HAMILTON-WENTWORTH DISTRICT SCHOOL BOARD

REFERENCE NO. 2024-166-P02050

TENDER FOR

Eastdale Elementary School Renovation Project

AT

99 Lincoln Rd, Hamilton, ON L8E 1Z4

ARCHITECTURAL SPECIFICATION

Contractors shall carefully examine and study all of the Contract Documents and shall visit the site(s) of proposed work in order to satisfy themselves by examination as to all conditions and dimensions.

ISSUED FOR TENDER **May 2024**

PROJECT Hamilton-Wentworth District School Board
Eastdale Elementary School Renovation Project
99 Lincoln Rd, Hamilton, ON L8E 1Z4

INTRODUCTORY INFORMATION **PAGES**

SPECIFICATIONS

DIVISION 01 GENERAL REQUIREMENTS

DIVISION 02 EXISTING CONDITIONS

DIVISION 04 MASONRY

DIVISION 05 METALS

DIVISION 06 WOOD AND PLASTIC

DIVISION 07 THERMAL AND MOISTURE PROTECTION

END OF TABLE OF CONTENTS

1 GENERAL

1.1 Comply with Division 1 requirements and documents referred to therein.

1.2 In addition to the General Conditions of the contract, the Contractors shall familiarize themselves with all Section of the Specifications.

1.3 Contractor shall include in contract Price all Contingency Allowances specified therein.

2 CASH ALLOWANCES

2.1 Include in the Contract Price, a stipulated sum Cash Allowance in the amount of **$15,000.00 (Fifteen Thousand Dollars)**.

2.2 Cash Allowances, unless otherwise specified, cover the net cost to the General Contractor of services, products, construction, machinery and equipment, freight, handling, unloading, storage installation and other authorized expenses incurred in performing the Work noted in item 2.6.

2.3 The Contract Price, *and not the Cash Allowance*, includes the General Contractor's profit in connection with such cash allowance.

2.4 The Contract Price will be adjusted by written order by the Consultant to provide for an excess or deficit to each Cash Allowance. Any unused portions of these allowances shall be returned to the Owner on the conclusion of the Contract.

2.5 Expend Cash Allowances as directed by the Consultant in writing. Allowances will be adjusted to actual cost with no adjustment to Contractor's charges. Cash expenditure must identify the H.S.T. separately.

2.6 The Contract Price and not the Cash Allowance includes the General Contractor's profit and co-ordination cost in connection with all Cash Allowance expenditures.

2.7 The following is a summary of the cash allowances to be included in the contract.

- PA/IT System
- Signage

Total: $15,000.00

END OF SECTION

PART 1 – GENERAL

1.1 SETTING OUT THE WORK

1.1.1 The Contractor shall be responsible for the construction layout.

1.1.2 Verify all elevations, lines, levels, and dimensions and report any errors, discrepancies or conflicts to the Consultant.

1.1.3 Establish and maintain benchmarks, location stakes and batter boards as required.

1.1.4 Verify and record proposed location and finished elevations relative to existing grades.

1.1.5 Determine actual location and elevation of existing underground utilities where connections are required.

1.1.6 Call in relevant utility companies where required to locate utilities.

1.1.7 Undertake test digging where required.

1.1.8 Verify and coordinate finished elevations and dimensions of the work of one Section with respect to a related Section of the Work.

1.1.9 Prepare interference drawings of system and equipment components to ensure that all elements can be accommodated within the spaces provided.

1.1.10 Ensure that all clearances required by authorities having jurisdiction are maintained in the installed work.

1.2 SURVEYOR'S CERTIFICATE

1.2.1 Provide an Ontario Land Surveyor's Certificate with a Surveyor's Plan to verify the location of the building in relation to the existing property lines.

1.2.2 Submit to the Consultant four (4) copies of the Surveyor's Certificate and the Surveyor's Plan within seven days of completion of the exterior foundations.

1.2.3 On completion of the work submit to the Consultant the same Survey to show the outline of paved areas, final finished grades throughout the site and the location of buried services. Note any deviations from the approved working drawings.

END OF SECTION

PART 1 - GENERAL

1.1 PERMITS, LICENSES AND FEES

1.1.1 The Owner shall obtain and pay for, in a timely manner in order to avoid delays to the construction, the Building Permit and Occupancy Permit.

1.2 BUILDING CODE BY-LAWS AND REGULATIONS

1.2.1 Carry out all work in accordance with the regulations of the Ontario Building Code, latest issue, including all amendments and revisions.

1.2.2 Comply with all requirements, regulations and ordinances of all jurisdictional authorities.

1.2.3 Comply with and pay for requirements of local authorities regarding any necessary work outside the property lines such as curbs and sidewalks.

1.2.4 Inform the Consultant of any known variance of the Contract Documents from the requirements of the Building Code and authorities having jurisdiction and assume responsibility for work known to be contrary to such requirements and performed without notifying the Consultant.

1.3 FIRE PROTECTION

1.3.1 Materials and components required to construct fire rated assemblies and materials requiring fire hazard classification shall be listed and labelled.

1.3.2 Fire rated assemblies shall be constructed in accordance with applicable fire test report information issued by the fire rating authority. Deviation from fire test report will not be allowed.

1.3.3 Construct fire rated assemblies as continuous, uninterrupted elements except for permitted openings. Extend fire rated walls and partitions from top of floor assembly to underside of the fire rated assembly above.

1.4 HAZARDOUS MATERIALS

1.4.1 Comply with requirements of the Occupational Health and Safety Act, as amended to include WHMIS (Workplace Hazardous Materials Information System).

1.4.2 Ensure that a current Material Safety Data Sheets (MSDS) arrives before or with the first delivery of every controlled product.

1.4.3 Check the date to ensure that the MSDS is up-to-date (MSDS are valid for three years from date of production).

1.4.4 Ensure that worksite copies of the MSDS are available to workers wishing to consult them and to the health and safety representative and/or joint health and safety committee.

1.4.5 Ensure that workers are instructed in the purpose and content of MSDS.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

1.1.1 This Section outlines the mandatory minimum Health and Safety protocol for all renovation, addition and new construction Project where all or a portion of the existing building remains occupied and in use.

1.1.2 These Health and Safety protocols are mandatory minimum requirements, procedures and standards that the Owner insists are fully complied with by all parties involved with the Projects.

1.2 RELATED SECTIONS

1.2.1 These specifications apply to all Divisions of this Project specification. It is the responsibility of the Contractor to apply these provisions wherever practical within specification limits to all products and services used on this Project.

1.2.2 The requirements of this Section supersede those of all other specification Sections and Drawings. Where conflicts exist in procedures, methods or materials, they shall immediately be brought to the attention of the Consultant and Owner. Where clarification is not immediately available, the Contractor shall assume the specifications contained in this Section are a minimum standard and the more stringent specification shall apply.

1.2.3 The Contractor must receive approval from Owner for any deviations from this specification Section.

1.2.4 The General Contractor shall recognize that it is they who are the Constructor of the Project. The General Contractor shall also recognize that they are solely responsible for site safety at the Place of the Work and compliance with the requirements of this Section does not limit or remove his total responsibility for site safety as Contractor of the Project.

1.3 REFERENCES

1.3.1 Applicable related regulations, standards and laws related to safety include but are not limited to:

- .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 Latest Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O.

1.4 COMPLIANCE SPECIFICATION

1.4.1 Notwithstanding the requirements of this Section, the Contractor must comply with all applicable health, safety and environmental regulations and statues.

1.5 BEYOND COMPLIANCE SPECIFICATION

1.5.1 These specifications apply in addition to all applicable health, safety and environmental compliance regulations. They are incorporated here to reflect the Owner’s intention to develop a specification which provides the safest practical procedures and policies for construction project sites that are occupied and in use by staff, students, and visitors during the execution of the Construction Contract.

1.5.2 Beyond compliance specifications recognize that performance well beyond the minimum regulatory standard is often desirable, possible and affordable, often with no cost or low cost options. It also recognizes that application methods or protocols may be as important as the material specified. Therefore, these specifications cover both material and methods.

1.5.3 These provisions apply to both indoor and outdoor applications equally.

PART 2 - EXECUTION AND COMPLIANCE REQUIREMENTS

2.1 APPLICATION OF COMPLIANCE REQUIREMENTS

2.1.1 The Contractor shall execute all of the procedures and meet all of the requirements set out herein and apply these protocols from the outset of the Construction Phase.

2.1.2 These procedures or requirements are to be maintained for the duration of the Construction Phase. The Contractor shall not discontinue any of the individual procedures or requirements without the prior approval of the Owner.

2.2 SITE SUPERVISOR (SITE SUPERINTENDENT)

2.2.1 A full-time Site Supervisor (Site Superintendent) is required for each site at any site, regardless of the number of active workers on site.

2.2.2 Site Superintendent must carry a cell phone at all times during construction with the ability to be reached directly during all work hours and the ability to have voicemail recorded during all non-work hours including weekends and holidays.

2.2.3 Site Superintendent shall not be changed throughout projects unless confirmed and approved by the Owner.

2.3 ONTARIO OCCUPATION HEALTH & SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS

2.3.1 General Contractor to comply with the Ontario Occupational Health & Safety Act and Regulations for Construction Projects, latest edition – including all amendments.

2.3.2 Beyond compliance in item .1 above, regardless of the number of labourers active on the Project, the General Contractor shall form a contractor's Health and Safety Committee at the outset of construction. This Committee shall then follow the standard requirements for such a Committee as set out in the *Occupational Health & Safety Act and Regulations for Construction Projects.*

2.4 ON-SITE COMMUNICATIONS

2.4.1 At the outset of the project the General Contractors shall provide to the Owner all relevant contract information for the Site Superintendent, General Contractor Project Manager and key sub-contractors including names and cell phone numbers.

2.4.2 The General Contractor shall provide at least one "emergency contact" telephone number at which the Contractor's representative can be reached directly during all work hours and have the ability to have voicemail recorded during all non-work hours including weekends and holidays. As outlined below, this may be designated to the Site Superintendent's cell phone number.

2.4.3 Regardless of compliance method for the emergency contact telephone number stated above, Site Superintendent must carry a cell phone at all times during construction with the ability to be reached directly during all work hours and the ability to have voicemail recorded during all non-work hours including weekends and holidays.

2.4.4 The Contractor is to ensure that the Owner and Consultant are immediately apprised of any safety issues as each arise and related request and/or resolution. The Owner and Consultant are responsible for any decisions that have an effect on the contract execution.

2.4.5 Notwithstanding the reporting to the Owner and Consultant noted above the Site Superintendent shall liaise with the Owner and Consultant on all safety related matters as required on a daily basis.

2.4.6 In the event of a safety issue requiring contractual clarification or action (i.e. Change Notice, etc.), the contractor shall ensure that, where applicable, the action is followed up with appropriate documentation.

2.5 SITE SAFETY SIGNAGE

2.5.1 Standardized Safety Signage is required at all construction entrances.

2.5.2 If not designated on the Contract Documents, the location of the Safety Signage shall be confirmed with the Owner and Consultant at the outset of the Project and before the placement of hoarding and fencing.

2.5.3 Safety Signage is to be posted at all street entrances to site and at each entrance to hoarded/ fenced construction area.

2.5.4 Total surface area of signage is to avoid exceeding municipal standards that would require a separate signage permit.

2.5.5 Access signage texts shall include cell phone contact number for Site Superintendent.

2.5.6 Contractor is responsible for co-ordination of all deliveries to the school. Deliveries are to be before of after school hours only. Communication with the Owner and school's caretaker is required before delivery.

2.6 ACCESS / EGRESS CONTROLS

2.6.1 At the outset of the Contract, the General Contractor shall advise all suppliers and subcontractors of the protocols listed herein and of the requirement to contact the Site Superintendent.

2.6.2 The drivers of all construction vehicles entering the site, including delivery vehicle drivers, are to contact Site Superintendent by cell phone prior to entering site; the Site Superintendent.

2.7 CONTRACTOR PARKING

2.7.1 Contractor parking is allowed on property during the summer, after school hours and on weekends. Contractor parking is not permitted on-site during school hours.

2.7.2 Outside of this street parking would be required ensuring to follow City By-Laws.

2.8 CONTRACTOR EQUIPMENT

2.8.1 Contractor is responsible to lock up all their equipment, materials, etc left on site.

2.8.2 Security of any materials, equipment, portable toilets, garbage bins, vehicles etc. are the Contractor's responsibility.

2.8.3 Contractor or their subtrades are not to use caretaker's equipment and/or tools.

2.8.4 A staging area for portable washroom, bins and container (for materials/equipment) must be approved by the Owner. No other area is to be used to store or house equipment or material. No materials and equipment are permitted to be stored on-site.

2.9 CONSTRUCTION FENCING AND HOARDING

2.9.1 Construction hoarding requirements shall be a site based decision to be determent by the Architect and Owner Project Manager at the design stage and shown on the Contract Documents.

2.9.2 Construction site area cannot impede on fire routes or city garbage removal.

2.9.3 Staging area placement and size must be approved by the Owner in writing, prior to erecting fencing and hoarding, and must be within the boundaries of the area noted in the Tender drawings.

2.9.4 In portions of the site where chain link is approved, it shall be continuous 1800mm high chain link fencing, wire-tied staked iron ‘tees’ at 1800mm on centre – OR – leased, modular ‘fast fence’ if staked down and wire tied together.

2.9.5 All fenced and hoarded areas to be gated with lockable vehicular and man gates- minimum construction to be steel rail and chain link construction.

2.9.6 The portable washroom must be within a fenced area that is locked and the portable washroom locked each night.

2.9.7 Plastic snow fencing is NOT permitted.

2.9.8 All hoarding and fencing shall be maintained in a stable condition, for the duration of construction period as part of the base contract price and to include Superintendent’s inspection at the beginning and end of each work day.

2.9.9 All Fire Routes to be outside all fenced and hoarded areas and maintained clear at all times.

2.9.10 Sufficent space must be provided for the City garbage removal.

2.9.11 ‘Covered Way’ protection shall be provided when accesses or pathway are proximity to construction, in accordance with Ministry of Labour *Occupational Health & Safety Act* Regulations.

END OF SECTION

PART 1 - GENERAL

1.1 START-UP MEETING

1.1.1 Post Contract Award, upon notification attend at location of Owner's choice, a start up meeting with the Owner and Consultants and Engineers.

1.2 PRE-CONSTRUCTION MEETING

1.2.1 Immediately prior to construction, upon notification attend at location of Owner's choice, a pre construction meeting, along with authoritative representatives of key subcontractors, project superintendent, inspection and testing company representatives, and the consultants.

1.2.2 Purpose of meeting is as follows:

.1 Review project communications procedures.

.2 Review Contract administration requirements including submittals, payment and change order procedures.

.3 Identify all critical points on Construction Schedule for positive action.

.4 Review Consultant's inspection requirements.

.5 Review any points which require clarification.

1.3 SITE MEETINGS

1.3.1 Hold regular site meetings every two weeks. Ensure that persons, whose presence is required, Are present and that relative information is available to allow meetings to be conducted efficiently. The Consultant will attend these meetings. The Owner may also choose to attend these meetings, at his discretion.

1.3.2 Schedule additional meetings, if required.

1.3.3 Prepare an agenda for each meeting and distribute a copy to all required participants prior to the meeting.

1.3.4 Prepare and distribute meeting minutes to all within 72 hours.

1.4 SUPERVISION

1.4.1 Employ an experienced and qualified superintendent for the project who shall devote his time exclusively to the work of this Contract and who shall be in complete charge of the work from commencement to completion. A working foreman will not be acceptable. The superintendent shall not be changed after commencement of work without the Consultant's approval.

1.4.2 Supervise, direct, manage and control the work of all forces carrying out the work, including subcontractors and suppliers. Carry out daily inspections to ensure compliance with the working drawings and detailed specifications and the maintenance of quality standards. Ensure that the inspection staff includes personnel competent in supervising the mechanical and electrical trades.

1.5 PROGRESS RECORD

1.5.1 The Contractor shall maintain on site, permanent written record of progress of work. Record shall be open to inspection by Owner at all times and copy shall be furnished to Consultants upon the Consultant's request.

1.5.2 This record shall show weather conditions, dates of commencement, progress and completion of various trades and items of work. Particulars pertaining to erection and removal of forms, pouring of concrete, installation of roofing and other critical or major components as well as number of employees of various trades and type and quantity of equipment employed daily, shall be noted.

1.5.3 Display a copy of the construction schedule in the site office from start of construction to completion. Superimpose actual progress of work on schedule at least once each week.

1.6 AS-BUILT DRAWINGS

1.6.1 Maintain an accurate set of As-Built Drawings showing progress of the work and all changes, revisions and additions to the work and deviations from the Contract Documents in red ink.

1.6.2 Include accurate location, depth, position, size and type of concealed and underground services, both inside and outside shall be as part of these As-Built Drawings, as required.

1.6.3 As-Built Drawings shall be available for review at each site meeting by the Consultant.

1.7 DOCUMENTS ON SITE

1.7.1 The Contractor at all times will have on-site, a complete set of Contract Documents (Schematic Drawings and Performance Specifications) with all addenda, site instructions, change orders, reviewed shop drawings and samples, colour schedule, paint materials schedules, hardware list, progress reports and meeting minutes.

1.7.2 The Contractor at all times will have on-site, a complete set of all construction documents, as issued for building permit and bearing the stamp of the appropriate municipal authority.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 No work requiring a sample or shop drawing submission shall be commenced until the submission has received the Consultant's final review. All such work shall be in accordance with reviewed samples and shop drawings.

1.1.2 Provide submittals as requested by the Contract Documents, as specified herein, and in accordance with the conditions of the Contract.

1.1.3 In addition to submittals specifically requested by the Contract Documents, provide other submittals as may be reasonably requested by the Consultant, or as are required to coordinate the Work and to provide the Owner with choices available, within the scope of Contract Documents.

1.1.4 Contractor’s review of submittals:

.1 Review submittals for conformity to Contract Documents before submitting to Consultant. Submittals shall bear stamp of Contractor and signature of a responsible official in Contractor’s organization indicating in writing that such submittals have been checked and coordinated by Contractor. Contractor’s review shall be performed by qualified personnel who have detailed understanding of those elements being reviewed and of the conditions at the Place of the Work proposed for installation.

.2 Check and sign each submittal and make notations considered necessary before submitting to Consultant for review. Where submittal is substantially and obviously in conflict with requirements of Contract Documents, reject submittal without submitting to Consultant and request resubmission. Note limited number of reviews of each submittal covered under Consultant’s services as specified below.

.3 Contractor shall assume sole responsibility for any conflicts occurring in the Work that result from lack of comparison and coordination of submittals required for the Work.

.4 Submittals that have not been reviewed, checked, and coordinated by Contractor prior to submission to Consultant, will be rejected.

.5 Notify Consultant in writing of changes made on submittals from Contract Documents. Consultant’s review of submittals shall not relieve Contractor of responsibility for changes made from Contract Documents not covered by written notification to Consultant.

1.1.5 Consultant’s review of submittals:

.1 Review of submittals by Consultant is for the sole purpose of ascertaining conformance with the general design concepts and the general intent of the Contract Documents. This review shall not mean that Consultant approves the detail design inherent in the submittals, responsibility for which shall remain with the Contractor. Such review shall not relieve the Contractor of responsibility for errors or omissions in the submittals, or responsibility for meeting requirements of Contract Documents.

.2 Contractor shall be responsible for dimensions to be confirmed and correlated at the Place of the Work for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of the Work.

.3 Consultant’s review and markings on submittals do not authorize changes in the Work or the Contract Time.

1.1.6 Make submittals with reasonable promptness and in an orderly sequence so as to cause no delay in the Work. Be responsible for delays, make up time lost and pay added costs, at no additional

cost to the Owner, incurred because of not making submittals in due time to permit proper review by Consultant.

1.1.7 Do not proceed with work affected by a submittal, including ordering of Products, until relevant submittal has been reviewed by Consultant.

1.1.8 Contractor's responsibility for errors and omissions in submittals is not relieved by Consultant's review of submittals.

1.1.9 Contractor's responsibility for deviations in submittal from requirements of Contract Documents is not relieved by Consultant's review of submittal, unless Consultant gives written acceptance of specific deviations.

1.1.10 Engineered submittals:

.1 Submittals for items required to be sealed by professional engineer (or as otherwise indicated as engineered), shall be prepared under the direct control and supervision of a qualified professional engineer registered in the Place of the Work, and having minimum professional liability insurance required in accordance with the General Conditions, as amended.

.2 Design includes life safety, sizing of supports, anchors, framing, connections, spans, and as additionally required to meet or exceed requirements of applicable codes, standards, regulations, and authorities having jurisdiction.

.3 Engineered submittals shall include design calculations, complete with references to codes and standards used in such calculations, supporting the proposed design represented by the submittal. Prepare calculations in a clear and comprehensive manner so that they can be easily reviewed. Incomplete or haphazard calculations will be rejected.

.4 The professional engineer responsible for the preparation of engineered submittals shall undertake periodic field review, including review of associated mock-ups, at locations wherever the work as described by the engineered submittal is in progress, during fabrication and installation of such work, and shall submit a field review report after each visit. Field review reports shall be submitted to the Consultant, to authorities having jurisdiction as required, and in accordance with the building code.

.5 Field reviews shall be at intervals as necessary and appropriate to the progress of the work described by the submittal to allow the engineer to be familiar with the progress and quality of such work and to determine if the work is proceeding in general conformity with the Contract Documents, including reviewed shop drawings and design calculations.

.6 Upon completion of the parts of the Work covered by the engineered submittal, the professional engineer responsible for the preparation of the engineered submittal and for undertaking the periodic field reviews described above, shall prepare and submit to the Consultant and authorities having jurisdiction, as required, a letter of general conformity for those parts of the Work, certifying that they have been Provided in accordance with the requirements both of the Contract Documents and of the authorities having jurisdiction over the Place of the Work.

.7 Costs for such field reviews and field review reports and letters of general conformity are included in the Contract Price.

1.1.11 Keep copies of reviewed submittals at the Place of the Work in a neat, orderly condition. Only submittals that have been reviewed by the Consultant's and are marked with Consultant's review stamp, as applicable, are permitted at the Place of the Work.

1.1.12 The Work shall conform to reviewed submittals subject to the requirements of this section. Remove and replace materials or assemblies not matching reviewed submittals at no increase in the Contract Time and at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIAL LIST

2.1.1 Within 10 days of award of Contract, submit a complete list of manufactured materials to Consultant.

2.1.2 List is required to enable Consultant to verify that materials meet Specifications prior to submission of shop drawings or installation, and to select colours and/or patterns.

2.1.3 Should materials not meeting requirements be included, the Consultant will require re-submission.

2.1.4 Only the listed materials shall be used, unless otherwise approved by the Consultant.

PART 3 - EXECUTION

3.1 PROJECT MEETING

3.1.1 Schedule regular bi-weekly construction progress meetings for duration of the work.

3.1.2 Contractor, major Subcontractors currently involved in the Work, Consultant and Owner are to be in attendance of the bi-weekly meetings.

3.1.3 Record minutes of each meeting and distribute copies to all participants, and all others requiring information of recorded minutes, within one week of date meeting.

3.1.4 Meeting Agenda will include the following:

.1 Review and approval of minutes from previous meeting.
.2 Work progress since previous meeting.
.3 Field observations, including any problems, difficulties, or concerns.
.4 Construction progress schedule.
.5 Two-week look ahead schedule.
.6 Submittal schedule including Status of CCOs, COs, RFIs, SIs, CAEs etc. (provide logs).
.7 Proposed changes in the Work.
.8 Shop drawing status and long lead items.
.9 Site Safety Issues.
.10 Maintenance of construction quality standards.
.11 Other business.

3.2 SHOP DRAWINGS

3.2.1 The term shop drawings means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data which are to be provided by the Contractor to illustrate details of a portion of the work.

3.2.2 Contractor shall arrange for the preparation of clearly identified shop drawings called for by the Contract Documents or as the Consultant may reasonably request.

3.2.3 Submitted shop drawings must indicate the name of the project and specific information as to

location within the project including reference to the drawing or specification section to which it relates.

3.2.4 The shop drawings shall show, but not necessarily be limited to the following:

.1 Clear and obvious notes of any proposed changes from Drawings and Specifications.
.2 Fabrication and erection dimensions.
.3 Provisions for allowable construction tolerances and deflections provided for live loading.
.4 Details to indicate construction arrangements of the parts and their connections, and interconnections with other work.
.5 Location and type of anchors, and exposed fastenings.
.6 Materials and finishes.
.7 Descriptive names of equipment.
.8 Mechanical and electrical characteristics when applicable.
.9 Information to verify that superimposed loads will not affect function, appearance, and safety of the work detailed as well as of interconnected work.
.10 Assumed design loadings, and dimensions and material specifications for load bearing members.
.11 Dimensions and dimensioned locations of proposed chases, sleeves, cuts and holes in structural members.

3.2.5 Prior to submission to the Consultant the Contractor shall review all shop drawings. By this review the Contractor represents that he has determined and verified all field measurements, field construction criteria, materials, catalogue numbers, and similar data, or will do so, and that he has checked and coordinated each shop drawing with the requirements of the work and of the Contract Documents. The Contractor's review of each shop drawing shall be indicated by stamp, date, and signature of a responsible person.

3.2.6 Contractor shall submit drawings to the Consultant for his review with reasonable promptness and in orderly sequence so as to cause no delay in the work or the work of other Contractors. If either the Contractor or the Consultant so requests they shall jointly prepare a schedule fixing the dates for the submission and return of shop drawings. Shop drawings shall be submitted in the form of one reproducible transparency and one white print. Where the subject of the shop drawings involves the structural, mechanical, or electrical Engineers, in addition to the one reproducible transparency, submit two white prints. At time of submission the Contractor shall notify the Consultant in writing of any deviation in the shop drawings from the requirements of the Contract Drawings.

3.2.7 Contractor shall make any changes in the shop drawings which the Consultant may require consistent with the Contract Documents and resubmit unless otherwise directed by the Consultant. When resubmitting, Contractor shall notify the Consultant in writing of any revision other than those requested by the Consultant.

3.2.8 Shop drawings shall define the division of responsibility between the trades and items shown on shop drawings. Shop drawings shall show materials, methods of construction, and attachment or anchorage, erection, connections and other details necessary to complete the work. Shop drawings shall show cross references to Drawings and specifications.

3.2.9 Review by the Consultant is for the sole purpose of ascertaining conformance with the general design concept. 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 does not relieve Contractor of his responsibility for errors or omissions in the shop drawings, or his responsibility for meeting all requirements of the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that

pertains solely to fabrication processes or technique of construction and installation, and for coordination of the work of all its subtrades and work of other Contractors.

3.2.10 Any adjustments made on the shop drawings by the Consultant are not intended to change the Contract Sum. If the Contractor deems that such adjustments affect the value of the work, he shall so state in writing before proceeding with the fabrication and installation of the work.

3.2.11 Submit two copies of each final reviewed shop drawing to the Consultant.

3.2.12 After final review, the Consultant will return reviewed copies to the Contractor, who shall reproduce, at his expense the number of prints required.

3.2.13 Submit 6 copies of standard preprinted shop drawings. Assemble submittals of more than 2 pages in individual booklet form, after final review. Consultant will return at least 3 copies of shop drawings to the Contractor.

3.2.14 After final review, the Consultant will return one copy to the Contractor.

3.2.15 Shop drawings which require the approval of a legally constituted authority having jurisdiction shall be submitted by the Contractor to such authority for approval. Such shop drawings shall receive final approval of authority having jurisdiction before being submitted to the Consultant.

3.2.16 No work requiring a sample or shop drawing submission shall be commenced until the submission has received the Consultant's final review. All such work shall be in accordance with reviewed samples and shop drawings.

3.3 SAMPLES

3.3.1 For the purpose of this Article samples means: Samples, models and templates.

3.3.2 Samples shall be submitted to the Consultant in a number as specified in the respective Section in sufficient time to permit review process before the item is needed to be installed or as directed otherwise.

3.3.3 If either the Contractor or the Consultant so requests, they shall jointly prepare a schedule fixing the dates for submission and return of samples, including time allowances for re-submissions.

3.3.4 Samples shall be submitted by the Contractor only.

3.3.5 Samples which are "rejected" shall be removed by the Contractor.

3.3.6 Samples will receive consideration only when hand delivered or mailed accompanied with a covering letter signed by the Contractor. Letter shall be sent via First Class mail and shall contain a list of samples being submitted, name of project, Contractor, Subcontractor, manufacturer, brand, also the project number, specification article and paragraph numbers to which the samples refer, and such additional information as may be required by the specification for the particular item being furnished. A copy of the letter shall be enclosed with the samples and any sample received without identification letter will be considered "unclaimed goods" and will be held for a limited time only.

3.3.7 Each sample shall be labelled to indicate name of project, Contractor, Subcontractor, manufacturer, brand, job number, as required.

3.3.8 Where samples are rejected by the Consultant, new samples shall be submitted as soon as

possible after notification of the rejection and shall be marked "Second submissions" or subsequent submissions in addition to the other information required on the label.

3.3.9 Review by the Consultant is for the sole purpose of ascertaining conformance with general design concept. This review shall not mean that the Consultant approves the detail design inherent in the samples, responsibility for which shall remain with the Contractor submitting same and such review shall not relieve the Contractor of his responsibility for errors or omissions or of his responsibility for meeting all requirements of the Contract Documents.

3.3.10 Cost of all samples shall be paid by the Contractor including all carrying charges, which shall be prepaid.

3.3.11 Where colour, pattern, or texture is a criterion, submit the full range of samples.

3.3.12 Field samples and mock-ups may form part of the Work if so agreed to by the Consultant.

3.3.13 Construct each sample or mock-up complete, including the work of all trades.

3.3.14 Reviewed samples or mock-ups will become standards of workmanship and material against which installed work shall be checked.

3.4 ACCESS PANELS AND ACCESS DOORS

3.4.1 Before commencing the installation of mechanical and electrical work, the Contractor with his mechanical and electrical Subcontractors shall prepare on a set of Drawings provided for that purpose, a complete lay out of all access panels and access doors which will be required. These lay outs shall be submitted for review as specified for shop drawings, and shall show exact sizes and locations of access panels and doors. Revisions may be required to the lay out before final review.

3.4.2 Items requiring access panels shall be located behind removable materials wherever possible. Location of access panels may be relocated by the Consultant to more unobtrusive locations.

3.4.3 Access panels and doors shall be finished to match adjacent wall and/or ceiling finish unless otherwise specified or indicated.

3.5 PROGRESS SCHEDULE

3.5.1 Contractor shall prepare and deliver to the Consultant for submitting to the Owner, within ten (10) days after the award of the contract, a progress schedule, indicating the dates for:

.1 Submission of shop drawings for the various Sections of the Work; shop drawings schedule for mechanical and electrical work shall contain a list identifying the contents of each shop drawing by subject matter, item, manufacturer's name and supplier's name.
.2 Commencement and completion of each major division of work, including the work to be done by the Subcontractors.
.3 Final completion date.

3.5.2 After the Owner issues the Award Letter, the Contractor is to submit the following documents as per the the Award Letter:
.1 WSIB Certificate
.2 Proof of Insurance
.3 Electronic Bonds

3.5.3 Furnish monthly progress reviews as related to the work schedule. Reviews shall include comments on both, the parts of the Work and general progress of the project. Correlate reviews to progress payment applications.

3.5.4 Update and re-issue the progress schedule as required to conform to monthly progress reviews.

3.5.5 Maintain progress schedule, as the work progresses.

3.5.6 Progress review shall show weather conditions, dates of commencement, progress and completion of various trades and items of work. Particulars pertaining to erection and removal of forms, pouring of concrete and type and quantity of equipment employed daily, shall be noted.

3.5.7 Completely update schedule and cash flow chart whenever changes occur to scheduling, in a manner and at times satisfactory to the Owner.

3.5.8 Provide competent and experienced staff familiar with scheduling work of this type to prepare, maintain, revise, direct and check implementation of schedule.

3.6 IMPERIAL

3.6.1 Contractor's submittals containing measurements of any kind shall be in the Imperial system of measurement.

3.7 PROGRESS PHOTOGRAPHS

3.7.1 Before starting work, photograph interiors, to record existing conditions and send electronically to the Consultant and the Owner.

.1 The number of photographs, close or otherwise must be sufficient to ensure that existing conditions are adequately recorded to minimize the possibility of unjustified claims against the Contractor and Owner.

.2 Where parts of existing buildings are concealed pending demolition work of this Contract, photograph immediately on exposure.

3.7.2 Upon commencement of the Work, and thereafter at monthly intervals until Completion of the Contract, the Contractor shall supply the Consultant with three copies of photographs with sufficient views, 4 locations, of the progress on all parts of the Work.

3.7.3 Contractor shall include for the total number of photographs stated herein, but the Consultant shall have the right to request that fewer photographs be taken at certain intervals, so that more photographs may be taken at other times, providing the total number of photographs taken remains the same.

3.7.4 Photographs shall be taken from exterior locations as determined by the Consultant.

3.7.5 Monthly Digital photograph by email is acceptable.

3.8 AS-BUILT DRAWINGS

3.8.1 Upon completion of Work, distribute As-Built Drawings electronically to the Consultant and the Owner in PDF and CAD format.

3.9 MOCK-UPS

3.9.1 Where required by the Contract Documents or as may reasonably be requested by the

Consultant during the course of the Work, Provide field or shop erected example of work complete with specified materials and workmanship.

3.9.2 Erect mock-ups at locations as specified and as acceptable to Consultant. Do not proceed with work for which mock-ups are required prior to Consultant's review of mock-ups.

3.9.3 Modify or remove and replace mock-ups as many times as required to secure acceptance of the Consultant. Such removal and replacement shall be done at no increase in either the Contract Price or the Contract Time.

3.9.4 Protect and maintain mock-ups until directed to be removed. Commence work demonstrated in mock-up only after review and acceptance of workmanship. If possible, mock-up may become part of finished work, at sole discretion, and with prior written acceptance, of Consultant.

3.9.5 Reviewed and accepted mock-ups will become standards of workmanship and material against which installed work will be compared.

3.9.6 Remove and replace materials or assemblies not matching reviewed mock-ups.

3.9.7 Resubmit mock-ups until written acceptance is obtained from Consultant.

3.10 EXTRA MATERIALS

3.10.1 Supply extra materials at completion of Project as specified in Trade Sections of this Specification.

3.10.2 Deliver extra materials to location designated by the Owners representative.

3.11 WASTE MANAGEMENT

3.11.1 Contractor shall prepare and submit waste audit and reduction plan in compliance with the requirements of Ontario Regulations 102/94, Waste Audits and Waste Reduction Workplans and 103/94, Industrial, Commercial and Institutional Source Separation Programs under the Environmental Protection Act of Ontario. For definitions refer to Ontario Regulation 105/94, Definitions.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with all Sections of Division 1, General Requirements and all documents referred to therein.

1.1.2 Provide all labour, materials, products, equipment and services required to complete the work of alterations and make good to existing building according to the Specifications and/or Drawings.

1.1.3 Execute each part of the Work related to existing building by tradesmen specializing in such work.

1.1.4 Schedule Work to avoid interference with progress of new construction Work.

1.2 PERMITS AND REGULATIONS

1.2.1 Arrange and pay for all permits, notices and inspections necessary for the proper execution and completion of the alteration work. For the exception of Building Permit which is to be paid for and provided by the Owner.

1.2.2 Follow Ontario Office of the Fire Marshall "Guidelines for Maintaining Fire Safety During Construction in Existing Buildings".

1.3 EXISTING BUILDING

1.3.1 Visit the site and become fully knowledgeable of existing building drawings and specifications and of conditions affecting the Work.

1.3.2 Ensure the operations of the existing building, the existing tenants' premises and access to the existing building areas, are not restricted or disrupted.

.1 Maintain existing exits and ensure that proper and safe means of egress from all parts of existing building to open spaces are provided at all times to the approval of authorities having jurisdiction. Locate and install exit lights, and illuminate temporary means of egress.

1.3.3 Before any work is commenced in any portion of the existing building, the Owner will remove all furnishing and movable furniture that do not require disconnecting from services, storing same in some other portion of the building or off the premises. All other items not removed from any section of the building being renovated, shall be removed from the premises by the Contractor.

1.3.4 All noisy, dusty and disruptive work to be completed outside of school hours.

1.3.5 The removal of hazardous and asbestos-containing materials will be under same contract and shall be the first scope undertaken before all other.

PART 2 - PRODUCTS

2.1 SALVAGE MATERIALS

2.1.1 Salvage materials, products, and equipment indicated. Carefully remove items to be salvaged, protect during alteration and reinstall in locations indicated.

2.1.2 Refer to sprinkler, mechanical and electrical Drawings and specifications for sprinkler, mechanical and electrical work to be reused.

2.1.3 Salvage the items as indicated on the Drawings for reuse and return to the Owner in an adequately preserved and usable condition on date of Substantial Performance or other mutually agreed date.

2.1.4 All materials and products from the alteration not required for reuse shall become the property of the Contractor. Remove all material and debris from the site as quickly as possible and dispose of legally. Burning of debris on the site will not be permitted.

2.2 SERVICES IN EXISTING BUILDING

2.2.1 Ensure that existing services are not damaged during demolition and construction. Arrange with mechanical and electrical Subcontractors to immediately cut off and cap concealed services uncovered during work.

2.2.2 Do not interrupt mechanical or electrical services of the existing building except for temporary close-downs to make connections to new work, and as approved by prior arrangements. Give the Owner minimum 72 hour notice of intention to interrupt mechanical or electrical services in existing building in any area. Notice is dependent on partial or full shutdown. For full shutdown up to 5 days notice is required.

2.2.3 In no case shall service interruptions affect the total existing building.

2.2.4 Should existing services be accidentally uncovered and disrupted, make complete restoration immediately, and ensure adequate protection to avoid further disruption until alternative means of providing permanent continuation of the services are made.

2.2.5 Make payment for work specified in the foregoing at no additional cost to the Owner if, in the opinion of the Consultant, such work could have been reasonably foreseen by examination at time of bidding and which has been caused by lack of proper care and protection.

2.2.6 Unless otherwise specified, restore services on which work is performed to original condition.

PART 3 - EXECUTION

3.1 SCREENS

3.1.1 Provide temporary fire rated partitions, screens, enclosures, tarpaulins etc., as may be required to enclose work areas from other areas of the building, to maintain security and to confine dust, noise and workmen to the work area. Locate screens as directed by the Consultant.

3.1.2 It is essential that the existing building be maintained weather-tight at all times. Provide temporary protection, enclosures, tarpaulins, etc., as may be required to weatherproof any openings made in the Work.

3.1.3 Construct fire rated, dust proof and wind-proof screens as required to completely enclose the work areas and the access passages to the work areas from the other areas of the existing building. Locate partitions as directed by the Consultant.

3.1.4 Build screens of 3-5/8" metal studs at 16" centres sheathed with sheets of 5/8" sheetrock firecode ‘c’ panels on both sides with close joints smoke and fire sealed at junctions typical. Where exposed to the weather, fully cover screens with a heavy waterproof and dustproof paper with lapped and sealed joints. Fill spaces between studs with 4" fibrous glass or mineral wool insulation batts to deaden sound.

3.1.5 Thoroughly pack framing and sealed at junctions of screens with floors, walls and ceilings with batt insulation in a manner to prevent infiltration of smoke, dust, dirt, etc. Over all junctions of screens with floors, walls and ceilings, apply continuous 1-1/2" wide strips of masking tape both sides of screen to ensure that rooms within closed off areas which are not being altered are kept dust free.

3.2 SEQUENCE OF ALTERATIONS

3.2.1 Schedule phasing of alterations and demolition as indicated on Drawings.

3.3 DEMOLITION

3.3.1 Demolition of, or alteration to, any portion of the existing buildings shall proceed only after approval of the Owner, and after weather-tight and dustproof partitions have been erected to provide thorough protection to the adjoining areas and rooms.

3.3.2 When permission has been granted to proceed with alterations in the existing buildings, work shall be carried out expeditiously and continuously to completion.

3.3.3 If suspected hazardous or contaminated materials are encountered, advise Consultant and the Owner and await instructions regarding removal and disposal of such contaminants which may be considered hazardous to health, prior to demolition.

3.4 RECONSTRUCTION, ALTERATIONS AND MAKING GOOD

3.4.1 The work shown on the Drawings, Schedules and Specifications may or may not be all the work required, do all demolition, make good all finishes and execute all necessary work including incidentals to make a complete job of the alterations.

3.4.2 Do not undermine, damage, or endanger existing pipe lines, electrical conduit and wiring by digging, cutting or any other operation in the performance of the Work of the Contract. Immediately repair and make good to any existing work so affected to the Consultant's satisfaction at the Contractor's expense.

3.4.3 Cut off, cap, divert, or remove existing water, gas, electric and other services in areas being altered which are affected by the changes as required or as directed by the municipal authorities and the utility company concerned, and the Consultant. Protect and maintain active services to the existing building.

3.4.4 Perform the Work in such a manner so as to cause a minimum of noise or interference to the use of the existing building.

3.4.5 Whenever it becomes necessary to cut or interfere in any manner with existing apparatus for short periods of time, Do work at such times as agreed upon between the Owner, Consultant, and the Contractor.

3.4.6 Where new work connects with existing and where existing work is altered, all necessary cutting and fitting required to make satisfactory connections with the existing work shall be performed under this Contract, so as to leave the entire work in a finished and workmanlike condition.

3.4.7 Make good materials and finishes which are damaged or disturbed during the process of additions and reconstruction under the Contract.

3.4.8 Where existing work is to be made good, the new work shall match exactly the old work in material, form, construction and finish unless otherwise noted or specified.

3.4.9 Perform drilling of existing work carefully, leaving a clean hole no larger than required.

3.4.10 Provide, throughout the entire construction period, proper and safe means of fire exit from all zones of the existing building at all times to the approval of the authorities having jurisdiction.

3.4.11 Protect work in the existing buildings, such as floors, finishes, trim, etc., as completely as possible to hold the replacing of damaged work by each Section to a minimum.

3.4.12 Provide openings through existing roof as required by new mechanical equipment. Maintain watertight at all times. Provide new blocking, curbs and cants and make good roof and provide flashing as may be required.

3.4.13 Protect existing roofs, roof flashings, parapets and all items on roofs from damages of any cause, and make good damages at no cost to the Owner.

3.4.14 Ensure the public is protected against falling debris, chemicals and water.

3.4.15 Properly co-ordinate the various Sections taking into account also the existing installations to assure the best arrangement of pipes, conduits, ducts and mechanical, electrical and other equipment, in the available space. Under no circumstances will any extra cost be allowed due to the failure by the Contractor to co-ordinate the work. If required, in critical locations, interference and/or installation drawings shall be prepared showing the work of the various Sections as well as the existing installation, and these drawings shall be submitted to the Consultant for review before the commencement of work.

3.4.16 Removal and relocation of mechanical and electrical items indicated as relocated and reused are specified under respective Mechanical and Electrical Drawings. Co-ordinate the removal and relocation of these items.

3.4.17 Remove existing finishes as indicated on the Drawings to neat, straight lines and leave substrate clean and even, suitable for new finishes indicated.

3.4.18 Without limiting the generality of the foregoing, do the following repairs:

.1 Replace existing windows as located on the Drawings. Solidly anchor and make weather tight.

3.4.19 Remove temporary partitions and screens when no longer required, and make good damaged or blemished adjoining work as directed by Consultant.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 For the purposes of this Section, independent inspection and testing agencies are referred to as "Inspector(s)".

1.1.2 The Owner, or the Consultant on his behalf, may obtain the services of Inspectors for the purpose of maintaining quality assurance and compliance with the Contract Documents. Reports by Inspectors shall in no way relieve the Contractor of his obligation to perform the work in accordance with the Contract Documents, or to maintain his own quality control.

1.1.3 The cost of supplying materials, products, and labour for testing purposes, and erection of entire mock ups, prototypes, and sample installations where specified, shall be borne by the Contractor and constitutes a part of the Work

1.2 REFERENCES

1.2.1 ASTM E329-14a Standard Specification for Agencies Engaged in Construction Inspection, Testing or Special Inspection.

1.3 QUALIFICATION OF INSPECTORS

1.3.1 Inspectors shall be authorized to operate in the Province in which the Project is located.

1.3.2 Inspectors required to provide laboratory services shall meet "Recommended Requirements for Independent Laboratory Qualification", published by the American Council of Independent Laboratories.

1.3.3 Where applicable, Inspector shall meet basic requirements of ASTM E329.

1.4 APPOINTMENT AND PAYMENT

1.4.1 Cost of inspection and testing shall be paid out of cash allowances listed in Section 01 21 00 Allowances, where so specified. Additional inspection and testing required for Owner's quality control will be paid by the Owner, except as otherwise stipulated in the Contract Documents.

1.4.2 The Contractor shall co-ordinate and the Owner shall pay independent inspection companies who shall inspect and test site conditions, procedures and materials related but not limited to the following:

Asphalt Paving
Foundations
Fireproof spray
Fill and compaction
Concrete
Mortar
Steel reinforcement
Steel erection
Waterproofing
Roofing and Air Barrier, Building Envelope
Millwork (AWMAC)
Windows

1.4.3 The Consultant will appoint Inspectors to perform services specified in respective Specification Sections, except for the following:

.1 Inspection and testing required by laws, ordinances, rules, regulations, or orders of public authorities.
.2 Inspection and testing performed exclusively for Contractor's convenience or their own quality control.
.3 Testing, adjustment, and balancing of conveying systems, mechanical and electrical equipment and systems.
.4 Mill tests and certificates of compliance.
.5 Tests specified to be carried out by Contractor under the supervision of the Consultant.

1.5 INSPECTOR'S RESPONSIBILITIES

1.5.1 Co-operate with the Consultant and the Contractor; provide qualified personnel after due notice.

1.5.2 Perform specified inspections, sampling, and testing of materials and methods of construction:

.1 Comply with specified standards, requirements of authorities having jurisdiction and as specified.
.2 Ascertain compliance of materials with requirements of Contract Documents.

1.5.3 Promptly notify Consultant, Owner, and Contractor of observed irregularities or deficiencies of work and products.

1.5.4 Submit within 4 days of inspection and testing electronic copies of reports of such inspection and tests to:

.1 Owner
.2 Consultant
.3 Contractor

1.5.5 Submit additional copies as directed or as specified under respective Sections.

1.5.6 Include in each report:

.1 Date issued.
.2 Project title and number.
.3 Testing and inspection agency name, address and telephone number.
.4 Name and signature of individual responsible for test or inspection.
.5 Date and time of sampling or inspection.
.6 Record of temperature and weather conditions.
.7 Date of Test.
.8 Identification of produce and reference to Specification Section.
.9 Location of sample or test in Project.
.10 Type of inspection or test.
.11 Results of tests and compliance with Contract Documents.
.12 Interpretation of test results, when requested by the Consultant.

1.5.7 Perform additional services as required by Owner.

1.5.8 Inspector is not authorized to:

.1 Revoke, alter, enlarge on, or release requirements of Contract Documents.
.2 Approve or accept any portion of the Work.
.3 Perform any duties of the Contractor's.

PART 2 - EXECUTION

2.1 CONTRACTOR'S RESPONSIBILITIES

2.1.1 Contractor shall maintain his own quality control to ensure that the requirements of the Contract Documents are attained.

2.1.2 Co-operate with Inspector's personnel. Provide access to work, and to manufacturer's operations to facilitate execution of required services.

2.1.3 Secure and deliver to Inspector adequate quantities of representative samples of materials proposed to be used which require testing.

2.1.4 Furnish mix designs proposed to be used for concrete, mortar, grout, and other material mixes with certification by an independent inspection and testing company that such mix designs meet the requirements of the Contract Documents.

2.1.5 Furnish copies of product tests, or mill test reports of steel products, as required.

2.1.6 Furnish labour and facilities to:

.1 Provide access to work to be inspected.

.2 Facilitate inspections and tests, including obtaining and handling samples at Project site or at source of product to be tested.

.3 Make good any work disturbed by inspection and test.

2.1.7 Provide storage on site for Inspector's exclusive use to store equipment and cure test samples.

2.1.8 Notify Inspector and Consultant sufficiently in advance of operations to allow assignment of personnel and scheduling of tests. When tests or inspections cannot be performed after such notice, reimburse Owner for Inspector's personnel and travel expenses incurred due to Contractor's negligence.

2.1.9 Pay costs for uncovering and make good work that has been covered before the required inspection or testing is completed and approved by the Consultant.

2.2 RESPONSIBILITIES OF THE CONSULTANT

2.2.1 The Contractor will submit a list of Inspection and Testing companies to the Consultant for his review.

2.2.2 The Consultant and Contractor will direct inspection and testing companies in the type and extent of inspection and testing to be undertaken.

2.2.3 The Consultant will receive submitted reports of inspections and tests for evaluation and will decide upon any actions that may be required.

2.2.4 The Consultant will provide Drawings and Specifications required by inspection and testing companies.

2.3 FAULTY WORK

2.3.1 Where tests or inspections reveal work not in accordance with Contract requirements, the Contractor shall bear costs for such additional tests or inspections as the Consultant deems necessary to verify the acceptability of corrected work.

2.3.2 All testing shall be conducted in accordance with the requirements of the Consultant.

2.3.3 Defective work discovered before expiration of the warranty period specified in the General Conditions of the Contract, as may be extended in this Specification, will be rejected, whether or not is has been previously inspected. If rejected, defective materials or work incorporating defective materials or workmanship shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

2.4 TOLERANCES FOR INSTALLATION OF WORK

2.4.1 Unless acceptable tolerances are otherwise specified in a Section or a reference standard or are otherwise required for proper functioning of equipment, site services, and mechanical and electrical systems:

.1 "plumb and level" shall mean plumb or level within 3mm in 3048mm (1/8" in 10').
.2 "square" shall mean not in excess of 10 seconds lesser or greater than 90 degrees.
.3 "straight" shall mean within 3mm (1/8") under a 3048mm (10') long straight edge.

END OF SECTION

PART 1 - GENERAL

1.1 TEMPORARY OFFICES AND SHEDS

1.1.1 Contractor is not permitted to use any part of existing facility for storage, meeting spaces, site offices, washrooms facilities or lunch rooms.

1.1.2 Provide an adequate temperature controlled and ventilated Contractor's field office, with suitable lighting for own use.

.1 Temporary field offices shall be designated on site. No other location shall be used for temporary field office. Temporary site office shall be sufficiently sized.
.2 Heat, cool, ventilation and light office to minimum code requirements for office buildings.
.3 Keep temporary field office clean and remove all rubbish at the end of each work day.
.4 Include construction and operating hardware, with security locks, as required by the Owner.

1.1.3 Site Storage:

.1 Contractor to provide their own storage trailers or construct weather-tight storage sheds for storage of materials that may be damaged or defaced by weather, in locations indicated by the Owner.
.2 Include security locks, as required.
.3 Install lighting in storage areas and heat in those storage areas containing materials damaged by low temperature.
.4 Provide separate shed located where directed in writing by Consultant for storage of volatile materials.
.5 Owner is not responsible for securing Products or materials at the Place of the Work.
.6 Handle and store materials so as to prevent damage or defacement to the Work and surrounding property.
.7 The Contractor is solely responsible for any materials, tools, material and equipment left on-site.

1.2 TEMPORARY SERVICES

1.2.1 Power, light, water and heat are available within the site. No exterior source of light, power, water, heat. Make arrangements with the Owner for use of these services.

1.2.2 Contractor to be responsible for the distribution of temporary power during construction. Exposed extension cords are not permitted outside the work areas.

1.2.3 Provide an adequate pure fresh water supply for the use of all Sections. Run supply pipe or pipes from the nearest available sources and maintain in good condition until the permanent system is installed and ready for use.

1.2.4 Provide temporary lighting and heating, to requirements of authorities having jurisdiction and at a level for the proper execution of the Work.

1.2.5 Provide temporary sanitary facilities to be located within the approved staging area. These facilities must be locked prior to leaving the site each day for the use of the workers engaged in the work, in compliance with local bylaws.

1.3 REMOVALS

1.3.1 Provide temporary and/or permanent supports and bracing as indicated, before demolition of walls, floors, roofs or other structural members that would endanger portion of building to remain.

1.3.2 Provide temporary and/or permanent mechanical and electrical service as indicated, to maintain Owner's operation without interruption, before cutting, relocating or removal of existing services.

1.4 HANDLING AND STORAGE

1.4.1 Handle and store materials and products on the job in such a manner that no damage shall be done to the material and products, the structure, the site and surrounding property. Construct and maintain such service roads as may be necessary to provide at all times safe, convenient and adequate access for materials, products and other supplies.

1.4.2 Confine operations of the work of this Contract to limits indicated on Drawings.

1.4.3 Store materials and products brought to the job by all Sections in the area of the site agreed upon with the Owner as a staging area. Keep the storage area tidy at all times. Do not use other areas of the site for storage. Additionally, this area is on the exterior of the building and Contractor to provide their own container for storage as noted above Section.

1.4.4 Lobbies, corridors, and washrooms shall be kept clean of construction materials at all times.

1.4.5 The building shall be properly closed and locked at nights, Sundays, holidays and other occasions when the work is not in progress.

1.4.6 Protect materials and products from damage during handling, storage and installation.

1.4.7 Store materials in dry weather-tight, lockable enclosures.

1.4.8 Store cementitious and clay products clear of the earth or concrete floors and away from walls.

1.4.9 Keep sand dry and clean and store on tight, wooden platforms, and covered with tarpaulins during inclement weather, if exposed to same.

1.4.10 Protect metals against damage, dirt or dampness.

1.4.11 Store packaged or bundled products in original and undamaged condition with manufacturer's seals and labels intact.

1.4.12 Provide flat, solid support for all sheet products during storage.

1.4.13 Store and mix paints in a room assigned for this purpose. Keep room under lock and key. Remove oily rags and any other combustible materials every night. Take every precaution to prevent spontaneous combustion.

1.4.14 Make good or replace damaged materials to the satisfaction of the Consultant.

1.5 LIMITS OF THE SITE

1.5.1 Confine materials, products, equipment and temporary structures within the limits of the site as shown on the Drawings.

1.6 PLANT AND MACHINERY

1.6.1 Provide formwork, scaffolding, ladders, cranes, derricks, tackle, gangways, planks, fans, screens, gantries, tarpaulins, tools and machinery for the proper execution of the Work.

1.7 ACCESS/DELIVERIES AND TRAFFIC CONTROL

1.7.1 Arrange for delivery of materials, products and equipment to arrive when needed and at times to prevent interfering with vehicular traffic on the streets and pedestrian traffic on sidewalks.

1.7.2 Provide Access roads as may be necessary to provide safe and adequate access for materials, products and other supplies. Provide and maintain access sidewalks, roadways, and similar facilities as may be required for access to the Work. Do not block public roads, or impede traffic or danger safety of the students during work of this Project and to temporary block traffic then provide flag person to direct traffic acceptable to Ministry of Labour Standard. Remove accumulations of ice and snow from areas providing access to Site. Ensure that access is available for emergency vehicles. Comply with fire plan for vehicular traffic. Bridge excavations with construction and steel cover plate to safely support any load that could be imposed and provide personnel to assist in deliveries to building(s) as required.

1.7.3 Access to the site shall be as established by the Owner at the commencement of the Work.

1.7.4 Delivery of materials, removal of refuse, and disruption to vehicular traffic shall be restricted to occur before 7:00 am or after 4:00 pm. No such delivery or disruptions shall occur between 7:00 am and 4:00 pm.

1.8 HOURS OF WORK

1.8.1 Normal working hours as specified in Tender Documents.

1.8.2 All core drilling required for electrical, telephone or mechanical installations is restricted to off normal hours and to be approved by Owner.

1.9 TEMPORARY FIRE PROTECTION

1.9.1 Operable fire extinguishers shall be provided by the Contractor, and shall be kept within the work areas throughout the construction period. Extinguishers shall be sufficient in number and of suitable types to combat potential fires in the work area.

1.10 SYSTEM SHUT DOWNS

1.10.1 Requests for any system shutdowns will be processed a week in advance.

1.11 GARBAGE REMOVAL

1.11.1 The Contractor shall ensure that all his subcontractors, including telephone company, remove all garbage and debris from the Work on a daily basis. Should it be necessary for the Owner to remove Contractor's garbage or debris due to inaction by the Contractor, the Contractor shall be invoiced for the cost thereof. Temporary storage of garbage or debris outside the Work areas is not permitted. The Contractor is not permitted to use any of the Owner's garbage bins for disposal of construction materials.

1.11.2 Corridors, lobbies, and other common areas are to be kept clear of any residual debris.

1.11.3 Garbage of a flammable nature (eg paper) shall not be allowed to accumulate, but shall be removed from the site as quickly as possible.

1.12 TRANSPORTING MATERIALS ON STREETS

1.12.1 The Contractor shall, if so directed by the Consultant or the City Engineer, provide "tight trucks", approved by the Engineer, to haul soft or wet material over streets, in order to prevent litter on the streets. In all cases where any materials are dropped from the trucks of the Contractor, he shall clean up same as often as directed and also keep all sidewalks clean and free from dirt and mud.

1.12.2 If the Contractor refuses or neglects to clean up said litter when order to do so by the Consultant or Engineer, the Owner will have the necessary cleaning and the cost of same will be deducted from monies due to the Contractor.

1.12.3 All construction and demolition materials shall be transported in accordance with the City requirements and by-laws, including all amendments.

1.13 PARKING

1.13.1 All parking by the Contractor is his responsibility. The Owner makes no representation that parking will be available. Under no circumstances shall vehicles impede or block access to the existing building.

1.14 HOISTS AND LIFTING FACILITIES

1.14.1 Install and operate an adequate number of elevators or hoists which shall be available for use by all trades and subcontractors. Hoists or elevators shall be properly positioned so as not to interfere with the construction, and if located outside the building, the exterior walls shall be protected against damage.

1.15 DUST NUISANCE

1.15.1 Prevent nuisance to adjacent properties near the work from dust, by taking appropriate anti-dust measures at such times as found necessary, and in response to complaints of dust received from the public.

1.16 REMOVAL OF TEMPORARY FACILITIES

1.16.1 Remove temporary facilities from the site when directed by the Consultant.

1.17 TRAFFIC CONTROL

1.17.1 Do not block roads or impede traffic. Keep construction traffic to designated roads only. Provide flag-person to direct traffic as required.

1.17.2 Provide a hard surface area at the Place of the Work for cleaning down trucks prior to entry onto municipal roads or private roads outside of the Place of the Work.

1.17.3 Keep public and private roads free of dust, mud and debris resulting from truck, machinery and vehicular traffic related specifically to this Project, for the duration of Work.

1.17.4 Clean roads regularly, public or private. Wash down and scrape flush roads at least daily when earth moving operations take place. Maintain public property in accordance with requirements of authorities having jurisdiction.

1.18 ENVIRONMENTAL/POLLUTION CONTROL/SITE CLEANING

1.18.1 Prevent the escape of untreated effluent, be it liquid or gaseous substance or any liquid or solid wastes, being objectionable or detrimental to adjoining areas of the construction site.

1.18.2 Burning or burying of rubbish, waste, and the like is not permitted on construction site.

1.18.3 Only fires for heating bitumen and temporary heaters as specified are permitted on site.

1.18.4 Take care to prevent staining or smoke damage to structure or materials. Replace stained or damaged work.

1.18.5 Make every effort to provide environmental protection, take precautionary measures to prevent excessive noise, sounds, vibrations, dust, air pollution, smoke, etc., which may become objectionable to people occupying adjacent areas.

1.18.6 Keep building site clean and free or unsightly collection of waste materials and debris. Provide for temporary storage and collection of waste materials, and dispose to local authorities having jurisdiction recommendations at intervals to maintain a clean site condition.

1.18.7 Confine apparatus, the storage of materials and the operations of workers to the site. Do not unreasonably encumber the premises with construction materials.

END OF SECTION

PART 1 - GENERAL

1.1 PRODUCT QUALITY

1.1.1 Products supplied for work shall be new and as far as possible and unless otherwise specified, of Canadian manufacture.

1.2 STANDARDS

1.2.1 The work of each trade shall be carried out by skilled, experienced personnel who have been certified to carry out the work by various trade associations and in accordance with the Apprenticeship and Trades Qualifications Act and applicable regulations.

1.2.2 Where reference is made to specification standards produced by various organizations, conform to the latest edition of the standards specified as amended and revised to the date of the Contract.

1.2.3 Each subcontractor must possess and be familiar with the specified standards which affect their work.

1.2.4 Generally, materials and workmanship shall meet or exceed the requirements of CAN/CSA, ASTM, CGSB, CAN/UL and manufacturer's printed instructions.

1.2.5 Where required, conform to the requirements of LEED® Certification.

1.3 SUBSTITUTIONS

1.3.1 The Contractor shall base his Tender Price upon the Tender Documents.

1.3.2 Prior to the Close of Tender, the Owner and the Consultant may consider requests for substitutions from that specified in the Tender Documents, providing the requests are submitted in writing describing such substitutions in full detail, the type of material, equipment or method and reasons for deviating from the Tender Documents. In addition, submit any increase or decrease in price of any substitution.

1.3.3 In making a request for a substitution, confirm in writing that:

.1 The Contractor has investigated the proposed product and method and determined it to be equal or superior in all respects to that specified.

.2 The same guarantee is given for the proposed substitution as for the product and method originally specified.

.3 The installation of the proposed substitution will be coordinated into the Work, and such changes in the Work will be made as required to accept the substitution and to ensure the Work is complete in all respects. The cost of changes in the Work necessary to incorporate a proposed substitution is to be included in any proposed increase or decrease to the Contract Price associated with the proposed substitution.

.4 Do not substitute materials, equipment or methods unless such substitutions have been determined acceptable and approved by the Owner and Prime Consultant via Addendum prior to Tender close.

.5 The Owner reserves the right to accept or reject, at its sole discretion, any proposed

substitution.

1.4 WORKMANSHIP

1.4.1 All work shall be carried out in accordance with the best trade practice, by mechanics skilled in the type of work concerned.

1.4.2 Products, materials, systems and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the applicable manufacturer's printed directions.

1.4.3 Where specified requirements are in conflict with manufacturer's written directions, follow manufacturer's directions, but inform the Consultant in writing prior to proceeding with affected work. Where specified requirements are more stringent than manufacturer's directions, comply with specified requirements.

END OF SECTION

PART 1 - GENERAL

1.1 SUBSTITUTIONS - MATERIALS AND PRODUCTS

1.1.1 Work of the Project shall be based upon using new materials and products specified or indicated by reference to standards, codes, specifications, to a manufacturer's name, by trade name or by catalogue reference, except where a material or product is indicated as being reused. Where two or more trade names are specified the choice shall be optional with the Contractor.

1.1.2 Contract Price shall be based on the materials and products specified, whether available or not at the time of bidding.

1.1.3 Requests for substitutions AFTER Bid Date will not be accepted.

1.1.4 Materials and products specified without the "or other approved manufacture" clause following the name of the material or product shall be supplied without substitution.

1.1.5 Where the Specifications include the "or other approved manufacture" clause substitutions will be considered by the Consultant if:

.1 products specified are not available, or
.2 substitute products to those specified, which are brought to the attention of, and considered by the Consultant as equivalent to those specified will result in a credit to the Contract Price, or
.3 substitute products to those specified, which are brought to the attention of, and considered by the Consultant as superior to those specified will not result in a change to the Contract Price and Contract Time.

1.1.6 Substitutions may be proposed by the Contractor under the following conditions:

.1 Submission of proposed substitutions shall show the material and product names and complete specifications and shall state what difference, if any, will be made in the Contract Price and Contract Time for each substitution, should it be accepted.
.2 Indicate name and manufacturer of product specified, for which substitute is requested and where in Specification product is specified.
.3 Respective costs of items originally specified and the proposed substitution.
.4 Confirmation of proposed substitution delivery, in writing by Product manufacturer.
.5 Compliance with the building codes and requirements of authorities having jurisdiction.
.6 Affect concerning compatibility and interface with adjacent building materials and components.
.7 Compliance with the intent of the Contract Documents.
.8 Reasons for the request.

1.1.7 Substitutions not permitted if Contractor fails to order a specified product or order a product by a specified manufacturer in adequate time to meet Contractor's construction progress schedule, Consultant will not consider that valid reason to accept a Substitution.

1.1.8 Should proposed substitution be accepted either in part or in whole the Contractor shall assume full responsibility when the substitution affects any other work. Any Contract Document changes required as a result of the substitution shall be executed by the Consultant at the Contractor's expense.

1.1.9 Proposed substitutions shall satisfy all design conditions and other specified requirements. Properties included but not limited to the following, as applicable, will be considered:

.1 Physical dimension requirements to satisfy the space limitations, static and dynamic weight limitations, structural properties, audible noise levels, vibration generation, interchangeability of parts or components, accessibility for maintenance, possible removal or replacement, colours, textures and compatibility with other materials, products, assemblies and components.

1.1.10 Cost of all changes in work of other Sections necessitated by use of proposed material and product substitutions shall be borne by the Contractor.

1.1.11 Bring to the attention of Owner and Consultant, in writing, the effect of all changes in the work of other Sections necessitated by use of proposed material and product substitutions. Should the contractor fail to bring to the attention of the Owner and the Consultant, the effect of any and all changes, due to the use of proposed materials or product substitutions, then cost of changes in the work of other Sections shall be borne by the Contractor.

1.1.12 Substitutions submitted on shop drawings without following requirements of this section prior to submission of the affected shop drawings will cause the shop drawings to be rejected.

1.2 SUBSTITUTIONS - METHODS OR PROCESSES

1.2.1 Contractor may suggest for consideration of the Consultant, substitutions to methods or processes described in the Specifications and/or shown on the Drawings and other Contract Documents ONLY IF there is a reason for it during construction – example: delivery delay, product/material no longer available. There shall be no obligation for the Owner and Consultant to accept any such suggestions. The Owner will not entertain any substitutes after Bid date.

1.2.2 Contractor shall be responsible for substitutions to methods or processes concerning such work, and the warranty covering all parts of the work shall not be affected.

1.2.3 Cost of all changes in work of other Sections, necessitated by the use of substituted methods or processes, shall be borne by the Contractor. Contract Document changes required as a result of the substitution shall be executed by the Consultant, at Contractor's expense.

1.2.4 Substituted methods or processes shall be accommodated by space allotted for the specified methods or processes.

1.3 CREDITS ARISING FROM SUBSTITUTIONS

1.3.1 Any and all credits arising from accepted substitutions shall be credited to the Contract in such sums as may be assessed by the Consultant and Contract Price will be adjusted accordingly. No substitutions will be permitted without prior written approval of the Consultant.

1.4 CODE REQUIREMENTS SUBSTITUTIONS

1.4.1 All proposed substitutions for materials, products, methods and processes shall meet the requirements of the National Building Code, Ontario Building Code, and the requirements of authorities having jurisdiction.

1.4.2 Proposed substitute materials, products, methods and processes shall not negate the compliance of adjacent materials, products and constructions with the requirements of the National Building Code, Ontario Building Code, and the requirements of authorities having jurisdiction, to which the proposed substitutions may be applied or attached.

1.4.3 Contractor shall obtain written approval of proposed substitutions from authority having jurisdiction and shall submit approval with the proposed substitution for the Consultant's consideration.

END OF SECTION

PART 1 - GENERAL

1.1 CLEAN UP DURING CONSTRUCTION

1.1.1 During construction, maintain the work in a tidy condition and free from accumulation of waste products, debris, snow and ice other than that caused by the Owner, Other Contractors or their employees.

1.1.2 At reasonable intervals during progress of the Work, clean-up site, building and access, and dispose of waste materials, rubbish and debris. Provide containers and locate on site for collection of waste materials, rubbish and debris. Do not allow waste materials, rubbish and debris to accumulate and become unsightly or hazardous.

1.1.3 Move waste materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights. Fog spray dusty debris with water.

1.1.4 Conduct clean up and disposal operations to comply with local ordinances and anti-pollution laws. Burning or burying of rubbish and waste materials on the Project site is not permitted. Do not dispose of volatile fluid wastes (such as mineral spirits, oil or paint thinner) in storm or sanitary sewer systems or into streams or waterways. Remove waste materials, rubbish and debris from the site and legally dispose of at public or private dumping areas off the Owner's property. All of the actions listed herein to follow all municipal, provincial and federal regulations and laws.

1.1.5 Vacuum clean interior building areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until building is ready for acceptance or occupancy.

1.1.6 Wash down exterior exposed aluminum surfaces using a solution of mild domestic detergent in warm water, applied with soft clean wiping cloths. Take special care to remove all dirt from corners. Wipe interior surfaces clean when curtain wall work is completed.

1.1.7 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable by the sealant manufacturer and the metal fabricator.

1.1.8 Where the accumulation of dirt does not respond to the washing or cleaning, refer the condition to the Consultant, with recommendations as to the remedial action required; but, do not undertake any cleaning procedure of a more severe nature without the written approval of the Consultant.

1.1.9 Remove concrete and alkali wash-offs on surfaces to prevent etching of glass and/or metal.

1.1.10 Remove temporary protective materials and coatings.

1.1.11 Clean exterior glass during construction, every 3 months or more frequently, to prevent the glass from being etched by alkaline bearing water.

1.2 CLEANING AT SUBSTANTIAL PERFORMANCE

1.2.1 Upon attaining Substantial Performance of the Work, remove surplus products, tools, construction machinery and equipment not required for the performance of the remaining work. Also remove waste products and debris and leave the work clean and suitable for occupancy by the Owner unless otherwise specified.

1.2.2 All final cleaning shall be carried out under this Section and the building shall be left in condition to meet the approval of the Consultant. The final cleaning shall not commence until authorized by the Consultant. This work shall include, without being limited to, the cleaning of floors, walls,

windows, ceilings, fixtures and equipment, the removal of debris and all work required on the interior and exterior to complete the building and site cleaning.

1.2.3 All floors shall be cleaned in a manner acceptable to the Consultant.

1.2.4 Stains, paint, grease, oil, temporary protection and covers, plaster, mortar droppings, labels, caulking and sealant compounds, and dirt shall be removed. Damaged painted areas shall be touched up. All surfaces and items, including without being limited to, walls, ceilings, doors, windows, glass, partitions, fixtures, hardware, mechanical and electrical equipment shall be dusted and/or polished.

1.2.5 Replace broken and scratched glass.

1.2.6 Remove debris off roofs. Sweep and wash clean paved areas outside the building. Rake clean landscaped areas.

1.2.7 Replace heating, ventilating and air conditioning filters if units were used during construction. Vacuum clean ducts, fans, blowers and coils if units were used without filters during construction.

1.2.8 Ensure that the inside of all air handling systems are clean and free from dust, and debris when building is turned over to Owner.

1.2.9 Vacuum out and wipe clean all electrical and signal panels, switchboards, transformers and other electrical equipment.

1.2.10 Use experienced workmen or professional cleaners for final cleaning. Use only cleaning materials recommended by manufacturer of surface to be cleaned. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

1.2.11 Completion of the Contract shall not be attained until the Contractor has removed surplus products, tools, construction machinery and equipment. Removed waste products and debris, other than that caused by the Owner, other Contractors or their employees.

1.3 HAZARD CONTROL

1.3.1 Conduct cleaning and disposal operations in strict accordance with all applicable codes, ordinances and anti-pollution laws.

1.3.2 Store volatile matters in covered metal containers and remove from site at end of each working day. Do not dispose of volatile and toxic wastes in storm or sanitary drains, streams or waterways.

END OF SECTION

1 GENERAL

1.1 Definition

1.1.1 Warranty = guarantee dated from date of Substantial completion.

1.2 Submission Requirements

1.2.1 Submit warranties as part of “Operating and Maintenance Manuals” in accord with requirements of Section 01 78 00.

1.2.2 Arrange warranties in systematic order matching Specification format. Include a table of contents listing warranties in same order.

1.2.3 Each warranty must show:

.1 Name and address of project.
.2 Name of Owner
.3 Section Number and Title

1.2.4 All warranties issued by the manufacturer must be presented under the Contractor’s letterhead, seal and signature and must bear the wording specified in Contract Documents.

1.3 List of Warranties

1.3.1 The following list of extended warranties is shown here for convenience only:

Item	Period
Entire Building, General Contract	1 year
Building Insulation	2 years
Sealant	5 years
Caulking	5 years
Paint and Finishing	2 years
Mechanical	As specified under respective section
Electrical	As specified under respective section

1.3.2 Refer to Divisions 20, 21, 22, 23, 24, 25, 26 and 27 for Mechanical and Electrical warranty requirements.

END OF SECTION

PART 1 - GENERAL

1.1 CONTRACT COMMISSIONING

1.1.1 Expedite and complete deficiencies and defects identified by the Consultant.

1.1.2 Submit required administrative and technical documentation, such as Statutory Declarations, Worker's Compensation Certificate, warranties, certificates of approval or acceptance from regulating bodies.

1.1.3 Review inspection and testing reports to verify conformation to the intent of the Documents and that changes, repairs or replacements have been completed.

1.2 AS BUILT-DRAWINGS

1.2.1 Prior to application for Substantial Performance, allowing sufficient time for review, clearly, neatly, and accurately transfer information from marked up white prints to CADD files saved on a USB key. Print lettering and numbers in size to match original. Lines may be drawn freehand but shall be neat and accurate. Add "AS-BUILT" at each drawing title block. Should extensive changes and deviations to a drawing make the information illegible, re draft the drawing. Submit one copy of marked up drawings on PDF file for review. When PDF file is approved by Consultant, submit electronic copies of CAD files and PDF files of all drawings, to the Owner.

1.3 OPERATIONS AND MAINTENANCE MANUAL

1.3.1 Provide **1 electronic (via email)** of Operations and Maintenance (OM) Manual, together with the record drawings as specified in the preceding Article, to the Owner prior to the date of Substantial Performance.

1.3.2 Submit one copy of the OM Manual for the Consultant's review prior to submitting the OM Manual to the Owner.

1.3.3 In the OM Manual separate each Section and Warranty by Tabs.

1.3.4 The OM Manual shall contain the name of the Contractor and the date of Substantial Performance for the Project. Supply the following data:

.1 Complete listing of materials, products, and equipment including serial numbers, manufacturer's names, and sources of supply.
.2 Description of each system, with the description of each major component of the systems.
.3 Operation and installation instructions for each assembly, component and system.
.4 Complete maintenance instructions for each assembly, component and system. Include warnings of harmful practices.
.5 Lists of spare parts for each assembly, component and system complete with names and addresses of suppliers.
.6 Cleaning, maintaining and preserving instructions for all materials, products and surfaces. Include warnings of harmful cleaning, maintaining and preserving practices.
.7 A lubrication schedule of all equipment.
.8 Final reviewed shop drawings.
.9 Copies of all warranties.
.10 Operating curves of mechanical and electrical equipment.
.11 Page-size Valve Tag Schedule and Flow diagrams.
.12 Water treatment procedures and tests.
.13 Final balancing reports for the mechanical systems.

.14 "As-built" drawing as per 1.2.1 item above

1.3.5 Terminology used in the various indexed sections of the books shall be consistent.

1.4 MAINTENANCE MATERIALS

1.4.1 The Owner requires only electronic copy of maintenance materials.

1.5 DISTRIBUTION SYSTEM DIAGRAMS

1.5.1 Prior to application for Substantial Performance, submit framed single line diagrams of the electrical distribution systems.

1.6 TRIAL USAGE AND INSTRUCTIONS – MECHANICAL

1.6.1 Thoroughly instruct the Owner's authorized representative in the safe operation of the systems and equipment.

1.6.2 Arrange and pay for the services of qualified manufacturer's representatives to instruct Owner on specialized portions of the installation; such as, refrigeration machines, boilers, automatic controls, and water treatment.

1.6.3 Submit a complete record of instructions as part of the maintenance instructions and data book given to the Owner. For each instruction period, supply the following data:

.1 Date.
.2 System or equipment involved.
.3 Names of persons giving instructions.
.4 Names of persons being instructed.
.5 Other persons present.

1.6.4 Instructional period shall be carried out during a continuous period of 30 days.

1.6.5 The Owner shall be permitted trial usage of systems or parts of system for the purpose of testing and learning operational procedures. Trial usage shall not affect the warranties, not be construed as acceptance thereof; and no claim for damage shall be made against the Owner for any injury or breakage to any part or parts of such systems due to the aforementioned tests, where such injuries and/or breakage are caused, directly or indirectly, by a weakness or inadequacy of parts, or by defective materials or workmanship of any kind whatsoever.

1.7 TRIAL USAGE AND INSTRUCTIONS – ELECTRICAL

1.7.1 Provide services of manufacturer's specialized representatives to instruct Owner in operation of systems and equipment.

1.7.2 Permit the Owner's representatives, in order to familiarize themselves with the equipment, to operate systems for a reasonable period of time, as may be arranged.

1.7.3 Trial usage of any equipment by the Owner shall not affect the warranties, nor be construed as acceptance of the equipment or system, and no claim for damage shall be made against the Owner for injury or breakage to any part or parts of the aforementioned system or systems due to any such test, where such injuries or breakage are caused, in whole or in part, directly or indirectly, by a weakness or inadequacy of parts, or by defective materials or workmanship of any kind whatsoever.

1.7.4 Review information provided in maintenance instructions and data book with the Owner's representatives to ensure the Owner has a complete understanding of the electrical equipment and systems and their operation.

1.8 WARRANTIES

1.8.1 Extended warranties (warranties of more than two years duration) where specified in the Contract Documents, shall be provided by the Contractor and shall be in a form acceptable to the Consultant.

1.8.2 Where manufacturers offer, as a general policy, extended warranties on their products or other greater benefits than those called for in the specifications, the Contractor shall obtain the benefit of such extended warranties for the Owner and shall certify that he has done so before making the final claim for payment.

1.8.3 Upon completion of the Contract by the Contractor, or upon other termination of this Contract, the Contractor hereby agrees and covenants to assign to the Owner all warranties and guarantees which the Contractor has received from the sub trades employed by him on the Project.

1.8.4 Specified warranty periods shall not be construed as limiting the provisions of the General Conditions.

1.8.5 The carrying out of replacement work and making good of defects shall be executed at times convenient to the Owner and this may require work outside of normal working hours at the Contractor's expense.

1.9 SUBSTANTIAL PERFORMANCE OF THE WORK

1.9.1 Refer to Owner’s Front End Specification document.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 Provide labour, materials, products, equipment and services required to complete the selective demolition work required and/or indicated on the Drawings and specified herein.

1.1.3 Visit site to establish extent of demolition to be carried out.

1.1.4 If suspected hazardous or contaminated materials are encountered, advise Consultant and the Owner, and await instructions regarding removal and disposal of such contaminants which may be considered hazardous to health, prior to demolition.

1.2 RELATED WORK

1.2.1 Removal and relocation of mechanical and electrical items indicated as relocated and reused are specified under respective Mechanical and Electrical Drawings. Co-ordinate the removal and relocation of these items.

1.3 REFERENCE STANDARDS

1.3.1 American National Standards Institute (ANSI):

.1 ANSI A10.8-2011, Scaffolding Safety Requirements

1.3.2 National Fire Protection Association (NFPA):

.1 NFPA 241-09, Standard for Safeguarding Construction, Alteration, and Demolition Operations

1.3.3 Provincial Legislation:

.1 Legislation specific to Authority Having Jurisdiction for work governed by this Section

1.4 DEFINITIONS

1.4.1 Demolish: Detach items from existing construction and legally dispose of them off site, unless indicated to be removed and salvaged or removed and reinstalled.

1.4.2 Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.

1.4.3 Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

1.4.4 Existing to Remain: Existing items of construction that are not removed and that are not otherwise indicated as being removed, removed and salvaged, or removed and reinstalled.

1.5 EXAMINATION

1.5.1 Visit and examine the site and note all characteristics and irregularities affecting Work of this Section. Submit a pre-demolition inspection report. Ensure the Owner of premises being inspected is represented at inspection.

1.5.2 Prepare a photographic or video record of existing conditions, particularly of existing work scheduled to remain.

1.5.3 Where applicable, examine adjacent tenancies not part of the scope of work. Determine extent of protection required to areas and related components not subject to demolition.

1.6 PROTECTION

1.6.1 Do not commence demolition until all personnel and Owner's equipment are removed from the area being demolished.

PART 2 - PRODUCTS

2.1 SALVAGE MATERIALS

2.1.1 Salvage materials, products, and equipment indicated. Carefully remove items to be salvaged, protect during alteration and reinstall in locations indicated.

2.1.2 Refer to sprinkler, mechanical and electrical Drawings and specifications for sprinkler, mechanical and electrical work to be reused.

2.1.3 Salvage the following items for reuse and return to the Owner in an adequately preserved and usable condition on date of Substantial Performance or other mutually agreed date:

.1 Millwork, fire extinguishers, lockers, lights, clocks, bells and plumbing fixtures.

.2 Remove existing ceiling and light fixtures, as indicated for reuse or return to the Board.

2.1.4 All materials and products from the demolition except noted otherwise shall become the property of the Contractor. Remove all material and debris from the site as quickly as possible and dispose of legally. Burning of debris on the site will not be permitted.

2.1.5 Salvage materials, products, and/or equipment as directed by the Consultant. Remove carefully items to be salvaged to the locations designated. Protect during demolition and store above items. Materials and/or equipment directed to be salvaged shall remain the property of the Owner.

2.2 REPAIR MATERIALS

2.2.1 Use repair materials identical to existing materials:

.1 If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

.2 Use a material whose installed performance equals or surpasses that of existing material.

.3 Comply with material and installation requirements specified in individual Specification Sections.

2.2.2 Floor Patching and Levelling Compounds: Cement based, trowelable, self-levelling compounds compatible with specified floor finishes; gypsum based products are not acceptable for work of this Section.

2.2.3 Concrete Unit Masonry: Lightweight concrete masonry units, and mortar, cut and trimmed to fit existing opening to be filled. Provide standard hollow core units, square end units and bond beam units as indicated on drawings.

2.2.4 Brick: Install brick and and mortar, cut and trimmed to fit existing opening to be filled, once demolition of hollow metal door and frame is completed. Match brick and mortar to existing adjacent materials as approved by the Consultant. Provide ties and accessories as required to complete the installation.

2.2.5 Gypsum Board Patching Compounds: Joint compound to ASTM C475, bedding and finishing types thinned to provide skim coat consistency to patch and prepare existing gypsum board walls ready for new finishes in accordance with Section 09 21 16 – Gypsum Board Systems.

2.2.6 Fireproofing: Patch and repair all fireproofing damaged during demolition of adjacent surfaces with compatible fireproofing materials. Provide test reports from fireproofing manufacture warranting installation, adhesion and compatibility between existing and new fireproofing materials.

2.2.7 Roofing: Remove no more existing roofing than can be covered in one day by new roofing. Refer to Division 7 for new roofing requirements.

PART 3 - EXECUTION

3.1 SEQUENCE OF ALTERATIONS

3.1.1 Schedule sequence of alterations and demolition as indicated on Drawings.

3.2 SCREENS

3.2.1 Provide temporary barriers, guard rails, protective covers, screens, enclosures, tarpaulins etc., as may be required to enclose work areas from other areas of the building, to maintain security, to confine dust, noise and workmen to the work area, and to give full protection to the public, building occupants, workmen employed for demolition and to adjoining property, in compliance with authorities having jurisdiction. Locate screens as directed by the Consultant.

3.2.2 It is essential that the existing building be maintained weathertight at all times. Provide temporary protection, enclosures, tarpaulins, etc., as may be required to weatherproof any openings made in the Work.

3.2.3 Construct dustproof and windproof screens as required to completely enclose the work areas and the access passages to the work areas from the other areas of the existing building. Locate partitions as directed by the Consultant.

3.2.4 Build screens of 90 mm (3-5/8") metal studs at 400 mm (16") centres sheathed with sheets of 16 mm (5/8") gypsum board on both sides with close joints. Where exposed to the weather, fully cover screens with a heavy waterproof and dustproof paper with lapped and sealed joints. Fill spaces between studs with 100 mm (4") fibrous glass or mineral wool insulation batts to deaden sound.

3.2.5 Thoroughly pack framing at junctions of screens with floors, walls and ceilings with batt insulation in a manner to prevent infiltration of dust, dirt, etc. Over all junctions of screens with floors, walls and ceilings, apply continuous 40 mm (1-1/2") wide strips of masking tape both sides of screen to ensure that rooms within closed off areas which are not being altered are kept dust free.

3.2.6 Remove screens and make good damaged or blemished adjoining work when directed.

3.3 EXISTING SERVICES

3.3.1 Arrange and pay for the disconnection, capping and for plugging of all gas, water, hydro, telephone and other services to the structures.

3.3.2 Notify in advance each utility company involved and obtain approvals before commencing work.

3.4 DEMOLITION WORK

3.4.1 Refer to Drawings for extent of selective demolition work. Do all demolition work not specified to be done under other Sections.

3.4.2 Carry out selective demolition in strict accordance with provincial and municipal authorities having jurisdiction.

3.4.3 Take precautions to guard against movement of existing building and structures and displacement of elements of the building to remain. If at any time the safety of such elements appear to be in danger, suspend operations and notify the Consultant promptly. Take measures to support such elements. Do not resume demolition until the Consultant issues instructions.

3.4.4 The work shown on the Drawings, Schedules and Specifications may or may not be all the work required, do all demolition, make good all finishes and execute all necessary work including incidentals to make a complete job of the alterations.

3.4.5 Cut off, cap, divert, or remove existing water, gas, electric and other services in areas being altered which are affected by the changes as required or as directed by the municipal authorities and the utility company concerned, and the Consultant. Protect and maintain active services to the existing building.

3.4.6 Perform the Work in such a manner so as to cause a minimum of noise or interference to the use of the existing building.

3.4.7 Whenever it becomes necessary to cut or interfere in any manner with existing apparatus for short periods of time, Do work at such times as agreed upon between the Owner, Consultant, and the Contractor.

3.4.8 Where new work connects with existing and where existing work is altered, all necessary cutting and fitting required to make satisfactory connections with the existing work shall be performed under this Contract, so as to leave the entire work in a finished and workmanlike condition.

3.4.9 Make good materials and finishes which are damaged or disturbed during the process of additions and reconstruction under the Contract.

3.4.10 Where existing work is to be made good, the new work shall match exactly the old work in material, form, construction and finish unless otherwise noted or specified.

3.4.11 Perform drilling of existing work carefully, leaving a clean hole no larger than required.

3.4.12 Provide, throughout the entire construction period, proper and safe means of fire exit from all zones of the existing building at all times to the approval of the authorities having jurisdiction.

3.4.13 Protect work in the existing buildings, such as floors, finishes, trim, etc., as completely as possible to hold the replacing of damaged work by each Section to a minimum.

3.4.14 Properly co-ordinate the various Sections taking into account also the existing installations to assure the best arrangement of pipes, conduits, ducts and mechanical, electrical and other equipment, in the available space. Under no circumstances will any extra cost be allowed due to the failure by the Contractor to co-ordinate the work. If required, in critical locations, interference and/or installation drawings shall be prepared showing the work of the various Sections as well as the existing installation, and these drawings shall be submitted to the Consultant for review before the commencement of work.

3.4.15 Remove existing finishes as indicated on the Drawings to neat, straight lines and leave substrate clean and even, suitable for new finishes indicated.

3.4.16 At the end of each work shift leave work in a safe condition so that no part of the building or its finishes are in danger of toppling, collapsing or falling.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 This Section includes supply and installation of unit masonry assemblies consisting of the following:

.1 Veneer Brick
.2 Architectural Concrete Masonry Units (CMUs)
.3 Mortar, and Grout
.4 Reinforcing steel
.5 Masonry joint reinforcement
.6 Ties and anchors
.7 Miscellaneous masonry accessories

1.2 REFERENCES

1.2.1	ASTM C216 Standard	SW Severe Weather (Cold Climate)
1.2.2	ASTM A82-02	Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
1.2.3	ASTM A116-11	Standard Specification for Metallic-Coated, Steel Woven Wire Fence Fabric.
1.2.4	ASTM A123/A123M-13	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
1.2.5	ASTM A153/A153M-09	Standard Specification for Zinc Coated (Hot-Dip) on Iron and Steel Hardware.
1.2.6	ASTM A167-99 (2009)	Standard Specification for Stainless and Heat-Resistant Chromium-Nickel Steel Plate, Sheet and Strip.
1.2.7	ASTM A580/A580M-15	Standard Specification for Stainless Steel Wire.
1.2.8	ASTM C207-06(2011)	Standard Specification for Hydrated Lime for Masonry Purposes.
1.2.9	ASTM C331/C331M-14	Standard Specification for Lightweight Aggregates for Concrete Masonry Units.
1.2.10	CSA A23.1-09/A23.2-09	Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
1.2.11	CAN/CSA G164-M92 (R2003)	Hot Dip Galvanizing of Irregularly Shaped Articles.
1.2.12	CSA A-82	EG Exterior Grade Masonry Unit
1.2.13	CSA S304-14	Design of Masonry Structures.

1.2.14	CSA A82.56-M1976	Aggregate for Masonry Mortar.
1.2.15	CSA A165 Series-14	CSA Standards on Concrete Masonry Units.
1.2.16	1 CSA A179-14	Mortar and Grout for Unit Masonry.
1.2.17	CSA A370-14	Connectors for Masonry.
1.2.18	CSA A371-14	Masonry Construction for Buildings.
1.2.19	CSA G30.3-M1983(R1998)	Cold Drawn Steel Wire for Concrete Reinforcement.

1.3 DEFINITIONS

1.3.1 Solid block: A masonry unit with a net cross sectional area of at least 75% of its gross sectional area in any plane parallel to its bearing surface.

1.3.2 One hundred percent (100%) solid block: A masonry unit with plain flat ends and without cores.

1.3.3 Administrative Requirements - Pre-Construction Conference: Arrange a site meeting attended by the contractor's superintendent, the Subcontractor's representative and foreman for this project, the Consultant, materials supplier(s), and other relevant personal before commencement of work for this Section; agenda for meeting will include; but not be limited to, the following:

.1 Confirmation of specifications and details for the project
.2 Required mortar, grout and concrete testing, batch control and grouting procedures
.3 Installation requirements of air/vapour membranes and insulation and coordination with other components of the Work
.4 Confirmation of cavity compartmentalization and drainage requirements
.5 Confirmation of appearance of exposed block lintels
.6 Confirmation of reinforcement at corners and wall intersections
.7 Coordination of interior and exterior crack control measures
.8 Confirmation of trowelled or tooled joints to concealed and exposed masonry faces
.9 Confirmation of methods for keeping mortar out of cavity space
.10 Confirmation of methods for controlling efflorescence during construction
.11 Confirmation of membranes and membrane flashing materials and details used for construction
.12 Review of submitted masonry unit samples
.13 Review of hot and cold weather requirements

1.3.4 Coordination: Coordinate components of the work of this Section with work performed by other Sections including; but not limited to, the following:

.1 Rain Screen Wall Construction: Masonry veneer forms a part of the exterior rain screen and protective facing. Construct assembly to allow for ventilation, drainage and pressure equalization of the voids between the veneer and the insulation with the outside pressures. Construct cavity space divided into separate compartments as a means of controlling these pressure differences within the building envelope.
.2 Steel Support Angles and Brackets: Coordinate requirements for structural steel support angles and brackets supplied and installed onto the building structure by Section 05 50 00.

1.4 DESIGN REQUIREMENTS

1.4.1 Fire and smoke separations: Where masonry walls, partitions and furring are required to act as fire and smoke separations or barriers or as fire protection for structural steel, they shall conform to Supplementary Guidelines to the latest OBC, with respect to equivalent thickness and type of concrete and to requirements of authorities having jurisdiction.

1.4.2 Comply with CSA A370, CSA A371, CSA S304, local building codes, authorities having jurisdiction and these Specifications. Should conflict occur, the more strict shall govern.

1.4.3 Comply with CAN3-A371 for construction tolerances. Tolerances shall not accumulate.

1.4.4 Irregularity in mortar joints of wall faces exposed or painted in the completed work shall not be noticeable when viewed from a distance of 15'.

1.5 SOURCE QUALITY CONTROL

1.5.1 The Consultant may appoint an independent testing company to test each type of masonry unit and mortar. Tests for masonry units shall be in accordance with CSA S304, and CSA A165 as appropriate. Submit products selected at random in presence of Consultant to the testing company for testing when directed.

1.5.2 Submit unit compression test and net area and absorption tests to Consultant prior to delivery of materials to the site.

1.5.3 Include testing cost as part of this Section.

1.6 FIELD QUALITY CONTROL

1.6.1 Perform field quality control tests as part of work of this Section.

1.6.2 Perform site tests to determine moisture content of unit at time of delivery to site.

1.6.3 Submit three test reports for each type of mortar and grout in accordance with CSA A179 .

1.6.4 Site test clay masonry units to determine initial rate of absorption in accordance with CSA A179.

1.7 SUBMITTALS

1.7.1 Submit two samples of each type of masonry unit, reinforcing, ties, anchors, accessories and cured coloured mortar for approval before delivery of materials to the site.

1.7.2 Submit two brick samples, each consisting of 6 bricks, showing range of colours and texture, stacked with simulated joints.

1.7.3 Submit layout of cavity wall locations for approval.

1.7.4 Products on site shall match approved samples.

1.7.5 Shop Drawings: Submit shop drawings indicating the following:

.1 Indicate sizes, profiles, coursing, and locations of special shapes for concrete masonry units.
.2 Indicate sizes, profiles, and locations of each stone trim unit required.
.3 Detail corner units, end dam units, and other special applications for fabricated flashings.

1.7.6 Informational Submittals: Provide the following submittals when requested by the Consultant: Submit ULC Assembly Listings and Materials cut sheets for fire rated assemblies as follows:

.1 Not later than 30 working days following Award of Contract, submit copies of ULC Assembly and Materials Listing for indicating ULC Number and how assembly meets the rating criteria for assemblies listed on drawings or meets requirements of Supplementary Standard SB-3 of Ontario Building Code

.2 Use the same system and material as would be required for a tested assembly for the project; ULC Listings are tested with the specific materials indicated; substitutions will not be permitted unless evidence of equivalency is confirmed.

.3 Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site; include manufacturer's printed instructions for installation.

1.8 MOCK-UP

1.8.1 Prior to commencement of work, construct a 1000 mm (40") high and 1500 mm (60") long sample wall for each type of masonry wall on site at locations on the building approved by the Consultant.

1.8.2 Allow Consultant to inspect sample wall during the various stages of its construction.

1.8.3 Sample wall shall show the specified mortar, bond, joint treatment, back-up masonry, cast-in-place concrete and metal stud, reinforcement, insulation, vapour barrier, and flashing where applicable. Remove rejected sample walls from site. Approved sample wall may form part of the completed work. All work shall match approved sample wall.

1.8.4 Co-ordinate erection of sample wall with Sections providing back up construction.

1.9 PRODUCT DELIVERY, STORAGE AND HANDLING

1.9.1 Deliver and store masonry units, palletized, level and under protective covering. Do not overload structure.

1.9.2 Protect materials and products from deterioration by weather, mechanical damage and other causes, and from soiling.

1.9.3 Keep masonry materials and products completely free from frost, snow and ice.

1.10 COLD WEATHER WORK

1.10.1 Comply with CSA A371 and the following:

.1 Where possible, deliver materials required to the site in advance of freezing temperatures.

.2 Use dry, unfrozen masonry units.

.3 Building on frozen work is prohibited. Remove sections of masonry deemed frozen and damaged before continuing construction of that section.

.4 Do not use scorched sand, salts, or anti-freeze admixtures.

1.10.2 Cold Weather Construction Requirements

.1 Provisions for work in progress:

Condition	Requirement
Ambient temperature above 40°F (4.5°C)	Normal construction practice. Cover stored materials.
Ambient temperature below 40°F (4.5°C) or temperature of units below 40°F (4.5°C)	Heat mortar materials to produce mortar temperatures between 40°F (4.5°C) and 120°F (49°C) at time of mixing. Maintain mortar above freezing until used in masonry. If units have a temperature below 20°F (-7°C), heat to above 20°F (-7°C). Remove visible ice from units.

Condition	Requirement
Ambient temperature is between 25°F (-4°C) and 20°F (-7°C)	Heat masonry under construction from both sides. Install wind breaks when wind velocities reach 15 mph (24 km/h).
Ambient temperature is below 20°F (-7°C)	Provide heat enclosure for masonry under construction and maintain temperature above 32°F (0°C) within that enclosure.

2. Protection of newly completed work:

Condition	Requirement
Mean daily temperature above 40°F (4.5°C)	Normal construction practice. Cover top of unfinished masonry work to protect it from weather.
Mean daily temperature between 40°F (4.5°C) and 25°F (-4°C)	Cover completed masonry with weather resistive membrane to protect from rain or snow for 24 hours after construction.
Mean daily temperature between 25°F (-4°C) and 20°F (-7°C)	Cover masonry with insulating blankets or equivalent protection for 24 hours after construction.
Mean daily temperature below 20°F (-7°C)	Maintain temperature of masonry above 32°F (0°C) for 24 hours after construction.

1.11 HOT WEATHER PROTECTION

1.11.1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.

PART 2 - PRODUCTS

2.1 MATERIAL

2.1.1 Concrete block: CSA A165.1, autoclaved, low pressure steam or bubble cured. All interior walls and partitions corners to be bullnose unit.

.1 Classification: S/15/A/M, 75% solid for all locations where structural members bear on concrete block.
.2 H/15/A/M, for all other block work.
.3 Fire Resistant Concrete Masonry Units: Manufactured in accordance with CSA A165:
  .1 2 Hour Fire Rating: H/15/C/O
  .2 1 Hour Fire Rating: H/15/A/O
.4 Size: Modular imperial to sizes indicated on Drawings.
.5 Special shapes:
  .1 Provide square units for exposed corners.
  .2 Provide purpose made shapes for lintels and bond beams.
  .3 Provide additional special shapes required for project.
  .4 Manufacture special shapes at same time and with the same batch as standard concrete block to be used.

2.1.2 Metric Brick: ASTM C216 Standard and CSA A-82 exterior grade masonry unit, Modular, Architectural series type FBX by Brampton Brick or equivalent, texture and colour to be confirmed by Architect.

.1 Special shapes: Provide special sizes and shapes as shown on drawings and as required including but not limited to, plain ends, halves, jambs, sash, lintel, bullnose, and other shapes. Special shapes shall be manufactured to shape, not cut.
.2 Notwithstanding the appearance requirements of the above mentioned CSA Standards, block shall be free from all surface indent¬ations, surface cracks and other defects detrimental to the appearance of the finished surface. Block having visual defects shall be rejected for exposed areas but may be used for concealed or unfinished areas.
.3 Efflorescence: When testing in accordance with CSA A82.2, concrete blocks shall be efflorescence free.
.4 Freeze/thaw resistance: Free of disintegration, weight loss, delamination, and pop outs when tested in accordance with CSA A165.3.
.5 Load bearing, hollow, normal weight units: H/15/A/M.
.6 Walls and partitions exposed to weather, normal weight: H/15/A/M.
.7 Load bearing, solid normal weight units: S/15/A/M.
.8 Load bearing, solid, lightweight units: S/15/B/M.
.9 Load bearing, hollow, lightweight units: H/15/B/M.
.10 Non load bearing, hollow, normal weight units: H/15/A/M.
.11 Non load bearing, solid, normal weight units: S/15/A/M.
.12 Non load bearing, hollow, lightweight units: H/15/B/M.
.13 Non load bearing, solid, lightweight units: S/15/B/M.
.14 Fire ratings: Provide concrete blocks having void to solid ratios and aggregate as required to achieve required fire ratings for width of fire rated walls shown. Use concrete block units as specified above and of special aggregate type L1 as required to obtain fire

ratings of walls, which cannot be achieved with concrete block units of standard type S or N aggregates.

.15 Aggregates for light weight concrete blocks: ASTM C331.

.16 Aggregates for normal weight concrete blocks: CSA A23.1.

.17 Architectural concrete block: 2-Rib, Split-Face,.

.18 Supply masonry units in compliance with "Intended Use of Different Types of Masonry Units as listed in Appendix 'C' of CSA A165.1..

2.1.3 Architectural Block: Architectural Block series by Brampton Brick or equivalent, texture and colour to be confirmed by Architect.

2.1.4 Portland cement: Type 10.

2.1.5 Masonry cement: Type H or Type L.

2.1.6 Sand: CSA A82.56M, as amended by CSA A179.

2.1.7 Lime: ASTM C207, hydrated lime.

2.1.8 Water: Clear and free from injurious amounts of deleterious substances.

2.1.9 Colour pigments: Pure mineral pigment, mineral oxide content minimum 70%. Fillers; inert. Maximum carbon black content; 1% water soluble matter. Colours to be selected by Consultant to match existing mortar at exterior brick.

.1 Extra Strong Colour by Elementis Pigments Inc.,

.2 Staybrite by Sternson Limited, or other approved manufacture.

2.1.10 Non-shrink grout: Minimum compressive strength of 35 Mpa (5000 psi) at 28 days. Include non-ferrous expansion agents where exposed to view or weather.

.1 Sika Grout 212 By Sika,

.2 Sealtight CG-86 by W.R. Meadows of Canada Ltd.,

.3 Thoro Multigrout by Harris Specialty Chemicals, or other approved manufacture

2.1.11 Parging mortar: Type N, having a compressive strength of 5.0 Mpa (759 psi) minimum, 1 part Portland cement to not less than 2 1/2 nor more than 3 1/2 parts sand by volume.

2.1.12 Control joint material:

.1 Rapid Control Joint by Dur O Wal Limited,

.2 Titewall BL-A by Blok lok Ltd., or other approved manufacture.

2.1.13 Premoulded filler: 100% over sized:

.1 Rodofoam PR grade by Sternson Limited,

.2 Sealtight Rescor by W.R. Meadows of Canada Ltd., or other approved manufacture.

2.1.14 Mineral wool filler: Mineral fibre batt insulation by Roxul Company, or other acceptable equivalents.

2.1.15 Through-wall flashing material: Modified bitumen, glass scrim reinforced elastomeric, 0.9 mm (35 mils) thick, Blueskin TWF by Henry Company, or other approved manufacture.

2.1.16 Flexible anchors and adjustable ties: 9 gauge galvanized rods.

2.1.17 Horizontal reinforcing:

.1 Reinforcing: Truss type, consisting of 9 ga. wire complying with CSA G30.3, two side rods welded to a continuous diagonal formed cross rod forming a truss design with alternating welds not exceeding 8". Width of reinforcing unit shall be 1 1/2" less than nominal thickness of wall, BL 30 Blok Truss by Blok Lok or other approved manufacture.

.2 Galvanizing: ASTM A116 Class 3 mill galvanized for interior walls and ASTM A153 Class B2 hot dipped galvanized after fabrication for exterior walls.

2.1.18 Masonry Unit Veneer/Concrete or Concrete Masonry Unit Substrate Tie Systems:

.1 Backer Plate: Fabricated from stainless steel meeting requirements of CSA A370-04(R2009) and ASTM A1011/A101aM-12; designed to transfer wind loads to steel stud framing; length to suit total cavity, insulation and sheathing thickness, as detailed on Drawings.

.2 Ties: Wire ties fabricated from stainless steel wire in accordance with CSA G30.18-09; length to allow for cavity width and to extend minimum 2” into masonry unit joint.

.3 Fasteners: Self tapping metal screws to metal stud backup as recommended by tie manufacturer consisting of close tolerance bits for use in percussion drills, and hammer driven anchors with pullout strengths of 5.4 kN for 20 MPa concrete and 3.75 kN for hollow concrete masonry unit with a 1” embedment:

.1 Fero Holdings Ltd., Rap-Tie System

.2 Blok-Lok, BL-407

2.1.19 Insulation fasteners: Wedge Lok by Block Lok Limited.

2.1.20 Interior and Exterior Single Wythe Concrete Block Walls:

.1 Single wythe interior and exterior concrete block walls: Horizontal reinforcement shall be ladder type or truss type having two parallel side rods 3/16" diam. welded to 3/16" cross rods forming a ladder or truss design. Side rods shall be notched or knurled. Design ladder or truss reinforcement to allow placement of side rods at center-line of both face shells of concrete block.

2.1.21 Minimum corrosion protection for masonry connectors and horizontal reinforcing, as outlined in CSA A370:

.1 Interior masonry not subjected to moisture; Mill galvanized carbon steel.

.2 Interior masonry subject to moisture, below grade masonry in contact with ground, and above grade exterior masonry in buildings less than 32'-0" in height (measured from the floor level of the first storey); Hot-dipped galvanized after fabrication with minimum zinc coating in accordance with ASTM A153, Class B wire ties/reinforcing 1.5 oz/ft² and ASTM A123 plates/strips/sheets 2 oz/ft², on each face.

2.1.22 Masonry connectors shall meet the following performance tolerance requirements as outlined in CSA A370:

.1 Deflection; Maximum 3/32" including free play when acted apon by a lateral load of 0.05 ton force in all possible positions.

.2 Linkage preventing separation of components i.e. brick tie/connector reinforcing, etc.

.3 Free play of multi-part connectors; not more than 0.048" when assembled in all possible configurations and not subject to a load.

2.1.23 All steel anchors, reinforcement and other accessories: Stainless steel conforming to ASTM A167 or hot dip galvanized, complying with CSA G164, as herein specified.

2.1.24 Trim Units: Manufactured in accordance with CSA A165, and as follows:

.1 Architectural Sill Profile:
- .1 Size: 5-1/2" deep, complete with drip edge, 3-1/2" high, and angled to 3-1/4" high, with beveled edges.
- .2 At locations requiring sills to wrap a corner, provide corner sill unit as a one (1) piece unit completed with beveled profile to match adjacent sill units. Miter joints are not permitted, unless prior written approved by the Consultant is obtained.
- .3 Colour: As indicated on the Drawings.
- .4 Basis of Cambridge Series, Architectural Sills Model R24/3.5 Angled, by Richvale York Block Inc.

2.2 MORTAR TYPES

2.2.1 Mortar types in parts by volume, complying with CSA A179-M shall be as follows:

TYPE	PORTLAND CEMENT	HYDRATED LIME OR LIME PUTTY	MASONRY CEMENT TYPE H	AGGREGATE LOOSE DAMP CONDITION	28 DAY COMPRESSIVE STRENGTH
S	1 1/2	1/2 or 0	0 1	4-1/2 4-1/2	12.5 MPa (1800 psi)
N	1 0	1 or 0	0 1	6 3	5 MPa (750 psi)

2.2.2 Use premixed masonry mortars prepared with Betomix 1.1.6 and Betomix Plus, by Daubois Inc., or other approved manufacture, for exterior face work.

2.2.3 Other masonry cement may be used only on interior masonry.

2.2.4 Add colouring pigment to mortar for face work if required. Colours shall be as later directed to match existing mortar at exterior brickwork. Under no circumstances shall colour pigment loading exceed 6% per 55 lb. of dry mixed mortar. Mix colouring pigment into mortar in accordance with manufacturer's written instructions and as required to ensure colour uniformity and consistency.

2.3 MORTAR LOCATIONS

2.3.1 Type SW hard burned clay face brick with initial rate of absorption range of 10 to 20 grams: Type N.

2.3.2 Back up masonry to exterior walls: Type S.

2.3.3 Bearing courses: Type S. Rake joints back 1/2" if such courses are to be exposed and point to match remainder of wall.

2.3.4 Non load bearing partitions: Type N.

2.3.5 Grout in around all beams, joists, truss bearing plates bearing on masonry work: Type S.

2.4 MORTAR PREPARATION

2.4.1 Measure and mix mortar products accurately according to CSA A179. Proportion products by either the property specifications or the proportion specifications of CSA A179.

2.4.2 Mortar of the products and proportions used shall be mixed to an initial flow of 100% to 115% and shall have a flow after suction of not less than 70% of original flow.

2.4.3 Do not mix different types of mortar in the same mixer unless the mixer is thoroughly cleaned first.

2.4.4 When air temperature is 27°C or higher, use and place mortar in its final position within two hours of mixing it. When air temperature is less than 27°C use and place mortar in its final position within 2 1/2 hours of mixing it. Discard mortar not used within above times.

2.4.5 Mortars which have stiffened within mix/use time limits due to moisture evaporation may be re tempered by adding enough water as is necessary to produce proper workability consistent with the initial rate of absorption of the masonry units.

2.5 GROUTS

2.5.1 Measure and mix grout products accurately according to CSA A179M.

2.5.2 Do not mix different types of grout in same mixer or mixer used for mixing of mortar unless mixer is thoroughly cleaned.

2.5.3 Use and place grout in its final position within 2 1/2 hours of mixing it. Discard grout not used within 2 1/2 hours.

2.5.4 Grout types by volume shall be as follows:

TYPE	PORTLAND CEMENT	HYDRATED LIME OR LIME PUTTY	AGGREGATE MEASURED IN LOOSE DAMP STATE
Fine Grout	1	0 to 1/10	2-1/4 to 3 times the sum of the cementitious materials
Coarse Grout	1	0 to 1/10	1 to 2 times the sum of the cementitious materials

2.5.5 Use coarse grout where required, in spaces 2" or more in least horizontal dimension. Use fine grout in spaces less than 2" in horizontal dimension.

2.6 ACCESSORIES

2.6.1 Weepholes: PVC 'T' shaped brick vents by Goodco Limited, or cadium plated airplane type 'Weep Holes-343' by Blok-Lok Limited, set 32" O.C. for architectural block in the following locations:

.1 Bottom course of manufactured stone masonry units throughout;
.2 Top courses of manufactured stone masonry units throughout.

2.6.2 Mortar Dropping Control Devices:

.1 High density, polyethylene or nylon woven mesh type mortar dropping control devices with trapezoidal "zigzag" shaped top edge, designed to allow moisture/water to flow/drain downward in cavity/collar joints to the weepholes, thicknesses to suit cavies and collar joints, 'The Mortar Net' by Mortar Net USA Ltd., and distributed by JV Building Supply, division of Consolidated Materials Corporation, or approved equal.

PART 3 - EXECUTION

3.1 LINES AND LEVELS

3.1.1 Provide general lines and levels. Be responsible for accurate dimensions, lines and levels of work of this Section. Make work plumb and true.

3.2 CUTTING AND PATCHING

3.2.1 Do all cutting, fitting and patching of masonry to receive work of other trades, to make work properly come together and to make good to match adjacent masonry.

3.3 BUILT INS

3.3.1 Install items supplied by other trades to be built into masonry walls, plumb, level, properly aligned, rigid and secure. Build in miscellaneous metal work, loose lintels, bearing plates, sleeves, anchor bolts, anchors, wood nailers and all other items which required attachment or building into the masonry.

3.3.2 Set access doors and panels with front face flush with final wall finish. Such fittings shall be located precisely as directed.

3.3.3 Anchor steel door frames in place and build masonry around them. Do not attach door frames to walls by fastening to wood nailers. Use steel anchors. Solidly grout voids between masonry and steel frames for doors full with masonry mortar or fine grout. Keep exposed faces of frames free from mortar. Remove droppings promptly.

3.4 PROVISIONS FOR OTHER TRADES

3.4.1 Provide openings in masonry walls where required or indicated.

3.4.2 Accurately locate chases and opening and neatly finish to required sizes.

3.4.3 Where masonry encloses conduit or piping, bring to proper level indicated and as directed. Do not cover any pipe or conduit chases or enclosures until advised that work has been inspected and tested.

3.5 ERECTION – GENERAL

3.5.1 Erect masonry to correct dimensions, plumb, true and with level courses.
3.5.2 Maintain joints vertical in alternate courses or as broken by bond pattern in line, throughout the entire height.

3.5.3 Reinforce masonry as required, to support wall mounted equipment, building components and fixtures provided under other Sections.

3.5.4 Verify the loads to be supported and the arrangement and type of fastenings with the appropriate Section.

3.5.5 Lay masonry exposed to view or to receive a brushed or sprayed finish carefully with even joint widths, and with exposed faces flush and even throughout. Broken corners and spoiled units are not acceptable. Do not use units which are too contrasting in appearance. Provide satisfactory blending of tones and textures.

3.5.6 Where resilient base is indicated, tool joints to within 4" of the floor. Strike joints at base flush.

3.5.7 Lay block to receive adhesive-applied gypsum board plumb, with joints finished flush.

3.5.8 Level, align and plumb masonry for application of thin set applied ceramic tile to requirements of 09 30 00 - Ceramic Tile, with joints struck flush.

3.5.9 The corners of concrete masonry units projecting into habitable areas and exposed or painted in the finished work shall be single or double bullnosed as required to suit the particular location. Lay specially shaped masonry units required or shown on Drawings.

3.5.10 Completely fill and tool head and bed joints to provide support for vapour barrier adhesive.

3.5.11 Completely fill joints in solid block masonry with mortar. Fully cover the end areas and bearing areas of the face shells of hollow units with mortar.

3.5.12 Provide anchors, ties, crimps, and other mason's iron work required for the construction of the work.

3.5.13 Build in anchors, nailers, accessories, flashings and other items required as the masonry work progresses. Solidly fill with non-shrink grout all voids in masonry into which anchor bolts or other connection materials are built.

3.5.14 Fill hollow metal door and borrowed light frames occurring in masonry with grout.

3.5.15 Provide grout setting bed for flashing under window sills.

3.5.16 Determine the location and size of openings to be left in masonry walls for heating, ventilating, plumbing, electrical fixtures, ducts, boxes and other items. Pass conduits and piping through hollow cells of blocks or build around them and split blocks. Build chases and openings as required accurately located and neatly finished, as the work progresses. Cut block for electrical boxes and recessed equipment accurately using a carborundum saw. Provide square clean edges.

3.5.17 Tooth new masonry into existing, where existing openings are to be filled in. necessary for construction purposes to "stop-off" a horizontal run of masonry, rake back 1/2-block length in each course. Toothing is not permitted, except with the written approval of the Consultant.

3.5.18 Tool joints in exposed masonry to a neat concave finish using 5/8" diameter non staining tool. Before tooling, ensure that surface of mortar is thumb print hard and has lost water sheen. Strike joints flush in concealed locations. Rake alternate joints back 1/2" where masonry is to receive plaster directly. Do not rake back joints containing reinforcing.

3.5.19 Where fresh masonry joins masonry that is partially or totally set, clean and lightly wet the exposed surface of the set masonry so as to obtain the best possible bond with the new work.

3.5.20 Where the joints in interior masonry will be apparent in the completed building, start interior walls and the back-up masonry for exterior walls with a 4" starter course, or as necessary to achieve a neat appearance at the door head/lintel condition.

3.5.21 Where insulation and vapour barrier are to be built into masonry walls. Co-ordinate the erection of the masonry with the installation of insulation under Section 07 21 00, Building Insulation. Strike joints flush on exterior face of interior wythes and parge this surface with a 1/4" thick coating of cement mortar. Trowel surface smooth to receive vapour barrier adhesive. Build exterior wythe tight to completed insulation.

3.5.22 Provide light weight aggregate as required for fire rated partitions.

3.5.23 Lay all joint 3/8" thick unless otherwise specified or indicated on Drawings.

3.5.24 Use lightweight aggregate units for concrete masonry visible or painted in the finished work.

3.5.25 Other masonry units shall be of lightweight aggregate or of regular sand and gravel aggregates.

3.6 COMPOSITE EXTERIOR WALLS

3.6.1 Construct exterior brick masonry using brick to match existing brick. Use only clean, sound brick. Brickwork shall match adjacent existing brickwork in coursing, bonding, colouring of brick and mortar and shall blend into existing, to approval of Consultant.

3.6.2 Tooth new brickwork into existing.

3.6.3 Supply insulation fasteners to Section 07 21 00 for installation.

3.7 PARTITIONS

3.7.1 Unless otherwise shown or specified, lay concrete block masonry in running bond.

3.7.2 Build up non load bearing walls to within 1" of underside of structure unless shown otherwise. Obtain lateral support anchors from Section 05 10 00. Secure lateral support anchors to structure along wall. Perform necessary drilling of concrete. Where junction of wall and structure will be visible in the completed building, lay sash block so that grooves engage in legs of metal anchors such that anchorage is concealed. Where junction of wall and structure will be concealed, lay top course to engage lateral support angles. Install mineral wool filler in void between top of wall and underside of structure. Cut filler around legs of concealed anchors. Leave ready for caulking.

3.7.3 Use concrete aggregate block for walls and partitions on slabs on grade. At all other locations use light weight block.

3.7.4 Carry partitions up through ceiling to slab or metal deck above.

3.7.5 Where walls and partitions are pierced by structural members, ducts, pipes, fill voids with mortar to within 1" of such members flush with wall face. Fill spaces between partition and structural members, ducts and pipes with glass fibre or mineral wool insulation compressed 50% completely from one side of wall to other.

3.8 REINFORCING AND ANCHORING

3.8.1 Reinforce and anchor masonry as required by local by laws when greater requirements are not specified or shown.

3.8.2 Unless otherwise shown, tie walls at corners in masonry bond, alternate courses.

3.8.3 At wall intersections, terminate one wall at the face of the other and build in prefabricated sections of truss type connectors at 16" o.c. vertically.

3.8.4 Provide horizontal reinforcing above first block course above floors slab and in first block course below floor slab, with box ties to anchor face masonry to back up.

3.8.5 Reinforce hollow concrete masonry walls with truss reinforcing every 16" o.c. to suit wall thickness.

3.8.6 Cut alternate continuous reinforcing at control joints in straight walls. Lap splices in continuous length reinforcing 6".

3.8.7 Install masonry reinforcing in two consecutive courses above and below openings in walls, extending not less than 3' 0" on both sides of opening.

3.8.8 Use adjustable wall ties where the horizontal joints in adjacent wythes of masonry walls requiring reinforcing are not in vertical alignment. Install ties 12" o.c. horizontally and 16" vertically.

3.8.9 Solidly fill with mortar all voids in masonry into which anchor bolts, reinforcing steel or other connection materials are built.

3.9 LINTELS

3.9.1 Lintels over openings in masonry shall have a minimum bearing of 8" on each side of opening. Provide building paper bond barrier at ends and under bearing parts of lintels.

3.9.2 Install loose steel lintels and bearing plates. Grout under lintels and/or bearing plates at each jamb with full bed of mortar.

3.9.3 Provide reinforced concrete block lintels of same thickness as wall for block walls of less than 8" thickness and for other block walls where units are to be painted or visible in the completed work. Construct lintels with special concrete lintel units. Supervise the filling of voids of units with concrete and their reinforcing with deformed steel bars. Cure before applying loads. Provide temporary support for lintels consisting of a level platform, true to the proper elevation and of sufficient strength to support the load without visible deflection. Maintain supports in place for a minimum of 7 days and for a period sufficient to permit the concrete to cure and gain suffic¬ient strength to safely support all loads. Lay masonry units with full mortar coverage on all abutting edges with joints shoved tight. Where masonry construction is continued above the lintel, place the first course of masonry units on the lintel in a full mortar bed.

3.10 BEARING AND ANCHORAGE

3.10.1 Provide at least 16" of 100% solid masonry under bearing of beams, girders, trusses and lintels extending 8" beyond each side of bearing, at least 8" of 100% solid masonry under joists and under slabs. Hollow units filled with concrete are not acceptable. Provide a concrete distribution pad in lieu of solid masonry specified above for bearing plates anchored with bolts. Solid masonry in locations visible in the completed work shall be of same material and appearance as adjacent wall surface.

3.11 INSTALLATION DAMPPROOF COURSES

3.11.1 At walls having grout fill, turn dampproof course material up at least 8" on the face of the back-up masonry and terminate in a reglet.

3.11.2 In all cases extend dampproof course material through full thickness of face masonry.

3.11.3 Make 100% watertight seal between dampproof course material strips with waterproof adhesive. Make 100% watertight seal between dampproof course material and items passing through it.

3.12 REPOINTING

3.12.1 Cut back defective joints 1/2" taking care not to damage units. Remove dust and loose materials by brushing or by water jet. If water jet is used, allow excess water to drain before repointing.

3.12.2 Repoint with mortar similar to original mortar mix. Pre hydrate mortar by mixing with only a portion of required water, two hours before use. At end of curing period, rework mortar, adding remaining water.

3.12.3 Pack mortar tightly in thin layers and tool to required joint finish.

3.13 CLEANING

3.13.1 Clean masonry according to masonry unit manufacturer's written instructions.

3.13.2 Where mortar or stains cannot be removed as specified above, propose other methods to the Consultant for approval. Employ methods approved by the Consultant and remove mortar and stains.

3.14 PROTECTION

3.14.1 Provide and maintain protection against entry of moisture into masonry whenever work is interrupted. Use non staining water repellant paper, polyethylene sheet or tarpaulins overhanging walls 2' 0" minimum and secured in place to prevent wind uplift. Similarly protect exposed ledges to be covered by flashing or other material until such materials are installed.

3.14.2 Provide and maintain protective non staining boards to external corners which may be damaged by construction activities. Secure protection without damaging the work.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 Provide all labour, materials, products, equipment and services required to complete the metal fabrications work necessary and/or indicated on the Drawings and specified herein including all metal work which is not specified elsewhere.

1.2 REFERENCES

1.2.1	ASTM A53/A53M-12:	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
1.2.2	ASTM A123/A123M-13	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
1.2.3	ASTM A143/A143M-07(2014)	Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedures for Detecting Embrittlement.
1.2.4	ASTM A153 / A53M-09	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
1.2.5	ASTM A167-99(2009)	Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate.
1.2.6	ASTM A307-14	Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
1.2.7	ASTM A325-14	Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
1.2.8	ASTM A394-08(2015)	Standard Specification for Steel Transmission Tower Bolts, Zinc-Coated and Bare.
1.2.9	ASTM A563-15	Standard Specification for Carbon and Alloy Steel Nuts.
1.2.10	ASTM A653/A653M-15	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
1.2.11	ASTM A780/A780M-09(2015)	Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
1.2.12	ASTM 1011/A1011M-14	Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength, Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra High-Strength.
1.2.13	ASTM C939-10	Standard Test Method for Flow of Grout for preplaced-aggregate Concrete (Flow Cone Method)

1.2.14	ASTM C1107/1107M-14a	Standard Specification for Packaged Dry Hydraulic-Cement Grout (Nonshrink)
1.2.15	CAN/CGSB 1.108-M89	Bituminous Solvent Type Paint.
1.2.16	CAN/CGSB 1.171-98	Inorganic Zinc Coating.
1.2.17	CAN/CGSB 1.181-99	Organic, Ready Mixed, Zinc Rich Coating.
1.2.18	CAN/CSA-G40.20-04(R2009)	General Requirements for Rolled or Welded Structural Quality Steel.
1.2.19	CAN/CSA-G40.21-04(R2009)	Structural Quality Steel.
1.2.20	CAN/CSA G164-M92 (R2003)	Hot Dip Galvanizing of Irregularly Shaped Articles.
1.2.21	CISC/CPMA 2-75	Quick-Drying Primer For Use on Structural Steel.
1.2.22	CSA W47.1-09(R2014)	Certification of Companies for Fusion Welding of Steel Structures.
1.2.23	CSA W47.2-11	Certification of Companies for Fusion Welding of Aluminum.
1.2.24	CSA W59-13	Welded Steel Construction (Metal Arc Welding).
1.2.25	CAN/CSA W117.2-12	Safety in Welding, Cutting and Allied Processes.

1.3 QUALIFICATIONS OF WELDING

1.3.1 Welding of steel and aluminum shall be undertaken only by a fabricator fully approved by the Canadian Welding Bureau and CSA W47.1 and CSA W47.2, as may be applicable.

1.3.2 Conform to safety requirements of CAN/CSA W117.2 for welding operations.

1.4 DESIGN

1.4.1 Design the work of this Section in accordance with the Ontario Building Code and the by-laws of the local municipality.

1.4.2 Maximum deflection for individual members shall not exceed 1/360th, of the span.

1.4.3 Work of this Section which will support other items or will be required to support structural loads of any nature shall be designed by a Professional Structural Engineer registered in Ontario and who shall affix his/her professional seal and signature to the shop drawings for such items.

1.4.4 Work of this Section to be executed by firm thoroughly conversant with laws, by-laws and regulations which govern, and capable of workmanship of best grade of modern shop and field practice known to recognized manufacturer's specializing in this work.

1.5 SUBMITTALS

1.5.1 Shop drawings:

.1 Make thorough examination of drawings and details, determine the intent, extent, and materials, and be fully cognizant of requirements when preparing shop drawings.

.2 Submit shop drawings showing and describing in detail all work of this Section including large scale detail of members and materials, of connection and interfacing with work of other Sections, jointing details, and of anchorage devices, dimension, gauges, thicknesses, description of materials, metal finishing, as well as other pertinent data and information.

.3 Digital files of design drawings shall not be used in the preparation of shop drawings.

1.5.2 Submit necessary templates and instructions where fastenings or anchors have to be built in by other trades.

1.5.3 Work designed by a Professional Engineer shall bear signature and stamp of the engineer.

1.5.4 Submit adequate written instructions for protection of completed work, and proper methods and materials to be used in cleaning.

1.6 STORAGE, DELIVERY, HANDLING AND PROTECTION

1.6.1 Coordinate deliveries to comply with construction schedule and arrange ahead for strategic off the ground, under cover storage locations. Do not load any area beyond the design limits.

1.6.2 Adequately protect and crate all components against damage, dirt, disfigurement and weather during delivery and storage. Damaged materials shall not be used and shall be replaced by approved material.

1.6.3 Cover and protect the work of other Sections in the area of work from damage. Make good all damage to the satisfaction of the Consultant.

Protect the installed work of this Section and on completion the work shall be examined and damage shall be remedied to the complete satisfaction of the Consultant.

1.7 WARRANTY

1.7.1 Warrant Miscellaneous metals work of this Section against defects in materials and workmanship in accordance with General Conditions but for an extended period of two (2) years and agree to repair or replace faulty materials or work which appears during warranty period, without cost to the Owner/Tenant. Defects shall include, but not limited to, deflection, opening of joints, or deterioration of metal.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Structural Steel Sections and Steel Plate: New stock (not weathered or rusted); to conform to CAN/CSA-G40.21, Grade 300W (44W) and Grade 350W (50W) for wide flange shapes.

2.1.2 Hollow Structural Sections (HSS): New stock; to conform to CAN/CSA-G40.21, Grade 350W (50W), Class C, stress relieved.

2.1.3 Sheet Steel (Structural Quality): Conforms to ASTM A1011/A1011M.

2.1.4 Sheet Steel (Commercial Quality): Conforms to ASTM A653/A653M, stretcher levelled or temper rolled.

2.1.5 Tube: Conforms to ASTM A53.

2.1.6 Welding materials: Complying with CSA W59.

2.1.7 Interior primer: Complying with CISC/CPMA 2-75, oil alkyd type.

2.1.8 Stainless steel: Type 302 or 304 alloy, complying with ASTM A167.
2.1.9 Aluminum sheet: 1100 alloy, H14 temper, anodizing quality.

2.1.10 Aluminum extrusions: Alcan 6063 alloy, T5 temper.

2.1.11 Steel members, fabrications and assemblies shall be galvanized after fabrication by the hot dip process in accordance with CAN/CSA G-164 or ASTM A123.

2.1.12 Bolts, nuts and washers and iron and steel hardware components shall be galvanized in accordance with CAN/CSA G-164 or ASTM A153. Nuts and bolts shall be supplied in accordance with ASTM A307, A325, A394 and A563 as applicable.

2.1.13 Products shall be safeguarded against embrittlement in conformance with ASTM A143.

2.1.14 Organic zinc rich primer: Complying with CAN/CGSB 1.181 "Galvafroid SB Grade" by W.R. Meadows of Canada Ltd.,"Kem Organic Zinc Rich Primer No. 6430" by Sherwin-Williams Company of Canada Ltd., "Glid-Guard Glid-Zinc Organic Line 5526 Line" by the Glidden Company Limited, or other approved manufacture.

2.1.15 Inorganic zinc coating: Complying with CAN/CGSB 1.171, "Glid-Guard Glid-Zinc No. 5535 Line" by Glidden Company Limited, or other approved manufacture.

2.1.16 Interior primer for steel: Complying with CISC/CPMA 2-75a.

2.1.17 Bituminous paint: Complying with CAN/CGSB 1.108.

2.1.18 Non-Shrink Grout: Premixed, high strength, maximum bearing, impact resistant, non-shrink non-metallic aggregate grout having minimum 76 Mpa 28 day compressive strength and conforms to ASTM C939 and ASTM C1107/C1107M, 'Embeco Premixed Grout' by Master Builders Technologies Ltd., or 'Tartan Grout Iron' by Webster & Sons Ltd., or 'Sika Grout 212 HP' by Sika Canada Inc.

2.2 FABRICATION

2.2.1 Verify all dimensions on the site before preparing Drawings or proceeding with shop work.

2.2.2 Insofar as practical, execute fitting and assembly in the shop with various parts of assemblies ready for erection at the building site.

2.2.3 Fabricate the work true to dimensions and square. Accurately fit members with hairline joints, and join using adequate fastening.

2.2.4 Construct finished work free from distortion and defects detrimental to appearance and performance.

2.2.5 File or grind exposed welds smooth and flush. Do not leave grinding marks. Construct internal and external corners with sharp lines. Provide continuous welds unless otherwise approved by the Consultant in writing.

2.2.6 Fabricate metal work complete with all components required for anchoring to concrete; bolting or welding to structural frames; standing free; or resting in frames or sockets in a safe and secure manner.

2.2.7 Weld all connections unless approved otherwise in writing by the Consultant.

2.2.8 Execute exposed fastenings neatly where approved and of the same material, colour and finish as the base metal, on which they occur.

2.2.9 Counter sink exposed fastenings, where such are approved in writing, and make as inconspicuous as possible with bolts cut off flush with nuts. Construct fastenings of the same material and finish as the base material on which they occur.

2.2.10 Insulate contact surfaces to prevent electrolysis due to metal to metal contact or between metal and masonry or concrete. Use bituminous paint, butyl tape, building paper or other approved means.

2.2.11 Thoroughly de-scale steel work before delivery to project site. Remove roughness and irregularities, clean with a wire brush, remove oil and grease and prime with one shop coat of paint to a 2 mil thickness.

2.2.12 Primer interior steel work supplied under this Section with one shop coat of interior primer.

2.2.13 Do not prime the following surfaces:

.1 steel to be encased in concrete;
.2 non-ferrous metals;
.3 surfaces and edges to be field welded. If painted, remove paint for field welding for a distance of at least 2" in all sides of the paint.

2.2.14 Hot-dip galvanize steel, where specified, in accordance with CAN/CSA G164 (coating weight as prescribed for type of article), or ASTM A653/G90 (coating weight;1.25 oz./sq.ft.) as applicable. Galvanize after fabrication where possible. Follow recommended precautions to avoid embrittlement of the base metal by overpickling, overheating or during galvanizing.

2.2.15 Touch-up galvanized steel where galvanizing is damaged during installation with zinc rich primer, in accordance with ASTM A780.

2.2.16 Stainless steel shall be finished in No. 4 bright, brush finish, unless otherwise noted.

2.3 ANCHOR BOLTS AND OTHER MEANS OF ANCHORAGE

2.3.1 Provide all anchor bolts and expansion bolts or other means of anchorage required for building into floors, walls and ceilings, where it is necessary to secure metal and wood to concrete, masonry or steel work. Supply anchor bolts, nuts and similar hardware to the respective Sections for fastening.

2.4 MISCELLANEOUS STEEL SECTIONS

2.4.1 Supply and install all steel items not indicated to be supplied under other Sections.

2.4.2 Where sections are required to be built into masonry or concrete supply such members to the respective Sections.

2.5 CONCEALED SUPPORT ELEMENTS AND FRAMING

2.5.1 Supply and install all support elements and framing as shown on the Drawings for the items listed herein. Construct supports from rolled steel sections assembled by welding.

2.5.2 Design supports to withstand, within acceptable deflection limitations, their own weight, the weight of the items to be supported, loads imposed by the motion of supported items, where applicable, and all live loads, static and dynamic which might be applied to the supported items in the course of their normal function. Design supports with a safety factor of 3. Design supports further as required to accommodate structural deflection.

2.5.3 Provide all accessories, inserts and fixings necessary for attachment of supports to building structure. Drill supports as required to receive attachment of supported items. Arrange supports to avoid conflicts with pipes, ducts, precast concrete connections, thermal and vapour barrier construction, framing provided under other sections, and such that supports and their fixings are fully concealed from view within the finished work.

2.5.4 Paint all supports unless galvanizing is specified.

2.5.5 Provide concealed support elements or framing as required for the following items:

.1 Vanities.
.2 Grab bars occurring on gypsum board partitions.

2.6 LINTELS

2.6.1 Supply loose steel lintels to other Sections where required for building into the work. Fabricate lintels as shown on the Drawings. Galvanize lintels which will be exposed to the exterior.

2.6.2 Lintels for wall of less than 8" nominal thickness shall be masonry lintels supplied and installed under Section 04200.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 Install miscellaneous metals work in the correct locations and positions, plumb, level, structurally sound, securely fastened, free from defects detrimental to finished appearance and to the approval of the Consultant.

3.1.2 Install the work of this Section using skilled craftsmen and in accordance with manufacturer's recommendations where applicable.

3.1.3 After installation, spot prime field bolt heads and nuts, field rivets, welds and any abrasions or damage to the shop coat of the primer.

3.1.4 Perform drilling of steel and/or concrete masonry to fasten the work of this Section.

3.1.5 All surfaces prime painted under the Section shall be free from runs, sags, crawls and other defects. This Section shall repair any such defects to the satisfaction of the Consultant.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 Provide all labour, materials, products, equipment and services to complete the rough carpentry indicated on the Drawings and specified herein and/or necessary.

1.2 REFERENCES

1.2.1	CSA-O141-05(R2014)	Softwood Lumber
1.2.2	CAN/ULC-S102-10	Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
1.2.3	CAN/CSA O80-Series-15	Wood Preservation
1.2.4	CSA B111-1974 (R2003)	Wire Nails, Spikes and Staples
1.2.5	CSA O121-08(R2013)	Douglas Fir Plywood

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

1.3.1 Accept delivery of pressed steel door frames. Be responsible for any damage to frames from time of delivery until accepted by the Consultant after installation.

1.3.2 Provide dry storage areas for rough carpentry materials. Stack lumber 6" clear of floor.

1.3.3 Protect fire-retardant materials against high humidity and moisture.

1.3.4 Install temporary wood protection strips at door jambs and similar locations vulnerable to damage.

1.3.5 Cover materials stored on site with tarpaulins or polyethylene sheets to prevent moisture, absorption and impairment of structural and aesthetic-properties.

1.4 QUALITY ASSURANCE

1.4.1 Identify all lumber and plywood delivered to the site by the grading stamp of an approved association or independent grading agency.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Wood materials: Straight, sawn square, true, dressed four sides, properly sized and shaped to correct dimensions from nominal sizes indicated or specified.

2.1.2 Lumber grade and moisture content: Comply with official grading rules of NLGA for the particular lumber and grade, and structurally complying with the latest requirements of the NBC. Use only grade marked lumber.

2.1.3 Maximum moisture content of lumber: 7% for interior work, 19% for exterior work.

2.1.4 Softwood lumber: Comply with CSA O141.

2.1.5 Douglas Fir Plywood: Complying with CSA O121, COFI Exterior.

2.1.6 Framing lumber: Lumber for structural components shall be of species and grade specified, well seasoned, processed and stamped at same mill with appropriate grade markings. Conform to requirements of Standard Grading Rules for Canadian Lumber of National Lumber Grades Authority the (NLGA) with latest supplements, approved by the Canadian Lumber Standards Administrative Board.

.1 No. 1 Construction grade, Spruce, Balsam Fir, Lodgepole Pine or Ponderosa Pine.

2.1.7 All wood materials: Well seasoned, free from defects that would impair strength or durability.

2.1.8 Wood curbs: Vacuum/pressure impregnated in accordance with CAN/CSA O80.1 to an average net retention of [6.0 kg/m^3|0.40 lb./ft^3]. Wolman CCA preservative or other approved manufacture. Species shall be southern pine, ponderosa pine, fir, western hemlock or jack pine.

2.1.9 Blocking, concealed framing, cant strips, grounds, nailing strips: No. 2 Ontario White Pine, No. 2 Red Pine, or Construction No. 1 Jack Pine, all complying with the grading rules of NLGA, or Construction Douglas Fir complying with COFI standard grading and dressing rules.

2.2 PRESSURE PRESERVATIVE TREATED MATERIALS FOR ALL EXTERIOR APPLICATIONS / FRAMING

2.2.1 Pressure Preservative Treated Lumber: Lumber graded and stamped in accordance with applicable grading rules and standards of associations or agencies approved to grade lumber by Canadian Lumber Standards Accreditation Board in accordance with CAN/CSA O80 Series.

.1 Species: Pine or Spruce-Pine
.2 Grade: No.2 or better structural posts and lumber, pieces may be grade stamped or shipment certified by letter of compliance.
.3 Grading authority: NLGA, paragraph 131CC
.4 Material having twisted grain or structural defects affecting integrity of lumber will not be acceptable for this project.
.5 Use only material with radius edges, minimum 6 mm.
.6 Kiln dry lumber materials to 8% moisture content or less.

2.2.2 Pressure Preservative Treated Plywood: Treated in accordance with CAN/CSA O80 Series, using water-borne preservative to obtain minimum net retention of 4 kg/m^3 of wood. Plywood or laminated materials shall be manufactured with exterior grade adhesives. After treatment, plywood shall be kiln dried to moisture content of 8% or less.

2.3 PRESSURE FIRE RETARDANT TREATED MATERIALS

2.3.1 Treat by pressure impregnation with fire-retardant chemicals in accordance with CAN/CSA O80 Series to provide classification for flame spread of not more than 25, smoke developed of not more than 75 in accordance with CAN/ULC S102.

2.3.2 All fire retardant wood must comply with the requirements in AWPA Standard C20 for lumber and C27 for plywood.

.1 AWPA C20: Structural Lumber, Fire-Retardant Pressure Treatment, lumber materials shall only be of species listed. After treatment, lumber 50 mm or less in thickness shall be kiln dried to moisture content of 8% or less.
.2 AWPA C27: Plywood, Fire-Retardant Pressure Treatment, plywood or laminated materials shall be manufactured with exterior grade adhesives. After treatment, plywood shall be kiln dried to moisture content of 8% or less.
.3 All species to comply with CAN/ULC S102 for surface-burning characteristics and shall bear identification showing classification and type of fire retardant.

2.3.3 Each piece or bundle of fire-retardant treated material or panel to bear ULC inspection label or stamp attesting to FRS rating indicating flame spread, smoke developed, and fuel contributed classification meeting AWPA standard C20 and C27 for Type A Use.

2.3.4 Fire retardant chemicals used to treat lumber must comply with FR-1 of AWPA Standard P17 and shall be free of halogens, sulphates and ammonium phosphate.

2.3.5 Acceptable materials: Plywood and lumber materials treated by licensed applicators with fire retardant materials from the following:

.1 Hickson Corporation – Dricon FRTW
.2 Hoover Treated Wood Products Inc. – Pyro-Guard
.3 Chemical Specialties Inc. – D-Blaze

2.3.6 Rough hardware: Nails, screws, bolts, lag screws, anchors, special fastening devices and supports as required for the erection of all rough carpentry items.

2.3.7 Fastenings, nails, bolts, screws, lag screws, anchors, special fastening devices and supports as required for the erection of all rough carpentry items: Complying with CSA B111.

2.4 FABRICATION

2.4.1 Comply with CAN/CSA-O86 for all fabrication and assembly of structural components off site, or on site.

2.4.2 Treat wood in contact with masonry, or concrete, with wood preservative before setting in place. Apply preservatives in accordance with the manufacturer's written instructions.

2.4.3 Design construction details for expansion and contraction of materials.

2.4.4 Machine sand surfaces exposed in the finished work. Hand sand to an even smooth surface free from scratches.

2.4.5 Refer to structural drawings for sizes and structural requirements.

2.5 FABRICATION - FIRE RETARDANT TREATMENT

2.5.1 Pressure fire retardant treat lumber prior to final milling. Each piece shall bear the mark of Underwriters' Laboratories of Canada indicating conformance to Standard CAN/ULC-S102.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

3.1.1 Supply all labour, materials, equipment, services and perform all operations required to complete all rough carpentry work to the full intent of the drawings and as herein specified.

3.1.2 Consult with and co-operate with other Sections in advance and build-in or make provisions for installation of other work.

3.1.3 Provide running members of the longest lengths obtainable.

3.1.4 Slowly feed machine-dressed members using sharp cutters. Provide finished members free from drag, feathers, slivers or roughness of any kind. Remove machine marks by sanding.

3.1.5 Properly frame material with tight joints and rigidly secure in place. Use glue-blocks where necessary.

3.1.6 Design construction methods for expansion and contraction of the materials.

3.1.7 Conceal joints and connections wherever possible. Locate prominent joints only where directed.

3.1.8 Erect work plumb, level, square and to the required lines.

3.1.9 Do not regard blocking, strapping and other rough carpentry indicated as complete or exact. Provide rough carpentry items required for the installation of the work of other Sections. Blocking shall be through-bolted to structure.

3.1.10 Set and secure wood level, plumb and to correct locations indicated on Drawings. Ensure horizontal bowing is kept to a minimum.

3.1.11 Provide temporary bracing and anchorage required to hold members in place until permanently secured. Ensure member ends have sufficient bearing area.

3.2 INSTALLATION - GROUNDS, STRAPPING AND FURRING

3.2.1 Install grounds of a thickness required for the application of finishes. Install roomside surfaces of grounds plumb and in true plane throughout. Secure grounds to metal furring with 16 ga. galvanized soft annealed tie wire.

3.2.2 Provide wood furring and strapping for applied facings, cupboards, caseworks, lockers, cubicles etc.

3.2.3 Provide 1" x 2" strapping at 16" o.c. to suit details. Secure to nailing strips.

3.2.4 Furring generally shall be 2" x 2" at 16" o.c. erected to suit job conditions, where indicated.

3.2.5 Shim members as required to provide a true and plumb surface.

3.3 INSTALLATION - CANT STRIPS, BLOCKING AND CURBS

3.3.1 Apply wood preservative to all surfaces of wood cant strips and blocking to be covered with flashing.

3.3.2 Provide wood blocking as indicated. Provide curbs around roof openings wider than 10" in any direction. Build up curbs of 2" x 6" members to 12" minimum above finished roof level. Bolt or anchor curbs securely in place at 2'-0" o.c. Provide blocking under cants equal to insulation thickness.

3.3.3 Provide 3/4" thick, fire retardant treated, plywood mounting boards as required for mechanical and electrical equipment. Securely fasten to concrete, masonry or gypsum wallboard framing.

3.3.4 Immediately apply, in instance where primed work is cut, a coat of wood preservative to the resulting raw surfaces.

3.3.5 Provide wood blocking for anchoring of window frames.

3.3.6 Provide double studs or wood blocking and bolts in stud partitions for fastening of handrails, grab bars, to be capable of supporting 230 kg (500 lb) downward pull. Provide double studs and blocking for anchoring of door frames, and other items anchored to stud partitions.

3.3.7 Provide 5/8" thick fire retardant treated plywood fastened to metal stud framing, at washroom mirrors. Provide 5/8" thick plywood backing for mirrors fastened to block.

3.3.8 Co-ordinate with Section 09 29 00 - Gypsum Board, the installation of wood blocking for fastening of wall mounted accessories and casework

3.4 INSTALLATION - ROUGH HARDWARE

3.4.1 Supply and install rough hardware, including hardware for temporary enclosures.

3.4.2 Provide fasteners long enough so that at least half their length penetrates into the second member and as recommended by COFI. Minimize splitting of wood members by staggering the fasteners in the direction of the grain and by keeping fasteners well in from edges. Use spiral, annular or resin coated nails for plywood.

3.4.3 Fasten to hollow masonry units with toggle bolt, to solid masonry or concrete with lead expansion shields and lag screws. Do not use organic fibre or wood plugs.

3.5 INSTALLATION - PRESSED STEEL FRAMES

3.5.1 Set frames plumb and square in their exact location. Firmly block and brace to prevent shifting. Shim up where required to ensure proper alignment dimensions from finished floor to head of frame. Install temporary wood spreaders at midheight.

3.5.2 Where pressed steel frames are installed in concrete walls, secure frames to concrete using lead expansion shields and anchor bolts. Perform drilling of concrete as required. Fill recessed bolt heads flush to frame face with approved metal filler and sand smooth.

3.5.3 Install fire rated door frames in accordance with requirements of authorities having jurisdiction to provide the required rating.

3.5.4 Install fire rated door frames in accordance with requirements of National Fire Protection Association and authorities having jurisdiction to provide the required rating.

3.6 PRESSURE PRESERVATIVE TREADED WOOD INSTALLATION

3.6.1 Comply with AWPA M4.

3.6.2 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation. Allow first coating to fully soak into grain before applying second coating in accordance with manufacturer’s instructions.

3.6.3 Remove with fine sandpaper, chemical deposits on treated wood to receive applied finish.

3.6.4 Use only hot-dipped galvanized, corrosion resistant nail or screw fasteners. Staples are not acceptable for installation of preservative treated materials.

3.6.5 Use water-borne preservative treated wood for:

.1 Wood in contact with masonry or concrete,
.2 Wood within 450 mm of grade,
.3 Wood decking and fence boards,
.4 Wood in contact with flashings,
.5 Wood in contact with waterproofing membranes, confirm compatibility with membrane manufacturer prior to application.

3.6.6 Use oil-borne preservative treated wood for:

.1 Wood in contact with the ground,
.2 Wood in contact with freshwater,
.3 Landscaping timbers,
.4 Retaining walls,
.5 Piers or docks,
.6 Pilings,
.7 Bases of utility poles,
.8 Bases of fence posts.

3.7 PRESSURE FIRE RETARDANT TREATED WOOD INSTALLATION

3.7.1 Field Cuts:

.1 Do not rip, mill or conduct extensive surfacing of fire retardant treated lumber, label will be voided.
.2 Only end cuts, drilling holes and joining cuts are permitted.
.3 All cuts on plywood will be considered end cuts.
.4 Fire-retardant lumber and plywood can be given a light sanding for cosmetic cleaning after treatment.
.5 Pre-cut to the greatest extent possible before treating.

3.7.2 Fire retardant treated plywood used in structural applications shall be graded or span-rated material.

3.7.3 Use only hot-dipped galvanized, corrosion resistant nail or screw fasteners. Staples are not acceptable for installation of fire resistant treated materials.

3.7.4 Where humidity conditions are such that moisture may condense between hardware and treated wood, hardware shall be back-primed with a corrosive-inhibitive paint.

3.7.5 Back-prime at contact points and fasteners to prevent electrolysis when fire retardant framing members are used in metal buildings.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and documents referred to therein.

1.1.2 Provide labour, materials, products, equipment and services required to complete the fire stopping and smoke seals work.

1.2 RELATED WORK SPECIFIED ELSEWHERE

1.2.1 Caulking and Sealants: Section 07 90 00.

1.2.2 Fire dampers in all locations where ductwork services and conduits passes through wall, partition, roof or ceiling, required to be fire rated: Mechanical & Electrical & IT Division.

1.3 REFERENCES

1.3.1	ASTM E814-13a	Standard Test Method of Fire Tests of Penetration Firestop Systems.
1.3.2	CAN/ULC S115-11	Standard Method of Fire Tests of Firestop Systems.

1.4 SYSTEM DESCRIPTION

1.4.1 Work of this Section comprises fire stopping and smoke seal materials and/or systems to provide closures to fire and smoke at openings around penetrations, at unpenetrated openings, at projecting or recessed items, and at openings and joints within fire separations and assemblies having a fire-resistance rating, including openings and spaces at perimeter edge conditions.

1.4.2 Provide seals to form draft tight barriers to retard the passage of flame and smoke.

1.4.3 The installed seal shall provide and maintain a fire resistance rating equivalent to the rating of the adjacent floor, wall or other fire separation assembly to the requirements of and as acceptable to the authorities having jurisdiction and the Consultant.

1.4.4 Fire stopping and smoke seals within mechanical (i.e. inside ducts, dampers) shall be provided as part of the work of Division 15. Fire stopping and smoke seals around the outside of such mechanical assemblies where they penetrate rated fire separations shall be part of the work of this Section.

1.5 QUALITY ASSURANCE

1.5.1 Provide the work of this Section using experienced and competent installers, approved, trained and licensed by the material or system manufacturer.

1.5.2 Fire stopping and smoke seal materials shall conform to the temperature and flame rating, and fire hose rating of CAN/ULC S115 and ASTM E814, and other requirements of authorities having jurisdiction.

1.6 SUBMITTALS

1.6.1 Submit shop drawings indicating the ULC assembly number, the required temperature and flame rating, thickness, installation methods and materials of fire stopping and smoke seals, damming

materials, anchorages and fastenings.

1.6.2 Submit manufacturer's product data for materials and prefabricated devices, providing descriptions sufficient for identification at the Project site. Include manufacturer's printed instructions for installation.

1.6.3 Submit samples of each type of fire stopping and smoke seal material.

1.6.4 Submit manufacturer's certification that installed fire stopping and smoke seal materials comply with specified requirements.

1.7 MOCK-UP

1.7.1 Apply one sample installation on representative substrate of each type of installation and required fire rating.

1.7.2 Sample shall comply with requirements as to thickness and density of application to achieve fire rating required.

1.7.3 Acceptable mock-up may remain as part of completed work.

1.8 DELIVERY, STORAGE AND HANDLING

1.8.1 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels intact. Protect from damage and environmental conditions in accordance with manufacturer's recommendations.

1.9 SITE CONDITIONS

1.9.1 Comply with manufacturer's recommended requirements for temperature, relative humidity, and substrate moisture content during application and curing of materials.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

2.1.1 Fire stopping and smoke seal materials of the following manufacturers complying with these specifications are acceptable:

.1 Canadian General Electric Company Limited.
.2 Electrovert Ltd.
.3 Firestop Systems Inc.
.4 M.W. McGill and Associates.
.5 Tremco Ltd.
.6 Hilti (Canada) Corporation.
.7 or other approved manufacture.

2.2 MATERIALS

2.2.1 Fire stopping and smoke seals: Asbestos free materials and systems complying with standards specified herein, by one or more of the specified acceptable manufacturers, installed in accordance with tested assemblies acceptable to authorities having jurisdiction to provide an effective barrier against the passage of fire, smoke and gases, and to provide a fire resistance rating not less than the fire resistance rating of the surrounding floor, wall or other assembly.

2.2.2 Products shall be manufactured under ULC Follow-up Program and each package/container shall bear ULC label or listing mark.

2.2.3 Service penetration assemblies: Certified by ULC in accordance with CAN/ULC S115 and listed in ULC Guide No. 40 U19.

2.2.4 Service penetration firestop components: Certified by ULC in accordance with CAN/ULC S115 and listed in ULC Guide No. 40 U19.13 under the Label Service of ULC.

2.2.5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: An elastomeric seal; do not use a cementitious or rigid seal at such locations.

2.2.6 Firestopping and smoke seals at openings around penetrations for pipes, duct work and other mechanical items requiring round and vibration control: Elastomeric, do not use cementitious or rigid seal at such locations.

2.2.7 Primers: To manufacturer's recommendation for specific material, substrate, and end use.

2.2.8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

2.2.9 Damming and backup materials, supports and anchoring devices: To manufacturer's recommendations, and in accordance with the tested assembly being installed as acceptable to authorities having jurisdiction.

2.2.10 Sealants for vertical joints: Non-sagging.

PART 3 - FABRICATION

3.1 FIRESTOPS

3.1.1 Supply and install mineral wool firestop material at all suspended slabs, between edge of slabs and exterior cladding and in vertical positions at air shafts. Place firestop material under permanent 35% compression. Use impaling clips or metal trims to hold insulation in place.

3.1.2 Supply and install stick clips at maximum [300 mm|1'-0"] o.c. secured to concrete in an approved manner, to support firestop material in place.

3.1.3 Supply and install continuous steel angles, hot dipped, galvanized, minimum [10 mm|3/8"] thick for firestopping where shown and as required.

PART 4 – EXECUTION

4.1 PREPARATION

4.1.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are dry and frost free.

4.1.2 Clean bonding surfaces to remove deleterious substances including dust, paint, rust, oil, grease and other foreign matter which may otherwise impair effective bonding.

4.1.3 Do not apply fire stopping and smoke seals to substrates and surfaces previously painted or treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

4.1.4 Remove insulation from insulated pipe and duct where such pipes or ducts penetrate a fire

separation unless ULC certified assembly permits such insulation to remain within the assembly.

4.1.5 Beginning of installation shall indicate acceptance of existing conditions.

4.1.6 Prepare surfaces and prime in accordance with manufacturer's directions.

4.1.7 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

4.2 MIXING

4.2.1 Mix components in a mixer clean and free of used and set materials and surface contaminants.

4.2.2 Thoroughly mix components in accurate proportions.

4.2.3 Apply mixed materials within time limit recommended by the manufacturer.

4.3 APPLICATIONS

4.3.1 Apply fire stopping and smoke seals in strict accordance with manufacturer's instructions and tested designs to provide the required temperature and flame rated seal, and to prevent the passage of smoke.

4.3.2 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

4.3.3 Completely fill and seal voids with fire stopping and smoke seal materials.

4.3.4 Tool or trowel exposed surfaces.

4.3.5 Remove excess compound promptly as work progresses and upon completion.

4.3.6 Allow materials to cure. Do not cover up materials until full curing has taken place.

4.3.7 Notify Consultant when completed installations are ready for inspection and prior to concealing or enclosing fire stopping and smoke seals.

4.4 SCHEDULE OF LOCATIONS

4.4.1 Provide fire stopping and smoke seal materials at openings and penetrations in fire resistance rated assemblies, including but not limited to, the following locations:

.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.

4.5 CLEAN UP

4.5.1 Remove excess materials and debris and clean adjacent surfaces immediately after application.

4.5.2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 All labour, materials, products, equipment and services to complete the joint caulking and sealants work necessary and/or indicated on the Drawings and specified herein.

1.1.3 All caulking and sealing required to make the building sealed tightly from the exterior and caulked from the interior to withstand the action of the elements and to complete the building vapour barrier and not specified under other Sections, shall be the work of this Section.

1.2 WORK INCLUDED UNDER OTHER SECTIONS

1.2.1	Cast-in-Place Concrete:	Section 03 30 00.
1.2.2	Masonry Wall:	Section 04 20 00.
1.2.3	Fire stopping and smoke seals:	Section 07 84 00.
1.2.4	Gypsum Board:	Section 09 29 00.

1.3 REFERENCES

1.3.1	CGSB 19-GP-5M	Sealing Compound, One-Component, Acrylic Base, Solvent Curing (Incorporating Amendment No. 1)
1.3.2	CAN/CGSB 19.24-M90	Multicomponent, Chemical-Curing Sealing Compound

1.4 QUALITY ASSURANCE

1.4.1 Perform the work by a recognized established caulking and sealing contractor having at least five years experience and skilled mechanics thoroughly trained and competent in the use of caulking and sealing equipment and the specified materials.

1.4.2 Arrange with the caulking and sealant manufacturers for visit at the job site by one of their technical representatives before beginning the caulking and sealing installation to discuss with the Contractor and the Consultant the procedures to be adopted, to analyze site conditions and inspect the surfaces and joints to be sealed, in order that recommendations may be made.

1.4.3 Discuss the following items:

.1 Weather condition under which work will be done;
.2 Anticipated frequency and extent of joint movement;
.3 Joint design;
.4 Suitability of Durometer hardness and other properties of material to be used.

1.4.4 Technical representative shall randomly inspect preparation of substrate and perform random testing of installed work at least ten (10) locations.

1. Cut tests locations to be 150mm long.
2. Certify thickness, hardness and surface finish conforms to intended design.
3. Report to consultant.

1.5 SUBMITTALS

1.5.1 Submit a signed letter from the sealant and caulking manufacturers prior to commencement of work of this Section which states:

.1 Sealants and caulking materials selected for use from those specified;
.2 Surface preparation requirements;
.3 Priming and application procedures;
.4 Verification that sealant and caulking are suitable for purposes intended and joint design;
.5 Sealants and caulking are compatible with other materials and products with which they come in contact including but not limited to sealants provided under other Sections, insulation adhesives, bitumen, block, concrete, metals and metal finishes;
.6 Verification that sealants and caulking are suitable for temperature and humidity conditions at time of application.

1.6 ENVIRONMENTAL CONDITIONS

1.6.1 Ambient and substrate surface temperatures shall be above 5°C during application and during the work of this Section.

1.7 WARRANTY

1.7.1 Submit a five year warranty of the materials and workmanship for the sealing work. Under the warranty, the materials shall not breakdown, decompose, lose their resiliency, crack, or lose bond with sides of joints.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 All caulking and sealants: Non-bleeding and capable of supporting their own weight except for the self-levelling type sealant for horizontal surfaces.

2.1.2 Caulking: One component acrylic base (solvent release type) complying with CGSB 19-GP-5M.

2.1.3 Caulking for horizontal surfaces: Self-levelling pourable grade, Shore "A" hardness of 25-35, fully water resistant for continuous wet conditions, grey in colour, Duoflex SL by Sika, or other approved manufacture.

2.1.4 Sealant: Multi-component chemical curing, complying with CAN/CGSB 19.24-M Type 2, Dymeric 240FC by Tremco Manufacturing Company (Canada) Ltd., or other approved manufacture.

2.1.5 Sealant for saw-cut horizontal surfaces: Multi-component, self-levelling, conforming to ASTM D2240 Tremco Control Joint Sealant, BASF Masterfill 300, or Sika Loadflex.

2.1.6 Sealant for Joints around Interior Door Frames, Windows and Under Exterior Thresholds: One-part, low or medium modulus, neutral curing 100% silicone joint sealant, conforming to ASTM C920-11, Type S, Grade NS, Class 35.

.1 DC CWS by Dow Corning.
.2 SWS by GE
.3 SikaSil WS-305CN by Sika

2.1.7 Sealant for Exterior Wall Joints: Air-seal sealant: One part, silicone, shore A hardness 15-25,

conforming to CGSB 19-GP-13M, classification C-1-40-B-N and C-1-25-B-N and ASTM C920-11, Type S, Grade NS, Class 25. Use NT, M, G, A and O:

.1 DC 791 by Dow Corning
.2 UltraPruf II SCS 2902 by GE
.3 Spectrum 3 by Tremco
.4 SikaSil N-Plus by Sika

2.1.8 Sealant for vanity and kitchen counter splash-backs and washroom fixtures: Mould and mildew resistant, Shore A Hardness 15-25, conforming to ASTM C920, Type S, Grade NS, Class25, use NT, G, and A:, colour white.

.1 SCS1700 by GE
.2 DC 786 by Dow Corning
.3 Tremsil 200 by Tremco
.4 Omni Plus by Sonneborn
.5 SikaSil –GP by Sika

2.1.9 All caulking, sealants, cleaning solvents, fillers and primers: Compatible with each other.

2.1.10 Colours for caulking and sealants: As selected later by the Consultant and not necessarily standard colours.

2.1.11 Joint backing: White non-absorbent open cell foam polyethylene, Sof Rod, by Tremco, or other approved manufacture. Filler diameter shall be 50% greater than joint width before installation.

2.1.12 Bond breaker: Tape of type supplied or recommended by sealant or caulking manufacturer.

2.1.13 Primers: As recommended by the caulking and sealant manufacturer. Primers shall suit the various job conditions.

2.1.14 Cleaning material: Xylol, Methyl-ethyl-ketone, Toluol or as recommended by the caulking and sealant manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

3.1.1 Ensure joints to receive sealant and caulking are suitable to accept the sealant and caulking.

3.1.2 Ensure that surfaces to be caulked or sealed are sound, dry, free from dirt, water, frost, loose scale, corrosion asphalt, paints or other contaminants which may adversely affect the performance of the caulking or sealing materials.

3.1.3 Before any caulking or sealing is commenced, test the materials for indications of staining or poor adhesion.

3.1.4 Do not apply caulking or sealing to masonry until mortar has cured.

3.1.5 Ensure joints and spaces which are to receive caulking or sealing compound are in no case less than [10 mm|3/8"] deep; nor less than [6 mm|1/4"] wide nor more than [20 mm|5/8"] wide.

3.2 PREPARATION

3.2.1 Perform cleaning to the extent required to achieve acceptable joint surfaces.

3.2.2 Ensure ambient and existing site conditions are suitable for installation of sealant work.

3.2.3 Protect adjacent finishes from damage, where heavy abrasive cleaning is required such as sandblasting, grinding or wire brushing.

3.2.4 Cleaning procedures:

.1 Metal:

.1 Blast cleaning: Sandblast or iron shot blast surfaces requiring heavy cleaning to bright metal. Remove loose matter by compressed air or commercial vacuum cleaner.

.1 Power tool cleaning: Clean surfaces by wire brush, impact tools, abrasive wheels or by buffing. Remove loose matter by compressed air or vacuum cleaner.

.3 Solvent cleaning: Clean with solvent applied by spray or brush. Wipe with clean wiping cloth. Remove paints with paint remover and wipe with solvent. Remove residue.

.2 Concrete and Masonry:

.1 Remove all friable material with wire brush or chipping, until surfaces are sound. Remove surface residue with a stiff brush, vacuum cleaner or compressed air.

.2 Concrete surfaces shall be cured for at least 28 days. Acid etch joint surfaces to remove alkaline salts and neutralize acid with a solution of trisodium phosphate, followed by rinsing with clean, cold water.

.3 Allow joints to dry thoroughly.

.4 Completely remove resinous products used as curing compounds and form release agents.

.3 Glass, Ceramics and Porcelain:

.1 Brush with solvent and wipe with clean wiping cloths. Remove residue.

.4 Wood:

.1 Remove foreign matter such as soil, paint, grease, asphalt, resin with solvents, abrasives and paint removers; make surfaces clean and dry.

3.2.5 Do not exceed shelf life, and pot life of the materials and installation times, as stated by the manufacturers.

3.2.6 Become familiar with the work life of the sealant to be used. Do not mix two part materials until required for use.

3.2.7 Mix sealants thoroughly with a mechanical mixer capable of mixing at 80-100 rpm without mixing air into the materials. Continue mixing until the material is a uniform colour and free from streaks of unmixed material.

3.2.8 Mask areas adjacent to the joints as required. Prevent contamination of adjacent surfaces. Remove masking promptly after the joint has been completed.

3.3 INSTALLATION

3.3.1 Install materials in compliance with the recommendations of their manufacturers.

3.3.2 Fill joints to within [10 mm|3/8"] of the surface with filler material.

3.3.3 If recommended by the manufacturer of the caulking or sealing materials, prime joints to prevent staining, or to assist the bond or to stabilize pouring surfaces. Apply primer with a brush which

will permit all joint surfaces to be primed. Perform priming immediately before installation of caulking or sealant.

3.3.4 Caulking and sealants shall be of gun or knife grade consistency to suit the joint condition. Use gun nozzles of the proper sized to suit the joints and the caulking and sealing material.

3.3.5 Install caulking and sealant with manually operated or air pressure operated guns.

3.3.6 Use sufficient pressure to fill all voids and joints. Caulking compounds and sealants shall bond to both sides of joint but not backing material.

3.3.7 Ensure that the correct sealant depth is maintained. Superficial painting with a skin bead will not be accepted.

3.3.8 Caulking installations shall be a full bead free from air pockets and embedded impurities and having smooth surfaces, free from ridges, wrinkles, sags, air pockets and imbedded impurities.

3.3.9 After joints have been completely filled, tool them neatly to a slight concave surface.

3.4 CLEANING

3.4.1 Immediately clean adjacent surfaces which have been soiled and leave work in a neat clean condition. Remove excess materials and droppings using recommended cleaners and solvents.

3.5 REPAIR

3.5.1 Cut out damaged caulking and sealing, re-prepare and prime joints and install new material as specified to the Consultant's satisfaction.

3.6 PROTECTION OF COMPLETED WORK

3.6.1 Provide wood planks or other approved, non-staining means of protection for the completed caulking and sealants installations where required to protect the work from mechanical, thermal, chemical and other damage by other construction operations and traffic.

3.6.2 Maintain protection securely in place until project completion. Remove protection when so directed by the Consultant.

3.7 LOCATION SCHEDULE

3.7.1 Use sealing compounds for joints to be filled on the exterior or weather side of the construction.

3.7.2 Seal between vanity and kitchen counter splash-back and wall finish, and sinks and taps to counter.

3.7.3 Seal between washroom fixtures and wall and/or floor.

3.7.4 Seal inside corners of tiled walls in washrooms.

3.7.5 Use caulking compounds to fill all other joints.

3.7.6 In general, seal the following joints:

.1 Exterior wood and metal frames - exterior side;

.2 Control and expansion joints in exterior walls, garage floors, and paving.
.3 Joints between walls and floating slabs.
.4 At shelf angle in exterior masonry walls.
.5 Provide sealant between curtain wall and air/vapour barrier and curtain wall and adjacent construction on the interior face of curtain wall.

3.7.7 In general, caulk the following joints:

.1 Interior aluminum or pressed steel frames - both sides;
.2 Exterior aluminum and pressed steel frames - interior side.
.3 Control joints in interior exposed masonry - both sides.
.4 Joint between full height masonry partitions and underside of structure - both sides.
.5 Drywall partitions extending to underside of structure - both sides.

3.7.8 Joint designations in previous paragraphs do not limit responsibility to caulk all locations required to create and secure a continuous enclosure.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 All labour, materials, equipment and services to supply the hollow metal door, and steel door and screen frame work necessary and/or indicated on the Drawings and specified herein.

1.2 RELATED WORK UNDER OTHER SECTION

1.2.1 Glass and glazing: Section 08 80 00.

1.3 REFERENCES

1.3.1	ASTM A794/A794M-12	Standard Specification for Commercial Steel (CS), Sheet, Carbon, (0.16% Maximum to 0.25% Maximum), Cold-Rolled.
1.3.2	ASTM A653/A653M-15	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
1.3.3	ASTM A924/M924-14	Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
1.3.4	CAN/CGSB 1.132-M90	Zinc Chromate Primer, Low Moisture Sensitivity.
1.3.5	CGSB 31-GP-105M	Coating, Conversion, Zinc Phosphate, for Paint base.
1.3.6	CAN/ULC S702-14	Standard for Thermal Insulation Mineral Fibre for Buildings.
1.3.7	CSA W47.1-09(2014)	Certification of Companies for Fusion Welding of Steel.
1.3.8	CSA W59-13	Welded Steel Construction (Metal Arc Welding), Includes Update No. 1 (2014), Update No. 3 (2015), Update No. 4 (2015).
1.3.9	ANSI/DHI A115	Installation Guide for Doors and Hardware.
1.3.10	CSDFMA	Canadian Steel Door and Frame Manufacturers Association.

1.4 SUBMITTALS

1.4.1 Shop drawings: Provide shop drawings in accordance with Section 01 33 00 - Submittals. Show, in as large a scale as practical, components, construction, methods of joining, welds, fastening and sleeving, type of metal, gauges and finishes, door swing, location of hardware and all other pertinent data. Clearly locate visible fixings on shop drawings.

1.4.2 Door and frame schedule: Identify each door and frame with a symbol listed in the schedule and place legibly on the unit at the time of manufacture. Co-ordinate symbol with architectural drawing symbols and indications.

1.4.3 Certificate: Substantiate design and construction of fire doors and frames, if required by the Consultant.

1.4.4 Submit full size hollow metal door and frame for approval, before production.

1.4.5 Upon Substantial Completion, provide Owner with a written Warranty, identifying both supplier and manufacturer, on materials and workmanship, for a period of one (1) year following date of completion. Deficiency correction during the period of warranty is the mutual responsibility of the General Contractor and the supplier.

1.4.6 Informational Submittals: Provide the following submittals when requested by the Consultant: Source Quality Control Submittals: Submit information on zinc coating treatment and primer spot treatment, including instructions for surface treatment before site painting and any restrictions or special coating requirements.

1.5 QUALITY ASSURANCE

1.5.1 Acceptable manufacturers listed below are members of The Canadian Steel Door & Frame Manufacturers' Association:
- All Steel Doors Ltd.
- Daybar Industries Ltd.
- Fleming Steel Doors

Acceptable manufacturers: Member of The Canadian Steel Door & Frame Manufacturers' Association.

1.5.2 Reference standards: Unless otherwise specified, meet requirements of "Canadian Manufacturing Specification for Steel Doors and Frames" published by the Canadian Steel Door & Frame Manufacturers' Association.

1.5.3 Fire protection requirements: fire rated doors; frames and sidelights shall bear ULC labels.

1.5.4 Frames shall be welded type; knockdown frames will not be acceptable.

1.5.5 All steel door and frame products shall be supplied from one manufacturer.

1.5.6 Owner to direct hardware requirements.

1.6 INSPECTION AND TESTING

1.6.1 One door will be selected at random by the Consultant and shall be submitted for deconstructive testing by the inspection and testing company appointed by the Consultant to verify conformance with the requirements of these specifications.

1.6.2 Door testing shall include:
.1 Verification that the door is internally reinforced with the specified core, steel sheet thickness, and other specified requirements.
.2 The cost of door inspection and testing shall be paid by the Owner. Replacement of tested door at no additional cost to the Contract.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

1.7.1 Carefully wrap doors and frames ensuring complete protection during shipping and storage.

1.7.2 Deliver units to the site in undamaged condition and store in a suitable location. Store units vertically.

1.7.3 Stockpile doors and frames inside the building with the identification symbol readily visible, and in the general order in which they will be required for installation and in such a way that the floor structure is not loaded beyond the capacity for which it was designed.

1.7.4 Touch-up damaged galvanized units promptly with zinc-rich primer. Touch-up prime coated units with primer.

1.7.5 Remove damaged units, installed or not, and install new units. Replace or make good adjacent work damaged on account of such replacements at no extra cost to the Owner.

1.8 SITE CONDITIONS

1.8.1 Site Measurements: Verify actual dimensions of openings by site measurements before fabrication and indicate measurements on shop drawings; coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.8.2 Established Measurements: Establish dimensions and proceed with fabricating doors and frames without site measurements where site measurements cannot be made without delaying the Work; coordinate construction to ensure that actual site dimensions correspond to established dimensions.

1.9 WARRANTIES

1.9.1 Submit a two (2) year warranty of the materials, products and labour of this Section and warranty that windows and panels are water and weather-tight, structurally sound and free from distortion; that aluminum finishes will not develop excessive fading or non-uniformity of colour, and will not crack, peel or otherwise corrode; that glazing splines and sealant will be free from deterioration from sunlight, weather and oxidation, and will be free from permanent deformation under load.

1.9.2 Submit a two (2) year warranty that aluminum finishes will not develop excessive fading, non-uniformity of colour, and will not crack, peel, delaminate, or otherwise corrode.

1.9.3 Submit a ten (10) year warranty of the insulating glass units and warranting that the insulating glass units shall be free from material obstruction of vision as a result of dust or film formation on the internal glass surfaces by any cause, under normal conditions, other than extrinsic glass breakage.

1.9.4 Upon Final Completion, provide Owner with a written Warranty, identifying both supplier and manufacturer, on materials and workmanship, for a period as listed above following date of completion. Deficiency correction during the period of warranty is the mutual responsibility of the General Contractor and the supplier.

1.9.5 Warranties shall include the prompt remedy of defect upon written notification from the Owner that defects exist. Remedy shall include labour, materials, equipment, and services required to make good defective areas of the work, and in case of the factory fabricated components, to supply and install new components, all at no cost to the Owner. Warranties shall also include making good other adjoining parts and finishes or other Owner's property damaged or disturbed in the process or remedying defects. Warranty period shall recommence on remedied work.

1.9.6 In the case of work performed by subcontractors and where warranties are specifically required or requested by the Consultant, secure such additional written warranties and deliver same to the Owner.

1.9.7 Warranties shall be in be in a form approved by the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Sheet steel:

.1 Exterior doors and frames galvanized steel sheet: commercial quality to ASTMA653. A653M. Hot dip coating to ASTM-A924/A924M, coating designation Z275 (G90) minimum steel thicknesses shall be in accordance with this specification. Finish painting of exterior frames and doors by others.

.2 Interior Doors and frames galvanized steel sheet: commercial grade steel to ASTM A653, CS Type B, coating designation ZF75 (A60) minimum steel thickness shall be in accordance with this specification. Frames to be supplied with factory prime paint; H.M. doors supplied with a factory paint finish.

2.1.2 Wipe coat galvanized with a minimum zinc coating of 107 g/sq m (0.35 oz/sq.ft.) to ASTM A653/A653M Coating Class A01.

2.1.3 Hot dip galvanized: Minimum 183 g/sq m (0.60 oz/sq.ft.) and having a Rockwell B maximum of 65 and suitable for forming and bending without metal or coating fracture.

2.1.4 Minimum thicknesses (Gauges), uncoated and zinc wipe coat steel:

.1	Door face sheets for interior doors	16 gauge (1.34 mm) base metal thickness, galvannealed coating Z75 (A60).
.2	Door face sheets for exterior doors	16 gauge (1.34 mm) base metal thickness, galvanized hot dip coating Z275 (G90).
.3	Top and bottom end channels spot Welded to the door faces	(16 ga.)

.4 Provide all interior, hollow metal doors with factory applied finish to meet or exceed ANSI/SDI A250.3-2007. Test procedure and acceptance criteria for factory applied finish coatings for steel doors and frames. Colour to be chosen by Architect.

.5 Provide all exterior hollow metal doors with factory applied prime finish to meet or exceed ANSI/SDI A250.10-1998. Test procedures and acceptance criteria for prime painted steel surfaces for steel doors and frames. Finish coats by Section 09900 – Painting.

.6 Doors to be bevelled 3 mm (1/8”) in 50 mm (2”) on hinge and lock edges, and have welded seams at hinge and lock edges.

.7 Doors shall have mortised hardware preparations and be adequately reinforced for all surface mounted hardware.

.8 Doors shall contain fixed metal louvres and/or lights as indicated on the drawings.

.9 Doors where shown or required shall be complete with approved fire labels.

.10 Reinforcements

Mortised template hinges	3.12 mm (10 ga.), with integral high-frequency angle, and integral field-conversion from standard-weight to heavy-weight hinges at all locations in both doors and frames.

.11

Continuous hinges	2.36 mm (12 ga.) continuous reinforcement in both doors and frames
Lock and Strike reinforcement	1.34mm (16 ga.)
Flush bolt reinforcement and Jamb floor anchors	1.34 mm (16 ga.)
Channel spreaders	1.34 mm (16 ga.)
Guard boxes	0.66 mm (22 ga.)
Hinge reinforcement	2.36 mm (12 ga.)
Anchors	
T anchors	1.34 mm (16 ga.)
L anchors	1.06 mm (18 ga.)
Closer	2.36 mm (12 ga.)
Surface mounted hardware	2.36 mm (12 ga.)

2.1.5 Door Cores:

.1 Exterior doors (non-heated areas) and interior heavy duty (high-traffic) doors (stairs, vestibules, general purpose room, and main entrance): hollow steel, vertically stiffened with 20 ga. steel ribs spot welded or laminated to face sheets. Fill voids with polystyrene insulation or fibreglass insulation. Edge seams to be continuously welded the full height of the door, filled and ground smooth with no visible seams. Exterior H.M. doors to be supplied factory primed painted. Interior H.M. doors to be supplied factory painted.

.2 Exterior doors (heated area): H.M. door stiffened and insulated with polyurethane or polyisocyanurate core. Edge seams to be continuously welded the full height of the door, filled and ground smooth with no visible seams. Exterior H.M. doors to be supplied factory primed painted.

.3 Interior doors standard duty: honeycomb structural small cell 25.4 mm (1”) maximum kraft paper ‘honeycomb’. Weight: 36.3 kg (80 lb.) per ream minimum, density: 16.5 kg/m³, (1.03 PCF) minimum, sanded to required thickness. Lockseam edges to be tack welded, filled and ground smooth. Interior doors to be supplied with a factory applied finish paint.

2.1.6 Primer: CAN/CGSB 1.132-M, Zinc chromate rust inhibitive primer.

2.1.7 Zinc rich primer: Galvafroid SB grade by W.R. Meadows Ltd., Kem Organic Zinc Rich Primer No. 6430, by Sherwin Williams Co. of Canada Ltd., Glidden No. 16113 zinc rich primer by Glidden Co. Ltd., or other approved manufacture.

2.1.8 Phosphatizing: CGSB 31-GP-105M.

2.1.9 Double stud bumpers: Black #52, by Stanley Works of Canada Ltd., or other approved manufacture.

2.1.10 Glass stops: 0.037" C-shaped, 16 mm (5/8") high, flush screw applied.

2.1.11 Fasteners for stops: Cadmium plated, recessed, flat or oval head Phillips screws.

2.1.12 Anchors: As required to suit condition.

2.1.13 Rubber Bumpers: 3 per door.

2.1.14 Insulation: CAN/ULC S702, Type 1, minimum density 24 kg/cu m (1.5 lb/cu.ft.) consisting of durable fibrous material processed from rock, slag or glass, bound with deterioration resistant binders.

2.1.15 Materials for fire-rated doors and frames: Complying with ULC requirements.

2.1.16 Sound and light seal: Drop seal mortise type 16 mm (5/8") neoprene insert by Pemko Mfg. Co., or mortise type drop seal #36H by Zero Weather-Stripping Co. Ltd., or other approved manufacture.

2.1.17 Gaskets: 16 mm (5/8") square neoprene rubber, closed cell extrusion.

2.2 FABRICATION – GENERAL

2.2.1 Assemble units by arc welding in accordance with CSA W59 to produce a finished unit square, true and free of distortion. Welding shall be continuous unless specified otherwise. Welding shall be undertaken only by a fabricator fully approved by the Canadian Welding Bureau to the requirements of CSA W47.1.

2.2.2 Permit access to an approved inspection and testing company for the purpose of inspecting at random, doors under construction for this project.

2.2.3 Make provisions in doors and frames to suit requirements of trade or Section providing security devices. Provide removable plates or knock-outs for electrical contacts. Provide conduit and fish wire to location of electric strike on concealed face of frames.

2.2.4 Provide all function holes for all latching and locking hardware, including those for through-bolted lever trim. (CSDFMA-08100, Article 2.3.5).

2.2.5 Factory mortise, reinforce, drill, and tap all preparations for mortise template hardware. Site-drill and tap for installation of surface-applied hardware, in accordance with hardware manufacturer=s installation templates. (CSDFMA-08100, Article 2.3.4).

2.3 FABRICATION - FRAMES AND SCREENS

2.3.1 Interior frames shall be wrap around frame and be made of 16 gauge (1.34mm thick) A60 galvannealed and have a minimum coating weight 0.6 oz/s.f. Frames to be supplied factory prime painted.

2.3.2 Exterior frames shall be wrap around frame and be made of 14 gauge (1.7mm thick) G90 galvanized. Fill jambs with batt insulation or spray in place polyurethane foam. Insulation to provide by frame install sub. Frames to be supplied factory primed.

2.3.3 Frames shall be set up and arc welded continuously on the inside of the face and ground smooth. Spreader bars are to be attached at the bottom and supplied with 3 rubber bumpers installed on strike jamb after final coat of paint has be supplied.

2.3.4 Frames with electronic hardware preparations are to be shipped to site with junction boxes welded to the frame at all mortised electric hardware preparations. Electrical boxes are supplied by this section. Frames shipped to site without required junction boxes will be rejected and returned to the supplier to be rectified. Knockdown frames will not be acceptable.

2.3.5 Form frames accurately to profiles indicated. Construct frames straight and free from twist or warp.

2.3.6 Blank, drill, reinforce and tap frames to receive templated hardware. Reinforce frames for installation of closers. Install stiffener plates or two angle spreaders where required to prevent bending of frame and to maintain alignment when setting. Weld reinforcement in place.

2.3.7 Punch frame mitres accurately and weld on inside of frame face. Fill frame corners, exposed surface depressions and butted joints with air-drying paste filler. Sand to a smooth uniform finish. Apply one coat of primer.

2.3.8 Supply jamb and mullion extensions and anchors required to secure screens to the structure. Fabricate anchorage to prevent transfer of load from support framing to the screens when deflection of structure occurs.

2.3.9 For all existing frames being modified to accommodate new standard height doors, each opening will require to be site measured. Confirm existing frame profile in order to fabricate horizontal mullions to fit. Notch mullions on both sides and fully weld in place. Construct new fire rated HM panels with two layers of 12mm or 16mm fire rated drywall laminated to two sheets of 18 gauge A60 Galvanized steel. Fastened panels using standard 12mm x 16mm glazing bead and self-drilling, self-tapping #6 x 1” glazing bead screws.

2.3.10 Where frames terminate at finished floor, supply floor plates for anchorage to slab. Check depth of extension of finished floor to structural slab and provide jamb extension anchorage as required. Provide 50 mm (2") minimum adjustment.

2.3.11 Provide three adjustable "T" anchors per jamb or six "L" anchors per jamb for frames up to 2300 mm (7'-6"). Add one "T" anchor or two "L" anchors per jamb for additional 600 mm (2'-0") or fraction thereof in frame height.

2.3.12 Supply removable stop and frame, where required for the overhead concealed door closers, properly connected to frame and prepared for attachment to closer, prior to shipment.

2.3.13 Provide three double stud bumpers per single door, four bumpers per double door, except for exterior doors. Lowest bumper shall be 230 mm (9") minimum above bottom of door.

2.3.14 Reinforce door frame head if opening is wider than 1500 mm (5'-0"). Reinforce jambs and mullions at junction of heads.

2.3.15 Fabricate metal screens to sizes shown.

2.3.16 Knock-down frames will not be permitted unless it can be shown that preassembled frames are impossible to install.

2.3.17 Install gaskets into 6 mm x 6 mm (1/4" x 1/4") deep groove in jambs and head of door frames, as shown. Apply with approved adhesive.

2.3.18 Where openings to receive hollow metal frames have already been built, supply reverse channel bucks, one for each 600 mm (2'-0") or fraction thereof. Reinforce bucks where frame is to be fire rated.

2.3.19 Fire rated frames in fire separations: Constructed to ULC approval and bearing ULC, ULI or Warnock Hersey Professional Services label, as acceptable to authorities having jurisdiction and as specified for doors. Locate label on inside of hinge jamb, midway between top hinge and head of door frame, so that it is concealed when door is closed.

.1 Frame System: Proprietary TRR framing system meeting the specified fire and resistive ratings and acceptable to fire rated glass systems installed under Section 08 80 00.

2.3.20 Where glass openings are indicated, provide integrally formed cutouts and sections with steel framed glass mouldings and glazing stop. Cutouts and moulded sections to allow for single snap in door glazing stop and double glazing stop. Aluminum mouldings will not be permitted.

2.4 FABRICATION - HOLLOW METAL DOORS

2.4.1 Fabricate doors 45 mm (1-3/4") thick, flush face, seamless and to conform to details and schedules.

2.4.2 Provide vertical steel stiffened core construction for all interior doors. Laminate steel stiffened core material to both inside faces of door, completely fill the inside hollow of the door with fiberglass insulation core material. Join door faces at vertical door edges by tack welding every 150mm (6”), filling, grinding and dressing smooth.

2.4.3 Provide insulated hollow steel construction for exterior doors and high traffic interior doors are required. Edge seams, continuously welded, filled and sanded flush. Weld recessed end channel closures to close top and bottom of door. Weld vertical stiffeners to face sheets at a maximum of 150 mm (6") o.c. Fill voids with insulation.

2.4.4 Equip fire labelled exterior doors with factory installed flush steel top caps.

2.4.5 Top and bottom of doors shall be provided with inverted, recessed, nominal 1.5 mm steel end channels [; nominal 2.74 mm steel end channels for acoustic doors], welded to each face sheet at 150mm on centre.

2.4.6 Mortise, reinforce, drill and tap doors to receive templated hardware and reinforce for surface mounted hardware. Check hardware list for details.

2.4.7 Provide both stiles of single doors bevelled 3 mm in 50 mm (1/8" in 2"). Fabricate doors with clearance of 3 mm (1/8") to the frame and 19 mm (3/4") to finished floor.

2.4.8 Provide flush top edge on exterior doors, with drip on exterior side.

2.4.9 Fill voids in stile and rail type doors, including stiles, transom head and bottom rail in glazed doors, with core material.

2.4.10 Where glass openings are indicated, provide integrally formed cutouts and sections with steel framed glass mouldings and glazing stop. Cutouts and moulded sections to allow for single snap in door glazing stop and double glazing stop. Aluminum mouldings will not be permitted.

2.4.11 Install sound and light gaskets using mortise type drop seal at bottom of door and gaskets at jamb and head of door. Set gaskets into a 6 mm x 6 mm (1/4" x 1/4") deep groove and fastened with approved adhesive.

2.4.12 Thermally broken doors shall be constructed in two sections, joined rigidly with thermal break material. Fabricate anchors for thermally broken frames to suit wall conditions; avoid cold transfer from exterior frame section to interior frame section.

2.4.13 Provide insulated sealed glazing kits to all exterior door with sidelight or glazed transom.

2.5 FABRICATION - FIRE RATED HOLLOW METAL DOORS

2.5.1 Construct fire rated doors to ULC requirements, bearing ULC, ULI, or Warnock-Hersey International Ltd., label, and acceptable to authorities having jurisdiction. Provide fire protection ratings indicated and time/ temperature rise label to requirements or authorities having jurisdiction.

2.5.2 Face sheets: Minimum nominal 1.5 mm (16 Ga.) base steel sheet thickness.

2.5.3 [Stiffened and sound deadened with vertical steel stiffeners laminated under pressure to each face sheet. Fill voids in between stiffeners with fiberglass insulation] [Stiffened, insulated and sound deadened with manufacturer’s proprietary Temperature Rise Rated (TRR) core material.]

2.5.4 Locate labels on the inside of door at hinge jamb midway between the top hinge and door head.

2.5.5 Construct and reinforce for hardware, fire-rated doors similar to standard units.

2.6 ACOUSTICAL DOORS AND FRAMES

2.6.1 Acoustical doors: Sound reduction doors, Series S, 45 mm (1-3/4") thick, complete with door frames, acoustical seals, automatic mortised door bottom, and complete assembly to provide minimum 43 STC when installed, by Stanley-Bumeda Ltd., or other approved manufacture.

2.7 INSULATED EXTERIOR STEEL DOOR FRAMES

2.7.1 Thermally broken frames shall be constructed in two sections, joined rigidly with thermal break material. Fabricate anchors for thermally broken frames to suit wall conditions; avoid cold transfer from exterior frame section to interior frame section.

2.7.2 Separate interior and exterior frame sections by a polyvinyl chloride (PVC) thermal break. Do not connect sections to each other by screws welds, grommets or other fastening devices.

2.7.3 Design wall and floor anchors to suit wall conditions and not to permit thermal transfer from exterior to interior surfaces of frame sections.

2.8 HARDWARE PREPARATION

2.8.1 Prepare for template hardware in accordance with ANSI/DHI A115 Standards, unless noted otherwise herein. Locate hardware preparations vertically in accordance with CSDFMA Recommended Dimensional Standards, unless noted otherwise herein.

2.9 FINISHING

2.9.1 Doors and frames manufactured from zinc wipe coated steel or hot dipped galvanized: Factory-applied touch-up primer to areas where coating has been removed or abraded due to grinding or handling.

2.9.2 Doors and frames to exterior: G90 Hot dipped galvanized.

2.9.3 Doors and frames to all other areas: A60 Wipe coat galvanized.

PART 3 - EXECUTION

3.1 EXAMINATION

3.1.1 Examine substrates, door swing arcs, areas of installation and conditions affecting installation for compliance with requirements for manufacturers installation tolerances and other conditions affecting performance of work of this Section.

3.1.2 Verify roughing-in for embedded and built-in anchor locations before installing frames.

3.1.3 Verify door and frame size, door swing and ratings with door opening number before installing frames.

3.1.4 Installation of hollow metal doors and frames will denote acceptance of site conditions.

3.2 INSTALLATION

3.2.1 Supply doors and frames to Sections responsible for installation.

3.2.2 Door Frames:

.1 Remove temporary spreaders before installing door frames, leaving exposed surfaces smooth and undamaged.
.2 Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set; limit of acceptable frame distortion 1/16” out of plumb measured on face of frame, maximum twist corner to corner of 1/8”; align horizontal lines in final assembly.
.3 Brace frames rigidly in position until adjacent construction is complete; install wooden spreaders at third points of frame rebate to maintain frame width, install centre brace to support head of frames 4’ and wider in accordance with ANSI A250.1; do not use temporary metal spreaders for bracing of frames.
.4 For frames over 1220mm (4’) in width, provide vertical support at the centre of head.

3.2.3 Frame Tolerances: Install frames to tolerances listed in ANSI A250.11, and as follows:

.1 Squareness: Maximum 0.8mm (1/32”) measured across opening between hinge jam and strike jamb.
.2 Plumbness: Maximum 0.8mm (1/32”) measured from bottom of frame to head level.
.3 Alignment: Maximum 0.8mm (1/32”) measured offset between face of hinge jamb and strike jamb relative to wall construction.
.4 Twist: Maximum 0.8mm (1/32”) measured from leading edge of outside frame rabbet to leading edge of inside frame rabbet.

3.2.4 Doors:

.1 Fit hollow metal doors accurately in frames within clearances required for proper operation; shim as necessary for proper operation.
.2 Install hardware in accordance with manufacturers' templates and instructions.
.3 Adjust operable parts for correct clearances and function.
.4 Install glazing materials and door silencers where required.
.5 Install fire rated doors within clearances specified in NFPA 80.
.6 Install louvers and vents.

END OF SECTION

PART 1 – GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 All labour, materials, products, equipment and services to supply factory finished wood doors required and/or shown on the Drawings and specified herein.

1.2 REFERENCES

1.2.1	ASTM E90-09 (2016)	Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
1.2.2		Architectural Woodwork Manufacturing Association of Canada (AWMAC) Architectural Woodwork Standards, 1st Edition, 2009.
1.2.3	CAN/CGSB 11.3-M87	Hardboard.
1.2.4	CAN/CGSB 19.13-M87	Sealing Compound, One Component, Elastomeric, Chemical Curing.
1.2.5		CHPA Official Grading Rules for Canadian Hardwood Plywood (1993).
1.2.6		CHPA Official Grading Rules for Rotary Cut Birch, Oak and Maple Veneers (June 1986).
1.2.7		Hardwood Plywood Reference Guide and Sales Handbook.
1.2.8	NFPA 80-2007	National Fire Protection Association (NFPA) Fire Doors and Windows
1.2.9		Underwriters Laboratories Canada (ULC), List of Equipment and Materials, Volume II, Building Construction, and Supplements.
1.2.10	ANSI/WDMA I.S. 1-A-13	Architectural Wood Flush Doors
1.2.11	WDMA I.S. 10-05	Testing Cellulosic Composite Materials for Use in Fenestrations Products

1.3 QUALITY ASSURANCE

1.3.1 Conform to Quality Standards for Architectural Woodwork (QSAW) produced by the Architectural Woodwork Manufacturer's Association of Canada (AWMAC) for Architectural Grade Doors.

1.4 Doors shall be manufactured by a Canadian company having five years experience in the manufacture of the doors specified.

1.4.1 Prior to fabrication of work of this Section, submit a list of new projects in the vicinity of the place of building for which the manufacturer has supplied doors during the past two years. List shall show the name of the Consultant associated with the project.

1.5 SUBMITTALS

1.5.1 Submit three 210 mm x 300 mm (8-1/2" x 11") samples of each type and colour of door facing material.

1.5.2 Submit a cut away section sample of each type of door showing its construction.

1.5.3 Shop Drawings: Submit shop drawings showing types of cores and construction details, glazing and stops, openings required, material designation and door schedules.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

1.6.1 Carefully wrap and crate units, and ensure complete protection of edges and finishes during shipment to the job site.

1.6.2 Store units inside the building in the order in which they will be required for installation, in such a way that no damage occurs and so that their identification of intended location is readily visible. Protect units from dust accumulation and moisture.

1.7 DELIVERY, STORAGE, HANDLING AND PROTECTION

1.7.1 Coordinate deliveries to comply with construction schedule and arrange ahead for off the ground, under cover storage location.

1.7.2 Do not permit delivery of work to job site until building is sufficiently dry, wet trades are completed and the moisture readings of surfaces in proposed storage area is less than 18%.

1.7.3 Materials shall be carefully checked, unloaded, stored and handled to prevent damage. Store doors flat on level surface. Protect materials with suitable non-staining waterproof coverings, but allow air circulation at sides.

1.7.4 Label each door with manufacturers' name, product identification, door size and type.

1.8 WARRANTY

1.8.1 Submit a five (5) year warranty, commencing from date of Substantial Performance, against defects in the materials and workmanship of the work of this Section, including but not limited to warping, cupping, twisting, shrinkage, swelling, delamination and splitting.

1.8.2 Warranty shall include the prompt remedy of defects upon written notification from the Consultant that defects exist. Remedy shall include labour, materials, products, equipment and services required to remove defective units and to supply and install new units including removal and replacement of hardware, fitting and hanging new unit and finishing to match original unit all at no cost to the Owner and at times convenient to the Owner.

1.8.3 Warranty shall also include making good other building parts and finishes and other property of the Owner damaged or disturbed in the course of remedying defects. Warranty periods shall recommence on remedied work.

1.9 LEED™ STRATEGIES

1.9.1 All trades must examine practices, as outlined in the related sections, to assist the team in achieving these results.

1.9.2 Related Sections:

.1 01 35 20 General LEED® Requirements
.2 01 35 50 Waste Management Disposal
.3 01 35 90 Indoor Air Quality Management
.4 01 61 10 LEED® Product Requirements
.5 31 25 00 Construction Pollution Prevention.

1.9.3 Materials used for Work in this section are to include, but are not limited to the following criteria:

.1 All materials under Work of this Section, including but not limited to, coatings, sealants, primers and adhesives to have low VOC contents in accordance with Section 01 35 90.
.2 Composite wood must contain no added urea-formaldehyde resins.
.3 Laminate adhesives to contain no urea-formaldehyde.
.4 All wood materials used in work of this Section are to be FSC Certified in accordance with Section 01 61 10.

1.9.4 The following must be submitted as appropriate for Consultant's review and approval:

.1 Submit an MSDS or product data sheet stating the VOC and urea-formaldehyde content, along with Schedule A of Section 01 35 90A LEED Product Requirements Schedules following the measures outlined in Section 01 35 90, for all applicable products.
.2 Submit Schedules A and D, as appropriate, of Section 01 61 10A LEED Product Requirements Schedules following the measures outlined in Section 01 61 10, for all applicable products.
.3 Submit Schedules C and D from Section 01 61 10A LEED Product Requirements Schedules for all FSC certified wood, and Schedule D for all wood, including wood contained in products/assemblies, following the measures outlined in Section 01 61 10.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

2.1.1 The following manufacturers are acceptable provided they comply with the requirements of this section:

.1 Baillargeon
.2 Lambton Doors
.3 Marshfield-Algoma.
.4 Mohawk Flush Doors
.5 VT Industries

2.2 MATERIALS

2.2.1 Conform to Quality Standards for Architectural Woodwork published by Architectural Woodwork Manufacturers Association of Canada (AWMAC) for Architectural Grade Doors, except where specified otherwise.

2.2.2 Unless otherwise specified herein, materials shall comply with requirements of CAN/CSA O132.2.

2.2.3 Wood for cores: Laminated Strand Lumber (LSL) Compliant with ANSI 1.S.4.

2.2.4 Mineral Cores (for fire-rated doors): Comply with the requirements of the label issuing authority for the scheduled fire ratings, as acceptable to the authorities having jurisdiction.

2.2.5 Sound Rated Doors: Where indicated in door schedule, provide STC 45 and 50 doors supplied with seals and gaskets tested by Manufacturer.

2.2.6 Edge Bands: Laminated to core with adhesive:

.1 Stiles: Laminated softwood and 5/8" thick hardwood edge, total width 4-1/2", at wood veneer faced doors provide hardwood edge matching wood veneer, at plastic laminate faced doors provide hardwood edge, between plastic laminate faces.
.2 Rails: 1/8” thick veneer, Longitudinally laminated for total with of 3 5/16”

2.2.7 Wood Stiles, Rails and Hardware Reinforcement: Low density hardwood species, kiln dried to 8% moisture content.

2.2.8 Adhesive: Conforms to CAN/CSA-0132.2 Series, Type II.

2.2.9 Vision panel stops: Machined to approved profile and smoothed, approximately 10 mm x 20 mm (1/2" x 3/4"), with all edges eased. Install with face flush with finished door surface. Stain finish to match face veneer.

2.3 FABRICATION - GENERAL

2.3.1 Door sizes shown on the Door Schedule are nominal sizes. Actual sizes shall fit openings.

2.3.2 Unless otherwise or more specifically required herein, door construction and tolerances shall comply with requirements of CAN/CSA O132.2, for flush doors.

2.3.3 Completely seal wood top, bottom and edges and edges of cut-outs, before units are shipped from the manufacturer's mill or are placed in the open air or unheated storage areas at the mill which would allow change in the specified moisture content of the wood. Apply sealer in accordance with the manufacturer's printed instructions without dilution or alteration of any kind. Give particular attention to finish. Obtain approval of Consultant of the finishes before proceeding with sealing. Should this procedure not be followed replace all doors which have been improperly sealed.

2.3.4 Provide blocking for closers, panic hardware, locksets and other door hardware as required.

2.3.5 Bevel edges of single acting doors 3 mm (1/8") on lock side and 1.5 mm (1/16") on hinge side.

2.3.6 Undercut doors for carpet in the plant.

2.4 FABRICATION - SOLID CORE DOORS

2.4.1 Flush wood doors: solid core to AWMAC Standard.

.1 Solid Wood Core: Laminated Strand Lumber (LSL) Compliant with ANSI 1.S.4
1. Construction: 5-ply.
2. Use: interior.
.2 Door Thickness: 45 mm overall.

2.5 FABRICATION - DOORS FOR NATURAL OR STAIN FINISH

2.5.1 Fabricate doors for natural or stain finish with solid cores.

2.5.2 Face veneer: complying with CAN/CSA O132.2, refer to part 2.2.8. of this Section.

2.6 FINISHES

2.6.1 Coloured stain finish, coordinate with section 06 20 00:
- .1 Sand
- .2 1 coat coloured stain to match sample provided by the Consultant.
- .3 1 coat sealer allow to dry
- .4 Sand
- .5 1 coat gloss varnish allowed to dry
- .6 Sand
- .7 1 coat satin varnish.

PART 3 - EXECUTION

3.1 EXAMINATION

3.1.1 Verify that frames are in accordance with indicated requirements for type, size, location, and swing characteristics and are installed with level heads and plumb jambs.

3.1.2 Exam all doors thoroughly before installation or finishing; reject any defective doors and obtain replacements from manufacturer at no additional cost to the Owner or Project.

3.1.3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

3.2.1 Deliver doors to site for installation under Section 06 20 00.

3.2.2 Trim doors as required for proper fit and function; refinish all cut or planed surfaces immediately to match finish.

3.2.3 Set and secure frame and trim components in place, plumb and level.

3.2.4 Place jamb lumber to floor surface. Install components with fasteners set below frame or trim surface.

3.2.5 Do not impair structural strength of door by the application of hardware, cutting and altering the door for lights, louvres or other special details.

3.2.6 Install mineral core fire doors in accordance with NFPA 80; install metal fire rating label to door, do not cover over with subsequent finishes; do not trim fire rated doors any greater than 1/8” in width from lock side only and 3/4” from bottom of door**. Not allowed to trim Fire Rated doors on site except for the bottom of the door.**

3.2.7 Install stops and louvers ready to receive finish.

3.2.8 Glaze doors at site with glass of type and thickness indicated, in accordance with Section 08 81 00 using elastomeric glazing sealant as specified in Section 07 92 00; secure glass in place with removable wood stops, for non-rated doors and Metal lite Kits for Fire Rated Doors.

3.3 FRAME ERECTION TOLERANCES

3.3.1 Squareness: Maximum 0.8mm (1/32”) measured across opening between hinge jam and strike jamb.

3.3.2 Plumbness: Maximum 0.8mm (1/32”) measured from bottom of frame to head level.

3.3.3 Alignment: Maximum 0.8mm (1/32”) measured offset between face of hinge jamb and strike jamb relative to wall construction.

3.3.4 Twist: Maximum 0.8mm (1/32”) measured from leading edge of outside frame rabbet to leading edge of inside frame rabbet.

3.4 CLOSEOUT ACTIVITIES

3.4.1 Deficient Work: Replace, rework or refinish work that does not meet AWS requirements as directed by Consultant.

3.4.2 Adjusting and Cleaning: Readjust doors and hardware just prior to completion of building to function freely and properly and as follows:

.1 Re-hang or replace doors that do not swing or operate freely.
.2 Replace doors that are damaged or that do not comply with requirements of this Section; doors may be repaired or refinished where work complies with requirements and shows no evidence of repair or refinishing in completed work.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 Provide all labour, materials, products, equipment and services to supply and install gypsum board systems and light gauge metal framing required and/or indicated on the Drawings and specified herein.

1.2 REFERENCES

1.2.1	ASTM C475/C475M-15	Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
1.2.2	ASTM C1002-14	Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
1.2.3	ASTM C1047-14a	Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
1.2.4	ASTM C1178/C1178M-13	Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel.
1.2.5	ASTM E90-09	Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
1.2.6	CAN/CGSB 7.1-98	Lightweight Steel Wall Framing Components.
1.2.7	CAN/CGSB 19.21-M87	Sealing and Bedding Compound Acoustical.
1.2.8	CAN/CSA A82.27-M91	Gypsum Board
1.2.9	CAN/CSA A82.31-M91	Gypsum Board Application.
1.2.10	CAN/CSA A123.2-03(R2013)	Asphalt-Coated Roofing Sheets.
1.2.11	CAN/ULC S702-14	Standard for Thermal Insulation Mineral Fibre for Buildings.

1.3 DESIGN

1.3.1 Fire Rated Construction: Construct to approved ULC design for fire resistance ratings indicated. Submit written proof of construction meeting ULC design.

1.3.2 Sound rated construction: STC tested in accordance with ASTM E90.

1.4 SUBMITTALS

1.4.1 Submit shop drawings showing pertinent construction details for fire and sound rated construction in large scale detail.

1.4.2 Product Data: Submit manufacturer's current technical literature for each component.

1.4.3 Samples: Supply for Consultant's review, if requested, samples of the following:

.1 Board: Submit sample of each panel product specified, 150mm (6") square.
.2 Trim: Submit sample of each type of trim specified, 305mm (12") long.
.3 Texture: Submit sample, 305mm (12") square, of textured coated gypsum board.

1.4.4 Quality Assurance Submittals:

.1 Design Data, Test Reports: Provide manufacturer's test reports indicating product compliance with indicated requirements.
.2 Manufacturer's Instructions: Provide manufacturer's written installation instructions.

1.5 QUALITY ASSURANCE

1.5.1 Contractor executing work of this Section shall have a minimum of five (5) years continuous Canadian experience in successful installation of work of type and quality shown and specified. Submit proof of experience upon Consultant's request.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

1.6.1 Deliver materials in original, unopened containers or bundles stored in a place providing protection from damage and exposure to elements.

1.6.2 Store board on flat, smooth and dry base.

1.6.3 Coordinate deliveries to comply with construction schedule and arrange ahead for off the ground, enclosed, under cover storage location. Do not load any area beyond the design limits.

1.6.4 Materials shall be carefully checked, unloaded, stored and handled to prevent damage. Protect materials with suitable non-staining waterproof coverings.

1.6.5 Store material in original, undamaged containers or wrappings with manufacturer's seals and labels intact, in accordance with GA-238 and manufacturer's recommendations.

1.6.6 Protect bagged products from excessive moisture or wetting. Store metal component sections in crates to prevent damage to material. Do not use bent or deformed material.

1.7 ENVIRONMENTAL REQUIREMENTS

1.7.1 Temperature within the building shall be maintained uniformly within the range of 12°C to 21°C, 24 hours before installation and until joint cement has dried.

1.7.2 Provide adequate ventilation to eliminate excessive moisture within the building before commencement of the work of this Section.

PART 2 - PRODUCTS

2.1 MATERIALS - GENERAL

2.1.1 Materials required for fire rated construction: Listed and labelled by ULC.

2.2 MATERIALS - GYPSUM BOARD

2.2.1 Gypsum board: Conforming to ASTM C1396, ivory paper faced, tapered edges, 1220mm (48") wide sheets of maximum practical lengths to minimize end joints, 1/2" thick unless indicated otherwise on drawings.

.1 Sheetrock Brand Gypsum Panels by CGC Inc.
.2 ProRoc Regular by CertainTeed.
.3 ToughRock Gypsum Wallboard by Georgia-Pacific Canada.

2.2.2 Fire-Rated Gypsum Board 'Type X': Conforming to ASTM C1396, 1220mm (48") wide sheets of maximum practical lengths to minimize end joints, tapered edges, 16mm (5/8") thick, as indicated on drawing.

.1 Sheetrock Brand Gypsum Panels, Firecode Core by CGC Inc.
.2 ProRoc Type X by CertainTeed.
.3 ToughRock Fireguard Gypsum Board by Georgia-Pacific Canada.

2.2.3 Gypsum Ceiling Board: Sag Resistant Gypsum Board: Meeting requirements of ASTM C1396M, ceiling board manufactured to have more sag resistance than regular type gypsum board with long edges tapered, and as follows:

.1 Location: Ceiling surfaces.
.2 Acceptable Materials:
  .1 Sheetrock Interior Ceiling Board by CGC Inc.
  .2 Tough Rock CD Ceiling Board by Georgia Pacific Canada.
  .3 ProRoc Interior Ceiling Board by CertainTeed.

2.2.4 Tile Backer Board: Glass Mat Water Resistant Gypsum Backer Board: Manufactured in accordance with ASTM C1178 and C1658 to produce greater resistance to water penetration and to provide improved surface bonding characteristics for ceramic tile than standard gypsum board:

.1 Location: Substrate for ceramic tile.
.2 Acceptable Materials:
  .1 Fiberock Aqua Tough Tile Backerboard by CGC Inc.
  .2 Diamondback Tile Backer by CertainTeed.
  .3 GlasRoc Tile Backer by Georgia-Pacific Canada.

2.2.5 Cement Board: Cementitious Backer Board: Reinforced portland cement board, reinforcing mesh embedded near both faces in accordance with ASTM C1325 or ANSI A118.9:

.1 Substrate for high impact areas.
.2 Acceptable Materials:
  .1 Durock by CGC Inc.
  .2 PanaRoc by CertainTeed.

2.2.6 Abuse Resistant Gypsum Board: Manufactured to produce greater resistance to surface indentation and impact penetration resistance than standard gypsum panels:

.1 Gypsum panels with glass fibre reinforced core, tapered edges, minimum 5/8” thickness, [Type X ULC fire rating], conforming to ASTM C1396M and tested to the following performance ratings.
.2 Acceptable Materials:
  .1 Sheetrock Abuse Resistant [Firecode] by CGC Inc.
  .2 Abuse Resistant [Type X] by CertainTeed.
  .3 ToughRock Abuse Resistant [Fireguard] by Georgia Pacific Canada.

2.2.7 Water (Moisture) and Mould Resistant Wallboard: Conforming to ASTM C1396 or ASTM C1278, 1220mm (48") wide panels of maximum practical lengths to minimize end joints, tapered edges, 13mm (1/2") thick, with water (moisture) and mould resistant core. Mould resistant panel score of

10 when tested in accordance with ASTM D3273 and evaluated to ASTM D3274. Less than 5% water absorption by weight after 2-hour immersion, as per ASTM C473.

.1 Acceptable Materials: Paperless, coated fibreglass mat on face, back and long edges, water-resistant treated core gypsum board. Conforming to ASTM C1658:
- .1 DensArmour Plus High Performance Interior Panels by Georgia Pacific Canada.
- .2 Fiberock Brand Aqua-Tough Interior Panels, by CGC Inc.

2.2.8 Exterior Sheathing Board: Glass mat faced, water-resistant treated core gypsum board, 1220mm (48") wide sheets of maximum practical lengths to minimize end joints, 13mm (1/2") thick, silicone treated gypsum core, front and back faces penetrated with inorganic glass fibre mats, square edge, conforming to ASTM C1177. Mould resistant panel score of 10 when tested in accordance with ASTM D3273 and evaluated to ASTM D3274.

.1 Acceptable Materials:
- .1 Securock Glass-Mat Sheathing by CGC Inc.
- .2 Dens-Glass Gold by Georgia-Pacific Canada.
- .3 GlasRoc Sheathing by CertainTeed.

2.2.9 Exterior Soffit Board: Mould and moisture resistant cement board, non-combustible, 48" wide sheets of maximum practical lengths to minimize end joints, 1/2" thick, aggregated portland cement core wrapped in polymer-coated, glass-fiber mesh. panel score of 10 when tested in accordance with ASTM D3273:

.1 Acceptable Materials:
- .1 Durock by CGC Inc.
- .2 PermaBase Cement Board by CertainTeed
- .3 ToughRock Fireguard Soffit Board by Georgia-Pacific Canada.

2.3 MATERIALS - FRAMING MEMBERS

2.3.1 Metal track: CAN/CGSB 7.1, 26 ga. galvanized steel, roll formed of width to suit metal studs.

2.3.2 Metal studs: CAN/CGSB 7.1, 26 ga. galvanized steel, cold-rolled formed face at least 1-5/8" wide, depth as indicated. Provide knock-outs in studs to facilitate pipe, and conduit installation.

2.3.3 Hangers: 9 lwg minimum soft annealed and galvanized wire for 1/2"]thick gypsum board; 3/16" diameter galvanized mild steel pencil rods for thicker gypsum board.

2.3.4 Ceiling runner or carrying channels: Cold formed 18 ga. mild steel channels, weighing not less than 0.60 lbs/ft., coated with a rust inhibitive paint or galvanized.

2.3.5 Ceiling furring channels: 26 ga. cold formed galvanized steel hat-shaped section.

2.3.6 Metal furring clips: 10 IW ga. minimum.

2.3.7 Wall furring channel: 26 ga. cold rolled galvanized steel hat-shaped section, 1-3/8" wide at crown, 2-3/4" wide at brim, 7/8" deep.

2.3.8 Resilient channels: RC-1 by CGC, or other approved manufacture.

2.3.9 Tie wire: 16 ga. extra pliable, soft, annealed, galvanized wire of high strength.

2.3.10 Hanger wire anchors: "RedHead TW-1614" anchors, by Phillips Drill Company, Division of ITT Industries of Canada Ltd., or other approved manufacture.

2.4 MATERIALS - ACCESSORIES

2.4.1 Accessories shall comply with ASTM C1047.

2.4.2 Joint treatment: 2" wide perforated tape reinforcement, joint filler or compound, and topping compound. Joint compound and tape shall be of the same manufacturer as gypsum board and comply with ASTM C475/C475M.

.1 Joint Compound for Tile Backing Panels: Gypsum based tile backing board: Use setting type taping and setting type, sandable topping compounds.
.2 Joint Compound for Exterior Sheathing Boards [and Soffit Panels]: Fibreglass mesh tape.
.3 Joint Compound for Abuse-Resistant Panels:
.1 ToughRock™ Sandable Joint Compound, by Georgia-Pacific.
.2 Durabond/Sheetrock Setting-Type Joint Compound, by CGC Canada Inc.

2.4.3 Laminating adhesive: Sheetrock brand laminating compound by Canadian Gypsum Co. Ltd., or other approved manufacture.

2.4.4 Tape for use with water resistant gypsum board: 2" wide 10 x 10 glass mesh tape.

2.4.5 Water: Clean, fresh, potable, free from deleterious materials.

2.4.6 Fasteners: Galvanized or aluminum, #6 x 1", 1-1/4", 1-5/8" drywall screws, flat head Phillips or recessed square socket type. 3/8" pan head door frame screws, (Type S12), and complying with ASTM C1002.

2.4.7 Fasteners for exterior soffit boards: 1-1/4", Type S-12, Wafer Head, Climaseal finished, screws.

2.4.8 Casing bead: Galvanized steel J-shaped trim, maximum lengths x thickness to suit gypsum board, concealed in the finish work by joint tape and joint compound, 200-A by CGC or other approved manufacture.

2.4.9 Control joint trim: Casing bead as specified above.

2.4.10 Corner bead and reveal trim: Galvanized steel L-shaped trim, maximum lengths, concealed in the finish work by joint tape and joint compound, 200-B by CGC or other approved manufacture.

2.4.11 Use No. 200-A trim or appropriate Beadex trim at reveals.

or

2.4.12 Reveal trim: No.200-B by Canadian Gypsum Company.

2.4.13 Acoustic sealant: CAN/CGSB 19.21, Acoustical Sealant by Tremco Ltd., or other approved manufacture.

2.4.14 Sealant for water-resistant gypsum board cut edges: Sheetrock Brand W/R sealant by Canadian Gypsum Co. Ltd., or other approved manufacture.

2.4.15 Sealant at ducts and frames and similar locations: Mono 555 as by Tremco Ltd., or other approved manufacture.

2.4.16 Sound insulation: Complying with CAN/ULC S702, "AFB" by Roxul Inc., "Noise Stop" sound attenuation blankets "Thermafibre" by CGC, or other approved manufacture.

2.4.17 Neoprene sponge strip: Moisture resistant closed cell insulating material.

2.4.18 Thermal break material: Neoprene sponge.

2.4.19 Asphalt felt: CAN/CSA A123.2-03(2008)

2.4.20 Mineral wool safing insulation: Firebarrier Firestopping by Double A/D Distributors Limited, Fire-Bloc Firestopping by M. W. McGill and Associates Ltd., Thermafibre by United States Gypsum Co., or other approved manufacture.

2.4.21 Access Panels: As indicated in Section 10 99 00.

PART 3 - EXECUTION

3.1 INSPECTION

3.1.1 Examine the work of other Sections which is to receive the work of this Section and proceed only when conditions are satisfactory.

3.1.2 Do not apply gypsum board over mechanical or electrical work which requires inspection and approval by authorities having jurisdiction and the Consultant. Ensure that insulation, if required, has been completed to walls, pipes and other items. Neglect of this instruction will nullify any claims for extra payment for removal and replacement of work of this Section.

3.1.3 Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

3.1.4 Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.2 INSTALLATION - GENERAL

3.2.1 Install all materials in accordance with the latest printed directions of the manufacturer and in accordance with CAN/CSA A82.31-M.

3.2.2 Perform all work by skilled craftsmen.

3.2.3 Provide partitions of thickness indicated on the Drawings.

3.2.4 Comply with CAN/CSA A82.31-M, except to its clauses referring to nailing.

3.2.5 Extend gypsum board to the underside of the structure above unless otherwise indicated.

3.2.6 Provide gypsum board baffles above ceilings, to underside of structure above, where indicated for sound barriers.

3.2.7 Install access doors supplied by respective Sections. Gypsum board infill at access panels shall have taped edges. Apply gypsum board with adhesive. Ensure finish of access panel is suitable for board, prime for adhesion if required. Fill and sand smooth perimeter edges as specified for joint finishing.

3.2.8 Locate vertical joints at least 12" from jamb lines of openings.

3.2.9 Where vapour barrier carries over metal framing members ensure that installation of insulation and vapour barrier and perimeter seals is complete before applying gypsum board finish.

3.2.10 Co-ordinate work of this Section with the Sections installing equipment above or in the suspended ceiling areas so as to produce a layout of hangers, carrying channels and furring channels suitable to accommodate fittings and units of equipment in a proper manner. This shall apply especially to flush mounted lighting fixtures, outlet boxes, diffusers and similar material. Failure to follow this procedure will require that the hangers and channels be revised to suit as necessary without extra cost to the Owner.

3.2.11 Provide bulkhead framing and gypsum board, were required, whether shown or not, for ductwork and plumbing. Coordinate with Mechanical Division.

3.3 INSTALLATION - PARTITION FRAMING

3.3.1 Accurately layout partitions as indicated on drawings. Securely attach floor and ceiling runners at 24" o.c. to the structure.

3.3.2 Position studs vertically in runners at 16" o.c. maximum unless otherwise indicated. Locate studs not more than 2" from all abutting partitions, partition corners and other construction.

3.3.3 Anchor studs located adjacent to door and window frames, partition intersections and corners to runner flanges with lock fasteners or by positive screw arrangement through each stud flange and runner flange.

3.3.4 When necessary, splice studs by nesting two studs with a minimum lap of 8" and attaching flanges together with two screws in each flange.

3.3.5 Make allowances for deflection at top of partitions to avoid transmission of structural loads to framing system.

3.3.6 Locate 2 framing members on each side of framed openings. Frame over and below openings with runner sections at least 6" longer than the rough openings. Cut ends to fit and bend web up and screw anchor to adjacent studs. Install cut to length intermediate vertical studs in same manner and spacing as wall studs over such framed openings. Securely anchor studs to head and jamb anchor of door frames by bolt or screw attachment. Insert intermediate studs above and below channels to support gypsum board.

3.3.7 Provide adequate reinforcing for framing to receive wall mounted counters and vanities.

3.3.8 Provide double studs or wood blocking and bolts in stud partitions for fastening of handrails, grab bars, to be capable of supporting 230 kg (500 lb) downward pull. Provide double studs and blocking for anchoring of door frames, and other items anchored to stud partitions.

3.3.9 At duct openings pack space between framing members and ducts with mineral wool safing insulation and seal with sealant.

3.3.10 Provide double stud partitions where indicated.

3.3.11 Provide asphalt felt under runners for partitions on slabs on grade.

3.3.12 Provide resilient channels at right angles to studs where indicated on special sound proof partitions. Space channels at 16" o.c.

3.3.13 Provide thermal break material to isolate metal studs and furring from steel framing, to eliminate cold bridges.

3.4 INSTALLATION - CEILING FRAMING

3.4.1 Space hangers at centres not exceeding 4'-0" each way, in rows parallel with the walls. Area between hangers shall not exceed 16 sq.ft. Supply hanger inserts or tabs in ample time and with instructions for their proper placement.

3.4.2 Use hangers of length required to assure secure anchorage and correct ceiling heights, straight and with a 90° bend at the lower end to engage the runner channels.

3.4.3 Do not secure hangers to pipes, ducts or any electrical or mechanical items.

3.4.4 Provide a row of hangers adjacent to and parallel with the walls for the support of the ends of runner channels at not more than 6" from the ends of runner channels.

3.4.5 Provide hangers to suspend gypsum board ceilings independent of partitions.

3.4.6 Start runners or carrying channels parallel to and not more than 6" away from edge of the ceiling. Ends of channels shall not contact vertical surfaces. Securely wire channels in parallel rows at not more than 4'-0" o.c. to hangers with double strand of tie wire. Twist tie wires up tight without slack.

3.4.7 Channels shall be level and true to a tolerance of 1/8" in 12'-0" in all directions.

3.4.8 Provide 12" lap at runner channel splice. Secure splice with double strand of tie wire at each end. Clustering or lining up of splices will not be permitted.

3.4.9 Frame around fixtures, grilles and other openings. Where ducts, or where a combination of ducts and other items interfere so that hanger spacing exceeds 4'-0" increase the size of the main runners and hanger wire accordingly, to sustain increased loading and span. Provide additional hangers as required to support the weight of lighting fixtures, diffusers, grilles and other built-in items occurring in ceilings.

3.4.10 Securely install furring channels at right angles to the runner channels and at 24" o.c. using furring clips or a double strand of tie wire. Fur around ducts, bulkheads and the like.

3.5 INSTALLATION - METAL FURRING DIRECT ATTACHMENT TO MASONRY OR CONCRETE

3.5.1 Secure metal furring runners to masonry or concrete vertically, spaced 24" o.c. Fasten runners 24" o.c. through alternate flanges of runners. Shim runners as required to present a true, plumb line for application of gypsum board.

3.5.2 At windows, doors or similar openings having returns, install lengths of notched and 90°bent pieces of channel horizontally at the returns spaced approximately 24" o.c. Locate runners not more than 2" away from all openings, interior corners, intersections, frames, jambs, control joints and the like.

3.5.3 Mitre furring around all corners. Form mitres by cutting the flanges and bending the web. Do not cut the web to form corners.

3.6 APPLICATION - GYPSUM BOARD

3.6.1 Take all measurements accurately. Cut boards by scoring the face paper, snapping the core of the board and then cutting the back paper. Smooth the cut edges with a rasp or coarse sandpaper.

3.6.2 Erect gypsum board vertically or horizontally whichever results in fewer end joints. Butt joints loosely with maximum gap of 1/4". Do not force boards into position. Place tapered edges next to one another. All end joints shall occur over framing members.

3.6.3 Minimize end joints. Align joints with edge of wall openings.

3.6.4 Provide approved thermal break material at edges of gypsum board in contact with non-thermally broken metal windows and at exterior door frames.

3.6.5 At curved surfaces, score back of gypsum board and wet boards, bend to required radius, and block in position until dry. Apply joint compound and trowel smooth to provide continuous, smooth radius, free from flat spots, facets or trowel marks.

3.6.6 Where gypsum board baffle occurs over door or glazed opening, extend baffle across door or glazing opening.

3.6.7 Provide special trim as specified at reveals.

3.6.8 Apply thermal break material to metal studs, where indicated, before applying gypsum board.

3.6.9 In areas where opposite side of partition is open to space below, provide metal lath on concealed side. Install lath with long dimension across the studs. Secure with tie wires at 6" o.c.

3.7 APPLICATION - GYPSUM BOARD LAMINATED TO CONCRETE AND/OR CONCRETE BLOCK MASONRY

3.7.1 Ensure base is straight, dry, uncoated, clean and free from efflorescence. Mix laminating adhesive in accordance with manufacturer's directions. Allow to stand 30 minutes before using.

3.7.2 Apply adhesive with a notched trowel to leave 3/8" x 1/2" ribbons, 1-1/4" apart over entire back side of face layer.

3.7.3 Erect gypsum board immediately after spreading adhesive. Use moderate pressure to develop full adhesive contact with substrate.

3.7.4 Temporarily secure gypsum board in place with concrete nails or bracing. Ensure that joints are accurately aligned. Avoid impact or movement of boards until adhesive sets firmly. Remove temporary support when adhesive has set.

3.8 APPLICATION - GYPSUM BOARD (MULTIPLE LAYERS)

3.8.1 Use square edged gypsum board for base layer and tapered edge for face layer. Place face layer at right angles to preceding layer. Apply base layer to framing members so that there will be a minimum number of end joints in the face layer. Offset the joints between the two layers a minimum of 10".

3.8.2 Apply base layer to framing members with 1" screws at 12" o.c. in the field and 8" o.c. at the end and edges. End joints may occur on or between framing members provided back blocking with supporting strips is used to assure alignment.

3.8.3 Mix laminating adhesive in accordance with manufacturer's written specifications. Allow to slake.

3.8.4 Cut and fit face layer and spread adhesive over back side with a metal spreader blade that has "V" shaped notches 1/2" deep, 5/16" wide and spaced 1-1/2" to 2" o.c.

3.8.5 Apply face layer, loosely butting all joints and temporarily hold in place with fasteners of sufficient length to penetrate framing member 3/4". Wipe off any adhesive forced out along the edges. Place temporary fasteners at 16" o.c.

3.9 APPLICATION - WATER RESISTANT GYPSUM BOARD

3.9.1 Provide water resistant gypsum board to walls in washrooms.

3.9.2 Apply water resistant gypsum board where ceramic tile is scheduled.

3.9.3 Provide water resistant gypsum board behind mirrors.

3.9.4 Apply water resistant gypsum board in strict accordance with manufacturers' written instructions.

3.9.5 Do not apply water resistant board to ceilings.

3.9.6 Apply coated water resistant gypsum board with black side out.

3.9.7 Give particular attention to sealing of cut edges, utility holes and joints, with approved sealant material. Seal all openings with sealant.

3.9.8 Apply tape over joints and angles.

3.9.9 Apply full bodied coat of sealer prior to application of fixtures and trim.

3.10 APPLICATION - CEILING

3.10.1 Unless otherwise noted, construct ceilings in 1/2" thick gypsum board, screw attached at 8" o.c. maximum.

3.10.2 Suspended gypsum board ceilings with joints taped shall be level, to within 1/8" in 12'-0" in all directions.

3.10.3 Make allowance for air-transfer openings in above ceiling partition construction. Review Mechanical Drawings to establish locations. Provide openings in gypsum board baffle (in plenum space) to accommodate all cross-talk silencer ducts. Refer to Mechanical Drawings and specifications for type and location. Co-ordinate with Partition Type and partition Location Plans.

3.10.4 Where slab to slab or baffle above ceiling partitions occur and large mechanical ducts prevent installation of such, a lead blanket is to be used as an alternate. Ensure complete continuous sound seal is provided.

3.10.5 At all gypsum board ceiling areas, air supply and return shall be via continuous slim-line linear diffusers. Locations as indicated on Mechanical Drawings.

3.10.6 Provide all openings in gypsum board ceilings to accommodate sprinklers, exit lights, access panels, pot lights, air diffusers and speakers.

3.10.7 Caulk perimeter of gypsum board ceilings where suspended with sound isolation hangers.

3.11 TILE BACKING PANELS

3.11.1 Install standard gypsum board panels in areas not subject to wetting to produce a flat surface.

3.11.2 Install water resistant gypsum board in locations requiring tile applications in washrooms, and as indicated on the Drawings.

3.11.3 Shim surfaces to produce a uniform plane across panel surfaces where tile backing panels abut other types of panels in the same plane.

3.12 EXTERIOR SHEATHING BOARD

3.12.1 Install exterior sheathing board to exterior walls in accordance with manufacturer's written instructions. Seal all cut edges, ends, utility holes and fastener heads, as recommended by manufacturer.

3.12.2 Receive masonry veneer anchors from Section 04200 - Masonry and install the masonry veneer anchor to the structural studs. Spacing of the masonry veneer anchor system must be maximum 406mm (16") vertically O.C. and stud spacing horizontally. Sufficient anchors must be provided on each structural stud prior to erection of stud. Sequentially lift anchors as exterior sheathing board is being installed such that each anchor rests on edge of the exterior sheathing board.

3.12.3 Tape and fill all joints and fastener heads using materials recommended by exterior sheathing board manufacturer.

3.13 FIRE RESISTANT ASSEMBLIES

3.13.1 Fire resistance rating of gypsum board assemblies and framing shall be as called for on drawings or schedules, and as required to conform with applicable codes and requirements of authorities having jurisdiction.

3.13.2 Appropriate ULC designs as listed in current ULC list of equipment and materials, Volume II, Building Construction, shall be placed when applicable. Extend partitions full height through ceiling space unless otherwise noted on drawings.

3.13.3 Vertical bulkheads in ceiling spaces over fire rated glazed partitions, doors and the like shall have same fire rating as the door or partition over which they occur. All such bulkheads shall be of drywall construction unless otherwise noted.

3.13.4 Use fire rated gypsum board as specified.

3.13.5 Where lighting fixtures, diffusers, and the like are recessed into fire rated ceilings or bulkheads, provide enclosure to maintain required fire rating. Form removable panel to give access to fixture outlet box.

3.13.6 Where fire hose cabinets or other fixtures or equipment are recessed in fire rated walls or partitions, provide drywall enclosure or backing to maintain required fire rating, unless otherwise detailed.

3.14 INSTALLATION - FASTENERS AND FASTENING

3.14.1 Apply gypsum board to metal furring, studs, runner channels, angles and other framing with approved screws. Use 1" long screws for fastening gypsum board up to 5/8" thickness to metal and wood furring and framing, and 1-1/4" long screws for fastening gypsum board up to 1" thickness to metal angle and channel runners.

3.14.2 Space screws 12" o.c. in field of board and 8" o.c. staggered along abutting edges. Start securing the board in the central portion and work toward the edges and ends. Drive all screws so screw heads provide a slight depression below the surface of the gypsum board without puncturing the face paper. Do not drive screws closer than 3/8" from edges and ends of gypsum board.

3.14.3 Use adhesive application for laminating gypsum board direct to other gypsum board in two or more layer construction and direct to concrete and masonry as specified herein before.

3.15 FINISHING

3.15.1 Finish gypsum board in conformance to CAN/CSA A82.31-M, except as herein specified.

3.15.2 Apply corner beads to all external vertical and horizontal corners and edges. Apply casing beads where the gypsum board butts against a surface having no trim concealing the juncture.

3.15.3 Erect corner beads and casing beads plumb and level with a minimum number of joints and secured at 6" o.c. with screws in each flange. Stagger fasteners in each flange.

3.15.4 Do not treat joints of laminated gypsum board for at least 24 hours after lamination.

3.15.5 Mix joint compound in accordance with manufacturer's specifications and allow to stand a minimum of thirty minutes before using.

3.15.6 Fill all gaps and screw nail depressions with three coats of joint compound. Allow preceding coat to set before applying subsequent coats.

3.15.7 On all corners apply joint compound to one side of corner and allow to set before applying compound to the other side of corner.

3.15.8 Apply a thin coat of joint compound over the board on each side of joints and embed the reinforcing tape and roll firmly into place. Cover all edges of tape with a thin coat of joint compound. Neatly crease tape at all internal corners. Allow to dry for 24 hours.

3.15.9 Apply joint compound over flanges of all corner beads and casing beads flush with nose of bead and extending at least 3" onto the surface of the board.

3.15.10 After bedding coat has set, apply second coat of joint compound feathered at least 6" on each side of butt joints and 4" past flanges of all beads.

3.15.11 After second coat has set, apply third coat of joint compound and feather to 8" on each side of butt joints and 5" past flanges of all beads.

3.15.12 Feather all coats of joint compound onto adjoining surfaces so that all joints, tape holes and flanges of beads are invisible.

3.15.13 After complete treatment has thoroughly set and after at least 24 hours, sand lightly with fine grit sandpaper to leave it smooth and ready for decoration.

3.15.14 Make the finished work smooth, seamless, plumb, true, flush and with square, plumb, neat corners and edges.

3.15.15 Do not finish joints of non-fire-rated walls in mechanical rooms, above finished ceilings or where acoustic tiles are scheduled.

3.15.16 Provide casing beads to edge of gypsum board on demising partitions where board meets ceiling, and convector cabinet enclosures, and at gypsum board terminations at recesses to accept carpet base and gypsum board terminations at coffered ceilings and to perimeter of gypsum board panels.

3.15.17 Tape joints in preparation for liquid applied vapour barrier.

3.15.18 Prepare surfaces ready for paint. Correct imperfections appearing after application of prime coat of paint.

3.16 CONTROL JOINTS

3.16.1 Install control joints in gypsum board where it is applied to concrete or masonry, either on furring or by adhesion, in the following locations; at masonry control joints and at junction of dissimilar wall materials.

3.16.2 Provide Control Joints at door panels, at each side of jamb, extending above door head.

3.16.3 Provide control joints in continuous runs of gypsum board at locations indicated or, if not indicated, spaced 30'-0" o.c. maximum at locations as directed by the Consultant.

3.16.4 Install double casing beads, back to back, fitted tightly together, on gypsum board edges at control joints. Finish casing beads but not joint between them.

3.16.5 Where application is on studs, double up studs at control and expansion joints, place one stud on each side of joint.

3.17 SOUND INSULATION

3.17.1 Provide sound attenuation blankets where indicated or required to attain sound attenuation, minimum STC 45 or as otherwise indicated.

3.17.2 Completely fill all spaces between studs laterally with blankets, run continuously from floor to ceiling or structure, over door frames and opening and around corners.

3.17.3 Provide sound attenuation blankets above ceilings as shown, completely covering ceiling to thickness indicated.

3.17.4 Pack sound insulation around cut openings in gypsum board walls and ceilings, behind outlet boxes around plumbing, heating or structural items passing through the system.

3.17.5 Pack sound insulation around openings in floors.

3.17.6 Secure blankets by adhesive or staples to one interior face of gypsum board.

3.17.7 Provide neoprene strips at perimeter of sound partitions as shown.

3.17.8 Provide batt insulation at air transfer ducts.

3.18 SEALING

3.18.1 Provide perimeter sealant (sound seal) at junction of gypsum board with structure, other partitions and at junction with dissimilar materials and adjacent construction. Apply in concealed locations only. Install in strict accordance with sealant manufacturer's written instructions.

3.18.2 Seal shall consist of 2 (STC 48 or less), 4 (STC 51) or 5 (STC 52) beads to meet or exceed partition rating.

3.18.3 Seal openings around ducts and similar protrusions passing through drywall system, at walls and ceilings.

3.18.4 Gypsum board shall be made air-tight around window and door openings. Return gypsum board at door and window openings and butt into window and door frames. At window stools, return gypsum board under stool. Perimeter edges where gypsum board butts to the frame shall be made air-tight with sealant.

3.18.5 In order to provide a continuous air barrier, the gypsum board on the exterior walls shall extend behind interior partitions, ducts, mechanical chases, heating units, etc. Coordinate with all relevant trades.

3.19 CUTTING AND PATCHING

3.19.1 Do all cutting, patching and making good as required by the installation of work of other trades and co-operate closely with these trades to assure a satisfactory finish. Remove and make good any work which, in the opinion of the Consultant is defective and not acceptable, at no additional cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 All labour, materials, products, equipment and services to supply and install the porcelain and ceramic tile work required and/or indicated on the Drawings and specified herein.

1.2 REFERENCES

1.2.1	ASTM C206-14	Standard Specification for Finishing Hydrated Lime.
1.2.2	ASTM C207-06(2011)	Standard Specification for Hydrated Lime for Masonry Purposes.
1.2.3	CAN/CGSB 19.22-M89	Mildew-Resistant Sealing Compound for Tubs and Tiles.
1.2.4	CAN/CSA A3000-13	Cementitious materials compendium(Consists of A3001, A3002, A3003, A3004 and A3005), Includes Update No. 1 (2014), Update No. 2 (2014), Update No. 3 (2014).
1.2.5	CSA A82.56-M76	Aggregate for Masonry Mortar.

1.3 QUALIFICATIONS

1.3.1 Subcontractor executing work of this Section shall employ installers having a minimum of five (5) years continuous Canadian experience in successful installation of work of type and quality shown and specified. Submit proof of experience upon Consultant's request.

1.3.2 Work of this Section shall be executed by workers especially trained and experienced in this type of work. Have a full time, senior, qualified representative at the Site to direct the work of this Section at all times. Representative shall meet Consultant's approval.

1.3.3 Ensure proper use of proprietary materials in strict accordance with the material manufacturer's directions. It shall be the responsibility of the material manufacturer or supplier to furnish these directions to the Contractor and to check periodically at the site to ensure that they are being carried out.

1.4 SUBMITTALS

1.4.1 Submit two samples of all materials and products to the Consultant for review.

1.4.2 Submit two full size tile samples of each colour and tile selected.

1.4.3 Maintenance Instructions: Upon completion of the Work, furnish Consultant with copies of maintenance instructions, containing complete detailed and specific instructions for maintaining, preserving and keeping clean the surfaces of this Work and in particular, giving adequate warning of maintenance practices of materials detrimental to the work of this Section for inclusion in the Operation and Maintenance Manual.

1.5 SITE MOCK-UP

1.5.1 Following the pre-installation conference, the Contractor shall install a 10'-0" x 10'-0" dry sample areas of porcelain tiles, ceramic mosaic tiles and ceramic wall tile showing all colours of tiles and layout in areas designated later by the Consultant.

1.5.2 After approval of tile colours and layout the Contractor shall set tile and grout including one caulked joint under the supervision of the material manufacturer's representative.

1.5.3 Upon completion and approval, sample areas shall serve as a standard of quality for the balance of the work of this Section. Subsequent work carried out and not in the Consultant's opinion, equal to the quality standard shall be removed and replaced at no additional cost to the Owner.

1.5.4 It shall be the responsibility of the material manufacturer's representative to visit the site during installation, at intervals agreed upon with the Consultant to ensure proper use of proprietary materials and assist the Contractor as may be required, and shall also submit a report to the Consultant of their findings after each site review to ensure their directions are being adhered to.

1.5.5 Co-ordinate work of mock-up with related work of other Sections.

1.5.6 Accepted work may form a part of the final installation.

1.6 EXTRA STOCK

1.6.1 At completion of work, deliver to the Owner 5% extra quantity of each type of tile, from same production run as installed tiles. Include cost of extra stock as part of the work of this Section.

1.7 DELIVERY, STORAGE, HANDLING AND PROTECTION

1.7.1 Co-ordinate deliveries to comply with construction schedule and arrange ahead for off the ground, under cover storage location. Do not load any area beyond the design limits.

1.7.2 Materials shall be carefully checked, unloaded, stored and handled to prevent damage. Protect materials with suitable non-staining waterproof coverings.

1.7.3 Store material in original, undamaged containers or wrappings with manufacturer's seals and labels intact.

1.7.4 Restrict traffic by other trades during installation.

1.7.5 Provide adequate protection of completed tiled surfaces to prevent damage by other trades until final completion of this project. Minimum protection shall consist of 4 mil polyethylene sheets lapped 4" and taped.

1.7.6 Heavily travelled areas shall have additional 1/2" thick fibreboard sheet protection with taped joints over polyethylene sheet protection as specified above.

1.7.7 Protect exposed edges of floor tile with same thickness as tile x 4" wide tapered strip of plywood adhered to floor until adjoining floor finish is to be installed.

1.8 ENVIRONMENTAL REQUIREMENTS

1.8.1 Maintain ambient temperature between 10 deg C and 20 deg C, for a period of 72 hours before commencement, during installation and 72 hours after installation.

.1 Temperature: Maintain tile materials and substrate temperature between TTMAC recommended minimum and maximum temperature range; unless indicated otherwise by manufacturer, for 48 hours before and during installation until materials are fully set and cured; provide additional heat during winter months or at any other time when there is a risk that surface temperatures may drop below minimum recommended temperatures.

.2 Ventilation: Maintain adequate ventilation where Work of this Section generates toxic gases or where there is a risk of raising relative humidity to levels that could damage building finishes and assemblies.

1.8.2 Moisture content of floor shall not exceed a maximum of 3 lbs. of water per 1,000 sq. ft. of concrete slab area over a 24 hour period as measured by one of the following methods, as approved by Consultant:

.1 Does not exceed 3% as measured by Calcium Carbide Hygrometer procedure.
.2 Does not exceed 5% as measured by normal Protimeter.

1.9 WARRANTY

1.9.1 Warrant the work of this Section against defects in materials for a period of five (5) years and in workmanship for a period of two (2) years, except as a result of structural failure of substrate.

1.10 LEED™ STRATEGIES

1.10.1 All trades must examine practices, as outlined in the related sections, to assist the team in achieving these results.

1.10.2 Related Sections:

.1 01 35 20 General LEED® Requirements
.2 01 35 50 Waste Management Disposal
.3 01 35 90 Indoor Air Quality Management
.4 01 61 10 LEED® Product Requirements
.5 31 25 00 Construction Pollution Prevention.

1.10.3 Materials used for Work in this section are to include, but are not limited to the following criteria:

.1 All materials under Work of this Section, including but not limited to, coatings, sealants, primers and adhesives are to have low VOC contents, in accordance with Section 01 35 63.
.2 Materials used in work of this Section are to contain high amounts of recycled content and
are to be sourced regionally from within 800 km via truck or 2400 km via rail or ship from jobsite in accordance with Section 01 61 10.

1.10.4 The following must be submitted as appropriate for Consultant’s review and approval:

1. Submit an MSDS or product data sheet stating the VOC and urea-formaldehyde content, along with Schedule A of Section 01 35 63 LEED Product Requirements Schedules following the measures outlined in Section 01 35 90, for all applicable products.
2. Submit Schedules A and D, as appropriate, of Section 01 61 10A LEED Product Requirements Schedules following the measures outlined in Section 01 61 10, for all applicable products.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

2.1.1 Dynamic Coefficient of Friction: Tile installed on walkway surfaces shall achieve a DCOF measurement of 0.42 as determined by testing identical products per ANSI A137.1-2012. Where tile is installed in wet environments, including washrooms and showers, test method shall also be carried out on wet tile.

2.1.2 Floor Level Tolerances: Provide materials to attain floor levelness tolerances required by this Section; calculate quantity of materials based on the difference between the specified tolerance and the initial tolerance specified in Section 03 35 00; measurements will be made in the same manner as used in Section 03 35 00.

.1 Small format floor tile: Tiles having dimensions less than 100 mm x 100 mm require floor flatness as specified in Section 03 35 00.

.2 Standard format floor tile: Tiles having dimensions from 100 mm x 100 mm and less than 400 mm x 400 mm require floor flatness measured to a minimum FF35; equivalent to 5 mm with no more than 2 gaps under a 3000 mm straightedge measurement.

.3 Large format floor tile: Tiles having dimensions 400 mm x 400 mm and larger require floor flatness measured to a minimum of FF50; equivalent to 3 mm with no more than 2 gaps under the 3000 mm straightedge measurement.

.4 Wall tiles: Provide wall leveling similar to that specified for floors, for tiles having similar sizes listed above.

2.2 MATERIALS

2.2.1 Porcelain floor tile (Non-Slip): 600 mm x 1200 mm (24" x 48"), “Perfect-Natural” by “Glocal Series” distributed by Centura Tile or equivalent – exact colour to be selected at a later date by the Board and Consultant.

2.2.2 Provide all special units, coves, corners, caps, bullnose as required.

2.3 TRIMS:

2.3.1 Straight Edge Strips: [Solid brass] [Extruded [mill finished] [clear satin anodized] aluminum] [Roll formed stainless steel] edge strips, 3 mm wide at top edge; height as required to suit tile installation; with integral perforated anchoring leg for setting the strip into the setting material: Basis-of-Design Materials: Schlüter Schiene AE

2.3.2 Transition Edge Strips: [Solid brass] [Extruded [mill finished] [[clear] [brass] satin anodized] aluminum] edge strips; height as required to suit tile installation; with integral perforated anchoring leg for setting the strip into the setting material and [sloped] [sloped, narrow profile] [sloped, wide profile] [flat, smooth profile] transition. Basis-of-Design Materials: Schlüter Reno [[M] [A] [AMB] [ACB]]-[[U] [TK] [UK] [T]

2.3.3 Stair Nosings: Extruded thermoplastic rubber, heavy traffic use, slip resistant stair nosing set into extruded [aluminum support section] [stainless steel support section] with integral perforated anchoring leg for setting the assembly into the setting material; width [25 mm] [50 mm] x height to suit application; colour as selected by Consultant from standard range, first tread and last tread of a contrasting colour [; complete with [end caps] [and] [replacement inserts representing 20% of installation]: Basis-of-Design Materials: Schlüter Trep [SE] [S] [B].

2.3.4 Cove Base Trims: Roll formed stainless steel inside corner, cove shaped joint profile with perforated anchoring legs for setting the corner joint into the setting material; heights as required to suit installation, complete with pre-formed outside corners, [pre-formed 3-way inside corners], pre-formed 2-way inside corners, connections, and pre-formed end caps: Basis-of-Design Materials: Schlüter Dilex [EHK] [EHKS].

2.4 SETTING BEDS

2.4.1 Cement: CAN/CSA A3000-08, grey or white Portland cement for mortar, white Portland cement for grout.

2.4.2 Sand: CSA A82.56-M, sharp, screened concrete sand free from inorganic and deleterious materials.

2.4.3 Water: Clean and free from oil, acid, alkali, organic matter or other deleterious substances.

2.4.4 Lime: ASTM C206 or ASTM C207, Type S, hydrated lime.

2.4.5 Surface Preparation Materials: Levelling Bed/Mortar Additive: Performance standard meeting requirements of ANSI A108.1, Type 2; Acceptable material:

.1 Flextile Ltd., Mortar Bed with #43 Additive.
.2 MAPEI Inc. Mapecem Premix PL50.
.3 Custom Building Products Level Quik Underlayment

2.4.6 Interior Thin Set Wall System: Dry set mortar meeting or exceeding the requirements of ANSI A108.1 formulated for thin set applications of ceramic biscuit tile, factory sanded mortar consisting of portland cement, sand and additives requiring only potable water to be added for installation:

.1 Flextile Ltd., #51 Floor and Wall Mix
.2 MAPEI Inc. Kerabond
.3 Custom Building Products Premium Blend Thinset

2.4.7 Interior Thin Set Floor System: Dry set mortar meeting or exceeding the requirements of ASTM C627 for Heavy installation using latex modified, portland cement mortar meeting requirements of ANSI A108.1:

.1 Flextile Ltd., #53 Floor Mix
.2 MAPEI Inc. Kerabond
.3 Custom Building Products Master Blend Thinset

2.4.8 Large Format Tile Mortar: Medium bed, dry set polymer modified mortar system designed specifically for use with large format tile materials over 305mm x 305mm (12” x 12”), requiring only the addition of water, rated for extra heavy service installation:

.1 Flextile Ltd., #50 PM Medium Bed Thin Set Mortar
.2 MAPEI Inc., Ultracontact
.3 Custom Building Products, Complete Contact

2.4.9 Epoxy Adhesive Setting Materials: Thin set adhesive system using 100% solids epoxy resin and epoxy hardener meeting or exceeding the requirements for ANSI A108.1; stain proof, chemical resistant and having high temperature resistance, water cleanable.

.1 Flextile Ltd., Flex Epoxy 100 Setting
.2 MAPEI Inc. Ker 410 Kerapoxy Mortar
.3 Custom Building Products 100% Solids Epoxy Mortar

2.4.10 All materials comprising a system shall be from one manufacturer and shall be compatible with each other.

2.5 GROUT

2.5.1 Epoxy Floor Grout: stain resistant Latapoxy SP-100 Colour selected by consultant must be a dark colour.

2.5.2 Wall Grout: unsanded dry set Laticrete 600 Series/1776

2.6 MIXES

2.6.1 Underlayment, by volume: 3 parts sand, 1 part cement and water with latex additive as required for proper trowelling consistency.

2.6.2 Thin set mortar: Mix to manufacturer's recommendations.

2.7 MISCELLANEOUS MATERIALS

2.7.1 Primers: As recommended by the manufacturer of the setting bed for the various substrate conditions.

2.7.2 Edge moulding: L-shaped extruded aluminum, anodized finish, 1/4" face depth x 7/8" perforated concealed flange, one piece length per location, by Ramca Tile, or other approved manufacture.

2.7.3 Polyethylene film: 0.1 mm (4 mil) thick.

2.7.4 Sealant and backing: CAN/CGSB 19.22-M, one component silicone, 'DC786' by Dow Corning Canada Limited or other approved manufacture, colour to match grout; tested by sealant manufacturer for non-staining of tile specified. Submit test reports. Joint filler as recommended by sealant manufacturer.

2.8 MEMBRANES

2.8.1 Crack Suppression Membranes: Load bearing, premanufactured self adhering lightweight fabric reinforced crack isolation membrane; nominal 1 mm thick manufactured to accommodate in-plane substrate movement in thin set applications meeting requirements of ANSI A108.1 and as follows:

.1 Flextile Ltd., 1000 Flexilastic Crack Isolation Membrane
.2 MAPEI Inc., Mapeguard 2

2.8.2 Waterproofing Membranes: Load bearing, reinforced, liquid applied membrane; manufactured to accommodate flood testing and reduce the incidence of thermal shock cracking to tiling installations; meeting requirements of ANSI A108.1 and as follows:

.1 Flextile Ltd., Flex WP-980 Waterproof and Crack Isolation Membrane
.2 MAPEI Inc. Mapelastic 315 Waterproofing and Reinforcing Fabric
.3 Custom Building Products Level Quik Waterproof and Anti-Fracture Membrane

2.9 SEALERS

2.9.1 Floor sealer and protective coating: Clear, non-slip "Traction Master", or other approved manufacture.

PART 3 - EXECUTION

3.1 INSPECTION

3.1.1 Examine the work upon which the work of this Section depends and report any defects to the Consultant.

3.1.2 Ensure that backings are structurally sound, level and plumb within the required tolerances.

3.1.3 Tolerance of substrate for thin set mortar or epoxy setting bed is used, ensure that overall surface variations do not exceed plus/minus 3 mm (1/8") and 1.6 mm (1/16") within any single running foot, non-cumulative.

3.1.4 Ensure that access doors are set to provide a flush installation of the tile.

3.2 PREPARATION

3.2.1 Where work is applied to areas having floor drains, apply primer at the rate of 5 sq m to 6 sq m/4.5 (250/300 sq.ft./gal.). Trowel apply underlayment to form a continuous and uniform slope from the room edges to drains provided.

3.2.2 Prime gypsum board before application of dry set mortar setting bed.

3.2.3 Ensure that concrete substrates are free from latency and foreign matter which would impair bond. Grind concrete if necessary to present a sufficiently smooth surface to ensure proper performance of membrane. Vacuum substrate.

3.2.4 Crack Suppression Membranes:

.1 Prepare all surfaces of non-structural and structural cracks in strict accordance with the crack suppression membrane manufacturer's written instructions.
.2 Prime and fill all surfaces of non-structural and structural cracks in strict accordance with the crack suppression membrane manufacturer's written instructions.

3.3 INSTALLATION - GENERAL

3.3.1 Do tile work in accordance with Specification Guide 09 30 00 Tile Installation Manual 2009/2010, produced by Terrazzo Tile and Marble Association of Canada (TTMAC) and Construction Specifications Canada (CSC), except where specified otherwise.

3.4 INSTALLATION - SETTING BED

3.4.1 Use thin set with latex mortar system for application of tile to concrete floors in accordance with TTMAC Detail No. 311F-07.

3.4.2 Thin set mortar system for masonry or concrete walls: Apply slight levelling coat plaster base and bond coat in accordance with TTMAC Detail 303W-02.

3.4.3 Thin set mortar with latex additive for application of tile to water resistant gypsum board in accordance with Detail 304W-02.

3.4.4 Use epoxy setting bed for ceramic wall tile on plywood.

3.4.5 On metal access doors, install ceramic tile using epoxy setting bed with rust-inhibitive additives. Pressure apply setting bed to 1.6 mm (1/16") thickness with trowel and comb it prior to the setting of tiles. Mix setting bed in accordance with the written recommendations of the manufacturer.

3.5 INSTALLATION - TILE

3.5.1 Back-mortar, tile larger than 150 mm x 150 mm (6" x 6").

3.5.2 Unless otherwise detailed, lay out tile so that fields or patterns are centred on wall and floor areas, or architectural features and so that no tile less than one-half size occurs. Align wall, floor and base tile joints at wall base, if tile sizes are suitable. Do not use cut tiles at finished ceiling level.

3.5.3 Schedule delivery of tile so that a homogeneous blend of colours can be achieved throughout entire extent of this work. Colour blend tile.

3.5.4 Distribute production run varieties evenly maintaining the continuity of pattern.

3.5.5 Unless otherwise detailed, arrange accessories in tile work so that they are evenly spaced, centred with joints and set true with correct projection. Ensure that each tile has continuous solid backing. Saw cut and trim tile as required around fittings, pipes, holdfasts, and fixtures. Cut or drill and set holdfasts, bolts and anchors required for fastening fixtures and fittings in tile areas. Grind cut edges smooth.

3.5.6 Back butter all floor tile.

3.5.7 Finish tile work clean, free of broken, damaged or defective tiles. Reject warped tiles.

3.5.8 Joints in base shall match floor patterns. Joints shall be watertight without voids, cracks or excess grout.

3.5.9 Cure tile installations for three days, sponging and wetting down as necessary.

3.5.10 Unless otherwise noted, install tile with 4.6 mm (3/16") maximum width joints.

3.5.11 Finish exposed edge of tiles with edge moulding at termination of wall, termination of wall tile panels, at external corner and elsewhere as required to provide finished appearance to tile application where bullnosed tile is not used. Secure moulding to substrate straight and true, Grout in perforated flange.

3.5.12 Sound tiles after setting and remove and replace tiles not fully bedded.

3.5.13 Re-point joints after cleaning to eliminate imperfections. Avoid scratching tile surfaces.

3.5.14 Finished tile work shall be clean and free of tiles which are pitted, chipped, cracked or scratched. All damaged tile shall be removed and replaced.

3.5.15 Where indicated on Drawings or as required, install continuous single piece metal edge trims centred under doors in closed position and other locations where tile meets other floor finishes.

3.6 CONTROL JOINTS AND SEALANT

3.6.1 Provide control joint in tile at locations where substrate changes to different material or construction, between new and existing substrates, where tile abuts other hard material, where areas change direction, at similar joints in structure, where structural substrate abuts non-structural substrate, at 4.8 m (16'-0") maximum in each direction as determined by tile pattern, around room perimeter and where indicated.

3.6.2 Apply sealant around fittings penetrating tile work including pipes and drains, around door frames, between tile and threshold, around fixtures, escutcheon plates, along floor/wall junction, and similar areas. Coordinate sealant application at wall/base junction with floor and base installation.

3.7 GROUTING

3.7.1 Ensure setting bed has cured before commencing grouting.

3.7.2 Grout floor tile using acid resistant grout.

3.7.3 Grout wall tile using dry curing grout.

3.7.4 Grout epoxy set tile using epoxy grout.

3.7.5 Where indicated, colour grout to match middle range of tile colours, as directed. Grout to suit the contour of the tile. Fill joints, tool and make uniform in appearance without voids or cracks and watertight. Where floor and wall tile are matching, use floor grout on walls.

3.7.6 Make joints between tile uniform, plumb, straight, true and aligned with adjacent tile. Ensure sheet layout is not visible after installation. Align patterns.

3.7.7 When grout hardens damp cure for next 3 days.

3.8 WATERPROOFING

3.8.1 Install waterproofing in accordance with waterproofing manufacturer's written instructions to produce a waterproof membrane of uniform thickness bonded securely to substrate.

3.8.2 Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.9 SEALING

3.9.1 Seal unglazed floor tile in accordance with manufacturer's instructions to provide a matte sheen.

3.10 FIELD QUALITY CONTROL

3.10.1 Sound walls and floors with a solid object. If there is a hollow sound remove grout around that tile and check tile adhesion.

3.10.2 Ensure that adhesive containers bear certification of compliance with specified standards.

3.10.3 Ensure that tile containers are labelled with grade seals.

3.11 CLEANING AND FINISHING

3.11.1 Clean, seal and finish tile works installed under this Section of the work in accordance with TTMAC Maintenance Guide.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 Provide all labour, materials, products, equipment and services to complete the painting and finishing work required and/or indicated on the Drawings and specified herein.

1.1.3 Provide surface preparation to receive painting and finishing specified under this Section of the work, in accordance with the the Master Painters Institute (MPI) Painting Specification Manual and as specified herein.

1.1.4 Examine the Specifications and Drawings for the work of other Sections regarding the provisions for prime and finish coats. Paint or finish all materials installed throughout the project which are required to be painted and which are left unfinished or unpainted by other Sections.

1.1.5 The only exception to the requirements of the preceding paragraph is where the drawings, Specifications, or Schedules state positively and explicitly that a surface is not to be finished.

1.1.6 For areas indicated as unfinished in the specifications, Finish Schedules, and Drawings, painting is not required, except for doors and frames, windows and frames, railings, steel stairs, insulation on mechanical equipment, pipes and fittings, and other items requiring protection including electrical panels.

1.2 RELATED WORK SPECIFIED ELSEWHERE

1.2.1 Shop painting of structural, miscellaneous and ornamental metal.

1.2.2 Shop coating of hollow metal doors and frames: Section 08 11 00.

1.2.3 Colour code markings for identification of piping and ductwork: Division 15.

1.3 REFERENCES

1.3.1	ASTM D523-14	Standard Test Method for Specular Gloss.
1.3.2	CAN/CGSB 1.213-2004	Etch Primer (Pretreatment Coating or Tie Coat) for Steel and Aluminum.
1.3.3	CAN/CGSB 85.100-93	Painting.

1.4 QUALITY ASSURANCE

1.4.1 Arrange with the paint manufacturer's and Canadian Paint and Coatings Association (CPCA) representatives to visit the site prior to the commencement of the painting operation to discuss the painting and finishing procedures to be used and to analyse the surface conditions in order that alternative recommendations may be made to the Consultant should adverse conditions exist.

1.4.2 Arrange with the paint manufacturer and CPCA to visit the site at intervals during the surface preparation and painting operations to insure that the proper surface preparation has been completed, the specified paint products are being used, the proper number of coats are being applied and the agreed finishing procedures are being used, and that the paint manufacturer

regularly submits written reports to the Consultant.

1.5 QUALIFICATIONS

1.5.1 Use only paint manufacturers and products as listed under the Approved Products section of the MPI Manual Architectural Painting Specification Manual.

1.5.2 Applicator shall have a minimum of ten (10) years proven satisfactory experience and shall maintain a qualified crew of painters throughout the duration of the work, who shall be qualified to fully satisfy the requirements of this specification. Only qualified journeymen (and apprentices) shall be engaged in painting and decorating work who have Tradesman Qualification certificate of proficiency.

1.6 SUBMITTALS

1.6.1 Submit 2 samples of every colour, in the required number of coats on 8"x 8" pieces of hardboard. Include specifications of materials, products and installation procedure used to obtain the finish. Resubmit samples until colours have been approved by the Consultant.

1.6.2 Colours shall match those specified in the Colour Schedule.

1.6.3 Retain samples at job site until completion of the work.

1.6.4 Two weeks after award of Contract submit to the Consultant a complete list of paint and finish materials to be used, showing the name of the manufacturer, the catalogue number, grade and quality of the materials proposed for use.

1.6.5 Materials and products delivered to the work shall comply with the approved list.

1.7 MOCK UP

1.7.1 A sample installation area located in the building will be designated by the Consultant.

1.7.2 Apply samples of finishes in the presence of the Consultant, Contractor and paint manufacturer. Apply samples with the correct material, number of coats, colour, texture and degree of gloss required. Refinish if required, until approval of the Consultant is obtained.

1.7.3 Leave sample installation undisturbed until completion of the Work. Approved sample installation shall serve as a standard for similar work throughout the Project. Work which does not match the approved finishes shall be corrected and refinished at no expense to the Owner.

1.8 PRODUCT DELIVERY, STORAGE AND HANDLING

1.8.1 Store materials in a single place. Keep storage clean and tidy.

1.8.2 Accept only paint and finishing materials and products delivered to the site in the manufacturer's unbroken, sealed containers, with manufacturer's label indicating type of paint, colour and instructions for reducing.

1.8.3 Store packaged materials undamaged in their original wrappings or containers with manufacturer's labels and seals intact.

1.8.4 Before commencement of work, remove electrical plates, surface hardware, canopies of lighting fixtures, and other escutcheons or appurtenances. Reinstall items in satisfactory condition when painting is completed. Do not clean hardware with solvents which will remove permanent lacquer finish.

1.8.5 Use sufficient drop cloth and protective coverings for the full protection of floors and surfaces not to be painted.

1.8.6 Protect materials and products from frost.

1.9 ENVIRONMENTAL REQUIREMENTS

1.9.1 Atmosphere at the area of work shall be dust free.

1.9.2 Temperatures, humidity, and moisture content of surfaces shall conform to the following:

.1 Temperatures; No painting shall be performed when temperatures on the surface, or the air in the vicinity of painting work are below 5°C. The minimum temperatures allowed for latex paints shall be 7°C. for interior work and 10°C for exterior work, unless specifically approved by the Consultant.
.2 Relative humidity shall not be higher than 85%.
.3 Moisture of surfaces shall be tested by an electronic Moisture Meter.
.4 Moisture content of wallboard shall not exceed 12%, of masonry, concrete or concrete block, 12% for solvent type paint.
.5 Masonry surfaces shall be tested for alkalinity.
.6 Maximum moisture content of wood; 15%.

1.9.3 Masonry and concrete block must be installed at least 28 days prior to painting, with a moisture content not exceeding 12%, before painting commences. This is not to be construed as including a "wetting down" process for latex.

1.9.4 Painting work shall not proceed unless a minimum of 15 candle power/sq ft lighting is provided on the surface to be painted.

1.9.5 All areas where painting work is proceeding shall have adequate continuous ventilation and sufficient heating to maintain temperatures above 7°C. for 24 hours before and after paint application.

1.9.6 Take all necessary precautions to prevent fire hazard and spontaneous combustion.

1.9.7 Where toxic materials, and both toxic and explosive solvents are used, take appropriate precautions and prohibit smoking.

1.10 INSPECTION AND WARRANTY

1.10.1 Inspections shall be carried out in accordance with the Canadian Painting Contractors' Architectural Painting Specification Manual.

1.10.2 Warrantee the work of this Section against faulty workmanship for a period of two (2) years from date of Substantial Completion.

1.10.3 Warrantee shall be in a form acceptable to the Consultant.

1.11 PROTECTION

1.11.1 Adequately protect other surfaces from paint and damage and make good any damage caused by failure to provide suitable protection.

1.11.2 Furnish sufficient drop cloths, shields and protective equipment to prevent spray or dropping from fouling surfaces not being painted and in particular, surfaces within storage and preparation area.

1.11.3 Cotton waste, cloths and material which may constitute a fire hazard shall be placed in closed metal containers and removed daily from the site.

1.11.4 Remove all electrical plates, surface hardware, fittings and fastenings, prior to painting operations. Carefully store, clean and replace these items on completion of work in each area. Do not use solvent that will remove the permanent lacquer to clean hardware.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Paint, varnish, stain, enamel, lacquer, fillers and other finishing materials shall comply with or exceed CAN/CGSB 85.100 for Premium Grade Work, highest grade, top line quality products of the specified manufacturers, and be of a type and brand herein specified and listed under "Paint Product Recommendations" as covered in the CPCA Painting Manual, for the specific purposes

2.1.2 Paints shall use a latex bonding agent.

2.1.3 Paint materials such as linseed oil, shellac, turpentine, etc., and any of the above materials not specifically mentioned herein but required for first class work shall be the highest quality of an approved manufacturer. All coating materials shall be compatible.

2.1.4 Paints, finishing and cleaning products shall be formulated with no petroleum based or other organic solvents (no V.O.C.'s) wherever possible.

2.1.5 The approval of the manufacturer of the painting and finishing materials will be based on his agreement to provide the supervision service herein before specified.

2.1.6 The following manufacturers are acceptable:

.1 Pittsburgh Paints (PPG) Manor Hall Series
.2 Benjamin Moore Aura exterior/interior paint
.3 Dulux Diamond exterior/interior paint

2.1.7 The Consultant reserves the right to refuse any paint or finishing material if in his opinion it is not suitable or adequate for the use which it is proposed.

2.1.8 Exterior paints: Factory tinted to scheduled colours.

2.1.9 Interior galvanized metal primer: to comply with LEED VOC limit of 250g/L per Green Seal GC-03 Anti-Corrosive Paints.

2.1.10 Etch primer: Complying with CAN/CGSB 1.213.

2.2 MIXING

2.2.1 Paints shall be ready-mixed unless otherwise specified, except that any coating in paste or powder form, or to be field-catalysed shall be field-mixed in accordance with directions of its manufacturer. Pigments shall be fully ground and shall maintain a soft paste consistency in the vehicle during storage that can and shall be dispersed readily and uniformly by paddle to a complete homogeneous mixture.

2.2.2 Paint shall have good flowing and brushing properties and shall dry cure free of sags and runs

etc. to yield the desired finish specified.

PART 3 - EXECUTION

3.1 INSPECTION

3.1.1 Examine the work upon which the work of this Section depends prior to commencement of work. If surfaces cannot be put in proper condition by customary cleaning, sanding and puttying, report any defects to the Consultant.

3.1.2 Failure to report defects will constitute acceptance of surfaces. Refinish the faulty work at no expense to the Owner.

3.1.3 Test all surfaces by an approved moisture testing device for moisture content before commencing work. Do not apply paint to substrates when the moisture content exceeds 12%.

3.2 PREPARATION

3.2.1 Refer to Canadian Painting Contractors' Architectural (CPCA) Painting Specification Manual for surface preparations.

3.2.2 Clean floors, adjacent surfaces and surfaces to be painted before work is commenced.

3.2.3 Cut out scratches, cracks and abrasions in wall surfaces and adjoining trim, as required, and fill with an approved non-shrink patching compound flush with adjoining surface. When dry, sand the patch smooth and seal before the application of the prime coat.

3.2.4 Fill nail holes, screw holes and other similar defects after the first coat of paint has been applied. The filler shall match the colour of the finish.

3.2.5 Surfaces to be finished shall be clean, free from machine, tool, or sanding marks, dust, grease, soil or other extraneous matter which could be detrimental to an acceptable finish.

3.2.6 Wood: Prepare in accordance with CAN/CGSB 85.100 Sand smooth, removing all tool marks, and dust clean. Apply one coat of aluminum primer to all knots and sap streaks, on wood if to be painted or one coat of white shellac if to be stained and varnished. Putty nail holes, cracks and defects only after the correct priming coat is dry. Fine sanding and dusting to be carried out between coats.

3.2.7 Gypsum board: Inspect to ensure properly filled joints, sand smooth. Remove contamination.

3.2.8 Concrete, Masonry: Surfaces shall be clean, free from all contamination. Scrape off all mortar nibs and cement spatter. Remove form oil by washing with Xylol. Remove efflorescence by brushing or washing with a dilute solution of muriatic acid - 1 part commercial muriatic acid to 20 parts water by volume - followed by complete rinsing with clean water. Remove mildew by the application of one part sodium hypochloride (Javex) to three parts water. If dirt is also in evidence, add 1/2 lb. trisodium phosphate to 1 gallon of the above solution. Scrub surface well and follow with a thorough clean water rinse.

3.2.9 Wash masonry surfaces which are to be painted with a solution consisting of 2.0 lb. of zinc sulphate to 1 gallon of water. Rinse with clean water and allow to dry thoroughly. Remove mortar spots and sharp edges with a scraper and ensure that patching is done where required.

3.2.10 Mildew removal: Scrub with solution of T.S.P. and bleach, rinse with clear water and allow

surface to dry completely.

3.3 APPLICATION - GENERAL

3.3.1 Apply paint according to accepted trade method.

3.3.2 Apply each coat at proper consistency.

3.3.3 Sand lightly between coats to provide anchor for successive coat.

3.3.4 Each coat of paint shall be slightly darker than preceding coat unless otherwise approved.

3.3.5 Do not apply finishes on surfaces that are not sufficiently dry. Each coat of finish shall by dry and hard before next coat is applied unless manufacturer's directions state otherwise. (Refer to polyurethane coatings).

3.3.6 Tint filler to match wood when clear finishes are specified. Work filler well into grain and before it has set wipe excess from surface.

3.3.7 On exterior work do not paint during temperatures under 5°C, or immediately following rain, frost or dew. On interior work do not paint during temperatures under 5°C, or on surfaces where condensation has formed or is likely to form (unless specifically formulated paints are used). Minimum temperatures allowed for latex paints shall be 7°C for interior work and 10°C for exterior work.

3.4 FIELD QUALITY CONTROL

3.4.1 Use pink litmus paper for testing surfaces for alkalinity. Where extreme alkali conditions occur, neutralize surface by washing. Wash shall consist of a 4% solution of Zinc Sulphate. Does not apply to surfaces to receive latex paints.

3.5 APPLICATION - PRIMERS

3.5.1 Apply one coat of primer to exposed ferrous metal surfaces including structural steel, mechanical and electrical equipment, piping, ducts and conduit that have not received a shop coat of primer.

3.5.2 Touch up primed metal work after loose paint and scale have been removed.

3.5.3 Thoroughly clean galvanized steel, including piping and ductwork of oil and grease with mineral spirits, treat with an approved chemical phosphoric metal etch and allow to dry, unless galvanized metal primer is to be used.

3.5.4 Wash masonry surfaces which are to be painted, with a solution consisting of 2.0 lb. of zinc sulphate to 1 gal. of water. Rinse with clean water and allow to dry thoroughly. Remove mortar spots and sharp edges with a scraper and ensure that patching is done where required. Prime masonry block surfaces with primer/block filler to fill all pores including pin holes.

3.5.5 Apply primer to piping having bituminous covering which is compatible with finish paint which will prevent bitumen bleeding through finish.

3.5.6 Apply sealer and prime coat on walls to receive mirrors before installation of mirrors.

3.5.7 When the primer-sealer coat is dry, touch up all visible suction spots before the first finish coat is applied and do not proceed with the work until all suction spots are sealed.

3.5.8 Minimal cracks, holes and imperfections appearing after application of prime coat shall be filled, patched and smoothed to match adjoining surface by Section providing the surface being pained.

3.6 APPLICATION - FINISH COATS

3.6.1 Mix materials thoroughly before application, apply evenly under adequate illumination and free from sags, runs, crawls and other defects. Do cutting in neatly.

3.6.2 Apply finish coats of the proper consistency as received from the container, and brush well showing a minimum of brush marks.

3.6.3 Sand semi-gloss, medium and high gloss lightly between coats.

3.6.4 Gloss terms shall have the following values when tested in accordance with ASTM D523 "Test for Specular Gloss":

.1 Gloss Term Gloss Value Pittsburgh
.2 Flat 5 to 20 Less than 15
.3 Eggshell 20 to 405 to 20
.4 Lo-Lustre 15 to 25
.5 Satin15 to 35
.6 Semi-gloss 40 to 6030 to 65
.7 Gloss, medium 60 to 80 over 65
.8 Gloss, High 80 to 90

3.6.5 Finish walls in eggshell, ceilings in flat and frames in semi-gloss, unless noted otherwise.

3.6.6 Apply coats only when the previous coat of paint, varnish or enamel is perfectly dry. Each finish coat shall be a tint lighter than the following. Only the last coat shall match the accepted samples.

3.6.7 Finish tops, bottoms and edges of doors in the same manner as the remainder of the door.

3.6.8 Finish the work uniformly as to sheen, gloss, colour and texture.

3.6.9 Apply materials in accordance with the directions and instructions of the manufacturers of the various materials. Do not use adulterants.

3.6.10 Finish closets and the interior of cabinets the same as adjoining surfaces of rooms, unless otherwise specified. Finish all other surfaces the same as the nearest or adjoining surfaces unless otherwise specified or directed by the Consultant.

3.6.11 Spray painting may be used only with the approval of the Consultant.

3.6.12 Repaint the entire plane of areas showing incomplete coverage. Patching is prohibited.

3.6.13 Paint surfaces and items visible through convector covers, grilles, heating cabinets, louvres and soffits with two coats black matte paint.

3.6.14 Do not paint over fire rating labels on doors and frames and over identification labels on mechanical and electrical equipment.

3.6.15 Paint reveals the same colour as the surface in which it occurs, unless otherwise indicated.

3.6.16 All interior metalwork which is exposed in the completed work, in rooms which are shown on the "Room Finish Schedules" to have a finish on the walls or ceiling shall receive two coats of interior paint over the prime coat. Painting shall include without being limited to, all structural steel, mechanical and electrical equipment, ductwork, and piping.

3.6.17 All interior metalwork in unfinished areas shall receive one coat of interior paint over the prime coat. Painting shall include without being limited to structural steel, steel ladders, mechanical and electrical equipment, piping and ductwork.

3.6.18 The following generally, will be painted in colour, texture and sheen to match adjacent surfaces:

.1 Access doors
.2 Registers
.3 Radiators and covers
.4 Prime coated butts
.5 Prime painted door closers
.6 Exposed piping.

3.7 APPLICATION - EXISTING SURFACES

3.7.1 Main off-white paint colour used in classrooms and corridors to match Pratt & Lambert 2127 – “Snowflake”, semi-gloss only; to be used on gypsum wallboard as well.

3.7.2 Paint or repaint all existing surfaces of rooms where noted on the "Room Finish Schedule" including "new" work which has been incorporated into the existing work and existing work which has been damaged, altered, or otherwise disturbed during renovation operations.

3.7.3 Repaint surfaces or rooms adjacent to rooms where alterations or renovations have been carried out and which have been damaged or otherwise disturbed by the alterations or renovations. Where such damage occurs, repaint completely.

3.7.4 Remove from existing surfaces to be coated all rust, scale, oil, grease, mildew, chemicals, and other foreign matter.

3.7.5 If coatings on existing surfaces have failed so as to affect the proper performance or appearance of coatings to be applied, or if such coatings can be easily scraped off, remove them and prepare their substrates properly. Dull hard or glossy surfaces by sanding, sandblasting, or by other abrasive methods prior to painting.

3.7.6 Repaint surfaces entirely between changes of plane which have been incorporated into the existing work and existing work which has been damaged, altered, or otherwise disturbed during renovation operations. Give existing surfaces two coats of paint or enamel over existing finish to match the previous finish.

3.7.7 Paint existing mechanical and electrical items exposed to view in areas indicated.

3.8 CLEANING

3.8.1 Promptly as the work proceeds and on completion of the work, remove all paint where spilled, splashed or spattered. During progress of the work keep premises free from unnecessary accumulation of tools, equipment, surplus materials and debris. At conclusion of the work leave premises neat and clean to the satisfaction of the Consultant, Paint Inspector and/or Owner.

3.9 INTERIOR FINISHES

3.9.1 Finish the various interior surfaces as follows, in addition to previously specified treatments, coatings or primers:

Concrete Block	1 coat masonry block filler and primer 2 coats eggshell latex
Galvanized Steel	1 coat galvanized metal primer or pretreatment 2 coats vinyl latex or epoxy of selected sheen
Gypsum Drywall	1 coat primer-sealer
Ceilings	2 coats flat vinyl-latex paint
Walls	2 coats eggshell latex paint
Steel, Miscellaneous	1 coat rust inhibiting primer 2 coats alkyd enamel of selected sheen
Shop Primed Steel	1 coat vinyl wash primer 2 coats alkyd paint of selected sheen
Piping, Conduit & Ductwork	1 coat metal primer 1 coat fire retardant and mildew resistant paint of selected sheen
Mechanical Equipment	2 coats gloss enamel
High heat areas	2 coats heat resistant paint
Insulation on pipes and ducts	1 coat fire retardant and latex sealer 2 coats latex paint of selected sheen
Metal Convectors & Heating Units	2 coats gloss enamel

3.10 EXTERIOR FINISHES

3.10.1 Finish the various exterior surfaces as follows:

Galvanized Steel	1 coat rust inhibiting metal primer 1 coats exterior epoxy or vinyl enamel of selected sheen
Shop Primed	1 coat vinyl wash primer
Steel	2 coats alkyd paint of selected sheen
Steel	1 coat rust inhibiting primer 2 coats exterior alkyd enamel

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

1.1.1 This Section includes requirements for supply and installation of metal toilet partitions and accessories required for a complete and functioning installation, in the following configuration:

.1 Ceiling Hung

1.2 RELATED WORK SPECIFIED ELSEWHERE

1.2.1	Washroom Accessories	Section 10 28 00
1.2.2	Plumbing Fixtures	Division 22

1.3 REFERENCES

1.3.1	ASTM A666-15	Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

1.4 DESIGN CRITERIA

1.4.1 Design: "barrier free access" toilet compartments conforming to CAN/CSA-B651-M, ANSI A117.1 and O.B.C. requirements.

1.5 ADMINISTRATION REQUIREMENTS

1.5.1 Coordination: Coordinate site dimensions affecting work of other Sections and provide data, dimensions and components, anchors and assemblies installed by other Sections in sufficient time for installation of products specified in this Section.

1.6 SUBMITTALS

1.6.1 Submit shop drawings in accordance with Section 01 30 00.

1.6.2 Clearly indicate fabrication details, plans, deviations, hardware and installation details.

1.6.3 Shop Drawings: Show and describe in detail materials, finishes, dimensions, details of connections and fastenings elevations, plans, sections, metal thicknesses, hardware and any other pertinent information.

1.6.4 Submit necessary templates and instructions where supports or anchors have to be built-in by others.

1.6.5 Colour: to be selected by Consultant.

1.6.6 Provide maintenance data for maintenance of metal finishes work for incorporation into Maintenance Manual.

1.7 PROTECTION

1.7.1 Factory-applied baked enamel finish to be protected by approved means during shipment and installation. Do not remove protection until immediately prior to final inspection.

1.8 SITE CONDITIONS

1.8.1 Site Measurements: Verify dimensions by site measurements before fabrication and indicate measurements on shop drawings where toilet compartments are indicated to fit between or around other construction; coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.8.2 Established Dimensions: Establish dimensions and proceed with fabricating toilet compartments without site measurements where site measurements cannot be made without delaying the Work; coordinate construction to ensure that actual site dimensions correspond to established dimensions; allow for trimming and fitting.

1.9 WARRANTY

1.9.1 At no cost to the Owner, remedy any defects in the work of this Section due to rusting of galvannealed steel components for a period of three (3) years from the date of substantial performance.

PART 2 - PRODUCTS

2.1 APPROVED PRODUCTS AND MANUFACTURERS

2.1.1 Basis-of-Design Products: Products named in this Section were used as the basis-of-design for the project; additional manufacturers offering similar products may be incorporated into the work of this Section provided they meet the performance requirements established by the named products.

2.1.2 Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include; but are not limited to, the following:

.1 ASI Watrous - Global Partitions
.2 Hadrian Manufacturing Inc.

2.1.3 Toilet Partitions Type: Floor mounted / overhead rail braced type; metal toilet partitions:

.1 Integrated Privacy TM Toilet Partitions by ASI
.2 Headrail Braced Toilet Partitions by Hadrian Manufacturing Inc.

2.2 MATERIALS

2.2.1 Doors, Panels, [and] Pilasters [and Headrails]: Sheet steel with commercial quality hot dipped zinc coating, in accordance with ASTM A653/A653M, Commercial Steel (CS), ZF001 (A01) galvannealed, bonded each side of paper honeycomb core with returned and sealed edges.

.1 Minimum steel thickness:
  .1 Doors and Panels: 22 gauge.
  .2 Pilasters [and head rails]: 20 gauge.
  .3 Urinal Screen: 22 gauge.

2.2.2 Pilaster shoes: Stainless steel conforming to ASTM A666, Type 304, satin finish.

2.2.3 Handrail: Anodized aluminum with satin finish, anti-grip profile.

2.2.4 Brackets: Galvaneal steel channels, finished to match panels.

2.2.5 Hinges: Stainless steel, Type 304, satin finish, heavy duty self closing, minimum per door.

2.2.6 Slide Bolt and Keeper: Stainless steel with emergency access.

2.2.7 Door Stops: Door stop complete with rubber insert. Door stop must be part of slider/locking device designed to eliminate its use as a hook or hanger.

2.2.8 Door Pull: Stainless steel, for barrier-free units.

2.2.9 Fasteners: Stainless steel, tamperproof type.

2.2.10 Anchors: Floor channel fastened to pilasters with pan head screws and to floor slab with #12 x 37mm pan head screws into nylon expansion sleeves.

2.2.11 Latch Set: Built-in, with emergency access feature to manufacturer's standard bright finish.

2.2.12 Bituminous Paint: CAN/CGSB-1.108, Type 2.

2.2.13 Butyl Tape: Extruded, high grade macro-polyisobutylene tape of width and shore hardness to suit conditions.

2.2.14 Hardware and Fittings:

.1 Compartment panels and pilasters shall be secured with brackets made of brush finish extruded aluminum alloy.
.2 Doors: Provide gravity type hinges, full concealed within the thickness of the door during operation.
.3 Hinges: Adjustable to permit door to come to rest at specified angle when not latched.
.4 Mount doors on upper and lower pilaster hinge brackets of chrome plated, zinc die castings.
.5 Provide reinforcement for washroom accessories as required to preserve integrity of partition panels and as required to ensure secure attachment of accessories.

2.3 FABRICATION

2.3.1 Shop fabricate toilet partitions. Take site measurements for areas where partitions are to be located and fabricate toilet partitions to suit site dimensions.

2.3.2 Fabricate doors, panels, and pilasters from sheet steel laminated to both sides of core material, under pressure, using waterproof adhesive. Finished doors and panels shall be 25mm (1") thick and pilasters shall be 32mm (1-1/4") thick.

2.3.3 Check sizes and locations for washroom accessories and if necessary, reinforce panels.

2.3.4 Form all edges of doors, panels and pilasters and secure together with continuous flat locking strip with mitred and welded corners.

2.3.5 Fill depressions and cavities with metal filler, sand smooth, degrease and clean thoroughly.

2.3.6 Prepare panels to accept tissue dispensers and grab bars where indicated on drawings.

2.3.7 Design supports to withstand, within acceptable deflection limitations, their own weight, the weight of the toilet compartments, loads imposed by the motion of compartment doors and all live loads, which might be applied to the toilet compartments in the course of their normal function. Design supports as required to accommodate structural deflection. Build in reinforcing to support the grab bars and withstand a downward pull of 500 lbs. at any point on the grab bar.

2.4 FINISHES

2.4.1 Finish surfaces of doors, pilaster and partition panels with two (2) coats of baked thermosetting acrylic enamel; Colour: As selected by the Consultant from the manufacturers standard colour line.

PART 3 - EXECUTION

3.1 GENERAL

3.1.1 Verify dimension on the site before preparing shop drawings or proceeding with fabrication work.

3.1.2 Co-ordinate installation of any inserts or anchors which must be built in by other trades.

3.2 INSTALLATION

3.2.1 Install toilet compartments in accordance with manufacturer’s recommended procedures and the reviewed shop drawings.

3.2.2 Erect Work straight, plumb, level, and secure to prevent distortion or displacement, or both.

3.2.3 Ensure clearance between panels and pilasters or walls does not exceed 12mm.

3.2.4 Fasten panels and pilasters to walls with brackets. Fasten headrails to walls with brackets. Joint lengths of headrails only at pilasters.

3.2.5 Securely attach fixing brackets and shoes.

3.2.6 Equip each door with hinges, latch and door stop. Provide stainless steel pull installed to door face of barrier free units.

3.2.7 Provide door plates at top and bottom of doors, through bolted.

3.3 CEILING HUNG PARTITION ERECTION

3.3.1 Secure pilasters to supporting structural framing using pilaster hangers.

3.3.2 Ensure pilaster hangers do not transmit load to finished ceiling.

3.3.3 Secure pilaster shoe in position.

3.3.4 Set bottoms of doors level with bottom of pilasters when doors are in closed position.

3.4 FLOOR SUPPORTED, OVERHEAD BRACED PARTITION ERECTION

3.4.1 Attach pilasters to floor with pilaster supports and level, plumb, and tighten installation with levelling device.

3.4.2 Secure head rail to pilaster face with not less than two fasteners for each face.

3.4.3 Secure pilaster shoes in position.

3.4.4 Set tops of doors parallel with overhead brace when doors are in closed position.

3.5 ADJUSTMENT AND CLEANING

3.5.1 Adjust and lubricate operating hardware to work smoothly and without force. Adjust hinges of toilet compartment doors so that all doors remain open to the same degree when unlatched.

3.5.2 Remove and replace damaged of defective Work from Site, at no extra cost to the Owner.

3.5.3 Remove soil and dirt deposits resulting from fabrication and installation.

3.5.4 Provide protection to prevent damage after installation.

3.5.5 Remove protection immediately prior to occupation of building by Owner. Perform final cleaning in accordance with Division 1.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 Provide all labour, materials, products, equipment and services to supply and install washroom accessories required as shown on the Drawings and as specified herein.

1.2 REFERENCE STANDARDS

1.2.1	ASTM A167-99(2009)	Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip (Withdrawn 2014).
1.2.2	ASTM A653/A653M-15 (Galvanized)	Standard Specification for Steel Sheet, Zinc-Coated or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
1.2.3	ASTM B117-11	Standard Practice for Operating Salt Spray (Fog) Apparatus.
1.2.4	CAN/CGSB 12.5-M86	Mirrors, Silvered.
1.2.5	CSA W55.3-08(R2013)	Certification of Companies for Resistance Welding of Steel and Aluminum.

1.3 SUBMITTALS

1.3.1 Submit shop drawings, clearly indicating accessory materials, products and finishes and showing in large scale detail the construction, reinforcing, anchorage and location of exposed fastenings, where permitted. Submit a prototype of each accessory for review before delivery to the site.

1.3.2 Submit necessary templates and instructions where recesses, openings, fastenings or anchors have to be built in by others.

1.3.3 Submit three copies of list of accessories requiring supplies together with names and addresses of local distributors of the supplies.

1.4 DELIVERY AND STORAGE

1.4.1 Carefully wrap accessories ensuring protection during shipping and storage.

1.4.2 Store accessories inside the building in location directed, and so that their identification is readily visible, and in the general order in which they will be required for installation.

1.4.3 Adequately protect the structure and work of other Sections during delivery, storage, handling and execution of the work of the Section.

1.4.4 Provide tools, plant and other equipment required for the proper execution of the work of this Section.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

2.1.1 The following manufacturers may be used for Base Bid:

.1 Bobrick Washroom Equipment of Canada
.2 Frost Products Limited
.3 ASI Watrous
.4 Saferail Products Inc.
.5 Or other approved manufacturers meeting or exceeding these requirements.

2.1.2 Manufacturer's standard products shall be modified to comply with these Specifications unless otherwise stated with bid submission for work of this Section.

2.1.3 Washroom accessories shall be as specified in this Section, and shall be of one manufacturer except as otherwise specified or approved. Washroom accessories of the same materials, construction and finishes, and similar in function, design and appearance to those specified of other manufacturers will be considered, in accordance with the requirements of the Contract Documents for proposing substitutions.

2.2 MATERIALS

2.2.1 Stainless steel: ASTM A167 Type 304 or Type 316, of one type throughout.

2.2.2 Galvanized steel sheet: ASTM A653/A653M, commercial quality sheets, plain commercial galvanized or electro-galvanized.

2.3 FABRICATION

2.3.1 Fabricate accessories true, square, rigid, free from distortion and from defects detrimental to appearance and performance.

2.3.2 Visible joints, where permitted, shall be straight, accurate, hairline butt joints. Corner joints shall be mitred.

2.3.3 Assemble sheet metal accessories by welding in accordance with CSA W55.3. Conceal welds, or grind smooth such as to be invisible in completed work.

2.3.4 Except as otherwise specified, assemble fastenings, hardware fixings, and mounting or installation devices shall be concealed in the finished work.

2.3.5 Provide fasteners for mounting accessories. Fasteners shall be of non-corrosive, expansion type metal, toggle type or other approved type of positive, mechanical anchor as required to suit the construction to which the accessory is to be mounted. Exposed fasteners, where permitted, shall be finished to match adjacent accessory surface, and shall be countersunk. Where accessories are mounted to sheet metal, provide 1/8" thick minimum full size metal back plate drilled and tapped to receive machine screws and finished to match the adjacent sheet metal surface.

2.3.6 Unless otherwise specified, hinges shall be concealed stainless steel piano hinges and shall extend full length of hinged element. Hinged elements shall have concealed, mechanically retained, rubber bumpers for silent closing, and shall close flush with faces of fronts or frames.

2.3.7 Unless otherwise specified, portions of sheet metal accessory items which are visible in the completed work shall be stainless steel. Changes in plane shall be formed or continuously welded and ground smooth.

2.3.8 Sheet metal accessory parts concealed in the finished installation shall be electro galvanized sheet metal.

2.3.9 Accessories for flange type mounting shall have forged brass, full flanges drilled and countersunk for three mounting fasteners. Fix flanges to tubes using solid silver soldering.

2.3.10 Accessory lettering shall be silk screened with durable paint to withstand wear, or shall be engraved. Size, location and typeface of lettering shall selected by Consultant. Edges of letters shall be straight and sharp.

2.3.11 Washroom and Custodial Accessories:

.1 Surface Mounted:
- .1 Fabricate units with tight seams and joints, and exposed edges rolled.
- .2 Hang doors and access panels with continuous stainless steel hinge.
- .3 Provide concealed anchorage where possible.

.2 Recessed Mounted:
- .1 Fabricate units of all welded construction, without mitred corners.
- .2 Hang doors and access panels with full length, stainless steel hinge.
- .3 Provide anchorage that is fully concealed when unit is closed.

.3 Workmanship shall be best grade of modern shop practice known to recognized manufacturers specializing in this work. Joints and intersecting members shall be accurately fitted, made in true planes with adequate fastening. Wherever possible fastenings shall be concealed.

.4 Isolate where necessary to prevent electrolysis between dissimilar metal to metal or metal to masonry or concrete contact.

.5 Keys: Provide universal keys for internal access to accessories for servicing and re-supplying. Provide minimum of six (6) keys to Owner's representative.

2.4 FINISHES

2.4.1 Finish stainless steel to a standard No. 4 mechanical finish. Where possible, arrange sheet stainless steel so that the grain of the finish runs vertically in the finished installation. Where accessories consist of stainless steel and brass, finish all visible surfaces to match a No. 4 stainless steel finish including etching, nickel strike, chromium plating and mechanical finishing.

2.4.2 Finish metal surfaces for paint finish visible in the completed installation with a comprehensive pre-treatment including mechanical removal of imperfections, buffing, degreasing, non etch chemical cleaning and 2 baked on coats of thermo setting acrylic enamel. Colour and gloss of enamel finish as designated by the Consultant.

2.5 WASHROOM AND CUSTODIAL ACCESSORY SCHEDULE

No.	Description / Model
CH	Coat Hooks: Surface mounted stainless steel, collapsible safety coat hook, provide 1 for each washroom, located as directed by Consultant: Frost 1150-SS
MS	Stainless Steel Shelf: 405mm (16”) long and 125mm (5”) wide Bobrick B-295
GB1	Grab Bar: Horizontal 1.214mm (0.048") thickness; 610 (24") long x 38mm (1-1/2") Ø, straight, stainless steel, slip resistant grip, concealed mounting, cap secured with vandal resistant set screws: ASI 3801-24P Bobrick B-6806.99x24
GB2	Grab Bar: Vertical 1.214mm (0.048") thickness; 765mm (30") long x 38mm (1-1/4") Ø, straight, stainless steel, slip resistant grip, concealed mounting, cap secured with vandal resistant set screws: ASI 3801-30P Bobrick B-6806.99x30
GBL	Grab Bar: Side "L"-shape grab bar, 760mm (30") long x 760mm (30") high 38mm (1-1/2") dia., stainless steel, slip resistant grip, concealed mounting, cap secured with vandal resistant set screws: ASI Type 04 Bobrick B-5898.99
FDGB	Fold Down Grab Bar: Swing up operation, 740mm (29") long x 32mm (1-1/4") Ø, stainless steel, concealed mounting, cap secured with vandal resistant set screws: Bobrick B-4998.99
MR1	Mirror (Tilt): Framed, 910mm (36") high x 460mm (18") wide, fixed tilt installation for disabled persons, mounted 1000mm (40") to bottom of frame: ASI 0535-1836 Bobrick B-293x1836

MR2	Mirror (Flat): Framed, 910mm (36") high x 460mm (18") wide, fixed installation, mounted 1000mm (40") to bottom of frame: ASI 0600-1836 Bobrick B-290 x1836
SND	Sanitary Napkin Disposal: 255mm (10”) high x 190mm (7.5”) wide x 95mm (3 13/16” (deep), stainless steel finish, surface mounted: Bobrick B-270
PTD	Paper Towel Dispenser: Supplied by Client, installed by General Contractor.
SD	Soap Dispenser: Supplied by Client, installed by General Contractor.
TPD	Toilet Paper Dispenser: Supplied by Client, installed by General Contractor.
HD	Hand Dryer: High-speed hand dryer, stainless steel finish surface mounted: World Dryer SLIMdri L-972

PART 3 – EXECUTION

3.1 EXAMINATION

3.1.1 Inspect surfaces over which the work of this Section is dependent for any irregularities detrimental to the application and performance of the work. Notify Consultant in writing of all conditions which are at variance with those in the Contract Documents and/or detrimental to the proper and timely installation of the work of this Section. The decision regarding corrective measures shall be obtained from the Consultant prior to proceeding with the affected work.

3.1.2 Commencement of work of this Section implies acceptance of surfaces and conditions.

3.2 INSTALLATION

3.2.1 Securely fasten accessories, level and plumb in the locations shown on the Drawings, specified herein and as further directed by the Consultant on the site.

3.2.2 Co-ordinate installation with Work of trades providing adjacent construction as required to achieve reveals or other edge conditions shown on Drawings. Install fully recessed frameless accessories so that their front face is flush with finished wall surface.

3.2.3 Perform drilling of steel, masonry and concrete necessary to install work of this Section.

3.2.4 Insulate accessory surfaces to prevent electrolytic action due to contact with masonry, concrete or dissimilar metal surfaces. Use bituminous paint, building paper or other approved means.

3.2.5 Do not install mirrors until back up wall has been thoroughly sealed and primed.

3.2.6 Install hand dryers in accordance with manufacturer's recommendations.

3.3 ADJUSTMENT

3.3.1 Upon completion of the work or when directed, remove all traces of protective coatings or paper.

3.3.2 Test mechanisms, hinges, locks and latches and where necessary, adjust and lubricate and ensure accessories are in perfect working order.

3.3.3 Load accessories with initial charge of supplies and leave ready for use.

3.4 CLEANING

3.4.1 Clean and make good surfaces soiled or otherwise damaged in connection with the work of this Section. Pay the cost of replacing finishes or materials that cannot be satisfactorily cleaned.

3.4.2 Upon completion of the Work, remove all debris, equipment and excess materials resulting from the work of this Section from the site.

END OF SECTION

APPENDIX A

Appendix A – Construction School Specific Information Sheet Sample

In addition to the terms and conditions of the Contract Documents, the Contractor shall follow the protocols of the Construction Site Specific Information Sheet, sample provided below.
A completed version of this document, with site specific content, will be provided to the Contractor at the pre-construction meeting.

HWDSB

Capital Projects
Facility Services

Construction School Specific Information Sheet

1. School Information:

School Name:	Insert School Name
Bell Times	
Morning (School Entry)**:**	0:00 AM
Afternoon (School Dismissal):	0:00 PM
Aftercare Program Dismissal:	6:00 PM
Caretaking Phone Number:	000-000-0000
Caretaking Hours	
September to June	6:00 AM – 10:00 PM
December Holiday Break	6:00 AM – 2:00 PM
March Break	6:00 AM – 2:00 PM
July to August	6:00 AM – 2:00 PM
Saturday / Sunday	CLOSED
PasWord Account Code:	HP0000
Security Panel Code:	0000

2. School Entry for afterhours, school holidays or closures:

Please follow these steps upon entry to the building outside of caretaker hours and on school holidays or closures:

1. Call PasWord Protection at 1-800-561-3099 or 905-522-6680 and notify them in advance of the day(s) and time(s) that access to the building will be required. They will require the PasWord account code noted above.
2. Disarm the security panel when arriving.
3. Arm the security panel when leaving.
4. Call PasWord to verify that the building is armed and secure.

Failure to follow this procedure outside of caretaker hours and on school holidays or closures will result in an automatic dispatch of a security guard to the building to verify who has entered/exited the building. Security costs associated with the dispatch of a security guard for failing to follow the procedure will be expensed to the contractor responsible for the incident.

3. Fire Safety Plan and Procedures:

The following procedures are to ensure the safe evacuation of the job site and school in the event of a fire alarm:

1. All employees, subcontractors, workers, and all visitors to the site are to review and follow the Hamilton Wentworth District School Board (HWDSB) posted room specific evacuation cards and school specific Fire Safety Plan located in the main office, on the health & safety board and in the fire manual binder (see caretaker).
2. Construction hoarding, fencing and temporary exits are to be implemented to ensure all fire routes are maintained for safe exiting.
3. In the event of a fire alarm, all construction activities must stop and all site personnel are to vacate the building and job site.
4. All site personnel are to meet at the predetermined meeting area as identified in the contractor's fire safety plan. contractor fire safety plan to be submitted with the Health & Safety submittals upon construction initiation.

4. Fire Alarm Bypass Protocols:

Please follow these steps to put the fire alarm on bypass. The FA system should not be put on test at any time. The following protocols are established by the HWDSB Fire Safety Plan and in the event that there is a discrepancy in a procedure the HWDSB Fire Safety Plan shall govern.

1. Contractor to contact Hamilton Fire Control (HFC) per the contact information below and make arrangements to review the site requirements for bypass – i.e. complete a walkthrough with HFC to determine which devices need to be bypassed, if any, if a device/s is/are to be red capped and protected from construction debris or damage, if a rate-of-rise device is to be installed or device disconnected and how to address the trouble on the panel.

   Contact: Michael Fleet - Hamilton Fire Control
   Phone: (905) 527-7042
   Email: michael@hamiltonfirecontrol.ca

2. Hamilton Fire Control to coordinate fire alarm bypass with HWDSB caretaker and PasWord.
3. The caretaker will post a notice that the school is on Fire Watch on the exterior doors. This is required anytime that the fire alarm Panel is in trouble, a fire alarm device is bypassed or impeded in any way (i.e. disconnected, gloved, red capped, etc.).
4. The caretaker will contact PasWord and the school main office to notify them the system is on bypass.

5. The contractor is to take all necessary precautions during this period to protect any FA devices in the construction zone from activating the emergency fire alarm system, including not conducting heat/smoke generating activities in proximity to the detectors (i.e. do not solder near the detector, protect devices from debris/ dust, disconnect device when required to perform work that may activate the emergency fire alarm system).
6. The contractor is responsible for Fire Watch at all times within the construction area including at any time that a fire alarm device is affected (i.e. disconnected, bypassed, trouble on the panel, device is red capped or gloved). The contractor must maintain and make available a copy of the hourly fire watch log. Fire Watch during unoccupied times is not required.
7. The caretaker will be responsible for Fire Watch within the occupied area of the school up to the delineation of the construction work area during occupied times when a fire alarm device is affected. Fire Watch during unoccupied times is not required.
8. In the event a fire alarm device is activated, all occupants of the school, including contractors, must follow the HWDSB Fire Safety Protocol and Fire Safety Plan and Procedures as outlined in this document, and evacuate the school.
9. The caretaker is responsible to notify the Fire Department should there be a trouble on the panel for longer than 72 hours.

5. Please follow these steps for planning any service (electrical, gas, water) shutdowns:

A. Internal Localized System/Service Shutdowns:

1. Localized shutdowns **require minimum 3 days' notice** to HWDSB project supervisor for coordination with the school facility and staff.
2. Shutdowns must be completed outside of school bell times/operational hours which vary by facility and must be scheduled for evenings after 6:00 PM, weekends or board holidays.
3. If a shutdown will impact the security system, the contractor shall contact PasWord Protection at 1-800-561-3099 or 905-522-6680 and notify them in advance of the day(s) and time(s) of the shutdown.
4. If a shutdown impacts the fire alarm system, the contractor shall follow the Fire Alarm Bypass Protocol, section 4 above.
5. If required, the contractor is to coordinate with Board vendor/s to be on site to ensure boilers, roof top units, heat pumps, etc. are functioning properly after service disruption has concluded.

    - Chamberlain Building Services Inc - info@chbs.ca, 905-664-1914 or
    - Union Boiler Company Limited - info@unionboiler.com, 905-528-7977

6. Process will vary based on services shutdown and ability to localize shutdown.

B. Complete School System/Service Shutdowns:

1. Complete building shutdowns **require minimum 5 days' notice** to HWDSB project supervisor.
2. Shutdowns must be completed outside of school bell times/operational hours which vary by facility and must be scheduled for evenings after 6:00 PM, weekends or board holidays.
3. Contractor to contact PasWord Protection at 1-800-561-3099 or 905-522-6680 and notify them in advance of the day(s) and time(s) of shutdown.
4. During the shutdown, the contractor is responsible for following Fire Alarm Bypass Protocol, section 4 above.
5. The contractor is to coordinate with Board vendor/s to be on site to ensure boilers, roof top units, heat pumps, etc. are functioning properly after service disruption has concluded.

    - Chamberlain Building Services Inc - info@chbs.ca, 905-664-1914 or
    - Union Boiler Company Limited - info@unionboiler.com, 905-528-7977

6. HWDSB project supervisor will coordinate with other HWDSB departments to ensure all systems (IIT, security, communications) are up and running after service disruption has concluded.
7. If required, HWDSB project supervisor will coordinate with City of Hamilton staff if site has shared facilities such as recreation centre, community centre, pool or library, etc.
8. Process will vary based on service shutdown.

C. Heating and Cooling System Shutdowns:

1. Heating and cooling system shutdowns **require minimum 5 days' notice** to HWDSB project supervisor
2. Shutdowns must be completed outside of school bell times/operational hours which vary by facility and must be scheduled for evenings after 6:00 PM, weekends or board holidays.
3. The contractor is to coordinate with Board vendor/s to be on site to ensure boilers, roof top units, heat pumps, etc. are functioning properly after service disruption has concluded.

    - Chamberlain Building Services Inc - info@chbs.ca, 905-664-1914 or
    - Union Boiler Company Limited - info@unionboiler.com, 905-528-7977

4. If the boiler system is drained, the contractor upon refilling the system, is responsible for coordinating Board approved chemical treatment vendor to treat water.

    - Aquarian Chemicals Inc - info@aquarianchemicals.com, 905-825-3711

5. Process will vary based on services shutdown and ability to localize shutdown.

D. Asbestos Abatement and Designated Substance Related Work:

1. Designated substance related work **requires minimum 5 days' notice** to HWDSB project supervisor.
2. Designated substance related work in occupied areas must be completed outside of school bell times/operational hours which vary by facility and must be scheduled for evenings after 6:00 PM, weekends or board holidays.