required revisions must be made, and the as-planned schedule finalized to the satisfaction of the Owner and the Consultant (whereupon it will become the final as-planned schedule, against which progress will be measured) within thirty (30) working days after Contract Award.

8. FINAL AS-PLANNED SCHEDULE SUBMISSION, REVIEW AND APPROVAL

.1 The Consultant will accept the final as-planned schedule if it demonstrates that the Work will be performed in an orderly manner and in conformity with the Contract Time, subject to the constraints set out in the Contract, but such acceptance

will neither impose on the Owner or the Consultant responsibility for the sequencing, scheduling or progress of the Work nor interfere with or relieve the Contractor from the Contractor's full responsibility therefore. Acceptance of the final as-planned schedule or any subsequent update by the Owner shall not be construed as a confirmation that the schedule is a reasonable plan for performing the Work.

.2 Acceptance of final as-planned schedule showing scheduled Contract duration shorter than specified Contract duration does not constitute change to Contract Time.

.3 Consider final as-planned schedule showing Work completed in less than specified Contract duration, to have float.

9. COMPLIANCE WITH CONTRACT SCHEDULE

.1 The Contractor shall adhere to latest schedule approved by the Consultant.

.2 The express or implied acceptance by the Owner or the Consultant of the final as-planned schedule and any progress schedules shall not constitute an approval or acceptance of the Contractor's construction means, methods, or sequencing or its ability to complete the work in a timely manner and shall not place any obligation or responsibility on Owner towards the Contractor nor in any way limit the Contractor's obligations and responsibilities.

10. PROGRESS MONITORING

.1 Monitor progress of Work in detail to ensure integrity of critical path, by comparing actual completions of individual activities with their scheduled completions and reviewing progress of activities that have started but are not yet completed. Monitoring should be undertaken sufficiently often so that causes of delays are immediately identified and removed if possible.

.2 On an ongoing basis, record "progress to date" on copy of schedule to be available at the Site. Inspect Work with the Owner and the Consultant at least bi-weekly to establish progress on each current activity.

11. UPDATES AND REVISIONS TO SCHEDULE

.1 The Contractor's schedule is to be updated and resubmitted to the Consultant as a progress schedule at least once per month, on a date to be mutually agreed by the Contractor and the Consultant, together with the related data and reports required by this Section. Updated schedule is to include a 2-week look-ahead schedule in the form of a bar chart.

.2 Each progress schedule shall record and report actual completion and/or start dates for each completed or in-progress activity, activity percent complete for in-progress activities and forecast completion dates for all activities that are not yet complete. Do not automatically update actual start and finish dates by using default mechanisms found in scheduling software. The progress schedule will show the projected completion date of the Work based on the progress information inserted into it, without changes to the schedule logic or the original duration of any activity. The Contractor shall use the retained logic option when executing schedule calculations. The final as-planned schedule (or an approved revision thereto) will be shown as a target schedule to indicate whether the current progress schedule remains on target, has slipped or is ahead of schedule.

.3 The Contractor may then, in a second and subsequent update to the progress schedule, incorporate any logic and duration changes that represent its revised planning, provided all such changes are identified and documented in the schedule narrative required to accompany the progress schedule, and are agreed to by the Consultant.

.4 If it appears that the progress schedule submitted by the Contractor no longer represents the actual sequencing and progress of the Work, the Consultant may instruct the Contractor to revise the progress schedule.

.5 In order to improve the schedule, eliminate unforeseen problems or reduce the time required for an activity, modifications to the schedule may be suggested by the Contractor, Sub-Contractors, Owner or Consultant during the execution of the Contract, and such modifications may be implemented by mutual agreement. The Contractor shall submit to the Consultant for acceptance proposed adjustments to the final as-planned schedule or any subsequent updates that will not change the Contract Time.

.6 If, at any time, the work is behind schedule with respect to the progress schedule currently in force, and if the Consultant believes there is a risk of the Work not being completed within the Contract Time as a result of such delay, the Contractor shall take all necessary measures to make up for such delay either by increasing staff, plant or facilities, or by amending its work methods, whichever is applicable.

.7 In all cases of delay or potential delay, the Contractor shall keep the Owner and the Consultant informed of its intentions with regard to mitigation of such delay and the Owner's Consultant may, if it is deemed necessary, require the Contractor to revise all or part of its current progress schedule.

.8 The current Contract Schedule can only be revised as agreed with the Owner and the Consultant by Change Order or an accepted revision to the logical sequence of described construction operations.

.9 Once accepted, the revised schedule will become the current Contract Schedule against which progress is reported and to which subsequent updates will be compared. The new Contract Schedule will be clearly identified to show it as the current Contract Schedule.

.10 Where the progress schedule shows completion of the Contract, or of any interim milestone, later than the Contract or milestone completion dates, acceptance of such progress schedules and of the monthly progress report will not constitute acceptance of the delay by the Consultant or the Owner.

12. EXTENSIONS OF TIME

.1 Float shall not be for the exclusive use of either the Contractor or the Owner. Extensions to the Contract Time will be granted only to the extent that appropriate adjustments to the duration of the affected activity exceed the total float time along the affected paths of the progress schedule in force at the time a Change Order or Change Directive is issued.

.2 Submit to the Consultant, justification, project schedule data and supporting evidence for approval of extension to the Contract Time or interim milestone date when required. Include as part of supporting evidence:

.1 Written submission of proof of delay based on revised activity logic, duration and costs, showing time impact analysis illustrating influence of each change or delay relative to approved Contract Schedule.

.2 Prepared schedule indicating how change will be incorporated into the overall logic diagram. Demonstrate perceived impact based on date of occurrence of change and include status of construction at that time.

.3 Other supporting evidence requested by the Consultant.

13. PROGRESS REPORTS

.1 Monthly progress reports shall be prepared by the Contractor and submitted to the Consultant in the form of two (2) hard copies, plus one (1) electronic copy of the relevant schedule files, to demonstrate how the Work is progressing and the planned and detailed sequencing of the Work at the time of the report. The cut-off date for the monthly progress report shall be as instructed by the Consultant and the report shall be submitted no later than ten (10) Working Days after the cut-off date and accompanying the monthly progress draw.

.2 Each monthly progress report shall be in a format acceptable to the Owner, and shall be arranged according to the following headings and sub-headings:

.1 Executive Summary.

.1 Activity to (date).

.2 Forecast activity to (date).

.2 Project Cost Information:

.1 Budget Summary.

.2 Cash Allowance Log.

.3 Change Order Log.

.3 Project Data:

.1 Project Schedule.

.2 Shop Drawing Log.

.3 Site Inspection Log.

.4 Site Testing Log.

.4 Critical Issues Log.

.5 Site Photos.

.3 Each monthly progress report shall include:

.1 An updated progress schedule, comparing actual and target progress for all milestones and activities. Sort activities by activity identification number and accompany with descriptions. List early and late start and finish dates together with durations, codes and float.

.2 Criticality report listing activities and milestones with up to five (5) days of total float used as first sort for ready identification of near critical paths through entire project. List early and late starts and finishes dates, together with durations, codes and float for critical activities.

.3 Progress report in early start sequence, listing for each trade, activities due to start, to be underway, or finished within two months from monthly update date. List activity identification number, description and duration. Provide columns for entry of actual start and finish dates, duration remaining and remarks concerning action required.

.4 A schedule narrative, including:

.1 Detailed descriptions of progress, including each stage of procurement, fabrication, delivery to site, construction, installation, and testing;

.2 Discussion of the basis for any work sequencing, logic, interdependencies or original activity duration revisions incorporated into an updated progress schedule; and

.3 Comparisons of actual and planned progress, with a brief commentary on any actual or forecast delays or problems that might have an impact on the completion. date of the Work, and a discussion of the measures being (or to be) adopted to overcome these.

.4 Charts showing the status of submittals, permits and approvals, utility relocations, purchase orders, manufacturing/fabrication and construction.

.5 For each fabricated item, the name and location of the fabricator, percentage progress, and the actual or expected dates of commencement of fabrication, Contractor's inspections, tests and delivery.

.6 Progress photographs taken, prepared, and submitted in formats specified, all in accordance with Section 01 33 00.

.7 RFI log.

.8 Timely submission of updates is of significant and crucial importance to the management of this project. Lack of or late receipt of updates diminishes their value to the Owner and the Consultant. Therefore, if the Contractor fails to submit any progress schedule or required revision to a progress schedule within the prescribed time period, the Owner, in its sole discretion, may hold back subsequent progress payments until the updated schedule is submitted or the revision is accepted.

14. REVIEW OF MONTHLY PROGRESS REPORTS

.1 The monthly progress reports and progress schedules will be used by the Owner and the Consultant to monitor the Contractor's performance against the current Contract Schedule.

Part 2. PRODUCTS

1. Not Applicable

Part 3. EXECUTION

1. Not Applicable

01 33 00 – SUBMITTAL PROCEDURES

1. Submit shop drawings in accordance with the attached schedule. Refer also to structural, mechanical, electrical drawings for additional submittals that may be required.
2. Submit one electronic copy in pdf format of each submittal and or shop drawing. The review by the Consultant is for the sole purpose of ascertaining conformance with the general design concept. The review does not mean that the Consultant approves the detail design inherent in the shop drawings, responsibility for which to remain with the Contractor submitting same, and such review does not relieve the Contractor of his responsibility for errors or omissions in the shop drawings or of his responsibility for meeting requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of the work of trades. The review of this drawing and/or any notes added to it, does not constitute authorization to proceed with any work which, in the Contractor's or Supplier's opinion, will involve extra cost to the Owner. In the event of any conflict between the Contract Documents and a shop drawing, the Contract Documents to govern. Shop drawings to show;
   The name of the project.
   Kinds of material and finishes.
   Sections, arrangements and details which indicate complete construction, as well as interconnections with other work.
   Fabrication and erection dimensions, together with quantities and/or locations.
   Assumed design loadings, dimensions of elements and material specifications for load-bearing members.
   Data verifying that superimposed loads will not affect function, appearance and safety of work shown on shop drawings, as well as other work interconnected.
   Proposed chases, sleeves, cuts, and holes in structural members.

SUBMITTAL SCHEDULE							
product / system description	***samples***	***product literature / data sheets***	***maintenance instructions***	***shop drawings***	***field review report***	***report / modelling analysis***	***additional requirements (refer to notes to submittal schedule)***
Compaction Test Results						x	Provide compaction testing at frequency as defined by the specifications – refer to civil structural drawings
Concrete Tests						x	Provide concrete testing at frequency as defined by the specifications – refer to structural drawings.
Granular Material Analysis						x	Refer to civil drawings for testing requirements.
Water Quality Tests						x	Refer to civil drawings for requirements.
Civil Inspection Reports					x		Refer to civil drawings for requirements.
Demolition Plan				x			Shop drawings to be stamped and sealed by a professional engineer licensed to practice in the province of Ontario where structural shoring, structural issues are present.
Metal Fabrications				x			Shop drawings to be stamped and sealed by a professional engineer licensed to practice in the province of Ontario.
Reinforcing Steel				x			Refer to structural drawings for requirements.
Miscellaneous Metals				x			Shop drawings to be stamped and sealed by a professional engineer licensed to practice in the province of Ontario.
Metal Stairs, Handrails And Guards				x	x		Shop drawings to be stamped and sealed by a professional engineer licensed to practice in the province of Ontario.
Metal Cladding and Trim	x		x	x			Shop drawings to be stamped and sealed by a professional engineer licensed to practice in the province of Ontario.
Firestopping				x			Engineered judgements, where required, to be stamped and sealed by a professional engineer licensed to practice in the province of Ontario.
Hollow Metal Door and Frame Shop Drawings		x	x	x			In addition to typical shop drawings / schedule, provide detailed product literature that describes typical doors and frames.
Hardware Schedule and Catalogue Cuts		x	x	x			
Washroom Accessories		x	x	x			Shop Drawings: Show and describe in detail, materials, finishes, dimensions, details of connections and fastenings, elevations, plans, sections, metal gauges, hardware and any other pertinent information.

							Submit a washroom accessories schedule indicating accessories required, showing model number, finish and mounting height on a room by room basis.
Acoustic Ceilings	x		x	x			
Resilient Flooring	x	x	x				
Elevator		x	x	x	x		Shop drawings to be stamped and sealed by a professional engineer licensed to practice in the province of Ontario
Inspection Reports From The Building Services Department						x	
Record Drawings				x			Record drawings to be prepared by the Contractor. Maintain one full set of drawings and specification on the site. Accurately record changes to the contract documents on these drawings and submit to the Architect at substantial completion of the work.
Electrical Safety Authority (ESA) Certificate						x	
Warranties						x	Provide copies of warranties and extended warranties signed and sealed by the Contractor and Trade Contractors. Where applicable provide extended warranties as required by the specifications.
Contractor / Trade Contractor Contact List Index						x	Provide a list of trades, contractors and suppliers that have contributed to the project. Provide corporate names, addresses, email telephone numbers and contact names for each.
Project Manual						x	At substantial completion provide a hardcopy and pdf copy of the project manual. Provide a detailed index of materials. Include copies of items in this schedule. Samples are not required.

3. Submittals When Project is Substantially Performed

Manufacturer's Data Book and Shop Drawings:

Provide the Owner with shop drawings and Manufacturer's Data Books at the completion of the Project.

.2 Shop drawings shall consist of two complete sets of final "REVIEWED" and "REVIEWED AS MODIFIED" shop drawings, on which corrections have been recorded of changes made during fabrication and installation of unforeseen conditions. Do not include drawings which were noted "REVISE AND RESUBMIT".

.3 The Manufacturer's Data Book shall consist of two (2) bound copies of hard, black, vinyl-covered loose leaf binders, to accommodate 8-1/2" x 11" sheets. Binders shall match in all dimensions. A title sheet labelled "Manufacturer's Data Book" with project name, and the date of Substantial Performance and list of contents shall precede data. Organize required material into applicable sections of work. Each section shall be marked by labelled tabs protected with celluloid covers fastened to hard paper dividers.

.4 The Manufacturer's Data Book shall contain:

Equipment and operating instructions on all operable equipment and on all mechanical and electrical equipment, plumbing fixtures, and architectural hardware. Notes shall be typed. Drawings shall be neatly drafted and inked, or white-printed. Refer to Divisions 15 and 16 for additional requirements.
Maintenance instructions for all exterior, and interior floors, walls and ceiling surfaces.
Operating and maintenance instructions for all mechanical and electrical equipment.
Original brochures on all equipment.
Parts lists on all equipment including a list of suppliers.
All additional material used in the project beyond that indicated by brochures listed under the various sections, showing manufacturers and sources of supply.
Names, addresses and telephone numbers of the designer(s) and major contractor(s) who worked on the building.
Commissioning data such as air and water flows and regulating valve positions.

01 35 00 – SAFETY

1. The Contractor shall conform to and enforce strict compliance with the Occupational Health & Safety Act and Construction Regulations, the Environmental Protection Act, Workplace Hazardous Materials Information System (WHMIS), Transportation of Dangerous Goods Act, and any other pertinent legislation for construction projects.
2. The Contractor for purposes of the Occupational Health & Safety Act, will be designated as the constructor for this project and will assume all of the responsibilities of the constructor set out in that Act and its Regulations.
3. The Contractor shall monitor the Work to ensure that all applicable Health & Safety Regulations are followed. Violations will be documented, appropriate action taken, and records kept on file.
4. The Contractor shall be informed of any minor violations of the Occupational Health & Safety Act or its Regulations and shall correct such minor violations immediately.
5. The Consultant or its authorized representative shall stop the Work immediately for any major violation of the Occupational Health & Safety Act or its Regulations. The Contractor shall not resume the Work until any such violation has been rectified.
6. The Contractor shall be responsible for any delay in the progress of the Work due to a violation of legislated or City health and safety requirements, and shall take the necessary steps to avoid delay in the final completion of the Work without additional cost to the Owner.
7. The Contractor shall cooperate with the Owner and Public Health Sudbury + District and actively review, modify and refine health and safety procedures as required throughout the project to create and maintain safe conditions for all persons.
8. The Contractor shall provide a telephone, first aid kit, stretcher, blanket, eye wash station, hand sanitizers, face masks, and any other measures foreseeable in the site office, or other appropriate location, for routine and / or emergency use.
9. The Contractor to perform the Work in a safe manner and to comply with applicable municipal, provincial, and federal legislation and any other regulation by authorities having jurisdiction of construction projects. In the event of conflict between any provisions on the above authorities, the most stringent provision to apply.
10. Maintain existing exits and accesses to exits and vehicle access points serving portions of the building scheduled to remain in use by the Owner, including corridors and doorways (man doors and overhead doors), free of impediments and obstructions.
11. Where an exit or access to exit is unavoidably blocked provide an acceptable alternate exit and/or access route, clearly defined and protected so that it is separated from the construction area by a smoke and dust tight partition equivalent to a 1 hour fire separation. Proposed alternate exits to be to the satisfaction of authorities having jurisdiction.
12. At existing occupied floor areas exposed to new construction, provide a temporary dust tight partition equivalent to a 1 hour fire separation. Proposed partition to be to the satisfaction of authorities having jurisdiction.

01 35 26 – LIFE AND FIRE SAFETY

1. **Genera**l:

   Enforce requirements established by Jurisdictional Authorities and Underwriters for life safety, fire prevention, and fire protection.

   Be **proactive** by means of communication with Building Controls and Local Fire Department regarding ongoing Life and Fire Safety.

2. **Fire Safety Plan**:

   All Contractors and their personnel shall be familiar with this section and its requirements. The contents of this section shall not diminish or relieve the contractor of his/her contractual obligations to the Owner.

3. **Fire Department Briefing:**

   The General Contractor shall coordinate arrangements for the trade Contractors to be briefed on Fire Safety at their pre-work conference by the Fire Chief before any work is commenced.

4. **Reporting Fires:**

   Know the location of nearest fire alarm box and telephone, including the emergency phone number.

   Report immediately all fire incidents to the Fire Department as follows:

   .1 Activate nearest fire alarm box, or

   .2 Telephone.

   Person activating fire alarm box shall remain at the box to direct Fire Department to scene of fire.

   When reporting a fire by telephone, give location of fire, name or number of building and be prepared to verify the location.

5. **Interior and Exterior Fire Protection and Alarm Systems**:

   Fire protection and alarm systems shall not be:

   .1 Obstructed,

   .2 Shut Off, or

   .3 Left inactive at the end of a working day or shift without notification and authorization from the Fire Chief or his representative.

   Fire hydrants, standpipes and hose systems shall not be used for other than firefighting purposes unless authorized by the Fire Chief.

   Fire Extinguishers:

   .1 The Contractor shall supply fire extinguishers, as scaled by the Fire Chief, necessary to protect, in an emergency, the work in progress and the Contractor's physical plant on site.

6. **Blockage of Roadways:**

   The Fire Chief shall be advised of any work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by the Fire Chief, erecting of barricades and digging of trenches.

7. **Smoking Precautions:**

   Although smoking is not permitted in hazardous areas, care must still be exercised in the use of smoking materials in non-restricted areas.

   Smoking is not permitted within the building.

8. **Rubbish and Waste Materials:**

   Rubbish and waste materials are to be kept to a minimum.

   The burning of rubbish is prohibited.

   All rubbish shall be removed from the work site at the end of the work day or shift or as directed.

   Extreme care is required where it is necessary to store oily waste in work areas to ensure maximum possible cleanliness and safety.

   Greasy or oily rags or materials subject to spontaneous combustion shall be deposited and kept in an approved receptacle and removed as required.

9. **Flammable Liquids:**

   The handling, storage and use of flammable liquids are to be governed by the current National Fire Code of Canada.

   Flammable liquids such as gasoline, kerosene and naphtha may be kept for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable liquids exceeding 45 litres for work purposes, requires the permission of the Fire Chief.

   Transfer of flammable liquids is prohibited within buildings or on jetties.

   Transfer of flammable liquids shall not be carried out in the vicinity of open flames or any type of heat-producing devices.

Flammable liquids having a flash point below 38 degC such as naphtha or gasoline shall not be used as solvents or cleaning agents.

Flammable waste liquids for disposal, shall be stored in approved containers located in a safe ventilated area. Quantities are to be kept to a minimum and the Fire Department is to be notified when disposal is required.

10. **Hazardous Substances**:

If the work entails the use of any toxic or hazardous materials, chemicals and/or explosives, or otherwise creates a hazard to life, safety or health, work shall be in accordance with the National Fire Code of Canada.

The Fire Chief is to be advised, and a 'Hot Work' permit issued in all cases involving welding, burning or the use of blow torches and salamanders, in buildings or facilities. Special precautions are necessary to safeguard life and property from damage by fire or explosives.

Wherever work is being carried out in dangerous or hazardous areas involving the use of heat, fire watchers, equipped with sufficient fire extinguishers shall be provided. The determination of dangerous or hazardous areas along with the level of precaution necessary for Fire Watch shall be at the discretion of the Fire Chief. Contractors are responsible for providing fire watch service for their work on a scale established and in conjunction with the Fire Chief at the pre-work conference.

Where flammable liquids, such as lacquers or urethanes are to be used, proper ventilation shall be assured and all sources of ignition are to be eliminated. The Fire Chief is to be informed prior to and at the cessation of such work.

11. **Questions and/or Clarifications**:

Any questions or clarification on Fire Safety in addition to the above requirements shall be directed to and cleared through the Fire Chief

01 45 00 – QUALITY CONTROL

1. The Owner / Architect will identify inspection testing companies. Testing will be paid for by the Owner unless noted otherwise.
2. Contractor to be responsible for coordinating completion of the required testing to suit the progress of the project and the required frequencies of the test defined in the specifications or requested by the Consultant Team.
3. Contractor to give the Consultant team notice of the progress of the work to provide reasonable opportunity to review the work for compliance with the Contract Documents. Failure to do so will be cause for the Consultant to classify the work as defective.
4. If the initial inspections and tests required to establish compliance with the Contract Documents indicates non-compliance with the Contract Documents, subsequent testing or re-inspection occasioned by non-compliance to be performed by the same Inspector(s) and the cost thereof borne by the Contractor. Where factual evidence exists, that defective workmanship has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculation of structural strength made and the like in order to help determine whether the work must be replaced. Tests, inspections, or surveys carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable. Testing to be conducted in accordance with the requirements of the Ontario Building Code, except where this would in the Consultant's opinion cause undue delay or give results not representative of the rejected material in place. In this case, the tests to be conducted in accordance with the standards given by the Consultant. Materials or workmanship which fails to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work incorporating defective materials or workmanship to be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.
5. Construction Tolerances:

   Unless more restrictive/demanding requirements are specified, the following construction tolerances are acceptable:

   .1 "Plumb and level" - 3mm in 3m (1/8" in 10'-0").
   .2 "Square" - 10 seconds more or less than 90 degrees.
   .3 "Straight" - 3mm (1/8") under a 3m (10'-0") long straight edge.
   .4 Tolerances to not be cumulative.

01 50 00 – TEMPORARY FACILITIES AND CONTROLS

1. The Contractor shall be responsible to ensure that activities are in compliance with applicable legislation. The Contractor shall be responsible for the provision of, and removal of, all temporary provisions and controls for the project including but not limited to the following;

Identification and enclosure of materials / spaces required to develop an appropriate 'field of operations / staging / storage areas' to permit the execution of the project. **Refer to drawings for extent of the site available to the Contractor for the 'field of operations'.**

The Contractor shall provide parking areas for the Contractors / Trade Contractors personnel. Onsite parking is available and limited to the Contractor's 'field of operations' identified on the drawings.

The Contractor shall provide all hoisting, scaffolding, roads, walkways and other construction aids as required.

The Contractor shall provide all field offices / sheds to be located in the 'field of operations'.

The Contractor shall provide temporary heat. Salamanders to not be permitted.

The Contractor shall provide temporary lighting and power systems. Maintain not less than 160 LUX level. Temporary power distribution wiring to comply with the Ontario Hydro Electrical Safety Code. Obtain inspection certificates and approvals for temporary electrical work.

The Contractor shall provide temporary washroom facilities for use by the Contractor and Subcontractors the duration of the project.

The Contractor shall provide protection of completed construction where ongoing work or exposure to weather may cause damage.

The Contractor shall provide protection of completed construction where ongoing work or exposure to weather may cause damage.

The Contractor shall provide building enclosures; Work to include temporary enclosure for building as required to protect it, in its entirety, or its parts, against vandals, the elements, and to maintain temperatures which ensure conditions for installation that prevent harm to materials. Erect temporary enclosures to allow accessibility for the installation of materials during the time the enclosures remain in place. Design temporary enclosures to withstand wind pressures. Structural framing of the building may be used within load limits for which the framing is designed, for support of temporary enclosures. Keep surfaces of temporary enclosures free of snow and ice, to avoid overloading of building framing.

Dust Nuisance, Mud, Snow and Ice Removal; The Contractor shall prevent nuisance to adjacent properties near the works from dust raising and mud deposits, by taking appropriate anti-dust and mud measures, at such times as found necessary, and as directed by the Consultant, or at any other times complaints of dust or mud are received from the public by either the Contractor, the Consultant, or the Owner.

The Contractor shall provide dust / air tight and protective partitions to protect occupants, existing equipment, maintain exits and keep existing area free of construction contaminants in accordance with the following;

.1 Provide dust tight screens or partitions to localize dust generating activities, and for the protection of workers, areas scheduled to remain occupied during construction, finished areas of work and the public. Maintain and relocate, as required, to suit construction sequencing and until such work is complete.

.2 Maintain existing exits and accesses to exits and vehicle access points serving portions of the building scheduled to remain in use by the Owner, including corridors and doorways (man doors and overhead doors), free of impediments and obstructions.

.3 Where an exit or access to exit is unavoidably blocked provide an acceptable alternate exit and/or access route, clearly defined and protected so that it is separated from the construction area by a smoke and dust tight partition equivalent to a 45 minute fire separation. Proposed alternate exits to be to the satisfaction of authorities having jurisdiction.

.4 At existing occupied floor areas exposed to new construction, provide a temporary dust tight partition equivalent to a 45 minute fire separation. Proposed partition to be to the satisfaction of authorities having jurisdiction.

The Contractor shall provide safeguards; In addition to the requirements of the Occupational Health and Safety Act provide temporary safeguards and protection adequate to maintain standard safety practices and to protect against:

.1 Accident or injury to any workman and other persons on the site, adjacent work and property, roads and walks.

.2 Damage to any part of the work and to any adjoining or adjacent structure, property, pavement, walks, services and other similar items by frost, weather, overloading, and any other cause resulting from the execution of the work.

.3 Particular attention to be paid to the prevention of fire and elimination of fire hazards which would endanger the work or adjacent buildings and premises.

.4 Particular attention to be paid to the prevention of spills or releases of asbestos, PCB's or mercury which would endanger the work at the site and at adjacent buildings and premises.

.5 Should any part of the work or any buildings, pavements, trees, poles, hydrants, cultivated or grassed areas, etc., on or surrounding the site and adjacent to any road leading thereto, become damaged or disfigured due to lack of failure of such protection, make good with material identical with existing and adjoining surfaces, or compensate the Owner for value of same.

.6 Provide necessary temporary enclosures, hoardings, fences, gates, guardrails, hoists, stairs, ladders, scaffolding, staging, runways, night-lights, and barriers as necessary for the work. Conform to such requirements of the Labour Laws and other Provincial or local labour safety laws, applicable thereto. Be responsible for scaffolding, formwork, or other temporary supports used during the work. Where such structures are of a complicated nature, employ the services of a Registered Professional Engineer to design such scaffolding, framework, or other temporary supports. Support scaffolding independently of the building's finished surfaces. Arrange to avoid when not in use to permit work to proceed unimpeded, and promptly remove when no longer required.

.7 Use temporary fire standpipes and hose, or other approved fire extinguishing equipment in the building(s) until the permanent fire protection system in the building(s) is available.

.8 Should work be stopped for any cause, provide protection for the work and necessary temporary cold weather heating during such periods of work stoppages.

.9 Keep portions of the work properly and efficiently drained during construction and until completion, and the Contractor will be held responsible for damage which may be caused or result from water backing up or flowing over, through, from, or along any part of the works, whether such damage is to the works, to the existing building, or to neighbouring properties.

.10 Underground Electrical Services: provide safeguards to existing underground electrical services.

Water, reasonably used, to be provided by the Owner at no cost.

Electricity, reasonably used, to be provided by the Owner at no cost. Contractor may connect to existing electricity for use of trades except for purpose of power welding and electric heating.

01 73 00 - EXECUTION REQUIREMENTS

Part 1. General

1. Examination

.1 Examine the site, existing premises and surrounding areas and be fully informed as to the conditions and limitations under which the work has to be executed. Claims for additional costs will not be entertained with respect to conditions which could reasonably have been ascertained by an inspection prior to bid closing.

.2 Prior to commencement of work, make careful examination of previously executed work, existing conditions, levels, dimensions and clearances. Promptly advise Consultant of unsatisfactory preparatory work and substrate conditions; commencement of work implies acceptance of conditions.

.3 No claims for extra payment will be paid for extra work made necessary or for difficulties encountered due to conditions of the site which were visible or reasonably inferable from an examination of the site at the time prior to tender closing date and furthermore, failure of the Contractor to visit and examine the site shall be deemed a waiver of all claims for extra payment due to any condition of the site existing prior to tender closing date.

.4 As-found damage: Record by photography and submit evidence to Owner's representative before commencing work, any found damaged surfaces or materials adjacent to new work, and not included under scope of this new work. Remedial work to any damage, not so recorded, shall be the responsibility of the Contractor

2. PROTECTION

.1 Ensure that no damage is caused to existing structures, buildings, foundations, pavement, fences, curbs, grounds, plants, property, utilities, services and finishes during the progress of Work. Repair and make good any damage caused at no extra cost to Owner to the complete satisfaction of the respective property owners and authorities having jurisdiction. Do not proceed with repairs or remedial work without written permission of the Consultant. Only trades specifically capable of performing the work will be allowed to make remedial or repair work.

.2 Keep surfaces to receive finished flooring dry and free from oil and grease. Stockpiling of damp or wet building materials and use of mixing boxes or water buckets without protecting floors from moisture gain by approved means, is prohibited.

.3 Keep municipal roads clean of mud and debris resulting from construction traffic

.4 Prevent soiling of pavement due to spillage, mixing of material or any other cause. Make good any damage caused.

.5 Protect new work from damage with suitable protective coverings.

.6 Protect work during periods of suspension, regardless of reason for suspension.

3. SERVICES AND UTILITY SYSTEMS

.1 Consult with utility companies and other authorities having jurisdiction to ascertain the locations of existing services on or adjacent to site.

.2 Information as to the location of existing services, if shown on the Drawings, does not relieve the Contractor of his responsibility to determine the exact number and location of existing services.

.3 Give proper notices for new services as may be required. Make arrangements with authorities and utilities for service connections required.

.4 Pay any charges levied by utilities or authorities for work carried out by them in connection with this Contract, unless specified otherwise.

.5 Operate and maintain all utility systems affected by work of this Contract, until the building or specific portions thereof have been accepted by the Owner.

.6 Report existing unknown services encountered during excavation to Consultant for instructions; cut back and cap or plug unused services. Be responsible for the protection of all active services encountered and for repair of such services if damaged.

.7 Immediately after award of the Contract, verify field service connections to ensure that drainage runs can meet the inverts of the site services. Give notification immediately of any apparent difficulties or discrepancies.

.8 At public utilities and services complete the following:

- .1 Immediately after award of the Contract, verify field service connections to ensure that drainage runs can meet the inverts of the site services. Give notification immediately of any apparent difficulties or discrepancies
- .2 Verify limitations imposed on project work by presence of utilities and services, and ensure no damage occurs to them.
- .3 Notify service authorities concerned so that they protect, remove, relocate or discontinue them, as they may require.
- .4 Make arrangements for services required for project work.
- .5 Locate poles, pipes, conduit, wires, fill pipes, vents, regulators, meters, and sanitary service work in inconspicuous locations. If not shown on drawings, verify location of service work with Consultant before commencing installation.

4. SLEEVES, SUPPORTS, AND FASTENERS

.1 Unless specified in other Sections, furnish, set and secure inserts, hangers, sleeves, fasteners, adhesives, anchors and other supports and fittings required for proper installation of work.
.2 Use exposed metal fastenings and accessories of same texture, colour and finish as base metal on which they occur.
.3 Select appropriate type of anchoring and fastening devices and in sufficient quantity and in such manner as to provide positive permanent anchorage of unit to be anchored in position. Keep exposed fasteners to a minimum, evenly spaced and neatly laid out.
.4 Fasteners shall be of permanent type. Do not use wood plugs.
.5 Fasteners which cause spalling or cracking of material to which anchorage is being made shall not be used.
.6 Fasteners in contact with preservative pressure treated wood shall be stainless steel unless otherwise approved by Consultant.

5. CONCEALMENT

.1 Conceal ductwork, piping, conduit and wiring located in finished areas, in ceiling spaces and furred construction unless specifically noted to be exposed.
.2 If any doubt arises as to means of concealment, or intent of Contract Documents in this connection, request clarification from Consultant before proceeding with portion of work in question.

6. CUTTING AND PATCHING

.1 Regardless of which Section of work is responsible for any portion of cutting and patching, in each case tradesmen qualified in work being cut and patched shall be employed to ensure that it is correctly done.
.2 Any cost caused by omission or ill-timed work shall be borne by party responsible therefore.
.3 Do not endanger any work by cutting, digging or otherwise altering, and do not cut nor alter any loadbearing element without written authorization by Consultant. Provide bracing, shoring and temporary supports as required to keep construction safely supported at all times.
.4 Cut holes carefully and not larger than required after they are located by Sections requiring them, using suitable equipment and tools.
.5 Patching and making good work shall be undetectable in finished work.

7. WORKMANSHIP

.1 All work shall be carried out in accordance with the best trade practice, by mechanics skilled in the type of work concerned.
.2 Products, materials, systems and equipment shall be applied, installed, connected, erected, used cleaned and conditioned in accordance with the applicable manufacturer's printed directions.
.3 Where specified requirements are in conflict with manufacturer's written directions, follow manufacturer's directions, but inform Consultant in writing prior to proceeding with affected work. Where specified requirements are more stringent than manufacturer's directions, comply with specified requirements.

8. LINES AND LEVELS

.1 Verify all elevations, lines, levels and dimensions as indicated and report errors, any conflicts, or inconsistencies to the Consultant before commencing work or as soon as discovered.
.2 Arrange to have building base lines laid out by an Ontario Land Surveyor.
.3 **Accurately** lay out work and establish lines and levels in accord with requirements of Contract Documents.
.4 Set up, maintain and protect permanent reference points and provide general dimensions and elevations for all Sections of Work.

9. DIMENSIONS

.1 Check and verify dimensions wherever referring to work. Dimensions, when pertaining to work of another Section, shall be verified with Section concerned. Details and measurements of work which is to fit or conform to the work installed shall be taken at site.
.2 Do not scale Drawings. If there is ambiguity, lack of information or inconsistency, immediately consult Consultant for directions. Be responsible for extra costs involved through the disregarding of this notice.
.3 Walls, partitions and screens shall be considered as extending from floor to underside of structural deck unless specifically indicated otherwise on Drawings.

10. LOCATION OF FIXTURES

.1 Location of fixtures, apparatus, equipment, fittings, outlets, conduits, pipes and ducts shown or specified, but not dimensioned, shall be considered approximate.
.2 Request direction from Consultant to establish exact location. Any relocation caused by Contractor's failure to request direction from Consultant shall be done by Contractor at no extra cost. Where job conditions require reasonable changes in indicated locations and arrangements, make changes at no additional cost.
.3 Conserve space and coordinate with work of other Sections to ensure that ducts, pipes, conduits and other items will fit into allocated wall and ceiling spaces, while ensuring adequate space for access and maintenance.

.4 Where ducts, piping and conduits are permitted to be exposed they shall be neatly and uniformly laid out parallel to adjacent building lines and parallel to each other where they run in the same direction. Review exposed installations with Consultant prior to start of work. At no cost to Owner make changes to exposed work as directed by the Consultant where such work is not installed in accordance with Consultant's prior review.

.5 Except where locations are specifically noted on Drawings, install exposed mechanical and electrical fixtures including outlets, switches, thermostats, panels and other items, located on walls, in orderly and neatly laid out manner, lining up with each other and grouped together where possible. Review installation with Consultant prior to start of rough-in work. Relocate at no cost to Owner any work which does not meet this requirement.

11. PRODUCT HANDLING

.1 Provide the required facilities to receive, store and secure construction products at the job site as required for the duration of construction.

.2 Where require provide system to heat, cool or humidify interior spaces to support the safe storage of materials. Refer to manufacturer of products for environmental requirements.

.3 Protect products from damage.

.4

Part 2. Products (not applicable)

Part 3. Execution (not applicable)

01 74 00 – CLEAN UP REQUIREMENTS

Part 1. General:

1. General Requirements

.1 Maintain the work in a tidy condition and free from the accumulation of waste products and debris, other than that caused by the Owner, other Contractors or their employees. Conform to requirements established by jurisdictional authorities for environmental and pollution control. Prevent dust from spreading to adjoining properties. Keep roads and sidewalks free from excavated materials, dirt and debris, snow, and ice.

.2 Use only cleaning materials recommended by manufacturer of surface to be cleaned.

.3 Use cleaning material only on surfaces recommended by cleaning material manufacturer.

2. Clean-up:

.1 Contractor will be responsible for clean up on a daily basis. If the site is not cleaned each day Owner will arrange for site clean-up and the Contractor will be charged the cost as determined by Owner.

.2 Contractor will be responsible for the clean-up and removal of rubbish and surplus material associated with his work. Clean up is to be scheduled and carried out to the satisfaction of Owner.

.3 Contractor will be responsible for daily general housekeeping.

.4 Should the Contractor repeatedly fail or refuse to perform his own clean-up, Owner to perform this work after 48 hours' notice and cost to be assessed to the Contractor's account.

.5 At completion of the work, each Contractor to remove tools, equipment, machinery, storage sheds, temporary protection and surplus material leaving the project clean and ready for occupancy.

3. Final Clean-up:

.1 Contractor to be responsible for the final clean-up of the project prior to achieving substantial completion. This to be completed by experienced personnel or professional cleaners to the satisfaction of Owner / Architect and to generally include the following;

- .1 Upon completion of work, or, where work is phased, upon completion of each phase, thoroughly clean all surfaces and components. Provide professional cleaning by a recognized, established cleaning company, to allow Owner to occupy without further cleaning except where specifically indicated otherwise.
- .2 All excess construction materials and construction debris to be removed from the site.
- .3 All interior surfaces and fixtures to be vacuum clean, mopped and wiped. Clean and polish glass and mirrors.
- .4 All manufacturer's labels, stickers, markings to be removed.
- .5 Remove stains, dirt and smudges from finished surfaces. Remove all essential labels completely from finished surfaces.
- .6 Clean exposed finished surfaces in accordance with respective material manufacturer's recommendations.
- .7 Clean mechanical and electrical fixtures and other fittings of labels, wrappings, paper and other foreign material.
- .8 Replace heating, ventilation and air conditioning filters if units were operated during construction. Clean inside of ducts, blowers and coils.
- .9 Remove from work areas all waste and surplus materials from all areas, including roofs and ceiling spaces.
- .10 Remove snow and ice from driveways, parking areas and walks.
- .11 Power wash paved surfaces.
- .12 Exterior building surfaces to be cleaned, washed and wiped. Dust, efflorescence or other markings, debris to be removed. Clean and polish glass.
- **.13** Exterior hard surfaces to be broom clean, soft landscaping to be rake clean.

4. Disposal of Waste Materials

.1 All waste materials resulting from construction activities belong to the Contractor and shall be removed and legally disposed unless clearly stated otherwise.

.2 Separate recyclable/reusable materials to maximum extent possible from general waste stream and transport to recycling/reuse facilities.

.3 Fires and burning of waste materials is not permitted on site.

.4 Do not bury waste or materials on site.

.5 Do not dispose of liquid waste or volatile materials into watercourses, storm or sanitary.

.6 Do not use the Owner's garbage disposal containers.

Part 2. Materials – not applicable

Part 3. Execution – not applicable

01 77 19 - CLOSEOUT REQUIREMENTS

Part 1. GENERAL

1. GENERAL INSTRUCTIONS

.1 The procedures for completing Contract and acceptance by the Owner shall be in accordance with the methods prescribed by Owner.

.2 Stages will be reviewed at the Contract start-up meeting to ensure that parties understand their responsibilities. Refer to Section 01 31 19 for procedures and requirements for Contract start-up meeting.

.3 Within four (4) weeks of commencement of the Work, submit to the Consultant a list of closeout submittals required by the Contract Documents.

.4 Note that entities other than the Owner may be involved in the closeout procedures described herein, including attendance at any operation and/or maintenance training sessions required. The Owner will coordinate such attendance as required.

2. FINAL CLEANING

.1 Co-ordinate final clean-up with the Owner's representatives and opening requirements.

.2 In addition to requirements for cleaning-up specified in the General Conditions of the Contract, and in Section 01 11 00, include in work final cleaning by skilled cleaning specialists on completion of construction.

.3 Remove temporary protections and make good defects before commencement of final cleaning.

.1 mirrors;
.2 porcelain, enamel, and finish metals;
.3 washroom accessories.

.4 Vacuum cleaning of ceilings, walls and floors.

.5 Cleaning of glazed wall surfaces.

.6 Cleaning of hardware, mechanical fixtures, lighting fixtures, cover plates, and equipment, including polishing of their finish metal, porcelain, vitreous, and glass components.

.7 Removing of visible labels left on materials, components, and equipment.

.8 Maintain cleaning until Owner has taken possession of building or portions thereof.

3. CLOSE-OUT SUBMITTALS

.1 Collect reviewed submittals, and assemble required closeout submittals executed by Subcontractors, Suppliers, and manufacturers. Prior to submitting closeout submittals to the Consultant, undertake the following:

.1 Review maintenance manual contents (operating, maintenance instructions, asbuilt drawings, materials) for completeness.
.2 Review in relation to Contract Price, Change Orders, Change Directives, holdbacks and other adjustments to the Contract Price.
.3 Review inspection and testing reports to verify conformance to intent of Contract Documents and that changes, repairs or replacements have been completed.
.4 Execute transition of performance bond and labour and materials payment bond to warranty period requirements.
.5 Submit a final statement of accounting giving total adjusted Contract Price, previous payments, and monies remaining at time of application for completion of the Contract. Consultant will issue a final change order reflecting approved adjustments to Contract Price not previously made, if any.

No later than then (10) working days prior to submitting request for Consultant's review to determine if Substantial Performance of the Work has been achieved, submit to the Consultant the closeout submittals specified in this section, including, but not limited to, reviewed shop drawings, Product data sheets, samples, operating instructions, as-built records, and fully executed warranties and guarantees.

For items of the Work delayed materially beyond date of Substantial Performance of the Work, provide updated closeout submittals within ten (10) working days after acceptance, listing date of acceptance as start of warranty period.

Neither the Consultant's review to determine if Substantial Performance of the Work has been achieved, nor acceptance of the Work, will take place until receipt, by the Consultant, of acceptable copies of the closeout submittals required herein and by the Contract Documents.

As-built records and operation and maintenance manuals, as indicated in Section 01 33 00.

Maintenance materials:

.1 Refer to schedule of itemized prices for overage, extra stock, and maintenance materials required. Deliver to a location and at a time specified by the Owner, organize items in Owner's storage area as directed by the Owner, and as follows:

Use unbroken cartons, or if not supplied in cartons, material shall be strongly packaged.

Clearly mark cartons or packaging as to contents, project name, and Supplier.
If applicable give colour and finish, room number or area where material is used.

.2 Replace incorrect or damaged maintenance materials delivered to Owner, including damage through shipment.

.3 Provide a typed inventory list of maintenance materials prior to Substantial Performance of the Work application. List all items, complete with quantities, and storage locations.

.4 Establish a master list identifying maintenance materials and maintain a log of when materials are turned over to Owner and signing authority for acceptance of materials on behalf of Owner. Master list and log shall be in a format acceptable to the Owner.

Owner communication material:

.1 Deliver Owner communication material that was applied to hoarding and/or temporary barriers and enclosures during the Work. Salvage such material in accordance with Section 01 11 00.

5. SUBSTANTIAL PERFORMANCE OF THE WORK

Deficiency review:

.1 Neither Owner nor Consultant will be responsible for preparation or issuance of extensive lists of deficiencies. Contractor assumes prime responsibility for ensuring that items shown and described in the Contract Documents are complete. Any reviews to approve the certificate of Substantial Performance of the Work will be immediately cancelled if it becomes obvious to the Consultant that extensive deficiencies are outstanding.

.2 The Contractor shall conduct an inspection of the Work to identify deficiencies and defects, which shall be repaired. When the Contractor considers that the Work is substantially performed, the Contractor shall prepare and submit to the Consultant a comprehensive list of items to be completed or corrected and apply for a review of the Work by the Consultant to determine if Substantial Performance of the Work has been achieved.

.3 The Contractor's request described above shall include a statement by Contractor that the Work to be reviewed by Consultant for deficiencies is, to the best of the Contractor's knowledge, in compliance with Contract Documents, reviewed shop drawings, and samples, and that deficiencies and defects previously noted by Consultant have been repaired.

.4 No later than fifteen (15) working days after the receipt of the Contractor's request described above, but contingent upon the prior receipt, by the Consultant, of the closeout submittals in the manner and form specified in this section, the Consultant and the Contractor will review the Work to identify any defects or deficiencies. If necessary, the Contractor shall tabulate a list of deficiencies to be corrected prior to Substantial Performance of the Work being certified by the Consultant.

.5 During review, the Consultant and the Contractor will decide which deficiencies or defects must be rectified before Substantial Performance of the Work can be certified, and which defects are to be treated as warranty items.

.6 Provide a schedule of planned deficiency review having regard to the foregoing.

Certification of Substantial Performance of the Work:

.1 When the Consultant considers that the deficiencies and defects have been completed and that it appears that the requirements of the Contract Documents have been substantially performed, the Consultant shall issue a certificate of Substantial Performance of the Work to the Contractor, stating the date of Substantial Performance of the Work.

.2 The certificate of Substantial Performance of the Work shall be prepared in form required by Construction Lien Act.

.3 The Contractor shall publish the notification of Substantial Performance and provide the Consultant a certification of publication. The date of certification of publication is the start date of the 60 day lien period.

Final Inspection for completion of the Contract:

.1 Deficiencies and defects shall be made good before the Contractor submits a written request for final review of the Work and before the Contract is considered complete.

.2 When Contractor is satisfied that the Work is complete, and after the Contractor has reviewed the Work to verify its completion in accordance with the requirements of the Contract Documents, the Contractor shall submit a written request for a final review by the Consultant, who in turn will notify the Owner.

.3 If there are any deficiencies identified as a result of this review, they shall be listed by the Consultant and submitted to the Contractor. This list shall be recognized as the final deficiency list for purposes of acceptance of the Work under the Contract.

.4 Such deficiencies shall be corrected by a date mutually agreed upon between Consultant and the Contractor, unless a specific date is required by Contract, and a further review by the Consultant shall be called for by the Contractor following his own review to take place within seven (7) days from date of request.

.5 Contractor shall thereafter submit invoice for final payment.

.6 Money shall be withheld for deficiency work and will be released only when all deficiencies have been completed. No partial payment to be recognized until all work is completed.

If the Contractor needs to return to the Place of the Work to complete deficiencies after the Owner has taken possession, the Contractor shall provide the Owner with a minimum of one (1) week's prior notice of such requirement.

6. WARRANTY PERIOD

Provide on-going review and attendance to call-back, maintenance and repair problems during the warranty periods. At the beginning of the 12th month after Substantial Performance of the Work, the Owner, Contractor and Consultant, along with key Subcontractors as designated, shall carry out a complete review of the built project to determine which deficiencies are to be rectified under the warranty.

.1 Extended warranty items shall have a complete review to determine which deficiencies are to be rectified under the warranty, one month prior to the end of the warranty.

Contractor shall be responsible for timely written notification of Owner, and Consultant a minimum of three (3) months prior to such end of warranty period inspection and any delay in such notification shall extend such warranty period until proper notification is received by Owner, and Consultant.

Part 2. PRODUCTS

1. Not Applicable

Part 3. EXECUTION

1. Not Applicable

01 78 00 – WARRANTIES

Part 1. General

1. WARRANTIES

.1 Warranties shall be in accordance with the General Conditions, as amended, and as follows:

.1 Warranties shall commence at date of Substantial Performance of the Work.

.2 Submit warranties for applicable items, signed by the applicable company responsible for each warranty.

.3 Submit warranties on form approved by Owner including, but not limited to, the following information:

.1 Name and address of Project.

.2 Warranty commencement date (date of Substantial Performance of the Work).

.3 Duration of warranty.

.4 Clear indication of what is being warranted and what remedial action will be taken under warranty.

.5 Authorized signature and seal of company providing each warranty.

.2 Owner shall be named in manufacturer's Product warranties. Submit on relevant Product manufacturer's standard warranty or guarantee form.

Part 2. PRODUCTS

1. Not Applicable

Part 3. EXECUTION

1. Not Applicable

DIVISION 02 – EXISTING CONDITIONS

02 00 00 – EXISTING CONDITIONS

1. Make good surfaces and finishes damaged or disturbed due to Work of this Contract to match existing. Ensure that material used to repair damage is compatible with existing work.
2. Term "make good" to mean repairing or filling operations performed on existing site finishes, floors, walls, ceiling or any other exposed surfaces. Perform cutting and patching where applicable as specified herein. It is intended that finished surfaces match and line up with existing adjoining surfaces.
3. Restore Site to condition equal to or, if specified elsewhere, to condition better than existing conditions.
4. Restore lands outside of limits of Work which are disturbed due to Work to original condition in addition to complying with requirements of General Conditions of the Contract

02 32 00 – GEOTECHNICAL INVESTIGATION

1. A Geo-technical Investigation for the project is included in the appendix of this specification for information. This report includes the following;

.1 Geotechnical Investigation Report, Alderville Senior's Residence Renovations, prepared by Cambium Inc., dated March 11, 27 pages.

2. **At the time of excavation for footings for the proposed addition, the Contractor shall be responsible for coordinating the review and report on the existing geotechnical conditions by a geotechnical engineer selected by the Owner.**
3. **The Contractor shall be responsible for coordinating construction activities as required to address the content of the geotechnical report.**
4. The report was carried out for the Owner for guidance in design and construction of the new building. Given the scope of the proposed new building the report contain relevant geotechnical information and is appended to this Section for information purposes only.
5. The Geotechnical Report is provided to assist in understanding existing subsurface conditions and to inform design and construction planning. It is considered a *reference document* within the tender package and does not alter, amend, or supersede the requirements of the Contract Documents. The Contractor shall review and take into account the information and recommendations contained in the report when preparing the bid and executing the Work, and shall notify the Consultant of any conditions encountered that differ materially from those described.
6. No responsibility is assumed by the Consultant or by the Owner for the scope or accuracy of the bore hole logs, and the soil investigation of this site. The Contractor to satisfy himself with regards to matters relating to sub-surface conditions.
7. Article GC 6.4 of Canadian Standard Construction Document CCDC 2 2020 to govern if the subsurface conditions are found to differ from the geotechnical report or assumptions articulated on the drawings.
8. During excavation, existing soils conditions will be reviewed by a geotechnical engineer. Copies of the completed geotechnical site review reports will be distributed to the Contractor for information
9. Refer also to **Section 31 23 19 – Dewatering** for requirements related to the control and removal of groundwater during excavation and foundation construction.

.1 Coordinate dewatering and excavation procedures with the Consultant and Geotechnical Engineer prior to commencement of work.

02 41 00 – DEMOLITION

1. Demolition activities to conform to CSA S350-M1980 (R2003), Code of Practice for Safety in Demolition of Structures. Refer to drawings for extent of demolition activities. Demolish portions of the existing building and related services as required to permit construction of new work. Demolish and dispose of components of existing building as described on demolition drawings.
   .1 Provide a comprehensive demolition plan that confirms with CSA S350-M1980 (R2003) and illustrates / describes the methodology for safely demolishing portions of the existing building to provide access to the new addition. Indicate temporary shoring where required. Demolition plan to be stamped by a professional engineer licenced to practice in the Province of Ontario.
2. Separate waste materials for reuse and recycling where possible and deliver to recycling depots.
3. Fires and burning of waste or materials is not permitted on site. Do not bury rubbish waste materials. Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.
4. Cover or wet down dry materials and waste to prevent blowing dust and debris.
5. Prevent movement, settlement or damage of adjacent structures, services, walks, paving, trees, and landscaping, adjacent grades to remain. Repair damage caused by demolition as directed by Consultant.
6. Support affected structures and, if safety of structure being demolished or adjacent structures, services or vehicles appears to be endangered, take preventative measures, stop Work. Notify Consultant immediately if existing building, services or vehicles on the site are affected.
7. Disconnect gas, water, sanitary, electrical and telephone service lines entering area of buildings to be demolished.
8. Do not disrupt active or energized utilities designated to remain undisturbed. Coordinate with building owner
9. Where applicable, supply separate, clearly marked disposal bins for categories of waste material. Dispose of demolished materials not designated for alternate disposal, in accordance with applicable regulations. Transport material designated for alternate disposal using approved haulers/ facilities/receiving organizations in accordance with applicable regulations.

DIVISION 03 – CONCRETE

*Refer to structural drawings prepared by **A2S Consulting Engineers** for additional Division 03 requirements.*

03 11 15 – CONCRETE

Part 1. General:

1. **Scope:** Provide all labour and materials required to form, pour and finish all concrete elements of the work.

Part 2. Products / Execution

1. Concrete shall conform with the following requirements;
   - .1 All concrete work shall conform to CSA A23.1 – Concrete Materials and Methods of Concrete Construction.
   - .2 Concrete is specified as per the 'performance specification' alternative as outlined in CSA A23.1, table 5. The Contractor and concrete supplier shall meet all certification, documentation and quality control requirements.
   - .3 The concrete supplier shall be certified by the Ready Mix Concrete Association of Ontario.
   - .4 The Contractor and the concrete supplier are to ensure that the plastic and hardened mix properties meet site requirements for placing, finishing and the Owner's performance requirements.
   - .5 Cement shall be Portland cement type GU.
   - .6 Aggregate shall not exceed 20mm.
   - .7 Concrete shall be normal density.
   - .8 Concrete for foundations shall be exposure Class – F-2, f'c – 25MPa, entrained air of 4%-7%, max w/c ratio of 0.55.
   - .9 Concrete for exterior concrete with exposure to chlorides shall be exposure Class - C-1 , f'c – 35MPa, entrained air of 4%-7%, max w/c ratio of 0.40.
   - .10 Concrete for interior walls, slabs, beams shall be exposure Class – N, f'c – 25MPa.
   - .11 Concrete for interior slabs on grade (with resilient floor finishes) shall be exposure Class – N, f'c – 25MPa, max w/c ratio of 0.45.
   - .12 Concrete for foundation walls / footings shall be exposure Class – C-1, f'c – 35MPa, entrained air of 5%-8%, max w/c ratio of 0.40.
   - .13 Concrete for non structural topping, housekeeping pads shall be exposure Class – N, f'c – 25MPa.
   - .14 Concrete for lean concrete mudslabs placed below frost depth shall be exposure Class – N, f'c – 10MPa.
   - .15 Protect concrete from excessive heat and drying.
   - .16 Protect concrete from freezing. Do not place concrete against frozen ground. Use cold weather concreting methods in accordance with CAN/CSA-A23.1.
   - .17 Reinforcing Steel for concrete slab on grades shall be welded wire fabric to ASTM A185/A185M. Provide a minimum clearance cover of 89mm (3.5") to all reinforcing.
   - .18 Provide 10mm (3/8") thick asphalt impregnated fibreboard isolation joint filler where the slab on grade terminates against a vertical concrete or masonry elements (unless dowelled to or chased in the vertical structure). Depth of the joint filler to match slab thickness.
   - .19 Formwork, Falsework and Reshoring:
     - .1 The contractor is responsible for retaining a professional engineer to design and perform general review of formwork, falsework and reshoring elements
     - .2 Form all sides of all structural elements
     - .3 Do not place earth against retaining or basement walls until the concrete has reached the specified 28 day strength

03 15 00 – CONCRETE ACCESSORIES

Part 1. General:

1. **Scope:** This section includes the following types of concrete accessories:
   - **.1** Expansion/contraction joint filler.
2. **Submittals:**
   - **.1** General: Submit the following in accordance with conditions of contract and Division 1 Section 01 33 00
   - **.2** Submit manufacturer's product data and application instructions.
3. **Delivery, Storage and Handling:**
   - **.1** Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
   - **.2** Store materials in a clean, dry area in accordance with manufacturer's instructions.
   - **.3** Protect materials during handling and application to prevent damage.

Part 2. Products:

1. **Manufacturers:**
   - **.1** W. R. Meadows, Inc.
   - **.2** Or approved equivalent.
1. **Accessories:**
   - **.1** Joint Sealants: as recommended by manufacturer in accordance with application and locations of expansion joint.

Part 3. Execution:

1. **Examination:**
   - **.1** Examine areas to receive expansion/contraction joint filler. Notify architect if areas are not acceptable. Do not begin application until unacceptable conditions have been corrected.
2. **Installation:**
   - **.1** Install expansion-contraction joint filler in accordance with manufacturer's instructions.
   - **.2** Position joint filler against forms, at interrupting objects or columns, and against abutting structures before concrete placement.
   - **.3** Install joint filler 1/2" below concrete surface.
   - **.4** Prior to sealing, slide expansion joint cap over the expansion joint.
   - **.5** Place concrete and screed to finish grade.
   - **.6** Allow concrete to cure.
   - **.7** Insert screwdriver through the top of expansion joint cap, pull free, and discard.
   - **.8** Seal with pavement joint sealant.
3. **Protection:**
   - **.1** Protect pavement joint sealant from traffic until fully cured

03 35 00 – CONCRETE FINISHING

Part 1. General:

1. Scope: The following section defines requirements for the finish and curing concrete slabs.
2. Submittals:
   - **.1** Submit qualifications of Installers who will be completing the work.
   - **.2** Product Data: Submit the manufacturer's descriptive data and product attributes for applicable products.
3. Quality Assurance:
   - **.1** Minimum Manufacturer's / Installers Qualifications: Firms specializing in the product manufacturing and / or the on work of this Section are required to have a minimum 5 years of documented experience.
4. Delivery, Storage and Protection
   - **.1** Deliver, store, protect and handle product to the site.
   - **.2** Ensure finished concrete areas are protected from abrasion from foot or wheeled traffic and from damage caused by spillage of oil or other harmful materials.

Part 2. Products

1. Curing-Sealing Compound: To meet requirements of ASTM C309, Type 1, Class B. Provide one of the following:
   - **.1** 'Sika Florseal WB' by Sika Canada
   - **.2** 'Masterseal' by Master Builders Technologies
   - **.3** 'Vococomp 20' by W.R. Meadows of Canada Limited.
2. Floor Surface Hardeners: Floor Surface Hardeners and Curing-Sealing Compound: Non-metallic natural grey colour. Provide one of the following;
   - **.1** Sika Diamag 7' by Sika Canada (Curing-Sealing Compound - "Florseal").
   - **.2** Natural Coloured 'Mastercron' by Master Builders Technologies (Curing-Sealing Compound - "Masterseal").
   - **.3** 'Surflex' by The Euclid Chemical Co. (curing-sealing compound - "Floor Coat").
   - **.4** 'Premium Floor Hardener' by CPD.
3. Interior Sawcut Joints Sealant / Grout Fill: Exposed, uncovered Sawcut Joints: Epoxy modified joint sealant, cold- applied, 2 component, pour grade (self-levelling) compound with minimum Shore D Hardness of 50. Provide one of the following:
   - **.1** 'Sika Loadflex' by Sika Canada.
   - **.2** 'Bondflex' by W.R. Meadows.
4. Joint Filler Sealant: Premoulded Joint Filler Sealant: Sealant over premoulded joint filler; self- levelling type, grey colour. Provide one of the following:
   - **.1** Single component, ASTM C920 Type S, Grade P, Class 25, movement +/-25%:
   - **.2** 'Pourthane SL' by W.R. Meadows. Multi component, ASTM C920 Type M, Grade P, Class 35, movement +100%/-50%:
   - **.3** 'Vulkem 445' by Tremco.

Part 3. Execution

1. Examination
   - **.1** Verify that surfaces are acceptable and are ready to receive and maintain concrete finishing, and capable of achieving specified performance.
   - **.2** Obtain manufacturer's and TTMAC recommendations of slab surface requirements prior to finishing to ensure proper substrate preparation.
2. Remedial Work
   - **.1** Grind floor levels which do not comply with specified tolerances to the tolerances required, or level with epoxy or latex compound.
   - **.2** Obtain approval of method for correcting tolerances before proceeding.
   - **.3** Immediately prior to installation of applied floor finishes but not sooner than 28 days after concrete has been placed, examine concrete floor surfaces and repair c racks. Route cracks which exceed 0.8 mm in width with mechanical router to 12 mm square cross section. Clean and fill cracks as specified for control joints.
3. Finishing
   - **.1** Ambient temperature shall not be less than 10 Degrees C. Do not start any finishing operation while there is excess moisture or bleeding water on the surface.
   - **.2** Finish concrete to level and dense surfaces and in accordance with the following Concrete Finish Schedule. See Room Finish Schedule for finishes applied to concrete.
   - **.3** Read the following in conjunction with Division 03 Section Cast-in-Place Conc rete:

Location	Concrete Finish Schedule
For concrete to receive concrete topping or mortar bed at shower and pool deck.	Broom finish
Base slab for stone or ceramic tile floors installed with mortar bed	Comply with TTMAC Guide 093000 requirements
Floors to receive resilient flooring, carpet, paint, and sealer	Powered Steel Trowel Finish, moist cure only
Concrete to receive ceramic tile or stone installed with thinset mortar	Comply with TTMAC Guide 093000 requirements
Interior exposed slabs except where otherwise specified	Powered Steel Trowel Finish with Non-Slip Swirls
Concrete floor or roof deck to receive roofing and waterproofing membrane, epoxy coating, seamless flooring or similar thin fluid applied finishes	Powered (Light) Steel Trowel, moist cure only
Areas to receive non-metallic hardener	Hardened Concrete with Powered Steel Trowel, Combination Curing and Sealing Compound.

4. Hardener
   - **.1** Apply non-metallic hardener at the rate of 27 kg of hardener per 9.2m² in two separate shakes. Apply two-thirds of the total amount in the first application
   - **.2** Steel trowel repeatedly to ensure maximum density. Finally spin trowel finish to produce a non-slip finish.
5. Sawcutting
   - **.1** Sawcut control joints and construction joints in slab at 3m o/c in both directions, 5mm wide 38mm deep, in straight lines.
   - **.2** Perform sawcutting when saw can be run over concrete surface without leaving tread marks, when concrete can be sawn without dislodging aggregate and before uncontrolled shrinkage has occurred.
   - **.3** Continuously spray water on saw blade during sawing. Grind edges of sawcuts to eliminate burrs; do not grind to bevel or chamfer joint edges. In sawcutting floor slabs on metal deck, run a wet vacuum cleaner immediately behind sawcutting equipment.
   - **.4** After sawing and grinding, clean joints with a jet of water, and blow out with compressed air. Immediately broom clean residue caused by sawing operation as work progresses.
   - **.5** When cleaned joints are dry and prior to traffic being allowed over area, install temporary polyethylene rope in joints to prevent contamination of joints.
6. Curing
   - **.1** Cure concrete as specified to CAN/CSA-A23.1 using curing sheet or curing compound. To avoid incompatibility of curing compound and adhesives, do not use curing compounds where flooring will be adhered.
7. Joint Sealant or Grout Fill
   - **.1** Do not fill isolation joints, construction joints, and control joints sooner than 30 days after concrete pours. Comply with curing and sawcutting requirements as specified herein. Execute joint sealant during cool, dry ambient conditions when slab is in contracted state to minimize future joint separation at sealant filled joints.
   - **.2** Remove temporary polyethylene rope from joints. Clean joints and blow clear with compressed air.
   - **.3** Fill interior sawed construction and control joints in concrete slabs full depth in accordance with manufacturer's printed directions.
   - **.4** Caulk over premoulded isolation joint fillers with specified premoulded joint filler sealant. Prime walls of joint and mix sealant as directed by manufacturer.
   - **.5** Comply with manufacturer's application and substrate temperatures requirements. After initial set prime previously applied sealant surface and refill joints with sealant as required to produce slightly convex joint surface.
8. Divider Strips
   - **.1** Install shelf-type divider strips at edges of exposed finish concrete surfaces and other materials. Install them on true, straight lines, flush with concrete surfaces and on the centrelines of the door where they occur.
9. Tolerances
   - **.1** Levels of finished concrete shall be within 6 mm of established elevations in any 3000 mm section, and shall be non-accumulative from datum line.
10. Cleaning
    - **.1** Clean soiled surfaces with cleaning solution.
    - **.2** Use non-metallic tools in cleaning operations.
11. Protection of Finished Work
    - **.1** Protect installed work.

.2 Ensure work incorporating the use of oils and deleterious liquids are not performed on finished areas unless they are fully protected by approved methods. Cooperate with other Subcontractors to ensure finished work is not damaged.

03 35 01 – CONCRETE FLOOR HARDENING + SEALING

1. **Scope:** Provide labour and material to supply and install new concrete floor hardener and sealer to concrete floors as scheduled.

1. **Materials**:
   - **.1** **Concrete Sealer and Hardener** to be 'Euclid Diamond Hard (hardener) and Eculid Ultraguard (polish)'. At a minimum provide one coat of each material in order to match recently completed work in adjacent areas. Use for floor areas with the abbreviation "**SC**" as indicated on the drawings. Refer to Room Finish Schedule.
   - **.2** **Control Joint Sealant** to be Sika Loadflex Polyurea. Use at new and existing control / expansion joints in areas where new concrete sealer is scheduled on the drawings. Colour to be selected from the manufacturer's standard colour range by the Owner at a later date.
2. **Installation -** Concrete Floor Hardener / Sealer:
   - **.1** Existing Concrete Floor Preparation:
     - .1 Before commencing with the work, examine floors to be sealed. Remove sealers, glues from the existing concrete surface. Grind floor to remove materials that will inhibit the sealer / hardener from penetrating the concrete floor. If required neutralize the floor as recommended by the manufacturer.
     - .2 ***At existing concrete slabs*** **and areas where concrete sealers have been applied**, provide grinding of floor. Grind floor to expose existing aggregate in floor slab to the satisfaction of the Architect / Owner. Use a terrazzo style grinder with vacuum assisted dust collection system as required to remove adhesive remaining on the floor after the removal of the carpet. Use of solvent based cleaners is not acceptable. Grind floor with the following grit sequence; 30 diamond, 80 diamond, 50 resin, 100 resin, 200 resin. Then wash floor and apply hardener. Once hardener has set continue to grid floor using 400 diamond, and 800 diamond and 1800 diamond grit. Apply polish layer after the completion of 1800 grit in all areas. Coordinate floor grinding with Contractor. Do not proceed with floor grinding until adequate hoarding is in place to protect occupied sections of the existing building. After grinding is complete clean surfaces thoroughly prior to installation of concrete hardener / polish layers. If construction equipment must be used for application, diaper components that might drip oil, hydraulic fluid or other liquids.
     - .3 Grinding at new concrete slabs is not required.
     - .4 If a curing compound is used on the new concrete slab it must be fully removed prior to installation of the hardener / sealer.
   - **.2** Application:
     - .1 Apply materials in accordance with the manufacturer's printed instructions and recommendations with respect to this project. Apply product with low pressure sprayer only. Do not use airless sprayers, as they atomize the material, allowing inhalation which may pose a health hazard.
     - .2 Apply materials in dust-free conditions suitable for achieving good results. Apply sealer in strict accordance with manufacturer's printed directions. Apply sealer to present uniformly-coloured surfaces, free from runs, bubbles, brush marks, crawls, dirt or dust particles, or other defects detrimental to appearance or performance.
     - .3 Saturate the surface with concrete sealer and hardener so that the entire surface is wet for 30 minutes.
     - .4 If after 30-40 minutes the majority of the concrete sealer / hardener has been absorbed into the surface, broom or squeeze any excess sealer / hardener (while still in its liquid form) from low spots and puddles so that remaining is entirely absorbed into the concrete or totally removed from the surface.
     - .5 If after 30-40 minutes the majority of the sealer / hardener is still on the surface, wait until it becomes slippery underfoot, then thoroughly flush the entire surface with clear water and squeegee completely dry to remove sealer hardener residue.
     - .6 If the material becomes slippery prior to the 30-minute period, lightly mist the surface with water. This can be done with either a low-pressure power sprayer or with a hose and nozzle (nozzle should be adjusted to create a mist). This step will resolubilize the concrete sealer / hardener so that it is no longer slippery or gel-like. Agitate the floor with a broom to aid the penetration of the sealer/hardener. Wait for the sealer / hardener to become slippery or gel-like a second time.
     - .7 At this point, thoroughly flush the surface with water. During the flushing process, the floor should be agitated with brooms to help loosen and remove excess concrete sealer from the surface.
     - .8 Thoroughly squeeze the slab dry by pushing the water ahead of you off the slab edge. At this point, the floor should look like bare concrete with nothing on it. During the squeegee process, there may be some slippery patches. This is an indication that excess concrete sealer is still on the surface. These areas should be re-flushed and squeegeed again until the entire surface is dry.

.9 Applications can be accomplished with the use of an auto-scrubber. The auto-scrubber should be equipped with four pneumatic tires to prevent damage to the concrete surface. Driving across saw-cut joints at an angle will reduce the stress on the joint edges
.10 Continue grinding as described in section (1) to 800 – 1800 resin grit levels as specified.
.11 Repeat application process with polish layer.
.12 Buff floor with high RPM electrical floor polisher to provide reflective sheen floor finish.
.13 Install protective hoarding layers as described in section (3).

.3 Protection:

.1 Where required by the Owner, protect floor surface with 6mil poly with taped joints and 12.7mm (1/2") plywood throughout the construction of the project in order to avoid staining and damage of the specified finish.
.2 Do not allow traffic on floors for three (3) hours after application.
.3 Do not allow parking of vehicles on concrete slab.
.4 If vehicles must be temporarily parked on slab, place drop cloths under vehicles during entire time parked.
.5 Do not allow pipe cutting using pipe cutting machinery on concrete slab.
.6 Do not allow temporary placement and storage of steel members on concrete slabs.
.7 Clean up spills immediately and spot-treat stains with degreaser or oil emulsifier.
.8 Clean floor regularly in accordance with manufacturer's recommendations.
.9 When plywood and poly is removed, inspect floors. Clean floors and remove and stains left from construction activities. Where required provide additional polish and / or buffing to provide a consistent sheen on floors.

DIVISION 04 – MASONRY

*Refer to structural drawings prepared by **A2S Consulting Engineers** for additional Division 04 requirements.*

04 05 10 – CONCRETE PARGING

Part 1. General

1. Scope: Provide **new concrete parging at existing foundation walls** in location noted on the drawings. Parging to comply with the following requirements.

Part 2. Products

1. Comply with the following reference standards;
   - **.1** CAN/CSA A179-14 (R2024) Mortar and Grout for Unit Masonry
   - **.2** CAN/CSA A371-14 (R2024) Masonry Construction for Buildings
2. Use the following materials;
   - **.1** Water: Verify that water used contains no salts to cause efflorescence.
   - **.2** Natural Mortar: Use materials only as specified in CSA A179 and ASTM C207. Ensure that water and aggregate used in mortar, other than in walls buried in earth, will not cause efflorescence.
     - .1 Aggregate: to conform to CSA A82.56-M76. Use fine aggregates.
     - .2 Mixes: Mix mortars as specified in CSA A179 using the Proportion Specification.
     - .3 Typically: Mortar to be natural except where coloured mortar is scheduled in selected locations.
     - .4 Type: mortar Type "S" based on Proportion specifications.

Part 3. Execution

2. Remove loose parts of unsound existing concrete parging and existing parging where presence of existing material will prevent the installation of new parging to be flush with brick masonry located immediately adjacent to new parged finishes.
2. Clean existing foundation wall. Remove all organic material, aggregate, fines. Use light pressure washing and hand brushing with stiff bristle and wire brushes. Allow wall to dry.
3. Inspect existing masonry and ensure existing masonry is sound. Report deficiencies to the Architect immediately.
4. Coordinate review of the existing cleaned foundation wall by the Architect prior to application of parging.
5. Mix mortar using cement, lime, aggregate and water in proportions as defined by CSA A179-14.
6. Apply mortar to existing foundation wall with trowels. Minimum thickness shall be ¼" (6mm). Create a smooth, flat surface.
7. Provide a cove base at the existing footing having a smooth, curved surface that starts at the vertical part of the foundation wall and extends in a downward slope to the outside horizontal edge of the concrete footing.
8. Protect mortar from the elements and keep damp until fully cured – generally 3-7 days after application.

DIVISION 05 – METALS

*Refer to structural drawings prepared by **A2S Consulting Engineers** for additional Division 05 requirements.*

05 50 00 - METAL FABRICATIONS

Part 1. General:

1. Scope**:** Provide required labour and materials to supply and install miscellaneous metals items and described on the drawings including all miscellaneous metal items listed herein.

2. Submittals:
   - **.1** Retain a Professional Structural Engineer registered in the Province of Ontario to design miscellaneous metals items; to prepare, seal and sign shop drawings for system including load bearing and/or force-resulting components and perform field review of installed assemblies. Shop Drawings to indicate both design and installation requirements.
   - **.2** Indicate design loads, member sizes, description of materials, design thickness / gauge, exclusive of coatings, connection and bracing details, screw sizes and spicing, and anchors as well as other pertinent data and information, for Consultant's review before fabrication.
   - **.3** Indicate locations, dimensions, openings and requirements of related work.
   - **.4** Indicate welds by welding symbols as defined in CSA W59.
   - **.5** Submit copies of engineering calculations or data verifying the capacity of the members and the ability of the assemblies to meet the design requirements.
3. Shop Drawings:
   - **.1** Submit shop drawings in accordance with Section 01 33 00, of all the work of this Section, including large-scale detail of members and materials, of connection and jointing details, and of anchorage devices, dimensions, gauges, thicknesses, description of materials, metal finishing, as well as all other pertinent data and information, for Consultant's review before fabrication.
   - **.2** Shop drawings of all load bearing and or force bearing, seismic (as defined by part 4 of the Ontario Building Code and item OBC 4.1.8.17) and/or force-resulting components shall bear the seal and signature of a Professional Structural Engineer registered in the Province of Ontario.
4. Product Delivery, Storage, and Protection:
   - **.1** Maintain protection provided for work of this Section from time of installation until final finishes are applied or to final clean up.
   - **.2** Protect prime-painted surfaces from damage.
   - **.3** Protect exposed surfaces of prefinished metal work which does not receive site finishing with protective coatings or wrappings. Use materials recommended by finishers or manufacturers of metals, to ensure that method is sufficiently protective, easily removable, and harmless to the finish.

Part 2. Products

1. Products**:** Miscellaneous metals products to have the following characteristics;
   - .1 Welding must conform to CSA W59, S16.1 and W47.1. Protect combustible materials and finishes during welding operations.
   - .2 Reinforcing steel to conform to G30.18-M92 – Grade 400.
   - **.3** Provide structural steel as noted on the drawings. Structural steel to conform to CAN/CSA G40.21M.
     - .1 Wide Flanges: Grade 350W.
     - .2 HSS Sections: Grade 350W, Class H for 102mm (4") or larger sections, Class C for smaller sections.
     - .3 Anchor Bolts: Grade 300W.
     - .4 Other Steel: Grade 300W.
   - .4 Metals:
     - .5 Steel: Structural: hot rolled to meet requirements of CAN3-G40.21, Grade 350W for plates, tubes and hollow sections. Sheet: cold-rolled furniture steel, double annealed, mill stretched and levelled, and fully pickled. Otherwise, steel shall be hot-rolled or cold-rolled of alloy to suit needs of fabrication, use, and appearance.
     - .6 Exterior Steel: Hot dip galvanized conforming to CSA G164, minimum Z350 coating.
     - .7 Stainless Steel: Type 304 alloy conforming to ASTM A167, No. 4 finish.
   - .5 Drilled concrete anchors (DCA) to be Hilti Kwik Bolts or equivalent. Drilled masonry anchors (DMA) to be Hilti SVA sleeve anchors or equivalent. Pull test anchors to rated capacity and report results.
   - .6 Provide 1/4" thick steel saddles at steel columns which support wood beams and lintels.
   - .7 Submit shop drawings for miscellaneous structural steel and reinforcing for review prior to commencing fabrication.
   - .8 Make field measurements necessary for fabrication and erection.
   - **.9** Prepare and submit shop drawings of miscellaneous metals items. Steel components and connections must be designed by a Professional Engineer licensed in the province of Ontario and retained by the Contractor. Shop drawings for connection details must be submitted with the Engineer's seal and signature.
   - .10 Bituminous Paint: Alkali-resisting to meet specified requirements of CAN/CGSB-1.108, Type 2.
2. Design and Fabrication:

.1 Generally:
- .1 Fabricate work of this Section with machinery and tools specifically designed for the intended manufacturing processes, and with skilled tradesmen.
- .2 Fit and assemble work in the shop. When this is not possible, make a trial shop assembly.

.2 Construction:
- .1 Fabricate work with materials, component sizes, metal gauges, reinforcing, anchors, and fasteners of adequate strength to withstand intended use, and with allowable design factors imposed by Jurisdictional Authorities.
- .2 Ensure that work will remain free of warping, buckling, opening of joints and seams, distortion, and permanent deformation.

.3 Assembly:
- .1 Accurately cut, machine, and fit joints, corners, copes and mitres so that junctions between components fit together tightly, and in true planes.
- .2 Fasten work with concealed methods, unless otherwise indicated on the Drawings.
- .3 Weld all connections where possible, and bolt where not possible, and cut off bolts flush with nuts. Countersink bolt heads and provide method to prevent loosening of nuts. Ream holes drilled for fastenings.
- .4 Make welded joints tight, flush, and in true planes with base metals, and continuous at joints where entry of water into building or into voids of members or assemblies is possible. Continuously grind and make smooth welds in exposed locations.
- .5 Provide for differential movements within assemblies and at junctions of assemblies with surrounding work.
- .6 Fabricate shims of steel of sizes required.

.4 Finish Work:
- .1 Provide holes and connections for work installed under other Sections of this Specification.
- .2 Cleanly and smoothly finish exposed edges of materials, including holes.
- .3 Cap open ends of sections exposed to view, such as pipes, channels, angles, and other similar work.

.5 Prime Painting of Steel: Clean all loose mill scale, rust, dirt, weld flux, and spatter from work after fabrication. Grind smooth sharp projections. Prepare for prime painting by blast cleaning to SSPC-SP6. Apply to steel a shop prime coat of paint. Work paint into corners, and onto open areas smoothly. Deliver work to site with primer undamaged. Paint all surfaces except those to be welded in field. Paint surfaces that are inaccessible to finish field painting with two coats of primer.

.6 List of Miscellaneous Metals: This Section includes, but is not necessarily limited to, the following:
- .1 Concealed support elements, anchors, bolts, inserts, sleeves, angles or other shapes cast in concrete, hangers, supports, sleeves for work in this Section only.
- .2 Lintels if not specified elsewhere.
- .3 Galvanized angles at foundation walls, door thresholds.

Part 3. Execution:

1. Inspection of Site:
   .1 Take site measurements to ensure that work is fabricated to fit surrounding construction around obstructions and projections in place, or yet to be put in place to suit service locations, and inaccuracies of construction.
2. Installation:
   .1 Install work plumb, true, square, straight, level, and accurately and tightly fitted together and to surrounding work.
   .2 Work includes anchor bolts, bolts, washers and nuts, lag screws, expansion shields, toggles, straps, sleeves, brackets, clips, shims and other items necessary for secure installation, as required to support and/or resist loads and forces, and as required by Jurisdictional Authorities.
   .3 Provide anchors at 24" (600mm) o.c. for cast-in-place work unless shown otherwise.
   .4 Attach work to wood by screws through countersunk holes in metal.
   .5 Attach work to masonry with lead plugs and non-corrosion fastenings to support load with a safety factor of three (3).
   .6 Insulate between dissimilar metals, or between metals and masonry or concrete with bituminous paint to prevent electrolysis.
2. Patching and Refinishing:
   .1 After erection, touch up prime paint finishes damaged or removed during installation.
   .2 Remove damaged, dented, defaced, defectively finished, or tool-marked components and replace with new.
   .3 Refinish shop-applied finishes in field only with approval of Consultant.
   .4 Clean off dirt on surfaces resulting from installation work.
3. Miscellaneous Items:

.1 Generally:
- .1 This schedule does not list all items included in work of this Section. Items not listed are shown on Drawings.
- .2 Ensure that all Drawings and Specification Sections, including those for structural, mechanical, and electrical work as applicable are consulted to establish the limits of work included in this Section.

.2 Support Elements and Framing:
- .1 Supply and install all support elements and framing as shown on the Drawings except where framing is part of building structural steel. Construct supports from rolled steel sections assembled by welding.
- .2 Design supports to withstand, within acceptable deflection limitations, their own weight, the weight of the items to be supported, loads imposed by the motion of supported items, where applicable, and all live loads, static and dynamic which might be applied to the supported items in the course of their normal function. Design supports with a safety factor of three (3). Design supports further as required to accommodate structural deflection.
- .3 Provide all accessories, inserts and fixings necessary for attachment of supports to building structure. Drill supports, as required, to receive attachment of supported items. Arrange supports to avoid conflicts with pipes, ducts, connections, thermal and vapour barrier construction, framing provided under other sections, and such that supports and their fixings are fully concealed from view within the finished work.

.3 O/H Door Bent Steel Plate at Jambs and Head:
- .1 Fabricate continuous galvanized bent steel plate at jambs and head of overhead door, secured to steel structure and / or wind loaded metal studs as indicated on the drawings.

.4 Galvanized Steel Angle at Exterior Door Thresholds:
- .1 Provide continuous hot dipped galvanized steel angles at exterior door thresholds in locations and in accordance with details indicated on the drawings

05 51 00 - METAL STAIRS, HANDRAILS AND GUARDS

Part 1. General:

1. **Scope:** Provide engineering, labour and materials required to provide the metal stairs, handrails and guards systems for the project in locations as scheduled and / or detailed on the drawings.

.1 **Design:** Design work to comply with the Ontario Building Code.

.2 **Shop Drawings:** Submit shop drawings for work, including large-scale detail of members and materials, of connection and jointing details, and of anchorage devices, dimensions, gauges, thicknesses, description of materials, metal finishing, as well as other pertinent data and information, for Consultant's review before fabrication. Shop drawings for work of this section to bear the seal and signature of a Structural Engineer registered in the Province of Ontario.

Part 2. Products:

1. **General:** Metals to be free from defects which impair strength or durability, or which are visible. Metals to be new, of best quality, and free from rust, or waves, or buckles, clean, straight, and with sharply defined profiles. Select materials for surface flatness, smoothness, and freedom from surface blemishes when exposed to view in finished unit. Exposed-to-view surfaces which exhibit pitting, seam marks, roller marks, "oil-canning", stains, discolorations, dents or other imperfections on finished units will not be acceptable.
2. **Steel:** For structural sections hot rolled to meet requirements of CAN/CSA-G40.20/G40.21, Grade 350W or better. For sheet, cold-rolled furniture steel, double annealed, mill stretched and levelled, and fully pickled. Otherwise, steel to be hot-rolled or cold-rolled of alloy to suit needs of fabrication, use, and appearance.
3. **Primers and Coatings:** Interior Steel in Dry Areas: Quick drying oil alkyd conforming to CISC/CPMA 2.75.
4. **Fastenings:** Nuts and bolts to conform to ASTM A307, A325, and A563 as applicable. For interior work: cadmium-plated fastenings where other protection is not specified.
5. **Anchors and Shims:** For exposed anchorage of steel, use stainless steel and otherwise to match metal anchored. For non-exposed work, anchors and shims may be galvanized steel.
6. **Pipe and Tube:** Ferrous steel pipe: to ASTM A53 / A53M, Type S- Seamless, Grades A and B. Ferrous steel square tube: to ASTM A519, cold drawn, seamless and welded.
7. **Non-Shrink Grout:** Where required provide CPD non-shrink grout, premixed, manufactured by CPD Construction Products
8. **Stair Nosing:** Provide cast-in-place nosing inserts with photoluminescent strips, provide continuous stair nosing set in concrete at each landing and tread.

.1 Approved product: 'SA1071 Black Non-Slip' by ECOGLO, Division of Kinesik Engineered Products.

Part 3. Execution:

1. Installation:

.1 Design and Fabrication Requirements.

.1 Fabricate this work with machinery and tools specifically designed for the intended manufacturing processes, and with skilled tradesmen.

.2 Fit and assemble work in the shop. When this is not possible, make a trial shop assembly.

.3 Materials, component sizes, gauges of metals, anchorage and fastenings to be of adequate strength to withstand the intended use within allowable design factors, as required by the Ontario Building Code, to ensure that work is free of warping, buckling, opening of joints and seams, distortion and permanent deformation. Stairs, ladders and handrails to support applicable live loads specified in the Ontario Building Code.

.4 The details on the drawings show the general arrangement of components to provide the desired appearance. The fabricator to employ an Ontario Professional Structural Engineer to design the details of the guards, handrails and stairs, and the connections to the building structure, to satisfy the requirements of the Ontario Building Code.

.5 Ensure that work will remain free of warping, buckling, opening of joints and seams, distortion, and permanent deformation.

.2 Assembly:

.1 Accurately cut, machine, and fit joints, corners, copes and mitres so that junctions between components fit together tightly, and in true planes.

.1 Fasten work with concealed methods, unless otherwise indicated on the Drawings.

.2 Weld connections where possible, and bolt where not possible, and cut off bolts flush with nuts. Countersink bolt heads and provide method to prevent loosening of nuts. Ream holes drilled for fastenings.

.3 Make welded joints tight, flush, and in true planes with base metals, and continuous at joints where entry of water into building or into voids of members or assemblies is possible. Continuously grind and make smooth welds in exposed locations.
.4 Provide for differential movements within assemblies and at junctions of assemblies with surrounding work.
.5 Fabricate shims of galvanized steel of sizes required.

.3 Prime Painting of Ferrous Steel: Clean loose mill scale, rust, dirt, weld flux, and spatter from work after fabrication. Grind smooth sharp projections. Prepare for prime painting by blast cleaning to SSPC-SP6 standard. Apply a shop prime coat of paint. Work paint into corners, and onto open areas smoothly. Deliver work to site with primer undamaged. Paint surfaces except those to be welded in the field, or those encased in concrete. Give surfaces that are inaccessible to finish field painting two (2) coats of primer.

.4 Finish Work:
.1 Provide holes and connections for work installed under other Sections of this Specification.
.2 Cleanly and smoothly finish exposed edges of materials, including holes.
.3 Cap open ends of sections exposed to view, such as pipes, channels, angles, and other similar work.

.5 Railings Handrails and Guardrails
.1 Provide handrails, railings, guardrails, clips, rod pickets, flanges and brackets to details shown. Minimum wall thickness 12 gauge.
.2 Form rail-to-end post connections and changes in rail direction by mitred joints or radius bends as applicable.
.3 Remove burrs from exposed cut edges. Form bends and wall returns to uniform radius, free from buckles and twists, with smooth finished surfaces, or use prefabricated bends.
.4 Close exposed ends of pipe and tube by welding metal closure in place or by use of prefabricated fittings.
.5 For posts set in concrete, furnish matching sleeves.
.6 Work to be one piece or in as long lengths as possible. Join pipe sections using concealed connectors.
.7 Weld field joints, grind and polish smooth to match base metal.
.8 Extend handrails horizontally at sides of stairs and ramps in accordance with Article 3.4.7.5 of the O.B.C.

.6 Stairs:
.1 The method of stair construction to conform to the Consultant's drawings and reviewed shop drawings. Framing to not restrict required width or headroom. Weld connections where possible; where not possible, bolted connections will be permitted, but bolts to be cut off flush with nuts and made as inconspicuous as possible.
.2 Fabricate stairs to facilitate erection as building is ready to receive them.
.3 Provide carborundum strips at stair nosing as detailed.

.7 Inspection of Site: Take site measurements to ensure that work is fabricated to fit surrounding construction around obstructions and projections in place, or yet to be put in place to suit service locations, and inaccuracies of construction.

.8 Installation:
.1 Install work plumb, true, square, straight, level, and accurately and tightly fitted together and to surrounding work.
.2 Work includes anchor bolts, bolts, washers and nuts, lag screws, expansion shields, toggles, straps, sleeve brackets, clips, shims and other items necessary for secure installation, as required to support and/or resist loads and forces, and as required by Jurisdictional Authorities.
.3 Insulate between dissimilar metals, or between metals and masonry or concrete with bituminous paint to prevent electrolysis.
.4 Provide temporary supports and bracing required to position stair assemblies.

.9 Patching and Refinishing:
.1 After erection, touch up prime paint, and shop applied coatings and finishes damaged or removed during installation.
.2 Remove damaged, dented, defaced, defectively finished, or tool-marked components and replace with new.
.3 Clean off dirt on surfaces resulting from installation work.

DIVISION 06 – WOOD, PLASTICS + COMPOSITES

*Refer to structural drawings prepared by **A2S Consulting Engineers** for additional Division 06 requirements.*

06 10 00 - ROUGH CARPENTRY

Part 1. General:

1. Rough Carpentry systems and materials to be provided in accordance with the following;
   - **.1** **Scope:** Provide required labour and materials to supply and install rough carpentry items and described on the drawings including the rough carpentry items listed herein.
2. Quality Assurance
   - **.1** N.L.G.A. 2017 National Lumber Grades Authority, Standard Grading Rules for Canadian Lumber.
   - **.2** Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board.
   - **.3** Plywood identification: by grade mark in accordance with applicable CSA Standards.
   - **.4** Each panel of plywood required to be fire retardant treated to bear ULC label indicating Flame Spread Classification (FSC) and smoke developed.
3. Referenced Standards
   - **.1** CSA O86:19 Engineering Design in Wood
   - **.2** CSA-B111 (R2003) Wire Nails, Spikes and Staples
   - **.3** CSA-O121-17 Douglas Fir Plywood
   - **.4** CSA-O151-05 (R2019) Canadian Softwood Plywood
   - **.5** CAN/CSA-O141-91 Softwood Lumber
   - **.6** CAN/CSA -O80 SERIES-15 (R2020) Wood Preservation
   - **.7** CAN/ULC-S102-M88 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
   - **.8** CAN/CSA G164-M92 Hot Dip Galvanizing of Irregularly Shaped Objects
   - **.9** NFPA 80-1999 Fire Doors and Windows.

Part 2. Products:

1. Materials:
   - **.1** Except as indicated or specified otherwise lumber to be softwood S4S, SPF Species moisture content (MC) not greater than 19% at time of installation in accordance with the following standards;
     - .1 CSA 0141.
     - .2 NLGA Standard grading rules for Canadian Lumber.
   - **.2** Machine stress - rated lumber is acceptable for purposes.
   - **.3** Lumber:
     - .1 S-DRY, graded and stamped to National Lumber Grades Authority, Standard Grading Rules for Canadian Lumber.
       - .1 Studs: No. 1/No. 2 (SPF), 121c. "STUD".
       - .2 Blocking, furring, strapping, battens, nailers, bracing, and bridging: spruce, pine or fir (SPF), standard or better grade.
   - **.4** Plywood: Canadian softwood plywood conforming to CSA 0151, "G1S".
     - .1 Pressure Treated Plywood: Pressure treated plywood conform to CSA 0151, "G1S".
   - **.5** Nails, Spikes, Staples and Other Connectors: to CSA B111, galvanized for exterior work, interior highly humid areas and for treated lumber; plain finish elsewhere.
   - **.6** Bolts, Nuts, Washers, Screws and Pin Type Fasteners: Hot dip galvanized to CAN/CSA G164 for exterior work. Elsewhere for sight exposed surfaces, prime paint. Use surface fastenings of following types, except where specified type is indicated:
     - .1 To hollow masonry, gypsum board and panel surfaces use toggle bolts.
     - .2 To solid masonry and concrete use expansion shield with lag screw, or lead plug with wood screw.
   - **.7** Floor / Wall Intersection Gasket: 'Perminator', 15 mil polyethylene vapour barrier as manufactured by WR Meadows Inc. (www.wrmeadows.com), Stego Wrap as manufactured by Stego Industries Ltd. (www.stego.com) or approved equal complete with Joint Tape: minimum 4" (100mm) wide, pressure sensitive, self-adhesive, "Perminator Tape" as manufactured by W.R. Meadows, or Stego Tape and / or Stego Claw as manufactured by Stego Industries Ltd. or approved equal and for use in sealing joints.

.8 Slip-Type Head Joints - Deflection Track: steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and width to accommodate depth of studs; equal to Bailey Multi-Slot Track – MST 250, 2.5" deep a width as required to suit all assemblies x 18 mils (minimum).

OR

Slip-Type Head Joints - Deflection Screw: structural deflector screw manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in lengths as recommended by the manufacturer to suit depth of studs; equal to Strong-Drive SDPW Deflector Screw, as manufactured by Simpson Strong-Tie.

2. Fabrication:
   - **.1** Comply with CAN3-086 or CAN3-086.1 for fabrication and assembly of structural components off site, or on site.
   - **.2** Design construction details for expansion and contraction of materials.
   - **.3** Machine sand surfaces exposed in the finished work. Hand sand to an even smooth surface free from scratches.
   - **.4** List of Rough Carpentry Items: This Section includes, but is not necessarily limited to, the following:
     - .1 Concealed support elements, anchors, bolts, inserts, sleeves for work in this section.
     - .2 Wood Blocking for Millwork: Provide wood blocking on and within partitions as required to support millwork and other wall mounted specialty items.
     - .3 Plywood Roof Sheathing: Provide 12.5mm thick T+G plywood exterior grade sheathing and required fasteners over roof truss system as detailed on the drawings. Refer to Structural Documents.
     - .4 Provide 19mm thick exterior grade plywood sheathing at fascia as detailed in the drawings.
     - .5 Provide 16mm exterior grade plywood sheathing and 2" x 6" pressure treated wood framing at windowsill, jambs and heads as detailed on the drawings.
     - .6 Pressure treated lumber; 2" x 4", 1"x 6" for the construction of the garbage enclosure.
     - .7 Wood framing at window openings: Provide 16mm thick exterior grade plywood sheathing and pressure treated wood framing in dimensions as detailed on the drawings around window opening.

Part 3. Execution:

1. Examination
   - **.1** Examine areas of work of this section, report any discrepancies and unsatisfactory conditions to the consultant, commencement of work implies acceptance of conditions.
2. General:
   - **.1** Lay out work carefully and to accommodate work of others. Cut and fit accurately. Erect in position indicated on drawings. Align, level, square, plumb and secure work permanently in place. Join work only over solid backing.
   - **.2** Bore holes true to line, and to same size as bolts. Drive bolts into place for snug fit, and use plates or washers for bolt heads and nut bearings. Turn up bolts and lag screws tightly when installed, and again just before being concealed by other work or at completion of work.
   - **.3** Co-operate with work of other Sections to ensure that unity of actions will ensure orderly progress to meet construction schedule.
   - **.4** Provide anchors, bolts and inserts required for attachment of the work of this Section to those performing the work of other Sections, and who are responsible for their installation.
   - **.5** Work to include such rough hardware as nails, bolts, nuts, washers, screws, clips, hangers, connectors, and strap iron required for installation of work, and operating hardware required on work of this Section for temporary work.
3. Grounds, Blocking, Strapping, Furring, Sleepers and Nailers:
   - **.1** Do not regard grounds, blocking, furring, and such other fastening provisions as shown on drawings as exact or complete. Provide required provisions for fastenings, located and secured to suit site conditions and adequate for intended support.
   - **.2** Cut fastening work into lengths as long as practicable, and with square ends. Erect work plumb, in true planes, and fastened rigidly in place.
   - **.3** Provide wood furring and strapping for applied facings, caseworks, etc.
   - **.4** Except where steel is specifically shown, provide wood blocking and supports in metal stud partitions for fastening of items anchored to stud partitions. Provide wood blocking and supplementary supports in metal studs supporting counters and similar items.
   - **.5** Co-ordinate with Section 09 21 16, for the installation of wood blocking for fastening of wall mounted accessories and casework.
4. Wood Framed Walls (non load bearing)
   - **.1** Construct wood framed walls with dimensional lumber and at spacings as scheduled on the drawings. All vertical studs shall be continuous and without splices.
   - **.2** Use single base plate and double top plate at all walls unless noted otherwise

.3 At all walls on concrete, install vapor gasket, using material specified, at bases of wall to separate wood from concrete. Provide a continuous sheet equal to the width + 3" wide. Overlap joints and seals joints with tape using material specified. Wrap edges up wall and staple to continuous baseplate prior to install of sheathing materials.

.4 At head of non load bearing walls that terminates at underside of structure, provide a slip type deflection track or the deflection screw, as specified to ensure load from bearing elements of the structure is not transferred to the non load bearing wall assembly.

.5 At 4"-0" o/c intervals vertically provide solid wood bridging between studs. Use the same material as that is being used on the wood stud wall.

.6 Prior to install scheduled sheathing, install wood blocking within the depth of the wall – using dimensional lumber cut to suit and ¾" plywood. Minimum width of wood blocking shall be 10". Install in all location required to suit schedules millwork, washroom accessories or other built in items.

.7 Use connecting nails as scheduled in the Ontario Building Code.

.8 Secure bottom plates to concrete floor slab using 12.5mm (1/2") dia. wedge anchors or quick shot pneumatic nails at a minimum of 2'-0" o/c

06 20 00 – FINISH CARPENTRY

Part 1. General:

1. Scope: Provide required labour and materials to supply and install finish carpentry items described on the drawings. Scope shall include custom millwork as described by the drawings and pre-manufactured millwork as specified.

2. Submittals:
   - **.1** Shop Drawings:
     - .1 Submit shop drawings to Consultant in accordance with Section 01 33 00, for casework, and casework hardware, handrails, guards and other fabrications.
     - .2 Clearly indicate the material being supplied and show connections, attachments, reinforcing, anchorage and location of exposed fastenings.
   - **.2** Samples:
     - .1 Submit samples in accordance with Section 01 33 00.
     - .2 Submit samples of exposed hardware, plywood veneers, plastic laminate
3. Quality Standard:
   - **.1** Millwork to conform to the Premium Grade requirements of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), Quality Standards For Architectural Woodwork, latest edition, except where more stringent requirements are specified otherwise.
   - **.2** For conditioning and storage of plastic laminate materials, manufacturing techniques, and choice of appropriate glues to suit atmospheric conditions to be encountered, conform to CSA Standard CAN3-A172-M79.
4. Single Source Responsibility:
   - **.1** It is the intent of this section to establish a single, competent source to be responsible for the supply and installation of finished panels which conform to the flame spread rating requirement specified.
5. Qualified Architectural Millwork Shops:
   - **.1** Qualifications: Work of this Section to be executed by manufacturer and tradesmen with experience in successful manufacture and installation of this type of work and of quality as indicated on drawings and as specified. Submit proof of such experience, with list of installations, upon request by Consultant.
6. Job Conditions:
   - **.1** Visit premises and take field measurements necessary to ensure proper fitting of the work of this Section with field conditions in the building.
   - **.2** Do cutting and fitting and prepare components to receive and accommodate work of other Sections.
7. Delivery, Storage And Handling:
   - **.1** Provide protective coverings of suitable material for plastic laminate items; take special precautions at corners.
   - **.2** If required, store millwork items in temperature and humidity controlled area until delivery.
   - **.3** Do not permit delivery of millwork to Site until area is sufficiently dry so that woodwork will not be damaged by excessive changes in moisture control.
8. Warranty:
   - **.1** Submit a warranty covering the maintenance, repair or replacement of defective work for a period of one (1) years from the expiration of the standard one (1) year warranty included in the Contract under the General Conditions.
   - **.2** Structural failure, loosening, fading, discolouration, deforming and failure of millwork units to be judged as defective work.
   - **.3** Total warranty period to be two (2) years.

Part 2. Products:

1. Materials:
   - .1 General:
     - .1 Where the designation "NLGA" appears hereinafter, it to mean NLGA Standard Grading Rules for Canadian Lumber, approved by the Canadian Lumber Standards Accreditation Board.
     - .2 Kiln dry lumber to maximum 8% moisture content.
   - .2 Casework Framing: Pine, NLGA 115a, No. 1 common.
   - .3 Nailing Strips, Blocking, Furring and Strapping: NLGA 122c, "Standard" light framing.
   - .4 Hardwood Plywood: Conform to CSA 0115.
   - .5 Core for Plastic Laminate and Melamine: Plywood conforming to CSA 0121, G2S.
   - .6 Nails, Spikes and Staples: To CSA B111. Galvanized for exterior work, interior highly-humid areas and for treated lumber; plain finish elsewhere. Use spiral thread nails, except where specified otherwise.
   - .7 Glue for Wood Furniture and Assemblies: CSA O112.4 M, polyvinyl adhesive.
   - .8 Glue for High Humidity Areas: CSA O112.5 M, Type II, moisture resistant urea formaldehyde resin adhesive.
   - .9 Tempered Hardboard: To CAN/CGSB 11-GP-3-M87, Type 2.

2. **Plastic Laminate Counter:** postformed Plam counters
   - **.1** Conforming to CAN3-A172, General Purpose - standard grade (GP-S), 1.6mm (1/16") thick for tops, Post Forming - Standard Grade (PF-S) 1.6mm (1/16") thick for post forming. Balance panels with 0.75mm (1/32") backing sheet (BK).
   - **.2** Use waterproof adhesive capable of holding materials together without failure.
   - **.3** Finish to be "Matte" by Arborite or equivalent manufactured by Formica Canada Inc., Wilsonart Canada, Nevamar or Pionite.
   - **.4** Plastic Laminate colour to be chosen by Architect at a later date.
   - **.5** Provide post formed countertops and backsplashes in accordance with the drawings.
3. Hardwood Veneer Plywood:
   - **.1** Hardwood veneer to be white oak, rift cut veneer flitches only. Rotary cut oak flitches will not be accepted.
4. Door Jambs, Casings and Stops:
   - **.1** Door jambs, casings and stop shall be clear, knotless, paint grade poplar, in dimensions as indicated on the drawings and with decorative profiles and defined by the architect at a later date.
5. Cabinet Hardware:
   - **.1** Hardware for 19mm (3/4") thick flush overlay doors:
     - .1 Hinges: Blum 90 Series or equal by Hafele or Richelieu, fully concealed adjustable, articulated, metal hinges, screw-on type, models as applicable for door type opening swing, etc. Supply 170 opening hinges unless specifically indicated otherwise or unless cabinet details make impractical (i.e. inside 90 degree corners with adjacent doors).
     - .2 Door Pulls: 8mm (5/16") diameter x 100mm (4") length, satin stainless steel as manufactured by Blum or equivalent by Richelieu or Hafele.
   - **.2** Hardware for Shelves:
     - .1 Typical adjustable shelf supports: For adjustable shelving in cabinets indicated and where shelves have abutting end supports provide steel pilaster strips equivalent to Knape & Vogt 255 in lengths to suit complete with Knape & Vogt 256 pilaster clips.
     - .2 Adjustable supports for exposed millwork shelves: For adjustable shelving in exposed gables provide 3/16" (5mm) diameter plug-in pins complete with stop equivalent to Hafele Catalogue No. 282.42.702.
   - **.3** Hardware for Drawers:
     - .1 Drawer Pulls: 5/16" (8mm) diameter x 4" (100mm) length, satin stainless steel as manufactured by Canadian Builders Hardware or equivalent by Richelieu, Gallery, or Stanley.
     - .2 Drawer Extensions: drawers up to 3" (75mm) deep and 16" (400mm) wide to be fitted with single extension box drawer slide equivalent to Knape & Vogt 8300. Other drawers to be fitted with full extension file drawer slide equivalent to Knape & Vogt 8500.
   - **.4** Closet Rod and Flanges: Provide in closets as indicated 1-1/4" (31mm) o.d. stainless steel coat rod equivalent to Canadian Builders Hardware CBH 762 complete with CBH 752 mounting flanges and intermediate supports as required.
   - **.5** Grommets: Richelieu Martin cable entry plug Model "60.2700.90", or Doug Mockett and Company type "SG" distributed by Trillium Hardware, colour black, 2" (50mm) diameter. Allow for twenty (20) to be installed in locations as directed by Consultant.
   - **.6** Exposed Fasteners: for securing plywood guards, panelling, etc. as indicated to be 3/8" (10mm) diameter stainless steel hex socket cap bolts and domed cap nuts complete with cup washers.
   - **.7** Locks:
     - .1 Locks for cabinet doors to be Rim Lock, pin tumbler, solid brass, and nickel finish, with striker plates and duplicated keys, locks in one room to be keyed alike, product no 346510180 as manufactured by Richelieu, www.richelieu.com.
     - .2 Locks for drawer units to be Drawer Lock, pin tumbler, solid brass, and chrome finish, with striker plates and duplicated keys, locks in one room to be keyed alike, product no 313153140 as manufactured by Richelieu. www.richelieu.com.
   - **.8** **Counter/Shelf Metal Brackets**
     - .1 Metal Bracket Type A to be Kolossus Heavy Duty Workstation Bracket, 21" wide x 15" high, colour to be Black, as manufactured by Richelieu.
6. Hardware for solid core wood doors in millwork:
   - **.1** Refer to hardware schedule in Section 08 71 00 – Finish Hardware.
7. Fabrication:
   - **.1** General Workmanship:
     - .1 Fabricate work in accordance with the best practice by skilled craftsmen of companies specializing in the work specified and to the requirements of other trades.

.2 Use running members in greatest lengths obtainable.
.3 Machine-dressed work to be slow fed using sharp cutters and the finished work to be free from drag, feathers, slivers or roughness of any kind. Remove machine marks by sanding.
.4 In finished work, machine-sand exposed surfaces in the shop and hand-sand on the job to even smooth surfaces, free from scratches, ready for finishing.
.5 Frame materials with tight joints rigidly held in place. Use glue blocks where necessary.
.6 Assemble work in shop and deliver to job ready for installation as far as practicable. Leave ample allowance for fitting and scribing on the job.
.7 Take care to prevent the opening up of glue lines in the finished work.
.8 Joints made on the on the job to be equal in quality and workmanship to joints made in the shop.
.9 Finish exposed edges of plywood and particleboard with matching veneer edge banding typical, glued in place. Use 1/4" (6mm) solid stock where indicated.
.10 Glue and blind screw or nail work unless otherwise specified. Set surface nails and plug surface screws with wood plugs of material to match surface.
.11 Glues to be waterproof and of type suitable for work to be joined. Refer to glue manufacturer's recommendations for lumber moisture content, glue shelf life, pot life, working life, mixing, spreading, assembly time, time under pressure and ambient temperature.
.12 Moisture content of interior woodwork to be not less than 4% nor more than 8%.
.13 Accurately scribe, cope, and mitre members where required.
.14 Erect work plumb, level, square, and to the required lines.
.15 Fabricate finished woodwork in the building free from bruises, blemishes, mineral marks, knots, shakes and other defects.
.16 Be responsible for methods of construction, and for ensuring that materials are rigidly and securely attached and will not be loosened by the work of other trades.
.17 Take field dimensions and fabricate work to suit field dimensions.
.18 Fasten wood nailers, blocking, framing, and strapping solidly to adjacent materials in true planes.
.19 Do not permit delivery of this work to the site until the area is sufficiently dry so that woodwork will not be damaged by excessive changes in moisture content.
.20 Provide blocking coming in direct contact with millwork in accordance with applicable provisions set forth herein.
.21 Provide drilled holes at 1-1/4" (32mm) o.c. vertically in fitment gables scheduled to receive pins for adjustable shelves.

.2 Custom Millwork:
.1 Construct units as detailed and specified herein.
.2 Fit drawers with stops to prevent tipping or complete withdrawal.
.3 Use plywood for countertops, fronts, backs, bottoms, gable divisions, shelves and doors.
.4 Drawer sides, backs and bottoms to be 1/2" (13mm) thick veneer plywood as scheduled and detailed. Drawer fronts to be 5/8" (16mm) thick veneer plywood as scheduled and detailed.
.5 Provide veneer edge banding on four sides of drawer fronts and doors and adjustable shelves; exposed edges of fixed shelving; exposed edges of cabinets including those behind drawer fronts and swing doors.
.6 Provide miscellaneous cut-outs in backs of millwork to accommodate electrical cords, telephone cords, etc., and provide purpose-made grommets.

.3 Veneered Panels and Millwork:
.1 Material for interior millwork to be hardwood plywood with wood veneer, as shown, and specified herein, for gables, shelves, backs, and division's tops and wherever sheet laminated material is shown, unless indicated to be of plastic laminate, and solid wood to match adjacent veneer, where solid material is indicated. Note veneer plywood panels at guards to be plywood core.
.2 To prevent warping use a backing veneer of same thickness as face. Apply backing veneer using the same application techniques such as application rate, method of application, drying techniques and finish. Provide backing sheet of sufficient thickness to compensate stresses caused by facing sheet. Apply uniform coating of sealer on exposed veneered edges.
.3 Semi Exposed Parts: Interior of cabinetwork except drawers, but including drawer fronts, to match exposed parts except where indicated otherwise on Drawings or in schedules and except where specified otherwise. Drawer bottoms and dividers to be oak plywood unless noted otherwise. Semi exposed drawer fronts to match exposed species and drawer fronts to cover spaces between gables and drawer sides.
.4 Doors and Drawer Fronts: to be 3/4" (19mm) thick with veneered plywood. Door and drawer faces to be of same species and cut as exposed plywood used for case. Provide edge bands on four sides of doors as specified. Face veneer to be vertical. Drawers to be fitted with sliding hardware and to be fully removable.

.5 Provide cut-outs as required for inserts, fixtures and fittings. Use radius corner and chamfer edges around cut-outs.

.6 Use specified exposed mechanical fasteners to attach wood panels to strapping in walls in accordance with details.

.4 Plastic Laminate Faced Work:

.1 Provide cores of not less than 5/8" (16mm) nominal thickness.

.2 Apply backing sheet to laminated flatwork. Supply uniform coating of sealer on exposed edges. Provide backing sheet of sufficient thickness to compensate stresses caused by facing sheet.

.3 Self-edge, straight line edging with 1/16" (1.6mm) standard material and radius corners with post forming material, apply with same adhesive as facing sheet. Chamfer edges uniformly at approximately 20 degrees, using machine router.

.4 Locate joints at 8'-0" to 10'-0" (2400mm to 3000mm) o.c. At 'L' shaped corners mitre plastic laminate, to outside corners. Accurately fit member together to provide tight and flush butt joints, in true planes. Provide 1/4" (6mm) blind spline and approved type draw bolts. Provide one (1) draw bolt for widths up to 6" (150mm). For width exceeding 6" (150mm), provide draw bolts at maximum 10" (250mm) centres. Colour match adjoining units.

.5 Provide cut outs as required for inserts, fixtures and fittings. Use radius corners and chamfered edges around cut outs to avoid chipping laminate.

.6 Post form laminate work to details indicated. Provide same core and laminate profiles to provide continuous support and bond for entire surface.

.7 Assemble work, true and square. Arrange adjacent parts of continuous laminate work to match in colour and pattern.

8. **Factory Applied Millwork Finish:**

.1 Maple veneer millwork, wood veneer panels and solid wood fitments to have factory applied finish installed in accordance with Part 5 of the AWMAC Quality Standards.

.2 Finish to be semi-transparent stain in custom colour selected by the Architect and consisting of: One (1) coat oil stain, one (1) coat sanding sealer, sanded lightly. Apply two (2) finish coats of clear standard or catalysed lacquer, at architectural woodwork manufacturer's option, satin finish.

.3 Submit to the Consultant two (2) – 12" x 24" (300mm x 600mm) representative sample panels illustrating finish for approval. Shop finished surfaces to closely match the approved samples in respects.

.4 Apply finishes evenly, and consistently throughout with no lighter or darker areas or blotches.

.5 Sheen to be consistent throughout.

.6 Fill nail holes and blemishes to closely match and blend with finish so as to be as inconspicuous as possible.

.7 Surfaces to be consistently smooth and even with no "orange peel", runs, sags, skips, drips, or rough areas.

.8 To prevent warping of veneer panels apply finish to surfaces including backs and edges.

.9 Prior to shipment to the site suitably protect millwork and fitments from possible damage prior to installation. Maintain protection of millwork on site after installation.

9. **Fire Retardant Coating and Top Coat:**

.1 General: Fire Retardant Coating and Top Coat shall be of the same source manufacturer, unless approved by the Consultant.

.2 Fire Coating: To be applied prior to top coat, and shall be clear gloss fire-retardant coating with minimum flame spread of 25 or less in accordance to CAN/ULC-S102. Compatible with finish material and wood species used, install as per manufacturers strict instructions. Let dry for 48 hours before applying top coat.

.1 Approved Product: 'Fire Safe 108 Wood' as manufactured by Green Dolphin Systems Corp. or approved equivalent.

.3 Top Coat: Low VOC water-based, non-yellowing top coat compatible with fire retardant coating. All surfaces must be smooth, dry, and free of mildew, grease, film, sanding dust or other contaminates. Thoroughly clean all surface contaminates before beginning application. If second coat is required, allow the first coat to dry 3-4 hours before applying second coat. Do not apply at temperatures below 10 degC (50 degF).

.1 Approved Product: 'GD Top Coat' as manufactured by Green Dolphin Systems Corp. or approved equivalent.

Part 3. Execution:

1. Installation:

.1 Strips and Blocking:

.1 Where wood is to be fastened to masonry, supply metal nailing plugs to masonry section, for building into masonry joints.

.2 Provide and install wood strips required for attaching the work of other Sections.
.3 Provide and install wood blocking required.

.2 Carpentry and Millwork:
.1 Install carpentry and millwork items as detailed.
.2 Execute installations and assemble work on the job using skilled forces, under supervision of competent joinery foreman.
.3 Adequately fasten units and secure in place with concealed fixings wherever possible. Include grounds and furring where required.
.4 Install casework level, plumb, true, and complete in respects. Shim as necessary with concealed shims. Accurately scribe and closely fit face plates, filler strips and trim to irregularities of adjacent surfaces.
.5 Installation to conform to AWMAC and latest revision of specified standards.
.6 Install casework finish hardware in accordance with manufacturer's recommendations.

.3 Plastic Laminate:
.1 Apply plastic laminate coverings in accordance with CSA Standard CAN3-A172-M79 and manufacturer's directions. Finish exposed edges around cut outs such as sinks, in plastic laminate. Apply laminate backing sheets on back face of material on which plastic laminate facing sheets are applied to minimize twist. Use the same adhesive and application techniques such as application rate, method of application, drying techniques, for bonding front and back laminates.
.2 Bond plastic laminate using urea formaldehyde glue to 3/4" (19mm) thick, 7 ply, poplar-faced, phenolic-bonded plywood or high-density particleboard. Self-edging to be 3/32" (2mm) material, electro-pressure-sealed and with edges bevelled.
.3 Joints in plastic laminate will not be permitted except in pieces exceeding 8'-0" (2400mm) in length. Butt joints tightly together, and reinforce with 1/4" (6mm) hardwood blind spline. Lock securely with draw bolt type fasteners at maximum of 3" (75mm) from edges. Apply backing sheet to plywood.
.4 When cutting holes in plastic laminate work, corners to be rounded and filed smooth.
.5 Do not remove paper protection until final cleaning.

.4 Premanufactured Items
.1 Research, prepare and submit shop drawings as required submittals to the Architect.
.2 Coordinate delivery of the premanufactured items to the site and / or storage areas controlled by the Contractor.
.3 Where required assemble premanufactured items.
.4 Coordinate installation of wood blocking within existing walls to suit the installation of the work.
.5 Install new premanufactured items.
.6 Confirm operation of doors, drawers and other movable components. Where required make adjustments to provide smooth operations.
.7 Clean interior and exterior of all premanufactured items.

DIVISION 07 – THERMAL + MOISTURE PROTECTION

07 10 00 – WATERPROOFING

Part 1. General:

1. Provide labour and materials as required to supply and install waterproofing membrane as follows:

Part 2. Products:

1. **Waterproofing Membrane:** Apply **Blueskin WP200 – Self Adhering Waterproof Membrane** as manufactured by Henry or approved equal, conforming to the requirements of CCMC 13297-R. System to have the following characteristics;
   - .1 Thickness: 60mill (1.5mm)
   - .2 Application temp (min):5 degC (37F)
   - .3 Water vapour permeance: 0.02 perms; ASTM E96 / E96M.
   - .4 Thickness: 1.5 mm (60 mils) min.,
   - .5 Flexibility: Pass @ -40 degrees C to ASTM D1970,
   - .6 Vapour permeance: 2.8 ng/Pa.s.m² (0.05 perms) to ASTM E96,
   - .7 Tensile strength (membrane): 2.24 MPa to ASTM D412,
   - .8 Tensile strength (film): 34.5 MPa to ASTM D882,
   - .9 Elongation: 300% to ASTM D412,
   - .10 Puncture resistance: 222 N min. to ASTM E154.

2. **Primer:** Primer for self-adhering membranes at temperatures above 25 degrees F shall be **Aquatac™ Primer manufactured by Henry**, a polymer emulsion based adhesive, quick setting, having the following physical properties:
   - .1 Colour: Aqua;
   - .2 Weight: 8.7 lbs/gal;
   - .3 Solids by weight: 53%;
   - .4 Water based, no solvent odours
   - .5 Drying time (initial set): 30 minutes at 50% RH and 70 degrees F;
   - .6 Before applying primer ensure surface is dry and free from dust, dirt, grease, oil, excess mortar/grout and other foreign matter.
   - .7 Apply with roller at a rate of 7m2/litre (300ft2/3.78L can).
   - .8 Allow for manufacturer's recommended dry time. Primed surfaces not covered by membrane during the same working day must be reprimed. Install at temperatures above 5 degC.

3. **Liquid Foam Insulation:** Single component, moisture cure, low expansion rate spray-in-place polyurethane liquid foam insulation to ULC-S710.1 and in accordance with manufacturer's written recommendations.

4. **Liquid Sealant and Termination Sealant:** Termination Sealant shall be **HE925 BES Sealant manufactured by Henry**; a moisture cure, medium modulus polymer modified sealing compound having the following physical properties:
   - **.1** Compatible with sheet air barrier, roofing and waterproofing membranes and substrate,
   - **.2** Complies with Fed. Spec. TT-S-00230C, Type II, Class A
   - **.3** Complies with ASTM C 920, Type S, Grade NS, Class 25
   - **.4** Elongation: 450 – 550%
   - **.5** Remains flexible with aging
   - **.6** Seals construction joints up to 1 inch wide

5. **Protection / Drainage Board:** Provide **DrainStar Wall Drain 90** placed to cover all parts of the waterproof membrane, having the following characteristics;
   - **.1** material: A two component prefabricated soil shett for below grade wayerproofing having the following components;
     - .1 fabric: polypropylene, 90lbs grab tensile strength, water flow rate of 190 gpm/sf
     - .2 core: profiled polystyrene, ¼" thick, 9000psf compressive strength, flow rate of 12.5 gpm/ft
   - **.2** Thickness: ¼"
   - **.3** Fasteners: stainless steel fasteners as recommended by the manufacturer.

Part 3. Execution:

1. Preparation

.1 Once excavation has been completed and the existing foundation wall is exposed, remove existing membrane layers and primer to expose existing ICF blocks.
.2 Where required, rasp existing EPS surface to provide a smooth, contiguous surface.
.3 Where surface is not a smooth, contiguous surface, provide repairs to provide support backing for new waterproofing membrane.
.1 Where imperfections or less than ½" (12mm) diameter use caulking / sealants to fill divot or imperfection and shape to provide a smooth contiguous surface.
.2 Where imperfections are larger than 1/2" (12mm) diameter use low expansion spray foam insulation to fill divot and shave and remove excess foam so that surface is smooth and contiguous with the adjacent EPS.
.4 Brush clean surface. Surfaces must be clean of oil, wax, pigments, dust and excess mortar.
.5 Concrete / grout must be free of frost and cured for a minimum of 7 days prior to installation of waterproofing.
.6 Pre-treat cracks in surface with caulking /sealants as specified.
.7 Surface must be smooth and without large voids, spalled areas, sharp protrusions or discontinuous surfaces.
.8 Remove protrusions.
.9 Strike masonry joints full-flush.
.10 At masonry only, fill voids and smooth discontinuous surfaces with non-shrink, dry packed grout. Allow grout to set completely.
.11 At new cove at footing wall intersection, allow new coved transition at this location to set completely prior to installation of new waterproofing.

2. Primer
.1 Apply primer for self-adhered membrane by roller or spray at rate recommended by manufacturer.
.2 Allow minimum 30 minute open time. Primed surfaces not covered by waterproofing membrane during the same working day must be re-primed.

3. Projections
.1 Extend waterproofing membrane tight to projection and seal with liquid membrane extending 3 inches along projection and 3 inches onto waterproofing membrane.

4. Waterproofing – vertical application
.1 Apply waterproofing membrane to prepared substrate in lengths of 6 feet or less.
.2 Roll laps with a counter top roller to effect seal.
.3 Provide 3 inch laps at both sides and ends. Position for alignment and remove protective film. Press firmly into place. Promptly roll all laps with a counter top roller to effect seal. If more than one length is required on a vertical surface, apply in a shingle fashion.
.4 Terminate membrane using termination mastic or termination bar, reglet or counter flashing as indicated. Refer to manufacturer's standard details.
.5 All laps within 12 inches of a 90 degrees change in plane are to be sealed with termination sealant.
.6 Inside Corners: Horizontal to vertical inside corner transition areas are to be pretreated with sealant fillet extending 19mm (3/4") vertically and horizontally from the corner. Apply a 225mm (9") wide strip centered at this joint.
.7 Outside Corners: outside corner transition areas are to be pretreated with a 225mm (9") wide strip centered at this joint.
.8 Projections: Extend waterproof membrane tight to projection and seal with sealant extending 2" along projection and 2" onto waterproof membrane.
.9 Install at temperature above 5 degC.

5. Protection / Drainage Board
.1 Install protection / drainage board to cover all parts of the installed waterproof membrane prior to placing backfill.
.2 Install sheets vertically extending from weeping to finished grade.
.3 Align and secure drainage up to foundation wall. Position bottom edge of drainage board to be in contact with weeping tile system.
.4 Cut sheets to suit size and profile of the foundation wall and to provide shingle style overlaps by a min of 1".
.5 Use fasteners as recommended by the manufacturer.
.6 Secure drainage board to foundation wall with stainless steel fasteners and washers spaced 8" o/c horizontally. Install minimum of 2 rows staggered and spaced 8 inches apart and min 3 inches from top edge.
.7 Overlap end laps, pull back loose fabric to expose drain core and position core of second panel over the overlap flange of first panel.
.8 Backfill bottom edge in conjunction with weeping tile system.

07 21 00 – BUILDING INSULATION

Part 1. General:

1. Scope**:** Provide fibreglass batt, blanket and mineral wool semi-rigid thermal insulation with accessories.
1. References:
   - **.1** CGSB 71 GP 24M, Adhesive, Flexible, for Bonding Cellular Polystyrene Insulation
   - **.2** CSA A451.1, Polystyrene Insulation Adhesives
   - **.3** CAN/ULC S102, Surface Burning Characteristics
   - **.4** CAN/ULC S114, Standard Method of Test for Determination of Non-Combustibility in Building Materials.
   - **.5** CAN/ULC S124, Standard Method of Test for the Evaluation of Protective Coverings for Foamed Plastic.
   - **.6** CAN/ULC S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
   - **.7** CAN/ULC S702, Thermal Insulation Mineral Fibre for Buildings
   - **.8** CAN/ULC S705.2, Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density - Application
   - **.9** CAN/ULC S770-03, Standard Test Method for Determination of Long-term Thermal Resistance of Closed-Cell Thermal Insulating Foams.
   - **.10** ASTM C 665, Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
   - **.11** ASTM C 518, Test Method for Steady State Thermal Transmission Properties by Means of the Heat Flow Meter.
   - **.12** ASTM C423, Test Method for Sound Absorption Coefficient by the Reverberation Room Method
   - **.13** ASTM D2842, Standard Test Method for Water Absorption of Rigid Cellular Plastics
   - **.14** ASTM D1621, Standard Test Method for Compressive Properties of Rigid Cellular Plastics
   - **.15** ASTM E 84, Test Method for Surface Burning Characteristics of Building Materials.
   - **.16** ASTM E 136, Test Method for Behavior of Materials in a Vertical Tube Furnace at 750□C.
   - **.17** ASTM E139, Standard Test Methods for Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials.
2. Submittals:
   - **.1** Provide submittals in accordance with Section 01 33 00.
   - **.2** Product Data: For each product provide data on published "R" value for thicknesses of insulation, product characteristics, performance criteria, limitations and fire ratings, if required.
   - **.3** Submit research and evaluation reposts for foam plastic insulation where required by authorities having jurisdiction.
   - **.4** Safety Data Sheets:
     - .1 Submit WHMIS safety data sheets for inclusion with project record documents. Keep one copy of WHMIS safety data sheets on site for reference by workers.
3. Product Delivery, Storage, and Handling:
   - **.1** Handle and store material in accordance with manufacturer's recommendations and Industrial Health and Safety Regulation requirements.
   - **.2** Materials will be delivered to job in their original packages and containers bearing manufacturer's labels intact and clearly visible.
   - **.3** Do not expose rigid insulation board to sunlight after installation. Protect with black polyethylene or tarpaulin cover as recommended by manufacturer if permanent covering is not completed within twenty-four (24) hours.
   - **.4** Store materials off ground in dry, watertight areas, under cover away from direct sunlight.
   - **.5** Protect to prevent damage by other trades.
4. Project Conditions:
   - **.1** Environmental Limitations: Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

Part 2. Products:

1. Rigid Insulation (high compressive strength):
   - **.1** For use below footings and monolith slabs on grade construction and as indicated on the drawings insulation to be closed-cell, expanded, extruded polystyrene complying with CAN/ULC-S701.1-17, Type 4, and the following minimum requirements:
     - .1 Thermal resistance: RSI 0.87 per 25mm (R 5.0 per 1 inch) thickness.
     - .2 Compressive strength: 275 kPa (40 p.s.i.).
     - .3 Water absorption: less than 0.3% by volume.
     - .4 Water vapour permeance: 57 ng/Pa s m2 (1.0 perms).

.5 Maximum Use Temperature: 165 degrees C
.6 Surface Burning Characteristics – flamespread <300, smoke developed ,700 to CAN/ULC S102.2
.7 Provide insulation in thicknesses as indicated on drawings.
.8 Where required secure to structure with Dekfast fastener, #15 High Strength Phillips Head, 13 tpi, drill point with Grey Sentre XP coating. Predrill holes in structure where required. Cut fasteners if required to suit thickness of insulation and depth of penetration into predrilled holes in structure. Sharpen tips with grinder as required.

.2 Acceptable manufacturers:
.1 "Styrofoam Brand Highload 40 XPS Foam Insulation" by Dupont.
.2 Or approved equal.

2. Mineral Fibre Batt Insulation:

.1 Mineral fibre batt insulation shall be 'Comfortbatt' as manufactured by Rockwool, or approved equal having the following characteristics;
.1 Compliance with CAN/ULC – S702 – Mineral Fibre Thermal Insulation for Buildings, Type 1.
.2 Compliance with CAN/ULC – S114 – Test for Non-combustibility – noncombustible.
.3 CAN ULC S102 Surface Burning Characteristics: Flame Spread – 0, Smoke Developed – 0.
.4 Thermal Resistance – R24.0 / 6" inch (6" thick batt) or R15.05 3.5" inch (3.5" batt).
.5 Density to ASTM C612-00- Actual - 2.0 lbs./ft3 (32 kg/m3).
.6 Dimensions – 16.25" x 28" x 6" (413mm x 1219mm x 152mm) or 16.25" x 28" x 3.5" (413mm x 1219mm x 194mm). Size the batt to suit the thickness of the wall construction as scheduled.

3. Sound (Acoustical) Insulation:

.1 Fibreglass or mineral fibre sound blanket insulation to thickness indicated on Drawings,

.2 Approved Products:
.1 'QuietZone' by Owens-Corning Canada.
.2 'Thermafiber' by CGC Gypsum, Division of CGC Inc.
.3 'Safe'n'Sound' by Rockwool.
.4 'NoiseReducer' by CertainTeed.
.5 Or approved equal.'

Part 3. Execution:

1. Installation (Rigid Installation):

.1 Verify that surfaces and conditions are ready to accept the Work of this section.

.2 Ensure concrete has been cured for a minimum of fourteen (14) days. substrates to be clean of oil or excess dust, pigments, and waxes; masonry joints struck flush; concrete surfaces to be free of large voids, spalled areas or sharp protrusions.

.3 Ensure existing granular material is flat and compacted.

.4 Fit boards neatly around beams, pipes, ducts, openings, and corners, reinforcing and bonding ties, and other obstructions.

.5 Butt insulation boards together and stagger joints. Apply firm hand pressure to level insulation boards

.6 Use the largest module of insulation possible where cutting is necessary, to reduce the number of joints. Patch holes and tears with the same material.

.7 Permanently seal vapour barrier at points where it is impaled by screws, staples, masonry reinforcing, or other fastening devices.

.8 Insulation installations to be reviewed and approved by the Consultant prior to the installation of covering materials.

2. Installation (Cavity Wall):

.1 Install stick pins and mechanically fasten to windloaded metal studs at 16" o/c horizontally and vertically using two (2) metal screws per fastener.

.2 Install first layer of insulation and install galv. washer.

.3 Install second layer of insulation and install gavl. washer.

.4 Fit boards neatly around beams, pipes, ducts, openings and corners, reinforcing and bonding ties, and other obstructions.

.5 Use the largest module of insulation possible where cutting is necessary, to reduce the number of joints. Patch holes and tears with the same material.

.6 Insulation installations to be reviewed and approved by the Consultant prior to the installation materials that cover the insulation.

3. Installation (Mineral Fibre and Glass Fibre Batt):

.1 Fit boards neatly around beams, pipes, ducts, openings and corners, reinforcing and bonding ties, and other obstructions.

.2 Use the largest module of insulation possible where cutting is necessary, to reduce the number of joints. Patch holes and tears with the same material.

.3 Insulation installations to be reviewed and approved by the Consultant prior to the installation materials that cover the insulation.

07 27 13 - WEATHER BARRIER MEMBRANES

Part 1. General:

1. Scope: Provide labour and materials required to provide weather membranes as indicated on the drawings.
2. Reference Standards:
   - .1 CAN/ULC S102 – Standard Method for Surface Burning Characteristics
   - .2 CAN/ULC S741-08 (R2016) – Standard for Air Barrier Materials - Specification
   - .3 CAN/ULC S742-11(R2016) – Standard for Air Barrier Assemblies - Specification
   - .4 ASTM D412 - [2006ae2], Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension
   - .5 ASTM D3330/D3330M - [2004(2010)], Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape.
   - .6 ASTM D3652/D3652M - [2001(2006)], Standard Test Method for Thickness of Pressure-Sensitive Tapes.
   - .7 ASTM E84 - [2012], Standard Test Method for Surface Burning Characteristics of Building Materials.
   - .8 ASTM E96/96M-[2010], Standard Test Methods for Water Vapor Transmission of Materials.
   - .9 ASTM E2178 - [2011], Standard Test Method for Air Permeance of Building Materials.
   - .10 ASTM E2357 - [2011], Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.
3. Product **Handling**: Handle, store and protect materials as recommended by the manufacturer.

Part 2. Products:

4. Air Barrier Membrane (peel+stick):

- .1 Air Barrier Membrane: shall be a self-adhered vapour permeable, water resistive air barrier membrane consisting of an engineered film and a permeable adhesive with split back poly release film. 'Blueskin VP160' as manufactured by Henry Company or approved equivalent. System to have the following characteristics;
  - .1 Thickness: 23 mils (0.58mm)
  - .2 Application Temp (min): +20 degF (-7 degC)
  - .3 Water Vapour Permeance: 29 perms; ASTM E96, Method A
  - .4 Air Leakage Rate: Classification A1; CAN/ULC-S742-11
- **.2** Primer**:** Install primer as recommended by the manufacturer, do not use spray prep primer. Lap, tape to make air-tight. Adhere to window and door frames / flanges. 'Blueskin Aquatic Primer' as manufactured by Henry Company or manufacturer approved equivalent.

5. Underslab Membrane Vapour Barrier (poly):

- .1 Vapour Barrier - Membrane: 'Perminator', 15 mil polyethylene vapour barrier as manufactured by WR Meadows Inc. (www.wrmeadows.com), Stego Wrap as manufactured by StegoIndustries Ltd. (www.stego.com) or approved equal.
- .2 Vapour Barrier– Joint Tape: minimum 4" (100mm) wide, pressure sensitive, self-adhesive, "Perminator Tape" as manufactured by W.R. Meadows, or Stego Tape and / or Stego Claw as manufactured by Stego Industries Ltd. or approved equal and for use in sealing vapour retarder seams and attachment to footings, foundation walls, protrusions, etc.

6. Exterior Wall Membrane Vapour Barrier (poly):

- .1 Vapour Barrier - Membrane: 10 mil clear polyethylene vapour barrier
- .2 Vapour Barrier– Joint Tape: minimum 4" (100mm) wide, pressure sensitive, self-adhesive, "Perminator Tape" as manufactured by W.R. Meadows, or Stego Tape and / or Stego Claw as manufactured by Stego Industries Ltd. or approved equal and for use in sealing vapour retarder seams and attachment to openings, walls, protrusions, etc.

Part 3. Execution:

7. Exterior Wall Vapour Barrier + air barrier membrane (peel+stick) Preparation / Installation

- .1 Install in all locations as noted on the drawings and as follows;
  - .1 At exterior sheathing, windows and door sills, heads, jambs as detailed
- .2 Brush clean surface. Pre-treat cracks in surface 1.5mm to 3mm wide with sealing compound. Surface must be smooth and without large voids, spalled areas, sharp protrusions or discontinuous surfaces. Remove protrusions. Strike masonry joints full-flush. Fill voids and smooth discontinuous surfaces with non-shrink, dry packed grout. Allow grout to set completely. Concrete must be cured a minimum of 14 days and be free from frost.
- .3 Lap and seal to curtain wall, door frames and other vapor barriers at floor and roof assemblies and as detailed on the drawings to provide continuous air / vapor seal at building envelop.
- .4 Follow manufacturer's installation instructions. Provide 65mm (2.5") laps at both sides and ends. Apply vertical rows in a shingle fashion. Roll all laps with a counter top roller to effect seal. Seal edge of membrane termination, all lap and penetrations with 'HE925 BES Sealant' as manufactured by Bakor.
- .5 Provide 3" lap onto all substrates.
- .6 Install at temperature above 5º C.
- **.7** Do not cover installation of air / vapour membrane until installation has been reviewed by the Architect

.8 COORDINATION OF MECHANICALLY ATTACHED VAPOR PERMEABLE WATER RESISTIVE, AIR BARRIER MEMBRANE INSTALLATION

.1 Download Installation Instructions at http://vaproshield.com/public-documents/installation-instructions.

.2 Installation Summary:

.1 Mechanically attached water-resistive vapor permeable air barrier sheet membrane should be installed horizontally over the outside face of exterior sheathing surfaces or other approved substrates.

.2 Complete detail work at; wall openings, building transitions and penetrations prior to field applications.

.3 Install mechanically attached water-resistive vapor permeable air barrier sheet membrane over the outside face of exterior sheathing surfaces or substrate, measure and pre-cut into manageable sized sheets to suit the application conditions.

.4 Install mechanically attached water-resistive vapor permeable air barrier sheet membrane complete and continuous to substrate in a sequential minimal 6 inch (76 mm) horizontal overlapping weatherboard.

.5 Stagger all vertical end lap seams and overlap a minimum of 12 inch (305 mm).

.6 Roll installed membrane with roller to ensure positive contact and adhesion immediately after the integral tape release film has been removed at the horizontal overlaps.

.3 BUILDING TRANSITION CONDITIONS

.1 Consult published details at www.VaproShield.com.

.2 Tie-in to thru wall flashing membranes, parapets, roofing systems and at the interface of dissimilar materials with adhesive / sealant as recommended by the manufacturer.

.3 Align and position air barrier membrane into bead of adhesive sealant and press firmly into place.

.4 Provide minimum 6 inch (152 mm) lap on to substrates.

.5 Ensure minimum 6 inch (152 mm) overlap at side and end laps of membrane and 6 inch (152 mm) at inside and outside corners, if joints occur at corner locations.

.6 Roll membrane and lap seams with roller to ensure positive contact and adhesion, immediately.

.4 MECHANICAL EQUIPMENT PENETRATIONS

.1 Mechanical pipe, electrical conduit and/or duct work must be secured solid into position prior to installation of mechanically attached water-resistive vapor permeable air barrier sheet membrane.

.2 Electrical services penetrating the wall assembly and mechanically attached water-resistive vapor permeable air barrier sheet membrane must be placed in appropriate conduit and secured solid into position.

.3 Install manufactured flanged penetration sleeves as recommended by sleeve manufacturer.

.4 For straight sided penetrations, cut and fit mechanically attached water-resistive vapor permeable air barrier sheet membrane to accommodate sleeve, install VaproLiqui-Flash to seal the air barrier membrane to ductwork or preformed flange sleeve.

.5 For pipe penetrations, refer to manufacturer's standard details.

.5 WINDOW, DOOR AND OTHER WALL OPENINGS

.1 Lap weather / air barrier onto to air / vapour membrane and seal with Vaprobond adhesive / sealant. Provide a minimum lap of 6"(152mm).

.6 MASONRY TIES

.1 Neatly cut slot in weather / air barrier to accommodate masonry tie.

.2 Seal slot with Vaprobond adhesive / sealant prior to installation of wedge lok plates provided by section 04 26 13 – Masonry Veneer

.7 FIELD QUALITY CONTROL

.1 Notify Architect when sections of work are complete to allow review prior to covering mechanically attached water-resistive weather barrier membrane system, with the installation of the cladding.

.8 PROTECTION

.1 Protect wall areas covered with mechanically attached water-resistive weather barrier membrane from damage due to construction activities, high wind conditions, and extended exposure to inclement weather.

.2 Review condition of mechanically attached water-resistive weather barrier membrane prior to installation of cladding. Repair, or remove and replace damaged sections with new membrane.

.3 Protect exposed back-up walls against wet weather conditions during and after application of membrane, including wall openings and construction activity above completed mechanically attached water-resistive weather barrier membrane installations.

.4 Remove and replace damaged water-resistive weather barrier membrane affected by chemical spills, surfactants, or physical events.

8. Underslab / Exterior Wall Vapour Barrier Preparation / Installation:

.1 Install underslab vapour barrier in accordance with the requirement listed below.

.2 The drawings do not indicate every situation where an air / vapour barrier is required, however it is a requirement in the design of the building to provide an integral monolithic impermeable air / vapour barrier that prevents water leakage and the diffusion of water vapour and air movement under the action of a difference in vapour and air pressure, at the inner face of the insulation. Exercise extreme care to ensure that a fully continuous air/vapour barrier will be maintained over the entire insulated area and that it extends across all junctions between different materials.

.3 Conform with manufacturer's recommendations for storage and application of vapour barrier sheet.

.4 Permanently seal vapour retarder at all penetration, punctures, etc. using vapour barrier membrane and/or joint sealant tape.

.5 Unroll vapour barrier membrane over the area where slab-on-grade is to be poured or at inside face of exterior wall. Cut to size, as required.

.6 Overlap all joints / seams, both lateral and butt, minimum 6" (150 mm) and seal with joint tape. The joint tape area shall be free from dust, dirt and moisture to allow maximum adhesion of tape.

.7 Extend underslab membrane up wall from the bottom to the top of the slab.

.8 Seal vapour retarder to vertical walls with joint tape

.9 Install the steel reinforcing for the slab on grade and radiant floor heating system above the vapour retarded membrane. Protect membrane from puncture prior to pouring of the concrete slab on grade.

07 31 13 – ASPHALT SHINGLE ROOFING

Part 1. General:

1. Scope: Provide all labour and materials required for the supply and installation of the asphalt shingles and eavestrough systems

2. Referenced Standards
   - .1 CAN/CGSB-37.5-M89 — Cutback Asphalt Plastic Cement
   - .2 CGSB — Canadian General Standards Board
   - .3 CCRA — Canadian Roofing Contractors' Association
   - .4 CSA A123.1-M1979 (R1992) — Asphalt Shingles Surfaced with Mineral Granules.
   - .5 CSA A123.3-05 (R2020) — Asphalt Saturated Organic Roofing Felt.
   - .6 CSA A123.51-14 (R2018) — Asphalt Shingle Application on Roof Slopes 1:6 and Steeper.
   - .7 CAN3 A123.52-M85 (R2011) — Asphalt Shingle Application on Roof Slopes 1:6 to less then 1:3
   - .8 CSA-B111 (R2003) — Wire Nails, Spikes and Staples
3. Description of Work / Quality Assurance:
   - .1 Roofing work to be carried out by competent, fully experienced tradesmen. The roofing subcontractor to be prepared to submit evidence of successful specialization in asphalt shingle roofing installations.
   - .2 Work of this Section to include, but not necessarily be limited to, the following:
     - .1 Installation of eave, protection membrane and roofing felt underlayment on wood roof sheathing over entire pitched roof assembly.
     - .2 Installation of asphalt shingles.
     - .3 Co-ordination and installation of roof accessories including ridge vents, roof vents, vent stack flashings, exhaust vents.
     - .4 Co-ordination of eavestrough installation.
4. Extra Materials:
   - .1 Provide two (2) bundles of shingles for use as maintenance materials.
   - .2 Store in location as directed by the Owner.
5. Delivery, Storage And Handling
   - .1 Deliver, handle, store and protect materials in accordance with manufacturer's printed instructions.
   - .2 Provide and maintain dry, off-ground weatherproof storage.
   - .3 Remove only in quantities required for same day use.
6. Waste Management and Disposal:
   - .1 Collect, package and store cutoffs and waste material from work and dispose in accordance with the requirements of authorities having jurisdiction.
7. Environmental Conditions:
   - .1 Roofing work to not be applied during wet conditions such as rain, fog, or snow or over damp, frozen, or unsuitable surface.
   - .2 Generally roofing to be applied at ambient temperatures satisfactory to the manufacturer and under dry conditions only.
   - .3 Review with manufacturer regarding cold weather insulation requirements and procedures.
8. Guarantees and Warranties:
   - .1 Manufacturer's Guarantee:
     - .1 Provide a written guarantee stating that asphalt shingle manufacture will guarantee to replace at its own expense, any portion of the asphalt shingle roofing work which experiences actual leaks resulting from defects in the manufacture of the roofing shingles for a lifetime period from the date the work is completed.
   - .2 Roofing Contractor's Warranty:
     - .1 Provide a written guarantee stating that the roofing contractor will guarantee to repair at its own expense any actual leaks in the asphalt shingle roofing flashing membrane and related sheet metal work resulting from faulty workmanship for a period of two (2) years from the date the work is completed.

Part 2. Products:

1. Materials – Accessories:
   - .1 Cement: Plastic Cement: to CAN/CGSB 37.5 and as recommended by manufacturer
   - .2 Lap Cement: to CAN/CGSB 37.4 and as recommended by manufacturer.
   - .3 Nails: To CSA B111, 11 or 12 gauge with 3/8"dia. heads, of galvanized steel sufficient length to penetrate 3/4" (19mm) into deck.

.4 Sealant: To be one-component, elastomeric, chemical curing complying with CAN/CGSB-19.13-M87, colour to match shingles.

2. Eave Protection Membrane

.1 Composite sheet comprised of rubberized asphalt integrally bonded to a film of high density cross laminated polyethylene. Minimum thickness of membrane to be 1.8mm thick.

.2 Acceptable Materials:

.1 **'WeatherWatch'** as manufactured by GAF

3. **Roofing Underlayment:** '**FeltBuster High Traction Synthetic Roofing Felt'** as manufactured by GAF

4. Asphalt Shingles: Contractor to provide commencement date for roofing installation in order to facilitate testing and inspection.

.1 Asphalt shingles to be in accordance with the requirements of CSA A123.5-16 and as follows:

.1 **Match existing shingle colour as closely as possible. New shingles shall match the quality of the following; 'Timberline HD'** as manufactured by GAF

5. **Ridge + Hip Shingles:** shall be '**Seal A Ridge Protective Cap Shingles',** preformed high form shingles to match type and colour as noted above.

6. Metal Starter Strip: shall be prefinished, galvanized metal, 3" wide" x 2 ¾" vertical leg with drip edge. Colour shall match prefinished metal flashing.

7. **Leading Edge:** shall be **'Prostart Eave / Rake Starter Strip'** as manufactured by GAF.

8. Prefinished Metal Flashing: shall be fabricated from minimum 26 gauge (0.6 mm) base metal thickness, pre-finished, zinc coated steel sheet, commercial quality. Zinc coating shall conform to ASTM A525, latest edition, with Z275 zinc coating designation. Cleats and Starter Strips shall be a minimum 16 gauge (0.06") (1.6 mm) thick zinc coated steel, minimum 2" (50 mm) wide; starter strips continuous. Form in profiles as detailed on the drawings. Provide alkali resistant bituminous paint. Colour shall be selected by the Architect at a later date.

9. Purpose Made Flashings:

.1 **At** vent stacks: Purpose made thermoplastic base flashing, to suit roof penetrations equivalent to SJ-24 or SJ-25 as manufactured by Thaler.

.2 At hot water tank exhaust stacks: Provide a new purpose made flashing system to suit the hot water tank exhaust stack equal to MEF-4A – 'B' Vent flashing as manufactured by Thaler. Size to suit existing vent diameter, ensure flashing has sloped base to suit existing roof slope.

.3 At natural gas pressure relief vent: Thaler, MEF-9 or SPJ-2 type premanufactured flashing system. Size to suit existing vent diameter, ensure flashing has sloped base to suit existing roof slope.

10. Roof Vents:

.1 Roof vent systems shall include the following types;

.1 **RV-1** shall be VMAX-301-12 complete with sloped base flashing to suit roof slope and 12" extension. Where possible reuse existing roof ventilators of this type salvaged from the existing building. All extensions and slope base flashings shall be new.

.2 RV-2 shall be type VMAX standard louvered penthouse C-40 complete with sloped base flashing to suit roof slope and position of vent at peak of slope.

.3 RV-3 shall be type VMAX-AT2-1836L.

.2 Colour: shall match existing; Dark Brown QC-8229, VW-6062.

.3 As manufactured by Ventilation Maximum (www.ventilation-maximum.com).or equivalent approved by the Architect.

11. Eavestroughing Systems:

.1 Eavestroughing systems as manufactured by Seamless Eavestrough Limited (www.seamless-eavestrough.com) or equal as approved by the Architect to have the following characteristics;

.1 Eavestrough material; prefinished aluminum, 0.032" thick, preformed, continuous (i.e. without joints except at corners) into a 5" eavestrough and complete with premanufactured box mitre corners mechanically fastened and sealed to eavestrough with gutter seal caulking by Tremco and 'fixatech' perforated eavestrough protection system.

.2 Colour; to be selected by the Architect from the manufacturer's standard colour range.

.3 brackets; purpose made galvanized brackets with screw fasteners at 18" o/c typical that attach Eavestrough to the wood fascia

.4 Downspouts; prefinished aluminum, 0.032" thick, preformed into a 3" x 4" (100mm x 127mm) downspouts complete with elbows, pipe straps, plug and stainless steel screws as required to complete installation. Downspouts are to be located, at a minimum every 30'-0" (9m) typical.

.5 Provide perforated pipe sections typical; non-perforated "snap tee" pipe section and down spout adapter at connection to down spout system (refer to details and civil drawings). Provide adapters, fittings, couplings as required.

Part 3. Execution:

1. General

.1 Remove existing shingles, underlay and eave protection. Clean existing deck.
.2 Inspect existing deck and ensure wood deck is smooth, dry, firm and in good condition.
.3 Report wood deck deficiencies to Architect prior to proceeding with the work.
.4 Do asphalt shingle work in accordance with CSA A123.51-14 (R2018) - Asphalt shingle application on roof slopes 1:6 and steeper, except where specified otherwise.

2. Starter Strip

.1 Install metal drip edges to the deck along the eaves and rake, in a bed a roofing cement and fasten to deck with roofing nails at 12" o/c max.

3. Eave Protection Membrane Application:

.1 Install eave protection membrane over the entire roof areas scheduled to receive asphalt shingles in accordance with the manufacturer's printed instructions.
.2 Eave protection to extend from the edge of the roof beginning at the low point. Overhang eaves by ¼ - ¾". Lap successive courses a minimum of 75mm (3") with 150mm (6") end laps.
.3 Provide a layer of eave protection membrane using 36" (900mm) widths centered on hips and valleys and roof / wall intersections. Extend up walls as detailed on the drawings. Refer also to drawings for extent at parapet walls.
.4 Install vent stack flashings and roof vents to suit roof penetrations.
.5 Provide eave protection membrane to seal vent stack flashings and roof ventilators to a minimum of 600mm (2'-0") around their respective perimeters, in locations indicated and make watertight.

4. Roofing Underlayment Installation:

.1 Ensure roof deck is swept clean, dry and free of debris.
.2 Unroll underlayment and lay flat on roof deck, horizontally starting at bottom of roof. Overlay eave protection by at least 4". Printed side shall face up.
.3 Provide 4" side laps and 6" end laps.
.4 Secure underlayment with roofing nails at locations as required to hold in place until shingles are installed.
.5 Space fasteners at 8" o/c on both sides of end laps.
.6 Fasten at 24" down middle of the roll in the field of the roof.

5. Valley Application:

.1 At an open valley installation complete the work as follows;
  .1 Install 24" wide, open metal valleys at centre line of all valleys using galvanized, prefinished metal valley liner. Use roofing nails to hold in place until shingles are installed.
  .2 Snap chalk lines in place defining the valley, 6" wide at the top and increasing in width by 1/8" for every 1' in length.
  .3 Install shingle so they lap over valley flashing and trim the ends of the shingles at the chalk line.
  .4 Cut a 2" triangle off the corner to direct water to the valley.
  .5 Embed the valley end of each shingle into a 3" band of asphalt plastic cement.
  .6 Do not place a nail in the shingle closer than 2" from the chalk line.
.2 At a closed cut valley application complete the work as follows;
  .1 Run the first course of shingles from the higher roof slope across the valley at least 12"(305mm).
  .2 Run the succeeding courses of shingles from the lower roof slope across the valley at least 12"9305mm) and nail not closer than 6"(152mm) to the centre of the valley
  .3 Ruin shingles from the upper slope into the valley and trim 2": (51mm) from the centre line of the valley.

6. Leading Edge Application:

.1 Install leading edge as per manufacturers written instructions.
.2 At lower left edge apply the cut leading edge shingle flush to the rake and eave edges of the leading edge with the matching colour portion on the bottom.
.3 Continue with a full length leading edge to the roof deck with four nails located 3" from the eave edge, approximately 1" from each end and midway between these points.
.4 Install continuous leading edge course at eave and rake.

7. Asphalt Shingle Application:

.1 First Course: Start with a full shingle. Apply the shingle flush with the starter course at rakes and eaves. Fasten the shingle with 4 nails. Continue with full length shingles to complete the first course, trimming the last shingles so that it matches the overhang of the starter course below.

.2 Snap chalk lines to aid installation: Coordinate exposure dimension with shingle type.

.3 Laterally offset each row of shingles from existing keyways to avoid waves or depressions caused by excessive dips in the roofing materials. Shingle offset varies Coordinate with manufacturer as required.

.4 Secure with nails as required to provide maximum resistance to wind.

.5 Drive nail to be flush with shingle surface.

.6 Manually apply roofing cement to seal shingles. Seal down each shingle at time of application with 3 – 1" diameter spots of roofing cement placed under each shingle, 2" above the bottom edge and equally spaced along the shingle. Use roofing cement sparingly.

8. Hips and Ridge Shingle Application:

.1 At hips and ridges install precut hip and ridge products as specified. Bend over hip or ridge and nail as per manufacturer's printed instruction. All nails shall be hidden.

.2 Final shingle shall be set in roofing cement, exposed heads of nails shall be covered with roofing cement.

9. Eavestrough Application:

.1 Install eavestrough is accordance with manufacturer's instructions and recommendations.

.2 Caulk abandoned holes in existing building envelop with Type A caulking as identified in Section 07 72 00 – Sealants.

.3 Fabricate lengths of eavestrough and downspouts to suit eaves and building dimensions. Field verify conditions on site prior to fabrication.

.4 Install premanufactured galv brackets at 18" o/c to hold eavestrough at fascia.

.5 Install premanufactured box mitre corners at corner conditions. Set in bead of gutter seal caulking and mechanically fasten corner to eavestrough. Caulk exposed joints within eavestrough using gutter seal caulking by Tremco.

.6 Install downspouts, elbows as required using stainless steel mechanical fasteners and gutter seal caulking at joints.

10. Completion:

.1 Upon completion, remove from site tools, plant, surplus material and debris resulting from work of this Section.

07 40 00 – PREFORMED METAL SOFFIT

Part 1. General:

1. Design Requirements:
   - .1 The preformed metal soffit system shall be designed in accordance with Reference Standards specified herein and to the following requirements:
     - .1 Positive wind load support: 1.915 kPa (40 psf).
     - .2 Negative wind load support: 1.436 kPa (30 psf).
     - .3 Deflection: not to exceed 1/180 of the span.
     - .4 Tensile stress: 138 MPa (20,000 psi) for the steel exterior element but in any case shall not exceed the values permitted by CSA S136.
   - .2 In addition to the design parameters indicated, design all preformed metal soffits to withstand wind uplift.
2. Shop Drawings:
   - .1 Submit preformed metal soffit shop drawings for the fabrication and installation of metal soffit in accordance with Section 01 33 00, Submittal Procedures.
   - .2 Clearly indicate type of metal soffit being supplied, materials, gauges, profiles, openness, types and locations of fastenings and installation details.
   - .3 Shop drawings shall bear the Seal of a Professional Structural Engineer registered in the Province of Ontario verifying the structural capabilities of the system.
   - .4 Samples: Submit to the Consultant in accordance with Section 01 33 00, two (2) 300mm x 300mm prepainted sample sections of metal soffit. Finished work shall match samples in colour, gloss and texture.
3. Delivery, Handling and Storage:
   - .1 Protect the work of this Section from damage. Protect other work from damage resulting from this work. Damaged work which cannot be satisfactorily repaired shall be replaced at no additional cost to the Owner.
   - .2 Store materials on site in a manner to prevent damage thereto, or deterioration of finish. Galvanized surfaces which show evidence of "white rust" will not be accepted.
   - .3 Stockpile panels tilted to provide water run-off, free from ground contact on firm, level, non-staining supports extending full width of sheet and spaced not more than 450mm apart. Cover components with opaque polyethylene sheet to protect from direct sunlight and moisture penetration. Vent to allow air movement.
   - .4 Conduct transport of materials to the job site storage compound in such a manner to prevent in-transit damage. These measures shall include, but not limited to crating, polyethylene wrapping system, etc.

Part 2. Products:

1. Prefinished Metal Soffit:
   - .1 39mm deep x 300mm wide sheet width, min. 30% open air perforation, as manufactured by VicWest Steel or equivalent profile as manufactured by Peerless or Canadian Metal Rolling Mills.
   - .2 Prefinished Aluminum Soffit and Trim: shall be 16" wide, 2 panel vented soffit, 4.02 in2 per linear foot of clear ventilation, as manufactured by Gentek. Or alternate approved by Consultant.

2. Painted Finishes
   - .1 Prior to fabrication all preformed perforated soffit sheets and accessories shall be cleaned and pre-treated prior to application of an inhibitive primer and shall receive a paint finish equal to the following:
     - .1 VicWest Colorite HMP Series, ceramic pigmentation, polyester paint coating, and wash coat on reverse (hidden) side.
     - .2 Alternate approved by Consultant.
   - .2 Colour to be chosen by Architect at a later date from the manufacturers standard colour range.

3. Vent Screening: fabricated from 4'x10'x 0.040" perforated aluminium sheet pre-painted black. Perforation pattern shall be 3/16" dia. at ¼" staggered centres for 50% net free area.

4. Accessories:
   - .1 Sheet Metal Flashings / Trims: shall be fabricated from minimum 26 gauge (0.6 mm) base metal thickness, pre-finished, zinc coated steel sheet or aluminum, commercial quality. Zinc coating on sheet steel shall conform to ASTM A525, latest edition, with Z275 zinc coating designation. Cleats and Starter Strips shall be a minimum 16 gauge (0.06") (1.6 mm) thick zinc coated steel, minimum 2" (50 mm) wide; starter strips continuous. Form in profiles as detailed on the drawings. Colour shall match soffit colour.

.2 Sealants: In accordance with Section 07 72 00, Joint Sealants. Colour to match exterior face sheets where exposed.

.3 Wood Strapping: S-DRY, graded and stamped to National Lumber Grades Authority, Standard Grading Rules for Canadian Lumber.

.1 Strapping: spruce, pine or fir (SPF), standard or better grade.

.4 Accessories: Miscellaneous clips, splicers, carriers, connectors, screws, nails, and other standard accessories shall be zinc-coated, be of strength and design compatible with the system specified. Provide all special accessories to complete the work.

.5 Fasteners: Concealed fasteners shall be stainless steel with hex head.

Part 3. Execution:

1. Examination:
   .1 Co-operate with all trades to ensure proper installation of metal soffit panels and flashings as soon as preceding work is ready to receive same.
2. Fabrication:
   .1 Roll form profiled panels and other Work unless impossible because of special design. Use other forming methods only with Consultant's approval. Form bends sharp and true.
   .2 Fabricate to conform to reviewed shop drawings, and to allow for structural movement within system.
   .3 Fabricate system to prevent entry of water into building and from collecting within wall assembly, and to prevent infiltration or exfiltration of air through system.
3. Installation:
   .1 Installation shall be by skilled mechanics, and in strict accordance with system manufacturer's printed directions, to produce a first-class installation, in true planes.
   .2 Erect metal components and accessories in strict accordance with reviewed shop and erection drawings and manufacturer's written instructions. System shall be installed plumb, straight and true to adjacent work. Co-operate with other trades to ensure proper installation and anchorage of this Work.
4. Cleaning:
   .1 Upon completion of the installation, clean down all preformed metal cladding and soffit and leave all work installed under this section clean.
   .2 Use only cleaning agents recommended by the cladding manufacturers.

07 42 10 – PREFORMED METAL EAVESTROUGH

Part 1. General:

1. **Scope:**
   - **.1 Provide all labour and materials required for the supply and installation of the eavestrough systems**
   - **.2 Coordinate with installation of roofing and subsurface drainage systems as specified and detailed on the drawings.**
2. Referenced Standards
   - .1 CCRA Canadian Roofing Contractors' Association
   - .2 ASTM A653/A 653M-001; Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. Description of Work / Quality Assurance:
   - .1 Roofing work to be carried out by competent, fully experienced tradesmen. The eavestrough subcontractor to be prepared to submit evidence of successful specialization in eavestrough installations.
   - .2 Work of this Section to include, but not necessarily be limited to, the following:
     - .1 Installation of new eavestrough and downspouts
     - .2 Co-ordination with other trades; roofing, metal flashing, subdrain installation.
4. Delivery, Storage And Handling
   - .1 Deliver, handle, store and protect materials in accordance with manufacturer's printed instructions.
   - .2 Provide and maintain dry, off-ground weatherproof storage.
   - .3 Remove only in quantities required for same day use.
5. Waste Management and Disposal:
   - .1 Collect, package and store cutoffs and waste material from work and dispose in accordance with the requirements of authorities having jurisdiction.
   - .2 Environmental Conditions:
     - .1 Work shall not be applied during wet conditions such as rain, fog, or snow or over damp, frozen, or unsuitable surface.
     - .2 Work to be applied at ambient temperatures satisfactory to the manufacturer and under dry conditions only.
     - .3 Do not apply in cold weather conditions.
6. Guarantees and Warranties:
   - .1 Manufacturer's Guarantee:
     - .1 Provide a written guarantee stating that eavestrough manufacturer will guarantee to replace at its own expense, any portion of the eavestrough work which experiences actual leaks resulting from defects in the manufacture, workmanship or installation of the eavestrough for a 5 year period from the date the work is completed.

Part 2. Products:

1. Materials – Accessories:
   - .1 Sealant: To be one-component, elastomeric, chemical curing complying with CAN/CGSB-19.13-M87, colour to match shingles.
   - .2 Fastners: Stainless steel fasteners, sizes and types as recommended by the manufacturer.
2. Eavestroughing Systems:
   - .1 Eavestroughing systems as manufactured by Seamless Eavestrough Inc, sales@sudburyseamless.ca, 705 561 2205 or equal as approved by the Architect to have the following characteristics;
     - .1 Eavestrough material; galvanized, prefinished metal, 24 gauge, 0.024" thick, preformed, continuous (i.e. without joints except at corners) into a 175mmx 139.7mm (7" x 5.5") eavestrough and complete with premanufactured box mitre corners mechanically fastened and sealed to eavestrough with gutter seal caulking by Tremco and 'fixatech' perforated eavestrough protection system.
     - .2 Provide removable, perforated metal caps at gutters that protect gutter from collection of leaves or other debris but permit waterflow. Provide a minimum of 50% open rate with perforations. Use the same galvanized, prefinished metal used to construct eavestrough.
     - .3 Colour; Black
     - .4 brackets; purpose made galvanized brackets with stainless steel screw fasteners at 18" o/c typical that attach eavestrough to the wood fascia
     - .5 Downspouts; prefinished aluminum, 24 gauge, 0.024" thick, preformed into a 5" x 5" (125mm x 125mm) downspouts complete with elbows, pipe straps, plug and stainless steel screws as required to complete

installation. Downspouts are to be located, at a minimum every 30'-0" (9m) typical and as indicated on the drawings.

.6 Provide perforated pipe sections typical; non-perforated "snap tee" pipe section and down spout adapter at connection to down spout system (refer to details and civil drawings). Provide adapters, fittings, couplings as required.

3. Concrete Splashpads – Where scheduled / detailed provide precast concrete splash pads at downspouts, 12" x24" x 2.5" with sloped gutter and outlet at one end only as manufactured by Brooklin Concrete or approved equal.

Part 3. Execution:

1. General
   - .1 Inspect condition and confirm that substrates are installed, cleaned and ready for installation of eavestrough and downspouts.
   - .2 Inspect outlets for subdrains and ensure these locations are ready for installation of downspouts.
2. Eavestrough Application:
   - .1 Install eavestrough in locations as indicated on the drawings and in accordance with manufacturer's instructions and recommendations.
   - .2 Fabricate lengths of eavestrough and downspouts to suit eaves and building dimensions. Field verify conditions on site prior to fabrication.
   - .3 Install premanufactured galv brackets at 18" o/c to hold eavestrough at fascia.
   - .4 Install premanufactured box mitre corners at corner conditions. Set in bead of gutter seal caulking and mechanically fasten corner to eavestrough. Caulk exposed joints within eavestrough using gutter seal caulking by Tremco.
   - .5 Install downspouts, elbows as required using stainless steel mechanical fasteners and gutter seal caulking at joints.
3. Completion:
   - .1 Upon completion, remove from site tools, plant, surplus material and debris resulting from work of this Section.
   - .2 Flood test eavestrough system and confirm that there are no leaks in the system and water flows freely and effectively through system.

07 72 00 – JOINT SEALANTS

Part 1. General

1. Scope**:**
   - **.1** Provide sealants of the following types and at the specified locations.
   - **.2** Provide sealant backing as conditions require.
   - **.3** Provide cleaning materials as required to remove excess sealant from adjacent material without damage.
   - **.4** Protect the work from damage.
2. Submittals: Prior to commencing the work submit the following items;
   - **.1** Submit preparation instructions and recommendations.
   - **.2** Submit samples for colour selection.
   - **.3** Submit a sample of each product.
3. Warranty
   - **.1** Special Manufacturer's Warranty: Manufacturer's standard form in which joint sealant manufacturer agrees to furnish joint sealants to repair or replace those that demonstrate deterioration or adhesive or cohesive failure under normal use within warranty period specified.
   - **.2** Warranty Period for Silicone Sealants: Five years date of Substantial Completion.
   - **.3** Special Installer's Warranty: Original statement on Installer's letterhead in which Installer agrees to repair or replace joint sealants that demonstrate deterioration or failure within warranty period specified.
   - **.4** Warranty Period: Two years from date of Substantial Completion.
   - **.5** Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
     - .1 Movement of the structure caused by structural settlement or stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
     - .2 Disintegration of joint substrates exceeding design specifications.
     - .3 Mechanical damage caused by outside agents.
     - .4 Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

Part 2. Products:

1. Schedule:
   - **.1** Type A – exterior, non-traffic bearing weather side of construction, multi component urethane based chemical curing sealant conforming to ASTM C920 Type S, Grade NS, Class 35; Dymonic FC manufactured by Tremco Limited, or approved equal. Provide sealant at joints between window / door frames and adjacent wall construction, at control joints in masonry, between and at other exterior locations as noted on the drawings.
   - **.2** Type B – interior, non-traffic bearing, one component, interior polyurethane sealant conforming to CAN/CGSB-19.13-M87; Sikaflex 1a manufactured by Sika. Provide sealant at joints between interior window / door frames and adjacent wall construction and at other interior locations as noted on the drawings.
   - **.3** Type C – interior sanitary caulking: one (1) component, chemical curing, mildew resistant, silicone conforming to CAN/CGSB-19.22-M, containing non-toxic fungicidal agents; DOWSIL 786 as manufactured by Dow Corning Canada Limited, Sanitary 1700 as manufactured by GE Silicones Canada or Proglaze as manufactured by Tremco Limited. Provide sealant at joints between washroom vanities, urinals, toilets, counters and backsplashes and adjacent wall / floor surfaces in kitchens, washrooms, kitchens and wet areas and as noted on the drawings.
   - **.4** Backing: Provide polyurethane backer rods as recommended by the caulking manufacture. Ensure backer rods and caulking materials are compatible.
   - **.5** Masking Material: Removable painting / masking tape.
   - **.6** Cleaning Materials: Commercial grade solvent as recommended by the caulking manufacturer.

Part 3. Execution

1. Installation of New Sealant Systems
   - **.1** Review project and identify areas where caulking is required. Refer to schedule noted in Part 2 of this section.
   - **.2** Select colour of caulking to match adjacent finished surfaces.
2. Examination
   - **.1** Examination of Existing Joint Sealants: Examine existing joint sealants indicated to be replaced. Examine joints for compliance with requirements for joint configuration, installation tolerances, condition of joint substrate, and other conditions affecting joint-sealant performance.

.2 Submit report indicating conditions that cannot be corrected to comply with joint sealant manufacturer's recommendations as part of the specified joint replacement or rehabilitation. Proceed with work once non-complying conditions are corrected.

3. Joint Preparation

.1 Removal of Failed Joint Sealant Materials: Cut out and remove joint materials and associated backing materials as indicated on drawings.

.2 Surface Cleaning of Joint Substrates: Clean joints thoroughly immediately before installing joint sealants. Remove foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

.1 Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods in addition to solvent cleaning to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Remove laitance and form-release agents from concrete.

.2 Clean porous and nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

.3 Masking: Mask adjacent surfaces to prevent staining or damage by contact with sealant or primer. Provide wood planks or other approved, non-staining means of protection for the completed caulking and sealants installations where required to protect the work from mechanical, thermal, chemical and other damage by other construction operations and traffic. Maintain protection securely in place until project completion.

.4 Joint Backing: Select joint backing materials recommended by sealant manufacturer as compatible with sealant and adjacent materials. Install backing material at depth required to produce profile of joint sealant allowing optimal sealant movement.

.5 Install joint backing to maintain the following joint ratios:

.1 Joints up to 1/2 inch (13 mm) wide: 1:1 width to depth ratio.

.2 Joints greater than 1/2 inch (13 mm) wide: 2:1 width to depth ratio; maximum 1/2 inch (13 mm) joint depth.

.3 Install bond breaker tape over substrates when sealant backings are not used.

4. Installation of Joint Sealants

.1 Sealant and Primer Installation Standard: Comply with ASTM C 1193 and manufacturer's written instructions.

.2 Joint Priming: Prime joint substrates when recommended by sealant manufacturer or when indicated by preconstruction testing or experience. Apply recommended primer using sealant manufacturer's recommended application techniques.

.3 Joint Sealant Application: Install sealants using methods recommended by sealant manufacturer, in depths recommended for application. Apply in continuous operation from bottom to top of joint vertically and horizontally in a single direction. Apply using adequate pressure to fill and seal joint width.

.1 Tool sealants immediately with appropriately shaped tool to force sealants against joint backing and joint substrates, eliminating voids and ensuring full contact.

.2 Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

.3 Tool exposed joint surface concave using tooling agents approved by sealant manufacturer for application.

.4 Cleaning: Remove excess sealant using materials and methods approved by sealant manufacturer that will not damage joint substrate materials.

.1 Remove masking tape immediately after tooling joint without disturbing seal.

.2 Remove excess sealant from surfaces while still uncured.

.3 Clean caulking if required.

.4 Replaced damaged caulking where required.

07 84 00 – FIRESTOPPING AND SMOKE SEALS

Part 1. General:

1. **Scope:** Provide tested firestop systems conforming to 'CAN/ULC-S115 – Fire Test of Fire Stop Systems' at penetrations / joints at fire separations in the project.
   - **.1** Firestop systems to have 'F' type rating not less than value required of a closure located in the fire separation. For fire separation with a fire resistance rating of 45min, a closure or 'F' rating of 30 minutes (minimum) is required.
   - **.2** Refer to drawings for the location of fire separations.
2. **Submittals:** Provide cUL or ULC shop drawings for tested firestop solutions that match existing conditions of penetrations and articulate required materials and components required to achieve required F rating. Where no cUL of ULC tested assembly is available provide and 'engineered judgement' prepared by the systems manufacturer and signed and sealed by an engineer licensed in the province of Ontario. Refer to Submittal Schedule.

Part 2. Products:

1. Materials to include Intumescent Firestopping Systems and related components and manufactured by Hilti. Hilti (Canada) Corporation, Mississauga, Ontario, 1-800-363-4458/www.ca.hilti.com or equals by Tremco or AD Fireproofing.

Part 3. Execution:

1. Complete a thorough review of the existing conditions, location of existing / new fire separations as indicated on the drawings.
3. Complete a thorough review of existing and new construction assemblies and penetrations at the assemblies at fire separations.
4. Install the firestopping materials and methods in accordance with the manufacturers printed instructions.
5. Coordinate review of firestopping with the Architect prior to covering up completed work of this section.

DIVISION 08 – OPENINGS

08 13 13 - HOLLOW METAL DOORS AND FRAMES

Part 1. General:

1. Scope: Provide labour and materials as required to supply hollow metal doors and frames.
1. Submittals:
   - **.1** Shop Drawings: Provide shop drawings that note / illustrate the following; manufacturer, number, size, door types, frame types / profiles, jamb type and depth, fire rating, gauge, glass units, anchor types, finish, door core.
   - **.2** Manufacturer's Literature: Provide manufacturer's literature on door and frame types and maintenance requirements.
2. Warranty:
   - **.1** Submit manufacturers' standard warranty covering the maintenance, repair or replacement of defective work for a period of one (1) year from the expiration of the standard one (1) year warranty included in the Contract under the General Conditions.
   - **.2** Structural failure, leaking, loosening, fading, discolouration, deforming and failure of doors and frames to be judged as defective work.
   - **.3** Total warranty period to be two (2) years.
3. Product Delivery, Storage, and Handling:
   - **.1** Brace frame units to prevent distortion in shipment, and protect finished surfaces by sturdy protective wrappings.
   - **.2** Store doors in protective wrappings in a secure dry location, to ensure that they are not damaged until hung. Install them only when work has progressed to a stage when no damage will occur to them in place.
4. Steel Fire Rated Doors and Frames: Doors and frames to be labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN/ULC S-104-2015, CAN4 S105-2016 and NFPA-80, 2016 edition for ratings specified or indicated.

Part 2. Products:

1. Manufacturers:
   - **.1** Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include; but are not limited to, the following:
     - .1 Fleming Steel Doors & Frames.
     - .2 Baron Metal Doors & Frames.
     - .3 Artek Door Ltd.
     - .4 Or approved equal.
2. Materials:
   - **.1** Steel: commercial grade steel to ASTM A568, Class 1, wiped coat galvanized to ASTM A527, coating designation ASTM A525, ZF75 typical.
3. Doors and Panels:
   - **.1** Facings, rails, stiles: 5/64" (1.2mm) (18 ga.) base steel thickness.
   - **.2** Interior Stiffeners: 0.914mm base steel thickness.
   - **.3** Hardware Reinforcement: 1/8" (3mm) base steel thickness.
   - **.4** Interior Doors - Sound Deadening Material: semi-rigid fibreglass 24 kg/m3 minimum density, to fill core space. Honeycomb structural core consisting of kraft paper with 3/4" (19mm) cells x core thickness may be used at interior locations.
   - **.5** Exterior Doors: door panels shall be D Series Doors by Fleming Door Products with insulating material: injected polyurethane foam, min U factor (imperial) 0.29, R3.4
   - **.6** Interior Doors: door panels shall be D Series Doors by Fleming Door Products or equivalent.(Maximum opening size, 4' x 10' single, Maximum opening size 8' x 10' pair)
   - **.7** Glazing Stops: 1/16" (1.6mm) base steel thickness, formed, drilled and countersunk for fasteners.
4. Interior Frames:
   - **.1** Steel: 1/16" (1.6mm) (16 ga.) base thickness.
   - **.2** Hardware Reinforcement: 1/8" (3mm) base steel thickness.
   - **.3** Mortar Guards: 0.762mm base steel thickness.
   - **.4** Rubber Bumpers: Glynn-Johnson GJ64 or approved equivalent.
2. Interior Door Frames (**in existing masonry openings only**): shall be A Series Door Frames by Fleming Door Products or equivalent, having the following characteristics;
   - .1 16 ga base thickness knock down frames
   - .2 Adjustable throat width 3.5" to 12.5"

.3 Reinforced with 14 ga sliding brackets, 10 ga plates at hinges, 16 gauge plates at strikes and 20 gauge clips at head.
.4 Secured on both sides a frame at factory dimples with fasteners as recommended by the manufacturer.
.5 Provide 12 ga surface closer reinforcing at head.
.6 Customize to suit hardware as scheduled.

5. Exterior Frames:
.1 Steel: 1/16" (1.6mm) (16 ga.) base thickness.
.2 Hardware Reinforcement: 1/8" (3mm) base steel thickness.
.3 Mortar Guards: 0.762mm base steel thickness.
.4 Rubber Bumpers: Glynn-Johnson GJ64 or approved equivalent.
.5 Insulation: Fill solid with polyurethane foam, min U factor (imperial) 0.69, R1.45
.6 Maximum Frame Depth: to suit existing condition complete with exposed retrofit fastners to exterior wall blocking or masonry.
.7 **Thermally Broken: Frame shall be constructed with a pvc spline separating interior and exterior parts of the hollow metal frame.**
6. Anchors:
.1 Frames in Masonry: adjustable "T" strap anchors.
.2 Labelled Frames: to conform to ULC requirements.
.3 Frames in Gypsum Board Partitions: steel anchor clips and floor anchors of suitable design securely welded inside each jamb.
.4 Anchorage to Floor: minimum 1/8" (3mm) thick clip angles with 2 holes for expansion bolting to floor.
7. Galvanizing:
.1 Typical interior units: steel sheet wipe coated with zinc-iron alloy to a total mass coating both sides of 75 g/m2 to conform to ASTM A525M, Z275 coating designation.
.2 Exterior units, and interior units in unheated areas: steel sheet coated with zinc to a total mass coating both sides of 275 g/m2 to conform to ASTM A525M, Z275 coating designation. Mill phosphatize to provide for good paint adhesion.
8. Fabrication:
.1 General:
.1 Fit and assemble work in the shop, where possible. Make trial assembly in shop when not possible.
.2 Fabricate, reinforce and anchor component parts and assemblies to support loads that usage will impose without deflection detrimental to function, appearance or safety. For interior doors either the use of metal stiffeners with the spaces between stiffeners filled with insulation, or honeycomb structural core will be acceptable. For exterior doors the core is to be completely filled with insulation.
.3 Reinforce components to resist in-use stresses imposed by finishing and security hardware.
.4 Prepare frames and doors for finish hardware with mortises and reinforcement. Drill and tap to template information. Reinforce for surface-mounted hardware and for door closer brackets. Provide for concealed door closers where specified. Install mortar guards at cut-outs and reinforcing plates in frame. For cylindrical locks install reinforcing units to lock manufacturer's specification. For mortise locks provide a suitable internal bracket to hold the lock case rigidly in the centre of the door.
.5 Provide for anticipated expansion and contraction of frames and supports.
.6 Fit elements at intersections and joints accurately together in true planes, plumb and level.
.7 Weld frame and door assemblies. Weld continuously at joints exposed to view including door edge seams, or at joints through which air or water could penetrate from the exterior of the building to the interior. Seams shall be welded, filled and sanded flush.
.8 Where welding is impossible, connections may be bolted. Ream drilled holes and leave exposed edges clean and smooth.
.9 Isolate from each other dissimilar metals and metal from concrete or masonry, to prevent electrolysis.
.10 Ensure that exterior doors and frames are tightly fitted, and that entry of water is prevented by drips on head frames of out swinging doors exposed to weather.
.11 Make allowance in frames and doors to receive electrical conduits for security strikes and contactors which may be installed in doors and frames. Provide electrical conduit protection mortar boxes to receive conduit for electric strikes, locks, door closers, and hinges as detailed.
.12 Fabricate hollow metals and frames and screens in accordance with CSDFMSA, Specifications for Commercial Steel Doors and Frames, Latest Edition.
.13 Coordinate fabrication of hollow metal doors, frames, and screens with hardware schedule.
.2 Doors and Frames:

.1 Fabricate interior and exterior doors and panels with sheet steel in specified base steel thickness.
.2 Minimum panel thickness applies only to doors not otherwise requiring heavier gauges to meet specified fire-rated construction.
.3 Fabricate doors with faces true and smooth, and with no dimples or welds visible.
.4 Bevel edges of stiles to suit door swing.
.5 Locate hardware to Canadian Steel Door & Frame Manufacturer's Association Standard, unless shown otherwise on Drawings or Door Schedule.
.6 Fill solid all voids within doors and panels with insulation, or honeycomb core. For exterior doors and panels, fill voids with insulation.
.7 Fabricate muntins, removable stops, and glass mouldings of minimum 1.2mm steel.
.8 Prepare doors to receive glass and grilles. Install grilles. Secure removable stops with countersunk Phillips oval head screws symmetrically spaced on stop lengths.
.9 Close top and bottom edges of exterior doors to make a weathertight seal, and doors to which the tops can be seen from stair landings or other high elevations, so that they are flush with face edges.

.3 Anchors:

.1 Provide frames for installation in masonry walls with the following number of anchors:
.1 Frames up to 7'-6" (2300mm) height, 3 anchors
.2 Frames 7'-6" (2300mm) to 8'-0" (2400mm), 4 anchors
.3 Frames over 8'-0" (2400mm), 1 anchor for each 2'-0" (600mm) or fraction thereof in height over 8'-0" (2400mm).

.2 Provide frames for installation in stud partitions with the following number of anchors:
.1 Frames up to 7'-6" (2300mm height, 4 anchors
.2 Frames 7'-6" (2300mm) to 8'-0" (2400mm),, 5 anchors
.3 Frames over 8'-0" (2400mm),, 5 anchors, plus 1 additional for each 2'-0" (600mm) or fraction thereof in height over 8'-0" (2400mm).

.3 Provide frames to be anchored to previously-placed concrete, masonry, or structural steel, with anchors of suitable design, as shown on reviewed shop drawings.
.4 Securely weld adjustable floor anchors to inside of each jamb profile, with two holes provided at each jamb for floor anchorage.
.5 Anchors shall have minimum gauges: "T" strap type, 1/16" (1.6mm) "L" type, 3/64" (1.2mm); wire type, 5/32" (3.9mm) diameter; stirrup type, 1/16" (1.6mm); stud type, 3/64" (1.2mm); jamb spreaders; 3/64" (1.2mm).

9. Finishing:
.1 Carbon Steel: Clean and smooth work at welds which has been ground. Fill if necessary, and prime all areas from which zinc has been removed.

10. Fire Rated Hollow Metal Doors and Frames:
.1 Construct fire-rated doors and frames of ratings indicated, in accordance with ULC Section 120 IDO, and as otherwise required by Jurisdictional Authorities. Fire rated screens containing doors shall be labelled (whole assembly).
.2 Ensure that hardware used meets requirements of ULC 120 ID16, and installed to NFPA 80 requirements.
.3 Doors and frames indicated as labelled shall have attached ULC labels. Attach labels on the inside of the hinge jamb midway between the top hinge and the head of the door frame. Where fire doors are shown in pairs swinging in the same or opposite directions they shall bear a ULC label of a category that does not require astragals.

11. Temperature Rise Limit:
.1 In addition to fire protection rating, certain doors require a maximum temperature rise limit, and are indicated on the Door Schedule by the designation "TRL".
.2 Provide combination temperature rise and fire protection rating label, attach to the door at the same location specified for fire rated doors.

Part 3. Execution:

1. Examination:
.1 Examine areas which are to receive the work of this section. Correct unsatisfactory conditions prior to start of work. Commencement of work implies acceptance of conditions as they exist and no extra will be allowed for failure to ensure satisfactory substrate condition.

2. Installation:
.1 Installation of the work of this Section is specified in other Sections.

08 36 50 – OVERHEAD DOORS

Part 1. General:

1. Scope: Provide labour and materials for the complete installation of exterior insulated overhead doors.
2. Submittals:
   - .1 Shop Drawings:
     - .1 Submit shop drawings in accordance with Division 01.
     - .2 Indicate sizes, service rating, types, materials, operating mechanisms, details, hardware and accessories, required clearances and electrical connections.
     - .3 Provide load diagrams of the doors in the closed and open positions. Details to also be provided showing clearance and attachment requirements for co-ordination with structural steel and miscellaneous steel installed by others.
     - .4 Field verify and confirm size of opening to receive new overhead doors.
   - .2 Operation and Maintenance Data:
     - .1 Upon completion and acceptance of installation, provide the following operation and maintenance data for incorporation into maintenance manual in accordance with the requirements of Division 01.
     - .2 Maintenance data to include instructions, data books, general layout drawings and schematic wiring diagrams containing sufficient information for operation and maintenance / servicing of doors.

Part 2. Products:

1. Acceptable Manufactures:
   - .1 Drawings and specifications for work of this Section are based on Thermatite Model 175 Insulated Sectional Overhead Doors as manufactured Richards-Wilcox Canada Inc.
   - .2 Products and systems by other manufacturers of similar profile and conforming to all required design and performance requirements of the drawings and specifications are also acceptable.
   - .3 Acceptable manufacturers:
     - .1 Richards-Wilcox Canada Inc.
     - .2 Atlas Roll-Lite Co. Ltd.
     - .3 Kinnear / Wayne Dalton Corp.
     - .4 Alternate approved by Consultant.
2. Materials – General:
   - .1 Galvanized steel sheet: commercial quality to ASTM A 526M with Z275 zinc coating.
   - .2 Steel sheet: commercial quality to ASTM A 366M.
   - .3 Aluminum extrusions: Aluminum Association alloy AA6063-T5.
   - .4 Primer: to CAN/CGSB-1.105 for steel CGSB 1-GP-121M for aluminium CGSB 1-GP-181M, for galvanized steel surfaces.
   - .5 Insulation: high pressure, CFC-11 free closed cell polyurethane and to meet design requirements.
   - .6 Cable: multi-strand galvanized steel aircraft cable.
3. Door Sections:
   - .1 Door Colour: White.
   - .2 Profile: Multi-Ribbed.
   - .3 Glazing Options: None.
   - .4 Fabricated from 1-3/4" (45 mm) thick composite, roll formed, metal sandwich sections insulated with polyurethane foam laminated to the interior and exterior steel skins.
   - .5 Fabricate panel frames in a continuous box frame with vertical stiffeners at 600mm (24") centres.
   - .6 Assemble components by means of spot or arc welding or coated rivet system or adhesive and self-tapping screws to manufacturer's recommendations.
   - .7 Fabricate doors from pre-painted steel stock.
   - .8 Install insulated glazing panels in doors as indicated complete with self-aligning glazing retainers.
4. Standard Duty Industrial Hardware:
   - .1 Track: to be minimum 12 gauge (3.0 mm) thick galvanized steel standard hardware to suit operation of door with 3-3/8" (86 mm) overall outside dimension. Make curves of proper radius for quiet and smooth operation and mount to full size gusset plates. Reinforce horizontal tracks full length with steel angles to prevent deflection. Mount vertical tracks to door jambs using continuous full length track mounting angles to prevent movement in vertical tracks. Size and thickness of steel angles to suit door opening and as recommended by manufacturer.
   - .2 Top roller carrier: galvanized steel minimum 14 gauge thick, adjustable.

.3 Rollers: minimum 3" (75 mm) diameter, using 5/8" (16 mm) diameter full floating, grease packed hardened steel, ball bearings. Roller axles to be minimum 7/16' (11mm) diameter.
.4 Roller brackets: hinged and fabricated from 12 gauge (3.0 mm) minimum overall thickness galvanized steel. Fit brackets with heavy duty steel tube cross pieces in which roller axles to ride. Reinforce brackets with steel gusset plates.
.5 Hinges: standard duty industrial, minimum 14 gauge thick, secured with self-tapping screws or as recommended by manufacturer.
.6 Drum and Shaft: minimum 5-1/2" (140 mm) diameter with 1-1/4" (32 mm) diameter solid steel shaft. Use proper size drums to suit both door height and weight
.7 Cable: minimum 5/32" diameter galvanized steel aircraft cable. Cables to be capable of providing a minimum of 5 to 1 safety factor.
.8 Counter balance: helically wound, oil tempered, torsion springs, custom engineered, designed and rated for 50,000 open and close cycles minimum, mounted on a continuous shaft revolving in anti-friction bearings and having cable drum at each end.

5. Accessories:
.1 Flat bar door latch and electric interlock switch, handle operated from inside to disconnect power to electrically operated doors.
.2 Bulb type extruded neoprene weather-strip for door sill section, full width.
.3 Extruded aluminum and arctic grade vinyl weather-strip for jambs and head, to manufacturer's standard.
.4 Finish ferrous hardware items with minimum zinc coating of 300 g/m2 to CSA G164.
.5 Track guards: 7/32" (5 mm) thick formed sheet 5'-0" (1500 mm) high track guards.
6. Prefinished Steel Sheet:
.1 Factory prefinished steel with factory applied polyvinylidene fluoride coating in colour to match existing adjacent overhead doors
.2 Finish sheet steel in accordance with manufacturer's recommendations.
7. Operation:
.1 Equip all overhead doors for operation by:
.1 Electrical type operator c/w interlock switch to disconnect power to operator when in manual operation.
.2 Built-in chain hoist with galvanized steel chain for manual operation in event of power failure.
8. Electrical Operators:
.1 Electric door operators to be of suitable heavy duty motor designed by door manufacturer to operate doors of dimensions scheduled. Electrical motor and related components to be supplied to suit voltage and other electrical characteristics of electrical systems of building. Location of electric door operators to provide for easy access for servicing and maintenance and to Consultant's approval. Door speed to be 12" (300 mm) per second.
.2 Electric motors, controller units, remote push-button stations, relays and other electrical components to conform to CSA and ULC approval with NEMA Class 1A rating.
.3 Power supply: 208 Volt, 3 Phase, 60 Hertz.
.4 Electric door operator motor to be rated for continuous duty and to include high starting torque motor, reduction gearing, solenoid brake, limit switches for upper and lower limits of door travel, emergency hand chain with electrical interlock to break motor circuit when hand chain is engaged, magnetic relay contactor, overload protection, pre-wiring to terminal block and three (3) button operating station. The electric operator to contain an integrated reverse circuit with heat and overload protection with a heavy duty industrial reversing contactor. Control transformer to be suitable for 24 Volt AC control voltage.
.5 Operation: All overhead doors to be equipped with remote pushbutton station, flush mounted adjacent to door on interior, with "OPEN-STOP-CLOSE" designations on pushbuttons in English, key operated. Cylinders to be master keyed to suit Owner's requirements. Push buttons to be controlled by momentary contact pressure. Provide brake to stop and hold doors in any position.
.6 Safety switch: combination roll rubber with bi-parting metal contact limit switches for full length of bottom rail of bottom section of door, to reverse door to open position when coming in contact with object on closing cycle.
.7 Mounting brackets: galvanized steel, size and gauge to suit conditions.

Part 3. Execution:

1. Installation – General:
.1 Erect all work plumb and true and in proper alignment and relationship to established lines and grades.
.2 All devices for anchoring frame assemblies to building structure to have sufficient adjustment to permit correct, accurate alignment. After alignment fasten anchorage devices to prevent movement other than those designed for expansion and contraction.

.3 All materials and methods of construction to be in accordance with the recommendations and specifications of the manufacturer. All work to be supervised by a competent foremen at all times and tradesmen to be fully experienced and skilled in their respective trades.

2. Installation:
   .1 Install doors and hardware in accordance with manufacturer's instructions.
   .2 Rigidly support rail and operator and secure to supporting structure.
   .3 Install operator including electrical motors, controller units, pushbutton stations, relays and other electrical equipment required for door operations.
   .4 Fit weather stripping snugly to doors so there is no rubbing action of vertical weather stripping until last moment contact. Make necessary adjustments to form a weathertight seal.
   .5 Lubricate and adjust door operating components to ensure smooth opening and closing of doors.

08 71 00 – VINYL WINDOWS

Part 1. General

1. Scope**:** Provide labour and materials required to provide vinyl windows, noted on the drawings as '**W-#**', in accordance the following requirements.
   - .1 Compliance with the following reference standards;
     - .1 AAMA/WDMA/CSA 101 / I.S.2/A440-11 - North American Fenestration Standard / Specification for Windows, Doors and Skylights, including the Canadian Supplement A440S1:19
   - .2 Warranty:
     - .1 Submit a warranty covering the maintenance, repair or replacement of defective work for a period of nine (9) years from the expiration of the standard one (1) year warranty included in the Contract under the General Conditions.
     - .2 Structural failure, leaking, loosening, fading, discolouration, deforming and failure of glazing units to be judged as defective work.
     - .3 Total warranty period to be ten (10) years.
   - .3 Submittals:
     - .1 Samples: Submit one (1) representative 24" x 24" (600mm x 600mm) sample of the curtain wall. Include frame, sash, sill, vision glass, spandrel panel and weatherproofing method, and surface finish.
     - .2 Test Reports:
       - .1 Submit test reports from approved independent testing laboratories, certifying compliance with specified performance class, grade and minimum tested size.
       - .2 Insulation and SHGC Values: Provide proof of overall thermal resistance values inclusive of frame and insulated glazing unit and solar heat gain coefficient for windows / glazed doors.
     - .3 Shop Drawings:
       - .1 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.
       - .2 Indicate size location of steel reinforcing located in aluminum mullions.
       - .3 Provide data / tables / and or test result that prove the window frame and insulated unit with achieve the thermal performance requirements required by this specification and the Ontario Building Code.
       - .4 Shop drawings to bear the seal and signature of a qualified Professional Structural Engineer licensed to practice in the Province of Ontario.
       - .5 Shop drawings for windows and curtain wall must be coordinated with exterior cladding design and shop drawings for the metal wall panel and metal cladding systems.
     - .4 Manufacturer's Maintenance Data: Provide manufacturer's maintenance data for the vinyl window system.

Part 2. Materials:

1. Exterior Windows: to be **'CORE+ 4 9/16" as manufactured by Ostaco'** or equal as approved by the Architect having the following characteristics;
   - .1 Vinyl windows shall have the following characteristics;
     - .1 performance class: **LC**
     - .2 performance grade: **PG-45**
     - .3 minimum size tested: **1.625m x 1.227m**
     - .4 type: AW (awning)
     - .5 U value - imperial: **0.29, (R value 3.45)**
     - .6 SHGC (solar heat gain coefficient): **max: 0.45**
     - .7 VT/SHGC **min 1.10**
     - .8 Insulted units shall be double or triple glazed glass with argon filled cavity(s) and low e coating(s) to suite minimum R values and identified above, glass thicknesses and types to suit opening sizes and wind loads as defined by the OBC.
     - .9 operating force (end of crank handle): 70 N (15.74lbs) to initiate motion, 45N (10.12lbS) to maintain motion
     - .10 air infiltration (max allowable leakage): **0.5 L/s m2 @ 300 kPa**
     - .11 air exfiltration (max allowable leakage): **0.5 L/s m2 @ 75 kPa**
   - .2 Where required provide reinforced vertical mullions to achieve performance grade level of performance.
   - .3 Frame to be PVC with brick mould closures. Dimensions of the PVC frame to be 3 1/4" wide + brick mould where required.
   - .4 Frame Colour: to be selected from the manufacturer's standard colour range by the Owner at a later date.
   - .5 Operators: casement style operators complete with locking hardware and roto style interior operators.

.6 Operator Restrictors: Provide restrictors on operable units to prevent windows from opening to provide more that a 4" (102mm) clear space between frames.
.7 Screens: glass fibre mesh, colour: black, located on interior of window in rolled aluminum, prefinished frame.
.8 Weather-stripping: to be polyethylene pile, thermoplastic elastomer bulb seal and extruded sill seal, permanently resilient, profiled to effect a continuous tight fitting weather seal.

Part 3. Execution:

1. Installation procedure to include the following;
   .1 Field verify jamb, head and sill conditions and dimensions of rough openings.
   .2 Develop shop drawings of required products. Identify and design structural connection of window / framing to existing superstructure. Confirm windows meet required wind and thermal loading. Provide engineered shop drawings to consultants for review.
   .3 Install new window systems. Tie in new assemblies to existing air and vapour barriers as detailed.
   .4 Provide low expansion spray foam insulation at sills, jambs and heads to seal areas around new window and door framing systems.

08 71 00 - DOOR HARDWARE – SUPPLY

Part 1. General

1. Scope: Provide door hardware in accordance with Owner's requirements, in compliance with the Ontario Building Code 2012 and this specification.
2. Submittals:
   - .1 Shop Drawings: Provide an updated hardware schedule prepared by an accredited architectural hardware consultant (AHC).
   - .2 Manufacturer's Literature: Provide manufacturer's literature on hardware types and maintenance requirements.
3. Warranty:
   - .1 Submit a warranty covering the maintenance, repair or replacement of defective work for a period of one (1) year from the expiration of the standard one (1) year warranty included in the Contract under the General Conditions.
   - .2 Structural or operational failure, loosening, discolouration, deforming of the hardware to be judged as defective work.
   - .3 Total warranty period to be two (2) years.

Part 2. Products

1. Hardware Supplier: Canadian Hardware Consultants, 1150 Kelly Lake Road, Sudbury, ON, T 705 673 5300 www.chc-sudbury.com or approved equal
2. Door Hardware shall be from the following manufacturers / suppliers, or equal:
   - .1 Hinges — McKinney
   - .2 Lockets, cylinders — Sargeant
   - .3 Hold Opens Closers — LCN
   - .4 Transformers — LCN
   - .5 Kickplates — CBH
   - .6 Floor Stops — CBH
   - .7 Smoke Seals — KN Crowder
   - .8 Smoke Sweeps — KN Crowder
3. Schedule:
   - .1 Aluminum Doors
     - .1 Pulls
     - .2 Locksets
     - .3 Automatic Operators, push buttons, related equipment
     - .4 Electric Strikes, where required
     - .5 Closers
     - .6 Overhead Friction Stops
     - .7 Thresholds
   - .2 Interior HM or Wood Doors:
     - .1 Latchset
     - .2 Hinges
     - .3 Deadlock
     - .4 Kickplate
     - .5 Top and bottom bolt
     - .6 Overhead Friction Stop or Wall Stop (as required)
     - .7 Smoke Sweep (if required, refer to Door Schedule)
     - .8 Set Smoke Seal (if required, refer to Door Schedule)
   - .3 Exterior HM Doors:
     - .1 Hinges
     - .2 Lockset
     - .3 Deadlock
     - .4 Lockguard
     - .5 Closer
     - .6 Kickplate
     - .7 Threshold
     - .8 Door sweep
     - .9 Weatherstripping

Part 3. Execution

1. Review contract documents; drawings and specifications, related schedules and existing keying systems and existing hardware on site.
2. Identify any other Owner requirements that may impact the project. Coordinate these requirements with the hardware list and Architect.
3. Develop hardware schedule that follows contract documents and coordinates with existing conditions and submit to the Architect for review.
4. Once an approved hardware schedule is received, order and provide hardware to the site, labelled and organized by door opening, ready for installation.

08 71 10 – DOOR HARDWARE – INSTALLATION

1. Scope**:** Provide labour and materials required to install doors and hardware scheduled for the project. Complete work in accordance with the following;

.1 **Fire** Rated Doors, Frames and Hardware: Install fire rated assemblies in accordance with NFPA-80-2016 edition, CAN/ULC S-104-2015, CAN4 S105-2016 for ratings specified or indicated.

.2 Product Handling: Accept delivery of doors and finish hardware. Inspect doors for damage, upon delivery to the site. Hollow metal doors which cannot be readily corrected by sanding, to be promptly returned to the manufacturer. Store doors in a dry and clean location. Store in a temperature and humidity controlled area. Stack 6" (150mm) off the floor. Be responsible for any damage to doors and hardware from time of delivery until accepted by Owner after installation. Provide locked room for the storage of hardware at the job and a person responsible for the control and distribution of hardware.

.3 Quality Assurance: Installation is to be executed by the Hardware Supplier's installer and by personnel with a minimum of five (5) years' experience in the installation of finishing hardware.

.4 Protection: 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.

.5 Installation of Finish Hardware:

.1 Install hardware at mounting heights as specified in the manufacturers' templates or specific references in approved hardware schedule or approved elevation drawings. Where mounting height is not otherwise specified, install hardware at mounting heights as agreed to by Owner and Consultant.

.2 Install hardware using only manufacturer supplied and approved fasteners in strict adherence with manufacturers published installation instructions.

.3 Ensure that locksets / latch sets / deadlocks are of the correct hand before installation to ensure that the cylinder is in the correct position. Handing is part of installation procedure.

.4 Ensure that 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.

.5 Follow manufactures installation instructions. Adjustment is inclusive of spring power, closing speed, latching speed and back-check at the time of installation.

.6 Delayed action door closers are to be adjusted to forty (40) second delay for handicapped accessibility and movement of materials. Time period to be approved by Owner.

.7 Install head seal prior to installation of "PA"-parallel arm mounted door closers and push side mounted door stops/holders.

.8 Counter sink through bolt of door pull under push plate during installation.

.9 Mount closers, automatic operators and hold-open devices with through bolts, as indicated in the finish hardware schedule.

.10 Set, fit and adjust hardware according to manufacturer's directions. Hardware to operate freely. After installation, adjust door closers for closing and latching speed and panic devices for proper latching. Protect installed hardware from damage and paint spotting.

.11 Pre-drill kick plates and doors before attachment of plates. Apply with water-resistant adhesive and countersunk stainless steel screws.

.12 Locate hardware in accordance with the hardware schedule.

.13 Thresholds: Site measure openings before cutting. Set thresholds on two continuous beads of caulking conforming to item entitled Sealant in this specification.

.14 Door Closers and Holders: Install door closers in such a manner that door opening is unaffected, and that maximum swing is permitted.

.15 Weather stripping of Doors: Install weather stripping effectively to tightly seal entire perimeter of doors. Secure in place with non-ferrous screws, in accurate alignment. Maintain integrity of weather seal at head of doors fitted with closers. Adapt weather stripping as required to achieve specified performance and provide any necessary accessories.

.16 Electronic Hardware: Install electronic handicap operator components, security components such as magnetic locks, door status switches, card readers, processors, transformers, and other electric devices. Wiring will be supplied and installed by Electrical Division 16 including conduit, boxes and other electrical appurtenances, including connections and terminations. Be responsible for ensuring that wiring work is done in accordance with the suppliers wiring diagrams and directions. Arrange for testing and commissioning of system by the distributor of the system. Submit a copy of reports to the Consultant.
Note: When installing electric strikes, it is imperative that doors are perfectly aligned to enable the bolt to properly close. Also ensure that rubber silencers do not impair the proper strike action required. *Adjust or remove silencers as necessary.*

2. Adjusting and Cleaning of Finish Hardware:
   .1 Check and adjust each operating hardware item to ensure proper operation and function of unit. Check locked doors against approved keying schedule.
   .2 Lubricate moving parts as recommended by hardware manufacturer. Use graphite type lubricant if no other is recommended.
   .3 Repair or replace defective materials and units which cannot be adjusted and lubricated to operate freely and smoothly. Re-install items found improperly installed.
   .4 Prior to date of Substantial Performance, re-adjust and re-lubricate as necessary.
   .5 Instruct Owner's designated personnel in the proper adjustment and maintenance of hardware and finishes at time of final hardware adjustment. Provide written verification to Consultant that this instruction has occurred.
   .6 Hardware to be left clean and free of disfigurements.
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 Upon completion of finish hardware installation, the Consultant, the Hardware Supplier, Installer, and General Contractor to do a thorough "walk-through" of the Project to determine that Finish and Security Products are;
      .1 Furnished and installed in compliance with the Specification.
      .2 Acceptable to the Owner as to fit their requirements, final installation, adjustment, and correct applications.
   .3 In the event the Consultant rejects any product or installation, the Contractor to correct the condition at no expense to the Owner, until the Consultant gives final acceptance. The Installer and the Contractor to record and provide a list of hardware deficiencies. The Hardware Supplier to re-inspect when notified by the Installer as to the clearing of deficiencies. The Installer and the General Contractor to certify in writing that hardware items and their installation are in accord with requirements of Contract Documents. Final inspection must ensure hardware items operate as per Hardware Supplier requirements. Coordinate final inspections with the Hardware Supplier's representatives as required to establish warranties. Send correspondence directly to the Consultant and copied to the Owner.

08 81 00 – GLASS + GLAZING

Part 1. General:

1. Scope: Provide labour and materials required to supply and install glass and glass product on the project.
2. References:
   - **.1** ASTM C1048 - 12e1 Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
   - **.2** ASTM C920 Standard Specification for Elastomeric Joint Sealants.
   - **.3** ASTM C1172, Standard Specification for Laminated Architectural Flat Glass.
   - **.4** CAN/CGSB 12.1, Safety Glazing.
   - **.5** CAN/CGSB 12.3, Flat, Clear Float Glass.
   - **.6** CAN/CGSB 12.5, Mirrors, Silvered
   - **.7** CAN/CGSB 12.8, Insulating Glass Units
   - **.8** CAN/CGSB 12.9, Spandrel Glass.
   - **.9** CAN/CGSB 12.11 Transparent (One Way) Mirrors
   - **.10** CAN/CGSB 12.20, Structural Design of Glass for Buildings.
   - **.11** ULC CAN-S104, Standard Method For Fire Tests of Door Assemblies
   - **.12** ULC CAN-S106, Standard Method For Fire Tests of Window and Glass Block Assemblies
   - **.13** NFPA 80, National Fire Protection Association, Fire Door and Windows
   - **.14** NFPA 257: Standard on Fire Test for Window and Glass Block Assemblies.
3. Submittals:
   - **.1** Submit information requested and specified in accordance with Section 01 33 00.
   - **.2** Product Data:
     - .1 Submit manufacturer's product data for each type of product specified. Data to indicate compliance with specification and installation recommendations of manufacturer of products being used.
     - .2 Submit copy of manufacturer's warranty, in Owner's name for review by consultant.
   - **.3** Samples:
     - .1 Submit samples of materials if required by Consultant before commencing work of this section. Samples to be clearly labeled with manufacturer's name and type.
     - .2 Submit samples of spandrel glass coatings for review and acceptance by Consultant prior to ordering.
     - .3 Samples for Verification: Upon consultant's request furnish a 12" x 12" samples of glass types, gaskets, tapes and sealants.
   - **.4** Shop Drawings:
     - .1 Submit shop drawings, to the Consultant for review prior to fabrication.
     - .2 Maintenance Data:
     - .3 Upon completion of installation, supply instructions covering re-glazing, adjustments and other relevant maintenance data.
4. Quality Assurance:
   - **.1** Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this section or referenced standards.
     - .1 GANA: "Glazing Manual," "Laminated Glazing Manual," and "Sealant Manual."
     - .2 IGMA: "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
   - **.2** Single-source fabrication responsibility: glass fabricated for each type to be processed and supplied by a single fabricator.
5. Delivery, Storage and Handling:
   - **.1** Delivery and Acceptance Requirements: Deliver packaged materials in their original containers with manufacturer's labels and seals intact.
   - **.2** Storage and Handling Requirements: Store vertically, blocked off the floor in a weatherproof enclosure in original containers with manufacturers labels and seals intact until read for installation, and as follows:
     - .1 Install glass as soon as possible after delivery to site.
     - .2 Handle glass carefully to its place of installation.
     - .3 Prevent damage to glass, adjacent materials and surfaces.
6. Environmental Conditions:
   - **.1** Ambient Conditions: Maintain temperature, humidity and solar exposure conditions of Glass Glazing materials during shipping, storage and site installation as required by manufacturer to maintain warranty and performance of installed products.
7. Warranty**:** Provide a warranty for insulated units that complies with the following;

.1 Warranty to cover the repair or replacement of defective work, starting at substantial completion of the project.
.2 Structural failure, leaking, loosening, condensation within units, deforming and failure of glazing units to be judged as defective work.
.3 Provide a Total Workmanship Warranty for a period of ten (10) years for components of the insulated units.
.4 Record noted deficiencies and arrange for their proper repair under warranty.

Part 2. Products:

1. Subject to compliance with requirements specified in this section, the following manufacturers are approved to be installed specified products on this project:
   .1 Oldcastle Glass
   .5 Guardian Industries
   .6 Vitro Architectural Glass
   .7 AGC
   .8 Vitricon
   .9 SCHOTT
   .10 TGP / Nippon

2. **Tempered Glass (noted as TG on the drawings):** Type 2, tempered; Class B, float or plate glass, clear; conforming to CAN/CGSB 12.1, 6mm thickness minimum.
3. **Frosted Glass (FTD):** Acid etched frosted glass on underside only, top will be smooth, gradient to be determined later by Architect. Submit 6" x 6" samples for review before fabrication of glass.
4. **Glazing Tape:** Preformed butyl with continuous spacer, Shore "A" 10-15 durometer hardness paper release, black colour, 1/8" (3mm) x 3/8" (10mm). **Use PVC glazing tape with fire rated glass.**
5. **Translucent Film:**
   .1 Provide privacy / safety / signage graphics on clear tempered glass in location and with patterns as shown on the drawings.
   .2 Translucent film shall be printable permanent matt translucent polymeric PVC film with etched glass surface finish, equal to HX5DEPM-HXDP03 as manufactured by Hexis (www.hexis-graphic.com) or equal by 3M, Avery, Arlon or Oracal
   .3 Graphics for signage and patterns shall be provided by the Owner. Graphics shown on the drawings have been provided to indicate concept for privacy, safety and signage requirements for installation on demountable partition systems, tempered glass doors and automatic sliding door systems.
   .4 Use graphic concepts identified on the drawings and electronic files provided by the Owner. Assist and coordinate final graphics as required to complete the work.
   .5 Provide shop drawings of all graphic for review and approval by Owner.
   .6 Install films on side of partition with the least amount of exposure to pedestrian traffic, i.e., inside offices / meeting rooms.
6. **Warm Edged Spacers:** Provide warm edged spacer in the construction of insulated units equal to Edgetech Super 'U' Spacer.
7. **Insulated Units**:
   .1 All insulating units shall confirm to CAN /CGSB 12.8.
   .2 All insulated unit configurations are basis of design, equals to be approved by Consultant.
   .3 Configuration for double glazed insulated glazing type noted as **GL-1** on the drawings;
      .1 Outboard Lite: 6mm (1/4") clear tempered glass with Solarban 70 reflective coating on surface 2 by Vitro Architectural Glass.
      .2 Space 1: 13mm (1/2") thick, filled with Argon – minimum Argon Concentration = 95% with non-metallic spacer.
      .3 Inboard Lite: 6mm (1/4") clear tempered glass by Vitro Architectural Glass
      .4 Insulated united data
         .1 Overall unit thickness: 25mm (1")
         .2 Winter night time U-value of: 1.35 W/m2K or lower (0.24 BTU/hr/ft2/F)
         .3 Solar Heat Gain Coefficient of: 0.27 or lower
         .4 Daylight transmittance of: 52% or higher
8. **Mirrors (noted as M on the drawings)**
   .1 Mirrors: Best quality, 1/4" (6 mm) thick float glass, conforming to CAN/CGSB-12.5-M86, Type 1A, and backed in an approved manner. Grind and polish exposed edges.
   .2 Mirror cushioning: PVC pressure-sensitive foamed tape, 1/4" (6 mm) thick with adhesive one side.
   .3 Concealed Mirror Clips: Type 302 or 304 No. 4 finish stainless steel.
   .4 Mirror Adhesive: "Mirror-Mastic" back-paint and adhesive by Palmer Asbestos and Rubber Corporation.

9. Fabrication and Manufacture:
   - **.1** Label each light of glass with the registered name of the product and the weight and quality of the glass.
   - **.2** Check dimensions on site before cutting materials.
   - **.3** Minimum bite or lap of glass on stops and rabbets as recommended by glass manufacturer. Finish surfaces to be free of tong marks.
   - **.4** Cut glass true to dimensions, square, plumb and level. Verify dimensions prior to fabrication.
   - **.5** Distortion, pock marking or defects detrimental to appearance and/or performance, as determined by the Consultant, will be rejected.

Part 3. Execution:

1. Installation:
   - **.1** Take critical site dimensions to ensure that adjustments in fabrication or installation are provided for, and that clearances to other constructions have been maintained.
   - **.2** Ensure that anchors and inserts installed by others are adequate to meet specified requirements, and make adaptations before installation.
   - **.3** Accurately measure openings and calculate light size based on manufacturer's installation tables, allowing for proper minimum edge engagement, rabbet width, rabbet depth, and expansion.
   - **.4** Free rabbets, stops and glass edges of dust, dirt, moisture, oil and other foreign matter detrimental to or obstructing the glazing material.
   - **.5** Follow manufacturer's recommendations for preparation.
   - **.6** Unless otherwise specified, dry glaze interior glass.
   - **.7** Remove and replace glazing stops in original locations using original fasteners, securely set and undamaged.
   - **.8** Use setting blocks and spacers as required to properly support the glass, centred in place in glazing space independent of the materials and to uniformly distribute its load.
   - **.9** Use a minimum of 2 setting blocks, locate at 1/8 points. Locate spacers at jamb edges of glass, uniformly spaced at 24" (600mm) o.c. maximum, and 12" (300mm) maximum from top and bottom.
   - **.10** Ensure rattle-free cushioning.
2. Mirror Installation
   - **.1** Install mirrors by means of concealed clips, or by means of 100% back-paint and adhesive method. If clips are used, install cushioning tape completely around perimeter of mirror back, set in concealed location within 1" (25 mm) of edge. Apply adhesive in strict accordance with manufacturer's printed instructions.
   - **.2** Use one piece mirrors wherever possible.
   - **.3** Where inset in ceramic tile, maintain a mirror-to-tile joint width of not more than 5/64" (2 mm) all around. Otherwise, Contractor will be directed to remove mirror and replace same to satisfy the joint requirement, all at no cost to the Owner.
3. Cleaning:
   - **.1** Repair defects caused by work of this section.
   - **.2** Remove excess or foreign materials or droppings that would set or become difficult to remove from surfaces at time of final cleaning.
   - **.3** Immediately prior to acceptance of work of this section by Consultant, remove temporary protection, clean and polish exposed surfaces of work of this section. Use proper cleaning materials and methods to prevent damage to surfaces, finishes, sealer, or work of other trades. Make good such damage to Consultant's satisfaction.
   - **.4** Do not use steel wool, wire brushes or steel scrapers on any finished surfaces.
   - **.5** Replace or make good to Consultant's satisfaction, upon completion of work of this section, defective, scratched, or damaged work, at no extra cost to the Owner.

DIVISION 09 – FINISHES

09 21 16 - GYPSUM BOARD ASSEMBLIES

Part 1. General:

1. Scope:
   - **.1** Provide labour and material required to supply and install gypsum board and metal stud systems. Gypsum board and metal stud materials and accessories to be in accordance with CAN/CSA A82.27.
2. References:
   - **.1** Built Green Canada Program & Guide for High Density (HD) Multi Family Residential New Construction.
   - **.2** ASTM C442 – Standard Specification for Gypsum Backing Board, Gypsum Core board and Gypsum Shaft liner Board
   - **.3** ASTM C475 – Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board
   - **.4** ASTM C840 – Standard Specification for Application and Finishing of Gypsum Board
   - **.5** ASTM C1177 – Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
   - **.6** ASTM C1396 – Standard Specification for Gypsum Board
   - **.7** ASTM F1267 – Standard Specification for Metal, Expanded, Steel
   - **.8** CAN/ULC-S102 – Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
   - **.9** CAN/ULC-S102.2 – Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies
   - **.10** Gypsum Association (GA):
     - .1 GA-214 - Recommended Levels of Gypsum Board Finish.
     - .2 GA-216 - Application and Finishing of Gypsum Board.

Part 2. Products:

1. Gypsum Wallboard**:** Conforming to ASTM C1396, ivory paper faced, tapered edges, 1219mm (48") wide sheets of maximum practical lengths to minimize end joints.
   - **.1** Acceptable Materials:
     - .1 'Sheetrock Brand Gypsum Panels' by CGC Canada Inc.
     - .2 'ProRoc Regular' by CertainTeed.
     - .3 'ToughRock Gypsum Wallboard' by Georgia-Pacific Canada.
2. Fire-Rated Gypsum Board 'Type X'**:** Conforming to ASTM C1396, 1219mm (48") wide sheets of maximum practical lengths to minimize end joints, tapered edges, 5/8" (16mm) thick, as indicated on drawing.
   - **.1** Acceptable Materials:
     - .1 'Sheetrock Brand Gypsum Panels, Firecode Core' by CGC Canada Inc.
     - .2 'ProRoc Type X' by CertainTeed.
     - .3 'ToughRock Fireguard Gypsum Board' by Georgia-Pacific Canada.
3. Gypsum Ceiling Board: Sag Resistant Gypsum Board: Meeting requirements of ASTM C1396M, ceiling board manufactured to have more sag resistance than regular type gypsum board with long edges tapered, and as follows:
   - **.1** Location: Ceiling surfaces.
   - **.2** Acceptable Materials:
     - .1 'Sheetrock Interior Ceiling Board' by CGC Canada Inc.
     - .2 'Tough Rock CD Ceiling Board' by Georgia Pacific Canada.
     - .3 'ProRoc Interior Ceiling Board' by CertainTeed.
4. Water (Moisture) and Mould Resistant Wallboard: Conforming to ASTM C1396 or ASTM C1278, 1219mm (48") wide panels of maximum practical lengths to minimize end joints, tapered edges, thick, with water (moisture) and mould resistant core. Mould resistant panel score of 10 when tested in accordance with ASTM D3273 and evaluated to ASTM D3274. Less than 5% water absorption by weight after 2-hour immersion, as per ASTM C473.
   - .1 Acceptable Materials: Paperless, coated fibreglass mat on face, back and long edges, water-resistant treated core gypsum board. Conforming to ASTM C1658:
     - .1 'DensArmour Plus High Performance Interior Panels' by Georgia Pacific Canada.
     - .2 'Sheetrock Glass Mat Mold Tough' by CGC Canada Inc.
     - .3 'ProRoc M2 Tech' by CertainTeed.
5. Water (Moisture) and Mould Resistant Wallboard 'Type X': Minimum 5/8" (15.9mm) thick or as noted on drawings; with water (moisture) and mould resistant core as above.
   - **.1** Acceptable Materials:
     - .1 'DensArmour plus Fireguard Type X Interior Panels' by Georgia-Pacific Canada.

.2 'Fiberock Brand Aqua-Tough Interior Panels Type X' by CGC Canada Inc.
.3 'ProRoc M2 Tech Type X' by CertainTeed.

6. Exterior Sheathing Board**:** Glass mat faced, water-resistant treated core gypsum board, 1219mm (48") wide sheets of maximum practical lengths to minimize end joints, silicone treated gypsum core, front and back faces penetrated with inorganic glass fibre mats, square edge, conforming to ASTM C1177. Mould resistant panel score of 10 when tested in accordance with ASTM D3273 and evaluated to ASTM D3274.
.1 Acceptable Materials:
.1 'Securock Glass-Mat Sheathing' by CGC Canada Inc.
.2 'Dens-Glass Gold' by Georgia-Pacific Canada.
.3 'GlasRoc Sheathing' by CertainTeed.

7. Exterior Sheathing Board 'Type X': Glass mat faced, water-resistant treated core gypsum board, 1219mm (48") wide sheets of maximum practical lengths to minimize end joints, silicone treated gypsum core, front and back faces penetrated with inorganic glass fibre mats, square edge, conforming to ASTM C1177. Mould resistant panel score of 10 when tested in accordance with ASTM D3273 and evaluated to ASTM D3274.
.1 Acceptable Materials:
.1 'Securock Firecode Type X' by CGC Canada Inc.
.2 'Dens-Glass Gold Fireguard Type X' by Georgia-Pacific Canada.
.3 'GlasRoc Sheathing Type X' by CertainTeed.

8. Exterior Sheathing Board with Vapour Permeable Weather Barrier: Applied to exterior face of Gypsum Board:
.1 Vapour Permeable, Water Resistant Sheathing: with integrated water resistant (air barrier, permeable vapour barrier) directly in the gypsum board below the fibreglass mat facer.
.1 Acceptable Systems:
.1 'DensElement' by Georgia-Pacific Canada with DensDefy Liquid Flashing.
.2 'Securerock ExoAir 430 Air Barrier System' by CGC/USG Inc. & Tremco Inc., with Dymonic 100 liquid Flashing.

9. Tile Backer Board: Water-resistant, mould-resistant, abrasive resistant with a fibreglass mat facer, for interior walls and ceilings. For use in wet and / or high traffic areas and / or areas scheduled to receive ceramic tile cladding on walls or ceilings. Suitable Suitable for noncombustible construction conforming to CAN/ULC S102.
.1 Acceptable Materials:
.1 'Glass-Mat Tile Backer Board' by CGC/USG Inc.
.2 'DensShield Tile Baker' by Georgia-Pacific Canada.
.3 'GlasRoc Diamondback Tile Backer' by CertainTeed.

10. Gypsum Board Liner Panels: 25.4mm (1") thick x 609.6mm (2'-0") wide gypsum liner panels friction fit, in accordance with ASTM E136, gypsum core UL-classified as non-combustible, ASTM E84, flame spread is 20; smoke developed is 0. Gypsum Board Liner Panels to be in accordance with ULC Design No 452.
.1 Acceptable Materials:
.1 'Sheetrock Gypsum Liner Panels' by CGC Canada Inc.
.2 Or approved equal.

11. Abuse Resistant Gypsum Board: ASTM C1396; 1/2 and 5/8-inch-thick, maximum permissible length, single core composition, with no surface reinforcement, ends square cut, tapered -edges.
.1 Acceptable Materials:
.1 'Fibre Abuse Resistant' by CGC Canada Inc.
.2 'DensAmour Plus Abuse Guard' by Georgia-Pacific Canada Inc.

12. **Very High Impact (VHI) Abuse Resistant Type X Gypsum Board:** ASTM C1396; 16mm (5/8") thick, maximum permissible length, single core composition, with no surface reinforcement, ends square cut, tapered edges;
.1 Acceptable Materials:
.1 'Sheetrock Brand Glass- Mat Mold Tough AR Firecode X Panels by CGC Canada Inc. or approved equal.

13. **Exterior Soffit Board:** Mould and moisture resistant cement board, non-combustible, 1219mm (48") wide sheets of maximum practical lengths to minimize end joints, aggregated Portland cement core wrapped in polymer-coated, glass-fiber mesh. Panel score of 10 when tested in accordance with ASTM D3273:
.1 Acceptable Materials:
.1 'Durock' by CGC Canada Inc.
.2 'PermaBase Cement Board' by CertainTeed.

14. **Joint Materials:**
.1 Joint Reinforcing Tape: 2" (50mm) wide x 0.3mm thick perforated paper with chamfered edges.
.2 Joint and Skim Compounds: gypsum with latex resin, possessing good adhesion, mixed with fresh, unadulterate.
.3 Skim Coating: "Durabond 90" or equivalent manufactured by Domtar Gypsum. Compounded water, having no detrimental effect on compounds.

.4 Green Glue Noiseproofing Compound: Noiseproofing compound manufactured by Green Glue Company (www.greenglue.com) to be applied between layers of gypsum board at a rate of 2 tubes per 4' x 8' sheet of gypsum board as scheduled – refer to the construction assemblies on the architectural drawings.

15. **Accessories:**

.1 Concrete Anchors:
- .1 Self-drilling tie wire anchors, Phillips "Red-Head No. T-32" by ITW Construction Products, or approved alternate. Do not use power activated anchors for seismic connections, and only with the approval of Structural Consultant.

.2 Concrete Inserts:
- .1 Hot-dip galvanized "turtle back" type concrete inserts to suit conditions as approved by Consultant, by Acrow-Richmond National Concrete Accessories, Division of Premetalco Inc., or approved alternate.

.3 Gypsum Wallboard Accessories:
- .1 In general, gypsum wallboard accessories will conform to ASTM C1047.
- .2 Corner Beads:
  - .1 Made from galvanized steel sheet conforming to ASTM A653, minimum 0.0179" (25 gauge). Minimum width of flanges 28mm (1-1/8") for 12mm (1/2") thick wallboard and 32mm (1-1/4") for 16mm (5/8") thick wallboard.
- .3 Casing Beads:
  - .1 Made from galvanized steel sheet conforming to ASTM A653, minimum 30 gauge, U-shaped designed for finishing with joint compound.
- .4 Control Joints:
  - .1 Made from galvanized sheet steel conforming to ASTM A653, minimum 0.0179" (25 gauge), or roll-formed zinc-alloy to resist corrosion, with expansion joint material perforated flanges.
  - .2 Where required provide fire rated control joints to suit FRR required.
  - .3 'Zinc Control Joint No. 093' by ClarkDietrich
  - .4 Or approved alternate.
- .5 Reveals:
  - .1 Galvanized sheet steel conforming to ASTM A653, minimum 0.0179" (25-gauge), in profiles as indicated on drawings.

.4 Wallboard Screws:
- .1 Corrosion resistant, self-drilling, self-tapping gypsum wallboard screws conforming to ASTM C1002 (Type S) and ASTM C954 (Type S-12), 24mm (1") long No. 6 for single layer application, 41mm (1-5/8") long No. 7 for double layer application.
- .2 At fire-rated construction, type and size of wallboard screw will be same as used in fire-rating test.

.5 Joint Compound for Interior Gypsum Board:
- .1 Conforming to ASTM C475 and as recommended by gypsum wallboard, fire-rated gypsum wallboard and exterior wallboard manufacturers to suit conditions.

.6 Joint Compound for Exterior Sheathing Boards and Soffit Panels:
- .1 Fibreglass mesh tape.

.7 Resilient Sponge Tape:
- .1 Closed cell neoprene sponge type tape with self-sticking adhesive on one side. 'Permastik 122X' by Jacobs and Thompson Ltd., or foamed vinyl type tape, 'Arnofoam' by Arno Adhesive Tape Incorporated.

.8 Adhesive:
- .1 Conforming to CGSB 71-GP-25M, and as recommended by manufacturer and compatible with contacted surfaces.

.9 Acoustic Sealant:
- .1 Green Glue Sealant: Noiseproofing sealant manufactured by Green Glue Company (www.greenglue.com) to be applied at joints between ceiling and wall assemblies' gypsum board and as indicated on the architectural drawings.

.10 Sill Plate Gasket:
- .1 Install sill gasket continuously under sill plate on concrete floors to isolate steel and reduce air infiltration.
- .2 Size: Thickness: 4.5mm (3/16"); Width: To suit stud width
- .3 Approved Products: FoamSealR by Owens Corning or approved alternate.

.11 Access Panels:

.1 Supply 600 x 600 (24" x 24") self-framing metal access panels with integral locks as approved by Consultant, where required for access to concealed controls and equipment, where panels are not provided by Division 22/3 and 26, by Le Hage Metal Ltd., or Acudor Products Limited, or approved alternate.

16. Steel Studs: Depth and gauge to suit span. Minimum load is 5 psf. Max deflection is L/240. Provide studs with increased depth where indicated on the drawings. Minimum requirements include; knurled flanges 1-1/4" (32mm) wide with edges doubled back at least 3/16" (4.8mm); #25 gauge (0.59mm) steel galvanized, typical, with girts as required and with service access holes. Where stud length is greater than 13'-0" use minimum 3 5/8", 18 gauge metal studs at 24" o/c.
17. Slip-Type Head Joints: Where indicated, provide one of the following:
    .1 Deflection Track: steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and width to accommodate depth of studs; equal to Bailey Multi-Slot Track – MST 250, 2.5" deep a width as required to suit all assembly x 18 mils (minimum).
18. Retainer Studs: As manufactured by Bailey Metal Products, or Insulock Systems.
19. Partition Runners: As specified for studs with flanges a minimum 5" (125mm) high, and to suit depth of studs as required to serve as backing for carpet base or terrazzo where carpet or terrazzo occurs.
20. Bracing Channels: For partitions, 3/4" wide x 1-1/2" high x 16 gauge thick (19mm x 38.1mm x 1.6mm) cold-rolled, galvanized steel.
21. Furring Channels: #25 gauge galvanized, nominal size of 7/8" (22mm) deep by 1-1/4" (32mm) face, hat type with knurled face.
22. Resilient Channels: CGC RC-1 or equivalent by other reputable manufacturers.
23. Shaft Wall Framing: C-H steel studs, size, gauge and spacing to suit shaft wall and horizontal shaft assemblies as described by ULC for use in ULC 452 shaft wall construction.
24. Ceiling Hanger System:
    .1 Hangers: Galvanized annealed steel wire, #12 gauge to support a maximum weight of 68 kg. per hanger. #9 gauge to support a maximum weight of 140 kg. per hanger, and galvanized annealed steel rod 3/16" (4.8mm) diameter to support a maximum weight of 250 kg. per hanger.
    .2 Inserts and Hanger Connection: Steel, galvanized after forming, suitable for structure and ceiling conditions and loading.
    .3 Runner Channels: Galvanized steel channels, #16 gauge (1.6mm) overall thickness, 1-1/2" high (38.1mm) with 3/4" (19mm) wide flanges, for primary furring member in suspended gypsum board ceilings at 4'-0" o/c max.
    .4 Furring Channels: #25 gauge galvanized, nominal size of 7/8" (22mm) deep by 1-1/4" (32mm) face, hat type with knurled face at 16"o/c max.
25. Acoustical Caulking: "Noiseproofing Compound / Sealant" by Green Glue or "Acoustical Sealant" by Tremco (Canada) Limited.
26. Gaskets: "Noiseproofing Tape" by Green Glue or FoamSealR Sill Gasket by Owens Corning. Sill gaskets to be 6mm thick x width of metal stud framing as indicated on the drawings.

Part 3. Execution:

1. Install gypsum boards and metal studs to conform with CAN CSA A82.31-M1980 – Gypsum Board Application and with the following;
    .1 Examination:
        .1 Before application of gypsum board commences, ensure that services have been installed, tested and approved by relevant Jurisdictional Authorities and Consultant; that conduits, pipes, cables and outlets are plugged, capped or covered; and that fastenings and supports installed by others are in place.
        .2 Ensure that environmental conditions and work preceding that of this Section are satisfactory.
        .3 Verify that work performed under other Sections as a part of a ULC specification for a fire-rated assembly has been done in accordance with that specification.
    .2 General:
        .1 Install furring, studs, gypsum board, accessories, and other related products in strict accordance with CSA Standard A82.31, including Appendix B "Control Joints". Where the standard does not incorporate specific products and methods, follow the manufacturer's directions. Use 5/8" (16mm) thick gypsum board for interior work unless detailed otherwise.
        .2 Install work within 1/8" (3mm) of dimensioned location unless approved otherwise by Consultant, and flat to tolerance of 1/8" (3mm) maximum in 10'-0" (3m) and 1/16" (1.6mm) maximum in any running 12' (300mm).
        .3 Co-ordinate the work of this Section with that of other Sections. Ensure that adequate preparation is made for the attachment of hangers, fasteners, stiffeners, and reinforcing. Provide for carrying and integration of flush-mounted and recessed components only after consultation and verification of methods with those performing the work of Divisions 15 and 16. Do not use through-the-roof hangers.
        .4 Do not install metal framing, trim, casings, or accessories which have been bent, dented, or otherwise deformed.

.5 Securely attach trim, casings, framing and accessories. Attachment by means of tape is unacceptable.

.6 Framing and furring shown on Drawings is indicative, but do not regard it as exact or complete. Construct work to provide adequate strength to withstand stresses imposed by use without distortion and to maintain dimensions indicated on drawings.

.7 Erect supporting and finish materials to dimensions indicated on drawings, plumb, level, straight, and square to adjoining elements.

.8 Provide for movement at intersections with structural members to avoid transference of loads to this work. Construct vertically sliding deflection space at top of partitions by means of double channels. Secure top channel to structure and bottom channel to stud work. Secure board only to bottom track making allowance for up to 3/4" (19mm) deflection of structure. Cut board short at top and caulk this joint.

.9 Make allowance for thermal movements in gypsum board systems.

.10 Provide control joints in gypsum board work in locations as indicated on Drawings and at no greater spacing than 20'-0" (6000mm) in each direction, at perimeters of ceilings where they abut walls and other vertical surfaces, at abutting structural elements, at dissimilar walls and ceilings, at structural expansion and control joints, and at other locations where stresses are likely to develop as recommended by board manufacturer. Line up control joints with joints in other construction or with centrelines of mullions, columns, piers, or similar building elements.

.11 Form control joints using continuous furring channels along each side of joint locations, and filling control joint space with specified joint strip, secured in place, making straight joints.

.12 Install casings and thermal breaks at junctions of gypsum board with exterior door, window, or screen joints.

.13 Do not support the work of this Section from, nor make attachment to ducts, pipes, conduit or the support framing of the work of other Sections. Place supplementary steel supports as required to maintain hanger spacing and to keep mechanical ducts free from hangers being secured to.

.14 Do not apply gypsum board in close proximity to hot pipes or heating ducts.

.15 Install materials with the minimum of joints. Tightly butt joints without force and neatly align them.

.16 Frame openings on each side with suitable sections. Provide clearances required at mechanical and electrical services such as grilles, diffusers, access panels and lighting fixtures only after verification of requirements in each case.

.17 Co-operate with those installing the work of other Sections. Where the work of others penetrates gypsum board construction, fit openings snugly, and to ensure cover by escutcheons or plates utilized.

.3 Fixture, Cabinet, Toilet Partition and Urinal Screen Supports:

.1 Verify location of supports within gypsum board assemblies to support wall mounted lights, fitments, cabinets, plumbing fixtures, wall plates required for grab bars and any other item attached to drywall. Co-operate and co-ordinate with trades and provide information in ample time to ensure supports are provided in the correct locations, and are adequate to support the loads.

.4 Partition Stability: Where partitions do not extend to structure, provide suitable internal reinforcement to prevent lateral movement of the partitions. Secure head runners to acoustic tees by means of "twist clips".

.5 Concrete Anchors: Locate anchorage points in reinforced concrete floor slab underside in accordance with gypsum board manufacturer's suspension requirements. Drill holes with carbide-tipped drill bits conforming to ANSI B94.12. Install anchors; minimum installation depth and method of expansion to be as recommended by the anchor manufacturer.

.6 Installation of Suspended Ceiling Framing and Furring:

.1 Include in the work of this Section the supply of hangers and supervision of their proper location, or inserts for hanger attachment, when either or both are embedded in concrete.

.2 Space hangers for runner channels to suit structure, to support ceiling load, at a maximum distance of 4'-0" (1220mm) o.c. and at no greater distance than 6" (150mm) from ends of runner channels.

.3 Install runner channels at 3'-0" (915mm) o.c. generally, and at no greater distance than 6" (150mm) from terminations of supported cross-furring members. Bend rod hangers sharply under bottom flange of runners, and wire securely in place with saddle ties.

.4 Splice runner channels by lapping at least 12" (300mm), with interlocking flanges and wires at each end with two loops. Splice only where unavoidable. Do not bunch or line up splices.

.5 Install cross-furring at 24" (600mm) generally, and at no greater distance than 6" (150mm) from walls, openings, breaks in continuity of ceilings, and changes of direction. Space furring in cases to suit incorporated services, and so as to avoid contact with perimeter walls. Span hat-type furring no greater than 4'-0" (1220mm). Use metal studs for greater spans: 1-5/8" (40mm) deep spanning to 5'-0" (1525mm), 2-1/2" (65mm) deep to 6'-0" (1830mm) and 3-5/8: (92mm) deep to 8'-0" (2440mm).

.6 Secure cross-furring to supports with double wire ties or approved equivalent attachment. Splice by nesting and tying together with8" (200mm) overlap.

.7 Erect entire hanger and suspension system to adequately support the ceiling assembly, including services incorporated with a maximum deflection of 1/360 of span of each component member, and free from horizontal movement.

.8 Enclose ducts, pipes or beams that occur below the general finished ceiling level with metal furring and gypsum board, in rooms where gypsum board is specified.

.9 Enclose ducts, pipes, or beams that occur below the general finished ceiling level with metal furring and gypsum board, in rooms where acoustic treatment for ceilings is specified.

.10 Form recesses for light coves where indicated on drawings. Enclose light coves with gypsum board.

.7 Metal Stud Partition Framing:

.1 Lay down gasket at location of bottom track. Secure runner channels at floor and tops of partitions for their full lengths, at 24" (610mm) o.c. with concrete fasteners or as suitable for the substrate material. Install runner channels also at heads and sills of openings. Secure runners at openings by cutting flanges, turning up webs, and screwing to studs.

.2 Butt, not mitre, runners at wall intersections and corners. At ceilings, lap and screw channels together.

.3 Space studs at 16" (400mm) o.c. generally, and at no greater distance than 2" (50mm) from abutting walls, partitions and corners.

.4 Secure studs to runners by screws, crimping, or welding as required by stud type to conform to manufacturer's design specification.

.5 Utilize only proper stud sizes to meet the requirements of this specification. Span studs of 1-5/8" (40mm) depth no greater than 8'-10" (2700mm) between supports, 2-1/2" (65mm) depth, 11'-9" (3600mm) and 3-5/8" (92mm) depth, 15'-9" (4800mm).

.6 Double studs at door jambs. At each jamb of doors exceeding either 36" (915mm) width or 2-1/2" (63mm) in thickness or both, install a structural channel reinforcing extending from floor structure to structure above, and adequately anchored at each end.

.7 Brace studs with stiffeners over doors in partitions of greater height than 10'-0" (3000mm) spaced as preceding, and above and below window type openings spaced not more than 6" (150mm) from the top and bottom of openings. Stiffeners to be 3/4" (19mm) bracing channels, wire tied or welded to each stud, and extending horizontally across entire length of each braced partition and across two full stud spaces at each side of door and window openings.

.8 Splice studs only when unavoidable by nesting with 8" (200mm) minimum lap, and fastened with one screw in each flange.

.9 Co-ordinate work with others installing horizontal runs of service lines so that work of is done simultaneously. Where standard holes are too small for installed services, notch studs and splice notched flange with a splice piece 12" (300mm) longer than notch, fastened with two screws.

.10 Unless shown otherwise on drawings, partitions, together with wallboard facing, to extend above ceilings to underside of structure above.

.11 Ensure that electrical and telephone boxes are not installed back to back.

.12 Screw frame anchor clips of frames supplied and installed under the work of another Section, to jamb studs and head and sill runners. Provide adequate fastening to prevent movement of frames within partitions.

.8 Acoustically Treated Walls and Bulkheads:

.1 Install board 1/2" (12.7mm) short at top, bottom and edges and fill with caulking. Caulk on both sides of wall. Caulk after gypsum board is in place, not before.

.2 Stagger joints in double layer gypsum board construction.

.3 Pack partition cavities with acoustical insulation. Friction fit insulation securely between studs.

.4 Fill butt joints of gypsum board with joint filler prior to taping or finishing.

.5 Caulk or plaster fill penetrations through gypsum board for electrical boxes, wiring, pipes, ducts and similar items. Caulk airtight around electrical and communication boxes before plate is installed.

.6 Do not let fastening screws extend through to opposite set of studs. Build bulkheads above acoustically rated doors and partitions and folding partitions as detailed.

.9 Installation of Gypsum Board:

.1 Extend boards into door, window, and other opening reveals.

.2 Back joints with a framing member.

.3 Install boards in maximum lengths and widths to minimize joints, and never in lengths of under 6'-0" (1800mm). Stagger end joints where they are unavoidable. Locate joints in ceilings and soffits where least prominently discernible.

.4 Form neat joints at mill ends and at field-cut edges of wallboard panels. Cut paper on face with a knife. Smooth by sanding and rubbing edges together.

.5 Fasten boards to metal support members by sheet metal gypsum board screws at 12" (300mm) o.c. no closer than 3/8" (10mm) to and no farther than 1/2" (12.7mm) from centre of joints. Do not force adjacent boards into place. Allow moderate contact. Provide extension slips where required. Drive screws to form a slight depression, but no so paper cover is broken.

.6 Where curved gypsum board is indicated, wet boards and bend to required radius, and block in position until dry. Finished curved surface to be smooth and even.

.10 Treatment of Gypsum Board Joints:

.1 Fill joints, screw holes, and depressions on board surfaces exposed to view to provide smooth, seamless surfaces, and square, neat corners. Use jointing compounds and reinforcing tapes in conformance with manufacturer's specifications. Ensure that board is tight against framing members, fasteners are properly depressed, and adhesives have sufficiently cured.

.2 Fill joints, edges and corners by Gypsum Association Level 5 three coat tape and joint filler method.

.3 At external corners, install corner beads secured to framing at 6" (150mm) o.c. on alternate flanges. Fill to nose of corner bead with joint filler and topping cement, as specified for bevelled joints.

.4 At casing beads installed at edges of board exposed to view, where board butts against other materials, with no trim to conceal junction at control joints, at perimeter of ceiling surfaces, at top of partitions where they stop against continuous ceiling surfaces, and where otherwise shown on drawings, secure casing beads to framing at 12" (300mm) o.c.

.5 At screwheads, fill holes and depressions with a two-coat application of joint filler.

.11 Exterior Sheathing Board with Vapour Permeable Weather Barrier :

.1 Install exterior sheathing boards as per manufacturer's strict instructions.

.2 Apply liquid flashing over joints, corners, rough openings, penetrations, material transitions, and fasteners in thicknesses as recommended by manufacturer.

.12 Joint and Surface Treatment of Cement Board – Typical:

.1 Apply 2" (50mm) glass fibre tape over joints and corners. Press firmly and uniformly in place to avoid bumps. Apply in accordance with manufacturer's directions.

.2 Where board is to serve as substrate for paint or coating, apply 1/8" (3mm) thick uniform water resistant skim coat, ready to receive paint or coating.

.13 Installation of Accessories:

.1 Install accessories such as access panels, and grilles when supplied by other sections. Obtain prior Consultant's approval of locations of accessories prior to installation.

.2 Gypsum board infill at access panels to have taped edges. Apply gypsum board with adhesive. Fill and sand smooth perimeter edges as specified for joint finishing.

.14 Fire Separations:

.1 Construct gypsum board assemblies where located at fire separations of metal framing covered on both sides by fire-rated gypsum wallboard.

.2 Fit assemblies tightly to enclosing constructions to maintain integrity of the separations. Install casing beads at perimeter edges. Ensure that caulking work under Section 07 72 00 relative to non-sound rated assemblies, i.e. perimeter joints in concealed locations is done, before continuing with the work of this Section.

.3 For two layers of gypsum board, attach one layer of gypsum board to each side of studs with long edges on studs by screws at 16" (400mm) o.c. as well as at intermediate studs and runners. Attach second layer of gypsum wallboard by screws at 16" (400mm) o.c. at studs and 12" (300mm) o.c. at runners. Stagger joints at first and second layers 12" (300mm) tape joints only where exposed to view. Fill screw holes. For tested assemblies secure in accordance with test data.

.4 Assemblies constructed other than those indicated may be approved by the Consultant on presentation of affidavits which validate fire resistance ratings by acceptance of the Jurisdictional Authorities.

.5 For walls containing fire dampers provide gypsum board end covers over studs between duct and stud.

.15 Cleaning and Patching:

.1 Remove droppings and excess joint compound from work of others and from work of this Section, before it sets.

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

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

.4 Clean off beads, casings, and other metal trim, and leave surfaces ready for specified finishes.

09 30 00 - WALL AND FLOOR TILE

Part 1. General:

1. Scope:
   - **.1** The work in this section includes, but is not limited to the following:
     - .1 Supply and installation of interior wall, floor tile.
     - .2 Supply and install waterproofing membrane at shower walls and floors.
     - .3 Supply and installation of uncoupling and waterproof membranes.
     - .4 The provision of floor topping to suit required floor slopes.
     - .5 The preparation of the floor and walls to receive tiles.
   - **.2** Protective barricades and traffic control. Protection of new tile surfaces.
   - **.3** Work required to result in a first class installation for the Owner's intended use. No substitution of materials or installation methods will be accepted.
   - **.4** Refer to drawings for locations and extent.
2. References:
   - **.1** ANSI A137.1: National Standard Specifications for Ceramic Tile.
   - **.2** ASTM C1178/C1178M, Standard Specification for Glass Mat Water Resistant Gypsum Backing Panel.
   - **.3** ASTM C920, Standard Specification for Elastomeric Joint Sealants.
   - **.4** CAN/CGSB 75.1 M88, Tile, Ceramic.
   - **.5** Terrazzo, Tile and Marble Association of Canada (TTMAC): Specification Guide 09 30 00, Tile Installation Manual.
   - **.6** TTMAC: Dimensional Stone Guide
   - **.7** TTMAC: Hard Surface Maintenance Guide
3. Definitions:
   - **.1** Wet Areas: Aquatic areas, showers, drying areas, change rooms, washrooms associated vestibules and corridors.
4. Performance Requirements:
   - **.1** Tile products manufactured and tested to ISO 10545 Series and ANSI A137.1.
   - **.2** Slip Resistance: Minimum dynamic coefficient of friction (DCOF) of 0.42 wet to ANSI A137.1.
   - **.3** Floor Traffic Load Bearing Performance: ASTM C627, meeting minimum moderate duty, and outlined in this section and the TTMAC Guide Specification.
   - **.4** Surface Flatness Tolerances:
     - .1 Small Format Floor Tile less than 100 x 100 mm: Variances in flat / sloped surfaces shall not exceed 6mm in 3000mm and shall be non accumulative from datum line.
     - .2 Standard Format Floor Tile 100 x 100 mm to 400 x 400 mm: Floor flatness measured to a minimum FF35; equivalent to 5 mm with maximum 2 gaps under a 3 m straight edge measurement.
     - .3 Large Format Floor Tile 400 x 400 mm: Floor flatness measured to a minimum of FF50; equivalent to 3 mm with maximum 2 gaps under 3m straight edge measurement .
     - .4 Wall Tiles: Wall levelling similar to floors tiles having similar sizes listed above.
5. Submittals for Review
   - **.1** Provide product data for each product. Include installation instructions for using all materials.
   - **.2** Samples: Provide physical samples of each tile type includes samples of all trims specified.
   - **.3** Closeout submittals: Operation and Maintenance Data -Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.
   - **.4** Extra Stock Materials: Provide a minimum 3 percent of total of each type and of each colour of floor tile and trim used from same production run for project maintenance upon completion. At a minimum provide 2 boxes of each type and colour of wall and floor tile. Neatly package and identify materials and deliver to location specified by Owner.
6. Quality Assurance
   - **.1** Perform work in accordance with TTMAC Specification Guide, Tile Installation Manual.
   - **.2** Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
   - **.3** Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.
   - **.4** Tile Setting Material Manufacturer's Review:
     - .1 Prior submitting Submittals obtain tile setting manufacturer's review and approval for conformance of tile installation methods and procedures with warranty requirements.
     - .2 Prepare and submit report signed by the tile setting manufacturer.

.3 Review of waterproofing membrane installation, and provide required testing ensuring waterproofing membrane manufactures recommended thickness is achieve.

7. Mock Ups;
   .1 Provide:
      .1 1500 x 1500 mm mock-up of a sample installation illustrating in a cutaway fashion the floor tile, wall tile, accent tile (as required), base and grout for the following:
         .1 Shower Floor and Wall
   .2 Build mock-ups using personnel, materials, and methods of construction that will be used at Project site
   .3 Locate where directed by Consultant.
   .4 Allow for multiple iterations until mock-up approved by Consultant.
8. Delivery, Storage, Handling and Protection:
   .1 Delivery: Coordinate deliveries to comply with construction schedule and arrange ahead for off the ground, under cover storage location. Do not load any area beyond the design limits.
   .2 Storage: Carefully check, unloaded, stored and handled materials to prevent damage. Store material in original, undamaged containers or wrappings with manufacturer's seals and labels intact.
   .3 Protection:
      .1 Restrict traffic by other trades during installation.
      .2 Provide adequate protection of completed tiled surfaces to prevent damage by other trades until final completion of this project. Minimum protection to consist of 4 mil polyethylene sheets lapped 4" and taped.
      .3 Heavily travelled areas to have additional 1/2" thick fibreboard sheet protection with taped joints over polyethylene sheet protection as specified above.
      .4 Protect exposed edges of floor tile with 4" wide tapered strip of plywood of same thickness of tile, adhered to floor until adjoining floor finish is to be installed.
9. Warranty:
   .1 Warrant the work of this section against defects in materials and workmanship in accordance with the General Conditions, but for a period of five (5) years, and agree to promptly 'make good' defects which become evident during the warranty period without cost to the Owner. Defects of the tiling and waterproofing systems will include but not be limited to the following; water leaks, cracking, loss of bond, loosening, leaking, splitting, and warping, or other deformations.

Part 2. Products:

1. Porcelain Ceramic Floor Tile (noted on the drawings as **PCT)**:
   .1 *'*Choice*"* as manufactured by Daltile, having the following characteristics;
      .1 Conforming to ANSI A137.1.
      .2 typical size 12"x 12",
      .3 Finish: matte finish.
      .4 DCOF >0.55, Slip resistance is required.
      .5 Trim usage: Provide all manufactured trims required to complete installation for base, inside and outside corners conditions.
      .6 Colour to be selected by Architect from manufacturer's standard range of colours. Allow for 2 colours.
   .2 Or approved equal.
2. Porcelain Ceramic Mosaics Floor Tile (noted on the drawings as **FT used in Showers**):
   .3 *'*Choice*"* as manufactured by Daltile, having the following characteristics;
      .1 Conforming to ANSI A137.1.
      .2 typical size / pattern 2"x 2".
      .3 pattern: straight joint mosaic, preset in 12"x 24" sheets
      .4 Finish: matte finish.
      .5 DCOF >0.55, Slip resistance is required.
      .6 Trim usage: Provide all manufactured trims required to complete installation for base, inside and outside corners conditions including but not limited to the following;
         .1 Base:
            1. cove base -C-833
            2. out corner base / universal trim SC-813
            3. cove base corner CK-813
      .7 Colour to be selected by Architect from manufacturer's standard range of colours. Allow for 2 colours.
   .4 Or approved equal.
3. Ceramic Wall Tile (noted on the drawings as PCT-W):
   .1 Color Wheel 'Linear' as manufactured by Daltile, having the following characteristics;
      .1 Conforming to ANSI A137.1.

.2 Typical size 4" x 12" x 1/4"
.3 Pattern: vertical stack bond
.4 Trim usage:
.1 Edge and Corner Trim: Bullnose on 12" side, 4"x 12" S44C9MOD
.5 Colour to be selected by Architect from manufacturer's standard range of colours. Allow for 4 colours.
.1 Or approved equal.

4. Mortar and Grout Materials
.1 Acceptable Tile Setting Materials: Subject to conformance to requirements, mortar and grout materials listed below shall be of a uniform quality for each adhesive, and grout component from a single manufacturer and each aggregate from one source or producer as follows:
.1 Mapei Corporation,
.2 Laticrete International Inc.,
.3 TEC Incorporated Building Products Group, an H.B. Fuller Company,
.4 Flextile Ltd.
.2 Setting and Grouting Materials: Conform to material standards in ANSI's Specifications for the Installation of that apply to materials and methods specified.
.1 Grout Colours: Unless otherwise indicated, to be selected by Consultant.
.2 Grout joints: for stone floor tiles provide grout material capable of maintaining maximum 3 mm grout joints.
.3 Source limitations: All materials shall be from one manufacturer, forming a complete system.
.4 Products: Provide like products from same production run. Install products in sequence from sequentially numbered dye lots

5. Mortar and Grout Setting Systems For **Dry** Areas
.1 Floors, concrete substrate: TTMAC Detail 311F-2016/2017-A, and ANSI A108/A118/A136.1.
.2 Gypsum Board Walls: TTMAC Detail 304-2016/2017
.3 Concrete and Concrete Block Walls: TTMAC Detail 303W-2016/2017.
.4 Walls with Glass-Mat, Water-Resistant Backing Board (Tile Backing Panels) on Metal Stud Wall Framing: TTMAC Detail 305W-2016/2017-B.
.5 Materials: to ANSI A108/A118/A136.1 and TTMAC Detail indicated:
.1 Thinset Mortar:
.1 Kerabond with Keralastic by Mapei,
.2 4237 latex additive and 211 Crete filler powder by Laticrete,
.3 TA 382 Ultimate LFT by TEC, HB Fuller.
.4 51 Premium Wall & Floor Thin-Set Mortar with 44 Acrylic Additive' by Flextil.
.2 Trowelable Underlayment and Screed Compound:
.1 Topcem by Mapei,
.2 226/3701 mortar mix by Laticrete,
.3 A 305 Fast Set Deep Patch by TEC, HB Fuller.
.4 FAST-SET SCREED BY Flextile
.3 Grout: ANSI A108/A118/A136.1:
.1 Standard for dry locations:
1. SPECTRALOCK PRO Premium Grout by Laticrete, or
2. Mapei UltracolorPlus, or
3. PowerGrout by TEC, HB Fuller or
4. 1600 RSG by Flextile
.4 Epoxy Grout: Public Washrooms
1. SPECTRALOCK PRO Premium Grout by Laticrete, or
2. Kerapoxy by Mapei,
3. AccuColour EFX by TEC, HB Fuller.
4. FLEX-EPOXY 100 GROUT by Flextile
.5 Uncoupling / waterproofing membranes
1. Ditra XL by Schluter
2. UM by Mapei

6. Mortar and Grout Setting Systems **Wet** Areas
.1 Showers, and wet corridors to comply with TTMAC Detail 310F-A.2016/2017.
.2 Concrete block walls in wet areas, comply with TTMAC Detail 303W- 2016-2017
.3 Materials: to ANSI A108/A118/A136.1 and TTMAC Detail indicated:

.1 Scratch/Skim/ Bond Coat:
- .1 Kerabond mixed with Keralastic additive by Mapei,
- .2 211/4237 by Laticrete,
- .3 TA392/393 SUPERFLEX ULTRA PREMIUM THIN SET by TEC
- .4 #51 FLOOR & WALL PREMIUM MORTAR MIXED #44 ACRYLIC ADDITIVE by Flextile

.2 Mortar Bed/levelling coat:
- .1 Topcem with Planicrete AC by Mapei,
- .2 226/3701 mortar mix by Laticrete,
- .3 TA305 FAST SET DEEP PATCH WITH PATCH ADDITIVE by TEC, FAST-SET SCREED or 4:1 DRY PACK with #44 Acrylic Additive by Flextile
- .4 For bed thicknesses over 40 mm, suspend reinforcing mesh within mortar bed.

.3 Waterproof Membrane: ANSI A118.10,
- .1 Sheet waterproof membrane:
  1. Kerdi by Schulter
  2. WP200 by Mapei Canada
- .2 Uncoupling / waterproofing membranes
  3. Ditra XL by Schluter
  4. UM by Mapei

.4 Grout: ANSI A108/A118/A136.1 Epoxy Grout:
- .1 Kerapoxy by Mapei
- .2 SPECTRALOCK PRO Premium Grout by Laticrete
- .3 AccuColour EFX by TEC, HB Fuller
  1. FLEX-EPOXY 100 GROUT by Flextile

.5 Grout / Sealer Mix (AN ALTERNATE TO EPOXY GROUT)
- .1 Powergrout by TEC
- .2 Ultracolour by Mapei

7. Accessories:

.1 Water Fresh, cleans, potable and free from deleterious matters, acids or alkalis.

.2 Sealant: movement and joint sealants as specified in section 07 72 00 – Joint Sealants.

.3 Trims:
- .1 Exposed **Tile Edge Strips:** not required – specified trims accommodate exposed edges
- .2 **Straight Edge Strips – Transition between PCT and other flooring types:** Stainless steel edge strips, 3mm wide at top edge; height as required to suit tile installation; with integral perforated anchoring leg for setting the strip into the setting material: Acceptable Products: Schlüter Schiene AE, or approved alternate.
- .3 **Straight Edge Strips – Transition between PCT and VCT:** Stainless steel strips with ramp transition approx. 18,,mm long and securing leg below PCT, sized to suit installation – 10mm+/- top to suit PCT installation and to 4 mm at base to suit VCT installation. Acceptable Products: Schlüter RENO-U, or approved alternate.

.4 Sealer: clear penetrating type, natural look unless otherwise noted.
- .1 Aqua Mix Sealer's Choice Gold by Centura Tile.
- .2 Lithofin MN Stain-Stop by CIOT Marble and Granite.

.5 Trowellable Underlayments and Patching Compounds: Latex-modified, Portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations specified or indicated.

.6 Tile Cleaner:
- .1 A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers and as follows:
  - .1 Job Site Cleaner: Phosphoric acid/nitric acid based cleaning solution mixed in accordance with cleaner manufacturer's recommendations and as recommended by tile manufacturer.
  - .2 Maintenance Cleaner: Nontoxic, electrolytic, biodegradable, non-ammonia containing, pH controlled cleaning solution mixed in accordance with manufacturer's recommendations.

Part 3. Execution:

1. Examination:

.1 Verify that surfaces are ready to receive work.

.2 Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated or specified.

.3 Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.

.4 Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Consultant.

.5 Maintain minimum temperature of 13 degrees C at tile installation area for 24 hours prior to curing and for 24 hours after installation. Do not apply work to frozen surfaces.

.6 Examine areas and conditions affecting work of this section and report any discrepancies or defects which would affect finished results.

.7 Verify sealants and grout are cured for manufactured recommended periods at required temperatures and relative humidity conditions, before water immersion.

.8 Verify, through a flood test, that setting beds provide complete water drainage to shower or change room drains prior to application of tiles. Ponding at drains will not be acceptable and will require remediation prior to occupancy.

2. Preparation

.1 Protect surrounding work from damage or disfiguration.

.2 Vacuum clean surfaces and damp clean, unless otherwise specified.

.3 Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

.4 Apply sealer to substrate surfaces in accordance with adhesive manufacturer's written instructions.

.5 Preparation for all Tile Areas: Substrates shall be structurally sound, level and plumb, within a maximum tolerance of 3 mm in 2400 mm for vertical surfaces, and horizontal surfaces within a maximum tolerances of 6 mm in 3000 mm from finished levels of surface or better. Apply a levelling compound on uneven surfaces or surfaces which do not meet a plumb or level finish to the tile.

.6 Fill cracks, holes, and depressions in concrete substrates for tiling installed with thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

.7 Check as per ASTM F710 for Concrete Preparation for excessive moisture levels & pH of the slab.

3. Installation of Mortar Bed

.1 Confirm new concrete slab on grade is set and cured for 28 days.

.2 Install mortar bed referenced TTMAC Manual and TTMAC systems listed.

.3 Install mortar bed in thickness and with slopes and indicated in the drawings.

.4 Install thickness to tolerances noted in this specification for tile installation.

.5 Where mortar bed thickness exceeds 40mm (1.5") provide a stainlessness steel reinforcing mesh.

.6 Provide a smooth, trowelled finished surface,

.7 Allow minimum 14 days for cure prior to installing tile.

4. Installation of Waterproofing / Decoupling Membranes

.1 All floor leveling and floor / wall patching required shall have been completed prior to the work in this part.

.2 Clean floor of dust, wax or oils or old adhesives. Surface shall be dry, even and load bearing

.3 Use clean water and with a sponge, wipe down floor. Leave no standing water.

.4 Use thin set mortar mixed the fairly fluid consistency. Apply with 4.5mm x 4.5mm square knotched trowel.

.5 Apply waterproof and decoupling membranes in accordance with manufacturer's written instructions.

.6 Apply to surfaces scheduled.

.7 Apply waterproofing membrane with fleece side down.

.8 Install all waterproofing membrane and decoupling membrane is full base of unmodified thinset mortar as recommended by the manufacturer. Press into mortar base, solidly embedding the waterproofing / uncoupling membrane into the bed or mortar.

.9 Lift a corner to check coverage proper installation shall see full contact between the fleece and the bed of mortar. Where coverage is not completed remove sheet and repeat process. Ensure mortar consistence and application is correct.

.10 At all inside and outside premanufactured corners provide waterproofing strips where required set in unmodified thinset mortar accordance with manufacturer's instructions

.11 Lap joint in membrane with sheet waterproofing strips, minimum overlap of 2"

.12 Install premanufactured sheet waterproofing corners for inside and outside corners, minimum overlap of 2".

.13 Provide purpose made round gaskets at shower heads and controls.

.14 Lap joints of decoupling membrane with waterproofing strips, minimum overlap of 2"

.15 Provide purpose made round sheet waterproofing gaskets at floor drains.

.16 Lap membranes continuous from ceiling to floor drain to provide a provide a continuous waterproof seal.

.17 Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

5. Installation of Tile

.1 Install thinset mortar, tile and grout to referenced TTMAC Manual and TTMAC systems listed.
.2 Install tiles in patterns and locations as indicated on drawings.
.3 Use specified trims at base, exterior corners and exposed wall tile edges.
.4 Thoroughly clean surfaces to which tile is to be applied.
.5 Back butter floor tile.
.6 Neatly cut tile around fitments, fixtures, access panels, and the like. Splitting of tile is expressly prohibited except where no alternative is possible. Form intersections, corners and returns accurately.
.7 Joints in base to match floor patterns. Joints will be watertight without voids, cracks or excess grout.
.8 Lay out tile so that fields or patterns are centred on wall areas or architectural features and so that no tile less than 1/2 size occurs.
.9 Coordinate work of this section with work of other sections for items requiring to be recessed into work of this section.
.10 Place edge strips at exposed tile edges.
.11 Cut and fit tile tight to penetrations through tile. Ensure finish trim will cover cut tile edges. Form corners and bases neatly. Align floor, base and wall joints.
.12 Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar or excess grout.
.13 Finish surfaces flat and level or, sloped and graded as required.
.14 Joint Widths: Install tile with the following joint widths, unless indicated on drawings. Make joints consistent width and alignment within tile area.
.1 Ceramic Mosaic Tile: 1/16" (1.5mm)
.2 Wall Tile: 1/16" (1.5mm)
.3 Large Format Tile: minimum 1/8" (3mm) to a maximum 1/4" (6mm)
.4 Maintain 2/3 of grout joint depth free of setting material.
.15 Sound tiles after setting and remove and replace tiles not fully bedded.
.16 Allow tile to set for a minimum of 48 hours prior to grouting.
.17 Where indicated on Drawings or as required, install continuous single piece metal edge trims centred under doors in closed position and other locations where tile meets other floor finishes.
.18 Grout tile joints.
.1 Grout tiles in accordance with manufacturer's written instructions, and ANSI A108.10.
.2 Mix grouts and install in strict accordance with the manufacturer's instructions.
.3 Re-wet joints and tile that have become dry before grouting. Force maximum grout into joints using stiff rubber float, squeegee or brush application method.
.4 In dry areas use white Portland cement. Colour to be chosen by Consultant.
.5 In wet areas use epoxy grout
.6 When grouting a fresh laid floor, make certain that traffic and grouting will not cause movement of floor in setting bed. Protect floor by using kneeling boards or gypsum board to defend floor against traffic while grouting.
.7 Excess grout will be removed from the surface of tiles using the edge of a rubber float held at a 45 degree angle, moving it diagonally to the joints. Fill gaps and air holes.
.8 Do not allow grout to harden on face of tile. Refer to manufacturer's instructions for thorough removal.
.9 Finished tile work will be clean and free of tiles which are pitted, chipped, cracked or scratched. damaged tile will be removed and replaced.
.10 Re-point joints after cleaning to eliminate imperfections. Avoid scratching tile surfaces.
.19 Movement Joints and Sealant-Filled Joints:
.1 Provide movement joints and other sealant-filled joints, including control, contraction, isolation joints, at junction of tile and dissimilar materials and junction of dissimilar planes, and where indicated. Form joints during installation of setting materials and tile. Do not saw-cut joints after installing tiles.
.2 Install control joints in accordance with TTMAC guidelines, **detail 301MJ**-C1 and the Tile Council of America; Handbook for Ceramic Tile Installation.
.3 Unless otherwise indicated, make control joints 6 mm wide.
.4 Install at 16'-20 'on centres. Review position and layout with architect prior to installation.
.5 At Shower Control Joints: Grout joints open with fibreglass mesh below. Apply sealant immediately prior to substantial completion, and after tiles have become acclimatized to building and substrate.
.6 Prepare joints and apply sealants to comply with requirements in Division 07 Section Joint Sealants.

6. Cleaning
.1 Clean installed work.
.2 Clean tile and grout surfaces.

.3 Clean tiled areas after grouting has cured, using compatible solutions and methods as recommended by the manufacturer.

.4 Remove grout residue from tile as soon as possible.

.5 Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's written instructions, but no sooner than 10 days after installation.

.6 Flush surface with clean water before and after cleaning.

.7 Leave finished installation clean and free of cracked, chipped, broken, unbounded, or other tile deficiencies.

7. Protection of Finished Work

.1 Protect installed work.

.2 Do not permit traffic over finished floor surface for 4 days after installation.

09 51 00 - ACOUSTICAL CEILINGS

Part 1. General:

1. Scope**:** This section includes requirements for supply and installation of ceilings consisting of acoustic panels, complete with exposed suspension system and trim.
2. References:
   - .1 ASTM C635 'Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings'.
   - .2 ASTM C636 'Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels'.
   - .3 ASTM E1264 'Standard Classification for Acoustical Ceiling Products'
   - .4 CAN/ULC S102 'Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies'.

Part 2. Products:

1. Suspended Ceiling Grid System (Typical):
   - .1 'Prelude XL' Series as manufactured by Armstrong World Industries Canada Ltd.
     - .1 Exposed suspension system materials to be factory finished, colour "white".
     - .2 Provide this suspension system for acoustic lay-in panels' types.
2. Acoustic Lay-in Panels:
   - .1 ACT (Typical): to be 24" (610mm) x 24" (610mm) x 1" (24.5mm) square edge panels, "Optima Open Plan" as manufactured by Armstrong World Industries Canada Ltd. Colour "white", NRC 0.95,
3. Basic Steel Material and Finish: Commercial quality cold rolled steel minimum 0.179" (26 gauge) thick, galvanized to zinc coating designation Z275. Exposed surfaces of metal products to be factory finished with satin white enamel.
4. Main Tees: 12'-0" (3650mm) long, 9/16" (15mm) face width double web design, rectangular bulb at top of web, 1-1/2" (38.1mm) web height.
5. Main Tee Splices: Designed to lock lengths of main tees together so that joined lengths of tee function structurally as single unit with tee faces at joint perfectly aligned and presenting tight seam
6. Cross Tees: 4'-0" (1220mm) long, 1" (25mm) web height structural cross-section, design same as main tees, designed to connect at main tees forming positive lock without play, loss or gain in grid dimensions with offset over-ride of face flange over main tee flange to provide flush joint
7. Edge Moulding: Materials and finish to match tees.
8. Hold-Down Clips: Spring steel clips by CGC Inc. or Armstrong.
9. Hangers and Anchors:
   - .1 #12 galvanized annealed steel wire for support of a maximum weight of 68 kg. Per hanger; #9 galvanized annealed steel wire for support of a maximum weight of 140 kg. Per hanger; 3/16" (4.5mm) diameter galvanized annealed steel rod to support a maximum weight of 250 kg. Per hanger.
   - .2 Inserts and attachments to structure for hanger connections to suit conditions and loading, and galvanized after forming. Minimum tensile strength 390 MPa.
   - .3 Concrete anchors to be Phillips Red Head TW-614 or other make of tie wire sleeve anchors conforming to US Federal Specifications FF-S-325, Group II Type III, Class 3, and QQ-2-325, Type II, Class 3.
10. Accessories:
    - .1 Miscellaneous clips, splicers, connectors, screws, nails, and other standard accessories to be zinc-coated and to be of strength and design compatible with the system specified. Provide special accessories to complete work.

Part 3. Execution:

1. Install acoustic ceilings to conform with the following:
   - .1 Installation to be by skilled tradesmen and in strict accordance with system manufacturer's printed directions to produce a first-class flush-finished surface, in true planes, and free from uneven joints, and dropping, warped, damaged tile or panels. Butt joints evenly.
   - .2 Install suspension system in general conformity with ASTM C636.
   - .3 Do not erect ceiling suspension system until work above ceiling has been inspected by Consultant.
   - .4 Hangers for systems to be spaced at approximately 4'-0" (1220mm) centres both ways, and where normally required in good standard practice for the systems specified. Supporting and grid members to provide adequate support for the ceiling and services incorporated with a maximum deflection of 1/360 in each grid member span. Support luminaries and diffusers with additional hangers placed within 6" (150mm) of each corner and at a maximum of 24" (600mm) around perimeter of luminaire and/or diffuser.
   - .5 Secure hangers firmly to grid and to anchors. Twist wire a minimum of two (2) turns around vertical hanging wire.

.6 Erect suspension system at required elevation and level to tolerance of 1/8" (3mm) over 12'-0" (3650mm). Frame around recessed fixtures, diffusers, grilles and openings, and where normally required in good standard practice. Furr around ducts, beams, bulkheads or the like, as shown or required in best standard practice. Tape or adhesive attachment is unacceptable.

.7 Install main grid with intersections arranged in a basket weave pattern.

.8 Co-ordinate the work with trades affected by the work of this Section. Provide a layout of hangers and framing suitable to accommodate fittings and units of equipment. Failure to follow this procedure will require that the hangers and channels be revised to suit as necessary without additional cost to the Owner.

.9 Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest adjacent hangers and related carrying channels and furring as required to span the greater distance.

.10 Lay out work in accordance with reflected ceiling plans. Allowable tolerance of finished acoustical ceiling system: 1/8" (3mm) in 12'-0" (3650mm), and1/64" (0.04mm) between adjacent metal members. Tolerances to not be cumulative.

.11 Hang suspended ceilings independently of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of the longitudinal axis of face plane of adjacent members.

.12 Centre acoustical ceiling installation on room axis leaving equal border pieces but not less than half the size of the panel specified. Provide a row of hangers adjacent to and parallel with the walls for the support of the ends of the main tee runners at not more than 6" (150mm) from the ends of runners.

.13 Install components to form a level ceiling with parts flush and true, parallel to the module lines, and to the pattern shown. Install panels in level, uniform plane free from twist, warp, dents and flush, without gaps and exposed face of carrying members. Fit border units neatly against abutting surfaces. Ensure that flanges of recessed light fixtures fit snugly and flush to ceiling plane.

.14 Install cut panel at sprinkler heads.

.15 Install hold-down clips on lay-in panels to hold such panels tight to grid system where within 20'-0" (6100mm) of exterior doors or interior vestibule doors.

2. Adjustments**:** Adjust any sags or twists which develop in the suspension system and replace any part of the complete system which is damaged or faulty.

09 62 00 – INTERIOR TACTILE WARNING SURFACE INDICATORS

Part 1. General:

1. Scope**:** Work of this section includes interior applications for tactile warning surfaces at the top of stairs and ramps and all other locations as indicated on the drawings.
2. Submittals:
   - .1 Manufacturers Maintenance Data and Installation Instructions
   - .2 Manufacturers full written warranty.
   - .3 Manufacturers samples indicating colour and size of specified products.

Part 2. Products:

1. Manufacturers:
   - .1 The following manufacturers are approved for use on this project:
     - .1 Kinesik Engineered Products.
       Contact: Sandro Pinto; tel 905.330.9233, email sandro.pinto@kinesik.ca
2. Applications:
   - .1 Resilient Floor applications: "Eon Tile" by Kinesik Engineered Products.
     - .1 Thickness: To be selected by Architect at a later date.
     - .2 Colour / Finish: To be selected by Architect at a later date.
   - .2 Porcelain Tile applications: "Elan Tile" by Kinesik Engineered Products.
     - .1 Colour / Finish: To be selected by Architect at a later date.
   - .3 Surface Applied (Tile-less) applications: "Advantage One" by Kinesik Engineered Products.
     - .1 Colour / Finish: To be selected by Architect at a later date.
   - .4 Abuse Resistant / High Traffic applications: ***"Access Tile" by Kinesik Engineered Products.***
     - .1 Surface Applied
     - .2 Colour / Finish: To be selected by Architect at a later date.

Part 3. Execution:

1. Examination:
   - .1 Examine areas which are to receive the work of this section. Correct unsatisfactory conditions prior to start of work. Commencement of work implies acceptance of conditions as they exist and no extra will be allowed for failure to ensure satisfactory substrate condition.
2. Installation:
   - .1 Install all products in strict compliance with manufacturer's instructions, and most recent AODA, CSA, ISO, and Ontario Building Codes.
3. Clean-up:
   - .1 Work to be handed over to the Owner free of blemishes and in perfect condition.

09 65 00 – RESILIENT FLOORING

Part 1. General:

1. Scope:
   - **.1** Provide vinyl composite tiles and rubber base.
   - **.2** Provide luxury vinyl tiles and rubber base.
   - **.3** Provide resilient sheet flooring and cove base.
2. References:
   - **.1** American Society for Testing Materials (ASTM):
     - .1 E648-06 - Critical Radiant Flux of Floor-Covering Systems Using a Radiant Energy Source.
     - .2 E662-06 - Specific Optical Density of Smoke Generated by Solid Materials.
     - .3 E1907-06 - Evaluating Moisture Conditions of Concrete Floors to Receive Resilient Floor Coverings
     - .4 F710-05 - Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.
     - .5 F1303-04 - Sheet Vinyl Floor Covering with Backing.
     - .6 F1913-04 - Sheet Vinyl Flooring without Backing.
   - **.2** Resilient Floor Covering Institute (RFCI):
     - .1 Recommended Work Practices for Removal of Resilient Floor Coverings.
3. Submittals:
   - **.1** Provide submittals in accordance with Section 01 33 00.
   - **.2** **Existing Materials Match Review: The intent of the project is to match the existing flooring and base materials patterns and colour. To achieve this match complete the following tasks;**
     - .1 Provide a sample of the existing flooring and base taken from the site.
     - .2 Provide samples of the specified flooring materials and base that match the existing tile for review and final selection by the Architect.
4. Product Data:
   - **.1** Description of resilient material and accessories to be provided.
   - **.2** Resilient material manufacturer's recommendations for adhesives, weld rods, sealants, and underlayment.
   - **.3** Application and installation instructions.
5. Maintenance Data and Operating Instructions:
   - **.1** Operation and Maintenance Data: Submit manufacturer's written instructions for maintenance and cleaning procedures, include list of manufacturer recommended cleaning and maintenance products, and name of original installer and contact information in accordance with Section 01 33 00 – Submittals: Operation and Maintenance Data.
6. Safety Data Sheet:
   - **.1** Submit WHMIS safety data s for incorporation into the Operation and Maintenance Manual. Keep one copy of WHMIS safety data s on site for reference by workers.
7. Quality Assurance:
   - **.1** Manufacturer's Qualifications: Manufacturer to have been installing poured in place surfacing for minimum of five (5) years.
   - **.2** Contractor executing work of this section to have a minimum five (5) years continuous Canadian experience in successful installation of work of type and quality shown and specified. Submit proof of experience upon Consultant's request.
   - **.3** Resilient Flooring Installer: Use an installer who is approved by flooring system manufacturer.
   - **.4** Pre Installation Conference: Conduct conference at Project site in accordance with requirements of Section 01 31 19 to verify project requirements, substrate conditions, patterns and layouts, coordination with other sections affected by work of this section, manufacturer's installation instructions and manufacturer's warranty requirements.
   - **.5** Sheet vinyl floor coverings to meet fire performance characteristics as determined by testing products, per ASTM test method, indicated below by Underwriters Laboratories, Inc. (UL) or another recognized testing and inspecting agency acceptable to authorities having jurisdiction.
     - .1 Critical Radiant Flux: 0.45 watts per sq. cm or more, Class I, per ASTM E648.
     - .2 Smoke Density: Less than 450 per ASTM E662.
8. Delivery, Storage, Handling and Protection:
   - **.1** Coordinate deliveries to comply with Construction Schedule and arrange ahead for off-the-ground, under cover storage location. Do not load any area beyond the design limits.
   - **.2** Materials to be carefully checked, unloaded, stored and handled to prevent damage. Protect materials with suitable non-staining waterproof coverings.
   - **.3** Store material in original, undamaged containers or wrappings with manufacturer's seals and labels intact.

.4 Restrict traffic by other trades during installation.

.5 Provide adequate protection of completed tiled surfaces to prevent damage by other trades until completion of this project. Minimum protection to consist of kraft paper.

9. Environmental Conditions:

.1 Temperature of room, floor surface and materials to not be less than 21 degC for 48 hours before, during and for 48 hours after installation. Concrete floors to be aged for a minimum of 28 days and will be dry before application of the resilient flooring.

.2 Moisture content of floor not to exceed a maximum of 3 lbs. of water per 1,000 sq.ft. of concrete slab area over a 24-hour period as measured methods approved by Consultant. Moisture content to not exceed 5% as measured by normal Thermometer Hygrometers.

.3 Avoid exposure to high humidity, cold drafts and abrupt temperature changes. Keep materials under cover and free from dampness.

.4 Coordination: Close spaces to traffic during flooring installation and until time after installation recommended in writing by manufacturer; install flooring and accessories after other finishing operations, including painting and ceiling construction have been completed.

10. Maintenance Materials:

.1 Provide 5% of each colour of floor type and 30'-0" lineal feet coil stock of each colour of resilient base specified, boxed and labelled.

.2 Store maintenance materials on the premises as directed by the Owner.

11. Warranty:

.1 Warrant the work of this section against defects in materials and workmanship in accordance with the General Conditions but for an extended period of five (5) years and agree to repair or replace faulty materials or work which become evident during warranty period without cost to the Owner. Defects to include, but not limited to, bond failure, and extensive colour fading.

Part 2. **Products:**

1. Manufacturers:

.1 Subject to compliance with requirements specified in this section, the following manufacturers are approved to be installed specified products on this project:

.1 Armstrong Flooring, Inc., Altro, Tarkett, Interface

.2 Or approved equal.

.2 Manufacturers offering similar solid surfacing systems may be incorporated into the work provided they meet the performance and aesthetic requirements established by the named products.

2. **Heterogenous Sheet Vinyl Flooring** (noted as **SVF** on the drawings):

.1 Vinyl Sheet Flooring shall be **Symphonia'** non-slip homogeneous sheet flooring as manufactured by Altro, having the following characteristics;

.1 sheet flooring standard: ASTM F1303, type 1, grade 1, class B, vinyl floor covering with backing.

.2 Thickness: 2.0mm

.3 wear layer: 8mm (32mil)

.4 size 2m x 20m (6.7' x 65.5')

.5 static coefficient of friction – 0.8 dry, 0.9 wet (ASTM D 2047)

.6 colours and patterns: to be defined and selected by the Architect at a later date. Allow for 2 colours.

.7 adhesives: As recommended by the manufacturer.

3. Accessories:

.1 Resilient Wall Base (RB):

.1 Provide 1/8 in. (3.2 mm thick), 4 in. (102mm) high, Armstrong Flooring Color-Integrated Wall Base with a matte finish, conforming to ASTM F 1861, Type TP - Rubber, Thermoplastic, Group 1 - Solid, Style B – Cove.

.2 Smooth, buffed exposed face, toe or toeless, and ribbed or grooved bonding surface supplied in maximum practical length.

.3 Use adhesive as recommended by the manufacturer.

.4 Colors and patterns to be defined and selected by the Architect at a later date. Allow for 3 colours.

.5 Approved product by Armstrong Flooring, Inc., Johnsonite or approved alternate.

.2 Fillers and Primers:

.1 Types and brands approved, acceptable to flooring material and resilient base manufacturers for the applicable conditions. Use non-shrinking latex compound.

.2 **Leveling Compound:** Provide cementitious products with latex additives as recommended by the flooring product manufacturer. Gypsum based products are unacceptable.

.3 **Adhesives**: As recommended by the manufacturer.

.4 **Sealant:** refer to Section 07 72 00.

.5 **Sealer and Wax**: Coordinated with Owners preferred long term maintenance program, sealer or wax as appropriate to flooring materials specified.

Part 3. Execution:

1. Examination:
   - **.1** Examine substrates, areas, and conditions affecting work are in accordance with manufacturer's requirements, and as follows:
     - .1 Test moisture emission rate of concrete subfloor prior to installing flooring, using the calcium chloride test method in accordance with ASTM F1869.
     - .2 Verify that floor surfaces are smooth and flat to plus or minus 1/8" over 10'; notify Consultant in writing where floor tolerances are not within acceptable values.
     - .3 Verify that concrete slabs exhibit normal alkalinity of between 5 and 9 and that they are free of carbonization or dusting deleterious to flooring installation or adhesive bond.
   - **.2** Prior to beginning any installation of flooring, it is recommended that entire room be vacuumed thoroughly to remove dust, loose dirt and debris. Do not use sweeping compounds.
   - **.3** Store tiles on clean, dry, flat surface, carefully protecting corners and edges from possible damage, including from exposure to harmful weather conditions.
   - **.4** Store rolls upright with space in between them.
2. Preparation:
   - **.1** Subfloors must be properly prepared to provide satisfactory bonding surface for adhesive being used to install resilient flooring. Refer to manufacturers' Subfloor Preparation Guide for requirements.
   - **.2** Provide finished concrete subfloor ready to receive resilient flooring. Subfloors must be smooth and level within tolerance of 1/8" (3mm) in 10' (3.05m) radius. Minor surface cracks or grooves must be filled with good quality Portland cement based patching or leveling compound. High spots, bumps and peaks must be repaired prior to installation. Once subfloor preparation is complete, subfloor to have CSP (Concrete Surface Profile) of 1.
   - **.3** Maintain stable room and subfloor temperature prior to installation, before performing moisture tests, during the installation and min. 48 hours after installation. Recommended temperature range of 18 degrees Celsius to 30 degrees Celsius. Humidity control level is between 35 to 55%.
   - **.4** Concrete substrates must be fully cured and free of any hydrostatic and moisture discrepancies. Moisture and alkalinity tests must be performed on concrete substrates, under in-service conditions (see sentence 3 above). pH level to be in range of 7 to 9. Readings below 7 and more than 9 known to affect adhesives. Moisture vapor emission content of concrete slab must not exceed tolerance of adhesive specified when tested per ASTM F1869 'Anhydrous Calcium Chloride for Moisture Vapors from Concrete', and relative humidity of concrete slab must not exceed the tolerance of the adhesive specified when tested per ASTM F2170 'In-Situ Probes for Relative Humidity in Concrete Slab'.
   - **.5** Do not attempt moisture test until HVAC unit has been operational for at least 7 days and the site conditions (temperature and humidity) are constant in building and reflective of in-service conditions.
3. Installation (vinyl composite tile):
   - **.1** Examine areas which are to receive the work of this section. Correct unsatisfactory conditions prior to start of work. Commencement of work implies acceptance of conditions as they exist and no extra will be allowed for failure to ensure satisfactory substrate condition.
   - **.2** Install work in strict compliance with manufacturer's instructions and approved layout drawings.
   - **.3** Arrange for a minimum number of seams and place them in inconspicuous and low traffic areas, but in no case, less than 150mm (6 inches) away from parallel joints in flooring substrates.
   - **.4** Match edges of resilient floor coverings for color shading and pattern at seams.
   - **.5** Inform Architect of conflicts between this section and manufacturer's instructions or recommendations for auxiliary materials, or installation methods, before proceeding.
   - **.6** Keep joints to a minimum; avoid small filler pieces or strips.
   - **.7** Follow manufacturer's recommendations for seams at butt joints. Do not leave any open joints that would be readily visible from a standing position.
   - **.8** Follow manufacturer's recommendations regarding pattern match, if applicable.
4. Rubber Base Application
   - **.1** Lay out base for resilient flooring. Keep number of joints at a minimum. Use full roll lengths to minimize joints.
   - **.2** Set base in adhesive tightly by using a 7lb. hand roller, against the wall and floor surfaces.
   - **.3** Install straight and level to variations of 1:1000.
   - **.4** Scribe and fit to door frames and other obstructions.

.5 Cope internal corners. Use formed straight base material for corners of other angles.

5. **Installation (rubber floor tile)**
   - **.1** Comply with manufacturer's written instructions for installing resilient tile flooring.
   - **.2** Install with Tarkett adhesive specified for the site conditions and follow adhesive label for proper use.
   - **.3** Roll the flooring in both directions using a 100 pound three-section roller.
   - **.4** Prevent normal traffic on installed tile for 24 hours after installation and prevent heavy traffic on newly installed tile for 72 hours after installation.

6. Installation (luxury vinyl tile)
   - **.1** Install after all other trades have completed work.
   - **.2** Complete installation of levelling / patching compounds. Substrate shall be smooth, flat, clean and free of imperfections, oils, waxes, polishes, greases, sealers, adhesives, dust or debris. **If required grind floor to remove adhesives of other contaminants.**
   - **.3** Fill cuts, cracks, grooves, dents or other irregularities with levelling compound.
   - **.4** Grind and highly polished / smooth surfaces.
   - **.5** Allow flooring and adhesive products to acclimatize to the conditions at the place of work for 48 hours prior to installation.
   - **.6** Allow new concrete to cure and dry for 90 days minimum.
   - **.7** Areas to receive new flooring shall be well lite and have facility HVAC system operating to provide temperatures between 20 and 26 degrees C and relative humidity between 40-65% for 48-72 hours before, during and after installation.
   - **.8** Test all concrete floors and ensure that the moisture and surface pH limits comply with manufacturer recommendations for adhesive used (Adhesive 2500 Plus (Canada)) for LVT products 4.5mm thick;
     - .1 moisture limit – up to 85% RH
     - .2 pH limit (using Interface pH testing protocol): between 7.0 and 9.0
   - **.9** Layout of starting point in accordance with colour / pattern schedule.
   - **.10** Pull tile from multiple boxes at a time is recommended
   - **.11** Ensure cut edges are always against the wall.
   - **.12** Use adhesive type and apply adhesive with tools in accordance with the manufacturer's recommendation for the substrate type. Refer to manufacturer's instructions.
   - **.13** When installing LVT, allow adhesive to set according to adhesive manufacturer's specifications prior to installation. Roll the tiles with a 3 section coated 100 lb. roller. Re-roll the entire glued floor area with the 100 lb. roller within the working time of the adhesive. Continue to roll the floor throughout the working day to ensure proper bond.
   - **.14** Lay tile in accordance with pattern type identified on the drawings / colour schedule issued by the Architect.
   - **.15** To properly cut LVT products, score the top side of the material with a utility knife. Bend the product and finish the cut through the backside. This will ensure the cleanest cut. It may be necessary to use a heat gun to cut around vertical obstructions. Allow the heated LVT to return to room temperature before installation. •
   - **.16** Cutting the product into a fine point may lead to delamination. Use an ethyl cyanoacrylate based super glue to help fuse the LVT point together. Be sure to clean all glue from the decorative surface immediately. Alcohol based super glues may cause the vinyl to swell.
   - **.17** Floor outlets are usually wired after tiles have been installed. Consequently, you should install tiles directly over floor outlets and mark the location with tape. This way, it will be easy to see which tiles need to be lifted for cutouts later.
   - **.18** Tile layout should allow trench headers to be centered under a row of tile. Secure the tiles on either side of trench headers with adhesive. This will prevent the installation from shifting while servicing trench headers.
   - **.19** Clean excess adhesive from tiles as the work progresses.
   - **.20** Always protect the floor with thick paper, hard board or similar during the construction period. If using tape, this must not be applied directly to the floor surface
   - **.21** Restrict foot traffic for 24 hours after installation. No heavy traffic, rolling loads or furniture placement for 72 hours after installation. Most suppliers of floor adhesives specify 72 hours before the final strength is achieved.

7. **Installation (homogeneous resilient tile flooring)**
   - **.1** Examine areas which are to receive the work of this section. Correct unsatisfactory conditions prior to start of work. Commencement of work implies acceptance of conditions as they exist and no extra will be allowed for failure to ensure satisfactory substrate condition.
   - **.2** Install work in strict compliance with manufacturer's instructions and approved layout drawings.
   - **.3** Arrange for a minimum number of seams and place them in inconspicuous and low traffic areas, but in no case, less than 150mm (6 inches) away from parallel joints in flooring substrates.
   - **.4** Inform Architect of conflicts between this section and manufacturer's instructions or recommendations for auxiliary materials, or installation methods, before proceeding.
   - **.5** Cut sheets to length where required and lay them out to acclimatize and relax prior to installation.
   - **.6** Tiles shall be fully adhered using adhesive and recommended by the manufacturer. Review and follow recommendations regarding coverage, open time, assembly time made by the manufacturer for the application of the adhesive.

.7 Install tiles to avoid colour differences.

.8 Rub the face surface down thoroughly to ensure that the floor covering makes good contact with the adhesive and that all air is expelled. Make sure that the tool used for rubbing down the floor covering does not scratch the surface. A broom is not suitable for this purpose. Use a floor roller (approx. 50 kg) and roll over the floor.

.9 Fittings / Corners; Neatly cut and install tile flooring around fittings, in corners. All sheet floor shall be installed in a full bed of adhesive.

.10 Always protect the floor with thick paper, hard board or similar during the construction period. If using tape, this must not be applied directly to the floor surface

.11 Restrict foot traffic for 24 hours after installation. No heavy traffic, rolling loads or furniture placement for 72 hours after installation. Most suppliers of floor adhesives specify 72 hours before the final strength is achieved.

.12 A regular maintenance program must be started by the Owner after initial cleaning.

8. Installation (sheet vinyl floors)

.1 Examine areas which are to receive the work of this section. Correct unsatisfactory conditions prior to start of work. Commencement of work implies acceptance of conditions as they exist and no extra will be allowed for failure to ensure satisfactory substrate condition.

.2 Install work in strict compliance with manufacturer's instructions and approved layout drawings.

.3 Arrange for a minimum number of seams and place them in inconspicuous and low traffic areas, but in no case, less than 150mm (6 inches) away from parallel joints in flooring substrates.

.4 Inform Architect of conflicts between this section and manufacturer's instructions or recommendations for auxiliary materials, or installation methods, before proceeding.

.5 Cut sheets to length and lay them out to acclimatize and relax prior to installation.

.6 Sheets shall be fully adhered using adhesive and recommended by the manufacturer. Review and follow recommendations regarding coverage, open time, assembly time made by the manufacturer for the application of the adhesive.

.7 Install sheets to avoid colour differences. Reverse sheets wherever possible, overlap and cut edges. Factory edges must be overlapped and cut. Prior to overlapping the vinyl sheet, trim off the factory edge on the bottom sheet. This is best done by striking a chalk line, then –using a utility knife and straight edge –cut through and remove the scrap piece. Overlap the top sheet and then trace the bottom edge onto the top sheet with a correctly set under scriber.

.8 Rub the face surface down thoroughly to ensure that the floor covering makes good contact with the adhesive and that all air is expelled. Make sure that the tool used for rubbing down the floor covering does not scratch the surface. A broom is not suitable for this purpose. Use a floor roller (approx. 65 kg) and roll crosswise over the floor.

.9 Fittings, Coving and Corners; Neatly cut and install sheet flooring around fittings, in corners and up walls to 100mm above finished floor to form a cove base. Use purpose made manufacturer's tools to aid in the installation including; the manufacturer's corner roller, hockey stick and grooving tools. All sheet floor shall be installed in a full bed of adhesive.

.10 Welding:

.1 Do not weld sheet joints until the adhesive has bonded completely, a min of 48 hours safter installation.

.2 Chamfer joints ¾ of the thickness using a hand grooving tool or machine prior to welding.

.3 Weld using then manufacturer welding threads and a hot-air tool with aTarkett Speed Welding Nozzle. Carry out a test welding on a left-over piece before commencing work, to adjust speed and temperature Use the manufacturer's speed welding nozzle.

.4 Wait for welded joints to cool.

.5 Trim joints using two steps – a rough trim and a fine trim.

.11 Always protect the floor with thick paper, hard board or similar during the construction period. If using tape, this must not be applied directly to the floor surface

.12 Restrict foot traffic for 24 hours after installation. No heavy traffic, rolling loads or furniture placement for 72 hours after installation. Most suppliers of floor adhesives specify 72 hours before the final strength is achieved.

9. Cleaning

.1 Cleaning and sealing/waxing of resilient tile flooring to be performed using the materials specified of one manufacturer in accordance with the manufacturer's instructions and recommendations. Allow a minimum of four (4) days to elapse after completion of each resilient flooring installation before commencing cleaning, sealing / waxing operations.

.2 Work to be handed over to the Owner free of blemishes and in perfect condition.

09 90 00 – PAINTING AND COATING

Part 1. General:

1. **Scope:** Provide paint finishes using the highest grade, first line quality product of the manufacturer and comply with or exceed CAN2-85-100 for premium grade work.
2. Submittals:
   .1 Manufacturer's Literature: Submit manufacturer's product literature for each paint formula listed and used on the project.
3. Warranty:
   .1 Submit manufacturers' standard warranty covering the maintenance, repair or replacement of defective work for a period of one (5) years from the expiration of the standard one (1) year warranty included in the Contract under the General Conditions.

Part 2. Products:

1. The following paint manufacturers are acceptable:
   .1 International PC.
   .2 Para Paints Canada Inc.
   .3 Benjamin Moore Paints.
   .4 ICI Paints Canada.
   .5 Sherwin-Williams Company of Canada Limited.

Part 3. Execution:

1. Prepare, prime and paint surfaces as noted in the room finish schedule and this specification and surfaces that are left unfinished by other sections / trades.
2. Paint colours to be selected by the Owner at a later date. Allow for multiple colours.
3. Hardware: Remove finish hardware, switch plates and accessories, removable trim, grilles, etc.; mask any that are not removable. Re-install these when paint is thoroughly dry and clean them. Do not clean hardware with solvent. Prime-painted hardware items to be painted to match the surface on which they are installed.
4. Provide drop cloths or adequate plastic sheets to protect floors in areas assigned for storage and mixing of paints. Mask and cover surrounding surfaces to provide neat, clean, true juncture lines, and to keep paint from adjacent surfaces. Upon completion, remove masking and clean adjacent surfaces free of overspray spatters, drips, smears and overspray.
5. Apply work using skilled tradesmen working under direction of a capable foreman, and according to manufacturer's specifications; in a workmanlike manner; with suitable clean equipment in good condition; in dust-free and under adequate illumination and suitable conditions for production of best results; evenly, uniform in sheen, colour and texture, free from brush marks, sags, crawls, runs, or other defects detrimental to appearance or performance; and in a manner to prevent spattering or spilling over finished surfaces. Sand lightly between coats with No. 00 sandpaper.
6. Prepare surfaces and provide paint finishes in accordance with the following formulas. The formula is intended to provide completely opaque surface. If surfaces are not completely opaque provide additional finish coats at no cost to the Owner.
   .1 On exposed ferrous metal surfaces:
      .1 Prepare ferrous metal surfaces as follows: sandblast / spongeblast / grind metal surface to SSPC-SP6 (to remove existing paint, rust and to expose metal surfaces) specifications before application of the primer coat.
      .2 Touch-up only with same paint as that applied in the shop.
      .3 Two (2) coats of acrylic latex, semi-gloss finish. Use exterior grade for exterior work and interior grade for interior work.
      .4 Prime caulking compound as required.
   .2 On exposed ferrous metal surfaces (shop primed);
      .1 Prepare Galvanized and Pre-Primed Surfaces as follows;
         .1 New Metal With Wipe Coated Galvanizing: Thoroughly clean to remove grease, oil, dirt and other contaminants which may be present on the surface. Mineral Spirits or Xylol are acceptable solvents to use for this purpose - that is, to remove grease, oil, dirt and similar contaminants. Remove scale by wire brushing.
         .2 Weathered Metal With Wipe Coated Galvanizing: For old and weathered galvanized and pre-primed metal, thorough surface preparation is essential - to ensure that contaminants have been removed from the surface and pre-treat as for New Metal.
         .3 Spangled Type Galvanizing: Treat with vinyl wash primer to provide proper bond for paint finish.
      .2 Touch-up only with same paint as that applied in the shop.
      .3 Two (2) coats of acrylic latex, semi-gloss finish. Use exterior grade for exterior work and interior grade for interior work.
      .4 Prime caulking compound as required.

.3 On wood studs / plywood surfaces as scheduled;
  .1 Prepare wood surface as follows; ensure surface is clean, free of dirt, grease or other construction debris.
  .2 Two (2) coats of solid stain, flat finish (Aborcoat by Benjamin Moore).

.4 Painted Masonry or Concrete:
  .1 Prepare surface using the following methods;
    .1 Test surfaces for alkalinity with pink litmus paper or other standard industry method.
    .2 Where extreme alkalinity occurs, wash surface with 4% solution tetrapotassium pyrophosphate where latex base paint is to be used, and with zinc sulphate solution where other paint bases are to be used.
    .3 Etch normal concrete surface to receive alkyd paint with commercial muriatic acid solution (1 part to 20 parts water by volume). Follow with complete rinsing with clean water.
    .4 Rub down surfaces of different textures and remove mortar spots and sharp edges with a scraper. Patch where required. Fill masonry and concrete surfaces with primer/block filler to fill holes and pores.
  .2 One (1) coat of masonry block filler,
  .3 One (1) coat of primer,
  .4 Two (2) coats of exterior acrylic latex enamel, pearl finish.

.5 On gypsum board bulkheads and walls:
  .1 Ensure gypsum board surfaces are prepared and ready to receive paint finishes. Ensure joints are completely filled and sanded smooth and surfaces are free from 'nail / screw popping'. Fill small nicks and or holes with patching compound and sand smooth.
  .2 One (1) coat of primer – sealer.
  .3 Two (2) coats of interior acrylic latex enamel, low lustre.

.6 On gypsum board ceilings in kitchens:
  .1 Prepare new wood trim as follows;
    .1 Wash existing paint finished surfaces with TSP solution and rinse clean. Allow surface to thoroughly dry.
    .2 Ensure gypsum board surfaces are prepared and ready to receive paint finishes. Ensure joints are completely filled and sanded smooth and surfaces are free from 'nail / screw popping'. Fill small nicks and or holes with patching compound and sand smooth.
  .2 One (1) coat of primer – sealer.
  .3 Two (2) coats of interior acrylic latex enamel, low lustre.

.7 Concrete Floors:
  .1 Prior to starting floor preparation confirm that water vapour is not migrating through existing concrete slab using the following technique; Tape a layer of dry piece of 10 mil poly, 6" x 6" to the existing concrete floor. Ensure section of floor is clean and try. Use red air / vapour barrier tape and to ensure an air seal all around the plastic patch. Let assembly stand for three (3) days. After this time frame remove tape and document the presence of moisture trapped between the plastic and the existing concrete slab. Record findings and communicate to Architect prior to proceeding with the preparation phase of the concrete floor.
  .2 Wash floor with TSP solution. Removal all wax, oil and like material.
  .3 Rinse floor thoroughly.
  .4 Grind with dust free diamond plate grinding equipment as recommended by paint manufacturer. Remove all existing paint finish, expose and scarify existing concrete surface and fine aggregate.
  .5 Restrict traffic from floor area to receive paint finish. Do not allow any other trades into this area until installation of paint finish is completed.
  .6 Provide two (2) coats of Enviroepoxy applied with notched trowel and backrolled with roller. Provide 8 mils thick coating, 4 mils per coat.
  .7 Apply at a rate of 300sf / gallon.
  .8 Colour to be selected from the manufacturer's standard colour range by Owner at a later date.

.8 On new wood trim;
  .1 Prepare new wood trim as follows;
    .1 Fill nail holes with wood puddy and joints with paintable caulking where required.
    .2 Lightly sand existing wood trim.
  .2 One (1) coat of bonding primer – **Stix by Insul-X**
  .3 Two (2) coats of waterborne acrylic urethane - **Benjamin Moore Command**

.9 On existing painted wood trim / wood wainscotting;
  .1 Prepare existing painted wood surfaces as follows;
    .1 Wash surface with TSP solution and rinse clean. Allow surface to thoroughly dry.
    .2 Remove loose paint with scrapers.

.3 Sand to create a smooth surface. Work from 80 grit to 120 grit.

.2 One (1) coat of bonding primer – **Stix by Insul-X**

.3 Two (2) coats of waterborne acrylic urethane - **Benjamin Moore Command**

.10 On existing varnished wood veneer doors;

.1 Prepare existing painted wood surfaces as follows;

.1 Wash surface with TSP solution and rinse clean. Allow surface to thoroughly dry.

.2 Remove loose paint with scrapers,

.3 Sand surface to create a smooth surface and remove all existing varnish and paint finishes, exposing existing wood veneer. Work from 80 grit to 120 grit.

.2 Two (2) coats of clear waterbourne acrylic by **SAMAN**

DIVISION 10 – SPECIALTIES

10 26 00 – Wall Protection

Part 1. General:

1. Scope**:** This section includes the following types of wall protection systems:
   - .1 Corner Guards
   - .2 Handrails
   - .3 Wall Covering Panels
2. Submittals:
   - .1 General: Submit the following in accordance with conditions of contract and Division 1 Section 01 33 00
   - .2 Product data and detailed specifications for each system component and installation accessory required, including installation methods for each type of substrate.
   - .3 Shop drawings showing locations, extent and installation details of corner guards. Show methods of attachment to adjoining construction.
   - .4 Samples for verification purposes: Submit the following samples, as proposed for this work, for verification of guard:
     - .1 12" (304.8mm) long sample of each model specified.
   - .5 Product test reports from a qualified independent testing laboratory showing compliance of each component with requirements indicated.
   - .6 Maintenance data for wall protection system components for inclusion in the operating and maintenance manuals specified in Division 1.
3. Quality Assurance:
   - .1 Installer qualifications: Engage an installer who has no less than 3 years' experience in installation of systems similar in complexity to those required for this project.
   - .2 Manufacturer's qualifications: Not less than 5 years' experience in the production of specified products and a record of successful in-service performance.
   - .3 Code compliance: Assemblies should conform to all applicable codes including IBC, UBC, SBCCI, BOCA and Life Safety.
   - .4 Fire performance characteristics: Provide metal components tested in accordance with ASTM E84 for Class A/1 fire characteristics.
   - .5 Single source responsibility: Provide all components of the wall protection system manufactured by the same company to ensure compatibility of color, texture and physical properties.
4. Delivery, Storage and Handling:
   - .1 Deliver materials to the project site in unopened original factory packaging clearly labeled to show manufacturer.
   - .2 Material must be stored flat.
   - .3 Deliver and store materials as per manufacturer's strict instructions.

Part 2. Products:

1. Manufacturers:
   - .1 Interior surface protection products specified herein and included on the submittal drawings shall be manufactured by Construction Specialties, Inc. or approved equivalent.
2. Materials:
   - .1 Stainless steel: To be type 304 alloy with #4 satin finish; minimum strength and durability properties as specified in ASTM A276.
   - .2 All necessary fasteners to be supplied by the manufacturer.
3. Corner Guards (**CG**):
   - .1 Shall be SM-20AN vinyl covered corner guards as manufactured by CS Acrovyn or approved equal.
   - .2 Corner guard shall be 48" high complete with 3" (76.6mm) leg, top and bottom cap, 3/16" (4.8mm) radius and 3/8" (9.5mm) wall offset. Mounted as per manufacturers written instructions.
   - .3 Colour to be selected from manufacturers Neutral range of colours by consultant at a later date.
4. Wall Covering Sheet (**WP**):
   - .1 Shall be Acrovyn Wall Covering - Woodgrains Collection as manufactured by CS Acrovyn or approved equal.
   - .2 Wall Covering as noted on drawings complete with all required colour matching plastic trims, for joints and transitions, including but not limited to top and side trims.
   - .3 Thickness: 0.60" (1.5mm)
   - .4 Install as per manufacturer's written instructions.

.5 Colour to be selected from entire Acrovyn Woodgrains Collection colour chart.

5. Fabrication:
   .1 General: Fabricate wall protection systems to comply with requirements indicated for design, dimensions, detail, finish and member sizes.
   .2 Preassemble components in shop as much as possible to minimize field assembly.
6. Finishes:
   .1 General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applications and designations of finishes.

Part 3. Execution:

1. Examination:
   .1 Verification of conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
   .2 Do not proceed until unsatisfactory conditions have been corrected.
2. Preparation:
   .1 Surface preparation: Prior to installation, clean substrate to remove dirt, debris and loose particles. Perform additional preparation procedures as required by manufacturer's instructions.
   .2 Protection: Take all necessary steps to prevent damage to material during installation as required in manufacturer's installation instructions.
3. Installation:
   .1 Install the work of this section in strict accordance with the manufacturer's recommendations, using only approved adhesive and locating all components firmly into position, level and plumb.
4. Cleaning:
   .1 General: Immediately upon completion of installation, clean material in accordance with manufacturer's recommended cleaning method.
   .2 Remove surplus materials, rubbish and debris resulting from installation as work progresses and upon completion of work.
5. Protection:
   .1 Protect installed materials to prevent damage by other trades. Use materials that may be easily removed without leaving residue or permanent stains.

10 28 00 – WASHROOM ACCESSORIES

Part 1. General:

1. Scope:
   - **.1** Provide washroom accessories as noted on the drawings and as per the following schedule;
     - .1 Universal WC 94
       - .1 AR push button (AR PB) 1 - refer to elec
       - .2 AR dome light + sounder (ARDL+S) 1 - refer to elec
       - .3 PB door lock (PB DL) 1 - refer to elec
       - .4 PB for bf operator (PB) 2 - refer to elec
       - .5 Nurse Call (NC) 2 – refer to elec
       - .6 Shower Rod+Curtain 1
       - .7 Shower Bench 1
       - .8 Collapsible Shower Threshold 1
     - .2 BF WR 110
       - .1 Nurse Call (NC) 2 – refer to elec
       - .2 Shower Rod+Curtain 1
       - .3 Shower Bench 1
     - .3 Typical Resident WR (6)
       - .1 Nurse Call (NC) 6 – refer to elec
     - .4 Resident WR 93B
       - .1 Nurse Call (NC) 2 – refer to elec
   - **.2** Include materials and fitments required for the operation of any unit furnished, in the manner, direction and performance shown on the shop drawings and specified herein.
2. Submittals:
   - **.1** Provide submittals in accordance with Section 01 33 00.
   - **.2** Shop Drawings: Show and describe in detail, materials, finishes, dimensions, details of connections and fastenings, elevations, plans, sections, metal gauges, hardware and any other pertinent information.
   - **.3** Coordinate the work of this section with the placement of internal wall reinforcement.
   - **.4** Submit manufacturer's catalogue cut of each component required.
   - **.5** Submit a washroom accessories schedule indicating accessories required, showing model number, finish and mounting height on a room by room basis.
3. Delivery, Storage and Handling:
   - **.1** Coordinate deliveries to comply with construction schedule and arrange ahead for off the ground, under cover storage location.
   - **.2** Materials will be carefully checked, unloaded, stored and handled to prevent damage. Protect materials with suitable non-staining waterproof coverings. Unsatisfactory materials to be removed from the site.
   - **.3** Store materials in original, undamaged containers or wrappings with manufacturer's seals and labels intact.
   - **.4** Adequately protect the structure and work of other sections during delivery, storage, handling and execution of the work of the section.
   - **.5** Provide tools, plant and other equipment required for the proper execution of the work of this section.
4. Warranty:
   - **.1** At no cost to Owner, replace mirrors should defects in silvering occur within from date of Substantial Performance a period of five (5) years.

Part 2. Products:

1. Manufacturers:
   - **.1** Basis-of-Design Products: Products named in this section were used as the basis-of-design for the project; additional manufacturers offering similar products may be incorporated into the work of this section provided they meet the performance requirements established by the named products and provided they submit requests for substitution in accordance with Section 01 33 00 Submittal Procedures.
   - **.2** Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include but are not limited to, the following:
     - .1 Bobrick.
     - .2 ASI (American Specialties Inc.)
     - .3 Bradley Corp.

.4 Frost Products Ltd.

.3 Install specified product as indicated on drawings.

5. Washroom Accessories:
   - **.1 Grab Bars (GB#):** Install at heights and locations shown on drawings. Equip water closet compartments designated for the handicapped with grab bars in conformance with the Ontario Building Code and as follows.
   - **.2 Toilet Backrest (TBR):** conforming to Section 3.8.3.9. Sentence (c) of the Ontario Building Code 2012 and CSA B651-18. Install at heights and locations as shown on drawings. Grab bar shall be Type-304 stainless steel with satin finish. Grab bar shall have 18-gauge 1.2mm wall thickness and 30mm (1-1/4") outside diameter. Clearance between the grab bar and wall shall be 210mm (8-1/4"). Concealed mounting flanges shall be 3mm (11-gauge) stainless steel plate, 50 x 80mm (2" x 3-1/8"), and equipped with six screw holes for attachment to wall. Flange covers shall be 0.8mm (22-gauge) stainless steel, 85mm (3-1/4") diameter, and shall snap over mounting flanges to conceal mounting screws. Ends of grab bar shall pass through concealed mounting flanges and be heliarc welded to form one structural unit. Grab bar shall be equipped with a 360 x 160 x 40mm (14-1/4" x 6-3/8" x 1-5/8") white polyurethane integral foam backrest.
   - **.3 Shower Rod + Curtain (SC):**
     - .1 Rod to be Bobrick B-6047, 1 ¼" (32mm) diameter x length to suit opening.
     - .2 Curtain and hooks to be Bobrick 204 series, 72" x length to suit opening.
   - **.4 Shower Bench (SB):** Bobrick B-5191.
   - **.5 Future Adult Change Table**: must conform to Section 3.8.3.12. Sentence (c) of the Ontario Building Code 2012.
   - **.6 Assistance Request Push Button (AR PB):** Refer to Electrical.
   - **.7 Assistance Requested Dome Light + Sounder (AR DL+S):** Refer to Electrical
   - **.8 BF Door Operators Push Button (PB):** Refer to Electrical
   - **.9 BF Door Lock Push Button (PB DL):** Refer to Electrical
6. Fabrication:
   - **.1** Fabricate work true to dimensions, square and plumb.
   - **.2** Thickness of metal to be adequate for the various conditions, and intended uses.
   - **.3** Finished work to be free from warping, open seams, weld marks, rattles and other defects. Drilling to be reamed and exposed edges finished smooth.
   - **.4** Fastenings to be concealed or theft proof type where possible. Exposed fastenings to be neatly executed and to be of the same material and finish as the base metal on which they occur.

Part 3. Execution:

1. Examination:
   - **.1** Take site measurements to ensure that work is fabricated to fit surrounding construction around obstructions and projects in place, or as shown on drawings, and to suit service locations.
2. Installation:
   - **.1** Securely fasten accessories plumb, true, square, straight, level, and accurately and tightly fitted together and to surrounding work. Install in locations shown and specified herein. Mounting heights as shown or in accordance with the OBC in the case of barrier-free accessories.
   - **.2** Work to include anchor bolts, bolts, washers and nuts, lag screws, expansion shields, toggles, straps, sleeve brackets, clips, and other items necessary for secure installation, as required by loading and by Jurisdictional Authorities.
   - **.3** Attach work at wood by screws through countersunk holes in metal.
   - **.4** Attach work to masonry with lead plugs and non-corrosive fastenings, to support load with a safety factor of 3. Perform drilling necessary to install the work.
   - **.5** Insulate between dissimilar metals or between metals and masonry or concrete with bituminous paint, to prevent electrolysis.
   - **.6** Co-ordinate installation with the work of other trades adjacent to accessories to achieve the reveals or other edge conditions shown, where their front faces are flush with the finished wall surfaces.
   - **.7** Install accessories in rooms as scheduled herein. Exact locations to be confirmed by Architect at later date.
3. Cleaning and Adjustment:
   - **.1** Upon completion of work or when directed, remove traces of protective coatings or paper.
   - **.2** Test mechanisms, hinges, locks and latches and where necessary, adjust, lubricate and ensure that accessories are in perfect working order.

DIVISION 12 – FURNISHINGS

12 24 00 – ROLLER SHADES

Part 1. General:

1. Scope:
   - .1 Supply and install roller shades and all required shade fabrics, controls, accessories and related openings for openings noted on the drawings. Refer to the drawings for detailed sizes, locations, shade divisions.
2. References:
   - .1 Fire Test: CAN/ULC-S109-14(R2019) Small and Large and/or NFPA 701-NFP 92-503 M1
   - .2 Optical: American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE): ASHRAE Standard 74073, Methods of Measuring Solar-Optical Properties of Materials".
3. Quality Assurance:
   - .1 The responsibility for the design, engineering, installation and performance of roller shade systems specified will be assigned to a single manufacturer and the qualified dealers/installers.
   - .2 Minimum ten (10) years' experience in the manufacture of products comparable to those specified in his section.
   - .3 Manufacturer shall furnish shading systems for a complete installation and single source responsibility of shading control where applicable.
   - .4 Installer(s) shall be qualified to install and commission the specified products by factory training, experience, demonstrated performance and acceptance of any requirement of the manufacturer, subsidiary of the manufacturer or licenced agent.
4. Submittals:
   - .1 Make submittals in accordance with Section 01330 – Submittals.
   - .2 Product Data: Submit manufacturer's descriptive literature and details for each product type specified. Details shall include product brochures and technical documents indicating materials, finishes, construction and mounting requirements. Also test reports including compliance with fabric properties specified.
   - .3 Shop Drawings:
     - .1 Submit fully detailed shop drawings for review prior to fabrication.
     - .2 Clearly indicate all components, finishes and perimeter construction conditions, installation, all applicable dimensions in relation to jambs, head anchorage details, hardware and accessories.
     - .3 Provide head, jamb and sill details and relevant dimensions for mounting requirements for each product type and mounting condition.
     - .4 Provide shade schedule indicating room number, quantities and key to details.
   - .4 Samples:
     - .1 Submit one fully operational window shade sample of each type required complete with selected shade fabric including sample of seam/batten when applicable. Location of sample shall be determined by the Consultant.
     - .2 Submit duplicate samples of specified fabric of each colour and texture form manufacturer's full range of available fabrics: minimum size 8.5" x 11" for review and selection by the Consultant.
     - .3 Submit duplicate samples of specified sections of fascia, closure, pocket, housing, trim, roller tube, hembar, operating hardware brackets and side channels or other accessories required for review.
     - .4 Submit material samples for colour and finish selection of controls.
   - .5 Test Reports: Submit duplicate copies of compliance to the following fabric tests:
     - .1 Fire — CAN/ULC S109-014-R2019
     - .2 Fire: — NFPA 701-04
     - .3 Bacterial & Fungal — ASTM E2180-07
   - .6 Manufacturer's Installation Instructions: Include application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
   - .7 Submit copies of operating and maintenance instructions including, name and telephone number of local service company. List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.
   - .8 Warranty: Submit manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.
   - .9 Motorized Shades:
     - .1 Provide schematic system riser diagram indicating component interconnections. Include requirements for interface with other systems.
     - .2 Provide shade drive layout drawing showing locations of shade drives, power supplies, and sensor modules.

.3 Include power requirements and standard wiring diagrams.

5. Mock-Up: Provide a mock –up for evaluation of preparation techniques and application workmanship.
   .1 Install for approval complete full size operating sample of typical roller shade unit with accessories in areas designated by Consultant. Mock-Up shall comply in all respects with the specifications.
   .2 Do not proceed with remaining work until workmanship and operation are approved by Consultant.
   .3 Adjust Mock-Up installation to gain acceptance. Accepted installed Mock-Up roller shade unit shall form standard for installed roller shades and may form part of the final installation.
6. Delivery, Storage, Handling:
   .1 Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.
   .2 Handle and store shades in accordance with manufacturer's recommendations.
   .3 Store all shades & accessories securely crated and protected free of damage of any kind.
   .4 Remove all waste and packaging materials of work upon completion.
   .5 Handle and store materials according to manufacturer's recommendations protecting materials and finishes from damages. Store materials in a dry secure place. Protect from weather, surface contaminations, corrosion, construction traffic and all other potential damage.
   .6 Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by the manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
7. Site Conditions
   .1 Verify that all blocking and framing necessary to carry shade assembly hardware is a proper installation and secure.
   .2 Make accurate measurements at the site before fabrication. Check layout of glazing framing sections, spans and loading capabilities.
8. Warranty
   .1 Provide manufacturers **5 (Five) YEAR LIMITED WARRANTY** from the date of Substantial Performance of Work.
   .2 Cover the repair and replacement of defective equipment. Make ordering of new equipment for expansions, replacements and spare parts available to a qualified dealer or installer.
   .3 Make replacement parts available for minimum of ten years from date of manufacture.
   .4 Provide factory direct technical support during standard business hours. Provide on-site service support within 48 hours.

Part 2. Products:

1. **Manufacturer:** Altex (www.altexdesign.com), contact Symmetry Shading 1-647-706-4515 – Christian Giovannoni or approved equal. christian@symmetryshading.com
2. **Manual Roller Shade System (small opening):** shall be Altex Sunproject Line DekoS70 Sqaure Cassette Lite Lift Roller Shades (noted as **B** on the drawings) or approved equal. Manual roller shade system shall have the following characteristics;
   .1 Clutch Brake Manual System
      .1 Roller Shades shall be chain-operated system utilizing a multi-layer coil spring system. The drive system must be reversible for future alterations and on-site maintenance.
      .2 Internal Tension Idler (I.T.I.) limiter automatically adjusts and controls the amount of torque and speed ratio in order to provide a constantly smooth operation of the shade system regardless of width and height.
      .3 The drive sprocket must contain **non-locking integrated pressure springs** for increased operational performance.
      .4 The system shall be capable of smoothly raising and lowering the shade to any desired height and maintaining that position without slippage.
      .5 The system MUST ALLOW FOR THE ABILITY TO LOWER THE SHADE BY PULLING ON THE HEMBAR without damage to the clutch or spring.
      .6 The system shall provide for a maximum fabric gap of 42mm total of both sides.
      .7 The clutch must brake at the point of pull release, shades that slide to a stop will not be accepted.
      .8 Clutch may be mounted on either the left or right side of the roller tube
   .2 Hardware
      .1 Shade universal mounting units must be interchangeable from wall to ceiling mount.
      .2 Universal Drive-Idler must be free of exposed fasteners or rivets.
      .3 All shades to be pre-mounted and be shipped as a fully assembled unit.
      .4 Chain shall be No. 10 qualified Stainless Steel, 90 pound test.
      .5 System must accommodate regular fabric roll (towards the glazing) or reverse fabric roll (away from the glazing).
      .6 End Plug. The idle-end plug must allow for internal rotation of the tube and must lock in place utilizing a square end-pin.

.7 The shade mechanisms and drive units are to be integrated into universal mounting units that prevent unwanted movement and misalignment.

.3 Casette
- .1 The shade shall be supplied to site fully assembled.
- .2 The shade shall be supplied as a two piece extruded aluminum cassette with a bottom closure for regular roll installation measuring 79mm x 80mm.
- .3 Noise reduction seals must be used for sound isolation of the mechanism.
- .4 Colour and finish of the cassette shall be: 'Deko Black Duracron''

.4 Roller Tube: Roller tubes shall be extruded aluminum in 32mm, 38mm, or 46mm with reinforced internal ribs to provide maximum span without tube deflection. Tube sizes will be determined by the manufacturer dependant on shade size.

.5 Hem Bar: The Hem Bar (bottom bar) shall be Oval shaped tubular extruded aluminum with an integrated recess to secure the fabric without visible connectors. End plugs shall be screwed securely to the ends showing no exposed aluminum.

.6 Chain Retainer: Operating chain shall be fully secured within a Chain Retainer to prevent accidental choking of infants. This installation is a requirement.

3. Typical Mounting / Shade Divisions:
- .1 Mount shades systems in interior face of wall at head of window.
- .2 Use 'regular roll' style.
- .3 Divide shade fabric at vertical mullions.

4. **Window shades and components** to be provided as follows:

.1 Sun Control Fabric: TexScreen 9103, 3% open, Green Guard certified fabric, as manufactured by Altex / SunProject, having the following optical properties.

.1	Solar transmission (max):	17%
.2	Solar reflectance (max):	64%
.3	Solar absorption (min):	19%
.4	Visible light transmission (max):	12%

.2 Conforms to CAN ULC S109-14(R2019) – Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

.3 Bacterial and fungal resistance to comply with ASTM E2180

.4 Edges to be laser cut and heat sealed to deter fraying.

.5 Color to be selected by owner at a later date from the manufacturer's standard color range.

Part 3. Execution

1. Examination:

.1 Examine finished openings for deficiencies that may preclude satisfactory installation. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding. Start of installation shall be considered acceptance of substrates.

2. Preparation:

.1 Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.

3. Installation:

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

.2 Window coverings for all rooms will be installed with new hardware.

.3 Provide end brackets, spring assist coil and support brackets 600mm for each end, with intermediate support brackets not more than 1200mm apart including fascia. The blinds shall operate smoothly and easily over full range of travel.

.4 Window coverings shall be mounted to the wall that the window is in.

.5 Shade Installation:
- .1 Install in accordance with approved shop drawings, using mounting devices as indicated.
- .2 Installation Tolerance: 1.5mm (1/16") maximum offset from level.
- .3 Replace shades that exceed specified dimensional tolerances at no extra cost to Owner.
- .4 Adjust level, projection and shade centering from mounting bracket where applicable.
- .5 Verify there is no telescoping of shade fabric. Ensure smooth shade operation.
- .6 When installing blinds on a curtain wall, the wall coverings shall be surface mounted onto the middle window mullion
- .7 The controls / hardware shall be on the right side to maintain constancy throughout the installation.
- .8 Before installation, the owner must approve the method of installation, colour and material used by a sample.

.6 Motorized Shade Control Installation:
  .1 Perform work in a neat and workmanlike manner in accordance with NECA 1 and, where applicable, NECA 130, except for mounting heights specified in those standards.
  .2 Adjust open and closed limits set by the manufacturer as required.
  .3 Assign each shade to a shade group and set control functions.

4. Cleaning:
  .1 Clean soiled shades and exposed components as recommended by manufacturer.
5. Closeout Activities:
  .1 Training:
    .1 Shade control system installer to perform on-site training of Owner's personnel on operation, adjustment, and maintenance of shade control system.
6. Protection:
  .1 Protect installed products from subsequent construction operations.
  .2 Touch-up, repair or replace damaged products before Substantial Completion.

DIVISION 14 – CONVEYING EQUIPMENT

14 20 00 – ELEVATORS AND LIFTS

Part 1. General:

1. Provide a new vertical lift platform elevating device, to be located in the proposed addition. Refer to architectural drawings for location.
2. Scope of Work of this Section: The work associated with the provision of the elevator work includes the provision of:
   - .1 Elevator car enclosures, hoistway entrances and signal equipment.
   - .2 Operation and control systems.
   - .3 Accessibility provisions for physically disabled persons.
   - .4 Equipment, machines, controls, systems and devices as required for safely operating the specified elevators at their rated speed and capacity.
   - **.5** Materials and accessories as required to complete the elevator installation.
3. Scope of Work provided by the Contractor to support the provision of the Elevator: Work to be provide by the Contractor, required to support the provision of the elevator to include the following:
   - .1 Provision of a plumb and legal hoistway, properly framed and enclosed an including a pit of proper depth, and a pit ladder for each elevator. Drains, lights, access doors, waterproofing and hoistway ventilation, as required.
   - .2 Provision of a suitable control closet with access and ventilation in accordance with applicable codes and regulations. The control closet to be maintained at a temperature between 32 degF (0 degC) and 104 degF (40 degC). To be measured at 6'-0" (1830mm) above the floor and 1'-0" (305mm) out from the front center of the car controller(s). Relative humidity is not to exceed 95% non-condensing.
   - .3 Hoistway must be maintained between 32 degF (0 degC) and 122 degF (50 degC) with a control space measured at the machine.
   - .4 Adequate supports to carry the loads of equipment, including overhead machine and machine beams located in hoistway including supports for guide rail brackets.
   - .5 Complete power requirementts, including necessary circuit breakers and fused mainline disconnect switches.
   - .6 Electric power of the same characteristics as the permanent supply without charge for the construction, testing and adjusting.
   - .7 Provide proper piping and conduit.
   - .8 Divider beams for rail bracket support as required.
   - .9 Cutting of walls floor, etc. and removal of such obstructions as may be necessary for proper installation of the elevator.
   - .10 Grouting of door sills, hoistway frames, and signal fixtures after installation of the elevator equipment.
   - .11 All painting, except as otherwise specified.
   - .12 Provide hoistway walls designed and constructed in accordance with the required fire rating (including those places where elevator fixture boxes, rail bracket fastings, and any other penetration into the hoistway walls).
   - .13 Temporary enclosures, barricades and other protection from open hoistways and elevator work area during the time the elevator is being installed to meet permanent installation safety codes.
   - .14 Smoke detector \ sensing devices and contacts wired to elevator control as required by local code.
   - .15 A means to automatically disconnect the main line power supply to the elevator prior to the application of water in the elevator controller room will be furnished by the electrical contractor. This means to not be self-resetting.
   - .16 Telephone wiring to controller room control panel, and installation of telephone instrument or other communication equipment in elevator cab with connections to elevator in controller room.
   - .17 Adequate storage facilities for elevator equipment prior to and during installation at ground level within 150 feet of hoistway.
   - .18 Setting of anchors and sleeves.
   - .19 Flooring within the elevator to be provided by the Contractor.
4. Reference Standards**:** Work to comply with the following reference standards;
   - .1 CAN/CSA B44 Safety Code for Elevators and Escalators.
   - .2 Ontario Building Code 2012.
   - .3 ASME A17.1 Safety Code for Elevators and Escalators, latest edition or as required by the local building code.
   - .4 CAN/CSA C22.1 Canadian Electrical Code.
   - .5 NFPA 70 National Electrical Code.
   - .6 NFPA 80 Fire Doors and Windows.
   - .7 Welding must conform to CSA W59, S16.1 and W47.1. Welds to be performed by a qualified CWB approved welder.
5. Warranty**:** Provide a written warranty for that complies with the following;

.1 Warranty to cover the repair, restore or replace defects in elevator work materials and workmanship not due to ordinary wear and tear or improper use or care for 36 months starting at substantial completion of the project.
.2 Arrange for elevator manufacturer to conduct visual inspections of elevator during the eleventh (11th) month after Substantial Performance of the Work.
.3 Record noted deficiencies and arrange for their proper repair under warranty.

6. Submittals: Provide the following submittals;
   .1 Shop Drawings: Provide shop drawings of the elevator systems stamped by an engineer licensed in the province of Ontario.
      .1 Show equipment arrangement in the control closet, corridor, pit and hoistway. Provide plans, elevations, sections and details of assembly, erection, anchorage, and equipment location.
      .2 Indicate elevator system capacities, sizes, performances, safety features, finishes and other pertinent information.
      .3 Show floors served, travel distances, maximum loads imposed on the building structure at points of support and similar considerations of the elevator work.
      .4 Indicate electrical power requirements and branch circuit protection device recommendations.
   .2 Finishes: Provide samples of the following finishes;
      .1 Powder Coat enamel selection: Submit manufacturer's standard selection charts for exposed finishes and materials.
      .2 Plastic laminate selection: Submit manufacturer's standard selection charts for exposed finishes and materials.
      .3 Metal Finishes: Upon request, standard metal samples provided.
   .3 Fixtures: Provide standard cab, entrance and signal fixture data to describe product for approval.
   .4 Operation and maintenance data: Provide the following information / data for the elevator systems;
      .1 Owner's manuals and wiring diagrams.
      .2 Parts list, with recommended parts inventory.
7. Quality Assurance:
   .1 Manufacturer Qualifications: An approved manufacturer with minimum 15 years' experience in manufacturing, installing, and servicing elevators of the type required for the project. The manufacturer of machines, controllers, signal fixtures, door operators cabs, entrances, and other major parts of elevator operating equipment. The major parts of the elevator equipment to be manufactured by the installing company, and not be an assembled system. The manufacturer to have a documented, on-going quality assurance program.
   .2 Installer Qualifications: The manufacturer or an authorized agent of the manufacturer with not less than 15 years of satisfactory experience installing elevators equal in character and performance to the project elevators.
8. Fire-Rated Entrance Assemblies: Opening protective assemblies including frames, hardware, and operation to comply with ASTM E2074, CAN4-S104 (ULC-S104), UL10 (b), and NFPA Standard 80. Provide entrance assembly units bearing labels that identify the fire resistance rating of the entrance systems by a Nationally Recognized Testing Laboratory.
9. Inspection and Testing: Elevator Installer to obtain and pay for required inspections, tests, permits and fees for elevator installation. Arrange for inspections and make required tests. Deliver records and test and inspections to the Owner upon completion and acceptance of elevator work.
10. Temporary Use**:**
   .1 Provide necessary protection to prevent damage to elevator used for construction purposes before Substantial Completion.
   .2 Provide temporary enclosures, coverings, guards, barriers and other devices required to protect the elevator car enclosures, hoistway entrances, signal fixtures and related materials, components and finishes from damage. Protective materials, methods and procedures to be approved by the elevator manufacturer and paid for by the user.
   .3 Maintenance during use, including cleaning, lubricating and adjusting equipment and components for proper elevator operation to be performed only by the elevator manufacturer. Cost for maintenance to be paid by the user.
   .4 Elevators to be free of damage or deterioration at time of Substantial Completion. Cost to repair damaged materials and finishes and replace worn or defective components to restore elevators to their original condition to be paid by the user.
11. Maintenance**:** Provide maintenance and call back service for a period of 12 months for elevator after substantial completion of the project. Maintenance contract to consist of the following components;
   .1 Service to consist of periodic examination of the equipment, adjustment, lubrication, cleaning, supplies and parts to keep the elevators in proper operation. Maintenance work, including emergency call back repair service, to be performed by trained employees of the elevator contractor during regular working hours.
   .2 Submit parts catalog and show evidence of local parts inventory with complete list of recommended spare parts. Parts to be produced by manufacturer of original equipment.
   .3 Manufacturer to have a service office and full time service personnel within a 100 mile radius of the project site.

Part 2. Products:

1. The elevator system to be V-1504 Enclosed Vertical Platform Lift, Type 3 platform as manufactured by Savaria, 1-800-661-5112, or approved equal. The elevator systems to have the following characteristics and components;
   - .1 Elevator Model: V-1504 Vertical Platform Lift, Type 3 platform.
   - .2 Elevator Type: 2:1, roller chain Hydraulic
   - .3 Rated Capacity: 340 kg (750 lbs.)
   - .4 Rated Speed: 0.1 m/s (20.0 ft. /min).
   - .5 Maximum Travel Distance: 2.7 metres (8'-11").
   - .6 Landings: Two (3) total.
   - .7 Openings:
     - .1 Elevator 1 (E-1): Front and Side – three (3) openings.
   - .8 Hoistway Entrance Size:
     - .1 Elevator 1 (E-1): 1067mm x 2438mm (3'-6" wide x 8'-0" high).
   - .9 Power Characteristics: 110 volts, 20 amp, single phase, 60 Hz.
   - .10 Seismic Requirements: as per manufacturer's requirements
   - .11 Hoistway Dimensions:
     - .1 Elevator 1 (E-1): 1511mm x 1659mm (59.5"x 65 5/16")
   - .12 Pit Depth: n/a (provide 36"x42" ramp by manufacturer)
   - .13 Push Button: Call / send stations at landings, operating call butons on platform, remote manual lowering device.
2. Passenger Elevator Care Enclosure: to have the following components;
   - .1 Car Enclosure:
     - .1 Walls reinforced cold-rolled steel with two coats factory applied baked enamel finish, colours to be selected by the Architect from the manufacturer's full colour ranges. Reveals, frieze, and 6" kick plat at base of wall: Stainless steel, no. 4 brushed finish.
     - .2 Wall Protection: Provide a set of fabric wall protectors complete with purpose made hanging device mounted on wall of cab to secure protectors to walls.
     - .3 Canopy: Cold-rolled steel with hinged exit with
     - .4 Ceiling: Downlight type with suspended LED downlights in metal pans two coats factory applied baked enamel finish, colours to be selected by the Architect from the manufacturer's standard colour range. Reveals: Stainless steel, no. 4 brushed finish.
     - .5 Cab Sills: Extruded aluminum, mill finish.
     - .6 Handrail: Provide 51mm (2") flat bar metal on side and rear walls on front opening cars and side walls only on front and rear opening cars. Handrails to have a stainless steel, no. 4 brushed finish.
     - .7 Ventilation: Manufacturer's standard exhaust fan, mounted on the car top.
1. Car Top Inspection: Provide a car top inspection station with an "Auto-Inspection" switch, an "emergency stop" switch, and constant pressure "up and down" direction and safety buttons to make the normal operating devices inoperative. The station will give the inspector complete control of the elevator. The car top inspection station to be mounted in the door operator assembly.

Part 3. Execution:

1. Installation procedure to include the following;
   - .1 Examination: Before starting elevator installation, inspect hoistway, hoistway openings, pits and machine rooms, as constructed, verify critical dimensions, and examine supporting structures and other conditions under which elevator work is to be installed. Do not proceed with elevator installation until unsatisfactory conditions have been corrected in a manner acceptable to the installer. **Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.**
2. Installation: Install elevator systems components and coordinate installation of hoistway wall construction.
   - .1 Work to be performed by competent elevator installation personnel in accordance with ASME A17.1, manufacturer's installation instructions and approved shop drawings.
   - .2 Comply with the National Electrical Code for electrical work required during installation.
   - .3 Perform work with competent, skilled workmen under the direct control and supervision of the elevator manufacturer's experienced foreman.
   - .4 Supply in ample time for installation by other trades, inserts, anchors, bearing plates, brackets, supports, and bracing including setting templates and diagrams for placement.
   - .5 Welded construction: Provide welded connections for installation of elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn

parts. Comply with CSA standards for workmanship and for qualification of welding operators. Welds to be performed by a qualified CWB approved welder.

.6 Coordination: Coordinate elevator work with the work of other trades, for proper time and sequence to avoid construction delays. Use benchmarks, lines, and levels designated by the Contractor, to ensure dimensional coordination of the work.

.7 Install machinery, guides, controls, car and equipment and accessories to provide a quiet, smoothly operating installation, free from side sway, oscillation or vibration.

.8 Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with cars. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum safe, workable dimensions at each landing.

.9 Erect hoistway sills, headers, and frames before erection of rough walls and doors; erect fascia and toe guards after rough walls finished. Set sill units accurately aligned and slightly above finish floor at landings.

.10 Lubricate operating parts of system, including ropes, as recommended by the manufacturer.

3. Field Quality Control: Acceptance testing: Upon completion of the elevator installation and before permitting use of elevator, perform acceptance tests as required and recommended by Code and governing regulations or agencies. Perform other tests, if any, as required by governing regulations or agencies. Advise the Owner, Contractor, Architect, and governing authorities in advance of dates and times tests are to be performed on the elevator.
4. Adjusting: Make necessary adjustments of operating devices and equipment to ensure elevator operates smoothly and accurately.
5. Cleaning: Before final acceptance, remove protection from finished surfaces and clean and polish surfaces in accordance with manufacturer's recommendations for type of material and finish provided. Stainless steel to be cleaned with soap and water and dried with a non-abrasive surface; it to not be cleaned with bleach-based cleansers. At completion of elevator work, remove tools, equipment, and surplus materials from site. Clean equipment rooms and hoistway. Remove trash and debris.
6. Protection: At time of Substantial Completion of elevator work, or portion thereof, provide suitable protective coverings, barriers, devices, signs, or other such methods or procedures to protect elevator work from damage or deterioration. Maintain protective measures throughout remainder of construction period.
7. Demonstration: Instruct Owner's personnel in proper use, operations, and daily maintenance of elevators. Review emergency provisions, including emergency access and procedures to be followed at time of failure in operation and other building emergencies. Train Owner's personnel in normal procedures to be followed in checking for sources of operational failures or malfunctions. Make a final check of each elevator operation, with Owner's personnel present, immediately before date of substantial completion. Determine that control systems and operating devices are functioning properly.

DIVISION 21 – FIRE SUPPRESSION

*Refer to Mechanical Drawings prepared by **David Hine Engineering Inc.***

DIVISION 22 – PLUMBING

*Refer to Mechanical Drawings prepared by **Suppa Engineering.***

DIVISION 23 – HEATING, VENTILATION AND AIR CONDITIONING

*Refer to Mechanical Drawings prepared by **Suppa Engineering.***

DIVISION 26 – ELECTRICAL

*Refer to Electrical Drawings prepared by **Suppa Engineering.***

DIVISION 27 – COMMUNICATIONS

*Refer to Electrical Drawings prepared by **Suppa Engineering.***

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

*Refer to Electrical Drawings prepared by **Suppa Engineering.***

DIVISION 29 – 30 – NOT USED

Geotechnical Investigation Report – 8465 County Road 45, Roseneath, ON

March 11, 2026

Prepared for:
Alderville First Nation
Attn: Carolyn Valleau, First Nation Administrator

Cambium Reference: 02512173.000

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1.0 Introduction

Cambium Inc. (Cambium) was retained by Alderville First Nation (Client) to complete a geotechnical investigation in support of the design and construction of the proposed exterior ramps to the existing structure, located at 8465 County Road 45, in Roseneath, Ontario (Site), illustrated in Figure 1. It is understood that the exterior ramps are part of an effort to bring the existing structure up to code to be used as a senior's residence.

The purpose of the field work and testing was to obtain information on the general subsurface soil and groundwater conditions at the site by means of a limited number of boreholes and laboratory tests. Based on an interpretation of the data available for this site, this report provides engineering comments, recommendations, and parameters for the geotechnical design aspects of the project, including selected construction considerations which could influence design decisions. It should be noted that this report addresses only the geotechnical (physical) aspects of the subsurface conditions at the site.

This report provides the results of the geotechnical exploration and testing and should be read in conjunction with the "Statement of Qualifications & Limitations" in Section 8.0 which forms an integral part of this document. The reader's attention is specifically drawn to this information, as it is essential for the proper use and interpretation of this report. The data, interpretations and recommendations contained in this report pertain to a specific project as described in the report and are not applicable to any other project or site location. If the project is modified in concept, location, or elevation, or if the project is not initiated within eighteen months of the date of the report, Cambium should be given an opportunity to confirm that the recommendations in this report are still valid.

2.0 Site Description

The Site is bound by the access road and a commercial development to the west, agricultural land to the south, and undeveloped forested land to the north and east. The Site is relatively flat and is currently developed with an existing structure, associated driveway and parking areas.

The geotechnical investigation was required to confirm the existing subsurface soil and groundwater conditions present at the Site and to prepare geotechnical design and construction recommendations for the proposed development. A borehole location plan is included as Figure 2 of this report.

This report presents the methodology and findings of the geotechnical investigation at the Site and addresses requirements and constraints for the design and construction of the planned residential development.

3.0 Methodology

3.1 Borehole Investigation

A borehole investigation was conducted on January 7, 2026, to assess subsurface conditions at the Site. A total of two boreholes, designated as BH101-26 and BH102-26 were advanced at the Site for geotechnical purposes and are shown on Figure 2. The boreholes were advanced in the vicinity of the two proposed exterior ramps and were advanced to depths of 6.6 m below ground surface (mbgs).

Drilling and sampling were completed using a track-mounted drill rig operating under the supervision of a Cambium technician. The boreholes were advanced to the sampling depths by means of continuous flight solid stem augers with 50 mm O.D. split spoon samplers. Standard Penetration Test (SPT) N values were recorded for the sampled intervals as the number of blows required to drive a split spoon sampler 305 mm into the soil, using a 63.5 kg drop hammer falling 750 mm, as per ASTM D1586 procedures. The SPT N values are used in this report to assess the relative density of non-cohesive soils. Soil samples were collected at approximately 0.75 m intervals to 3.0 m and at 1.5 m intervals thereafter.

The encountered soil units were logged in the field using visual and tactile methods, and samples were placed in labelled plastic bags for transport, future reference, possible laboratory testing, and storage. Open boreholes were checked for groundwater and general stability prior to backfilling. All were backfilled and sealed in accordance with Ontario Regulation (O.Reg.) 903.

Borehole logs are provided in Appendix A. Site soil and groundwater conditions are described, and geotechnical recommendations are discussed in the following sections of this report.

3.2 Physical Laboratory Testing

Physical laboratory testing, including one particle size distribution analysis (LS-702,705), was completed on selected soil samples to confirm textural classification and to assess geotechnical parameters. Moisture content testing (LS-701) was completed on all retrieved soil samples. Results are presented in Appendix B and are discussed in subsequent sections of this report.

4.0 Subsurface Conditions

Subsurface conditions are generally consistent across the Site. A surficial layer of topsoil, with variable thickness is present over the site, overlying a moist layer of very loose to compact sand and silt. Underlying the sand and silt soils, saturated very loose to compact silt and sand soils to the borehole termination depth. It should be noted that the conditions indicated on the borehole logs are for specific locations only and can vary between and beyond the borehole locations.

The individual soil units are described in detail below and shown on the borehole logs provided in Appendix A.

4.1 Topsoil

Dark brown silt, topsoil was encountered at the ground surface in both boreholes. The topsoil had a thickness of approximately 50 mm and 130 mm, respectively, and was described as moist at the time of the investigation.

4.2 Sand and Silt

Brown sand and silt, with variable amounts of clay, was encountered beneath the topsoil in both boreholes, extending to a depth of approximately 1.4 mbgs. Trace organic material was encountered down to a depth of approximately 0.8 mbgs to 1.0 mbgs in both borehole locations. The sand and silt encountered was found to be moist at the time of investigation, with moisture contents ranging from 15% to 23%. SPT N values ranging from 3 to 12, provide evidence of very loose to compact relative density.

A laboratory particle size distribution analysis was completed on one sample of the sand and silt material, as summarized in Table 1, with full results provided in Appendix B.

Table 1 Particle Size Distribution Analysis – Sand and Silt

Location	Depth (mbeg)	Description	% Gravel	% Sand	% Silt	% Clay	% Moisture Content
BH101-25 SS2	0.8 – 1.2	Sand and Silt	0	55	45		17.8

4.3 Silt and Sand

Light brown silt and sand material, with some clay, was encountered beneath the sand and silt soils at an approximate depth of 1.4 mbgs in both boreholes. The silt and sand material formed the predominant subsurface soils at the Site and extended to borehole termination depths of 6.6 mbgs in each borehole. This material was found to be wet to saturated at the time of investigation, with moisture contents ranging from 22% to 27%, based on laboratory testing. SPT N values in the silt and sand material were found to range from 3 to 20, indicating very loose to compact relative density.

4.4 Bedrock

Bedrock was not encountered as part of this investigation.

4.5 Groundwater

Groundwater was encountered in both boreholes over the course of the investigation. Wet soils were first encountered at a depth of 1.52 mbgs in each borehole. Water level on completion of drilling was encountered at a depth of 3.3 mbgs in each borehole.

Caving of soils was not observed in either of the boreholes upon completion of drilling.

It is noted that groundwater levels vary seasonally and in response to climatic activity.

5.0 Geotechnical Design Considerations

This section of the report provides engineering information and recommendations for the geotechnical design aspects of the project based on our interpretation of the borehole information, the laboratory test data and on our understanding of the project requirements. The following recommendations are provided to assist designers. It is possible that subsurface conditions beyond the borehole locations may vary from those observed. Recommendations should not be construed as providing instructions to contractors, who should form their own opinions about site conditions. Contractors bidding on or undertaking any work at the Site should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction and make their own interpretation of the factual data as it affects their proposed construction techniques, schedule, equipment capabilities, costs, sequencing, and the like. If significant variations are found before or during construction, Cambium should be contacted so that we can reassess our findings, if necessary.

5.1 Site Preparation

All topsoil, organics, stockpiled soils, and deleterious material, if any, should be removed from below the area of reconstruction. In areas where a subgrade inspection or proof roll and/or inspection has identified unsuitable subgrade conditions, whether loose, too soft, or too wet, the poorly performing material is to be removed and replaced with an approved material and compacted as directed by the Geotechnical Engineer.

Materials for the use of engineered fill must be approved by Cambium prior to placement. When the fill is treated as an engineered fill to support structural elements or pavement, general guidelines for the placement and preparation are presented below:

- The subgrade or base of the engineered fill area must be approved by Cambium prior to placement of any new fill, to ensure that suitability of subgrade condition.
- Cambium suggests the engineered fill should be approved OPSS 1010 Granular ‘B’ Type I or Type II material.
- The engineered fill should be placed at a moisture content at or near optimum moisture in maximum 200 mm thick lifts and compacted to minimum 100% standard Proctor maximum

dry density (SPMDD). Any frost penetration into the fill material must be removed prior to placement of subsequent lifts of fill or reviewed by Cambium.

- Full time testing and inspection will be required for all excavation, backfilling, and compaction operations.

5.2 Frost Penetration

Based on the Ontario Provincial Standard Drawing (OPSD) 3090.101, the typical frost penetration depth is expected to be approximately 1.5 mbgs.

Footings for all structures should be situated at or below this depth for frost protection or should be adequately insulated.

5.3 Excavations

Any excavations must be carried out in accordance with the latest edition of the Occupational Health and Safety Act (OHSA). Very loose to loose soils encountered near surface may be classified as Type 4 soils in accordance with OHSA and may be excavated with unsupported side slopes no steeper than 3H:1V from the base of the excavation. Compact soils may be classified as Type 3 soils above the groundwater table in accordance with OHSA and may be excavated with unsupported side slopes no steeper than 1H:1V. Below the groundwater table these soils should be considered Type 4 soils. Test excavations should be carried out at the time of construction to assess the soil integrity and water levels to determine any shoring requirements.

Excavation side slopes should be protected from exposure to precipitation and associated ground surface runoff and should be inspected regularly for signs of instability. If localized instability is noted during excavation or if wet conditions are encountered, the side slopes should be flattened as required to maintain safe working conditions or the excavation sidewalls must be fully supported (shored).

5.4 Dewatering

The first encounter of groundwater within soils was found to be at 1.52 mbgs in each borehole. However, water levels on completion of drilling provide evidence that groundwater is at depths

greater than 3.0 mbgs. Depending on the time of construction, excavations may encounter minor groundwater seepage at the base of the excavation. It is anticipated that the groundwater seepage, if encountered, should be controllable with filtered sumps and pumps.

It is noted that the elevation of the groundwater table will vary due to seasonal conditions and in response to heavy precipitation events.

Test excavations should be carried out at the time of construction to assess water levels and any potential change in dewatering requirements.

5.5 Backfill and Compaction

Excavated topsoil from the Site is not appropriate for use as fill below grading, and development areas. Excavated native soils, and imported fill, not containing organics or any other deleterious material, may be appropriate for use as engineered fill provided it is free of significant boulder and cobble, and the moisture content is close to optimal to allow for adequate compaction. Some moisture content adjustments may be required depending upon seasonal conditions. Geotechnical inspections and testing of engineered fill are required to confirm acceptable quality.

Any engineered fill should be placed in lifts appropriate to the type of compaction equipment used on site and be compacted to a minimum of 100% of standard Proctor maximum dry density (SPMDD), as confirmed by nuclear densometer testing. If native soils from the site are not used as engineered fill, imported material for engineered fill should consist of clean, non-organic soils, free of chemical contamination or deleterious material. The moisture content of the engineered fill will need to be close enough to optimum at the time of placement to allow for adequate compaction. Consideration could be given to using a material meeting the specifications of OPSS 1010 Granular B Type 1 material.

Retaining wall backfill should consist of free-draining granular material meeting the specifications of OPSS 1010 Granular A or Granular B Type 1 or an approved equivalent and should be placed in maximum 200 mm thick lifts compacted to a minimum of 100% SPMDD as confirmed by densometer testing. If engineered fill is being placed for general site backfill and grading, then compaction to 98% of SPMDD is applicable.

5.6 Foundation Design and Retaining Wall – Exterior Ramps

Assuming that the site is prepared as outlined above, the native sub-soils throughout most of the Site are competent to support the proposed exterior wood-framed ramps with piers and footings. Assuming exterior footings will be placed a minimum of 1.5 m below final grade for frost protection, footings can be founded on very loose to compact native silt and sand soils, at 1.5 mbgs. Soil at or below the recommended depths may be designed to a bearing capacity of 75 kPa at Serviceability Limit State (SLS) and 120 kPa at Ultimate Limit State (ULS). Settlement potential at the above-noted SLS loading is less than 25 mm and differential settlement should be less than 10 mm.

It is also understood that the north ramp will include a basement exit with a retaining wall.. For a concrete or segmental retaining wall, footings will need to be placed at a minimum of 1.5 m below final adjacent for frost protection and placed on undisturbed native soils at depth. The granular base can be founded on the undisturbed native silt and sand soils, which may also be designed for an allowable bearing capacity of 75 kPa at SLS and 120 kPa at ULS. The granular base for the wall should consist of a minimum of 200 mm of OPSS Granular A compacted to 100% of SPMDD. Any required grade raises to the footing elevations can be accomplished with engineered fill, using OPSS 1010 SSM or Granular B Type I in 200 mm lifts and compacted to a minimum of 100% of SPMDD. Where OPSS 1010 Granular B Type I is utilized as an engineered fill up to underside of proposed footing elevation, the engineered fill may be designed for bearing capacity 100 kPa at SLS and 150 kPa at ULS. Settlement potential at the above-noted SLS loading is less than 25 mm and differential settlement should be less than 10 mm. Under no circumstances will the foundations be placed directly on organic materials, loose, frozen subgrade, construction debris, or within ponded water. Footings and walls exposed to frost action shall be backfilled with OPSS 101 Granular B Type I granular material.

If footings are to be placed above frost depth, as per the A2S Consulting Engineers structural drawings, drawing number S-3.0, and dated February 18, 2026, elimination of frost action would require placement of a 100 mm thick layer high-density insulation (Styrofoam Brand Highload Insulation or equivalent) below the footings and extending laterally out from the foundation a distance of 1.2 m.

The quality of the subgrade shall be inspected by Cambium during construction, prior to constructing the footings and placing engineered fill, to confirm bearing capacity estimates. Any very loose/soft or organic matter at the base of the excavation identified at the time of proof-rolling that is unable to uniformly be compacted should be subexcavated and backfilled with engineered fill, placed in 200 mm maximum lifts and compacted to 100% of SPMDD up to footing elevations.

5.6.1 Slab-on-Grade Foundation Option

Alternatively, the ramps can be supported on slab-on-grade foundation systems. Inorganic soils at the site are considered competent to support the proposed ramp loads. For this option, existing soils should be removed to a minimum depth of 0.8 m below existing grade (mbeg) in the vicinity of borehole BH101-26 (west ramp), and to a minimum depth of approximately 1.3 mbeg in borehole BH102-26 (north ramp), to avoid founding on very loose and/or organic soil. The subgrade at the base of the excavation should be proof-rolled and inspected by a Geotechnical Engineer prior to backfilling. The excavations should also extend 1.0 m wider than the foundation footprints and should be excavated to the same depth as the middle of the foundation footprints. This will ensure that the slabs are supported by the same material throughout. For both excavated areas, the excavations should be backfilled to 200 mm below the required subgrade elevation for the slab using OPSS 1010 Granular B or equivalent material placed in 200 mm thick lifts compacted to a minimum of 100% of SPMDD as determined by nuclear densometer testing. The final 200 mm of the excavated area should be backfilled with OPSS 1010 Granular A or equivalent, compacted to 100% of SPMDD as determined by nuclear densometer testing.

It is noted that the soils below the granular base of the concrete pad are frost susceptible so the slab will be subject to frost heave. Complete elimination or any frost action would require increasing the thickness of the free draining granular base (OPSS 1010 Graular B or equivalent) below the slab to 1.5 m or placement of a 100 mm thick layer high-density insulation (Styrofoam Brand Highload Insulation or equivalent) below the slab and extending laterally out from the slab a distance of 1.5 m. The perimeter insulation strip should be placed on a slight slope, grading away from the structure to encourage drainage, at a minimum depth

of 300 mm from final grade. Care should be taken to cover any insulation above grade to prevent exposure to sunlight, UV rays, and foot or vehicle traffic.

If the area is prepared as noted above and given the loose to compact native of the native soils, the slab can be designed for a bearing capacity of 75 kPa at SLS and 120 kPa at ULS.

5.7 Lateral Earth Pressures

Lateral earth pressure coefficients (K) for foundation and retaining wall design are provided below. It is assumed that potential lateral loads will result from cohesionless, frictional materials, such as well-drained granular backfill.

Ko (at rest)	0.42
Ka (active)	0.27
Kp (passive)	3.7

The following formula may be used to calculate active lateral thrust (Pa) on yielding retaining structures;

$$Pa = (H/2)(Ka)(\gamma H + 2q)$$

where,

H = Height of retaining structure (m)

γ = unit weight of retained soil (kN/m^3)

q = surcharge (kPa)

A unit weight of 22 kN/m^3 should be assumed for compacted granular backfill loadings.

5.8 Seismic Site Classification

For the purpose of seismic design, geotechnical information shall be used to determine the “Site Class”. The average properties in the top 30 m (below the lowest founding level) are to be used. The site classification recommendation would be based on the available information as well as our interpretation of conditions below the boreholes based on our knowledge of the soil conditions in the area. In accordance with Table 4.1.8.4.A of the OBC (2024), it is recommended that Site Class “E” (soft soil) be applied for structural at the Site. These seismic

design parameters should be reviewed in detail by the structural engineer and incorporated into the design as required.

Consideration could be given to conducting shear wave velocity testing (Multichannel Analysis of Surface Waves, MASW) to evaluate whether an improved seismic site class and/or seismic hazard value can be obtained. Further details regarding shear wave velocity testing can be provided upon request.

6.0 Design Review and Inspections

Test excavations should be advanced throughout the Site, prior to construction, to compare findings to those observed in this report. Should soil or groundwater conditions change drastically from this report, a qualified geotechnical engineer should be consulted.

Testing and inspections should be carried out during construction operations to examine and approve subgrade conditions, placement and compaction of fill materials, and dewatering requirements. Concrete used during construction should also be tested for slump, air entrainment and compressive strength.

We should be contacted to review and approve design drawings, prior to tendering or commencing construction, to ensure that all pertinent geotechnical-related factors have been addressed. It is important that onsite geotechnical supervision be provided at this site for excavation and backfill procedures, deleterious soil removal, subgrade inspections and compaction and concrete testing.

7.0 Closing

Please note that this work program and report are governed by the attached Qualifications and Limitations. If you have questions or comments regarding this document, please do not hesitate to contact the undersigned at (705) 742-7900.

Respectfully submitted,

Cambium Inc.

DocuSigned by:
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Josh Riseling, EIT
Coordinator - Geotechnical

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Stuart Baird, M.Eng., P.Eng.
Director of Technical Operations, Services Corporate

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Juan Monroy, P.Eng.
Coordinator - Geotechnical

Jr/seb/jdm

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8.0 Statement of Qualifications & Limitations

Limited Warranty

Cambium relies on its client to provide instructions on the scope of work to be performed. Cambium undertakes all work in accordance with applicable accepted industry practices and standards, and with the degree of care and skill ordinarily exercised by professionals performing similar services for similar projects in the same region. Unless required under applicable laws, other than as expressly stated herein, no other warranties or conditions, either expressed or implied, are made regarding the services, work or reports provided.

Reliance on Materials and Information

The findings, results, information and data prepared by Cambium are based on the materials, documents and information provided by the client to Cambium and on the facts, conditions and circumstances encountered by Cambium during the performance of the work. In formulating its findings, results, information and data, Cambium assumes that the information, documents and materials provided by the client to Cambium are factual, accurate and represent a true depiction of the circumstances that exist at the Project. Cambium relies on its client to inform Cambium if there are changes to any such information, documents and materials. Cambium does not review, analyze or attempt to verify the accuracy or completeness of the information, documents or materials provided by the client, other than in accordance with applicable accepted industry practice. Cambium will not be responsible for matters arising from incomplete, incorrect or misleading information or from facts or circumstances that are not fully disclosed to Cambium, are unknown by Cambium, or are otherwise concealed from Cambium during the provision of its services.

Facts, conditions, information and circumstances may vary with time and locations and Cambium's work is based on a review of such matters as they existed at the particular time and location indicated in the findings, results, information and data prepared by Cambium. No assurance is made by Cambium that the facts, conditions, information, circumstances or any underlying assumptions made by Cambium in connection with the work performed will not change after Cambium has completed its work. If any such changes occur or additional information is obtained, Cambium should be advised and requested to consider if the changes or additional information affect its work.

When preparing reports, Cambium considers applicable legislation, regulations, governmental guidelines and policies. Cambium is not qualified to advise with respect to legal matters. The presentation of information regarding applicable legislation, regulations, governmental guidelines and policies is for information purposes only and is not intended to and should not be interpreted as constituting a legal opinion concerning the work completed or conditions outlined in a report. All legal matters should be reviewed and considered by an appropriately qualified legal practitioner.

Site Assessments

A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work considers any locations or times other than those from which information, sample results and data was specifically received, the work shall be based on a reasonable extrapolation from such information, sample results and data, but the actual conditions encountered may vary from those extrapolations.

Only conditions at the site and locations chosen for study by the client are evaluated; no adjacent or other properties are evaluated unless specifically requested and paid for by the client. Any physical or other aspects of the site chosen for study by the client, or any other matter not specifically addressed in findings, results, information and data prepared by Cambium, are beyond the scopes of the work performed by Cambium and such matters have not been investigated or addressed.

Intellectual Property Rights

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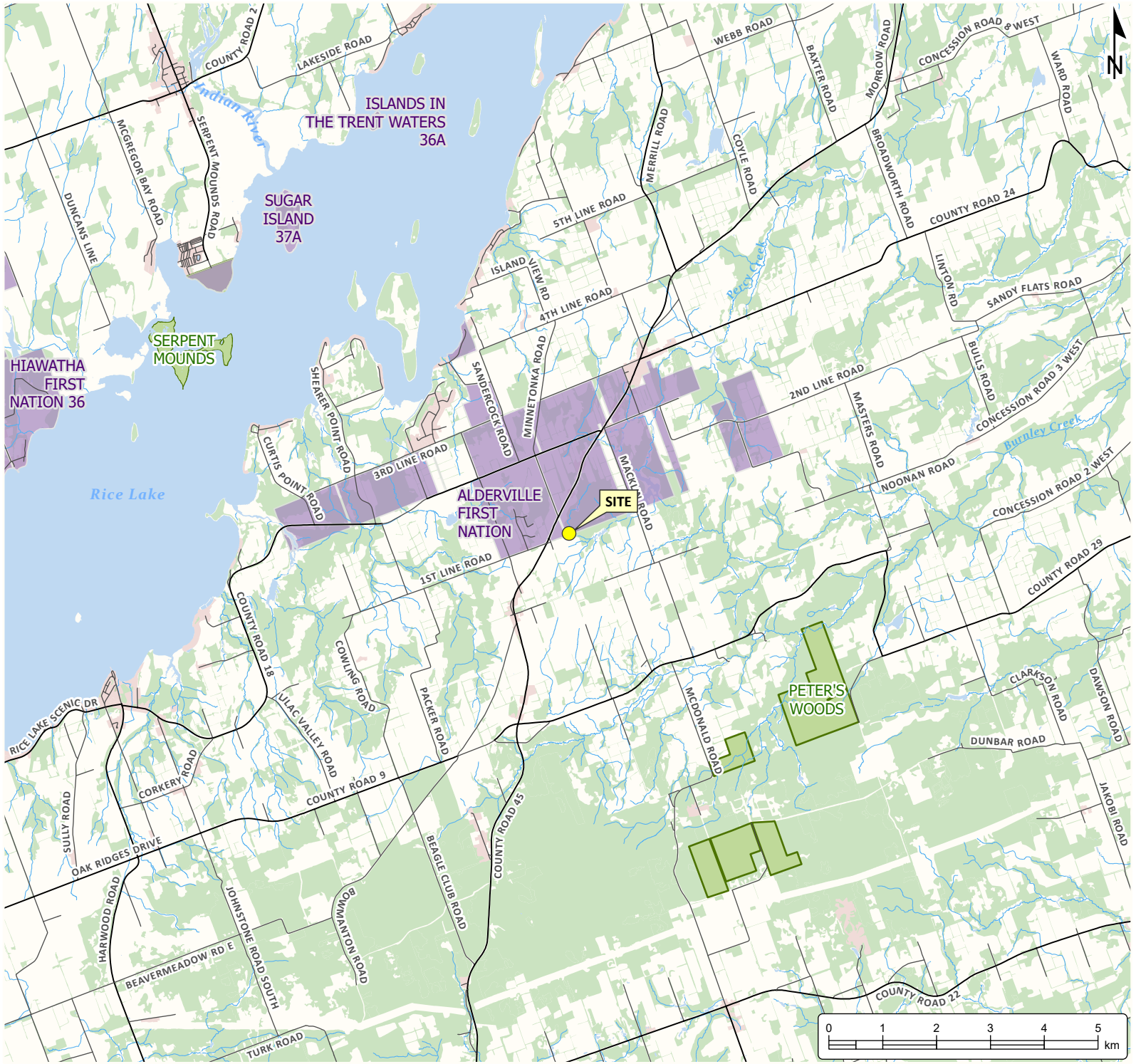
Potential liability to the client arising out of the report is limited to an amount equal to the fees paid to Cambium for the preparation of the report. Cambium shall only be liable for direct damages to the extent caused by Cambium's negligence and/or breach of contract. Cambium shall not be liable for indirect, consequential, aggravated or punitive damages and the client expressly waives the right to claim for such damages.

Personal Liability

The client expressly agrees that Cambium employees shall have no personal liability to the client with respect to a claim, whether in contract, tort and/or other cause of action in law. Furthermore, the client agrees that it will bring no proceedings nor take any action in any court of law against Cambium employees in their personal capacity.

Appended Figures



GEOTECHNICAL INVESTIGATION

ALDERVILLE FIRST NATION
8465 County Road 45
Roseneath, Ontario

LEGEND

- Major Road
- Minor Road
- Watercourse
- First Nations Reserve
- Provincial Park
- Water Area
- Wooded Area
- Built Up Area

Notes:
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- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
- Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.

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SITE LOCATION PLAN

Project No.:	Date:
02512173.000	January 2026
Scale: 1:100,000	Projection: NAD 1983 UTM Zone 17N
Created by: CC	Checked by: JM
Figure: 1	

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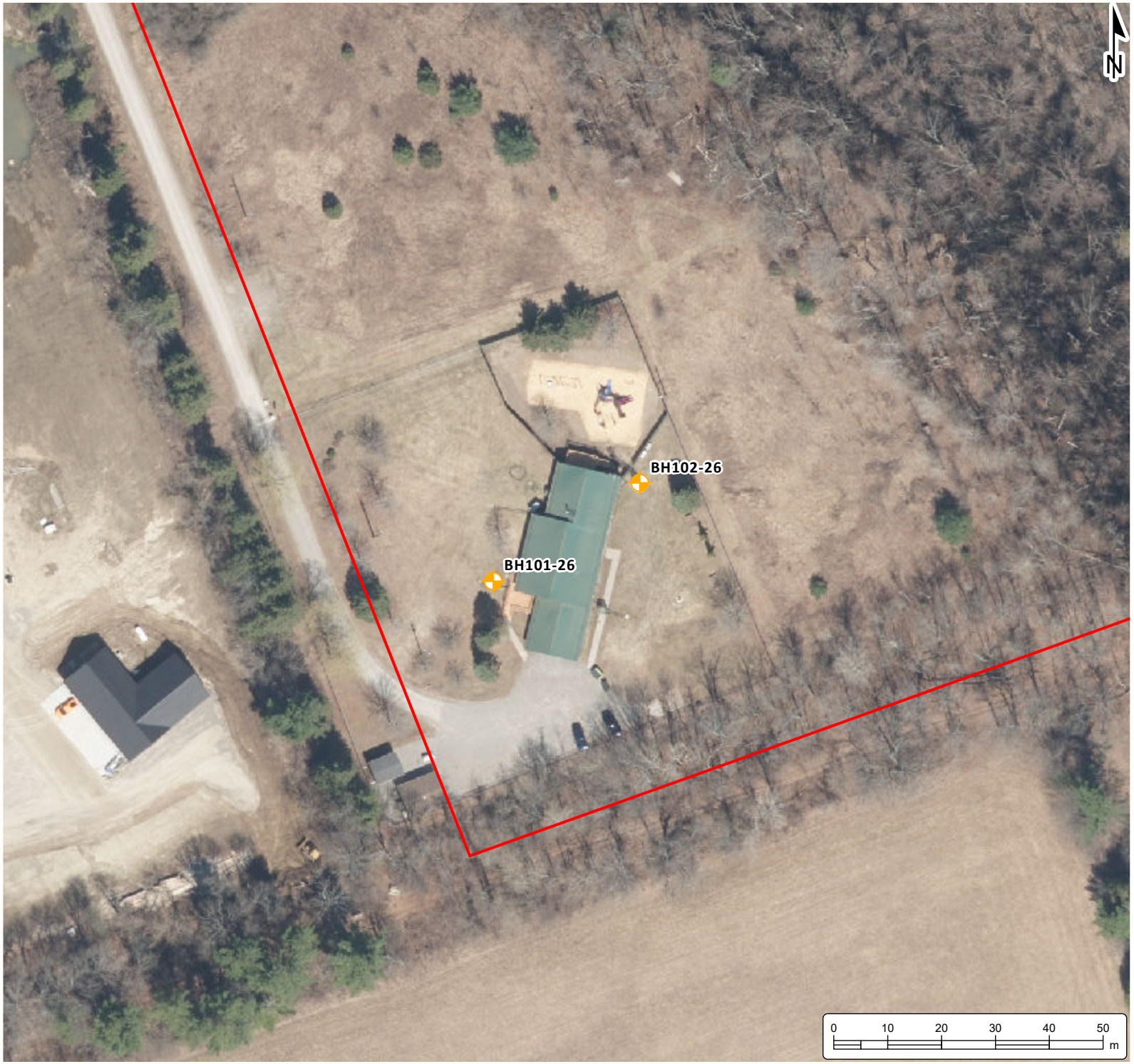

GEOTECHNICAL INVESTIGATION

ALDERVILLE FIRST NATION
8465 County Road 45
Roseneath, Ontario

LEGEND

- Borehole
- Subject Property (approximate)

Notes:
- Aerial Imagery from the South Central Ontario Orthophotography Project (SCOOP) 2023. Source: Ontario Ministry of Natural Resources and Forestry.

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BOREHOLE LOCATION PLAN

Project No.:	Date:
02512173.000	January 2026
Scale: 1:1,000	Projection: NAD 1983 UTM Zone 17N
Created by: CC	Checked by: JM
Figure: 2	

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Appendix A
Borehole Logs

CAMBIUM

Client: Alderville First Nation
Contractor: Ace Drilling
Project No.: 02512173.000
Location: 8465 County Road 45, Roseneath

Project Name: 8465 County Road 45, Roseneath
Method: Track Mounted Solid Stem Auger
Elevation: 0.00
UTM: 17T **N:** 4894267.94 **E:** 73379.08

Log of Borehole: BH101-26
Page: 1 of 1
Date Completed: Jan. 7, 2026

Elevation (m)	Depth	Description	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%) 25 50 75 / % Moisture 25 50 75	Shear Strength Cu, kPa (nat V., rem V.) 20 40 60 80 / SPT (N) 20 40 60 80	Well Installation	Log Notes
0	0	**TOPSOIL:** SILT; dark brown, trace organics; moist, loose	1A	SS			34.6%			
		-0.05 / 0.05	1B	SS	71	4	14.8%	4		
		(SP) SAND and SILT: brown, trace organics; moist, loose								
-0.5	0.5									
-1	1	-Becomes compact, no organics	2	SS	33	12	17.8%	12		SS2 GSA: Gravel 0%, Sand 55%, Silt & Clay 45%
		-1.37 / 1.37								
-1.5	1.5	**(ML) SILT and SAND:** some clay; light brown; saturated, very loose	3	SS	72	3	26.3%	3		
-2	2									
-2.5	2.5	-Becomes loose	4	SS	89	9	25.7%	9		
-3	3									
-3.5	3.5	-Becomes wet	5	SS	78	8	27.2%	8		Groundwater level measured in borehole at a depth of ~3.3 mbgs upon completion of drilling.
-4	4									
-4.5	4.5	-Becomes saturated, compact	6	SS	33	17	24.9%	17		
-5	5									
-5.5	5.5									
-6	6		7	SS	67	11	21.8%	11		Borehole was open upon completion of drilling.
-6.5	6.5	-6.55 / 6.55								
		Borehole terminated @ 6.6 mbgs due to target depth achieved.								
-7	7									
-7.5										

GRAINSIZE DISTRIBUTION

SAMPLE	GRAVEL	SAND	SILT	CLAY
SS2	0	55	45	

Logged By: ME **Input By:** ME

Peterborough, Barrie, Whitby, Kingston, Ottawa

Client:	Alderville First Nation	**Project Name:**	8465 County Road 45, Roseneath	**Log of Borehole:**	BH102-26
Contractor:	Ace Drilling	**Method:**	Track Mounted Solid Stem Auger	Page:	1 of 1
Project No.:	02512173.000	**Elevation:**	0.00	**Date Completed:**	Jan. 7, 2026
Location:	8465 County Road 45, Roseneath	**UTM:**	17T **N:** 4894282.44 **E:** 733808.79		

SUBSURFACE PROFILE				SAMPLE							
Elevation (m) / Depth	Lithology	Description	Elevation / Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%) LL PL PI; % Moisture 25 50 75	Shear Strength Cu, kPa nat V. rem V.; SPT (N) 20 40 60 80	Well Installation	Log Notes
0 / 0		**TOPSOIL:** SILT; dark brown, trace organics; moist, very loose	-0.13 / 0.13	1A	SS			23.4%			
-0.5 / 0.5		**(SP) SAND and SILT:** brown, trace organics; moist, very loose		1B	SS	58	3	14.7%	3		
-1 / 1		-Becomes some clay, no more organics		2	SS	22	3	22.8%	3		
-1.5 / 1.5		**(ML) SILT and SAND:** some clay; light brown, oxidation staining; saturated, loose	-1.37 / 1.37	3	SS	78	4	23.3%	4		
-2 / 2											
-2.5 / 2.5		-Becomes compact		4	SS	44	15	24.5%	15		
-3 / 3				5	SS	67	14	26.7%	14		Groundwater level measured in borehole at a depth of ~3.3 mbgs upon completion of drilling.
-3.5 / 3.5											
-4 / 4											
-4.5 / 4.5				6	SS	61	20	22.8%	20		
-5 / 5											
-5.5 / 5.5											
-6 / 6				7	SS	44	10	22.1%	10		Borehole was open upon completion of drilling.
-6.5 / 6.5		Borehole terminated @ 6.6 mbgs due to target depth achieved.	-6.55 / 6.55								
-7 / 7											
-7.5											

GRAINSIZE DISTRIBUTION: SAMPLE | GRAVEL | SAND | SILT | CLAY

Logged By: ME **Input By:** ME

Appendix B

Soil Laboratory Testing Results

Grain Size Distribution Chart

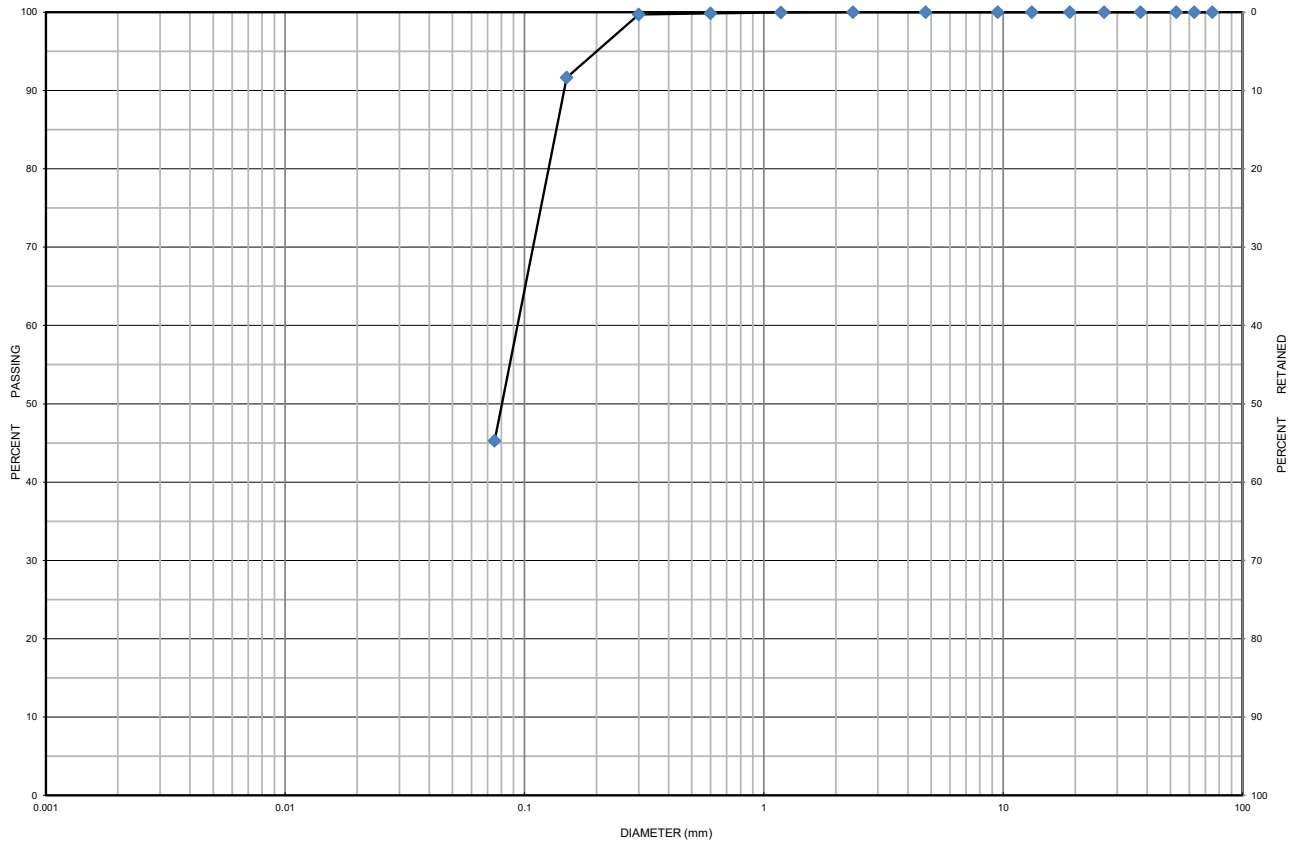
Project Number: *02512173-000* **Client:** *Alderville First Nation*

Project Name: *8465 County Road 45, Roseneath*

Sample Date: *January 7, 2026* **Sampled By:** *Maya Ervine - Cambium Inc.*

Location: *BH 101-26 SS 2* **Depth:** *0.8 m to 1.2 m* **Lab Sample No:** *S-26-0025*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
BH 101-26	SS 2	0.8 m to 1.2 m	0	55	45		17.8

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Sand and Silt	SM	0.092	-	-	-	-

Additional information available upon request

Issued By: _____ *Date Issued:* *January 16, 2026*

(Senior Project Manager)

Cambium Inc. (Laboratory)
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Moisture Content

Project Number: 02512173.000
Project Name: 8465 County Road 45, Roseneath
Client: Alderville First Nation
Date Taken: 2026-01-07

Lab Number: S-26-0024
Date Tested: 2026-01-13
Tested By: I. Meldrum

Borehole Number	Sample Number	Sample Depth (m)	Water Weight (g)	Water Content (%)	Additional Observations
101	1A	0.00-0.05	18.7	34.6	NR,1
101	1B	0.05-0.61	28.9	14.8	1
101	2	0.76-1.22	65.5	17.8	NR
101	3	1.52-1.98	66.5	26.3	
101	4	2.29-2.74	58.7	25.7	
101	5	3.05-3.51	75.9	27.2	
101	6	4.57-5.03	58.8	24.9	
101	7	6.10-6.58	48.5	21.8	
102	1A	0.00-0.13	38.7	23.4	NR,1
102	1B	0.13-0.61	26.6	14.7	1
102	2	0.76-1.22	29.7	22.8	NR
102	3	1.52-1.98	63.1	23.3	
102	4	2.29-2.74	69.5	24.5	
102	5	3.05-3.51	71.8	26.7	
102	6	4.57-5.03	59.3	22.8	
102	7	6.10-6.55	64.1	22.1	

1 – Contains organics
2 – Contains rubble
3 – Hydrocarbon Odour
4 – Unknown Chemical Odour
5 – Saturated – free water visible
6 – Very moist – near optimum moisture content
7 – Moist – below optimum moisture
8 – Dry – dry texture – powdery
9 – Very small – caution may not be representative
10 – Hold sample for gradation analysis