AECOM

KAWARTHA PINE RIDGE DISTRICT SCHOOL BOARD

# Interior Renovations Phase 2
# Murray Centennial Public School

## Issued for Permit/Tender

**PROJECT NO: 60533591**

**February 7, 2018**

# Specifications

**1.1 OWNER:**

**Kawartha Pine Ridge District School Board**
1994 Fisher Drive
Peterborough, Ontario

**1.2 PROJECT:**

**Interior Renovations Phase 2; Murray Centennial Public School**
654 County Road 40
R.R. #1
Trenton, Ontario

**1.3 PROFESSIONAL SEALS AND SIGNATURES**

.1 Professional seals and signatures are provided as required by the Ontario Building Code (latest edition), Ontario Regulation 403/97 **(350/06)**, Subsection 2.3.1 **(Division C, Part 1, Subsection 1.2.1)** and all amendments thereto, for the Project stated above and apply only to those documents and specifications prepared by the respective Architect of Record, in Document 00 01 10, List of Contents. The professional seal and signature stated above are as follows:

**ARCHITECT OF RECORD (A):**

**AECOM Canada Architects Ltd.**

Address: 300 Water Street
Whitby, Ontario
L1N 9J2

Phone: (905) 668-9363
Fax: (905) 668-0221

ONTARIO ASSOCIATION OF ARCHITECTS
JAN 31/18
ARTHUR WILLIAM DIAMOND
LICENCE
6100

ARTHUR DIAMOND — JAN 31/18

Architect of Record — Date

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**END OF SECTION**

1 General

## 1.1 GENERAL REQUIREMENTS

.1 Division 1 requirements apply to all Sections of Work.

## 1.2 SUMMARY OF WORK

.1 Provide all items, articles, materials, services and incidentals, whether or not expressly specified or shown on Drawings, to make finished work complete and fully operational, consistent with the intent of the Contract Documents.

.2 Provide all work indicated in Contract Documents, regardless whether located within or outside Owner's property lines.

.3 The following work is not included in this Contract:

.1 Work designated N.I.C. on the Drawings.

## 1.3 THE CONTRACT DOCUMENTS

.1 Work will be performed under one Contract; the Contract will be in the form of the Agreement between Owner and Contractor.

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

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

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

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

.6 As a result, the Consultant shall not be required to decide on questions arising with regard to agreements or contracts between the Contractor and Subcontractors or Suppliers, nor to the extent of the parts of the Work assigned thereto.

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

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

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

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

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

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

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

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

## 1.4 STANDARDS AND CODES

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

## 1.5 METRIC PROJECT

.1 This project is based on The International System of Units (SI). Measurements are expressed in metric (SI) units and depending on the progress made in the various sectors of the industry are either hard or soft converted units.

.2 All metric units specified shall be taken to be the minimum acceptable unless otherwise noted.

.3 It is the Contractor's responsibility to check and verify with manufacturers and suppliers on the availability of materials and products in either metric or imperial sizes.

.4 Where a material or product cannot be obtained in the metric size specified, provide the next larger imperial size available.

.5 Where both metric and imperial sizes or dimensions are shown, the metric size or dimension shall govern.

## 1.6 LAWS, NOTICES, PERMITS AND FEES

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

.2 Permits:

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

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

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

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

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

## 1.7 DISCREPANCIES AND CLARIFICATIONS

.1 Advise Consultant of discrepancies discovered in requirements of the Contract Documents and request clarification from Consultant in written form.

.2 Advise Consultant when clarifications are required pertaining to meaning or intent of requirements of Contract Documents and request clarification from Consultant in written form.

.3 Do not proceed with related work until written clarification is provided by Consultant.

.4 Failure to notify Consultant shall result in Contractor incurring responsibility for resulting deficiencies and expense at no additional cost to the Owner.

.5 Written instructions issued by Consultant for the purpose of clarification, implicitly supersede applicable and relevant aspects of the Contract Documents irrespective of whether or not these documents are explicitly or specifically cited in clarification requests or clarification instructions.

## 1.8 SITE PROGRESS RECORDS

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

.1 Weather conditions with maximum and minimum temperatures.

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

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

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

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

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

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

.8 Dates, status and particulars of submissions, ie. shop drawings, samples, mock-ups and the like.

.9 Dates, status and particulars of deliveries, ie. manufacturing dates, delivery and installation dates.

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

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

## 1.9 DOCUMENTS AT THE PLACE OF THE WORK

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

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

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

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

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

.5 Field Test Reports.

.6 Consultant’s field review reports and deficiency reports.

.7 Reports by authorities having jurisdiction.

.8 Building and other applicable permits, and related permit documents.

.9 Daily log of the Work.

.10 Project record drawings recording as-built conditions, instructions, changes, and the like, as called for in Section 01 33 00, prior to being concealed.

.2 Make above material available to Consultant upon request.

## 1.10 EXAMINATION

.1 Examine site, and ensure that each Section performing work related to site conditions has examined it, so that all are fully informed on all particulars which affect the Project Work (thereon and at the place of the building, and in order that construction proceeds competently and expeditiously).

.2 Ensure by examination that all physical features at the work, and working restrictions and limitations which exist are known, so that the Owner is not restricted in his use of the premises for his needs.

.3 Previously Completed Work:

.1 Where dimensions are required for proper fabrication, verify dimensions of completed work in place before fabrication and installation of work to be incorporated with it.

.2 Verify that previously executed work and surfaces are satisfactory for installation or application, or both, and that performance of subsequent work will not be adversely affected.

.3 Ensure that work installed in an unsatisfactory manner is rectified by those responsible for its installation before further work proceeds.

.4 Commencement of work will constitute acceptance of site conditions and previously executed work as satisfactory.

.5 Defective work resulting from application to, or installation on, or incorporation with, unsatisfactory previous work will be considered the responsibility of those performing the later work.

.4 Construction Measurements:

.1 Take site dimensions of completed work before installation of work to be incorporated commences.

.2 Before commencing installation of work, verify that its layout is accurately in accordance with intent of Drawings, and that positions, levels, and clearances to adjacent work are maintained.

.3 Before commencing work, verify that all clearances required by authorities having jurisdiction can be maintained.

.4 If work is installed in wrong location, rectify it before construction continues.

.5 Where dimensions are not available before fabrication commences, the dimensions required shall be agreed upon between the trades concerned.

.6 All measurements shall be Imperial.

## 1.11 PROTECTION OF WORK, PROPERTY AND PERSONS

.1 Include in work necessary methods, materials, and construction to ensure that no damage or harm to work, materials, property and persons results from the work of this Contract. Temporary facilities relating to protection are specified in Section 01 50 00.

.2 Comply with all instructions and/or orders issued by authorities having jurisdiction.

.3 Ensure that compulsory wearing of hard hats and safety boots is observed by all persons employed on the work. Provide spare hard hats for visitors, refuse admission to the premises to those refusing to wear same.

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

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

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

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

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

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

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

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

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

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

.14 Public Utilities and Services:

.1 Verify location of and limitations imposed by, existing mechanical, electrical, telephone and similar services, and protect them from damage. If necessary, relocate active services to ensure that they function continuously wherever possible in safety and without risk of damage or down time to the existing buildings.

.2 Cap off and remove unused utility services encountered during work after approval is given by the utilities concerned or authorities having jurisdiction, which ever may apply. Relocation, removal, protection and capping of existing utility services shall be performed only by the applicable utility, and of other services by licensed mechanics.

.3 Make arrangements and pay for connection charges for services required for the Work.

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

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

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

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

## 1.12 SAFETY AND SECURITY

.1 Be responsible for security of all areas affected by work of this Contract until taken over by Owner. Take steps to prevent entry to the Work by unauthorized persons and guard against theft, fire and damage by any cause.

.2 Provide suitable surveillance equipment and/or employ guard services, as required to adequately protect the Work.

.3 Maintain fire protection for work. Store paints and volatile substances in a separate and controlled location and inspect frequently. Inspect temporary wiring, drop cords, extension cables for defective insulation or connections frequently. Remove combustible wastes frequently. Prohibit smoking in areas where volatile and flammable substances are used.

.4 Do not cut, bore or sleeve through any loadbearing member, new or existing without Consultant's written authorization, unless specifically indicated on Drawings.

**1.13 SALVAGE**

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

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

**1.14 USE OF SITE**

.1 Accept full responsibility for assigned work areas from the time of Contract award until Substantial Performance of the Work.

.2 Check means of access and egress, rights and interests which may be interfered with. Do not block lanes, roadways, entrances or exits. Direct construction traffic and locate access to site as directed by municipality.

.3 Where encroachment beyond property limits is necessary make arrangement with respective property owners.

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 GENERAL

.1 Prices included in the Contract shall be complete for the applicable work, and shall constitute the full consideration, payment, compensation and remuneration to the Contractor for all such work. For greater certainty, but without limitation to the foregoing, such prices shall constitute full and complete consideration, payment, compensation and remuneration to the Contractor for the following (subject to adjustment only as specified in the Contract Documents):

.1 Expenditures for wages and for salaries of workmen, engineers, superintendents, draftsmen, foremen, timekeepers, accountants, expediters, clerks, watchmen and such other personnel as may be approved, employed directly under the Contractor and while engaged on the applicable work at the site and expenditures for travelling and board allowances of such employees when required by location of the applicable work or when covered by trade agreements and when approved; provided, however, that nothing shall be included for wages or salary of the Contractor if an individual, or of any member of the Contractor's firm if the Contractor is a firm or the salary of any officer of the Corporation if the Contractor is a corporation, unless otherwise agreed to in writing;

.2 Expenditures for material used in or required in connection with the construction of the applicable work including material tests and mix designed required by the laws or ordinances of any authority having jurisdiction and not included under Subparagraph .9.

.3 Expenditures for preparation, inspection, delivery, installation and removal of materials, plant, tools and supplies;

.4 Temporary facilities as required for the applicable work;

.5 Travelling expenses properly incurred by the Contractor in connection with the inspection and supervision of the applicable work or in connection with the inspection of materials prepared or in course of preparation for the applicable work and in expediting their delivery;

.6 Rentals of all equipment whether rented from the Contractor or others, in accordance with approved rental agreements including any approved applicable insurance premiums thereon and expenditures for transportation to and from the site of such equipment, costs of loading and unloading, cost of installation, dismantling and removal thereof and repairs or replacements during its use on the applicable work, exclusive of any repairs which may be necessary because of defects in the equipment when brought to the work or appearing within thirty (30) days thereafter;

.7 The cost of all expendable materials, supplies, light, power, heat, water and tools (other than tools customarily provided by tradesmen) less the salvage value thereof at the completion of the applicable work;

.8 Assessments under the Workplace Safety Insurance Act, the Unemployment Insurance Act, Canada Pension Act, statutes pay or any similar statutes; or payments on account usual vacations made by the contractor to his employees engaged on the applicable work at the site to the extent to which such assessments or payments for vacations with pay relate to the work covered by the specified price; and all sales taxes or other taxes where applicable;

.9 The amounts of all Subcontracts related to the specified price;

.10 Premiums on all insurance policies and bonds called for under this Contract as related to the specified price;

.11 Royalties for the use of any patented invention on the applicable work;

.12 Fees for licences and permits in connection with the applicable work;

.13 Duties and taxes imposed on the applicable work; and

.14 Such other expenditures in connection with the applicable work as may be approved; provided always that except with the consent of the Owner, the above items of cost shall be at rates comparable with those prevailing in the locality of the work.

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 APPROVED ALTERNATES AND APPROVED EQUALS

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

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

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

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

## 1.2 SUBSTITUTIONS

.1 Submission of substitutions:

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

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

.2 Submission requirements:

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

.2 Manufacturer’s Product data sheets for proposed Products.

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

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

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

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

.7 Compliance with the intent of the Contract Documents.

.8 Effect on Contract Time.

.9 Reasons for the request.

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

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

.5 Consultant’s decision concerning acceptance or rejection of proposed substitutions is final. Should it appear to the Consultant that the value of services required to evaluate the substitution exceeds the potential reduction, the Consultant will advise the Owner that the substitution does not merit consideration before proceeding with a full evaluation. If the substitution will produce a reduction commensurate with or exceeding the value of the Consultant’s services to evaluate the substitution, the Consultant will request the Owner’s direction to proceed with evaluation.

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 REQUEST FOR INTERPRETATION - RFI

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

.2 Submittal procedures:

.1 RFI form:

.1 Submit RFI on “Request for Interpretation” form, appended to this section. The Consultant shall not respond to an RFI except as submitted on this form.

.2 Where RFI form does not provide sufficient space for complete information to be provided thereon, attach additional sheets as required.

.3 Submit with RFI form necessary supporting documentation.

.2 RFI log:

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

.2 Submit updated log of RFIs with each progress draw submittal.

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

.4 RFIs shall be submitted only to the Consultant.

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

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

.7 Submit one distinct RFI per RFI form.

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

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

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

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

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

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

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

*Contractor's* Request for Interpretation

*Contractor's Supplemental Instructions*

| Date | # of Pages |
|---|---|
| To | From |
| Co. | Co. |
| Phone # | Phone # |
| Fax # | Fax # |

*Project*: _____ RFI No.: _____

Date of Request: _____

*Owner*: _____

To: _____ *Contractor*: _____

(*Consultant's* Representative)

*Contractor's* Representative: _____

Project No.: _____

*Consultant's* Fax No.: _____ Fax No.: _____

Interpretation Requested: (Description of request for interpretation and references to relevant portions of Contract Documents)

Attachments: _____

Requested by: _____

*Consultant's Supplemental Instruction*:

Attachments: _____

Reply By: _____

The work shall be carried out in accordance with these *Supplemental Instructions* issued in accordance with the *Contract Documents* without change in *Contract Price* or *Contract Time*. Prior to proceeding with these instructions, indicate acceptance of these instructions as being consistent with the *Contract Documents* by returning a signed copy to the *Consultant*.

*Supplemental Instruction* Issued: *Supplemental Instruction* Accepted:

By: _____ By: _____

*Consultant* Date *Contractor* Date

Cc: ☐ *Owner* ☐ *Consultant* ☐ Contractor ☐ Field ☐ Other: _____

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 DESCRIPTION

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

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

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

## 1.2 RELATED MECHANICAL AND ELECTRICAL WORK

.1 Coordination of the installation of mechanical and electrical systems indicated on the Drawings, including the interrelating operation and functioning between components of a system and between systems, is the responsibility of those performing the mechanical and electrical work, with final coordination the responsibility of the Contractor.

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

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

## 1.3 QUALITY ASSURANCE

.1 Requirements of Regulatory Agencies:

.1 Coordinate requirements of authorities having jurisdiction.

.2 Quality Control:

.1 Ensure that work meets specified requirements.

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

.3 Job Records:

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

## 1.4 SUPERINTENDENCE

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

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

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

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

## 1.5 SUBMITTALS

.1 Provide a complete set of all required Contract Documents, together with instructions for changes to the work which are issued, to each firm preparing shop drawings.

.2 Schedule and expedite submission of specified submittals.

.3 Review submittals and make comments as specified in Section 01 33 00.

.4 Ensure that each original submission, and their subsequent revisions and resubmissions are made on schedule.

## 1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

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

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

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

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

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

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

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

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

## 1.7 JOB CONDITIONS

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

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

## 1.8 WARRANTIES

.1 Ensure that warranties are provided, as indicated in Section 01 78 36 Warranties.

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

## 1.9 CO-ORDINATION

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

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

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

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

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

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

.7 Ensure that setting drawings, templates, and all other information necessary for the location and installation of materials, holes, sleeves, inserts, anchors, accessories, fastenings, connections, and access panels are provided by each Section whose work requires cooperative location and installation by other Sections, and that such information is communicated to the applicable installer.

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

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

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

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

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

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

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

**1.10 COOPERATION**

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

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

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

**1.11 PROJECT RECORD DRAWINGS**

.1 Record, as the work progresses, work constructed differently than shown on Contract Documents. Record all changes in the work caused by site conditions; by Owner, Consultant, sub-consultants, Contractor, and Subcontractor originated changes; and by site instructions, supplementary instructions, field orders, change orders, addendums, correspondence, and directions of authorities having jurisdiction. Accurately record location of concealed structure, and mechanical and electrical services, piping, valves, conduits, pull boxes, junction boxes and similar

work not clearly in view, the position of which is required for maintenance, alteration work, and future additions. Do not conceal critical work until its location has been recorded.

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

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

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

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

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

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

## 1.12 DETAIL FINISHING DRAWINGS

.1 During the course of the work, the Owner will provide the Contractor with detail drawings showing the interior finishes and furnishings of the building. The Contractor shall read these drawings in conjunction with the Contract Documents. The Contractor shall check the detail drawings against the Contract Documents and shall report any discrepancies to the Consultant.

## 1.13 CUTTING AND PATCHING

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

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

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

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

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

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

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

.1 Include under mechanical or electrical work for cutting or provision of holes up to and including 50 square inches and related patching, except as otherwise indicated.

.2 Include under work of this Division holes and other openings larger than 50 square inches, and chases, bulkheads, furring and required patching. This Section shall be responsible for determination of work required for holes in excess of 50 square inches.

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

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

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

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 ADMINISTRATIVE

.1 Schedule and administer meetings every 2 weeks (or more frequently as required) with the Consultant throughout the progress of the Work. Schedules to be updated with the Consultant every 2 weeks for distribution at each meeting.

.2 Prepare agenda for such meetings.

.3 The Owner's Representative shall chair such meetings. The Consultant shall administer such meetings and prepare minutes within three (3) days after the meeting date for distribution to the Owner and the Contractor.

.4 Distribute written notice of each meeting four (4) days in advance of meeting date to the Consultant and the Owner and other affected parties.

.5 Representatives of parties attending meetings shall be authorized to act on behalf of the parties they represent. Subcontractors and Suppliers do not attend meetings unless authorized by the Consultant and the Owner.

.6 Prepare and distribute monthly progress reports in accordance with Section 01 32 16, and containing updated schedules, construction photos in accordance with Section 01 33 00, shop drawing logs, requests for interpretation logs, submittals and budget.

## 1.2 CONTRACT START-UP MEETING

.1 Within five (5) days after award of Contract, request a meeting of parties in Contract to discuss and resolve administrative procedures and responsibilities prior to the commencement of the Work.

.2 The Owner, the Consultant, the Contractor, site superintendent(s), inspection and testing company, and authorities having jurisdiction, as applicable and at their discretion, will be in attendance.

.3 Agenda to include the following:

.1 Appointment of official representative of participants in the Project.

.2 Status of permits, fees and requirement of authorities having jurisdiction. Action required.

.3 Review of standard project forms.

.4 Requirements for Contract modification and interpretation procedures, including, but not limited to: requests for interpretation, proposed Change Orders, Change Orders, Change Directives, Supplemental Instructions, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.5 Requirements for notification for reviews. Allow a minimum of two (2) Working Days notice to Consultant for review of the Work.

.6 Review of schedules and scheduling procedures and requirements in accordance with Section 01 32 16.

.7 Appointment of inspection and testing agencies or firms, Section 01 45 00.

.8 Requirements for temporary facilities, signs, offices, storage sheds, utilities; Section 01 50 00.

.9 Security requirements at and for the Place of the Work, Section 01 50 00.

.10 Record drawings, Section 01 33 00.

.11 Maintenance manuals, Section 01 33 00.

.12 Take-over procedures, acceptance, Section 01 78 00.

.13 Warranties, Section 01 78 36.

.14 Progress claims, administrative procedures, holdbacks.

.15 Insurances, transcripts of policies.

.16 Contractor's safety procedures.

.17 Cleaning/staging area for vehicles.

.18 Workplace Safety and Insurance Board Certificate.

.4 The Consultant shall organize and chair the contract start-up meeting. Consultant shall record minutes of the contract start-up meeting and distribute a copy to each participant within ten (10) days of meeting.

**1.3 PRE-INSTALLATION MEETINGS**

.1 During the course of the Work prior to Substantial Performance of the Work, schedule pre-installation meetings as required by the Contract Documents and coordinated with the Consultant.

.2 As far as possible, pre-installation meetings shall be scheduled to take place on the same day as regularly scheduled progress meetings.

.3 Agenda to include the following:

.1 Appointment of official representatives of participants in the Project.

.2 Review of existing conditions and affected work, and testing thereof as required.

.3 Review of installation procedures and requirements.

.4 Review of environmental and site condition requirements.

.5 Review of schedules and scheduling procedures and requirements of the applicable portions of the Work in accordance with Section 01 32 16, in particular:

.1 Schedule of submission of samples, mock-ups, and items for Consultant's consideration.

.2 Delivery schedule of specified equipment.

.3 Requirements for notification for reviews. Allow a minimum of two (2) Working Days notice to Consultant for review of the Work.

.6 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences, Section 01 50 00.

.7 Requirements for inspections and tests, as applicable.

.1 Schedule and undertake inspections and tests in accordance with Sections 01 32 16 and 01 45 00.

.8 Special safety requirements and procedures.

.4 The following shall be in attendance:

.1 Contractor.

.2 Subcontractors affected by the work for which the pre-installation meeting is being conducted.

.3 Consultant.

.4 Manufacturer's representatives, as applicable.

.5 Inspection and testing company, as applicable.

## 1.4 PROGRESS MEETINGS

.1 During the course of the Work prior to Substantial Performance of the Work, schedule progress meetings as directed by the Consultant.

.2 In advance of progress meetings, Contractor shall submit to the Consultant a two week look ahead schedule of items of work to be undertaken in the two weeks subsequent to the progress meeting. Two week look ahead schedule will be reviewed at the meeting and recorded in the minutes of the meeting. Refer to Section 01 32 16 for requirements for look ahead schedule.

.3 Attendees at progress meetings shall include the following:

- .1 Contractor.
- .2 Contractor's site superintendent(s).
- .3 Consultant.
- .4 Owner.

.4 Agenda to include the following:

- .1 Review, approval of proceedings of previous meeting.
- .2 Review of items arising from proceedings.
- .3 Review of progress of the Work since previous meetings.
- .4 Review of schedules in accordance with Section 01 32 16, including:
  - .1 Revisions to construction schedule.
  - .2 Progress and schedule for subsequent period of the Work: Two (2) week look-ahead.
  - .3 Problems that impede compliance with construction schedule.
  - .4 Review of off-site fabrication delivery schedules.
  - .5 Review of material delivery dates/schedule.
  - .6 Corrective measures and procedures to regain construction schedule.
  - .7 Review of submittal schedules: expedite as required.
- .5 Field observations, problems, conflicts.
- .6 Review status of submittals.
- .7 Maintenance of quality standards.
- .8 Pending changes and substitutions.
- .9 Review of Contract modifications and interpretations including, but not limited to: requests for interpretation and log, proposed Change Orders, Change Orders, Change Directives, Supplemental Instructions, for effect on construction schedule and on Contract Time.
- .10 Review of status of as-built documents.
- .11 Other business.

## 1.5 PRE-TAKEOVER MEETING

.1 Prior to application for Substantial Performance of the Work, schedule a pre-takeover meeting.

.2 Agenda to include the following:

- .1 Review, approval of proceedings of previous meeting.
- .2 Review of items arising from proceedings.

.3 Review of procedures for Substantial Performance of the Work, completion of the Contract, and handover of the Work.

.4 Field observations, problems, conflicts.

.5 Review of outstanding Contract modifications and interpretations including, but not limited to: requests for interpretation and log, proposed Change Orders, Change Orders, Change Directives, Supplemental Instructions, for effect on construction schedule and on Contract Time.

.6 Problems which impede Substantial Performance of the Work.

.7 Review of procedures for deficiency review. Corrective measures required.

.8 Progress, schedule, during succeeding period of the Work.

.9 Review submittal requirements for warranties, manuals, and all demonstrations and documentation required for Substantial Performance of the Work.

.10 Review of status of as-built documents and record drawings.

.11 Other business.

**1.6 POST-CONSTRUCTION MEETING**

.1 Prior to application for completion of Contract, schedule a post-construction meeting. Four days prior to date for meeting, Consultant shall confirm a date for meeting based on evaluation of completion requirements.

.2 Agenda to include the following:

.1 Review, approval of proceedings of previous meeting.

.2 Confirmation that no business is arising from proceedings.

.3 Confirmation of completion of the Contract, and handover of reviewed documentation from the Consultant to the Owner.

.4 Confirmation of completion of proposed Change Orders, Change Orders, Change Directives, and Supplemental Instructions.

.5 Problems that impede Contract completion.

.6 Identify unresolved issues or potential warranty problems.

.7 Confirmation of completion of deficiencies.

.8 Corrective measures required.

.9 Confirm submittal requirements for warranties, manuals, and demonstrations and documentation for Contract completion are in order.

.10 Review of procedures for communication during post-construction period.

.11 Handover of reviewed record documents by the Consultant to the Owner.

.12 Handover of Contract completion insurance policy transcripts by Contractor.

.13 Submission of final application for payment.

.14 Review and finalize outstanding claims, pricing, and allowance amounts.

.15 Status of commissioning and training.

.16 Demobilization and the Place of the Work restoration.

.17 Review of requests for interpretation log.

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 PLANNING, SCHEDULING AND MONITORING - GENERAL

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

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

.1 Ensure adequate planning and execution of the Work by the Contractor;

.2 Establish the standard against which satisfactory completion of the project will be judged;

.3 Assist the Owner and the Consultant in monitoring progress;

.4 Assess the impact of changes to the Work.

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

## 1.2 CONSTRUCTION SCHEDULE

.1 Within five (5) days of Contract award, submit in format acceptable to Consultant, the Contractor's critical path construction schedule.

.2 Set up format to permit plotting of actual construction progress against scheduled progress.

.3 Schedule shall show:

.1 Commencement and completion dates of Contract.

.2 Commencement and completion dates of construction stages/phases, if any.

.3 Commencement and completion dates of each trade. Major trades shall be further broken down as directed by Consultant; generally follow Specification format.

.4 Order and delivery dates for major or critical equipment.

.5 Critical dates for shop drawing/sample submissions.

.6 Any other information relating to orderly progress of Contract, considered by Contractor or Consultant to be pertinent.

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

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

.6 Consultant, together with Contractor shall review construction progress once a month during or immediately following regular site meeting, or more often as directed by Consultant.

.7 Update construction schedule, whenever changes occur, in manner and at times acceptable to Consultant.

## 1.3 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Schedules shall be submitted to the Consultant in both hard copy and electronic forms. Electronic schedule submissions shall be in an original scheduling software data file type that permits modification of the layouts and data. In case of a discrepancy between an electronic copy of the

schedule and the corresponding hard-copy schedule, the hard copy of the schedule that has been formally submitted and reviewed in accordance with the requirements of Section 01 33 00 shall govern.

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

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

.1 Contractor and its Sub-Contractors intend to execute the Work in the sequence indicated on such schedule;

.2 Contractor has distributed the proposed schedule to its Sub-Contractors for their review and comment, and has obtained their concurrence;

.3 All elements of the Work required for the performance of the Contract are included. Failure to include any such element shall not excuse the Contractor from completing the Work within the Contract Time and within any other constraints specified in the Contract;

.4 Seasonal weather conditions have been considered and included in the planning and scheduling of the Work influenced by high and low ambient temperatures and/or precipitation;

.5 Contractor has thoroughly inspected the Site and has incorporated any other special conditions in planning the Work such as specified or required non-work periods, etc.

.5 Cash flow diagram:

.1 Contractor shall submit an updated cash flow diagram quarterly.

.2 Cash flow diagram shall be in format acceptable to the Owner.

.3 Cash flow diagram shall represent Contractor's anticipated invoicing.

## 1.4 PROGRESS RECORD

.1 Maintain on site, permanent written record of progress of work. Record shall be open to inspection by Consultant at all times and copy shall be furnished to Consultant upon request.

.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.

.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.

## 1.5 PROGRESS MONITORING

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

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

## 1.6 UPDATES AND REVISIONS TO SCHEDULE

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

.2 Each progress schedule shall record and report actual completion and/or start dates for each completed or in-progress activity, activity percent complete for in-progress activities and forecast

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

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

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

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

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

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

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

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

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

## 1.7 RECORD DRAWINGS

.1 Obtain and keep on site at all times a complete and separate set of black line white prints.

.2 Note clearly, neatly, accurately and promptly as the work progresses all architectural, structural mechanical and electrical changes, revisions and additions to the work and deviations from the Contract Documents.

.3 Accurate location, depth, position, size and type of concealed and underground services, both inside and outside shall be included as part of these record drawings.

.4 Record drawings shall be available for review at each site meeting.

.5 Refer to Section 01 31 13 for requirements on submission of record drawings.

### 1.8 PROGRESS PHOTOGRAPHS

.1 Concurrently with monthly application for payment submit two sets of 200 mm x 250 mm coloured, glossy photographs as follows:

.1 Up to four photographs shall be taken from positions determined by Consultant.

.2 Photographs shall be properly exposed and in focus; views shall be unobstructed.

.3 Identify each photograph on back stating name of project, name of photographer, description of view and date of photograph taken.

### 1.9 PRODUCT DELIVERY CONTROL

.1 It is the responsibility of the Contractor to ensure that the supplier or distributor of materials specified or alternatives accepted, which he intends to use, has materials on the site when required. The Contractor shall obtain confirmed delivery dates from the supplier.

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

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

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

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

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

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 GENERAL

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

.2 In addition to submittals specifically requested by the Contract Documents, 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.

.3 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.

.4 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 As part of their scope of work, Consultant shall review shop drawings no more than twice. Should three or more reviews be required due to reasons of Contractor omissions causing resubmission requests, then Contractor shall reimburse the Consultant for time expended in these extra reviews. Time shall be invoiced to the Owner (to be deducted from monies due to the Contractor and paid to Consultant by Owner) at rates recommended by Consultant's professional association and disbursements shall be invoiced at Consultant's cost. The Contractor shall cover directly costs and administration associated with courier services and the like for these extra shop drawing reviews.

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

.5 Submittals received but not required by the Contract Documents or requested by the Consultant will not be reviewed by the Consultant and will be marked 'NOT REVIEWED' by the Consultant and returned to the Contractor.

.5 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.

.6 Submittals that contain substitutions will be rejected.

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

.8 Prepare submittals using SI (metric) units.

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

.10 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.

.11 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.

.12 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.

.13 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.

## 1.2 SUBMISSION PROCEDURES

.1 Coordinate each submittal with requirements of the Work and Contract Documents. Individual submittals will not be reviewed until related information is available.

.2 Distribute copies of submittals to parties whose work is affected by submittals except Consultant and Owner before final submission for review by Consultant.

.3 Accompany submittals with transmittal letter, in duplicate, containing:

.1 Date.

.2 Project title and number.

.3 Contractor's name and address.

.4 Identification and quantity of each submittal.

.5 Other pertinent data.

.4 Each submittal shall be identified numerically by relevant specification section number with a numeric indicator for multiple submittals by that section followed by revisions number, for example 08 11 13-01-R0.

.5 Make any changes in submittal that Consultant may require, consistent with Contract Documents, and resubmit as directed by Consultant.

.6 Notify Consultant, in writing, when resubmitting, of any revisions other than those requested by Consultant.

.7 After Consultant's review, distribute copies to affected parties.

## 1.3 PRODUCT DATA SHEETS

.1 Submit Product data sheet prints; three (3) sets for Consultant (which includes 1 set that will be returned once submittal has been reviewed), 1 set for Contractor and 1 set each of applicable consulting engineers.

.2 Submit Product data sheets for requirements requested in the Contract Documents and as the Consultant may reasonably request where shop drawings will not be prepared due to a standardized manufacture of a Product. Manufacturers' catalogue cuts will be acceptable in such cases, providing that they are 8-1/2" x 11" originals, and that they indicate choices including sizes, colours, model numbers, options and other pertinent data, including installation instructions. Submissions showing only general information are not acceptable.

.3 Where requirements of Contract Documents are more stringent than design proposed on Product data sheets, the requirements of the Contract Documents take priority.

.4 Upon completion of review by Consultant, one (1) marked set of Product data sheets will be returned to Contractor for reproduction and distribution.

.5 Retain one (1) complete set of prints of reviewed Product data sheets for issuance to Owner immediately prior to Substantial Performance of the Work, in an acceptable, bound manner.

## 1.4 SHOP DRAWINGS

.1 Submit shop drawings for which submission is required in other Sections of this Specification. Include in final shop drawing submissions detailed information, templates and installation instructions required for incorporation and connection of the work concerned, and other details as may be specified in other Sections.

.2 In addition to shop drawings specified in other Sections, submit shop drawings required by authorities having jurisdiction in accordance with their requirements.

.3 The General Contractor shall check, sign, and make notations he considers necessary on shop drawings before each submission to the Consultants for their review.

.4 Indicate on each submission changes from the Contract Drawings and Specification that have been incorporated in the shop drawings. The Contractor shall be responsible for changes made from the Contract Drawings and Specification which are not indicated or otherwise communicated in writing with the submission.

.5 Shop drawing review by Consultant or sub-consultants is for the sole purpose of ascertaining conformance with the general design concept and as a precaution against oversight or error. This review shall not mean that Consultant and sub-consultants approve the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents. No review of design shall be assumed made when such design is a responsibility of the Contractor included in the work. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of the work of all Subcontractors.

.6 Show on shop drawings all pertinent information required for materials and installation, and for proper integration of this installation with work of others.

.7 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.

.8 Submit shop drawings folded into 8-1/2" x 11" size with title block appearing on outside. Four (4) copies of engineering data sheets, catalogue cuts and standard diagrams may be substituted for shop drawings where applicable. One (1) reproducible and three (3) white prints of each drawing are required.

.9 Shop drawings which require extensive correction or are in substantial disagreement with intent of contract documents will be sent back for revisions and resubmission. The reproducible copy will be returned.

.10 Otherwise, shop drawings will be sent back with review comments only. The reproducible copy and two (2) white prints will be returned. One (1) white print will be retained.

.11 Conform to review comments and stamped instructions of each shop drawings reviewer.

.12 Only drawings noted for revision and resubmission need be resubmitted. Include revisions required by previous reviews before resubmission of shop drawings.

.13 Do not add new details or information to shop drawings after they have been reviewed, unless requested by the reviewer, requiring a re-submission.

.14 Do not proceed with work dependent on shop drawing information until approval is given and verification received from Contractor. The Contractor shall be responsible for work performed prior to receipt of reviewed shop drawings. No review comments shall be construed as authorization for Changes in the work.

.15 Fabricate work exactly as shown on shop drawings. If shop practice dictates revisions, revise drawings and resubmit.

.16 File one (1) copy of each finally revised and corrected shop drawing on site.

.17 Provide shop drawings as called for in the Trade Sections of this Specifications.

**1.5 SAMPLES**

.1 Submit samples for which submission requirement is specified in Trade Sections of this Specification.

.2 Submit samples in triplicate of adequate size to represent the material in its intended use on Project. Submit an extreme range of samples when the degree of marking or colour cannot be represented by a single sample.

.3 Label samples with Project name, number, Contractor, and date.

.4 Include in the work cost of delivery and handling, assembly, and return to supplier of samples.

.5 If sample is disapproved, two samples will be returned. If sample is approved, one sample will be returned, marked "Approved".

.6 Approved samples shall serve as a model against which the products incorporated in the work shall be judged.

.7 Each product incorporated in the work shall be precisely the same in all details as the approved sample.

.8 Should any change of material, colour, texture, finish, dimensions, performance, function, operation, construction, joining, fastening, fabrication techniques, service characteristics, and other qualities be made to a product after approval has been given, submit for approval of the revised characteristics in writing and resubmit samples of the product for approval if requested.

.9 When samples are very large, require assembly, or require evaluation at the site, they may be delivered to the site, but only with approval and as directed.

.10 Provide samples as called for in the Trade Sections of this Specifications.

**1.6 MOCK-UPS**

.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.

.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 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.

.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.

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

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

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

**1.7 INSERT LOCATION DRAWINGS**

.1 Submit insert location drawings which are required for installation of work.

.2 Indicate on insert location drawings the location and size of sleeves, anchor bolts, openings and miscellaneous items to be incorporated in the work.

.3 Submit insert location drawings well in advance of construction of work incorporating built-in work.

**1.8 COORDINATION DRAWINGS**

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

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

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

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

**1.9 PROJECT RECORD DRAWINGS**

.1 Submit Project Record Drawings specified under work of Section 01 31 13 with application for Certificate of Substantial Performance. Final acceptance of the work will be predicted on receipt and approval of record drawings.

**1.10 WARRANTIES**

.1 The Contractor shall submit all the warranties as herein specified, in an approved uniform format as indicated in Section 01 78 36 Warranties.

**1.11 MAINTENANCE MANUAL AND OPERATING INSTRUCTIONS**

.1 Submit three (3) copies of Maintenance Manuals at completion of Project on application for Certificate of Substantial Performance, Maintenance Manual shall consist of shop drawings, extended warranties and Project Data Book.

.2 Include in Maintenance Manual one copy of each final approved shop drawing issued for Project of which have been recorded changes made during fabrication and installation caused by unforeseen conditions.

.3 Submit extended warranties together in one report binder, properly titled and with a typed table of contents.

.4 The Project Data Book shall:

.1 Consist of a hard-cover, black, vinyl-covered, loose-leaf, letter size binder.

.2 Have a title sheet, or sheets preceding data on which shall be recorded Project name, date, list of contents, and Contractors' and Subcontractors' names and addresses.

.3 Be organized into applicable sections of work with each Section separated by hard paper dividers with plastic covered tabs marked by Section.

.4 Contain only typed or printed information and notes, and neatly drafted drawings.

.5 Contain maintenance instructions as specified in various Sections and as referenced in Section 01 78 00.

.6 Contain brochures and parts lists on all equipment.

.7 Contain a list of manufacturers and trade names of finishes and coatings applied.

.8 Contain sources of supply for all proprietary products used in the work.

.9 Contain lists of supply sources for maintenance of all equipment in Project of which more detailed information is not included above.

.10 Contain finished hardware schedule.

.11 Contain charts, diagrams and reports indicated on Mechanical and Electrical Drawings.

**1.12 EXTRA MATERIALS**

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

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

**1.13 INSPECTION COMPANY REPORTS**

.1 Submit copies of test and verification reports as specified in Section 01 45 00 and in other Sections of the Specifications of "Source Quality Control" and "Field Quality Control" immediately they are completed.

.2 Submit one copy of each report unless specified otherwise, and signed by a responsible officer of the inspection and testing company to the Owner and Consultant.

.3 Submit an additional report directly after it is completed to:

.4 Applicable design engineer.

.5 The Contractor.

.6 Authorities having jurisdiction when such reports are required by them.

.7 Each report shall include:

.1 Date of issue.

.2 Project name and number.

.3 Name and address of inspection and testing company.

.4 Name and signature of inspector or tester.

.5 Date of inspection or test.

.6 Identification of product and Specifications Section covering inspected or tested work.

.7 Location of inspection or from which tested material was derived.

.8 Type of inspection or test.

.9 Remarks and observations on compliance with Contract Documents.

**1.14 PROGRESS PHOTOGRAPHS**

.1 Unless otherwise specified, provide and submit two prints of each from six (6) difference vantage points on the project site as directed, and taken as soon as possible after the first day of each month throughout the project.

.2 Prints shall be 8" x 10" glossy mounted on muslin with 3/4" binding hems along the side of each. Identify prints at bottom of each, stating name of project, name of Contractor, name of Consultant and date. Include short log describing camera position, also direction of view for each print and a constant location number. The Consultant may request changes of vantage points, either interior or exterior, as the job progresses. He may further request more than six (6) in which case, the additional photographs will be paid for by the Owner as an addition to the contract amount.

.3 Submit two prints of each photograph with each application for payment.

**1.15 PROGRESS BILLING**

.1 Coordinate progress billing with cost breakdown.

.2 Include value of work completed during billing period.

.3 Include running total of value of work completed by the end of the billing period.

.4 Format of progress billing shall be as requested by and approved by the Owner.

.5 Progress billings shall be dated and submitted on the 25th day of each month.

.6 Progress billings shall be discussed as part of the preconstruction meeting.

**1.16 PRICING OF CHANGES TO WORK**

.1 Submit with quotations for changes to work detailed estimate sheets showing initial and revised quantities of labour, materials and equipment, and the related unit costs.

.2 Payment for use of small tools, travelling, out-of-town accommodations and preparation of price change submittals will be considered a part of overhead as specified in the Supplementary Conditions.

.3 Submit quotations within ten (10) days of issuance of the contemplated change for changes to work with full documentation to Consultant.

**1.17 WASTE MANAGEMENT**

.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.

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 PERMITS, LICENCES, FEES

.1 Comply with requirements of GC 10.2.

.2 Where permits, licences and inspection fees are required by authorities having jurisdiction for specific trade functions, they shall be obtained by particular subtrade responsible for that work.

.3 Review building permit set with Consultant immediately following receipt of building permit and jointly determine whether or not changes to Contract are required.

.4 Be responsible for ensuring that no work is undertaken which is conditional on permits, approvals, reviews, licences, fees, until all applicable conditions are met. No time extension will be allowed for delay in obtaining necessary permits.

.5 Report to the Consultant in writing any condition which would prohibit granting of any permit or approval before work affecting such items is commenced.

.6 Give notice of completion of project prior to occupancy, as required by applicable legislation.

## 1.2 BUILDING CODE, BY-LAWS, REGULATIONS

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

.2 Comply with requirements, regulations and ordinances of other jurisdictional authorities.

.3 Where it is necessary to carry out work outside property lines, such as sidewalks, paving or concrete curbs, comply with applicable municipal requirements.

.4 Promptly submit written notice to Consultant, of observed variance of Contract Documents from requirements of Building Code and authorities having jurisdiction. Assume responsibility for work known to be contrary to such requirements and performed without notifying Consultant.

## 1.3 AUTHORITIES HAVING JURISDICTION

.1 Where reference are made to "authorities having jurisdiction", it shall mean all authorities who have within their constituted powers the right to enforce the laws of the place of the building.

## 1.4 REQUIREMENTS OF REGULATORY AGENCIES

.1 Work shall include protection measures consisting of materials constructions and methods, and first-aid equipment and personnel, required by the latest edition of The Occupational Health and Safety Act, and the Workplace Safety and Insurance Board (WSIB) Regulations, of the Province of Ontario, and as otherwise imposed by authorities having jurisdiction to save persons and property from harm.

.2 Ensure that pollution, noise pollution and environmental control of construction activities are exercised as required during the work.

.3 Except where special permission is obtained, maintain clear access for roads and sidewalks on public property.

.4 Maintain all (Municipal and Provincial) roads and sidewalks clear of construction materials and debris, including excavated material. Clean roads and sidewalks as frequently as required to ensure that they are cleared of materials, debris and excavated material.

.5 Remove snow and ice from sidewalks as required and to the standards acceptable by the Municipality.

## 1.5 CONSTRUCTION SAFETY

.1 Comply with requirements of GC 3.6.

.2 Be governed by pertinent safety requirements of Federal or Provincial Governments and of municipal bodies having authority, particularly the Ontario Construction Safety Act, and regula-

tions of Ontario Ministry of Labour, and work in conjunction with proper safety associations operating under the authority of Ontario Workers' Compensation Act.

.3 Do not, in the performance of the work, in any manner endanger the safety or unlawfully interfere with the convenience of the public.

.4 Notify the Ontario Ministry of Labour of intended work of this Contract as required by the Occupational Health and Safety Act. One copy of the "Notice of Project" shall be handed to Consultant.

**1.6 FIRE PROTECTION**

.1 Refer to technical Sections of Specifications and Drawings for fire protection requirements.

.2 Test methods used to determine fire hazard classification and fire endurance rating shall be as required by Ontario Building Code.

.3 Upon request, furnish Consultant with evidence of compliance with project fire protection requirements.

.4 Materials and components used to construct fire rated assemblies and materials requiring fire hazard classification shall be listed and labelled, or otherwise approved, by fire rating authority. Labelled materials and their packaging shall bear fire rating authorities label showing product classification.

.5 Fire rated door assemblies shall include doors, frame, anchors and hardware and shall bear label of fire rating authority showing opening classification and rating.

.6 Materials having a fire hazard classification shall be applied or installed in accordance with fire rating authority`s printed instructions.

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

.8 Construct fire separations as continuous, uninterrupted elements except for permitted openings. Extend fire rated walls and partitions from floor to underside of structural deck above.

.9 Fill and patch voids and gaps around openings and penetrations in and at perimeter of assemblies so as to maintain continuity and to produce a fire resistant smoke tight seal, acceptable to jurisdictional authorities and Consultant.

**1.7 HAZARDOUS MATERIALS**

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

.2 Ensure that Material Safety Data Sheets (MSDS) are available on site prior to first delivery to site of any controlled material or substance.

.3 Maintain on site for duration of Contract a hazardous materials log containing all required MSDS.

.4 Log shall be open for inspection for Owner, Consultant and all personnel on site.

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

**1.8 WASTE MANAGEMENT**

.1 Comply with applicable regulations of the Ministry of Environment and Energy governing waste management.

.2 Prepare and submit waste audit, waste reduction and source separation plans in accordance with applicable regulatory requirements.

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 REFERENCE STANDARDS

.1 Where edition date is not specified, consider that references to manufacturer's and, published codes, standards and specifications are made to the latest edition (revision) approved by the issuing organization, current at the date of this Specification.

.2 Reference standards and specifications are quoted in this Specification to establish minimum standards. Work of quality or of performance characteristics that exceeds these minimum standards will be considered to conform.

.3 Should the Contract Documents conflict with specified reference standards or specification, the General Conditions of the Contract shall govern.

.4 Where reference is made to manufacturer's directions, instructions or specifications they shall include full information or storing, handling, preparing, mixing, installing, erecting, applying, or other matters concerning the materials pertinent to their use and their relationship to materials with which they are incorporated.

.5 Have a copy of each code, standard and specification, and manufacturer's directions, instructions and specifications, to which reference is made in the Specifications, always available at construction site.

.6 Standards, specifications, associations, and regulatory bodies are generally referred to throughout the specifications by their abbreviated designations. These are as follows:

| ABBREVIATION | MEANING |
|---|---|
| AA | ALUMINUM ASSOCIATION |
| AAMA | ARCHITECTURAL ALUMINUM MANUFACTURERS` ASSOCIATION |
| AASHO | AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS |
| ACI | AMERICAN CONCRETE INSTITUTE |
| AGA | AMERICAN GAS ASSOCIATION |
| AIA | AMERICAN INSTITUTE OF ARCHITECTS |
| AIMA | ACOUSTICAL & INSULATING MATERIALS ASSOCIATION |
| AISC | AMERICAN INSTITUTE OF STEEL CONSTRUCTION |
| AISI | AMERICAN IRON AND STEEL INSTITUTE |
| AMCA | AIR MOVING AND CONDITIONING ASSOCIATION INC. |
| ANSI | AMERICAN NATIONAL STANDARDS INSTITUTE |
| ASHRAE | AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIRCONDITIONING ENGINEERS |
| ASTM | AMERICAN SOCIETY FOR TESTING AND MATERIALS |
| AWI | ARCHITECTURAL WOODWORK INSTITUTE (USA) |
| AWMAC | ARCHITECTURAL WOODWORK MANUFACTURERS ASSOCIATION OF CANADA |
| AWS | AMERICAN WELDING SOCIETY |
| CCA | CANADIAN CONSTRUCTION ASSOCIATION |
| CCRC | CANADIAN CODE FOR RESIDENTIAL CONSTRUCTION |
| CEC | CANADIAN ELECTRICAL CODE |
| CFUA | CANADIAN FIRE UNDERWRITERS ASSOCIATION |
| CGA | CANADIAN GAS ASSOCIATION |
| CGSB | CANADIAN GENERAL STANDARDS BOARD |
| CIQS | CANADIAN INSTITUTE OF QUANTITY SURVEYORS |
| CISC | CANADIAN INSTITUTE OF STEEL CONSTRUCTION |
| CITC | CANADIAN INSTITUTE OF TIMBER CONSTRUCTION |
| CLA | CANADIAN LUMBERMEN`S ASSOCIATION |
| CMHC | CANADA MORTGAGE & HOUSING CORPORATION |
| COFI | COUNCIL OF FOREST INDUSTRIES OF BRITISH COLUMBIA |
| CPCI | CANADIAN PRESTRESSED CONCRETE INSTITUTE |

| | |
|---|---|
| CRCA | CANADIAN ROOFING CONTRACTORS ASSOCIATION |
| CSA | CANADIAN STANDARDS ASSOCIATION |
| CSC | CONSTRUCTION SPECIFICATIONS CANADA |
| CSI | CONSTRUCTION SPECIFICATIONS INSTITUTE (USA) |
| CSPI | CORRUGATED STEEL PIPE INSTITUTE |
| CSSBI | CANADIAN SHEET STEEL BUILDING INSTITUTE |
| CUA | CANADIAN UNDERWRITERS` ASSOCIATION |
| CWB | CANADIAN WELDING BUREAU |
| CWC | CANADIAN WOOD COUNCIL |
| DND | DEPARTMENT OF NATIONAL DEFENCE, CANADA |
| FM | FACTORY MUTUAL ENGINEERING CORPORATION |
| FS | FEDERAL SPECIFICATION (USA) |
| IES | ILLUMINATING ENGINEERING SOCIETY |
| IGMAC | INSULATED GLASS MANUFACTURERS ASSOCIATION OF CANADA |
| LTIC | LAMINATED TIMBER INSTITUTE OF CANADA |
| MIA | MARBLE INSTITUTE OF AMERICA |
| MPMDD | MODIFIED PROCTOR MAXIMUM DRY DENSITY |
| NAAMM | NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (USA) |
| NBFU | NATIONAL BOARD OF FIRE UNDERWRITERS |
| NBC | NATIONAL BUILDING CODE OF CANADA |
| NBS | NATIONAL BUREAU OF STANDARDS (USDC) |
| NEMA | NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION |
| NFPA | NATIONAL FIRE PROTECTION ASSOCIATION |
| NHLA | NATIONAL HARDWOOD LUMBER ASSOCIATION (USA) |
| NLGA | NATIONAL LUMBER GRADES AUTHORITY |
| NRC | NATIONAL RESEARCH COUNCIL |
| OBC | ONTARIO BUILDING CODE |
| OHSA | OCCUPATIONAL HEALTH AND SAFETY ACT |
| OPSS | ONTARIO PROVINCIAL STANDARD SPECIFICATIONS |
| PCA | PORTLAND CEMENT ASSOCIATION |
| PCI | PRESTRESSED CONCRETE INSTITUTE |
| RAIC | ROYAL ARCHITECTURAL INSTITUTE OF CANADA |
| SDI | STEEL DECK INSTITUTE |
| SMACNA | SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION |
| SPMDD | STANDARD PROCTOR MAXIMUM DRY DENSITY |
| SSPC | STEEL STRUCTURES PAINTING COUNCIL |
| TTMAC | TERRAZZO, TILE & MARBLE ASSOCIATION OF CANADA |
| ULC | UNDERWRITERS' LABORATORIES OF CANADA |
| ULI | UNDERWRITERS' LABORATORIES, INC. (USA) |
| USAS | UNITED STATES OF AMERICA STANDARDS INSTITUTE |
| WSIB | WORKPLACE SAFETY AND INSURANCE BOARD |

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 GENERAL

.1 Related Requirements Specified Elsewhere:

.1 Inspections and testing required by the laws, ordinances, rules and regulations of authorities having jurisdiction:

.1 General Conditions of the Contract.

.2 Verification by certification that specified products meet requirements of reference standards:

.1 In applicable Sections of the Specification.

.3 Testing, balancing and adjusting of equipment:

.1 In applicable mechanical and electrical Sections of the Specification.

.4 Cutting and Patching:

.1 Section 01 31 13.

.5 Submission of Inspection and Testing Reports:

.1 Section 01 33 00.

## 1.2 TOLERANCES FOR INSTALLATION OF WORK

.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.

## 1.3 CONSTRUCTION REVIEW

.1 The Consultant and his sub-consultants may carry out construction review during the progress of the work. The Consultant's general review during construction, and inspection and testing by independent inspection and testing companies reporting to the Consultant, are both undertaken to inform the Owner of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve him of contractual responsibility.

## 1.4 QUALITY CONTROL

.1 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and state his recommendations in writing.

.2 The Consultant may appoint and direct inspection and testing companies to review completed work in addition to inspection and testing specified for inclusion in the work under Source and Field Quality Control in other Sections.

## 1.5 INSPECTION AND TESTING

.1 Source and Field Quality Control Specified in Other Sections:

.1 This Section includes requirements for performance of inspection and testing specified under Source Quality Control and Field Quality Control in other Sections of the Specification.

.2 Do not include in work of this Section responsibilities and procedures that relate solely to an inspection and testing company's function under the direction of the Owner and that

are specified in another Section which is paid for directly by the Owner. Such information is included in this Section for only the Contractor's information.

.2 Do not limit responsibility for ensuring that products and execution of the work meet Contract requirements and inspection and testing required to this end, to specified inspection and testing.

.3 Payment for Inspection and Testing Services:

.1 Payment for specified inspection and testing will be made by the Contractor, as required by each applicable Section.

.2 Payment for reinspection and retesting of defective and rejected work shall be made by the Owner and backcharged to the Contractor.

.3 Contractor to engage approved company(s) for inspections and tests for additional inspections and tests as may be performed for the Contractor's own purposes and convenience. Include cost of this inspection and testing in the Stipulated Price Contract.

.4 Include cost in the Stipulated Price Contract for tests of reinforcing steel for which no mill tests are submitted.

## 1.6 INSPECTION AND TESTING SERVICES AND REFERENCE STANDARDS

.1 Qualifications of Inspection and Testing Companies:

.1 Companies engaged for inspection and testing shall provide equipment, methods of recording and evaluation, and knowledgeable personnel to conduct tests precisely as specified in reference standards.

.2 If requested, submit affidavits and copies of certificates of calibration made by an accredited calibrator to verify that testing equipment was calibrated and its accuracy ensured within the previous twelve months.

.3 Inspection and testing of concrete and concrete materials will be carried out by a CSA Certified testing laboratory to CSA A283, for review in accordance with CSA A23.1/A23.2.

.2 Reference Standards:

.1 Perform inspection and testing in accordance with standards quoted and as required by procedures described in specified reference standards that are applicable to the work being inspected and tested.

## 1.7 SUBMITTALS

.1 Submit inspection and testing reports in accordance with Section 01 33 00.

## 1.8 RESPONSIBILITIES OF THE CONSULTANT

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

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

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

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

## 1.9 RESPONSIBILITIES OF THE CONTRACTOR

.1 Inspection and testing performed by firms engaged for Source and Field Quality Control specified in other Sections shall not relieve the Contractor from responsibility of performing his work in accordance with the Contract Documents.

.2 Provide access for inspection and testing personnel to work in progress and to fabricator's operations.

.3 Provide samples of materials to be tested in required quantities at locations testing is performed.

.4 Submit copies of mill test reports in accordance with Section 01 33 00.

.5 Provide labour and facilities:

.1 To facilitate inspections and tests.

.2 For storing of specimens at required temperature and free from vibration, in conformance with reference standard and inspection and testing company instructions.

.3 For obtaining, handling and transporting of samples at site and plant.

.6 Notify Consultant, and inspection and testing company at least 48 hours before work to be inspected and tested commences.

.7 When it is discovered on inspection that work is proceeding with incorrect materials or methods, ensure that corrections are immediately made and that improperly completed work is replaced.

.8 Inspect all work done by subtrades prior to application of final cover materials i.e. pressure plates, drywall ceilings, concrete slab pours and the like.

## 1.10 RESPONSIBILITIES OF INSPECTION AND TESTING COMPANIES

.1 Determine from Specifications and Drawings the extent of inspection and testing required for work of contract as directed by Consultant. Notify Consultant of any omissions or discrepancies in the work inspected and/or tested.

.2 Perform applicable inspection and testing described in the Specification and as may be additionally directed.

.3 Provide competent inspection and testing personnel when notified by the Contractor that applicable work is proceeding. Inspection personnel shall co-operate with the Consultant and Contractor to expedite the work.

.4 Inform the Consultant of intended scheduling of inspections and of each visit of inspection personnel to the work site and fabricator's operations.

.5 Notify the Consultant and Contractor of deficiencies and irregularities in work immediately they are observed in course of inspections and tests.

.6 Inspection and testing companies shall not perform or supervise any of the Contractor's work, and shall not authorize:

.1 Performance of work that is not in strict accordance with the Contract Documents.

.2 Approval or acceptance of any part of the work.

## 1.11 INSPECTION AND TESTING PROCEDURES

.1 Perform specified inspection and testing only in accordance with specified reference standards, or as approved.

.2 Observe and report on compliance of work to requirements of Contract Documents.

.3 Ensure that inspectors are on site or at fabricator's operations for full duration of critical operations, and as otherwise required to determine that work is being performed in accordance with the Contract Documents.

.4 Identify samples.

.5 Identify sources of materials.

.6 Review and report on progress of work. Report on count of units fabricated and inspected at fabricator's operations.

.7 Observe and report on conditions of significance to work in progress at time of inspection or at fabricator's operations. Include where applicable and if critical to work in progress:

.1 Time and date of inspection.

.2 Temperature of air, materials and adjacent surfaces.

.3 Humidity of air, and moisture content of materials and adjacent materials.

.4 Presence of sunlight, wind, rain, snow and other weather conditions.

.8 Include in reports all information critical to inspection and testing.

.9 Ensure that only materials from the work and intended for use therein are tested.

.10 Determine locations for work to be tested.

**1.12 DEFECTIVE WORK**

.1 Where factual evidence exists that defective workmanship has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculation of structural strength made, and the like, in order to help determine whether the work must be replaced. Testing, retesting, inspections or surveys carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

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

.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.

**1.13 BUILDING ENVELOPE**

.1 Requirements specified herein apply to all elements of the exterior building envelope.

.2 Continuity of air barrier/vapour retarder and insulation components is critical and must be maintained at all locations. Where different systems meet, ensure proper interface and continuity between adjacent components by implementing suitable construction sequences and by using compatible materials only.

.3 Provide control joints in exterior building components of design and spacing which will permit expansion and contraction of components without causing distortion, failure of joint seals, undue stress, cracking, bowing or other defects detrimental to appearance and performance. Review design and location of control joints with Consultant prior to start of work and follow directions given by Consultant.

.4 Anchor exterior cladding components to structure in manner suitable to accommodate structural deflection and creep. Design anchorage to withstand expected wind loads, positive and negative, in accordance with applicable regulations.

.5 Ensure that air spaces within exterior building components are firestopped in accordance with applicable regulations.

.6 Ensure that air spaces on the outside of vertical air barrier/vapour retarder (walls) are constructed with adequate drainage provisions to the exterior.

**1.14 DRAINAGE**

.1 Lay out and construct work to ensure that positive drainage is provided to roof drains, floor drains, site drains and catch basins, as set in their final position, preventing undrained areas and ponding.

.2 Ensure that allowable construction tolerances and structural deflection do not cause ponding of water.

.3 Report to Consultant in writing prior to executing work affected, in case adequate drainage cannot be provided.

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 GENERAL

.1 Include in the work construction of temporary facilities as required for the performance of the work as construction aids and as required by authorities having jurisdiction, or as otherwise specified. Install to meet needs of construction as work progresses. Maintain construction and temporary facilities during use, repair them when damaged, relocate them as required by the work, remove them at completion of need, and make good adjacent work and property affected by their installation.

.2 Include in the work, construction of temporary facilities to provide for construction safety such as: fences, barricades, bracing, supports, storage, sanitation and first aid facilities, fire protection, stand pipes, electrical supply, temporary heat, steam supply, ventilation, construction equipment with its supports and guards, stairs, ramps, platforms, runways, ladders, scaffolds, guardrails, temporary flooring, rubbish chutes, and walkway, morality and guard lights, all as required of the Construction by the Occupational Health and Safety Act of the Province of Ontario, latest edition, as well as all other regulations of the authorities having jurisdiction.

.3 Construct temporary work of new materials unless otherwise approved.

.4 Ensure that structural, mechanical, and electrical characteristics of temporary facilities are suitable and adequate for the use intended. Be responsible that no harm is caused to persons and property by failure of temporary facilities because of placing, locations, stability, protection, structural sufficiency, removal, or any other cause.

.5 Prepare shop drawings and specifications of temporary work, and submit for approval of authorities having jurisdiction if so required. Submit duplicate copy to Consultant for his information.

.6 Locate temporary facilities where shown on Drawings or as directed.

.7 Apply two coats of paint, in approved colours, to temporary constructions, such as storage sheds; offices; supports; bracing and back side of signs; barricades; and where otherwise specified.

.8 Temporary Electric Service:

.1 Provide and maintain an adequate temporary electrical service for performance of the Work including, but not limited to, operation of electric pumps, motors, vibrators and other power tools, hoisting and related construction and general illumination during the Work. Provide power at temporary storage sheds and field office when required.

.2 Make connections available to any part of the work within distance of a 3048mm (10') extension. Each Subcontractor shall be responsible for their own extension cords.

.3 Contractor shall provide and be responsible for payment of temporary power required for all equipment for construction use in excess of available existing sources.

.4 Provide and maintain any components and equipment necessary to transform supply power to necessary temporary power voltage.

.5 Contractor will be permitted use of existing power for construction purposes at no cost to the Contractor. Provide additional temporary power for individual tasks required by the technical sections

.9 Temporary Lighting:

.1 Install lighting for the following:

.1 Emergency evacuation, safety and security throughout the Project at intensity levels required by authorities having jurisdiction.

.2 Performance of work throughout work areas as required, evenly distributed, and at intensities to ensure proper installations and applications are achieved.

.3 Performance of finishing work in areas as required, evenly distributed, and of an intensity of at least 30 foot candles.

.2 Permanent lighting may be used during construction, provided lamps, fluorescent tubes and ballasts that are so used are replaced with new at time work is turned over to Owner.

.10 Temporary Heating and Ventilation:

.1 Provide and pay for temporary heating, cooling and ventilating required for the Work, including attendance, maintenance and fuel.

.2 Provide temporary heat and ventilation as required to:

.1 Facilitate continuous uninterrupted progress of the Work.

.2 Protect the Work and Products against damage and defacement caused by weather, harmful levels of temperature, humidity, and moisture.

.3 Provide ambient temperatures and humidity levels for proper storage, installation and curing of materials, in accordance with specified standards and manufacturer's requirements.

.4 Provide adequate ventilation to meet health regulations for safe working environment.

.3 Maintain work areas at not less than 7 deg C. Increase temperatures in isolated areas to 20 deg C as required by various sections of the specifications or by Product manufacturers.

.4 Solid fuel salamanders will not be permitted.

.5 Provide temporary heat or adequate protection by means of straw or other coverings to floor slabs, footings, or any part of building not specifically designed to withstand frost penetration.

.6 Furnish other temporary heating as required by various sections of the specifications or by Product manufacturers.

.7 Replace with new, any work damaged due to failure to provide adequate heat at no cost to Owner.

.8 If possible, and when approved by the Owner, the permanent heating and ventilation system may be used during construction. If approved, the Contractor shall be responsible for its operation, and for replacing and repairing damage it may suffer, and shall assume operation and maintenance of the system in all its parts and payment for fuel consumed.

.9 Operation and maintenance shall include inspection at least every two weeks of thermostats, valves, switches, lubrication, fan, belt and motor adjustment, cleaning and/or replacement of filters, and replacement of filters and re-servicing of system at completion of work.

.10 Connect electric motors only to permanent source of power, or otherwise provide proper source with correct design characteristics and with no fluctuation in voltage.

.11 Commence warranty period after re-servicing and from time the Owner takes over the premises.

.11 Temporary Water Supply:

.1 Provide water of potable quality for all construction purposes, at one location at least, on each floor area.

.2 Extend supply pipe or pipes from nearest available sources and maintain in good condition until no longer required.

.3 If possible, and when approved by the Owner, the permanent site water source be used to provide water during construction.

.12 Temporary Sanitary Facilities:

.1 Provide sanitary facilities for persons on the work site as approved by the authorities having jurisdiction. Install them in sufficient number and maintain them in a sanitary condition.

.2 Do not permit construction personnel to use washroom and toilet facilities on premises which have been installed as part of the new work or which are part of the existing building for use by non-construction personnel.

.13 Temporary First-Aid Facilities:

.1 Provide site equipment and medical facilities necessary to supply first-aid service to injured personnel in accordance with regulations of the Workers' Compensation Act. Maintain facilities for duration of Contract.

.14 Connections to Utilities:

.1 Make arrangements for connections to water, sewer, gas, electric, and telephone utilities as required for temporary use during construction.

.2 The Owner is responsible for payment of final connection charges that are part of service contracts between him and each utility.

## 1.2 CONSTRUCTION AIDS

.1 Hoists and Cranes:

.1 Each Subcontractor is responsible for providing his own hoisting and crane operations. Equipment shall be operated by qualified hoist and/or crane operators.

.2 Where multiple trades are involved in high level work, the Contractor shall co-ordinate the hoisting and trade requirements.

.2 Building Enclosure:

.1 Include in work, temporary enclosures for building as required to protect it, in its entirety or in its parts, against the elements, to maintain environmental conditions required for work within the enclosure, and to prevent damage to materials stored within. Design enclosures to withstand wind pressures required for the building by authorities having jurisdiction.

.2 Use structural framing of building for support of temporary enclosure framing only upon verification that the load limits of the building frame will not be exceeded. Erect enclosures to allow complete accessibility for installation of materials during the time enclosures remain in place.

.3 Scaffolding:

.1 Each Subcontractor shall provide his own scaffolding.

.2 Scaffolding shall be erected clear of walls, and to ensure that it does not interfere with continuing work.

.3 Subcontractor shall be responsible for its examination for sufficiency of his scaffolding and be responsible for accidents due to its insufficiency.

.4 The Contractor will be responsible for co-ordination of scaffold work if multiple trade usage can by achieved from one installation.

.4 Provide temporary stairs, ladders, ramps required for movement and placing of materials, equipment and personnel.

## 1.3 PROTECTION

.1 Provide temporary protection to construction as required by the Work, to protect it from damage.

.2 Box with wood or otherwise protect from damage, by continuing construction, finished sills, jambs, corners, and the like.

.3 Adequately protect the Work at all stages of operations and maintain protection until the Work is completed. Remove and replace, at no additional cost to Owner, damaged Work and materials that cannot be repaired or restored to the approval of the Consultant.

.4 Provide spare safety helmets for and enforce their use by Owner, Consultants, and representatives and authorized visitors to the site.

.5 In addition to requirements of authorities having jurisdiction, provide temporary protection and safeguards adequate to protect against:

.1 Accident or injury to workers and other persons on the site or adjacent work and properties.

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

.3 Protect work, existing property, adjacent tenant and public property from damage during performance of Work. Should any part of the Work or any buildings, services or similar items on or surrounding the areas of the work and adjacent to any road leading thereto become damaged or disfigured due to lack or failure of such protection, they shall be made good with material identical with the existing and adjoining surfaces, to the satisfaction of the authorities having jurisdiction and the Owner.

.4 Damaged work shall be made good by those performing work originally, or workers experienced or skilled in that particular type of work, at expense of those causing damage.

.5 Provide and maintain necessary temporary enclosures, hoardings, fences, gates, barriers, guards, hoists, cranes, stairs, ladders and scaffolding, walks, platforms, staging as necessary for the Work and protection of workers, public and others from injury, and for public access to adjacent buildings. All such apparatus shall meet requirements of the authorities having jurisdiction.

.6 Provide secure, rigid guard railings, hoardings and barricades around openings, as required by authorities having jurisdiction and to maintain safety.

.7 Provide proper guard devices, signs, signals and lights for the prevention of accidents.

.8 Maintain at night, sufficient and suitable warning lights to prevent accidents and injuries to persons and/or property.

.9 Alter, remove and relocate or replace hoardings, barriers and entrances as required by the Work. Hazards requiring such protection shall be eliminated as soon as possible and protection devices removed. Maintain protection until state of construction allows their removal.

.10 Provide and maintain temporary weathertight protection for all exterior openings in walls, floors and roofs until the building is closed in.

.11 Close off floor areas where walls are not finished, seal off openings and enclose building interior work area. Polyethylene or other approved translucent material shall be framed in or around wall openings. Provide temporary doors, frames, hinges, locks, keys and bolts as required.

.12 Should the work be stopped for any cause, provide protection and bracing for the Work.

.6 Lay protective 13mm (1/2") plywood over completed areas of roof on which other trades are to work.

## 1.4 PUBLIC PROTECTION

.1 Provide fencing, barricades, hoarding, notices and warning boards and maintain lights and signals for protection of workers engaged on the Work, for protection of adjoining property and for protection of the public.

.2 Such protective measures shall be finish painted to Owner's approved colour, when visible to the public.

.3 Where any special hazard exists from which it is not possible to protect the public safety by other means, watchpersons shall be employed to preserve public safety until the area of special hazard no longer poses a risk to public safety.

**1.5 PLANT PROTECTION**

.1 Protect all existing trees and landscaping which is to remain at the Place of the Work, using methods and materials recommended by the Canadian Nursery Trades Association and as approved by the Consultant.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2440 mm (8').

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Provide minimum 1.8 m high chain link fencing outside of dripline of trees or groups of trees and other plants. Leave fenced areas undisturbed; do not use areas for storage, stockpiling or any other purpose. Do not dump or flush any contaminants in areas of tree feeder roots.

.5 Where limbs or portions of plants are required to be removed to accommodate new work, they shall be removed in accordance with accepted arboricultural practice.

.6 Where root systems of protected trees adjacent to construction are exposed or damaged, they shall be neatly trimmed and the area backfilled with suitable material to prevent desiccation.

.7 Where necessary give plants an overall pruning to restore the balance between roots and top growth and/or to restore appearance.

.8 Minimize stripping of topsoil and vegetation.

.9 Restrict tree removal to areas indicated or designated by Consultant.

**1.6 FIRE SAFETY REQUIREMENTS**

.1 Comply with fire and safety regulations required by the authorities having jurisdiction.

.2 Take necessary precautions to eliminate fire hazards and to prevent damage to Work, building materials, equipment and other property both public and private having to do with Work. Inspect Work at minimum weekly intervals for this purpose.

.3 Store and locate products and equipment packed in cardboard cartons, wood crates and other combustible containers in orderly and accessible manner.

.4 Tarpaulins shall be fire-resistant.

.5 Open fires and burning of rubbish are not permitted on the site.

.6 Provide and maintain in working order, ULC labelled fire extinguishers or other approved fire extinguishing equipment, locate in prominent positions, in accordance with requirements of authorities having jurisdiction and insurance companies having jurisdiction, codes, regulations and bylaws in the building until the permanent fire protection system in the building is available.

.7 Provide temporary standpipe system, when required by authorities having jurisdiction.

.8 Except as otherwise specified herein, soldering, welding and cutting operations shall be carried out in areas free of combustible and flammable contents, with walls, ceilings and floors of noncombustible construction or lined with noncombustible materials.

.9 When it is not practicable to undertake welding, soldering and cutting operations in areas described in the previous paragraph, combustible and flammable materials shall either be removed minimum of 9144mm (30') from the work area or otherwise protected against ignition by sheet metal or other noncombustible material.

.10 When welding, soldering, or cutting is to be carried out near piping containing flammable gas, the section of piping located within 914mm (3') of the torch or other source of combustion shall be covered with wet, noncombustible insulating material at least 6mm (1/4") thick.

.11 Prior to initiating any open flame work or welding operation, discuss the proposed work with the Consultant and take necessary precautions to prevent inadvertent activation of the existing fire alarm system. Have sufficient suitable hand operated fire extinguishers on hand near the work area. Ensure that an additional person is readily available to operate fire extinguishers should the need arise.

## 1.7 PERSONAL HEALTH AND SAFETY REQUIREMENTS

.1 Comply with all requirements of the Occupational Health and Safety Act, Ministry of Labour, Construction Safety Association and all other authorities having jurisdiction in the place of the Work.

.2 Contractor shall submit company safety policy for review by Owner and Consultant. The policy must meet or exceed the requirements of the authorities having jurisdiction.

.3 Contractor shall employ and pay for services of safety supervisor in accordance with the requirements of the authorities having jurisdiction. Safety supervisor shall have training with the Construction Safety Association.

.4 Alcohol and/or drugs will not be allowed on the site. Anyone found in possession of alcohol and/or drugs shall be dismissed from the site immediately and without notice, maybe subject to civil and/or criminal proceedings.

.5 WHMIS program shall be fully enforced.

.6 Contractor shall be prepared to sign the "Guidelines For The Structure and Function Of The Joint Occupational Health and Safety Committee", if requested by the Owner.

.7 When carrying out soldering, welding or cutting procedures, be it in shop or in the field, ensure that workers comply with the following:

.1 Wear appropriate protective clothing such as gloves, leather aprons and/or arm spark guards.

.2 Wear suitable goggles or face shields as appropriate.

.3 Protect co-workers from eye or other injuries through the use of fire resistant portable shielding devices.

.4 Provide and use a portable fume eliminator at all times during welding, soldering, or cutting operations within the existing building.

## 1.8 SECURITY

.1 Maintain security of construction site by control of access through enclosing barricades, and hoardings during times work is in progress, and by locking hardware.

.2 Properly close and lock the construction site at nights, Sundays, holidays and other occasions when the Work is not in progress.

.3 The Owner assumes no responsibility for the safeguarding of tools or equipment from theft.

.4 Take precautions to guard construction site, premises, materials and the public during and after working hours. During regular working hours, maintain watch to guard construction site and contents.

.5 Maintain security at all times construction is shut down because of a strike or a lockout.

.6 Provide security guards and security lighting during all after hour work.

.7 Provide personnel to direct traffic as required during working hours.

## 1.9 ACCESS ROADS, WALKS AND PARKING

.1 Access Roads and Walks:

.1 All construction vehicles and personnel required for construction shall use existing access roads and walks as determined at later date by Owner. When no longer required, or at completion of Work, make good disturbed surfaces. Maintain roads and walks, removing dirt, mud, debris, ice, snow and other obstructions during use.

.2 Provide for access of emergency vehicles at all times.

.2 Parking:

.1 Parking for Contractor's, subcontractors, suppliers and/or their employee's vehicles shall be limited to restricted area as designated by the Owner.

.2 The Owner, property management and their employees will not be responsible for parking fines incurred by the Contractor, Subcontractors, suppliers and/or their employees.

## 1.10 SITE SIGNS

.1 No signs, bills or posters will be allowed on the site, other than site signs as follows:

.1 Project construction sign shall be supplied and installed by Owner under work of separate Contract.

.2 Place only specified project construction sign and notices regarding safety, caution, or instructions on or near site.

.3 No unauthorized signs, bills, posters or advertisements of any kind are permitted. Should such unauthorized advertisements be applied to the temporary hoarding by the public or anyone else, upon discovery of such, the Contractor shall remove them on a weekly basis.

.4 Erect all notices as directed by Owner.

.5 Remove all notices on completion of the Contract.

## 1.11 FIELD OFFICES AND SHEDS

.1 Field Offices:

.1 Provide temporary offices for Owner's, Consultant's and Contractor's use. They shall contain facilities as required for Contractor, a conference table and chairs for site meetings, and facilities for the Owner and the Consultants.

.2 Temporary field offices shall be designated on site until such time where an area located inside the constructed building, can be designated by the Owner. No other location shall be used for temporary field office. Temporary site office shall not exceed 3048mm (10') x 15240mm (50').

.3 Facilities shall consist of: an office desk and chair, a two drawer filing cabinet, two chairs, use of a telephone, use of facsimile machine, and a layout table for drawings located so that when drawings are spread out their orientation is same as that of building under construction.

.4 Heat, cool and light offices to minimum code requirements for office buildings.

.5 Keep temporary field office clean and remove all rubbish at the end of each work day.

.6 Include construction and operating hardware, with security locks, as required by the Owner.

.2 Site Storage:

.1 Until such time where an area can be located inside the constructed building, designated by the Owner as a temporary site storage, provide 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 Provide floors raised 150 mm (6") clear of ground for storage of Products.

.3 Include security locks, as required.

.4 Install lighting in storage areas and heat in those storage areas containing materials damaged by low temperature.

.5 Provide separate shed located where directed in writing by Consultant for storage of volatile materials.

.6 Owner is not responsible for securing Products or materials at the Place of the Work.

.7 Handle and store materials so as to prevent damage or defacement to the Work and surrounding property.

## 1.12 DUST CONTROL

.1 Provide dust tight screens or barriers to localize dust generating activities for the protection of tenants, employees, equipment, adjacent and finished areas of Work, and the public. Maintain and relocate protection until Work is complete. Respond immediately to complaints of dust received from the public, authorities having jurisdiction, Owner and Consultant.

.2 Obtain Consultant's approval of installed dustproof screens and protection methods before proceeding with construction/alteration work.

.3 Painted gypsum wallboard and metal stud dustproof screens, shall extend to underside of structure, and shall be erected to protect adjoining areas and rooms. Apply bead of sealant or other acceptable seal continuously around periphery of each face of partitioning to seal gypsum board/structure junction where dustproof screens abut fixed building components. Seal perimeter of cutouts, around fixtures and fittings and other penetrations. Tape or seal between adjacent boards. Separate construction areas from occupied areas.

.4 Provide protection for existing equipment sensitive to dust and noise. Co-ordinate location of dust barriers and dust tight doors with Consultant.

.5 Install temporary packing at bottom of doors to areas where demolition/construction shall be performed to prevent dust seepage into existing spaces. Do not permit dust and dirt to escape beyond area being constructed/altered.

.6 Provide daily vacuuming of construction dust from existing areas as work progresses; this shall be considered a minimum requirement, increase vacuuming as necessary. The Owner may have vacuuming work done by others and cost deducted from Contractor's progress payments if this requirement is not fulfilled.

.7 Provide locked doors in barriers to permit access by Consultant, Owner and Owner's security personnel to construction areas and to areas under Contractor's custody. Supply padlocks and construction cores.

.8 Remove dustproof screens at completion of work in areas and make good damaged or blemished areas. Patch and make good to access, altered and damaged areas caused by work and screens. Maintain integrity of fire or sound separation.

.9 Prevent nuisance to adjacent areas near the work from dust by taking additional appropriate anti-dust measures at such times as found necessary, and at other times complaints of dust are received from the Owner's representative and others.

## 1.13 NOISE AND VIBRATION CONTROL

.1 Take measures to control noise and vibration generated by the Work.

.2 Take appropriate noise and vibration control measures at times found necessary, and at other times complaints of noise are received from the public, authorities having jurisdiction, Owner and Consultant.

.3 These requirements are for the consideration of the public, tenants and employees. Requirements shall not be construed as cause for elimination or restriction of Contractor's working schedule, claims for delay of work nor additional costs.

## 1.14 COLD WEATHER WORKING

.1 Particular attention is drawn to the requirement that the Contractor shall commence work immediately the Contract is awarded and shall continue full scale operations throughout the winter months and thereafter until the work is completed and accepted by the Consultant.

.2 It is understood that the Contract Price includes sufficient funds for the provisions of temporary heating, temporary shelters and all other necessary cold weather measures to enable all trades to proceed without delay regardless of weather.

## 1.15 SNOW REMOVAL

.1 Allow no accumulation of ice and snow within the Place of the Work. There shall be no use of salt for de-icing in areas of building work.

.2 Remove snow from access routes to the Work to maintain uninterrupted progress of the Work.

## 1.16 PEST CONTROL

.1 Provide rodent control and other pest control programs during the Work in accordance with the requirements of authorities having jurisdiction.

## 1.17 FIRES

.1 Open burning fires on site will not be permitted.

## 1.18 FIRST AID SERVICES

.1 Provide and maintain First Aid services as required by the authorities having jurisdiction, the Workplace Safety and Insurance Board (WSIB) and Union Agreements.

## 1.19 TRAFFIC CONTROL

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

.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.

.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.

.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.

## 1.20 ENVIRONMENTAL/POLLUTION CONTROL/SITE CLEANING

.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.

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

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

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

.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.

.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.

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

**1.21 TEMPORARY DRAINAGE AND DEWATERING**

.1 The Work includes the removal of collected groundwater and surface water accumulating from precipitation and groundwater infiltration throughout the course of the Work until date of Substantial Performance of the Work.

.2 Keep drainage lines and gutters open. No flow of water shall be directed across or over pavements except through pipes or properly constructed troughs. Keep portions of the Work properly and efficiently drained during construction and until completion. Be responsible for disturbances, dirt and damage which may be caused by or result from water backing up or flowing over, through, from or along any part of the Work, or due to operations which may cause water to flow elsewhere.

.3 Keep trenches and other excavations free of water. Remove water in a manner that will prevent loss of soil, and maintain the stability of existing soils.

.4 Dispose of such water in a manner that will not be hazardous to public health and safety, private property, or to the Work.

.5 Drainage of trenches or other excavation through storm drainage pipe will be allowed only with the express permission of the authority having jurisdiction.

.6 When drainage is permitted in writing to be directed to existing catch basins, regularly and at Substantial Performance of the Work inspect such catch basins and remove accumulated debris and sediment.

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 GENERAL

.1 Products refer to materials, manufactured components and assemblies, fixtures and equipment incorporated in the work.

.2 Use only products of Canadian manufacture unless such products are not manufactured in Canada, are specified otherwise, or are not competitive.

.3 Products for use in the Project and on which the Bid was based shall be in production at time of tender date, with a precise model and shop drawings available for viewing.

.4 Where equivalent products are specified, or where alternatives are proposed, these products claimed by the Contractor as equivalent shall be comparable in construction, type, function, quality, performance, and, where applicable, in appearance. Where specified equivalents are used in the Stipulated Price for the work, they shall be subject to final approval.

.5 Incorporate products in the work in strict accordance with Manufacturers' directions, instructions and specifications, where reference is made to them, shall include full information on storing, handling, preparing, mixing, installing, erecting, applying, and other matters concerning the materials that are pertinent to their use and their relationship to materials with which they are incorporated.

.6 Products delivered to the Project site for incorporation in the work shall be considered the property of the Owner. Maintain protection and security of products stored on the site after payment has been made for them.

.7 Do not install permanently incorporated labels, trademarks and nameplates, in visible locations unless required for operating instructions or by authorities having jurisdiction.

## 1.2 PRODUCT HANDLING

.1 Manufacture, pack, ship, deliver and store products so that no damage occurs to structural qualities and finish appearance, nor in any other way detrimental to their function or appearance, or both.

.2 Ensure that products, while transported, stored or installed, are not exposed to an environment which would increase their moisture content beyond the maximum specified.

.3 Schedule early delivery of products to enable work to be executed without delay. Before delivery, arrange for receiving at site.

.4 Deliver and store products at site where directed by the Contractor.

.5 Brace work such as door frames, large window units and similar products to prevent distortion or breakage in handling.

.6 Deliver packaged products, and store until use, in original unopened wrapping or containers, with manufacturer's seals and labels intact.

.7 Label packaged products to describe contents, quantity and other information as specified.

.8 Label fire-rated products to indicate approval of Underwriters' Laboratories.

.9 Product handling requirements may be repeated, and additional requirements specified, in other Sections.

## 1.3 STORAGE AND PROTECTION

.1 Store products on site with secure protection against all harmful environmental conditions. Prevent damage, adulteration, staining and soiling of materials while stored.

.2 Store manufactured products in accordance with manufacturers' instructions.

.3 Store steel, lumber, masonry units, and similar products on platforms raised clear of ground.

.4 Store finished products and woodwork under cover at all times.

.5 Do not store products at locations or in such a manner that they damage previously completed work.

.6 Storage and special protection requirements may be repeated and additional requirements specified, in other Sections.

**1.4 SCHEDULING OF PRODUCT DELIVERY**

.1 Verify that products supplied by all Sections are ordered from suppliers in sufficient time to ensure delivery for incorporation in the work within the time limits established by approved construction schedule.

.2 Obtain confirmed delivery dates from product suppliers.

.3 Immediately inform the Consultant should supplier's confirmation of delivery dates indicate that Project completion may be delayed.

.4 Submit copies of purchase orders and confirmations of delivery dates for products as may be requested.

.5 A schedule of product delivery shall be established and reviewed at each job site meeting.

.6 When deemed necessary, plant visits shall occur by the General Contractor to ensure delivery dates given are true and accurate.

**1.5 DEFECTIVE PRODUCTS AND WORK**

.1 Products and work found defective; not in accordance with the Specifications; or defaced or injured through negligence of the Contractor, his employees or Subcontractors, or by fire, weather or any other cause will be rejected for incorporation in the work whether or not incorporated in the work.

.2 Remove rejected products and work from the premises immediately.

.3 Replace rejected products and work with no delay after rejection. Provide replacement products and execute replacement work precisely as required by the Specifications for the defective work replaced. Previous inspection and payment shall not relieve the Contractor from the obligation of providing sound and satisfactory work in compliance with the Specifications.

.4 Testing and retesting of any part of the work as directed by the Owner, Consultant or Contractor to establish its conformance to the Contract Documents shall be performed at no addition to the Contract Price.

**1.6 WORKERS, SUPPLIERS AND SUBCONTRACTORS**

.1 Assign work only to workers, suppliers, and Subcontractors who have complete knowledge, not only of the conditions of the Specifications, but of jurisdictional requirements, and reference standards and specifications.

.2 Give preference to use of local workers, suppliers and Subcontractors wherever possible.

.3 Certified and qualified installers of a specific product line shall be used when called for in these Specifications.

2 Products

**2.1 SPECIFIED PRODUCTS**

.1 Products used for temporary facilities may have been previously used, providing they are sound in structural qualities.

.2 Specified Options: The Work is based on materials, Products and systems specified by manufacturer's catalogued trade names, references to standards, by prescriptive specifications and by performance specifications.

.1 Where only one manufacturer's catalogued trade name is specified for a Product, the Product is single sourced and shall be supplied by the specified manufacturer.

.2 Where more than one manufacturer's catalogue trade name is specified for a Product, supply the Product from any one of those manufacturers specified.

.3 When a Product is specified by reference to a standard, select any Product from any manufacturer that meets or exceeds the requirements of the standard.

.4 When a Product or system is specified by prescriptive or performance specifications, Provide any Product or system which meets or exceeds the requirements of the prescriptive or performance specifications.

.5 The onus is on the Contractor to prove compliance with governing published standards, prescriptive specifications and with performance specifications.

.3 Products, materials, equipment and articles (referred to as Products throughout the Contract Documents) incorporated in the Work shall be new, not damaged or defective, and of the quality standards specified, for the purpose intended. If requested, furnish evidence as to type, source and quality of Products Provided.

.4 Where Contract Documents list acceptable Products or acceptable manufacturers, select as applicable, any one Product from any one manufacturer meeting performance of specifications.

.5 Where Contract Documents require design of a Product or system, and minimum material requirements are specified, the design of such Product or system shall employ materials specified within applicable section. Where secondary materials or components are not specified, augment with materials meeting applicable code limitations, and incorporating compatibility criteria with adjacent work.

.6 Defective Products, whenever identified prior to completion of the Work, will be rejected, regardless of previous reviews. Review of the Work by the Consultant or inspection and testing companies does not relieve the Contractor of the responsibility for executing the Work in accordance with the requirements of the Contract Documents, but is a precaution against oversight or error. Remove and replace defective Products and be responsible for delays and expenses caused by rejection at no additional cost to the Owner.

.7 Should any dispute arise as to quality or fitness of Products, the decision rests strictly with Consultant based upon the requirements of the Contract Documents.

.8 Unless otherwise indicated in the Contract Documents, maintain uniformity of manufacturer for any like item, material, equipment or assembly for the duration of the Work.

.9 Products exposed in the finished work shall be uniform in colour, texture, range, and quality, and be from one production run or batch, unless otherwise indicated.

.10 Permanent labels, trademarks and nameplates on Products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical, electrical, machinery or like rooms.

.11 Owner retains right to select from choices available within specified Products for colours, patterns, finishes or other options normally made available. Submit full range of Product options in accordance with 01 33 00 for such selection.

.12 Quality Control:

.1 Implement a system of quality control to ensure compliance with Contract Documents.

.2 Notify Consultant of defects in the Work or departures from intent of Contract Documents that may occur during construction. Consultant will recommend appropriate corrective action in accordance with requirements of the Contract.

3 Execution

## 3.1 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in the Contract Documents, install or erect Products in accordance with manufacturer's printed instructions. Do not rely on labels or enclosures supplied with Products. Obtain printed instructions directly from manufacturers.

.2 Notify Consultant in writing, of conflicts between the Contract Documents and manufacturer's instructions.

.3 Improper installation or erection of Products, due to failure in complying with these requirements, authorizes Consultant to require removal and re-installation at no additional cost to the Owner.

.4 Manufacturers' representatives shall have access to the Work at all times. Contractor shall render assistance and facilities for such access in order that the manufacturers' representatives may properly perform their function.

## 3.2 GALVANIC/DISSIMILAR METAL CORROSION

.1 Insulate dissimilar metals from each other by suitable plastic strips, washers or sleeves to prevent galvanic corrosion where conductive liquid or electrolyte exists.

## 3.3 WORKMANSHIP

.1 General:

.1 Execute the Work using workers experienced and skilled in the respective duties for which they are employed.

.2 Do not employ an unfit person or anyone unskilled in their required duties.

.3 Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with Consultant, whose decision is final.

.4 Upon request by the Consultant, submit proof, in the form of CCDC 11 - Contractor's Qualification Statement, of qualifications of Subcontractors to verify Subcontractor's qualifications and experience meet or exceed the requirements of the Contract Documents.

.1 If, upon review of the Contractor's Qualification Statement, it is found that the Subcontractor does not meet the qualification requirements specified in the Contract Documents pertaining to the parts of the Work for which the Subcontractor has been retained, the Contractor shall replace the unqualified Subcontractor with a qualified Subcontractor, satisfactory to the Contractor and the Owner, at no additional cost to the Owner and at no increase in the Contract Time.

.2 Coordination:

.1 Ensure cooperation of workers in layout of the Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

.3 Cutting and Remedial Work:

.1 Perform cutting and remedial work required to make parts of the Work come together. Coordinate the Work to ensure this requirement is maintained. Obtain permission from Consultant before commencing any cutting.

.4 Fastenings:

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action and corrosion between dissimilar metals and materials.

.5 Protection of work in progress:

.1 Take reasonable and necessary measures, including those required by authorities having jurisdiction, to Provide protection.

.2 Adequately protect parts of the Work completed or in progress. Parts of the Work damaged or defaced due to failure in providing such protection is to be removed and replaced, or repaired, as directed by the Consultant, at no additional cost to the Owner.

.3 Do not cut, drill or sleeve any load bearing structural member without written permission of Consultant, unless specifically indicated.

.4 Keep floors free of oils, grease or other materials likely to discolour them or affect bond of applied surfaces.

.5 Protect work of other Subcontractors from damage while doing subsequent work. Damaged work shall be made good by appropriate Subcontractors but at expense of those causing damage.

.6 Protect existing buildings, curbs, roads and lanes. If, during the Work, any buildings, curbs, roads or lanes are damaged, bear costs for repairs.

.6 Existing Utilities:

.1 When breaking into or connecting to existing services or utilities, execute the Work at times approved by Owner, with a minimum of disturbance to Owner's ongoing operations, the Work, and traffic.

.2 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in a manner approved by authority having jurisdiction and stake or otherwise record location of capped service.

.7 Operational requirements: Operable Products shall be Provided fully operational and ready for intended use.

**END OF SECTION**

1 General

## 1.1 EXAMINATION

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

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

## 1.2 PROTECTION

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

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

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

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

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

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

## 1.3 SERVICES AND UTILITY SYSTEMS

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

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

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

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

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

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

## 1.4 SLEEVES, SUPPORTS, AND FASTENERS

.1 Unless specified in other Sections, furnish, set and secure inserts, hangers, sleeves, fasteners, adhesives, anchors and other supports and fittings required for proper installation of work.

.2 Use exposed metal fastenings and accessories of same texture, colour and finish as base metal on which they occur.

.3 Select appropriate type of anchoring and fastening devices and in sufficient quantity and in such manner as to provide positive permanent anchorage of unit to be anchored in position. Keep exposed fasteners to a minimum, evenly spaced and neatly laid out.

.4 Fasteners shall be of permanent type. Do not use wood plugs.

.5 Fasteners which cause spalling or cracking of material to which anchorage is being made shall not be used.

**1.5 CONCEALMENT**

.1 Conceal ductwork, piping, conduit and wiring located in finished areas, in ceiling spaces and furred construction unless specifically noted to be exposed.

.2 If any doubt arises as to means of concealment, or intent of Contract Documents in this connection, request clarification from Consultant before proceeding with portion of work in question.

**1.6 CUTTING AND PATCHING**

.1 Regardless of which Section of work is responsible for any portion of cutting and patching, in each case tradesmen qualified in work being cut and patched shall be employed to ensure that it is correctly done.

.2 Any cost caused by omission or ill-timed work shall be borne by party responsible therefore.

.3 Do not endanger any work by cutting, digging or otherwise altering, and do not cut nor alter any loadbearing element without written authorization by Consultant. Provide bracing, shoring and temporary supports as required to keep construction safely supported at all times.

.4 Cut holes carefully and not larger than required after they are located by Sections requiring them, using suitable equipment and tools.

.5 Patching and making good work shall be undetectable in finished work.

**1.7 WORKMANSHIP**

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

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

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

**1.8 LINES AND LEVELS**

.1 Verify all elevations, lines, levels and dimensions as indicated and report errors, any conflicts, or inconsistencies to the Consultant before commencing work or as soon as discovered.

.2 Arrange to have building base lines laid out by an Ontario Land Surveyor.

.3 Accurately lay out work and establish lines and levels in accord with requirements of Contract Documents.

.4 Set up, maintain and protect permanent reference points and provide general dimensions and elevations for all Sections of Work.

**1.9 DIMENSIONS**

.1 Check and verify dimensions wherever referring to work. Dimensions, when pertaining to work of another Section, shall be verified with Section concerned. Details and measurements of work which is to fit or conform with work installed shall be taken at site.

.2 Do not scale Drawings. If there is ambiguity, lack of information or inconsistency, immediately consult Consultant for directions. Be responsible for extra costs involved through the disregarding of this notice.

.3 Walls, partitions and screens shall be considered as extending from floor to underside of structural deck unless specifically indicated otherwise on Drawings.

**1.10 LOCATION OF FIXTURES**

.1 Location of fixtures, apparatus, equipment, fittings, outlets, conduits, pipes and ducts shown or specified, but not dimensioned, shall be considered approximate.

.2 Request direction from Consultant to establish exact location. Any relocation caused by Contractor's failure to request direction from Consultant shall be done by Contractor at no extra cost. Where job conditions require reasonable changes in indicated locations and arrangements, make changes at no additional cost.

.3 Conserve space and coordinate with work of other Sections to ensure that ducts, pipes, conduits and other items will fit into allocated wall and ceiling spaces, while ensuring adequate space for access and maintenance.

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

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

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 GENERAL

.1 Be responsible for cleanliness of assigned work areas to satisfaction of Consultant. Maintain work areas in neat and orderly condition at all times.

.2 Periodically, or when directed by the Consultant, remove from work areas rubbish and waste materials.

.3 Burning or burying of rubbish and waste materials on site is not permitted.

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

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

## 1.2 ADMINISTRATIVE REQUIREMENTS

.1 Coordination and Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the work occurring onsite. Provide a clear delineation of responsibilities for each sub-trade.

.2 Sequencing: Ensure that the sub-trades mobilized onsite have access to the necessary bins to facilitate the separation of solid waste streams.

.3 Scheduling: Remove full bins in a timely fashion, and ensure that empty and partially full bins are properly labeled to minimize cross-contamination.

## 1.3 CLEANING DURING CONSTRUCTION

.1 Remove debris, packaging and waste materials frequently.

.2 Keep dust and dirt to an acceptable level, as directed.

.3 Remove oily rags, waste and other hazardous substances from premises at close of each day, or more often if required.

.4 Clear sidewalks of snow and ice, adjacent to construction site.

## 1.4 FINAL CLEANING

.1 Upon completion of work, or, where work is phased, upon completion of each phase, thoroughly clean all surfaces and components. Provide professional cleaning by a recognized, established cleaning company, to allow Owner to complete final cleaning and floor preparation / build-up.

.2 Remove stains, dirt and smudges from finished surfaces.

.3 Clean exposed finished surfaces in accordance with respective material manufacturer's recommendations.

.4 Clean mechanical and electrical fixtures and other fittings of labels, wrappings, paper and other foreign material.

.5 Replace heating, ventilation and air conditioning filters if units were operated during construction. Clean inside of ducts, blowers and coils.

.6 Remove from work areas all waste and surplus materials from all areas, including roofs and ceiling spaces.

.7 Steam clean existing masonry which becomes an interior exposed wall surface.

.8 Remove snow and ice from driveways, parking areas and walks.

.9 Power wash paved surfaces.

## 1.5 WASTE COLLECTION AND DISPOSAL

.1 All waste materials and debris resulting from the work of this Contract shall belong to the Contractor and shall be removed from the site and legally disposed.

.2 Periodically, or when directed by the Consultant remove waste material and debris.

.3 Construction Waste:

.1 Designate an area onsite for the separation and storage of waste materials. Allow enough space to accommodate multiple bins.

.2 At a minimum, provide storage bins onsite for concrete, metal, wood, cardboard, plastic, gypsum board and mixed waste. Landclearing debris, asphalt and concrete can be stockpiled onsite, as opposed to being placed in bins, for further processing.

.3 Provide signage on each bin to identify the specific waste streams that can be placed in each.

.4 The waste separation and storage area and bins are to be kept neat, and clean, and clearly marked in order to avoid contamination of materials.

.5 Hazardous waste and hazardous materials are not within the scope of this Section and must be handled in accordance with the requirements stipulated by local regulations.

.4 Domestic Recyclables

.1 “Blue Box” receptacles shall be placed in close proximity all site trailers, and throughout the building, to collect recyclable material generated by workers. At minimum, provide receptacles for metal and glass beverage and food containers and paper products.

.2 Make arrangements with the Municipality or a receiving facility to have domestic recyclables picked up regularly.

.3 Adjacent to each “Blue Box” receptacle, provide a mixed waste receptacle in order to avoid contamination of recyclables.

.5 Separate and salvage materials suitable for recycling from general waste stream and transport to recognized recycling facility.

.6 Burying, burning, selling waste materials on site is prohibited.

.7 Disposal of liquid wastes into waterways, sewers is prohibited.

## 1.6 SCHEDULING

.1 Ensure that an appropriately sized bin is provided onsite for each new waste stream that is introduced onsite.

.2 Arrange for the prompt collection by, or delivery to, the appropriate recycling or reuse facility when a bin is full, or nearly full.

## 1.7 ONSITE QUALITY CONTROL

.1 Waste Handling:

.1 Clean and strip materials (as stipulated by the receiving facility) prior to placing in collection containers. Deliver materials free of dirt, adhesives, solvents, and petroleum contamination.

.2 Ensure that no cross-contamination has occurred in bins and receptacles. Should bins become cross-contaminated, the Contractor shall separate the waste streams prior to removal from the site. The only exception to this is if a qualified off-site sorting facility is responsible for separating the waste streams.

.3 Ensure that signage is in place and clearly visible on all bins and receptacles.

.4 Ensure that bins and receptacles are easily accessible by workers and waste haulers. Supplies, equipment and materials must never restrict access.

.5 Ensure site is free and clear of accumulated debris. If materials are being stockpiled prior to removal from the site, ensure they are located away from the building, and out of the way of typical traffic patterns.

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 GENERAL INSTRUCTIONS

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

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

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

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

## 1.2 FINAL CLEANING

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

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

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

.4 Replace glass and mirrors that have been broken, damaged and/or etched during construction, or which are otherwise defective.

.5 Remove dust, stains, paint spots, soil, grease, fingerprints, and accumulations of construction materials, interior and exterior to the building. Perform cleaning in accordance with installer's instructions for each material. Final cleaning shall include:

.1 Washing of interior concrete floors.

.2 Cleaning and polishing of:

.1 glass;

.2 mirrors;

.3 porcelain, enamel, and finish metals;

.4 washroom accessories.

.3 Vacuum cleaning of ceilings, walls and floors.

.4 Cleaning of glazed wall surfaces.

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

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

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

## 1.3 CLOSE-OUT SUBMITTALS

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

.1 Review maintenance manual contents (operating, maintenance instructions, asbuilt drawings, materials) for completeness.

.2 Review in relation to Contract Price, Change Orders, Change Directives, holdbacks and other adjustments to the Contract Price.

.3 Review inspection and testing reports to verify conformance to intent of Contract Documents and that changes, repairs or replacements have been completed.

.4 Execute transition of performance bond and labour and materials payment bond to warranty period requirements.

.5 Submit a final statement of accounting giving total adjusted Contract Price, previous payments, and monies remaining at time of application for completion of the Contract. Consultant will issue a final change order reflecting approved adjustments to Contract Price not previously made, if any.

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

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

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

.5 Maintenance materials:

.1 Deliver to a location and at a time specified by the Owner, organize items in Owner's storage area as directed by the Owner, and as follows:

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

.2 Clearly mark cartons or packaging as to contents, project name, and Supplier.

.3 If applicable give colour and finish, room number or area where material is used.

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

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

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

.6 Owner communication material:

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

## 1.4 SUBSTANTIAL PERFORMANCE OF THE WORK

.1 Deficiency review:

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

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

Work by the Consultant to determine if Substantial Performance of the Work has been achieved.

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

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

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

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

.2 Certification of Substantial Performance of the Work:

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

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

.3 Final Inspection for completion of the Contract:

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

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

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

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

.5 Contractor shall thereafter submit invoice for final payment.

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

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

## 1.5 WARRANTY PERIOD

.1 Provide on-going review and attendance to call-back, maintenance and repair problems during the warranty periods.

.2 At the beginning of the 12th month after Substantial Performance of the Work, the Owner, Contractor and Consultant, along with key Subcontractors as designated, shall carry out a complete review of the built project to determine which deficiencies are to be rectified under the warranty.

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

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 WARRANTIES

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

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

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

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

.1 Name and address of Project.

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

.3 Duration of warranty.

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

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

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

2 Products

**Not Used**

3 Execution

**Not Used**

**END OF SECTION**

1 General

## 1.1 SUMMARY

.1 Review drawings, site conditions, and other specification sections to ascertain the extent and nature of work of this section.

.2 The Work of this Section includes demolition and removal of, but not limited to the following:

.1 Doors, frames and associated hardware;

.2 Partitions, ceilings including grid, wall and floor finishes, as indicated on drawings;

.3 Millwork, including sinks and associated plumbing;

.4 Visual display boards including adhesive;

.5 Heater covers;

.6 Washroom accessories, including plumbing fixtures and associated plumbing;

.7 Lockers;

.8 Disconnect/cap existing service in areas of demolition.

.9 Dispose of demolished materials except where required to be salvaged or reused.

.10 Refer to demolition notes indicated on drawings.

## 1.2 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI):

.1 ANSI A10.8-2011, Safety Requirements for Scaffolding and Comparison Document

.2 Canadian Standards Association (CSA):

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

.3 National Fire Protection Association (NFPA):

.1 NFPA 241-2013, Standard for Safeguarding Construction, Alteration, and Demolition Operations

.4 Provincial Legislation:

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

## 1.3 DEFINITIONS

.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.

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

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

.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.

## 1.4 EXAMINATION

.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.

.2 Where appropriate prepare a photographic or video record of existing conditions, particularly of existing work scheduled to remain.

.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.

## 1.5 SUBMITTALS

.1 Provide required information in accordance with Section 01 33 00.

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Prepare schedule in conjunction with overall project schedule, and outline proposed methods in writing. Obtain approval before commencing demolition work, and indicate the following:

.1 Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity

.2 Interruption of utility services

.3 Coordination for shutoff, capping, and continuation of utility services

## 1.6 QUALITY ASSURANCE

.1 Conform to requirements of all authorities having jurisdiction.

.2 Comply with applicable requirements of CSA S350-M "Code of Practice for Safety in Demolition of Structures".

.3 Work of this Contract shall be executed by an approved company having a minimum of five (5) years continuous experience and able to deploy adequate equipment and skilled personnel to complete work expediently in an efficient and orderly manner.

.4 Perform cutting and coring, where applicable, by a firm specializing in this type of work, able to produce evidence of successful completion of similar work over a period of at least five (5) years immediately prior to date of contract.

.5 Apply for, secure, arrange and pay for all permits, notices and inspections necessary for proper execution and completion of work in this Section.

## 1.7 PROTECTION

.1 Prevent movement or settlement of adjacent work. Provide and place bracing or shoring and be responsible for safety and support of such work. Be liable for any such movement or settlement, and any damage or injury caused.

.2 Cease operations and notify Consultant if safety of any adjacent work or structure appears to be endangered. Take all precautions to support the structure. Do not resume operations until reviewed with the Consultant.

.3 Prevent debris from blocking surface drainage inlets and mechanical and electrical systems which remain in operation.

.4 Temporarily suspended work that is without continuous supervision shall be closed to prevent entrance of unauthorized persons.

## 1.8 REMAINING AND ADJACENT STRUCTURES

.1 Do not interfere with, encumber, endanger or create nuisance, from any cause due to demolition work, to public property or any adjacent attached and/or detached structures in possession of Owner or others, which are to remain, whether occupied or unoccupied during this work.

.2 Make good damage to such structures resulting from work under this Section at no cost to Owner. Make good adjacent building surfaces damaged by work of this Section.

### 1.9 PROTECTION OF SERVICES AND STRUCTURES

.1 Take necessary precautions to guard against movement, settlement or collapse of existing adjacent utility services, public property and/or structures, whether to remain or not. If these or other unforeseen conditions develop, take immediate emergency measures, report to Consultant, confirm in writing, and await instructions before proceeding with any further related demolition work.

.2 Prior to saw cutting or core drilling of existing concrete slabs, use ground penetrating radar (GPR) to detect utilities and structural reinforcing. Concrete X-Rays can be used when access to both sides of concrete slab is accessible for placement of required x-ray film.

### 1.10 EXISTING SERVICES

.1 Prior to start of demolition disconnect all electrical service in the areas to be demolished. Post warning signs on all electrical lines and equipment which must remain energized to serve other areas during period of demolition. Disconnect electrical and telephone service lines in demolition areas to the requirements of local authority having jurisdiction.

.2 In each case, notify the affected utility company in advance and obtain approval where required before commencing with the work on main services.

.3 Arrange with utility companies for locating of such services and for disconnection of existing services owned by utility companies and which will be disconnected by said utility companies, provided such services do not interfere with adjacent tenancy operators.

.4 Remove sewer and water lines where required within existing building as deemed necessary, and cap to prevent leakage, in accordance with authorities having jurisdiction.

.5 Existing services are to be maintained where required for normal tenant operation during regular hours of operation and/or as deemed necessary by Owner.

2 Products

### 2.1 DEBRIS, SALVAGED MATERIAL AND EQUIPMENT DISPOSAL

.1 All materials and or equipment salvaged from demolition work becomes property of demolition Contractor unless designated otherwise.

.2 At no cost to Owner repair or replace material and/or equipment scheduled to remain which is damaged by demolition work. Do not sell any salvaged material or equipment directly from project site.

.3 Remove waste debris continually and entirely from project site during demolition work. Do not load vehicles transporting such debris beyond their safe capacity or in a manner which might cause spillage on public or private property. If spillage does occur, clean up immediately to prevent traffic hazards or nuisance.

### 2.2 PROTECTION

.1 Temporary Protection:

.1 Erect temporary dust screens, as indicated in Section 01 50 00, to prevent dust and debris to enter areas of the building which are not scheduled for demolition. Remove temporary dust screens when no longer required.

### 2.3 REPAIR MATERIALS

.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 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; in accordance with Section 03 35 00.

.3 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 Assemblies.

.4 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.

### 2.4 EXISTING MATERIALS

.1 Items to be retained and relocated for use in new construction include, but are not limited to the following:

.1 Window coverings; Remove and reinstall in original window once selective demolition has been completed in that area. Replace damaged or missing hardware to allow window coverings to operate in proper manner.

.2 Miscellaneous Items; Remove and return to the Owner all miscellaneous items in rooms to have selective demolition such as, but not limited to the following:

.1 Book Shelves and books;

.2 Furniture;

.3 Projector screens;

.4 Smart boards and computers;

.5 Equipment;

.3 Confirm with Consultant any materials that appear to be in re-usable condition prior to disposal.

.4 Confirm with Consultant any materials scheduled for re-use that are not in re-usable condition prior to installation.

## 3 Execution

### 3.1 GENERAL

.1 Exercise caution in dismantling, disconnecting of work adjacent to existing work designated to remain.

.2 Carry out demolition in a manner to cause as little inconvenience to the adjacent properties as possible.

.3 Carry out demolition in an orderly and careful manner.

.4 Demolition by explosives is not permitted.

.5 Selling or burning of materials on site is not permitted.

.6 Lower waste materials in a controlled manner; do not drop or throw materials from heights.

.7 At end of each day's work, leave in safe condition so that no part is in danger of toppling or falling.

### 3.2 SAFETY AND SECURITY

.1 Maintain security of the building at all times during demolition work.

.2 Provide and maintain fire prevention equipment and alarms accessible during demolition.

## 3.3 ACCESS ROUTES

.1 Restrict operations to designated access routes.

.2 Do not obstruct roads, parking lots, sidewalks, hydrants and the like.

## 3.4 SELECTIVE DEMOLITION

.1 Provide necessary shoring and supports to assure safety of structure prior to cutting and coring.

.2 Where practical, sawcut and remove material as required.

.3 Where sawcutting is not appropriate, use suitable hand tools.

.4 Demolish, cut-out and remove from site all other work noted on drawings or required to permit new construction.

.5 Do not allow water to accumulate or flow beyond work area. Provide receptacles and mop-up as work proceeds.

.6 Fill all openings in concrete block walls with concrete masonry units, coursing to match existing, prepare ready to receive new finishes to match existing.

.1 Provide bond beams in new openings cut into existing concrete masonry unit walls.

.2 Provide finished end masonry units to patch and repair for new jamb sections in existing concrete masonry unit walls.

.7 Fill all openings in gypsum board walls with gypsum board and steel framing to match existing, skim coat to make wall smooth and even.

.8 Demolish existing flooring and wall finishes, and adhesive remnants as follows:

.1 Floor and wall substrate shall be smooth, free from ridges and depressions, and adhesive remnants that could telegraph through new flooring and wall finishes.

.9 Demolish completely all ceiling panels and grid as indicated.

.10 Remove all wall coverings scheduled for demolition. Patch and repair wall surfaces with skim coat of gypsum board joint compound leaving wall surfaces smooth and even ready for new wall finishes.

.11 Patch and repair all walls, floor and ceilings damaged during demolition with material matching adjacent walls, prepare ready for new finishes.

.1 Prepare existing surfaces schedule to receive new finish by grinding, filling, over-coating, stripping, washing, etching, shot blasting or other chemical or mechanical means, as required to ensure satisfactory installation of new finish.

## 3.5 PATCHING AND REPAIRING

.1 Floors and Walls:

.1 Where walls or partitions that are demolished extend from one finished area into another, patch and repair floor and wall surfaces in the new space.

.2 Provide an level and smooth surface having uniform finish colour, texture, and appearance.

.3 Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform colour and appearance.

.4 Patch with durable seams that are as invisible as possible.

.5 Provide materials and comply with installation requirements specified in other Sections of these Specifications.

.6 Where patching occurs in a painted surface, apply primer and intermediate paint coats over patch and apply final paint coat over entire unbroken surface containing patch. Provide additional coats until patch blends with adjacent surfaces.

.7 Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

.2 Ceilings: patch, repair, or re-hang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

## 3.6 EXCESSIVE DEMOLITION

.1 Where excessive demolition occurs, be responsible for cost of replacing such work.

.2 Consultant shall determine extent of such 'over-demolition' and method of rectification.

## 3.7 COMPLETION

.1 Leave project site as directed, reasonably clean and presentable, free from above grade debris, any salvaged material and/or equipment except those designated to remain.

.2 Maintain access to exits clean and free of obstruction during removal of debris.

**END OF SECTION**

1 General

## 1.1 SUMMARY

.1 Work of this Section includes the following:

.1 Testing and measurement for floor flatness and levelness,

.2 Trowelling, levelling, and floating of floor surfaces for ready for applied finishes.

## 1.2 RELATED REQUIREMENTS

.1 Section 05 50 00: Metal Fabrications

## 1.3 DEFINITIONS

.1 Floor Classifications: Classification of concrete floor slabs based on their intended use, methods of finishing and finish materials applied to flooring as denoted by the F-rating below, and as follows:

.1 Single Course Floor: Floors placed in a single course with final finishing applied to properly levelled concrete.

.2 Finish or Finishes: Materials applied to finished concrete surface, i.e.: stained or coloured concrete, carpet, resilient flooring or ceramic tile.

.3 Finishing: Methods, tools and equipment employed to achieve levelness or surface flatness for shored slabs and slabs-on-grade, and durability indicated and as follows:

.1 F3-Finishing: Floors having a straightedge value of ±1.6 mm over 3048 mm (1/6” over 10’); similar to CSA A23.1 Class C Slab Finishing.

## 1.4 REFERENCE STANDARDS

.1 American Concrete Institute (ACI):

.1 ACI 117-2010, Specifications for Tolerances for Concrete Construction and Materials and Commentary

.2 ACI 302.1R-15, Guide for Floor and Slab Construction

.2 Canadian Standards Association (CSA):

.1 CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.3 International Concrete Repair Institute (ICRI):

.1 ICRI 310.2R-2013, Guideline for Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays and Concrete Repair

## 1.5 ADMINISTRATION REQUIREMENTS

.1 Coordination: Coordinate a meeting between the Contractor, Subcontractor responsible for concrete placement, and the Consultant to determine Site Quality Control testing section borders and sample measurement line locations, method of measurement, and accuracy requirements of the measuring devices.

.2 Pre-Construction Meetings: Arrange meeting with Contractor, Subcontractor for work of this Section and other Subcontractors affected by work of this Section to discuss effects and issues governing installation of concrete finishing materials; prepare an outline agenda for meeting in accordance with Section 01 31 19 Project Meetings.

## 1.6 SUBMITTALS

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

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Product Data: Submit manufacturers product data for each materials specified including recommended application rates and methods of installation.

.3 Informational Submittals: Provide the following submittals during the course of the work:

.1 Site Quality Control Submittals: Submit results for straightedge measurements to demonstrate compliance with specified tolerances. Record the following information on a drawing indicating floor slab layout, column locations and slab penetrations:

.1 Indicate variance from specified straightedge measurements as a + or - value.

.2 Failed tests in excess of 50% of the straightedge will require the Subcontractor to flash patch floor to achieve specified tolerance; example of tolerance failure.

.3 Slabs-On-Grade: Measurement of 1.6mm (1/16") or greater than ±6mm (1/4") measurement will be considered as a failed test and will require flash patching.

**1.7 PROJECT CLOSEOUT SUBMISSIONS**

.1 Operation and Maintenance Data: Submit detailed cleaning and maintenance instructions for concrete densifier products, and instruct Owner in proper care and maintenance of specified floor finishes, including a complete list of floor care products that will be required for ongoing maintenance, in accordance with Section 01 33 00.

**1.8 QUALITY ASSURANCE**

.1 Qualifications:

.1 Work of this Section shall be executed by a company that has adequate equipment and skilled tradesmen to perform it expeditiously, and is known to have been responsible for satisfactory installations similar to that specified, during a period of at least the immediate past five years.

.2 Co-operation:

.1 Ensure that concrete supplied for slabs contains no admixtures which would be incompatible with floor finishing materials.

**1.9 SITE CONDITIONS**

.1 Environmental Requirements:

.1 Ensure that adequate temporary heating is provided as required for cold weather work.

.2 Provide adequate moisture, sun shades and wind barriers to prevent too rapid drying of concrete during hot weather.

.2 Protection:

.1 Ensure that finished concrete floor areas are protected from abrasion from foot or wheeled traffic, and from damage caused by spillage of oil or other harmful materials.

2 Products

**2.1 MATERIALS**

.1 Underlayment:

.1 Concrete Substructure: Cementitious, self-levelling, single component, polymer modified underlayment and manufacturer's recommended primer, for application thicknesses to a minimum feather edge to 13 mm (½"); acceptable.

.1 Basis of Design Materials:
.1 Planipatch by MAPEI Canada Inc.
.2 Sika Level-125 CA by Sika Canada Ltd.
.3 Floor-Top STG by W.R. Meadows of Canada

.2 Patching and Flash Patching Materials: Cementitious based, polymer modified, fine aggregate, single component, rapid curing, early strength floor patching compounds having high adhesion, for application in thicknesses to a minimum of 1/8” to 1”.

.1 Basis of Design Materials:

.1 Mapecem 101 by MAPEI Canada Inc.

.2 SikaQuick 1000 by Sika Canada Ltd.

.3 Meadow-Crete H by W.R. Meadows of Canada

.3 Joint Sealant: Refer to Section 07 92 00 Joint Sealants.

3 Execution

## 3.1 EXAMINATION

.1 Before commencing work, ensure that surfaces are acceptable to receive and maintain concrete finishing, and that specified installation will be achieved.

## 3.2 FINISHING FLOORS AND SLABS

.1 Finish floors and slabs in accordance with CSA A23.1 and ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces; do not wet concrete surfaces.

## 3.3 INSTALLATION

.1 Floor Underlayment:

.1 Leak Prevention: Fill cracks and voids in subfloor where leakage of slurry could occur using suitable quick setting patch material or caulk, as recommended by underlayment manufacturer.

.2 Prime substrate according to manufacturers recommendations.

.3 Installation shall not begin until building is enclosed.

.4 Install sound attenuation mat where required on drawings, complete with isolation strips, prior to pouring floor underlayment.

.5 Mix underlayment in accordance with manufacturers written instructions and test mix for slump using 100 mm (4") cylinder.

.6 Pour underlayment to recommended thickness and immediately spread and screen to smooth surface.

.2 Control Joints:

.1 As soon as concrete surface is firm enough not to be torn or damaged by cutting, cut 5 mm (3/16") wide control joints into surface of concrete with abrasive blade power saw.

.2 Locate control joints on centre lines of columns, and at maximum spacing of 6096 mm (20') in both directions unless noted.

.3 Cut joints in slabs on grade 38 mm (1-1/2") deep.

.4 Within four (4) weeks of cutting joints, fill them with joint sealant. Completely clean side joint surfaces of dirt, oil, grease, and similar contaminants. Mask floor surfaces at joints while pouring. Prime side joint surfaces with compatible primer if surfaces are not completely dry.

.3 Cast-in all items as supplied by other Sections.

## 3.4 PATCHING AND REFINISHING

.1 Before completion of project, patch and refinish defective surfaces to match surrounding areas with no discernible variation in appearance.

**END OF SECTION**

1 General

## 1.1 SUMMARY

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

.1 Concrete Masonry Units (CMUs)

.2 Mortar, and Grout

.3 Ties and anchors

## 1.2 RELATED REQUIREMENTS

.1 Section 09 91 00: Painting

## 1.3 REFERENCE STANDARDS

.1 Canadian Standards Association (CSA):

.1 CSA A165 Series-04 (R2009), CSA Standards on Concrete Masonry Units

.2 CSA A179-04 (R2009), Mortar and Grout for Unit Masonry

.3 CSA A370-04 (R2009), Connectors for Masonry

.4 CSA W186-M1990 (R2012), Welding of Reinforcing Bars in Reinforced Concrete Construction

.2 American Society for Testing of Materials (ASTM):

.1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

.2 ASTM A153/A153M-09, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

.3 ASTM A496/A496M-07, Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement

.4 ASTM A563-07a, Standard Specification for Carbon and Alloy Steel Nuts

.5 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.6 ASTM A1011/A1011M-12, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

.7 ASTM C67-11, Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.

.8 ASTM C207-06(2011), Standard Specification for Hydrated Lime for Masonry Purposes

.9 ASTM C270-12, Standard Specification for Mortar for Unit Masonry.

.10 ASTM C494-11, Standard Specification for Chemical Admixtures for Concrete.

.11 ASTM E488/E488M-10, Standard Test Methods for Strength of Anchors in Concrete Elements

.12 ASTM F593-02(2008)e1, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs

.13 ASTM F594-09e1, Standard Specification for Stainless Steel Nuts

.3 Ontario Concrete Masonry Block Association (OCBA):

.1 OCBA Metric Technical Manual

## 1.4 ADMINISTRATIVE REQUIREMENTS

.1 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 Confirmation of reinforcement at corners and wall intersections

.4 Coordination of interior crack control measures

.5 Confirmation of trowelled or tooled joints to concealed and exposed masonry faces

.6 Review of submitted masonry unit samples

## 1.5 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 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.

.3 Certificates: Submit statements of material properties indicating compliance with specified requirements for each type and size of the following:

.1 Masonry Units:

.1 Include material test reports substantiating compliance with requirements.

.2 Cementitious Materials:

.1 Include brand, type, and name of manufacturer for site mixed mortar materials.

.2 Include description of type and proportions of ingredients for pre-blended, dry mortar mixes.

.3 Include description of type and proportions of ingredients for grout mixes.

.3 Accessories:

.1 Reinforcing bars

.2 Joint reinforcement

.3 Anchors, ties, and metal accessories

.4 Site Quality Control Submissions: Submit detailed description of methods, materials, and equipment used in accordance with cold or hot weather requirements; and proposed unit masonry cleaning techniques.

## 1.6 SITE CONDITIONS

.1 Protection of Masonry: Protect masonry and other work from marking and other damage and as follows:

.1 Cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work during construction until permanent flashings and membranes are completed.

.2 Cover partially completed masonry when construction is not in progress to prevent wetting of inside wythes of construction and contribution to efflorescence.

.3 Extend cover a minimum of 24” down both sides and hold cover securely in place.

.4 Secure cover a minimum of 24" down face next to un-constructed wythe and hold cover in place where 1 wythe of multi-wythe masonry walls is completed in advance of other wythes.

.5 Provide adequate bracing for masonry during construction and until permanent lateral supports are in place.

.6 Do not apply uniform floor or roof loads for a minimum of 12 hours and concentrated loads for a minimum of 3 days after building masonry walls or columns.

### 1.7 DELIVERY, STORAGE, HANDLING AND PROTECTION

.1 Delivery and Acceptance Requirements: Deliver pre-blended, dry mortar mix in moisture resistant containers designed for lifting and emptying into dispensing silo; store dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

.2 Storage and Handling Requirements: Store masonry units on elevated platforms in a dry location and as follows:

.1 Stack materials on floors of building so that structural design loads are not exceeded; coordinate with Consultant.

.2 Cover tops and sides of stacks with waterproof sheeting securely tied to pallets if units are not stored in an enclosed location; do not install masonry units that become wet until they are dry.

.3 Store cementitious materials on elevated platforms, under cover, and in a dry location; do not use cementitious materials that have become wet or damp.

.4 Store aggregates where grading and other required characteristics can be maintained; store to prevent contamination by substances deleterious to performance and appearance.

.5 Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

## 2 Products

### 2.1 MANUFACTURERS

.1 Subject to compliance with requirements listed in this Section, manufacturers listed as offering products may be incorporated into the Work; alternates may be considered by the Consultant when submitted a minimum of five (5) days before closing of Bids.

.2 Manufacturer all exposed masonry by one manufacturer to provide uniform in colour, shade and texture.

### 2.2 CONCRETE MASONRY UNITS

.1 Standard concrete blocks shall be autoclave or bubble cure process, high pressure steam cured, modular, conforming to CSA A165 Series-04 (R2009), with lineal shrinkage and moisture movement not to exceed 0.035% and shall be as follows;

.1 H/15/A/M for all block work.

.2 Size: Modular imperial to sizes indicated on Drawings.

.3 Special shapes:

.1 Provide bullnose units for exposed corners.

.2 Provide additional special shapes required for project.

.3 Manufacture special shapes at same time and with the same batch as standard concrete block to be used.

.2 Exposed block shall all be made by one manufacturer and shall be uniform in colour, shade and texture.

## 2.3 MORTAR MATERIALS

.1 Mortar materials shall conform to CSA A179-04 (R2009).

.2 Water: Potable (clean, exempt of ice, oils, acid, alkalis, organic matter, sediments or any other harmful matter). CSA A179-04 (R2009).

.3 Aggregate:

.1 CSA A179-04 (R2009).

.2 Use same brands of materials and source of aggregate for entire project.

.3 Use washed aggregate consisting of natural sand or crushed stone for mortar that is exposed to view.

.4 Cement: Normal portland, in accordance with CSA A3000-08, Type GU.

.5 Grout: In accordance with CSA A179-04 (R2009), Table 3.

.6 Hydrated Lime: ASTM C207-06 (2011), Type S.

## 2.4 MORTAR MIXES

.1 Mixing:

.1 Prepare and mix mortar materials under strict supervision and in small batches for immediate use only. Mix proprietary mortars in strict accordance with CSA A179. Do not use re-tempered mortars for coloured mortars.

.2 Interior Reinforced or Non-Reinforced Block Walls:

.1 Use Type 'S', premixed 'Bloc Mix' by Daubios Inc., or approved equal by Maxi-Mix.

## 2.5 MASONRY REINFORCEMENT, TIES AND ANCHORS

.1 Masonry Joint Reinforcement: In accordance with to CSA A371-04(R2009) and ASTM A496/A496M-07, with corrosion protection in accordance with CSA S304.1-04(R2010) and CSA A370-04 (R2009), and as follows:

.1 Interior Walls: Hot dip galvanized, carbon steel.

.2 Lengths: A minimum of 10’ with prefabricated corner and tee units.

.2 Connectors: In accordance with to CSA A370-04 (R2009) and CSA S304.1-04(R2010) with hot dip galvanized finish.

.3 Single Wythe Masonry Joint Reinforcement: Either ladder or truss type with single pair of side rods.

.4 Ties and anchors specified in this section shall be designed in accordance with CSA A370-04 (R2009) for non-conventional masonry connectors as follows:

.1 Deflection: Maximum 1/16” including free play, when acted upon by a lateral load of 0.45 kN, in all possible positions of adjustment.

.2 Positive restraint at position of maximum adjustment.

.3 Free play of multi-component ties maximum 1/32” when assembled in all possible configurations.

.4 Anchors shall allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall.

.5 Lateral Partition Supports (Top of Wall Anchors):

.1 Angle Support: Fabricated from 1/8" core metal thickness angled steel plate having 3" long legs fastened to deck structure to allow vertical movement of masonry assembly; hot dip galvanized; coordinate with Section 07 84 00 for firestopping insulation and smoke seals.

.2 Plate Support: Fabricated from 1/8" core metal thickness stainless steel plate with 3/8" diameter metal 6" long welded to plate having closed end plastic tube fitted over rod that allows rod to move in and out of tube.

.3 Anchor Bolts: Where required provide Headed or L-shaped steel bolts in accordance with ASTM A307-10, Grade A; with ASTM A563-07a hex nuts and, where indicated, flat washers; hot-dip galvanized in accordance with ASTM A153/A153M-09, Class C.

.4 Post Installed Anchors: Provide chemical anchors, with capability to sustain, without failure, a load equal to six times the load imposed when installed in solid or grouted unit masonry and equal to four times the load imposed when installed in concrete when tested in accordance with ASTM E488/E488M-10 conducted by a qualified independent testing agency, and as follows:

.1 Indoor Locations: Carbon-steel components zinc-plated in accordance with ASTM B633-11, Class Fe/Zn 5.

.2 Fastening into Solid Concrete or Solidly Grouted Installation: Two component, injectable adhesive specifically manufactured for use in installing dowels or threaded anchor rods and inserts into new or existing concrete or grout. Basis-of-Design Materials: Hilti Inc., HIT HY150 System, no Substitutions Accepted.

.3 Fastening Trough Hollow Wall Installation: Two component, injectable adhesive specifically manufactured for use in installing dowels or threaded anchor rods and inserts, with cylindrical mesh screen tube into new or existing masonry cavity wall. Basis-of-Design Materials: Hilti Inc., HIT HY20 System, no Substitutions Accepted.

.6 Galvanizing for Masonry Reinforcement, Ties and Anchors:

.1 Hot Dip Hardware and Bolts: In accordance with ASTM A153/A153M-09, Class B-2 regardless of location.

.2 Hot Dip Sheet Steel: In accordance with ASTM A653/A653M-11, Coating Designation Z600, regardless of location.

.3 Structural Shapes and Pipes: In accordance with ASTM A123/A123-09, Grade 85, regardless of location.

## 2.6 MISCELLANEOUS MASONRY ACCESSORIES

.1 Sealants: As specified under Section 07 92 00, and as follows:

.1 Vertical Sealant: Colour to match brick

.2 Horizontal Sealant: Colour to match mortar

.2 Joint Filler:

.1 Compressible Filler: Pre-moulded filler strips in accordance with ASTM D1056-07, Grade 2A1; compressible up to 35%; of width and thickness indicated; formulated from neoprene, urethane or PVC.

3 Execution

## 3.1 EXAMINATION

.1 Examine conditions for compliance with requirements for installation tolerances and other conditions affecting performance of work.

.1 Prepare written report listing conditions detrimental to performance of work and submit to the Consultant.

.2 Verify that foundations are within tolerances specified.

.3 Verify that reinforcing dowels are properly placed.

.2 Examine rough-in and built-in construction for piping systems to verify actual locations of piping connections before installation of unit masonry.

.3 Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 INSTALLATION - GENERAL

.1 Thickness: Build single wythe walls to actual widths of masonry units, using units of widths indicated on Drawings.

.2 Single wythe masonry construction shall conform with the Ontario Concrete Block Association (OCBA) requirements for water resistant single wythe masonry construction.

.3 Use full size units without cutting except as follows:

.1 Cut units with motor driven saws if cutting is required to provide a continuous pattern or to fit adjoining construction.

.2 Provide clean, sharp, un-chipped edges.

.3 Allow units to dry before laying unless wetting of units is specified.

.4 Install cut units with cut surfaces and cut edges concealed where possible; obtain Consultant’s acceptance where cut edges must be exposed.

.4 Select and arrange units for exposed unit masonry to produce a uniform blend of colours and textures; mix units by drawing units diagonally down multiple rows from at least three different pallets as masonry units are placed. "Exposed" means visible in complete work, unpainted and painted.

.1 Large variations in colour or texture between adjacent blocks of material will cause the Consultant to reject the installation, and the installer to rebuild the assembly at no additional cost to Contract.

.5 Wet masonry before laying when recommended by manufacturer; allow units to absorb water so they are damp but not wet at time of laying.

.6 Maintain dimensions, lines and levels.

.7 Keep exposed faces free from stains, chips and cracks. Keep tolerance in plane of 1/8" in 8’-0". Do not use chipped, cracked or deformed units in exposed work.

.8 Buttering corners of units, throwing mortar droppings into joints, will not be permitted. Do not shift or tap units after mortar has taken initial set, where adjustments must be made after mortar has started to set, remove mortar and replace with fresh supply.

## 3.3 LAYING MASONRY WALLS

.1 Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement type joints, returns, and offsets; avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

.2 Bond Pattern for Exposed Masonry: Unless otherwise indicated in this Section or on the Drawings, lay exposed masonry in running bond; do not use units with less than 4" horizontal face dimensions at corners or jambs; lay masonry in running bond where not otherwise indicated.

.3 Lay concealed masonry with all units in a wythe in running bond or bonded by lapping a minimum of 4", and as follows:

.1 Bond and interlock each course of each wythe at corners.

.2 Do not use units with less than nominal 4" horizontal face dimensions at corners or jambs.

.4 Stopping and Resuming Work:

.1 Stop work by racking back units in each course from those in course below; do not tooth.

.2 Clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry when resuming work.

.5 Built-In Work:

.1 Build in items specified in this and other Sections as construction progresses.

.2 Fill in solidly with masonry around built-in items.

.3 Fill space between steel frames and masonry solidly with mortar.

.4 Place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core where built-in items are to be embedded in cores of hollow masonry units.

.5 Protect built-in items from damage arising from work of this Section.

.6 Build non-load bearing interior partitions full height of storey to underside of solid floor or roof structure above, leaving a gap to allow for structural deflection, and as follows:

.1 Fasten lateral partition supports to structure above and build into top of partition; grout cells of concrete masonry units solidly around plastic tubes of anchors and push tubes down into grout to provide ½" clearance between end of anchor rod and end of tube; space anchors at 4' O.C.

## 3.4 MORTAR BEDDING AND JOINTING

.1 Lay block work as follows:

.1 Provide special shapes and sizes as required such as halves, jambs, lintels, solids, corners, semi-solids, etc.

.2 webs to align plumb over each other with thick ends of webs up. Leave no cells open in exposed work. Reinforce all block.

.3 Minimize cutting block. Cut exposed work with power driven abrasive cutting disc or diamond cutting wheel for flush mounted electrical outlets, grilles, pipes, conduit, etc., leaving 1/8" maximum clearance.

.4 Do not wet concrete masonry units before or during laying.

.5 Locate corners accurately. Use full bed of mortar for first course. Bed face shells and cross and end web fully in mortar. Stagger joints in every course. Align joints plumb over each other in every other course.

.6 Bond intersecting block walls in alternate courses. Where block abuts concrete, bond each block course with dovetail anchors, ties and dovetail slot. Do not break bond of corridor walls or other walls of exposed units where partitions intersect and if bonding would show through on intersect with prefabricated intersection masonry reinforcement in each course.

.7 Take special care in erecting block walls to which other sections will be applying finishes or attaching equipment to ensure tolerances required for work of other sections can be met with reasonable construction procedures. (e.g. thin-set application of ceramic tile.)

.8 Provide bullnose block at all exposed block corners.

.9 Build block lintels, ensure that lintel jointing coincides with regular bond.

## 3.5 PARTITIONS (OTHER THAN LOAD-BEARING)

.1 Carry following partitions up through ceiling to structure above, unless noted or specified otherwise; corridor partitions, partitions around staircases and shafts, partitions around washrooms, and any other partitions so indicated on drawings. Terminate all other partitions at first coursing joint above finished ceiling.

.2 Except around staircases and shafts, terminate through partitions within 3/4" of structure above, i.e. floor, roof decking depending under which partitions occur, and where such partitions occur directly under and parallel to structural framing carry these partitions up to within 3/4" of bottom of such structural framing.

.3 Around staircases and shafts, wedge and grout masonry solidly to structure above. Laterally support other partitions as required by building code. Where tops of partitions are exposed to view, lateral supports shall be concealed.

.4 Where walls and partitions are pierced by structural members, ducts or pipes, fill voids with mortar to within 3/4" of such members flush with wall fins.

**.5** Fill spaces between partition and structure, ducts and pipes with compressed glass fibre or mineral wool insulation completely from one side of wall to other.

## 3.6 REINFORCEMENT AND REINFORCING TIES

.1 Reinforce all masonry walls with continuous masonry reinforcement in every second block course.

.2 Provide extra reinforcement or reinforcing ties at openings so that first and second courses above and below openings are reinforced. Extend extra reinforcement 2'-0" beyond opening in each direction.

.3 Anchor new masonry to structural steel to concrete elements, to existing construction at maximum 16" O.C., vertically in accordance with local building code requirements.

## 3.7 BUILT-INS

.1 Built-in items provided by other Sections, anchor bolts, sleeves, inserts, loose steel lintels, shelf angles, access panels, and other such items. Built-in items to present neat, rigid, true and plumb installation. Leave wall openings required for ducts, grilles, pipes and other items.

.2 Fill voids between masonry and metal frames with masonry mortar.

## 3.8 REPOINTING OR TUCKPOINTING

.1 Repoint defective joints as follows:

.1 Cut back joints 1/2", taking care not to damage units. Remove dust and loose materials by brushing or by water jet.

.2 If water jet is used, allow excess water to drain before repointing.

.3 Repoint with same mix as original. Pack mortar tightly in thin layers, and tool joints or strike flush as required.

## 3.9 CLEANING

.1 Keep work clean and free of mortar stains during laying. Allow mortar droppings which adhere to wall to dry out but not set. Then rub with small piece of masonry followed by brushing to remove all traces. On completion of masonry, after mortar is thoroughly set and cured, and defective joints tucked and pointed, clean masonry thoroughly.

.2 Remove mortar with wood paddles and scrapers before wetting. Saturate masonry with clean water and flush off loose mortar and dirt. Clean block work using water, scrubbing brushes and wood paddles only.

**END OF SECTION**

1 General

## 1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

## 1.2 RELATED REQUIREMENTS

.1 Section 04 20 00: Masonry

.2 Section 06 10 00: Rough Carpentry

.3 Section 09 21 16: Gypsum Board Assemblies

.4 Section 09 91 00: Painting

## 1.3 WORK SUPPLIED BUT NOT INSTALLED

.1 Supply following items for installation under other Sections of work: anchor bolts, bearing plates, sleeves and other inserts to be built into concrete and masonry elements and required for anchorage and support of metal fabrications.

.2 Supply other Sections with instructions, and if required, templates, necessary for accurate setting of inserts and components.

## 1.4 QUALITY ASSURANCE

.1 All Codes and Standards referred to in this Specification shall be current editions including all latest revisions and addenda.

.2 Conform to requirements of CSA-S16, Design of Steel Structures and CAN/CSA-S136, Cold Formed Steel Structural Members.

.3 Architectural metals work shall be of the highest architectural quality, free of scratches, pitting, roughness, marring, discolouration, staining and other imperfections.

.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.

.5 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.

.6 Qualifications of Welders: certified under CSA W47.1 for appropriate class of work.

.7 Upon completion of installation of ladders, stairs, platforms, pit covers, balustrades and railings submit certification by professional engineer responsible for design of these components, verifying that they have been installed in accordance with reviewed shop drawings.

.8 Sizes of structural members, such as stair stringers shall be taken to be a minimum size and shall not be decreased without Consultant’s approval.

## 1.5 SUBMITTALS

.1 Submit submittals in accordance with the General Conditions and Section 01 33 00, bearing stamp or seal and signature of the Professional Engineer responsible for the design of the work of this Section.

.2 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.

**1.6 STORAGE, DELIVERY, HANDLING AND PROTECTION**

.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.

.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.

.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.

.4 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.

2 Products

**2.1 MATERIALS**

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

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

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

.5 Square steel tube: CAN/CSA-G40.21-04, Grade 350W.

.6 Steel Pipe: Hot-dip galvanized, zinc coated, welded and seamless type steel pipe conforming to ASTM A53/A53M.

.7 Galvanized Sheet Steel (Commercial Quality): Galvanized coating G90 (Z275) in accordance with ASTM A653/A653M, minimized spangle, stretch levelled or temper rolled. Specially treat by phosphate conversion process conforming to CGSB 31-GP-105Ma ready to receive prime paint finish.

.8 Welding materials: CSA W59.

.9 Shop primer: CAN/CGSB-1.40-97.

.10 Zinc rich shop paint:

.1 Shop coat: Inorganic reinforced zinc rich paint: Devoe Catha-Coat 302.

.2 Field touch up: CAN/CGSB 1.181-02.

.11 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.

.12 Bolts, Nuts, Washers: Conforms to ASTM A325.

.13 Metal Filler: Polyester based type. 'M45' by Dura Chemical Ltd., Hamilton, Ontario

.14 Painting:

.1 Shop Applied Structural Steel Primer: Steel Spec Universal Primer (B50RV6227 Red), by Sherwin Williams Company of Canada Ltd., or approved equal. Apply a minimum of 2 mils dft./coat. Grey coloured primer is acceptable.

.2 Zinc Rich Paint For Touch-up of Galvanized Metals: Ready mixed, zinc-rich primer conforming to CAN/CGSB-1.181, Sealtight Galvafroid Zinc-Rich Coating by W.R. Meadows of Canada Limited or Zinc Clad No. 5 Organic Zinc Rich Primer by Sherwin Williams Company of Canada Ltd., or approved equal.

.3 Touch-up Primer (On Site): Procryl Universal Acrylic Primer by Sherwin Williams Company of Canada Ltd, or approved equal. Touch-up primer shall be no less than 3 mil dft.

.4 Refer to Section 09 91 00, and coordinate with the above.

.15 Bituminous Paint: WR Meadows or approved equal.

.16 Building Paper: Conforms to CAN/CGSB-51.32.

.17 Butyl Tape: Extruded, high grade, macro-polyisobutylene tape of size, width and shore hardness to suit conditions.

## 2.2 FABRICATION - GENERAL

.1 Fabricate components in the shop in largest size practicable to minimize field jointing.

.2 Fabricate components square, straight, true, free from warpage and other defects. Accurately cut, machine file and fit joints, corners, copes and mitres.

.3 Reinforce fabricated components to safely withstand expected loads.

.4 Make joints in built-up sections with hairline joints in least conspicuous locations and manner.

.5 Make allowance for thermal expansion and contraction when fabricating exterior work.

.6 Joints shall be welded unless otherwise indicated and unless details of construction do not permit welding. Exposed welds shall be continuous and shall be ground smooth.

.7 Close exposed open ends of tubular members with welded on steel plugs.

.8 Where work of other Sections is to be attached to work of this Section, prepare work by drilling and tapping holes, as required to facilitate installation of such other work.

.9 Work of this Section, supplied for installation under other Sections, shall be prepared as required ready for installation by: drilling, countersinking and tapping holes, forming shapes and cutting to required sizes.

.10 Grind off mill stampings and fill recessed markings on steel components left exposed to view.

## 2.3 FINISHES

.1 Thoroughly clean steel of loose scale, rust, oil, dirt and other foreign matter. Suitably prepare steel surfaces by power tool cleaning to receive specified finishes.

.2 Grind smooth sharp projections.

.3 Remove oil and grease by solvent cleaning.

.4 Apply coatings in the shop and before assembly. Where size permits, galvanize components after assembly.

.5 Shop apply coat of primer to interior components after fabrication except where stainless steel, galvanized or zinc rich paint finish is required.

.6 Hot dip galvanize (unpassivated) components where so indicated after fabrication in accordance with requirements of CAN/CSA-G164-M92, minimum coating weight 600 g/$m^2$.

.7 Apply coat of bituminous enamel to contact surfaces of metal components in contact with cementitious materials and dissimilar metals.

3 Execution

**3.1 INSTALLATION**

.1 Install components plumb, square, straight and true to line. Drill, cut and fit as necessary to attach this work to adjoining work.

.2 Provide temporary supports and bracing required to position components until they are permanently anchored in place.

.3 Securely anchor components in place; unless otherwise indicated, anchor components as follows:

.1 To concrete and solid masonry with expansion type anchor bolts.

.2 To hollow construction with toggle bolts.

.3 To thin metal with screws or bolts.

.4 To thick metal with bolts or by welding.

.5 To wood with bolts or lag screws.

.6 Fill space between railing members and sleeves with non-shrink grout.

.4 Provide all components required for anchoring. Make anchoring in concealed manner wherever possible. Make exposed fastenings, where approved by Consultant, neatly and of same material, colour, texture and finish as base metal on which they occur. Keep exposed fastenings evenly spaced.

.5 Dissimilar metals and metals in contact with cementitious elements shall have contact surfaces coated with bituminous paint or be isolated by other means as approved by Consultant.

.6 After installation, clean and refinish injured finishes, welds, bolt heads and nuts. Refinish with zinc rich paint or primer to match original finish.

.7 Upon completion of work, or when directed by Consultant, remove protective coverings from stainless steel components.

**3.2 SCHEDULE**

.1 General: Supply and install all miscellaneous metal work indicated on drawings and not included in the work of other Sections in addition to items listed below. Where items are required to be built into masonry, concrete or other work, supply such items to respective Sections with all anchors and accessories for building in.

.2 Itemized List: Supply and install metal work listed below unless specifically designated to be supplied only. Each item shall be as shown on drawings and as detailed on reviewed shop drawings.

.3 Miscellaneous Steel Framing, Channels, Angles, Plates and Brackets: As required and indicated on drawings.

.4 Masonry Lateral Supports:

.1 Install deflection space and lateral support for non-load-bearing masonry walls and partitions in accordance with specified requirements of CAN3-S304-M.

.5 Bench Framing:

.1 38mm x 38mm x 6mm painted metal channel and legs, complete with plastic end plugs.

.1 Leg Spacing: 1000mm o/c.

.2 Wood Slat Bench Top: As indicated in Section 06 20 00 Finish Carpentry.

.6 Unless otherwise shown provide:

.1 Interior components: prime coated steel

.2 Other metal fabrications required.

.3 Bollards

**END OF SECTION**

1 General

**1.1 GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

**1.2 RELATED WORK**

.1 Section 06 20 00: Finish Carpentry

.2 Section 06 41 00: Architectural Wood Casework

**1.3 QUALITY ASSURANCE**

.1 Lumber shall bear the grading stamp of an agency certified by The Canadian Lumber Standards Administration Board.

.2 All lumber shall be sound, straight, dressed all sides and kiln dried, and moisture content at any time during shipment and storage shall not exceed 19%.

**1.4 WORK SUPPLIED BUT NOT INSTALLED**

.1 Supply to other Sections anchors, bolts, rough hardware and other items required to be built into work of other Sections to receive, accommodate, secure work of this Section.

.2 Provide other Sections with instructions to ensure accurate setting of built-in items.

**1.5 PRODUCT HANDLING**

.1 Store materials on site to prevent deterioration, loss or impairment of their structural and other essential properties. Prevent excessive moisture gain of materials.

2 Products

**2.1 MATERIALS**

.1 Framing Lumber:

.1 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 Treatable Species: No. 2 and better - S4S, Dry, 19%.

.2 Lumber:

.1 Except as indicated or stated otherwise, lumber to be softwood, S4S, moisture content 19% or less, in accordance with the following standards:

.1 CAN/CSA O141-05 (R2009) - “Softwood Lumber”.

.2 NLGA - “Standard Grading Rules for Canadian Lumber” (latest supplement).

.2 Blocking, Copings, Nailers, Curbs: NLGA 122c "Standard" S-P-F.

.3 Plywood:

.1 All locations except backboards: Douglas Fir to CSA 0121-M1978 Unsanded Exterior Sheathing Grade.

.2 Backboards: Douglas Fir to CSA 0121-M1978, Sanded grade, solid two sides, fire retardant pressure treated.

.3 19mm thick and/or thickness as indicated on drawings

.4 Plywood Roof Sheathing:

.1 Minimum 13mm thick, exterior grade Douglas fir plywood, veneer core, tongue and groove edges, Select Sheathing - Tight Face, unsanded with non-slip surface one side, 'B' faces and conforming to CSA 0121-08.

.5 Fasteners and Connecting Hardware:

.1 Nails: to CSA B111-1974, hot dip galvanized steel for exterior work including components located in exterior walls and roofs; bright finish steel in all other locations. Unless otherwise indicated use common spiral flathead nails.

.2 Bolts, nuts, washers: ASTM A307, hot dip galvanized steel.

.3 Connectors, anchors, brackets, spikes: hot dip galvanized structural quality steel.

.4 Screws: to CSA B35.4-1972 zinc, cadmium or chrome plated.

## 2.2 WOOD TREATMENT

.1 Surface cut, bore and trim components to sizes required as much as possible prior to pressure treatment.

.2 Pressure Preservative Treated Lumber:

.1 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 -08.

.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 Pressure Preservative Treated Plywood: Treated in accordance with CAN/CSA O80 Series -08 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.

.3 Fire Retardant Pressure Treated Components:

.1 Treat by pressure impregnation with fire-retardant chemicals in accordance with CAN/CSA O80 Series -08 to provide classification for flame spread of not more than 25, smoke developed of not more than 75 in accordance with CAN4 S102.

.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 CAN4 S102 for surface-burning characteristics and shall bear identification showing classification and type of fire retardant.

.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.

.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.

.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

3 Execution

**3.1 GENERAL**

.1 Erect work plumb, level, square and to required lines. Ensure that materials are rigidly and securely attached to each other and to adjacent building elements and will not be loosened by work of other Sections.

.2 Where other materials and components are to be applied directly over wood members recess heads of fastening devices below wood surfaces.

.3 Where work remains exposed to view, fasteners shall be uniformly and evenly spaced and neatly installed.

**3.2 NAILERS, BLOCKING, COPINGS, GROUNDS, CURBS**

.1 Provide wood nailers, blocking, copings, strapping, bucks, grounds and other rough carpentry components to sizes and in locations required for satisfactory support of fabricated items and other work. Provide wood blocking at steel stud framed gypsum board partitions for support of wall mounted components.

.2 Unless otherwise indicated, provide minimum 38 mm thick materials. Grounds may be 21 mm thick material unless otherwise indicated.

.3 Provide built-up wood curbs for rooftop mounted equipment. Unless otherwise detailed, provide 90 mm thick curbs extending minimum 300 mm from top of roof membrane to top of curb.

.4 Provide minimum 12 mm thick plywood back-up for fastening of curtain tracks and blinds at head of windows, where curtains or blinds are required.

**3.3 ANCHORS AND FASTENERS**

.1 Provide rough hardware including nails, screws, bolts, washers, brackets, hangers, and fastening devices of all types.

.2 Unless otherwise indicated, attach wood members at maximum 600 mm o.c. as follows:

.1 To concrete and solid masonry with expansion or friction type anchor bolts.

.2 To hollow masonry with toggle bolts.

.3 To heavy gauge metal with bolts.

.4 To light gauge metal with screws or bolts.

.5 To wood with nails, screws or bolts as required to ensure stability.

.3 Bucks and plates shall be anchored to masonry walls with 13 mm galvanized steel bolts or with approved type screw anchors.

.4 Fasten wood copings to supporting masonry elements with 13 mm galvanized steel bolts minimum 450 mm long spaced maximum 600 mm o.c. Where width of coping plate exceeds 100 mm, stagger bolts off centre.

### 3.4 ROOF SHEATHING

.1 Install roof sheathing with surface grain at right angles to the roof framing underneath with 3/32" gap between adjacent panels to allow for expansion.

.2 All roof sheathing panel edges that are not tongue and groove require supports of minimum 1-1/2" x 1-1/2" wood blocking securely fastened between roof framing members or use 'H' clips in conformance with O.B.C. article 9.23.15.1 and .2.

.3 Install roof sheathing to prefabricated wood trusses and framing using minimum 2" long annular or spiral type nails spaced 6" O.C. at edges and 12" O.C. along intermediate supports.

.4 Install roof sheathing to cold formed metal joist trusses and framing using minimum 6 x 1-5/8" long "bulge head" type drywall screws spaced 6" O.C. at edges and 12" O.C. along intermediate supports.

### 3.5 BACKBOARDS

.1 Size backboards to adequately accommodate equipment to be mounted. Secure boards with countersunk fasteners to supporting walls in manner which will carry equipment load without damaging wall.

### 3.6 PRESSURE PRESERVATIVE TREADED WOOD INSTALLATION

.1 Comply with AWPA M4.

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

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

.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.

.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

.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.

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

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

.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.

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

**END OF SECTION**

1 General

**1.1 GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

**1.2 RELATED WORK**

.1 Section 05 50 00: Metal Fabrications

.2 Section 06 10 00: Rough Carpentry

.3 Section 06 41 00: Architectural Wood Casework

.4 Section 09 91 00: Painting

**1.3 QUALITY ASSURANCE**

.1 Reference Standards: unless otherwise specified, carry out finish carpentry work in accordance with requirements of "Quality Standards for Architectural Woodwork" (latest issue) of Architectural Woodwork Manufacturer's Association of Canada (AWMAC).

**1.4 SUBMITTALS**

.1 Submit two samples of each type of solid wood and plywood used in exposed work scheduled to receive transparent finish.

**1.5 PRODUCT DELIVERY, HANDLING & STORAGE**

.1 Protect against damage, including damage by excessive changes in moisture content, during delivery and storage. Maintain minimum storage temperature of 16°C, and relative humidity 25% to 55%.

.2 Do not deliver finish carpentry components to site before all wet trades are completed, the building is closed in and humidity conditions on site are acceptable. Do not deliver during rain or damp weather.

.3 Store materials on site in such a way as to prevent deterioration or loss or impairment of essential properties. Prevent moisture gain of kiln dried materials.

**1.6 PROTECTION**

.1 Provide coverings as necessary to protect finish carpentry components from damage of any kind during storage and after installation.

2 Products

**2.1 MATERIALS**

.1 Solid Wood:

.1 Unless otherwise indicated, provide AWMAC Premium Grade.

.2 All wood materials shall be new, straight and clean, free of sap, knots, pitch, and other defects, except as permitted by applicable grading rules.

.3 All wood shall be kiln dried to a maximum moisture content of 8-12% for interior work.

.4 Hardwood: Species as indicated; where no species is indicated, provide Birch.

.5 Softwood: to CAN/CSA 0141-05, dressed all sides used in concealed locations only except where shown otherwise. Unless otherwise indicated use No. 1 White Pine at interior locations.

.2 Panel Materials:

.1 Hardwood plywood: to CSA 0115-M1982, Type II Veneer: AWMAC Architectural Grade Maple or Select White Birch; use veneer core or multi-core plywood.

.2 Softwood plywood: to CSA 0151-04 Sanded Grade, Solid Two Sides. Use in concealed locations only; use veneer core or multi-core plywood only.

.3 Fasteners and Adhesives:

.1 Nails and staples: CSA B111-1974, galvanized.

.2 Screws: zinc, cadmium or chrome plated steel.

.3 Adhesive: waterproof type as approved by Consultant.

**2.2 FABRICATION**

.1 General Requirements:

.1 Exposed joints and edges:

.1 Uniformly space exposed joints unless otherwise indicated.

.2 Edge grain shall not be visible; mitre external corners, house internal corners. Secure corners with corrugated metal fasteners. Glue mitred corners.

.3 All exposed edges of plywood shall have solid wood edging, pressure glued.

.2 Mechanical fasteners:

.1 Inconspicuously locate mechanical fasteners. Wherever possible conceal fastenings.

.2 Countersink nail heads.

.3 Unless otherwise indicated, countersink screw and bolt heads and fill holes with matching wood plugs.

.3 Cutting and fitting: make cutouts in work of this Section as required to accommodate work of other Sections.

.2 Standing & Running Trim:

.1 Fabricate trim and base of softwood where paint finish is designated and of hardwood where transparent finish is required.

.2 Length: standing trim shall be in one piece. Running trim shall be in longest practicable lengths.

.3 Thickness: unless otherwise indicated, minimum 13 mm.

.3 Rails, Slats, Caps, Base:

.1 Fabricate components to profiles shown and in longest practicable lengths.

.2 Slightly round exposed edges, sand smooth all surfaces.

.3 Unless otherwise indicated fabricate members of hard- wood. Use the same species of wood throughout, except where specifically indicated otherwise.

3 Execution

**3.1 INSTALLATION**

.1 Install finish carpentry components plumb, true and level and securely fasten in place. Accurately scribe and closely fit components to irregularities of adjacent surfaces.

.2 Accurately fit joints in true plane, locate joints over bearing or supporting surfaces.

.3 Provide mechanical fastening devices such as nails, screws and bolts required for fastening wood components. Unless permitted provide concealed fastening of components.

.4 Where permitted, nail with small headed finishing nails. Countersink nail heads with nail setter.

.5 Where components are fastened with screws or bolts, countersink screw and bolt heads and provide wood plugs matching surrounding wood.

.6 Install caps, rails, base, casings and trim in longest practicable lengths; accumulation of short pieces not permitted. No edge grain shall be visible; mitre corners. Slope cut intermediate joints.

.7 Select components within any area to produce well blended, uniform appearance. Avoid use of components with starkly contrasting colours. Replace components which in Consultant's opinion are not of satisfactory appearance.

**3.2 FINISHING**

.1 Sand finished wood surfaces thoroughly as required to produce uniformly smooth surface, always sanding in direction of grain run. Coarse grained sandpaper marks, hammer marks, or other similar imperfections in finished work are not acceptable.

**3.3 SCHEDULE**

.1 Unless specifically indicated otherwise, all finish carpentry components shall receive transparent stain and varnish finish by Section 09 91 00.

.2 Provide the following:

.1 Bench and Shelf Slats:

.1 Species: Birch

.2 Bench Slats: 38mm x 89 or 140mm, fastened to steel channel from below.

.3 Finish: Clear Stain, as indicated in Section 09 91 00.

.2 Other finish carpentry components required.

**END OF SECTION**

1 General

## 1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

## 1.2 RELATED WORK

.1 Section 05 50 00: Metal Fabrications

.2 Section 06 10 00: Rough Carpentry

.3 Section 06 20 00: Finish Carpentry

.4 Section 07 21 00: Thermal Insulation

## 1.3 DEFINITION

.1 "Exposed" when referred to in this Section shall mean all parts that can be viewed and shall include interiors of cupboards, cabinets and counters, backs of doors, shelving, gables, drawers.

## 1.4 QUALITY ASSURANCE

.1 Reference Standards: unless otherwise specified, carry out finish carpentry work in accordance with requirements of "Quality Standards" (latest issue) of Architectural Woodwork Manufacturers' Association of Canada (AWMAC), Custom Grade.

## 1.5 SUBMITTALS

.1 Submit detailed shop drawings for cabinetwork showing proposed assembly, connections, anchorage, materials, dimensions, thickness and finishes.

.2 Shop drawings shall be originated and produced by fabricator and may not be copied or reproduced from Consultant's drawings. Each item shall be shown in plan, section and elevation, detailed in appropriate scale, clearly displaying all required information. Single line diagrams are not acceptable.

.3 Submit duplicate samples of each type of solid wood and plywood used in exposed work prior to fabrication of cabinetwork.

## 1.6 PRODUCT DELIVERY, HANDLING & STORAGE

.1 Protect cabinetwork against damage, including damage by excessive changes in moisture content. Maintain minimum storage temperature of 16$^{o}$C, and relative humidity 25% to 55%.

.2 Cover plastic laminate faces at shop with heavy kraft paper.

.3 Do not deliver finish carpentry components to site before all wet trades are completed, the building is closed in and humidity conditions on site are acceptable. Do not deliver during rain or damp weather.

.4 From time of fabrication until installation, store handle and transport materials so as to prevent deterioration or loss or impairment of essential properties. Prevent moisture gain of kiln dried materials.

## 1.7 PROTECTION

.1 Provide coverings as necessary to protect finish carpentry components from damage of any kind during storage and after installation.

## 1.8 WARRANTY

.1 At no cost to Owner remedy any defects in work of this Section due to defects in materials and workmanship, including but not necessarily limited to delamination, warping, and other defects detrimental to appearance and/or performance for a period of 2 years from date of Substantial Performance.

2 Products

## 2.1 MATERIALS

.1 Solid Wood:

.1 Unless otherwise indicated, provide AWMAC Premium Grade.

.2 All wood materials shall be new, straight and clean, free of sap, knots, pitch, and other defects, except as permitted by applicable grading rules.

.3 All wood shall be kiln dried to a maximum moisture content of 6% to 8%.

.4 Hardwood: White Birch Premium Grade.

.5 Softwood: to CAN/CSA-0141-05, dressed all sides used in concealed locations only except where shown otherwise. Concealed framing: No. 1 Grade White Pine.

.2 Plywood Panel Materials:

.1 Hardwood plywood: to CSA 0115-1982, Type II, veneer: AWMAC Architectural Grade Select White Birch; use veneer core, multi-core plywood or particle core.

.2 Softwood plywood: to CSA 0151-04 Sanded Grade, solid two sides. Use in concealed locations only; use veneer core or multi-core plywood only.

.3 Plastic Laminated Components:

.1 Plastic laminate facing sheet: ANSI/NEMA LD3-2005 Grades HGS, VGS, HGP; colours, gloss and texture will be selected by Consultant from full range of products by Formica, Arborite, Nevamar, Wilsonart, Pionite.

.2 Plastic laminate backing and liner sheets: High pressure, paper based, melamine surfaced, laminated plastic backing sheets, conforming to CAN3-A172, backing grade (BK), minimum 0.5mm (0.020") thick, colour as selected later by Consultant and by manufacturer of plastic laminate face sheets.

.3 Core: veneer core plywood.

.4 Laminating adhesive: urea formaldehyde type meeting requirements of CAN3-0112 Series M1977.

.5 Core sealer: clear water resistant synthetic resin sealer.

.4 Fasteners & Adhesive:

.1 Nails and staples: CSA B111-1974, galvanized.

.2 Screws: zinc, cadmium or chrome plated steel.

.3 Adhesive: CAN3-0112 Series - M1977, waterproof type.

.5 Solid Core Doors: to CSA 0132.2-M1977, flush doors, 35 mm thick, face veneer and edge banding matching adjacent cabinetwork.

.6 Cabinet Hardware: products listed below are a standard of acceptance. Products by other manufacturers, of equal quality and similar appearance may also be provided subject to review and approval by Consultant.

.1 Hinges for 19 mm door Blum 91-650, $170^{o}$ with self-closing spring.

.2 Hinges for 35 mm thick doors: Hager 1279 76 x 76.

.3 Door and drawer pull: GSH 302 x 100 mm, CTC 7.5 mm o.d. brushed stainless steel.

.4 Drawer slides: KV 1429 full extension for 45 kg load.

.5 Drawer locks: Olympus 078 or National Cabinet Lock C8702 or Corbin CCL 02066, keyed as directed by Consultant.

.6 Cabinet locks: Olympus 078 or National Cabinet Lock C8702 or Corbin CCL 02067, keyed as directed by Consultant.

.7 Automatic door bolt for double doors: Hafele 245.58.754.

.8 Door locks for 35 mm doors: by Section 08 71 00.

.9 Pilaster and clips: KV 255, 256.

.10 Coat Hooks:

.1 Under Coat Racks & Middle of Cubbies:

.1 Finish: Chrome.

.2 Size: 114mm L x 13mm W x 89mm projection.

.3 Basis of Design Materials: GSH 307 by Gallery Specialty Hardware.

.2 Sides of Cubbies:

.1 Finish: Chrome.

.2 Size: 45mm L x 22mm W x 38mm projection.

.3 Basis of Design Materials: Lifestyle Hooks, Model BP6506140, Single Wardrobe Hook by Richelieu Hardware.

.11 Coat rod: As indicated on Drawing A603.

.12 Hardware finish: Unless otherwise indicated chrome or nickel plated.

.7 Aluminum Grille Register Cover: Aluminum Sheet and Plate: In accordance with ASTM B209-10, Type 6063-T6 having clear anodized Architectural Class II Coating.

.1 Horizontal Grille Cover: 100mm wide x see drawings for length, heavy duty aluminum bar grille, complete with type “A” fastening; Finish: Brushed aluminum.

.1 Basis of Design Product: Price Industries, LBPH Series, Type 25c Core, complete with Type 750 Border.

.2 Vertical Grille Cover: Continuous mesh lattice grille, 100mm high, 14 gauge aluminum construction, complete with type “A” fastening and black paint finish.

.1 Basis of Design Product: Price Industries, LG75 Series.

.8 Foil-Faced Insulation: As identified in Section 07 21 00 Thermal Insulation.

.1 Supplied and installed under the millwork contract, and installed within the kindergarten and classroom book shelf, as indicated on bookshelf detail.

## 2.2 FABRICATION

.1 General Requirements:

.1 Exposed surfaces:

.1 Provide wood members free from bruises, blemishes, mineral marks, knots, shakes and other defects, except as specifically permitted by grade rules.

.2 Select exposed surfaces in any one area for balanced overall appearance free of stark contrasts.

.3 Sand smooth all exposed surfaces to provide even and uniform finish free of defects detrimental to appearance.

.2 Exposed joints and edges:

.1 Uniformly space exposed joints unless otherwise indicated.

.2 No edge grain shall be visible; mitre external corners, house internal corners. Secure corners with corrugated metal fasteners. Glue mitred corners.

.3 All exposed edges of plywood and particle board shall have solid wood edging, pressure glued.

.3 Mechanical fasteners:

.1 Inconspicuously locate mechanical fasteners. Wherever possible conceal fastenings.

.2 Countersink nail heads.

.3 Where exposed to view, countersink screw and bolt heads and fill holes with matching wood plugs.

.4 Cutting and fitting: make cutouts in work of this Section as required to accommodate work of other Sections.

.2 Standing & Running Trim:

.1 Fabricate trim of hardwood.

.2 Length: standing trim shall be in one piece. Running trim shall be in longest practicable lengths.

.3 Thickness: unless otherwise indicated, minimum 6 mm.

.3 Plastic Laminate Components:

.1 Unless otherwise specified herein meet requirements of AWMAC “Quality Standards”.

.2 Assembly: bond plastic laminate to core with adhesive using pressure. Bond plastic laminate to both faces of core using same adhesive and same pressure.

.3 Core: unless otherwise indicated: 19 mm thick veneer core plywood.

.4 Balanced construction: plastic laminate covered components shall be of balanced construction, with plastic laminate on both faces of core. Seal core edges not covered with plastic laminate.

.5 Use largest practicable plastic laminate sheet size.

.6 Provide joints symmetrically; provide joints at corners and at changes in superficial areas; provide concealed draw bolt anchors at joints. All butt joints shall have a blind spline.

.7 Construct countertops with preformed front edge and square corner splashback. Chamfer edges uniformly at approximately $20^{o}$C; do not mitre.

.8 At L-shaped corners mitre plastic laminate to outside corner. Accurately fit members together to provide tight and flush butt joint.

.9 Apply self-edged minimum 1.1 mm thick plastic laminate to exposed ends of countertops.

.10 Construct splashbacks minimum 100 mm high or higher where indicated. Return splashback at ends except where indicated otherwise.

.11 Openings and cutouts:

.1 Radius internal corners at least 3 mm and chamfer edges.

.2 Where core edge is to remain exposed, cover with plastic laminate edging.

.3 Where core edge is to be concealed, seal with sealer.

.4 Cabinetwork:

.1 As far as practicable, assemble work in shop and deliver to site ready for installation. Leave ample allowance for fitting and scribing in place.

.2 Except where otherwise detailed use "flush overlaid" construction. Where shown or required use "exposed case" construction. Tenon, dado, dowel or rabbet interior construction with all parts well glued along full length/height. Use glue blocks where necessary. Shoulder mitre all exposed corners. Open ends or skeleton frames against walls are not permitted.

.3 Construct all cabinetwork, counters, cupboards, including tops, bottoms, backs and shelves from hardwood faced veneer core plywood or solid hardwood. Use same species of hardwood throughout, unless a specific species is called up, shown or specified for a particular unit or area. Select hardwood plywood for each cabinetwork unit so as to produce well blended uniform appearance. Avoid use of starkly contrasting veneer colours within any one unit. Replace components which in Consultant's opinion are not of satisfactory appearance.

.4 Design and fabricate work to accommodate expansion and contraction of components. All connectors and fasteners shall be concealed unless permitted by Consultant to be exposed. Fabricate work to produce tight joints. Locate prominent joints where directed. Prevent opening up of joints and glue lines in finished work.

.5 Unless otherwise indicated provide the following thicknesses:

.1 Doors: 19 mm

.2 Drawer fronts: 19 mm

.3 Gables: 19 mm

.4 Cabinet backs (floor supported): 12 mm

.5 Cabinet backs (wall hung): 19 mm

.6 Shelves: 19 mm

.7 Drawer bodies: 12 mm

.6 Rout gables for pilaster strips where adjustable shelving is required.

.7 Limit shelf span to 900 mm.

.8 Construct doors and drawer fronts of veneer faced, 19 mm particle core. Where height of door exceeds 1200 mm provide 35 mm thick solid core doors, unless otherwise shown.

.9 Provide running members in maximum length obtainable. Provide thickness of members in maximum dressed size of standard lumber. Where width or thickness indicated is not available, use glue laminations to obtain sizes required.

.10 Install cabinet hardware in accordance with hardware manufacturer's directions. Unless otherwise indicated, provide each drawer and door with pull, each drawer with extension hardware and each door with minimum two hinges, (2 hinges for door height up to 900 mm, 3 hinges for door height up to 1350 mm and 4 hinges for door height up to 1800 mm); provide additional hinges where recommended by hinge manufacturer based on door size and weight.

.11 Unless otherwise indicated, factory finish all cabinetwork with a stain and polymerizing two component catalytic conversion varnish system; colour and sheen to be selected by Consultant. All surfaces shall be carefully prepared and sanded before and between coats to provide final finish which shall be smooth, even and uniform free of machine marks, hammer marks, depressions and imperfections.

.12 Apply moisture repellent sealer to concealed backs of cabinetwork.

3 Execution

## 3.1 INSTALLATION

.1 Install cabinetwork components plumb, true and level and securely fasten in place. Accurately scribe and closely fit components to irregularities of adjacent surfaces.

.2 Accurately fit joints in true plane, locate joints over bearing or supporting surfaces.

.3 Provide mechanical fastening devices such as nails, screws and bolts required for fastening wood components. Unless permitted provide concealed fastening of components.

.4 Where permitted, nail with small headed finishing nails. Countersink nail heads with nail setter.

.5 Install plastic laminate components using concealed fastening devices.

.6 Where components are fastened with screws or bolts, countersink screw and bolt heads and provide wood plugs matching surrounding wood.

.7 Where cabinetwork abuts other building elements provide wood trim matching cabinetwork except where otherwise detailed.

.8 Where access is required to valves and other mechanical and electrical components, located behind cabinetwork, provide removable plywood access panels of size required and secure with four brass screws.

.9 Install display case cork and liner in accordance with manufacturer's recommendations. Bond to substrates with adhesive free of bubbles and tears, with joints neat and tight and with exposed surfaces free of adhesive and stains.

.10 Check operation of all movable parts and, if necessary, adjust to ensure proper and smooth function.

.11 Upon completion of installation, inspect work of this Section and touch up, where required, minor or damaged surface finish to restore it to original condition. Replace damaged components which, in the opinion of the Consultant, cannot be satisfactorily repaired.

**END OF SECTION**

1 General

## 1.1 SUMMARY

.1 Section Includes:

.1 Labour, Products, equipment and services necessary to complete the work of this Section; Consisting of a fully adhered conventional installation using 4-plys of asphalt coated fibreglass felts in a built-up bituminous membrane roofing system, tying into an existing built-up bituminous membrane roofing system.

.2 Maintain the existing building watertight at all times. Provide required temporary protection, and enclosures. Seal off or temporarily dam open roof edges to prevent any incidence of water into existing building or structure.

## 1.2 QUALITY ASSURANCE

.1 Tie-in new work with adjacent existing roofing system in accordance with the manufacturer=s recommendations for the products used. All products to be compatible with the existing and new roofing system components.

.2 Do work to maintain existing roof warranty.

.3 All work shall meet the requirements of the Canadian Roofing Contractors Association (CRCA), including all amendments.

.4 Applicators: Member in good standing of the Canadian Roofing Contractors Association and which has a minimum of 5 years of proven satisfactory experience in the Work of this Section.

.5 Ensure surfaces to receive work of this Section are clean, level, smooth, solid and dry before commencing work each day.

.6 Ensure temperatures during application are not less than the minimum recommended by the material manufacturer. Do not perform work during inclement weather conditions.

.7 Stop work when temperature remains consistently below recommended temperature.

.8 Use only dry materials and apply only during weather that will not introduce moisture into roofing system.

.9 Arrange for roofing material manufacturer's representative to visit the site and discuss roofing application and any special requirements, prior to commencement of work.

## 1.3 SUBMITTALS

.1 Provide submittals specified and as required to assess conformance with the Contract Documents and Section 01 33 00.

.2 Shop Drawings: Provide shop drawings showing complete details of all conditions, construction and interfacing with work of other Sections.

.3 Product Data: Submit 3 copies of the manufacturers' recommended roofing inspection and maintenance procedures for inclusion in the maintenance instructions and data book.

## 1.4 PROTECTION

.1 Provide all necessary protection measures to prevent fumes, dust particles, odours and other foreign matter created or caused by roofing operation from entering the building, including the return air ducts.

.2 Provide temporary protection at work areas or access to work areas with minimum ½” plywood underlaid with 1” polystyrene insulation board extending 3’ beyond work area. Remove protection at completion of work.

.3 Prevent bitumen, precipitation and debris entering openings and drains during work.

.4 Cover walls and adjacent work where materials hoisted or used. Locate kettles so that smoke and fumes will not discolour the building or adjacent buildings or become a nuisance to adjacent owners or the public.

.5 Use warning signs and barriers. Maintain in good order until completion of work.

.6 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed work and materials out of storage.

### 1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials in original containers, sealed, with labels intact.

.2 Do not store insulation in direct contact with the earth, road surface, or roof deck. Place suitable supports under the insulation upon delivery to protect it from absorbing dampness from the surrounding terrain or deck.

.3 Store materials to manufacturer's instructions. Provide and maintain dry, off-ground weatherproof storage. Take particular care to prevent materials from absorbing moisture. Remove unsatisfactory materials promptly and provide new dry materials.

.4 Deliver fasteners in boxes or kegs and keep in protective storage until used. Do not oil or grease fasteners.

.5 Remove materials only in quantities required for same day use.

.6 Remove and replace damaged, wet or broken materials.

.7 Cover gravel during inclement weather.

.8 Store materials away from open flame or ignition sources.

### 1.6 WARRANTY

.1 Provide Canadian Roofing Contractors Association (CRCA) Standard Form of Warranty, complete with a copy of the CRCA's Preventative Maintenance Manual or similar written warranty acceptable to the Owner and the Consultant. The warranty shall be for a period of two years from date of Substantial Performance.

.2 Provide material and material and labour warranties offered by the material manufacturers.

.3 Repair defects within 24 hours of notification.

.4 Inspect the roof 30 days before expiry of warranty and correct defects within 15 days of inspection. This inspection shall be performed at no additional cost to the Owner.

.5 Carry out repair work required under the warranty in accordance with the recommendation of the Consultant.

## 2 Products

### 2.1 MATERIALS

.1 Roofing products: Matching and compatible with existing installed materials.

.1 Fibreglass Felt: Asphalt coated fibreglass felt in accordance with CSA A123.17-05 (R2009) and ASTM D2178 - 04, Type IV

.2 Asphalt: Conforming to CSA A123.4 – 04 (R2008), Type 3 on cants and vertical surfaces; Type 2 elsewhere.

.3 Asphalt Primer: Unfilled asphalt conforming to CGSB 37-GP-9Ma.

.4 Roofing Cement: Cut back asphalt plastic cement conforming to CAN/CGSB-37.5.

.5 Bituminous Primer for SBS Membranes: As recommended by membrane manufacturer.

.6 Flexible Flashing: 1mm (40 mil) thick, asphalt compatible flexible flashing membrane of a polymeric alloy, integrally laminated to a polyester reinforcing scrim. Basis of Design Materials: Flash-Tite FR-40 Flexible Flashing by Lexcor.

3 Execution

**3.1 EXAMINATION**

.1 Examine site conditions and surfaces to ensure that they are in satisfactory condition for the commencement of the work of this section. Do not proceed with work until surfaces are satisfactory.

.2 Examine existing work to ensure materials used for work of this Section are compatible with and matching existing roofing system.

**3.2 ROOFING**

.1 Remove only areas of the existing roofing system which can be replaced, complete with membrane flashings, on the same day.

.2 Adequately install cants at junctions between horizontal and vertical surfaces. Provide tight flush joints between length of cants and mitre corners.

.3 Provide roofing and flashing construction to matching existing.

.4 Provide flexible flashing overtop of new roofing construction and existing roofing construction 305mm to ensure joint is completely sealed, mopping into hot asphalt.

.5 Install sheet metal work in accordance with CRCA specifications, using concealed fastenings except where approved before installation.

.6 Fabricate metal flashings and other sheet metal work to details shown. Form pieces in 8' maximum lengths. Make allowance for expansion at joints.

.1 Hem exposed edges on underside 1/2". Miter and seal corners with sealant.

.2 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.3 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

.4 Counterflash membrane flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock forming tight fit over hook strips.

.5 Lock end joints and caulk with sealant.

**3.3 CLEANING**

.1 Remove all existing debris from all roof areas.

.2 Clear out roof drains, scuppers, eaves troughs and down spouts of debris resulting from work of this Section and ensure they are free draining at project completion.

.3 Daily as the work proceeds and on completion, remove all surplus materials and debris resulting from work.

.4 Remove stains, caulking or other adhesive from all affected surfaces.

**END OF SECTION**

**1** General

**1.1 GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

**1.2 RELATED REQUIREMENTS**

.1 Section 06 41 00: Architectural Wood Casework

.2 Section 07 84 00: Firestopping

.3 Section 09 21 16 Gypsum Board Assemblies

**1.3 QUALITY ASSURANCE**

.1 Applicator of sprayed insulation shall be trained and approved by insulation manufacturer.

**1.4 PRODUCT STORAGE AND HANDLING**

.1 Deliver insulation to site in sealed wrappings bearing manufacturer's name, product name and RSI or KSI value.

.2 Store materials in a dry area protected from the elements.

**1.5 PROTECTION**

.1 Temporarily protect installed insulation from damage and action of the elements until it is permanently concealed or protected.

.2 Protect polystyrene insulation from sunlight.

**2** Products

**2.1 INSULATION**

.1 Type 1: Glass Fibre Batt Acoustical Insulation:

.1 Unfaced, preformed glass fibre batt insulation in accordance with ASTM C665, Type 1; Thickness as required to meet design insulation values indicated on drawings or as required to fill insulated spaces where not indicated; formaldehyde free.

.2 Basis of Design Materials:

.1 Owens-Corning Canada Inc., Acoustic Insulation

.2 CertainTeed, CertaPro AcoustaTherm Batts

.2 Type 2: Double reflective insulation: (location in book self millwork with wall fin by millwork trade)

.1 Basis of Design Material: Double Reflective rolls by Reflectix.

**2.2 CAVITY COMPARTMENT SEALS, FIRESTOPS**

.1 Sheet metal: minimum 0.9 mm thick sheet steel formed to profiles required, hot dip galvanized ASTM A653, zinc coating designation Z275.

**3** Execution

**3.1 PREPARATION**

.1 Clean substrates as required. Remove concrete surface ridges and deposits.

## 3.2 INSULATION INSTALLATION - GENERAL

.1 Provide under this Section all thermal insulation required except where it is specified to be part of other Sections.

.2 Provide continuous uniform thermal insulation over insulated areas.

.3 Where insulation is interrupted by construction elements, neatly fit insulation around such elements and pack spaces around elements with same insulation.

.4 Moderately butt insulation boards against each other so that there are no gaps.

.5 Stagger joints at multiple layer installations.

## 3.3 TYPE 1 INSULATION

.1 Install batt insulation in locations and thicknesses shown. Seal joints to prevent transfer of sound.

## 3.4 TYPE 2 INSULATION

.1 Apply insulation with suitable equipment, in accordance with manufacturer's directions.

.2 Fill designated spaces completely, leaving no voids or gaps; trim excess material.

## 3.5 SCHEDULE

.1 Unless otherwise indicated provide the following:

.1 Type 1 insulation: Acoustical insulation within gypsum wall assemblies.

.2 Type 2 insulation: where indicated.

**END OF SECTION**

1 General

**1.1 GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

**1.2 RELATED REQUIREMENTS**

.1 Section 04 20 00: Masonry

.2 Section 06 10 00: Rough Carpentry

.3 Section 07 01 50: Maintenance Roofing Work

.4 Section 07 92 00: Joint Sealants

.5 Section 08 62 13: Domed Unit Skylights

**1.3 DESIGN & PERFORMANCE REQUIREMENTS**

.1 Appearance: neatly and evenly lay out and install components. Exposed fastening devices not permitted.

.2 Effects of wind: resist positive and negative wind pressures without causing detrimental effects.

.3 Water control: prevent passage of water.

.4 Thermal movement: accommodate expansion and contraction of component parts without causing buckling, failure of joints, undue stress on fasteners and other detrimental effects.

.5 Compatibility: components shall be compatible with dissimilar metals and materials with which they are in contact or fastened to so as to prevent corrosion, staining and other detrimental effects. If required, treat or separate contact surfaces with inert and non-staining insulation material to achieve compatibility.

**1.4 SAMPLES**

.1 Submit minimum 300 mm long samples of typical flashings showing profile, method of locking and anchoring and corner condition, fabricated from materials specified.

**1.5 JOB CONDITIONS**

.1 Schedule and co-ordinate installation of metal flashing components with work of other Sections where it is integral or contiguous therewith.

.2 Install metal counter and cap flashings immediately after installation and inspection of roofing membrane base flashings.

**1.6 WARRANTY**

.1 At no cost to Owner, remedy any defects in work, including work of this and other Sections, due to faults in materials and/or workmanship provided under this Section of Specifications appearing within a period of 2 years from date of Substantial Performance.

2 Products

**2.1 MATERIALS**

.1 Prepainted sheet steel: galvanized sheet steel pretreated, primed and finish coated: CSSBI 8000+; colour selected by Consultant.

.2 Galvanized sheet steel: ASTM A446 Grade A, zinc coating designation Z275 (ASTM A653).

.3 Mechanical fastening devices: non-corrosive metal compatible with sheet metal.

.4 Sealant: one part low modulus silicone to CAN/CGSB-19.18-M87. Consultant will select colour of sealant exposed in finished work.

.5 Isolation coating: alkali resistant asphalt based enamel.

**2.2 FABRICATION - GENERAL**

.1 Shop fabricate metal flashing components, of prefinished sheet steel to profiles indicated. Where flashings are required but not detailed follow applicable requirements of SMACNA Architectural Manual. Provide the following minimum core thickness material unless otherwise indicated:

.1 Flashings: 0.5 mm (24 ga)

.2 Lockstrips: 0.9 mm (20 ga)

.2 Provide components free from distortion, waves, twists, buckles and other defects detrimental to performance and appearance. Form sections square, true and accurate to size.

.3 Double back exposed edges at least 12 mm.

.4 Seams: space seams uniformly at maximum 2.5 m o.c. Unless otherwise indicated, use flat locked seams, lapped 25 mm. Make horizontal seams in directions of water flow. Mitre and seal corners.

.5 Cleats and edge strips: non-corrosive metal compatible with sheet metal, thickness as required to provide rigid support and positive securement for metal flashings.

.6 Unless otherwise indicated, counter flashings shall completely cover base flashings.

.7 Furnish everything necessary for complete metal flashing installation, including clips and fastening devices.

.8 Back paint metal flashings with asphaltic paint.

.9 Fabricate scupper drains and downpipes to details and for locations indicated.

3 Execution

**3.1 INSTALLATION**

.1 Provide sheet metal flashing at roof curbs, copings, penetrations, at junction of roof to wall, and where shown. Provide all wall cap flashings, except those specifically covered by other Sections.

.2 Protect all membrane flashings with metal counter flashings.

.3 Clean surfaces to be covered with metal flashings of dirt and other foreign matter. Drive projecting nails flush with substrate. Do not apply metal flashings over substrates likely to cause rupture.

.4 Provide underlay of resin sized paper under metal flashings installed over masonry, concrete or wood. Lay underlay dry as sheet metal work is installed. Secure in place and lap joints 100 mm.

.5 Secure flashings to supporting building elements with concealed continuous cleats and locking strips; avoid exposed surface fasteners.

.6 Provide standing seam corners at cap flashings.

.7 Where flashing is punctured by bolts, provide sheet lead or neoprene washers, 6 mm larger than bolt hole.

.8 At reglets in masonry walls, secure metal flashings to reglet with mechanical fasteners at maximum 610 mm o.c.

.9 Where vertical portion of metal flashing exceeds 300 mm provide vertical standing seams at 600 mm o.c.

.10 Wherever possible, install sleeve flashing systems at penetrations through roof membrane. Install systems in accord with manufacturer's directions and as follows:

.1 Prior to installation of roofing membrane place bead of sealant around pipes, vent stacks and other components penetrating roof. Place bitumen protection cups over pipes into sealant.

.2 Insulate between penetrating elements and sleeve with 25 mm thick fibrous insulation.

.3 Prime contact surfaces with mastic cement; place flashing jackets onto roof membrane so that base flange is in contact with mastic cement placed on membrane.

.4 Sweat solder or weld on rain collar.

.11 Imperfections in metal flashing work such as holes, dents, creases, or oil-canning will not be accepted.

**END OF SECTION**

1 General

## 1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

## 1.2 RELATED REQUIREMENTS

.1 Section 04 20 00: Masonry

.2 Section 07 92 00: Joint Sealants

## 1.3 DESCRIPTION

.1 Include in work of this Section all firestopping required except for firestopping and smoke seals within mechanical assemblies (i.e. inside ducts, dampers) and electrical assemblies (i.e. inside bus ducts). Firestopping and smoke seals around outside of such mechanical and electrical assemblies, where they penetrate fire rated separations, shall be part of work of this Section.

.2 Firestop and seal (draft-tight) gaps, control joints, expansion joints and penetrations in fire rated assemblies, including assemblies with a zero rating, against passage of fire, smoke, gasses, firefighter's hose stream and, where designated, passage of liquids. Smoke seal at angle support at fire dampers.

## 1.4 QUALITY ASSURANCE

.1 Work of this Section shall be carried out by a firm specialized in the type of work specified herein. Use competent installers, experienced, trained and approved by material or system manufacturer for application of materials and systems being used. Installers shall have minimum 5 years experience in installation of firestopping materials.

## 1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to site in manufacturer's sealed and labelled containers.

.2 Store materials in protected location prior to use, in accordance with manufacturer's directions.

## 1.6 ENVIRONMENTAL CONDITIONS

.1 Conform to manufacturer's recommended temperatures, relative humidity and substrate moisture content for storage, mixing, application and curing of firestopping materials.

## 1.7 SUBMITTALS

.1 Prior to start of work submit list of proposed firestopping and smoke seal materials together with suitable documentation to verify that specified requirements will be met. Provide the following information as applicable to this Project:

.1 ULC assembly number certification

.2 required temperature rise and flame rating

.3 hose stream rating (where applicable)

.4 thickness

.5 proposed installation methods

.6 material of firestopping and smoke seals, primers, reinforcements, damming materials, reinforcements and anchorages/fastenings

.7 size of opening

.8 adjacent materials

.2 Upon Consultant's request submit samples of materials.

.3 Upon completion of work submit written certification that work of this Section has been carried out in accordance with specified requirements.

**1.8 MOCK-UPS**

.1 At locations directed by Consultant prepare mock-ups of each type of firestopping/smoke seal required.

.2 Provide linear firestopping/smoke seal mock-ups minimum 1 m long. Provide mock-up of each type or penetration firestopping.

.3 Mock-ups may be incorporated into finished work if approved by Consultant.

2 Products

**2.1 SYSTEMS**

.1 Firestopping and smoke seal systems shall be:

.1 tested in accordance with CAN/ULC-S115-05.

.2 listed by ULC or other fire testing agency approved by jurisdictional authorities.

.3 capable of providing fire resistance rating not less than that required by surrounding assembly.

.4 comply with F, T and H rating required.

.2 Firestopping and smoke seals for vertical fire separations shall meet ULC Designation PJ, JF and HW as required for respective location.

**2.2 MATERIALS**

.1 Firestopping and smoke seal materials:

.1 Provide materials which are:

.1 PCB and asbestos-free

.2 of easily identifiable colour, except where used in exposed location

.3 suitable for intended application

.4 compatible with adjacent materials.

.2 Provide elastomeric type materials at locations requiring future re-entry (such as cable) and at penetrations for ducts and other mechanical items requiring sound and vibration control.

.3 Sealant type materials shall be non-sagging for vertical surfaces and self-levelling for level floors.

.2 Primer: as recommended by firestopping material manufacturer for specific substrate and use.

.3 Damming and back-up materials, support and anchoring devices: non-combustible, in accordance with tested assembly and as recommended by manufacturer.

**2.3 MIXING**

.1 Mix materials at correct temperature and in accordance with manufacturer's directions.

3 Execution

**3.1 PREPARATION**

.1 Remove combustible material and loose material detrimental to bond from edges of penetration. Clean, prime or otherwise prepare substrate material to manufacturer's recommendation.

.2 Do not apply firestop material to surfaces previously painted or treated with sealer, curing compound, water repellent to other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.3 Verify openings, dimensions and surfaces conform to fire and smoke seal assembly.

.4 Protect adjacent surfaces from marring or damage.

.5 Prime surfaces in accordance with manufacturer's directions.

.6 Remove insulation from area of insulated pipe and duct where such pipes or ducts penetrate fire separation unless ULC certified assembly permits such insulation to remain within assembly.

.7 Provide temporary damming, forming, packing and bracing materials necessary to contain firestopping. Upon completion, remove forming and damming materials not required to remain as part of system.

.8 Examine sizes, anticipated movement and conditions of opening and penetration to establish correct system and depth of backup materials and of firestopping material required.

## 3.2 INSTALLATION

.1 Seal penetrations through and gaps in fire rated separations in accordance with ULC listing for tested system selected.

.2 Apply firestopping materials in accordance with manufacturer's instructions and tested designs. Apply wit sufficient pressure to properly fill and seal openings to ensure continuity and integrity of fire separation. Tool or trowel exposed surfaces as required.

.3 Remove excess compound promptly as work progresses and upon completion.

.4 Unless otherwise indicated or permitted by Consultant recess firestopping and smoke seals in exposed locations to permit installation of decorative sealant by Section 07 92 00.

.5 Do not cover materials until full cure has taken place.

.6 Provide firestopping and smoke seal systems at following locations, without being limited to:

.1 At all openings, voids and penetrations through all floor slabs except openings within shafts constructed with a fire resistance rating and slabs on granular fill.

.2 At all openings, voids, control joints and penetrations through fire rated masonry, concrete and gypsum board walls, partitions and shaft walls.

.3 At all openings, voids and penetrations installed for future use through fire rated masonry, concrete and gypsum board walls, partitions and shaft walls.

.4 Around mechanical and electrical assemblies penetrating fire rated assemblies.

.5 Between perimeter of all floor and roof slabs and exterior wall construction.

.6 Between curtainwall and adjacent assemblies.

.7 Between tops of all fire rated walls and partitions and underside of floor or roof slabs.

.8 At building expansion joints.

.7 Curing: cure materials in accordance with manufacturer's directions.

## 3.3 FIELD QUALITY CONTROL

.1 Upon Consultant's request, manufacturer's representative shall inspect work of this Section and confirm in writing that it complies with specified requirements.

.2 Request Consultant's review of installed systems before they are covered by other work.

**END OF SECTION**

1 General

## 1.1 SUMMARY

.1 Read other Sections of the Specification for extent of sealant specified in those Sections. Do all other sealing indicated, specified or required.

.2 Provide all items, articles, materials, operations or methods listed, mentioned or scheduled on drawings and/or herein, including all labour, materials, equipment and incidentals necessary and required for the completion of the sealant.

## 1.2 RELATED REQUIREMENTS

.1 Section 04 20 00: Masonry

.2 Section 05 50 00: Metal Fabrications

.3 Section 06 20 00: Finish Carpentry

.4 Section 06 41 00: Architectural Wood Casework

.5 Section 07 62 00 Sheet Metal Flashing and Trim

.6 Section 08 81 00: Glass and Glazing

.7 Section 09 21 16: Gypsum Board Assemblies

.8 Section 10 28 13: Washroom Accessories

## 1.3 DEFINITION

.1 Caulking = Sealant.

## 1.4 SUBMITTALS

.1 Submit submittals in accordance with the General Conditions and Section 01 33 00.

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Manufacturer's Data: Submit manufacturer's literature describing each material to be used in the work of this Section. Literature shall contain a statement that the material complies with the specified standard.

.2 Samples: Submit for approval and colour selection sample of each type of compound, recommended primers and joint filler or fillers proposed to be used.

.3 Safety Data Sheets: Submit WHMIS safety data sheets for inclusion with project record documents. Keep one copy of WHMIS safety data sheets on Site for reference by workers.

## 1.5 QUALITY ASSURANCE

.1 Sealants must be installed by qualified caulking contractor with minimum five (5) years experience and proven record of being able to produce good quality work.

.2 Upon Consultant's request arrange for sealant manufacturer's technical representative to visit the site, investigate conditions and make recommendations in connection with work of this Section.

## 1.6 PRODUCT HANDLING

.1 Deliver sealants to site in sealed containers bearing manufacturer's name, brand name of sealant and reference standard to which sealant complies.

.2 Store materials in a dry area having an ambient temperature within limitations recommended by material manufacturer.

### 1.7 JOB CONDITIONS

.1 Unless otherwise specified, apply sealants when air temperature is between 10°C and 25°C. When air temperature is above 25°C or below 10°C follow sealant manufacturer's recommendations regarding application.

### 1.8 WARRANTY

.1 At no cost to Owner remedy any defects in work, including work of this and other Sections, due to faults in materials and workmanship provided under this Section appearing within a period of 2 years from date of Substantial Performance.

2 Products

### 2.1 MATERIALS

.1 Joint Cleaner: Non-corrosive solvents as recommended by sealant manufacturer for applicable substrate material(s).

.2 Primer: Non-staining type as recommended by sealant manufacturer, for use on substrate conditions outlined, and compatible with specified sealant being applied.

.3 Joint Back-Up – Backer Rod: Round, open cell, reticulated foam, 50% compression, compatible with sealant and primer, non-adhering to sealant.

.4 Bond Breaker: Pressure sensitive plastic tape, not bondable to sealant as recommended by sealant manufacturer.

.5 Sealants:

.1 Sealant Type "A" – Joints around Interior Door Frames, Windows and Under Exterior Thresholds:

.1 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

OR

.2 One component, low modulus, moisture curing, polyurethane joint sealant, conforming to ASTM C920-11, Type S, Grade NS, Class 25.

.1 Dymonic FC by Tremco Ltd., division of RPM Company.

.2 Sikaflex 1A by Sika Canada Inc.

.3 Sonolastic NP1 by BASF.

.2 Sealant Type "B" – Expansion / Control Joints:

.1 One-part, ultra low modulus, non-staining neutral curing 100% silicone joint sealant, conforming to ASTM C920-11, Type S, Grade NS, Class 50.

.1 DC 790 by Dow Corning.

.2 Spectrem 1 by Tremco

.3 SCS2700 SilPruf LM by GE

.4 SikaSil WS-290 by Sika

.3 Sealant Type "E" – Mould and Mildew Resistant:

.1 Mould and mildew resistant, Shore A Hardness 15-25, conforming to ASTM C920-11, Type S, Grade NS, Class25, use NT, G, and A:

.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

.4 Sealant Type "F" – Glazing Joints:

.1 Silicone Sealant: Butt glazing, one part, moisture curing, shore A hardness 15-25, conforming to CAN/CGSB-19.13-M, Classification C-1-40-B-N and C-1-25-B-N and ASTM C920-11, Type S, Grade NS, Class 25, use NT, G, A, O; Colour: clear (translucent):

.1 DC 795 by Dow Corning

.2 SCS2000 by GE

.3 Multiseal by Chemtron

.4 Spectrum 2 by Tremco

.5 SikaSil WS-295 by Sika

.5 Sealant Type "H" – Saw Cut Sealant:

.1 Multi-component, self-levelling, conforming to ASTM D2240-05(2010):

.1 Tremco Control Joint Sealant

.2 BASF Masterfill 300

.3 Sika Loadflex

.6 Preformed Compression Seal: Compartmental open cell neoprene extrusion type conforming to ASTM C509, complete with liquid lubricant adhesive recommended by manufacturer.

3 Execution

**3.1 EXAMINATION**

.1 Examine joints to be caulked and report in writing to the Consultant any defects in work of other Sections which would impair installation, performance and warranty of sealants.

.2 Do not commence installation of sealants until conditions are acceptable.

.3 Start of work implies acceptance of conditions.

**3.2 PREPARATION**

.1 Clean and prepare joints to be caulked to produce clean sound surfaces for sealant adhesion.

.2 Remove dust, oil, grease, water, frost, loose mortar and other foreign matter. Remove loose particles by blowing joint out with compressed air.

.3 Chemically clean non-porous surfaces such as metal and glass, taking care to wipe solvents dry with a clean cloth. Use solvents recommended by sealant manufacturer.

.4 Clean porous surfaces such as masonry, concrete and stone by mechanical abrading.

.5 Surfaces adjacent to joints to be primed and which may be stained by primer shall be masked with tape before primer is applied.

.6 Prime joints in accordance with sealant manufacturer's recommendations. Apply primer before installing premoulded backup.

.7 Install premoulded backup in joints 6 mm and more in width. Roll rope type backup into joint, do not stretch or braid. Install bond breaker in joints less than 6 mm in width.

.8 Protect adjacent surfaces from stains and contamination. Make good any damage caused.

## 3.3 APPLICATION

.1 Apply sealants under pressure using suitable equipment. Gun nozzle shall be of proper size to fit, and seal joint.

.2 Force sealant into joints in full bead, making certain that void free contact is made with sides of joint. Tool joints to produce a slightly concave surface.

.3 Caulking must appear as a concave recessed joint, free of ridges, wrinkles and embedded foreign matter. Caulking shall not spread or bulge beyond surfaces on each of joint.

.4 Apply sealants in accordance with following table:

| Joint Width | Sealant Depth |
|---|---|
| 5 mm | 5 mm |
| 10 mm | 5 mm |
| 15 mm | 7 mm |
| 20 mm | 10 mm |
| 25 mm | 12 mm |

.5 Vent exterior joints in accordance with Consultant’s directions.

## 3.4 CLEANING

.1 As work progresses, remove sealant smears and stains from adjacent surfaces. Use cleaning method recommended by sealant manufacturer.

.2 Leave adjacent surfaces in neat and clean condition.

## 3.5 SCHEDULE

.1 Apply sealant at the following interior locations:

.1 Between dissimilar materials in exposed locations except where specifically indicated otherwise.

.2 Perimeter of exterior door, louvre and screen frames.

.3 Perimeter of interior door frame, where gap between frame and wall exceeds 2 mm, or where width of gap is inconsistent.

.4 Control joints in masonry elements, and joints between bearing and non-bearing masonry walls.

.5 Ceramic tile control joints.

.6 Perimeter of firehose cabinets, access panels, and control panels.

.7 Between vanities/countertops and wall.

.8 Where shown.

.2 At interior locations use acrylic emulsion sealant except:

.1 At floor control joints use polyurethane.

.2 At vanities/countertops and at ceramic wall tile control joints use silicone sealant.

.3 Where expected joint movement exceeds movement capability of sealant, provide sealant specified for exterior use as directed by Consultant.

**END OF SECTION**

1 General

## 1.1 SUMMARY

.1 This Section includes requirements for supply and installation of the following:

.1 Sidelight Frames for Wood Doors

## 1.2 RELATED REQUIREMENTS

.1 Section 07 92 00: Joint Sealants

.2 Section 08 14 00: Wood Doors

.3 Section 08 71 00: Door Hardware

.4 Section 09 91 00: Painting

## 1.3 DEFINITIONS

.1 Base Metal Thickness: Thickness dimensions are minimums as defined in referenced ASTM standards for both uncoated steel sheet and the uncoated base metal of metallic coated steel sheets.

.2 Opening Sizes: Standard metric door sizes indicated on Drawings are considered nominal dimensions, measured from frame rabbet width and height, with allowances for nominal clearances between head, jamb and door bottom in accordance with CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames.

## 1.4 REFERENCES

.1 American National Standards Institute (ANSI):

.1 ANSI/SDI A250.8-2014, Specifications for Standard Steel Doors and Frames (SDI-100)

.2 ANSI/SDI A250.11-2012, Recommended Erection Instructions for Steel Frames.

.2 American Society for Testing and Materials (ASTM):

.1 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.2 ASTM A879/A879M-12, Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface

.3 ASTM A924/A924M-14a, Standard Specification for General Requirements for Sheet Steel, Metallic-Coated by the Hot-Dip Process.

.3 Canadian General Standards Board (CGSB):

.1 CAN/CGSB 1.132-M90, Primer, Zinc Chromate, Low Moisture Sensitivity

.2 CAN/CGSB 41-GP-19Ma-78(1984), Rigid Vinyl Extrusions for Windows and Doors

.3 CAN/CGSB 82.5-M88, Insulated Steel Doors

.4 Canadian Standards Association (CSA):

.1 CSA W59-13, Welded Steel Construction (Metal Arc Welding)

.5 Canadian Steel Door Manufacturers Association (CSDMA):

.1 Recommended Dimensional Standards for Commercial Steel Doors and Frames, 2007

## 1.5 SUBMITTALS

.1 Provide requested information in accordance with Section 01 33 00.

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Product Data:

.1 Submit product data for each type of frame indicated.

.2 Shop Drawings:

.1 Show each type of frame, door, hardware blanking, reinforcing, tapping and drilling arrangements, metal gauges, thicknesses and finishes.

.2 Submit door and frame schedule identifying each unit. Each unit shall bear a legible identifying mark corresponding to that listed in the door and frame schedule.

.3 Samples:

.1 Supply for Consultant's review, if requested, sample of frame corner showing construction, workmanship and finish.

.4 Informational Submittals: Provide the following submittals when requested by the Consultant:

.1 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.

## 1.6 QUALITY ASSURANCE

.1 Manufacturer: Obtain hollow metal doors and frames from single source of supply and from a single manufacturer, and as follows:

.1 Fabricate work of this Section to meet the requirements of the Canadian Steel Door and Frame Manufacturer's Association, Manufacturing Specification for Doors and Frames as a minimum, and as further modified in this section.

.2 Fabricator shall be a member in good standing of the Canadian Steel Door and Frame Manufacturer's Association.

.2 Installer: Use installers who are experienced with the installation of hollow metal frames of similar complexity and extent to that required for the Project.

## 1.7 DELIVERY, STORAGE AND HANDLING

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

.2 Adequately protect units against rust and damage during manufacture, delivery and storage.

.3 Store materials on planks in a dry area and cover to protect from damage. Make good immediately any damage done. Clean scratches and touch-up with rust-inhibitive primer.

## 1.8 SITE CONDITIONS

.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.

.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.

2 Products

## 2.1 MATERIALS

.1 Sheet Steel:

.1 Interior Frames (Normal Humidity): Electrolytic zinc coated steel sheets in accordance with ASTM A879/A879M-12, Commercial Steel (CS), Class B coating; mill phosphatized; suitable for unexposed applications; stretcher levelled standard of flatness.

.2 Gauges:

.1 Door Frames:

.1 Gauge: 16 msg

.3 Touch-Up Primer: Rust inhibitive primer meeting CAN/CGSB 1.132, touch up zinc coatings using shop applied primer; grey or red coloured primer, clear primer not acceptable; provide additional primer for site touch-up to repair damaged zinc and shop applied coatings.

.4 Accessories:

.1 Door Silencers (Bumpers or Mutes): Manufacturer's standard black or grey neoprene silencers; three silencers on strike jambs of single door frames; two silencers on heads of double-door frames; stick on bumpers are not acceptable.

## 2.2 FABRICATION AND MANUFACTURE

.1 Gauges of metal shall be as specified. No deviations or substitutions will be accepted

.2 Reinforcing specified is the minimum acceptable. Provide additional reinforcement where required to ensure a permanent, rigid, trouble free installation able to withstand the stresses of heavy commercial usage.

.3 Cut, shear, straighten and work the steel in manner to prevent disfigurement of the finished work.

.4 Punch frames for rubber door bumpers.

.5 Fill seams, joints and weld depressions with epoxy metal filler, disc sand to a smooth, flat, uniform scratch-free surface, with all arrises sharp and true to line. Drilled and punches holes shall be reamed and have all burrs removed.

.6 Finished work shall be free of warp, open seams, buckles, weld and grind marks and other surface defects detrimental to the production of a good paint finish.

.7 Fastenings shall be concealed except those required for loose glazing stops.

.8 Welding shall conform to CSA W59-03 (R2008).

.9 Hardware Requirements:

.1 Blank, mortise, reinforce, drill and tap frames to receive templated hinges and other hardware as required. Check hardware lists for requirements.

.10 Frames:

.1 Fabricate frames to profiles shown. Frames shall be fabricated to suite the header conditions of masonry work. Mitre corners of frames. Cut frame mitres accurately and weld continuously on inside of frame. Fabricate header frame to suit. Where site welding or splicing is required due to size of unit, the location of field joints shall be shown on the shop drawings and strictly adhered to.

.2 Protect strike and hinge reinforcements and other openings with mortar guard boxes welded to frame.

.3 Cutouts in doors for mortise lock sets shall be fitted with leaf spring clips and back limit stop to facilitate easy positioning and setting of locksets.

.4 Weld floor clip angles to inside of each jamb profile, two holes in each for anchorage to floor. Where required provide adjustable type floor clip angles.

.5 Fit frames with channel or angle spreaders, two per frame, to ensure proper frame alignment. Install stiffener plates or spreaders between frame trim where required, to prevent bending of trim and to maintain alignment when setting and during construction.

.6 Where frames occur in masonry provide and adjustable T-strap type or wire type anchor for every 2'-0" of jamb length. Special anchors for frames to be set in concrete shall be as detailed.

.11 Finishing

.1 Shop apply zinc rich primer to repair damaged zinc coatings arising from fabrication; cure primer fully before shipping to site; include compatible primer for site finishing and correction of surface abrasions to zinc coatings and factory applied primer.

.2 Remove weld slag and splatter from exposed surfaces.

.3 Fill and sand smooth tool marks, abrasions and surface blemishes to present smooth uniform surfaces.

3 Execution

## 3.1 EXAMINATION

.1 Verify roughing-in for embedded and built-in anchor locations before installing frames.

.2 Verify door and frame size, door swing and ratings with door opening number before installing frames.

.3 Installation of hollow metal frames will denote acceptance of site conditions.

## 3.2 INSTALLATION

.1 Install steel frames, and accessories in accordance with reviewed shop drawings, ANSI A250.11, CSDMA Installation Guide, manufacturer's data, and as specified in this Section.

.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 Install studded door silencers.

.5 For frames over 1220mm (4’) in width, provide vertical support at the centre of head.

.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.

.4 Adjusting and Cleaning

.1 Immediately after installation, sand smooth any rusted or damaged areas of prime coat and apply touch up of air-drying primer compatible with factory applied primer, and as follows:

.1 Clean exposed surfaces with soap and water to remove foreign matter before site touch-up.

.2 Finish exposed site welds to a smooth uniform surface and touch-up with site applied rust inhibitive primer.

.3 Site apply touch-up primer on exposed surfaces where zinc coating or factory applied primer has been damaged during installation or handling.

**END OF SECTION**

1 General

## 1.1 SUMMARY

.1 This Section of the contract includes all wood doors and accessories indicated on the Drawings, as required to provide a complete installation.

.2 The work includes but is not limited to the following:

.1 Interior wood doors

## 1.2 RELATED REQUIREMENTS

.1 Section 08 11 00: Metal Doors and Frames

.2 Section 08 71 00: Door Hardware

.3 Section 08 81 00: Glass and Glazing

## 1.3 REFERENCES

.1 AWMAC (Architectural Woodwork Manufacturers' Association of Canada) - Quality Standards Illustrated (QSI), latest edition.

.2 CAN/CGSB-11.3-M87, Hardboard

## 1.4 SUBMITTALS

.1 Submit submittals in accordance with the General Conditions and Section 01 33 00.

.2 Shop Drawings:

.1 Submit shop drawings showing types of cores and construction details, glazing and stops, openings required, material designation and door schedules.

.3 Samples:

.1 Submit for Consultant's review, if requested, two 12" x 12" corner samples of each type of door specified herein showing construction, workmanship and finish including face veneers, core materials, edge strips and stops.

## 1.5 QUALITY ASSURANCE

.1 Except where otherwise specified, meet requirements of CAN/CSA-0132.2 Series and applicable provisions of AWMAC Quality Standards Illustrated (QSI), Custom Grade.

## 1.6 DELIVERY, STORAGE AND HANDLING

.1 Coordinate deliveries to comply with construction schedule and arrange ahead for off the ground, under cover storage location.

.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%.

.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.

.4 Label each door with manufacturers' name, product identification, door size and type.

## 1.7 EXTENDED WARRANTY

.1 Submit written warranty that doors will be free from defects in materials or workmanship in accordance with General Conditions but for a period of three (3) years.

.2 Make good defects promptly during warranty period by replacing defective doors.

.3 Defects shall include, but not be limited to delamination of edges, warp, twist, bow exceeding 1/4". "Replace" as used herein includes installing hardware, finishing, hanging and fitting.

2 Products

## 2.1 MANUFACTURERS

.1 Wood doors shall be flush, solid particle core with reinforced styles and rails to CAN/CSA 0132.2-M1990.

.2 Acceptable products and corresponding manufacturers shall be as follows:

.1 Cambridge Doors Ltd.

.2 Baillargeon Door Inc

.3 Lampton Doors

.4 Mowhawk Flush Doors

.5 VT Industries

.6 Marshfield Wood Doors

.7 JWS Manufacturing Inc.

.3 Doors of equal quality and construction are also acceptable subject to conformance to specifications and door schedule.

## 2.2 MATERIALS

.1 Conform to CAN/CSA-0132.2 Series for wood flush doors.

.2 All wood doors to be supplied from same manufacturer.

.3 Door Construction

.1 Solid Particleboard Wood Flush Doors

.1 Construction: 5 ply.

.2 Particle Board for Cores: CAN3-O188.1-M, extruded particle board having spruce particles in melamine based binder, minimum density of 480 kg/cu.m. (30 pcf).

.3 Clear hardwood edges minimum 13 mm thick.

.4 Adhesive: Type I: Waterproof phenol, resorcinol and phenol - resorcinol resin adhesive.

.4 Hardwood Face Veneer for Flush Wood Doors Scheduled to have Transparent/Stained Finish:

.1 Minimum 1/8" thick AWMAC Architectural Quality Grade, selected White Birch, Premium Grade, and No.1 back", and or other species, as indicated on drawings and conforms to requirements of AWMAC Custom Grade and NHLA Select Grade.

.2 Hardwood face veneers shall be selected for architectural quality, uniformity of colour, figure, grain, character, architectural "book matched" and all sheets numbered in sequence, parallel clipped, jointed by tapeless splicer and edge glued.

.3 Face veneers shall also have a high standard of finished appearance, including being free of, but not limited to the following; mineral streaks, discolouration, grain ruptures, loose texture, shakes, open joints, face depressions, glue stains, patches, plastic wood repairs, and any other manufacturing defects or irregularities.

## 2.3 FABRICATION

.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 Size doors for 1.6 mm clearance of heads and jambs and 9 mm at bottom. Undercut doors for air intake where indicated on Door Schedule.

.3 Wood Stiles, Rails and Hardware Reinforcement: Low density hardwood species, kiln dried to 8% moisture content.

.4 Stiles and Rails: Hardwood. Stile thickness minimum 1-1/2" and rail thickness minimum 1-1/8".

.5 Bevel vertical edges of single acting doors 3 mm in 50 mm or lock side and 1.5 mm in 50 mm on hinge side.

.6 Radius vertical edges of double acting doors to 60 mm radius.

.7 Seal wood edges and edges of cut outs before units are placed in unheated storage areas.

.8 Fabricate doors using 5 ply hot press construction technology. Bond stiles and rails to core using Type I adhesive. Sand for uniform thickness. Laminate door facing, cross banding and assembled core in hot press.

.9 Factory cut glass light openings. Ensure openings are square with internal corners slightly rounded. Provide metal glass tops, paint finished to match face veneer for vision panels in unrated doors

.10 Factory fit doors for frame opening dimensions identified on shop drawings.

.11 Provide inner blocks at lock edge and top of door closer for hardware reinforcement.

.12 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.

.1 Apply sealer in accordance with the manufacturer's printed instructions without dilution or alteration of any kind. Give particular attention to finish.

.2 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.

.13 Provide blocking for closers, panic hardware, locksets and other door hardware as required.

## 2.4 FABRICATION - DOORS FOR NATURAL OR STAIN FINISH

.1 Fabricate doors for natural or stain finish with solid cores.

.2 Provide solid wood cross banding at right angles to door face, minimum 2.5 mm (1/10") thick.

.3 Provide face veneer minimum 0.91 mm (1/28") thick of species indicated on Door Schedule.

.4 Face veneer: complying with CAN/CSA O132.2.

## 2.5 FABRICATION - FACTORY FINISH

.1 Complete fabrication of doors before applying factory finishes including, but not limited to fitting doors for openings and machining for recessed hardware.

.2 Factory finish all four edges, edges of cut outs, and mortises the same as for faces, except that stains and fillers may be omitted on bottom edges, edges of cut outs, and mortises, and as follows:

.1 Finish doors at factory that are indicated to receive finish, other than paint finish.

.3 Steam out deep scratches and ease sharp edges by sanding before starting factory finishing; block sand using 150/180 grit in direction of grain on all surfaces to remove handling marks and fingerprints.

.4 Perform filling, sanding and finishing in horizontal position wherever possible.

.5 Do not use water based primers, stains or combination stain sealers as they raise natural wood grain and may cause veneer splitting and highlighting of veneer joints.

.1 Use caution when staining Birch, Oak, or any light wood to another colour; achieve uniform colour by thoroughly block sanding veneer faces to ensure consistent fibre raise; apply thin sealer coat prior to staining to prevent blotchiness and reduce the barber pole effect; do not use penetrating stains.

.2 Use caution when working with Oak to prevent blue stain, caused when natural tannic acid in the wood comes into contact with iron and moisture:

.1 Do not use steel wool on bare wood.

.2 Do not store transparent finish in unlined metal containers.

.3 Remove blue stain prior to finishing using a solution of oxalic acid made by dissolving one part acid to 7 parts of lukewarm water; allow solution to work, rinse with clear water; dry and sand with 150/180 grit sandpaper.

.6 Transparent Finish:

.1 Grade: Premium.

.2 Staining White Birch: Unless otherwise indicated, factory finish all cabinetwork with a stain and polymerizing two component catalytic conversion varnish system; colour and sheen to be selected by Consultant. All surfaces shall be carefully prepared and sanded before and between coats to provide final finish which shall be smooth, even and uniform free of machine marks, hammer marks, depressions and imperfections.

.3 Effect: Open-grain finish.

3 Execution

**3.1 EXAMINATION**

.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.

.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 Proceed with installation only after unsatisfactory conditions have been corrected.

**3.2 INSTALLATION**

.1 Install doors and hardware in accordance with manufacturer's instructions.

.2 Accurately fit doors into frames to ensure smooth operation without binding. Doors shall have 1.5 mm clearance at head and jambs and 6 mm over finished floor surfaces unless otherwise indicated.

.3 Undercut doors where shown, and as required to accommodate floor finish thickness.

.4 Install hardware in accordance with hardware supplier's instructions.

.5 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.

.6 Adjust operable parts to ensure proper door operation. Install louvres and glazing stops where required.

**3.3 CLOSEOUT ACTIVITIES**

.1 Deficient Work: Replace, rework or refinish work that does not meet AWS requirements as directed by Consultant.

.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. 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**

1 General

## 1.1 SUMMARY

.1 This Section includes the following:

.1 Sealed double acrylic dome skylights for flat roof applications.

## 1.2 RELATED REQUIREMENTS

.1 Section 07 01 50: Maintenance Roofing Work

.2 Section 07 92 00: Joint Sealants

## 1.3 PERFORMANCE REQUIREMENTS

.1 General: Provide skylights capable of withstanding loads and thermal and structural movements indicated without failure. Failure includes the following:

.1 Deflection exceeding specified limits.

.2 Thermal stresses transferred to the building structure.

.3 Framing members transferring stresses, including those caused by thermal and structural movement, to glazing.

.4 Noise or vibration created by thermal and structural movement and wind.

.5 Loosening or weakening of fasteners, attachments, and other components.

.6 Sealant failure.

.2 Structural Loads: Provide skylights, including anchorage, capable of withstanding the effects of the following design loads when supporting full dead loads in accordance with NBC Climatic Design Data (50 year probability):

.1 Wind Loads

.2 Snow Loads

.3 Rain Loads

.4 Live Loads

.5 Seismic Loads

.3 Structural Performance: Provide skylights, including anchorage, capable of withstanding test pressure indicated without material and deflection failures and permanent deformation of structural members exceeding 0.2 percent of span when tested according to ASTM E330.

.1 Test Pressure: 150 percent of positive and negative wind-load design pressures.

.2 Test Duration: As required by design wind velocity; fastest 1 mile (1.609 km) of wind for relevant exposure category.

.4 Thermal Movement: Provide skylights that allow for thermal movements resulting from the change (range) in ambient and surface temperatures by preventing buckling, sealant failure, and other detrimental effects.

.5 Air Infiltration: Provide skylights with maximum air leakage of 0.03 L/s per sq. m (0.06 cfm/sq. ft.) of surface when tested according to ASTM E283 at a minimum static-air-pressure differential of 300 Pa (6.24 lbf/sq. ft.).

.6 Water Penetration: Provide skylights that do not evidence water penetration when tested according to ASTM E331 at a minimum differential static pressure of 20 percent of positive design wind load, but not less than 300 Pa (6.24 lbf/sq. ft.).

## 1.4 SUBMITTALS

.1 Provide required information in accordance with Section 01 33 00.

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Product Data: Include construction details, material descriptions, dimensions and profiles of components, and finishes for skylights.

.2 Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.

.1 Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

.3 Samples for Verification: For each exposed curb frame finish required, provide 305mm x 305mm (12" x 12") long samples.

.4 Preconstruction Test Reports: Indicate and interpret test results for compliance with requirements.

.5 Product Test Reports: From a qualified testing agency indicating skylights comply with requirements, based on comprehensive testing of current products.

.6 Sealant Compatibility and Adhesion Test Reports: From sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with sealants; include sealant manufacturer's interpretation of test results for sealant performance and recommendations for primers and substrate preparation needed for adhesion.

.7 Field Test Reports: Indicate and interpret test results for compliance with requirements.

## 1.5 QUALITY ASSURANCE

.1 Installer Qualifications: An experienced installer to assume engineering responsibility who has specialized in installing dome unit skylights similar to those indicated for this Project and who is acceptable to manufacturer.

.1 Engineering Responsibility: Preparation of Shop Drawings, testing program development, test result interpretation, and comprehensive engineering analysis by a qualified professional engineer, registered in the place of the work.

.2 Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E548.

.3 Preinstallation Conference: Arrange a pre-construction meeting in accordance with Section 01 31 19 Project Meetings.

.4 Review methods and procedures related to skylights including, but not limited to, the following:

.1 Inspect and discuss condition of substrate and other preparatory work performed by other trades.

.2 Review structural load limitations.

.3 Review skylight curb structural requirements.

.4 Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

.5 Review required testing procedures.

.6 Review weather and forecasted weather conditions and procedures for unfavorable conditions.

.7 Review protection of adjacent roof areas.

## 1.6 WARRANTY

.1 General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

.2 Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of skylights that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:

.1 Structural failures.

.2 Sealant failures.

.3 Failure of systems to meet performance requirements.

.4 Deterioration of finishes, and other materials beyond normal weathering.

.5 Water leakage; defined as uncontrolled water appearing on normally exposed interior surfaces of skylights from sources other than condensation. Water controlled by flashing and gutters and drained back to the exterior and that cannot damage adjacent materials or finishes is not water leakage.

.6 Warranty Period: Five (5) years from date of Substantial Completion.

2 Products

## 2.1 MANUFACTURERS

.1 Basis-of-Design products are named in this Section; additional manufacturers offering similar aluminum framed entrance and storefront systems may be incorporated into the work provided they meet the performance requirements established by the named products.

.2 Acceptable Materials Manufacturers: Subject to compliance with requirements specified in this Section and as established by the Basis-of-Design Materials, manufacturers offering products that may be incorporated into the Work include; but are not limited to, the following:

.1 Artistic Skylight Domes

## 2.2 FRAMING MATERIALS - FLAT ROOF APPLICATION

.1 Curb Frame: Rigid vinyl, high-impact extruded vinyl curb frame, incorporating 10 deg sloped condensation gutter with drainage to exterior, co-extruded rubber draft seal.

.2 Retaining Cap Frame: Extruded aluminum, 6063-T5 alloy, complete with heliarc welded corners.

.3 Curb Construction: Existing frame, unless existing frame is damaged or deteriorated.

.1 New Curb Construction: Two (2) piece construction of 1.27mm (0.05") outer and inner wall, mill finished, complete with 50mm (2") thick rigid styrofoam insulation and 75mm (3") aluminum mounting flange.

.2 Height: 305mm (12").

## 2.3 ACCESSORIES

.1 Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories; compatible with adjacent materials.

.1 Movement Joints: Provide slip-joint linings, spacers, and sleeves of material and type recommended by manufacturer.

.2 Framing-System Gaskets and Joint Fillers: Manufacturer's standard permanent gaskets and joint fillers for sliding, compression, and nonmoving joints.

.3 Framing-System Sealants: Compatible with components with which sealants come in contact and recommended by skylight and sealant manufacturers for this use.

.4 Bituminous Paint: Cold-applied asphalt mastic paint complying with SSPC-Paint 12, except containing no asbestos, and formulated for 30-mil (0.8-mm) thickness per coat.

## 2.4 DOME UNIT MATERIALS

.1 Sealed, double acrylic domes, meeting CAN/CGSB 63.14M-89 Plastic Skylights, and having the following properties:

.1 Size: 2273mm x 2273mm (89-1/2” x 89-1/2”), unless otherwise indicated on the Drawings.

.2 Acrylic Dome Colour:

.1 Clear

.3 Basis of Design Model:

.1 Flat Roof Application: Model CL Insulated Curb Skylight by Artistic.

.2 Glazing Gaskets: Manufacturer's standard pressure-glazing gaskets of elastomer type and hardness selected by skylight and gasket manufacturers to comply with requirements. Provide gasket assemblies that have corners sealed with sealant recommended by gasket manufacturer.

.3 Spacers, Edge Blocks, and Setting Blocks: Manufacturer's standard permanent nonmigrating type of elastomer type and hardness selected to comply with requirements.

.4 Weatherseal Sealant: Neutral-curing silicone sealant recommended by skylight and sealant manufacturers for this use.

**2.5 FABRICATION**

.1 Framing Components: As follows:

.1 Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.

.2 Fabricate components to drain water passing joints and to drain condensation and moisture occurring or migrating within skylight system to the exterior.

.3 Fabricate components to accommodate expansion, contraction, and field adjustment, and to provide for minimum clearance and shimming at skylight perimeter.

.4 Fabricate components to ensure that dome is thermally and physically isolated from framing members.

.5 Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.

.6 Fit and assemble components to greatest extent practicable before finishing.

.7 Fit and secure joints with screw and spline, internal reinforcement, or welding.

.8 Reinforce members as required to retain fastener threads.

.9 Where fasteners are exposed to view from interior, countersink bolt or screw heads and finish to match framing.

.10 Before shipping, shop assemble, mark, and disassemble components that cannot be permanently shop assembled.

.2 Prepare framing to receive anchor and connection devices and fasteners.

3 Execution

**3.1 EXAMINATION**

.1 Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting skylight performance.

.1 Proceed with installation only after unsatisfactory conditions have been corrected.

**3.2 PREPARATION**

.1 Metal Protection: As follows:

.1 Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.

.2 Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

.3 Where aluminum will contact pressure-treated wood, separate dissimilar materials by methods recommended by manufacturer.

## 3.3 INSTALLATION

.1 General: Comply with manufacturer's written instructions for protecting, handling, and installing skylight components.

.1 Fit frame joints to produce hairline joints free of burrs and distortion.

.2 Rigidly secure non-movement joints.

.3 Accommodate thermal and mechanical movements.

.4 Install framing components to drain water passing joints and to drain condensation and moisture occurring or migrating within skylight system to the exterior.

.5 Coordinate installation of insulation and flashings at skylight perimeters to maintain continuity of thermal and water barriers.

.6 Set continuous curbs and flashings in a full sealant bed, unless otherwise indicated. Comply with requirements in Section 07 92 00.

.2 Erection Tolerances: Install skylight components true in plane, accurately aligned, and without warp or rack. Adjust framing to comply with the following tolerances:

.1 Variation from Plane: Limit variation from plane or location shown to 3mm in 3m (1/8" in 10'); 6mm (1/4") over total length.

.2 Alignment: Where surfaces abut in line and at corners and where surfaces are separated by less than 75mm (3"), limit offset from true alignment to less than 0.8mm (1/32"); otherwise, limit offset from true alignment to 3mm (1/8").

## 3.4 FIELD QUALITY CONTROL

.1 Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field quality-control tests and to prepare test reports.

.2 Testing Agency: Engage a qualified independent testing and inspecting agency to perform field quality-control tests and to prepare test reports.

.3 Sealant Adhesion Tests: Test installed sealant in a minimum of two areas and as follows:

.1 Test structural silicone sealant according to field adhesion test method described in AAMA CW 13, "Structural Sealant Glazing Systems (A Design Guide)."

.2 Test weatherseal sealant as recommended in writing by sealant manufacturer.

.4 Water-Spray Test: Test skylights for compliance with requirements according to procedures in AAMA 501.2.

.5 Air Infiltration: Test skylights according to AAMA 503, which requires testing according to ASTM E783.

.1 Static-Air-Pressure Differential: 75 Pa (1.57 lbf/sq. ft.) minimum.

.2 Air Leakage: 0.03 L/s per sq. m (0.06 cfm/sq. ft.) of surface maximum.

.6 Water Penetration: Test skylights for compliance with requirements according to AAMA 503, which requires testing according to ASTM E1105.

.1 Uniform Static-Air-Pressure Difference: 20 percent of positive design wind load, but not less than 300 Pa (6.24 lbf/sq. ft.).

.7 Repair or replace Work that does not meet requirements or that is damaged by testing; repair or replace to comply with specifications.

## 3.5 CLEANING

.1 Clean skylights inside and outside, immediately after installation and after sealants have cured, according to manufacturer's written recommendations.

.1 Remove temporary protective coverings and strippable coatings from prefinished metal surfaces. Remove labels and markings from all components.

.2 Remove excess sealant according to sealant manufacturer's written recommendations.

**END OF SECTION**

1 General

**1.1 GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

**1.2 RELATED REQUIREMENTS**

.1 Section 06 41 00: Architectural Wood Casework

.2 Section 08 11 00: Metal Doors and Frames

.3 Section 08 14 00 Wood Doors

**1.3 QUALITY ASSURANCE**

.1 Meet requirements of Ontario Building Code and other applicable regulations.

.2 Upon completion of finish hardware installation, hardware supplier's qualified representative shall inspect work and shall certify in writing that all items and their installation are in accordance with requirements of Contract Documents and are functioning properly. This document shall be included in maintenance manuals.

**1.4 SUBMITTALS**

.1 Upon Consultant's request submit samples of finish hardware.

.2 Prepare and submit six copies of a detailed hardware schedule and cut sheets based on the drawings

.3 Furnish other Sections with templates required for hardware preparation and installation. Issue templates when requested so as not to cause any delays but not before hardware list has received final review by Consultant.

.1 Supply lever type handle for installation on teachers closet to Section 06 41 00.

.4 The Board will provide the keying schedule.

.5 Contractor will be required to carry Rivet Hardware Ltd., refer to attached Hardware schedule (Door Listing)

**1.5 PRODUCT DELIVERY, HANDLING & STORAGE**

.1 Deliver each hardware item packaged separately in individual containers with necessary screws, keys, instructions and installation templates.

.2 Mark each container with item number corresponding to number shown on hardware schedule with respective door number.

.3 Store hardware in dry, lockable area.

2 Products

**2.1 FINISH HARDWARE - GENERAL**

.1 Type: heavy duty commercial grade.

.2 Hardware shall comply with requirements of jurisdictional authorities.

.3 All door closers shall have back checking features and shall be of proper size to operate door efficiently.

.4 Confirm all kick plate and threshold sizes before ordering them.

.5 Do not use wall stops on drywall.

.6 Exposed screws for installing hardware shall have Phillips or Robertson heads.

.7 Confirm degree of swing for door holders, closers.

.8 The following products may be used. Include for preparation of doors and frames accordingly.

.1 Butt hinges: full mortise type; 4 hinges per door

.2 Locks and latch sets: Cylinder type with through-bolted trim.

.3 Overhead stop: where wall stops cannot be used, surface mounted except where door closer necessitates concealed mounting.

**2.2 KEYING**

.1 Locks shall be keyed by the Owner.

.2 Locks and cylinders shall be temporary construction grade only.

.3 P Locks and cylinders will be updated by owner near the end of construction

3 Execution

**3.1 INSTALLATION**

.1 Meet requirements of ANSI/DHI A115.1G-94 “Installation Guide for Doors and Hardware”.

.2 Confirm locations and mounting heights of finish hardware with Consultant.

.3 Install finish hardware in accordance with hardware suppliers directions. Ensure that hardware is installed correctly. Issue instructions if required to Sections concerned.

.4 Unless otherwise directed by the Consultant, or unless otherwise dictated by glass height or rail location, install finish hardware at the following heights above finish floor:

| | | |
|---|---|---|
| .1 | Locksets and Latchsets | 1025 mm to centre of strike |
| .2 | Push Plates | 1025 mm to centre of plant |
| .3 | Door Pulls | 1065 mm to centre of pull |

**END OF SECTION**

CONSULTANT : **KEVIN WILBUR**
CONTRACT # :

DATE :
REV.#1:

# RIVETT ARCHITECTURAL HARDWARE LTD.

## FINISHING HARDWARE SCHEDULE

FOR

**MURRAY CENTENNIAL PS**
**PHASE 2**
**TRENTON, ONTARIO**

ARCHITECT/ENGINEER/CONSULTANT

**AECOM**
**KPRDSB**

| **CUSTOMER :** | **SUBMITTED BY :** |
|---|---|
| | **RIVETT ARCHITECTURAL HARDWARE LTD.**<br>111 INDUSTRIAL DR., WHITBY, ONTARIO<br>CANADA L1N 5Z9<br>TEL-905-668-4455 FAX-905-668-4433 |

**kevin@rivett.com**
**OVER THIRTY-NINE YEARS OF EXCELLENCE**

# HARDWARE INFORMATION AND SPECIFICATIONS

February 5, 2018

**FINISH:** ALL FINISHES SHALL BE AS INDICATED IN THE FINISHING HARDWARE SCHEDULE BY INTERNATIONAL CODES.

**KEYING:** **PROVIDE LOCKS WITH KEYWAY SPECIFIC TO MURRAY CENTENNIAL PS FINAL KEYING BY KPRDSB.**

**INSTALLATION:** ALL HARDWARE SHALL BE INSTALLED AND ADJUSTED COMPLETE AS PER THE MANUFACTURERS PRINTED INSTRUCTIONS AND TEMPLATES, BY SKILLED CARPENTERS IN THE APPLICATION OF FINISHING HARDWARE.

**PRODUCTS:** MANUFACTURER'S PRODUCTS SHALL ALL BE AS SPECIFIED. ANY EQUALS MAYBE APPROVED IN WRITING IF THEY ARE EQUAL IN DESIGN, FUNCTION, QUALITY, AND FINISH AS LISTED HEREIN.

HINGES BY HAGER
LOCKS BY SARGENT
TRIM HARDWARE BY HAGER

**HANDLING:** WHERE DOORS AND FRAMES ARE TO BE FIELD PAINTED OR FINISHED, ALL HARDWARE SHALL BE REMOVED BY THE GENERAL CONTRACTOR, PRIOR TO SAME. AFTER FINISHING HAS BEEN COMPLETED, THE GENERAL CONTRACTOR SHALL RE-INSTALL ALL THE HARDWARE TO MANUFACTURERS RECOMMENDATIONS.

**PACKING:** LABEL ALL FINISHING HARDWARE WITH DOOR NUMBERS AND ITEM NUMBERS. THE GENERAL CONTRACTOR SHALL RECEIVE IN A LOCKED DRY STORAGE AREA AND ADVISE WITHIN 24 HOURS OF ANY SHORTAGES.

**SUBMITTAL:** BEFORE MATERIAL IS ORDERED, SUBMIT (1) ONE COPY OF THE COMPLETED HARDWARE SCHEDULE FOR FINAL APPROVAL. SUPPLY ALL NECESSARY TEMPLATES REQUIRED FOR FABRICATION.

**WARRANTY:** THE WARRANTY PERIOD SHALL BE ONE (1) YEAR GENERALLY AND TEN (10) YEARS FOR DOOR CLOSERS, THIS SHALL BE SENT TO THE GENERAL CONTRACTOR ON COMPLETION.

**OMISSIONS:** ANY ITEMS OF FINISHING HARDWARE REQUIRED FOR THIS PROJECT AND NOT INCLUDED IN THIS SPECIFICATION AND/OR SCHEDULE WILL BE ADDED TO THE CONTRACT AFTER AN APPROVED CHANGE NOTICE HAS BEEN ISSUED BY THE ARCHITECT.

**QUALITY:** PERSONNEL WHO WILL BE RESPONSIBLE FOR SCHEDULING, ORDERING AND CO-ORDINATION HARDWARE FOR THIS PROJECT SHALL BE AN EXPERIENCED HARDWARE CONSULTANT AND WITH AN EXPERIENCED HARDWARE DISTRIBUTOR BOTH OF WHICH SHALL HAVE A MINIMUM OF FIVE YEARS EXPERIENCE. THE ARCHITECT MAY REQUEST A QUALIFICATION FORM SUBMITTED.

# SYMBOLS

RIVETT ARCHITECTURAL HARDWARE LTD. February 5, 2018

## FINISHES

| B.H.M.A. | CANADIAN | U.S.A. | DESCRIPTION |
|---|---|---|---|
| 600 | CP | USP | PRIMED FOR PAINT |
| 602 | C2C | US2C | CADMIUM PLATED |
| 603 | C2G | US2G | ZINC PLATED |
| 605 | C3 | US3 | BRIGHT BRASS CLEAR COATED |
| 606 | C4 | US4 | SATIN BRASS CLEAR COATED |
| 609 | C5 | US5 | SATIN BRASS BLACKENED CLEAR COAT |
| 612 | C10 | US10 | SATIN BRONZE CLEAR COATED |
| 613 | C10B | US10B | OXIDIZED SATIN BRONZE OIL RUBBED |
| 619 | C15 | US15 | SATIN NICKEL PLATED CLEAR COATED |
| 625 | C26 | US26 | BRIGHT CHROMIUM PLATED |
| 626 | C26D | US26D | SATIN CHROMIUM PLATED |
| 627 | C27 | US27 | SATIN ALUMINUM CLEAR COATED |
| 628 | C28 | US28 | SATIN ALUMINUM CLEAR ANODIZED |
| 629 | C32 | US32 | BRIGHT STAINLESS STEEL |
| 630 | C32D | US32D | SATIN STAINLESS STEEL |
| 689 | SBL | USP28 | ALUMINUM PAINT |
| 690 | DBL | USP20 | DARK BRONZE PAINT |

## HANDING

| | | | |
|---|---|---|---|
| LH | LEFT HAND | LHA | LEFT HAND ACTIVE |
| RH | RIGHT HAND | RHA | RIGHT HAND ACTIVE |
| LHR | LEFT HAND REVERSE | LHRA | LEFT HAND REVERSE ACTIVE |
| RHR | RIGHT HAND REVERSE | RHRA | RIGHT HAND REVERSE ACTIVE |

## WORDS

| | | | |
|---|---|---|---|
| ALUM | ALUMINUM | NRP | NON REMOVABLE PIN |
| ASA | ASA STRIKE | PR | PAIR |
| BS | BACKSET | SEC | SECTION |
| CC | CANCELED | SGLE | SINGLE |
| CYL | CYLINDER | STD | STANDARD |
| DA | DOUBLE ACTING | TB | THRU BOLTS |
| DS | DEAD STOP | ULA | UNDERWRITERS LABELED 3 HOUR RATED |
| EA | EACH | ULB | UNDERWRITERS LABELED 1 1/2 HOUR RATED |
| ELEV | ELEVATION | ULC | UNDERWRITERS LABELED 3/4 HOUR RATED |
| HDWE | HARDWARE | ULD | UNDERWRITERS LABELED 1/3 HOUR RATED |
| HO | HOLD OPEN | UL | UNDERWRITERS FIRE LABELED |
| MM | MILLIMETERS | 161 | STANDARD CYLINDER LOCK CUTOUT |

## DOORS & FRAMES

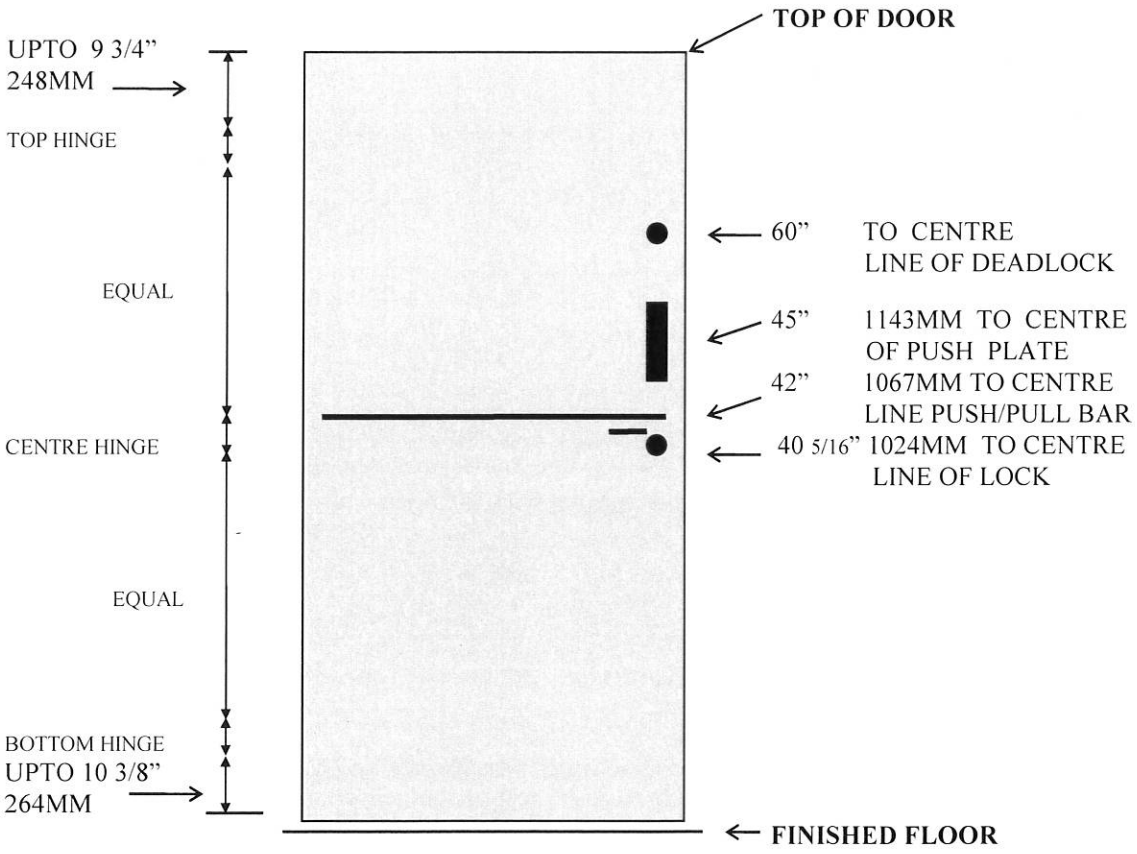
| | | | |
|---|---|---|---|
| FS | FRAME SINGLE "KD" | FD | FRAME DOUBLE "KD" |
| FSW | FRAME SINGLE WELDED | FDW | FRAME DOUBLE WELDED |
| FSWTH | FRAME SINGLE WELDED THERMO | FDWTB | FRAME DOUBLE WELDED THERMO |
| FSTB | FRAME SINGLE THERMO "KD" | FDWDE | FRAME WELDED DOUBLE EGRESS |
| FSDW | FRAME SINGLE DRYWALL | FDWCS | FRAME WELDED CONTRA SWING |
| FSDWW | FRAME SGLE DRYWALL WELDED | FDDW | FRAME DOUBLE DRYWALL "KD" |
| D | DOOR "D" SERIES HONEYCOMB CORE | -14 | 14 GAUGE STEEL DOOR OR FRAME |
| H | DOOR "H" SERIES STEEL STIFFENED | -16 | 16 GAUGE STEEL DOOR OR FRAME |
| E | DOOR "E" SERIES EMBOSSED | -18 | 18 GAUGE STEEL DOOR OR FRAME |
| Z | DOOR "Z" SERIES STEEL STIFFENED | -20 | 20 GAUGE STEEL DOOR OR FRAME |
| M | FLUSH FACE DOOR | PSF | PRESSED STEEL FRAME |
| G | HALF LITED DOOR | WF | WOOD FRAME |
| NL | NARROW LITED DOOR | HMD | HOLLOW METAL DOOR |
| L | LOUVERED DOOR | HCWD | HOLLOW CORE WOOD DOOR |
| 2G | TWO LITED DOOR | SCWD | SOLID CORE WOOD DOOR |
| V | VIEW LITED DOOR | PL | PLASTIC LAMINATED DOOR |
| KD | KNOCK DOWN | FR | FRAME |
| TRR | TEMPERATURE RISE RATED | CIF | CHANNEL IRON FRAME |
| STC | SOUND TRANSMISSION | DR | DOOR |

## KEYING

| | | | |
|---|---|---|---|
| GGMK | GREAT GRAND MASTER KEY | KD | KEYED DIFFERENT |
| GMK | GRAND MASTER KEY | KA | KEYED ALIKE |
| MK | MASTER KEY | CMK | CONSTRUCTION MASTER KEY |
| EMK | EMERGENCY MASTER KEY | SK | SEPARATE KEY NO MASTERS |
| BK | BLOCK-O KEYED | CC | CONSTRUCTION CORE |
| RM | REMOVABLE CORE | CK | CUT KEYS |

# HARDWARE LOCATION DIAGRAM

RIVETT ARCHITECTURAL HARDWARE LTD. February 5, 2018




ALL HARDWARE MOUNTING LOCATIONS SHALL BE AS PER LOCATIONS DIAGRAM AND HELD CONSISTENT THROUGHOUT THE PROJECT, UNLESS INDICATED ELSEWHERE IN THE ARCHITECTS DRAWINGS, FINISHING HARDWARE SCHEDULE OR AS DIRECTED BY

# Rivett Architectural Hardware Ltd.

## Door Listing

## MURRAY CENTENNIAL PS - PHASE 2 - TRENTON, ONTARIO

**Schedule** 90718
**Date** Feb 05-18

| Door | Set Number |
|---|---|
| | 3 |
| D113 | 1 |
| D120 | 2 |
| D120A | 1 |
| D120B | 1 |
| D121 | 1 |
| D121A | 2 |

**Rivett Architectural Hardware Ltd.**
**Hardware Schedule**
**MURRAY CENTENNIAL PS - PHASE 2 - TRENTON, ONTARIO**

**Schedule** **90718**
**Date** **Feb 05-18**

**Set #** **1**

1 SINGLE DR # D113 CORRIDOR H4 FROM CLASSROOM 113 LHR
1 SINGLE DR # D120A CORRIDOR H5 FROM KINDERGARTEN 120 RHR
1 SINGLE DR # D120B CORRIDOR H5 FROM KINDERGARTEN 120 LHR
1 SINGLE DR # D121 CORRIDOR H5 FROM KINDERGARTEN 121 RHR

4 -950 x 2150 x 45 x D1/WD DR x EXIST/PSF x 20min
GC to confirm size, hinge and lock locations

| | Qty | | |
|---|---|---|---|
| : : | 12 | EA HINGE | BB1168-114 X 101- 626 |
| : : | 4 | EA OFFICE LOCKSET | 28 X 11G05 X LL X 626 |
| : : | 4 | EA SURFACE STOP | 904S X 630 |
| : : | 4 | EA KICKPLATE | 190S X 203 X 914 X 630 |

**Set #** **2**

1 SINGLE DR # D120 KINDERGARTEN 120 TO W/RM 120A RH
1 SINGLE DR # D121A KINDERGARTEN 121 TO W/RM 121A LH

2 -813 x 2150 x 45 x D2/WD DR x F1/PSF

| | Qty | | |
|---|---|---|---|
| : : | 6 | EA HINGE | BB1279-114 X 101- 626 |
| : : | 2 | EA LATCHSET | 28 X 11U15 X LL X 626 |
| : : | 2 | EA WALL STOP | 232W X 626 |

**Set #** **3**

2 SINGLE DR # IN CLASSROOM 113
2 SINGLE DR # IN KINDERGARTEN 120
2 SINGLE DR # IN KINDERGARTEN 121

6 -914 x 2065 x 35 x D1/WD DR
doors by millwork supplier

| | Qty | | |
|---|---|---|---|
| : : | 18 | EA HINGE | BB1279-88 X 88-626 |
| : : | 6 | EA STOREROOM LOCKSET - 13/8" dr | 28 X 7G04 X LL X 626 |

1 General

## 1.1 SUMMARY

.1 Furnish glazing materials and accessories to complete the fabrication and installation of:

.1 Wood Doors

## 1.2 RELATED REQUIREMENTS

.1 Section 07 92 00: Joint Sealants

.2 Section 08 14 00: Wood Doors

## 1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM):

.1 ASTM C542-05(2011), Standard Specification for Lock-Strip Gaskets

.2 ASTM C920-11, Standard Specification for Elastomeric Joint Sealants

.2 Canadian General Standards Board (CGSB):

.1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass

.2 CAN/CGSB-12.3-M91, Flat, Clear Float Glass

## 1.4 SUBMITTALS

.1 Submit submittals in accordance with the requirements of Section 01 33 00.

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Product Data: Submit manufacturer's product data for each type of product specified. Data shall indicate compliance with specification and installation recommendations of manufacturer of products being used.

.2 Samples: Submit samples of materials if required by Consultant before commencing work of this section. Samples shall be clearly labeled with manufacturer's name and type.

.3 Shop Drawings: Submit shop drawings, to the Consultant for review prior to fabrication.

.4 Samples for Initial Selection: Submit samples for initial selection by Consultant:

.1 Submit samples of spandrel glass coatings for review and acceptance by Consultant prior to ordering.

.5 Samples for Verification: Submit samples for verification including sample sets showing the full range of variations expected where products involve normal colour variations.

.6 Maintenance Data: Upon completion of installation, supply instructions covering re-glazing, adjustments and other relevant maintenance data.

## 1.5 QUALITY ASSURANCE

.1 Conform to the requirements of the Flat Glass Marketing Association Glazing Manual, latest Edition.

## 1.6 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: Deliver packaged materials in their original containers with manufacturer's labels and seals intact.

.2 Storage and Handling Requirements: Store vertically, blocked off the floor in a weatherproof enclosure in original containers with manufacturers labels and seals intact until read for installation, and as follows:

.1 Install glass as soon as possible after delivery to site.

.2 Handle glass carefully to its place of installation.

.3 Prevent damage to glass, adjacent materials and surfaces.

**1.7 SITE CONDITIONS**

.1 Ambient Conditions: Maintain temperature, humidity and solar exposure conditions of Glass Glazing materials during shipping, storage and site installation as required by manufacturer to maintain warranty and performance of installed products.

**1.8 WARRANTY**

.1 Provide manufacturer’s warranty for the following types of glass listed, against defects in materials and workmanship for the period indicated, commencing from the date of Substantial Performance of Work:

.1 Seal Failure: Failure of hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions.

.2 Evidence of Failure: Obstruction of vision by dust, moisture, or film on interior surfaces of glass.

.3 Allowable Specific Exclusions: Breakage resulting from thermal stress will be accepted as a limitation to the warranty in accordance with CAN/CGSB 12.20.

.4 Warranty Period: Ten (10) Years.

2 Products

**2.1 MATERIALS**

.1 Float Glass: In accordance with CAN/CGSB-12.3, glazing quality and as follows:

.1 Clear Glass: No tint

.2 Tempered Glass:

.1 Minimum 1/4" thick, clear, conforming to CAN/CGSB-12.1, Type 2, Class 'B'. Tempering shall be performed using horizontal tong free method. Provide 1/2" where indicated on drawings.

.3 Gaskets:

.1 Neoprene/EPDM thermoplastic rubber type gaskets of sufficient thickness to be compressed 25% when installed, having 2,000 psi tensile strength, with 50 durometer shore A hardness plus/minus 5, maximum 30% resistance to permanent set, resistance to ozone without cracking, minimum elongation at break of 300% and conforming to ASTM C542.

.2 Colour - "Black".

.4 Sealant:

.1 One component, silicone base, solvent curing sealant conforming to ASTM C920. Colour as selected Later by Consultant.

.5 Glazing Compound:

.1 Non-hardening modified oil type glazing compound.

.6 Setting Blocks:

.1 Neoprene/EPDM rubber type, 4" long, with 40 to 50 durometer shore A hardness plus/minus 5; resistant to sunlight, weathering, oxidation and permanent deformation under load and wide enough to extend from fixed stop to opposite face of glass of thickness suitable to glazing condition to provide adequate glazing "bite".

.7 Spacer Shims:

.1 Neoprene/EPDM rubber type, with 40 to 50 durometer shore A hardness plus/minus 5; resistant to sunlight, weathering, oxidation and permanent deformation under load and of adequate thickness to provide correct glass to face clearance at least 1/8".

.8 Glazing Tape:

.1 Macro-polyisobutylene preformed glazing tape, 'Polyshim' or 'Vision Strip' by Tremco Ltd., division of RPM Company, or approved equal.

### 2.2 FABRICATION AND MANUFACTURE

.1 Label each light of glass with the registered name of the product and the weight and quality of the glass.

.2 Check dimensions on site before cutting materials.

.3 Minimum bite or lap of glass on stops and rabbets as recommended by glass manufacturer. Finish surfaces shall be free of tong marks.

.4 Cut glass true to dimensions, square, plumb and level. Verify all dimensions prior to fabrication.

.5 Distortion, pock marking or defects detrimental to appearance and/or performance, as determined by the Consultant, will be rejected.

## 3 Execution

### 3.1 EXAMINATION

.1 Examine areas of work affecting the work of this section. Report in writing all defects, errors and discrepancies immediately to the Consultant.

.2 Commencement of work implies acceptance of surfaces and conditions.

### 3.2 PREPARATION

.1 Openings shall be free from moisture, frost, rust, dirt and foreign matter.

.2 Clean surface to receive sealant with a clean cloth dampened with xylol or a 50-50 mixture of acetone and xylol. Wipe dry with a clean, dry cloth.

### 3.3 INSTALLATION

.1 Conform to the recommendation of the glazing manual, Flat Glass Marketing Association, latest edition and as specified herein.

.2 Unless otherwise indicated on drawings otherwise, provide tempered glass at all doors, transoms, sidelights and vision lites within 2'-6" of grade and/or finished floor.

.3 Glaze doors scheduled to be glazed.

.4 Set sheet glass with draw lines horizontal.

.5 Glaze interior openings using compound or glazing tapes or gaskets.

.6 Install removable stops. Insert spacer shims between glass and stops at 24" O.C. and not less than 1/4" below "sight lines". Fill remaining voids with sealant or glazing compound to "sight lines" and trim sealant/glazing compound to produce clean, sharp, straight lines without voids or depressions.

.7 Replace loose stops in their original positions, tighten all screws.

.8 Refer to drawings and door and frame schedule for locations of each type of glass.

## 3.4 CLEANING

.1 Repair all defects caused by the work of this section. Remove as work progresses, all excess or foreign materials or droppings which would set or become difficult to remove from surfaces at time of final cleaning.

.2 Immediately prior to acceptance of work of this section by Consultant, remove temporary protection, clean and polish exposed surfaces of all work of this section. Use proper cleaning materials and methods to prevent damage to surfaces, finishes, sealer or work of other trades. Make good such damage to Consultant's satisfaction.

.3 Do not use steel wool, wire brushes or steel scrapers on any finished surfaces.

.4 Replace or make good to Consultant's satisfaction, upon completion of work of this section, all defective, scratched or damaged work, at no extra cost to the Owner.

**END OF SECTION**

1 General

**1.1 GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

**1.2 RELATED REQUIREMENTS**

.1 Section 04 20 00: Masonry

.2 Section 06 41 00: Architectural Wood Casework

.3 Section 07 21 00: Thermal insulation

.4 Section 07 84 00: Firestopping

.5 Section 07 92 00 Joint Sealants

.6 Section 08 11 00: Metal Doors and Frames

.7 Section 08 14 00: Wood Doors

.8 Section 09 91 00: Painting

**1.3 DEFINITION**

.1 Drywall = gypsum board.

**1.4 WORKMANSHIP STANDARDS**

.1 Interior metal framing and furring: comply with applicable requirements of ASTM C754 and ASTM C840 unless otherwise shown.

.2 Gypsum board application and finishing: comply with requirements of ASTM C840, unless otherwise shown.

**1.5 PRODUCT HANDLING & STORAGE**

.1 Handle gypsum board panels to prevent damaged and broken edges.

.2 Store materials in dry place so as to preserve their quality and fitness for work.

**1.6 JOB CONDITIONS**

.1 Install and finish gypsum board when ambient temperature is between 14 and 22$^{o}$C. Maintain this temperature range in areas to receive gypsum board for 24 hours before and during application and until joint cement and adhesives are fully cured.

.2 Apply gypsum board after building has been completely enclosed. Ensure that work to be concealed by gypsum board has been installed, tested, inspected and approved before starting work.

2 Products

**2.1 FRAMING, FURRING AND TRIM**

.1 Unless otherwise specified, provide framing members of minimum 0.5 mm core thickness steel hot dip galvanized (wipe coat) to ASTM A653.

.2 Studs, interior locations: channel shaped screw-on type: depth as indicated; with knurled supporting flanges at least 34 mm wide; with service pass-through holes at 610 mm o.c. in web. Provide minimum 0.9 mm thick studs where stud depth exceeds 92 mm and where cementitious board and abuse resistant gypsum board is supported.

.3 Top and bottom runners: channel sections, 35 mm legs. Depth to suit studs. Provide oversized top runner where required to accommodate deflection of structure.

.4 Rough framing members: 38 x 19 x 1.2 mm and 19 x 13 x 1.2 mm galvanized steel channels.

.5 Furring and strapping members to receive gypsum board: 19 mm deep channel shaped section with outstanding flanges and 35 mm wide knurled supporting face.

.6 Corner beads: beaded angle with perforated flanges.

.7 Casing beads: channel shaped; beaded corners.

.8 Hangers: minimum 3 mm galvanized steel wire.

.9 Tie wire: minimum 1.5 mm soft annealed galvanized steel.

.10 Metal control joint section: bellows shaped section with perforated flanges.

.11 Reveal mouldings: extruded aluminum, profiles as indicated, by Fry, Gordon or Pittcon Softforms.

**2.2 GYPSUM BOARD**

.1 Exposed gypsum board for interior use: tapered edge; ASTM C1396.

.2 Unexposed gypsum board for interior use: backing board: ASTM C1396.

.3 Abuse resistant gypsum board: 16 mm thick fire rated with tapered edge: Fiberock VHI by CGC.

**2.3 FASTENING & FINISHING MATERIALS**

.1 Drywall screws: self-drilling, self-tapping, case hardened. Use zinc, nickel or cadmium plated screws for fastening of gypsum sheathing and cementitious board.

.2 Laminating adhesive: CGC Durabond 90 compound by Canadian Gypsum Co.Ltd., or similar by Westroc or Domtar.

.3 Joint tape: 50 mm perforated type.

.4 Joint filler and topping cement: vinyl or latex base, slow setting.

.5 Joint Compound for Interior Gypsum Board: Conforming to ASTM C475 and as recommended by gypsum wallboard, fire-rated gypsum wallboard and exterior wallboard manufacturers to suit conditions.

**2.4 ACOUSTICAL MATERIALS**

.1 Acoustic Insulation: As indicated in Section 07 21 00.

.2 Caulking: to CAN/CGSB-19.21-M87: Acoustical Sealant by Tremco, or CGC Acoustical Sealant.

.3 Steel deck closures: Emseal 25V Expanding Foam Sealant, sized and shaped to fit flutes.

**2.5 THERMAL BREAK**

.1 Adhesive face rubberized cork 3 mm thick or self adhesive closed cell neoprene sponge tape "Permastik" 122X by Jacobs and Thompson Ltd., or foamed vinyl tape "Arnofoam" by Arno Adhesive Tape Inc.

3 Execution

**3.1 METAL FRAMING**

.1 General:

.1 Framing and furring indicated is schematic and shall not be considered exact or complete. Location and spacing of members, bracing, supports and securement shall be in accord with referenced standards as required to provide complete and finished work.

.2 Make provision for supporting recessed and surface mounted fixtures and equipment. Provide additional framing, supports and stiffeners as required.

.3 Neatly frame around recessed fixtures and openings.

.2 Partitions:

.1 Unless specified or shown otherwise, extend steel studs to underside of structural slab or deck above. Make provisions to accommodate structural creep and deflection.

.2 All steel studs shall be spaced at 400 mm maximum, except where indicated otherwise. At curved walls/partitions space studs closer so as to maintain uniform curvature.

.3 Install runner channels at top and bottom of partition and secure to supporting building elements at maximum 610 mm o.c.

.4 At partition corners extend one runner channel to end of corner and butt other runner channel; allow clearance for gypsum board thickness; do not mitre runner channels.

.5 Install steel studs vertically; fix studs to runner channels by crimping or screwing on both sides of stud.

.6 Install additional studs as detailed and required at partition intersections, openings and terminations at dissimilar materials. Place studs not more than 50 mm from abutting walls, openings and each side of corners.

.7 Stiffen partitions over 3.6 m in height at mid-height with at least one 19 mm horizontal bracing channel extending full length of partition.

.3 Bulkheads, Coves, Furring:

.1 Frame to profiles shown, rigid, square, true to line and securely fastened to supporting building elements.

.2 Space furring members to receive gypsum board at maximum 610 mm o.c.

.3 Provide rough framing and bracing members as required to ensure stability and accuracy of work.

## 3.2 GYPSUM BOARD INSTALLATION

.1 Unless otherwise specified, erect gypsum board vertically or horizontally, whichever results in fewer end joints.

.2 Locate board end joints over supporting members.

.3 Cut and fit gypsum board as required to accommodate other work.

.4 Unless otherwise shown or specified, extend gypsum board on both sides of partitions to underside of structural deck above. Fasten gypsum board to studs, not to top channel. Allow for 13 mm deflection.

.5 Do not install gypsum board until wood blocking or other back-up components are installed. Remove and reinstall gypsum board at no extra cost to Contract where this requirement is not complied with.

.6 Provide corner beads at external corners.

.7 Provide casing beads around openings and where gypsum board abutts dissimilar material and construction.

.8 Fasten gypsum board to supports with screws spaced at maximum 305 mm o.c.

.9 Install gypsum sheathing horizontally at outside of exterior wall steel studs. Fasten each board at each stud with minimum 3 screws.

.10 Adhesive bonded gypsum board; apply 13 x 13 mm ribbons of laminating adhesive to back side of board, parallel to long dimension; space adhesive ribbons at max.150 mm o.c. temporarily brace boards until complete adhesive bond develops.

## 3.3 GYPSUM BOARD FINISHING

.1 Tape and fill exposed joints, fastener heads, edges, corners, to produce an acceptable surface ready for decoration.

.2 Conceal exposed flanges of corner beads, casing beads and other trim sections with at least 3 coats of cement, feathered out minimum 200 mm.

.3 Fill depressions at fastener head with cement, then apply 2 additional coats of cement to produce smooth, level surface.

.4 Treat joints using 3 coat method as follows:

.1 Apply thin uniform layer of cement and embed joint tape.

.2 Immediately apply thin skim coat of cement over tape and allow to dry.

.3 Apply 2 additional coats of cement. Allow first coat to dry before applying second coat.

.5 Sand each coat of topping cement with fine sandpaper as required to produce smooth surface. Do not sand paper face of gypsum board.

.6 Finish concealed fastener heads at fire rated gypsum board elements in manner specified for exposed work.

.7 Finish concealed joints at fire rated and at acoustically insulated gypsum board elements in manner specified for exposed work.

## 3.4 CONTROL AND RELIEF JOINTS

.1 Control Joints:

.1 Provide control joints where shown and at maximum 8 m o.c.

.2 Break continuity of gypsum board and framing system at control joints; install continuous metal control joint section.

.2 Relief Joints:

.1 Provide relief joints where shown and where gypsum board assemblies abutt dissimilar construction.

.2 Stop gypsum board 6 mm from abutting construction at dissimilar building elements, unless otherwise indicated.

.3 Where gypsum board comes into contact with window frames or exterior door/screen frames install thermal break. Adhere self-sticking tape to casing bead and compress during installation of gypsum board.

.4 Where indicated, install reveal mouldings.

## 3.5 SOUND CONTROL

.1 Acoustical Insulation: Provide acoustical insulation in gypsum board partitions and ceilings as indicated. Unless otherwise noted provide 50 mm thick insulation. Extend acoustical insulation over full height of partition, including portions located above ceiling.

.2 Acoustical Caulking:

.1 Provide acoustical caulking at all partitions, bulkheads and ceilings scheduled to receive acoustical insulation as follows:

.1 At perimeter of gypsum board partitions and ceilings.

.2 Around objects penetrating gypsum board elements.

.2 Provide 2 bead caulking system around horizontal and vertical perimeters of partitions. Apply continuous sealant beads at each side of horizontal runner tracks and vertical end studs, between gypsum board and adjacent construction.

.3 Caulk around objects such as electrical outlets, light switches, electrical and mechanical panels and boxes, grilles, and other objects penetrating. Caulk behind metal control joint sections.

.3 Where acoustically insulated partitions meet steel deck running perpendicularly to partition, provide steel deck closures.

## 3.6 DOOR FRAMES / ACCESS DOORS

.1 Install steel door frames occurring in gypsum board partitions. Follow installation requirements specified in Section 08 11 00.

## 3.7 GYPSUM BOARD SCHEDULE

.1 Use abuse resistant gypsum board where indicated.

.2 Unless otherwise specified or shown, provide 16 mm thick standard gypsum board.

**END OF SECTION**

1 General

**1.1 GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

**1.2 RELATED REQUIREMENTS**

.1 Section 03 35 00 Concrete Finishing

.2 Section 07 92 00: Joint Sealants

**1.3 QUALITY ASSURANCE**

.1 Installer Qualifications: not used

**1.4 SUBMITTALS**

.1 Of each type of tile required, submit sample consisting of minimum 4 tiles bonded to rigid board back-up and joints filled with grout. Select tiles to show full range of tile to be used. Resubmit sample if required until tile range and group colour is approved by the Consultant.

.2 Submit list of mortar mixes and grouts to be used. In each case products proposed must be suitable for the purpose intended and they shall be capable to produce top quality work. Upon Consultant's request submit evidence of material manufacturer's endorsement of products proposed.

.3 Upon Consultant's request submit samples of bases, trim and fittings.

.4 Maintenance materials: provide an additional 2% of each type/colour tile required. Clearly identify each package and store where directed. Obtain receipt.

**1.5 JOB CONDITIONS**

.1 Maintain minimum air temperature of 10$^{o}$C during installation and curing period.

.2 Exclude construction traffic from areas to receive tile during installation and curing period.

.3 Protect tile flooring subjected to construction traffic with non-staining protective covers.

2 Products

**2.1 MATERIALS**

.1 Products by Laticrete listed herein are specified to establish a standard of acceptance. Equivalent products, subject to Consultant's review, by Mapei and H.B. Fuller (TEC) are also acceptable.

.2 Water: potable and non-staining.

.3 Portland cement: CAN/CSA-A5-03.

.4 Sand: CSA A82.56-M1976.

.5 Thick bed mortar: high strength latex-portland cement mix: Laticrete 226/3701/8510.

.6 Thin set mortar: latex-portland cement mix: Laticrete 211/4237.

.7 High strength mortar: 100% solids epoxy adhesive: Latapoxy 300.

.8 Organic adhesive: latex adhesive to ANSI A136.1: Laticrete 15 Multi-Mastic.

.9 Wall grout: Unsanded dry set, coloured: Laticrete 600 Series/1776 or by TEC. Colours selected by Consultant.

.10 Control joints: Schlüter DILEX-BWB, height to suit tile thickness, colour selected by Consultant.

.11 Primer: ECO Prim Grip by Mapei.

.12 Floor Tiles and Bases:

.1 Size: 12” x 12”

.2 Series, Colours and Manufacturers: As selected by the Consultant.

.13 Cleaning compound: TTMAC 1001

**2.2 MIXES**

.1 Mortar and grout: mix using suitable mechanical mixers in accordance with material manufacturer's directions.

.2 Place liquid into mixer, start mixer and add dry material. Mix only long enough to wet out batch; do not overmix. Dump mixed material from mixer promptly and clean out mixer with water after each batch.

3 Execution

**3.1 PREPARATION**

.1 Substrates shall be clean and free of foreign matter and minimum 10°C.

.2 Clean substrates as required to produce acceptable surface.

.3 Where substrate conditions require it, apply levelling coat and allow to cure.

**3.2 TILE INSTALLATION**

.1 Unless otherwise specified, meet applicable requirements of TTMAC Tile Installation Manual 09°30°00; 2016-17 edition.

.2 Bond tiles to substrate in accordance with mortar / adhesive manufacturer's directions and as follows:

.1 All locations except where indicated otherwise: thin set mortar.

.3 Finished work shall be level, plumb, true, square and free of defective, chipped, broken, discoloured or blemished tiles. Maximum allowable finished surface variation shall be 3 mm in 3 m when measured, in any direction, with a 3 m straightedge.

.4 Lay out tile patterns symmetrically within each area and to patterns shown. Unless otherwise indicated provide stacked pattern. Provide checkerboard pattern at quarry tile floors.

.5 Joints shall be parallel, uniform, neat, straight, square and of width directed by Consultant.

.6 Fit tile neatly against and around interruptions, penetrations and abutting dissimilar surfaces. Wherever possible, drill holes for penetrating elements to ensure neat fitting.

.7 After setting, sound tiles and replace hollow backed tiles.

.8 Provide tile manufacturer's standard trim pieces at changes in direction and at terminations. Unless otherwise indicated provide the following corner and edge conditions:

.1 Internal horizontal corners: coved joint.

.2 External vertical and horizontal corners and edges: bullnose.

.3 Internal vertical corners and unexposed edges: square butt joint.

.4 At steps provide tread tiles complete with right and left angle corner tiles where required.

.9 Where tile abuts dissimilar flooring, install edge strip.

**3.3 CONTROL JOINTS**

.1 Provide control joints at substrate control joint locations, at abutting dissimilar materials and at maximum 8 m in tile field. Review control joint locations with Consultant prior to start of work.

.2 Install control joints as recommended by material manufacturer. Set control joints slightly lower than finish tile surface.

## 3.4 GROUTING

.1 Commence grouting not earlier than 24 hours after setting tiles unless otherwise directed by grout manufacturer.

.2 Force grout into joint so as to fill them flush, leaving no voids.

.3 Promptly as work progresses remove excess grout from adjacent tile surfaces before grout establishes tight permanent adhesion.

.4 Cure grout in accord with manufacturer's directions.

.5 Provide epoxy grout for all floor joints.

## 3.5 CLEANING

.1 Thoroughly clean and polish all ceramic tile surfaces in accordance with material manufacturer's recommendations.

.2 Remove grout haze from exposed tile surfaces; use acid wash if necessary.

**END OF SECTION**

1 General

## 1.1 SUMMARY

.1 This Section includes requirements for supply and installation of ceilings consisting of acoustic panels, complete with exposed suspension system and trim.

## 1.2 RELATED REQUIREMENTS

.1 Section 05 50 00: Metal Fabrications

.2 Section 09 21 16: Gypsum Board Assemblies

## 1.3 QUALITY ASSURANCE

.1 The Contractor executing work of this Section shall have a minimum of five (5) years continuous Canadian experience in successful and installation of work of type and quality shown and specified. Submit proof of experience upon Consultant's request.

.2 Comply with applicable requirements of ASTM C636.

## 1.4 SUBMITTALS

.1 Submit submittals in accordance with the General Conditions and Section 01 33 00.

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Product Data: Submit product data for each type of product specified.

.2 Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling mounted items indicating the following:

.1 Ceiling suspension system members.

.2 Method of attaching suspension system hangers to building structure.

.3 Ceiling mounted items including light fixtures; air outlets and inlets; speakers; sprinklers; and special mouldings at walls, column penetrations, and other junctures of acoustic ceilings with adjoining construction.

.3 Samples for Initial Selection: Manufacturer's colour charts consisting of sections of acoustic panels, suspension systems, and trim showing the full range of colours, textures, and patterns available for each type of ceiling assembly indicated.

.4 Samples for Verification: Full size units of each type of ceiling assembly indicated; in sets for each colour, texture, and pattern specified, showing the full range of variations expected in these characteristics:

.1 150mm (6") square samples of each acoustic panel type, pattern, and colour.

.2 Set of 305mm (12") long samples of exposed suspension system members, including trim, for each colour and system type required.

.5 Maintenance and Materials:

.1 Provide five percent (5%) of each type of acoustic ceiling panels and two percent (2%) of each suspension system and trim for future repairs. Identify cartons and place where directed by the Owner.

.2 Maintenance materials shall be of same production run as installed materials.

## 1.5 DELIVERY, STORAGE, HANDLING AND PROTECTION

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

.2 Materials shall be carefully checked, unloaded, stored and handled to prevent damage. Protect materials with suitable non-staining waterproof coverings.

.3 Store material in original, undamaged containers or wrappings with manufacturer's seals and labels intact.

### 1.6 SITE CONDITIONS

.1 Install ceiling systems after building has been completely enclosed and not before cementitious building elements are complete and cured and humidity levels are acceptable in the opinion of the Consultant.

.2 Ensure that work to be concealed by ceiling systems has been installed, tested, inspected and approved before starting work.

## 2 Products

### 2.1 MANUFACTURERS

.1 Acceptable Materials Manufacturers: Subject to compliance with requirements specified in this Section, manufacturers offering products that may be incorporated into the Work include the following:

.1 Armstrong World Industries, Inc.

.2 Chicago Metallic

.3 CertainTeed

.4 CGC Ceilings, a USG Company

### 2.2 DESIGN CRITERIA

.1 Superimposed Loads: Determine superimposed loads applied to suspension systems by components of the building and verify that adequate hangers are installed to support additional loads in conjunction with normal loads of the ceiling system, and as follows:

.1 Maximum Deflection: Limit deflection to L/360 in accordance with ASTM C635 deflection test.

### 2.3 MATERIALS

.1 Acoustic Panels (ACT-1): Provide manufacturer's standard panels of configuration indicated in accordance with ASTM E1264 classifications as designated by the nominal values for types, patterns, acoustic ratings, and light reflectance class listed in this Section; with flame spread rating of 25 or less and smoke developed rating of 50 or less when tested in accordance with CAN/ULC S102 and as follows:

.1 Physical Properties: Type: III; Form: 2; Pattern C, D

.2 Dimensions: 24" x 48" x 5/8"

.3 Edge Profile: Square Edge

.4 Colour: White.

.5 Acoustic and Visual Performance (Minimum Nominal):

.1 Noise Reduction Coefficient: 0.55

.2 Ceiling Attenuation Class: 35

.3 Light Reflectance: 0.82

.6 Basis of Design Material: Cortega 769 by Armstrong World Industries, Inc., or CGC Radar Basic #2315 or approved alternate, as accepted by the Consultant.

.2 Metal Suspension System - Acoustical Panel Ceilings: Manufacturer's standard direct hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C635 requirements and as supplied by same materials supplier as acoustic panels for intermediate duty, exposed tee bar and as follows:

.1 Tee Bar Grid Face Width: 15/16".

.2 Module: Sized as appropriate to acoustic panel size.

.3 Hangers, Braces and Ties: Nominal 14 ga. diameter steel wire, galvanized.

.4 Exposed Finish: Manufacturer's standard satin, white finish.

.5 Corrosion Resistance: Hot-dip galvanized or stainless steel components.

.6 Basis of Design Material: 15/16" Prelude XL by Armstrong World Industries, Inc.

.3 Tie Wire: 3/64" galvanized soft annealed steel wire.

.4 Accessories: Miscellaneous 'U' clips, splicers, screws, anchors, nails, wire, hold-down clips for complete installation.

.1 Wall moulding: prefinished exposed face galvanized steel angle.

3 Execution

**3.1 CEILING LAYOUTS**

.1 Lay out ceilings in accordance with reflected ceiling plans and symmetrical within each area to obtain uniform borders. Where layout is not shown install ceilings as directed by Consultant.

.2 Finished work shall be plumb, level and square with adjoining work.

**3.2 SUSPENSION SYSTEM**

.1 Suspend ceilings directly from structural elements. Do not suspend from ducts, pipes, conduits, steel roof deck.

.2 Erect suspension systems level with a maximum tolerance of 3 mm over 3 m length.

.3 Install main tees in accordance with module size. Suspend at maximum 1220 mm o.c.

.4 Install cross tees perpendicular to main tees in accord with module size. Interlock with main tees.

.5 Hangers for suspended ceilings shall support grillage independently of walls, columns, pipes and ducts. Space hangers at maximum 1220 mm o.c. along supporting grillage and not more than 150 mm from ends.

.6 Make provisions for carrying fixtures occurring on and in suspended ceilings. Install additional hangers and reinforcing to ensure that loads being carried do not compromise integrity of system. Frame around fixtures and openings as required.

.7 Where ductwork, piping and other elements within ceiling spaces interfere with direct suspension of ceiling from structure, install additional framing securely fastened to main structure to accommodate proper hanging of ceiling.

.8 Exposed members shall be as long in length as practical to minimize joints. Distribute joints to prevent clustering in one area. Joints shall be made square, tight and flush so that exposed faces of intersecting members are on same plane.

.9 Joints in suspension system members shall be reinforced with splines or other suitable methods.

.10 Install perimeter moulding at abutting vertical surfaces.

.11 Provide aluminum channel trim at perimeter of free-floating ceilings. Suspend trim independently. Mitre corners.

.12 Where work of other Sections is fastened to acoustical ceilings, reinforce suspension system and/or acoustical panels in manner acceptable to Consultant.

## 3.3 ACOUSTICAL PANELS

.1 Install panels so that work is clean and unmarked.

.2 Neatly cut and fit panels as required to suit ceiling layout and to accommodate other work.

.3 Recessed items shall replace or be centred on panel unless otherwise indicated.

## 3.4 CLEANING

.1 After installation, clean and touch up minor surface defects on acoustical panels and gypsum board panels.

.2 Remove damaged and badly marked units and replace with new unmarked material.

**END OF SECTION**

1 General

## 1.1 SUMMARY

.1 This Section includes, but is not limited to, the following:

.1 Resilient tile materials:

.1 Vinyl composition floor tile for classrooms

.2 Sheet Vinyl Flooring

.3 Resilient accessories:

.1 Resilient wall bases

.2 Resilient accessories for transition strips, area dividers

## 1.2 RELATED REQUIREMENTS

.1 Section 03 35 00: Concrete Finishing

## 1.3 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM):

.1 ASTM F1066-04(2014)e1, Standard Specification for Vinyl Composition Floor Tile

.2 ASTM F1516-13, Standard Practice for Sealing Seams of Resilient Flooring Products by the Heat Weld Method (when Recommended)

.3 ASTM F1861-08(2012)e1, Standard Specification for Resilient Wall Base

.4 ASTM F1869-11, Standard Test Method for Measuring Moisture Vapour Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

.5 ASTM F1913-04(2010), Standard Specification for Vinyl Sheet Floor Covering Without Backing

.6 ASTM F2034-08, Standard Specification for Sheet Linoleum Floor Covering

.2 Canadian General Standards Board (CGSB):

.1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction

## 1.4 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Close spaces to traffic during flooring installation and until time period after installation recommended in writing by manufacturer; install flooring and accessories after other finishing operations, including painting and ceiling construction have been completed.

.2 Pre-Installation Conference: Conduct conference at Project site in accordance with requirements of Section 01 31 19 Project Meetings, to verify project requirements, substrate conditions, patterns and layouts, coordination with other Sections affected by work of this Section, manufacturer's installation instructions and manufacturer's warranty requirements.

## 1.5 SUBMITTALS

.1 Provide submittals in accordance with the General Conditions and Section 01 33 00.

.2 Action Submittals:

.1 Product Data: Submit one copy of product data for each type of product specified.

.2 Shop Drawings: Submit shop drawings indicating:

.1 Location of seams and edges

.2 Location of columns, doorways, enclosing partitions, built-in furniture, cabinets, and cut-out locations

.3 Type and style of resilient transition strip used between adjacent flooring types

.3 Samples for Selection: Submit manufacturer's colour charts and samples for initial selection consisting of full range of colours and patterns available for each type of product indicated.

.4 Samples for Verification:

.1 Resilient Flooring: Submit samples of each different specified product for verification of colour and pattern in manufacturer's standard size, but not less than 6” x 6” in size for tile or sheet material, or 6” long for resilient accessories.

.3 Informational Submittals: Provide the following submittals during the course of the work:

.1 Site Quality Control Test Results: Submit results or moisture emission testing of concrete subfloors prior to installation of flooring. Results shall include comparison of manufacturer’s recommended moisture content to actual moisture vapour emission rate.

.4 Maintenance Data and Operating Instructions:

.1 Operation and Maintenance Data: Submit manufacturer’s written instructions for maintenance and cleaning procedures, include list of manufacturer recommended cleaning and maintenance products, and name of original installer and contact information in accordance with Section 01 78 00 Project Closeout.

.5 Safety Data Sheets:

.1 Submit WHMIS safety data sheets for incorporation into the Operation and Maintenance Manual. Keep one copy of WHMIS safety data sheets on site for reference by workers.

.6 Maintenance Materials:

.1 Provide 2% of each colour of vinyl composition tile and 30'-0" lineal feet coil stock of each colour of resilient base specified, boxed and labelled.

.2 Store maintenance materials on the premises as directed by the Owner.

## 1.6 QUALITY ASSURANCE

.1 Contractor executing work of this Section shall have a minimum of five (5) years continuous Canadian experience in successful and installation of work of type and quality shown and specified. Submit proof of experience upon Consultant's request.

.2 Resilient Flooring Installer: Use an installer who is competent in heat welding and have a minimum of five (5) years documented experience in the installation of resilient sheet flooring and seams in accordance with manufacturer’s training or certification program.

## 1.7 DELIVERY, STORAGE, HANDLING AND PROTECTION

.1 Coordinate deliveries to comply with Construction Schedule and arrange ahead for off-the-ground, under cover storage location. Do not load any area beyond the design limits.

.2 Materials shall be carefully checked, unloaded, stored and handled to prevent damage. Protect materials with suitable non-staining waterproof coverings.

.3 Store material in original, undamaged containers or wrappings with manufacturer's seals and labels intact.

.4 Restrict traffic by other trades during installation.

.5 Provide adequate protection of completed tiled surfaces to prevent damage by other trades until final completion of this project. Minimum protection shall consist of kraftpaper.

## 1.8 SITE CONDITIONS

.1 Temperature of room, floor surface and materials shall not be less than 21 deg C for 48 hours before, during and for 48 hours after installation. Concrete floors shall be aged for a minimum of 28 days and shall be dry before application of the resilient floor tile.

.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 Rubber Manufacturer's Association (RMA) moisture test using anhydrous calcium chloride.

.2 Does not exceed 3% as measured by Calcium Carbide Hygrometer procedure.

.3 Does not exceed 5% as measured by normal Protimeter.

.3 Avoid exposure to high humidity, cold drafts and abrupt temperature changes.

**1.9 WARRANTY**

.1 Warrant the work of this Section against defects in materials and workmanship in accordance with the General Conditions but for an extended period of five (5) years and agree to repair or replace faulty materials or work which become evident during warranty period without cost to the Owner.

.2 Defects shall include, but not limited to, bond failure, and extensive colour fading.

2 Products

**2.1 MANUFACTURERS**

.1 Basis-of-Design Manufacturers: Manufacturers named in this Section were are approved to provide work specified in this Section. Additional manufacturers offering similar products may be incorporated into the work of this Section provided they meet the performance requirements indicated and provided requests for substitution are provided in accordance with Section 01 33 00 Submittal Procedures, a minimum of five (5) days in advance of Bid Closing.

.2 Approved manufacturers:

.1 Johnsonite

.2 Armstrong Flooring

.3 Polyflor

**2.2 TILE FLOORING MATERIALS**

.1 Vinyl Composition Floor Tile (VCT): Asbestos free uniform in thickness with uniform colour and pattern through the full thickness, with straight, sharp and square edges and corners, accurately cut to size, conforming to ASTM F1066 and the following:

.1 Classification: Class 2 – Through Pattern

.2 Colour: To match #51899 Cool White.

.3 Thickness: 1/8”

.4 Size 12” x 12”

.5 Basis of Design Material: Standard Excelon Imperial Texture by Armstrong Flooring.

**2.3 SHEET FLOORING MATERIALS**

.1 Unbacked Sheet Vinyl Flooring (VF): Conforming to ASTM F1913 and the following:

.1 Wear Layer: Specialty Performance Film

.2 Colour and Pattern: Selected from manufacturers standard range. Allow for two (2) colours.

.3 Total Thickness: nominal 2mm

.4 Width: 2m

.5 Roll Length: 20m

.6 Basis of Design Material: Mystique PUR by Polyflor, or approved alternate by Johnsonite Flooring, or Armstrong Flooring.

**2.4 RESILIENT ACCESSORIES**

.1 Resilient Wall Base (RB): Smooth, buffed exposed face and ribbed or grooved bonding surface supplied in maximum practical length, with pre-moulded end stops and external corners to match base, conforming to ASTM F1861 and as follows:

.1 Type: TP – Thermoplastic Rubber

.2 Group: 1 – Homogeneous

.3 Style: B – Cove

.4 Height: 4”

.5 Thickness: 1/8”

.6 Colour: Black.

.7 Length: Manufacturers standard maximum length

.8 Basis of Design Manufacturer: Johnsonite Flooring.

.2 Resilient Transition and Edge Strips: Extruded vinyl shapes meeting or exceeding ADA Recommendations for change of level transitions for transition between floors finishes having different levels, i.e.: between resilient flooring on underlayment to carpet with no cushion or underlayment; acceptable materials as follows:

.1 The following list is included to indicate the most commonly used transition and edge strip accessories; additional materials may be required where transition heights differ from the products listed and shall be included as a part of the Contract.

.2 Transition Strip: TS4 – Resilient Flooring to Concrete Slab Transition:
Johnsonite SSR-XX-B Transitional Moulding between materials having a thickness to materials having no thickness; colour: selected from manufacturer’s standard range.

.3 Primers, fillers, adhesives: those recommended by flooring manufacturer which will produce good and permanent bond between subfloor and flooring.

.1 Resilient Floor Tile Adhesive: Standard Tile: Waterproof, clear setting type and brands as recommended by the tile manufacturer.

.4 Cementitious underlayment: As indicated in Section 03 35 00 Concrete Finishing.

.5 Cleaning and finishing materials: as recommended by flooring material manufacturer.

.1 Sealer and Wax: Coordinated with Owners preferred long term maintenance program, sealer or wax as appropriate to flooring materials specified.

3 Execution

**3.1 EXAMINATION**

.1 Surfaces to receive resilient flooring shall be dry, true, even and smooth, and free of paint, grease and oil.

.2 Perform moisture tests on concrete substrates where moisture content is uncertain. Perform tests in minimum ambient temperature of 18$^{o}$C. Do not install materials until test results are satisfactory.

.3 Concrete slabs shall be at least 28 days old before installation of resilient flooring.

.4 Inspect condition of concrete slabs scheduled to receive resilient flooring as soon as possible after completion and record in writing any deficiencies discovered or state, if no deficiencies are found, acceptance of floor conditions.

## 3.2 PREPARATION

.1 Level depressions, cracks and joints in subfloor with non-shrinking type filler compatible with bonding adhesive.

.2 If recommended by adhesive or tile manufacturer, prime substrates. Apply primer in accordance with manufacturer's directions.

## 3.3 UNDERLAYMENT

.1 Where resilient flooring abuts other flooring of different thickness, provide cementitious underlayment allowing for smooth and level transition between finished floor surfaces.

.2 Mix, apply and finish underlayment in accordance with latex admixture manufacturer's recommendations.

## 3.4 FLOORING INSTALLATION - GENERAL

.1 Install resilient flooring materials in accordance with material manufacturer's current printed directions. Keep a copy of manufacturer's installation manual on site during execution of work.

.2 Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints. Extend flooring into recesses and closets.

.3 Locate change to different floor finish or colour centred under doors.

.4 Provide reducing strip adhesive bonded to floor where floor covering terminates, exposing edge of floor. Install transition strip at junction with other types of flooring.

## 3.5 RESILIENT TILE

.1 Lay out each area to be tiled symmetrically square with axis of room to provide perimeter tiles at least one half tile in width.

.2 Distribute tiles having varying shades or pattern evenly over floor area to obtain uniform effect. Abrupt variations will not be permitted. Tile joints shall be flush, uniform, in moderate contact and in straight lines.

.3 Install tile with joints staggered half tile in one direction and with tile pattern running as directed by the Consultant.

.4 Immediately after installation, roll entire floor to ensure adhesion in accordance with tile and adhesive manufacturer's recommendations.

## 3.6 RESILIENT SHEET FLOORING

.1 Maintain uniformity of resilient flooring direction.

.2 Do not bridge building expansion joints with sheet flooring.

.3 Arrange for a minimum number of seams, where seams are necessary place them in inconspicuous and low traffic areas, and not less than 150mm (6") away from parallel joints in flooring substrates.

.4 Match edges of flooring for colour shading and pattern at seams in accordance with manufacturer's written recommendations.

.5 Obtain Consultant’s acceptance in writing before installing materials having cross seams; make adjustments to seaming plan as directed by Consultant to minimize or eliminate cross seams.

.6 Weld seams with welding rod where optional with manufacturer in accordance with written instructions for treatment of flooring adjacent to seams:

.1 Route joints of sheet flooring, leaving recommended joint profile for welding rod and permanently weld seams in accordance with ASTM F1516

.7 Install flooring flush with adjoining floor covering surfaces.

.8 Scribe sheet flooring to walls, columns, cabinets, floor outlets and other appurtenances.

.9 Roll sheet flooring in both directions in accordance with manufacturer's instructions.

## 3.7 RESILIENT BASE

.1 Adhesive apply cove base to vertical surfaces so that gaps do not occur behind base, so that front lip of base cove bears firmly and uniformly on floor surfaces and so that good and permanent bond is produced between base and surface to which is it applied.

.2 Use full length pieces where practicable; accumulated short lengths not permitted. Wrap base around outside corners, mitre at inside corners; score back of coved base at outside corners. Use preformed end stops where base end is exposed. Butt joints flush without gaps.

## 3.8 CLEANING

.1 Cleaning, sealing and finishing of resilient tile flooring shall be performed using the cleaning, sealing and finishing materials specified of one manufacturer in accordance with the manufacturer's instructions and recommendations.

.1 Allow a minimum of four (4) days to elapse after completion of each resilient flooring installation before commencing cleaning, sealing, and finishing operations.

.2 Work shall be handed over to the Owner free of blemishes and in perfect condition.

.3 Promptly remove adhesive from surface of resilient materials as work progresses.

.4 Seal and wax floor immediately prior to turnover of building when required by flooring manufacturer. Owner reserves the right to reject resilient floors which show defects after completion of sealing and waxing.

**END OF SECTION**

1 General

**1.1 GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

**1.2 RELATED REQUIREMENTS**

.1 Section 04 20 00: Masonry

.2 Section 06 41 00: Architectural Wood Casework

.3 Section 08 11 00: Metal Doors and Frames

.4 Section 08 14 00: Wood Doors

.5 Section 09 21 16: Gypsum Board Assemblies

**1.3 SUBMITTALS**

.1 List of Materials:

.1 Before ordering materials, submit written request in form acceptable to Consultant, for approval of paint materials. List each of the materials proposed and surfaces to be covered. State manufacturer's name and brand name of materials.

.2 List of materials shall be endorsed by manufacturer as being the best material for the applicable condition.

.3 Do not order material or commence work until list of materials is approved by Consultant.

.2 Samples:

.1 Submit two 200 mm x 250 mm colour drawdowns of each paint colour coated with manufacturer's paint system to confirm colour match with colour chips supplied by Consultant.

.2 Submit sample of natural and stained finishes on each species and grade of wood to receive such finishes.

.3 Prepare full size samples showing each type of door finish.

.4 Prepare sample panels of each wall and ceiling paint system specified, as directed by Consultant.

.3 Maintenance Materials:

.1 Upon completion of work provide one sealed and properly identified 1 L can of each type and colour paint used on this project.

.2 Only top coating paints used in building interior are required.

**1.4 MOCK-UP ROOM**

.1 Prior to start of any painting; prepare a mock-up room designated by Consultant.

.2 Paint all surfaces including but not limited to walls, ceilings, doors and frames.

**1.5 PRODUCT HANDLING**

.1 Deliver paint materials to site in sealed original labelled containers bearing manufacturer's name, brand name, type of paint and colour designation.

.2 Store materials in strict accordance with manufacturer's recommendations.

.3 Store paints, stains, varnishes, equipment in designated area inside building. Maintain separate workshop / storage area for duration of work by this Section.

### 1.6 SITE CONDITIONS

.1 Environmental Conditions:

.1 Maintain temperature in interior areas to receive coatings between 15°C and 25°C for at least 24 hours before, during application and until coatings have cured after application. Apply exterior coatings only when temperature is above 10°C.

.2 Do not apply exterior coatings during periods of precipitation nor when precipitation is imminent.

.3 Do not apply coatings under direct sunlight during hot weather.

.4 Adequately ventilate areas where coatings are being applied. Maintain a reasonably dust-free atmosphere for duration of work.

.2 Protection:

.1 Protect adjacent surfaces not scheduled to receive coatings from damage.

.2 Remove electrical plates, surface hardware, fittings and fastenings prior to painting operations. These items shall be carefully stored, cleaned and replaced on completion of work in each area. No solvent shall be used to clean hardware that will remove permanent lacquer finish on these items.

.3 Mask labels and specification plates occurring on equipment to be painted.

.4 Post "wet coating" signs and "no smoking" signs while work is in progress and while coatings are curing.

.5 Keep oily rags, wastes and other combustible materials in closed metal containers and remove at end of each work day. Take every precaution to avoid spontaneous combustion.

.3 Work Schedule:

.1 Unless otherwise permitted, apply coatings only after all other Sections have completed their work.

.2 Co-ordinate work of this Section with that of Section 07 92 00 and review order of installation with Consultant where sealants are installed adjacent to painted surfaces.

.3 If it becomes necessary for the Owner to occupy areas of the building prior to their completion, schedule work of this Section to hours when occupants have vacated building.

## 2 Products

### 2.1 MANUFACTURERS

.1 Unless otherwise specified, materials shall be manufactured and supplied by one of the following:

.1 Benjamin-Moore

.2 or equal by Para Paints or PPG Canada Inc. - Architectural Finishes.

### 2.2 MATERIALS

.1 Materials shall be "top line quality" products and shall be supplied by a single manufacturer except for specialty products not available from paint manufacturer.

.2 Materials wherever possible shall be low odour products, free or low in VOC content.

.3 Paints shall be factory mixed unless otherwise specified, except any coating in paste or powder form, or to be field-catalyzed shall be field-mixed in accordance with manufacturer's directions.

.4 Primers shall be as specified by manufacturer and fully compatible with finish coats.

.5 The contractor shall in all cases leave on-site in the property sealed can a minimum of one gallon of each colour and or type of paint used.

.6 Metal and Glazed Surfaces Primed with: Fresh start All-Purpose 100% (K023)

.7 Classrooms & all other areas not specified: Eco-Spec WB Semi-Gloss Finish (K376)

.8 Interior Doors & Trim: Eco-Spec WB Semi-Gloss Finish (K376)

.9 Millwork: Eco-Spec WB Semi-Gloss Finish (K376)

.10 Ceilings: Moores Latex Ceiling Paint (K258)

.11 Natural Wood: Stays Clear Acrylic Urethane Satin Finish (K422)

.12 Hallways: Eco-Spec WB Semi-Gloss Finish (K376)

.13 Concrete floor sealer: S.C. Johnson “Securethane”, Proseal “Prothane”, Euclid “Ecuo-Thane” or Tennant “420 System”.

.14 New conc. block: Prime with block filler (K160) – by Benjamin Moore.

**2.3 FINISHES**

.1 Paint colours and other finishes will be selected by Consultant. Do not start work until after receiving colour schedule.

.2 Colours selected by the Consultant will not necessarily be from manufacturer's standard colours.

.3 A variety of colours may be used. Consultant may select different colours for different elements such as ductwork, bulkheads, exposed decks, slabs and structural steel. Include for up to 15 colours, not including mechanical room colours listed below. Of these colours, up to 50% may be deep tones.

.4 Confirm gloss levels for all surfaces with Consultant before starting work. Unless otherwise indicated, allow:

.1 Walls: semi-gloss

.2 Ceilings: semi-gloss

.3 Frames, doors, trim: semi-gloss.

.5 Paint exposed piping, ductwork and conduits in mechanical and boiler rooms in colours directed by Consultant.

3 Execution

**3.1 CONDITIONS OF SUBSTRATES**

.1 Sound, non-dusting, and free of grease, oil, dirt, and other matter detrimental to adhesion and appearance of coatings.

.2 Temperature: minimum 13°C.

.3 Moisture content: maximum 12%. Test for moisture content using moisture meter.

.4 Alkalinity: test cementitious substrates for alkalinity. Use method recommended by coating manufacturer.

**3.2 PREPARATION OF SUBSTRATES**

.1 All substrates: clean as required to produce an acceptable surface. If wood, metal or any other surface to be finished cannot be put in proper condition for finishing by cleaning, sanding and filling as specified, notify Consultant in writing or assume responsibility for an rectify any unsatisfactory finish resulting.

.2 Wood generally: clean soiled surfaces; sand smooth and dust off; putty nail holes, splits, scratches, after prime coat has been applied and dried; colour putty to match finish; putty stained wood after stain application.

.3 Wood for paint: clean knots, pitch streaks and sappy sections of residue and seal with sealer before applying prime coat.

.4 Wood for transparent finish: clean knots, pitch streaks and sappy sections of residue and seal with white shellac; seal after applying stain. Apply filler to open grained woods, prior to application of stain unless directed otherwise by Consultant. Do not apply satin varnish coat until Consultant has inspected and approved gloss varnish coat.

.5 Bare ferrous metal: remove rust and scale; wash with solvent; chemically clean; apply coat of metal primer.

.6 Previously primed metal: remove rust, oil, grease and loose shop paint by washing or wire brushing; make good shop coat; feather out edges of touch-up.

.7 Zinc coated metal: wash and etch to dull paint receptive surface using an approved crystalline zinc phosphate or vinyl pretreatment.

.8 Hot dip galvanized steel: light brush blast.

.9 Unit masonry & concrete: fill minor cracks, holes and fissures with Polyfilla and smooth to a flush surface. Texture filled areas to match surrounding surface.

.10 Plaster: fill minor cracks, holes and fissures with patching plaster, allow to dry, smooth to a flush surface and texture filled area to match surrounding surface.

.11 Gypsum board: fill minor cracks, holes and imperfections with patching plaster; allow to dry and sand smooth; sand taped joints and remove dust.

.12 Alkaline surfaces: wash and neutralize using proper type of solution compatible with paint to be used.

.13 Previously painted surface need to be cleaned with TSP prior to priming.

.14 Existing gloss surface shall be dulled down with wet sandpaper.

.15 Existing oil based surfaces to be primed with Fresh start by Benjamin Moore.

**3.3 BACK PRIMING**

.1 Back prime wood schedule for paint or enamel finish immediately on arrival at site with interior or exterior primer as applicable.

.2 Back prime wood scheduled for stain, varnish or natural finish immediately on arrival at site, with gloss varnish reduce 25% with mineral spirits.

**3.4 APPLICATION OF COATINGS**

.1 Apply paint by brush or roller, except on wood and metal surfaces where paint shall be applied by brush only.

.2 Spray painting may be permitted where deemed advantageous and shall be subject to Consultant's approval. When spray painting is permitted, use only airless spray guns. Consultant may prohibit use of spray painting at any time for such reasons as carelessness, poor masking or protective measures, drifting paint fog, disturbance to other trades or failure to obtain a uniform satisfactory finish.

.3 Applied and cured coatings shall be uniform in thickness, sheen, colour and texture and free of brush or roller marks, sags, crawls and other defects detrimental to appearance and performance.

.4 Regardless of the number of coats specified for any surface, apply sufficient paint to completely cover and hide substrate and to produce a solid uniform appearance.

.5 Thoroughly mix materials before application. Use same brand of paint for primer, intermediate and finish coats.

.6 Where two or more coats of same paint are to be applied, undercoats shall be tinted in lighter shades of final coat to differentiate from final coat.

.7 Touch up suction spots after application of first coat. Sand lightly between coats with fine sandpaper.

.8 Each coat of finish shall be dry and hard before succeeding coats are applied with a minimum of 24 hours between coats, unless manufacturer's instructions state otherwise. Do not proceed with any coat until the last preceeding coat is approved by the Consultant.

.9 Stained woodwork shall be covered with a uniform coat of stain and wiped off if required. Wood shall have uniform shade. Match stain so that dissimilar woods have uniform finished appearance.

## 3.5 PATCHING / TOUCH-UP

.1 Prior to takeover of project by Owner, inspect work of this Section and touch-up or refinish damaged finishes and finishes unsatisfactory to Consultant.

## 3.6 SCHEDULE OF FINISHES

.1 General Requirements:

.1 Paint or otherwise finish surfaces of building materials, building services and building accessories not otherwise protected or covered, as shown on Room Finish and Door Schedule, Drawings and as specified herein.

.2 In addition to finishing required by Room Finish and Door Schedules, Drawings and these Specifications, and unless otherwise specified, all work which is exposed to view and which is not prefinished shall be finished by this Section.

.3 In areas specifically designated as "unfinished" painting is not required except for bare, primed and zinc coated metal surfaces and insulated ductwork and pipes.

.4 Where exposed to view paint bare metals, previously primed metals and zinc coated metals unless specified otherwise.

.5 Paint behind surface mounted fixtures on walls and ceilings with full coats of paint.

.6 Paint walls behind wall mounted heating units with full coats of paint.

.7 Paint inside surfaces of light coves white.

.8 Finish tops of doors, trim, projections and other work as specified for surrounding work whether above site lines or not.

.9 Finish edges of doors to match face of door. Refinish edges of doors after fitting.

.10 Finish drawers on all sides, inside and outside. Unless otherwise indicated finish drawers with two coats of varnish.

.11 Paint tops, bottoms and edges of shelves with full specified coats, whether exposed to view or not.

.12 Paint interior of ducts at grilles and diffusers with two coats of flat black paint, so that duct interior is not visible when grilles and diffusers are installed.

.13 Paint piping, ducts and conduits in colours matching background wall or ceiling colours, unless otherwise directed by the Consultant. Ducts in mechanical rooms require only one finish coat in addition to primer. Other exposed ductwork to receive two finish coats.

.14 Paint all gas piping whether exposed to view or not, with high-visibility yellow-orange paint meeting CGSB Colour Code #1-GP-12, Code 505-101 or equal.

.15 Unless specifically indicated to be painted, all finish carpentry work shall receive transparent finish.

.16 Unless specifically indicated otherwise paint all rooftop equipment and components, regardless of material and finish, including but not necessarily limited to mechanical rooftop equipment, vent stack flashings, sleeve flashings window washing anchors, but not including prefinished sheet steel flashings.

.17 Where finishing formula for surfaces requiring painting is not included hereunder, follow recommendations of Canadian Painting Contractor's Association Architectural Painting Specification Manual, latest issue.

.2 Interior Finishing:

.1 Concrete and concrete block:

.1 1 coats block filler

.2 1 coat primer, latex or PVA based

.3 2 coats acrylic latex

.2 Metal, prime painted:

.1 spot prime with alkyd metal primer

.2 2 coats acrylic latex

.3 Metal, zinc coated:

.1 1 coat galvanized primer

.2 2 coats acrylic latex

.4 Woodwork, painted:

.1 1 coat alkyd enamel undercoat

.2 2 coats acrylic latex

.5 Woodwork, stained and varnished (transparent finish):

.1 1 coat stain

.2 1 coat sanding sealer, sand lightly

.3 1 coat alkyd or polyurethane varnish, gloss

.4 1 coat alkyd or polyurethane varnish, satin

.6 Gypsum board:

.1 1 coat drywall primer

.2 2 coats acrylic latex

.7 Exposed piping, wrapped:

.1 1 coat block filler

.2 2 coats acrylic latex

.8 Exposed piping and conduit, unwrapped:

.1 1 coat alkyd metal primer

.2 2 coats acrylic latex

.9 Exposed ductwork, insulated:

.1 1 coat block filler and primer

.2 2 coats acrylic latex

.3 Existing Interior Finishing:

.1 Previously painted Concrete and concrete block: (same finished colour)

.1 1 coat primer, latex or PVA based

.2 1 coat acrylic latex

.2 Previously painted Concrete and concrete block: (different finished colour)

.1 1 coat primer, latex or PVA based

.2 2 coats acrylic latex

.3 Previously painted Metal:

.1 1 coat acrylic latex primer

.2 1 coat acrylic latex

.4 Previously stained and varnished Woodwork, (transparent finish):

.1 Sand lightly

.2 1 coat sanding sealer, sand lightly

.3 1 coat alkyd or polyurethane varnish, gloss

.4 1 coat alkyd or polyurethane varnish, satin

.5 Previously painted Gypsum board:

.1 1 coat primer

.2 1 coats acrylic latex

.6 Previously painted Exposed piping:

.1 1 coat acrylic latex primer

.2 1 coat acrylic latex

**END OF SECTION**

1 General

## 1.1 SUMMARY

.1 This Section includes requirements for visual display boards, tackboards, hardware, trim and accessories.

## 1.2 RELATED REQUIREMENTS

.1 Section 06 10 00: Rough Carpentry

.2 Section 09 21 16: Gypsum Board Assemblies

## 1.3 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM):

.1 ASTM E84, Test for Surface Burning Characteristics of Building Materials

.2 Underwriters Laboratories Canada (ULC):

.1 CAN/ULC S102, Standard Method of Test for Surface Burning Characteristics

.3 Porcelain Enamel Institute (PEI):

.1 PEI 501, Appearance Properties of Porcelain Enamel.

.2 PEI 502, Mechanical and Physical Properties of Porcelain Enamel

## 1.4 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Action Submittals: Provide the following submittals before starting work of this section:

.1 Shop Drawings: Submit shop drawings for each type of visual display board required including, but not limited to, the following:

.1 Include dimensioned elevations.

.2 Show location of joints between individual panels where unit dimensions exceed maximum panel length.

.3 Include sections of typical trim members.

.4 Show anchors, grounds, reinforcement, accessories, layout, and installation details.

.2 Product Data: Submit product data for each type of visual display board indicated.

.3 Samples for Initial Selection: Provide Manufacturer's colour charts showing the full range of colours and textures for initial selection of materials for the following:

.1 Marker Boards and Tackboards: Actual sections of finish for each type of visual display surface specified in this Section.

.4 Samples for Verification: Provide samples for verification for the following products, showing colour and texture or finish selected; include sample sets showing the full range of variations expected where finishes involve normal colour and texture variations; prepare Samples from the same material to be used for the Work:

.1 Visual Display Boards: Sample panels not less than 200 mm x 300 mm, mounted on the substrate indicated for the final Work. Include a panel for each type, colour and texture required.

.2 Aluminum Trim and Accessories: Samples of each finish type and colour, on 150 mm long sections of extrusions and not less than 100 mm squares of sheet or plate. Include Sample sets showing the full range of colour variations expected.

### 1.5 PROJECT CLOSEOUT SUBMISSIONS

.1 Provide operations and maintenance information in accordance with Section 01 78 00.

.2 Submit data for cleaning of finishes and maintenance, and of operational hardware.

### 1.6 QUALITY ASSURANCE

.1 Qualifications: Provide proof of qualifications when requested by the Consultant:

.1 Source Limitations: Obtain pre-manufactured visual display boards through one source from a single manufacturer.

.2 Engage an experienced installer who is an authorized representative of visual display board manufacturer for both installation and maintenance of the type of products required for this Project.

### 1.7 SITE CONDITIONS

.1 Verify field measurements before preparation of shop drawings and before fabrication to ensure proper fitting and as follows:

.1 Coordinate fabrication schedule with construction progress to avoid delaying the Work:

.2 Allow for trimming and fitting where taking field measurements before fabrication might delay the Work.

.2 Establish dimensions and proceed with fabricating visual display surfaces without field measurements where field measurements cannot be made without delaying the work, coordinate wall construction to ensure actual dimensions correspond to established dimensions.

### 1.8 WARRANTY

.1 Provide manufacturers written guarantee, signed and issued in the name of Owner, to replace the following items for defective material and workmanship for the time stated from date of Substantial Performance:

.1 Framing, Panels and hardware: Failure of performance requirements specified in Contract Documents; two (2) years.

## 2 Products

### 2.1 MANUFACTURERS

.1 Basis-of-Design products are named in this Section; additional manufacturers offering similar Products may be incorporated into the work provided they meet the performance requirements established by the named products provided they submit requests for substitution a minimum of ten (10) days in advance of Bid Closing.

.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 Global School Products Inc.

.2 Architectural School Products Ltd.

.3 Claridge Products and Equipment Inc.

.4 C.P. Distributors Ltd.

.5 Crestway Systems Ltd.

.6 Egan Visual Inc.

.7 Malem Architectural Specialties Ltd.

.8 Shanahan's Ltd.

## 2.2 MARKER BOARDS

.1 Face Sheet: Minimum 0.62 mm enamelling grade steel specifically processed for temperatures used in coating porcelain on steel to manufacturers standard process, and as follows:

.1 Coat exposed face and edges with a 3-coat process consisting of primer, ground coat, and colour cover coat.

.2 Coat concealed face with a 2-coat process consisting of primer and ground coat.

.2 Cover Coats: Provide manufacturer's standard, light coloured, special writing surface with gloss finish intended for use with erasable dry markers.

.3 Core: Use any one of the following core materials to the manufacturer’s standard:

.1 10 mm thick, particleboard core material complying with requirements of ANSI A208.1, Grade 1 M 1.

.2 6 mm thick, tempered hardboard.

.3 13 mm gypsum board.

.4 Backing Sheet: Use any one of the following backing materials to the manufacturer’s standard:

.1 0.38 mm thick, aluminum sheet backing.

.2 0.127 mm thick, aluminum foil sheet backing.

.3 0.45 mm thick, galvanized steel sheet backing.

.5 Laminating Adhesive: Manufacturer's standard, moisture resistant, thermoplastic type adhesive.

## 2.3 TACKBOARDS

.1 Natural Cork Tackboards: Mildew resistant, washable vinyl fabric, weighing not less than 440 g/m2, laminated to 6 mm thick cork sheet, and as follows:

.1 Cork Thickness: 6mm (1/4”)

.2 Backing: 6mm (1/4”) thick particle board

.3 Over Thickness: 13mm (1/2”)

.4 Maximum panel size: 1220mm x 2440mm (8’ x 4’)

.2 Basis of Design Materials: Natural Cork Tackboards by Global School Products Inc, or acceptable alternate as approved by the Consultant.

.3 Trim: Extruded from aluminum alloy 6063 T5. Clear anodized finish in accordance with AA M12C22A31, full length for each installation.

.4 Chalk trays: Manufacturer's standard, plate type, extruded aluminum with clear anodized anodic oxide finish in accordance with AA M12C22A31, full length for each installation.

.5 Maprails: Extruded from aluminum alloy 6063 T5. Clear anodized anodic oxide finish in accordance with AA M12C 22A31. Cork insert. Metal map hooks. Indicate as ‘tackable strips’.

## 2.4 FABRICATION

.1 Shop fabricated display boards in one piece for lengths 3600 mm or less, for longer sections colour match adjacent pieces.

.2 Laminate display board and backing sheet to the core in accordance with the display board manufacturer's recommendations.

.3 Apply pre-finished trim in continuous horizontal and vertical lengths, cut and mitred at corners, and as follows:

.1 Marker Boards:

.1 Provide continuous chalk trays below all marker boards.

.2 Provide continuous maprails above all marker boards.

.3 Use adhesive to secure centre portions of panels.

.2 Tackboards:

.1 Provide continuous maprails above all tackboards adjacent to marker boards, and elsewhere as indicated.

.2 Trim edges with J trim, join to adjacent boards or marker boards with H trim and provide map rails at the top edge.

3 Execution

**3.1 EXAMINATION**

.1 Inspect Work and conditions affecting the Work of this Section. Proceed only after deficiencies, if any, have been corrected.

.2 Ensure that all anchors and setting or installing components provided by this Section for installation are properly located and installed.

**3.2 PREPARATION**

.1 Obtain all dimensions from the job site.

.2 Provide data, dimensions and components, anchors and assemblies to be installed (where required) in proper time for installation.

**3.3 INSTALLATION**

.1 Erect Work in strict accordance with manufacturer's written instructions.

.2 Conceal all anchors and fitments. Exposed heads of fasteners not permitted. All joints in exposed work to be flush hairline butt joints.

.3 Mount display boards as indicated on drawings.

.4 Refer to schedule and details on drawings for sizes locations, confirmed on site with Owner before installation.

.5 Mount on site maprails and tackable strips, and accessories as indicated.

**3.4 CLEANING**

.1 At completion and continuously as Work proceeds, remove all surplus materials, debris and scrap.

.2 At completion of Work, remove all protective surface covering film and wrappings. Clean all frames and hard surfaces using mild soap or other cleaning agent approved by manufacturer.

**END OF SECTION**

1 General

## 1.1 SUMMARY

.1 Furnish labour, materials and other services to complete the fabrication and installation of;

.1 Washroom accessories and framed mirrors and

.2 Attachment hardware.

.2 Include all materials and fitments required for the operation of any unit furnished, in the manner, direction and performance shown on the shop drawings and specified herein.

## 1.2 RELATED REQUIREMENTS

.1 Section 06 10 00: Rough Carpentry

.2 Section 09 21 16: Gypsum Board Assemblies

## 1.3 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM):

.1 ASTM A153/A153M-09, Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware

.2 ASTM A653/A653M-15, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.3 ASTM A666-10, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar

.4 ASTM A1008/A1008M-12a, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable

## 1.4 SUBMITTALS

.1 Provide submittals specified and as required to assess conformance with the Contract Documents, in accordance with Section 01 33 00 Submittal Procedures.

.2 Shop Drawings: Show and describe in detail, materials, finishes, dimensions, details of connections and fastenings, elevations, plans, sections, metal gauges, hardware and any other pertinent information.

.3 Coordinate the work of this Section with the placement of internal wall reinforcement.

## 1.5 DELIVERY, STORAGE AND HANDLING

.1 Coordinate deliveries to comply with construction schedule and arrange ahead for off the ground, under cover storage location.

.2 Materials shall be carefully checked, unloaded, stored and handled to prevent damage. Protect materials with suitable non-staining waterproof coverings.

.3 Store materials in original, undamaged containers or wrappings with manufacturer's seals and labels intact.

.4 Unsatisfactory materials shall be removed from the site.

.5 Adequately protect the structure and work of other Sections during delivery, storage, handling and execution of the work of the Section.

.6 Provide tools, plant and other equipment required for the proper execution of the work of this Section.

2 Products

## 2.1 MANUFACTURERS

.1 Basis-of-Design Products: Products named in this Section were used as the basis-of-design for the project; additional manufacturers offering similar products may be incorporated into the work of this Section provided they meet the performance requirements established by the named products and provided they submit requests for substitution in accordance with Section 01 33 00 Submittal Procedures.

.2 Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include; but are not limited to, the following:

.1 ASI Watrous - Global Partitions

.2 Bobrick

.3 Frost

.4 Koala Kare

.5 Dyson

## 2.2 MATERIALS

.1 Provide one of the products indicated for each designation in the Washroom and Custodial Accessory Schedule below, subject to compliance with specified requirements.

.2 Stainless Steel: In accordance with ASTM A666, Type 304, with No. 4 finish (satin); minimum nominal thickness as established by product type.

.3 Sheet Steel: Steel: In accordance with ASTM A1008/A1008M, cold rolled, commercial quality; minimum nominal thickness as established by product type; surface preparation and metal pretreatment as required for applied finish.

.4 Galvanized Steel Sheet: In accordance with ASTM A653/A653M, minimum Z180 coating designation.

.5 Galvanized Steel Mounting Devices: In accordance with ASTM A153/A153M, hot dip galvanized after fabrication.

.6 Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.

## 2.3 FABRICATION

.1 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.

.2 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.

.3 Isolate where necessary to prevent electrolysis between dissimilar metal to metal or metal to masonry or concrete contact.

.4 Fabricate and erect work square, plumb, straight, true and accurately fitted. Provide adequate reinforcing and anchorage.

.5 Drilling shall be reamed and exposed edges left clean and smooth.

.6 Include anchors and fastenings necessary to anchor work of this Section.

.7 Coordinate with Section 06 10 00: Rough Carpentry, for wood blocking for attachment of washroom accessories.

.8 Keys: Provide universal keys for internal access to accessories for servicing and re-supplying. Provide minimum of six (6) keys to Owner's representative.

3 Execution

**3.1 EXAMINATION**

.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.

.2 Commencement of work of this Section implies acceptance of surfaces and conditions.

**3.2 INSTALLATION**

.1 Make thorough examination of drawings and details, determine the intent, extent, materials, conditions of interfacing with other work and be fully cognizant of requirements.

.2 Work of this Section shall include complete installation of items specified herein. Installation shall be in strict accordance with manufacturer's printed instructions.

.3 Securely fasten accessories, level and plumb in the locations shown on the drawings and specified herein. All fastenings shall be concealed.

.4 Co-ordinate the work of this Section with the work of other Sections to provide the necessary recesses, edge conditions wood blocking for the accessories as required.

.5 Do all drilling of steel, masonry and concrete necessary for the anchorage of the work.

.6 Installed grab bars shall be capable of supporting a downward pull of 500 lbs. per lineal foot.

**3.3 ADJUSTING**

.1 Check mechanisms, hinges, locks and latches, adjust and lubricate to ensure that accessories are in perfect working order.

**3.4 CLEANING**

.1 Upon completion of the work of this Section or when directed by Consultant, remove all protective coatings, and coverings. Clean and polish exposed surfaces.

**3.5 WASHROOM AND CUSTODIAL ACCESSORY SCHEDULE**

| **No.** | **Description / Model** |
|---|---|
| M3 | Mirror (Tilt): Framed, 762mm (30") high x 460mm (18") wide, fixed tilt installation:<br>ASI 0535-1830<br>Bobrick B-293x1830 |

### 3.6 WASHROOM ACCESSORY SCHEDULE – SUPPLIED BY THE SCHOOL BOARD

| | |
|---|---|
| PTD | Paper Towel Dispenser: Supplied by school board and installed by Contractor. |
| TTD | Toilet Tissue Dispenser: Supplied by school board and installed by Contractor. |
| SD | Soap Dispenser: Supplied by school board and installed by Contractor. |

**END OF SECTION**

1 General

**1.1 GENERAL REQUIREMENTS**

.1 General Conditions, Supplementary Conditions and Division 01 apply to this Section.

**1.2 DELIVERY, STORAGE, AND HANDLING**

.1 Package or crate, and brace products to prevent distortion in shipment and handling. Label packages and crates, and protect finish surfaces by sturdy wrappings.

**1.3 SUBMITTALS**

.1 Submit submittals in accordance with the General Conditions and Section 01 33 00.

.2 Shop drawings:

.1 Indicate the following: methods of anchoring, thickness and finishes of materials, relationship of work of other sections, including all required cut-outs, and all other pertinent data and information.

.3 Maintenance data: Three copies of instructions covering cleaning, replacement and other relevant maintenance data.

.4 Extended Warranty: Submit a written warranty in accordance with Section 01 33 00.

.1 Warranty period of 5 years

.2 Commencement: Substantial Performance of the Work

2 Products

**2.1 MATERIALS**

.1 Provide reinforcing, fastenings, and anchorage required for building in.

.2 Insulate between dissimilar metals, and metal and incompatible materials to prevent electrolysis with bituminous paint or other approved means.

.3 Do not attach manufacturer's name or trademark, plates, imprints or labels to products unless approved by Consultant.

**2.2 FABRICATION**

.1 Verify site dimensions prior to fabrication. Fabricate work true to dimensions and square. Finished work shall be free from distortion and defects detrimental to appearance and performance.

**2.3 MISCELLANEOUS SPECIALTIES**

.1 Refer to drawings and schedules for items required but not specified herein.

**2.4 COAT AND HAT RACK**

.1 Wall mounted coat and hat rack, adjustable height, finished with high performance electrostatically applied powder coating.

.1 Shelf: Consisting of four (4) 19mm square tubes, closed and protected with plastic end caps.

.2 Brackets and Channel Mount: 2.3mm steel brackets and channel mounting, designed for vertical adjustment of one full shelf height, complete with plastic end caps. Channel Spacing: Not to exceed 1016mm.

.3 Hanger Rod: 25mm diameter, 1.2mm thick chrome plated steel tube with plastic end caps.

.4 Mounting Hardware: Provided by manufacturer to ensure a complete installation of coat and hat racks.

.5 Colour: Medium gray, unless otherwise indicated.

.2 Solid ABS hooks available in five (5) different colours, impact resistant, spaced at 150mm (6") on center.

.1 Colour: As selected by the Consultant from the manufacturer's standard product line.

.3 Basis of Design Materials:

.1 Coat and Hat Racks, Model SCR1001 by Global School Products.

.2 ASP Student Line Coat Rack by Architectural School Products

3 Execution

**3.1 INSTALLATION**

.1 Securely fasten work level and plumb in the locations shown on the drawings and as specified herein.

.2 Co-ordinate installation with the work of Sections providing adjacent construction as required.

.3 Execute electrical work by qualified electricians and in compliance with the Canadian Electrical Code and other requirements of authorities having jurisdiction.

**3.2 ADJUSTMENT**

.1 Upon completion of the work or when directed, remove all traces of protective coatings or paper.

.2 Test operation, adjust, lubricate and ensure that accessories are in perfect working order.

**END OF SECTION**