

MILLHAVEN NEW ADMIN. BUILDING AND STORAGE BUILDING ADDITION

240 COUNTY ROAD 4, BATH, ONTARIO

SPECIFICATIONS

Project Nos. 223-05b and 223-05c
10 June 2026



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END OF SECTION

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END OF SECTION

1 CASH ALLOWANCES

- .1 Refer to the General Conditions of the Contract.
- .2 Include in the Contract Price, the cash allowances stated herein.
- .3 Cash allowances, unless otherwise specified, cover the net cost to the Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage, installation where specified, and other authorized expenses incurred in performing the work.
- .4 The Contract Price, and not the cash allowance, includes the Contractor's overhead and profit in connection with such cash allowance.
- .5 The Contract Price will be adjusted by written order to provide for an excess or deficit to each cash allowance.
- .6 Where costs under a cash allowance exceed amount of the allowance, the Contractor will be compensated for any excess incurred and substantiated, plus an allowance for overhead and profit as set out in the Contract Documents.
- .7 Progress payments on accounts of work authorized under cash allowances shall be included in the Consultant's monthly certificate for payment.
- .8 A schedule shall be prepared jointly by the Departmental Representative and the Contractor to show when items called for under cash allowances must be authorized by the Departmental Representative for ordering purposes so that the progress of the Work will not be delayed.
- .9 The amount of each allowance is as follows:
 - .1 Inspection & Testing Allowance: \$15,000
 - .2 Security system, cameras and access control and associated IT cabling
- supply and Install: \$90,000

2 TOTAL OF ALLOWANCES: **\$ 105,000**

END OF SECTION

1 SUBSTITUTIONS DURING THE BIDDING PERIOD

- .1 Generally, specific materials, products and systems are specified in the Contract Documents to provide a standard of acceptance. Except where substitutions are specifically excluded in the individual Sections of the specification, equivalent materials, products or systems by other manufacturers are acceptable as substitutions, provided that the properties and compliances of the substitutions meet or exceed the properties and compliances of the specified materials, products and systems in all respects and that items exposed to sight are of the same appearance as the specified items.
- .2 Substitutions which do not satisfy the above requirements may be rejected by the Owner or the Consultant. Materials, products and systems which are so rejected shall be replaced by the specified items at no cost to the Contract.
- .3 In the event that, prior to closing of bids, the Bidder wishes to offer a substitution or a proposal of work, materials or methods as an alternative to those described in the Contract Documents, he shall submit a request in writing no later than the time specified herein.
- .4 The request shall include the following:
 - .1 A description of the proposed substitution.
 - .2 In the case of materials, products or systems, a direct comparison between the properties and compliances of the specified materials, products or systems with the properties and compliances of the proposed substitution, arranged in tabular form, in the same sequence as specified in the applicable specification section or in the sequence listed in the specified manufacturer's published literature, as appropriate.
 - .3 In the case of materials or products, country of manufacture.
 - .4 Shop drawings, product data, and certified test results attesting to the proposed material or product equivalence.
 - .5 If requested by the Consultant, a list of no less than five projects of comparable size and complexity, where the proposed substitution has been used in a similar application. Such projects shall have been in service for at least five (5) years and, where applicable, shall have been subjected to climatic conditions similar to those experienced at the location of the Project. The list shall include the name and current telephone number of the Owner or the Prime Consultant for each project.
- .5 The burden of proof is on the proposer. In the event that the Consultant deems the information provided with the request for approval of a substitution to be inadequate, the request may be rejected.
- .6 A request constitutes a representation that the Bidder:
 - .1 Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
 - .2 Will provide the same warranty for the Substitution as for the specified Product.
 - .3 Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to the Owner. (A later claim by Bidder for an addition to Contract Price because of changes in work necessitated by use of substitutions shall not be considered).

- .4 Waives claims for additional costs or time extension which may subsequently become apparent.
- .5 Will reimburse the Owner and the Consultant for the cost of review of the request for substitution.
- .6 Will reimburse the Owner and the Consultant for the cost of review or redesign services necessitated by:
 - .1 changes to the building design required to properly accommodate the substitute; and
 - .2 re-approval by authorities.
- .7 Substitutions will not be considered in either of the following circumstances:
 - .1 When they are indicated or implied on shop drawing or product data submittals, without a separate written request having been made.
 - .2 When acceptance will require revision to the Contract Documents.
- .8 Where the terms "or equal", "or equivalent" or terms of similar meaning are used in the specifications, this shall not be construed as acceptance of any alternative material, product or system to those specified. The use of these terms does not relieve the Subcontractor from his responsibility to follow the procedures for approval of substitutions specified herein.
- .9 When a request to substitute a Product is accepted, the Consultant will issue an Addendum to known bidders.

2 SUBSTITUTIONS AFTER CONTRACT AWARD

- .1 No substitutions will be permitted after award of the Contract without the prior approval of the Owner and the Consultant by means of a letter of acceptance of the specific substitution.
- .2 In the event that the Contractor wishes to offer a substitution or a proposal of work, materials or methods as an alternative to those described in the Contract Documents, he/she shall submit a request in writing.
- .3 The request shall include the following:
 - .1 Reasons for the proposed substitution.
 - .2 A description of the proposed substitution.
 - .3 The amount of any credit offered for the substitution.
 - .4 In the case of materials, products or systems, a direct comparison between the properties and compliances of the specified materials, products or systems with the properties and compliances of the proposed substitution, arranged in a form acceptable to the Consultant.
 - .5 In the case of materials or products, country of manufacture.
 - .6 Shop drawings, product data, and certified test results attesting to the proposed material or product equivalence.
 - .7 If requested by the Consultant, a list of no less than five projects of comparable size and complexity, where the proposed substitution has been used in a similar application. Such projects shall have been in service for at least five (5) years and, where applicable, shall have been subjected to climatic conditions similar to those experienced at the location of the Project. The list shall include the name and current telephone number of the Prime Consultant for each project.

- .4 The Consultant reserves the right to request such additional information as the Consultant deems necessary prior to acceptance or rejection of a proposed substitution.
- .5 A request constitutes a representation that the Contractor:
 - .1 Has investigated proposed Product and determined that
 - .1 it meets or exceeds the quality level of the specified Product; or
 - .2 the request describes accurately and completely the specific ways in which it fails to meet the quality level of the specified Product.
 - .2 Will provide the same warranty for the Substitution as for the specified Product.
 - .3 Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to the Owner. (A later claim by Bidder for an addition to Contract Price because of changes in work necessitated by use of substitutions shall not be considered).
 - .4 Waives claims for additional costs or time extension which may subsequently become apparent.
 - .5 Will reimburse the Owner and the Consultant for the cost of review of the request for substitution.
 - .6 Will reimburse the Owner and the Consultant for the cost of review or redesign services necessitated by:
 - .1 changes to the building design required to properly accomodate the substitute; and
 - .2 re-approval by authorities.
- .6 When a request to substitute a Product is accepted, the Consultant will issue to the Contractor a formal letter of acceptance.

END OF SECTION

1 COORDINATION AND PROJECT CONTROL

- .1 Coordinate the progress of the Work, progress schedules, submittals, the use of the site, temporary utilities, construction facilities and controls and the work of the various sections of the specifications to ensure the efficient and orderly installation of interdependent construction elements.
- .2 Coordinate the work of the various sections having interdependent responsibilities for installing, connecting to and placing in service utilities and equipment.
- .3 Coordinate space requirements, supports and the installation of mechanical and electrical work which is indicated schematically on the drawings. Follow the routing shown for pipes, ducts and conduits as closely as possible; place runs parallel with lines of the building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance and for repairs.
- .4 Except where indicated otherwise, in finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings. Coordinate locations of fixtures and outlets with finished elements. Before installation, inform the Consultant if there is a contradictory situation. Install as directed by the Consultant.
- .5 Coordinate the completion and clean-up of the work of separate sections in preparation for Substantial Completion.
- .6 After Owner occupancy of the premises, coordinate access to the site for correction of defective work and work not in accordance with the Contract Documents, to minimize disruption of the Owner's activities.

2 DOCUMENTS REQUIRED

- .1 Maintain at the Project Site, one copy each of the following:
 - .1 Approved drawings forming part of the Site Plan Agreement with the Town of Carleton Place.
 - .2 Contract drawings.
 - .3 Specifications
 - .4 Addenda
 - .5 Reviewed shop drawings.
 - .6 Change orders.
 - .7 Other modifications to the Contract.
 - .8 Field test reports.
 - .9 The latest accepted version of the construction progress schedule specified in Section 01 32 16.
 - .10 The latest accepted version of the site-specific Health and Safety Plan specified in Section 01 35 29.
 - .11 Manufacturers' installation and application instructions.
- .2 Ensure that all trades and all subcontractors are in possession of a complete set of Contract Documents and the latest edition of all codes, regulations and standards that are applicable to their portion of the Work.

3 INTERFERENCE DRAWINGS

- .1 When directed by the Consultant, prepare interference and equipment placing drawings to ensure that all components will be properly accommodated within the spaces provided.
- .2 Where the relationship of a system with other systems is critical, prepare drawings to indicate coordination and methods of installation. Ensure that all details of equipment apparatus and connections are coordinated.
- .3 Ensure that clearances required by authorities having jurisdiction and clearances for proper maintenance are indicated on the drawings.
- .4 Provide all line and layout from the information provided on the Contract Drawings.

4 EQUIPMENT ELECTRICAL CHARACTERISTICS AND COMPONENTS

- .1 Power requirements: Coordinate the Work of the individual specification sections with Division 16 to ensure the provision of required electrical power with the appropriate electrical characteristics.
- .2 Wiring terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes and materials indicated. Size terminal lugs to NFPA 70. Include lugs for terminal boxes.
- .3 Cord and plug: Where not otherwise specified in the individual specification Sections, provide minimum 1.8 m cord and plug, including grounding connector for connection to electric wiring system.

END OF SECTION

1 PRECONSTRUCTION MEETING

- .1 Schedule a preconstruction meeting after award of Contract. Attendance by:
 - .1 The Owner's Representatives
 - .2 The Contractor
 - .3 The Consultant
 - .4 Other interested parties on the invitation of the Owner, the Contractor and/or the Consultant.
- .2 Agenda:
 - .1 Execution of Project Contract Agreement.
 - .2 Submission of executed bonds and insurance certificates.
 - .3 Distribution of Contract Documents.
 - .4 Submission of List of Subcontractors, Price Breakdown, Contract Price, Unit Prices, Construction Schedule and Proposed Product List.
 - .5 Designation of the personnel representing the parties in the Contract.
 - .6 Procedures and processing of field decisions, submittals, substitutions, applications for payments, Proposal Change Requests, Change Orders and Contract closeout.
 - .7 Scheduling.
 - .8 Scheduling of activities of independent inspection and testing laboratories.
 - .9 Terms of Payment and proposed cash flow for the project.
 - .10 Project meeting procedures.
- .3 Record minutes and distribute copies to meeting participants and affected parties not in attendance within 48 hours of the meeting.

2 SITE MOBILIZATION MEETING

- .1 Schedule a mobilization meeting at the Project Site, prior to Contractor occupancy. Attendance by:
 - .1 The Owner's Representative
 - .2 The Consultant
 - .3 Specialized sub-consultants.
 - .4 The Contractor
 - .5 Major subcontractors.
- .2 Agenda:
 - .1 Use of the premises by the Contractor.
 - .2 Construction facilities and controls.
 - .3 Temporary facilities.
 - .4 Survey and building layout.
 - .5 Security and housekeeping procedures.
 - .6 Health and safety procedures.
 - .7 Construction Schedule.
 - .8 Application for payment procedures.
 - .9 Procedures for testing.
 - .10 Procedures for maintaining record documents.
 - .11 Requirements for start-up of equipment.
 - .12 Inspection and acceptance of equipment put into service during the construction period.

- .3 Record minutes and distribute copies to meeting participants and affected parties not in attendance within 48 hours of the meeting.

3 PROGRESS MEETINGS

- .1 In consultation with the Owner and the Consultant, schedule progress meetings at the Project Site, at the same time and day of the week, at two-weekly intervals, throughout the progress of the Work. By agreement, additional meetings may be held if circumstances require.
- .2 Attendance required (as appropriate to agenda topics for each meeting):
 - .1 The Owner's Representative
 - .2 The Consultant
 - .3 Specialized sub-consultants.
 - .4 Contractor.
 - .5 Contractor's superintendent.
 - .6 Other parties affected by the Work.
 - .7 Major subcontractors.
- .3 Subcontractors and/or suppliers shall be invited only by prior agreement with the Consultant.
- .4 The Contractor shall:
 - .1 Distribute written notices of meetings to all affected parties.
 - .2 Provide physical space and make arrangements for meetings.
- .5 Agenda:
 - .1 Review of minutes of previous meetings.
 - .2 Review of Work progress.
 - .3 Field observations, problems and decisions. progress.
 - .4 Identification of problems which impede planned progress.
 - .5 Review of Schedule of Submittals and status of submittals.
 - .6 Review of off-site fabrication and delivery schedules.
 - .7 Maintenance of Progress Schedule.
 - .8 Corrective measures to regain projected schedules.
 - .9 Planned progress during succeeding work period.
 - .10 Coordination of projected progress.
 - .11 Maintenance of quality and work standards.
 - .12 Effect of proposed changes on the Progress Schedule and coordination.
 - .13 Other business relating to the Work.
- .6 Record minutes. Minutes shall include significant proceedings and decisions and will identify "action by" parties.
- .7 Distribute copies to meeting participants and affected parties not in attendance within 48 hours of the meeting.

4 PREINSTALLATION MEETINGS

- .1 When required by individual Sections of the Specification, the Contractor shall:
 - .1 Convene a preinstallation meeting at the site or at an appropriate location, prior to commencing the work of the Section.
 - .2 Require the attendance of parties directly affecting or affected by the work of the Section.
 - .3 Distribute written notice of the meeting to all parties required to attend.
 - .4 Prepare the agenda and preside at the meeting:
 - .1 Review conditions of installation, preparation and installation procedures.
 - .2 Review coordination with related work.
 - .5 Record minutes and distribute copies to meeting participants and affected parties not in attendance within 48 hours of the meeting.

END OF SECTION

1 SCHEDULES REQUIRED

- .1 Submit a Construction Progress Schedule within 10 days of contract award.
- .2 Include the following supplementary schedules, coordinated with the Construction Progress Schedule:
 - .1 Submittal Schedule for Shop Drawings and Product Data.
 - .2 Submittal Schedule for Samples.
 - .3 Product Delivery Schedule.
 - .4 Cash Allowance Schedule for purchasing products.

2 FORMAT

- .1 Prepare schedules in the form of a horizontal bar chart.
- .2 Provide a separate bar for each major item of work or operation.
- .3 Split horizontally for projected and actual performance.
- .4 Provide a horizontal time scale identifying first workday of each week.
- .5 Format for listings: chronological order of start of each item of work.

3 SUBMITTAL SCHEDULES

- .1 Include schedules for submitting shop drawings, product data, samples, and other submittals called for in the individual specification sections.
- .2 Include in the submittal schedule a complete list of all submittals required for the project.
- .3 Indicate dates for submitting, review time, resubmission time, last date for meeting fabrication schedule.

4 MAINTENANCE OF SCHEDULES

- .1 Update the progress schedules for every progress meeting and submit an updated schedule with each monthly progress billing.

END OF SECTION

1 GENERAL

- .1 Submit to the Consultant for review, shop drawings, product data and samples specified in the respective specification Sections.
- .2 Until a submission is reviewed, work involving the relevant product may not proceed.
- .3 Generally, submittals shall be in .pdf digital format. For shop drawings, scanned documents are not acceptable.
- .4 For submittals that cannot be transmitted digitally (i.e. samples), arrange and pay for all deliveries and pick-ups to and from the office of the Consultant.
- .5 Maintain an email inbox capable of accepting minimum 20 Mb of data.

2 SHOP DRAWINGS AND PRODUCT DATA

- .1 Shop drawings to be originals prepared by the Contractor, Subcontractor, Supplier or Distributor, which illustrate the appropriate portion of the Work; showing fabrication, layout, setting or erection details, as specified in the appropriate Sections.
- .2 Identify details by reference to sheet and detail numbers shown on the Contract Drawings.
- .3 Drawing Format Submissions:
 - .1 Digital files in .pdf format.
 - .2 Upon return to the Contractor of reviewed digital submissions, the Contractor shall be responsible for printing and distribution of reviewed submissions to the Subcontractors and affected parties.
- .4 Product Data:
 - .1 Certain specification Sections specify that manufacturer's standard schematic drawings, catalogue sheets, illustrations and other standard descriptive data will be accepted in lieu of shop drawings.
 - .2 The above will be accepted only if they conform to the following:
 - .1 Delete information which is not applicable to project.
 - .2 Supplement standard information to provide additional information applicable to project.
 - .3 Show dimensions and clearances required.
 - .4 Show performance characteristics and capacities.
 - .5 Show wiring diagrams (where applicable) and controls.
 - .3 Submit as .pdf files.

3 SAMPLES AND MOCK-UPS

- .1 Submit samples in sizes and quantities specified.
- .2 Where colour, pattern or texture is a criterion, submit the manufacturer's full range of samples.

- .3 Construct field samples and mock-ups at locations acceptable to the Consultant.
- .4 Construct each sample or mock-up complete, including work of all trades required to finish work.
- .5 Reviewed samples or mock-ups will become the standards of workmanship and material against which installed work will be checked on the project.

4 COORDINATION OF SUBMISSIONS

- .1 Review and stamp shop drawings, product data and samples prior to submission.
- .2 Verify:
 - .1 Field measurements.
 - .2 Field construction criteria.
 - .3 Catalogue numbers and similar data.
- .3 Coordinate each submission with the requirements of the Work and the Contract Documents. Individual shop drawings will not be reviewed until all related drawings are available.
- .4 The Contractor's responsibility for errors and omissions in submission is not relieved by the Consultant's review of submittals.
- .5 The Contractor's responsibility for deviations in submission from the requirements of the Contract Documents is not relieved by the Consultant's review of the submission, unless the Consultant gives written acceptance of specified deviations.
- .6 Notify the Consultant, in writing at the time of submission, of deviations from the requirements of the Contract Documents.
- .7 After the Consultant's review, the .pdf file will be returned to the Contractor who shall distribute copies.
- .8 Originators preparing more than one submission, shall prepare a list of all shop drawings, complete with submission dates to the Consultant. Include this list with the first submission.

5 SUBMISSION REQUIREMENTS

- .1 Schedule submissions at least 30 days before the dates reviewed submissions will be needed.
- .2 Accompany each electronic submission with an email.
- .3 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name of:
 - .1 Contractor.
 - .2 Subcontractor.

- .3 Supplier.
 - .4 Manufacturer.
 - .5 Separate detailer when pertinent.
 - .4 Identification of product or material.
 - .5 Relation to adjacent structure or materials.
 - .6 Field dimensions, clearly identified as such.
 - .7 Specification section number.
 - .8 Applicable standards, such as CSA or CGSB numbers.
 - .9 Where applicable, the code used in the Contract Documents to identify the product
 - .10 Originator's stamp and signature, certifying review of submission, verification of field measurements and compliance with the Contract Documents.
 - .11 Contractor's stamp and signature, certifying review of submission.
 - .12 Professional engineer's stamp and signature, where specific sections of the specification so direct. Note that drawings will not be reviewed unless the Professional Engineer's stamp and signature is present.
 - .13 CSA/CGSB/ASTM or other conformance certificates where applicable.
- .4 The Contractor's stamp and signature, certifying review of the Submission shall be interpreted to mean that the Contractor has reviewed the drawings and coordinated them with the work of other trades. Drawings which have not been so reviewed and coordinated by the Contractor will be returned for resubmission before Consultant review will be undertaken.

6 SHOP DRAWINGS REVIEW

- .1 The review of shop drawings by the Consultant is for the sole purpose of ascertaining conformance with the general concept. This review shall not mean that the Consultant approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and contract documents.
- .2 Without restricting the generality of the foregoing, 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 all subtrades.

END OF SECTION

1 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Health Canada / Workplace Hazardous Materials Information System (WHMIS):
 - .1 Material Safety Data Sheets (MSDS).
- .3 Province of Ontario
 - .1 Occupational Health and Safety Act, R.S.O. 1990 Updated 2014.

2 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Submit a site-specific Health and Safety Plan within 7 days after the date of Notice to Proceed and prior to commencement of Work. The Health and Safety Plan must include:
 - .1 Results of a site-specific safety hazard assessment.
 - .2 Results of a safety and health risk or hazard analysis for site tasks and operations.
- .3 Submit, weekly, 2 copies of the Contractor's authorized representative's work site health and safety inspection reports to the Consultant and, when required, to the authority having jurisdiction.
- .4 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets for all applicable products used on the Project.
- .7 The Consultant will review the Contractor's site-specific Health and Safety Plan and provide comments to the Contractor within 5 working days after receipt of the plan. Revise the plan as appropriate and resubmit the plan to the Consultant within 5 working days after receipt of comments from the Consultant.
- .8 The Consultant's review of the Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .9 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations. Include site-specific requirements.

3 FILING OF NOTICE

- .1 File Notice of the Project with Provincial authorities prior to beginning of Work.

4 SAFETY ASSESSMENT

- .1 At the start of the project, perform a site-specific safety hazard assessment related to the Project. Conduct a monthly review the assessment during the course of the project and update as required.

5 MEETINGS

- .1 Schedule and administer a Health and Safety meeting with the Consultant prior to commencement of Work.

6 GENERAL REQUIREMENTS

- .1 Develop a written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce the plan until final demobilization from site. The Health and Safety Plan must address the project specifications.
- .2 The Consultant may respond in writing, where deficiencies or concerns are noted and may request re-submission with the correction of deficiencies or concerns.

7 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for the protection of persons adjacent to site and the environment to the extent that they may be affected by the conduct of the Work.
- .2 Assume the role of "Constructor" as defined and regulated by legislation of the Province of Ontario.
- .3 Comply with and enforce compliance by employees with the safety requirements of the Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with the site-specific Health and Safety Plan.

8 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Health and Safety Act, R.S.O.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

9 HAZARDOUS MATERIAL DISCOVERY

- .1 Asbestos: Demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify the Consultant.
- .2 PCB: Polychlorinated Biphenyl: Stop work immediately when material resembling Polychlorinated Biphenyl is encountered during demolition work. Notify the Consultant.

- .3 Mould: Stop work immediately when material resembling mould is encountered during demolition work. Notify the Consultant.

10 UNFORSEEN HAZARDS

- .1 When unforeseen or a peculiar safety-related factor, hazard, or condition occur during performance of Work, follow the procedures in place for Employee's Right to Refuse Work in accordance with the Acts and Regulations of the Province of Ontario and advise the Consultant verbally and in writing.

11 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in a conspicuous location on site in accordance with the Acts and Regulations of the Province of Ontario, and in consultation with the Consultant.

12 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by the authority having jurisdiction or by the Consultant.
- .2 Provide the Consultant with a written report of action taken to correct identified health and safety non-compliance issues.
- .3 The Consultant may stop Work if non-compliance with health and safety regulations is not corrected.

13 BLASTING

- .1 Blasting or other use of explosives is not permitted without prior receipt of written instructions by the Consultant and a permit obtained by the Owner.

14 POWDER ACTUATED DEVICES

- .1 Use powder actuated devices only after receipt of written permission from the Consultant.

15 FIRE HYDRANTS

- .1 Maintain fire hydrants in operating condition, free of snow and ice, accumulations, readily available and unobstructed for use in accordance with the Ontario Fire Code, O. Reg. 213/07, as amended and the requirements of the Town of Carleton Place.

16 WORK STOPPAGE

- .1 Give precedence to safety and health of the public and site personnel and protection of the environment over cost and schedule considerations for the Work.

END OF SECTION

1 DEFINITIONS

- .1 *Environmental Pollution and Damage:* The presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.
- .2 *Environmental Protection:* Prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

2 FIRES

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

3 DISPOSAL OF WASTES

- .1 Do not bury rubbish and waste materials on site.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .3 Dispose of waste or volatile materials which could be hazardous to the health, in strict accordance with the requirements of the authorities having jurisdiction and in a manner which will protect construction personnel, visitors to the site and the public from all such hazards.

4 DRAINAGE

- .1 Provide temporary drainage and pumping as necessary to keep excavations and the site free from water.
- .2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
- .4 Implement an erosion and sediment control plan to provide for protection of the receiving storm sewer or water course during construction activities. This plan, to be used during construction, shall ensure that no sediment and/or associated pollutants are discharged to a receiving water course which could degrade water quality and/or impair fish or other aquatic habitat. The methods used must be regularly maintained to ensure their effectiveness and to ensure compliance with provincial/federal legislation pertaining to water quality and habitat.

5 POLLUTION CONTROL

- .1 Control emissions from equipment and plant to conform to local authorities' emission requirements.
- .2 Prevent sandblasting and other extraneous materials from contaminating air beyond the application area by providing temporary enclosures.
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- .4 Clean public roads at the access points to the site as required to keep public roadways clear of site materials and debris at all times.

6 NOTIFICATION

- .1 The Consultant will notify the Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws, regulations, or permits.
- .2 After receipt of such notice, the Contractor shall inform the Consultant of proposed corrective action and take such action for approval by the Consultant.
- .3 The Consultant will issue a stop work order until satisfactory corrective action has been taken.
- .4 No time extensions will be granted or equitable adjustments allowed to the Contractor for such suspensions.

END OF SECTION

1 REFERENCES AND CODES

- .1 Perform the Work in accordance with the current edition of the Ontario Building Code, including amendments up to tender closing date and other codes of provincial and local application provided that, in case of conflict or discrepancy, the more stringent requirements apply.
- .2 Meet or exceed requirements of:
 - .1 The Contract documents.
 - .2 Specified standards, codes and referenced documents.
 - .3 Ontario Regulation for Industrial Establishments O.Reg. 851.
 - .4 CAN/CSA-B651-12, Accessible Design for the Built Environment.

2 BUILDING SMOKING ENVIRONMENT

- .1 Smoking is prohibited on the property.

3 PERMITS AND FEES

- .1 The Contractor shall pay for all required permits, fees and inspections by all authorities having jurisdiction.
- .2 The Owner will apply and pay for the Building Permit and any municipal development fees.
- .3 The Contractor will be responsible for following up with the Township, to facilitate the expeditious issue of the Building Permit.
- .4 The Contractor shall provide the Owner with photocopies of all permits required for the work.
- .5 The Contractor shall obtain all necessary approvals from the Township with regard to the installation of the storm and sanitary sewers and watermains and the provision of sewage holding/treatment facilities.

END OF SECTION

1 QUALITY ASSURANCE - CONTROL OF INSTALLATION

- .1 Monitor quality control over suppliers, manufacturers, products, services, site conditions and workmanship to produce work of the specified quality.
- .2 Comply with manufacturer's instructions, including each step in the sequence.
- .3 Should manufacturer's instructions conflict with the Contract Documents, request clarification from the Consultant before proceeding.
- .4 Comply with specified standards as a minimum quality for the Work, except where more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.
- .5 Perform work by persons qualified to produce the required and specified quality.
- .6 Wherever critical to a proper fit, verify dimensions on site prior to commencement of manufacture.
- .7 Secure materials and products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

2 TOLERANCES

- .1 Monitor fabrication and installation tolerance control of products to produce acceptable work. Do not permit tolerances to accumulate.
- .2 Comply with manufacturers' tolerances. Should a manufacturer's tolerances conflict with the Contract Documents, request clarification from the Consultant before proceeding.
- .3 Adjust products to appropriate dimensions; position products before securing in place.

3 REFERENCES, CODES AND STANDARDS

- .1 Perform the Work in accordance with the latest edition, including all revisions, of applicable codes and regulations of federal, provincial, or local application, provided that, in any case of conflict or discrepancy, the more stringent requirements shall apply.
- .2 Meet or exceed the requirements of specified standards, codes and referenced documents.
- .3 For materials, products or workmanship specified by association, trade or other consensus standards, comply with the requirements of the standard, except where more rigid requirements are specified or are required by applicable codes.
- .4 In each case, where a standard, code or other document is referenced, the latest edition or revision shall apply, unless specified otherwise, except where a specific date of issue is established by code.

- .5 Neither the contractual relationships, duties or responsibilities of the parties in the Contract shall be altered from those defined by the Contract Documents by mention or inference otherwise in any referenced document.

4 MOCK-UPS

- .1 Procedures for the preparation and submission of mock-ups are specified in Section 01 33 00 "Submittal Procedures".
- .2 Tests will be performed under the provisions identified in this Section.

5 INSPECTION AND TESTING

- .1 Inspection:
 - .1 Provide access to the Work at all times.
 - .2 Provide full cooperation and sufficient, safe, and proper facilities at all times for review of the Work by and for inspection of the Work by authorized agencies.
 - .3 If portions of the Work are in preparation off site, provide access to such work, whenever it is in progress.
 - .4 Provide the Consultant with reasonable notice of when work designated for tests, inspections or approvals will be ready for review and inspection.
 - .5 Provide the Consultant with reasonable notice of the date and time of inspections by other authorities.
- .2 Independent Inspection Agencies:
 - .1 Independent Inspection/Testing Agencies will be engaged by the Owner for the purpose of inspecting and/or testing portions of the Work. The Cost of initial inspections and/or testing will be paid by the Owner.
 - .2 Cooperate with Inspection/Testing Agencies. Furnish samples of materials, design mix, equipment, tools, storage, safe access and assistance by incidental labour as requested.
 - .3 If additional tests are required by the Contractor, make arrangements with the Inspection/Testing Agency and pay for additional samples and tests.
 - .4 The cost of additional inspection and/or testing required because of non-compliance with the Contract Documents at the initial test, shall be paid by the Contractor.
- .3 Reports:
 - .1 All inspection and test reports shall include for, one copy to each of the following:
 - .1 The Owner.
 - .2 The Consultant.
 - .3 Applicable Specialist Consultant(s) (if applicable).
 - .4 The subcontractor (if any) responsible for the work.
 - .5 Material/product manufacturers and/or suppliers, as applicable.
 - .2 The Contractor shall provide copies to the Subcontractor of the work being inspected/tested and to the manufacturer(s)/fabricator(s) of material(s) being inspected/tested.
- .4 Covering Installed Work: Do not cover installed work with subsequent work until the installed work has been reviewed on site by the Consultant.

6 MANUFACTURERS' FIELD SERVICES

- .1 When individual specification Sections require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment and testing, adjusting and balancing of equipment, as applicable, and to initiate instructions when necessary.
- .2 Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to the manufacturer's written instructions.
- .3 Refer to Section 01 33 00 "Submittal Procedures".

END OF SECTION

1 INSTALLATION/REMOVAL

- .1 Provide construction facilities and temporary controls as required to execute the Work expeditiously.
- .2 Prior to Substantial Completion, remove from the site all construction facilities and temporary controls.
- .3 Make good any damage to or disturbance of existing property caused by such work. Restore affected existing property to a condition at least equal to that which existed prior to construction.

2 TEMPORARY ELECTRICAL POWER

- .1 The existing electrical system may be used for temporary power required during construction for operating equipment and machinery, temporary lighting and operating power tools, provided the system is not overloaded and warranties for new work are not affected.
- .2 Connect to delivery points in accordance with the Canadian Electrical Code and to the satisfaction of the local authority having jurisdiction. Provide all equipment and temporary lines to bring power services to the point of use. Provide flexible power cords as required.

3 TEMPORARY LIGHTING

- .1 Provide and maintain general level temporary lighting for construction operations to achieve a minimum lighting level of 2 watts/ft² (21 watts/m²).
- .2 Provide and pay for additional temporary lighting equipment required for the proper execution of specific tasks. Provide branch wiring from the power source to distribution boxes with lighting conductors, pigtails and lamps, as required.
- .3 Provide and maintain temporary lighting to interior and exterior staging and storage areas, after dark, for security purposes.
- .4 Subject to the approval of the Owner, the permanent lighting system of the building may be used during construction, provided warranties are not affected.

4 HEATING

- .1 At the discretion of the Owner and the Consultant, the permanent heating system of the building, or portions thereof, may be used when available, provided warranties are not affected.
- .2 Prior to operation of new permanent equipment for temporary heating purposes, verify that the installation is approved for operation, equipment is lubricated, and filters are in place.
- .3 Be responsible for damage thereto. Before takeover by the Owner, change all filters, vacuum all ductwork, replace any worn or consumed parts and perform such other maintenance work as required to leave the system in proper operating condition.

5 TEMPORARY VENTILATION

- .1 Ventilate enclosed areas as required to cure materials, to dissipate humidity and to prevent accumulation of dust, fumes, vapours or gases.
- .2 The permanent ventilation system of the building may be used, subject to the same provisions as specified above for the use of the permanent heating system and provided such use does not result in contamination of the air outside the area of construction.
- .3 Extend and supplement the permanent equipment with temporary fan units as required to maintain clean air for construction operations.
- .4 Completely clean the entire building ventilation system immediately prior to takeover by the Owner.

6 TELEPHONE, COMPUTER AND PRINTER

- .1 Provide telephone, computer and printer for own use and the use of the Consultant.
- .2 The cost of long distance telephone calls shall be paid for by the respective party.

7 TEMPORARY WATER SERVICE

- .1 The existing building water supply system may be used for construction use. Connect to delivery points to the approval the Owner and the authorities having jurisdiction.
- .2 Provide all equipment and temporary lines to bring water to the point of use. Provide flexible hoses as required.

8 SCAFFOLDING

- .1 Erect scaffolding in accordance with CAN/CSA-S269.2.
- .2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, and temporary stairs as required for the execution of the work.

9 HOISTING

- .1 Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
- .2 Hoists and cranes to be operated by qualified operators licensed in the Province of Ontario.

10 SITE ACCESS

- .1 Provide and maintain adequate access to the project site.
- .2 Clean roads and ground surfaces where used by Contractor's equipment.

11 SITE STORAGE/LOADING

- .1 Confine work and operations of employees to the area designated in the Contract Documents. Be advised that the area is limited.
- .2 Obtain and pay for use of additional storage or work areas if needed for operations.
- .3 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .4 Locate materials not required to be stored in weatherproof sheds on site in a manner that will cause the least interference with work activities.
- .5 Do not unreasonably encumber the premises with products. Move stored materials or equipment when directed by the Consultant.
- .6 Do not permit any part of the work to be loaded with a weight or force which will endanger the safety of the work or cause undue deflection.

12 SANITARY FACILITIES

- .1 Provide sufficient temporary sanitary facilities for construction personnel.
- .2 Maintain the facilities in a clean and sanitary condition.

13 SITE ENCLOSURE

- .1 Provide and maintain a temporary enclosure around the designated staging area, using minimum 2400 mm high modular steel fencing.
- .2 Locate where indicated on the drawings and include a lockable vehicle gate.

14 DUST-TIGHT SCREENS

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

15 PROTECTION OF INSTALLED WORK

- .1 Protect installed work and provide special protection where specified in individual specification Sections.
- .2 Provide temporary and removable protection for installed products. Control activity in the immediate work area to prevent damage.

- .3 Provide protective coverings at walls, projections, jambs, sills and soffits of openings.
- .4 Protect finished floors, stairs and other surfaces from traffic, dirt, wear, damage or movement of heavy objects by covering with durable sheet materials.
- .5 Prohibit traffic from landscaped areas.

16 FIELD OFFICES

- .1 Provide office space of sufficient size to accommodate site meetings.
 - .1 Maintain a temperature of 22°C. Provide adequate ventilation in winter and air conditioning in summer.
 - .2 Maintain a minimum lighting level of 750 lx.
 - .3 As a minimum, furnish the following:
 - .1 A drawing laydown table
 - .2 A filing cabinet
 - .3 A table of sufficient size to accommodate meeting attendees, complete with chairs.
 - .4 A coat rack and shelf.
 - .4 Provide marked and fully stocked first-aid case in a readily available location.
 - .5 Maintain in clean condition.

17 PROJECT CLEANLINESS

- .1 Maintain the Work in tidy condition, free from accumulation of waste products and debris.
- .2 Remove debris and rubbish from pipe chases, plenums attics, crawl spaces or other closed or remote spaces.
- .3 Broom and vacuum clean interior areas prior to the start of finish work; maintain areas free of dust and other contaminants during finishing operations.
- .4 Remove waste material and debris from site and deposit in a designated waste container at the end of each working day.
- .5 Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

18 PROJECT SIGNAGE

- .1 No signs are allowed without the prior approval of the Owner and the Consultant, except those required by law.

END OF SECTION

1 REFERENCE STANDARDS

- .1 Within the individual specifications Sections, reference standards are identified. Conform to these standards, in whole or part, as specifically specified.
- .2 Conform to latest date of issue of referenced standards in effect on the date of submission of tenders, except where a date of issue is specifically noted.

2 QUALITY

- .1 Products, materials, equipment and articles (referred to as materials or products throughout the specifications) incorporated in the Work shall be new, not damaged or defective, and of the best quality (compatible with the specifications) for the purpose intended. If requested, furnish evidence as to the type, source and quality of materials or products provided.
- .2 Should any dispute arise as to the quality or fitness of materials or products, the decision rests strictly with the Consultant, based upon the requirements of the Contract Documents.

3 PRODUCT AVAILABILITY

- .1 Immediately review material and product delivery requirements and anticipate foreseeable supply delays for any items. Notify the Consultant.
- .2 In the event of failure to notify the Consultant at the commencement of the Work, the Consultant reserves the right to substitute more readily available products of similar character, at no increase in the Contract Sum.

4 TRANSPORTATION AND HANDLING

- .1 Transport and handle materials and products in accordance with the manufacturer's instructions.
- .2 Promptly, upon arrival on site, inspect shipments to ensure that products comply with the requirements, quantities are correct and materials and products are undamaged.
- .3 Handle and store materials and products in a manner which will prevent damage, adulteration, deterioration and soiling and in accordance with the manufacturer's instructions when applicable.

5 STORAGE AND PROTECTION

- .1 Store packaged or bundled materials or products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in the Work.
- .2 Store sensitive materials and products in weathertight, climate controlled enclosures, in an environment favourable to the material or product.
- .3 For exterior storage of fabricated products, place on sloped supports, above ground.

- .4 Remove and replace damaged materials and products at own expense and to the Consultant's satisfaction.
- .5 Provide off-site storage and protection when the site does not permit on-site storage or protection, of products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of materials and products.
- .6 Store loose granular materials on solid flat surfaces, in a well-drained area. Prevent mixing with foreign matter.
- .7 Provide equipment and personnel to store materials and products by methods to prevent soiling, disfigurement, or damage.
- .8 Arrange storage of materials and products to permit access for inspection. Periodically inspect to verify materials and products are undamaged and are maintained in acceptable condition.

6 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in the specifications, install or erect materials and products in accordance with the manufacturers' instructions.
- .2 Improper installation or erection of materials and products, due to failure in complying with these requirements, authorizes the Consultant to require removal and re-installation at no increase in the Contract Sum.

7 WORKMANSHIP

- .1 Workmanship shall be the best quality, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Consultant if required Work is such as to make it impractical to produce the required results.
- .2 Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with the Consultant whose decision is final.

8 CONCEALMENT

- .1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

9 REMEDIAL WORK

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

10 FASTENINGS

- .1 Provide metal fastenings and accessories in the same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use noncorrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically specified in the affected specification Section.

11 PROTECTION OF WORK IN PROGRESS

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

12 OVERLOADING

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

13 EXISTING UTILITIES

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

14 PRODUCT OPTIONS

- .1 Products specified by reference standards or by description only: any product meeting those standards or description.
- .2 Products specified by naming one or more manufacturers with substitutions specifically excluded: products of manufacturers named and meeting the specifications; no options or substitutions allowed.
- .3 Products specified by naming one or more manufacturers with no specific exclusion of substitutions: submit a request for substitution for any manufacturer not named, in accordance with the provisions of Section 01 25 00 "Substitution Procedures".

END OF SECTION

1 FIELD ENGINEERING

- .1 The Contractor shall be responsible for the provision of bench marks and reference points for Subcontractors' use.
- .2 The Contractor shall employ a Registered Ontario Land Surveyor (OLS) to establish the initial survey points.
- .3 Survey Reference Points: The OLS shall:
 - .1 establish two permanent bench marks on site, referenced to established bench marks by survey control points.
 - .2 locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction;
 - .3 record locations, with horizontal and vertical data in the Project Record Documents;
 - .4 make no changes or relocations without prior written notice to the Consultant;
 - .5 replace control points which are lost, or destroyed or require relocation because of changes in grade;
 - .6 establish lines and levels, locate and lay out the work by instrumentation;
 - .7 stake for grading, fill and topsoil;
 - .8 establish pipe invert elevations;
 - .9 stake batter boards for foundations;
 - .10 establish foundation; column locations and floor elevations;
 - .11 establish lines and levels for mechanical and electrical work;
 - .12 maintain a complete, accurate log of control and survey work as it progresses;
 - .13 on completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of the work; and
 - .14 submit a certificate, signed by the OLS, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.
- .4 Each Subcontractor shall:
 - .1 lay out his/her own work relative to the established survey control points and to adjacent work already in place;
 - .2 report to the Contractor when a reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.

2 DIMENSIONS

- .1 Check and verify dimensions wherever referring to the work. Dimensions, when pertaining to the work of another trade, shall be verified with the trade concerned. Details and measurements of work which is to fit or conform with work installed shall be taken at the site.
- .2 Do not scale drawings. If there is ambiguity, lack of information or inconsistency, immediately consult the Consultant for directions. Be responsible for extra costs caused by the disregarding of this requirement.

3 EXISTING UTILITIES

- .1 It is the applicable Contractor's responsibility to obtain all information required for sewer, gas, water, telephone, electrical signal systems, and any other utilities that are within the building and surrounding other locations.
- .2 Ensure that piping, sewer lines, conduit, and similar items, belonging to others, are protected during construction activity.

4 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Verify that the existing site conditions and substrate surfaces are acceptable for subsequent work.
- .3 Verify that the existing substrate is capable of structural support or attachment of new work being applied.
- .4 Verify the specific conditions described in individual specification Sections.
- .5 Verify that utility services are available, of the correct characteristics, and in the correct locations.
- .6 Do not proceed with the work until unsatisfactory conditions have been corrected to the installer's satisfaction.
- .7 Commencement of the installation will be construed as acceptance of the site conditions.

5 PREPARATION

- .1 Clean substrate surfaces prior to applying next material or substance.
- .2 Allow substrate surfaces to cure or dry out to the moisture content limits recommended by the manufacturer of their material or substance to be applied.
- .3 Seal cracks or openings in the substrate prior to applying the next material or substance.
- .4 Apply the manufacturer's recommended or required substrate primer, sealer or conditioner prior to applying any new material or substance.

END OF SECTION

1 WORKMANSHIP

- .1 Workmanship shall be best quality, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify the Consultant if required work is such as to make it impractical to produce the required results.
- .2 Do not employ any unfit person or anyone unskilled in his/her required duties.
- .3 In cases of dispute, decisions as to quality or fitness of workmanship rest with the Consultant.

2 CONCEALMENT

- .1 Except where indicated otherwise, in finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings,
- .2 Before installation, inform the Consultant if there is a contradictory situation. Install as directed by the Consultant.

3 LOCATION OF FIXTURES

- .1 The locations of fixtures, apparatus, equipment, fittings, outlets, conduits, pipes and ducts shown or specified, but not dimensioned, shall be considered approximate.
- .2 Request clarification from the Consultant, to establish exact locations. Any relocation caused by the Contractor's failure to request clarification shall be done by the Contractor as part of the Work. Where job conditions require reasonable changes in indicated locations and arrangements, make such changes at no additional cost.
- .3 Conserve space and coordinate with the work of other Sections to ensure that ducts, pipes and conduits will fit into allocated wall and ceiling spaces.
- .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. Request the Consultant's review of exposed installations prior to the start of work. Where exposed work is not installed in accordance with the Consultant's prior review, make changes to such work, as directed by the Consultant, at no extra cost to the Contract.
- .5 Except where locations are specifically noted on the drawings, install exposed mechanical and electrical fixtures, including outlets, switches, thermostats, panels and other items located on walls in an orderly and neatly laid out manner, lining up with each other and grouped together where possible. Request the Consultant's review of the proposed installation prior to the start of rough-in work. Relocate at no extra cost to the Contract any work for which the Consultant's review prior to the start of work was not requested.

4 REMOVED MATERIAL

- .1 Unless otherwise specified, materials designated for removal become the Contractor's property and shall be taken from site.
- .2 Deposit removed unsalvageable materials in a garbage container daily or more frequently if directed by the Consultant.
- .3 Locate the garbage container where directed by the Consultant.
- .4 Arrange for removal of containers immediately as soon as they are full. Legally dispose of content.

5 USE OF PLUMBING FIXTURES

- .1 The use of plumbing fixtures and/or floor drains for mixing, draining or dumping of construction materials is not permitted.

6 CONSTRUCTION SAFETY REQUIREMENTS

- .1 Execute all work in strict compliance with construction health and safety requirements specified in Section 01 35 29 "Health and Safety Procedures".

7 NUISANCE OR DISTURBANCE

- .1 Perform the work so as not to constitute a nuisance or disturbance to abutting or nearby properties or to the Owners thereof. Comply with written instructions issued by the City concerning any such nuisance or disturbance regardless of whether such instructions require positive action or discontinuance of action.

8 POWDER ACTUATED FASTENING DEVICES

- .1 Do not use powder actuated tools using explosives, unless permitted expressly by the Consultant; comply with applicable regulations regarding the use and handling of powder actuated tools.

9 CUTTING, PATCHING & MAKING GOOD

- .1 Approvals: Submit written request in advance of cutting or alteration which affects:
 - .1 Structural integrity of any element of Project.
 - .2 Integrity of weather-exposed or moisture-resistant elements.
 - .3 Efficiency, maintenance, or safety of any operational element.
 - .4 Visual qualities of sight-exposed elements.
 - .5 Work of the Owner or a separate contractor.
- .2 Inspection:
 - .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
 - .2 After uncovering, inspect conditions affecting performance of work.

- .3 Beginning of cutting or patching shall be construed to mean acceptance of existing conditions.
- .3 Execution:
 - .1 Perform cutting, fitting, and patching as required to complete the Work.
 - .2 Remove and replace defective and non-conforming work.
 - .3 Provide openings in non-structural elements of the Work for penetrations of mechanical and electrical work.
 - .4 Perform work in a manner which will avoid damage to other work.
 - .5 Prepare proper surfaces to receive patching and finishing.
 - .6 Where possible, employ the original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
 - .7 Cut rigid materials using a power saw or core drill. Pneumatic or impact tools will not be allowed.
 - .8 Restore work with new products in accordance with the Contract Documents.
 - .9 Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
 - .10 At penetrations of fire-rated wall, ceiling, or floor construction, completely seal voids with fire-rated material, acceptable to the authorities having jurisdiction, full thickness of construction element.
 - .11 Refinish surfaces to match adjacent finishes; for continuous surfaces refinish to the nearest intersection; for an assembly, refinish the entire unit.
 - .12 In the finished work there shall be no detectable difference in appearance between existing surfaces, patched surfaces and new surfaces.

10 SLEEVES, HANGERS AND INSERTS

- .1 Co-ordinate the setting and packing of sleeves and supply and installation of hangers and inserts. Obtain Consultant's approval before cutting into structure.

END OF SECTION

1 GENERAL

- .1 Be responsible for the cleanliness of assigned work areas to the satisfaction of the Consultant. Maintain the work areas in a neat and orderly condition at all times.
- .2 Periodically, or when directed by the Consultant, remove from work areas rubbish and waste materials.
- .3 Burning or burying of rubbish and waste materials on site is not permitted.
- .4 Use only cleaning materials recommended by the manufacturer of the surface to be cleaned.
- .5 Use cleaning material only on surfaces recommended by the cleaning material manufacturer.

2 CLEANING DURING CONSTRUCTION

- .1 Keep work areas free from the accumulation of waste products, packaging and debris.
- .2 Remove waste material, packaging and debris from the site and deposit in waste container at the end of each working day or more often if required.
- .3 Keep dust and dirt to an acceptable level, as directed by the Consultant.
- .4 Remove oily rags, waste and other hazardous substances from the premises at the end of each working day or more often if required. of waste
- .5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal and debris.
- .6 Upon verbal or written instruction from the Consultant, conduct clean-up as instructed.

3 FINAL CLEANING

- .1 Prior to Substantial Performance, remove surplus products, tools, construction machinery and equipment not required for the performance of the remaining Work.
- .2 Remove stains, dirt and smudges from finished surfaces.
- .3 Clean exposed finished surfaces in accordance with respective material manufacturers' recommendations.
- .4 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .5 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors and other surfaces.

- .6 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .7 Wax, seal, shampoo or prepare floor finishes, as recommended by the manufacturer.
- .8 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .9 Broom clean and wash exterior walks, steps and surfaces.
- .10 Remove dirt and other disfiguration from exterior surfaces.
- .11 Clean and sweep roofs, gutters, areaways, sunken wells.
- .12 Sweep and wash clean paved areas.
- .13 Clean mechanical and electrical fixtures and other fittings of labels, wrappings, paper and other foreign material.
- .14 Replace heating, ventilation and air conditioning filters, if units were operated during construction.
- .15 Clean ducts, blowers and coils if heating, ventilation and air conditioning systems were operated without filters during construction.
- .16 Clean roofs, downspouts, and drainage systems.
- .17 When the Work is completed, remove surplus products, tools, construction machinery and equipment. Remove waste products and debris.

END OF SECTION

1 GENERAL

- .1 Designate one person as "Waste Management Coordinator (WMC)" to be responsible for implementation of the waste management plan and ensuring compliance by all construction personnel with the requirements of this Section.
- .2 Comply with the Environmental Protection Act, Ontario Regulations O. Reg. 102/94 and O. Reg. 103/94 for waste management program on construction and demolition projects.

2 WASTE MANAGEMENT PLAN

- .1 The WMC shall develop and implement a waste management plan for the project to implement procedures to reduce, reuse and recycle materials to the maximum extent possible.
- .2 A copy of the waste management plan shall be posted in a conspicuous location where it can be readily seen by all construction personnel.

3 WASTE DISPOSAL

- .1 All construction personnel are required to conform to the waste management plan and implement throughout the project a materials source separation program to collect re-usable and recyclable materials in an orderly fashion for diversion from the general waste stream and alternative disposal at appropriate materials recycling and re-use facilities. The Contractor shall provide appropriate on-site disposal bins.
- .2 Collect and separate packaging for disposal at recycling facilities. Include paper, plastic, polystyrene, corrugated cardboard, metal banding, and other recyclable packaging materials.

4 ENVIRONMENTAL PROTECTION

- .1 Dispose of unused adhesive, sealant, volatile materials such as mineral spirits, oil or paint thinner, and other volatile materials which could be hazardous to the health, including empty containers, at an official hazardous materials collection site acceptable to the Consultant, in strict accordance with the requirements of the authorities having jurisdiction and in a manner which will protect construction personnel, visitors to the site, and the public from all such hazards.
- .2 Do not permit such materials to enter waterways, storm or sanitary sewers; do not dispose onto ground or other location that might pose a health or environmental hazard. Do not bury or burn rubbish and waste materials on site.

END OF SECTION

1 STARTING SYSTEMS

- .1 Coordinate the schedule for start-up of various equipment and systems.
- .2 Notify the Consultant four (4) days prior to start-up of each item.
- .3 Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- .4 Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- .5 Verify that wiring and support components for equipment are complete and tested.
- .6 Execute start-up under the supervision of the applicable manufacturer's representative and Contractors's personnel in accordance with the manufacturer's instructions.
- .7 When specified in individual specification Sections, require the manufacturer to provide an authorized representative to be present at the site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise the placing of equipment or the system in operation.
- .8 Submit a written report in accordance with Section 01 33 00 "Submittal Procedures", stating that equipment or system has been properly installed and is functioning correctly.

2 DEMONSTRATION AND INSTRUCTIONS

- .1 Demonstrate the operation and maintenance of equipment, products and systems to the Owner's personnel two weeks prior to the date of final inspection.
- .2 Demonstrate Project equipment and instruct in a classroom environment, by a qualified manufacturers' representative who is knowledgeable about the Project.
- .3 For equipment or systems requiring seasonal operation, perform a demonstration for other season within seven (7) months.
- .4 Utilize the operation and maintenance manuals as the basis for instruction. Review the contents of the manual with the Owner's personnel, in detail, to explain all aspects of operation and maintenance.
- .5 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at an agreed time, at the equipment location.
- .6 Prepare and insert additional data in the operations and maintenance manuals when the need for additional data becomes apparent during instruction.
- .7 Prepare and submit with the contract closeout submittals, a video of all demonstrations and instructions. Submit in DVD format.

3 TESTING, ADJUSTING, AND BALANCING

- .1 The Contractor shall pay for the services of an independent firm, acceptable to the Consultant, to perform testing, adjusting, and balancing.
- .2 Reports shall be submitted by the independent firm to the Consultant indicating observations and results of tests and indicating compliance or non-compliance with the requirements of the Contract Documents.

END OF SECTION

1 INSPECTION AND DECLARATION PROCEDURES

- .1 Follow the recommended procedures concerning substantial performance of construction contracts and completion take-over of projects as prescribed in OAA/OGCA Document 100 "Take Over Procedures".

2 REINSPECTION

- .1 Should status of the Work require reinspection by Consultant due to failure of Work to comply with the Contract Documents, the Owner will deduct the costs of reinspection services from payment to the Contractor.

3 FINAL CLEANING

- .1 Refer to Section 01 74 13 "Progress and Final Cleaning".

4 ADJUSTING

- .1 Adjust operating products and equipment to ensure smooth and unhindered operation.

5 PROJECT CLOSEOUT SUBMITTALS

- .1 Prior to application for Certificate of Substantial Performance, submit the documentation the following documents, in accordance with the requirements Section 01 78 00 "Closeout Submittals" and the Contract Documents:
 - .1 Project Record Documents
 - .2 Operation and Maintenance Manual
 - .3 Warranties and maintenance service agreements
 - .4 Final shop drawings
 - .5 Specified spare parts and maintenance materials.
- .2 The Certificate of Substantial Performance will not be issued until the above documents and items have been submitted and are deemed by the Consultant to be acceptable.
- .3 The submission of the specified Contract Closeout Documents is a requirement of the Contract and failure to submit any item to the satisfaction of the Consultant will be deemed to be a deficiency under the Contract. Accordingly, the Owner will withhold a 5% of the Contract Price from payments due to the Contractor. The purpose of this provision is to ensure that Contract closeout documents are accurately and properly prepared and submitted.
- .4 This holdback will be released upon acceptance of all the required Contract closeout documents.

6 SYSTEMS DEMONSTRATION AND TRAINING

- .1 Prior to final inspection, demonstrate the operation of each system to the Owner.
- .2

- .3 Conduct a pre-handover briefing and walk-through of the completed Work for the Owner's operation and maintenance staff, prior to Substantial Performance of the Work or receipt of an Occupancy Certificate for partial or full occupancy.
- .4 Prior to an agreed handover date, arrange for and provide a full and complete hands-on instruction program for the Owner's operation and maintenance staff in accordance with Section 01 79 00 "Demonstration and Training".

END OF SECTION

1 OPERATION AND MAINTENANCE MANUAL

- .1 Prepare an Operation and Maintenance Manual for the building.
- .2 Include the requirements of all Sections of the specifications for maintenance instructions.
- .3 Include one complete set of final shop drawings (bound separately) indicating corrections and changes made during fabrication and installation.
- .4 Format: Electronic files in .pdf format plus three hard copies, as follows:
 - .1 Binders: vinyl, hard covered, 3-ring, loose leaf 219 x 279 mm with spine and face pockets.
 - .2 When multiple binders are used, correlate data into related consistent groupings.
 - .1 Identify contents of each binder on the spine.
 - .3 Cover: identify each binder with type or printed title 'Operation and Maintenance Manual'; list title of project and identify subject matter of contents.
 - .4 Table of Contents for Each Volume: include:
 - .1 Date of submission;
 - .2 Names, postal addresses, telephone numbers and email addresses of the Consultant and Contractor with names of responsible parties.
 - .3 Schedule of products and systems, indexed to the content of the volume.
 - .5 For each product or system:
 - .1 List names, postal addresses, telephone numbers and email addresses of subcontractors and suppliers, including local source of supplies and replacement parts.
 - .2 Product Data: mark each sheet to identify specific products and component parts, and data applicable to the installation; delete inapplicable information.
 - .6 Drawings: supplement product data to illustrate the relationship of component parts of equipment and systems, to show control and flow diagrams.
 - .7 Printed Text: as required to supplement product data.
 - .1 Provide a logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

2 AS-BUILT AND PROJECT RECORD DRAWINGS

- .1 Maintain on site one complete hardcopy set of Contract Drawings for the exclusive purpose of recording as-built conditions.
 - .1 Identify this set of drawings as 'As-Built Drawings'.
- .2 Record accurately on the As-Built Drawings significant deviations from the Contract Documents caused by site conditions and changes ordered by the Consultant.
- .3 Mark changes in red ink.
- .4 Where applicable, record the following information:
 - .1 Depths of various elements of foundations in relation to finish ground floor.
 - .2 Horizontal and vertical locations of underground utilities and appurtenances referenced to a permanent surface improvement.

- .3 Locations of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
- .4 Field changes of dimension and detail.
- .5 Changes made by Change Order, Additional Instruction or order for minor change in the Work.
- .5 Consultant with the as-built information 4 weeks of Substantial Performance, or earlier if required.
- .6 Project record Drawings
 - .1 At the completion of the project and prior to final inspection, submit the As-Built Drawings to the Consultant and the sub-consultants for the production of Project Record Drawings by revising the electronic drawing files to incorporate the as-built information.
 - .2 The provision of complete information for the production of the Project Record Drawings is the responsibility of the Contractor.

3 SPARE PARTS AND MAINTENANCE MATERIALS

- .1 Quality:
 - .1 Spare parts, maintenance materials and special tools provided shall be new, not damaged or defective, and of the same quality and manufacture as materials and products provided in the Work.
 - .2 If requested, furnish evidence as to type, source and quality of products provided.
 - .3 Defective materials and products will be rejected, regardless of previous inspections. Replace materials and products at no additional cost to the Contract.
- .2 Pay costs of transportation.
- .3 Storage, handling and protection:
 - .1 Store spare parts, maintenance materials and special tools in a manner which will prevent damage, or deterioration.
 - .2 Store in original and undamaged condition with the manufacturer's seals and labels intact.
 - .3 Store components subject to damage from weather in weatherproof enclosures.
 - .4 Store paints and freezable materials in a heated and ventilated room.
 - .5 Remove and replace damaged products at no additional cost to the Contract and to the Consultant's satisfaction.
- .4 Spare parts:
 - .1 Provide spare parts in quantities specified in the individual specification Sections.
 - .2 Provide items of the same manufacture and quality as items in the Work.
 - .3 Deliver to the Project Site, place and store where directed by the Consultant.
 - .4 Receive and catalogue all items. Submit an inventory listing to the Consultant. Include the accepted listings in the Operation and Maintenance Manual specified in Section 01 78 23.
 - .5 Obtain receipts for delivered products and submit receipts prior to final payment.
- .5 Maintenance materials:
 - .1 Provide maintenance and extra materials in quantities specified in individual specification Sections.
 - .2 Provide items of same the manufacture and quality as items in the Work.

- .3 Provide materials from the same production run as installed materials.
 - .4 Deliver to the Project Site, place and store where directed by the Consultant.
 - .5 Receive and catalogue all items. Submit an inventory listing to the Consultant. Include the approved listings in the Operation and Maintenance Manual.
 - .6 Obtain receipts for delivered products and submit receipts prior to final payment.
- .6 Special tools:
- .1 Provide special tools in quantities specified in the individual specification Sections.
 - .2 Provide items with tags identifying their function and the equipment with which they are associated.
 - .3 Deliver to the Project Site, place and store where directed by the Consultant.
 - .4 Receive and catalogue all items. Include the accepted listings in the Operation and Maintenance Manual.

4 MAINTENANCE SERVICE

- .1 Furnish service and maintenance of components indicated in specification sections for the specified time period commencing on the date of Substantial Performance.
- .2 Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- .3 Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- .4 Maintenance service shall not be assigned or transferred to any agent or Subcontractor without the Owner's prior written consent.

5 WARRANTIES

- .1 Refer to Section 01 78 36.

END OF SECTION

1 SUMMARY

- .1 This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers standard warranties on products and special warranties.
 - .1 Refer to the General Conditions for terms of the Contractor's period for correction of the Work.
- .2 Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and Subcontractors required to countersign special warranties with the Contractor.

2 WARRANTY REQUIREMENTS

- .1 Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.
- .2 Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original and shall commence on the date of completion and acceptance of the corrective work.
- .3 Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- .4 Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.
 - .1 Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
- .5 Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, the Owner reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

3 SUBMITTALS

- .1 Submit written warranties to the Consultant prior to the date certified for Substantial Performance. If the Consultant's Certificate of Substantial Performance designates a commencement date for warranties other than the date of Substantial Performance for the Work, or a designated portion of the Work, submit written warranties upon request of the Consultant.
 - .1 When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Consultant within 15 days of completion of that designated portion of the Work.
 - .2 For items of work delayed beyond the date of Substantial Performance of the Work, provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as the start of the warranty period.
- .2 When the Contract Documents require the Contractor and a Subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner to the Consultant for approval prior to final execution.
 - .1 Refer to Divisions 02 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.
- .3 Form of Submittal: At Final Completion compile 2 copies of each required warranty properly executed by the Contractor, Subcontractor, Supplier, or manufacturer and assembled by the Contractor. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - .1 Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 216 mm x 281 mm paper.
 - .2 Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the Installer.
 - .3 Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title or name, and name of the Contractor.
- .4 If the validity of an extended warranty is related to proper maintenance and servicing of equipment, etc., provide full details of maintenance requirements.
- .5 When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

END OF SECTION

1 ADMINISTRATIVE REQUIREMENTS

- .1 Demonstrate operation and maintenance of equipment and systems to the Owner's personnel two weeks prior to date of interim completion.
- .2 The Owner will provide a list of personnel to receive instructions, and coordinate their attendance at agreed-upon times.
- .3 Preparation:
 - .1 Verify conditions for demonstration and instructions comply with requirements.
 - .2 Verify designated personnel are present.
 - .3 Ensure equipment has been inspected and put into operation in accordance with the requirements of the respective specification sections.
 - .4 Ensure testing, adjusting, and balancing has been performed and equipment and systems are fully operational.
- .4 Demonstration and Instructions:
 - .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment at agreed upon times, at the equipment location.
 - .2 Instruct personnel in phases of operation and maintenance using operation and maintenance manuals as basis of instruction.
 - .3 Review contents of manual in detail to explain aspects of operation and maintenance.
 - .4 Prepare and insert additional data in operation and maintenance manuals when needed during instructions.
 - .5 Perform training as required to fully inform the Owner's personnel regarding the correct operation and maintenance of each item of equipment.

2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit schedule of the time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for the Owner's approval.
- .2 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.
- .3 Give time and date of each demonstration, with list of persons present.
- .4 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

3 QUALITY ASSURANCE

- .1 When specified in individual Sections and/or when necessary for the proper and complete training of the Owner's personnel, arrange with the manufacturer to provide an authorized representative to demonstrate operation of equipment and systems:
 - .1 Instruct the Owner's personnel.
 - .2 Provide written report that demonstration and instructions have been completed.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The Work of this Section includes the provision of all labour, materials, equipment and services required to demolish selected portions of the existing building as required to accommodate the new work, as indicated on the drawings, as required by site conditions, as specified herein, and as required for a complete project.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA):
 - .1 CSA-S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.

1.4 EXISTING CONDITIONS

- .1 Should material resembling spray or trowel applied asbestos or any other designated substance be encountered in the course of demolition, stop work, take preventative measures, and notify the Consultant immediately. Do not proceed until written instructions have been received.

1.5 DEMOLITION DRAWINGS

- .1 Where required by authorities having jurisdiction, submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning.
- .2 Submit drawings stamped and signed by qualified professional engineer registered or licensed in the Province of Ontario.

1.6 PROTECTION

- .1 Execute the demolition work with as little as possible disturbance of the parts of the building designated to remain in place.
- .2 Prevent movement, settlement or damage to parts of the existing building designated to remain. Provide bracing, shoring and underpinning as required. Repair damage caused by demolition as directed by the Consultant.
- .3 Support affected structures and, if the safety of the structure being demolished appears to be endangered, take preventative measures and then cease operations and notify the Consultant.
- .4 Perform all work in accordance with Section 01 35 43 "Environmental Protection".

- .5 Prevent debris from blocking the surface drainage system, or mechanical and electrical systems which must remain in operation.
- .6 Ensure that demolition work does not contribute to excess air and noise pollution.
- .7 Fires and burning of waste or materials is not permitted on site.
- .8 Do not bury waste or materials on site.
- .9 Do not dispose of waste or volatile materials such as: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers. Ensure proper disposal procedures are maintained throughout project.
- .10 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.
- .11 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities.
- .12 Prevent extraneous materials from contaminating air beyond the application area by providing temporary enclosures during demolition work.
- .13 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all roads.
- .14 Where the Work involves demolition of portions of the existing building immediately adjacent to other work which is designated to remain, take care to protect the adjacent work from damage during demolition.
 - .1 Protect existing building elements, including, but not limited to existing "punched" windows and existing HVAC units.
 - .2 Keep all protection in place and maintain in good condition until the new wall assembly is installed.
- .15 Protect finished surfaces designated to remain. Where existing finishes are to be partially removed or abut other items which are to be demolished, make accurate, clean, straight cuts, true-to line, as required to facilitate the proper execution of the new work.

1.7 REGULATORY REQUIREMENTS

- .1 Perform the work in compliance with applicable federal, provincial, and municipal regulations.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".

- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 EQUIPMENT

- .1 Equipment and heavy machinery to meet or exceed all applicable emission requirements.
- .2 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

Part 3 Execution

3.1 PREPARATION

- .1 Disconnect electrical and telephone service lines in the areas of the building where demolition work is to be carried out. Post warning signs on electrical lines and equipment which must remain energized during the period of demolition.
- .2 Disconnect and cap mechanical services where necessary.
- .3 Do not disrupt active or energized utilities that are designated to remain undisturbed.

3.2 SAFETY CODE

- .1 Do demolition work in accordance with CSA S350 governing construction/demolition safety regulations.
- .2 Blasting operations are not permitted during demolition.

3.3 DEMOLITION

- .1 Demolish parts of the structure as necessary to permit new construction work as indicated.
- .2 At the end of each day's work, leave the work in a safe and stable condition. Protect interiors from exterior elements at all times.
- .3 Demolish to minimize dusting. Where appropriate, keep materials wetted as directed by the Consultant.
- .4 Remove and dispose of demolished materials, except where noted otherwise and as directed by the Consultant, in accordance with Section 01 74 21 "Waste Management and Disposal" and in accordance with the requirements of the authorities having jurisdiction.

- .5 Protect existing items which are designated to be removed and stockpiled for renovation and re-use or to be handed over to the Owner.
- .6 Remove contaminated or dangerous materials, as defined by authorities having jurisdiction relating to environmental protection, from the site and dispose of in a safe manner to minimize danger at the site or during disposal.
- .7 Use natural lighting to work by wherever possible. Shut off all lighting except those required for security purposes at the end of each day.

3.4 CLEANING

- .1 Remove demolished materials, rubbish, tools and equipment on completion of the work and leave the installation clean.
- .2 Make good damage to existing work designated to remain.

END OF SECTION

CONCRETE SECTIONS UNDER SEPARATE COVER

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to execute concrete unit masonry work, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Work:
 - .1 Structural steel sections under separate cover.
 - .2 Section 05 50 00 - Metal Fabrications.
 - .3 Section 07 21 00 - Board and Batt Insulation.
 - .4 Section 07 27 16 - Vapour Permeable Air/Moisture Barrier.
 - .5 Section 07 62 00 - Sheet Metal Flashing and Trim.
 - .6 Section 07 92 00 - Joint Sealants.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM C144-25, Standard Specification for Aggregate for Masonry Mortar.
 - .2 ASTM C494/C494M-24, Standard Specification for Chemical Admixtures for Concrete.
- .2 Canadian Standards Association (CSA):
 - .1 CSA A165-Series-14(R2024), CSA Standards on Concrete Masonry Units (Consists of A165.1, A165.2 and A165.3).
 - .2 CAN/CSA A179-14(R2024), Mortar and Grout for Unit Masonry.
 - .3 CAN/CSA A371-14(R2024), Masonry Construction for Buildings.
 - .4 CSA G30.18:21, Carbon Steel Bars for Concrete Reinforcement.
 - .5 CSA S304:24, Design of Masonry Structures.

1.4 DEFINITION

- .1 "Exposed" means visible in the completed Work, painted and unpainted.

1.5 SUBMITTALS

- .1 Submit each item in this Article according to the conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Shop Drawings: Provide shop drawings for the connectors for the masonry veneer walls.
 - .1 Clearly indicate the layout and spacing of the reinforcement. Include bar sizes and other pertinent information.

- .2 The layout and design of the reinforcement shall be designed by a structural engineer licensed to practise in the Province of Ontario. Each shop drawing submitted shall bear the stamp and signature of the aforesaid structural engineer.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver materials to job site in dry condition.
- .2 Deliver packaged products in original unopened packaging with legible manufacturer's identification.
- .3 Keep materials dry until use.
- .4 Store concrete masonry units on elevated platforms, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not install until they are in an air-dried condition.
- .5 Store cementitious materials on elevated platforms, under cover, and in a dry location.
- .6 Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- .7 Store masonry accessories, including reinforcement, to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT CONDITIONS

- .1 Protection of Masonry: During erection, protect laid masonry from damage by weather. Cover partially completed masonry when construction is not in progress.
 - .1 At the end of each day's work or at the beginning of a shutdown period, cover tops of walls, projections, and sills with canvas or strong waterproof membrane, securely clamped down and overhanging each side of the wall at least 600 mm.
 - .2 Use wire spring clamps extending 200 mm down each side of the wall, spaced at 2400 mm o.c. or other method acceptable to the Consultant.
- .2 Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - .1 Protect the base of walls from rain-splashed mud and mortar splatter by coverings spread on the ground and over the wall surface.
 - .2 Protect projections from mortar droppings.
 - .3 Protect surfaces of adjacent materials from mortar droppings.
 - .4 Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.
- .3 Cold-Weather Requirements:
 - .1 Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds.

- .2 Remove and replace brick and concrete unit masonry damaged by frost or freezing conditions.
- .3 Use approved smokeless heaters. Do not use scorched sand.
- .4 Do not use salts, admixtures, or antifreezes.
- .5 Comply with the following requirements:

Air Temperature	Heating of Materials	Protection
Above 5°C	Normal masonry procedures	Cover walls and materials
Below 5°C	Heat mixing water. Maintain mortar temperature between 5°C and 30°C until placed.	Cover walls and materials to prevent wetting and freezing.
Below 0°C	In addition to above, heat sand. Thaw frozen sand and frozen wet masonry units before use.	With wind velocities over 35 kph, provide windbreaks during the work day and cover walls and materials at the end of each work day to prevent wetting and freezing. Maintain masonry above 0°C by using auxiliary heat or insulated blankets for 16 h after laying masonry units.
Below -6°C	In addition to above, heat dry masonry units.	Provide enclosure and supply sufficient heat to maintain masonry enclosure above 0°C for 24 h after laying masonry.

- .4 Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 38°C and above.

1.8 PROTECTION

- .1 Until masonry work is completed and protected by flashings or other permanent construction, keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain.
- .2 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.
- .3 Provide temporary bracing of masonry work, during and after erection, until permanent lateral support is in place.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".

- .2 Handle and dispose of waste materials, including packaging materials, generated by the work of this Section in accordance with the Waste Management Plan.

Part 2 Products

2.1 MASONRY UNITS

- .1 Normal weight concrete masonry units to CSA-A165, H/15/A/M, as follows:
 - .1 Size: metric modular 190 mm high x 390 mm long x 140 mm thick. Provide special sizes and shapes where necessary. Include purpose-made shapes for lintels.
 - .2 Strength: 15 Mpa on net area.
 - .3 Fire ratings: Provide concrete blocks having void to solid ratios and concrete types as necessary to achieve required fire ratings for thicknesses of fire rated walls indicated.
 - .4 Exposed masonry units shall be free from all surface indentations, surface cracks and other defects detrimental to the appearance of the finished surface. Block having visual defects will be rejected for exposed areas but may be used for concealed or unfinished areas.

2.2 MORTAR

- .1 For exposed masonry, use the same brand of mortar and source of aggregate for entire project to ensure uniformity of colouration and other mix characteristics. Ensure mix and colour consistency from day to day.
- .2 Masonry Cement, where not otherwise specified: Premixed, masonry cement, Type based on proportion specifications of CSA A179 as specified.
- .3 Aggregate for Mortar: Sand to ASTM C144, graded with 100% passing No.16 (1.18 mm) sieve
- .4 Admixtures: Do not use admixtures, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless specified or specifically approved in writing by the Consultant. Do not use calcium chloride in mortar or grout.
- .5 Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by the manufacturer for use in masonry mortar of the specified composition. Add cold-weather admixture (if used) at the same rate for all mortar, regardless of weather conditions, in order to ensure that mortar colour is consistent.
- .6 Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with concrete masonry units containing integral water repellent by the same manufacturer.
- .7 Water: Potable.

2.3 MORTAR MIXES

- .1 Mix mortar materials under strict supervision and in small batches for immediate use only. Discard mortar which has not been used before initial set has taken place. Do not use retempered mortars.

- .2 Mix proprietary mortars in strict accordance with CSA A179.
- .3 Provide the following mixes, based on property specifications except where otherwise specified:

Location/Application	Type	28-Day Strength	Description
Bedding lintels	M	17.5 Mpa (2,500 psi)	
Masonry below grade and in contact with earth.	S	8.5 Mpa (1,200 psi)	
All other locations/applications	N	3.5 Mpa (500 psi)	

2.4 GROUT

- .1 Grout for Unit Masonry: To CSA A179. Mix grout of consistency indicated or, if not otherwise indicated, of consistency (fine or coarse) at time of placement that will completely fill spaces intended to receive grout.
 - .1 Use fine grout in grout spaces less than 50 mm in horizontal dimension, unless otherwise indicated.
 - .2 Use coarse grout in grout spaces 50 mm or more in least horizontal dimension, unless otherwise indicated.
- .2 Minimum compressive strength at 28 days: 15 Mpa
- .3 Slump: 75 mm.

2.5 REINFORCEMENT

- .1 General: Reinforcement shall conform to CSA A371.
- .2 Reinforcement:
 - .1 Bar: To CSA A371 and CSA G30.18, Grade 400W.
 - .2 Truss: To CSA A371, truss type, flush welded, prefabricated corners and tees.
- .3 Bolts and anchors: to CSA A371 and CSA S304.
- .4 Bolts and anchors: to CSA A371 and CSA S304.
- .5 Galvanizing (where not otherwise specified):
 - .1 Interior Locations: Mill galvanized, minimum 136 g/m² zinc coating weight.
 - .2 Exterior locations: Hot-dipped galvanized to ASTM A123, minimum 400 g/m² zinc coating weight

2.6 MISCELLANEOUS MASONRY ACCESSORIES

- .1 Sealant and sealant accessories: Refer to Section 07 92 00 "Joint Sealants".

Part 3 Execution

3.1 EXAMINATION

- .1 Examine conditions, with the installer present, for compliance with requirements for installation tolerances and other conditions affecting the performance of unit masonry. Do not proceed with installation until unsatisfactory conditions have been corrected.
- .2 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .3 Commencement of the masonry work will be construed as acceptance of the site conditions and, thereafter, the Trade Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 WORKMANSHIP

- .1 Do masonry work in accordance with CSA-A371 except where specified otherwise.
- .2 Build masonry plumb, level, and true to line, with joints staggered in alternate courses alternate vertical joints in vertical alignment. Maintain specified tolerances.
- .3 Lay out coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.
- .4 Cut concrete masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting, where possible. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- .5 Cut masonry for flush-mounted electrical outlets, grilles, pipes, conduit, and other recessed or penetrating items. Leave maximum 3 mm clearance.
- .6 Keep exposed faces free from stains, chips and cracks. Remove chipped, cracked, and otherwise deformed units and replace with undamaged units.
- .7 Make vertical and horizontal joints 10 mm thick, except where otherwise indicated or specified. Fill all joints solidly with mortar except where specifically designated to be left open.
- .8 Buttering corners of units, throwing mortar droppings into joints will not be permitted. Do not shift or tap units after mortar has taken initial set. Where adjustment must be made after the mortar has started to set, remove mortar and replace with fresh supply.

- .9 Build chases and recesses to accommodate items specified in this and other Sections of the Specifications.
- .10 Leave openings for equipment to be installed before completion of masonry. After installing equipment, complete masonry to match construction immediately adjacent to the opening.

3.3 CONSTRUCTION TOLERANCES

- .1 Variation from Plumb:
 - .1 For vertical lines and surfaces of columns, walls, and arises, do not exceed 6 mm in 3 m, nor 10 mm in 6 m, nor 12 mm in 12 m.
 - .2 For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 6 mm in 6 m, nor 12 mm in 12 m or more.
 - .3 For vertical alignment of head joints, do not exceed plus or minus 6 mm in 3 m, nor 12 mm maximum.
- .2 Variation from Level:
 - .1 For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 6 mm in 6 m, nor 12 mm in 12 m or more.
 - .2 For top surface of bearing walls, do not exceed 3 mm in 3 m, nor 1.5 mm within width of a single unit.
- .3 Variation of Linear Building Line: For position shown in plan and related portion of columns, walls, and partitions, do not exceed 12 mm in 6 m, nor 20 mm in 12 m.
- .4 Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 6 mm nor plus 12 mm.

3.4 LAYING MASONRY WALLS

- .1 Do not wet concrete masonry units before or during laying.
- .2 Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.
- .3 Lay walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.
- .4 Provide special shapes as required, such as halves, jambs, corners, and other required special shapes.
- .5 Bond Pattern for Exposed Masonry: Generally, lay exposed masonry in running bond with joints in consecutive courses offset generally 200 mm. Do not use units with less than nominal 100 mm horizontal face dimensions at corners or jambs.

- .6 Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond; do not tooth. Clean exposed surfaces of set masonry, and remove loose masonry units and mortar prior to laying fresh masonry.
- .7 Built-in Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

3.5 MORTAR BEDDING AND JOINTING

- .1 Lay masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not furrow bed joints or slush head joints.
- .2 In concrete unit masonry work, use a full bed of mortar for the first course. Bed face shells and the cross and end web fully in mortar.
- .3 In exposed masonry work, use concave joints. Allow joints to set just enough to remove excess water and, when mortar is "thumbprint" hard, tool with round jointer to provide smooth, compressed, uniformly concave joints.
- .4 Strike flush all joints concealed in walls and joints in walls to receive tile, insulation, or other applied material, except that where paint or similar thin finish coating is called for, use concave joints as specified for exposed work.

3.6 CONTROL AND EXPANSION JOINTS

- .1 General: Install control and expansion joints in concrete unit masonry where indicated. Build-in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall movement.

3.7 LINTELS

- .1 Install lintels where indicated and where required by site conditions. Provide minimum bearing of 150 mm at each jamb, unless otherwise indicated.

3.8 FLASHINGS

- .1 Install flexible flashings in accordance with the manufacturer's instructions and where shown on or reasonably implied by the drawings or required by good practice.
- .2 Include a through-wall flashing to bridge the airspace at each floor level, as indicated.
- .3 Design through-wall flashings with a profile which will divert water to the outside of the wall. Extend flashing membrane slightly beyond the exterior face of the masonry and neatly trim. Do not caulk at the outside face of the wall.

- .4 Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Place through-wall flashing on a sloping bed of mortar and cover with mortar. Seal penetrations in the flashing with adhesive, sealant, or tape as recommended by the flashing manufacturer before covering with mortar.
- .5 Install reglets and nailers for flashing and other related construction where shown to be built into masonry.

3.9 FIELD QUALITY CONTROL

- .1 The Construction Manager will appoint a qualified independent testing agency to perform testing for field quality control. The cost of initial inspection and testing will be paid by the Owner. The cost of reinspection and retesting required as a result of failure to meet specified requirements on the initial inspection/test shall be paid by the Trade Contractor.
- .2 Evaluation of Quality-Control Tests: In the absence of other indications of noncompliance with requirements, masonry will be considered satisfactory if results from construction quality-control tests comply with minimum requirements indicated.

3.10 REPAIRING, POINTING, AND CLEANING

- .1 Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units; install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- .2 Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point-up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for application of sealants.
- .3 In-Progress Cleaning: Allow mortar droppings on masonry surfaces to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of block and finally by brushing. **DO NOT PERMIT MORTAR DROPPINGS ON MASONRY SURFACES TO BECOME HARD BEFORE CLEANING. CLEAN WITHIN MAXIMUM 24 HOURS OF LAYING.**
- .4 Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - .1 Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - .2 Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain the Consultant's approval of sample cleaning before proceeding with cleaning of masonry.
 - .3 Protect adjacent non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
 - .4 Use only cleaning methods and materials recommended by both the masonry unit and the masonry cement manufacturers.
 - .5 Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

- .5 Protection: Provide final protection and maintain conditions that ensure unit masonry is without damage and deterioration at time of Substantial Performance.

END OF SECTION

STRUCTURAL STEEL SECTIONS UNDER SEPARATE COVER

- .4 Steel Structures Painting Council (SSPC):
 - .1 SSPC-S.P.6-85, Surface Preparation Standard, Commercial Blast Cleaning.

1.4 DESIGN CRITERIA

- .1 Design hand railings, balustrades, guards, and all connections to support minimum horizontal live load 0.75 kN/m or a concentrated load of 1.0 kN.
- .2 Design hand railings, balustrades, guards, and all connections to support minimum vertical live load 1.5 kN/m.

1.5 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Shop Drawings:
 - .1 Clearly indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
 - .2 Include details of the interface with adjacent construction.
 - .3 Items where structural failure could represent a safety hazard, including all related connections and fastenings, shall be designed by a structural engineer permanently licensed to practise in the Province of Ontario. Each shop drawing submitted shall bear the stamp and signature of the aforesaid structural engineer.
- .3 Source Quality Control:
 - .1 If requested by the Consultant, submit laboratory test reports in accordance with Section 01 45 00 "Quality Control".
 - .2 Laboratory test reports shall certify compliance of materials with specification requirements.
- .4 Post-installation certification: After installation, provide written certification, signed by the structural engineer responsible for the shop drawings, that all items have been installed in accordance with the shop drawings.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 MATERIALS

- .1 Steel sections and plates: to CSA-G40.21, Grade 300W.
- .2 Steel pipe: to ASTM A53, standard weight, schedule 40, seamless, black for interior work, galvanized for exterior work.
- .3 Welding materials: to CSA-W59.
- .4 Bolts and anchorbolts: to ASTM A307.
- .5 High strength bolts: to ASTM F3125.
- .6 Shop coat primer:
 - .1 For interior steel surfaces: MPI APL #76 or #79, at the option of the fabricator.
 - .2 For exterior steel surfaces: MPI APL #79.
 - .3 Touch-up primer for galvanized surfaces: Zinc-rich primer, APL #19
- .7 Grout: non-shrink, non-metallic, flowable, 24h, MPa 15, pull-out strength 7.9 MPa.

2.2 FABRICATION

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Fabricate items from steel unless otherwise noted.
- .3 Exposed surfaces of finished steelwork to be machined and/or filled to a smooth blemish-free surface, prior to prime coating. File and grind exposed welds smooth and flush. Grind off weld-splatter.
- .4 Connections:
 - .1 Use welded connections for all metal work unless otherwise approved by the Consultant or unless otherwise indicated on the drawings.
 - .2 Where welded connections are not used, use bolted connections unless otherwise indicated.
 - .3 Use screws only where indicated or only with the approval of the Consultant. Where assembly by screws is indicated, use self-tapping, flat headed, shake-proof screws.
- .5 Where possible, fit and shop assemble work, ready for erection.
- .6 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush. Seal exterior steel fabrications to provide corrosion protection in accordance with CSA S16.

2.3 SHOP PAINTING

- .1 Preparation of Interior Steelwork: Clean, prepare surface and shop prime steel to CSA-S16. Thoroughly de-scale steelwork; remove roughness and irregularities; clean with a wire brush; remove oil and grease.
- .2 Preparation of Exterior Steelwork and Interior Railings: Non-galvanized steel which will be exposed to elements: Sand blast steel to SSPC-S.P.6 prior to shop primer or sealer application.
- .3 Primer Application:
 - .1 Except where specified otherwise, apply one coat of primer to non-galvanized surfaces.
 - .2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7°C.
 - .3 Take special care when applying primer to prepared surfaces of steelwork to be exposed in the finished installation to obtain a smooth surface capable of allowing a high-quality paint finish. Do additional filling and grinding if required.
 - .4 Field touch-up: Verify that surfaces to be touched up are free from rust, scale, grease. Touch up with same material as shop primer.
 - .5 Finish painting is specified in Section 09 91 00 "Painting".
- .4 Do not prime the following surfaces:
 - .1 Steel to be encased in concrete;
 - .2 Galvanized or non-ferrous metals;
 - .3 Surfaces and edges to be field welded. If painted, remove paint for field welding for a distance of at least 50 mm in all sides of the paint.

2.4 GALVANIZING

- .1 Where galvanized finish is specified, hot dip galvanize steel surfaces after fabrication to ASTM A123, minimum 600 g/m² coating thickness.

2.5 MISCELLANEOUS METALWORK

- .1 Examine architectural, structural, mechanical and electrical drawings and specifications and furnish all miscellaneous metalwork items required for proper execution of project, including, but not necessarily limited to, the items described herein.
- .2 Supply for installation by respective trades, steel brackets, supports and angles as indicated. Drill for countersunk screws and anchor bolts. Prime paint for interior installation, galvanize for exterior installations.
- .3 Provide all accessories necessary for proper installation and correlation with adjoining work.

2.6 COORDINATION

- .1 Where the work of this Section is furnished for installation by other Sections, coordinate with the appropriate Sections to ensure a proper fit and to schedule delivery dates to ensure the expeditious completion of the project.

2.7 LOOSE LINTELS

- .1 Provide loose lintels, for installation by the masonry trade contractor. Check drawings for openings or recesses in non-loadbearing walls requiring lintels. Where not otherwise specified or indicated on the structural drawings, fabricate mild steel angle lintels (one angle for each 100 mm of wall thickness) to sizes as follows:
 - .1 Up to 1200 mm span: L90 x 90 x 8.
 - .2 Up to 1800 mm span: L100 x 90 x 8 (LLV).
 - .3 Up to 1900 mm span: L125 x 90 x 8 (LLV).
 - .4 Up to 2400 mm span: L125 x 90 x 8 (LLV).
- .2 Provide loose lintels for installation under Section 04 21 13 "Brick Veneer Masonry".
- .3 Fixed lintels and loose lintels above openings wider than 2400 mm: Refer to Structural Drawings.
- .4 Lintels to be hot-dip galvanized after fabrication for paint finish by Section 09 91 00.

2.8 STEEL RAILINGS

- .1 Design railings to conform to OBC requirements, and fabricate in accordance with the reviewed and accepted shop drawings.
- .2 Fabricate from steel sections of sizes and to the configuration indicated on the reviewed and accepted shop drawings.
- .3 Make provision for proper attachment in accordance with the reviewed and accepted shop drawings.
- .4 Cap exposed ends of pipe railings.
- .5 Terminate at abutting walls with end flanges.
- .6 Finish:
 - .1 Interior railings to be shop prime coated for on-site paint finish by Section 09 91 00.
 - .2 Exterior railings to be hot dip galvanized after fabrication for on-site paint finish by Section 09 91 00.

2.9 MISCELLANEOUS METAL FABRICATIONS FOR OVERHEAD DOOR

- .1 Provide miscellaneous steelwork as required for the sectional metal overhead door and high-speed rolling door installations. Coordinate installation with the overhead door trade contractor.
- .2 Coordinate with Section 08 36 12 "Sectional Metal Overhead Door". Verify requirements with the system manufacturer and provide and install metal fabrications required for the sectional metal overhead door installations, including framing, support brackets and bearing plates required for proper fastening of tracks, c/w track support and protection channels, hardware, support for torsion springs, machinery, accessories and all other metal fabrications required for a complete installation, in accordance with the requirements of the reviewed and accepted manufacturers' door shop drawings.

- .3 Verify dimensions on site prior to fabrication.
- .4 Coordinate with the structural steel supplier.
- .5 Steel to be prime coated.
- .6 Be advised that claims for extras to the Contract Sum for the supply and/or installation of metal fabrications associated with the sectional metal overhead door and high-speed rolling door installations will not be considered.

2.10 STEEL FRAME FOR OVERHEAD DOOR

- .1 Provide and install steel frame to jambs and head of sectional metal overhead door opening and high-speed rolling door opening, as indicated on the drawings and as required by site conditions.
- .2 Frame to be fabricated from steel channels, c/w anchors for securement to concrete.
- .3 Steel to be prime coated for paint finish by Section 09 91 00 "Painting".
- .4 Coordinate with Section 08 36 12 "Sectional Metal Overhead Doors".

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .3 Take field measurements to verify or supplement dimensions.
- .4 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 ERECTION

- .1 Except where otherwise indicated, install all metal fabrications.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage, acceptable to the Consultant, such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

- .4 Make field connections with bolts to CSA S16 or weld.
- .5 Hand items over for casting into concrete to the appropriate trades together with setting templates.
- .6 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.
- .7 Touch-up galvanized surfaces with zinc primer where burned by field welding.

3.3 METALWORK INTEGRATED INTO THE WORK OF OTHER SECTIONS

- .1 Coordinate with the appropriate other Sections, work which is to be integrated into the work of those Sections.
- .2 Where appropriate, fabricate the work of this Section and hand over to others for installation.

3.4 CLEANING

- .1 Remove surplus materials, rubbish, tools and equipment on completion of installation.
- .2 Make good damage to other work caused by the work of this section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included:
 - .1 The Work of this Section includes the provision of all labour, materials, equipment and services required to fabricate and install metal fabrications, as indicated on the drawings, as specified herein and as required for a complete project.
 - .2 Examine the architectural, structural, mechanical and electrical drawings to establish the full extent of the Work of this Section.
- .2 Related Work:
 - .1 Section 04 22 00 - Concrete Unit Masonry.
 - .2 Section 06 10 00 - Rough Carpentry.
 - .3 Section 09 91 00 - Painting.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM A53/A53M-24, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless.
 - .2 ASTM A123/A123M-24, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM A307-21, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
 - .4 ASTM A653/A653M-25a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
 - .5 ASTM F3125/F3125M-25a, Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.
- .2 Canadian Standards Association (CSA):
 - .1 CSA G40.20-13/G40.21-13(R2023), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA S16:24, Design of steel structures.
 - .3 CSA W59:24, Welded Steel Construction.
- .3 Master Painters Institute (MPI):
 - .1 MPI Architectural Specification Manual, Online Subscription (referred to herein as "MPI Manual").
 - .2 MPI Approved Product List, (referred to herein as "MPI APL"), current edition.

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included:
 - .1 The work of this Section includes the provision of all labour, materials, equipment and services required to complete rough carpentry work, as indicated on the drawings, as specified herein and as required for a complete project.
 - .2 The work includes rough carpentry work as required for the proper completion of the work of all trades, as required for a complete project.
- .2 Related Sections:
 - .1 Section 04 22 13 - Concrete Unit Masonry.
 - .2 Section 05 50 00 - Metal Fabrications.
 - .3 Section 06 20 00 - Finish Carpentry.
 - .4 Section 06 41 10 - Plywood Casework.
 - .5 Section 07 21 00 - Batt and Blanket Insulation.
 - .6 Section 07 27 16 - Vapour Permeable Air/Moisture Barrier.
 - .7 Section 07 41 13 - Preformed Metal Roofing.
 - .8 Section 07 42 43 - Aluminum Composite Material (ACM) Panels.
 - .9 Section 07 62 00 - Sheet Metal Flashing and Trim.
 - .10 Section 08 11 13 - Steel Doors and Frames.
 - .11 Section 08 11 16 - Aluminum Doors and Frames.
 - .12 Section 08 31 00 - Access Doors.
 - .13 Section 08 53 16 - Aluminum-Clad Vinyl Windows.
 - .14 Section 09 21 16 - Gypsum Board Assemblies.
 - .15 Section 10 28 10 - Toilet and Bath Accessories.
 - .16 Mechanical and Electrical under separate cover.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM A123/A123M-24, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM D5456-24, Standard Specification for Evaluation of Structural Composite Lumber Products.
 - .3 ASTM F1667/F1667M-21a, Standard Specification for Driven Fasteners; Nails, Spikes, and Staples.

- .4 ASTM F3125/F3125M-25a, Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.
- .2 Canadian Standards Association (CSA):
 - .1 CAN/CSA O80-Series:21, Wood Preservation, Includes Administrative Update (2022).
 - .2 CSA 0112.9:21, Evaluation of Adhesives for Structural Wood Products (Exterior Exposure), (Includes Administrative Update (2022)).
 - .3 CSA O121-17(R2022), Douglas Fir Plywood.
 - .4 CSA O141:23, Canadian standard lumber.
 - .5 CSA O151-17(R2022), Canadian Softwood Plywood.
 - .6 CSA O325:21(R2025), Construction Sheathing (Adopted NIST PS 2-18 with Canadian deviations), Includes Administrative Update (2021).
- .3 National Lumber Grades Authority (NLGA):
 - .1 NLGA Standard Grading Rules for Canadian Lumber, 2022. Including Errata Nos. 1 to 4 and Supplements Nos. 1 and 2 (2022)

1.4 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Shop Drawings:
 - .1 Clearly indicate details of wood frame structure.
 - .2 Include layout of structural members, member sizes and spacing, lumber grades, sheet materials, grades and thicknesses, connection details, fastenings, and other pertinent details.
 - .3 The structure, including all related connections and fastenings, shall be designed by a structural engineer licensed to practise in the Province of Ontario. Each shop drawing submitted shall bear the stamp and signature of the aforesaid structural engineer.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle products in accordance with the manufacturer's printed instructions.
- .2 Deliver products in original unopened factory packaging with legible manufacturer's identification.
- .3 Storage and handling:
 - .1 Store materials in accordance with manufacturers' recommendations and off-ground, in a clean, dry, well-ventilated area.
 - .2 Protect wood and wood products from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.6 QUALITY ASSURANCE

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

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 FRAMING AND STRUCTURAL MATERIALS

- .1 For materials, sizes and grades, refer to structural drawings.
- .2 Lumber: Softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:
 - .1 CSA O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
- .3 Glued end-jointed (finger-jointed) lumber is not acceptable for this project.
- .4 Framing and board lumber: in accordance with OBC, supplemented by the following:
 - .1 Studs: Spruce, pine, or fir (SPF), "No. 2" or better grade.
 - .2 Joists, lintels, beams, and plates: Spruce, pine, or fir (SPF), "No. 2" or better grade.
- .5 Pressure treated (PT) wood: Wood species and grades as specified in the above paragraphs, pressure treated with ACQ in accordance with CAN/CSA O80 Series, minimum retention 4.0 kg/m³ by assay.
- .6 Wood trusses: Refer to Section 06 17 53 "Shop-Fabricated Wood Trusses".
- .7 Furring, blocking, nailing strips, grounds, rough bucks, curbs, fascia backing and sleepers:
 - .1 S4S.
 - .2 Board sizes: "Standard" or better grade.
 - .3 Dimension sizes: "Standard" light framing or better grade.
 - .4 Post and timbers sizes: "Standard" or better grade.
- .8 Structural composite lumber (SCL): In accordance with ASTM D5456.

2.2 PANEL MATERIALS

- .1 Plywood and wood based composite panels: to CSA O325.
- .2 Douglas fir plywood (DFP): to CSA O121, standard construction.
- .3 Canadian softwood plywood (CSP): to CSA O151, standard construction, no added formaldehyde.

2.3 ACCESSORIES

- .1 General purpose adhesive: to CSA O112.9.
- .2 Nails, spikes and staples: to ASTM F1667.
- .3 Bolts: to ASTM F3125, 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.
- .4 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.

2.4 FASTENER FINISHES

- .1 Galvanizing: to ASTM A123. Use galvanized fasteners for exterior work, interior highly humid areas pressure-preservative treated lumber.

2.5 WOOD PRESERVATIVE

- .1 Pressure impregnated with alkaline copper quaternary (ACQ) to CSA O80-Series.

Part 3 Execution

3.1 INSTALLATION

- .1 Comply with OBC requirements, supplemented by following paragraphs.
- .2 Install members true to line, levels and elevations, square and plumb.
- .3 Construct continuous members from pieces of longest practical length.
- .4 Install spanning members with "crown-edge" up.
- .5 Install furring and blocking as required to space-out and support casework, wall and ceiling finishes, facings, fascia, soffit, siding, electrical equipment mounting boards, and other work as required.

- .6 Provide wood and plywood blocking within the stud space as required to support casework, toilet and bath accessories, corridor handrails, and other wall-mounted items.
- .7 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .8 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.
- .9 Install sleepers as indicated.
- .10 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.

3.2 ERECTION

- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .2 Countersink bolts where necessary to provide clearance for other work.

3.3 SURFACE-APPLIED WOOD PRESERVATIVE

- .1 Treat surfaces of pressure impregnated material (PT) which are exposed by cutting, trimming or boring, with wood preservative before installation.
- .2 Apply by dipping, or by brush to completely saturate and maintain wet film on surface for minimum 3 minute soak on lumber and one minute soak on plywood.

3.4 EQUIPMENT BACKBOARDS

- .1 Provide backboards as required for mounting electrical equipment. Use 19 mm thick G1S FRT plywood on 19 x 38 mm furring around perimeter and at maximum 400 mm intermediate spacing. Prepare for paint finish by Section 09 91 00. Coordinate size and location with Division 26 "Electrical".

3.5 CLEANING

- .1 Remove surplus materials, rubbish, tools and equipment on completion of installation and leave the installation clean.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included:
 - .1 The work of this Section includes the provision of all labour, materials, equipment and services required to engineer, fabricate and install shop-fabricated wood trusses, as indicated on the drawings, as specified herein and as required for a complete project.
 - .2 The drawings show the overall roof profile and the general intent of the roof assembly. The engineering design of the roof trusses is the responsibility of the manufacturer.
- .2 Related Sections:
 - .1 Section 06 10 00 - Rough Carpentry.
 - .2 Section 07 41 13 - Preformed Metal Roofing.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA):
 - .1 CSA O86:24, Engineering design in wood, Includes Update No. 1 (2025).
 - .2 CSA O141:23, Canadian standard lumber.
 - .3 CSA S307-M1980(R2001), Load Test Procedure for Wood Roof Trusses for Houses and Small Buildings.
 - .4 CSA S347-14(R2018), Method of Test for Evaluation of Truss Plates Used in Lumber Joints.
 - .5 CSA W47.1:19, Certification of Companies for Fusion Welding of Steel.
- .2 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 National Lumber Grades Authority (NLGA):
 - .1 NLGA Standard Grading Rules for Canadian Lumber, 2022. Including Errata Nos. 1 to 4 and Supplements Nos. 1 and 2 (2022)
- .4 National Research Council (NRC)/Institute for Research in Construction (IRC) - Canadian Construction Materials Centre (CCMC):
 - .1 Registry of Product Evaluations.
- .5 Truss Plate Institute of Canada (TPIC):
 - .1 TPIC-2019, Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses.

1.4 DESIGN REQUIREMENTS

- .1 Design light metal plate connected wood trusses in accordance with TPIC truss design procedures for wood truss chords and webs in accordance with engineering properties in CSA O86.
- .2 Design light metal plate connected wood trusses in accordance with TPIC truss design procedures for truss joint designs to test engineering properties in accordance with CSA S347 and listed in CCMC Registry of Product Evaluations.
- .3 Design trusses, bracing and bridging in accordance with CSA O86.1 for loads indicated for the building locality in accordance with OBC climatic data.
- .4 Limit live load deflection to 1/360th of span.
- .5 Provide camber for trusses as indicated.

1.5 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Fabricator for trusses to show evidence of quality control program such as provided by regional wood truss associations, or equivalent.
 - .2 Fabricator for welded steel connections to be certified in accordance with CSA W47.1.

1.6 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Shop Drawings:
 - .1 The roof truss and rafter assembly, including all related connections and fastenings, shall be designed by a structural engineer licensed to practise in the Province of Ontario. Each shop drawing submitted shall bear the stamp and signature of the aforesaid structural engineer.
 - .2 Indicate special structural application and specification as required by local authorities having jurisdiction.
 - .3 Indicate TPIC truss design procedure and CSA O86 engineering design procedure and specific CCMC Product Registry number of the truss plates
 - .4 Indicate species, sizes, and stress grades of lumber used as truss members. Show pitch, span, camber, configuration and spacing of trusses. Indicate connector types, thicknesses, sizes, locations and design value. Show bearing details. Indicate design load for members.
 - .5 Submit stress diagram or print-out of computer design indicating design load for truss members. Indicate allowable load and stress increase.
 - .6 Provide certification that trusses meet requirements of CSA S307 and CSA S347.
 - .7 Indicate arrangement of webs or other members to accommodate ducts and other specialties.
 - .8 Show location of lateral bracing for compression members.

- .3 Test reports: submit certified test reports for prefabricated wood trusses from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
- .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .5 Instructions: submit manufacturer's installation instructions.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, handle, store and protect materials in accordance with the manufacturer's recommendations.
- .2 Storage and Protection:
 - .1 Store trusses on job site in accordance with manufacturer's instructions. Provide bearing supports and bracings. Prevent bending, warping and overturning of trusses.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 MATERIALS

- .1 Lumber: Softwood, species and grade as prescribed by the structural engineer responsible for the shop drawings, S4S, with maximum moisture content of 19% at time of fabrication and to following standards:
 - .1 CSA O141.
 - .2 NLGA (National Lumber Grading Association), Standard Grading Rules for Canadian Lumber.
- .2 Fastenings: to CSA O86.

2.2 FABRICATION

- .1 Fabricate wood trusses in accordance with reviewed and accepted shop drawings.
- .2 Provide for design camber and roof slopes when positioning truss members.
- .3 Connect members using methods prescribed by the engineer responsible for the shop drawings.

2.3 SOURCE QUALITY CONTROL

- .1 Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 ERECTION

- .1 Erect wood trusses as indicated and in accordance with reviewed and accepted shop drawings.
- .2 Handling, installation, erection, bracing and lifting in accordance with manufacturers instructions.
- .3 Make adequate provisions for handling and erection stresses.
- .4 Exercise care to prevent out-of-plane bending of trusses.
- .5 Install temporary horizontal and cross bracing to hold trusses plumb and in safe condition until permanent bracing and decking are installed.
- .6 Install permanent bracing in accordance with reviewed and accepted shop drawings, prior to application of loads to trusses.
- .7 Do not cut or remove any truss material without approval of the Consultant.

3.3 CLEANING

- .1 Remove surplus materials, excess materials, rubbish, tools and equipment on completion of installation.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to execute finish carpentry work, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Section 06 10 00 - Rough Carpentry.
 - .2 Section 06 41 10 - Plywood Casework.
 - .3 Section 06 41 93 - Cabinet and Miscellaneous Hardware.
 - .4 Section 08 14 16 - Flush Wood Doors.
 - .5 Section 08 71 10 - Door Hardware.
 - .6 Section 09 91 00 - Painting.

1.3 REFERENCES

- .1 National Particleboard Association (NPA):
 - .1 NPA A208.1-2009, Particleboard.
 - .2 NPA A208.2-2009, Medium Density Fiberboard for Interior Applications.
- .2 American Society of Mechanical Engineers (ASME):
 - .1 ASME B18.6.1-1981(R2016), Wood Screws (Inch Series).
- .3 American Society for Testing and Materials (ASTM):
 - .1 ASTM F1667/F1667M-21a, Standard Specification for Driven Fasteners; Nails, Spikes, and Staples.
- .4 Architectural Woodwork Manufacturers' Association of Canada (AWMAC):
 - .1 North American Architectural Woodwork Standards, NAAWS 4.0, (2021) Plus Errata (referred to herein as "AWS").
- .5 Canadian Standards Association (CSA):
 - .1 CSA O121-17(R2022), Douglas Fir Plywood.
 - .2 CSA O141:23, Canadian standard lumber.

1.4 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.

- .2 Shop Drawings:
 - .1 For finish carpentry items, show dimensions, profiles, materials, finishes, fastenings and attachments.
- .3 Product Data:
 - .1 Provide complete manufacturer's technical product data for each specified product.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- .1 Protect materials against dampness during and after delivery.
- .2 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

1.6 WASTE MANAGEMENT

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials, including packaging materials, generated by the work of this Section in accordance with the Waste Management Plan.

Part 2 Products

2.1 LUMBER MATERIAL

- .1 Softwood lumber: Pine species, to NAAWS Custom grade or better for exposed work, S4S, moisture content average 7%, maximum 9% for interior work. Machine stress-rated lumber is acceptable for all purposes.
- .2 Hardwood lumber: Maple or birch species to NAAWS Custom grade or better for exposed work, S4S, moisture content average 7%, maximum 9% for interior work.

2.2 PANEL MATERIAL

- .1 Douglas fir plywood (DFP): to CSA O121, standard construction.
- .2 Melamine panels: Melamine resin impregnated decorative sheet thermal-fused to rigid particleboard substrate to the following standards:
 - .1 Core: Mat-formed wood particleboard: industrial grade to ANSI A208.1 Grade R, density 449 k/m³.
 - .2 Melamine finish: to NEMA LQ1, minimum 120 gram weight, thermally fired to both sides of particleboard. Colour: White.
 - .3 Prepainted UV board or vinyl-faced board is not acceptable as a substitute for melamine panels specified herein.

2.3 TRIM

- .1 Medium Density Fibreboard (MDF): to ANSI 208.2., density 769 kg/m³, prefinished white prime coat. Profiles as follows:
 - .1 Base boards: 89 mm x 17.5 mm base.
 - .2 Door frame and window trim: 57 mm x 15 mm casing.

2.4 ACCESSORIES

- .1 Nails and staples: to ASTM F1667; galvanized to ASTM A123 for exterior work, interior humid areas and for treated lumber; plain finish elsewhere.
- .2 Wood screws: to ASME B18.6.1 electroplated steel, type and size to suit application.
- .3 Adhesives: as recommended by installer.
- .4 Wood filler: as recommended by installer.
- .5 Edge banding (for melamine panels): "Polyband" polyester edge banding, 60 gram print paper, fully impregnated with polyester resin, hot meltcoated. Colour to match melamine. Apply to all exposed edges.
- .6 Handrail wall-mount bracket: Stainless steel in-line bracket with angle and height adjustment. Standard of acceptance: No. HR20473338170 by Richelieu.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .3 Take field measurements to verify or supplement dimensions.
- .4 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Trade Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 INSTALLATION

- .1 Install finish carpentry to NAAWS Custom Grade, except where specified otherwise.
- .2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.

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

3.3 STAIR RAILINGS

- .1 Fabricate and install stair railings to NAAWS Custom Grade and in compliance with OBC requirements, as indicated on the reviewed and accepted shop drawings.
- .2 Install 51 mm dia. round-profile hardwood wall-mounted railings on metal brackets as specified herein.

3.4 WOOD DOOR FRAMES

- .1 Fabricate and install pine door frames to NAAWS, Custom Grade with rabbet joints and applied stops.
- .2 Coordinate with Section 08 14 16 "Flush Wood Doors" to ensure a proper interface.

3.5 STANDING AND RUNNING TRIM

- .1 Form right angle joints of casing and base with mitred joints.
- .2 Fit backs of casing snugly to wall surfaces to eliminate cracks at junction of casing with walls.
- .3 Install in longest possible single lengths without splicing. Install door and window trim in single lengths.

3.6 OTHER ITEMS

- .1 Provide other finish carpentry items as indicated and as required for a complete project.

3.7 CLEANING

- .1 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Make good damage to other work caused by the Work of this Section.
 - .1 Execute repair work in accordance with the original manufacturer's written instructions.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included:
 - .1 The work of this Section includes the provision of all labour, material, equipment and services required to fabricate and install wood-veneer-faced casework, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Work:
 - .1 Section 06 10 00 - Rough Carpentry.
 - .2 Section 06 20 00 - Finish Carpentry.
 - .3 Section 06 41 36 - Cabinet and Miscellaneous Hardware.
 - .4 Section 06 61 16 - Solid Surface Fabrications.
 - .5 Section 07 92 00 - Joint Sealants.
 - .6 Plumbing sections under separate cover.

1.3 REFERENCE STANDARDS

- .1 American Society of Mechanical Engineers (ASME):
 - .1 ASME B18.6.1-1981(R2016), Wood Screws (Inch Series).
- .2 American Society for Testing and Materials (ASTM):
 - .1 ASTM D523-25, Standard Test Method for Specular Gloss.
 - .2 ASTM F1667/F1667M-21a, Standard Specification for Driven Fasteners; Nails, Spikes, and Staples.
- .3 Architectural Woodwork Manufacturers' Association of Canada (AWMAC):
 - .1 North American Architectural Woodwork Standards, NAAWS 4.0, (2021) Plus Errata (referred to herein as "AWS").
- .4 Canadian Standards Association (CSA):
 - .1 CSA-O115-M1982(R2001), Hardwood and Decorative Plywood.
 - .2 CSA-O121-17, Douglas Fir Plywood.
- .5 Forest Stewardship Council of Canada (FSC):
 - .1 FSC-STD-01-001 V5-2 2018, FSC Principles and Criteria for Forest Stewardship.
- .6 Green Seal Environmental Standards (GS):
 - .1 GS-36-2025, Edition 2, Adhesives for Commercial Use.

- .7 National Particleboard Association (NPA)
 - .1 NPA A208.2-2009, Medium Density Fiberboard for Interior Use.

1.4 DEFINITIONS

- .1 Plywood: Layers or plies of wood veneer, permanently bonded together in panels with the grain of each layer at 90° to adjacent layers. The outer plies are called face and back. The inner plies are called the "core". The term "plywood", as used in this specification, does not include assemblies manufactured with particleboard, hardboard or fibreboard cores.

1.5 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Shop Drawings: Submit shop drawings in accordance with AWS recommendations.
 - .1 Shop drawings to include complete dimensioned drawings of each cabinetwork and millwork item, including locations of on-site joints in countertops, details of construction, profiles, jointing, fastening and other related details.
 - .2 Indicate all materials, thicknesses, finishes and hardware.
 - .3 Indicate locations of all service outlets in casework, typical and special installation conditions, and all connections, attachments and anchorage.
- .3 Samples: Submit a minimum 150 mm x 150 mm sample of hardwood plywood to be exposed to sight in the finished work, fabricated from actual materials and finishes to be used. Include:
 - .1 Hardwood plywood
 - .2 Each type and colour of laminated plastic.

1.6 PRODUCT HANDLING AND STORAGE

- .1 Handle and store products in accordance with AWS recommendations.
- .2 Protect materials against dampness during and after delivery.
- .3 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.
- .4 Cover finished surfaces with heavy kraft paper or put in cartons during shipment. Do not remove protection until immediately before final inspection.
- .5 Do not store or install materials in areas where relative humidity is less than 25% or greater than 60% at 22°C.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".

- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

1.8 WARRANTY

- .1 For the work of this Section, the 12-months warranty period prescribed in the General Conditions of the Contract is extended to 5 years.

Part 2 Products

2.1 LUMBER MATERIALS

- .1 Softwood lumber: Pine species, FSC certified, 6 to 12% moisture content, grades in accordance with AWS, as follows:
 - .1 Exposed Work: Premium Grade
 - .2 Semi exposed work: Custom Grade or better.
 - .3 Concealed work: Economy Grade or better.
 - .4 Finger-jointed lumber is not acceptable.
- .2 Hardwood lumber, FSC certified:
 - .1 6 to 12% moisture content. Species and grades in accordance with AWS, as follows:
 - .1 Clear or transparent finish, exposed work: White Birch, Premium Grade.
 - .2 Clear or transparent finish, semi-exposed work: White Birch, Custom Grade.
 - .3 Concealed work or opaque finish: Species at the option of the fabricator, Economy Grade.

2.2 PANEL MATERIALS

- .1 Softwood plywood: Douglas Fir Plywood (DFP), FSC certified: CSA-0121, G1S or G2S sanded grade, as applicable, urea formaldehyde free.
- .2 Hardwood plywood, FSC certified: To CSA-0115, specifications in accordance with AWS requirements, based on veneer face grades established by HPVA, urea formaldehyde free, as follows:
 - .1 White Birch species, flat cut, random slip matched for exposed work:
 - .1 Exposed faces: Grade A. There shall be no sharp colour contrasts between adjacent flitches.
 - .2 Semi-exposed faces: Grade B.
 - .2 Concealed faces: Species and grade at the option of the fabricator.
- .3 Medium Density Fibreboard (MDF): to ANSI 208.2., Grade 130, density 700 to 745 kg/m³, urea formaldehyde free, FSC certified.

2.3 FASTENERS AND ADHESIVES

- .1 Nails and staples: ASTM F1667, hot dipped galvanized for exterior work, and areas subject to high humidity, plain finish elsewhere.
- .2 Wood screws: to ASME 18.6.1, electroplated, type and size to suit application.
- .3 Adhesives: As recommended by the casework fabricator, Green Seal GS-36 certified for VOC emissions.
- .4 Sealant: Refer to Section 07 92 00 "Joint Sealants".

2.4 ACCESSORIES

- .1 Sealant for caulking of countertops at wall: One-component, mildew resistant sealing compound for tubs and tiles to CAN-CGSB-19.22. Acceptable product: Tremsil 600. Colour to match adjacent materials to the approval of the Consultant.
- .2 Cabinet hardware: Refer to Section 08 71 13 "Cabinet and Miscellaneous Hardware".

2.5 WOOD-VENEER-FACED CASEWORK CONSTRUCTION

- .1 Furring, blocking, nailing strips, grounds and rough bucks, sleepers and concealed framing: Softwood lumber, pine species.
- .2 Base: 19 mm DFP faced with base material specified for room.
- .3 Concealed casework framing: Wood species at the option of the fabricator.
- .4 Case bodies (ends, divisions, bottoms, shelves, backs):
 - .1 Natural birch veneer plywood.
 - .2 Thicknesses:
 - .1 Generally 19 mm.
 - .2 Backs 10 mm.
- .5 Applied drawer fronts and cabinet doors:
 - .1 Solid: 16 mm natural birch veneered MDF panels.
 - .2 Glazed: Shaker-style, solid birch stile and rail, c/w 4 mm tempered glass panels to CAN/CGSB-12.1.
- .6 Finished edge banding, exposed and semi-exposed edges: matching solid natural birch, 10 mm thick.

2.6 DRAWERS

- .1 Fabricate drawers to AWS Custom grade.
 - .1 Semi-exposed fronts, sides and backs: 16 mm thick birch plywood. Grain direction: longitudinal.
 - .2 Bottoms: 10 mm thick natural birch plywood: Grain direction: longitudinal.
 - .3 Edges of drawer sides and backs: Fill all voids and sand smooth to receive transparent finish.

OR:

- .2 Prefabricated drawer kits. Standard of acceptance: Ten Drawers Kits by Richelieu.

2.7 COUNTERTOPS

- .1 Refer to Section 06 61 16 "Solid Surface Fabrications". Coordinate sizes and configurations to achieve a proper interface between casework and countertops.

2.8 FABRICATION OF CASEWORK

- .1 Fabricate casework in accordance with AWS Custom grade, double-front, flush overlay type, except where otherwise indicated.
- .2 Use dado construction for fixed shelves and intermediate gables. Use rabbet joint construction at top and bottom of end gables.
- .3 Shop joints to be pressure glued, tight and flush, without nailing.
- .4 Except where otherwise indicated, all cabinet shelves shall be adjustable using specified adjustable shelf hardware.
- .5 Provide cutouts for plumbing fixtures and fittings and other fixtures.
- .6 Shop-assemble work for delivery to site in size easily handled and to ensure passage through building openings.
- .7 Join units on site with screws. Knock-down joint locations to be indicated on the shop drawings for review by the Consultant prior to fabrication.

2.9 SHOP FINISHING

- .1 Quality Standard: Comply with AWS unless otherwise indicated.
- .2 General: Finish wood and wood veneer surfaces of casework at fabrication shop as specified in this Section. Defer only final touch-up, cleaning, and polishing until after installation.
- .3 Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of panelling.

- .4 Clear: Comply with AWS requirements indicated below for grade and sheen, with sheen measured on 60-degree gloss meter per ASTM D523:
 - .1 Grade: Custom.
 - .2 AWS Finish System: Vinyl, Catalyzed:
 - .1 1 Coat vinyl sanding sealer
 - .2 Sand (240 Grit)
 - .3 1 Coat vinyl catalyzed sealer
 - .4 Sand (320 Grit)
 - .5 2 Coats precatalyzed lacquer - 30% Sheen (semi-gloss) to match sample provided by the Consultant.

PART 3 EXECUTION

3.1 Examination

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .3 Take field measurements to verify or supplement dimensions.
- .4 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 INSTALLATION OF CABINETWORK

- .1 Do not install base cabinets until gypsum board behind cabinets has been painted.
- .2 Install cabinetwork at locations shown on drawings. Position accurately, level, plumb and straight.
- .3 Set and secure all materials and components in place, rigid plumb and square. Caulk counter tops to walls, scribe cabinets to walls and floors, install filler mouldings where required. Secure all cabinets to walls and floors, through back rails, top and bottom.
- .4 Provide heavy duty fixture attachments for wall-mounted cabinets.
- .5 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, cabling, columns, fixtures, outlets or other projecting, intersecting or penetrating objects. Scribe base to floor.
- .6 Make allowances around perimeter where fixed objects pass through or project into casework to permit normal movement without restriction.

- .7 Provide cutouts for inserts, grilles, appliances, outlet boxes and other penetrations. Round internal corners, chamfer edges and seal exposed core.
- .8 At junction of countertop backsplash and adjacent wall finish, apply a small continuous bead of silicone caulking, colour to the approval of the Consultant. Refer to Section 07 92 00 "Joint Sealants".
- .9 Apply bituminous coating over wood framing members in contact with masonry or cementitious construction.
- .10 Fit hardware accurately and securely in accordance with manufacturer's directions. adjust operating parts for smooth, correct function. Refer to drawings.

3.3 PROTECTION

- .1 Protect installed work from damage.

3.4 CLEANING

- .1 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Adjust hardware for correct function and true alignment.
- .3 Make good any damage caused by the work of this section.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to supply cabinet hardware and miscellaneous hardware, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Section 06 41 13 - Wood Veneer Faced Casework.

1.3 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Hardware Schedule:
 - .1 Provide a complete Cabinet and Miscellaneous Hardware Schedule for the project.
 - .2 Pay the cost of preparation of the Hardware Schedule and include in the Contract Price.
 - .3 Clearly indicate hardware proposed, including make, model, material, function, finish and all other pertinent information.
 - .4 Indicate the complete hardware requirements for each casework assembly. Show the hardware types and quantities, cross-referenced to the sub-paragraph number for each item in Part 2 of this specification.
 - .5 The Consultant's review of the Hardware Schedule does not limit or release the Contractor from the responsibility to provide all necessary hardware and related components required for a complete installation.
- .3 Samples and Literature:
 - .1 If requested by the Consultant, submit samples and technical literature as necessary to fully inform the Consultant regarding hardware items proposed.
 - .2 Submit samples and literature.
- .4 Product Data:
 - .1 Include installation instructions for each item of hardware.

1.4 DEVIATION FROM THIS SPECIFICATION

- .1 If any deviation from the items specified herein is proposed, submit a list of the alternative items complete with samples and technical literature.
- .2 Acceptance will be subject to the written approval of the Consultant.

- .3 Installed hardware which deviates from the specified items and has not been approved by the Consultant will be rejected and shall be replaced with the specified hardware at no additional cost to the Owner

1.5 COORDINATION WITH OTHER TRADES

- .1 Submit template information to all manufacturers and trades who have finish hardware applied to their products.

1.6 DELIVERY AND STORAGE

- .1 Store hardware in locked, clean and dry area.
- .2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 MANUFACTURERS

- .1 This specification is based on cabinet hardware distributed by Quinquallerie Richelieu Ltée.
- .2 Except where otherwise specified, catalog numbers refer to Richelieu products.
- .3 Requests for substitutions will be considered in accordance with provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.
- .4 Use one manufacturer's product for all similar items.

2.2 HARDWARE ITEMS

- .1 Cabinet hardware:
 - .1 Swing door hinges:
 - .1 Blum hinge #70T358180
 - .2 Blum mounting plate #175L810180
 - .3 Blum Tip-On touch latch #9561004
 - .2 Cabinet handles: Contemporary metal pull, 814 Series, #BP814160195

- .3 Drawer hardware:
 - .1 Blum slides: Medium duty: #760H5500M (40kg)
 - .2 Blum slide bracket #T51760102 (right).
 - .3 Blum slide bracket #T51760103 (left).
- .4 Adjustable shelf hardware: Standard metal shelf pins, 6.4 mm drilling diameter, 10 kg load capacity per shelf, nickel finish #2100NS. Include centre support at back of shelf.

2.3 FASTENINGS

- .1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .2 Exposed fastening devices to match finish of hardware.
- .3 Use fasteners compatible with material through which key pass.

Part 3 Execution

3.1 INSTALLATION INSTRUCTIONS

- .1 Provide manufacturers' instructions for proper installation of each hardware component.

3.2 INSTALLATION

- .1 Hand over hardware items for installation by Section 06 41 13 "Wood Veneer Faced Casework".

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included:
 - .1 The work of this Section includes the provision of all labour, materials, equipment and services required to fabricate and install quartz solid surface countertops, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Work:
 - .1 Section 06 41 13 - Wood Veneer Faced Casework.
 - .2 Section 07 92 00 - Joint Sealants.
 - .3 Plumbing sections under separate cover.

1.3 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specifications Sections.
- .2 Samples:
 - .1 Submit a sample of each specified product.
 - .2 Include, as applicable, samples of joints, edging, cutouts and profiles.
- .3 Product Data:
 - .1 Provide manufacturer's complete technical product data for each product.
 - .2 Include installation instructions, as applicable.
- .4 Maintenance Data: Provide maintenance data for each product for incorporation into the operation and maintenance manual specified in Section 01 78 00 "Closeout Submittals".

1.4 PRODUCT HANDLING

- .1 Cover finished surfaces with heavy kraft paper or put in cartons during shipment. Protect installed surfaces by approved means. Do not remove until immediately before final inspection.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

1.6 WARRANTY

- .1 Warrant the work of this Section in accordance with the General Conditions of the Contract but for ten (10) years.

Part 2 Products

2.1 MANUFACTURERS

- .1 This specification is based on quartz fabrications by MSI.
- .2 Subject to compliance with the specification requirements, equivalent products by the following manufacturers are acceptable alternatives:
 - .1 Stonesense Inc.
 - .2 Planet Granite & Quartz.
- .3 Requests for substitutions will be considered in accordance with the provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.

2.2 QUARTZ SURFACING MATERIALS

- .1 Quartz:
 - .1 Standard of acceptance: Cultured quartz surfacing by MSI Surfaces.
 - .2 Colour to be selected by the Consultant.

2.3 ACCESSORIES

- .1 Joint adhesives: manufacturers' standard adhesive kits to create inconspicuous, non-porous joints.
- .2 Sealant: manufacturers' standard mildew-resistant, silicone sealant in colours matching components. Refer to Section 07 92 00 "Joint Sealants". Maximum VOC content: 250 g/L (less water).

2.4 FABRICATION - QUARTZ SURFACING

- .1 Fabrication to be performed by the quartz surface manufacturer's certified fabricator/installer.
- .2 Verify dimensions prior to fabrication. Coordinate with Section 06 41 19 "Melamine Board Casework" to ensure a proper interface with the casework. Verify dimensions on site.
- .3 Wherever possible, fabricate in a single piece accurately made to fit the space.

- .4 Factory-fabricate components to greatest extent practicable. Sizes and shapes to be as indicated, in accordance with the reviewed and accepted shop drawings and the manufacturer's printed instructions. Countertop thickness to be 19 mm minimum with a 32 mm thickened nosing with a 13 mm radiussed profile along top exposed edges.
- .5 Form joints between components using manufacturer's standard joint adhesive. Joints shall be inconspicuous in appearance and without voids. Attach 100 mm wide solid surfacing material reinforcing strip under joints.
- .6 Provide factory cutouts for plumbing fittings and toilet accessories. Use templates provided by the plumbing fixture and toilet accessories manufacturers for undermount sinks and other plumbing fixtures and counter-mounted toilet accessories.
- .7 Cut and finish component edges with clean, sharp returns. Rout radii and contours to template. Rout cut-outs then sand edges smooth. Repair or reject defective and inaccurate work.
- .8 All exposed surfaces shall have a uniform finish.
- .9 Carefully inspect finished quartz units at the fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine surfaces to receive quartz countertops and conditions under which stone countertops will be installed, with the Installer present, for compliance with requirements for installation tolerances and other conditions affecting the performance of stone countertops.
- .2 Repair of chipped stone pieces will not be permitted except in exceptional circumstances and at sole discretion of Consultant.
- .3 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .4 Coordinate measurements with Section 06 41 13 "Wood Veneer Faced Casework".
- .5 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 PREPARATION

- .1 Clean quartz surfaces that have become dirty or stained by removing soil, stains, and foreign materials before setting. Clean quartz by thoroughly scrubbing with fibre brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.

3.3 INSTALLATION

- .1 Install components plumb and level, scribed to adjacent finishes, in accordance with the reviewed and accepted shop drawings and product installation data.
- .2 Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work. Keep components and hands clean when making joints.
- .3 Adhere undermount or topmount sinks/bowls to countertop, using the manufacturer's recommended adhesives and colour-matched sealant.
- .4 Provide backsplashes and sidesplashes as indicated and as required. Adhere to countertop using manufacturer's standard colour matched silicone sealant.

3.4 CONSTRUCTION TOLERANCES

- .1 Variation from Level: Do not exceed 3 mm in 3 m, 6 mm in 6 m, or 10 mm maximum.

3.5 ADJUSTING AND CLEANING

- .1 Remove and replace quartz countertop units of the following description:
 - .1 Broken, chipped, stained, or otherwise damaged quartz. Quartz may be repaired if methods and results are acceptable to the Consultant.
 - .2 Quartz units not matching accepted samples.
 - .3 Quartz units not complying with other requirements specified or indicated on the drawings.
- .2 Replace in a manner that results in quartz units matching the accepted samples, complying with other requirements, and showing no evidence of replacement.
- .3 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .4 Clean any drippage and spills of surplus adhesive or sealant from adjacent surfaces.
- .5 Remove adhesives, sealants and other stains. If stains cannot be removed, replace the entire component.
- .6 Make good any damage to other work caused by the work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

3.6 PROTECTION

- .1 Cover and protect surfaces from damage until date of Substantial Performance. Repair work or replace damaged work that cannot be repaired.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to supply and install fluid-applied bituminous dampproofing membrane to below-grade exterior foundation walls, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Concrete sections under separate cover.
 - .2 Section 09 24 33 - Cement Parging.
 - .3 Section 31 23 10 - Excavating, Trenching and Backfilling.
 - .4 Section 33 46 20 - Foundation Drainage.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM D695-26, Standard Test Method for Compressive Properties of Rigid Plastics.
 - .2 ASTM D1187/D1187M-97(2024), Standard Specification for Asphalt Base Emulsions for Use as Protective Coatings for Metal.
 - .3 ASTM D1227/D1227M-13(2024), Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing.
 - .4 ASTM D2196-20(2026), Standard Test Methods for Rheological Properties of Non-Newtonian Materials by Rotational Viscometer.
 - .5 ASTM D2746/D2746M-18(2023), Standard Test Method for Staining Tendency of Asphalt (Stain Index).
 - .6 ASTM D4258-23, Standard Practice for Surface Cleaning Concrete for Coating.
- .2 International Standards Organization (ISO):
 - .1 ISO 9001:2015, Quality Management Systems - Requirements.

1.4 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Product Data:
 - .1 Submit manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of dampproofing.
 - .2 Include a complete set of manufacturer's standard details for the fluid applied bituminous dampproofing membrane showing a continuous plane of water tightness below grade.

- .3 Provide a material checklist, complete with application rates and minimum thicknesses of adhesives and primers.
- .3 Qualification Documentation:
 - .1 Provide documentation to verify the manufacturer's and installer's qualifications.
 - .2 Include a notarized copy of the manufacturer's official ISO 9001 certificate.
 - .1 Include fluid applied bituminous dampproofing membrane, adhesives and associated auxiliary materials.
- .4 Sample Warranty: Copy of special waterproofing manufacturer's warranty stating obligations, remedies, limitations, and exclusions before starting waterproofing.

1.5 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: A company with minimum ten years experience in the actual production of the specified products.
- .2 Installer Qualifications: A company licensed by the membrane manufacturer as an approved installer with a minimum of 3 years documented experience in the installation of waterproofing membranes of similar scope and nature.
- .3 Preinstallation Conference:
 - .1 A preinstallation conference will be held before installation starts, with the following present:
 - .1 Consultant.
 - .2 Installer.
 - .3 Manufacturer's technical representative.
 - .4 Inspection and Testing Agency.
 - .5 Other trade contractors whose work affects or is affected by the Work of this Section.
 - .2 Agenda:
 - .1 Review methods and procedures related to installation, including the manufacturer's written instructions;
 - .2 Examine substrate conditions for compliance with the manufacturers installation requirements;
 - .3 Review temporary protection measures required during and after installation.
 - .4 Review installation schedule and coordination with other trades.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver liquid materials to project site in original packages with seals unbroken, labelled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
 - .1 At the time of delivery, visually inspect all materials for damage. Note any damaged to materials on the receiving ticket and immediately report to the shipping company and the material manufacturer.
 - .2 Remove damaged materials from the site immediately.

- .2 Storage:
 - .1 Store materials in their original undamaged packages, as recommended by manufacturer and conforming to applicable safety regulations. Refer to all applicable data including but not limited to MSDS sheets, product data sheets, product labels, and specific instructions for personal protection.
 - .2 Store fluid-applied bituminous dampproofing in closed containers outdoors, away from open flame or excessive heat.
- .3 Handling: Handle material in accordance with sound material handling practices and in accordance with the manufacturer's written instructions.

1.7 PROJECT CONDITIONS

- .1 Ambient conditions:
 - .1 Apply dampproofing when ambient air and substrate temperatures are within the temperature range indicated by the manufacturer, during installation, and for a minimum of 48 hours after installation, unless otherwise directed by the Consultant.
 - .2 Ensure surfaces are sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants.
- .2 Protection:
 - .1 Ensure surfaces are dry prior to and for a minimum of 16 hours after installation.
 - .2 Do not permit traffic of any kind over unprotected bituminous dampproofing membranes. Apply protection course as soon as possible in accordance with manufacturers written instructions.

1.8 COORDINATION

- .1 Coordinate with other trades to ensure continuity of the water seal throughout the scope of this Section.
- .2 Install dampproofing after completion of the work by other trades is complete and provides adequate dry, clean, level, and plumb surfaces for installation and adhesion.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

1.10 WARRANTY

- .1 For the work of this Section, the 12-months warranty prescribed in the General Conditions of the Contract is extended to 5 years.

- .2 Contractor Warranty: Warrant that the fluid applied dampproofing membrane and membrane flashings will stay in place and remain leak proof for 5 years.
- .3 Provide written warranty, signed by dampproofing manufacturer, agreeing to replace dampproofing material that does not comply with requirements or that does not remain watertight during the specified warranty period.

Part 2 Products

2.1 MANUFACTURERS

- .1 This specification is based on bituminous dampproofing materials by Henry Co.
- .2 Requests for substitutions will be considered in accordance with provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.

2.2 BITUMINOUS DAMPPROOFING

- .1 Non-fibred asphalt emulsion dampproofing to ASTM D1227, Type 3. Class 1 and ASTM D1187, Type 1, designed for dampproofing the exterior side of below-grade foundation walls, made from selected asphalt, emulsified with bentonite clay and water, containing no solvents.
 - .1 Standard of acceptance: Non-Fibred Asphalt Emulsion Dampproofing 788 by Henry Co., physical properties as follows:
 - .1 Appearance: Glossy black when dried.
 - .2 Application Temperature (Ambient): 10°C and rising.
 - .3 Ash: <8%.
 - .4 Behaviour @ 60°C: No blistering/sagging/sliding.
 - .5 Brookfield Viscosity (ASTM D2196): 8000-16000 cPs.
 - .6 Degree of Staining/Absorption (ASTM D2746): None
 - .7 Flash point: >100°C.
 - .8 VOC content: 0 g/L.
 - .9 Minerals or Stabilizers by Weight: <8%.
 - .10 Solids by Weight: 47-53%.
 - .11 Specific Gravity @ 25°C: 1.04.
 - .12 Weight Per Litre (ASTM D2828): 1.14-1.05 kg/L.
- .2 Asphalt Primer: Light bodied asphalt based material for priming surfaces for cold-applied dampproofing coatings.
 - .1 Standard of acceptance: 910-01 Penetrating Asphalt Primer by Henry Co., physical properties as follows:
 - .1 Colour: Black
 - .2 Solids by Volume: 37%

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed, with the installer present, and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Verify that surfaces and conditions are ready to accept the Work of this Section in accordance with published literature.
 - .1 Concrete surfaces shall be smooth and without large voids, honeycombing, spalled areas or sharp protrusions.
 - .2 Verify that concrete has cured and aged for minimum time period recommended by dampproofing manufacturer. Confirm concrete curing and form-release materials are compatible with dampproofing materials.
- .3 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .4 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 PREPARATION

- .1 Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
 - .1 Fill holes, cracks and recessed joints in concrete with cement mortar for a smooth, clean surface without depressions or projections.
 - .2 Scour with wire brush to at least 4" from both sides of fine cracks and corners.
 - .3 Fill in vertical cold joints flush with the surface, using a sealant compatible with asphalt.
 - .4 Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.
 - .5 Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
 - .6 Remove dust and dirt from joints and cracks according to ASTM D4258.
- .2 Mask off adjoining surfaces not receiving dampproofing to prevent spillage and overspray affecting other construction.

3.3 COATING

- .1 Stir coating thoroughly.
- .2 A tighter bond to porous surfaces will result if the surface is damp when coating is applied.
- .3 Apply coating with a soft bristle brush or heavy duty spray equipment.
 - .1 For best results, keep brush strokes in one direction and apply additional coats at a right angle to the former coat. Avoid excessive brushing.

- .2 For spraying, use Graco 9:1 ratio pump or equivalent, capable of delivering 12-19 litres per minute, and a pole gun with 3-6 mm tip.
- .1 A 19 mm I.D. material hose from the pump to gun is preferred for most applications.

3.4 DAMPPROOFING OF EXTERIOR SURFACES BELOW GRADE - DENSE SURFACES

- .1 For dense concrete surfaces not subject to hydrostatic pressure, apply a single coat of non-fibred asphalt emulsion dampproofing, approximately 1.6 mm thick.
- .2 If applying by spray or for severe conditions, apply two coats at the rate of . Apply each coat at 8 to 10 litres 10 m²., allowing the first coat to dry before applying the second coat.
- .3 Fill in all crevices and grooves, making sure the coating is continuous and free from breaks and pinholes. Carry coating over the exposed top and outside edge of the footing.
- .4 Spread around all joints, grooves, and slots and into all chases, corners, reveals and soffits.
- .5 Bring the coating to finished grade.

3.5 DRYING

- .1 Allow adequate drying time, usually 8 to 12 hours in warm dry weather, up to 2 to 7 days in cool damp weather.
- .2 Allow to dry between coats.
- .3 On below-grade foundations, let cure at least 24 to 48 hours, with good air circulation, before exposure to water or backfilling.
- .4 Use forced air if needed.
- .5 Be advised that coating becomes waterproof only after drying thoroughly. Test for dryness in slowest drying area by vigorously rubbing the surface with a wet finger. Coating is dry if no staining occurs.
- .6 Protect the dry membrane from back-filling damage.
- .7 Be advised that the fluid-applied dampproofing membrane is not designed for permanent UV exposure. Apply insulation, and backfill as soon as possible after dampproofing membrane installation.

3.6 CLEANING AND PROTECTION

- .1 Progress Cleaning: Leave the work area clean at the end of each work day, ensuring safe movement of passing pedestrians.
- .2 Protect dampproofing from damage and wear during the remainder of the construction period.

- .3 Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.
- .4 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .5 Make good damage to other work caused by the Work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to supply and install board and batt insulation, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Work:
 - .1 Cast-in-place concrete: Refer to structural specifications under separate cover.
 - .2 Section 04 22 00 - Concrete Unit Masonry.
 - .3 Section 06 10 00 - Rough Carpentry.
 - .4 Section 07 11 13 - Bituminous Dampproofing.
 - .5 Section 07 21 19 - Spray-Applied Urethane Foam Insulation.
 - .6 Section 07 21 20 - Urethane Foam Insulating Sealant.
 - .7 Section 07 27 16 - Vapour Permeable Air/Moisture Barrier.
 - .8 Section 31 23 10 - Excavating, Trenching and Backfilling.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM D1621-16(2023), Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
 - .2 ASTM E96/E96M-24a, Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.
- .2 Health Canada / Workplace Hazardous Materials Information System (WHMIS):
 - .1 Material Safety Data Sheets (MSDS).
- .3 Underwriters' Laboratories of Canada (ULC):
 - .1 CAN/ULC 102.2:18, Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.
 - .2 CAN/ULC 114:2018, Standard Method of Test for Determination of Non-Combustibility in Building Materials.
 - .3 CAN/ULC 701.1:2025, Standard for Thermal Insulation, Polystyrene Boards.
 - .4 CAN/ULC S702.1:2021, Standard for Mineral Fibre Insulation for Buildings, Part 1: Material Specification.
 - .5 CAN/ULC 704.1:2023, Thermal Insulation, Polyurethane and Polyisocyanurate, Boards.

1.4 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.

- .2 Samples:
 - .1 Submit, for the Consultant's acceptance, a sample of each type of insulation and each accessory proposed for use.
- .3 Product Data:
 - .1 Provide complete technical product data for each product.
 - .2 Include installation instructions for each application.
 - .3 Include manufacturer's material safety data sheets for the safe handling of the specified materials and products, in accordance with Workplace Hazardous Materials Information Service (WHMIS) requirements.
- .4 Quality Assurance/Control Submittals:
 - .1 Certificates: Manufacturer's certificate that products meet or exceed specified requirements.
 - .2 If requested by the Consultant, submit laboratory test reports certifying compliance of insulation products with specification requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver products in original unopened packaging with legible manufacturer's identification.
- .2 Store materials in strict accordance with the manufacturer's recommendations.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 MANUFACTURERS

- .1 This specification is based on products by the specified manufacturers.
- .2 Requests for substitutions will be considered in accordance with provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.

2.2 INSULATION MATERIALS

- .1 Below grade - foundation walls and under slab and where not otherwise indicated: Polystyrene board insulation to CAN/ULC 701,1, Type 4, square ends, shiplap edges except where otherwise indicated, thickness as indicated. Standard of Acceptance: Styrofoam SM, properties as follows:
 - .1 Minimum RSI 0.87 m².°C/W per 25 mm thickness.
 - .2 Compressive strength 210 kPa.

- .2 Above grade walls: Rigid foam, vapour permeable, water resistive, sheathing insulation made from BASF Neopor 5300 GPS expanded polystyrene containing graphite and coated with a perforated reflective laminate to Can/ULC 701.1, Type 1. Standard of acceptance: Halo Exterra rigid EPS foam insulation, properties as follows:
 - .1 Size: 1219 mm x 2438 mm boards cut to fit x 38 mm thick except where otherwise shown.
 - .2 Thermal insulation value: RSI 0.88 m².°C/W per 25.4 mm thickness.
 - .3 Compressive strength at 10% deformation (25.4 mm thick board) (ASTM D1621): 70 kPa.
 - .4 Water vapour permeance (38 mm thick board) (ASTM E96): 77ng/Pa.s.m².
 - .5 Surface burning characteristics (CAN/ULC 102.2)
- .3 Batt insulation: Semi-rigid mineral wool batt insulation made from basalt rock and steel slag, conforming to ULC 702, Type 1. Standard of acceptance: Rockwool Comfortbatt.

2.3 ACCESSORIES

- .1 Provide adhesives, mechanical fasteners, insulation clips, metal flashings, and other accessories as recommended by the insulation manufacturer to retain the insulation in position, for each specific application.
- .2 Sealants: As recommended by the insulation manufacturer for each specific application.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Where applicable, verify that the air vapour barrier is in place and undamaged and has been reviewed and accepted by the Consultant.
- .3 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .4 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 WORKMANSHIP

- .1 Do not install insulation until the work behind it has been reviewed and accepted by the Consultant.
- .2 Install insulation in strict accordance with the insulation manufacturer's written instructions, to maintain continuity of thermal, acoustical and fire protection to building elements and spaces.
- .3 Apply single layer of insulation to produce thickness indicated, except where multiple layers are indicated or required to make up total thickness. Offset both vertical and horizontal joints in multiple layer applications.

- .4 Use only insulation that is undamaged, dry, unsoiled, free from chipped or broken edges, and has not been exposed at any time to ice and snow.
- .5 Cut and trim insulation to a neat compression-fit in spaces. Do not compress insulation excessively to fit spaces. Butt joints tightly. Use largest possible dimensions to reduce number of joints.
- .6 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation in accordance with the manufacturer's instructions.
- .7 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of chimneys and vents.
- .8 Where necessary, retain insulation in position with adhesives or mechanical fasteners recommended by the insulation manufacturer for the specific application.
- .9 Do not enclose insulation until it has been reviewed and accepted by the Consultant.

3.3 BATT INSULATION

- .1 Install batt insulation where indicated in accordance with the manufacturer's instructions to completely fill voids
 - .1 Cut and fit into spaces and around penetrations and protrusions with a snug friction fit.
 - .2 Fill voids with insulation or foam sealant as specified in Section 07 21 20 "Urethane Foam Insulating Sealant"

3.4 CLEANING

- .1 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Trim surplus urethane foam insulating sealant from adjacent surfaces.
- .3 Make good damage to other work caused by the Work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required install spray-applied polyurethane-based foamed-in-place insulation, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Section 06 10 00 - Rough Carpentry.
 - .2 Section 06 17 53 - Shop-Fabricated Wood Trusses.
 - .3 Section 07 26 00 - Sheet Vapour Retarders.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM C411-19, Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
 - .2 ASTM C518-21, Standard Test Method for Steady State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - .3 ASTM D1621-16(2023), Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
 - .4 ASTM D1622-20, Standard Test Method for Apparent Density of Rigid Cellular Plastics.
 - .5 ASTM D1623-17(2023), Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
 - .6 ASTM D2126-25, Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
 - .7 ASTM E96/E96M-24a, Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.
 - .8 ASTM E2178-21a, Standard Test Method for Determining Air Leakage Rate and Calculation of Air permeance of Building Materials.
- .2 Canadian Construction Materials Centre (CCMC).
- .3 International Standards Organization (ISO):
 - .1 ISO/IEC 17024:2012, Conformity Assessment. General Requirements for Bodies Operating Certification of Persons.
- .4 Underwriters' Laboratories of Canada (ULC):
 - .1 CAN/ULC 102:2019, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

- .2 CAN/ULC 705.2:2022, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density - Application.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate the work of this Section with the work of other trade contractors for proper time and sequence to avoid construction delays.
- .2 Pre-Installation Meeting: Convene a pre-installation meeting after Award of Contract and approximately one week prior to commencement of the work of this Section to verify project requirements, substrate conditions and co-ordination with other building trade contractors, and to review the manufacturer's written application recommendations.
 - .1 Attendees shall include:
 - .1 Contractor.
 - .2 Consultant.
 - .3 Spray foam insulation applicator.
 - .4 Manufacturer's technical representative.
 - .5 Other trades whose work affects or is affected by the work of this Section.
 - .2 The meeting agenda shall include a review of methods and procedures related to foamed-in-place polyurethane insulation application including coordination with related work.
 - .3 The Contractor will record meeting proceedings including corrective measures and other actions required to ensure successful completion of the work and will distribute to each attendee within 1 week of the meeting.

1.5 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Product Data: Submit product data including manufacturer's literature for foamed-in-place polyurethane insulation components and accessories, indicating compliance with specified requirements and material characteristics.
 - .1 Submit a list, on the spray foam insulation manufacturer's letterhead, of materials, components and accessories to be incorporated into the Work.
 - .2 Include details of insulation joints connections to sealants. Verify that the joint sealant and insulation are compatible.
 - .3 Include product names, types and series numbers.
 - .4 Include contact information for the manufacturer and their representative for this Project.
- .3 Test Reports: Submit test reports, verifying that insulation meets or exceeds the requirements of this specification.
 - .1 Submit test reports to ULC 102 for surface burning characteristics.
- .4 Field Reports: Submit third party inspection agency's field reports within 5 days of the agency representative's site visit and inspection.
- .5 Applicator Qualifications: Submit a letter on the spray foam insulation manufacturer's letterhead verifying the applicator's certification for work similar to the work of this Section.

- .6 Closeout Submittals:
 - .1 Record Documentation: In accordance with Section 01 00 10 "General Instructions":
 - .1 List materials used in foamed-in-place polyurethane insulation work.
 - .2 Warranty: Submit warranty documents specified.

1.6 QUALITY ASSURANCE

- .1 Applicator Qualifications: Verify that the applicator of foamed-in-place polyurethane insulation is licensed by ISO/IEC 17024 certification organization recognized by CCMC.
- .2 Quality Assurance Program: Use only third party quality assurance providers certified to ISO/IEC 17024 and recognized by CCMC.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver foamed-in-place polyurethane insulation materials and components in the manufacturer's original packaging with identification labels intact and in sizes to suit the project.
- .2 Store materials off ground and protected from exposure to harmful weather conditions.
 - .1 Store materials at temperatures between 18°C and 21°C.

1.8 ENVIRONMENTAL REQUIREMENTS

- .1 Apply foamed-in-place polyurethane insulation only when surfaces and ambient temperatures are within the manufacturers' prescribed limits:
 - .1 Substrate temperature for Summer Grade: 10°C to 40°C.
 - .2 Substrate temperature for Winter Grade: -10°C to 10°C.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 00 10 "General Instructions".
- .2 Handle and dispose of waste materials, including packaging materials, generated by the work of this Section in accordance with the Waste Management Plan.

1.10 WARRANTY

- .1 For the work of this Section, the 12-months warranty period prescribed in the General Conditions of the Contract is extended to 10 years.
- .2 Submit, for the Owner's acceptance, a manufacturer's standard warranty document executed by an authorized company official.
 - .1 Manufacturer's warranty is in addition to and not intended to limit other rights the Owner may have under the Contract Conditions.
 - .2 Warranty period: 3 years commencing on the Date of Substantial Performance of the Work.

- .3 The warranty shall include coverage of the applied foamed-in-place polyurethane insulation which:
 - .1 Fails to achieve airtight and watertight seal.
 - .2 Exhibits loss of adhesion or cohesion.
 - .3 Does not cure.

Part 2 Products

2.1 MANUFACTURERS

- .1 This specification is based on Sealtite spray-applied polyurethane foam insulation by Carlisle.
- .2 Walltite by BASF is an acceptable alternative.
- .3 Requests for substitutions will be considered in accordance with the provisions of Section 01 00 10 "General Instructions". Acceptance of alternative products is subject to the approval of the Consultant.

2.2 MATERIALS

- .1 Two-Component spray-applied medium density closed-cell polyurethane foam insulation and air barrier. Standard of acceptance: SealTite PRO Closed Cell, summer or winter grade as appropriate to schedule, performance characteristics as follows:
 - .1 Thermal Resistance to ASTM C518: 1.2 RSI per 25 mm..
 - .2 Density to ASTM D1622: 32 kg/m³.
 - .3 Water vapour transmission @ 89 mm thickness to ASTM E: 0.23 perms.
 - .4 Closed cell content: Minimum 90%
 - .5 Air Permeability @ 25 mm thickness to ASTM E2178: 0.02 L/s m².
 - .6 Surface Burning Characteristics to CAN/ULC 102:
 - .1 Flame spread: 25.
 - .2 Smoke developed: 450..
 - .7 Hot Surface Performance to ASTM C411: 90°C.
 - .8 Dimensional Stability to ASTM 2126: 9% volume change @ 28 days.
 - .9 Compressive Strength to ASTM D1621: 324 kPa.
 - .10 Tensile Strength to ASTM D1623: 406 kPa minimum.

2.3 ACCESSORIES

- .1 Primers: In accordance with the foamed-in-place polyurethane insulation manufacturer's written recommendations for the specific surface conditions.
- .2 Joint Sealants: In accordance with Section 07 92 00 "Joint Sealants".
 - .1 Ensure sealants are compatible with foamed-in-place polyurethane insulation.
 - .2 Acceptable material: In accordance with foamed-in-place polyurethane manufacturer's written recommendations.

Part 3 Execution

3.1 APPLICATORS

- .1 Use applicators who have been trained by the foamed-in-place polyurethane manufacturer and certified by ISO/IEC 17024 certification organization recognized by CCMC.

3.2 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Verify that conditions of the substrate are acceptable for foamed-in-place polyurethane insulation application in accordance with the manufacturer's written recommendations.
 - .1 Visually inspect substrate in presence of Construction Manager and the Consultant.
 - .1 Ensure substrates are clean of oil or excess dust.
 - .2 Ensure that substrate temperatures are within the manufacturer's parameters for the product being applied.
 - .3 Ensure that there is no surface spalling.
 - .4 Ensure sealants completely fill gaps in the substrate and at joints and are applied in accordance with Section 07 92 00 "Joint Sealants".
- .3 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .4 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.3 PREPARATION

- .1 Remove loose or foreign matter, which might impair adhesion of materials.
- .2 Ensure the substrate is free of frost and surface moisture prior to application of foamed-in-place insulation.

3.4 APPLICATION

- .1 Apply foamed-in-place insulation to clean surfaces in accordance with the manufacturer's printed instructions and with CAN/ULC 705.2.
- .2 Apply primer to substrate where required in accordance with the manufacturer's written recommendations.
- .3 Site-mix liquid components in accordance with the manufacturer's written recommendations.
- .4 Use only high pressure sprayers to apply foamed-in-place insulation
 - .1 Apply evenly in 15 mm to 50 mm thick increments.

- .5 Apply foamed-in-place polyurethane insulation to the thicknesses as indicated on the drawings. Apply in two applications progressively with the erection of the supporting framework for the preformed metal siding system.
 - .1 Coordinate the scheduling of the work with Sections 04 26 13 "Brick Masonry Veneer" and 07 42 46 "Cementitious Wall Panels".

3.5 FIELD QUALITY CONTROL

- .1 Field Inspection: Co-ordinate third party field inspection in accordance with Section 01 45 00 "Quality Control".
 - .1 Schedule and pay for site visits to review work at the following stages:
 - .1 Twice during the progress of the work at 25% and 60% complete.
 - .2 Upon completion of the work, after cleaning is carried out.
 - .2 Report deficiencies immediately to the Consultant.
 - .3 Obtain written reports within 10 days of review and submit immediately to the Consultant.
- .2 Site Application Tolerances:
 - .1 Thickness: +6 mm, -0 mm of thickness indicated.

3.6 CLEANING

- .1 Progress Cleaning: Perform cleanup as work progresses. Leave work area clean at end of each day.
- .2 Upon completion of the work of this section, remove from the premises all surplus material, rubbish, dirt and debris, tools and equipment caused by the work of this Section and leave the installation clean.
- .3 Clean drippage and spills of surplus foam insulation from adjacent surfaces.
- .4 Make good damage caused by the work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

3.7 PROTECTION

- .1 Protect applied materials from damage during construction.
 - .1 Repair damage to foamed-in-place polyurethane insulation caused by ongoing construction.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to install polyurethane foam insulating sealant, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Work:
 - .1 Section 07 21 00 - Board and Batt Insulation.
 - .2 Section 07 21 19 - Spray-Applied Urethane Foam Insulation.
 - .3 Section 07 27 16 - Vapour Permeable Air/Moisture Barrier.
 - .4 Section 07 92 00 - Joint Sealants.
 - .5 Section 08 11 13 - Steel Doors and Frames.
 - .6 Section 08 11 16 - Aluminum Doors and Frames.
 - .7 Section 08 53 13 - Aluminum-Clad Vinyl Windows.

1.3 REFERENCES

- .1 Health Canada / Workplace Hazardous Materials Information System (WHMIS):
 - .1 Material Safety Data Sheets (MSDS).
- .2 Underwriters' Laboratories of Canada (ULC):
 - .1 CAN/ULC 102:2019, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.4 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Product Data:
 - .1 Provide complete technical product data.
 - .2 Include application instructions.
 - .3 Include manufacturer's material safety data sheets for the safe handling of the specified materials and products, in accordance with Workplace Hazardous Materials Information Service (WHMIS) requirements.

1.5 ENVIRONMENTAL REQUIREMENTS

- .1 Apply insulation only when surfaces and ambient temperatures are within the manufacturer's prescribed limits.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver products in original unopened packaging with legible manufacturer's identification.
- .2 Store materials in strict accordance with the manufacturer's recommendations.

1.7 COMPATIBILITY

- .1 Provide written certification, signed by the insulating sealant manufacturer, that sealant is fully compatible with the building air and vapour barrier membranes and other adjacent materials. Confirm that the membranes will not shrink and pull a membrane away from its substrate.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 MATERIAL

- .1 Foam insulating sealant: Two-component polyurethane foam insulating sealant, ULC Class I (flame spread of 25 or less) to ULC-102.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Ensure that surfaces are free of dust, oil, grease and other loose debris which may impair bond.
- .3 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .4 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 PROTECTION

- .1 Provide suitable protective masking to adjacent exposed surfaces.

3.3 FOAM INSULATING SEALANT APPLICATION

- .1 Apply foam insulating sealant in strict accordance with the manufacturer's printed directions, using dispensing gun from material manufacturer. Fill all voids in the exterior wall insulation with sealant.
- .2 Apply in all locations where required to maintain the continuity of the insulation and/or the vapour barrier, including, but not necessarily limited to the following:
 - .1 Sealing voids in the exterior envelope of the building and at all locations where the continuity of the insulation is interrupted.
 - .2 Sealing at junctions between materials and components which comprise the air barrier as required to maintain continuity of the air barrier.
 - .3 All locations indicated on the drawings.
- .3 Note that this material expands 2.5 times its original volume when applied. Do not overfill voids.
- .4 If necessary, apply in several layers, each successive layer being allowed to cure before next layer is applied.
- .5 Curing may be accelerated in deep cavities by slight moistening of surrounding surfaces prior to application.
- .6 While curing, tool foam if required.
- .7 If leakage occurs after curing, cut back flush with surrounding surfaces or recess to sufficient depth to provide for finishing caulking.

3.4 CLEANING

- .1 Upon completion of the work of this Section remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Remove masking and temporary protection from adjacent surfaces.
- .3 Make good damage to other work caused by the Work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to install sheet vapour retarders under the concrete floor slab, to exterior walls and the building envelope, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Work:
 - .1 Cast-in-place concrete: Refer to structural specifications under separate cover.
 - .2 Section 04 22 00 - Concrete Unit Masonry.
 - .3 Section 07 21 00 - Board and Batt Insulation.

1.3 REFERENCES

- .1 American Concrete Institute (ACI):
 - .1 ACI 302.1R-15, Concrete Floor and Slab Construction.
 - .2 ACI PRC 302.2-22, Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
- .2 American Society for Testing and Materials (ASTM):
 - .1 ASTM D1709-24, Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.
 - .2 ASTM E96/E96M-24a, Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.
 - .3 ASTM E154/E154M-08a(2025), Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.
 - .4 ASTM E1643-24, Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
 - .5 ASTM E1745-17(2023), Standard Specification for Water Vapor Retarders Used in Contact with Soil.
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS):
 - .1 Material Safety Data Sheets (MSDS).

1.4 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.

- .2 Product Data:
 - .1 Submit manufacturer's product data on sheet vapour retarder and joint tape specified, including data substantiating that materials comply with specified requirements.
 - .2 Include installation instructions.
 - .3 Include manufacturer's material safety data sheets for the safe handling of the specified materials and products, in accordance with Workplace Hazardous Materials Information Service (WHMIS) requirements.
- .3 Samples: Submit duplicate minimum 150 mm x 150 mm samples of each type of sheet material and minimum 1 m joint tape.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials to project site in original packages with seals unbroken, labelled with manufacturer's name, product, date of manufacturer, and directions for storage.
- .2 Store materials in their original undamaged packages in a clean, dry, protected location and within the temperature range required by the material manufacturer. Protect stored materials from direct sunlight.
- .3 Stack material on smooth ground or wood platform to eliminate warping.
- .4 Protect materials during handling and application to prevent damage or contamination.

1.6 ENVIRONMENTAL REQUIREMENTS

- .1 Be advised that these products are not intended for uses subject to abuse or permanent exposure to ultra violet light.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 MANUFACTURERS

- .1 This specification is based on the specified products.
- .2 Requests for substitutions will be considered in accordance with the provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.

2.2 MATERIALS

- .1 Sheet vapour retarder for walls: 0.15 mm polyethylene sheet.
- .2 Sheet vapour retarder / moisture barrier for concrete slab-on-grade: 0.38 mm thick polyolefin-based vapour barrier/retarder specifically formulated for use under concrete slab-on-grade, with the following minimum performance characteristics:
 - .1 Water vapour permeance (ASTM E96, Water Method): 0.0093 Perms
 - .2 Puncture resistance (ASTM D1709, Method B): > 4300 Grams
 - .3 Tensile strength (ASTM E154, Section 9): 84 lb force/inch
 - .4 Water vapour permeance (after wetting out), drying out and after long term soaking (ASTM E154, Section 8 and ASTM E96, Procedure B): 0.0136 Perms
 - .5 Water vapour permeance, resistance to plastic flow and elevated temperature (ASTM E154, Section 11 and ASTM E96, Procedure B): 0.0121 Perms
 - .6 Water vapour permeance, effect of low temperature and flexibility (ASTM E154, Section 12 and ASTM E96, Procedure B): 0.0140 Perms
 - .7 Water vapour permeance, resistance to deterioration from organisms and substances in contacting soil (ASTM E154, Section 13 and ASTM E96, Procedure B): 0.0123 Perms
 - .8 Material shall meet or exceed all requirements of ASTM E1745, Class A, B and C.
 - .9 Material shall meet or exceed the vapour retarder / moisture barrier recommendations of ACI 302.2R.
 - .10 Standard of acceptance:
 - .1 Permiator 15 mil by W. R. Meadows.
 - .2 Stego Wrap Vapour Barrier by Stego Industries LLC.

2.3 ACCESSORIES

- .1 Seam tape: Tape with pressure sensitive adhesive, as recommended by the membrane manufacturer for each specific product:
 - .1 Under slab-on-grade: 100 mm.
- .2 Staple Fasteners: 6 mm narrow crown staples minimum length 12 mm installed at 300 mm o.c.
- .3 Pointing mastic: As recommended by the membrane manufacturer.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Verify that services are installed and have been reviewed and accepted by the Consultant prior to installation of the vapour retarder.

- .3 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .4 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 SURFACE PREPARATION

- .1 Prepare surfaces in accordance with manufacturers instructions.
- .2 For under-slab-on-grade application, level, tamp, or roll earth or granular material beneath the slab base in accordance with ASTM E1643. and ACI 302.1R prior to placement of the membrane.

3.3 INSTALLATION - WALLS

- .1 Install sheet vapour retarder in accordance with manufacturer's instruction.
- .2 Install sheet vapour retarder on the warm side of exterior building envelope assemblies prior to the installation of gypsum board to form a continuous barrier.
- .3 Unroll vapour retarder with the longest dimension parallel with the insulated wall.
- .4 Lap vapour retarder over head and sill plates.
- .5 Use sheets of largest practical size to minimize joints. Overlap vapour retarder joints 75 mm and seal with tape.
- .6 Installed vapour retarder shall form a complete and continuous envelope at exterior building elements, properly sealed at joints, fastenings and penetrations, effectively resisting moisture migration.
- .7 Coordinate the installation of the vapour retarder with the installation of the fluid-applied air/vapour/moisture barrier specified in Section 07 27 19 to ensure continuity between the vapour retarder and the air barrier at door and window openings and other penetrations.
- .8 Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapour retarders with tape of type recommended by vapour retarder manufacturer to create an air-tight seal between penetrating objects and vapour retarder.
- .9 Minimize wrinkles along the stud surfaces to make gypsum board installation easier.
- .10 Inspect sheets for continuity. Repair punctures and tears with sealing tape or another layer of vapour retarder before work is concealed. Where a vapour retarder is punctured, apply a patch with a minimum of 150 mm overlap in any direction. Tape continuously around the perimeter of each patch.

- .11 To ensure continuity of the vapour barrier at all locations, install strips of vapour retarder material of sufficient widths at all intersecting walls, at tops of walls at joist bearings, and at all other locations where subsequent work would otherwise prevent installation of a continuous vapour retarder membrane.

3.4 INSTALLATION - UNDER SLAB-ON-GRADE

- .1 Install vapour retarder / moisture barrier membrane in accordance with the manufacturer's instructions.
- .2 Unroll membrane over the area where the slab is to be poured. Cut to size. The membrane must completely cover the pour area. Use sheets of largest practical size to minimize joints.
- .3 Overlap all joints/seams, both side and end minimum 150 and tape using 100 mm wide tape. The tape area of adhesion must be free from dust, dirt, and moisture to allow maximum adhesion of the pressure-sensitive tape.
- .4 Before placing concrete slab, ensure all penetrations, block outs, and damaged areas are repaired/addressed.
- .5 Seal all protrusions. Cut a slit around pipes, ductwork, rebar, and wire penetrations to place the initial layer of membrane. To further protect the concrete slab from external moisture sources, use a piece of membrane and place a collar around this as well.
 - .1 Cut a piece of membrane minimum 300 mm wide x $1\frac{1}{2}$ times the pipe circumference. With a roofer's knife or scissors, cut "fingers" half the width of the film.
 - .2 Wrap around and tape the collar onto the pipe and completely tape fingers to the bottom layer of membrane.
- .6 Inspect membrane for continuity. Repair damage to the membrane occurring during or after installation.
 - .1 Cut a piece of membrane large enough to cover any damage by a minimum overlap of 150 mm in all directions.
 - .2 Clean all adhesion areas of dust, dirt, and moisture.
 - .3 Tape down all edges using the manufacturer's recommended 100 mm wide tape.
- .7 Leave ready to receive concrete slab, poured directly on the vapour retarder / moisture barrier membrane.

3.5 CLEANING

- .1 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Make good damage to other work caused by the Work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY OF WORK

- .1 Work Included:
 - .1 The work of this Section includes the provision of all labour, materials, equipment and services required to supply and install a self-adhered, vapour permeable air/moisture barrier system, as indicated on the drawings, as specified herein and as required for a complete project.
 - .2 The air/moisture barrier system includes:
 - .1 Adhesive/Primer
 - .2 Self-Adhered Water Resistive Air Barrier
 - .3 Sealant
- .2 Related Sections:
 - .1 Section 04 22 00 - Concrete Unit Masonry.
 - .2 Section 07 21 00 - Board and Batt Insulation
 - .3 Section 07 21 20 - Urethane Foam Insulating Sealant.
 - .4 Section 07 26 00 - Sheet Vapour Retarders.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM D412-16(2021), Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension.
 - .2 ASTM D882-18, Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
 - .3 ASTM D1970/D1970M-21, Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
 - .4 ASTM D2247-15(2020), Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
 - .5 ASTM E84-23c, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .6 ASTM E96/E96M-23, Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.
 - .7 ASTM E2178-21a, Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials.
 - .8 ASTM E2357-23a, Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies.
- .2 Health Canada / Workplace Hazardous Materials Information System (WHMIS):
 - .1 Material Safety Data Sheets (MSDS).

- .3 International Code Council (ICC):
 - .1 ICC-ES AC-38, Acceptance Criteria for Water-Resistive Barriers.
 - .2 ICC-ES AC-48, Acceptance Criteria for Self-Adhered Roof Underlayments for Use as Ice Barriers.
- .4 National Fire Protection Association (NFPA):
 - .1 NFPA (Fire) 285-2022, Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components, 2023 Edition.

1.4 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Product Data: Provide the following product data.
 - .1 Air Barrier Manufacturer's guide specification.
 - .2 Air Barrier Manufacturer's complete set of technical data sheets for assembly.
 - .3 Air Barrier Manufacturer's complete set of guide details for assembly.
- .3 Certificates:
 - .1 Product certification confirming assembly components are supplied and warranted by a single source Air Barrier Manufacturer.
- .4 Tests and Evaluation Reports:
 - .1 NFPA 285 wall assembly compliance:
 - .1 Air Barrier Manufacturer statement that anticipated wall assembly complies with NFPA 285.
 - .2 Submit documentation from an independent testing agency acceptable to the Consultant certifying compliance with:
 - .1 The air leakage rates of the air barrier membrane assembly, including primary membrane, primer and sealants have been tested to meet ASTM E2357.
 - .2 Acceptance criteria prescribed in ICC-ES AC-38.
 - .3 Peel adhesion to unprimed plywood and and cyclic and elongation per ICC-ES AC-48.
 - .4 Class a Flame Spread Index to ASTM E84.
 - .3 Submit documentation from an independent testing agency certifying the air leakage and vapour permeance rates of the air barrier membrane, including primary membrane and transition sheets, exceed OBC requirements and in accordance with ASTM E2178.
 - .1 Test report submittals shall include test results of sustained wind loads and gust load air leakage results.
- .5 Shop Drawings:
 - .1 Indicate layout, sections, details, materials, flashings, membrane terminations, membrane penetrations, control joints, and accessories.
 - .2 Include details for all penetrations, including penetrations not detailed on the architectural drawings.

- .6 Warranty:
 - .1 Sample warranty as specified.

1.5 QUALITY ASSURANCE

- .1 Single Source Responsibility:
 - .1 Obtain air barrier and auxiliary materials including adhesive/primer, air barrier, flashings, and sealants from a single air barrier manufacturer regularly engaged in the manufacturing and supply of the specified products.
 - .2 The Contractor to verify product compliance with federal, provincial, and local regulations controlling use of Volatile Organic Compounds (VOC).
- .2 Applicator Qualifications:
 - .1 The work of this Section shall be executed by a company approved by the material manufacturer as an applicator, using skilled tradesmen who are fully familiar with the application of air/moisture/vapour barrier membranes and are experienced in this work.
 - .2 Perform the work in accordance with manufacturer's written instructions and this specification.
 - .3 Maintain one copy of the manufacturer's written installation instructions on site.
 - .4 Allow access to Work site by the air barrier membrane manufacturer's representative.

1.6 PRE-INSTALLATION CONFERENCE

- .1 Convene a preinstallation conference with the following present:
 - .1 Contractor
 - .2 Consultant
 - .3 Installer
 - .4 Manufacturer's technical representative
 - .5 Other trades whose work affects or is affected by the work of this section.
 - .1 Ensure all subcontractors responsible for creating a continuous plane of air tightness are present.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Refer to current Product MSDS for proper storage and handling.
- .2 Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.
- .3 Storage of Materials:
 - .1 Store materials as recommended by the air barrier manufacturer and conforming to applicable safety regulatory agencies. Refer to all applicable data including, but not limited to, MSDS information, product data sheets, product labels, and specific instructions for personal protection.
 - .2 Keep solvents away from open flame or excessive heat.
 - .3 Store materials in original packaging.
 - .4 Protect rolls from direct sunlight until ready for use.

.5 Refer to air barrier manufacturer's published literature.

.4 Handling: Refer to air barrier manufacturer's published literature.

1.8 SITE CONDITIONS

.1 Environmental Requirements:

.1 Perform no work during rain or inclement weather.

.2 Perform no work on frost covered or wet surfaces.

.2 Protection:

.1 It is the responsibility of the installing Trade Contractor to protect all adjacent surfaces from overspray, including, but not limited to, windows, doors, adjacent areas, and vehicles.

.2 Cap and protect exposed back-up walls against wet weather conditions during and after application of the membrane.

.3 Ensure all preparation Work is completed prior to installing the air barrier.

.4 All equipment shall be grounded during operations.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".

.2 Handle and dispose of waste materials, including packaging materials, generated by the work of this Section in accordance with the Waste Management Plan.

1.10 WARRANTY

.1 In addition to the 12-months warranty prescribed in the General Conditions of the Contract, provide a manufacturer's warranty against product defect for a period of 12 years from the date of the date of substantial performance.

Part 2 Products

2.1 GENERAL

.1 This specification is based on Blueskin Air Barrier Membrane by Henry Company.

.2 Requests for substitutions will be considered in accordance with provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.

.3 Air Barrier and auxiliary materials must be obtained as a single-source from the air barrier manufacturer to ensure total system compatibility and integrity.

2.2 PRIMARY AIR/MOISTURE BARRIER MEMBRANE

- .1 Primary Sheet-Applied, Vapour Permeable Water Resistive Air Barrier: Self-adhered vapour permeable, water resistive air barrier consisting of a reinforced, modified polyolefin tri-laminate film surface and patented permeable adhesive technology with split-back poly-release film.
 - .1 Standard of acceptance: Blueskin VP160 by Henry Co.
 - .2 The air barrier shall have the following typical physical properties:
 - .1 Colour: Blue
 - .2 Thickness: 0.58 mm
 - .3 Water Vapour Permeance (ASTM E96): 29 perms
 - .4 Air Leakage of Air Barrier Assemblies (ASTM E2357): Pass
 - .5 Air Permeance (ASTM E2178): Pass
 - .6 Nail Sealability (ASTM D1970): Pass
 - .7 Dry Tensile Strength (ASTM D882):
 - .1 41 lbf /182N MD
 - .2 29 lbf /129N CD
 - .8 Surface Burning Characteristics (ASTM E84):
 - .1 Flame Spread: Class A
 - .2 Smoke Development: Class A
 - .9 Low Application Temperature: -7°C

2.3 ASSEMBLY AUXILIARY MATERIALS

- .1 Adhesives/Primers: One or more of the following products as recommended by the manufacturer for each specific application:
 - .1 Standard VOC adhesive: Synthetic rubber based quick setting adhesive.
 - .1 Standard of acceptance: Blueskin Adhesive by Henry Co.
 - .2 Adhesive shall have the following typical physical properties:
 - .1 Colour: Blue
 - .2 Maximum VOC: 450 g/L
 - .3 Drying time (initial set): 30 minutes
 - .4 Low Application Temperature: -12°C
 - .2 Low VOC adhesive: Synthetic rubber based quick setting adhesive with low VOC content.
 - .1 Standard of acceptance: Blueskin LVC Adhesive by Henry Co.
 - .2 Adhesive shall have the following typical physical properties:
 - .1 Colour: Blue
 - .2 Maximum VOC: <240 g/L
 - .3 Drying time (initial set): 30 minutes
 - .4 Low Application Temperature: -12°C
 - .3 Aerosol spray adhesive: Quick drying spray adhesive used to prepare construction surfaces for the application of flashings.
 - .1 Standard of acceptance: Blueskin Spray Prep Adhesive by Henry Co.
 - .2 Spray adhesive shall have the following typical physical properties:
 - .1 Colour: Clear amber
 - .2 Solids by weight: 35%
 - .3 Drying time (initial set): 3 minutes
 - .4 Low Application Temperature: -23°C

- .4 Quick setting primers:
 - .1 Synthetic rubber based quick setting adhesive with low VOC content.
 - .1 Standard of acceptance: Blueskin LVC Spray Primer by Henry Co.
 - .2 Primer shall have the following typical physical properties:
 - .1 Colour: Blue
 - .2 Maximum VOC: 250 g/L
 - .3 Dry time: 1-3 minutes
 - .4 Low Application Temperature: 4.4°C
 - .2 Polymer emulsion water based quick setting adhesive with low VOC content.
 - .1 Standard of acceptance: Aquatac Primer by Henry Co.
 - .2 Primer shall have the following typical physical properties:
 - .1 Colour: Aqua
 - .2 Maximum VOC: 50 g/L
 - .3 Drying time (initial set): 30 minutes
 - .4 Low Application Temperature: -4°C
- .2 Liquid-Applied Flashing: Moisture-curing single component elastomeric liquid-applied flashing using a highly advanced Silyl-Terminated Polyether (STPE) polymer curing to a monolithic membrane.
 - .1 Standard of acceptance: Air-Bloc LF Liquid-Applied Flashing by Henry Co.
 - .2 Liquid applied flashing shall have the following typical physical properties:
 - .1 Colour: Blue
 - .2 Air Permeance (ASTM E2178): Pass
 - .3 Water Vapour Permeance (ASTM E96): 21.8 perms @ 25 mils
 - .4 Air Leakage of Air Barrier Assemblies (ASTM E2357): Pass
 - .5 Water Resistance (AC212/ASTM D2247): Pass
 - .6 Nail Sealability (AAMA 711): Pass
 - .7 Surface Burning Characteristics (ASTM E84):
 - .1 Flame Spread: Class A
 - .2 Smoke Development: Class A
 - .8 Elongation (D412): 264%
 - .9 Low Application Temperature: -7°C
- .3 Sealants:
 - .1 Building Envelope Sealant: Moisture cure, medium modulus polymer modified sealing compound.
 - .1 Standard of acceptance: 925 BES Sealant by Henry Co.
 - .2 Sealant shall have the following typical physical properties:
 - .1 Colour: Varies
 - .2 Elongation: 450 - 550%.
 - .2 Termination Sealant: One-part high performance synthetic rubber sealant.
 - .1 Standard of acceptance: 212 All Purpose Crystal Clear Sealant by Henry Co.
 - .2 Sealant shall have the following typical physical properties:
 - .1 Colour: Clear
 - .2 Elongation: 200% minimum

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed. Inspect all substrate surfaces and notify the Construction Manager and the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Verification of Conditions:
 - .1 Verify substrates to receive the work and surrounding adjacent surfaces are in accordance with the air barrier manufacturer's published literature prior to installation of the air barrier assembly.
 - .2 Existing substrate must be continuous and secured prior to application of air barrier.
 - .3 Sheathing panels must be securely fastened and installed flush to ensure a continuous substrate in accordance with the air barrier manufacturer's published literature.
 - .4 Strike masonry joints flush.
 - .5 Concrete masonry surfaces shall be smooth and without large voids, spalled areas or sharp protrusions.
 - .6 Do not install air barrier over saturated substrates.
- .3 Do not apply air barrier until substrate and environmental conditions are in accordance with Air Barrier Manufacturer's published literature.
- .4 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .5 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 PREPARATION

- .1 All surfaces must be sound, dry, clean, and free of oil, grease, dirt, excess mortar, frost, laitance, loose and flaking particles, or other contaminants.
- .2 Protect adjacent surfaces not included in the work of this section to prevent spillage and overspray.
- .3 Cap and protect exposed back-up walls against wet weather conditions during and after application of membrane.

3.3 INSTALLATION

- .1 Ensure substrate is ready to receive air barrier in accordance with air barrier manufacturer's published literature.
- .2 Temperature limitation:
 - .1 Primary air barrier: Substrate temperature must be above -7°C and rising.
 - .2 Auxiliary products: Temperature limitations may vary. Refer to air barrier manufacturer's published literature.

- .3 Application of Sheet-Applied Air Barrier:
 - .1 Where required, install adhesive/primer recommended by the air barrier manufacturer continuously and at rate recommended by the barrier manufacturer to ensure complete substrate coverage of anticipated flashing installation area.
 - .1 Allow adhesive/primer to cure to a tacky film prior to application of air barrier.
 - .2 Only apply adhesive/primer to surfaces which will be covered during the same working day. Primed areas not covered by end of day must be re-primed prior to installation of air barrier membrane.
 - .2 Peel protective film from primary air barrier and align top of membrane verifying proper positioning prior to complete film removal and placement.
 - .3 Press primary air barrier firmly into place by applying hand pressure to the middle of the membrane and working the pressure to the edges eliminating wrinkles and air bubbles.
 - .4 Install primary air barrier in shingle fashion to eliminate reverse laps.
 - .5 Where lap adhesion is less than desired, install low VOC adhesive continuously at rate recommended by air barrier manufacturer to ensure complete substrate coverage of anticipated flashing installation area.
 - .1 Allow adhesive/primer to cure to a tacky film prior to subsequent primary air barrier installation.
 - .6 Lap adjoining edges:
 - .1 Horizontal seams: 50 mm minimum.
 - .2 Vertical seams: 75 mm minimum.
 - .7 Roll primary air barrier and laps with countertop roller to obtain thorough adhesion.
 - .8 Seal permanently exposed reverse laps of primary air barrier with termination sealant.
- .4 Special Considerations: Contact the air barrier manufacturer to verify product and installation requirements.
- .5 Fastener Penetrations Through Air Barrier:
 - .1 It is the responsibility of the installer penetrating the air barrier assembly to properly install fasteners and components in accordance with the air barrier manufacturer's published literature.
 - .2 Installation requirements:
 - .1 Drill fasteners and components with sufficient compression to maintain continuity in the air barrier assembly.
 - .2 Refer to "Self-tapping fasteners" and/or "Pre-drilled fasteners".
 - .3 Supplemental sealant:
 - .1 Penetrations that do not meet installation requirements require the addition of termination sealant at point of insertion through the air barrier membrane to maintain continuity in the air barrier assembly.
 - .4 Self-tapping fasteners:
 - .1 Fastener head must be larger in diameter than the shank.
 - .2 Drill fasteners perpendicular to the substrate until flush with the air barrier.
 - .3 Drill fasteners to provide a continuous compression firmly against the air barrier membrane creating a gasketing seal without damaging the membrane.
 - .4 Do not install fasteners through air barrier over unsupported areas of the substrate such as sheathing joints.

- .5 Overdriven fasteners, improperly installed fasteners, defective/broken fasteners, or fasteners not properly fastened into the building structure beyond the air barrier membrane should be removed and the vacated hole sealed with termination sealant prior to the installation of the cladding or veneer system.
- .5 Pre-drilled fastening assemblies:
 - .1 Fastening head or assembly component must be larger in diameter than predrilled hole.
 - .2 Fastening head or assembly component must be mounted flush with the air barrier.
 - .3 Fastening head or assembly component must provide a continuous compression firmly against the air barrier creating a gasketing seal without damaging the integrity of the air barrier.
 - .4 Do not install fastening components through air barrier over unsupported areas of the substrate such as sheathing joints.
 - .5 Seal improperly drilled and/or vacated holes with termination sealant prior to the installation of the cladding or veneer system.

3.4 FIELD QUALITY CONTROL

- .1 Damage to surface by other trades shall be the responsibility of the Trade Contractor causing the damage.
- .2 Final Observation and Verification:
 - .1 Final inspection of sheet applied vapor permeable air barrier assembly shall be carried out by the Consultant, Contractor, the Installer air barrier manufacturer as required by warranty.
 - .2 Contact the air barrier manufacturer for warranty issuance requirements.
- .3 Sheet-applied vapour permeable water resistive air barrier assembly is not designed for permanent UV exposure. Refer to air barrier manufacturer's published literature for product limitations.

3.5 CLEANING

- .1 Promptly as the Work proceeds, and upon completion, clean up and remove from the premises all rubbish and surplus materials resulting from the foregoing Work.
- .2 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .3 Clean soiled surfaces, spatters, and damage caused by Work of this Section.
- .4 Make good damage to other work caused by the Work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to engineer, fabricate, and install a standing seam steel roofing system, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 The work includes, but is not necessarily limited to:
 - .1 Steel roofing.
 - .2 Ice and water shield.
 - .3 Flashings, accessories and trim.
- .3 Related Sections:
 - .1 Structural Steel and steel deck sections under separate cover.
 - .2 Section 06 10 00 - Rough Carpentry.
 - .3 Section 07 21 00 - Board and Batt Insulation.
 - .4 Section 07 62 00 - Sheet Metal Flashing and Trim.
 - .5 Section 07 92 00 - Joint Sealants.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM A653/A653M-25a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian Sheet Steel Building Institute (CSSBI) Standards.
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS):
 - .1 Material Safety Data Sheets (MSDS).

1.4 DESIGN AND PERFORMANCE REQUIREMENTS

- .1 Appearance:
 - .1 Exposed surfaces free of distortion, twist, waves and buckles.
 - .2 Fasteners to be concealed.
- .2 Structural loads: Resist wind uplift loads expected in this geographical area. Components shall not vibrate when subjected to the effects of wind.
 - .1 Climatic data for the location of the site to OBC, current edition.
- .3 Moisture control: Prevent infiltration of water and snow through the roofing.

- .4 Thermal Movement: Design metal roofing system to allow for thermal movement of components caused by an ambient temperature range of -40°C to 40°C without causing buckling, failure of joint seals, undue stress on fasteners and other detrimental effects.
- .5 Structural movement: accommodate movement between the roofing system and the building structure caused by structural movement, without permanent distortion, racking of joints, breakage of seals or water penetration.
- .6 Water penetration: provide continuous and uninterrupted barrier against water penetration, effectively sealed at laps, penetrations and terminations.

1.5 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Shop Drawings:
 - .1 Provide large-scale details showing roofing profile, flashing and trim profiles, and methods of attachment.
 - .2 Include details of the interface with adjacent construction.
 - .3 The standing seam steel roofing installation, including all related connections and fastenings, shall be designed by a structural engineer licensed to practise in the Province of Ontario. Each shop drawing submitted shall bear the stamp and signature of the aforesaid structural engineer.
- .3 Samples:
 - .1 Submit duplicate 400 mm long full-size samples of roofing material in the specified profile, texture, finish, and colour.
 - .2 Submit duplicate 300 mm long full-size samples of trim and flashings in the intended profile.
- .4 Product Data:
 - .1 Provide complete technical product data for all components of the assembly.
 - .2 Include installation instructions for the roofing system.
 - .3 Include manufacturer's material safety data sheets for the safe handling of the specified materials and products, in accordance with Workplace Hazardous Materials Information Service (WHMIS) requirements.
- .5 Quality Assurance/Control Submittals:
 - .1 Certificates: Manufacturer's certificate that products meet or exceed specified requirements.
 - .2 If requested by the Consultant, submit laboratory test reports certifying compliance of the roofing system with specification requirements.
 - .3 Qualification Documentation: Submit documentation of experience indicating compliance with specified qualification requirements.
- .6 Post-installation certification: After installation, provide written certification, signed by the Structural Engineer responsible for the shop drawings, that all items have been installed in accordance with the shop drawings.

- .7 Maintenance Data:
 - .1 Provide maintenance data for the steel roofing system for incorporation into the operation and maintenance manual specified in Section 01 78 00 "Closeout Submittals".
 - .2 Include instructions for cleaning and maintenance of steel finishes.

1.6 QUALITY ASSURANCE

- .1 Manufacturer Qualifications:
 - .1 The work of this Section shall be manufactured by a manufacturer with minimum 10 years experience in the actual production of steel roofing systems similar to that required for this project.
- .2 Installer Qualifications:
 - .1 The work of this Section shall be executed by a company licensed by the material manufacturer as an approved installer.
 - .2 If requested by the Consultant, provide evidence of previously completed projects of a similar nature.
- .3 Preinstallation Conference:
 - .1 A preinstallation conference will be held before installation starts, with the following present:
 - .1 Contractor.
 - .2 Consultant.
 - .3 Subcontractor (Installer).
 - .4 Other trades whose work affects or is affected by the Work of this Section.
- .4 Regulatory Requirements: Conform to current OBC requirements, and all other applicable codes and regulations, to the satisfaction of the authorities having jurisdiction.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver products in original unopened packaging with legible manufacturer's identification.
- .2 Store and handle materials in strict accordance with the manufacturer's recommendations.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

1.9 WARRANTY

- .1 For the work of this Section, the 12-months warranty period prescribed in the General Conditions of the Contract is extended to 20 years.

Part 2 Products

2.1 MANUFACTURERS

- .1 This specification is based on standing seam steel roofing systems by Ideal Roofing.
- .2 Requests for substitutions will be considered in accordance with the provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.
- .3 All components of the standing seam steel roofing system shall be obtained from or approved for use by a single manufacturer.

2.2 STANDING SEAM STEEL ROOFING

- .1 Concealed fastener, standing seam steel roof panel system. Standard of acceptance: Heritage Series by Ideal Roofing.
 - .1 Material: Preformed galvanized sheet steel to ASTM A653M, Grade 33, 230 MPa, Z275 standard commercial coating, 0.46 mm (26 ga) minimum base metal thickness:
 - .2 Profile: Heritage (HF) 406 mm (16").
 - .3 Finish: Prepainted Series 10,000 (Kynar 500).
 - .4 Colour to be selected by the Consultant.

2.3 ACCESSORIES

- .1 Trim: Manufacturer's standard profiles as required for a complete installation, colour-matched to the roofing.
- .2 Fastening devices:
 - .1 Non-corrosive fasteners as recommended by the system manufacturer for each specific application.
 - .2 Exposed fasteners are not acceptable.
- .3 Sealants:
 - .1 Tape sealant as recommended by the roofing system manufacturer, non-skimming, non-drying, butyl rubber.
 - .2 One-part silicone sealant in accordance with Section 07 92 00 and as recommended by the roofing manufacturer, colour to match colour of roofing panels, to the approval of the Consultant.
- .4 Touch-up paint supplied by the steel roofing manufacturer.

2.4 ICE AND WATER SHIELD

- .1 Self-adhesive rubberized asphalt membrane underlayment with a slip-resistant surface, designed to resist leakage caused by water back-up behind ice dams or from wind-driven rain. Standard of acceptance: Grace Ice & Water Shield, CCMC Approval No. 13670-L, properties as follows:
 - .1 Roll width: 914 mm.

- .2 Thickness: (ASTM D3767): 1.02 mm.
- .3 Colour: Grey/black.
- .4 Membrane tensile strength (ASTM D412, Die C modified): 1720 kN/m².
- .5 Elongation (ASTM D412, Die C modified): 250%.
- .6 Low temperature flexibility (ASTM D1970): Unaffected @ -29°C.
- .7 Adhesion to plywood (ASTM D903): 525 N/m.
- .8 Vapour permeance (ASTM E96): 2.9 ng/m².s.Pa.
- .9 Material weight installed (max.) (ASTM D461): 1.3 kg/m².

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .3 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 PREPARATION

- .1 Verify that the structure is in place and the substrate presents a smooth, flat surface, free of irregularities, and without defects.
- .2 Verify that the substrate surface is clean, dry and free of ice and snow.

3.3 ICE AND WATER SHIELD INSTALLATION

- .1 Install ice and water shield in the locations indicated, in accordance with the manufacturers printed instructions. Apply in fair weather when the air, roof deck, and membrane are at temperatures of 5°C or higher.
- .2 Apply primer to the substrate where recommended by the manufacturer prior to adhering the ice and water shield membrane.
- .3 Cut the membrane into 3 to 5 m lengths and reroll loosely.
- .4 Peel back 300 to 600 mm release liner, align the membrane, and continue to peel the release liner from the membrane. Press the membrane in place with heavy hand pressure.
- .5 Side laps to be minimum 90 mm and end laps minimum 150 mm. Install all laps, shingle fashion to shed water, starting at the eaves and working upwards.

- .6 Precautions and limitations:
 - .1 Slippery when wet or covered with frost.
 - .2 Release liners are slippery. Remove from work area immediately after membrane application.
 - .3 Do not fold over the roof edge.
 - .4 Repair holes, fishmouths, tears and damage with a round patch of membrane extending 150 mm past the damaged area in all directions.

3.4 INSTALLATION

- .1 Erect panels in accordance with the reviewed and accepted shop drawings and the system manufacturer's details and instructions and so as to meet specified design criteria and performance.
- .2 Securely anchor finished work, free of distortion and surface imperfections, uniform in colour.
- .3 Use concealed fastenings only.
- .4 Install panels plumb, true, level and in alignment with established lines and elevations.

3.5 CLEANING

- .1 Remove protective film from panels.
- .2 Repair and touch-up minor surface damage with colour matching high grade enamel provided by the system manufacturer.
- .3 Replace damaged panels and components which cannot be satisfactorily repaired.
- .4 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .5 Make good damage to other work caused by the Work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included:
 - .1 The work of this Section includes the provision of all labour, materials, equipment and services required to fabricate and install a composite aluminum exterior wall panel system, as indicated on the drawings, as specified herein and as required for a complete project.
 - .2 The work includes:
 - .1 Composite metal panels.
 - .2 Manufacturers engineered metal system for attachment of the metal siding to the building structure.
 - .3 Related metal flashings and accessories.
 - .4 Joint sealants where required (specified in Section 07 92 00).
 - .3 The panel fabricator/installer shall assume undivided responsibility for all components of the panel assembly including, but not limited to, a metal sub-frame assembly for proper attachment of the panels to the building structure, panel to panel joinery, panel to dissimilar material joinery, trim, metal flashings and joint seals associated with the panel system.
- .2 Related Sections:
 - .1 Section 06 10 00 - Rough Carpentry.
 - .2 Section 07 21 00 - Building Insulation.
 - .3 Section 07 27 16 - Vapour Permeable Air/Moisture Barrier.
 - .4 Section 07 62 00 - Sheet Metal Flashing and Trim.
 - .5 Section 07 92 00 - Joint Sealants.
 - .6 Section 08 36 12 - Sectional Metal Overhead Doors.

1.3 REFERENCE STANDARDS

- .1 American Architectural Manufacturers Association (AAMA):
 - .1 AAMA Metal Curtain Wall, Window, Storefront, and Entrance Guide Specifications Manual.
 - .2 AAMA CW-10-15, Care and Handling of Architectural Aluminum from Shop to Site.
- .2 American Society for Testing and Materials (ASTM):
 - .1 ASTM B209/B209M-21a, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - .2 ASTM D1781-98(2021), Standard Test Method for Climbing Drum Peel for Adhesives.
 - .3 ASTM D4214-23, Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
 - .4 ASTM E283/E283M-19, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

- .5 ASTM E330/E330M-14(2021), Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .6 ASTM E331-00(2023), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference.
- .3 The Society for Protective Coatings (SSPC):
 - .1 SSPC-Paint 12 1982, Paint Specification No. 12: Cold Applied Asphalt Mastic (Extra Thick Film).

1.4 QUALIFICATIONS

- .1 The work of this Section shall be fabricated by a manufacturer with minimum five years experience in the actual production of the specified products.
- .2 The work of this Section shall be executed by a company licensed by the material manufacturer as an approved installer.
- .3 Employ only skilled tradesmen who are experienced in this work.
- .4 If requested by the Consultant, provide evidence of previously completed projects of a similar nature.

1.5 QUALITY ASSURANCE

- .1 Take field measurements prior to the completion of shop fabrication. Indicate field dimensions on shop drawings.
- .2 Do as much work as possible under controlled shop conditions. Keep field fabrication to an absolute minimum.
- .3 Obtain all components from a single manufacturer.
- .4 Retain a Professional Engineer, licensed in the Province of Ontario, with experience in work of comparable complexity and scope to perform the following services as part of the Work of this Section:
 - .1 Design the complete cladding system, including supports and attachment system to different substrates as required.
 - .2 Review, stamp and sign all shop drawings.

1.6 DESIGN AND PERFORMANCE REQUIREMENTS

- .1 Provide a watertight and structurally sound panel system that allows no uncontrolled water penetration, on the inside face of the panel system as determined by ASTM E331.
- .2 Provide a wall assembly that has been tested and certified to conform to the following criteria:
 - .1 Air Leakage: Not more than 0.003 (L/s)mG, when tested at .075 kPa in accordance with ASTM E283.

- .2 Water Penetration: No water infiltration under static pressure when tested in accordance with ASTM E331 at a differential of 10% of inward acting design load, .299 kPa minimum, after 15 minutes.
 - .1 Water penetration is defined as the appearance of uncontrolled water in the wall.
 - .2 The wall design shall feature provisions to drain to the exterior face of the wall any leakage of water at joints and any condensation that may occur within the construction.
- .3 Design, fabricate and erect wall panel system to meet the following requirements:
 - .1 Rain penetration: Prevent rain penetration through wall system. Design system based on "Rain Screen Principle" by the National Research Council. Incorporate means of draining to the exterior space between wall panel and insulation.
 - .2 Wind load: Design wall system to resist wind loads, positive and negative, expected in this geographical region (OBC climatic date, 100 year probability) without causing rattling, vibration or excessive deflection of panels, overstressing of fasteners, clips and other detrimental effects on the wall system.
 - .3 Structural and thermal movement: Accommodate movement of supporting structural framing and movement caused by thermal expansion and contraction of system component parts without causing bowing, buckling, delamination, oil canning, failure of joint seals, excessive stress on fasteners or any other detrimental effects.
 - .4 Air barrier: Shall be continuous and sealed at joints, laps, terminations and penetrations to prevent air infiltration and exfiltration and to effectively retard moisture vapour migration through system.
- .4 Panel Flatness Tolerance: Fabricate panels not exceeding the following tolerances:
 - .1 Applying to even rises and falls across panel; local bumps and depressions will not be accepted:
 - .1 1.5 mm in a convex direction, measured perpendicularly to normal plane
 - .2 1.5 mm in a concave direction, measured perpendicularly to normal plane.
 - .2 Maximum deviation from vertical and horizontal alignment of erected panels: 6 mm in 6 m.
- .5 Panel Removal: System shall be non-progressive, allowing removal of any individual panel without necessitating removal of adjacent work. Design panel mounting to be resistant against unauthorised removal of panels.
- .6 Structural Performance: Provide systems that have been tested in accordance with ASTM E330 at a design pressure of 3.12 kPa and have been certified to be without permanent deformation or failure of structural members.

1.7 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Shop Drawings:
 - .1 Submit shop drawings showing panel layout and elevations, profiles, dimensions, panel thickness, fastening and anchoring methods, detail and locations of joints, sealants, and gaskets, including joints necessary to accommodate thermal movement, trim, flashing, accessories, and other pertinent information.

- .2 Show how the work of this section interfaces with adjacent cladding materials and assembly types.
 - .3 Indicate attachment clips, joint extrusion system, angles, z-bars, channels, insulation, non-permeable air/moisture/vapour barrier and installation details.
 - .4 Show fastening and anchoring details of panels and accessories.
 - .5 The composite aluminum panel system, including supporting girts and/or metal studs and all related connections and fastenings, shall be designed by a Professional Engineer licensed to practise in the Province of Ontario. Each shop drawing submitted shall bear the stamp and signature of the aforesaid Professional Engineer.
- .3 Product Data: Submit two copies of manufacturer's literature for the panel material. These documents shall include, but not be limited to:
 - .1 Appropriate evaluation reports and/or test reports.
 - .2 Product transportation, storage, handling and installation requirements.
 - .4 Samples: Submit a minimum 150 mm x 150 mm sample of the composite metal panels for each selected colour, fabricated from actual materials and finishes to be used in the finished work.
 - .5 Quality Assurance/Control Submittals:
 - .1 Certificates: Manufacturer's certificate that products meet or exceed specified requirements.
 - .2 If requested by the Consultant, submit laboratory test reports certifying compliance of the wall panel system with specification requirements.
 - .3 Qualification Documentation: Submit documentation of experience indicating compliance with specified qualification requirements.
 - .6 Post-installation certification: After installation, provide written certification, signed by the Professional Engineer responsible for the shop drawings, that all items have been installed in accordance with the shop drawings.
 - .7 Warranty: Submit 3 copies of the manufacturer's warranty specified herein in accordance with Section 01 78 36 "Warranties".
 - .8 Maintenance Data:
 - .1 Provide maintenance instructions for the wall panel system for incorporation into the operation and maintenance manual specified in Section 01 78 00 "Closeout Submittals".

1.8 MOCK-UPS

- .1 Construct a minimum 12 m² long x 1.6 m high mock-up panel of a representative sample of the composite aluminum wall panel assembly, for review and acceptance by the Consultant.
- .2 Locate where directed by the Consultant.
- .3 Include all components of the wall assembly including, but not limited to, air/vapour barrier insulation, cladding and support/anchoring systems.
- .4 Do not proceed with the panel system installation until the mock-ups have been reviewed and accepted by the Consultant.

- .5 The accepted mock-ups may be incorporated into the finished work and shall be the standard of acceptance for the work of this Section. Remove and dispose of any mock-ups which do not form part of the work.

1.9 DELIVERY, STORAGE AND HANDLING

- .1 Protect finish and edges in accordance with panel manufacturer's recommendations.
- .2 Handle prefabricated composite aluminum panel work in accordance with the panel manufacturer's recommendations and AAMA CW-10.
- .3 Protect prefabricated aluminum surfaces with strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.10 INSPECTION AND TESTING

- .1 The Owner will engage an independent inspection and testing company to verify that the sub-framing support system and anchoring installation complies with the specified requirements.
- .2 Submit inspection and testing reports to the Consultant, as soon as inspection and testing is completed.
- .3 The cost of initial inspection and testing will be paid by the Owner. The cost of re-testing/re-inspection necessitated by failure to meet specification requirements on the initial inspection/test shall be paid by the Trade Contractor.
- .4 Inspection and testing procedures shall be completed and all deficiencies rectified prior to commencing installation of the remainder of the composite aluminum panel assembly.

1.11 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials, including packaging materials, generated by the work of this Section in accordance with the Waste Management Plan.

1.12 WARRANTY

- .1 For the work of this section, the 12-months warranty period prescribed in the General Conditions of the Contract is extended to 3 years from the date of Substantial Performance.
- .2 In addition to the 3-year warranty, provide a panel manufacturer's written warranty covering failure of the factory-applied exterior finish on the composite metal panels.
 - .1 Warrant the finish per ASTM D4214 for chalking not in excess of 8 NBS Units and for fade not in excess of 5 NBS Units.
 - .2 Warranty period for finish: 20 years from the date of Substantial Performance.

Part 2 Products

2.1 ACCEPTABLE PRODUCTS

- .1 This specification is based on Alucobond composite aluminum panel systems by Alusuisse Composites Inc. and distributed by Sobotec Ltd.
- .2 Requests for substitutions will be considered in accordance with provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.
- .3 Obtain all components of the system from a single manufacturer.

2.2 PANELS

- .1 Composition: Two sheets of aluminum sandwiching a core of extruded thermoplastic material formed in a continuous process without the use of glues or adhesives between dissimilar materials; bond integrity testing to conform to ASTM D1781. Product characteristics as follows:
 - .1 Aluminum Face Sheets:
 - .1 Thickness: 0.50 mm.
 - .2 Alloy: AA3003.
 - .2 Panel Thickness: 4 mm.
 - .3 Panel Weight: 5.47 kg/m².
 - .4 Tolerances:
 - .1 Panel Bow: Maximum 0.8% of panel dimension in width and length.
 - .2 Panel Dimensions: Field fabrication shall be allowed where necessary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible. Field fabrication will be subject to review and may be rejected and replaced with shop-fabricated components at no additional cost to the Owner.
 - .3 Panel lines, breaks, and angles shall be sharp, true, and surfaces free from warp and buckle.
 - .4 Maximum deviation from panel flatness shall be 3 mm in 1500 mm on panel in any direction for assembled units. (Non-accumulative).
 - .5 Finishes and colours to be selected by the Consultant.
- .2 System Characteristics: Material/performance shall conform to the following minimum standards:
 - .1 System shall provide a dry joint with maximum 10 mm reveal.
 - .2 The system shall be designed to perform in accordance with the NRC "Rainscreen" principle.
 - .3 The system shall have no visible fasteners, telegraphing or fastening on the panel faces nor any other compromise of a neat and flat appearance.
 - .4 The system shall comply with the applicable provisions of the AAMA Metal Curtain Wall, Window, Storefront, and Entrance Guide Specifications Manual.
 - .5 Fabricate the panel system to dimensions, sizes, and profiles indicated on the drawings based on a design temperature of 21°C.
 - .6 Fabricate components of the system in the shop ready for installation on site. Include full continuous joint reveals within the system.

- .7 Fabricate the panel system so that no restraints can be placed on the panel which might result in compressive skin stresses. The installation detailing shall be such that the panels remain flat regardless of temperature changes and at all times remain airtight and watertight.
- .8 The finish side of the panel shall have a removable plastic film applied which shall remain on the panel during fabrication, shipping, and erection to protect the surface from damage.

2.3 ACCESSORIES

- .1 Panel Accessories:
 - .1 Exposed trim, closures, caps, flashings and other elements using same material as panels as required for complete installation.
 - .2 Provide proprietary aluminum extrusions, compatible with panel edges, to manufacturer's standard profiles, including vertical and horizontal joint closures and perimeter trim and caps as required for a complete installation. Include gaskets as required for tight joints.
 - .3 Fasteners: As recommended by the panel manufacturer, concealed, stainless steel, fully adjustable and compatible in profile with closures.
- .2 Joint extrusions and joint extrusion clips for attaching panels to the sub-structure: Purpose made aluminum.
 - .1 PVC shims, 1.6 mm thick, shall be used as thermal separator between extrusions and sub-girts.
- .3 Joint filler strip: Same material and colour as panels.
- .4 Manufacturer's attachment system designed to accommodate expansion and contraction, dynamic movements and design load requirements.
- .5 Air Barrier: Refer to Section 07 27 16 "Vapour Permeable Air/Moisture Barrier".
- .6 Membrane Flashings: Material compatible with membrane air/membrane barrier.
- .7 Metal flashings: Purpose made extruded aluminum to match adjacent panels.
- .8 Shop-fabricate accessory and trim components ready for installation.
- .9 Isolation coating: alkali resistant bituminous paint to SSPC Paint-12.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Surfaces to receive panels shall be even, smooth, sound, clean, dry and free from defects detrimental to work.

- .3 Surfaces to receive panels shall be structurally sound as determined by a registered structural engineer.
- .4 Do not proceed with erection until unsatisfactory conditions have been corrected.
- .5 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 SUPPORT FRAMING INSTALLATION

- .1 Install panel system framing as required. Install framing in accordance with the applicable requirements of CSA-16.1 and CSA-S136.
- .2 Install framing progressively with the thermal insulation. Coordinate with Section 07 21 00 "Building Insulation".
- .3 Install subgirts and miscellaneous system framing as required to provide proper support for the panel system. Fasten to supporting structure. Provide additional framing at terminations, openings and penetrations.
- .4 Touch up damaged galvanized surfaces with zinc-rich primer.

3.3 INSTALLATION

- .1 After review and acceptance by the Consultant of the support framing and insulation installation, install wall panels in accordance with the manufacturer's instructions and the reviewed shop drawings.
- .2 Erect panels plumb, level, and true, in accordance with reviewed shop drawings and manufacturer's instructions. Ensure panel alignment with established lines shown on elevation. Report any misalignments to the Consultant before proceeding.
- .3 Thermal movement:
 - .1 Attachment system shall allow for the free and noiseless vertical and horizontal thermal movement due to expansion and contraction for a material temperature range of -30°C to +80°C.
 - .2 Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement will not be permitted.
 - .3 Fabrication, assembly, and erection procedure shall account for the ambient temperature at the time of the respective operation.
- .4 Anchor panels securely in accordance with manufacturer's engineering recommendations and in accordance with reviewed and accepted shop drawings to allow for necessary thermal movement and structural support.
- .5 Conform to panel fabricator's instructions for installation of concealed fasteners.

- .6 Do not install component parts which are observed to be defective, including; warped, bowed, dented, abraided, and broken members.
- .7 Do not cut, trim, weld, or braze component parts during erection in a manner which would damage the finish, decrease strength, or result in a visual imperfection or a failure in performance. Return component parts which require alteration to shop for refabrication, if possible, or for replacement for new parts.
- .8 Separate dissimilar metals and use gasketed fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.
- .9 Protect metal surfaces in contact with concrete or other cementitious surfaces, and aluminum in contact with steel with isolation coating.
- .10 Erect panels and joint extrusions in accordance with the system manufacturer's details and instructions and to meet specified design and performance requirements.
- .11 Secure finished work securely anchored, free of distortion and surface imperfections, uniform in colour and gloss.
- .12 Ensure all penetrations of the installed air barrier membrane are sealed and repair any breeches in accordance with the air barrier system manufacturer's recommendations.
- .13 Where indicated on the drawings or as required for a complete installation, supply and install closures, caps, fascias, covers and trim with colour to match adjacent finish where exposed.
- .14 Provide openings required in the composite aluminum panel system. Provide flashings around penetrations through panels.
- .15 Seal around all openings and all other locations indicated or required to provide a weathertight and watertight seal.

3.4 ADJUSTING AND CLEANING

- .1 Repair panels with minor damage. Remove and replace panels damaged beyond repair.
- .2 Remove protective film as soon as possible after installation.
- .3 Provide additional protection, after installation, as necessary to protect the installation from damage by other trades.
- .4 Make sure weep holes and drainage channels are unobstructed and free of dirt and sealants.
- .5 Conduct Final Cleaning in accordance with the manufacturer's instructions and Section 01 74 13 "Progress and Final Cleaning".

- .6 Remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .7 Make good damage to other work caused by the Work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to engineer, fabricate, and install steel siding, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 The work includes, but is not necessarily limited to:
 - .1 Vertical steel siding.
 - .2 Flashings, accessories and trim.
- .3 Related Sections:
 - .1 Section 04 22 00 - Concrete Unit Masonry.
 - .2 Section 06 10 00 - Rough Carpentry.
 - .3 Section 07 21 00 - Board and Batt Insulation.
 - .4 Section 07 62 00 - Sheet Metal Flashing and Trim.
 - .5 Section 07 92 00 - Joint Sealants.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM A653/A653M-23, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian Sheet Steel Building Institute (CSSBI) Standards.
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS):
 - .1 Material Safety Data Sheets (MSDS).

1.4 DESIGN AND PERFORMANCE REQUIREMENTS

- .1 Appearance:
 - .1 Exposed surfaces free of distortion, twist, waves and buckles.
 - .2 Fasteners to be concealed.
- .2 Structural loads: Resist wind loads expected in this geographical area with a maximum allowable deflection of 1/180 of span. Components shall not vibrate when subjected to the effects of wind.
 - .1 Climatic data for the location of the site to OBC, current edition.
- .3 Moisture control: Prevent infiltration of water and snow through the siding.

- .4 Thermal Movement: Design metal siding system to allow for thermal movement of components caused by an ambient temperature range of -40°C to 40°C without causing buckling, failure of joint seals, undue stress on fasteners and other detrimental effects.
- .5 Structural movement: accommodate movement between the siding system and the building structure caused by structural movement, without permanent distortion, racking of joints, breakage of seals or water penetration.
- .6 Water penetration: provide continuous and uninterrupted barrier against water penetration, effectively sealed at laps, penetrations and terminations.

1.5 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Shop Drawings:
 - .1 Provide large-scale details of the siding showing siding profile, trim profile, method of substructure, and methods of attachment.
 - .2 Include details of the interface with adjacent construction.
 - .3 The steel siding installation, including all related connections and fastenings, shall be designed by a structural engineer licensed to practise in the Province of Ontario. Each shop drawing submitted shall bear the stamp and signature of the aforesaid structural engineer.
- .3 Samples:
 - .1 Submit duplicate 400 mm long full-size samples of siding material in the specified profile, texture, finish, and colour.
 - .2 Submit duplicate 300 mm long full-size samples of trim and flashing members in the specified profile.
- .4 Product Data:
 - .1 Provide complete technical product data for all components of the assembly.
 - .2 Include installation instructions for the siding system.
 - .3 Include manufacturer's material safety data sheets for the safe handling of the specified materials and products, in accordance with Workplace Hazardous Materials Information Service (WHMIS) requirements.
- .5 Quality Assurance/Control Submittals:
 - .1 Certificates: Manufacturer's certificate that products meet or exceed specified requirements.
 - .2 If requested by the Consultant, submit laboratory test reports certifying compliance of the siding system with specification requirements.
 - .3 Qualification Documentation: Submit documentation of experience indicating compliance with specified qualification requirements.
- .6 Post-installation certification: After installation, provide written certification, signed by the Structural Engineer responsible for the shop drawings, that all items have been installed in accordance with the shop drawings.

- .7 Maintenance Data:
 - .1 Provide maintenance data for the steel siding system for incorporation into the operation and maintenance manual specified in Section 01 78 00 "Closeout Submittals".
 - .2 Include instructions for cleaning and maintenance of steel finishes.

1.6 QUALITY ASSURANCE

- .1 Manufacturer Qualifications:
 - .1 The work of this Section shall be manufactured by a manufacturer with minimum 10 years experience in the actual production of steel siding systems similar to that required for this project.
- .2 Installer Qualifications:
 - .1 The work of this Section shall be executed by a company licensed by the material manufacturer as an approved installer.
 - .2 If requested by the Consultant, provide evidence of previously completed projects of a similar nature.
- .3 Preinstallation Conference:
 - .1 A preinstallation conference will be held before installation starts, with the following present:
 - .1 Construction Manager.
 - .2 Consultant.
 - .3 Trade Contractor (Installer).
 - .4 Other trade contractor whose work affects or is affected by the Work of this Section.
- .4 Regulatory Requirements: Conform to current OBC requirements, and all other applicable codes and regulations, to the satisfaction of the authorities having jurisdiction.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver products in original unopened packaging with legible manufacturer's identification.
- .2 Store and handle materials in strict accordance with the manufacturer's recommendations.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

1.9 WARRANTY

- .1 For the work of this Section, the 12-months warranty period prescribed in the General Conditions of the Contract is extended to 20 years.

Part 2 Products

2.1 MANUFACTURERS

- .1 This specification is based on steel siding by Ideal Roofing.
- .2 Requests for substitutions will be considered in accordance with the provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.
- .3 All components of the steel siding installation shall be obtained from or approved for use by a single manufacturer.

2.2 STEEL SIDING

- .1 Steel siding: Preformed galvanized sheet steel to ASTM A653M, Grade 33, 230 MPa, Z275 standard commercial coating, 0.46 mm (26 ga) minimum base metal thickness:
 - .1 Profile: To be selected by the Consultant.
 - .2 Finish: Prepainted Series 10,000 (Kynar 500).
 - .3 Colour: To be selected by the Consultant.

2.3 ACCESSORIES

- .1 Trim: Manufacturer's standard profiles as required for a complete installation, colour-matched to the siding.
- .2 Fastening devices:
 - .1 Non-corrosive fasteners as recommended by the siding manufacturer, colour-matched to the siding.
- .3 Sealants:
 - .1 Tape sealant as recommended by the siding system manufacturer, non-skimming, non-drying, butyl rubber.
 - .2 One-part silicone sealant in accordance with Section 07 92 00 and as recommended by the siding manufacturer, colour matched to siding panels, to the approval of the Consultant.
- .4 Touch-up paint supplied by the siding manufacturer.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.

- .3 Take field measurements to verify or supplement dimensions.
- .4 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 PREPARATION

- .1 Verify that wood stapping is in place and without defects.

3.3 INSTALLATION

- .1 Erect panels in accordance manufacturer's details and instructions and so as to meet specified design criteria and performance.
- .2 Securely anchor finished work, free of distortion and surface imperfections, uniform in colour.
- .3 Install panels plumb, true, level and in alignment with established lines and elevations.
- .4 Align fasteners.

3.4 CLEANING

- .1 Remove protective film from panels.
- .2 Repair and touch-up minor surface damage with colour matching high grade enamel provided by the system manufacturer.
- .3 Replace damaged panels and components which cannot be satisfactorily repaired.
- .4 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .5 Make good damage to other work caused by the Work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to fabricate and install sheet metal flashing and trim, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Section 04 22 00 - Concrete Unit Masonry.
 - .2 Section 06 10 00 - Rough Carpentry.
 - .3 Section 07 41 13 - Preformed Metal Roofing.
 - .4 Section 07 42 43 - Aluminum Composite Material (ACM) Panels.
 - .5 Section 07 46 19 - Preformed Metal Siding.
 - .6 Section 07 92 00 - Joint Sealants.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM A653/A653M-25a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM B209/B209M-21a, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - .3 ASTM F1667/F1667M-21a, Standard Specification for Driven Fasteners; Nails, Spikes, and Staples.
- .2 Canadian Standards Association (CSA):
 - .1 CSA A123.3-05(R2025), Asphalt Saturated Organic Roofing Felt (Reaffirmed 2010).
- .3 Canadian Roofing Contractors' Association (CRCA).
- .4 The Society for Protective Coatings (SSPC):
 - .1 SSPC-Paint 12 1982, Paint Specification No. 12: Cold Applied Asphalt Mastic (Extra Thick Film).

1.4 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.

- .2 Samples:
 - .1 Submit duplicate sample panels, minimum 150 mm x 150 mm of each type, thickness, finish and colour of sheet metal proposed for use.
- .3 Shop drawings:
 - .1 Provide large-scale dimensioned drawings indicating proposed sheet metal flashing and trim profiles at each location.
 - .2 Include interface with adjacent construction, methods of attachment, joint details and profiles and other pertinent information.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 MATERIALS

- .1 Sheet metal:
 - .1 Galvanized sheet steel to ASTM A653M, Grade 33, 230 MPa, Z275 coating, 0.76 mm (22 ga) minimum base metal thickness.
 - .1 Finish when exposed to sight: Prepainted, 0.025 mm fluoropolymer (PVDF) coating. Colour to match adjacent material or to be selected by the Consultant.
 - .2 Aluminum sheet: To ASTM B209, alloy, temper and thickness to suit application.
 - .1 Finish when exposed to sight: Prepainted, finish and colour to match adjacent material or to be selected by the Consultant.
- .2 Underlayment: No.15 non-perforated asphalt felt to CSA-A123.3, single ply.
- .3 Sealant: Refer to Section 07 92 00 "Joint Sealants".
- .4 Tape: isobutyl, colour grey, 3 x 25 mm.
- .5 Cleats: of same material, and temper, as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.
- .6 Fasteners: Stainless steel, to ASTM F1667, type as recommended by installer for each specific application.
 - .1 Exposed fasteners to be finished to match adjacent material.
- .7 Washers: Stainless steel, 1 mm thick with rubber packings.
- .8 Back-priming sheet metal: High-build bituminous paint, SSPC-Paint 12.

2.2 FABRICATION

- .1 Fabricate metal flashings and other sheet metal work as indicated and as required for a complete installation.
- .2 Form pieces in 2400 mm maximum lengths. Make allowance for expansion at joints.
- .3 Hem exposed edges on underside 12 mm. Mitre and seal corners with sealant.
- .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .5 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

2.3 PIPE PENETRATIONS

- .1 Provide and install 1.6 mm (16 ga) spun aluminum flashings and caps to all vent stacks.
- .2 For flashing of miscellaneous mechanical and electrical items penetrating the roof membrane, provide:
 - .1 Factory prefabricated, insulated aluminum sleeve flashings, with matching aluminum collar, size to suit item to be flashed.
 - .2 Sleeve and collar to be fabricated from aluminum, with premoulded urethane insulation on the inner side, interior surfaces bituminous painted to prevent galvanic action with dissimilar metals. Aluminum for sleeve to be 1.6 mm (16 ga) thick and for collar to be 1.4 mm (17 ga) thick.
 - .3 Provide deck flange, integral with sleeve aluminum.
 - .4 Standard of acceptance: Roof accessories by Thaler Metal Industries Inc., (800) 287-7217 or type to suit each specific application.
- .3 Pitch pockets are unacceptable.

Part 3 Execution

3.1 INSTALLATION

- .1 Install sheet metal work to CRCA specifications except where otherwise detailed.
- .2 Use concealed fastenings throughout.
- .3 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock forming tight fit over hook strips, except where otherwise shown.
- .4 Lock end joints and caulk with sealant.

- .5 Joints, seams and edges shall be formed, folded, locked and well caulked. Raw edges shall be turned under to conceal them.
- .6 Provision shall be made for expansion and contraction and all work shall be executed using concealed fasteners.
- .7 Caulk flashing at cap flashing with sealant. Install a continuous strip of isobutyl tape between parapet and flashing membrane to stop windblown water.
- .8 At intersections with wall surfaces provide and adequately fasten metal counter flashings over roofing membrane flashings. No counter flashing shall be installed until built-up base flashings have been inspected.

3.2 CLEANING

- .1 Upon completion of the installation remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Clean any drippage and spills of surplus sealant or plastic cement from adjacent surfaces and make good damage caused by the work.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to install firestopping and smoke seal materials, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Section 06 10 00 - Rough Carpentry.
 - .2 Section 09 21 16 - Gypsum Board Assemblies.
- .3 Fire stopping and smoke seals within mechanical assemblies (i.e inside ducts, dampers) and electrical assemblies (i.e. inside cable trays) are by the mechanical and electrical trades.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM E814-24, Standard Test Method for Fire Tests of Penetration Firestop Systems.
- .2 Health Canada / Workplace Hazardous Materials Information System (WHMIS):
 - .1 Material Safety Data Sheets (MSDS).

1.4 REGULATORY REQUIREMENTS

- .1 The work of this Section shall conform to the requirements of the OBC 2006, latest revision, to ULC design requirements for each assembly and to all other applicable codes and regulations, to the satisfaction of the authorities having jurisdiction.

1.5 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Product Data:
 - .1 Provide product data.
 - .2 Include installation instructions for each product.
 - .3 Include manufacturer's material safety data sheets for the safe handling of the specified materials and products, in accordance with Workplace Hazardous Materials Information Service (WHMIS) requirements.
- .3 Samples: Submit samples of each material or combination of materials proposed for use.

- .4 Submit laboratory test reports certifying compliance of each proposed material or combination of materials with the specification requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver products in original unopened packaging with legible manufacturer's identification.
- .2 Store materials in strict accordance with the manufacturer's recommendations.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 MATERIALS

- .1 Fire stopping and smoke seal systems: in accordance with ASTM E814, asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of ASTM E814 and not to exceed opening sizes for which they are intended.
- .2 Service penetration assemblies: certified by ULC and listed in ULC Guide No. 40 U19.
- .3 Service penetration firestop components: certified and listed in ULC Guide No. 40 U19.13 and ULC Guide No. 40 U19.15 under the Label Service of ULC.
- .4 Fire-resistance rating of installed fire stopping assembly shall not be less than the fire-resistance rating of the surrounding floor and wall assembly.
- .5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.
- .6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

- .9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- .10 Sealants for vertical joints: non-sagging.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.
- .3 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .4 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 PREPARATION

- .1 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.
- .2 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.
- .3 Mask where necessary to avoid spillage and over coating onto adjoining surfaces.

3.3 INSTALLATION

- .1 Install fire stopping and smoke seals at service penetrations through fire resistive construction and at all locations where the continuity of fire resistive construction is interrupted, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.
- .3 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
- .4 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

- .5 Tool or trowel exposed surfaces to a neat finish.
- .6 Remove excess compound promptly as work progresses and upon completion.

3.4 REVIEW

- .1 Notify the Consultant when ready for review and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

3.5 SCHEDULE

- .1 Firestop and smoke seal at:
 - .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
 - .2 Top of fire-resistance rated masonry and gypsum board partitions.
 - .3 Intersection of fire-resistance rated masonry and gypsum board partitions.
 - .4 Control joints in fire-resistance rated masonry and gypsum board partitions and walls.
 - .5 Penetrations through fire-resistance rated floors, ceilings, and roofs.
 - .6 Around mechanical and electrical assemblies penetrating fire separations.
 - .7 Rigid ducts: greater than 129 cm²: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.
 - .8 Between edge of floor assembly and exterior wall assembly at building perimeter.
 - .9 In other locations where the continuity of a fire-resistant element is interrupted.

3.6 CLEANING

- .1 As work progresses, remove excess materials and clean adjacent surfaces immediately after application.
- .2 Remove temporary dams after initial set of fire stopping and smoke seal materials.
- .3 Upon completion of the work of this Section:
 - .1 Remove masking and temporary protection from adjacent surfaces.
 - .2 Remove stains on adjacent surfaces and make good damage to adjacent surfaces caused by the work of this Section.
 - .3 Remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .4 Make good damage to other work caused by the Work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to execute sealant work, as indicated on the drawings, as specified herein and as required by job conditions and normally considered to be work covered by this Section.
- .2 The term "sealant" shall be interpreted as synonymous with the term "caulking" where used on the drawings and/or in the specifications.
- .3 Related Sections
 - .1 Section 06 41 13 - Wood Veneer Faced Casework.
 - .2 Section 06 61 13 - Quartz Fabrications.
 - .3 Section 04 22 00 - Concrete Unit Masonry.
 - .4 Section 07 41 13 - Preformed Metal Roofing.
 - .5 Section 07 42 43 - Aluminum Composite Material (ACM) Panels.
 - .6 Section 07 46 19 - Preformed Metal Siding
 - .7 Section 07 62 00 - Metal Flashing and Trim.
 - .8 Section 08 11 13 - Steel Doors and Frames.
 - .9 Section 08 51 13 - Aluminum Windows.
 - .10 Section 09 21 16 - Gypsum Board Assemblies.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM C834-17(2023), Standard Specification for Latex Sealants.
 - .2 ASTM C920-18(2024), Standard Specification for Elastomeric Joint Sealants.
- .2 Health Canada / Workplace Hazardous Materials Information System (WHMIS):
 - .1 Material Safety Data Sheets (MSDS).

1.4 QUALIFICATIONS

- .1 The work of this Section shall be executed by an independent Subcontractor whose primary business is in the application of caulking and sealants, using tradesmen skilled and trained in the techniques of caulking, and who are completely familiar with the published recommendations of the manufacturer of the caulking material being used.
- .2 If requested by the Consultant, provide evidence of previously completed projects of a similar nature.

- .3 Indication of lack of skill or defective work to be sufficient grounds for the Consultant to reject the installed caulking and to require its immediate removal and complete recaulking at no additional cost to the Owner during the warranty period.
- .4 Cooperate with the Consultant and/or any inspection and testing agency the Owner may appoint.

1.5 COMPATIBILITY

- .1 Sealants used for the various building interior assemblies shall be selected from those specified in the respective assembly Section, and shall be coordinated with the sealant being provided under other Sections. Preferably, one sealant of the same manufacturer shall be used throughout. If different sealants are selected, from those specified, it is the responsibility of the respective Section to ensure compatibility between selected sealant, substrates, and sealants of other Sections which come in contact with the selected sealant.

1.6 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Prior to commencement of the work, submit, for each type of sealant, a certificate signed by the sealant manufacturer which states:
 - .1 Surface preparation requirements.
 - .2 Priming and application procedures.
 - .3 Verification that sealant materials are selected for use from those specified.
 - .4 Verification that sealants are suitable for their locality, purposes intended and joint designs.
 - .5 Verification that sealants are compatible with other materials and products with which they come in contact, including but not limited to sealants provided under other Sections, and finishes.
 - .6 Verification that sealants will not stain the substrates or finished products.
 - .7 Verification that sealant is suitable for temperature and humidity conditions at the time of application.
- .3 For each specified product, include manufacturer's material safety data sheets for the safe handling of the products, in accordance with WHMIS requirements.

1.7 ENVIRONMENTAL AND SAFETY REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada.
- .2 Subject to compliance with other specification requirements, select low-odour, non-carcinogenic products in all locations for which such products are available.

- .3 Conform to manufacturers' recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
 - .1 Do not apply sealants when the temperature of the sealant and the materials to which it is applied is below 5°C.
 - .2 Should it become necessary to apply sealants when the temperature is below 5°C, consult the sealant manufacturer and follow his recommendations.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact.
- .2 Store materials in strict accordance with the manufacturer's recommendations. Protect from freezing, moisture, water and contact with ground or floor.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

1.10 WARRANTY

- .1 For the work of this Section, the 12-months warranty period prescribed in the General Conditions of the Contract is extended to 5 years.
- .2 In addition to the 5-year warranty specified above, provide a manufacturer's warranty for silicone sealants for a period of 20 years.
- .3 Warrant that caulking work will not leak, crack, crumble, melt, shrink, bubble, run, lose adhesion or stain adjacent surfaces.

Part 2 Products

2.1 MANUFACTURERS

- .1 This specification is based on the specific sealant products named herein.
- .2 Requests for substitutions will be considered. Acceptance of alternative products is subject to the approval of the Consultant. Refer to Section 01 25 00 "Substitution Procedures".

2.2 SEALANTS

.1 Sealant Types:

Application	Type	Description	Movement Capability	Standards	Acceptable Product	Comments
Around interior door frames and windows, against drywall and where acoustical sealant exposed to sight is called for	A	Paintable, siliconized, acrylic latex sealant.		ASTM C834	Tremflex 834 Paintable Siliconized Acrylic Latex Sealant	
Exterior joint work interior and exterior masonry control joints and where extreme movement is anticipated	B	Ultra-low-modulus, one-part, neutral-cure silicone sealant for extreme movement joints	+ 100% - 50%	ASTM C920 Type S Grade NS Class 100/50 Use T, NT, M, G, A, O	Dow Corning 790 Silicone Building Sealant	No primer reqd. on concrete. Non-staining, good unprimed adhesion to most substrates (Fluoropolymer coatings, polyethylene faced mod.bit. membrane etc.)
Exterior joint work where not otherwise specified or indicated.	C	One-part, neutral-cure silicone sealant	+ 50%	ASTM C920 Type S Grade NS Class 50 Use NT, M, G, A	Dow Corning 791 Silicone Weather -proofing Sealant	Manufacturer to recommend Type C or D for specific application
	D	One-part, neutral-cure, medium modulus, architectural grade, silicone sealant	+ 50%	ASTM C920 Type S Grade NS Class 50 Use NT, G, A, O	Dow Corning 795 Silicone Building Sealant	Note that Type C has a limited colour range
Sealant for caulking countertops at wall, ceramic tile, plumbing fixtures, and in wet areas where not otherwise specified	E	One-part, acetoxy-cure, mildew-resistant, silicone sealant for non-porous substrates	+ 25%		Dow Corning Tub, Tile & Ceramic Silicone Sealant	
Acoustical Sealant in concealed locations	F	Flexible Synthetic rubber acoustical sealant			Tremco Acoustical Sealant	

- .2 Colour of sealants: selected from the manufacturer's complete colour range to match adjacent materials, to the approval of the Consultant.
- .3 Joint cleaner: xylol, methylethyleketon, IPA, or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

2.3 ACCESSORIES

- .1 Primers: type recommended by sealant manufacturer for each specific application.

- .2 Joint fillers: Chemically compatible with primers and sealants, outsized 30 to 50%, type recommended by sealant manufacturer for each specific application.
- .3 Bond breaker: pressure sensitive plastic tape, which will not bond to sealants.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 For exterior sealants, arrange for a technical representative of the manufacturer to conduct adhesion tests for each joint condition and to make recommendations with respect to sealant type, primers (if required) and joint preparation. Do not deviate from the manufacturer's recommendations without prior written approval.
- .3 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .4 Commencement of the work of this Section will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 PREPARATION

- .1 Remove dust, paint, loose mortar and other foreign matter. Dry joint surfaces.
- .2 Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.
- .3 Remove oil, grease and other coatings from non-ferrous metals with joint cleaner.
- .4 Prepare concrete, masonry, glazed and vitreous surfaces to sealant manufacturer's instructions.
- .5 Examine joint sizes and correct to achieve depth ratio 1/2 of joint width with minimum width and depth of 6 mm. Maximum width 75 mm.
- .6 Install joint filler to achieve correct joint depth and shape with approximately 30% compression.
- .7 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .8 Apply bond breaker tape where required to manufacturer's instructions.
- .9 Use primers where recommended by the sealant manufacturer. Prime sides of joints to sealant manufacturer's instructions immediately prior to caulking.

3.3 WORKMANSHIP

- .1 Caulk all joints between dissimilar materials.
- .2 Before application of any sealant, confirm that sealant material is compatible with the materials and finishes of the surfaces to which the material is applied or is in contact with.
- .3 Apply sealants in strict accordance with the manufacturer's printed directions for the specific applications of the particular materials used, using a gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.
- .4 Concrete or masonry joints shall be a minimum of 6 mm wide x 6 mm deep. Depth shall be equal to width in joints up to 12 mm wide. For joints 12 mm to 25 mm wide, depth shall be 12 mm.
- .5 For joints in metal, glass and other non-porous surface, sealant depth shall be a minimum of 1/2 the applied sealant width, and shall in no case exceed the applied sealant width.
- .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities. Neatly tool surface to a slight concave joint.
- .7 Cure sealants in accordance with manufacturer's instructions. Do not cover up sealant until curing is complete and proper seal has been achieved.

3.4 SEALANT APPLICATION

- .1 Apply caulking around the perimeter of every external wall opening, both sides; set exterior door thresholds in a continuous bead of sealant.
- .2 Apply sealant to all exposed control joints in masonry, concrete, and gypsum board walls, ceilings, and bulkheads, joints between adjacent building components.
- .3 Provide interior caulking in walls, floor finishes around all metal frames, door frames, access panels, built-in specialties; around pipes, ducts, grilles, outlet boxes, conduits, etc. penetrating floors, walls and ceiling.
- .4 Apply Type A siliconized acrylic latex caulking around wood trim and wipe smooth prior to painting.
- .5 Caulk solidly around both outside and inside of all window/wall and door/wall joints, horizontal and vertical window and door surrounds, and all other exterior trim, to provide a weathertight seal and prevent condensation.
- .6 Caulk with Type E mildew resistant silicone sealant around plumbing fixtures, base and rim of sinks, at transitions between flooring and tub or shower units, counters and splashbacks, joints in ceramic or porcelain tile and other interior wet or damp locations.
- .7 Supply and install paintable sealant around all piping to sinks and lavatories where piping passes through walls.

3.5 PREFORMED FOAM SEALANT INSTALLATION

- .1 Install preformed foam sealant in joints where indicated, in accordance with the manufacturer's printed instructions.
- .2 Verify dimensions on site and take particular care to select the correct size preformed sealant for the joint.
- .3 Install sealant to a clean line, flush with adjacent surfaces, and filling the joint, without interruption, for its entire length.

3.6 CLEANING

- .1 Upon completion of the work of this Section remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Clean any drippage or spills of sealant or primers from adjacent surfaces immediately and make good damage caused by the work of this Section, using cleaners recommended by the manufacturer, as work progresses.
- .3 Remove masking tape after tooling of joints.

3.7 MANUFACTURER'S WARRANTY INSPECTION

- .1 Upon completion, arrange for inspection of exterior sealant work by a technical representative of the sealant manufacturer.
- .2 Correct deficiencies.
- .3 Arrange for the issuance of the manufacturer's 20-year materials warranty for exterior sealants.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to fabricate and install hollow steel doors and frames, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Section 04 22 00 - Concrete Unit Masonry.
 - .2 Section 07 21 20 - Urethane Foam Insulating Sealant.
 - .3 Section 07 27 16 - Vapour Permeable Air/Moisture Barrier.
 - .4 Section 07 92 00 - Joint Sealants.
 - .5 Section 08 14 16 - Flush Wood Doors.
 - .6 Section 08 71 10 - Door Hardware.
 - .7 Section 09 91 00 - Painting.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM A653/A653M-25a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian Standards Association (CSA):
 - .1 CSA W59:24, Welded Steel Construction.
- .3 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA):
 - .1 CSDFMA Specifications for Commercial Steel Doors and Frames.
- .4 Door and Hardware Institute (DHI):
 - .1 ANSI/DHI A115 IG-1994, Installation Guide for Doors and Hardware.
- .5 Master Painters Institute (MPI):
 - .1 MPI Architectural Specification Manual, Online Subscription (referred to herein as "MPI Manual").
 - .2 MPI Approved Product List, (referred to herein as "MPI APL").
- .6 National Fire Protection Association (NFPA):
 - .1 NFPA (Fire) 80-2025, Standard for Fire Doors and Other Opening Protectives, 2025 Edition.
 - .2 NFPA (Fire) 252-2022, Standard Methods of Fire Tests of Door Assemblies, 2022 Edition.
- .7 Underwriters' Laboratories of Canada (ULC):
 - .1 CAN/ULC 104:2015, Standard Method for Fire Tests of Door Assemblies

- .2 CAN/ULC 105:2016, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC S104.

1.4 REQUIREMENTS OF REGULATORY AGENCIES

- .1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with ULC 104 and ULC 105 for ratings specified or indicated.
- .2 The work of this Section shall conform to OBC requirements, NFPA 80, and all other applicable codes and regulations, to the satisfaction of the authorities having jurisdiction.

1.5 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Shop Drawings:
 - .1 Indicate each type of door, size, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, glazed openings, arrangement of hardware and fire rating where applicable.
 - .2 Indicate each type frame, elevation, profile, material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and finishes.
 - .3 Include a schedule which identifies each unit, with door marks and numbers which clearly correspond to the room numbering system used on the architectural drawings.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Protect products during fabrication, transportation, site storage and erection.
- .2 Store products in strict accordance with the manufacturer's recommendations.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 STEEL

- .1 Steel: Commercial grade steel to ASTM A653/A653M, wipe coat galvanized steel, coating designation ZF001 (A01), minimum base steel thickness unless noted otherwise:
 - .1 Frames: 1.6 mm (16 ga).

- .2 Door faces:
 - .1 Exterior doors: 1.6 mm (16 ga).
 - .2 Interior doors: 1.2 mm (18 ga).
- .3 Top and bottom end channels: 1.2 mm (18 ga).
- .4 Reinforcements:
 - .1 Lock and strike reinforcements: 1.6 mm (16 ga).
 - .2 Hinge reinforcements: 3.4 mm (10 ga).
 - .3 Flush bolt reinforcements: 1.6 mm (16 ga).
 - .4 Door closer and holder reinforcements: 2.7 mm (12 ga).

2.2 ACCESSORIES

- .1 Anchors: as required to suit each specific condition.
- .2 Touch-up primer for galvanized steel sheet: Inorganic zinc-rich primer to MPI APL #19.
- .3 Door silencers: Single stud rubber/neoprene type, 3 per door.
- .4 Other components: Provide other door and frame components in accordance with CSDFMA requirements.

2.3 FABRICATION

- .1 Fabricate doors and frames as detailed, to Canadian Steel Door and Frame Manufacturers' Association, (CSDFMA) Canadian Manufacturing Specifications for Steel Doors and Frames, except where specified otherwise. Reinforce door and frames to suit hardware requirements specified in Section 08 71 10 "Door Hardware".
- .2 Blank, reinforce, drill and tap doors and frames for mortised hardware. Reinforce doors and frames for surface mounted hardware.
- .3 Specified reinforcement is the minimum requirement. Provide additional reinforcement where required to ensure a permanent, rigid, trouble-free installation able to withstand the stresses of heavy usage.
- .4 Cut, shear, straighten and work the steel in a manner which will prevent disfigurement of the finished work.
- .5 Punch frames for rubber door bumpers.
- .6 Fill seams and joints and weld depressions with epoxy metal filler, disk-sand to a smooth, flat, uniform, scratch-free surface, with all arrases sharp and true-to-line. Ream drilled and punched holes and remove all burrs.
- .7 Finished work shall be free of warp, open seams, buckles, weld and grind marks and other surface defects detrimental to the production of a good paint finish.
- .8 Conceal all fastenings except those required for loose glazing stops.

- .9 Welding shall conform to CSA W59.

2.4 FABRICATION OF DOORS

- .1 Doors shall be swing-type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Exterior and interior doors and transom panels to be hollow steel construction.
- .1 Faces: Form each face sheet for exterior and interior doors from a single steel sheet.
 - .2 Reinforce exterior doors with vertical stiffeners, securely welded to each face sheet at 150 mm on centre maximum.
 - .3 Fill voids between stiffeners with expanded polyurethane insulation.
 - .4 Construct interior doors with a honeycomb core.
- .3 Make provision for glazing as indicated and provide the following:
- .1 Channel formed glazing stop, 16 mm high.
 - .2 Screw fixing with countersunk oval head sheet metal screws.
- .4 Longitudinal edges shall be welded. Top and bottom shall be closed with recessed spot welded channel closures. Grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
- .5 All exterior doors and also interior doors with electronic contacts shall have a top flush steel closure with edges welded and seam filled.
- .6 Bevel the opening edge of the door to provide clearance for a tighter fit in frame.
- .7 Provide reinforcement and drill holes in the locations and diameters required in accordance with hardware requirements and templates. Refer to Section 08 71 10 "Door Hardware".
- .8 Provide fire labelled doors where indicated in the Door Schedule. Fire rated doors shall be tested in strict conformance with ULC 104 or NFPA 252 and listed by an agency acceptable to the authorities having jurisdiction. Construct doors as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by the listing agency to individual manufacturers.
- .9 Attach ULC labels to doors where applicable.
- .10 Touch up galvanized finish damaged during fabrication with zinc-rich primer and leave all surfaces ready to receive paint finish by Section 09 91 00.
- .11 Shop-prime exterior doors with cementitious primer with cementitious galvanized metal primer to MPI APL #26.

2.5 FABRICATION OF FRAMES: GENERAL

- .1 Frames to be manufactured by the same manufacturer as doors.
- .2 Frames in public areas and suite entrance door frames to be continuously welded construction. Spot welded or knockdown frames are acceptable only within suites.

- .3 Exterior frames shall be thermally broken with minimum 6 mm neoprene spacer mechanically interlocked with the inner and outer portions of the frames to form a single rigid assembly.
- .4 Cut mitres and joints accurately and weld continuously on inside of profile. Accurately cope and securely weld butt joints of mullions, transom bars, centre rails and sills.
- .5 Grind welded joints to a flat plane, fill with metallic paste filler and sand to uniform smooth finish.
- .6 Conceal fastenings except where exposed fastenings are indicated.
- .7 Blank, mortise, reinforce, drill and tap frames and reinforcements to receive hardware using templates provided by finish hardware supplier. Refer to Section 08 71 10 "Door Hardware.
- .8 Protect mortise cutouts with steel guard boxes.
- .9 Protect strike and hinge reinforcements using guard boxes welded to frames.
- .10 Reinforce head of frames wider than 1200 mm (4'-0").
- .11 Securely attach floor anchors to the inside of each jamb profile.
- .12 Weld in two temporary jamb spreaders per frame to maintain proper alignment during shipment.
- .13 Provide for appropriate anchorage to floor and wall construction. Locate each wall anchor immediately above or below each hinge reinforcement on the hinge jamb and directly opposite on the strike jamb. For rebate opening heights up to and including 1520 mm, provide two anchors, and an additional anchor for each additional 760 mm of height or fraction thereof, except as indicated below.
- .14 For frames in previously placed concrete, provide anchors located not more than 150 mm from the top and bottom of each jamb, and intermediate anchors at 660 mm on centre maximum.
- .15 Provide single stud rubber door silencers. Install three on strike jamb for each single door and two at head for each pair of doors.
- .16 Provide fire labelled frames where indicated in the Door Schedule. Fire rated frames shall be tested in strict conformance with ULC 104 or NFPA 252 and listed by an agency acceptable to the authorities having jurisdiction. Construct frames as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by the listing agency to individual manufacturers.
- .17 Attach ULC or Warnock Hersey labels to frames, where applicable.
- .18 When required due to site access or due to shipping limitations, frames for large openings may be fabricated in sections with splice joints for field assembly. Show the locations of field joints on the shop drawings and adhere to those locations.
- .19 Touch up galvanized finish damaged during fabrication with zinc-rich primer to MPI APL #18 and leave all surfaces ready to receive paint finish by Section 09 91 00.

- .20 Shop-prime exterior frames with cementitious primer to MPI APL #26.

Part 3 Execution

3.1 INSTALLATION GENERAL

- .1 Install doors, frames and hardware in accordance with ANSI/DHI A115 IG.
- .2 Install labelled doors, frames and hardware in accordance with NFPA 80.

3.2 FRAME INSTALLATION

- .1 Set frames plumb, square, level and at correct elevation and secure anchorages and connections to adjacent construction.
- .2 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
- .3 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
- .4 Grout exterior frames solid on the exterior side and fill on the interior side with insulation.
- .5 Refer to Section 07 92 00 "Joint Sealants" for application of sealant around the exterior and interior perimeter of the frames.

3.3 DOOR INSTALLATION

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 10 "Door Hardware".
- .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
 - .1 Hinge side: 1.0 mm.
 - .2 Latchside and head: 1.5 mm.
 - .3 Finished floor and thresholds:
 - .1 Generally: 13 mm.
 - .2 Doors identified as undercut: 25 mm.
- .3 Adjust operable parts for smooth, correct function.

3.4 CLEANING

- .1 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.

- .2 Make good damage to other work caused by the Work of this Section.
 - .1 Execute repair work in accordance with the original manufacturer's written instructions.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to fabricate and install glazed aluminum doors and frames, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Section 06 10 00 - Rough Carpentry.
 - .2 Section 07 21 19 - Urethane Foam Insulating Sealant.
 - .3 Section 07 27 16 - Vapour Permeable Air/Moisture Barrier.
 - .4 Section 07 92 00 - Joint Sealants.
 - .5 Section 08 52 13 - Aluminum-Clad Wood Windows.
 - .6 Section 08 80 00 - Glazing.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM A123/A123M-24, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM B209/B209M-21a, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - .3 ASTM B221-21, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
 - .4 ASTM E283/E283M-19, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- .2 Fenestration and Glazing Industry Alliance (FGIA):
 - .1 AAMA 2605-20, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- .3 Canadian Standards Association: (CSA):
 - .1 CSA G40.20-13/G40.21-13(R2023), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA S157-17/S157.1-17(R2022), Strength Design in Aluminum / Commentary on CSA S157-17, Strength Design in Aluminum.
- .4 Master Painters Institute (MPI):
 - .1 MPI Architectural Specification Manual, Online Subscription (referred to herein as "MPI Manual").

.2 MPI Approved Product List (referred to herein as "MPI APL").

.5 The Society for Protective Coatings (SSPC):

.1 SSPC-Paint 12 1982, Paint Specification No. 12: Cold Applied Asphalt Mastic (Extra Thick Film).

1.4 REGULATORY REQUIREMENTS

.1 The work of this Section shall conform to the requirements of the OBC 2006, latest revision, and all other applicable codes and regulations, to the satisfaction of the authorities having jurisdiction.

1.5 DESIGN CRITERIA AND PERFORMANCE

.1 Design frames and doors in exterior walls to accommodate expansion and contraction within an ambient temperature range of -35°C to +35°C.

.2 Base structural performance on CSA-S157 and a maximum deflection of 1/175 of the span.

.3 Air infiltration for exterior doors and frames shall not exceed 2.78 m³/h.m for a single door or 5.56 m³/h.m for a pair of double doors, when tested in accordance with ASTM E283 at a pressure differential of 75 Pa.

.4 Thermally, the grid members of exterior frames shall have a condensation resistance equal to, or better than, the area along the bottom of a 25 mm sealed glass unit with standard metal spacer edge construction.

1.6 SUBMITTALS

.1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.

.2 Shop Drawings:

.1 Indicate each type of door and frame, extrusion profiles, method of assembly, section and hardware reinforcement, locations of exposed fasteners, finishes and location of manufacturer's nameplates.

.2 Submit catalogue details for each type of door and frame illustrating profiles, dimensions and methods of assembly.

.3 Coordinate with other Sections and ensure that shop drawings are submitted early enough in the schedule to permit review prior to the work of any trade required to build in items for this Section. For example: inserts or weld plates, for anchorage, required to be built into cast-in-place concrete work.

.3 Maintenance Data: Provide maintenance data for cleaning and maintenance of aluminum finishes for incorporation into the operation and maintenance manual specified in Section 01 78 00 "Closeout Submittals".

.1 Include recommendations for the maintenance of the aluminum finish.

1.7 PROTECTION

- .1 Apply temporary protective coating to finished surfaces. Remove coating after erection. Do not use coatings that will become hard to remove or leave residue.
- .2 Leave protective covering in place until final cleaning of building.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

1.9 WARRANTY

- .1 For the work of this Section, the 12-months warranty period prescribed in the General Conditions of the Contract, is extended to 5 years.

Part 2 Products

2.1 GENERAL

- .1 This specification is based on aluminum doors and frames as manufactured by Kawneer Company Canada Limited.
- .2 Requests for substitutions will be considered in accordance with provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.

2.2 MATERIALS

- .1 Aluminum extrusions: To ASTM B221, Aluminum Association alloy AA6063-T5 anodizing quality.
- .2 Sheet aluminum: To ASTM B209, Aluminum Association alloy AA1100-H14 anodizing quality.
- .3 Steel reinforcement, fastening clips, etc.: to CSA-G40.21, hot dip galvanized to ASTM A123.
- .4 Fasteners: 300 Series stainless steel or 400 Series cadmium plated stainless steel of sufficient size and quantity to perform their intended function, finished to match adjacent material.
- .5 Weatherstrip: replaceable mohair metal backed wool pile.
- .6 Door bumpers: black neoprene.

- .7 Threshold: Aluminum extrusion, 12.7 mm high x extended width to cover top of foundation wall x length to suit. Aluminum Association alloy AA6063-T5, mill finish. Provide cadmium plated steel fasteners as required.
- .8 Door bottom seal: Adjustable door seal of anodized extruded aluminum frame and vinyl weather seal, recessed in door bottom, closed ends.
- .9 Isolation coating: Alkali resistant bituminous paint to SSPC Paint-12 applied at rate of 1 l/m².
- .10 Zinc-rich coating: MPI APL #18.
- .11 Glass and glazing materials: Provided by this Section in accordance with Section 08 80 00 "Glazing".
- .12 Sealants: Refer to Section 07 92 00 "Joint Sealants".
- .13 Door hardware: Refer to Section 08 71 10 "Door Hardware".

2.3 FRAMED ALUMINUM DOORS

- .1 Construct doors of porthole extrusions with minimum wall thickness of 3 mm.
- .2 Reinforce mechanically-joined corners of doors to produce sturdy door unit.
- .3 Glazing stops: interlocking snap-in type for dry glazing.
- .4 Exterior stops: tamperproof type.
- .5 Exterior thermal entrance doors: .
 - .1 Standard of acceptance: Kawneer Insulclad 360 Series.
 - .2 Stile and rail dimensions:
 - .1 Sightline: 103 mm.
 - .2 Thickness: 57 mm.
- .6 Interior entrance doors:
 - .1 Standard of acceptance: Kawneer Standard 350 Series.
 - .2 Stile and rail dimensions:
 - .1 Sightline: 88 mm.
 - .2 Thickness: 45 mm.

2.4 ALUMINUM FRAMES

- .1 Construct frames of aluminum extrusions with minimum wall thickness of 3 mm.
- .2 Exterior frames: TriFab Versaglaze 451T Series.
 - .1 Assembled frame members to be 51 mm wide x 114 mm deep.

- .3 Interior: TriFab Versaglaze 451 Series.
 - .1 Assembled frame members to be 51 mm wide x 114 mm deep.

2.5 FINISHES

- .1 Aluminum surfaces:
 - .1 Finish aluminum surfaces with PVDF fluoropolymer paint to AAMA 260, including 70% Kynar 500 PVDF resin. Colour to be selected by the Consultant to match the windows specified in Section 08 52 13 "Aluminum-Faced Wood Windows".
- .2 Prior to application of finish:
 - .1 Notching and welding to be completely executed.
 - .2 Exposed surfaces to be fine satin finished to ensure elimination of extrusion die marks and fabrication marks and to ensure uniformity of finish.
- .3 Steel clips and reinforcement: 380 g/m² zinc coating to ASTM A123.
- .4 Isolate aluminum from the following components by a heavy coating of bituminous coating:
 - .1 Dissimilar metals except stainless steel, zinc or white bronze in small area.
 - .2 Concrete, mortar and masonry.
 - .3 Wood.

2.6 FABRICATION

- .1 Doors and framing to be by same manufacturer.
- .2 Fabricate doors and frames to profiles and maximum face sizes as shown. Provide minimum 22 mm bite for insulating glazed units.
- .3 Provide structural steel reinforcement as required.
- .4 Fit joints tightly and secure mechanically.
- .5 Conceal fastenings.
- .6 Design anchorages so that they do not interfere with other work such as floor finishes or drywall finishes to walls.
- .7 Mortise, reinforce, drill and tap doors, frames and reinforcements to receive hardware using templates provided by Section 08 71 10 "Door Hardware".
- .8 Coordinate installation of hardware in the doors and frames to ensure proper operation of the completed installation.
- .9 Isolate aluminum from direct contact with dissimilar metals, concrete and masonry.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .3 Take field measurements to verify or supplement dimensions.
- .4 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Trade Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 INSTALLATION

- .1 Set frames plumb, square, level at correct elevation in alignment with adjacent work.
- .2 Anchor securely.
- .3 Touch-up galvanized steel brackets with zinc-rich coating immediately following the alignment and fastening operation.
- .4 Brace frames rigidly for building-in. Install temporary horizontal wood spreaders at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders and supports after frames are built-in.
- .5 Install doors and hardware in accordance with hardware templates and manufacturer's instructions.
- .6 Adjust operable parts for correct function.
- .7 Make allowances for deflection of structure to ensure that structural loads are not transmitted to frames.

3.3 GLAZING

- .1 Glaze aluminum doors and frames in accordance with Section 08 80 00 "Glazing" and the manufacturer's standard glazing methods and materials.

3.4 AIR/VAPOUR SEAL

- .1 Ensure airtight connections with adjacent construction to maintain the airseal over the entire building envelope.
- .2 Coordinate with the building air/vapour barrier installer and install air/vapour barrier transition strips at the interface with adjacent construction. Refer to details.

- .3 Inspect the entire assembly for gaps in the air seal and make good.

3.5 CAULKING

- .1 Seal joints to provide weathertight seal at outside and air, vapour seal at inside.
- .2 Apply sealant in accordance with Section 07 92 00 "Joint Sealants". Conceal sealant within the aluminum work except where exposed use is permitted by the Consultant. Colour of exposed sealant to match finish to the approval of the Consultant.

3.6 PROTECTION

- .1 During and after installation, protect the work of this Section from damage. Remove all corrosive or foreign material or droppings resulting from the work of this or other trades.
- .2 Do not use coatings that will become hard to remove or leave residue.

3.7 FINAL CLEANING

- .1 Remove protective coating and clean all surfaces, using materials and methods recommended by the door and frame manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to fabricate flush wood doors, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections
 - .1 Section 06 20 00 - Finish Carpentry.
 - .2 Section 08 11 13 - Steel Doors and Frames.
 - .3 Section 08 71 10 - Door Hardware.
 - .4 Section 09 91 00 - Painting.

1.3 REFERENCES

- .1 Architectural Woodwork Manufacturers' Association of Canada (AWMAC):
 - .1 North American Architectural Woodwork Standards, NAAWS 4.0, (2021) Plus Errata (referred to herein as "AWS").
- .2 Door and Hardware Institute (DHI):
 - .1 ANSI/DHI A115 IG-1994, Installation Guide for Doors and Hardware.
- .3 National Fire Protection Association (NFPA):
 - .1 NFPA (Fire) 80-2022, Standard for Fire Doors and Other Opening Protectives, 2022 Edition.
- .4 National Particleboard Association (NPA):
 - .1 ANSI/NPA A208.1-2009, Particleboard.
- .5 Underwriters' Laboratories of Canada (ULC):
 - .1 CAN/ULC 104:2015, Standard Method for Fire Tests of Door Assemblies
 - .2 CAN/ULC 105:2016, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC S104.

1.4 PROTECTION

- .1 Protect doors from dampness. Arrange for delivery after work causing abnormal humidity has been completed.
- .2 Store doors in well ventilated room, off floor, in accordance with manufacturer's recommendations.
- .3 Protect doors from scratches, handling marks and other damage. Wrap all doors.

1.5 REQUIREMENTS OF REGULATORY AGENCIES

- .1 Fire rated doors: labelled and listed by an organization accredited by Standards Council of Canada in conformance with ULC 104 and ULC 105 for ratings specified or indicated.
- .2 The work of this Section shall conform to OBC requirements and all other applicable codes and regulations, to the satisfaction of the authorities having jurisdiction.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

1.7 WARRANTY

- .1 For the work of this Section, the 12-months warranty period prescribed in the General Conditions of the Contract is extended to 5 years.
- .2 Warrant that doors will not warp, twist, show core holes, delaminate or sag.

Part 2 Products

2.1 SOLID CORE WOOD DOORS

- .1 Flush solid core wood interior doors to NAAWS door type PC-5, custom grade, as follows:
 - .1 Fire rating: As indicated on the Door Schedule.
 - .2 Thickness: 45 mm.
 - .3 Construction: framed core of extruded particleboard to ANSI/NPA A208.1, Grade LD-1 or LD-2. Stiles and rails securely bonded to core then entire unit abrasive planed before veneering.
 - .4 Top and bottom rails: Minimum 21 mm thick after factory fitting, one-piece or laminated wood without voids or telegraphing.
 - .5 Stiles: Minimum 25 mm thick after factory fitting, solid or laminated wood.
 - .6 Crossband: Nominal 1.6 mm thick one-piece wood, species at the option of the fabricator.
 - .7 Face skins:
 - .1 Where paint finish is indicated: Paint grade hardwood veneer, species at the option of the fabricator.
 - .2 Where clear or stain finish is indicated: Maple veneer in accordance with NAAWS standards, based on veneer face grades established by HPVA: Grade AA, flat cut, random slip matched.
 - .8 Edge detail: NAAWS Type A.
 - .9 Adhesives:
 - .1 Face adhesive: Type I(waterproof).
 - .2 Core assembly adhesive: Type II (water-resistant).
 - .10 Glazing stops (where applicable): Lip moulding profile.

2.2 FABRICATION

- .1 Fabricate doors and panels in accordance with the applicable NAAWS requirements.
- .2 Bevel vertical edges of single acting doors 3 mm on lock side and 1.5 mm on hinge side.

Part 3 Execution

3.1 INSTALLATION

- .1 Install doors and hardware in accordance with ANSI/DHI A115 IG and manufacturer's instructions.
- .2 Install fire rated doors and hardware to NFPA 80.
- .3 Fit hardware accurately and securely in accordance with the manufacturer's directions. Adjust operating parts for smooth, correct function. Refer to Section 08 71 10.
- .4 Seal all four edges immediately for fitting, including areas routed for concealed closers and other hardware.

3.2 ADJUSTMENT

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

3.3 CLEANING

- .1 Upon completion of the installation remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Make good damage to other work caused by the Work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to fabricate and install access doors, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Section 09 21 16 - Gypsum Board Assemblies.
 - .2 Plumbing: Refer to mechanical specifications under separate cover.
 - .3 Heating, ventilating and air conditioning (HVAC): Refer to mechanical specifications under separate cover.
 - .4 Electrical: Refer to electrical specifications under separate cover.

1.3 REFERENCES

- .1 National Fire Protection Association (NFPA):
 - .1 NFPA (Fire) 80-2022, Standard for Fire Doors and Other Opening Protectives, 2022 Edition.

1.4 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Shop Drawings: Submit catalogue details for each type of door illustrating profiles, dimensions and methods of assembly.
- .3 Maintenance Data: Provide maintenance data for cleaning and maintenance of stainless steel finishes for incorporation into the operation and maintenance manual specified in Section 01 78 00 "Closeout Submittals".

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 ACCESS DOORS

- .1 Access doors to be fire-rated to match assembly, minimum sizes as follows, except where indicated otherwise:
 - .1 For body entry: 900 mm x 900 mm.
 - .2 For hand entry: 300 mm x 300 mm.
- .2 Construction: Rounded safety corners, concealed hinges, screwdriver latch, anchor straps, able to open 180°.
- .3 Materials:
 - .1 For tiled surfaces: Stainless steel with brushed satin or polished finish as directed by the Consultant.
 - .2 Other surfaces: galvanized steel for paint finish by Section 09 91 00 "Painting".

Part 3 Execution

3.1 INSTALLATION

- .1 Install ULC labelled fire-rated access doors to NFPA 80
- .2 Install flush with adjacent finish materials
- .3 Ensure smooth operation of panel covers without binding

3.2 FINISHING

- .1 Floor access doors: finished flooring to match adjacent floor
- .2 Wall and ceiling access doors: painted to match adjacent wall/ceiling.

3.3 LOCATIONS

- .1 Ensure that equipment to be accessed is within view and accessible for operating, inspecting, adjusting and servicing without using special tools.

3.4 CLEANING

- .1 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Make good damage to other work caused by the Work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to fabricate and install an overhead coiling door to the accessory building, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Section 02 41 19 - Selective Demolition.
 - .2 Section 04 22 00 - Concrete Unit Masonry.
 - .3 Section 05 50 00 - Metal Fabrications.
 - .4 Section 06 10 00 - Rough Carpentry.
 - .5 Section 09 91 00 - Painting.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM A653/A653M-25a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.

1.4 PERFORMANCE CRITERIA

- .1 Design the door to withstand at least 0.958 kPa windload.
- .2 Design the door to a standard maximum of 25 cycles per day and an overall maximum of 50,000 operating cycles for the life of the door.

1.5 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Product Data: Provide manufacturer's data sheets, including:
 - .1 Preparation instructions and recommendations.
 - .2 Storage and handling requirements and recommendations.
 - .3 Installation methods.
- .3 Manufacturer's Certificates: Certify products meet or exceed specified requirements.

- .4 Maintenance Data:
 - .1 Provide manufacturer's maintenance instructions for inclusion in the operation and maintenance manual specified in Section 01 78 00 "Closeout Submittals".
 - .2 Include recommendations for periodic checking, adjustment and lubrication of components.

1.6 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: A company specializing in performing the work of this section with a minimum of five years documented successful experience in the fabrication and installation of overhead coiling doors of the type required for this project.
- .2 Installer Qualifications: A company with a minimum of three years documented experience in the installation of overhead coiling doors and licensed by the product manufacturer as an approved installer.
- .3 If requested by the Consultant, provide evidence of previously completed projects of a similar nature.

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Store products in manufacturer's unopened packaging with seals and labels intact until ready for installation.
- .2 Store materials off the ground in a dry, warm, ventilated weathertight location and protect from damage.

1.8 SEQUENCING

- .1 Ensure that locating templates and other information required for installation of products of this Section are furnished to affected trades in time to prevent interruption of construction progress.
- .2 Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.9 PROJECT CONDITIONS

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

1.10 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".

- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

1.11 WARRANTY

- .1 For the work of this Section, the 12-months warranty period prescribed in the General Conditions of the Contract is extended to 5 years.

Part 2 Products

2.1 MANUFACTURERS

- .1 This specification is based on overhead coiling doors by Cookson.
- .2 Requests for substitutions will be considered in accordance with the provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.

2.2 ROLLING STEEL DOOR

- .1 Standard of acceptance: Thermiser Max Model ESD30 Insulated Rolling Door, by Cookson, galvanized finish, between-jamb mount.
- .2 Description:
 - .1 Size as indicated on the drawings (verify on site)
 - .2 Curtain: composed of interlocking roll-formed slats fabricated from galvanized steel sheet to ASTM A653, G90 coating designation, for on-site painting by Section 09 91 00.:
 - .1 Slat profile: 76 mm wide (face) x 24 mm deep.
 - .2 Base metal thickness:
 - .1 Outer skin: 1.21 mm (18 ga).
 - .2 Inner skin: 0.61 mm (24 ga).
 - .3 Core: Insulating Foam.
- .3 Performance:
 - .1 Air infiltration: < 0.1 m³/min/m².
 - .2 Thermal insulation: RSI 1.28 m²·°C/W per 25 mm.
- .4 Bottom Bar: Two equal steel angles, 3 mm minimum thickness, to stiffen curtain, 1 coat prime paint finish for on-site painting by Section 09 91 00 "Painting".
 - .1 Include a continuous extruded rubber weatherstrip.
- .5 Guides (Face of wall mount E): 3 steel angles, bolted together with 10 mm fasteners to form a channel for the curtain to travel.
 - .1 The wall angle portion shall be continuous and fastened to the surrounding structure with minimum 13 mm fasteners.
 - .2 Finish: 1 coat prime paint finish for on-site painting by Section 09 91 00 "Painting".
 - .3 Include a continuous extruded rubber weatherstrip at jambs.

- .6 Weatherstripping at head: Extruded rubber seal sandwiched by a double lintel seal brush. contacting the door curtain.
- .7 Brackets: Fabricated from steel, not less than 6 mm thick, bolted to the wall angle with minimum 13 mm fasteners, 1 coat prime paint finish for on-site painting by Section 09 91 00 "Painting".
- .8 Gears: Cast iron with teeth cut from machine-cut patterns.
 - .1 Pinion gear to be minimum 76 mm diameter
 - .2 Design the gear ratio for a maximum effort of not more than 14 kg.
- .9 Barrel: Minimum 100 mm dia. steel tubing, oil tempered torsion springs, capable of correctly counterbalancing the weight of the curtain.
 - .1 Provide both a main and an auxiliary spring.
 - .2 Design the barrel to limit the maximum deflection to 4 mm per lineal metre of opening width.
 - .3 The springs to be adjustable by means of an exterior wheel.
 - .4 Finish: 1 coat prime paint finish for on-site painting by Section 09 91 00 "Painting".
- .10 Hood: Hood to enclose curtain coil and counterbalance mechanism, fabricated of minimum 0.61 mm (24 ga) galvanized sheet steel to ASTM A 653, G90 coating designation, flanged at the top for attachment to the header and flanged at the bottom to provide longitudinal stiffness.
- .11 Operation: The push-up operated door shall open and close with a maximum of 13.6 kg of effort using handles in the curtain.
- .12 Locking Mechanism: Slide bolt on the bottom bar.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Examine conditions of substrates, supports, and other conditions under which this work is to be performed.
- .3 Verify that:
 - .1 openings have been properly prepared to receive the doors;
 - .2 adjacent walls and bulkheads are constructed in accordance with the required fire resistance requirements; and
 - .3 all necessary structural support, electrical work and miscellaneous metal fabrications are in place.
- .4 Take field measurements to verify or supplement dimensions.
- .5 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.

- .6 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Trade Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 PREPARATION

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

3.3 INSTALLATION

- .1 Install in accordance with manufacturer's instructions.
- .2 Install door complete with necessary hardware, jamb and head mould strips, anchors, inserts, hangers, and supports, in accordance with reviewed and accepted shop drawings, manufacturer's instructions, and as specified herein.
- .3 Fit, align and adjust rolling door assemblies level and plumb for smooth operation.
- .4 Upon completion of final installation, lubricate, test and adjust doors to operate easily, free from warp, twist or distortion and fitting for entire perimeter.

3.4 ADJUSTING

- .1 Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- .2 Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

- .1 Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.
- .2 Remove labels and visible markings.
- .3 Touch-up, repair or replace damaged products to the satisfaction of the Consultant before Substantial Performance of the Contract. Replace damaged products that cannot be satisfactorily repaired.
- .4 Remove from the premises all surplus material, dirt and debris caused by the work of this section and leave the installation clean.
- .5 Make good any damage caused by the work of this Section.

3.6 PROTECTION

- .1 Protect installed products until completion of the project.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to supply and install a sectional metal overhead door, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Section 04 22 00 - Concrete Unit Masonry.
 - .2 Section 05 50 00 - Metal Fabrications.
 - .3 Section 06 10 00 - Rough Carpentry.
 - .4 Section 07 42 43 - Aluminum Composite Material (ACM) Panels.
 - .5 Section 07 46 19 - Preformed Metal Siding.
 - .6 Section 07 92 00 - Joint Sealants.
 - .7 Section 08 71 10 - Door Hardware.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM A653/A653M-25a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.

1.4 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Product Data: Include:
 - .1 Materials and details of construction and finish
 - .2 Preparation instructions.
 - .3 Handling and storage requirements
 - .4 Manufacturer's Installation Instructions:
 - .1 Indicate installation sequence, adjustment, and alignment procedures.
 - .5 Data on electrical operation.
- .3 Shop Drawings:
 - .1 Include Materials, anchorage methods, hardware locations, and installation details
 - .2 Indicate rough and actual opening dimensions.
 - .3 Include a complete electrical wiring diagram.
- .4 Quality Assurance/Control Submittals:

- .1 Certificates: Manufacturer's certificate that products meet or exceed specified requirements.
- .2 Qualification Documentation: Submit documentation of experience indicating compliance with specified qualification requirements.
- .5 Operation and Maintenance Data:
 - .1 Provide maintenance data for incorporation into the operation and maintenance manual specified in Section 01 78 00 "Closeout Submittals".
 - .2 Include modes of operation, lubrication requirements and frequency, and periodic adjustments required.
- .6 Specimen warranty: a copy of the warranty.

1.5 QUALIFICATIONS

- .1 The work of this Section shall be manufactured by a manufacturer with minimum ten years experience in the actual production of the specified products.
- .2 The work of this Section shall be executed by a company licensed by the product manufacturer as an approved installer.
 - .1 Employ only skilled tradesmen who are experienced in this work.
 - .2 If requested by the Consultant, provide evidence of previously completed projects of a similar nature.

1.6 QUALITY ASSURANCE

- .1 Preinstallation Conference:
 - .1 A preinstallation conference will be held before installation starts, with the following present:
 - .1 Contractor.
 - .2 Contractor.
 - .3 Installer.
 - .4 Manufacturer's technical representative.
 - .5 Other Subcontractors whose work affects or is affected by the Work of this Section.
- .2 Regulatory Requirements: Conform to current OBC requirements, and all other applicable codes and regulations, to the satisfaction of the authorities having jurisdiction.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver products in original unopened packaging with legible manufacturer's identification.
- .2 Store materials in strict accordance with the manufacturer's recommendations.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

1.9 WARRANTY

- .1 For the work of this Section, the 12-months warranty period prescribed in the General Conditions of the Contract is extended to five years.
- .2 Complete the forms in the Owner's name and register with manufacturer.

Part 2 Products

2.1 MANUFACTURERS

- .1 This specification is based on overhead sectional steel doors by Overhead Door Corporation.
- .2 Requests for substitutions will be considered in accordance with the provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.

2.2 UPWARD ACTING SECTIONAL STEEL DOORS

- .1 Standard of acceptance: Thermacore Steel Sectional Door, Model 596, by Overhead Door Corporation, as follows:
 - .1 Size: 4267 mm wide x 3658 h x 51 mm thick.
 - .2 Mounting: Surface mounted on the interior of the building.
 - .3 Operating speed (opening and closing): Variable speed of 152 to 305 mm per second.
 - .4 Air Infiltration at 40 km/hr: 2.37 m³/hr/m².
 - .5 U-Factor: 0.10.
 - .6 RSI-value: 3.09.
 - .7 STC Rating: Class 26.
 - .8 Operation Cycles: Capable of operating for minimum 100,000 cycles.
 - .1 One operation cycle is complete when door is opened from closed position to fully open position and returned to closed position.
 - .9 Exterior Steel Thickness: 0.91 mm.
 - .10 Joint Profile: Shiplap.
 - .11 Section Height: Manufacturer's standard based on door height.
 - .12 Exterior Surface Profile: Flush.
 - .13 Glazing: Insulated double thermal acrylic, aluminum sash section to match existing glazing.
 - .14 Exterior finish and colour to match existing overhead doors.
 - .15 Locking options to include: Cylinder. Refer to Hardware Schedule specified in Section 08 71 10 "Door Hardware".
 - .1 Lock Locations: Both jambs.
 - .16 Weatherstripping and Seals: Required.
 - .17 Tracks:
 - .1 Constructed of steel with members fully bolted together.
 - .2 Size: 76 mm.
 - .3 Finish: Mill finish.
 - .18 End Stiles: 14 gauge, 1.897 mm galvanized steel.

- .19 Brackets supporting counterbalance and curtain: Hot-dip galvanized steel.
- .20 Springs: Rated for 100,000 cycles.
- .21 Manual emergency operation: Chain hoist.
- .22 Motor Operation: Provide ULC-listed electric operator; size as recommended by the manufacturer to move the door in either direction at minimum 152 mm per second.
- .23 Timer to Close: Automatic closing controlled by adjustable hold-open time delay.
- .24 Operation Supply Voltage: Coordinate with Electrical Subcontractor
- .25 Signalling Device: Traffic warning light.
- .26 Actuation Device: As directed y the Consultant
- .27 Motor Mounting: Centre wall mounted.
- .28 Obstruction Safety Detection: Infrared sensor mounted in-plane to door curtain at 152 mm from the floor.

Part 3 Execution

3.1 GENERAL

- .1 Execute the work in strict accordance with the manufacturer's instructions, and the reviewed shop drawings, to the satisfaction of the authorities having jurisdiction.

3.2 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .3 Verify wall openings are ready to receive the work and opening dimensions and tolerances are within the manufacturer's acceptable limits.
- .4 Verify electric power is available and meets the manufacturer's requirements.
- .5 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.3 PREPARATION

- .1 Prepare the opening to permit correct installation of the door unit to provide a proper perimeter air and vapor barrier seal.

3.4 INSTALLATION

- .1 Install the door unit assembly in accordance with the manufacturer's instructions.
- .2 Anchor assembly to the wall construction without distortion or stress.
- .3 Install level, plumb and in true alignment and fasten securely in place.

- .4 Securely brace door tracks suspended from the structure. Attach the tracks to structural members only.
- .5 Fit and align door assembly including hardware. Adjust for correct function.
- .6 Coordinate the installation of electrical service. Complete power and control wiring from the disconnect to unit components.

3.5 TOLERANCES

- .1 Maintain the following dimensional tolerances and alignment with adjacent work.
 - .1 Maximum Variation from Plumb: 1.5 mm.
 - .2 Maximum Variation from Level: 1.5 mm.
 - .3 Longitudinal or Diagonal Warp: ± 3 mm in 3 m when measured with a 3 m straight edge.

3.6 ADJUSTING

- .1 Adjust the door assembly for smooth operation and full contact with the weatherstripping.
- .2 Confirm with the manufacturer's field representative that operation is in accordance with the manufacturer's instructions. Identify adjustments to the door assembly.

3.7 CLEANING

- .1 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Clean doors, frames, and glazing.
- .3 Remove temporary labels and visible markings.
- .4 Make good damage to other work caused by the Work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

3.8 PROTECTION

- .1 Protect installed products from damage until the date of Substantial Performance.
- .2 Do not permit construction traffic through overhead door openings after adjustment and cleaning.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to supply and install aluminum-clad wood windows, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 The work includes:
 - .1 Casement windows.
 - .2 Fixed windows.
- .3 Related Sections:
 - .1 Section 06 10 00 - Rough Carpentry.
 - .2 Section 07 21 20 - Urethane Foam Insulating Sealant.
 - .3 Section 07 27 16 - Vapour Permeable Air/Moisture Barrier.
 - .4 Section 07 42 43 - Aluminum Composite Material (ACM) Panels.
 - .5 Section 07 46 23 - Prefinished Wood Siding.
 - .6 Section 07 92 00 - Joint Sealants.
 - .7 Section 08 11 16 - Aluminum Doors and Frames.
 - .8 Section 08 80 00 - Glazing.
 - .9 Section 09 90 00 - Painting.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM A123/A123M-24, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM B221-21, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
 - .3 ASTM E283/E283M-19, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - .4 ASTM E330/E330M-14(2021), Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 - .5 ASTM E331-00(2023), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference.
- .2 Fenestration and Glazing Industry Alliance (FGIA):
 - .1 AAMA 2605-20, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

- .3 Canadian Standards Association (CSA):
 - .1 CSA/AAMA/WDMA/CSA101/I.S.2/A440:22, North American Fenestration Standard/Specification for windows, doors, and skylights, Includes Errata (2023) and Update No. 1 (2024).
- .4 Master Painters Institute (MPI):
 - .1 MPI Architectural Specification Manual, Online Subscription (referred to herein as "MPI Manual").
 - .2 MPI Approved Product List (referred to herein as "MPI APL").
- .5 National Fenestration Rating Council (NFRC):
 - .1 ANSI/NFRC 100-2023, Procedure for Determining Fenestration Product U-Factors

1.4 REGULATORY REQUIREMENTS

- .1 The work of this Section shall conform to the requirements of the OBC 2006, latest revision, and all other applicable codes and regulations, to the satisfaction of the authorities having jurisdiction.

1.5 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Product Data:
 - .1 Manufacturer's data sheets on each product to be used.
 - .2 Storage and handling requirements and recommendations.
 - .3 Manufacturer's installation instructions.
- .3 Shop Drawings:
 - .1 Include dimensions, relationship to adjacent construction, air and vapour barrier seal to component anchorage, type of caulking, window locations, installation methods, materials, and finishes.
- .4 Samples: Duplicate representative units of each material type, pattern, and colour.
 - .1 Include two 300 mm x 300 mm samples of glazing.
- .5 Test Reports: Certification by a recognized independent testing laboratory demonstrating each type of window unit complies with performance requirements for air infiltration, water resistance, uniform structural loads, life cycle testing and thermal performance.
- .6 Quality Assurance/Control Submittals:
 - .1 Certificates: Manufacturer's certificate that products meet or exceed specified requirements.
 - .2 If requested by the Consultant, submit laboratory test reports certifying compliance of with specification requirements.
 - .3 Qualification Documentation: Submit documentation of experience indicating compliance with specified qualification requirements.

- .7 Maintenance Data:
 - .1 Provide maintenance data for windows for incorporation into the operation and maintenance manual specified in Section 01 78 00 "Closeout Submittals".
 - .2 Include recommendations for the maintenance of the aluminum finish.

1.6 QUALITY CONTROL

- .1 The work of this Section shall be manufactured by a manufacturer with minimum ten years experience in the production of the specified products.
- .2 The work of this Section shall be executed by a company licensed by the material manufacturer as an approved installer.
 - .1 Employ only skilled tradesmen who have successfully completed a course of instruction provided by the product manufacturer and are experienced in this work.
 - .2 If requested by the Consultant, provide evidence of previously completed projects of a similar nature.
- .3 Pre-installation Window Test: The Owner reserves the right to randomly select one window of each type and submit it to an independent laboratory for testing to verify compliance of the production run with the specified requirements.
 - .1 The initial cost for pre-installation testing will be paid by the Owner. The cost of retesting caused by failure to meet specified requirements on the initial test shall be paid by the Contractor.
 - .2 Deficiencies discovered by the testing, and deficiencies in any similar models used in the Project will be corrected by the Contractor at no cost to the Owner.
- .4 Preinstallation Conference:
 - .1 A preinstallation conference will be held before installation starts, with the following present:
 - .1 Consultant.
 - .2 Installer.
 - .3 Manufacturer's technical representative.
 - .4 Inspection and Testing Agency.
 - .5 Other Subcontractors whose work affects or is affected by the Work of this Section.
 - .2 The agenda shall include the schedule, responsibilities, critical path items and approvals.
- .5 Mock-Up:
 - .1 Construct mock-up of a complete window installation, for the Consultant's review.
 - .2 Locate where directed by the Consultant.
 - .3 If the mock-up is not acceptable, rebuild the mock-up until satisfactory results are achieved.
 - .4 The accepted mock-up may be incorporated into the finished work.
 - .5 The accepted mock-up will be the minimum standard of acceptance for the Work of this Section.
- .6 Regulatory Requirements: Conform to current OBC requirements, and all other applicable codes and regulations, to the satisfaction of the authorities having jurisdiction.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store, protect and handle windows in strict compliance with manufacturer's written instructions and recommendations.
- .2 Securely store window units, upright, and protected from the environment.
- .3 Protect from damage due to weather, excessive temperature, and construction operations.
- .4 Protect materials and finishes during handling and installation.

1.8 PROJECT CONDITIONS

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

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

1.10 WARRANTY

- .1 For the work of this Section, the 12-months warranty period prescribed in the General Conditions of the Contract is extended as follows:
 - .1 Windows: Written warranty executed by the window manufacturer against defects in material and workmanship of the windows under normal use.
 - .2 Aluminum components (excluding screen) degrading, bowing or twisting: Limited lifetime.
 - .3 Insulated glass:
 - .1 Failure of seal: 20 years from date of manufacture.
 - .2 Stress cracks: 2 years from date of manufacture.
 - .4 Hardware, weatherstripping, screens, etc.: 5 years from date of manufacture.

Part 2 Products

2.1 MANUFACTURERS

- .1 This specification is based on aluminum-clad wood windows by Norwood Windows and Doors.
- .2 Requests for substitutions will be considered in accordance with the provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.

- .3 Source Limitations: Provide all windows from a single manufacturer to ensure uniformity.

2.2 WINDOWS

- .1 Standard of acceptance: Norclad Ovato Series by Norwood Windows and Doors.
- .2 Window types:
 - .1 Casement: Outward projecting. 180 degree reversing.
 - .2 Fixed sash.
- .3 Materials:
 - .1 Exterior:
 - .1 Extruded aluminum to ASTM B221, 6063-T6 alloy and temper.
 - .2 Finish: PVDF fluoropolymer paint to AAMA 260, including 70% Kynar 500 PVDF resin. Colour to be selected by the Consultant to match the doors and framea specified in Section 08 52 13 "Aluminum Doors and Frames".
 - .3 Prior to application of finish:
 - .1 Notching and welding to be completely executed.
 - .2 Exposed surfaces to be fine satin finished to ensure elimination of extrusion die marks and fabrication marks and to ensure uniformity of finish.
 - .4 Isolate aluminum from the following components by a heavy coating of bituminous coating:
 - .1 Dissimilar metals except stainless steel, zinc or white bronze in small area.
 - .2 Concrete, mortar and masonry.
 - .3 Wood.
 - .2 Interior: Clear solid pine free of finger joints and veneers, smooth and free of surface defects.
 - .1 Kiln dried to 6% to 12% moisture content; preservative treated.
 - .2 Frame: 17.5 mm thick x 89 mm wide.
 - .3 Jamb extensions: 16.7 mm thick x width to suit opening depth.
 - .4 Finish: factory primed for on-site paint finish. Refer to Section 09 90 00 "Painting".
 - .3 Steel clips and reinforcement to CSA G40.20-13/G40.21-13, 380 g/m² zinc coating to ASTM A123.
 - .4 Glazing: Factory-installed sealed double glazing units to CAN/CGSB 12.8:
 - .1 4 mm clear float glass to CAN/CGSB 12.1.
 - .2 Warm edge spacers. Colour: Aluminum.
 - .3 Argon filled cavity.
 - .4 Low-E coating surface 2.
 - .5 Hardware:
 - .1 Hinges: Concealed 2-bar.
 - .2 Operator: Roto X-Drive Evolve, Colour to be selected by the Consultant.
 - .3 Operator Arm: Split Arm.
 - .4 Locking system: Roto X-Drive multi point.
 - .6 Screens:
 - .1 Frame: Roll-formed aluminum, paint finish to match interior frames.
 - .2 Screen cloth: Pureview^R fibreglass screen cloth (18 x 16 mesh).
 - .7 Isolation coating: Alkali resistant bituminous paint to SSPC Paint-12 applied at rate of 1 l/m².
 - .8 Zinc-rich coating: MPI APL #18.

2.3 PRODUCT PERFORMANCE

- .1 General: Aluminum and wood composite window units that meet or exceed the following performance ratings when tested by a recognized independent testing agency:
 - .1 Casement:
 - .1 Performance Grade: 55. Class: CW
 - .2 Uniform Structural Load (ASTM E330). Tested at a positive and negative pressure of 3600 Pa, with no glass breakage, permanent damage to fasteners, hardware parts or other damage to make the window inoperable. There must be no permanent deformation of any main frame or sash member in excess of 2 percent of its span.
 - .3 Air Infiltration (ASTM E283): Windows shall not exceed 0.02 L/s/m² of sash crack at a uniform pressure of 300 Pa.
 - .4 Water Resistance (ASTM E331): No water leakage at a static pressure of 720 Pa.
 - .5 Thermal U-Factor: (NFRC 100): 1.08 W/m².K.
 - .6 Condensation Resistance: 69.

Part 3 Execution

3.1 GENERAL

- .1 Execute the work in strict accordance with the manufacturer's instructions, and the reviewed shop drawings, to the satisfaction of the authorities having jurisdiction.

3.2 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .3 Verify that openings are properly prepared and within the window manufacturer's tolerances.
- .4 Verify that fasteners within the openings are fully driven and will not interfere with the window installation.
- .5 Verify that the air barrier wrap has been properly installed and forms a continuous seal.
- .6 Take field measurements to verify or supplement dimensions.
- .7 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.3 INSTALLATION

- .1 Install level, plumb and in true alignment and fasten securely in place.

- .2 Shim jambs to hold the window firmly in place, in its correct location.
- .3 Fasten the window through the jamb and shim into the rough opening framing.
- .4 Coordinate with applicable other trades for the installation of exterior and interior trim at the window perimeter.
- .5 Test and adjust operable parts for correct function.

3.4 PROTECTION

- .1 Protect the installation from damage by other trades until Substantial Performance.

3.5 CLEANING

- .1 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Make good damage to other work caused by the Work of this Section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to provide finish door hardware, as indicated in the Interior Design Package and as required for a complete project in compliance with OBC requirements.
- .2 Related Sections:
 - .1 Section 08 11 13 - Steel Doors and Frames.
 - .2 Section 08 11 16 - Aluminum Doors and Frames.
 - .3 Section 08 14 16 - Flush Wood Doors.
 - .4 Section 08 33 23 - Overhead Coiling Doors.
 - .5 Section 08 36 13 - Sectional Metal Overhead Doors.

1.3 REFERENCES

- .1 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA):
 - .1 Standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction).
- .2 Door and Hardware Institute (DHI):
 - .1 ANSI/DHI A115 IG-1994, Installation Guide for Doors and Hardware.

1.4 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Hardware Schedule:
 - .1 Provide a complete Door Hardware Schedule for the project based on the hardware requirements indicated on the drawings.
 - .2 Pay the cost of preparation of the Hardware Schedule and include in the Contract Price.
 - .3 Clearly indicate hardware proposed, including make, model, material, function, finish and all other pertinent information.
 - .4 The Consultant's review of the Hardware Schedule does not limit or release the Trade Contractor from the responsibility to provide all necessary hardware and related components required for a complete installation and as required by OBC and the authorities having jurisdiction.
- .3 Samples: Submit samples and technical literature as necessary to fully inform the Consultant regarding new hardware items proposed.

1.5 COORDINATION WITH OTHER TRADES

- .1 Submit template information to all manufacturers and trades who have finish hardware applied to their products.

Part 2 Products

2.1 HARDWARE ITEMS

- .1 Products:
 - .1 Be advised that principal door hardware items are indicated on the door schedules
 - .2 Provide complete finishing hardware in accordance with the reviewed and accepted Hardware Schedule called for in this Section and OBC requirements. Do not order any item until it has been approved by the Owner.
 - .3 Include cylinders for all locks.
 - .4 Refer to the article "RELATED SECTIONS" in Part 1 of this Section.
- .2 Keys, keying: Masterkey to the Owner's approval. Provide (3) cut keys per lock.
- .3 Key Cabinet: Provide a suitable wall-mounted key cabinet and install where directed.
- .4 Fasteners:
 - .1 Provide manufacturer's recommended tamper-proof fasteners throughout.
 - .2 Expansion shields shall be of double cinch anchor/type.
 - .3 Fasteners shall be ferrous or non-ferrous to match the product being applied.
 - .4 Length of fasteners shall be sufficient to afford adequate thread engagement.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Furnish manufacturer's instructions for proper installation of each hardware component.

3.2 INSTALLATION: GENERAL

- .1 Generally, the installation of door hardware is by the door installers. Refer to PART 1 GENERAL: Related Sections.
- .2 Coordinate with the applicable other trade contractors and provide templates and instructions for the proper preparation of doors and frames to receive hardware.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to install glazing, as indicated on the drawings, as specified herein and as required for a complete project.
 - .1 For exterior window glazing, refer to Section 08 52 13 "Aluminum-Clad Wood Windows".
 - .2 For glazing to the sectional overhead door, refer to Section 08 35 13 "Sectional Metal Overhead Door".
- .2 Related Sections:
 - .1 Section 08 11 13 - Steel Doors and Frames.
 - .2 Section 08 11 16 - Aluminum Doors and Frames.

1.3 REFERENCES

- .1 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB 12.1-2017, Safety Glazing.
 - .2 CAN/CGSB 12.3-M91(R2017), Flat, Clear Float Glass.
 - .3 CAN/CGSB 12.8-2017, Insulating Glass Units.
 - .4 CAN/CGSB 19.13-M87, Sealing Compound, One Component, Elastomeric, Chemical Curing.

1.4 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Samples: Submit sample of each glass type specified.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

1.6 WARRANTY

- .1 For the work of this Section, the 12-months warranty period prescribed in the General Conditions of the Contract, is extended to 10 years.
- .2 Warrant insulating glass units against defects and malfunction under normal usage, including failure of seal of enclosed air space and deposits on inner faces of glass detrimental to vision.

Part 2 Products

2.1 INSULATING GLASS UNITS

- .1 Exterior glazed doors and sidelights: Insulating glass units to CAN/CGSB-12.8, as follows:
 - .1 Outer pane: Clear tempered float glass to CAN/CGSB-12.1. Thickness to suit loading conditions.
 - .2 Cavity thickness as required, warm edge spacers.
 - .3 Inner pane: Clear tempered float glass to CAN/CGSB-12.1. Thickness to suit loading conditions.
 - .4 Overall unit thickness to suit door or frame profile, as applicable

2.2 GLAZING AND SEALING COMPOUND MATERIALS

- .1 Glazing tape: preformed butyl tape, 10-15 durometer hardness, paper release, white colour, thickness and width as recommended by steel door and screen frame manufacturer.
- .2 Setting blocks: Neoprene, Shore "A" durometer hardness 70 - 80, 100 mm long x 6 mm high x width to suit glass thickness.
- .3 Spacer shims: Neoprene, Shore "A" durometer hardness 70-80, 75 mm long x 2.4 mm thick x 9 mm high.
- .4 Primers, sealers and cleaners: to glass manufacturer's standard.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .3 Take field measurements to verify or supplement dimensions. Make necessary allowances for thermal movement.

- .4 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 WORKMANSHIP

- .1 Remove protective coatings and clean contact surfaces with solvent and wipe dry.
- .2 Apply primer-sealer to contact surfaces.
- .3 Place setting blocks as per manufacturer's instructions.
- .4 Install glass, rest on setting blocks, ensure full contact and adhesion at perimeter.
- .5 Install removable stops, without displacing tape or sealant.
- .6 Provide edge clearance of 3 mm minimum.
- .7 Insert spacer shims to centre glass in space. Place shims at 600 mm o.c. and keep 6 mm below sight line.
- .8 Do not cut or abrade tempered, heat treated, or coated glass.

3.3 GLAZING OF HOLLOW STEEL DOORS AND FRAMES AND WOOD DOORS

- .1 Hollow steel doors and wood doors: Dry method - tape/tape as follows:
 - .1 Coordinate with Sections 08 11 13 and 08 14 16 as applicable.
 - .2 Cut glazing tape to length and install against permanent stop, project 1.5 mm above sightline.
 - .3 Place glazing tape on free perimeter of glass in same manner described above.
 - .4 Screw-fasten steel glazing stops in accordance with the manufacturer's instructions and nail, set, fill, and sand wood glazing stops.

3.4 FINISHING

- .1 Immediately remove sealant and compound droppings from finished surfaces. Remove labels after work is completed.

3.5 CLEANING

- .1 Upon completion of the work of this Section remove from the premises all surplus material, dirt and debris caused by the work.
- .2 Make good damage to adjacent finished surfaces.
 - .1 Execute repair work in accordance with the original manufacturer's written instructions.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included:
 - .1 The work of this Section includes the provision of all labour, materials, equipment and services required to install gypsum board wall and ceiling finishes, as indicated on the drawings, as specified herein and as required for a complete project.
 - .2 The work includes patching and making good existing gypsum board work which is damaged by the demolition work.
- .2 Related Work:
 - .1 Section 04 20 00 - Unit Masonry.
 - .2 Section 06 10 00 - Rough Carpentry.
 - .3 Section 07 92 00 - Joint Sealants.
 - .4 Section 09 91 00 - Painting.
 - .5 Electrical: Refer to electrical specifications under separate cover.

1.3 REFERENCES

- .1 American Society for Testing and Materials:
 - .1 ASTM A568/A568M-25a, Standard Specification for Steel Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.
 - .2 ASTM A641/A641M-19(2025), Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - .3 ASTM A653/A653M-25a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
 - .4 ASTM C11-25, Standard Terminology Related to Gypsum and Related Building Materials and Systems.
 - .5 ASTM C475/C475M-17(2022), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .6 ASTM C754-20, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 - .7 ASTM C840-25, Standard Specification for Application and Finishing of Gypsum Board.
 - .8 ASTM C1047-19, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .9 ASTM C1396/C1396M-24, Standard Specification for Gypsum Board.
- .2 Gypsum Association (GA):
 - .1 GA-214-2021, Levels of Finish for Gypsum Panel Products.

- .3 Underwriters' Laboratories Canada (ULC):
 - .1 Design requirements for fire resistant assemblies.

1.4 REGULATORY REQUIREMENTS

- .1 Fire-resistance rated assemblies incorporating gypsum board: ULC fire resistive floor/ceiling and roof/ceiling design requirements.

1.5 DESIGN CRITERIA

- .1 Design suspended ceiling and bulkhead framing to be attached to and supported by the joists above. Attachment to the subfloor or sheathing will not be permitted.
- .2 The suspension system to be capable of safely supporting the weight of all items which are designed to be supported by it. Be advised that light fixtures will not be provided with separate support.
- .3 Design the suspension system to withstand normal and seismic loads.
- .4 Maximum deflection: 1/360 of span to ASTM C635 deflection test.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- .2 Store materials inside, under cover and in accordance with the manufacturers' instructions.
- .3 Keep materials dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.
- .4 Neatly stack gypsum panels flat to prevent sagging.

1.7 PROJECT CONDITIONS

- .1 Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.
- .2 Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 4°C. For adhesive attachment and finishing of gypsum board, maintain not less than 10°C for 48 hours before application and continuously after until dry. Do not exceed 35°C when using temporary heat sources.
- .3 Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 STEEL FRAMING AND FURRING COMPONENTS

- .1 General: Provide components complying with ASTM C754 for conditions indicated. Fabricate sheet steel products from Galvanized steel sheet to ASTM A653M with Z 180 hot-dipped galvanized finish.
- .2 Anchors and Fasteners: Anchors and fastener of types suitable for the applications indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attachment to adjacent construction.
- .3 Channels: Cold-rolled steel, 1.5 mm (16 ga) minimum base metal (uncoated) thickness and 11 mm wide flanges. Sizes as required by loading conditions and fire resistant design requirements.
- .4 Steel Studs for Furring Channels: ASTM C645, 0.45 mm base metal thickness, unless otherwise indicated or required by loading conditions. Depth as indicated and as required by loading conditions.
- .5 Steel Furring Channels:
 - .1 Rigid: ASTM C645, hat shaped, depth of 22 mm, and minimum thickness of base (uncoated) metal of 0.45 mm (26 ga), unless otherwise indicated or required by loading conditions.
 - .2 Resilient: Manufacturer's standard product designed to reduce sound transmission, fabricated from steel sheet complying with ASTM A653M or ASTM A568M to form 13 mm deep channel of single- or double-leg configuration: asymmetric-shaped channel with face connected to a single flange by a single-slotted leg (web) or hat-shaped channel, with 38 mm wide face connected to flanges by double-slotted or expanded-metal legs (webs).

2.2 GYPSUM BOARD PRODUCTS

- .1 General: Provide gypsum board of types indicated in maximum lengths available that will minimize end-to-end butt joints in each area indicated to receive gypsum board application, thicknesses as indicated. Requirements as follows except where otherwise indicated:
 - .1 Width: 1219 mm.
 - .2 Thicknesses: as indicated.
 - .3 Edges:
 - .1 For surfaces to be finished with joint compound: Tapered.
 - .2 For unfinished surfaces: Square.
 - .4 Ends: Square.

- .2 Gypsum Board to ASTM C1396:
 - .1 Standard gypsum board.
 - .2 Fire resistant gypsum board: Type X where required for fire-resistance-rated assemblies.
 - .3 Moisture Resistant gypsum in locations subject to moisture or humidity.

2.3 TRIM ACCESSORIES

- .1 Accessories for Interior Installation: Cornerbead, edge trim, and control joints complying with ASTM C1047 and requirements indicated below:
 - .1 Material: Formed steel sheet zinc coated by hot-dip or electrolytic process.
 - .2 Shapes as required in accordance with ASTM C1047.
 - .1 LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim, unless otherwise indicated.
 - .2 L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.
 - .3 One-piece control joint formed with V-shaped slot and removable strip covering slot opening.
 - .3 Note that standard "U" bead (J-trim) is not acceptable. Use "L" bead that is concealed when taped and filled.

2.4 JOINT TREATMENT MATERIALS

- .1 General: Provide joint treatment materials complying with ASTM C475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
- .2 Joint Tape: Paper reinforcing tape as recommended by the gypsum board manufacturer.
- .3 Joint Compound: Factory-mixed, all-purpose compound formulated for both taping and topping compound.

2.5 MISCELLANEOUS MATERIALS

- .1 General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.
- .2 Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum panels.
- .3 Spot Grout: ASTM C475, setting-type joint compound recommended for spot-grouting hollow metal door frames.
- .4 Fasteners: Steel drywall screws for attachment to wood as recommended by the gypsum board manufacturer.
- .5 Acoustic sealant: Refer to Section 07 92 00 "Joint Sealants".

Part 3 Execution

3.1 COORDINATION

- .1 Examine the mechanical and electrical drawings and coordinate with appropriate other trades to establish openings, additional support, furring out and other special provisions required for mechanical and electrical fixtures and fittings and access hatches built into the work of this Section.
- .2 Examine the architectural drawings and coordinate with appropriate other trades to establish openings, additional support and other special provisions required for items built into or partially supported by the work of this Section.

3.2 GYPSUM BOARD APPLICATION

- .1 Do not apply gypsum board until bucks, anchors, blocking, wood and/or metal furring, electrical and mechanical work are reviewed and accepted.
- .2 Apply gypsum board to wood or metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm o.c.
- .3 Conform to UL design requirements for fire resistance rated assemblies.
- .4 Apply a 12 mm diameter bead of acoustic sealant continuously around the periphery of each face of partitioning to seal the gypsum board/structure junction where partitions abut fixed building components. Seal the full perimeter of cut-outs around electrical boxes, ducts and any other items which penetrate one or both faces of the partition, in partitions where the perimeter is sealed with acoustic sealant.

3.3 ACCESSORIES

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm o.c.
- .2 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.

3.4 CONTROL JOINTS

- .1 Confirm locations of control joints with Consultant before installation.
- .2 Construct control joints of preformed units except where otherwise shown. At junction of partitions with bulkheads, where indicated on the drawings, use two casing beads as indicated on the drawings.
- .3 Set gypsum board facing in the preformed units or casing beads and support independently on both sides of joint.

- .4 Provide continuous dust barrier behind and across control joints.
- .5 Where not otherwise indicated, locate control joints at changes in substrate construction, at approximate 10 m spacing on long wall or partition runs, at approximate 15 m spacing on ceilings. Verify locations with the Consultant before installation.
- .6 Install control joints straight and true.

3.5 ACCESS DOORS

- .1 Install access doors to electrical and mechanical fixtures and electrical panelboards specified in respective Sections.
- .2 Rigidly secure frames to furring or framing systems.

3.6 ACOUSTICAL SEAL AT PARTITION PERIMETERS

- .1 Minimize gaps between gypsum board and adjacent construction at partition perimeters. Gaps greater than 13 mm wide are unacceptable.
- .2 Gaps between 6 mm and 13 mm to be packed with back-up rod and caulked with acoustical sealant specified in Section 07 92 00 "Joint Sealants". Gaps below 6 mm do not require back-up rod.
- .3 In double-layer installations, apply acoustical sealant to the first layer of gypsum board and arrange for review by the Consultant before application of the second layer of gypsum board.
- .4 Cut drywall neatly and tight around all penetrations at STC rated walls. Provide fitted drywall flanges around all mechanical penetrations. Complete drywall flange by caulking full perimeter to penetrations and adjacent gypsum board. Caulking to be reviewed by the Consultant before concealing.
- .5 Stagger electrical outlets or mechanical installations on opposing sides of STC rated walls. Ensure sound attenuation insulation runs continuously behind all penetrations. All electrical outlets to have vapour hoods and cover plate gaskets.

3.7 TAPING AND FILLING

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

- .4 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .5 Completed installation to be smooth, level or plumb, free from blemishes.
- .6 Gypsum Board Finish: finish gypsum board walls and ceilings to be site-finished to the following levels in accordance with GA-214 recommended levels of finish:
 - .1 Paint finish, generally: Level 4
 - .2 Paint finish, utility areas, service rooms, etc.: Level 3
 - .3 Concealed bulkheads in ceiling plenum space: Level 1
 - .4 Temporary dust barriers: Level 0.

3.8 CLEANING

- .1 Upon completion of the work of this Section, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Clean drippage and spills of joint compound from adjacent surfaces.
- .3 Make good damage to other work caused by the work of this Section.
 - .1 Execute repair work in accordance with the original manufacturer's written instructions.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to apply Portland cement parging to exposed, above grade, portions of the foundation wall, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Cast-in-place concrete: Refer to structural specifications under separate cover.
 - .2 Section 31 23 10 - Excavating, Trenching and Backfilling.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA):
 - .1 CSA A179-14(R2024), Mortar and Grout for Unit Masonry.
- .2 Health Canada / Workplace Hazardous Materials Information System (WHMIS):
 - .1 Material Safety Data Sheets (MSDS).

1.4 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Product Data:
 - .1 Provide manufacturer's complete technical product data for each specified product.
 - .2 Include application instructions for parging.
 - .3 Include manufacturer's material safety data sheets for the safe handling of the specified materials and products, in accordance with Workplace Hazardous Materials Information Service (WHMIS) requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials to job site in dry condition.
- .2 Deliver packaged products in original unopened packaging with legible manufacturer's identification.
- .3 Storage and Protection:
 - .1 Keep materials dry until use.
 - .2 Store cementitious materials on elevated platforms, under cover, and in a dry location.

1.6 ENVIRONMENTAL CONDITIONS

- .1 Do not apply parging in wet weather.
- .2 Maintain ambient and surface temperatures of minimum 5°C in the area of the work before, during and for at least 72 hours after parging application.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 MATERIALS

- .1 Cement/lime/sand parging mix: To CSA A179, proprietary, premixed, mixture of Type S sand, hydrated lime, Portland cement and agents designed to enhance bond and workability, formulated specifically for parging masonry walls above and below grade. Standard of acceptance: Bétomix Plus, Type N mortar.
 - .1 Requests for substitutions will be considered in accordance with the provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.
- .2 Water: Potable.

2.2 MIXING

- .1 Empty contents of bag into mixing container.
- .2 Add clean water at the rate of 5 litres per 30 kg bag.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine areas and conditions under which work is to be performed and notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the applicator.

- .3 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Trade Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 SURFACE PREPARATION

- .1 Surfaces must be structurally sound.
- .2 Remove all loose and friable material.
- .3 Clean surfaces free of residual dirt, sand, dust, form oil and other contaminants which could impair the bond of the parging, by brushing vigorously with a broom or stiff brush and water.
- .4 If small amounts of grease or oil are present, scrub vigorously with a strong detergent solution and flood with large volumes of water.

3.3 PARGING APPLICATION

- .1 Thoroughly saturate the area to be parged with clean water and remove any free standing water. Some very porous materials may require several applications of water to ensure complete saturation.
- .2 Apply parging to damp surface, not more than 10 mm in thickness, using a trowel.
- .3 If a greater thickness is necessary to produce the required finish, rough up surface with a coarse broom, and allow to harden 24 hours before repeating the process.
- .4 Trowel-finish to a smooth flat surface.

3.4 CURING

- .1 After setting, keep damp for 5 days, including weekends by misting occasionally with water.

3.5 CLEANING

- .1 Upon completion of the application, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Clean drippage and spills of surplus parging mortar from adjacent surfaces.
- .3 Make good damage to other work caused by the work of this Section.
 - .1 Execute repair work in accordance with the original manufacturer's written instructions.

END OF SECTION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to fabricate and install suspended acoustical panel ceilings, including suspension grids and lay-in acoustical ceiling panels, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Section 09 21 16 - Gypsum Board Assemblies.
 - .2 Heating, Ventilating and Air Conditioning (HVAC) specifications under separate cover.
 - .3 Electrical specifications under separate cover.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM A641/A641M-19(2025), Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - .2 ASTM A653/A653M-25a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
 - .3 ASTM C423-23e1, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - .4 ASTM C635/C635M-22, Standard Specification for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - .5 ASTM C636/C636M-19(2025), Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
 - .6 ASTM E1264-23, Standard Classification for Acoustical Ceiling Products.

1.4 QUALIFICATIONS

- .1 The work of this Section shall be fabricated by a manufacturer with minimum five (5) years experience in the actual production of the specified products.

1.5 DESIGN CRITERIA

- .1 The suspension system to be capable of safely supporting the weight of all items which are designed to be supported by it, including, but not limited to:
 - .1 Light fixtures.
 - .2 Diffusers.
 - .3 Other items supported by the ceiling system.

- .2 Be advised that light fixtures will not be provided with separate support.
- .3 Design the suspension system to withstand normal and seismic loads.
- .4 Size attachment components for five times the design load indicated in ASTM C635, Table 1, direct hung except where otherwise indicated.
- .5 Size hanger wire for three times the design load indicated in ASTM C635, Table 1.
- .6 Maximum deflection: 1/360 of span to ASTM C635 deflection test.
- .7 Design the suspension system to provide lateral support to the tops of partitions which are attached to it.

1.6 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Samples: Submit a sample of each type of acoustical unit.
- .3 Shop Drawings:
 - .1 Show complete details of the suspension system.
 - .2 The suspension system, including all related connections and fastenings, shall be designed by a structural engineer permanently licensed to practise in the Province of Ontario. Each shop drawing submitted shall bear the stamp and signature of the aforesaid structural engineer.
- .4 Post-Installation Certification: After installation, provide written certification, signed by the Structural Engineer responsible for the shop drawings, that all items have been installed in accordance with the shop drawings.

1.7 ENVIRONMENTAL CONDITIONS

- .1 Commence installation only after the building is enclosed, sufficient heat is provided and dust generating activities have terminated.
- .2 Permit wet work to dry before commencement of installation.
- .3 Maintain a uniform minimum temperature of 15°C and a relative humidity of 20% - 40% before and during installation.
- .4 Store materials in the work area for not less than 48 hours prior to installation.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Construction Manager's Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 MANUFACTURERS

- .1 This Specification is based on suspension system and ceiling panels as manufactured by CGC Interiors.
- .2 Equivalent products by Armstrong World Industries Canada Limited are acceptable alternatives.
- .3 Requests for substitutions will be considered in accordance with provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.

2.2 SUSPENSION SYSTEM

- .1 To ASTM C365, exposed tee system, as follows:
 - .1 Material: Double web electrogalvanized sheet steel.
 - .2 Face dimension: 24 mm.
 - .3 Surface finish: Baked polyester paint, colour white.
 - .4 Grid dimensions: To suit panel size.
 - .5 Standard of Acceptance: Donn DX.
- .2 Provide all accessories, including matching hemmed angle wall mouldings, #9 galvanised soft annealed steel hanger wire and suspension system accessories as required for a complete installation.

2.3 ACOUSTICAL CEILING PANELS

- .1 To ASTM E1264, Type II, Form 2, Pattern CD, characteristics as follows:
 - .1 Colour: White.
 - .2 Size: 609 mm x 609 mm x 16 mm.
 - .3 Edge detail: Bevelled tegular.
 - .4 Fire performance: Class A, flame spread 25 or under (UL labelled).
 - .5 NRC: .55
 - .6 CAC: 33
 - .7 Light reflectance: 0.82.
 - .8 Standard of Acceptance: CGC Fissured.

2.4 ACCESSORY MATERIALS

- .1 Suspension system accessories: splices, clips, wire ties, retainers and wall moulding to complement the suspension system components, as recommended by the system manufacturer.
- .2 Hanger wire: Galvanized soft annealed steel wire to ASTM A641, Class 1, 2.6 mm diameter, prestretched
- .3 Hanger inserts: purpose made.
- .4 Retention clips: Armstrong Product No. 414, purpose made clips to secure tile to suspension system.
- .5 Touch-up paint: type and colour to match acoustical units, as provided by the acoustical unit manufacturer.

Part 3 Execution

3.1 INSTALLATION: SUSPENSION SYSTEM

- .1 Install ceiling suspension system to ASTM C636 and in accordance with the manufacturer's printed instructions.
- .2 Furnish hanger clips and inserts for installation by the applicable other Sections, with instructions for their correct placement.
- .3 Secure hangers to the overhead structure using attachment methods acceptable to the Consultant,
- .4 Except where otherwise indicated, lay out the grid symmetrically with border widths not less than 50% of standard unit widths.
- .5 Coordinate the ceiling system with related components.
- .6 Hang the suspension system independently of walls, columns, ducts, pipes and conduit. Provide additional hangers and carrying channels as necessary.
- .7 Provide additional hangers and framing as necessary to carry the weight of all items which are designed to be supported by the suspension system.
- .8 Frame at openings for light fixtures, air diffusers, speakers, and at changes in ceiling height.
- .9 Provide additional hangers at light fixtures, air diffusers, speakers, and other ceiling-supported items within 150 mm of each corner and at maximum 600 mm o.c. around the perimeter of the fixture.
- .10 Attach cross members to main runners to provide a rigid assembly.

- .11 Install wall trim to provide correct ceiling height. Install wall trim or suitable edge moulding to match existing at the interface between the acoustic tile ceiling and other materials, for the entire length of the joint. Secure to construction. Butt joints tightly, neatly, square, and in true alignment.
- .12 Arrange recessed items to replace or be centred on a panel unless indicated otherwise.
- .13 Finished ceiling system to be square with adjoining walls and level within 1:1000.

3.2 INSTALLATION: PANELS

- .1 Install acoustical panels in the ceiling suspension system, in accordance with the manufacturer's instructions.
- .2 Fit acoustical panels in place, free from damaged edges or other defects detrimental to appearance or function.
- .3 Install acoustical panels level, in uniform plane and free from twist, warp, dents, damaged edges or other defects detrimental to appearance or function.
- .4 Cut panels to fit irregular grids and perimeter edge trim.
- .5 Install retention clips within 6 m of exterior doors.

3.3 CLEANING

- .1 Remove surplus materials, rubbish, tools and equipment on completion of installation.
- .2 Make good damage to other work caused by the work of this section.
 - .1 Use repair methods and materials recommended by the original manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to execute interior and exterior painting work, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Section 05 50 00 - Metal Fabrications
 - .2 Section 06 20 00 - Finish Carpentry
 - .3 Section 08 11 13 - Steel Doors and Frames
 - .4 Section 08 11 16 - Aluminum Doors and Frames
 - .5 Section 08 14 16 - Flush Wood Doors
 - .6 Section 09 21 16 - Gypsum Board Assemblies.

1.3 REFERENCES

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .2 Master Painters Institute (MPI):
 - .1 MPI Architectural Specification Manual, Online Subscription (referred to herein as "MPI Manual").

1.4 SUBMITTALS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Product Data:
 - .1 Submit product data and instructions for each paint and coating product to be used.
 - .2 Submit product data for the use and application of paint thinner.
 - .3 Submit 2 copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) Indicate VOCs during application and curing.
 - .4 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .5 Submit manufacturer's application instructions.

1.5 STORAGE AND HANDLING

- .1 Storage and Protection:
 - .1 Provide and maintain dry, temperature controlled, secure storage.
 - .2 Store materials and supplies away from heat generating devices.
 - .3 Store materials and equipment in well ventilated area within temperature as recommended by manufacturer.
- .2 Fire Safety Requirements:
 - .1 Provide one 9 kg dry chemical fire extinguisher adjacent to storage area.
 - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
 - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.

1.6 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces.
 - .2 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 Apply paint finishes when ambient air and substrate temperatures at location of installation can be satisfactorily maintained during application and drying process, within MPI and paint manufacturer's prescribed limits.
 - .2 Test concrete, masonry and plaster surfaces for alkalinity as required.
 - .3 Apply paint to adequately prepared surfaces, when moisture content is below paint manufacturer's prescribed limits.
- .3 Airborne Dust: Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 MATERIALS

- .1 Only paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Provide paint materials for each paint system from a single manufacturer.
- .3 Conform to latest MPI requirements for all painting work including preparation and priming.
- .4 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Manual and APL.
- .5 Provide paint products meeting MPI "Environmentally Friendly" E2 rating or better, based on VOC (EPA Method 24) content levels. Where the APL lists products with E3 rating, select products from among those which have the E3 rating.
- .6 Provide vapour-retardent paint where indicated.

2.2 COLOURS

- .1 A Paint Schedule will be provided after Contract Award.
- .2 The reference to specific paint manufacturers is intended only to identify required paint colours and is not intended to exclude other manufacturers' products which comply with the requirements of this specification section.

2.3 MIXING AND TINTING

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

2.4 GLOSS/SHEEN RATINGS

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

Gloss Level	Description	Gloss @ 60°	Gloss @ 85°
1	Matte or flat finish	max. 5	max. 10
2	Velvet-like finish	max. 10	10 to 35
3	Eggshell finish	10 to 25	10 to 35
4	Satin-like finish	20 to 35	min. 35
5	Traditional semi-gloss finish	35 to 70	
6	Traditional gloss finish	70 to 85	
7	High-gloss finish	> 85	

- .2 Gloss level ratings of painted surfaces as specified herein.

2.5 EXTERIOR PAINTING

- .1 Paint exterior surfaces in accordance with the following MPI Architectural Specification Manual requirements, Premium Grade (generally primer plus two coats) throughout.
- .2 For steel surfaces to receive paint finish, apply EXT 5.1D: Alkyd, G5 finish, Premium grade.
- .3 For galvanized metal surfaces (not chromate passivated) to receive paint finish, apply EXT 5.3B: Alkyd, G5 finish, Premium grade.
- .4 For dressed lumber to receive paint finish, apply EXT 6.3A: Latex, G5 finish, Premium grade.

2.6 INTERIOR PAINTING

- .1 Paint interior surfaces in accordance with the following MPI Architectural Specification Manual requirements, Premium Grade (generally primer plus two coats) throughout.
- .2 For concrete masonry surfaces to receive paint finish, apply INT 4.2D: High performance architectural latex, G4 finish. Provide vapour-retardent paint where indicated.
- .3 For wood surfaces to receive paint finish, apply INT 6.3A: High performance architectural latex, G5 finish.
- .4 For wood surfaces to receive stain finish, apply INT 6.3E: Semi-Transparent Stain, polyurethane varnish, G4 finish.
- .5 For wood surfaces to receive clear finish, apply INT 6.2H: Clear polyurethane varnish, G4 finish.

- .6 For plaster and wallboard surfaces, to receive latex paint finish, apply INT 9.2B: High performance architectural latex, gloss level as follows:
 - .1 Ceilings: G2
 - .2 Walls:
 - .1 Generally: G3
 - .2 Kitchens and Washrooms: G4
- .7 For miscellaneous steel (factory primed), apply INT 5.1E: Alkyd G5 finish.
- .8 For zinc-coated steel, apply INT 5.3C: Alkyd G5 finish over cementitious primer.

Part 3 Execution

3.1 GENERAL

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

3.2 EXAMINATION

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to the Construction Manager damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

3.3 PREPARATION

- .1 Protection:
 - .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by the Consultant.
 - .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
 - .3 Protect factory finished products and equipment.
- .2 Surface Preparation:
 - .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
 - .2 Move and cover furniture and portable equipment as necessary to carry out painting

- operations. Replace as painting operations progress.
- .3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of the Construction Manager.
 - .3 Clean and prepare surfaces in accordance with MPI Manual specific requirements and coating manufacturer's recommendations.
 - .4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
 - .5 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
 - .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
 - .2 Apply wood filler to nail holes and cracks.
 - .3 Tint filler to match stains for stained woodwork.
 - .6 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
 - .7 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements.
 - .8 Touch up of shop primers with primer as specified.
 - .9 Do not apply paint until prepared surfaces have been accepted by the Consultant.

3.4 APPLICATION

- .1 Method of application to be as approved by the Construction Manager. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .3 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by the manufacturer.
- .4 Sand and dust between coats to remove visible defects.
- .5 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
- .6 Finish inside of cupboards and cabinets as specified for outside surfaces.
- .7 Finish closets and alcoves as specified for adjoining rooms.

- .8 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.5 MECHANICAL/ELECTRICAL EQUIPMENT

- .1 Paint conduits, piping, hangers, ductwork and other mechanical and electrical equipment exposed in finished areas, to match adjacent surfaces, except as indicated.
- .2 Do not paint over nameplates.
- .3 Keep sprinkler heads free of paint.
- .4 Paint fire protection piping red.
- .5 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .6 Paint natural gas piping yellow.
- .7 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

3.6 CLEANING

- .1 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Clean drippage and spills of surplus paints and coatings from adjacent surfaces.
- .3 Make good damage to other work caused by the Work of this Section.
 - .1 Execute repair work in accordance with the original manufacturer's written instructions.

END OF SECTION

Part 1 General

1.1 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to fabricate and install washroom accessories as indicated on the drawings, as specified herein, and as required for a complete project.
- .2 Related Sections:
 - .1 Section 06 10 00 - Rough Carpentry.
 - .2 Section 09 21 16 - Gypsum Board Assemblies.
 - .3 Plumbing sections under separate cover.

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM A123/A123M-24, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium Nickel Steel Plate, Sheet, and Strip.
 - .3 ASTM A653/A653M-25a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
 - .4 ASTM B456-17(2022), Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

1.3 SUBMITTALS

- .1 Shop Drawings:
 - .1 Submit shop drawings or catalogue illustrations.
 - .2 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, rough opening dimensions, and other pertinent information.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 MANUFACTURERS

- .1 This specification is based on washroom accessories by Bobrick Washroom Equipment of Canada Ltd.

- .2 Except where otherwise stated, tradenames and catalogue references in this Section refer to ASI Watrous products.
- .3 Subject to compliance with the specification requirements, equivalent products by the following manufacturers are acceptable alternatives:
 - .1 ASI Watrous Inc.
 - .2 Frost Products Ltd.
 - .3 Wood & Wyant.
- .4 Requests for substitutions will be considered in accordance with provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.
- .5 Obtain all similar items from a single manufacturer.

2.2 MATERIALS

- .1 Sheet steel: commercial quality to ASTM A653/A653M with ZF001 designation zinc coating.
- .2 Stainless steel sheet metal: to ASTM A167, Type 304, with #4 finish.
- .3 Stainless steel tubing: Type 304, commercial grade, seamless welded, 1.2 mm wall thickness.
- .4 Fasteners: concealed screws and bolts hot dip galvanized, exposed fasteners to match face of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.

2.3 FINISHES

- .1 Chrome and nickel plating: to ASTM B456, polished finish.
- .2 Stainless steel: Polished finish.
- .3 Manufacturer's or brand names on face of units not acceptable.

2.4 FIXTURES

- .1 Soap Dispenser: Standard of acceptance: Bobrick B-306 "Trimline" recessed.
- .2 Paper Towel Dispenser/Waste Receptacle: Standard of acceptance: Bobrick B-6997 Trimline Series.
- .3 Toilet roll holder: Standard of acceptance: Bobrick B-6997 recessed toilet tissue dispenser.
- .4 Toilet Seat Cover Dispenser: Standard of acceptance: Bobrick B-3013, Trimline Series recessed seat cover dispenser.

- .5 Feminine Napkin Disposal: Standard of acceptance: Bobrick B-3513, Trimline Series recessed sanitary napkin disposal.
- .6 Grab Bars: 32 mm dia. Standard of acceptance as follows:
 - .1 Bobrick B-5806 x 24 1¹/₄" diameter straight grab bar.
 - .2 Bobrick B-5898 1¹/₄" diameter 90° grab bar.
- .7 Mirrors: Standard of acceptance as follows:
 - .1 Bobrick B-293 2436 fixed-position tilt mirror.
 - .2 Bobrick B-165 2436 channel frame mirror.
- .8 Shower Curtain Rod: Heavy gauge, 25 mm dia. x 1 mm wall thickness, length to suit. Standard of acceptance: Bobrick B-6107.
- .9 Shower Curtain: Opaque matte white vinyl, 0.2 mm thick. Standard of acceptance: Bobrick #204-2 or #204-3 as required to suit opening.
- .10 Shower Curtain Hooks: Stainless steel, quantity to suit shower curtain. Standard of acceptance: Bobrick #204-1.
- .11 Utility Hook: Standard of acceptance: Bobrick B-6707 utility hook.
- .12 Change Table: Recessed. Standard of acceptance: Foundations 100SSE-R, recess-mounted stainless steel, special needs, changing station.
- .13 Shelf: Standard of acceptance: Bobrick B-295 x 18 stainless steel shelf.
- .14 Shower Towel Bar: Standard of acceptance: Bobrick B-545 and B-5456 surface-mounted towel bar.
- .15 Shower Soap Dish: Standard of acceptance: Bobrick B-4390 recessed heavy-duty soap dish with bar.

2.5 FABRICATION

- .1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.
- .2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.
- .3 Brake form sheet metal work with 1.5 mm radius bends.
- .4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
- .5 Back paint components where contact is made with building finishes to prevent electrolysis.
- .6 Hot dip galvanize concealed ferrous metal anchors and fastening devices to ASTM A123.
- .7 Shop assemble components and package complete with anchors and fittings.

- .8 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.
- .9 Provide steel anchor plates and components for installation on studding and building framing.

Part 3 Execution

3.1 INSTALLATION

- .1 Install and secure accessories rigidly in place as follows:
 - .1 Install steel back-plates or plywood/wood blocking to stud space prior to drywall finish.
 - .2 Provide back-plates with threaded studs or plugs.
 - .3 For plywood/wood blocking, provide suitable screw fasteners.

3.2 CLEANING

- .1 Upon completion of the installation, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Adjust accessories for correct function and true.
- .3 Make good damage to other work caused by the work of this section.

END OF SECTION

MECHANICAL AND ELECTRICAL SECTIONS
UNDER SEPARATE COVER

CIVIL SECTIONS UNDER SEPARATE COVER

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to execute excavating, trenching and backfilling, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
 - .1 Concrete specifications under separate cover.
 - .2 Section 07 11 13 - Bituminous Dampproofing.
 - .3 Section 09 24 33 - Cement Parging.
 - .4 Section 33 46 20 - Foundation Drainage.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM C117-23, Standard Test Method for Materials Finer than 75 μm (No. 200 Sieve) in Mineral Aggregates by Washing.
 - .2 ASTM C136/C136M-25, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D698-12(2021), Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - .4 ASTM D1557-12(2021), Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 - .5 ASTM D4318-17e1, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Ontario Provincial Standard Specifications (OPSS):
 - .1 OPSS-1010-2013, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

1.4 REGULATORY REQUIREMENTS

- .1 Perform all Work in accordance with provincial and municipal requirements, to the satisfaction of the authorities having jurisdiction.

1.5 INSPECTION AND TESTING

- .1 The Owner will direct an independent geotechnical testing agency to conduct field inspections and to perform required field and laboratory testing.

- .2 The cost of initial inspection and testing will be paid by the Owner. The cost of re-inspection and retesting required as a result of failure to meet specification requirements on the initial inspection/test shall be paid by the Trade Contractor.

1.6 DEFINITIONS

- .1 Common Excavation: Excavation of materials which can be ripped and excavated with heavy construction equipment.
- .2 Rock Excavation: Excavation of material from solid masses of igneous, sedimentary or metamorphic rock which, prior to its removal, was integral with its parent mass, and boulders or rock fragments having an individual volume in excess of 0.75 m³.
- .3 Waste Material: Excavated material unsuitable for re-use or surplus to requirements.
- .4 Unsuitable Materials: Very weak and compressible materials; Frost susceptible materials. Suitability of materials will be determined by the geotechnical testing agency.

1.7 EXISTING UNDERGROUND UTILITIES

- .1 Locate and protect during excavation work. If unknown or incorrectly charted utilities are encountered, stop work and inform the Construction Manager immediately.

1.8 SURVEY CONTROL POINTS

- .1 Protect monuments, bench marks and other reference features.

Part 2 Products

2.1 MATERIALS

- .1 Except where otherwise specified, all granular materials shall be virgin, free from recycled asphaltic concrete or Portland cement concrete materials.
- .2 Granular materials conforming to OPSS 1010 as follows:
 - .1 OPSS Granular "A".
 - .2 OPSS Granular "B", Type I.
 - .3 OPSS Granular "B", Type II.
 - .4 OPSS Granular "O".
 - .5 OPSS Select Subgrade Material (SSM).

- .3 19 mm Clear crushed stone: clean, hard crushed stone, free from shale, clay, friable materials, organic matter and other deleterious substances when tested to ASTM C136 and ASTM C117 and conforming to the following gradation:

<u>ASTM Sieve Designation</u>	<u>% Passing</u>
19 mm	100
9.5 mm	0

- .4 Sand (Granular "B", Type I, modified): clean, hard, durable sand, free from shale, clay, friable materials, organic matter and other deleterious substances when tested to ASTM C136 and ASTM C117.

<u>ASTM Sieve Designation</u>	<u>% Passing</u>
4.75 mm	100
1.18 mm	10 - 100
0.425 mm	5 - 30
0.075 mm	0 - 10

- .5 Native and imported backfill: Selected material from the excavation or other sources, approved by the Consultant for the use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods refuse or other deleterious materials.

2.2 ACCESSORIES

- .1 Window wells: Compact straight metal window wells:
- .1 Material: Heavy gauge galvanized steel.
 - .2 Top edge rolled 19 mm for strength and safety.
 - .3 Flat, prepunched flanges for attachment to building structure.
 - .4 Sizes: As indicated and to suit window size and grade level.
 - .5 Colour to be selected by the Consultant from the manufacturer's complete colour range.
 - .6 Standard of acceptance: Compact Straight Metal Window Well by Window Well Supply

Part 3 Execution

3.1 PREPARATION

- .1 Make pavement cuts with neat, clean-cut edges and legally dispose of removed material, off-site.
- .2 Remove abandoned underground piping, conduits or other items which would interfere with construction.

3.2 DISPOSAL OF DEMOLISHED MATERIALS

- .1 Following the Construction Manager's approval, legally dispose of, off-site, all debris, rubbish and other materials not suitable for re-use. Do not store on site.

3.3 DEWATERING AND HEAVE PREVENTION

- .1 Keep excavations free of water while work is in progress. Pump water from excavations continuously if necessary.
- .2 Protect open excavations against flooding and damage due to surface run-off.
- .3 Provide flocculation tanks, setting basins, or other treatment facilities to remove suspended solids or other material before discharging to storm sewers, water courses or drainage areas.
- .4 Dispose of water in a manner not detrimental to public or private property, streets, sewers or any portion of work completed or under construction. Construct sedimentation traps where necessary.
- .5 Protect the soils at footing locations from freezing. Provide frost protection as required.
- .6 If requested, submit for the Consultant's review details of proposed dewatering or heave prevention methods.

3.4 SHORING AND PROTECTION

- .1 Provide shoring as required to protect adjacent property.

3.5 EXCAVATION

- .1 Dewatering: Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades and from flooding surrounding areas. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- .2 Excavation for Structures: Excavate to required elevations and dimensions within a tolerance of ± 25 mm. Extend the excavation sufficiently for placing and removing formwork, installing services and other construction and for inspections.
- .3 Engineered fill: Remove unsuitable material such as existing fill or organic material down to undisturbed soil and replace with engineered fill as specified herein up to the level of the underside of the footings.
- .4 Do not disturb excavation bottoms. Excavate by hand to final grade just before placing reinforcement and concrete. Trim to required lines and levels and leave a solid base for other work.
- .5 Do not proceed with other work until excavation bottoms have been inspected and approved by the Consultant.
- .6 Excavation for Utility Trenches:
 - .1 Excavate trenches to required slopes, lines, depths and invert elevations.
 - .2 Where trench excavations pass within 450 mm of building footings, backfill with concrete to level of bottom of adjacent footing.
 - .3 Do not backfill until tests and inspections have been made. Take care not to damage or displace pipe systems during backfilling.

- .7 Unauthorized Excavation: Fill unauthorized excavation under foundations by extending indicated bottom elevation of concrete foundation or footing to excavation bottom without altering top elevation. Lean concrete fill may be used with the Consultant's prior approval.

3.6 EARTH COVER

- .1 Provide exterior footings and footings in unheated earth portions of the structure with at least 1500 mm of earth cover.
- .2 Where feasible, provide footings to unheated areas, isolated footings and footings adjacent to areas which will be kept clear of snow with at least 1800 mm of earth cover.
- .3 Where the specified earth cover cannot be achieved provide foundation insulation to the approval of the Consultant. Coordinate with Section 07 21 00 "Board Insulation".

3.7 WINDOW WELLS

- .1 Install window wells prior to backfilling in accordance with the manufacturer's instructions.
- .2 Securely attach to the building structure.

3.8 BACKFILLING PLACEMENT AND COMPACTION

- .1 Do not backfill until installations have been reviewed by the Consultant.
- .2 Except where otherwise indicated, backfill with the following materials:
 - .1 Backfill within building perimeter: OPSS Granular B Type II.
 - .2 Backfill for exterior paved areas: OPSS Granular B Type II.
 - .3 Backfill against the exterior of foundation walls: OPSS Granular B Type I or II.
 - .4 Backfilling of window wells: Clear crushed stone to within 200 mm of window sill.
 - .5 Bulk backfill for exterior sodded or landscaped areas: Approved native soil or OPSS Granular B Type I or II.
 - .6 Bedding for site services: OPSS Granular A.
 - .7 Backfilling for site services: As specified above.
 - .8 Granular fill under vehicular ramp to garage: OPSS Granular O.
 - .9 Granular sub-base (where required) for paved areas: OPSS Granular B Type II.
 - .10 Granular base under interior slab-on-grade: OPSS Granular A, blinded with a 40 mm layer of sand.
 - .11 Granular base under exterior paved areas: OPSS Granular A.
 - .12 Bedding for foundation and underslab drainage (where required): 19 mm clear crushed stone.
- .3 Except where otherwise indicated, compact each layer of backfill to the following percentages of maximum dry density according to ASTM D1557:
 - .1 Under structures, slabs-on-grade and pavements, 100%.
 - .2 Under walkways: 95%
 - .3 Under lawn, planted areas, or other unpaved areas: 90%

- .4 Place and compact backfill materials in maximum 300 mm loose lifts for except under slabs-on-grade and paving and maximum 200 mm loose lifts under paving.
- .5 Place and compact backfill materials equally on both sides of walls to minimize unequal earth pressure.
- .6 Backfilling for site services:
 - .1 Pipe bedding: Minimum 150 mm OPSS Granular "A" compacted to 95% standard proctor density. Extend the bedding material to the spring line of the pipe.
 - .2 If the soil at the subgrade level becomes disturbed, increase bedding to 300 mm in thickness. Place and compact in two 150 mm lifts.
 - .3 Cover material: From the spring line of the pipe to at least 300 mm above the top of the pipe, place OPSS Granular "A" or Granular B Type I and compact to at least 95% standard proctor density.
 - .4 Trench backfill: Native material (grey-brown silty clay crust), to the Consultant's approval, may be used for trench backfill. Under paved areas, the soil used for backfill to a depth of 2 m shall match the soil at the trench walls for frost heave compatibility. Place backfill in maximum 150 mm lifts and compact to at least 90% standard proctor density.
 - .5 If the moisture content of the native material makes it difficult to handle, use it in the lower portions of the trench only or waste the material.
- .7 Engineered fill:
 - .1 Install engineered fill where topsoil, organic material and/or fill exists in the zone of influence of the building.
 - .2 Remove all existing fill, topsoil and organic material to a depth of at least 300 mm below subgrade level and proof roll the exposed grade with a heavy roller.
 - .3 Sub-excavate any soft areas that become evident and replace with well-compacted fill.
 - .4 Place Granular "B" Type II and compact to no less than 98% standard proctor density in lifts not exceeding 150 mm.

3.9 SURPLUS MATERIAL

- .1 Remove from the site material unsuitable for fill, grading or landscaping and legally dispose of it.

END OF SECTION

CIVIL SECTIONS UNDER SEPARATE COVER

CIVIL SECTIONS UNDER SEPARATE COVER

Part 1 General

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to install a perimeter foundation drainage system, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Work
 - .1 Cast-in-place concrete: Refer to structural specifications under separate cover.
 - .2 Section 07 11 13 - Bituminous Dampproofing.
 - .3 Section 09 24 33 - Cement Parging.
 - .4 Section 31 23 10 - Excavation, Trenching and Backfilling.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM C117-23, Standard Test Method for Materials Finer than 75 µm (No. 200 Sieve) in Mineral Aggregates by Washing.
 - .2 ASTM C136/C136M-25, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D1248-25, Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Cooperate with the Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal".
- .2 Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

Part 2 Products

2.1 MATERIALS

- .1 Perforated corrugated high density polyethylene tubing and fittings as manufactured by Armtec Ltd.:
 - .1 Material: High density polyethylene resin to ASTM D1248 Type III, Category 4 or 5, Grade P33 or P34, Class C.
 - .2 Pipe diameter: 150 mm nominal, except where otherwise indicated.

- .3 Joints: Snap, insert or split couplers, as recommended by pipe manufacturer.
- .4 Sock: All drainage pipes to be encased in a continuous geotextile sock, filter.
- .2 Filter bed: 19 mm clear crushed stone as specified in Section 31 23 10 "Excavating, Trenching and Backfilling".

Part 3 Execution

3.1 INSPECTION

- .1 Ensure graded subgrade conforms with the required drainage pattern before placing the filter bed material.
- .2 Report to the Construction Manager improper slopes, unstable areas, areas requiring additional compaction or other unsatisfactory conditions.
- .3 Before installing the underslab drainage system, ensure the subgrade has been properly prepared to the correct elevations to receive the drainage tile and the penetrations through the foundation wall are correctly located and of appropriate size.
- .4 Begin installation of foundation and underslab drainage after deficiencies have been corrected.

3.2 COORDINATION

- .1 Coordinate with the cast-in-place concrete installer to schedule the installation of the underslab drainage system and review and acceptance by the Consultant prior to pouring the floor slab.
- .2 Coordinate with Section 31 23 10 "Excavating, Trenching and Backfilling" and schedule the work so that backfilling is executed immediately after inspection and acceptance by the Consultant of the perimeter weeping tile installation.

3.3 PIPE LAYING

- .1 Connect the foundation drainage system around the perimeter of the new foundation wall to the existing foundation drainage system in accordance with the drawings.
- .2 Ensure pipe interior and coupling surfaces are clean before laying.
- .3 Lay drains on prepared bed, true to line and grade with inverts smooth and free of sags or high points.
- .4 Commence laying at outlet and proceed in upstream direction.
- .5 Lay with face perforations and coupling slots downward.

- .6 Use fittings recommended by manufacturer. Make joints tight in accordance with the manufacturer's instructions.
- .7 Do not use shims to establish pipe slope.
- .8 Where applicable, place pipe immediately adjacent to footings.
- .9 Connect to the storm drainage sump. Refer to site services drawings.
- .10 Encase pipes in a continuous filter-fabric sock.
- .11 Protect pipe ends from damage and ingress of foreign material. Plug upstream ends of pipes with plastic plugs.
- .12 Provide flush cleanouts at all changes of building direction and in pipe runs greater than 15 m.
- .13 Provide back-flow valves where required to prevent backing up.

3.4 DRAINAGE FILTER BED BACKFILL:

- .1 Place filter bed backfill after pipe installation is reviewed by the Consultant.
- .2 Place minimum of 300 mm thickness coarse filter aggregate over perforated pipe.
- .3 Extend filter aggregate to and along foundation wall minimum 300 mm above top of pipe.
- .4 Place filter bed by hand, in 150 mm lifts. Consolidate by hand tamping lightly. Prevent displacement of pipe.

END OF SECTION

