TOWNSHIP OF UXBRIDGE

TENDER U18-01

Addendum 06

May 28, 2018

Re: **26'x 38' Addition to Goodwood Community Centre**

CLOSING: June 12, 2018 at 2:00 P.M. (Local time)

This addendum will form a part of the Tender Documents for the above-noted Tender and shall read in conjunction therewith. This addendum will take precedence over all requirements of the original Tender Documents and any addenda issued previously. Bidders shall acknowledge receipt of this addendum by signing and returning this addendum with the completed Tender in a sealed envelope with the Tender number marked clearly on the front. If, in the opinion of the Township of Uxbridge, the addendum issued affects the price of the Tender and the addendum is not acknowledged or returned in the submitted Tender document, then the Tender submitted will be deemed non-compliant and rejected. If, in the opinion of the Township of Uxbridge, the addendum does not affect the Tender price and it is not acknowledged or submitted with the Tender document, the bidder will be allowed two working days to submit the missing signed addendum to the Township of Uxbridge.

I/we hereby acknowledge receipt of this addendum.

_____

Signed (must be Signing Officer of Firm

_____

Position

_____

Name of Firm

ADDENDUM NO. 6

1) Please be advised that the closing date for Tender U18-01 has been extended to Tuesday, June 12, 2018 at 2:00 p.m.

2) Please be advised that all work under the contract shall be completed by October 16, 2018.

3) Attached find Specification Document, Architectural drawings and new structural drawings that reflect the architectural drawings.

AECOM Imagine it. Delivered.

TOWNSHIP OF UXBRIDGE

Goodwood Community Centre Addition

Issued for Tender and Permit

PROJECT NO: 60240627

May 2018

Specifications

1.1 OWNER:

Township of Uxbridge
51 Toronto Street South
Uxbridge, Ontario

1.2 PROJECT:

Goodwood Community Centre Addition
268 Highway 47
Goodwood, Ontario

1.3 PROFESSIONAL SEALS AND SIGNATURES

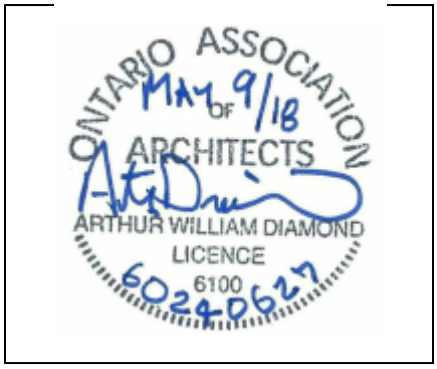
.1 Professional seals and signatures are provided as required by the Ontario Building Code (latest edition), Ontario Regulation 403/97 **(350/06)**, Subsection 2.3.1 **(Division C, Part 1, Subsection 1.2.1)** and all amendments thereto, for the Project stated above and apply only to those documents and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



Arthur Diamond May 9, 2018

Architect of Record Date

END OF SECTION

SECTION	REV	TITLE	DIS	ISSUED PACKAGE	ISSUED DATE
DIVISION 00 PROCUREMENT AND CONTRACTING REQUIREMENTS					
00 00 00	R0	Title Page	A	100% Review	05/04/18
00 01 07	R0	Professional Identification	A	100% Review	05/04/18
00 01 10	R0	List of Contents	A	100% Review	05/04/18
00 43 13	R0	Procurement Form Supplements	A	100% Review	05/04/18
DIVISION 1 GENERAL REQUIREMENTS					
01 11 00	R0	Summary of Work	A	100% Review	05/04/18
01 20 00	R0	Price and Payment Procedures	A	100% Review	05/04/18
01 25 13	R0	Product Substitution Procedures	A	100% Review	05/04/18
01 26 13	R0	Requests for Interpretation	A	100% Review	05/04/18
01 31 13	R0	Project Coordination	A	100% Review	05/04/18
01 31 19	R0	Project Meetings	A	100% Review	05/04/18
01 32 16	R0	Construction Progress Schedule	A	100% Review	05/04/18
01 33 00	R0	Submittal Procedures	A	100% Review	05/04/18
01 41 00	R0	Regulatory Requirements	A	100% Review	05/04/18
01 42 13	R0	Acronyms and Abbreviations	A	100% Review	05/04/18
01 45 00	R0	Quality Control	A	100% Review	05/04/18
01 50 00	R0	Temporary Facilities and Controls	A	100% Review	05/04/18
01 56 26	R0	Temporary Fencing and Barriers	A	100% Review	05/04/18
01 61 00	R0	Basic Product Requirements	A	100% Review	05/04/18
01 71 23	R0	Field Engineering	A	100% Review	05/04/18
01 73 29	R0	Cutting and Patching	A	100% Review	05/04/18
01 74 19	R0	Construction Waste Management	A	100% Review	05/04/18
01 78 00	R0	Project Closeout	A	100% Review	05/04/18
01 78 36	R0	Warranties	A	100% Review	05/04/18
DIVISION 2 EXISTING CONDITIONS					
02 41 19	R0	Selective Demolition	A	100% Review	05/04/18
DIVISION 3 CONCRETE					
03 30 00	R0	Cast-in-Place Concrete	A	100% Review	05/04/18
03 35 00	R0	Concrete Finishing	A	100% Review	05/04/18
DIVISION 4 MASONRY					
04 20 00	R0	Masonry	A	100% Review	05/04/18

NAME OF BIDDER_____

BID FOR:

Goodwood Community Centre Addition
268 Highway 47
Goodwood, Ontario

PROCUREMENT FORM SUPPLEMENT - ALTERNATIVES FORM:

We, the undersigned, agree that the following itemized prices, separate prices, alternate prices, unit prices, and builders alternative prices are taken into consideration, and allow for changes and adjustments in other work as required to complete the project. begin

ALTERNATE PRICES

The following are our prices for Alternate Work listed hereunder. Such Alternate Work and amounts are NOT INCLUDED in our Bid Price and DO NOT include HST.

Alternative Price #	Trade Package	Description of Work	Effect on Bid Price ($)		
			Addition		Deletion
1	07 21 29 Sprayed Polyurethane Foam Insulation	Provide 75mm (3") spray foam insulation instead of specified continuous board insulation with taped joints, mineral wool batt insulation within the stud spacing, and vapour retarder.	$ _____		$ _____

_____
Name of Bidder

_____
Date **Seal**

_____
Signature

_____
Name & Title

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 Owner has obtained and paid for the Building Permit for the Project.

.2 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.

.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.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

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:

By: _____
Consultant Date

Supplemental Instruction Accepted:

By: _____
Contractor Date

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

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, minimum three (3) copies of 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.

.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 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.

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

.3 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.

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

.5 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 Be governed by pertinent safety requirements of Federal or Provincial Governments and of municipal bodies having authority, particularly the Ontario Construction Safety Act, and regulations of Ontario Ministry of Labour, and work in conjunction with proper safety associations operating under the authority of Ontario Workers' Compensation Act.

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

.3 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. Maintain on site for duration of Contract a hazardous materials log containing all required MSDS. Log shall be open for inspection for Owner, Consultant and all personnel on site.

.3 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. 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 non-combustible construction or lined with non-combustible 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 non-combustible 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, non-combustible 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 SECTION INCLUDES

.1 Requirements for temporary hoarding.

1.2 PERMTIS

.1 Arrange and pay for necessary permits for proper execution and completion of the work of this section.

1.3 SUBMITTALS

.1 Shop Drawings:

.1 Submit shop drawings for temporary barriers and enclosures in accordance with Section 01 33 00.

.2 Clearly indicate details of construction, profiles, jointing, fastening and other related details.

1.4 HOARDING DESIGN

.1 Design hoarding to meet bylaws and regulations of authorities having jurisdiction and obtain approvals from authorities having jurisdiction.

.2 Location and types of hoarding as indicated on Drawings.

.3 Design and install hoarding to withstand wind loads at the Place of the Work without collapse, permanent deformation, or other failure of the hoarding system.

2 Products

2.1 HOARDING MATERIALS

.1 Plywood Hoarding:

.1 Provide rough hardware required for the work of this section.

.2 Framing lumber and posts: Unless otherwise specified or indicated, NLGA No. 2 Construction SPF.

.3 Reused material may be used.

.4 Dimensions as follows, unless otherwise indicated or required by authorities having jurisdiction:

.1 Vertical posts: 89mm x 89mm (3-1/2" x 3-1/2").

.2 Horizontal rails: 39mm x 89mm (1-1/2" x 3-1/2").

.3 Hoarding: Plywood, 1220mm x 2440mm x 13mm thick (4' x 8' x 1/2"), sheathing grade conforming to CSA 0141-M1978.

.4 Reused material may be used.

.5 Hoarding to be painted in accordance with Section 09 90 00. Colour: As selected by the Consultant.

.2 Chain Link Hoarding:

.1 Fence fabric: 3.75mm diameter (No. 9 gauge) steel wire woven in a 50mm (2") mesh, hot dipped galvanized after weaving and knuckled finish top and bottom selvage edges.

.2 Galvanized fabric to have a minimum zinc application of 490 g/m² of surface area.

.3 Posts: CLFMI (Chain Link Fence Manufacturer Institute) Type 1, standard buttwelded Schedule 40, ASTM F1083-10 standard weight, galvanized pipe.

.4 Provide prefabricated panelized chain link and post galvanized metal hoarding system.

.3 Signage: Provide suitable sized notice signs at entrance to the Place of the Work with contrasting text "RESTRICTED ACCESS - CONSTRUCTION SITE" complete with the name of Contractor.

3 Execution

3.1 HOARDING FABRICATION

.1 Provide hoarding immediately upon award of Contract.

.2 Erect framing members and install hoarding panels at the perimeter of the Place of the Work as indicated or required by authorities having jurisdiction to fully enclose the Place of the Work and as follows, unless otherwise indicated or required by authorities having jurisdiction:

.1 Height of hoarding: 2440mm (8') minimum, unless otherwise indicated, above grade at any point.

.2 Vertical posts spaced 2440mm (8’) on centre, maximum.

.3 Vertical posts: Set a minimum of 1220mm (4’) in the ground.

.4 Horizontal rails securely nailed or screwed to vertical posts at top, bottom, and intermediate locations at 610mm (24") on centre.

.5 Erect panels around objects as required.

.6 Hoarding shall contain no opening more than 100mm (4") wide or less than 914mm (3') above the bottom of the fence except where required for access to and from the Place of the Work.

.7 Provide no rails, other horizontal or diagonal bracing, attachments, or pattern of openings on the outside that would facilitate climbing.

.8 At access openings: Provide gates that provide performance and safety at least equivalent to hoarding and contain wire mesh of sufficient openness to provide visibility for traffic entering or exiting the Place of the Work.

.3 Provide overhead protection hoarding where public access is required.

.4 Provide hoarding, access gates, access doors, in conformance with the Contract Documents and authorities having jurisdiction.

.5 Incorporate silt control fabric from 200mm (8”) below existing grade and attach to hoarding to provide silt control to requirements of authorities having jurisdiction and Owner.

.6 Mesh fencing: Erect metal posts at 3050mm (10') on centre maximum with tensar mesh.

.7 Hoarding hardware: Provide rough and finish hardware as required.

3.2 DESIGN AND SAFETY REQUIREMENTS FOR TEMPORARY WORK

.1 Be responsible for design, erection, operation, maintenance and removal of temporary structural and other temporary facilities, barriers, and enclosures.

.2 Engage and pay for registered professional engineering personnel skilled in the appropriate disciplines to perform these functions where required by law or by the Contract Documents; and in cases where such temporary facilities and their method of construction are of such a nature that professional engineering skill is required to produce safe and satisfactory results.

.3 Engage and pay for professional engineer(s) registered in Place of the Work to design and supervise construction and maintenance of hoardings, covered ways, protective canopies and project sign(s). Designs provided by Consultant or Owner for such work cover general appearance only.

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 Protect prefinished metal surfaces by protective coatings or wrappings until time of final cleanup specified in Section 01 78 00. Protection shall be easily removable under work of Section 01 78 00 without damage to finishes.

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

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

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

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

.7 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 LAYOUT AND SURVEY

.1 Lines, Levels and Locations for Building:

.1 Existing grades, lines, and site conditions shown on drawings were taken from survey information established by persons engaged directly by Owner. The accuracy of survey information is not the Consultant's responsibility.

.2 The Owner will establish location of property lines. The Contractor shall establish necessary lines and levels, and provide batter boards and other means to control the accurate positioning of all building elements.

.2 Work Adjacent to Public Property:

.1 Verify before commencing work at adjacent public property, that no plans for altering clearances, set-backs, easements, grades, or otherwise have been made by local authorities having jurisdiction, subsequent to their approval of Contract Documents, and which would affect the original intent.

1.2 SUBMITTALS

.1 Submit qualification data for land surveyor to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

.2 Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

.3 Submit two (2) copies of certified survey signed by registered land surveyor.

.4 Submit two (2) copies of final property survey showing the Work performed and record survey data.

.5 Submit a Certificate of Compliance at completion of site grading stating the “As Constructed” grading elevations, and whether or not they differ from design grades.

1.3 DRAINAGE

.1 Ensure that positive drainage is provided to roof, floor and site drains and catch basins, as set in their final positions. Provide constant slopes for drained surfaces to drains and drainage courses.

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

.3 Verify the extent of each area served by a drain, or drainage course, to eliminate possible undrained surfaces. Coordinate the work of involved Sections before each proceeds.

1.4 RECORD DRAWINGS

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

.2 Ensure that clearances required by authorities having jurisdiction and/or for easy maintenance of equipment will be shown on the above drawings.

.3 Interference drawings shall be prepared before any orders for equipment and/or materials are released to suppliers.

1.5 SURVEY REFERENCE POINTS AND LEGAL SURVEY MARKERS

.1 Verify existing base horizontal and vertical control points designated on drawings.

.2 Locate, confirm and protect control points and legal survey markers prior to starting site work; preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice to Consultant.

.4 Report to Consultant when a reference point or legal survey marker is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.5 Replace control points in accordance with original survey control.

.6 Replace legal survey markers lost or destroyed as a result of construction activities.

1.6 SURVEY LAYOUT

.1 Coordinate with Contractor for layout and protection of grade controls.

.2 Establish permanent bench mark(s) as required, referred to established bench marks by survey control points; record locations, with horizontal and vertical data.

.3 Establish lines and levels, locate and layout, by instrumentation.

.4 Stake for grading, cuts and fills, slopes.

.5 Replace grade controls lost or destroyed as a result of construction activities.

1.7 CONSTRUCTION LAYOUT

.1 Verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. Notify Consultant promptly if discrepancies are discovered.

.2 Engage a land surveyor to lay out the Work using accepted surveying practices:

.1 Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.

.2 Establish dimensions within tolerances indicated; do not scale Drawings to obtain required dimensions.

.3 Inform installers of lines and levels to which they must comply.

.4 Check the location, level and plumb, of every major element as the Work progresses.

.5 Notify Consultant when deviations from required lines and levels exceed allowable tolerances.

.6 Verify accuracy of site dimensions shown on drawings.

.7 Verify that present, or known future restrictions, are not violated by construction on the site or lines of traverse to all public utilities.

.8 Verify accurately the final underground location on site of all buried storm, sanitary, water and electrical duct banks, when applicable.

.9 Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

.3 Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

.4 Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Consultant when requested.

1.8 FIELD ENGINEERING

.1 Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations:

.1 Do not change or relocate existing benchmarks or control points without prior written approval of Consultant.

.2 Report lost or destroyed permanent benchmarks or control points promptly.

.3 Report the need to relocate permanent benchmarks or control points to Consultant before proceeding.

.4 Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

.5 Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

.6 Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.

.7 Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

.2 Provide as-built site survey information after completion of demolition and excavation operations ready for construction.

.1 Survey grade elevations shall be on a 9 m grid or as required to locate property lines and new building structural grid lines.

2 Products

Not Used

3 Execution

Not Used

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 porcelain, and finish metals;

.3 Vacuum cleaning of ceilings, walls and floors.

.4 Clean exposed open web steel joists within the area of the work.

.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, but is not limited to the following:

.1 Demolish and removal of the following where indicated on the Drawings:

.1 Rain water leader;

.2 Exterior windows;

.3 Exterior concrete block wall to create an opening.

.4 Gas pipe;

.5 Roofing materials;

.2 Disconnect/cap existing service in areas of demolition.

.3 Trace, demolish and remove decommissioned mechanical and electrical services found during demolition. Remove decommissioned services to the area of demolition to the source, leaving no buried services in walls and floors, unless otherwise approved by written notice from the Owner.

.4 Dispose of demolished materials except where required to be salvaged or reused.

.5 Refer to demolition notes indicated on all disciplines Drawings.

.3 Drawings contain details that suggest directions for solving some of the major demolition and removal requirements for this project; Contractor is required to develop these details further by submitting a demolition plan prepared by a professional engineer employed by the Contractor.

1.2 RELATED REQUIREMENTS

.1 Section 03 30 00: Cast-In-Place Concrete

.2 Section 04 20 00: Masonry

.3 Section 05 40 00: Cold Formed Metal Framing

.4 Section 05 50 00: Miscellaneous Metals

.5 Section 06 10 00: Rough Carpentry

.6 Section 09 21 16: Gypsum Wallboard

.7 Section 31 23 33: Excavation, Trenching and Backfilling

1.3 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI):

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

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

.4 Provincial Legislation:

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

1.4 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.

1.5 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.

1.6 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

1.7 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.

.6 Professional Engineer Qualifications: Procure the services of a professional engineer who is experienced in providing relevant engineering services to perform the following:

.1 Review portions of the Work requiring structural performance, prepare plan of action, engineer temporary shoring and bracing, and Provide site administration and inspection for work of this Section.

1.8 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 Prevailing weather conditions and weather forecasts shall be considered. Demolition work shall not proceed when weather conditions constitute a hazard to the workers and site.

.4 Prevent damage of surrounding vegetation by construction. Install tree protection barriers to trees that are scheduled to remain, as detailed on Drawing CM-1 Construction Management Plan.

.5 Prevent debris from blocking surface drainage inlets and mechanical and electrical systems which remain in operation.

.6 Temporarily suspended work that is without continuous supervision shall be closed to prevent entrance of unauthorized persons.

1.9 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.

1.10 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.

1.11 EXISTING SERVICES

.1 Prior to start of demolition disconnect all electrical service lines 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 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.

1.12 DECOMMISSIONED SERVICES

.1 Remove fully decommissioned electrical and mechanical service lines, plumbing, ducting, fixtures and all fasteners and supports for decommissioned items.

.1 Remove sewer and water lines where required within existing building as deemed necessary, and cap to prevent leakage, in accordance with authorities having jurisdiction.

.2 Patch and repair surfaces affected by this selective demolition to match existing adjacent surfaces, as approved by the Consultant.

1.13 EXISTING WARRANTIES

.1 Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

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 hoarding protection, as indicated in Section 01 56 26, to enclose openings in exterior walls, and/or provide security to partially occupied interior spaces.

.2 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; as indicated in Section 03 35 00.

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

.4 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.

.5 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.

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 Sprinkle exterior debris with water to prevent dust. Do not cause flooding, contaminated run-off or icing. Do not allow waste material, rubbish, and windblown debris to reach and contaminate adjacent properties.

.7 Lower waste materials in a controlled manner; do not drop or throw materials from heights.

.8 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.

3.5 PATCHING AND REPAIRING

.1 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 Provide materials and comply with installation requirements specified in other Sections of these Specifications.

.4 Patch any existing areas adjoining / adjacent to new construction in good workmanship, filling and finishing gaps between finishes to allow new work to blend seamlessly with existing work.

.5 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.

.6 Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

.2 Exterior Walls: Where existing doors and/or windows are schedule to be removed during demolition, patch and repair exterior walls using similar wall construction techniques as adjacent wall construction. Ensure compatibility between insulation, air barrier and vapour retarder, providing continuous air and vapour control and wall R-Value between existing and new construction. Provide exterior and interior finish materials, matching existing adjacent materials, 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 GENERAL REQUIREMENTS

.1 General Conditions, Supplementary Conditions and Division 01 apply to this Section.

1.2 RELATED WORK UNDER OTHER SECTIONS

.1 Contractor shall be responsible for co-ordinating this section with all related sections.

1.3 REFERENCE STANDARDS

.1 All Codes, Standard Specifications and By-Laws referred to in this Specification shall be current editions including all revisions and addenda.

.2 Conform to the Building Code from the Province of construction.

.3 Conform with CSA Standards CAN2-A23.1, .2 and .3. (References made to CAN/CSA A23M shall mean whichever Part, .1, .2 or .3 that is relevant to the topic)

.4 Conform with CSA Standard CAN3-A5.

.5 Conform with ACI Standard 214-77.

.6 Conform with CSA Standards CAN3-A266.1, .2 and .4. (References made to CAN2-A266M shall mean whichever part, .1, .2 or .4 that is relevant to the topic)

.7 Conform with ASTM Standard C309.

.8 Conform with CSA Standard A283.

.9 Conform with CSA-S413.

2 Products

2.1 GENERAL

.1 Provide new materials equal in all respects to those specified.

.2 No substitutions will be allowed unless the following arrangements are made:

.1 Written permission is obtained from the Architect/Engineer.

.2 The Contractor ensures that substitutions can be both physically and dimensionally incorporated in the work with no loss of intention, function or construction time and at no additional cost to the Owners.

.3 The Contractor shall reimburse all Consultants for additional expenses due to these substitutions.

2.2 MATERIALS

.1 Cement:

.1 Provide Portland Cement of Canadian Manufacture conforming with CSA Standard CAN/CSA-A5. **Type 10**, unless noted otherwise on plans, (from the same source for entire project for concrete exposed to view).

.2 Aggregates:

.1 Provide clean, uncoated sand and coarse aggregates from approved sources which conform with CSA Standard CAN3-A23.1. Nominal size of coarse aggregate shall be 20mm unless otherwise stated on the structural drawings or specifications.

.2 Coarse aggregate for concrete in 300mm to 375mm thick columns shall be of calcareous nature and shall contain a combined total of not more than 10% of quartz, chert and flint.

.3 Water:

.1 To CSA-A23.1. Verify that no salts are present which will cause efflorescence.

.4 Ready Mix Concrete:

.1 Shall be quality controlled concrete conforming with CSA-A23.1.

.2 Unless noted on drawings, the following concrete mixes and twenty-eight (28) day compressive strengths for concrete shall be used:

.1 Foundations: 25MPa, Class F2

.2 Basement walls: 25MPa, Class F2

.3 Foundation walls: 25MPa, Class F2

.4 Grade Beams: 25MPa, Class F2

.5 Interior Slab-on-Grade: 25MPa

.1 Minimum cement content 280 kg/m^3.

.2 Maximum water/cement ratio 0.55.

.6 Interior Piers, Walls, Columns and All Other Interior Concrete: 25MPa

.1 Minimum cement content 230 kg/m^3.

.2 Maximum water/cement ratio 0.69.

.7 Retaining Walls: 35 Mpa, Class C1

.8 Parking Structure Slabs, Walls and Columns: 35 Mpa, Class C1

.9 All Exterior Reinforced Concrete: 35 Mpa, Class C1

.10 All Exterior Unreinforced Concrete: 32 Mpa, Class C2

.3 Concrete shall also conform to the following:

.1 Conform with the requirements of CSA-A23.1

.2 The co-efficient of variation of twenty-eight (28) day compressive strength test results shall be in the 'Good or Better' range (15% variation is acceptable) as laid down in ACI 214.

.3 Chlorides of any kind shall not be used.

.4 Limit water/cement ratio of mixes to no more than the requirements of CSA-A23.1 or as specified on the structural drawings/specifications, whichever is less.

.5 Slumps:

.1 In accordance with CSA-A23.1 unless otherwise noted on structural drawings.

.6 Admixtures:

.1 Where permitted, shall conform with CSA-A266M.

.1 Water Reducing Admixtures: CSA-A266.2 and A266.4.

.2 Air Entrainment: CSA-A266.1.

.3 Chemical Admixtures: CAN3-A266.2 and A266.4, Type A - water reducing.

.1 Admixtures containing thyocyanates, calcium choline or more than 0.1% chloride ions are not permitted. Corrosive content: no more than present in municipal drinking water.

.2 Maximum water soluble chloride ion content in hardened concrete at twenty-eight (28) days: Not to exceed 0.15% by weight of cement.

.7 Fly-Ash and Slag:

.1 Do Not incorporate Fly-Ash or Slag into concrete mix designs without prior approval in writing.

.2 Fly-Ash will not be accepted in any concrete which is exposed to view.

.3 Obtain Consultant's written approval prior to the use of any other admixtures.

.8 Grout:

.1 Dry Pack Grout:

.1 Use a mix consisting of one (1) part Portland Cement and one & one-half (1-1/2) parts sand and two (2) parts of 8mm pea gravel with only sufficient water to dampen the mixture, and to attain a compressive strength of 50 Mpa at twenty-eight (28) days.

.2 Non-Shrink Grout:

.1 Pre-mixed, non-shrinking, high strength grout, COE CRD-621; compressive strength of 50 Mpa in twenty-eight (28) days.

.1 'Masterflow 713', by Master Builders Co.

.2 'Euco-N-S Grout' by Euclid Chemical Company.

.3 'Sonogrout' by Sonneborn Building Products.

.4 'M-BED Standard' by Sika Canada Inc.

.3 Epoxy Bonding Agent: ASTM C881

.1 'Concresive 1001 LPL' by M.B.T. Co.

.2 Similar product by other manufacturers; submit name, compressive strength and tensile strength for acceptance.

.3 'Sikadur 32 Hi-Mod' by Sika Canada Inc.

.9 Concrete Curing Materials:

.1 Chemical Cure for Slabs:

.1 'Kure-N-Seal' by Sonneborn Building products or 'Florseal S.B.R.' by Sika Canada Inc., acrylic formula designed and certified to compatible with resilient flooring adhesives.

.2 Substitutions: None accepted.

.3 Chemical Curing shall not be used for parking deck slabs.

.10 Moisture Cure:

.1 Water: Potable.

.11 Moisture-Retaining Coverings:

.1 Burlap, cotton mats or other moisture-retaining fabrics; AASHTO M182, ASTM C171 or AASHTO M73. Provide burlap free of seizing; rinse thoroughly in caustic soda to remove soluble substances and make burlap more absorbent.

.12 Concrete Mix:

.1 Mix and deliver concrete in accordance with CSA-A23.1 and ASTM C94.

3 Execution

3.1 APPROVALS

.1 Submit for review proposed concrete mix designs for each class and strength of concrete to be utilized in the project, including pump mix designs as intended to be provided by the supplier.

.2 Submit copies of mix designs to the Architect, the Engineer and the appointed inspection and testing company.

.3 Submit for approval brand name, etc. of admixtures to be incorporated in mix designs.

.4 Submit for approval brand name of proposed curing compound to be used.

.5 Submit for the Architect's review, drawings (scale 1:48 or 1:50) showing type, extent and location of items to be cast in, and openings to be formed in concrete work. Concrete must not be placed until Architect has reviewed these drawings. Particular emphasis is to be placed on accurately locating all openings in walls.

.6 Use concrete pumps to place concrete only with approval of methods, equipment and mix design.

.7 Submit drawings or marked-up prints showing proposed locations of construction and control joints in all slabs for review by the Engineer.

3.2 EXAMINATION

.1 Ensure that no water is present. No flooding water is permitted on foundation beds. Provide skim coats where footings and other concrete work are to be placed on soils which do not provide an acceptable working surface. Place concrete only on frost-free ground. Remove previously frozen bearing surfaces.

.2 Ensure that all spread foundations bear on undisturbed soil or approved engineered fill. If bearing surfaces are disapproved because conditions do not meet those anticipated during design, make adjustments only as directed. No extra payment will be made for adjustments made necessary because of damage to bearing surfaces caused by weather, traffic, or removal of frozen material, or by presence of adjacent construction or services incorporated in the Work.

.3 Ensure that compacted fill has been placed to meet specified requirements and that under-slab services have been installed, inspected, tested and approved.

.4 Keep excavations dry while placing concrete. Pump as required.

.5 Verify anchors, seats, plates reinforcement and other items to be cast into concrete are accurately placed, held securely and will not cause hardship in placing concrete.

3.3 PREPARATION

.1 Reinforcement shall be stored in such a manner that it is off the ground and kept free of mud and foreign matter.

.2 Before concrete is placed, all reinforcing steel, accessories and hangers, inserts, conduits, sleeves, outlets, etc., must be securely tied in place and reviewed.

.3 Before casting concrete, obtain Engineer's approval of reinforcement in place. Leave open one (1) side of forms for the following structural elements until all reinforcement is secured in place and reviewed and accepted by the Consultant's representatives.

.1 All columns.

.2 Walls or deep beams containing heavy or complicated reinforcement.

.4 At least 75% of all reinforcing steel in any structural concrete member must be properly secured in position before the reviewing inspector can accept the steel for casting concrete.

.5 All dirt, clips, sawdust, water, snow, ice and other foreign matter must be removed from forms and reinforcing steel.

.6 All forms, surfaces, reinforcing steel and ground with which the concrete is, or is calculated to come in contact with, shall be heated to a temperature of not less than 5EC.

.7 The bottom of excavations for footings and foundations must be undisturbed soil or approved engineered fill, clean, free from loose material, organic material, water and frost, properly levelled and approved by the Soils Consultant prior to the placing of concrete.

.8 All sides of footings shall be formed unless hand excavated on stiff cohesive soil.

.9 Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Apply bonding agent in accordance with manufacturer's instructions. Do not apply bonding agent at slab-on-grade construction joints.

3.4 WORKMANSHIP

.1 Conform with the requirements of CSA Standard CAN/CSA-A23M. Maintain a copy of the Standard on the site throughout the construction period.

.2 Provide a competent and experience supervisor or foreman who shall be present o the site continuously throughout each working day.

3.5 PLACING CONCRETE

.1 Place concrete in accordance with CAN/CSA-A23.1; including hot and cold weather placement procedures.

.2 Notify the rebar inspection company at least 24 hours before any concreting operation is to proceed, for a review of the operations. The planning casting must be made continuously without stop.

.3 Maximum time between adding mix water and complete discharge of concrete into forms shall be ninety (90) minutes.

.4 Conveying and placing equipment shall be such that once concreting has started, the depositing of concrete shall be a such a rate and of such sequence that the concrete is at all times sufficiently plastic to ensure proper binding of successive layers or panels.

.5 Conveying and placing equipment shall be kept free from hardened concrete and foreign material and shall be cleaned at frequent intervals.

.6 Contact local meteorological office at least twenty-four (24) hours before start of concrete casting. Re-schedule casting if adverse weather conditions are imminent (rain, snow, etc.). Do not place concrete when it is raining or likely to rain.

.7 Notify testing laboratory minimum twenty-four (24) hours prior to commencement of concreting operations.

.8 Inspect reinforcement, insets and embedded parts before beginning concrete placement to ensure accurate size and location.

.9 Ensure reinforcement, insets, embedded parts and formed joints are not disturbed during concrete placement.

.10 Do not deposit concrete which has partially set or hardened. Do not deposit initial lubricating mortar when pumping concrete. Remove hardened or partially hardened concrete which has accumulated on forms or reinforcement. Do not place concrete on previously deposited concrete which has hardened sufficiently to cause formation of seams or planes of weakness within respective members or sections, except as specified.

.11 Do not deposit concrete into excavation where water is standing. If place of concrete cannot be successfully pumped dry, place through tremie with outlet end near bottom of place of deposit.

.12 Consolidate and screen concrete slabs-on-grade by use of vibratory screed of size to allow construction joint pattern as indicated on Structural drawings and specified.

.13 Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Structural Engineer upon discovery.

3.6 JOINTS

.1 Construction Joints:

.1 In general, incorporate both horizontal and vertical construction joints in accordance with CSA Standard CAN/CSA-A23-M and typical details shown on drawings.

.2 Refer also to in slabs-on-grade specifications in this section.

.3 Refer to submittals in this section.

.4 ACI recommends that reinforced concrete slabs shall be cast in sections not exceeding 560 square meters in area. Contractor shall take necessary measures to prevent excessive cracking if pour size is increased and shall be responsible for repairing cracked concrete resulting from exceeding recommended maximum pour size. Each pour shall be bounded by a vertical bulkhead or abutting construction. Provide additional reinforcement, as per typical details.

.5 Maximum spacing between vertical construction joints in walls shall be 9000mm. Engineer's approval shall be obtained for location and details of construction joints if required otherwise by site conditions.

.6 Provide 40mm deep x 90mm wide continuous key in all footings under reinforced concrete walls and wall joints below grade.

3.7 COLD WEATHER PROTECTION REQUIREMENTS

.1 Conform with the requirements of CSA Standard CAN/CSA-A23M, and as hereinafter specified.

.2 Protection Against Early Frost Damage:

.1 Effective means shall be provided for maintaining the temperature of the concrete in place above the minimum limits shown in Table 14 in CAN/CSA-A23.1-M for a minimum period of three (3) days or until sufficient hydration has occurred to protect the concrete from frost damage.

.3 Protection for Structural Safety:

.1 If, subsequent to the above period of protection, the ambient conditions are not likely to be favourable for continuous strength development, the protection period shall be extended until the concrete has achieved sufficient strength for structural safety.

.4 Protection for Strength and Durability:

.1 When subsequent ambient conditions are not conducive to continued curing and strength development, the protection period shall be extended until total period of seven (7) days at temperature above 10EC has been attained.

.5 The Architect may instruct that additional protection and/or heating facilities be provided, if in his opinion, that which has already been provided is inadequate, at no extra cost to the contract.

.6 Equipment and materials capable of maintaining adequate temperature, humidity and protection shall be available on site and be ready for operation when any concrete is placed.

3.8 HOT WEATHER PROTECTION REQUIREMENTS

.1 Conform with the requirements of CSA Standard CAN/CSA-A23M, the recommendations of ACI Standard 305 and as hereinafter specified.

.2 Job Preparation:

.1 Facilities shall be provided for protection of the concrete in place from the effects of hot and/or drying weather conditions. In extremely hot weather, the formwork, reinforcement and concreting equipment shall be protected from the direct rays of the sun, or cooled by fogging and evaporation.

.3 Concrete Temperature:

.1 When the air temperature is at or above 25EC or when there is a probability of it rising to this during the placing (as forecast by the local official meteorological office) special effort shall be made to maintain the temperature of the concrete as low as practicable and in no case more than that stipulated in Table 14 in CAN/CSA-A23.1-M.

3.9 FINISHING OF CONCRETE

.1 Exposed Surfaces: As indicated in Section 03 35 00.

.2 Non-Exposed Surfaces:

.1 Honeycombing shall be cut out and filled and any fins which interfere with strapping, etc., shall be cut back. Holes left by from separators shall be filled. (See also Defective Concrete)

3.10 TROWELLING AND SCREEDING

.1 Conform with the requirements of CSA Standard CAN/CSA-A23M and as modified hereinafter.

.2 Bring tops of floors to an even level or sloping surfaces as shown on the drawings.

3.11 CURING

.1 Conform with the requirements of CSA Standard CAN/CSA-A23M.

.2 Refer also to COLD WEATHER PROTECTION REQUIREMENTS and HOT WEATHER PROTECTION REQUIREMENTS.

.3 All equipment needed for curing and protection of the concrete shall be on hand and ready for use before actual placing is started.

.4 All exposed non-formed surfaces shall be kept wet cured for a period of at least seven (7) consecutive days after casting. The water for curing shall be clean and free from any materials that will stain or discolour the concrete. A liquid, membrane forming, curing compound may be used under circumstances where application of such compounds will not jeopardize the appearance of the concrete nor the bonding of floor finishes.

.5 Wheeling, handling, piling or storing of any material over or on slabs is prohibited during the first seven (7) days after placing concrete, except such handling or wheeling on planked walkways as may be approved by the Engineer.

.6 Protect all freshly placed concrete from extreme heat, running water and mechanical shock for a duration of the curing period.

3.12 DEFECTIVE CONCRETE

.1 Concrete not meeting the requirements of the specifications and drawings shall be considered defective concrete.

.2 Concrete not conforming to lines, details, quality and grade specified or as shown on the drawings shall be modified or replaced at no increase to the contract price, and to the satisfaction of the Architect and Engineer.

.3 Finished lines, dimensions and surfaces shall be correct an true within tolerances specified.

.4 Cores drilled and tested from areas in question, as directed by the Engineer and in accordance with CSA Standard CAN/CSA-A23M and/or load testing of the structural elements in accordance with the requirements of the Engineer shall be done at no increase to the contract price.

.5 Defective concrete shall be replaced to the Architect's and Engineer's satisfaction at no increase to the contract price.

3.13 CONDUITS, PIPES, OPENINGS AND INSERTS

.1 Comply with Clause Submittals in this section.

.2 No sleeves, ducts, pipes or other openings shall pass through joists, beams or columns, except where expressly detailed or approved by the Structural Engineer in writing.

.3 Electrical conduit and other pipe embedded in the concrete shall not be of aluminum or any other material harmful to the concrete and shall:

.1 Not pass through or be embedded in a column.

.2 Not be a larger outside diameter than one-third (1/3) the thickness of the slab, wall or beam in which they are embedded.

.3 Not be spaced closer than three (3) diameters on centre, unless otherwise shown on the structural drawings.

.4 Have a concrete covering of not less than 25mm or one third (1/3) the thickness of the slab, whichever is greater.

.5 Be so installed that it will not require cutting, bending or displacement or the reinforcement or impair the structural strength of the system.

.4 Provide and cast-in all sleeves, frameouts, inserts and fastening devices shown on the drawings, except as otherwise specified.

.5 Provide sleeves in slabs or walls for mechanical piping and avoid openings where possible. Engineer's approval must be obtained for any concentration of sleeves in column band and around columns. Conform to typical details. Sleeving drawings must be submitted for approval minimum two (2) weeks prior to pouring of concrete.

.6 Provide openings in slabs or walls as shown on structural drawings or otherwise required by various trades. Engineer's approval must be obtained for locations and sizes of openings not shown on structural drawings. All openings must be formed before the slab or wall is poured. See typical details. Do not cut any openings, after concrete has been poured, unless specifically authorized by the Engineer.

.7 Openings and driven fasteners required in the concrete work after the concrete is placed shall be approved by the Engineer prior to installation.

.8 Install where required in the concrete frame, all brackets and inserts, etc., as required by the window and/or curtain wall supplier for the support of the windows, and/or curtain walls.

.9 Check the drawings and specifications for the requirements of other trades as they may affect the placing of concrete and make provisions for holes through structural members and be responsible for all inserts, sleeves, conduits, etc., as set by all trades.

.10 Give instruction and information in writing or by schedules to all trades, of the requirements necessary for services, materials or inserts prepared and/or supplied by other trades which will affect the work of this section.

.11 Assist and co-ordinate with all trades in the preparation of drawings showing the type, extent and location of items to be cast in and openings to be formed in Concrete Work. These drawings must be submitted to the Engineer and reviewed prior to placing of concrete. (Refer to Article 3.1, Item .5)

3.14 GROUT

.1 Provide and place dry pack concrete grout or non-shrink grout as required and co-operate with other trades in the placing thereof.

3.15 REINFORCED MASONRY LINTELS

.1 Where required or where covered by the requirements of the General Notes and Typical Details, provide reinforcing and place concrete for reinforced masonry block lintel beams. Reinforcing and concrete is to be in accordance with the requirements of the Drawings and General Notes.

3.16 SLABS-ON-GRADE

.1 Provide screeds set to an engineer's level for levelling the surface of floor slabs-on-grade.

.2 Provide keys or dowels at construction joints as detailed on the drawings.

.3 Provide separate concrete pour around columns. Unless otherwise shown, leave out diamond shaped, or circular shaped, areas around columns, equal to the dimension of the cap below or 300mm larger than the column. Concrete shall be placed in these areas not less than fourteen (14) days after the adjoining floor slabs have been placed. See typical details on structural drawings.

.4 ACI recommends that slab-on-grade shall not be cast in sections exceeding 950 square meters. Contractor shall take necessary measures to prevent excessive cracking if pour size is increased and shall be responsible for repairing cracked concrete resulting from exceeding recommended maximum pour size. Each pour shall be bounded by a vertical bulkhead or abutting construction joint.

.5 Provide 3mm wide x 25mm deep saw cuts as soon as possible after slab is poured. Saw cut slab into panels along column lines, and between column lines at maximum 40 times the slab thickness, each way, and at building expansion joints.

.6 Where panels abut construction joints, construction joints shall be considered to act as saw cuts, and additional saw cutting is not required.

.7 Slab-on-grade panels are to be approximately square with the longer side of the panel not greater than 1.5 times the shorter side.

.8 Caulk at saw cut lines with approved flexible caulking material.

.9 Provide a drawing, or marked-up print, for review by the Architect, for proposed joint locations in the slab-on-grade. Also co-ordinate saw cuts with architectural floor pattern.

.10 Provide double stripping terrazzo and/or line tile joints over saw cuts.

.11 Where floor depressions occur, maintain the slab thickness specified on the foundation plans. Refer to architectural drawings for depression locations, depths, etc.

.12 For granular material under slab-on-grade, see soil report and foundation plan. Recommendation in soil report shall govern when specifications differ.

.13 Permission to pour concrete slab-on-grade shall be granted subject to the following conditions:

.1 That the grade is compacted to min. 97% modified Proctor maximum dry density or as recommended by the Soil Engineer.

.2 That any trenches, holes, etc., which are dug after the compaction as stated in .1, above, are finished, and filled with new granular 'B' material and compacted to a minimum of compaction mentioned above.

.3 That a properly spaced system of saw cuts is used to take care of shrinkage of the slab-on-grade.

.4 That the operations mentioned under items .1 to .3, inclusive, are carried out under approved supervision.

.14 Obtain all requirements, and provide for mechanical bases, pits, sumps and trenches not shown on the structural drawings.

.15 Do not use frozen material containing ice or snow. Do not place concrete on frozen sub-grade or on sub-grade containing frozen material. Ascertain that forms, reinforcing steel and adjacent concrete surfaces are entirely free of frost, snow and ice, and that the temperature of these materials are above 5EC before placing concrete.

4 Quality Control

4.1 GENERAL

.1 Refer also to Article 3.1.

.2 Refer also to Article 3.16, Item .1.

.3 Routine testing of materials and of proposed mix designs shall be carried out by an independent inspection and testing company, appointed by the Owner, and will be paid for by the Owner.

.4 Any testing required by the Contractor to vary mix design, grade of steel, or to provide strength of concrete in place, or load testing where specified design strengths are not attained, or where errors have been made in construction, shall be done at the Contractor's expense.

4.2 ROUTINE INSPECTION AND TESTING

.1 Inspect the ready mix plant and truck mixers and ascertain that good quality control practices are followed in accordance with CSA Standard CAN/CSA-A23M and ASTM C-94.

.2 Review proposed concrete mix design and check-test if considered necessary.

.3 Concrete Strength Tests:

.1 Obtain representative samples of fresh concrete from each 130 cubic yards or fraction thereof and of each mix design of concrete placed in any one (1) day.

.2 Perform a standard slump test to conform with CSA Standard CAN/CSA-A23M for each set of specimens.

.3 Perform standard air entrainment test for concrete so specified to conform with CSA Standard CAN/CSA-A23M for each set of specimens.

.4 Three (3) specimens moulded in 150mm diameter cylindrical steel moulds, stored, and laboratory cured to conform with CSA Standard CAN/CSA-A23M, shall comprise a strength test. One (1) specimen shall be compression tested at seven (7) days and the remaining two (2) at twenty-eight (28) days after sampling.

.5 During the placing of concrete under the conditions of 'Cold Weather Concreting', one (1) additional specimen shall be made and shall be stored on the job site under conditions similar to the concrete it represents. The specimen is intended as a field control test and shall be field cured to conform with CSA Standard CAN/CSA-A23M. This specimen shall be compression tested at seven (7) days after sampling.

.4 Early Stripping of Forms:

.1 Any stripping sequence at an accelerated rate to that specified, requires approval in writing by the Architect. 'Pull-Out' moulds cast with the casting may be required. The use of 'Pull-Out' moulds shall be at the discretion of the Engineer. (Refer also to Article 4.5)

.5 Identify and correlate reinforcing steel from Canadian Mills with mill test reports for compliance with the requirements of CSA Standard G30.12-M1977.

.1 Specimens of unidentified reinforcing steel or reinforcing steel from non-Canadian mills shall be tested for each ten (10) tonnes of steel. The cost of this inspection and testing shall be paid for by the Contractor.

.6 Reports:

.1 Inspection company reports of test of materials and compression tests of concrete control cylinders shall be distributed as directed by the Architect.

.2 Concrete cylinder test reports shall contain the following information:

.1 Whether specimens are laboratory or field cured, date cast, date received in lab, date tested, unit weight of concrete, specified twenty-eight (28) day strength, correlate the exact location of each casting with the test cylinders in question, concrete supplier, person who cast the cylinder, time mixer charged, time cylinder cast, measured slump, temperature of concrete and air, whether or not water was added at the job and by what authority, nominal aggregate size, type of admixture, air-entrainment agent, project identification and with sequential numerical identification.

.3 Should a crushed cylinder show a test result below that which is anticipated, the inspection company shall immediately advise the Architect and Engineer by telephone of such occurrence in order to expedite curing or remedial measures which may be required.

.4 In the even that test cylinders indicate a strength of concrete below that which is specified, the test report shall state the reason for the lack of strength, i.e. poor quality concrete in place, cylinders improperly taken, stored, capped, frozen, improperly handled or faulty testing procedure. A correct analysis of the cause of poor tests will save unnecessary inconvenience when the report is submitted to all parties involved.

.5 The inspection company shall supply written reports of tests of materials and reinforcing steel, giving all pertinent information required by the above mentioned specifications and standards.

4.3 RESPONSIBILITY OF THE INSPECTION COMPANY

.1 The representative of the inspection company shall not be required to supervise the Work or to instruct the Contractor. The Inspector's function shall be that of sampling and testing materials, observing procedures and reporting of same to the Engineer. If any material is at variance with the Specification the Inspector shall immediately advise the Superintendent and then inform the Engineer by telephone.

.2 The inspection company will advise and co-operate with the Contractor regarding adequate protection of cylinders. The inspection company will supply the Contractor, with a copy to the Engineer, with a drawings and specification for an insulated storage box for cold weather curing of cylinders.

4.4 RESPONSIBILITY OF THIS SECTION

.1 Co-operate with the representatives of the inspection company.

.2 Advise the inspection company and the Engineer at least twenty-four (24) hours in advance of the placing of concrete.

.3 Provide an insulated storage box according to the specification and drawings supplied by the inspection company.

.4 Protect test cylinders.

.5 Keep a record set of drawings upon which shall be marked, by the Contractor's Superintendent, the time and date of casting of each section of concrete, the date of removal of forms and a daily record of the temperature.

4.5 RETESTING

.1 Payment for re-testing and re-inspection of Work replacing that found defective following initial inspection made under Contract Work, or as otherwise made evident, is the responsibility of the Contractor and will not be considered as additional Work of this Section.

5 Clean-Up (General)

.1 Upon satisfactory Completion of the Work, clear away from the building and site, excess or waste materials and debris and leave the premises in a condition acceptable to the Architect within the contract time.

.2 Do no unload excess concrete from concrete trucks during clean-up operations and do not deposit in undesignated and unauthorized locations within the Scope of Work boundaries whether concealed or not.

END OF SECTION

1 General

1.1 SUMMARY

.1 Work of this Section includes the following:

.1 Requirements for concrete floor additives such as:

.1 Penetrating sealer

.2 Testing and measurement for floor flatness and levelness,

.3 Trowelling, levelling, and floating of floor surfaces for ready for applied finishes.

1.2 RELATED REQUIREMENTS

.1 Section 03 30 00: Cast-In-Place Concrete

.2 Section 05 50 00: Miscellaneous Metals

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 ±1.6mm over 3048mm (1/6” over 10’); similar to CSA A23.1 Class C Slab Finishing.

1.4 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM):

.1 ASTM C309-11, Standard Specification for Liquid Membrane-Forming Compound for Curing Concrete.

.2 ASTM C979/C979M-10, Standard Specification for Pigments for Integrally Colored Concrete.

.2 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

.3 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.

.4 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 Provide 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 manufacturer's 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 Unless specified otherwise, materials shall meet specified requirements of Section 03 30 00.

.2 Curing Sheet: 2 mil polyethylene sheet conforming to CGSB 51-GP-51M or laminated waterproof kraft paper.

.3 Liquid Applied Penetrating Sealer: Clear water based silane micro emulsion penetrating concrete sealer formulated to prevent water and chloride intrusion into concrete surfaces.

.1 Basis of Design Materials:

.1 Planiseal WR 40 by Mapei Inc.

.2 Cipadm S-40 by CPD Construction Products

.3 Sikagard SN40 by Sika Canada Inc.

.4 Hydrozo Silane 40 VOC by BASF.

.4 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 Planitop 18ES by MAPEI Canada Inc.

.2 SikaQuick 1000 by Sika Canada Ltd.

.3 Meadow-Crete H by W.R. Meadows of Canada

.5 Joint Sealant: Refer to Section 07 92 00: 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 Concrete Finishing:

.1 Roll or tamp concrete to force coarse aggregate into concrete mix and then screed.

.2 Bring surface to true grade by floating.

.3 Steel trowel to a true and even surface.

.4 Follow with second steel trowelling to produce a smooth burnished surface.

.2 Sealed Floors:

.1 Seal all exposed concrete floors. Apply sealer as recommended by manufacturer. Install bond breaker of silica sand, polyethylene film strip or foam filler in bottom of joints.

.3 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 manufacturer's 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 manufacturer's written instructions and test mix for slump using 100mm (4") cylinder.

.6 Pour underlayment to recommended thickness and immediately spread and screen to smooth surface.

.4 Control Joints:

.1 As soon as concrete surface is firm enough not to be torn or damaged by cutting, cut 5mm (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 6096mm (20') in both directions unless noted.

.3 Cut joints in slabs on grade 38mm (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.

.5 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 Architectural Concrete Masonry Units (CMUs)

.2 Precast Trims

.3 Mortar, and Grout

.4 Reinforcing steel

.5 Masonry joint reinforcement

.6 Ties and anchors

.7 Embedded flashing

.8 Miscellaneous masonry accessories

1.2 RELATED REQUIREMENTS

.1 Section 05 40 00: Cold Formed Metal Framing

.2 Section 05 50 00: Miscellaneous Metals

.3 Section 06 10 00: Rough Carpentry

.4 Section 06 17 53: Shop-Fabricated Wood Trusses

.5 Section 07 11 13: Bituminous Dampproofing

.6 Section 07 21 13: Board Insulation

.7 Section 07 21 16: Blanket Insulation and Vapour Barrier

.8 Section 07 21 29: Sprayed Polyurethane Foam Insulation

.9 Section 07 27 23: Board Product Air Barriers

.10 Section 07 41 16: Standing Seam Metal Roofing System

.11 Section 07 46 33: Plastic Siding

.12 Section 08 51 13: Aluminum Windows

.13 Section 09 21 16: Gypsum Wallboard

.14 Section 31 23 33: Excavation, Trenching and Backfilling

1.3 REFERENCE STANDARDS

.1 American Concrete Institute: (ACI):

.1 ACI 530.1-99/ASCE 6-99/TMS 602-99, Commentary on Specification for Masonry Structures

Canadian Standards Association (CSA):

.2 CSA A165 Series-04 (R2009), CSA Standards on Concrete Masonry Units

.3 CSA A179-04 (R2009), Mortar and Grout for Unit Masonry

.4 CSA A370-04 (R2009), Connectors for Masonry

.5 CAN/CSA A371-04 (R2009), Masonry Construction for Buildings

.6 CSA S304.1-04 (R2010), Design of Masonry Structures

.7 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 C568/C568-10, Standard Specification for Limestone Dimension Stone

.12 ASTM E488/E488M-10, Standard Test Methods for Strength of Anchors in Concrete Elements

.13 ASTM E514/E514M-11, Standard Test Method for Water Penetration and Leakage Through Masonry

.14 ASTM E2556/E2556M-10, Standard Specification for Vapour Permeable Flexible Sheet Water Resistive Barriers Intended for Mechanical Attachment.

.15 ASTM F593-02(2008)e1, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs

.16 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 Installation requirements of air/vapour membranes and insulation and coordination with other components of the Work

.4 Confirmation of appearance of exposed block lintels

.5 Confirmation of reinforcement at corners and wall intersections

.6 Coordination of interior and exterior crack control measures

.7 Confirmation of trowelled or tooled joints to concealed and exposed masonry faces

.8 Confirmation of methods for controlling efflorescence during construction

.9 Confirmation of membranes and membrane flashing materials and details used for construction

.10 Review of submitted masonry unit samples

.11 Review of hot and cold weather requirements

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

.1 Steel Support Angles and Brackets:

.1 Coordinate requirements for structural steel support angles and brackets supplied and installed onto the building structure by Section 05 50 00.

.2 Provide requirements for supply of loose steel lintels and shelf angles installed by this section to Section 05 50 00.

.2 Masonry Anchors:

.1 Coordinate supply of anchor sections connecting to structural frame installed by Structural.

.2 Include additional products for coordination furnished, but not installed, under this Section.

1.5 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Samples: Submit samples of the following; stone tile panel, concrete block, mortar, masonry reinforcement, ties and anchors, damp course/thru-wall flashing and adhesive, metal drip flashing, mortar dropping control device and weepholes for Consultant's approval before commencing work of this section.

.3 Shop Drawings: Submit shop drawings indicating the following:

.1 Indicate sizes, profiles, coursing, and locations of special shapes for concrete masonry units and stone masonry cladding.

.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.

.4 Samples for Verification: Submit samples for verification for each type and colour of the following:

.1 Decorative stone masonry cladding units, in the form of small scale units.

.5 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.

.2 Cold Weather Protection:

.1 Keep masonry materials completely free from ice and frost. Use approved smokeless heaters. Do not use scorched sand. Do not use salts, admixtures or antifreezes.

.3 Conform to the following construction requirements:

AIR TEMPERATURE	HEATING OF MATERIALS	PROTECTION
Above 5 deg C	Normal masonry procedures.	Cover walls and materials
Below 5 deg C	Heat mixing water. Maintain mortar temperatures between 5 deg C and 50 deg C until placed.	Cover walls and materials to prevent wetting and freezing.
Below 0 deg C	In addition to above heat sand. Thaw frozen sand and frozen wet masonry units before use.	With wind velocities over 35 km/h provide windbreaks during the workday and cover walls and materials at the end of each workday to prevent wetting and freezing. Maintain masonry above 0 deg C by using auxiliary heat or insulated blankets for 16 hours after laying masonry units.

Below -6 deg C	In addition to above heat dry masonry units to -6 deg C.	Provide enclosure and supply sufficient heat to maintain masonry enclosure above 0 deg C for 24 hours after laying masonry units.

.4 Hot Weather Requirements

.1 Comply with hot weather construction requirements contained in reviewed submittals.

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

.3 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until masonry work is completed and protected by flashings or other permanent construction.

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 Classification: S/15/A/M, 75% solid for all locations where structural members bear on concrete block.

.2 H/15/A/M, for all other block work.

.3 Size: Modular imperial to sizes indicated on Drawings.

.4 Special shapes:

.1 Provide square units for exposed corners.

.2 Provide purpose made shapes for lintels and bond beams.

.3 Provide additional special shapes required for project.

.4 Manufacture special shapes at same time and with the same batch as standard concrete block to be used.

.2 Exposed block shall all be made by one manufacturer and shall be uniform in colour, shade and texture.

2.3 ARCHITECTURAL TRIM UNITS

.1 Trim Units: Manufactured in accordance with CAN/ CSA A165 Series-04 (R2009), and as follows:

.1 Architectural Sill Profile:

.1 Size: 5-1/2" deep, complete with drip edge, 3-1/2" high, and angled to 3-1/4" high, with beveled edges.

.1 At locations requiring sills to wrap a corner, provide corner sill unit as a one (1) piece unit completed with beveled profile to match adjacent sill units. Miter joints are not permitted, unless prior written approved by the Consultant is obtained.

.2 Colour: As indicated on the Drawings.

.3 Basis of Cambridge Series, Architectural Sills Model R24/3.5 Angled, by Richvale York Block Inc.

2.4 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.

.7 Cold Weather Admixture:

.1 Non-chloride, non-corrosive, accelerating admixture in accordance with CSA A179 and ASTM C494, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

.2 Acceptable Materials:

.1 Grace Construction Products, Morset

.2 BASF, Trimix-NCA

2.5 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 For Masonry Below Grade and In Contact With Earth:

.1 Use premixed silo or bagged Type 'S' masonry cement mortar having minimum compressive strength of 8.5 Mpa at 28 days, jobsite tested.

.3 For Exterior Wythe of Cavity/Composite Walls (non load-bearing, above grade):

.1 Use Type 'N', 1:1:6 pre-mixed, pre-coloured, Portland cement/lime/sand mortar, 'Betomix Plus' by Daubois Inc., or Maxi-Mix silo. Use non-staining "white" cement where required to achieve colour as selected later by the Consultant.

.4 Interior Reinforced or Non-Reinforced Block Walls:

.1 Use Type 'S', premixed 'Bloc Mix' by Daubios Inc., or approved equal by Maxi-Mix.

.5 For All Other Masonry:

.1 Use Type 'N', premixed silo or bagged masonry mortar having a minimum compressive strength of 3.5 Mpa at 28 days, jobsite tested as per property specification, Table 6, CSA A179-04 (R2009).

2.6 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 Exterior Walls: Stainless steel.

.3 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 Masonry Unit Veneer/Steel Stud Tie Systems:

.1 Side of Steel Stud Mount:

.1 Tie Support: Fabricated hot dip galvanized in accordance with ASTM A123-09; designed to transfer wind loads to steel stud framing; length to suit total cavity, insulation and sheathing thickness.

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

.3 Fasteners: Self tapping metal screws to metal stud backup as recommended by tie manufacturer; of sufficient length to penetrate minimum ½" into steel stud.

.4 Acceptable Materials:

.1 Fero Holdings Ltd., Side Mounted Rap-Tie System

.2 Blok-Lok, BL-607

.6 Masonry Unit Veneer/Concrete Masonry Unit Substrate Tie Systems:

.1 Face of Masonry Mount:

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

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

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

.4 Acceptable Materials:

.1 Fero Holdings Ltd., Rap-Tie System

.2 Blok-Lok, BL-407

.7 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 Outdoor and High Humidity Locations: Alloy Group 1 or 2 stainless steel bolts complying with ASTM F593-02(2008)e1 and nuts complying with ASTM F594-09e1.

.3 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.

.4 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.

.8 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.

2.7 MISCELLANEOUS MASONRY ACCESSORIES

.1 Packing Insulation: Loose, mineral wool insulation, 1.0 lbs./cu.ft. density, and conforming to CAN/CGSB-51.11, as indicated in Section 07 21 16.

.2 Firestopping: As specified under Section 07 84 00.

.3 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

.4 Maintenance Cleaners: Manufacturer's recommended maintenance cleaners formulated for use with anti-graffiti coating used on project.

.5 Support Angle:

.1 Hot dip galvanized 458 g/m5/side in accordance with CSA A370-04 (2009) and ASTM A153/A153M-09.

.6 Fasteners: Galvanized fasteners meeting the requirements of ASTM A325-10, and as recommended by manufacturer.

.7 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.

.8 Bond Breaker Strips: #15 asphalt saturated, organic roofing felt in accordance with CSA A123.3-05 (R2010).

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 cavity walls and other masonry construction to full thickness shown on Drawings and 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 Grouting and Concrete Core Fills:

.1 Fill cores in hollow concrete masonry units with concrete 24" under bearing plates, beams, lintels, posts, and similar items.

.2 Use concrete where indicated, and also for vertical core filling, lintel beams, bond beams and other filled cores where reinforcing steel is indicated.

.3 Use fine grout where the space being grouted is 2" or less in its least dimensions; use concrete in all other applications that call for grout.

.4 Use square end concrete masonry units wherever a full or half concrete masonry unit will receive concrete fill.

.5 Use full mortar bedding of cross webs for cares that are filled.

.6 Fill cores in lifts of 4' maximum; provide cleanout openings for lifts in excess of 4' where Consultant has accepted larger lifts.

.7 Consolidate core fill during placement by vibration or puddling.

.8 Stop concrete core fill 1-1/2" below top surface of lift whenever filling will be stopped for more than a 1 hour time duration.

.9 Fill all cores of roof parapets with concrete.

.10 Secure vertical reinforcement in position at top and bottom of core, and a maximum 4' spacing, refer to Drawings for location of vertical reinforcement.

.11 Fill voids solid with mortar so that ties and anchors are set in full mortar bed where masonry walls abut steel or concrete columns.

.7 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 solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place; do not deeply furrow bed joints or slush head joints.

.2 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 Set trim units in full bed of mortar with full vertical joints, and as follows:

.1 Fill dowel, anchor, and similar holes.

.2 Clean soiled surfaces with fibre brush and soap powder and rinse thoroughly with clear water.

.3 Lay stonework so that joints are even and so that average distance between joint centrelines is equal to the nominal modular dimension of the stone. Lay stonework in running bond, stack bond or soldier coursing as indicated on drawings. Where not indicated, notify Consultant prior to starting work.

.4 Set stone in accordance with manufacturers recommended installation practices and materials. Review manufacturer's written recommendations with the Consultant before proceeding.

.5 Leave openings for equipment to be installed before completing stonework. After installing equipment, complete stonework to match the construction immediately adjacent to the opening.

.6 Use chipped or blemished units only where the defect will be concealed; reject all defective and broken units or units with chipped edges or corners.

.7 Install cut units with cut surfaces and, where possible, cut edges concealed. Where complex cutting is required, place mortar along the cut edge and trowel smooth to provide a consistent 2@ wide gap.

.4 When mortar is "thumbprint" hard, tool all masonry joints (exposed or concealed) concave except at blockwork designated to receive ceramic tile finish which blockwork shall be struck flush. Use sufficient force to press mortar tight against masonry units on both sides of joints. Remove excess material or burrs left after jointing. Use trowel or rub with burlap bag.

.5 Lay all joints 3/8" thick unless otherwise specified or otherwise indicated. Fill all joints solidly with mortar except where specifically designated to be left open.

.6 Stagger joints in every course. Align joints plumb over each other in every other course. Vertical and horizontal joints to be uniform in thickness.

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 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.

.4 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 CONTROL JOINTS

.1 Provide vertical through wall control joints 25'-0" O.C. maximum (except as otherwise shown or specified) in continuous walls having no openings, intersections or columns. Locate control joints as directed by Consultant.

.2 Locate control joints at high stress concentrations and at points of weakness such as at abrupt changes in work height, wall thickness changes such as at chases and at pilasters and maximum of 12'-0" from corners.

.3 Construct joint as detailed and generally as follows:

.1 Place building paper against end of block on one side of control joint. Extend bond breaker full wall thickness.

.2 Fill voids between ends of block with mortar to form key and strike back exposed vertical joints 3/4" deep, install backer rod and caulk in accordance with Section 07 92 00.

.3 Reinforce joints every third course with two 1/4" diameter greased smooth rods. Locate rods 1-1/4" in from faces of block centres on joint running parallel to wall.

3.7 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.

.4 Masonry Veneer/Metal Stud Back-Up System:

.1 Ensure wire tie spaced maximum 16" O.C. vertically and stud spacing horizontally.

.2 Tie wires shall be minimum 3/16" diameter stainless steel wire ties.

.3 Embed ties 2" minimum into the bed joints of masonry veneer.

.5 Chemical Anchors:

.1 Coordinate work with Contractor for work that forms a part of this Section.

.2 Install anchors in accordance with manufacturer’s written instructions, and as follows:

.1 Drill and clean anchor holes in accordance with manufacturer’s instructions; insert screen tube, prepare and mix two part adhesive anchor system and fill holes; insert connector pins and twist to ensure that adhesive is in contact with connector pin.

.2 Do not adjust connector pins after gel time of adhesive occurs.

.3 Testing:

.1 Test first 10 anchors to demonstrate a pullout capacity equal to four times the required service capacity of 0.44 kN after cure time established by adhesive manufacturer.

.2 Randomly test 2% of remaining installed anchors after cure time established by adhesive manufacturer to service load capacity of 0.44 kN; additional tests may be required where failures occur.

3.8 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.

3.9 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.

3.10 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 SUMMARY

.1 Unless otherwise specified conform to CSA-S16, Steel Structures for Building - Limit States Design and CAN/CSA-S136, Cold Formed Steel Structural Members.

1.2 RELATED REQUIREMENTS

.1 Section 04 20 00: Masonry

.2 Section 06 10 00: Rough Carpentry

.3 Section 07 21 13: Board Insulation

.4 Section 07 21 16: Blanket Insulation and Vapour Barrier

.5 Section 07 27 23: Board Product Air Barriers

.6 Section 07 41 16: Standing Seam Metal Roofing System

.7 Section 07 46 33: Plastic Siding

.8 Section 08 51 13: Aluminum Windows

.9 Section 09 21 16: Gypsum Wallboard

1.3 REFERENCE STANDARDS

.1 Canadian Institute of Steel Construction (CISC):

.1 CISI - Specification for the Design of Cold-Formed Steel Structural Members, in accordance with CAN/CSA-S136.

.2 American Society for Testing and Materials (ASTM):

.1 ASTM A153/A123M-09, Zinc Coating (Hot-Dipped) on Iron and Steel Hardware.

.2 ASTM A568/A568M-11b, General Requirements for Steel Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled.

.3 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.4 ASTM C955-11c, Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Track), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases.

.3 American National Standards Institute/American Welding Society:

.1 ANSI/AWS D1.3, Structural Welding Code - Sheet Steel.

.4 Canadian Standards Association:

.1 CSA-W47.1, Certification of Companies for Fusion Welding of Steel Structures.

.2 CSA-W59-03 (R2008), Welded Steel Construction (Metal Arc Welding).

.3 CSA-S16-09, Design of Steel Structures

.4 CAN/CSA-S136-07, North American Specification for the Design of Cold-Formed Steel Structural Members

.5 Canadian General Standards Board (CGSB):

.1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating

.2 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type

.6 Canadian Sheet Steel Building Institute:

.1 CSSBI 51M-1991, Lightweight Steel Framing Design Manual.

1.4 SYSTEM DESCRIPTION

.1 Design Requirements:

.1 Have work of this section designed by a professional engineer licensed to design structures and registered in the place of Work.

.2 Design cold formed metal framing system to resist pressure and suction of wind loads, snow loads, snow load build-up and temperature range, expected in the geographical area for this project, under the local Building Code, climatic information for 30 year probability without any detrimental effects on appearance and performance.

.3 Design shall be based on Limit States Design principles using factored loads and resistances.

.4 Deflection (inward or outward) shall not be greater than L/720 of the span between points of support.

.5 Resistance strength and resistance factors shall be determined in accordance with applicable building code requirements and CAN/CSA-S136.

.6 Construct work of this section to provide for expansion and contraction of components as will be caused by ambient temperature range without causing buckling, failure of joint seals, undue stress on fasteners or other effects detrimental to appearance or performance.

.7 Section properties shall be computed on the basis of the nominal core thickness.

.8 Design bridging to prevent member rotation and member translation perpendicular to the minor axis. Provide for secondary stress affects due to torsion between lines bridging. Sheathing shall not be used to help restrain member rotation and translation perpendicular to the minor axis for wind bearing studs.

.9 Design cold formed metal framing system to support loads and superimposed loads transferred from cladding and include for design of support and attachment components between other assemblies and stud system. Responsibility for design of exterior wall loads transferred from other envelope components is part of work of this section.

1.5 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Shop Drawings:

.1 Prepare and submit shop and erection drawings which conform to the requirements of the CAN/CSA-S16, and as specified herein.

.2 Cold formed metal framing system must have shop drawings prepared by qualified draftsmen, checked by and bearing the seal of a professional engineer registered to design structures and practice in the place of Work.

.3 Show the size, spacing and location of connections, attachments, reinforcing and anchorage. Include necessary plans, elevations and details. Indicate size and type of fastening. For weld connections use welding symbols in compliance with AWS and indicate clearly net weld lengths.

.4 Submit typical details of connections, and any special connections for approval before preparation of shop drawings.

.5 Review of shop drawings by the Consultant and Structural Engineer will not absolve the Contractor from his responsibility of providing materials and equipment to complete and finish work of this section in accordance with the architectural and structural drawings. Departures or differences from the referenced drawings shall be approved in writing by the Consultant.

1.6 QUALITY ASSURANCE

.1 Conform to requirements of CAN/CSA-S16, Steel Structures for Buildings, and CAN/CSA-S136, Cold Formed Steel Structural Members.

.2 Work 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.

.3 Work 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.

.4 Install system to provide for movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.

.5 Install system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

1.7 INSPECTION AND TESTING

.1 An independent inspection and testing company appointed and paid for by the Owner may carry out inspection and testing of the structural steel stud systems in accordance with Section 01 45 00.

.2 Provide free access for inspectors to all places where work is being done.

.3 Inspectors are to ensure that materials conform to the requirements of this section.

.4 Any inspection and/or testing required because of an error by the Contractor, or due to departure from the Contract Documents shall be paid for by the Contractor.

.5 Inspection and testing of structural metal stud systems shall include, but shall not be limited to the following:

.1 Checking that mill test reports are properly correlated to materials.

.2 Sampling fabrication and erection procedures for general conformity to the requirements of the specification.

.3 Checking that the welding conforms to the requirements of CSA W47.1, CSA W59 (R2008) and/or ANSI/AWS D1.3, whichever is applicable.

.4 Checking fabricated members against specified member shapes.

.5 Visual inspection of all welded connections including sample checking of joint preparation and fit-up.

.6 Sample checking of screwed and bolted joints.

.7 Sample checking that tolerances are not exceeded during fit-up and/or erection.

.8 Additional inspection and testing of welded connections at required by CSA W59.

.9 General inspection of field cutting and alterations required by other trades.

.10 Submission of reports to the Consultant covering the work inspected with details of deficiencies discovered.

.6 The inspection and testing provided in this Section does not relieve the Contractor of his responsibility for the performance of the Contract. The Contractor shall implement his own supervisory and quality control procedures.

.7 Materials and/or workmanship not conforming to the requirements of the Contract Documents may be rejected at any time during the progress of the work, and shall be replaced and/or repaired without cost to the Owner.

1.8 DELIVERY, STORAGE, HANDLING AND PROTECTION

.1 Coordinate deliveries to comply with Construction Progress Schedule and arrange ahead for off-the-ground storage location. Do not load any area beyond the design limits.

.2 Adequately protect steel against rust and damage during manufacturing, delivery and storage.

.3 Store material on planks on a dry area and protect from damage. Make good immediately any damage done, clean scratches and the like, touch-up with specified primer.

2 Products

2.1 MANUFACTURERS

.1 Cold formed metal framing as indicated on drawings and as specified herein shall be by one of the following:

.1 Bailey Metal Products Limited, or;

.2 Canadian Steel Manufacturing, Division of British Steel Canada Inc., or;

.3 Lightsteel Inc., Boucherville, Quebec or;

.4 Approved equal.

2.2 MATERIALS

.1 Faming materials shall conform to the requirements of CAN/CSA-S136.

.2 Galvanized Sheet Steel:

.1 Conform to ASTM A653/A653M, minimum Grade D, 50 PSI (345 Mpa) yield for 1.5mm (.060") material.

.3 Structural Metal Studs:

.1 Galvanized sheet steel formed to channel shape, of minimum gauge, sizes, and section properties to meet design requirements, and conforms to ASTM C955.

.4 Metal Stud Runners/Top and Bottom Tracks:

.1 Galvanized sheet steel formed to channel shape, having same width as studs, with tight fit and solid web, of minimum gauge to meet design requirements, but no less than gauge of metal studs, and conforms to ASTM C955.

.5 Metal Plates, Bridging, Gussets and Clips:

.1 Formed from galvanized sheet steel, of gauges, shapes and sizes required to meet design requirements determined for conditions encountered, and of same finish as framing members.

.6 Fastenings:

.1 Self-drilling, Self-tapping Screws, Bolts, Nuts and Washers: Hot-dip galvanized to 1.25 ounce per square foot and conforms to ASTM A153/A153M-09, Class B3, '12-24 x 7/8 HWH #4STLG' by Hilti Canada, or approved equal.

.2 Anchorage Devices: Power driven, powder actuated, drilled expansion bolts, or screws with sleeves, as application dictates.

.3 Welding Materials: Conforms to CSA W59.

.4 Electrodes for welding shall have minimum 480 Mpa tensile strength series, (E480XXX,E480S-X).

.7 Touch-Up Primer:

.1 Ready mixed, zinc-rich primer, and conforms to CAN/CGSB-1.181, 'Sealtight Galvafroid Zinc-Rich Coating' by W.R. Meadows of Canada Limited, or 'Zinc Clad No.7 Organic Zinc Rich Primer' by Sherwin Williams Company of Canada Ltd., or approved equal.

.8 Dampproof Course:

.1 No. 15 asphalt building paper conforming to CAN/CGSB-51.32-M77.

2.3 FABRICATION

.1 Fit and assemble work in shop where possible. Execute work according to details and reviewed shop drawings.

.2 Take measurements at the building for work which is to fit or be connected to steel, concrete framing or masonry, before commencing fabrication.

.3 Structural metal studs shall have one unreinforced service cut-out centred in the web of the studs and with the centreline of the cut-out a minimum of 455mm (1'-6") from the bottom of the studs. In addition to the above, provide cut-outs for internal bridging as required. All unreinforced cut-outs shall conform to dimension limitations of Table 1, in the CSSBI M50-1987 Manual.

.4 Provide prepunched cut-outs in inner top track for anchor clearances so that deflection clearances are not reduced.

.5 Fabrication tolerances for cold formed steel framing members shall to Table 2 of the CSSBI M50-1987 Manual.

.6 Cutting of cold formed steel framing members shall be by "power saw" or "shear" methods. Cutting by "torch" method shall not be permitted.

.7 Steel thickness, exclusive of coating shall be marked on all cold formed steel framing members by embossing, or by stamping with indelible ink, or by colour coding method.

.8 Gauges and sizes of metal shall be adequate for various conditions.

3 Execution

3.1 EXAMINATION

.1 Verify at site that the work to receive the work of this section is free of irregularities detrimental to the installation and performance of the work and that it is located correctly and at proper levels before delivery and installation.

.2 Verify that building framing components are ready to receive work.

.3 Beginning of installation means acceptance of existing conditions.

3.2 ERECTION OF STUDS

.1 Install components in strict accordance with manufacturer's written instructions.

.2 Methods of construction may be either piece by piece (stick-built), or by fabrication into panels (panelized) either on or off site. Handling and lifting of prefabricated panels shall not cause permanent distortion to any member or collateral material.

.3 Cold formed steel framing shall be erected true and plumb within the tolerances specified herein. Temporary bracing shall be employed wherever necessary to withstand all loads to which the structure may be subject during erection and subsequent construction. Temporary bracing shall be left in place as long as required for the safety and integrity of the structure. The Contractor shall ensure that during erection a margin of safety consistent with the requirements of the National Building Code and CAN/CSA-S136 exists in the uncompleted structure.

.4 Erection Tolerances:

.1 For the purposes of erection tolerances, "camber" is defined as the deviation from straightness of a member or any portion of a member with respect to its major axis and "sweep" is defined as the deviation from straightness of a member or any portion of a member with respect to its minor axis.

.2 For wind bearing studs, out of plumbness shall not exceed 1/500th of the member length. Out of straightness (camber and sweep) shall not exceed 1/1000th of the member length.

.3 For runners/tracks, camber shall not exceed 1/1000th of the member length.

.4 Studs shall seat into top and bottom runners/tracks. The gap between the end of the stud and the web of the runner/track shall not exceed 4mm (5/32") for wind bearing studs.

.5 Where cold formed metal framing is made in prefabricated panels, align adjacent prefabricated panels to provide surface continuity at the interface.

.6 Spacing of studs shall not be more than 3mm (1/8") from the design spacing. The cumulative error in spacing shall not exceed the requirements of the finishing materials.

.5 Align floor and ceiling runners/tracks, locate to wall or partition layout. Secure in place with screws or welding at maximum 610mm (24") O.C. Coordinate installation of sealant with floor and ceiling track.

.6 Place studs to meet design requirements as indicated on approved shop drawings, and not more than 50mm (2") from abutting walls, and at each side of openings. Connect studs to tracks using clips and ties, screws, or welding. Diameter of screws shall be equal to, or exceed the minimum diameter indicated on the reviewed shop drawings. Penetration of screws beyond joined materials shall be not less than three (3) exposed threads. Thread types and drilling capability of screws shall conform to the manufacturer's written recommendations to suit design requirements and conditions. Screws to be covered by sheathing materials shall have "low profile" type heads.

.7 Field cutting of cold formed steel framing members shall be by "power saw" or "shear" methods. Cutting by "torch" method shall not be permitted.

.8 Holes that are field cut into cold formed steel framing members shall conform to the dimensional requirements of Table 1, in the CSSBI M50-1987 Manual.

.9 Brace structural metal studs as required to meet design requirements and as indicated on reviewed shop drawings.

.10 Provide continuous dampproof course to underside of bottom runner/track.

.11 Construct corners using minimum of three studs. Double studs at door, window jambs, and wall openings.

.12 Erect studs one piece full length. Splicing of studs is not permitted.

.13 Erect load bearing studs, brace, and reinforce to develop full strength to meet design requirements.

.14 Refer to drawings for height of partition framing.

.15 Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.

.16 Install intermediate studs above and below openings to match wall stud spacing.

.17 Provide deflection allowance in stud bottom runner/track, directly below horizontal building framing for non-load bearing framing.

.18 Attach cross studs or furring channels to studs for attachment of fixtures anchored to walls. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

.19 Touch-up field welds and damaged galvanized surfaces with two coats of zinc rich touch-up primer.

END OF SECTION

1 General

1.1 SUMMARY

.1 Supply and install all miscellaneous metal work indicated on drawings and not included in the work of other Sections in addition to items listed in this Section.

1.2 RELATED REQUIREMENTS

.1 Section 04 20 00: Masonry

.2 Section 05 40 00: Cold Formed Metal Framing

.3 Section 05 50 00: Miscellaneous Metals

.4 Section 06 10 00: Rough Carpentry

.5 Section 06 17 53: Shop-Fabricated Wood Trusses

.6 Section 07 41 16: Standing Seam Metal Roofing System

.7 Section 07 46 33: Plastic Siding

.8 Section 08 51 13: Aluminum Windows

.9 Section 09 21 16: Gypsum Wallboard

.10 Read carefully all other Sections and review drawings to determine extent of metal work supplied and installed, or installed by others.

.11 Be responsible for co-ordinating this section with all related sections.

1.3 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM):

.1 ASTM A53/A53M-12, Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc Coated, Welded and Seamless

.2 ASTM A325-10, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

.3 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.4 ASTM C939-10, Standard Test Method for Flow of Grout for Preplaced Aggregate Concrete (Flow Cone Method)

.5 ASTM A1011/A1011M-12b, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with improved Formability, and Ultra-High Strength

.6 ASTM C1107/C1107M-11, Standard Specification for Packaged Dry, Hydraulic Cement Grout (Nonshrink)

.2 Canadian Standards Association (CSA):

.1 CSA G40.20-04/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel

.2 CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing or Irregularly Shaped Articles

.3 CSA-S16-09, Design of Steel Structures

.4 CSA-S136-07, North American Specification for the Design of Cold Formed Steel Structural Members

.5 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel

.6 CSA W55.3-08, Certification of Companies for Resistance Welding of Steel and Aluminum

.7 CSA W59-03 (R2008), Welded Steel Construction (Metal Arc Welding)

.3 Canadian General Standards Board (CGSB):

.1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating

.2 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type

.3 CGSB 31-GP-105Ma, Zinc Phosphate Conversion Coatings for Paint Base

.4 The Society for Protective Coatings (SSPC):

.1 SSPC1 Solvent Cleaning - 2004

.2 SSPC2 Hand Tool Cleaning - 2004

.3 SSPC-3 Power Tool Cleaning - 2004

.4 SSPC-6 Commercial Blast Cleaning - 2007

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 Where required by authorities having jurisdiction, have work of this Section designed by a professional engineer licensed to design structures and registered in the Province of the Work.

1.5 SUBMITTALS

.1 Provide submittals in accordance with 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 Tube: Conforms to ASTM A53.

.6 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.

.7 Steel Pipe: Hot-dip galvanized, zinc coated, welded and seamless type steel pipe conforming to ASTM A53/A53M.

.8 Aluminum Plate and Sheet: ASTM B209M, Alloy 6061-T6.

.9 Aluminum Extrusions: ASTM B221M, Alloy 6063-T6.

.10 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.

.11 Galvanizing: All uncoated steel specified to be galvanized shall be galvanized after fabrication by the hot dip process according to CAN/CSA-G164, with minimum coating of 2 oz./sq.ft. Galvanize after all welding is complete. Welding of galvanized material will not be permitted. Specially treat by phosphate conversion process conforming to CGSB 31-GP-105Ma ready to receive prime paint finish.

.12 Primer Paint: CISC/CPMA 2-75.

.13 Bolts, Nuts, Washers: Conforms to ASTM A325.

.14 Welding Materials: Conforms to CSA W59.

.15 Metal Filler: Polyester based type.

.16 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 90 00, and coordinate with the above.

.17 Isolation Coating: Acid and alkali resistant bituminous paint.

.18 Building Paper: Conforms to CAN/CGSB-51.32.

.19 Butyl Tape: Extruded, high grade, macro-polyisobutylene tape of size, width and shore hardness to suit conditions.

2.2 FABRICATION

.1 Fit and assemble work in shop where possible. Execute work according to details and reviewed shop drawings.

.2 Take measurements at the building for work which is to fit or be connected to steel or concrete before commencing fabrication.

.3 Where shop fabrication is not possible, make trial assembly in shop.

.4 Do all welding in accordance with requirements of CSA W59, CSA W55.3 and CSA W47.1 including all supplements. Weld stainless steel electric arc process. Grind welds smooth and flush with surface of parent metal, where exposed to view and where specifically indicated on drawings. Welds shall be continuous seam welds unless specified otherwise. Maintain sharp arises.

.5 Fit joints and intersecting members accurately in true planes, square, plumb, straight with tight joints and intersections.

.6 Provide adequate reinforcing, fastenings, anchors, accessories required for fabrication and erection of work of this Section. Such items occurring on or in an exterior wall or slab shall be hot-dip galvanized. Make thread dimensions such that nuts and bolts will fit without rethreading or chasing threads.

.7 Fabricate, drill and tap members to accommodate attachments, anchorage and work of other Sections where located and directed by them.

.8 Exposed steel surfaces shall be smooth and free from imperfections such as warping, buckling, weld marks, burrs, rust and scale.

.9 Gauges and sizes of metal shall be adequate for various conditions.

.10 Make exposed metal fastenings and accessories of same material, texture, colour and finish as base metal on which they occur unless otherwise shown or specified. Keep exposed fastenings to an absolute minimum evenly spaced and neatly laid out. Make fastenings of permanent type unless otherwise indicated.

2.3 SHOP PAINTING AND PROTECTION

.1 As per SSPC2 Hand Tool Clean and SSPC1 Solvent Clean, clean welds by wire brushing and wash down with clean water, to remove the chemical residues left by the electrodes, prior to painting.

.2 Prepare steel as per SSPC-3 Power Tool Cleaning for Interior or SSPC-6 Commercial Blast Cleaning for exterior members. Remove rust, mill scale, oil, dirt, and other foreign matter before commencing shop painting.

.3 Apply shop coat of primer to all surfaces except areas requiring field welding. Apply by brush, working paint well into surfaces, interstices and cavities.

.4 Primer is to be free of runs, sags, or other collections of primer due to dipping of members into primer.

.5 Steel work shall be painted under cover, and shall remain under cover, until the paint protection is dry.

.6 Prime field welded areas after erection and touch up shop coat where damaged and barred by erection and handling.

.7 Prime steel with two full coats of paint in strict accordance with paint manufacturer's directions.

.8 Give the parts which are inaccessible after assembly two coats of primer coat paint, of different colours, when members are noted to be painted.

2.4 HOT DIP GALVANIZING

.1 Hot dip galvanize, after fabrication, steel metal fabrication items. Straighten shapes and assemblies true to line and plane after galvanizing. Repair damaged galvanized surfaces with brush or spray-applied anti-corrosion coating containing 92-95% zinc, in accordance with manufacturer's printed directions.

.1 Members exposed to elements when in final location.

.2 Members embedded on exterior side of exterior walls.

.3 Members imbedded in concrete.

.4 Members specified in this Section or indicated on Drawings.

.2 Hot-dip galvanize members in accordance with CAN/CSA G164 and requirements of the following ASTM standards, with minimum coating weights or thicknesses as follows:

.1 Rolled, Pressed and Forged Steel Shapes, Plates, Bars and Strips: ASTM A123/A123M; average weight of zinc coating of actual surface

.1 4.8 mm (3/16”) and less member thickness: 600 g/sq.m.

.2 6 mm (1/4”) and heavier members: 640 g/sq.m.

.2 Iron and Steel Hardware: ASTM A153/A153M; minimum weight of zinc coating, in gram per square meter of surface, in accordance with Table 1 for the various classes of materials used in the Work.

2.5 ALUMINUM FINISHES

.1 Finish designations prefixed by AA comply with the system established by the Aluminium Association for designating aluminium finishes.

.2 As Fabricated Finish (Mill Finish): AA-M10, as fabricated mechanical finish.

.3 Clear Anodic Finish: AA-M12C22A41, as fabricated nonspecular mechanical finish, medium matte etched chemical finish, architectural class I clear anodic coating of minimum 18 um (0.7 mil) thick complying with AAMA 611.

3 Execution

3.1 GENERAL

.1 Verify at site that the Work to receive the work of this Section is free of irregularities detrimental to the installation and performance of the work and that it is located correctly and at proper levels before delivery and installation.

.2 Erection: To meet specified requirements of CAN/CSA-S16.

.3 Bearing Plates and Anchors: Standard.

.4 Anchors: Anchors to structural concrete shall be approved inserts set into concrete or approved self-drilling expansion insets drilled and placed afterwards.

3.2 INSTALLATION

.1 Assemble and erect work plumb, true, square, straight, level and accurate to sizes detailed, to reviewed shop drawings, free from distortion and defects detrimental to appearance and performance.

.2 Isolate metals where necessary to prevent corrosion due to contact between dissimilar metals and between metals and masonry, concrete or plaster. Use bituminous paint or butyl tape.

.3 Supply adequate instructions, templates, and if necessary, supervise installation of the fastenings or accessories requiring to be built-in by other Sections of the Work.

3.3 SCHEDULES

.1 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 Loose Lintels:

.1 Provide and install loose lintels if not by structural steel.

.2 Finish: Hot-dip galvanized after fabrication.

.5 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.

.2 At walls with concealed tops:

.1 3" x 2" x 1/4" angles 8" long on both sides of walls. Anchor to structure above wall.

.3 At walls with tops exposed to view:

.1 3" x 2" x 1/4" angles, continuous on both sides of wall. Anchor to structure above wall.

.4 Finish: Prime paint.

.6 Frames for Overhead Doors:

.1 Supply and install 1/4" thick bent steel plate around openings at heads and jambs to suit wall thickness and return 3" on either side of wall face. Provide extensions on interior side at head to accommodate track and operators to suit doors specified.

.2 Co-ordinate installation with Sections 04 20 00, 05 40 00 and 07 24 00. Provide proper anchors for solid installation.

.3 Finish: Hot-dip galvanized after fabrication, ready for painting by Section 09 90 00.

.7 Overhead Doors Track Protection Guards:

.1 Provide 1/4" thick x 60" high "Z" shaped bent steel plate track protection guards at overhead door tracks.

.2 Co-ordinate installation with work of other Sections. Provide proper anchors for solid installation.

.3 Hot-dip galvanized after fabrication, ready for painting by Section 09 90 00.

.8 Other Miscellaneous Metal Components:

.1 As required and indicated on drawings.

.2 Finish: Prime paint for interior components, ready for finishing by Section 09 90 00 and hot-dip galvanized after fabrication for exterior components.

END OF SECTION

1 General

1.1 SUMMARY

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

1.2 RELATED REQUIREMENTS

.1 Section 05 40 00: Cold Formed Metal Framing

.2 Section 07 21 13: Board Insulation

.3 Section 07 21 16: Blanket Insulation and Vapour Barrier

.4 Section 07 27 23: Board Product Air Barriers

.5 Section 07 41 16: Standing Seam Metal Roofing System

.6 Section 07 46 33: Plastic Siding

.7 Section 09 21 16: Gypsum Wallboard

.8 Section 09 90 00: Painting

1.3 DELIVERY, STORAGE, HANDLING AND PROTECTION

.1 Co-ordinate deliveries to comply with construction schedule and arrange ahead for off-the-ground, under cover storage location. Do not load any area beyond the design limits.

.2 Materials shall be carefully checked, unloaded, stored and handled to prevent damage. Protect materials with suitable non-staining waterproof coverings.

.3 Do not store seasoned materials under conditions that will cause their moisture content to increase.

.4 Protect edges and corners of sheet materials from damage during handling and storage.

.5 Store preservative-treated materials under cover, off the ground and protected from moisture.

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.

.2 Framing, Furring, Strapping, Blocking:

.1 Spruce, 122c, "Standard" light framing, except as otherwise specified.

.3 Plywood Roof Sheathing:

.1 Shall be minimum 1/2" 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.

.4 Rough Hardware:

.1 Provide rough hardware such as nails, spikes, staples, H-clips, bolts, nuts, washers, screws, clips, strap iron and including hardware for temporary enclosures. Nails for plywood shall be annular or spiral type, all other nails shall be spiral type. All nails, spikes and staples shall conform to CSA B111. All rough hardware shall be galvanized unless otherwise noted. Galvanizing shall conform to CAN/CSA-G164.

.5 All Other Materials and Hardware:

.1 Shall be as noted on drawings.

2.2 PRESSURE PRESERVATIVE TREADED MATERIALS

.1 Pressure Preservative Treated Lumber: Lumber graded and stamped in accordance with applicable grading rules and standards of associations or agencies approved to grade lumber by Canadian Lumber Standards Accreditation Board in accordance with CAN/CSA O80 Series -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/m³ of wood. Plywood or laminated materials shall be manufactured with exterior grade adhesives. After treatment, plywood shall be kiln dried to moisture content of 8% or less.

2.3 PRESSURE FIRE RETARDANT TREATED MATERIALS

.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 INSTALLATION-GENERAL

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

.2 Provide and fit in place all furring, strapping, battens, nailers, sleepers, grounds and blocking required to provide adequate properly placed fixing for all wood finishes, fitments and as required for the work of others trades.

.3 Blocking, strapping and other rough carpentry indicated shall not be regarded as complete or exact. Provide all rough carpentry work required, whether specifically shown or not. Grounds shall be of a thickness to provide for application of finishes. Room side surfaces of grounds shall be plumb and in true plane throughout.

.4 All nails shall be long enough so that at least half their length penetrate in to the second member. Splitting of wood members shall be minimized by staggering the nails in the direction of the grain and by keeping nails well in from edges.

.5 Blocking shall be through-bolted to structure.

.6 Anchor rough bucks to concrete or masonry with 3/8" diameter expansion bolts and shields or Drummond and Reeves security buck anchors, minimum three per jamb.

3.2 WOOD BLOCKING, CANTS AND NAILERS

.1 Provide wood blocking, cants and nailers, where shown to be required as detailed. Bolt securely in place. Block under cants same thickness as installed roof insulation.

.2 Check mechanical, electrical, architectural drawings and provide all blocking, cants, nailers etc. required. Leave work ready for built-up bituminous roofing and prefinished sheet metal flashings.

3.3 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.

3.4 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.

3.5 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 SUMMARY

.1 Supply all labour, materials, equipment, services and perform all operations required to complete the following:

.1 Shop-fabricated wood trusses.

1.2 REFERENCE STANDARDS

.1 CSA International

.1 CAN/CSA O80 Series-08, Wood Preservation.

.2 CSA O86 Consolidation-09, Engineering Design in Wood.

.3 CSA O141-05(R2009), Softwood Lumber.

.4 CSA S307-M1980(R2001), Load Test Procedure for Wood Roof Trusses for Houses and Small Buildings.

.5 CSA S347-99(R2009), Method of Test for Evaluation of Truss Plates Used in Lumber Joints.

.6 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel.

.7 CAN/CSA-Z809-08, Sustainable Forest Management.

.2 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber 2010.

.3 National Research Council Canada (NRC)

.1 National Building Code of Canada 2015(NBC).

.2 Canadian Construction Materials Centre (CCMC)-on-line edition, Registry of Product Evaluations.

.4 Truss Plate Institute of Canada (TPIC)

.1 TPIC - 2007, Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses (Limit States Design).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for wood trusses and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.

.2 Include on drawings:

.1 Each shop drawing submission showing connection details.

.2 Indicate special structural application and specification as according to local authorities having jurisdiction.

.3 Indicate TPIC Truss Design Procedure and CSA O86 Engineering Design in Wood and specific CCMC Product Registry number of the truss plates.

.4 Indicate species, sizes, and stress grades of lumber used as truss members. Show pitch, span, camber, configuration and spacing of trusses. Indicate connector types, thicknesses, sizes, locations and design value. Show bearing details. Indicate design load for members.

.5 Submit stress diagram or print-out of computer design indicating design load for truss members. Indicate allowable load and stress increase.

.6 Provide certification that trusses meet requirements of CSA S307 and CSA S347. Do load testing on representative trusses selected by Consultant.

.7 Indicate arrangement of webs or other members to accommodate ducts and other specialties.

.8 Show location of lateral bracing for compression members.

.9 Test reports: submit certified test reports for prefabricated wood trusses from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.

.10 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.11 Instructions: submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

.1 Qualifications:

.1 Fabricator for trusses to show evidence of quality control program such as provided by regional wood truss associations, or equivalent.

.2 Fabricator for welded steel connections to be certified in accordance with CSA W47.1.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00, with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials indoors off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect wood trusses from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

.4 Provide bearing supports and bracings. Prevent bending, warping and overturning of trusses.

2 Products

2.1 DESIGN REQUIREMENTS

.1 Design light metal plate connected wood trusses in accordance with TPIC truss design procedures for wood truss chords and webs in accordance with engineering properties in CSA O86.

.2 Design light metal plate connected wood trusses in accordance with TPIC truss design procedures for truss joint designs to test engineering properties in accordance with CSA S347 and listed in CCMC Registry of Product Evaluations.

.3 Design trusses, bracing and bridging in accordance with CSA O86.1 for loads indicated and minimum uniform and minimum concentrated loadings stipulated in NBC commentary for building locality as ascertained by National Building Code of Canada (NBC), Climatic Information for Building Design in Canada.

.4 Limit live load deflection to 1/360th of span where gypsum board ceilings are hung directly from trusses.

.5 Limit live load deflections to 1/180thof span unless otherwise specified or indicated.

.6 Provide camber for trusses as indicated.

2.2 MATERIALS

.1 Lumber: Non-Exposed Softwood: Fabricator's option, meeting requirements of CAN/CSA O141-05(R2009), kiln dried for interior use to a moisture content of 4% to 8%, and 7% to 10% for exterior use; Surface 4 sides (S4S).

.1 NLGA (National Lumber Grading Association), Standard Grading Rules for Canadian Lumber.

.2 CAN/CSA-Z809 or FSC or SFI certified.

.2 Fastenings: to CSA O86.

.3 Preservative and Fire Retardant: Manufacturers standard.

2.3 FABRICATION

.1 Fabricate wood trusses in accordance with stamped shop drawings.

.2 Provide for design camber and roof slopes when positioning truss members.

.3 Connect members using methods recommended by the shop-fabricated truss manufacturer.

.4 Apply fire retardant preservative in accordance with CAN/CSA O80 Series.

2.4 SOURCE QUALITY CONTROL

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

.2 Certify by agency accredited by Standards Council of Canada that fire retardant preservative treated wood in accordance with CAN/CSA O80 Series.

3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 MANUFACTURER'S INSTRUCTIONS

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

3.3 ERECTION

.1 Erect wood trusses in accordance with stamped shop drawings.

.2 Handling, installation, erection, bracing and lifting in accordance with manufacturer's instructions.

.3 Make adequate provisions for handling and erection stresses.

.4 Exercise care to prevent out-of-plane bending of trusses.

.5 Install temporary horizontal and cross bracing to hold trusses plumb and in safe condition until permanent bracing and decking are installed.

.6 Install permanent bracing in accordance with stamped shop drawings, prior to application of loads to trusses.

.7 Do not cut or remove any truss material without approval of Consultant.

.8 Remove chemical and other surface deposits on treated wood, in preparation for applied finishes.

3.4 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 Have manufacturer of products supplied under this Section review work involved in handling, installation/application, protection and cleaning of its products, and submit written reports, in acceptable format, to verify compliance of work with Contract.

.2 Manufacturer's field services: provide manufacturer's field services, consisting of product use recommendations and periodic site visits for inspection of product installation, in accordance with manufacturer's instructions.

.3 Schedule site visits to review work at stages listed:

.1 After delivery and storage of products, and when preparatory work on which work of this Section depends is complete, but before installation begins.

.2 Twice during progress of work at 25% and 60% complete.

.2 Upon completion of work, after cleaning is carried out.

.3 Obtain reports within three days of review and submit immediately to Consultant.

3.5 CLEANING

.1 Progress Cleaning: Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

END OF SECTION

1 General

1.1 SUMMARY

.1 This Section includes supply and installation of a liquid-applied bituminous dampproofing for foundation walls, complete with primer, and drainage board required for a complete system installation.

1.2 RELATED REQUIREMENTS:

.1 Section 03 30 00: Cast-In-Place Concrete

.2 Section 04 20 00: Masonry

.3 Section 07 21 13: Board Insulation

.4 Section 31 23 33: Excavation, Trenching and Backfilling

1.3 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM):

.1 ASTM D412-06a(2013), Standard Test Method for Vulcanized Rubber and Thermoplastic Elastomers - Tension

.2 ASTM D882-12, Standard Test Method for Tensile Properties of Thin Plastic Sheet

.3 ASTM E96/E96M-15, Standard Test Methods for Water Vapour Transmission of Materials

.4 ASTM E154/E154M-08a(2013)e1, Standard Test Methods for Water Vapour Retarders Used in Contact with Earth Under Concrete Slabs, on Walls or as Ground Cover

1.4 SUBMITTALS

.1 Provide required information in accordance with Section 01 33 00.

.2 Action Submittals:

.1 Product Data:

.1 Submit copies of the most current technical data sheets, describing materials physical properties, and explanations about product installation, including installation techniques, restrictions, limitations and other manufacturer recommendations.

.2 Submit membrane manufacturer’s standard details that will be utilized for this project, indicate changes that must be made to make the details project specific for review by the Consultant.

.3 Samples: Provide samples of all materials required for work of this Section.

.4 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 Subcontractor executing work of this Section shall have a minimum of five (5) years continuous Canadian experience in successful application of bituminous dampproofing work of type as indicated on drawings and specified herein. Submit proof of experience upon Consultant's request.

.2 Work of this Section shall be executed by workers especially trained and experienced in this type of work. Have a full time, senior, qualified representative at the Site to direct the work of this Section at all times.

.3 Subcontractor executing work of this Section shall ensure that manufacturer's representative shall inspect substrates prior to commencement of work of this Section, during application of bituminous dampproofing and upon completion of work of this Section.

.4 Subcontractor executing work of this Section shall ensure that manufacturer's representative shall provide technical assistance to applicator and assist where required in correct application of bituminous dampproofing materials.

.5 Submit copies of the manufacturer's current ISO certification including the manufacturing of the dampproofing, primer, adhesives and drainage board.

1.6 STORAGE, DELIVERY, HANDLING AND PROTECTION

.1 Coordinate deliveries with construction schedule and arrange for proper storage areas. Do not load any area beyond the design limits.

.2 Materials shall be carefully handled and stored in a manner to protect them from any condition which may adversely affect their performance in service. Ensure that asphalt emulsions are protected from freezing, storage temperatures to be maintained above 10 deg C.

.3 Protect asphalt emulsion applications from rain during and after installation until coatings have fully dried.

.4 Protect surfaces which are not to be dampproofed from soiling by spillage, overspray or other causes in connection with the work of this section. Make good any damage caused by the dampproofing application at no additional cost to the Owner.

1.7 COMPATIBILITY

.1 All dampproofing materials must be provided by the same manufacturer to ensure compatibility between products used for the different applications identified in this Section.

.2 When required, ensure that dampproofing placed in contact with existing or new waterproofed foundation walls is compatible, and when possible, supplied by the same manufacturer to ensure full coverage warranty.

1.8 PROJECT CONDITIONS

.1 Apply dampproofing within the range of ambient and substrate temperatures recommended by dampproofing manufacturer.

.2 Do not apply dampproofing in snow, rain, fog or mist, or when such weather conditions are imminent during application and curing period.

.3 Maintain adequate ventilation during application and curing of dampproofing materials.

2 Products

2.1 MANUFACTURER

.1 Compatibility: Verify that dampproofing systems identified in this Section are provided by a single manufacturer to ensure compatibility at intersections. Multiple manufacturers providing dampproofing systems on this project will not be accepted.

.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 Henry Company

.2 W.R. Meadows

.3 Grace Construction Products

2.2 MATERIALS

.1 Dampproofing for Application Temperatures Above 4 deg C:

.1 Asphalt emulsion, composed of vacuum-reduced asphalt dispersed in a mineral colloid emulsifier. Complies with CAN/CGSB-37.2.

.2 Basis of Design Product: 700-01 Waterproofing Asphalt Emulsion by Henry Company, or approved equal.

.2 Dampproofing for Application Temperatures Below 4 deg C:

.1 Solvent type dampproofing compound of selected asphalts and fibres permitting application in thick films. Complies to CAN/CGSB-37.16.

.2 Basis of Design Product: 710-11 Premium Grade Foundation Coating by Henry Company, or approved equal.

.3 Surface Primer:

.1 As recommended by dampproofing manufacturer, for use in same ambient temperature range as dampproofing, and conforming to CAN/CGSB-37.16-M89, cut as required.

.4 Drainage Board:

.1 High impact polypropylene core board with polypropylene fabric attached, having the following physical properties:

.1 Flow Rate: 223L/min/m,

.2 Compressive Strength: 15,100 psf,

.3 Thickness: 10mm (3/8")

.2 Basis of Design Product: DB6200 by Henry Company, or approved alternate.

.5 Drainage Board Adhesive:

.1 As recommended by the membrane manufacturer.

.6 Drainage Board Accessories:

.1 Moulding Strip: Continuous 90mm (3-1/2") wide “Z” flashing strip to fit over exposed top edge of drain board.

3 Execution

3.1 EXAMINATION OF SURFACES

.1 Inspect surfaces over which the work of this section is dependent for any irregularities detrimental to the application and performance of the work of this section.

.2 Concrete surfaces shall be cured for a minimum of fourteen days. All surfaces shall be clean, solid and free of laitance, frost, dust, dirt, oil, grease, curing compounds and other foreign matter detrimental to adhesion of the bituminous dampproofing.

.3 Ensure that all items penetrating the walls, such as pipes and conduits are in place and properly sealed.

.4 Report any defects or any conditions which might impair the performance of the work of this section. Do not apply dampproofing until defects have been corrected.

.5 Commencement of work implies acceptance of surfaces and conditions.

3.2 PREPARATION

.1 Cut back form ties, patch tie holes and honeycomb areas of concrete walls. Thoroughly clean down surfaces of all foreign matter and laitance.

3.3 INSTALLATION

.1 Parge top of footings of concrete foundation walls with cement parging to form 30 deg slope away from foundation wall. Finish parge coat with steel trowel to produce smooth true surface.

.2 Apply dampproofing to surfaces of foundation walls extending from grade level down and over parging surface and face of footing.

.3 At temperature of 4 deg C and above apply mineral colloid asphalt emulsion in accordance with CAN/CGSB-37.3, in two coats over prime coat.

.4 At temperature below 4 deg C apply filled asphalt cutback in accordance with CGSB 37-GP-36M in a continuous film in two coats over prime coat.

.5 Apply prime coat at rate of not less than 3/4 gal./100 sq.ft. by brush or spray. When prime coat is dry apply bituminous dampproofing at a rate of not less than 2 gal./100 sq.ft. Allow dampproofing to cure before placing drainage board over the dampproofed surfaces.

.6 Obtain Consultant's approval of dampproofing before backfilling.

3.4 INSTALLATION - DRAINAGE BOARD

.1 Align and hang drainage up to foundation wall. Position bottom edge of drainage board to be in moderate contact with weeping tile system.

.2 Secure drainage board to foundation wall with nails and washers spaced 457mm (18") o/c horizontally. Install minimum of 2 rows staggered and spaced 150mm (6") apart and min 150mm (6") from top edge.

.3 Align and install termination strip along top edge with nails spaced 305mm (12") o/c and seal with termination sealant.

.4 Align and install moulding strip over completed top edge detail.

.5 Overlap end laps, pull back loose fabric to expose drain core and position core of second panel over the overlap flange of first panel.

.6 Bend drain board to create inside corners and cut board to create outside corners, provide 75mm (3") of extra fabric to wrap corner.

.7 Stagger or offset joints of drain board sheets.

.8 Place all subsequent sheets in an overlapping single fashion.

.9 Backfill bottom edge in conjunction with weeping tile system.

3.5 FIELD QUALITY CONTROL

.1 An independent inspection and testing company appointed and paid for by the Owner will carry out inspection and testing in accordance with the General Conditions.

.2 Arrange site meeting with inspection company representative three weeks prior to commencement of work of this Section on Site. Obtain inspector's instructions and procedures to be followed.

.3 Co-operate with the inspector and afford all facilities necessary to permit full inspection of the work of this Section and testing of materials prior to their use. Act immediately on instructions given by the inspector.

END OF SECTION

1 General

1.1 SUMMARY

.1 This Section includes requirements for supply and installation of the following:

.1 Foundation and Underslab Insulation Board

1.2 RELATED REQUIREMENTS

.1 Section 04 20 00: Masonry

.2 Section 07 11 13: Bituminous Dampproofing

.3 Section 07 21 16: Blanket Insulation and Vapour Barrier

.4 Section 07 27 23: Board Product Air Barriers

.5 Section 31 23 33: Excavation, Trenching and Backfilling

.6 Section 33 46 19: Underslab Drainage Systems

1.3 REFERENCE STANDARDS

.1 Underwriters Laboratories of Canada (ULC):

.1 CAN/ULC S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering

.2 American Society for Testing and Materials (ASTM):

.1 ASTM D1621-10, Standard Test Method for Compressive Properties of Rigid Cellular Plastics

.2 ASTM D2842-06, Standard Test Method for Water Absorption of Rigid Cellular Plastics

.3 Canadian General Standards Board (CGSB):

.1 CGSB 71-GP-24M, Adhesive, Flexible for Bonding Cellular Polystyrene Insulation

1.4 SUBMITTALS

.1 Provide submittals in accordance with the General Conditions and Section 01 33 00.

.2 Affidavits:

.1 In lieu of samples and inspection procedures when required by CGSB and CAN/ULC Standards, submit affidavits, if requested, that materials supplied under these requirements meet CGSB and CAN/ULC Standards.

.3 Safety Data Sheets:

.1 Submit WHMIS safety data sheets for inclusion with project record documents. Keep one copy of WHMIS safety data sheets on site for reference by workers.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Store insulation materials in dry areas, protected from wetting, sunlight and traffic. Store insulation board flat, on a flat surface, and to prevent edge damage and placing of materials on top of stored boards.

.2 Ensure that insulation board and adhesives are stored at a minimum temperature of 4 deg C for twelve (12) hours before installation, and that freezable adhesives are stored only at temperatures above 0 deg C at all times.

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 five (5) days in advance of Bid Closing.

.2 Acceptable Manufacturers: Subject to compliance with requirements specified in this Section, manufacturers offering products that may be incorporated into the Work include the following:

.1 Dow Canada

.2 Owens-Corning Canada

.3 Roxul Inc.

2.2 MATERIALS

.1 Foundation and Underslab Insulation Board:

.1 Closed-cell, cellular, foamed, smooth skin, extruded expanded polystyrene, having 30 psi compressive strength, thicknesses as indicated on drawings and specified herein, conforming to CAN/ULC S701, Type IV.

.1 Basis of Design Materials:

.1 Styrofoam SM by Dow Chemical Canada Inc.

.2 Celfort 300 by Owens-Corning Canada Inc.

.2 Provide underslab insulation board with shiplapped edges.

.2 Plastic Cavity Wall Insulation Board: As indicated in Section 07 27 23.

2.3 ACCESSORIES

.1 Insulation Fasteners:

.1 Mechanical Fasteners: High quality, impact resistant plastic fastener system specifically designed for installation of board insulation materials; 38mm (1-1/2”) diameter, shaft length to suit insulation thickness and hot dipped galvanized fastener to suit substrate.

.2 Insulation Clips: Impale type, perforated 50mm x 50mm (2” x 2”) cold rolled carbon steel 1mm (1/32”) core metal thickness, adhesive back; 1.6mm (1/16”) diameter annealed steel wire spindle, length to suit insulation, 25mm (1”) diameter self locking washers.

.2 Adhesive:

.1 Trowelable Polystyrene Insulation Adhesive: Trowel consistency, synthetic rubber based insulation adhesive compatible with polystyrene insulation in accordance with CGSB 71-GP-24M; suitable for application to temperature of -10 deg C or lower, as approved by insulation board supplier.

.3 Protection Board: As indicated in Section 07 11 13.

3 Execution

3.1 EXAMINATION

.1 Before commencing work, ensure that all surfaces to which perimeter insulation board is applied are clean, reasonably smooth with no abrupt changes in plane, free of grease, and with protruding fins of mortar or concrete removed, and that the surfaces are otherwise acceptable for insulation application as specified.

3.2 PREPARATION

.1 Clean substrates of substances harmful to insulations; remove projections that interfere with insulation attachment.

.2 Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

.1 Install insulation and accessories in accordance with manufacturer's written instructions applicable to products and application indicated and as follows:

.1 Use insulation that is undamaged, dry, and unsoiled.

.2 Maintain continuous thermal insulation, vapour barrier and air tightness for building spaces and elements, and as follows:

.1 Saw cut and trim insulation neatly to fit spaces; fill voids with foamed-in-place insulation compatible with installed insulation.

.2 Butt edges and ends tight

.3 Fit insulation tight against mechanical, electrical and other items protruding through the plane of insulation

.4 Use insulation free of broken or chipped edges

.5 Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise specifically shown or required to make up total thickness

.6 Fit insulation firmly against substrate using mechanical fasteners spaced in accordance with manufacturers recommended spacing and pattern; in addition, adhere insulation to uneven substrate surfaces and provide additional fasteners to eliminate air spaces between insulation and substrate

.7 Mechanically fasten insulation boards 50mm (2”) in from edges at 305mm (12”) centers

.2 Leave insulation joints unbonded over line of expansion and control joints; bond a continuous 150mm (6”) wide strip of primary vapour membrane over expansion and control joints using compatible adhesive

.3 Protect insulation from damage until it is covered; replace any broken, sunburned, crushed or dented insulation immediately prior to covering; coordinate with back-filling operations

.4 Board Insulation: Install board insulation to vertical surfaces with adhesive applied in accordance with manufacturer's written instructions, and as follows:

.1 Exterior Application: Extend boards as indicated on Drawings to top of footing, installed on exterior face of perimeter foundation wall.

.2 Apply adhesive to the substrate by the "dab" method not less than (3/8” x 3/4") size at 150mm (6”) centers; bed the insulation in the adhesive before the adhesive loses its tack or skins over.

.3 Protect below grade insulation on vertical surfaces from damage during backfilling by applying protection board; set in adhesive according to insulation manufacturer's written instructions.

.5 Foundation and Under Slab Insulation: Extend boards as indicated on Drawings, and as follows:

.1 Lay boards on level compacted fill.

.2 Insulate structural slabs at entrances with insulation placed horizontally underneath the concrete, and insulate surrounding slabs on grade in the same way for a distance of 1220mm (4’) in every direction from the perimeter of the structural slab; omit perimeter insulation on adjacent foundations for the width of the structural slab.

3.4 PROTECTION

.1 Protect installed board insulation from damage due to harmful weather exposures, physical abuse, and other causes.

.2 Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

1 General

1.1 SUMMARY

.1 Supply and install the following as indicated in this Section:

.1 Glass Fibre Batt Insulation

.2 Mineral Fibre Batt Insulation

.3 Vapour Barrier

1.2 RELATED REQUIREMENTS

.1 Section 05 40 00: Cold Formed Metal Framing

.2 Section 06 17 53: Shop-Fabricated Wood Trusses

.3 Section 07 27 23: Board Product Air Barriers

.4 Section 07 41 16: Standing Seam Metal Roofing System

.5 Section 07 46 33: Plastic Siding

.6 Section 09 21 16: Gypsum Wallboard

1.3 REFERENCE STANDARDS

.1 Underwriters Laboratories of Canada (ULC):

.1 CAN/ULC S702-09-AM1, Standard for Thermal Insulation Mineral Fibre for Buildings

.2 CAN/ULC S114-05, Standard Method of Test for Determination of Non-Combustibility in Building Materials

.3 CAN/ULC S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

.2 Canadian General Standards Board (CGSB):

.1 CAN/CGSB-51.10-92, Mineral Fibre Board Thermal Insulation

.2 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction

1.4 SUBMITTALS

.1 Provide submittals in accordance with the General Conditions and Section 01 33 00.

.2 Affidavits:

.1 In lieu of samples and inspection procedures when required by CGSB Standards, submit affidavits, if requested, that materials supplied under these requirements meet CGSB Standards.

.3 Safety Data Sheets:

.1 Submit WHMIS safety data sheets for inclusion with project record documents. Keep one copy of WHMIS safety data sheets on site for reference by workers.

1.5 DELIVERY, STORAGE, HANDLING AND PROTECTION

.1 Handle and store material in accordance with the manufacturer's recommendations.

.2 Materials shall be delivered to the job in their original packages and containers bearing the manufacturer's labels intact and clearly visible.

.3 Store materials in dry, watertight areas and protect to prevent damage by other trades.

2 Products

2.1 MATERIALS

.1 Glass Fibre Batt Insulation:

.1 Unfaced, preformed glass fibre batt insulation in accordance with CAN/ULC S702-09, Type 1; having a nominal RSI of 0.55/25 mm, thickness as required to meet design insulation values indicated on drawings or as required to fill insulated spaces where not indicated; formaldehyde free, manufactured using recycled glass.

.2 Basis of Design Materials:

.1 Owens-Corning Canada Inc., Pink Fiber Glass Insulation

.2 CertainTeed Sustainable Insulation

.3 Johns-Manville Formaldehyde Free Batt Insulation

.2 Mineral Fibre Batt Insulation:

.1 Unfaced, semi-rigid mineral slag batt insulation in accordance with CAN/ULC S702-09, Type 1; having a nominal RSI of 0.67/25 mm; rated non-combustible in accordance with CAN/ULC S114-05 and having a flame spread rating of 5 or less in accordance with CAN/ULC S102; density 32 kg/m3; square edges, thickness as required to meet design insulation values indicated on drawings or as required to fill insulated spaces where not indicated.

.2 Basis of Design Materials:

.1 Roxul Inc., Roxul COMFORTBATT

.2 Thermafiber, SAFB (2.5 pcf Density)

.3 Vapour Barrier:

.1 6 mils thick clear polyethylene sheet conforming to CAN/CGSB-51.34.

.4 Polyethylene Adhesive Tape:

.1 'Scotch Brand No.483' manufactured by 3M Company, or 'Polyken No.827' manufactured by Kendall Co. (Canada) Ltd.

3 Execution

3.1 PREPARATION

.1 All materials and methods used in application shall be in strict accordance with the printed instructions of the manufacturer.

.2 Remove stains, defective work or materials when directed by the Consultant and replace with approved work and materials at no cost to Owner.

.3 Clean all surfaces of dust, dirt and projecting surfaces prior to the application of insulation.

.4 Do not install insulation when ambient air and surface temperatures are below 4 deg C (40 deg F) or more than 38 deg C (100 deg F). The temperature shall be maintained in the building during and after installation as necessary by the above requirement and as directed for curing of the adhesive. Obtain approval prior to proceeding with application of adhesive and insulation.

3.2 INSTALLATION

.1 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.2 Cut insulation to fit around electrical boxes, pipes, ducts, openings, corners and all protruding obstructions occurring on the surface to be insulated and seal with adhesive.

.3 Keep insulation minimum of 75mm (3") away from heat emitting devices.

.4 Trim and cut insulation neatly to fit spaces. Butt joints tightly, offsetting vertical joints. In multiple layer application, offset both vertical and horizontal joints.

.5 Install batt insulation in locations and thicknesses shown. Seal joints to prevent transfer of moisture.

.6 Install continuous vapour barrier, overlapping adjacent surfaces including self-joints a minimum of 50mm (2") and seal with specified tape. Applications to form a complete vapour seal.

END OF SECTION

1 General

1.1 SUMMARY

.1 Spray application of medium-density, closed-cell polyurethane foam insulation to provide continuous thermal insulation and air/vapour barriers to substrates indicated on drawings and specified herein.

.2 Alternate Price:

.1 Sprayed polyurethane foam insulation shall be not be included in the Bid Price, but should be indicated in Section 00 43 13 as Alternative Price #1.

1.2 RELATED REQUIREMENTS

.1 Section 04 20 00: Masonry

.2 Section 05 40 00: Cold Formed Metal Framing

.3 Section 05 50 00: Miscellaneous Metals

.4 Section 09 21 16: Gypsum Wallboard

1.3 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM):

.1 ASTM C518-10: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

.2 ASTM E84-12b: Test Method for Surface Burning Characteristics of Building Materials

.3 ASTM E96-10: Standard Test Methods for Water Vapor Transmission of Materials

.4 ASTM E283-04(2012): Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

1.4 SUBMITTALS

.1 Provide submittals in accordance with the General Conditions and Section 01 33 00.

.2 Product Data for each type of insulation product specified.

.3 Product test reports performed by a qualified third-party testing agency evidencing compliance of insulation products with specified requirements including those for thermal resistance, fire-test-response characteristics, water-vapor transmission, and other properties, based on comprehensive testing of current products.

.4 Manufacturer's certificate certifying insulation provided meets or exceeds specified requirements.

.5 Installer's certificate showing manufacturers installation certification for quality assurance.

1.5 QUALITY ASSURANCE

.1 Contractor executing work of this section shall have a minimum of five (5) years continuous Canadian experience in successful installations. Provide proof of experience to Consultant upon request.

.2 Single Source Responsibility: Single source product from one manufacturer.

.3 The insulating material must be applied by personnel who are certified by manufacturer. These certified individuals must have their certification cards in their possession and available for presentation upon request.

.4 A copy of the manufacturer's installation manual or guide for the application of sprayed on polyurethane foam must be kept on site.

.5 Tests must be conducted daily on both core density and cohesion/adhesion to the substrate, following procedures established by the manufacturer. The results of these tests must be entered in the daily report forms provided by the manufacturer.

.6 Fire-Test-Response Characteristics: Provide materials specified as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

.1 Surface-Burning Characteristics: ASTM E 84

.7 Submit copy of all completed forms to Consultant prior to making application for payment.

.8 Toxicity/Hazardous Materials:

.1 Provide products that contain no urea-formaldehyde

.2 Provide products that contain no PBDEs

.3 Provide products that are “Low-emitting”

1.6 SEQUENCING AND SCHEDULING

.1 Co-ordinate the work of this section with installation of associated work specified under other sections.

1.7 DELIVERY, STORAGE, HANDLING AND PROTECTION

.1 Co-ordinate deliveries to comply with construction schedule. Comply with manufacturers written instructions for handling and protection prior to and during installation.

.2 Store material as recommended by manufacturers written instructions in original, undamaged containers with manufacturers seals and labels intact. During cold weather, store raw materials in heated storage.

.3 Protect adjacent surfaces and equipment from damage by overspray.

2 Products

2.1 MATERIALS

.1 Sprayed Polyurethane Foam Insulation:

.1 CFC free formulation, closed-cell sprayed polyurethane foam type insulation and conforming to CAN/ULC 705.1.

.1 Basis of Design Product: Walltite ECO by BASF, as represented by Building Resource Inc, or ICYNENE MD-C-200 by Icynene Inc.

.2 Provide primers in accordance with manufacturers recommendations if required for surface conditions.

2.2 EQUIPMENT

.1 Use equipment as recommended by sprayed polyurethane foam insulation manufacturer for types of applications required.

3 Execution

3.1 EXAMINATION

.1 Verify that surfaces and conditions are suitable to accept work of this section.

.2 Report in writing, defects in surfaces or conditions which may adversely affect the performance of products installed under this section to the Contractor, prior to commencement of work of this section.

.3 Do not commence work of this section until defects have been corrected.

.4 Commencement of work of this section implies acceptance of surfaces and conditions.

3.2 PREPARATION

.1 Mask and cover adjacent areas to protect from overspray.

.2 Apply primers for special conditions as required by sprayed polyurethane foam manufacturer.

.3 Clean work area prior to commencing spray operations.

.4 Coordinate with work of other sections.

3.3 APPLICATION

.1 Apply sprayed polyurethane foam insulation to clean surfaces in accordance with manufacturers written instructions. Use primers where recommended by manufacturer.

.2 Thicknesses of sprayed polyurethane foam insulation shall be minimum 2-5/8" and thicker as indicated on drawings, with a maximum tolerance from required thickness of 1/4". Fill in gaps and spaces around structural steel, steel deck and other locations with sprayed polyurethane foam insulation to form continuous air/vapour and thermal barriers.

END OF SECTION

1 General

1.1 GENERAL REQUIREMENTS

.1 The General Conditions, the Supplementary Conditions, the Instructions to Bidders and Division 1 General Requirements shall be read in conjunction with and govern this section.

.2 The Specification shall be read as a whole by all parties concerned. Each Section may contain more or less than the complete work of any trade. The Contractor is solely responsible to make clear to the Subcontractors the extent of their work.

1.2 SUMMARY

.1 This section includes requirements for supply and installation of the following rigid insulation exterior air barrier system , as required for complete and proper installation:

.1 Polyethylene Gasket;

.2 Extruded Polystyrene Rigid Insulation direct to wood studs or intermediate sheathing;

.3 Fasteners;

.4 Foam Joint Tape;

.5 Flashing Tape;

.6 Termination Sealant.

1.3 RELATED REQUIREMENTS

.1 Section 05 40 00: Cold Formed Metal Framing

.2 Section 05 50 00: Miscellaneous Metals

.3 Section 06 10 00: Rough Carpentry

.4 Section 07 21 16: Blanket Insulation and Vapour Barrier

.5 Section 08 11 13: Steel Doors and Frames

.6 Section 08 36 16: Sectional Overhead Insulated Metal Doors

.7 Section 08 51 13: Aluminum Windows

.8 Section 09 21 16: Gypsum Wallboard

1.4 REFERENCE STANDARDS

.1 Specification American Society for Testing and Materials (ASTM):

.1 ASTM C177, Standard Test Method for Stead-State Heat Flux Measures and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

.2 ASTM C203, Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation

.3 ASTM C518, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

.4 ASTM C665, Specification for Mineral-Fibre Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing (Corrosion Resistance Criteria)

.5 ASTM C1338, Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings

.6 ASTM D696, Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 deg C and 30 deg C with a Vitreous Silica Dilatometer

.7 ASTM D1621, Standard Test Method for Compressive Properties of Rigid Cellular Plastics

.8 ASTM D2126, Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging

.9 ASTM D2842, Standard Test Method for Water Absorption of Rigid Cellular Plastics

.10 ASTM E96, Standard Test Methods for Water Vapor Transmission of Materials

.2 Underwriters Laboratories of Canada (ULC):

.1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings

.2 CAN/ULC-S102.2, Standard Method of Test for Surface Burning Characteristics of Flooding, Floor Covering and Miscellaneous Materials and Assemblies

.3 Canadian General Standards Board (CGSB):

.1 CGSB 71-GP-24M, Adhesive, Flexible, for Bonding Cellular Polystyrene Insulation

.4 Canadian Construction Materials Centre (CCMC):

.1 Evaluation Report CCMC 12935-R; FOAMULAR CodeBord Exterior air barrier system (CABS)

.2 Evaluation Report CCMC 14003-R; JointSealR Foam Joint Tape and FlashSealR Foam Flashing Tape

1.5 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Coordinate the Work of this Section with the installation of exterior substrate; Sequence work so that installation of rigid insulation board and gaskets coincides with installation of substrate preparation without causing delay to the Work.

.2 Pre-Construction Conference: Arrange a site meeting attended by the Contractor, the Subcontractor, the framing contractor, the Consultant, materials supplier(s), and other relevant personal before commencement of work for this Section; as indicated in Section 01 31 19 Project Meetings.

.1 Review methods and procedures related to installation, including manufacturer's written instructions;

.2 Examine substrate conditions for compliance with manufacturers installation requirements;

.3 Review temporary protection measures required during and after installation.

1.6 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: Submit manufacturer’s data sheets covering the care and recommended maintenance procedures for incorporation into maintenance manuals.

.2 Certifications:

.1 Submit documentation from an approved independent testing laboratory certifying that the air leakage rates of the exterior air barrier system, including rigid insulation, gaskets, joint tape, termination sealants and flashing have been tested.

.2 Submit documentation from an approved independent testing laboratory certifying that the air leakage rates of the exterior air barrier system, exceed the requirements of the National or Provincial Building Code.

.3 Submit manufacturers’ complete set of standard details for the exterior air barrier system showing a continuous plane of air tightness throughout the building envelope.

.4 Provide material checklist complete with application rates and fastening pattern.

1.7 QUALITY ASSURANCE

.1 Qualifications: Provide proof of qualifications when requested by Consultant:

.1 Submit in writing, a document stating that the applicator of the exterior air barrier system specified in this section is recognized by the manufacturer as suitable for the execution of the Work.

.2 Perform Work in accordance with the manufacturer's written instructions of the exterior air barrier system and this specification.

.3 Maintain one copy of manufacturer's written instructions on site.

.4 At the beginning of the Work and at all times during the execution of the Work, allow access to Work site by the air barrier system manufacturers' representative.

.5 Components used in this section shall be sourced from one manufacturer, including rigid insulation, gaskets, joint tape, termination sealants and flashing.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Delivery: At the time of delivery, visually inspect all materials for damage. Note any damaged to materials on the receiving ticket and immediately report to the shipping company and the material manufacturer.

.1 Remove damaged materials from the site immediately.

.2 Storage:

.1 Store materials as recommended by manufacturer and conforming to applicable safety regulatory agencies. Refer to all applicable data including but not limited to Safe Use Instruction Sheets, Product Data sheets, product labels, and specific instructions for personal protection.

.2 Store materials in original packaging.

.3 Store adhesives and sealants at temperatures of 5 deg C (41 deg F) and above to facilitate handling.

.3 Handling: Material shall be handled in accordance with sound material handling practices and in accordance with manufacturer's written instructions.

1.9 COORDINATION

.1 Ensure continuity of the air seal throughout the scope of this section.

.2 Ambient Conditions:

.1 Install materials outlined in this Section after completion of work by other Sections is complete; to provide adequate dry, clean, level, and plumb surfaces for installation and adhesion.

.2 Apply when ambient air and substrate temperatures are above temperature range indicated by exterior air barrier system manufacturer, during time of install, and for a minimum of forty-eight (48) hours after installation, unless otherwise indicated.

.3 Ensure surfaces are sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants.

2 Products

2.1 MATERIALS

.1 Principal Exterior Air Barrier System Component:

.1 Extruded polystyrene rigid insulation board, having the following properties:

.1 Colour: Pink

.2 Thickness: 51mm (2")

.3 Water Vapour Permeance (ASTM E96, Method A): 45 - 55 ng/Pa.m^2.s., (0.79 – 0.96perms)

.4 Air Permeability at 75 Pa: 0.001 L/s.m^2

.5 Water Absorption (ASTM D2842): 0.70

.6 Greenguard Gold certification

.7 SCS recycled content: 20%

.8 Water Affinity: Hydrophobic

.9 Compressive Strength (ASTM D1621): 140 kPa (20 psi)

.10 Thermal Resistance (ASTM C518 or C177):

.1 RSI: 0.88 m2 C/W

.2 R-5/Inch: ft2 hr F/BTU

.11 Basis of Design Product: FOAMULAR (CodeBord or EASI) Extruded Polystyrene Rigid Insulation by Owens Corning Canada LP.

.2 Auxiliary Materials:

.1 Polyethylene Gasket: Multi-purpose rigid gasket made from polyethylene foam; a flexible, durable and moisture resistant gasket to eliminate air leakage.

.1 Thickness: 3.175mm (1/8")

.2 Width: 89mm (3-1/2")

.3 Length: 15.2m (50')

.4 Basis of Design Product: FoamSealR Gasket by Owens Corning Canada LP.

.2 Foam Joint Tape: Self-adhering seam tape for vertical and horizontal applications, for sealing joints between panels of extruded polystyrene rigid insulation board; complete with durable backing coated with an aggressive acrylic adhesive and release liner backing.

.1 Thickness (mils): 9.9 (0.25mm)

.2 Width: 89mm (3-1/2")

.3 Length: 27.4m (90')

.4 Service Temperature Range: -40 - 74 deg C (-40-165 deg F)

.5 Application Temperature Range: -18 - 49 deg C (0-120 deg F)

.6 Air Permeance (tested at 75 Pa) (ASTM E2178): 0.00017 L/s m^2

.7 Basis of Design Product: JointSealR Foam Joint Tape by Owens Corning Canada LP.

.3 Flashing Tape: Flexible, durable and tear-resistant, self-adhering flashing tape, recommended for use with extruded polystyrene rigid insulation board, to seal around sills, jambs and heads of window and door openings. Seals around wall protrusions, nails and staples to prevent moisture intrusion, complete with split release liner.

.1 Thickness (mils): 9.9 (0.25mm)

.2 Width: 152mm (6")

.3 Length: 27.4m (90')

.4 UV Exposure: Up to 180 days.

.5 Nail Sealability (AAMA 711, Section 5.2): Pass

.6 Flame Spread (ASTM E84): 5

.7 Smoke Development (ASTM E84): 25

.8 Water Vapour Transmission: 11 ng/Pa.m².s (0.19 perms) to ASTM E96, Method B.

.9 Service Temperature Range: -40 - 74 deg C (-40-165 deg F)

.10 Application Temperature Range: -18 - 49 deg C (0-120 deg F)

.11 Air Permeance (tested at 75 Pa) (ASTM E2178): 0.00017 L/s m^2

.12 Basis of Design Product: FlashSealR Foam Flashing Tape by Owens Corning Canada LP.

.4 Termination Sealants: As recommended by exterior air barrier system manufacturer, compatible with extruded polystyrene rigid insulation board.

.5 Fasteners: Cap nail complete with minimum 25mm (1”) diameter (plastic or metal) head, with nail penetration depth of at least 25mm (1”) into wood stud.

3 Execution

3.1 EXAMINATION

.1 Verification of Conditions:

.1 Examine substrates to receive work and surrounding adjacent surfaces for conditions affecting installation.

.2 Sheathing panels, if required, must be securely fastened and installed flush to ensure a continuous substrate in accordance with manufacturer published literature.

.3 Fastener penetrations must be set flush with sheathing and fastened into solid backing.

.4 Notify Consultant in writing of any discrepancies. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrate.

.2 Notify Contractor in writing of any conditions that are not acceptable.

.3 The installing contractor shall examine and determine that surfaces and conditions are ready to accept the Work of this section in accordance with published literature. Commencement of Work or any parts thereof shall mean installers acceptance of the substrate.

3.2 PREPARATION

.1 All surfaces must be sound, dry, clean and free of oil, grease, dirt or other contaminants.

3.3 INSTALLATION

.1 Installation - Rigid Insulation Exterior Air Barrier System (Direct to Studs):

.1 Foundation Connection to Rigid Insulation Board:

.1 Install polyethylene gasket under sill plate and on vertical face of sill plate. Gasket held in place with staples. Place rigid insulation board on top and fasten to form a compression seal with cap nail spaced every 6-8” on-center around perimeter and 8-12” on-center for remainder of board.

.2 First Floor Header Connection to Above Grade Wall:

.1 Install joint tape to horizontal joint between header rigid insulation board and first floor wall rigid insulation board.

.3 Ship Lap Joints:

.1 Fasten rigid insulation board with cap nail maximum spacing 6-8” on-center around perimeter and 8-12” on-center for remainder of board.

.2 Install joint tape to ship lap joint. (optional)

.3 Tape all butt edge joints with joint tape

.4 Windows:

.1 Install polyethylene gasket on entire face of rough window opening; Fasten rigid insulation board with cap nail spaced every 6-8” on-center around window perimeter.

.1 Air seal from rigid insulation board to window is achieved when sealant and backer rod or low expansion spray foam insulation is installed around entire interior perimeter of window.

.2 Install sealant and backer rod or low expansion spray foam insulation to exterior vertical and exterior top horizontal window frame. Bottom horizontal of window frame shall be left open to permit drainage.

OR

.2 Apply flashing tape to entire window perimeter, on top of rigid insulation board, connecting to wood stud.

.1 Air seal from rigid insulation board to window is achieved when sealant and backer rod or low expansion spray foam insulation is installed around entire interior perimeter of window.

.2 Install sealant and backer rod or low expansion spray foam insulation to exterior vertical and exterior top horizontal window frame. Bottom horizontal of window frame shall be left open to permit drainage.

.5 Ceiling:

.1 Tape or apply sealant from ceiling vapour and air barrier to second floor top plate. Tape or apply sealant to all ceiling vapour and air barrier joints, and any penetrations. OR

.2 Install rigid insulation board to entire ceiling surface with cap nail spaced 6-8” on-center around perimeter and 8-12” on-center for remainder of board, taping all joints and connection to second floor top plate taped or sealed. Seal all penetrations.

3.4 FIELD QUALITY CONTROL

.1 Final Observation and Verification:

.1 Final inspection of rigid insulation exterior air barrier system shall be carried out by the Owner’s representative, and the contractor.

.2 Contact Manufacturer for warranty issuance requirements.

.2 Rigid insulation exterior air barrier system is not designed for permanent UV exposure. Refer to manufacturer published literature for product limitations.

3.5 CLEANING AND PROTECTION

.1 Progress Cleaning: Leave work area clean at the end of each work day, ensuring safe movement of passing pedestrians.

.2 Waste Management: Co-ordinate recycling of waste materials and packaging at appropriate facility, diverting waste from landfill. Certified installer shall be responsible for ensuring waste management efforts are practiced.

END OF SECTION

1 General

1.1 SUMMARY

.1 This Section includes requirements for supply and installation of factory formed, site assembled, non-structural, concealed fastener, architectural standing seam metal roofing system; including accessories required for weather tight installation; job site manufactured materials will not be acceptable for this project.

.2 Drawings indicate size, profiles, and dimensional requirements of metal roofing system and are based on the specific system indicated; do not modify intended aesthetic effects.

1.2 DEFINITIONS

.1 Metal Roofing System Assembly: Metal roofing system, attachment system components, miscellaneous metal framing, thermal insulation, and accessories necessary for a complete weather tight roofing system.

.2 Core Metal Thickness: Minimum thickness of base metal without metallic coatings or painted finishes.

1.3 RELATED REQUIREMENTS

.1 Section 06 10 00: Rough Carpentry

.2 Section 06 17 53: Shop-Fabricated Wood Trusses

.3 Section 07 21 16: Blanket Insulation and Vapour Barrier

.4 Section 07 27 23: Board Product Air Barriers

.5 Section 07 46 33: Plastic Siding

.6 Section 07 71 36: Metal Soffits, Gutters and Rainwater Goods

1.4 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM):

.1 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.2 ASTM A755/A755M-11, Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products

.3 ASTM C1396/C1396M-11, Standard Specification for Gypsum Board

.2 Canadian General Standards Board (CGSB):

.1 CGSB 37-GP-56M, Membrane, Modified, Bituminous, Prefabricated and Reinforced for Roofing

.3 Canadian Standards Association (CSA):

.1 CSA A123.3-05 (R2010), Asphalt or Tar Saturated Roofing Felt

.2 CSA S136-07, North American Specification for the Design of Cold Formed Steel Structural Members

.4 Canadian Sheet Steel Building Institute (CSSBI):

.1 CSSBI 20M-99, Sheet Steel Cladding for Architectural, Industrial and Commercial Building Applications

.5 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA):

.1 Architectural Sheet Metal Manual, 5th Edition, 1993

1.5 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Construction Meeting: Arrange a pre-construction meeting in accordance with Section 01 31 19 at project site with Contractor, Subcontractor, Owner's inspection agency and Consultant present before starting roof construction; purpose of meeting is to review methods and procedures related to roof construction and metal roofing system including; but not limited to, the following:

.1 Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.

.2 Review methods and procedures related to metal roofing system installation, including manufacturer's written instructions.

.3 Examine sheathing conditions for compliance with requirements, including flatness and attachment to structural members.

.4 Review structural loading limitations of sheathing during and after roofing.

.5 Review flashings, special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect metal roofing system.

.6 Review temporary protection requirements for metal roofing system during and after installation.

.7 Review roof observation and repair procedures after metal roofing system installation.

.8 Contractor will document proceedings, including corrective measures and actions required, and furnish copy of record to each meeting participant.

.2 Coordination:

.1 Coordinate metal roofing system with rain drainage work, flashing, trim, and construction of sheathing, and other adjoining work to provide a leak proof, secure, and non-corrosive installation.

1.6 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: Submit product data including; but not limited to, construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal roofing system and accessory.

.2 Shop Drawings: Submit shop drawings indicating fabrication and installation layouts of metal roofing system; details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, closures, and accessories; and special details, identify between factory and site assembled work, include details for the following:

.1 Accessory details drawn at minimum 1:10 scale including; but not limited to, the following:

.1 Flashing and trim

.2 Gutters

.3 Downspouts

.4 Snow guards

.3 Samples: Submit two (2) samples for each type of exposed finish required for Consultant's verification of finishes, prepared in sizes as follows:

.1 Metal roofing system: 12" long by actual panel width; include fasteners, clips, closures, and other metal roofing system accessories.

.2 Trim and Closures: 12" long; include fasteners and other exposed accessories.

.3 Vapour Retarders: 6" square samples.

.4 Accessories: 12" long samples for each type of accessory.

.3 Informational Submittals: Provide the following submittals when requested by the Consultant:

.1 Coordination Drawings: Coordination drawings drawn at minimum 1:100 indicating locations of penetrations and roof mounted items including; but not limited to, the following:

.1 Roof systems and attachments.

.2 Equipment supports

.3 Pipe supports and penetrations

.4 Lighting fixtures

.5 Snow guards

.6 Items mounted on roof curbs

1.7 PROJECT CLOSEOUT SUBMISSIONS

.1 Operation and Maintenance Data: Submit manufacturers written maintenance data for metal roofing system, include name of original installer and contact information for inclusion in maintenance manuals in accordance with Section 01 78 00.

1.8 QUALITY ASSURANCE

.1 Qualifications: Provide proof of qualifications when requested by Consultant:

.1 Manufacturer: Obtain each type of metal roofing system through one source from a single manufacturer.

.2 Installer: Use only installers that are trained and qualified by factory formed roofing panel manufacturer, and who have experience in projects of similar complexity and scope.

1.9 DELIVERY, STORAGE, AND HANDLING

.1 Delivery and Acceptance Requirements: Deliver components, sheets, metal roofing system, and other manufactured items to prevent damage or deformation; package metal roofing system for protection during transportation and handling.

.2 Storage and Handling Requirements: Unload, store, and erect metal roofing system in a manner to prevent bending, warping, twisting, and surface damage, and as follows:

.1 Protect metal roofing system to prevent wetting of materials, and as follows:

.1 Stack metal roofing system on platforms or pallets, covered with suitable weather tight and ventilated covering.

.2 Do not store metal roofing system in contact with other materials that might cause staining, denting, or other surface damage.

.2 Protect strippable protective covering on metal roofing system from exposure to sunlight and high humidity, except to extent necessary for period of metal roofing system installation.

1.10 SITE CONDITIONS

.1 Site Measurements: Verify locations of roof framing and roof opening dimensions by site measurements before metal roofing system fabrication and indicate measurements on shop drawings.

.2 Established Dimensions: Establish framing and opening dimensions and proceed with fabricating metal roofing system without site measurements where site measurements cannot be made without delaying the Work, or allow for site trimming of panels; coordinate roof construction to ensure that actual building dimensions, locations of structural members, and openings correspond to established dimensions.

.3 Ambient Conditions: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal roofing system in accordance with manufacturers' written instructions and warranty requirements.

1.11 WARRANTY

.1 Provide manufacturer's standard form of warranty stating that manufacturer agrees to repair or replace components of metal roofing system that fail in materials or workmanship within specified warranty period; failures will be considered to include; but are not limited to, the following:

.1 Structural failures, including rupturing, cracking, or puncturing.

.2 Deterioration of metals, metal finishes, and other materials beyond normal weathering.

.3 Deterioration of finishes, peeling or cracking of coating, failure to adhere to bare metal, colour fading and chalking.

.2 Warranty Period:

.1 Metal Roof System: Two (2) years from date of Substantial Performance.

.2 Finishes: Twenty (20) years from date of Substantial Performance.

.3 Weather Tightness: Five (5) years from date of Substantial Performance stating that manufacturer agrees to repair or replace metal roofing system failing to remain weather tight; including leaks, within specified warranty period.

2 Products

2.1 MANUFACTURERS

.1 Basis-of-Design products are named in this Section; additional manufacturers offering similar setting systems may be incorporated into the work provided they meet the performance requirements established by the named products.

.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 Behlen Industries

.2 Berridge Manufacturing Company

.3 Canadian Metal Rolling Mills

.4 Vicwest Steel Inc.

2.2 STANDING SEAM METAL ROOFING SYSTEM

.1 Performance Requirements: Provide metal roofing system in accordance with performance requirements specified in this Section and as follows:

.1 Design and construct roof so that completed installation will not leak.

.2 Provide maximum deflection not exceeding 1/180 under system weight plus snow load and build-up, and wind and suction loads acting normal to the plane in accordance with the Building Code Climatic Data, wind load for 1:50 years.

.3 Provide movement of components without causing buckling, failure of joint seals, undue stress on fasteners when subject to seasoned temperature range, from -40 degree C to +50 degree C, and preceding noted wind and suction loads.

.4 Provide expansion joints to accommodate movement in wall system and between wall system and building structure where these movements are caused by deflection of building structure, without permanent distortion, damage to in-fills, racking of joints, breakage of seals, or water penetration into system.

.5 Provide for positive drainage to the exterior of all water entering or condensation occurring within the system.

.2 Panel Materials: Coated steel sheet with coil coating having galvanized finish using hot dip process and pre-coated using coil coating process in accordance with ASTM A755M, and as follows:

.1 Galvanized Steel Sheet: ASTM A653/A653M-11, having Z275 coating designation; structural quality.

.2 Core Metal Thickness: Manufacturers standard.

.3 Profile:

.1 Panel Width, Profile and Texture: To match adjacent, existing roof panels, as approved by the Consultant.

.2 Seam Profile: Standing Seam.

.4 Finish: Prefinished colour selected from manufacturer's standard range using Dofasco Perspectra or Valspar WeatherX or Baycoat 10000 Series.

.3 Auxiliary Levelling Surface: Plywood sheathing, as indicated in Section 06 10 00.

.4 Ice and Water Shield Membrane: Self adhering, SBS modified bitumen membrane reinforced with skid resistant polyethylene surface film. Meeting ASTM D1970 and self-gasketing when penetrated by mechanical fasteners.

.1 Basis of Design Materials: Blueskin RF200 by Henry Company.

.5 Insulation: As indicated in Section 07 21 16.

.6 Miscellaneous Metal Framing: Cold rolled steel framing in accordance with CSA S136-07, and as follows:

.1 Steel Sheet Components: Fabricated from 3/64" nominal base metal thickness galvanized steel to ASTM A653/A653M-11, with Z180 zinc coating.

.2 Hat Shaped, Rigid Furring Channels: Fabricated from 1/32" nominal base metal thickness galvanized steel, depth to match existing.

.3 Furring Brackets: Adjustable, corrugated edge type, steel sheet with minimum 1/32" nominal bare steel thickness.

.4 Tie Wire: Zinc coated, soft temper, minimum 1 ½" nominal diameter wire, or double strand of 1 ¼" nominal diameter wire.

.5 Z-Bars: Slotted or non-slotted web, face flange 1 ¼" wide; wall attachment flange 7/8" wide x depth to suit insulation thickness, minimum 1/64" nominal bare metal thickness.

.7 Metal Framing Fasteners: Type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates as recommended by manufacturer.

2.3 ACCESSORY MATERIALS

.1 Provide components required for complete metal roofing system assembly including trim, copings, corner units, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items; match material and finish of metal roofing system.

.2 Fasteners: Self tapping screws, bolts, nuts, self locking rivets and bolts, end welded studs, and other suitable fasteners designed to withstand design loads, and as follows:

.1 Provide exposed fasteners with heads matching color of metal roofing system by means of plastic caps or factory applied coating.

.2 Fasteners for Roof systems: Self drilling or self tapping, zinc plated, hex head carbon steel screws, with a stainless-steel cap or zinc aluminum alloy head and EPDM or neoprene sealing washer.

.3 Fasteners for Flashing and Trim: Blind fasteners or self drilling screws with hex washer head; no exposed fastenings on exposed faces.

.3 Bituminous Coating: Cold applied asphalt mastic, SSPC-Paint 12, compounded for 3/64" dry film thickness per coat; inert type non-corrosive compound free of asbestos fibres, sulphur components, and other deleterious impurities.

.4 Flashing, Roof Curbs, Gutters and Downspouts, and Trim: Prefinished flashing materials to match roofing materials in accordance with Section 07 71 36.

.5 Surface Mounted Snow Guards: Prefabricated, non-corrosive units designed installed without penetrating metal roofing system, and complete with predrilled holes, clamps, or hooks for anchoring.

.1 Material and Finish: To match existing, as approved by the Consultant.

.2 Acceptable Materials:

.1 S-5!

.2 Glacier Snow Guard

.3 Polar Blox Standing Seam Guards

.4 Snoblox Snow Guards

.5 Zaleski Snow Guards for Roofs Inc.

.6 Pipe Flashing: Pre-moulded, EPDM pipe collar with flexible aluminum ring bonded to base.

2.4 FABRICATION

.1 Fabricate and finish metal roofing system and accessories at the factory to greatest extent possible, using manufacturer's standard procedures and processes to obtain the indicated profiles and meeting dimensional and structural requirements for the Project.

.2 Fabricate flashing and trim in accordance with SMACNA recommendations that apply to the design, dimensions, metal, and other characteristics of item indicated.

2.5 FINISHES, GENERAL

.1 Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

.2 Variations in appearance of abutting or adjacent pieces are acceptable if they are within ½ the range of reviewed samples:

.1 Noticeable variations in the same piece are not acceptable.

.2 Variations in appearance of other components are acceptable if they are within the range of reviewed samples and are assembled or installed to minimize contrast.

3 Execution

3.1 EXAMINATION

.1 Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roofing system supports, and other conditions affecting performance of work.

.2 Examine primary and secondary roof framing to verify that angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roofing system manufacturer.

.3 Examine roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roofing system manufacturer.

.4 Examine roughing-in for components and systems penetrating metal roofing system to verify actual locations of penetrations relative to seam locations of metal roofing system before metal roofing system installation.

.5 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

.1 Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.

.2 Install auxiliary levelling substrate boards over steel deck; attach with mechanical fasteners into top flutes of steel to prevent wind uplift.

.3 Install flashings and other sheet metal in accordance with requirements specified in Section 07 71 36.

.4 Install fasciae and copings in accordance with requirements specified in Section 07 71 36.

.5 Install sub-purlins, eave angles, furring, and other miscellaneous roof system support members and anchorage in accordance with metal roofing system manufacturer's written recommendations.

3.3 ICE AND WATER SHIELD INSTALLATION

.1 Install self adhering sheet ice and water shield, wrinkle free, on roof sheathing under metal roofing system.

.2 Apply over entire roof in shingle fashion to shed water, with end laps of not less than 6” staggered 24" between courses and as follows:

.1 Overlap side edges not less than 3 ½”.

.2 Extend ice and water shield into gutter trough.

.3 Roll laps with roller.

.4 Cover ice and water shield within 14 days.

.3 Install flashings to cover ice and water shield in accordance with requirements specified in Section 07 71 36.

.4 Apply slip sheet over ice and water shield before installing metal roofing system.

3.4 METAL ROOFING SYSTEM INSTALLATION

.1 Install metal roofing system in accordance with manufacturer’s written instructions and as modified by this Section.

.2 Provide metal roofing system of full length from eave to ridge, unless restricted by shipping limitations.

.3 Anchor metal roofing system and other components of the Work securely in place, with provisions for thermal and structural movement:

.1 Site cutting of metal roofing system by torch is not permitted.

.2 Rigidly fasten eave end of metal roofing system and allow ridge end free movement due to thermal expansion and contraction; pre-drill panels before installing fasteners.

.3 Provide metal closures at peaks, rake edges and each side of ridge caps.

.4 Flash and seal metal roofing system with weather closures at eaves, rakes, and at perimeter of all openings; fasten with self tapping screws.

.5 Locate and space fastenings in uniform vertical and horizontal alignment.

.6 Install ridge caps as metal roofing system work proceeds.

.7 Locate panel splices over, but not attached to, structural supports.

.8 Stagger panel splices and end laps to avoid a four-panel lap splice condition.

.9 Lap metal flashing over metal roofing system to allow moisture to run over and off the material.

.4 Use stainless steel fasteners for surfaces exposed to the exterior and galvanized steel fasteners for surfaces exposed to the interior.

.5 Protect against galvanic action where dissimilar metals contact each other or corrosive substrates, by painting contact surfaces with bituminous coating, by applying rubberized asphalt ice and water shield to each contact surface, or by other permanent separation as recommended by metal roofing system manufacturer.

.6 Install gaskets, joint fillers, and sealants where required for weatherproof performance of metal roofing system; include types of gaskets, fillers, and sealants recommended by metal roofing system manufacturer, and as follows:

.1 Seal metal roofing system end laps with double beads of tape or sealant, full width of panel.

.2 Seal side joints where recommended by metal roofing system manufacturer.

.3 Prepare joints and apply sealants in accordance with requirements in Section 07 92 00.

.7 Fasten metal roofing system to supports with concealed clips at each standing seam joint at location, spacing, and with fasteners recommended by manufacturer, and as follows:

.1 Install clips to supports with self tapping fasteners.

.2 Install pressure plates at locations indicated in manufacturer's written installation instructions.

.3 Crimp standing seams with manufacturer approved motorized seaming tool so clip, metal roofing system, and factory applied sealant are completely engaged.

.8 Align bottom of facia panels and fasten with blind rivets, bolts, or self tapping screws; flash and seal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

3.5 ACCESSORY INSTALLATION

.1 Install accessories with positive anchorage to building and weather tight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

.2 Install components required for a complete metal roofing system assembly including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.

.3 Install flashing and trim in accordance with performance requirements, manufacturer's written installation instructions, and SMACNA recommendations; provide concealed fasteners where possible, and set units true to line and level; install work with laps, joints, and seams that will be permanently watertight and weather resistant.

.4 Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.

.5 Provide for thermal expansion of exposed flashing and trim:

.1 Space movement joints at equally spaced intervals to a maximum of 10 feet O/C with no joints allowed within 24”of corner or intersection.

.2 Form expansion joints of intermeshing hooked flanges, not less than 1” deep, filled with mastic sealant concealed within joints where lapped or bayonet type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof.

.6 Join gutter sections with riveted and soldered, or lapped and sealed joints:

.1 Attach gutters to eave with gutter hangers spaced not more than 48” O/C using manufacturer's standard fasteners.

.2 Provide end closures and seal watertight with sealant.

.3 Provide for thermal expansion.

.7 Join downspout sections with 1 ½" telescoping joints:

.1 Provide fasteners designed to hold downspouts securely 1" away from walls.

.2 Locate fasteners at top and bottom and at approximately 60" O/C between top and bottom fasteners.

.3 Provide elbows at base of downspouts to direct water away from building.

.8 Attach snow guards to metal roofing system with adhesive, sealant, or adhesive tape, as recommended by snow guard manufacturer; do not use fasteners that will penetrate metal roofing system.

.9 Form flashing around pipe penetration and metal roofing system; fasten and seal to metal roofing system as recommended by manufacturer.

3.6 ERECTION TOLERANCES

.1 Shim and align metal roofing system units within installed tolerance of 6 mm in 6 metres on slope and location lines as indicated and within 3 mm offset of adjoining faces and of alignment of matching profiles.

3.7 SITE QUALITY CONTROL

.1 Engage a factory authorized service representative to inspect completed metal roofing system installation, including accessories and to report results in writing to Owner and Consultant.

.2 Remove and replace applications of metal roofing system where inspections indicate that they do not comply with specified requirements.

.3 Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.8 CLEANING AND PROTECTION

.1 Remove temporary protective coverings and strippable films, if any, as metal roofing system are installed, unless otherwise indicated in manufacturer's written installation instructions.

.2 Clean finished surfaces as recommended by metal roofing system manufacturer upon completion of metal roofing system installation; maintain in a clean condition during remainder of construction.

.1 Replace metal roofing system components that become damaged or have deteriorated beyond successful repair by finish touch-up or similar minor repair procedures.

END OF SECTION

1 General

1.1 SUMMARY

.1 This Section includes the supply and installation of the following:

.1 Rigid Vinyl Siding

.2 Accessories

1.2 RELATED REQUIREMENTS

.1 Section 04 20 00: Masonry

.2 Section 05 40 00: Cold Formed Metal Framing

.3 Section 05 50 00: Miscellaneous Metals

.4 Section 06 10 00: Rough Carpentry

.5 Section 06 17 53: Shop-Fabricated Wood Trusses

.6 Section 07 21 16: Blanket Insulation and Vapour Barrier

.7 Section 07 27 23: Board Product Air Barriers

.8 Section 07 41 16: Standing Seam Metal Roofing System

.9 Section 07 71 36: Metal Soffits, Gutters and Rainwater Goods

1.3 REFERENCE STANDARDS

.1 American Society of Mechanical Engineers (ASME)

.1 ASME B18.6.3-2011, Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch Series).

.2 ASTM International

.1 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM D2369-10e1, Test Method for Volatile Content of Coatings.

.3 ASTM D2832-92(2011), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.

.4 ASTM D5116-10, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-41.24-95, Rigid Vinyl Siding, Soffits and Fascia.

.2 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.

.4 CSA International

.1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for plastic siding and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 33 00.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.

.2 Indicate dimensions, siding profiles, attachment methods, schedule of wall elevations, trim and closure pieces, and related work.

.4 Samples:

.1 Submit duplicate 305mm x 305mm (12” x 12”) samples to indicate finish and colour of vinyl siding, for review by the Consultant prior to ordering.

1.5 QUALITY ASSURANCE

.1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions and Section 01 61 00.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials indoors, in dry location, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect plastic siding from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

2 Products

2.1 MATERIALS

.1 Rigid vinyl: Extruded polyvinyl chloride to CAN/CGSB-41.24Ma, horizontal profile, and the following:

.1 Surface texture, colour and width: To match existing siding as approved by the Consultant.

.2 Accessories: internal corners, external corners, cap strip, drip cap, under sill trim, starter strip and window/door trim of extruded plastic, same material and colour as siding, with nailing strip pre-punched.

.3 Fasteners: nails to CSA B111, screws to ASME B18.6.3 galvanized steel.

.4 Galvanized steel sheet: commercial grade to ASTM A652M with Z275 zinc coating.

3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 MANUFACTURER'S INSTRUCTIONS

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

3.3 INSTALLATION

.1 Install flashings, starter strips, inside corners, edgings, drip and cap.

.2 Install siding sequentially from starter strip up, in accordance with manufacturer/fabricators written instructions.

.3 Install exterior corners, fillers and closure strips with carefully formed and profiled work.

.4 Maintain joints in exterior panels, true to line, tight fitting, hairline joints.

.5 Seal junctions with dissimilar materials with sealant. Do work in accordance with Section 07 92 00.

.6 Attach components in manner not restricting thermal movement. Conceal fasteners where possible.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 78 00.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 78 00.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by plastic siding installation.

END OF SECTION

1 General

1.1 SUMMARY

.1 This section shall include the supply and installation of all prefinished metal soffits, fascias, gutters and rainwater goods as indicated on the drawings and specified herein.

1.2 RELATED REQUIREMENTS

.1 Section 04 20 00: Masonry

.2 Section 05 50 00: Miscellaneous Metals

.3 Section 06 10 00: Rough Carpentry

.4 Section 06 17 53: Shop-Fabricated Wood Trusses

.5 Section 07 92 00: Sealants

.6 Section 08 51 13: Aluminum Windows

1.3 QUALITY ASSURANCE

.1 Qualifications:

.1 Manufacturer and tradesmen executing the work of this section shall have had a minimum five (5) years continuous Canadian experience in successful manufacture and installation of work of type and quality shown and specified. Submit proof of experience upon Consultant's request.

.2 Erection of metal soffits, gutters and rainwater goods shall be by workers especially trained and experienced in this type of work. Have a senior, qualified representative at the job site to direct the work of this section at all times.

1.4 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Shop Drawings:

.1 Submit fully dimensional shop drawings to Consultant showing construction, assembly, elevations, sections and interfacing with work of other sections.

.2 No work of this section shall be fabricated until shop drawings and all other related submittals, documentation, certifications and samples as required by this section, have been reviewed by the Consultant.

.3 Details shall indicate metal thicknesses, areas to be sealed and sealant materials, gaskets, type of joints, flashings, trim, finishes, fasteners and all anchorage assemblies and components and erection details.

.3 Samples:

.1 Submit to the Consultant for approval, samples of materials and components to be used in the system, prior to fabrication of work together with name of manufacturer and technical literature. Submit 300mm x 300mm samples of prefinished metal.

1.5 DESIGN REQUIREMENTS

.1 Design gutters and rainwater goods to contain volume rainwater coming off sloped roof areas in compliance with the requirements of the local Building Code and the requirements of all authorities having jurisdiction.

.2 Design total systems, confirm adequacy of design, proper provision for and use of all proprietary materials and components from other suppliers forming part of the work of this section.

.3 Co-ordination:

.1 Co-ordinate the work of this section with related trades to ensure best quality installation.

1.6 WORKMANSHIP

.1 Joints and intersecting members shall be accurately fitted, in true planes, square, plumb, straight, true with tight joints and intersections. Provide adequate reinforcing, anchorage and fastenings.

.2 Execute the work of this section in accordance with the recognized highest standards of workmanship of the industry.

.3 Exposed steel surfaces shall be smooth and free from imperfections such as warping, buckling, scratches, dents and abrasion.

.4 Thickness of metal shall be adequate for various conditions.

.5 Isolate where necessary to prevent electrolysis due to dissimilar metal to metal contact or metal to masonry or concrete. Use bituminous paint or other approved divorcing membrane.

.6 Ensure proper use of proprietary materials in strict accordance with the material manufacturer's directions.

1.7 DELIVERY, STORAGE, HANDLING AND PROTECTION

.1 Co-ordinate deliveries to comply with construction schedule and arrange ahead for 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.

.3 Assembled units and/or their component parts shall be transported, handled and stored in a manner to preclude damage. Accessory materials required for erection at the site shall be delivered to the site in manufacturer's labelled containers. Remove all units or components which are cracked, bent, chipped, scratched or otherwise unsuitable for installation and replace with new.

.4 Provide safe and adequate equipment on the Site to execute the work of this section, hoisting, scaffolding, staging, safety protection equipment, tools, plant and other equipment required for the completion of the work of this section.

.5 Delivered damaged materials or materials which do not comply with this section shall be rejected by Consultant, removed from the Site and replaced with acceptable materials at Contractor's expense.

.6 Adequately protect the structure and work of all other trades during delivery, storage, handling and erection of the work of this section.

.7 Components being hoisted to the working level shall be adequately banded and carefully slung employing steel wire rope.

.8 Bundles shall be tag lined during the ascent of the hoisting operation. Precaution shall be taken to avoid damage to metal components and to prevent marring of exposed surfaces.

.9 Metal components, after being positioned, shall be adequately secured in place as quickly as possible and prior to leaving the job site at the end of the working day.

.10 Loose bundles of metal components shall be adequately secured at the completion of each working day.

.11 Scaffolds, platforms, ladders, and the like, required by the erector for installation of metal components shall be properly secured to prevent accidental movement or collapse.

2 Products

2.1 MATERIALS

.1 Steel:

.1 Sheet steel conforming to ASTM A653/A653M-11, structural quality, Grade 'A' with a minimized spangle zinc coating of Z275 conforming to ASTM A653/A653M-11, shall be used for preformed metal soffits, trims, fascias, gutters, rainwater goods and flashings.

.2 Preformed metal soffits shall be minimum 22 gauge required base steel nominal thickness or thicker, to meet design requirements.

.3 Metal fascias and flashings shall be minimum 24 gauge required base steel nominal thickness or thicker, to meet design requirements.

.4 Metal gutters and rainwater goods shall be minimum gauge required base steel nominal thickness or thicker, to meet design requirements.

.2 Preformed Metal Soffit:

.1 Acceptable Manufacturers:

.1 AD 300 by VicWest

.2 P-12 by Peerless Enterprises

.3 S-12 by Canadian Metal Rolling Mills

.3 Flat Stock Material:

.1 Minimum thickness to suit design requirements, coil coated sheet steel.

.4 Roofing Cement:

.1 Cut back asphalt plastic cement conforming to CAN/CGSB-37.5.

.5 Lap Cement:

.1 Fibrated cut back asphalt plastic cement conforming to CAN/CGSB-37.4.

.6 Bituminous Paint:

.1 Conforming to CAN/CGSB-1.108, Type 2.

.7 Nails and Spikes:

.1 Galvanized steel nails and spikes of sufficient length and conforming to CSA B111, Table 12.

.8 Sealant:

.1 Multi-component, chemical curing epoxidized polyurethane conforming to CAN/CGSB-19.24, 'Dymeric 240' by Tremco (Canada) Ltd. Colour as selected later by Consultant.

.2 Primers: As recommended by sealant manufacturer to suit applicable conditions.

.9 Recessed Reglets:

.1 Preformed 0.70mm prefinished galvanized steel channel with face and ends covered with plastic tape.

.10 Eavestrough Brackets:

.1 3mm x 38mm prefinished galvanized steel straps.

.11 Eavestrough Spacers:

.1 2mm x 38mm prefinished galvanized steel straps.

.12 Eavestrough Anchors:

.1 10mm diameter x 150mm long galvanized lag screws and ferrules.

.13 Field Touch-Up Paint:

.1 Zinc rich anti-corrosion primer, conforming to CAN/CGSB-1.181, 'Galvafroid, Grade SB' by W.R. Meadows of Canada Limited and top coating of type and colour to match finish sheet.

2.2 FABRICATION

.1 Form metal rake and eave edge flashings from 0.55mm thick prefinished galvanized steel.

.2 Form curb metal flashings from 0.55mm thick prefinished galvanized steel.

.3 Form eavestroughs and downspouts from prepainted galvanized sheet steel. Form eavestroughs of 100mm widths using continuous rolling process. Downspouts shall be corrugated type for ogee profile eavestroughs and rectangular box type for rectangular profile eavestroughs. Eavestroughs of different profiles and girths shall require different metal thicknesses as follows:

Ogee Profile	Girth Thickness	Nominal Size
100mm	255mm	.48mm
150mm	380mm	.55mm

Rectangular Profile	Girth Thickness	Nominal Size
100mm	510mm	.55mm
150mm	530mm to 635mm	.70mm

.4 Fabricate all flashings components to maximum length of 2400mm.

.5 Form rake edge flashing with 100mm wide deck flange and minimum 100mm deep fascia flange with 15mm x 45E doubled drip edge.

.6 Form eave edge flashing with 100mm wide deck flange and minimum 100mm deep fascia flange.

.7 Overbrake rake and eave flashings slightly so that when installed, fascia flashings are sprung tightly to fascia boards or wall fascia panels.

.8 Form flashing and counterflashing for penetrations from 0.70mm thick prefinished galvanized sheet steel.

.9 Form valley flashing from 0.70mm thick prefinished galvanized sheet steel. Sheet shall be wide enough to extend 250mm from either side of the valley.

2.3 FINISH

.1 Preformed metal soffits, fascias, gutters, rainwater goods and metal flashings shall be prefinished coil coated material in accordance with Technical Bulletin No. 7 "Prefinished and Post Painted Galvanized Sheet Steel for Exterior Building Products" of the Canadian Sheet Steel Building Institute. (CSSBI), in CSSBI 5,000 Series finish.

.2 Colour: As selected by Consultant from manufacturer's full available colour range including extended colour range.

3 Execution

3.1 EXAMINATION AND PREPARATION

.1 Inspect areas of the Work over which the work of this section is dependent for any irregularities detrimental to the application and performance of the work of this section.

.2 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 of this section.

.3 Coordinate work of this section with work of other sections.

.4 Commencement of work of this section implies acceptance of surfaces and conditions.

3.2 INSTALLATION

.1 Join all prefinished steel components with sealant and cadmium plated screws.

.2 Lap flashing joints 50mm and seal both sections along lap with sealant. Nail joints securely.

.3 Backpaint sheet metal with bituminous paint on surfaces in contact with concrete, masonry, other cementitious materials or dissimilar metal.

.4 Where reglet detail is indicated or required, insert metal flashing into reglet to form tight fit. Seal flashing into reglet with sealant.

.5 Set edge flashing on deck along rake and eave edges.

.6 Nail deck flange to deck with two rows of annular ringed nails. Set one row 25mm from fascia board with nails at 200mm O.C. Set second row 25mm from cut edge of metal with nails at 400mm O.C., staggered with first row.

.7 Secure 100mm wide eavestroughs to building with galvanized lag screws through spacer sleeves at 750mm O.C.

.8 Secure eavestroughs over 100mm wide with brackets at 750mm O.C. Install spacer bars at 750mm O.C. Stagger position of brackets and spacer bars.

.9 Slope eavestroughs to downspouts.

.10 Install eavestroughs in maximum 1500mm lengths. Close ends of each length. Allow 15mm between sections. Install to each section at least one downspout.

.11 Install "ells" and "tees" as required, and secure downspouts to wall with prepainted galvanized sheet steel straps at 1500mm O.C., minimum 2 straps per downspout.

.12 Install valley flashing over valley ice dam protection, nailing as far from valley centre as possible and having 150mm headlap.

.13 Install prefinished metal soffit panels complete with all edge trims level to within 3mm in 2400mm.

.14 Install continuous, prefinished perimeter soffit vents to provide ventilation of concealed spaces in accordance with OBC requirements.

3.3 CLEAN UP AND REPAIRS

.1 Clean and make good to the Consultant's approval, surfaces soiled or otherwise damaged in connection with the work of this section. Pay the cost of replacing finishes or materials that cannot be satisfactorily cleaned, without additional cost the Owner.

END OF SECTION

1 General

1.1 SUMMARY

.1 Supply and install materials in accordance with published 'Through-Penetration Firestop Systems' in UL's Fire Resistance Directory or the publication of another approved independent laboratory.

1.2 RELATED REQUIREMENTS

.1 Section 04 20 00: Masonry

.2 Section 07 92 00: Sealants

.3 Section 09 21 16: Gypsum Wallboard

.4 Contractor shall be responsible for coordinating this section with all related sections.

1.3 REFERENCE STANDARDS

.1 Underwriters Laboratories of Canada (ULC):

.1 CAN/ULC S115-05, Standard Method of Fire Tests and Firestop Systems

.2 American Society for Testing and Materials (ASTM):

.1 ASTM E814-11a, Standard Test Method for Fire Tests of Penetration Firestop Systems

1.4 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Shop Drawings:

.1 Provide details indicating all reinforcing, anchorages, fastening and proposed method of installation for the various conditions within the project.

.3 Samples:

.1 Submit samples of each type of firestop and smokeseal material and accessory.

1.5 QUALITY ASSURANCE

.1 Applicator shall be licensed by the manufacturer of fireproofing materials.

.2 Conform to flame and temperature ratings established by ULC CAN4-S115-05 and ASTM E814-11a.

.3 Submit manufacturer's certification that materials meet or exceed specified requirements.

.4 Maintain flame and temperature ratings equal to surrounding materials.

1.6 DELIVERY, STORAGE, HANDLING AND PROTECTION

.1 Deliver materials in original, unopened packages bearing name of manufacturer and product identification.

.2 Store materials off ground, under cover, and away from damp surfaces.

1.7 SITE CONDITIONS

.1 Do not apply materials when temperature of substrate material is below 4 deg C and surrounding air temperature is below 4 deg C, for 24 hours prior to application.

2 Products

2.1 MATERIALS

.1 Bears UL, ULC or Warnock Hersey label and confirmation of compliance with ASTM E814-11a or CAN4-S115.

.2 Provide fire stopping and smoke sealing systems in accordance with CAN4-S115-M and shall also conform to special requirements in part 3.5 of the Building Code.

.3 Fire-resistant rating of fire stopping material assemblies must meet or exceed the fire-resistance rating of the wall section being penetrated.

.4 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control shall be elastomeric seal type. Do not use a cementitious, or rigid seal at such locations.

.5 Primers shall be to manufacturer's recommendation for specific material, substrate, and end use.

.6 Damming and backup materials, supports and anchoring devices shall be to manufacturer's recommendations, and in strict accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

.7 Sealants for vertical joints, shall be non-sagging type.

3 Execution

3.1 PROTECTION

.1 Mask adjacent work of other Sections as necessary to avoid spillage onto adjoining surfaces. Remove stains on adjacent surfaces as required.

3.2 PREPARATION

.1 Examine sizes and conditions to establish correct thickness and installation of backup materials. Ensure surfaces are dry and frost free.

.2 Clean bonding surfaces of deleterious substances including dust, paint, rust, oil, grease and other foreign matter which may otherwise impair effective bonding.

.3 Do not apply firestops and smokeseals to surfaces previously painted or treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Prepare surfaces in accordance with manufacturer's instructions.

.5 Priming and Sealing: Prime surfaces in accordance with manufacturer's instructions.

3.3 APPLICATION

.1 Mix materials in accordance with manufacturers' written instructions.

.2 Apply in strict accordance with ULC certification and manufacturer's recommendations to provide a temperature and flame rated seal equal as a minimum to the rating of the wall surrounding.

.3 Seal all holes or voids made by penetrations to ensure an air and water resistant seal.

.4 Seal all joints to ensure an air and water resistant seal, capable to withstand compression due to thermal, wind or seismic joint movement.

.5 Consult with Mechanical Engineer and project manager prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.

.6 Apply to mechanical and electrical service through-penetrations, to formed, sleeved, or cored openings in smoke and fire rated masonry, or gypsum wallboard stud walls and structural ceilings.

.1 Coordinate with plumbing, HVAC and electrical contractors to ensure proper firestopping application, providing smokeseal around penetrations through fire rated assemblies. Ensure that end joints between lengths of firestopping material have been properly sealed.

.7 Apply to head of smoke and fire rated gypsum wallboard stud wall abutting underside of structure (concrete or steel deck).

.8 Apply to control joints in rated stud walls.

.9 Apply to penetrations for passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire rated vertical barriers (walls and partitions), horizontal beams (ceiling assemblies) and vertical service shaft walls and partitions.

.10 Apply to openings between structurally separate sections of walls.

.11 Apply to gaps between tops of walls and ceiling or roof assemblies.

.12 Apply to openings and penetrations in fire rated partitions or walls containing fire doors.

.13 Apply to openings around structural members which penetrate fire rated walls.

.14 Apply firestop and smokeseal materials in accordance with manufacturer's directions, with sufficient pressure to properly fill and seal openings.

.15 Tool or trowel exposed surfaces.

.16 Remove excess compounds promptly as work of this Section progresses and upon completion of work of this Section.

3.4 CURING

.1 Cure materials in accordance with manufacturer's instructions.

.2 Do not cover up materials until proper curing has taken place.

3.5 IDENTIFICATION

.1 Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, prepreinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:

.1 The words: "Warning: Through-Penetration Firestop System - Do Not Disturb"

.2 Contractor's name, address and telephone number.

.3 Designation of applicable testing and inspection agency.

.4 Date of installation.

.5 Manufacturer's name for firestop materials.

3.6 CLEAN UP AND REPAIRS

.1 Clean adjacent surfaces immediately and leave work neat and clean.

.2 Remove excess materials using recommended procedures, as work progresses.

.3 Remove dams after initial set of firestops and smokeseals as required.

.4 Correct staining and discolouring of adjacent surfaces as directed by Consultant.

.5 Remove all debris and excess materials entirely from the site and leave the work in a neat and tidy condition.

.6 Perform one simulated smoke test for each penetration type once per day. Simulate smoke at a rate of four seconds/100 cubic feet (2.8 cubic metres) and maintain the fog density until inspection is complete.

.7 After inspection is complete, repair all defective firestopping and smokeseals and test again. Continue this procedure until all firestopping and smokeseals passes test.

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 03 30 00: Cast-in-Place Concrete

.2 Section 05 40 00: Cold Formed Metal Framing

.3 Section 05 50 00: Miscellaneous Metals

.4 Section 06 10 00: Rough Carpentry

.5 Section 06 17 53: Shop-Fabricated Wood Trusses

.6 Section 07 11 13: Bituminous Dampproofing

.7 Section 07 21 13: Board Insulation

.8 Section 07 21 16: Blanket Insulation and Vapour Barrier

.9 Section 07 27 23: Board Product Air Barriers

.10 Section 07 41 16: Standing Seam Metal Roofing System

.11 Section 07 71 36: Metal Soffits, Gutters and Rainwater Goods

.12 Section 08 51 13: Aluminum Windows

.13 Section 09 21 16: Gypsum Wallboard

.14 Section 09 90 00: Painting

1.3 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM):

.1 ASTM C509-06(2011), Standard Specifications for Elastomeric Cellular Performed Gasket and Sealing Material

.2 ASTM C920-11, Standard Specification for Elastomeric Joint Sealants

.3 ASTM C-1382-11, Standard Test Method for Determining Tensile Adhesion Properties of Sealants when Used in Exterior Insulation and Finish Systems (EIFS) Joints

.4 ASTM D2240-05(2010), Standard Test Method for Rubber Property - Durometer Hardness

.2 Canadian General Standards Board (CGSB):

.1 CAN/CGSB-19.13-M87, Sealing Compound, One-Component, Elastomeric, Chemical Curing

1.4 SUBMITTALS

.1 Provide 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 Mock-Up:

.1 If requested by the Consultant, construct mock-ups where directed to show location, size, shape, colour and depth of joints complete with back-up material, primer and sealant. Mock-up may be part of finished work.

.2 Allow 24-hours for inspection of work before proceeding with work.

.4 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 Adhere to Manufacturer's recommendations for mixing or preparation of materials listed in this Section.

.2 Pot life or installation times shall not be exceeded.

.3 Integral materials which compose a joint detail shall be compatible.

.4 Component parts, where possible, shall have the same manufacturer.

.5 A representative of sealant material manufacturer shall visit the site during application to ensure that all Work is carried out according to the manufacturer's printed instructions.

1.6 SITE CONDITIONS

.1 Apply sealants only to completely dry surfaces, and at air, substrate and material temperatures above minimum established by manufacturer's written specifications.

1.7 DELIVERY, STORAGE HANDLING AND PROTECTION

.1 Deliver all materials to the jobsite in their original, unopened containers, with all labels intact.

.2 Receive and store materials as recommended by materials manufacturer.

.3 Maintain containers and labels in undamaged condition.

1.8 WARRANTY

.1 Provide a written warranty endorsed and issued in the name of the Owner stating that all sealant work of this Section is warranted against leakage, cracking, crumbling, melting, running, deterioration, shrinkage, loss of cohesion, loss of adhesion, staining of adjoining or adjacent work or surfaces, or failure to provide intended seal for a period of five (5) years from the Date of Substantial Performance of the Work, and that any defects will be made good including, related materials and installation at no additional cost to the Owner.

2 Products

2.1 MATERIALS

.1 Joint Cleaner:

.1 Non-corrosive solvents as recommended by sealant manufacturer for applicable substrate material(s).

.2 Primer:

.1 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:

.1 Round, open cell, reticulated foam, 50% compression, compatible with sealant and primer, non-adhering to sealant.

.4 Bond Breaker:

.1 Pressure sensitive plastic tape, not bondable to sealant as recommended by sealant manufacturer.

.5 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.

.4 Pourthane NS by W.R MEADOWS

.6 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

.7 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

.8 Sealant Type "G" – Exterior Wall Joints:

.1 Air-seal sealant: One part, silicone, shore A hardness 15-25, conforming to CGSB 19-GP-13M, classification C-1-40-B-N and C-1-25-B-N and ASTM C920-11, Type S, Grade NS, Class 25. Use NT, M, G, A and O:

.1 DC 791 by Dow Corning

.2 UltraPruf II SCS 2902 by GE

.3 Spectrum 3 by Tremco

.4 SikaSil N-Plus by Sika

.9 Sealant Type "I" – HVAC Sealant:

.1 One-part, RTV, acetoxy-cure silicone sealant for heating, ventilation, air conditioning and refrigeration applications:

.1 Dow Corning HVAC Silicone Sealant

.10 Sealant Type "J" – Electrical Sealant:

.1 One-part, white, non-flowing moisture cure adhesive for electrical applications:

.1 Dow Corning 738 Electrical Sealant

.11 Preformed Compression Seal:

.1 Compartmental open cell neoprene extrusion type conforming to ASTM C509-06(2011), complete with liquid lubricant adhesive recommended by manufacturer.

3 Execution

3.1 INSPECTION

.1 Verify at site that joints and surfaces conditions provided will not adversely affect execution, performance or quality of completed work.

.2 Ensure masonry and concrete have cured 28 days minimum.

.3 Ascertain that sealers and coatings applied to substrates are compatible with sealant used and that full bond of the sealant and substrate is attained. Request samples of the sealed or coated substrate from their fabricators for testing of compatibility and adhesion, if necessary.

.4 Verify that specified recommended environmental conditions are present before commending work.

.5 Defective work resulting from application to unsatisfactory joint conditions will be considered the responsibility of those performing the work of this section.

.6 Do not start work of this Section until conditions are satisfactory.

3.2 PREPARATION

.1 Clean joint surfaces using joint cleaner as necessary, to remove dust, paint, loose mortar, and other foreign matter and dry joint surfaces.

.2 Remove dust, silt, scale and coatings from ferrous metals by wire brush, grinding or sandblasting.

.3 Remove oil, grease and other coatings from non-ferrous metals with approved cleaning solvent.

.4 Ensure surfaces are free of frost, rust, lacquers, laitance, release agents, moisture or other matter which might adversely affect adhesion of sealant.

.5 Examine joint sizes and correct as required to allow for anticipated movement and to achieve proper width/depth ratio per manufacturer's written recommendations for specified sealant.

.6 Support joint filler on horizontal traffic surfaces against vertical movement which might result from traffic loads or foot traffic.

.7 Prepare surfaces as recommended by sealant manufacturer.

.8 Fully remove existing sealant scheduled to be removed and replaced with new sealant, in areas indicated on the Drawings.

.1 Follow manufacturers procedures for removal of existing sealant and test areas for adhesion of new sealant. Provide the Consultant with field report identifying results of adhesion testing.

.9 Install joint backing material or apply bond breaker tape to achieve correct joint depth and prevent three-sided adhesion.

.10 To protect adjacent surfaces, mask adjacent surfaces with tape prior to priming and/or sealing.

.11 Prime sides of joints using two cloth method in accordance with manufacturer's directions immediately prior to sealing.

.12 Before any sealing is commended, a test of the material shall be made for indications of staining, poor adhesion or other undesirable effects.

.13 Seal joints in surfaces to be painted before painting. Where surfaces to be sealed are prime painted in shop before sealing, check to make sure prime paint is compatible with primer and sealant. If incompatible inform Consultant, consult the manufacturer, and change primer and sealant to approved compatible types.

.14 Check form release agent used on concrete for compatibility with primer and sealant. If incompatible inform Consultant and change primer and sealant to approved compatible types or clean concrete to Consultant's approval.

3.3 APPLICATION

.1 Apply sealant in accordance with manufacturer's directions, using a gun with proper nozzle size, ensuring to fill voids and joints completely, to leave a weathertight, airtight installation. Superficial pointing with skin bead is not acceptable.

.2 Neatly tool surface to a slight concave profile. Surface of sealant shall be smooth, free from ridges, wrinkles, sags, air pockets and embedded impurities.

.3 Clean adjacent surfaces immediately and leave Work neat and clean. Remove excess sealant and droppings, using recommended cleaners as Work progresses. Remove masking tape after tooling of joints.

3.4 CLEANING AND PROTECTION

.1 Remove all waste materials from site. Sealant shall be cleaned of all foreign material as recommended by the sealant manufacturer. Leave work in a condition satisfactory to the Consultant.

END OF SECTION

1 General

1.1 SUMMARY

.1 This Section includes requirements for supply and installation of the following:

.1 Exterior and Interior Steel Doors

.2 Exterior and Interior Steel Door Frames

1.2 RELATED REQUIREMENTS

.1 Section 04 20 00: Masonry

.2 Section 07 92 00: Sealants

.3 Section 08 70 00: Hardware

.4 Section 09 90 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 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI):

.1 ANSI/SDI A250.7-1997 (R2002), Nomenclature for Standard Steel Doors and Steel Frames

.2 ANSI/SDI A250.11-2001, Recommended Erection Instructions for Steel Frames.

.2 American Society for Testing and Materials (ASTM):

.1 ASTM A653/A653M-11, 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-10a, 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 W59-03 (R2008), 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 door and frame indicated, include door designation, type, level and model, material description, core description, construction details, label compliance, and finishes.

.2 Shop Drawings:

.1 Show each type of frame, door, hardware blanking, reinforcing, tapping and drilling arrangements, metal gauges, thicknesses and finishes.

.2 Show details of doors including vertical and horizontal edge details.

.3 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 Supplier: Obtain hollow metal doors and frames from single source of supply and from a single manufacturer.

.3 Installer: Use installers who are experienced with the installation of hollow metal doors and 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 Exterior Doors and Frames: Galvanized, AS120, steel sheets in accordance with ASTM A924/M924-14; coated to meet requirements of ASTM A653/A653M, Commercial Steel (CS), Type B; stretcher levelled standard of flatness where used for face sheets.

.2 Interior Doors and 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 and Screen Frames:

.1 Gauge: 16 msg

.2 Doors (Honeycomb or Polystyrene Core):

.1 Door Faces:

.1 Gauge: 18 msg.

.3 Top and Bottom End Channels:

.1 Gauge: 18 msg.

.4 Reinforcements:

.1 Lock and Strike Reinforcements:

.1 Gauge: 16 msg.

.2 Hinge Reinforcements:

.1 Gauge: 10 msg.

.3 Flush Bolt Reinforcements:

.1 Gauge: 16 msg.

.4 Door Closer or Holder Reinforcements:

.1 Gauge: 12 msg.

.3 Anchors:

.1 As required to suit condition.

.4 Rubber Bumpers:

.1 3 per door.

.5 Weatherstrip:

.1 Extruded aluminum with vinyl insert #W13 for head and jambs and #W5 for pairs of doors without mullions, manufactured by Crowdertrack Limited.

.6 Door Cores:

.1 Interior doors, except fire rated doors: Structural small cell; 1” maximum, kraft paper honeycomb; minimum weight 36 kg/ream; minimum density 16.5 kg/m^3; sanded to required thickness.

.2 Exterior doors: Rigid extruded, closed cell insulation, fire retardant treated meeting the requirements of ULC S701-11, Type 4, minimum thermal resistance R-Value 4.5/1" thickness.

.7 Adhesives:

.1 Core Adhesive: Heat resistant, single component adhesive recommended by manufacturer.

.8 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.

.9 Accessories:

.1 Sealant: As specified in Section 07 92 00.

.2 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.

.8 Welding shall conform to CSA W59-03 (R2008).

.9 Hardware Requirements:

.1 Blank, mortise, reinforce, drill and tap doors and 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.

.7 Provide continuous weatherstripping at head and jambs of exterior door frames. Properly secure in place with screws and adjust as required.

.8 Insulate exterior frames to provide continuous thermal barrier in exterior frames.

.11 Doors:

.1 Fabricate doors to present one continuous face free from joints, tool markings and abrasions.

.2 Reinforce, stiffen honeycomb doors with small cell honeycomb core laminated to the inside faces of panels. The core shall completely fill the inside hollow of the door.

.3 Exterior doors shall be completely filled with polystyrene foam core.

.4 Reinforce door edges with channel reinforcing. Bevel stiles 1/8". Assemble by tack welding and fill.

.5 Provide flush top edge on exterior doors.

.12 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 Examine substrates, door swing arcs, areas of installation and conditions affecting installation for compliance with requirements for manufacturer’s installation tolerances and other conditions affecting performance of work of this Section.

.2 Verify roughing-in for embedded and built-in anchor locations before installing frames.

.3 Verify door and frame size, door swing and ratings with door opening number before installing frames.

.4 Installation of hollow metal doors and frames will denote acceptance of site conditions.

3.2 INSTALLATION

.1 Install steel doors, 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 Doors:

.1 Fit hollow metal doors accurately in frames within clearances required for proper operation; shim as necessary for proper operation.

.2 Install hardware in accordance with manufacturers' templates and instructions.

.3 Adjust operable parts for correct clearances and function.

.4 Install door silencers.

.5 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 GENERAL REQUIREMENTS

.1 General Conditions, Supplementary Conditions and Division 01 apply to this section.

1.2 RELATED REQUIREMENTS

.1 Section 04 20 00: Masonry

.2 Section 05 50 00: Miscellaneous Metals

.3 Section 06 10 00: Rough Carpentry

.4 Section 09 21 16: Gypsum Wallboard

.5 Section 09 90 00: Painting

1.3 QUALITY ASSURANCE

.1 Design sectional overhead insulated metal doors to operate at 1 kPa wind pressure, without any detrimental effects.

1.4 SUBMITTALS

.1 Submit submittals in accordance with the General Conditions and Section 01 33 00.

.2 Shop Drawings:

.1 Submit detailed shop drawing showing fabrication and installation requirements.

.3 Operating and Maintenance Data:

.1 Provide operating and maintenance data for incorporation into the Operating and Maintenance Manual.

1.5 STORAGE, DELIVER, HANDLING AND PROTECTION

.1 Co-ordinate deliveries to comply with construction schedule and arrange ahead for off the ground, under cover storage location. Do not load any area beyond the design limits.

2 Products

2.1 APPROVED PRODUCTS AND MANUFACTURERS

.1 This specification is based on 'Thermatite 175' sectional steel, polyurethane laminated, overhead doors by Richards Wilcox Door Systems (Toronto) Limited. The following manufacturer's shall also be accepted provided they conform in general with specified requirements:

.1 Steel-Craft Door Products Ltd.

.2 Upwardor Corporation.

2.2 STEEL SECTIONS

.1 Door sections shall be constructed from Galvalume sheet steel, a corrosion-resistant embossed steel, coated with approximately 55% aluminum 1.6% silicone, with the balance being zinc.

.2 Door sections shall be manufactured by a continuous foamed-in-place polyurethane lamination process resulting in a homogenous sandwich of even-textured polyurethane insulation of metal/foam/metal construction to form a section 1-13/16” thick. Sections shall be roll-formed to produce a thermal break. Sections shall have a thermal resistance of minimum RSI of 2.15.

.3 Joints between sections shall be designed with pivotable round horizontal links to eliminate accumulated water from flowing down the inside of the door when opened.

.4 Sections shall be equipped with 1/16" thick steel end caps for bracket and end hinge attachment.

2.3 WEATHER SEALS

.1 Thermal plastic rubber tube seal shall be fitted inside every joint between the sections to control air infiltration and exfiltration.

.2 Provide EPDM rubber head flexible seal fitted to an aluminum extruded strip to ensure proper seal against header door frame regardless of outside/inside temperature variances.

.3 Nylon jamb seal shall be provided on the vertical angle supporting the tracks to prevent contact between conductive metal surfaces, provide seal against wind, rain and heat loss and reduce friction.

.4 Provide EPDM rubber severe weather blade-type jamb seal. This seal shall attach to the nylon jamb seal retainer to form a weathertight seal against the outside skin of the door.

.5 Provide EPDM double-bottom sealing weatherstrip for manually operated doors. Door bottom weatherstripping shall conform to minor irregularities in the floor.

2.4 TRACKS

.1 Tracks shall be 3" heavy-duty gauge galvanized steel vertical lift track as indicated on drawings, designed for clearances shown. Provide complete track assembly including brackets, bracing and reinforcing for rigid support of the track for the required door type and size. Slope tracks at proper angle from vertical to ensure tight closure at jambs when the door is closed. Weld or bolt to track supports.

.2 Provide steel roll-formed track channel. Track channel shall be faced with polyvinyl chloride (PVC). Track channel shall allow temperature change movements of the door to take place when subjected to extreme temperature variance between inside and outside.

2.5 REINFORCEMENTS AND SUPPORTS

.1 Provide galvanized steel track reinforcement and support members. Secure, reinforce and support tracks as required for size and weight of door to provide strength and rigidity and to ensure against sag, sway and detrimental vibration during opening and closing of doors.

.2 Support and attach tracks at opening jambs with continuous angle welded to tracks and attached to wall. Support horizontal tracks with continuous angle in accordance with manufacturer's specification for size and weight of door.

2.6 COUNTERBALANCING SYSTEM

.1 Doors shall be equipped with helical wound torsion springs having a minimum spring life of 50,000 cycles.

.2 Spring material shall be made of high tensile wire.

.3 Doors shall be supplied with solid steel shaft keyed the entire shaft length, in accordance with manufacturer's written instructions.

2.7 HARDWARE

.1 Provide heavy-duty fully adjustable roller brackets to each end reinforcement plate as per manufacturer's recommendations. The adjustable roller brackets are to provide an easy adjustment of the door to the jamb to achieve the proper seal. Use self-tapping fasteners to secure brackets to the door sections.

.2 Provide heavy-duty, rust-resistant hardware, with galvanized fasteners, to suit type of door.

.3 All bottom corner brackets shall be equipped with adjustable roller brackets. All brackets shall feature the locking wedge on the cable fastener for complete adjustments.

.4 Provide heavy-duty rollers, with 10 steel ball bearings in case-hardened steel races. Extend roller shaft through both brackets where double brackets are required. Provide roller tires to suit size of track.

2.8 CABLE DRUM

.1 Provide cast aluminum cable drums grooved to receive the proper diameter cable for the weight of the door with two extra safety wraps and dual locking screws.

2.9 MANUAL OPERATION

.1 Mechanical type, manually operated chain hoist which has a continuous, hot-dip galvanized heavy-duty, comfortable grip operating chain which operates through a sprocket and roller chain drive with chain guard and pull required to operate the hand chain shall not exceed (156N) 35 lbs. Handing of chain hoist operator shall be as selected later by Consultant.

2.10 LOCKING (MANUAL OPERATION)

.1 Shall be across the door bar latch (inside only) with "night" lock having provision for padlocks and interior handle. Padlocks shall be provided by the Owner.

2.11 MISCELLANEOUS

.1 Provide all wood blocking, shims, bolts, washers, anchors, expansion shields, wiring, connectors and all other miscellaneous items necessary to complete the work of this section.

.2 Provide lift handles.

2.12 FINISHES

.1 All exposed steel surfaces shall be suitably cleaned and pre-treated. Apply one coat of manufacturer's standard shop primer. Ready for finish painting by Section 09 90 00.

3 Execution

3.1 EXAMINATION

.1 Examine all areas of Work that affect the work of this section. Report in writing all errors, defects and discrepancies immediately to the Consultant.

.2 Commencement of work of this section implies acceptance of surfaces and conditions.

3.2 INSTALLATION

.1 Install doors, tracks and operating equipment complete with necessary hardware, jamb and head mould stops, anchors, brackets and accessories. Install manually operated sectional overhead insulated metal doors where indicated on drawings.

.2 Mount counterbalance mechanism with manufacturer's fully adjustable ball bearing brackets at each end of shaft. Furnish torsion shaft centre support bearings as required for size and weight of doors.

.3 Fasten vertical track assembly to framing at maximum 24" O.C.

.4 Install weather seals at heads, jambs and door bottoms as recommended by door manufacturer to form a continuous weathertight seal at door perimeter.

.5 Doors shall fit snugly to all edges of jambs and heads of frames and shall operate smoothly and freely under all conditions of operation. Door shall sit in any position in door opening and shall not drift upward or downward.

3.3 ADJUSTMENT AND DEMONSTRATION

.1 Upon completion of work of this section, and when directed by the Consultant, adjust and lubricate sectional overhead doors, check and adjust controls, ensure that all equipment and mechanisms are operating smoothly, and demonstrate the operation, control and safety features of each door to the Consultant and the Owner.

3.4 CLEANING AND CLEAN-UP

.1 Clean and make good to the Consultant's approval, surfaces soiled or otherwise damaged in connection with the work of this section. Contractor shall pay the cost of replacing finishes or materials that cannot be satisfactorily cleaned.

.2 On completion of the work of this section, remove all debris, equipment and excess material from the site that results from the work of this section.

END OF SECTION

1 General

1.1 SUMMARY

.1 This Section includes requirements for supply and installation of aluminum windows having fixed sealed glass units, and operable awning units, with internal weep drainage.

.2 Drawings contain details that suggest directions for solving some of the major design requirements; these details can be developed further by the Contractor provided that the final installation adheres to aesthetic criteria established by the drawings and specified dimensions with all elements in planes as drawn, maintaining their relationships with all other building elements.

1.2 RELATED REQUIREMENTS

.1 Section 04 20 00: Masonry

.2 Section 05 40 00: Cold Formed Metal Framing

.3 Section 05 50 00: Miscellaneous Metals

.4 Section 06 10 00: Rough Carpentry

.5 Section 07 21 16: Blanket Insulation and Vapour Barrier

.6 Section 07 27 23: Board Product Air Barriers

.7 Section 08 80 00: Glazing

1.3 REFERENCE STANDARDS

.1 Canadian Standards Association (CSA):

.1 CAN/CSA A440-00/A440.1-00, Windows/User Selection Guide to CSA Standard CAN/CSA A440-00, Windows

.2 CAN/CSA G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels

.3 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel Structures

.4 CSA W47.2-11, Certification of Companies for Fusion Welding of Aluminum.

.5 CSA W59-03(2008), Welded Steel Construction (Metal Arc Welding), Metric.

.2 Canadian General Standards Board (CGSB):

.1 CAN/CGSB-1.108-M89, Bituminous Solvent Type Paint

.2 CAN/CGSB-51.20-M87, Expanded Polystyrene Thermal Insulation

.3 American Society of Testing and Materials (ASTM):

.1 ASTM A167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip

.4 Aluminum Association (AA)

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: Submit product data including construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of product indicated.

.2 Shop Drawings: Submit shop drawings clearly detailing profiles, construction, assembly, finishes, installation for all conditions, also flashing, caulking, sealing, provision for thermal movement and glazing, attachment to building structure and method of adjustment.

1.5 PROJECT CLOSEOUT SUBMISSIONS

.1 Provide operations and maintenance information in accordance with Section 01 33 00.

.2 Submit data for cleaning of aluminum finishes and maintenance, and of structural silicone glazing system and operational hardware.

1.6 QUALITY ASSURANCE

.1 Qualifications: Provide proof of qualifications when requested by the Consultant:

.1 Installer: Use personnel experienced with the materials specified, with work of similar complexity to that indicated for the project, and who are acceptable to manufacturer.

1.7 SITE CONDITIONS

.1 Site Measurements: Verify actual locations of structural supports for aluminum windows by site measurements before fabrication and indicate measurements on Shop Drawings.

.2 Established Dimensions: Establish dimensions and proceed with fabricating aluminum windows where site measurements cannot be made without delaying the Work; coordinate construction to ensure that actual dimensions correspond to established dimensions.

.3 Ambient Conditions: Confirm installation requirements for ambient and surface temperatures of sealants with manufacturer and apply sealants when temperatures are greater than manufacturer's stated minimum from time of application until sealants have cured.

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 Glazing: Failure of performance requirements specified in Contract Documents; 5 years

.2 Sealed Glass Units: Misting, dusting and seal failure; 5 years

.3 Sealants: Failure to maintain seal; 5 years

.4 Aluminum Brake Shapes: Oil canning and de-laminations; 5 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 in a minimum of five (5) days in advance of Bid Closing.

.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 Alumicor Limited

.2 Oldcastle Building Envelope

.3 Kawneer Canada Ltd

2.2 DESIGN CRITERIA

.1 Aluminum framed, integral fixed, outward projecting awning windows with double glazed insulating glass units and concealed tamperproof fasteners.

.2 Performance Requirements: Provide assemblies able to withstand positive and negative pressures normal to the plane of window in accordance with Building Code climatic requirements based on 1 in 30 year criteria in accordance with CAN/CSA A440/A441.

.3 Provide aluminum framed window systems, including anchorage, capable of withstanding, without failure, the effects of the following:

.1 Thermal movements

.2 Movements of supporting structure including, but not limited to, deflection from uniformly distributed and concentrated live loads

.3 Dimensional tolerances of building frame and other adjacent construction

.4 Failure of performance requirements will be considered to include, but not be limited to, the following:

.1 Deflection exceeding specified limits

.2 Thermal stresses transferred to building structure

.3 Framing members transferring stresses, including those caused by thermal and structural movements, to glazing

.4 Glazing-to-glazing contact in structural silicone glazed systems

.5 Noise or vibration created by wind and thermal and structural movements

.6 Loosening or weakening of fasteners, attachments, and other components

.7 Sealant failure

.8 Failure of operating units to function properly

.5 Window Classification: To NAFS 11 (North American Fenestration Standards):

.1 PG AW 85 (Awning)

.2 PG AW 85 (Casement)

.3 PG AW 85 (Fixed)

.4 PG AW 85 (Combination fixed, awning)

.5 Forced Entry: F40.

2.3 MATERIALS

.1 Aluminum: Materials recommended by manufacturer for type of use and finish indicated, and as follows:

.1 Sheet and Plate: In accordance with ASTM B209/B209M, and ANSI H35.1 AA1100-H14, or AA5005-H32 or H34, anodizing quality.

.2 Extruded Bars, Rods, Profiles, and Tubes: In accordance with ASTM B221/B221M), and ANSI H35.1 AA6063-T5 or T6, anodizing quality.

.3 Extruded Structural Pipe and Tubes: In accordance with ASTM B429, and ANSI H35.1 AA6061-T6 or AA6063-T6, anodizing quality.

.4 Structural Profiles: In accordance with ASTM B308/B308M, anodizing quality.

.5 Welding Rods and Bare Electrodes: CSA W59.2.

.2 Steel Reinforcement: Coat steel with manufacturer's standard corrosion resistant primer applied immediately after surface preparation and pre-treatment, and as follows:

.1 Rolled Sheet or Strip: CSA G40.20/G40.21.

.2 Structural Shapes, Plates and Bars: CSA G40.20/G40.21.

.3 Brackets and Reinforcements: Manufacturer's standard high strength aluminum with non-staining, nonferrous shims for aligning system components.

.4 Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials.

.1 Use self locking devices where fasteners are subject to loosening or turn out from thermal and structural movements, wind loads, or vibration.

.2 Reinforce members as required to receive fastener threads.

.3 Use only concealed fasteners, unless use of exposed fasteners has been accepted in writing by the Consultant. When approved, use exposed fasteners with countersunk Phillips screw heads.

.4 Finish exposed portions to match framing system.

.5 Use slip joint linings, spacers, and sleeves at movement joints of material and type recommended by manufacturer.

.5 Anti-Rotation Channels: Extruded aluminum anti-rotation channel designed to mechanically retain air seal membrane to the face of the tubular back section.

.6 Anchors: Three way adjustable anchors that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.

.7 Concealed Flashing: Manufacturer's standard corrosion resistant, non-staining, non-bleeding flashing compatible with adjacent materials.

.8 Transition Membranes: Full length mechanically anchored, extruded silicone rubber transition membrane to perimeter of SSG frame profile to provide continuous air/vapour retarder to adjacent wall construction:

.1 Basis-of-Design Materials: Tremco Proglaze ETA Engineered Transition Assembly

.9 Glazing Gaskets: Manufacturer's standard sealed corner pressure glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers; as recommended by manufacturer for joint type.

2.4 WINDOW FRAMES

.1 Main Frame: Extruded aluminum: To ASTM B221, 6063 alloy with T5 temper, anodizing quality and 1.6 mm (0.062”) minimum thickness.

.1 Main frame depth: 150 mm (6”).

.2 Insulating glass units: In accordance with Section 08 80 00.

.3 Basis of Design Materials: Integra 6000 Series by Alumicor LTD.

2.5 HARDWARE

.1 Hardware: Stainless steel hinges and aluminum handles to permit easy operation of units.

.2 Locks: Provide operating sash with multi point locking handle

.3 Operators: Equip window units with underscreen stay bar assembly crank operated, scissor type roto-operator with locking claw handles.

.4 Hinges: 1 pair, stainless steel, 4 bar friction arm hinges complete with semi-concealed operating tension adjustment device.

.5 Supporting angles, plates, bars, rods, and other steel accessories: Mild steel CAN3-G40.20/G40.21, shop painted with zinc chromate primer, thickness as required to sustain imposed loads and in no case less than 5 mm thick.

.6 Sealant: Including primer, joint filler, as specified in Section 07 92 00.

.7 Dielectric separator: Bituminous paint CAN/CGSB-1.108.

.8 Thermal separator: Polyvinylchloride, 50 Shore A durometer hardness +5.

.9 Spacers for glazing, backpans/aluminum spandrels to be full length, purpose made, aluminum channels.

.10 Glazing Tape: Refer to Section 08 80 00.

.11 Fibrous insulation: Refer to Section 07 21 16.

.12 Metal air seal/vapour barrier (by window supplier) to be bonded to window frame and extend behind wood mounting frame as indicated on details. Seal all corners to maintain air sea/vapour retarder. Note that flexible flashing with continuous metal retaining strip will be supplied and installed by the interior finishing contractor.

2.6 FABRICATION

.1 Fit and assemble all Work in the shop insofar as practical.

.2 Carefully fit and match all Work for continuity of line and design, using rigidly secured joints with hairline contact, unless otherwise shown.

.3 Reinforce members and joints with steel plates, bars, rods or angles for rigidity and strength as needed to fulfill performance requirements. Use concealed stainless steel fasteners for jointing which cannot be welded.

.4 Separate unlike metals or alloys with a heavy coating of bituminous paint, separator gaskets or slip gaskets as required to prevent galvanic action.

.5 Provide weepholes in the glazing recess and an airseal at the interior glassline.

2.7 FINISHES

.1 Clear anodized: Exposed aluminum sections shall be given an anodic oxide treatment in accordance with Aluminum Association specification AA-M12C22A31.

.2 Unexposed aluminum: Mill finish.

3 Execution

3.1 INSPECTION

.1 Inspect Work and conditions affecting the Work of this Section. Proceed only after deficiencies, if any, have been corrected.

.2 Ensure that all flashings built-in or provided by others integrate with system to divert moisture to exterior.

.3 Ensure that all reglets, anchor blocks or inserts required to receive system are correctly located and installed.

.4 Ensure that all anchors and setting or installing components provided by this Section for installation are properly located and installed.

.5 Ensure that building air and vapour retarding membranes can be sealed to window units to maintain system integrity.

3.2 PREPARATION

.1 Obtain all dimensions from the job site.

.2 Provide data, dimensions and components, anchors and assemblies to be installed by others in proper time for installation.

3.3 ERECTION

.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 Use anchors that will permit sufficient adjustment for accurate alignment. Make allowance for deflection of building structure.

.4 Build in and provide any supplementary reinforcing and bracing required by assembly loads and deflections.

.5 Secure Work adequately to structure in a manner not restricting thermal and wind movement.

.6 Correctly locate and install flashings, deflectors and weep holes to ensure proper drainage of moisture to exterior.

.7 Maintain alignment with adjacent Work.

.8 Isolate aluminum surfaces from adjacent dissimilar materials and metals with coatings of bituminous paint.

.9 Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

3.4 GLAZING

.1 Ensure all stops, gaskets, splines, seals etc., are perfectly aligned and ready to receive glazing and insulated panels as specified herein.

.2 Install glazing to approved details and instruction, using material specified.

.3 When a full wall mullion is used at perimeter framing, glazing pocket may be stabilized for pressure plate with a block of rigid insulation.

.4 Glazing stops, snap covers shall be of a continuous length from corner to corner, and be fitted at corners.

.5 All preformed tapes or gaskets shall be of a continuous length corner to corner and shall be cut over length to prevent stretching. Joints, splices and corners shall be mitred and sealed.

.6 Clean all contact surfaces of glazing with solvent and wipe dry. Ensure all glazing channels are clean, true to line, and free of dirt or debris and that weep and drainage vents are open.

.7 Rest glazing on setting blocks at 1/4 points.

.8 Install shims at sides to align glass units.

.9 Apply a full heel bead of non-drying non-skinning sealant to the interior perimeter of each glass unit to provide positive air/vapour seal to warm light of glass.

3.5 SEALANT

.1 Caulk and seal full perimeter of windows to building air/vapour retarder to provide and maintain the designed air/vapour/thermal barrier integrity and weather tightness.

.2 Install sealants and back-up materials in strict accordance with manufacturer's written instruction.

3.6 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 glass, panels and frames using mild soap or other cleaning agent approved by manufacturer.

.3 Remove all excess glazing or joint sealing materials from exposed surfaces. Clean and polish glass.

END OF SECTION

1 General

1.1 SUMMARY

.1 Supply and install door hardware listed in the Door Hardware Schedule, prepared by an Architectural Hardware Consultant, establishes the quality standards, finishes, manufacturers and functions.

1.2 RELATED REQUIREMENTS

.1 Section 08 11 13: Steel Doors and Frames; Supply of steel doors and frames.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Submission of Substitutions: Materials other than the named products for the Project may be acceptable to the Consultant. Submit manufacturer's names and complete catalogue number of alternative hardware types proposed for supply and submit this list for review before preparing shop drawings.

.2 Consultant will review all proposed alternates prior to close of bids when submitted no later than five (5) days prior to bid closing date

.3 Substitutions for materials of this section will be considered after the close of bids.

.4 Pre-installation Conference: Arrange a preconstruction meeting in accordance with Section 01 31 19 to discuss the following:

.1 Keying Conference: Conduct keying conference at Project site and incorporate decisions into final keying schedule after reviewing door hardware keying system.

.2 Electrified Hardware Conference: Conduct pre-installation conference at Project site and review methods and procedures related to electrified door hardware.

.5 Coordination: Obtain and distribute templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Coordinate with shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware.

1.4 SUBMITTALS

.1 Provide submittals specified and as required to assess conformance with the Contract Documents, 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 indicating installation details, material descriptions, dimensions of individual components and profiles, and finishes.

.2 Shop Drawings: Submit shop drawings indicating details of electrified door hardware including, but not limited to, the following:

.1 Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer installed and site installed wiring.

.3 Samples:

.1 Submit samples of complete line of hardware and finishes, if and when requested, to accompany any proposal for substitution. Fully label each sample as to manufacture, type, size and location for use proposed.

.4 Hardware Schedule: Submit door hardware schedule prepared Architectural Hardware Consultant (AHC), detailing fabrication and assembly of door hardware.

.3 Do not order hardware from manufacturers until samples have been approved. Hardware and finishes supplied shall be identical with approved samples.

1.5 PROJECT CLOSEOUT SUBMISSION

.1 Operation and Maintenance Data: Provide operations and maintenance information in accordance with Section 01 33 00.

.2 Spare Parts and Tools: Submit unique parts and tools for maintaining hardware system in accordance with Section 01 33 00.

1.6 QUALITY ASSURANCE

.1 Hardware Supplier: Obtain hardware from one source having a minimum of three (3) years industry experience, with resources to provide all products indicated in the Hardware Schedule, consistent in quality, appearance and physical properties.

1.7 DELIVERY, HANDLING AND PROTECTION

.1 Pack hardware in suitable wrappings and containers to protect from injury during shipping and storage. Enclose accessories, fastening devices and other loose items with each item. Mark packages for easy identification as indicated on approved delivery schedule. Hand over hardware to designated installer.

1.8 WARRANTY

.1 Warrant door closers to remain free from defects in materials and workmanship in accordance with the General Conditions, but for a period of five (5) years, and locks and locksets for two (2) years. Agree to promptly make good defects which become apparent within warranty periods without cost to Owner.

2 Products

2.1 GENERAL

.1 Supply to the job site all items of finishing hardware as indicated in the Hardware Scheduled appended to this Section. All items to be supplied with complete and adequate fixing and anchoring devices necessary for satisfactory installation into or upon the various surfaces to which it is to be affixed.

.2 Cooperate with all trades using hardware supplied under this Section.

.3 Render a complete service to the metal fabrication contractor wherein full cooperation is assured them of the supply of hardware information, and templates as requested.

.4 Supply for installation by others where specified, as scheduled or indicated on the drawings.

.5 In case of dispute the Consultant's decision will be binding in all cases.

.6 Provide six, (6) copies of the hardware specification for field construction and office use.

.7 All hardware shall be of the best quality and design, construction and finish, free from all defects.

.8 All blank strikes shall be ASA with no lip.

.9 Lock strikes shall be ASA with lip.

.10 All deadlock strikes shall be ASA with no lip.

.11 Where door pulls are scheduled on one side of door and a push plate on the other side, the contractor shall be responsible for fixing, so that the pull shall be secured through the door from the reverse side and the push plate installed to cover the thru bolts which will be countersunk flush with door.

.12 All door closers shall be non sized and where possible non handed. They shall be sized and adjusted by the installer to suit the site conditions.

.13 Panic sets are to be of style specified and completely plated.

.14 Before installing any hardware, carefully check all architectural drawings of Work requiring hardware, verify door swings, door and frame material and operating conditions. Ensure hardware will fit Work.

.15 Check shop drawings and frame and door lists affecting hardware type and installation. Certify to correctness or advise Consultant in writing of required revisions.

.16 Templates:

.1 Check hardware schedule, drawings and specifications. Furnish promptly to applicable trades any patterns, templates, template information and manufacturer's literature required for proper preparation for and application of hardware, in ample time to facilitate progress of Work.

.2 Exposed screws for installing hardware shall have Phillips or Robertson heads.

.3 All door closers shall have back-checking features and shall be of proper size to operate door efficiently.

.4 Use no wall stops on drywall.

.5 Rim Panic Device strikes shall be mortise type application. Equip panic devices with hex bolts.

.17 Hinges

.1 Provide mortise type hinges, steel based for interior doors and stainless steel or brass for exterior doors or interior doors exposed to moisture.

.2 Provide hinges with stainless steel pins; non removable for exterior and public interior exposure, non rising for non security exposure.

.3 Provide full length continuous geared hinges, continuous pin and barrel hinges or full mortise type heavy weight butt hinges on all high frequency use or extreme weighted doors.

.4 Where doors are required to swing 180 degrees, provide ball bearing type swing clear hinges sufficient to clear trim.

.18 Locks, Cylinders, Latches and Bolts

.1 Locks are to be ANSI Grade 1 mortise type unless specified otherwise.

.2 Equip all locks with anti-friction latches with auxiliary latch guard. All fire rated doors must have a minimum latch throw as indicated on the fire door label.

.3 Where lever trim is required, provide levers containing concealed mounting and constructed of solid cast or forged material.

.4 Locks must be lever type.

.5 Provide locks in accordance with current barrier free accessibility requirements as set out by the OBC or by the jurisdiction having authority, when located in the barrier free path of travel.

.6 Strikes shall be ANSI standard size with curved lip strikes for latch bolts and no lip strikes for deadlocks. Provide complete with wrought iron boxes finished to match strike.

.7 Automatic flush bolts are to be equipped on all fire rated pairs of doors with regular use. Provide a coordinator in conjunction with automatic flush bolts.

.8 Provide a filler bar when using coordinators for a clean architectural appearance.

.19 Closers

.1 All closers shall be hydraulically controlled and full rack and pinion in operation.

.2 All closers shall be fully adjustable including the following features: back check, speed control, and latch speed control.

.3 Provide mounting plates where required on special frame applications.

.4 Install all necessary attaching brackets, mounting channels, and cover plates where necessary for correct application of door closers.

.5 Supply to the Owner any special keys and wrenches as usually packed with door closers.

.6 Closers complete with a cover unless specified otherwise by the Consultant. Provide cover of matching architectural finish to the other hardware used in the project.

.7 Coordinate closers with overhead stops & holders.

.20 Door Stops and Holders

.1 Wall stops are only to be used on wall conditions such as block or masonry. If necessary to mount on drywall, provide proper backing to ensure no damage to the wall.

.2 Supply floor stops of sufficient height to suit floor conditions and the undercut of the door.

.3 Provide gray rubber exposed resilient parts.

.4 Surface mount overhead door stops may be used unless they conflict with the door closer. All overhead stops are to be set to 90 degree opening unless stated otherwise.

.21 Door Seals and Thresholds

.1 Perimeter seals must be provided that fully seal all gaps between the floor, door and frame. Perimeter seal must protect against weather, smoke and sound.

.2 Frame gasketing must be constructed of neoprene. The aluminum housing must have a rib to prevent against distortion during installation.

.3 Provide aluminum frames with felt inserts by door supplier.

.4 Install Thresholds in a manner that ensures the door bottom comes in full contact.

.5 All thresholds shall be aluminum and installed with lead shields and stainless steel screws.

.6 Cut ends of thresholds to follow exactly the door frame profile.

2.2 HARDWARE FINISHES

.1 P - Primed

.2 32D - Brushed Stainless Steel

.3 AL - EN - Aluminum Paint

.4 26D - Brushed Chrome

.5 15 - Brushed Nickel

.6 28 - Anodized Aluminum

.7 CAD - Cadmium Plated

.8 26 - Polished Chrome

.9 3 - Polished Brass

.10 EAB - Brass Paint

.11 BRN – Brown

.12 630 – Stainless Steel

3 Execution

3.1 INSTALLATION

.1 Subcontractor installing the hardware shall carefully follow manufacturers' instructions for installation of all finish hardware.

.2 For mounting heights of various hardware items refer to the following;

.1 Locksets: 1024mm (40-5/16") from centre of knob to finished floor.

.2 Deadlocks: 1220mm (48") from centre of cylinder to finished floor.

.3 Mortise Night Latches: 1024mm (40-5/16") from centre of cylinder to finished floor.

.4 Panic Bolts: 1024mm (40-5/16") from centre of crossbar to finished floor.

.5 Blank Strike: 1024mm (40-5/16") from centre of strike to finished floor.

.6 Blank Fronts: 1024mm (40-5/16") from centre of strike to finished floor.

3.2 PERFORMANCE

.1 Adjust and Clean:

.1 Provide services of competent mechanic without additional cost to Owner. Mechanic shall inspect installation of all hardware furnished under this Section and supervise all adjustments (by trades responsible for fixing) necessary to leave hardware in perfect working order.

END OF SECTION

1 General

1.1 SUMMARY

.1 Furnish glazing materials and accessories to complete the fabrication and installation of:

.1 Aluminum Windows

1.2 RELATED REQUIREMENTS

.1 Section 04 20 00: Masonry

.2 Section 05 40 00: Cold Formed Metal Framing

.3 Section 05 50 00: Miscellaneous Metals

.4 Section 06 10 00: Rough Carpentry

.5 Section 07 27 23: Board Product Air Barriers

.6 Section 08 51 13: Aluminum Windows

.7 Section 09 21 16: Gypsum Wallboard

.8 Section 09 90 00: Painting

1.3 REFERENCE STANDARDS

.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

.3 ASTM C1172-09e1, Standard Specification for Laminated Architectural Flat Glass

.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

.3 CAN/CGSB-12.8-97, Insulating Glass Units

.4 CGSB-12.20-M89, Structural Design of Glass for Buildings

1.4 SUBMITTALS

.1 Provide 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 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 Verification: Submit samples for verification including sample sets showing the full range of variations expected where products involve normal colour variations.

.5 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 INSULATING GLASS

.1 Insulating Glass Units: Provide sealed insulating glass units in accordance with CAN/CGSB-12.8 in configurations indicated, and as specified herein.

.2 Manufacture sealed insulating glass units without edge channels or tape, that is, with bare glass edges.

.3 Use two stage seal method of manufacture, as follows:

.1 Primary Seal: Polyisobutylene sealing compound between glass and metal spacer/separator. Colour: Black.

.2 Secondary Seal: Structural silicone based, filling gap between the two lites of glass at the edge up to the spacer/separator and primary seal. Colour: Black.

.4 Install stainless steel capillary breather tubes to equalize pressure differentials between insulating glass fabricating location and insulating glass installation location; crimp tube immediately prior to installation in accordance with glass fabricators written instructions.

.5 Insulating Glass Units:

.1 Unit Composition - up to 3’ above finish floor or grade:

.1 Exterior Lite: Clear tempered glass.

.2 Air Space: ½” Air Filled

.3 Interior Lite: Clear tempered glass having standard performance Low E coating on #3 surface.

.2 Low Emissivity Coating:

.1 Basis of Design Product: Solarban 60 by PPG Industries.

2.3 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 SUMMARY

.1 This Section includes requirement for supply and installation of components required for a complete wall and ceiling assembly with proprietary components as follows:

.1 Non-Loadbearing Steel Framing:

.1 Metal Studs

.2 Floor and Ceiling Partition Track

.3 Furring Members

.4 Drywall Grid Suspension for Ceilings

.2 Gypsum board panels:

.1 Gypsum Ceiling Board

.2 Abuse Resistance Gypsum Board

.3 Gypsum Wallboard Accessories:

.1 Screws, tape, joint compound and all other accessories required for gypsum board ceiling and wall partitions.

.2 Access Panels.

1.2 RELATED REQUIREMENTS

.1	Section 04 20 00:	Masonry
.2	Section 05 50 00:	Miscellaneous Metals
.3	Section 06 10 00:	Rough Carpentry
.4	Section 06 17 53:	Shop-Fabricated Wood Trusses
.5	Section 07 21 16:	Blanket Insulation and Vapour Barrier
.6	Section 07 21 29:	Sprayed Polyurethane Foam Insulation
.7	Section 07 27 23:	Board Product Air Barriers
.8	Section 07 41 16:	Standing Seam Metal Roofing System
.9	Section 07 46 33:	Plastic Siding
.10	Section 08 11 13:	Steel Doors and Frames
.11	Section 08 36 16:	Sectional Overhead insulated Metal Doors
.12	Section 08 51 13:	Aluminum Windows
.13	Section 09 90 00:	Painting

1.3 REFERENCE STANDARDS

.1 Canadian Standards Association (CSA):

.1 CSA S136-07, North American Specification for the Design of Cold-Formed Steel Structural Members.

.2 Canadian General Standards Board (CGSB):

.1 CAN/CGSB-7.1-98, Lightweight Steel Wall Framing Components

.3 American Society for Testing and Materials International (ASTM):

.1 ASTM A641/A641M-09a, Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.

.2 ASTM A653/A653M-11 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.3 ASTM A792/A792M-10, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.4 ASTM A875/A875M-10, Specification for Steel Sheet, Zinc-5% Aluminum Alloy-coated by the Hot Dip Process.

.5 ASTM A1003/A1003M-12, Specification for Steel Sheet, Carbon, Metallic and Non-Metallic Coated for Cold Formed Framing Members.

.6 ASTM C11-10a, Standard Terminology Relating to Gypsum and Related Building Materials.

.7 ASTM C473-12, Standard Test Methods for Physical Testing of Gypsum Panel Products.

.8 ASTM C475/C475M-12, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.9 ASTM C514-04(2009)e1, Standard Specifications for Nails for the Application of Gypsum Board.

.10 ASTM C645-11a, Standard Specification for Nonstructural Steel Framing Members.

.11 ASTM C665-12, Standard Specification for Mineral-Fibre Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

.12 ASTM C754-11, Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

.13 ASTM C834-10, Standard Specification for Latex Sealants.

.14 ASTM C840-11, Standard Specification for Application and Finishing of Gypsum Board.

.15 ASTM C841-03(2008)e1, Standard Specification for Installation of Interior Lathing and Furring.

.16 ASTM C954-11, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033" to 0.112" in Thickness.

.17 ASTM C955-11c, Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases

.18 ASTM C1002-07, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

.19 ASTM C1047-10a, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

.20 ASTM C1396/C1396M-11, Standard Specification for Gypsum Board.

.21 ASTM C1629/C1629M-06(2011), Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.

.4 Gypsum Association (GA):

.1 GA-214-10, Recommended Levels of Gypsum Board Finish.

.2 GA-216-10, Application and Finishing of Gypsum Board.

.3 GA-231-06, Assessing Water Damage to Gypsum Board.

.4 GA-238-03, Guidelines for the Prevention of Mold Growth on Gypsum Board.

1.4 QUALITY ASSURANCE

.1 Contractor executing work of this Section shall have a minimum of five (5) years continuous Canadian experience in successful installation of work of type and quality shown and specified. Submit proof of experience upon Consultant's request.

1.5 SUBMITTALS

.1 Submit submittals in accordance with the requirements of the General Conditions and Section 01 33 00.

.2 Shop Drawings: Submit shop drawings showing the design, construction and relevant details of furring, enclosures and partitions which require a fire rating.

.3 Product Data: Submit manufacturer's current technical literature for each component.

.4 Samples: Supply for Consultant's review, if requested, samples of the following:

.1 Board: Submit sample of each panel product specified, 150mm (6") square.

.2 Trim: Submit sample of each type of trim specified, 305mm (12") long.

.5 Quality Assurance Submittals:

.1 Design Data, Test Reports: Provide manufacturer's test reports indicating product compliance with indicated requirements.

.2 Manufacturer's Instructions: Provide manufacturer's written installation instructions.

1.6 DELIVERY, STORAGE, HANDLING AND PROTECTION

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

.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, in accordance with GA-238 and manufacturer's recommendations.

.4 Protect bagged products from excessive moisture or wetting. Store metal component sections in crates to prevent damage to material. Do not use bent or deformed material.

1.7 PROJECT CONDITIONS

.1 Establish and maintain environmental conditions for application and finishing gypsum wallboard to comply with ASTM C 840 and in accordance with manufacturer's written instructions.

.2 In cold weather (outdoor temperatures less than 13 deg. C, controlled heat in the range of 13 deg. C to 21 deg. C must be provided. This heat must be maintained both day and night, 24 hours before, during, and after entire gypsum board joint finishing and until the permanent heating system is in operation or the building is occupied. Minimum temperature of 10 deg. C shall be maintained during gypsum board application.

.3 Ventilate building spaces to remove excess moisture and humidity during the drying process. Avoid drafts during dry, hot weather to prevent materials from drying too rapidly.

2 Products

2.1 MATERIALS - WALLBOARD

.1 Gypsum Ceiling Board:

.1 Sag Resistant Gypsum Board: Meeting requirements of ASTM C1396M, ceiling board manufactured to have more sag resistance than regular type gypsum board with long edges tapered, and as follows:

.1 Location: Ceiling surfaces.

.2 Acceptable Materials:

.1 Sheetrock Interior Ceiling Board by CGC Inc.

.2 Tough Rock CD Ceiling Board by Georgia Pacific Canada.

.3 ProRoc Interior Ceiling Board by CertainTeed.

.2 Abuse Resistant Gypsum Board:

.1 Manufactured to produce greater resistance to surface indentation and impact penetration resistance than standard gypsum panels:

.1 Gypsum panels with glass fibre reinforced core, tapered edges, minimum 5/8" thickness, conforming to ASTM C1396M and tested to the following performance ratings.

.2 Acceptable Materials:

.1 Sheetrock Abuse Resistant by CGC Inc.

.2 Abuse Resistant by CertainTeed.

.3 ToughRock Abuse Resistant by Georgia Pacific Canada.

2.2 MATERIALS - STEEL FRAMING

.1 Non-Loadbearing Steel Framing:

.1 General:

.1 Steel sheet components shall comply with ASTM C645 requirements for metal, unless otherwise indicated.

.2 Steel for non-loadbearing members shall have metallic coats that conform to ASTM A653M or ASTM A792M with minimum metallic coating weighs (mass) of Z120 and AZM150 respectively.

.3 Framing members shall comply with the CAN/CSA S136 - North American Specification for the Design of Cold Formed Steel Structural Members, for conditions indicated.

.4 Isolate where necessary to prevent electrolysis due to dissimilar metal-to-metal contact or metal-to-masonry and concrete contact. Use bituminous paint, butyl tape or other approved divorcing material.

.2 Metal Studs:

.1 Minimum 0.0179" (25 gauge), screwable with crimped web and returned flange. Provide knockout openings in web at 150mm (6") O.C. to accommodate (if required) horizontal mechanical and electrical service lines, and bracing. Widths as indicated on drawings. Provide structural studs where indicated.

.2 Framing behind all fire resistant gypsum board shall be minimum 0.0329" (20 gauge).

.3 Framing behind all abuse resistant gypsum board shall be minimum 0.0329" (20 gauge).

.4 Where metal stud framing forms walls are to be thermally insulated as indicated on drawings, provide metal studs with integrated fastening system for glass fibre/mineral fibre insulation.

.5 Provide special shapes indicated on drawings as part of steel stud/drywall assemblies.

.3 Floor and Ceiling Partition Track:

.1 Made from galvanized sheet steel, minimum 0.0179" (25 gauge), with minimum 30mm (1-3/16") legs, top track having longer legs were required to compensate for deflection of structure above. Width to suit metal studs.

.4 Furring Members:

.1 Hat-shaped, rigid furring channels shall comply with the ASTM C645 and shall have a minimum base steel thickness of (25 gauge) and a minimum depth of 22mm (7/8") the minimum width of furring attachment flanges shall be 13mm (1/2").

.2 Resilient furring channels designed to reduce sound transmission shall have a minimum base steel thickness of 0.0179" (25 gauge) and have a minimum depth of 13mm (1/2").

.3 Furring members shall be used for furring out any surface for application of gypsum wallboard finish and for secondary furring member in suspended ceilings/soffits.

.4 All furring members shall be hot-dipped galvanized.

.5 Drywall Grid Suspension for Ceilings: Conforming to ASTM C645 and ASTM C754, direct hung system composed of main beams and cross furring members that interlock and as follows:

.1 Tie Wire: Tie wire shall comply with ASTM A641/A641M zinc-coated, soft annealed.

.1 8 gauge used for hangers in suspended ceiling grid work.

.2 12 gauge for drywall suspension system.

.3 18 gauge for wire-tying channels in wall furring and ceiling construction.

.2 Furring Runners: Manufactured from 0.020” thick steel, 35mm (1-3/8”) wide with knurled face by 38mm (1-1/2”) high by 305mm (12’) long, with factory punched cross tee slots, hanger holes and non-directional bayonet end tab couplings.

.3 Furring Tees: Manufactured from 0.0179” (25 gauge) thick steel, 35mm (1-3/8”) wide with knurled face by 38mm (1-1/2”) high by 1220mm (4’) long with stab-type end tab couplings, with factory punched cross tee slots, and hanger holes.

.4 Furring Cross Channels: Manufactured from 0.0179” (25 gauge) thick steel, 35mm (1-3/8”) wide with knurled face by 22mm (7/8”) high by 1220mm (4’) long with straight locking end tabs.

.5 Cross Tees: Manufactured from 0.0179” (25 gauge) thick steel, 24mm (15/16”) wide by 22mm (7/8”) high by 1220mm (4’) long with stab-type end tab couplings, with factory punched cross tee slots, and hanger holes.

.6 Wall Track: Manufactured from 0.0179” (25 gauge) thick steel, 39mm (1-9/16”) high by 3048mm (10’) long with a 25mm (1”) top and bottom flange.

.7 Basis of Design System: 660-C Stab Drywall Grid Suspension System by Rockfon, or acceptable equivalent by Armstrong World Industries Inc., as approved by the Consultant.

2.3 ACCESSORIES

.1 Concrete Anchors:

.1 Self-drilling tie wire anchors, "Red-Head No. T-32" by Phillips Drill Company, Division of ITT Industries of Canada Ltd., or approved equal.

.2 Concrete Inserts:

.1 Hot-dip galvanized "turtle back" type concrete inserts to suit conditions as approved by Consultant, by Acrow-Richmond National Concrete Accessories, Division of Premetalco Inc., or approved equal.

.3 Mineral Fibre Insulation: As indicated in Section 07 21 16.

.4 Gypsum Wallboard Accessories:

.1 In general, gypsum wallboard accessories shall conform to ASTM C1047.

.2 Corner Beads:

.1 Made from galvanized steel sheet conforming to ASTM A653, minimum 0.0179" (25 gauge). Minimum width of flanges 28mm for 13mm (1-1/8" for 1/2") thick wallboard and 32mm for 16mm (1-1/4" for 5/8") thick wallboard.

.3 Casing Beads:

.1 Made from galvanized steel sheet conforming to ASTM A653, minimum 30 gauge, U-shaped designed for finishing with joint compound.

.4 Control Joints:

.1 Made from galvanized sheet steel conforming to ASTM A653, minimum 0.0179" (25 gauge), or roll-formed zinc-alloy to resist corrosion, with expansion joint material perforated flanges.

.1 'Zinc Control Joint No. 093' by CGC Inc.

.2 or approved equal.

.5 Reveals:

.1 Galvanized sheet steel conforming to ASTM A653, minimum 0.0179" (25 gauge), in profiles as indicated on drawings.

.5 Wallboard Screws:

.1 Corrosion resistant, self-drilling, self-tapping gypsum wallboard screws conforming to ASTM C1002 (Type S) and ASTM C954 (Type S-12), 25mm (1") long No. 6 for single layer application, 41mm (1-5/8") long No. 7 for double layer application.

.2 At fire rated construction, type and size of wallboard screw shall be same as used in fire-rating test.

.6 Joint Compound for Interior Gypsum Board:

.1 Conforming to ASTM C475 and as recommended by gypsum wallboard, fire-rated gypsum wallboard and exterior wallboard manufacturers to suit conditions.

.7 Joint Compound for Abuse-Resistant Panels:

.1 ToughRock™ Sandable Joint Compound, by Georgia-Pacific.

.2 Durabond/Sheetrock Setting-Type Joint Compound, by CGC Canada Inc.

.8 Resilient Sponge Tape:

.1 Closed cell neoprene sponge type tape with self-sticking adhesive on one side. 'Permastik 122X' by Jacobs and Thompson Ltd., or foamed vinyl type tape, 'Arnofoam' by Arno Adhesive Tape Incorporated.

.9 Adhesive:

.1 Conforming to CGSB 71-GP-25M, and as recommended by manufacturer and compatible with contacted surfaces.

3 Execution

3.1 EXAMINATION

.1 Examine gypsum wallboard panels for damage and existence of mould. Install only undamaged panels.

.2 Examine gypsum wallboard in accordance with GA-231 for water damage.

.3 Examine areas and substrates, with installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance.

.4 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

.1 Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

.2 Coordinate installation of gypsum board suspension systems with installation of acoustical ceiling tiles (ACT) suspension systems. Where gypsum board suspension systems abut ACT systems, ensure that ceiling tiles grid fit into gypsum grid without affecting overall design and appearance.

.3 Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.3 INSTALLATION - GENERAL

.1 Conform to ASTM C840, except as otherwise specified herein. Co-operate with mechanical, electrical and other trades to accommodate fixtures, fittings and other items in wallboard areas.

.2 Review extent of temporary heat provided. Carry out the work of this Section only when temperature is maintained and controlled in the range of 13 deg. C to 21 deg. C for at least 24-hours before installing gypsum wallboard and is maintained or can be maintained until joint compound and adhesives are dried or cured.

.3 Metal studs in partitions and bulkheads are to be continuous to underside of steel deck, except where noted otherwise on drawings. Continue framing around ducts penetrating partitions above ceiling.

.4 Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

.5 Install bracing at terminations in assemblies.

.6 Do not bridge building control and expansion joints with non-loadbearing steel framing members. Frame both sides of joints independently.

.7 Bring gypsum board into contact, but do not force into place.

3.4 STUD PARTITIONS

.1 Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

.2 Provide continuous dampproof course to underside of floor track.

.3 Install studs so flanges within framing system point in same direction.

.4 Provide accurately aligned partition tracks at top and bottom of partitions. Secure at 610mm (24") O.C. and 50mm (2") from each end.

.5 Erect studs vertically in partition tracks at 406mm or 610mm (16" or 24") O.C. maximum as required, and not more than 50mm (2") from abutting walls, openings and each side of corners.

.6 Install cut to length intermediate vertical studs, in same manner and spacing as wall studs, over door frames and above and below other openings.

.7 Door Openings:

.1 Extend studs on each side of openings from floor to ceiling or structure above, whichever is indicated.

.2 Install cut to length piece of runner horizontally over door frames.

.3 Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.

.4 Install two (2) studs at each jamb, unless otherwise indicated.

.5 Install cripple studs at head adjacent to each jamb stud, with a minimum 13mm (1/2") clearance from jamb stud to allow for installation of control joint in finished assembly.

.8 Other Framed Openings: Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

.9 Where studs extend over 3658mm (12') in height provide internal horizontal bridging spaced approximately 1220mm (4') O.C. vertically and provide double studs at each side of door frames.

.10 Size, brace and reinforce studs as necessary to provide sturdy, rigid partitions to heights and lengths required.

.11 Design bridging to prevent member rotation and member translation perpendicular to the minor axis. Provide for secondary stress affects due to torsion between lines of bridging. Wallboard shall not be used to help restrain member rotation and translation perpendicular to the minor axis. Maximum bridging spacing to be 1220mm (48") O.C.

.12 Securely anchor framing to building structure making allowance for deflection of structure above with relief joint to avoid transmission of structural loads to partitions.

.13 Where horizontal runs of service lines are to be installed, arrange with applicable trades to have lines installed prior to wallboard application.

.14 Z-Furring Members:

.1 Erect insulation, as specified in Section 07 21 16, Blanket Insulation and Vapour Barrier, vertically and hold in place with Z-furring members.

.2 Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or power-driven fasteners spaced 24" O.C.

.3 At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12" from corner and cut insulation to fit.

3.5 CEILING FURRING

.1 Install suspension system components in sizes and spacings indicated on drawings, but not less than those required by referenced installation standards for assembly types and other assembly components indicated.

.2 Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

.3 Hangers:

.1 Hangers for suspended gypsum wallboard ceiling, bulkheads and duct furring shall support the grillage independent of walls, columns, pipes, ducts, conduit and similar components.

.2 Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

.3 Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, counter splaying, or other equally effective means.

.4 Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

.1 Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.

.5 Wire Hangers: Secure by looping and wire tying, either directly to structure or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.

.6 Do not attach hanger to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.

.7 Powder actuated fasteners are not approved.

.8 Do not attach hangers to or through steel deck. Attach hangers to steel joists. Where joist spacing is not suitable and where ducts and other equipment interfere, provide adequate cross channels between joists and securely wire tie in position for support of hangers.

.9 Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.

.10 Do not connect or suspend steel framing from ducts, pipes, or conduit.

.11 Recessed ceiling fixtures which exert a load in excess of 10 lbs/ft² (48.824 kg/m^2)shall be suspended independent of ceiling furring for gypsum wallboard application.

.12 Prior to installation of suspension system confirm that ceiling heights called for on room finish schedules and drawings can be maintained and that all recess lighting can be accommodated and shall not interfere with piping, ductwork and the like.

.13 Space hangers at maximum 1220mm (4') O.C. along the runner channels and not more than 150mm (6") from the ends to support weight of ceiling and superimposed loads such as lighting fixtures, diffusers and grilles.

.14 Where ducts are large or where combination of ducts, or combination of ducts and other items interfere so that hanger spacing exceeds 1220mm (4'), increase size of main runner channels and hangers accordingly to sustain increased loading and span.

.15 For fire-resistant rated assemblies, wire tie furring channels to supports.

.16 Install suspension systems that are level to within 3mm (1/8") measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

.4 Carrying Channels:

.1 Space carrying channels at maximum 1220mm (4') O.C. and not more than 150mm (6") from boundary walls, interruptions of continuity and changes in direction.

.2 Run channels at right angles to structural framing members where splices are necessary, lap members at least 200mm (8") and wire each end with minimum double strand of tie wire. Avoid clustering or lining up splices.

.3 Attach channels to rod hangers by bending hanger sharply under bottom of flange of runner and securely wire in place with a saddle tie.

.5 Cross Furring:

.1 Erect furring channels at right angles to carrying channels.

.2 Space furring channels at 610mm (24") O.C. and not more than 150mm (6") from boundary walls, interruptions in ceiling continuity and change in direction.

.3 Secure furring channels to each support with a double strand of tie wire or with clip approved by manufacturer of furring components. Splice joints by nesting and tying channels together.

.4 The wallboard furring channels shall be level to a maximum tolerance of 3mm over 3658mm (1/8" over 12') non-cumulative.

3.6 GYPSUM WALLBOARD - SINGLE LAYER APPLICATION

.1 Metal Studs:

.1 Apply gypsum wallboard with screws. Erect wallboard with long dimension at right angles to supports. For fire rated partitions, erect board vertically or horizontally according to the ULC listing. Locate end joints over supporting members.

.2 Locate vertical joints at least 305mm (12") from the jamb/head/sill lines of openings.

.3 For parallel application space screws at 200mm (8") O.C. at board edges at 305mm (12") O.C. on board fields.

.2 Fasteners:

.1 Perimeter screws shall be not less than 10mm (3/8") from edges and ends and shall be opposite the screws on adjacent boards.

.2 Screws shall be driven with a power screw gun and set with countersunk head slightly below the surface of the board.

.3 Joints:

.1 Finish all joints.

3.7 GYPSUM WALLBOARD - DOUBLE LAYER APPLICATION

.1 General:

.1 Lay out work to minimize end joints on the face layer and to offset parallel joints between face and base layers by at least 254mm (10"). Apply the face layer at right angles to the base layer.

.2 Base Layer:

.1 The base layer shall be same as face layer or wallboard backing board applied at right angles to framing members. Secure base layers with screws spaced 305mm (12") O.C. to each member. Perimeter screws shall be opposite the screws on adjacent boards.

.2 The surface of the erected base layer shall be straight, plumb or level, and without protrusions before the face layer is applied.

.3 Face Layer:

.1 Apply face layer at right angles to base layer with adhesive. Apply adhesive with a notched spreader to leave 10mm x 13mm (3/8" x 1/2") ribbons, 38mm (1-1/2") apart over entire back side of face layer. Erect wallboard immediately after spreading adhesive. Supplement adhesive with screw fasteners. Provide temporary support for wallboard until adhesive bond has fully developed. As an alternative to adhesive specified, joint compound mixed with water in accordance with manufacturer's directions may be used. Allow joint compound and water mixture to stand 30-minutes before using.

.4 Joints:

.1 Finish joints in face layers only, unless otherwise required to achieve fire resistant ratings indicated, as hereinafter specified.

3.8 CONTROL JOINTS

.1 Install control joints using metal control joint strip as specified where:

.1 A partition, furring or column fireproofing abuts a structural element, dissimilar wall or partition assembly, or other vertical penetration, or ceiling.

.2 A ceiling or soffit abuts a structural element, dissimilar wall or partition assembly or other vertical penetrations.

.3 Wings of "L", "U" and "T"-shaped ceiling/soffit areas are joined;

.4 Construction changes within the plane of the partition or ceiling or soffit.

.5 Partition, restrained ceiling or furring run exceeds 9144mm (30').

.6 Unrestrained ceiling dimensions exceed 15240mm (50') in either direction.

.7 Expansion or control joints occur in the base exterior wall.

.8 Wallboard is installed over masonry control joints.

.9 And elsewhere as indicated on the drawings.

.2 Install in accordance with manufacturer's instructions. Where application is on furring members and double furring members at control joints, place one furring member on each side of the control joint.

3.9 BULKHEADS

.1 Fur out bulkheads in areas indicated and as required to conceal mechanical, electrical or other services in rooms where drywall finishes are scheduled, and elsewhere if called for on drawings.

.2 Ensure hangers are installed as to prevent splaying.

3.10 PRESSED STEEL (HOLLOW METAL) FRAMES

.1 Install pressed steel (hollow metal) frames where they occur in gypsum wallboard partitions.

.2 Anchor frames securely to studs using a minimum of three (3) anchors per jamb for jambs up to 2134mm (7') high and minimum of four (4) anchors per jamb for jambs over 2134mm (7') high.

3.11 THERMAL BREAK

.1 Install self-sticking resilient sponge tape at edges of wallboard in contact with metal windows and exterior door frames to provide a thermal break. Adhere tape to casing bead and compress during installation.

3.12 FINISHING

.1 Before proceeding with installation of finishing materials ensure the following:

.1 Wallboard is fastened and held close to framing and furring.

.2 Fastening heads in wallboard are slightingly below surface in dimple formed by driving tool.

.2 Levels of Gypsum Wallboard Finish:

.1 Level 0: Temporary construction only.

.2 Level 1: Plenum areas and above ceilings. Where a fire-resistance rating is required finishing should be in accordance with reports of fire tests of assemblies that have met the requirements of the fire rating imposed.

.3 Level 2: Areas of water resistant gypsum backing board under tile, exposed areas where appearance is not critical.

.4 Level 3: Service corridors and areas to receive heavy or medium textured coatings or heavy-duty wall coverings.

.5 Level 4: Areas to receive light textured coatings or lightweight wall coverings.

.6 Level 5: Areas to receive gloss, semi-gloss or flat sheen paints and critical lighting conditions. Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges, and apply skim coat over entire surface for corridors, long hallways, walls and ceilings longer than 7500 mm or walls higher than 3600 mm , and for all curved or angled wall surfaces.

.3 Finish gypsum wallboard in strict accordance with ASTM C840, GA-214 and GA-216 and as follows:

.1 Fill and tape joints and internal corners and fill screw depressions in board face and smooth out along corner beads and metal strip with joint compound.

.2 Mix joint compound (powder) in accordance with manufacturer's written instructions.

.3 Prefill "V" grooves of rounded edges with special setting type joint compound using a 127mm to 150mm (5" to 6") joint finishing knife. Finish flush with tapered surface ready for tape reinforcing application. Allow prefill material to dry thoroughly before application of embedding compound and tape.

.4 Apply joint compound in thin uniform layer. Embed reinforcing tape accurately centred on joint and securely pressed in, leaving sufficient compound under tape to provide proper bond. Immediately apply skim coat over tape application. Allow to dry thoroughly before application of next coat.

.5 Apply fill coat finishing the tapered depression flush with board surfaces. Allow to dry thoroughly before application of finish coat.

.6 Apply finish coat extending slightly beyond the filler coat and feathered out onto the board surface. Do not apply finish coat to gypsum board scheduled to be sprayed with acoustic surfacing finish.

.7 Sand between coats and following the finishing coat, where necessary, and leave surface smooth and ready for painting.

.8 Finish screw depressions with filler material and finish coat as specified above.

.9 Joint and depression finish shall in no case protrude beyond the plane of the board surface.

.10 Furnish corner beads and metal trim flush with board surface using filler and finishing coats feathered out approximately 50mm (2") and 100mm (4") respectively onto the board surface.

.11 Provide metal casing beads at exposed edges, at junctions of gypsum/cement board with dissimilar material, at control joints and at junction with columns. Casing beads are required at perimeter of gypsum/cement wallboard ceilings and soffits. Fasten with screws at 305mm (12") O.C. along entire length.

.12 Finish gypsum board to receive a Level 4 finish.

.13 Finish all curved gypsum board to receive a Level 5 finish.

3.13 REPAIRS

.1 After taping and finishing has completed, and before decoration, repair all damaged and defective work, including non-decorated surfaces.

.2 Patch holes or openings 13mm (1/2") or less in diameter, or equivalent size, with a setting type finishing compound or patching plaster.

.3 Repair holes or openings over 13mm (1/2"), or equivalent size, with 16mm (5/8") thick gypsum wallboard secured in such a manner as to provide solid substrate equivalent to undamaged surface.

.4 Tape and refinish scratched, abraded or damaged finished surfaces including cracks and joints in non-decorated surface to provide smoke tight construction, fire protection equivalent to the fire rated construction and STC equivalent to the sound rated construction.

3.14 PROTECTION

.1 Protect installed products from damage during remainder of construction period.

.2 Remove and replace panels that are damaged.

END OF SECTION

1 General

1.1 SUMMARY

.1 This Section includes, but is not limited to, the following:

.1 Resilient sheet materials:

.1 Homogeneous sheet vinyl flooring

.2 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

.2 Section 09 21 16: Gypsum Wallboard

.3 Section 09 90 00: Painting

1.3 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM):

.1 ASTM F1516-13, Standard Practice for Sealing Seams of Resilient Flooring Products by the Heat Weld Method (when Recommended)

.2 ASTM F1861-08(2012)e1, Standard Specification for Resilient Wall Base

.3 ASTM F1869-11, Standard Test Method for Measuring Moisture Vapour Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

.4 ASTM F1913-04(2010), Standard Specification for Vinyl Sheet Floor Covering Without Backing

.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, 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 Submit 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 33 00.

.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 5% 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 ENVIRONMENTAL 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. 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 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 Submittals, a minimum of five (5) days in advance of Bid Closing.

.2 Approved manufacturers:

.1 Johnsonite

.2 Armstrong Flooring

2.2 SHEET FLOORING MATERIALS

.1 Unbacked Sheet Vinyl Flooring (VF): Conforming to ASTM F1913 and the following:

.1 Classification: Commercial

.2 Wear Layer: Specialty Performance Film

.3 Colour: Selected from manufacturers standard range.

.4 Pattern: Textured

.5 Total Thickness: nominal 1/16”

.6 Width: minimum nominal 8”

.7 Length: Manufacturers standard roll length.

2.3 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: A – Straight.

.4 Height: 100mm.

.5 Thickness: 3mm.

.6 Length: Manufacturers standard maximum length.

.7 Basis of Design Material: Traditional Wall Base by Johnsonite.

.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 Trowellable Levelling and Patching Compounds: As indicated in Section 03 35 00.

.4 Heat Welding Bead: Solid strand product recommended by flooring manufacturer for heat welding seams, and as follows:

.1 Colour and Pattern: Match colour and pattern of resilient flooring, as approved by the Consultant.

.5 Fillers and Primers:

.1 Types and brands approved, acceptable to flooring material and resilient base manufacturers for the applicable conditions. Use non-shrinking latex compound.

.6 Resilient Floor Tile Adhesive:

.1 Standard Tile: Waterproof, clear setting type and brands as recommended by the tile manufacturer.

.7 Sealer and Wax: Coordinated with Owners preferred long term maintenance program, sealer or wax as appropriate to flooring materials specified.

.8 Polyethylene: 6" thickness conforming to CAN/CGSB-51.34.

.9 Tape: Self adhesive 3" wide cloth tape.

3 Execution

3.1 EXAMINATION

.1 Testing and Inspections: Test moisture emission rate of concrete subfloor prior to installing flooring, using the calcium chloride test method in accordance with ASTM F1869.

.2 Examine substrates, areas, and conditions affecting work are in accordance with manufacturer's requirements, and as follows:

.1 Verify that floor surfaces are smooth and flat to plus or minus 1/8" over 10'; notify Consultant in writing where floor tolerances are not within acceptable values.

.2 Verify that concrete slabs exhibit normal alkalinity of between 5 and 9 and that they are free of carbonization or dusting deleterious to flooring installation or adhesive bond.

.3 Verify that subfloors are free of cracks, ridges, depressions, scale, and foreign deposits that could interfere with flooring installation.

3.2 PREPARATION

.1 Comply with resilient flooring manufacturer's written installation instructions for preparing substrates indicated to receive flooring.

.2 Fill cracks, holes, and depressions in substrates using trowellable levelling and patching compounds in accordance with manufacturers written instructions and as follows:

.1 Levelling and patching shall be restricted to correcting minor deviations or imperfections to bring floor surface finish to within flooring manufacturers tolerances for flatness.

.3 Remove coatings from concrete substrates, including curing compounds and other substances that are incompatible with flooring adhesives, and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer; do not use solvents.

.4 Broom and vacuum clean substrates immediately before installing flooring.

3.3 INSTALLATION

.1 Comply with resilient flooring manufacturer's written installation instructions.

.2 Unroll flooring and allow stabilizing before cutting and fitting in accordance with manufacturer’s installation instructions.

.3 Apply primer in strict accordance with manufacturer's printed instructions. Permit primer to dry.

.4 Apply adhesive uniformly with an approved notchtooth spreader at the recommended rate. (Mechanical spreader not approved). Do not spread more adhesive than can be covered before initial set takes place. Use waterproof adhesive throughout. Follow manufacturer's instructions.

.5 Layout sheet flooring as follows:

.1 Maintain uniformity of resilient flooring direction.

.2 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.

.3 Match edges of flooring for colour shading and pattern at seams in accordance with manufacturer's written recommendations.

.4 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.

.5 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

.6 Install flooring flush with adjoining floor covering surfaces.

.7 Scribe sheet flooring to walls, columns, cabinets, floor outlets and other appurtenances.

.8 Roll sheet flooring in both directions in accordance with manufacturer’s instructions.

.6 Layout resilient base as follows:

.1 Fit joints tight and vertical.

.2 Joints along one plane shall be at minimum 23’ spacing, at inconspicuous locations.

.3 Mitre internal corners, use pre-moulded sections for external corners and exposed ends.

.4 Install base on solid backing. Adhere tightly to wall and floor surfaces.

.5 Scribe and fit to door frames and other obstructions.

.6 Install outside corners prior to installation of straight sections.

.7 Install straight and level to variation of plus or minus 1/8" over 10’ straight edge.

.8 Do not stretch base during installation.

.9 Shave back of base where necessary to produce snug fit to substrate.

.7 Layout resilient accessories as follows:

.1 Install edge strips at unprotected and exposed edges where flooring terminates.

.8 Accurately scribe tile around walls, and other floor conditions.

.9 Each type of material used shall be from one manufacturer throughout the work and material in each area shall be of same production run.

.10 Remove and replace loose, damaged and defective tiles where required and as directed by Consultant.

3.4 CLEANING, SEALING AND FINISHING

.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. 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.

END OF SECTION

1 General

1.1 SUMMARY

.1 Provide labour, materials, tools and other equipment, services and supervision required to complete interior and exterior, painting work.

.2 Surface preparation for this section will be limited to priming and back-priming, and specific pre-treatments noted in this section or as specified in the Master Painters Institute (MPI) Painting Specification Manual.

1.2 RELATED REQUIREMENTS

.1 Other sections of the specification requiring painting refer to this section. Coordinate requirements of referencing sections.

1.3 REFERENCE STANDARDS

.1 Environmental Choice Paints and Surface Coatings, Low VOC Product Listings Program (ECP):

.1 Paints and Surface Coatings, Low VOC Product Listings

.2 The Master Painters Institute (MPI):

.1 New Surfaces: Architectural Painting Specification Manual.

.3 The Society for Protective Coatings (SSPC):

.1 Coating Materials Guidelines

.2 Surface Preparation Guidelines

.3 Application, Inspection and Quality Control Guidelines

1.4 DEFINITIONS

.1 Gloss Levels: Standard coating terms defined by MPI Manual apply to products of this Section as follows:

.1 G1: Matte of Flat: Lustreless or matte finish with a gloss range below 10 when measured at 85° to meter and 0 to 5 when measured at 60°.

.2 G2: Velvet: Matte to low sheen finish with a gloss range of 10 to 35 when measured at 85° to meter and 0 to 10 when measured at 60°.

.3 G3: Eggshell: Low sheen finish with a gloss range of 10 to 35 when measured at 85° to meter and 10 to 25 when measured at 60°.

.4 G4: Satin: Low to medium sheen with a gloss range of minimum 35 when measured at 85° to meter and 20 to 35 when measured at 60°.

.5 G5: Semi-Gloss: Medium sheen finish with a gloss range of 35 to 70 when measured at 60° to meter.

.6 G6: Gloss: High sheen finish with a gloss range of 70 to 85 when measured at 60° to meter.

.7 G7: High Gloss: Reflective sheen having a gloss range in excess of 85 when measured at 60° to meter.

.2 Gloss Values: Generally, provide paints and coatings having the following sheens when installed on the following substrates:

.1 Walls: Eggshell (G3) or Satin (G4) as selected by Consultant at a later date.

.2 Trim and Doors: Semi-gloss (G5).

.3 Ceilings: Flat (G1).

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 Product Data: Submit list of all painting materials used for the Work to the Consultant for review prior to ordering materials for each paint system indicated, including block fillers and primers.

.1 Material List: An inclusive list of required coating materials indicating each material and cross reference specific coating, finish system, and application; identify each material by manufacturer's catalogue number and general classification.

.2 Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.

.2 Samples: Provide stepped samples, defining each separate coat, including block fillers and primers using representative colours required for the project; label each sample for location and application, and as follows:

.1 Drawdown Samples: Provide three (3) drawdown sample charts (cards) for each type, texture and colour of finish specified for verification purposes before ordering paint materials.

.3 Informational Submittals: Provide the following submittals when requested by the Consultant:

.1 Certification: Submit certification reports for paint products indicating that they meet or exceed low VOC and coloured base requirements listed in this Section.

1.6 PROJECT CLOSEOUT SUBMISSIONS

.1 Operation and Maintenance Data: Submit copies of paint manufacturer’s written maintenance information for inclusion in the operations manual in accordance with Section 01 33 00, including specific warning of any maintenance practice or materials that may damage or disfigure the finished Work.

.2 Maintenance Materials: Deliver maintenance materials to Owner in quantities indicated and in accordance with Section 01 33 00, that match products installed; packaged with protective covering for storage, and identified with labels describing contents and building location and as follows:

.1 Paints and Coatings: Minimum of 4-4L containers of field colours and 4-1 L containers of each accent colour, and all remnants.

1.7 QUALITY ASSURANCE

.1 Conform to the standards contained in the MPI Manual.

.2 Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in service performance, and as follows:

.1 Have a minimum of five (5) years proven satisfactory experience and shall show proof before commencement of work that he will maintain a qualified crew of painters throughout the duration of the work.

.2 When requested provide a list of the last three comparable jobs including, name and location, specifying authority, start and completion dates and cost amount of the painting work.

.3 Apprentices may be employed provided they work under the direct supervision of a qualified journeyman in accordance with trade regulations.

.3 Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats and as follows:

.1 Use only paint manufacturers and products as listed under the Approved Products section of the MPI Manual Architectural Painting Specification Manual.

1.8 ENVIRONMENTAL REQUIREMENTS

.1 Conform to MPI Manual and manufacturers requirements.

.2 Perform no painting or decorating work when the ambient air and substrate temperatures, relative humidity and dew point and substrate moisture content is below or above requirements for both interior and exterior work.

.3 Apply paint only to dry, clean, properly cured and adequately prepared surfaces in areas where dust is no longer generated by construction activities such that airborne particles will not affect the quality of finished surfaces.

.4 Ensure adequate continuous ventilation and sufficient heating and lighting is in place.

.5 Paint, stain and wood preservative finishes and related materials (thinners, solvents, caulking, empty paint cans, cleaning rags, etc.) shall be regarded as hazardous products. Recycle and dispose of same subject to regulations of applicable authorities having jurisdiction.

.6 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into the ground retain cleaning water and filter out and properly dispose of sediments.

.7 Set aside and protect surplus and uncontaminated finish materials not required by the Owner and deliver or arrange collection for verifiable re-use or re-manufacturing.

1.9 WARRANTY

.1 Special Warranty: Provide an MPI two (2) year guaranty, or a 100% two (2) year Maintenance Bond in accordance with MPI Manual requirements; painting subcontractors choosing the Maintenance Bond option must provide a maintenance bond consent from a reputable surety company licensed to do business in Canada as follows:

.1 Warrant that painting work has been performed in accordance with MPI Manual requirements.

.2 Provide a cash value to repair or replace defective coatings in the event that the original installer is not able to perform warranty work.

2 Products

2.1 MANUFACTURERS

.1 Subject to compliance with requirements, manufacturers that have attained the prerequisites for ecologically sustainable labelling mark on their products and may be incorporated into the Work include; but are not limited to, the following:

.1 Dulux Ltd.

.2 Sherwin-Williams LLC

.3 Benjamin Moore and Co. Limited

2.2 MATERIALS

.1 Primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, and other painting materials shall be in accordance with the MPI Manual “Approved Product” listing and shall be from a single manufacturer for each system used.

.2 Materials such as linseed oil, shellac, and other accessory materials shall be the highest quality product of an approved manufacturer listed in the MPI Manual and shall be compatible with other coating materials.

.3 All materials and paints shall be lead and mercury free and shall have low VOC content where possible.

.4 Colour and Manufacturer: As selected by the Consultant. Price for five (5) colours.

3 Execution

3.1 PREPARATION OF SURFACES:

.1 Prepare surfaces in accordance with MPI Manual requirements. Refer to the Manual for specific surface preparation requirements for each substrate material.

3.2 APPLICATION

.1 Paint when substrates and environmental conditions (heating, ventilation, lighting and completion of other work) are acceptable for applications of products specified in this Section.

.2 Paint surfaces requiring paint or stain finish to Premium MPI Manual finish requirements with application methods in accordance with best trade practices for type and application of materials used.

.3 Continue paint finishes through behind wall mounted items.

.4 Painting coats specified are intended to cover surfaces satisfactorily when applied at proper consistency and in accordance with manufacturer's recommendations.

.5 Apply a minimum of four coats of paint where deep or bright colours are used to achieve satisfactory results.

3.3 EXTERIOR SURFACES

.1 Paint exterior surfaces in accordance with the MPI Manual painting systems listed in this section.

.2 Concrete Masonry Units (smooth and split face block and brick):

.1 EXT 4.2D: Elastomeric coating, with block filler or primer as recommended by manufacturer, flat finish.

.3 Galvanized Metal (doors, frames, railings, misc. steel, pipes, overhead decking, ducts, gutters, flashing, etcetera):

.1 EXT 5.3D: Wash primer/2 component aliphatic polyurethane G5 finish (high contact areas).

3.4 INTERIOR SURFACES

.1 Paint interior surfaces in accordance with the MPI Manual painting systems listed in this section.

.2 Concrete Masonry Units (smooth and split face block and brick):

.1 INT 4.2D: High Performance Architectural Latex G3 coating, with block filler.

.3 Galvanized Metal (doors, frames, railings, misc. steel, pipes, overhead decking, ducts, etcetera):

.1 INT 5.3B: Water based light industrial coating G5 finish.

.4 Plaster and Gypsum Board (gypsum board, drywall, and other sheet gypsum materials):

.1 INT 9.2A: Latex (over latex sealer) G3 finish.

.5 Canvas and Cotton Coverings:

.1 INT 10.1A: Latex G1 finish.

3.5 MECHANICAL AND ELECTRICAL EQUIPMENT

.1 Paint "unfinished" conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and texture to match adjacent surfaces, in the following areas:

.1 In exposed-to-view exterior and interior areas.

.2 In interior high humidity interior areas.

.3 In boiler room, mechanical and electrical rooms.

.2 Leave conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks in unfinished areas.

.3 Paint inside of ductwork where visible behind louvers, grilles and diffusers beyond sight line with primer and one coat of matt black (non-reflecting) paint.

.4 Paint the inside of light valances gloss white.

.5 Refer to Mechanical and Electrical specifications for painting, banding, stencilling of other surfaces/equipment, and generally as follows:

.1 Paint gas piping gas standard yellow where visible in service spaces.

.2 Paint both sides and all edges of plywood backboards for equipment before installation.

.3 Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

.4 Do not paint over nameplates.

3.6 SITE QUALITY CONTROL

.1 Painted surfaces will be considered to lack uniformity and soundness if any of the following defects are apparent at time of field review when viewed from a distance of 4’ from the painted surface:

.1 Runs, sags, hiding or shadowing by inefficient application methods

.2 Evidence of poor coverage at rivet heads, plate edges, lap joints, crevices, pockets, corners and re-entrant angles

.2 Painted surfaces will be considered as deficient if any of the following defects are apparent at time of field review, regardless of viewing distance.

.1 Damage due to touching before paint is sufficiently dry or any other contributory cause.

.2 Damage due to application on moist surfaces or caused by inadequate protection from the weather.

.3 Damage or contamination of paint due to windblown contaminants (dust, sand blast materials, salt spray, etcetera)

.3 Painted surfaces found as unacceptable shall be replaced or repaired at no cost to the Owner or Consultant:

.1 Small affected areas may be touched up

.2 Large affected areas or areas without sufficient dry film thickness of paint shall be repainted.

.3 Runs, sags or damaged paint shall be removed by scraper or by sanding before application of new paint coats.

3.7 PROTECTION

.1 Protect newly painted exterior surfaces from rain and snow, condensation, contamination, dust, salt spray and freezing temperatures until paint coatings are completely dry.

.2 Curing periods shall exceed the manufacturers recommended minimum time requirements.

.3 Erect barriers or screens and post signs to warn of or limit or direct traffic away or around work area as required.

3.8 CLEANUP

.1 Remove all paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.

.2 Keep work area free from an unnecessary accumulation of tools, equipment, surplus materials and debris.

.3 Remove combustible rubbish materials and empty paint cans each day and safely dispose of it in accordance with requirements of authorities having jurisdiction.

.4 Clean equipment and dispose of wash water or solvents, and other cleaning and protective materials (rags, drop cloths, masking papers, etcetera), paints, thinners, paint removers and strippers in accordance with the safety requirements of authorities having jurisdiction.

END OF SECTION

1 General

1.1 GENERAL REQUIREMENTS

.1 General Conditions, Supplementary Conditions and Division 01 apply to this Section.

1.2 RELATED REQUIREMENTS

.1 Section 07 11 13: Bituminous Dampproofing

.2 Section 07 21 13: Board Insulation

.3 Section 33 46 19: Underslab Drainage Systems

1.3 SITE CONDITIONS

.1 Examine Site:

.1 Note all characteristics and features affecting work. No allowance will be made for difficulties encountered or expenses incurred on account of any site conditions or any growth or item existing thereon, visible or known to exist when bid is submitted.

.2 Underground Services:

.1 Notify public utilities or municipal authorities in advance of planned excavations adjacent to their services. Take care not to damage or displace encountered known and unknown services. When such services are encountered, immediately notify Consultant, and protect, brace and support active services. Where repairs become necessary, use the following procedure:

.2 Known Services:

.1 Repair at no expense to Owner.

.3 Unknown Services:

.1 Forward complete breakdown of estimated cost of such work. Proceed immediately with repairs upon receipt of written approval of cost of such repair work.

.4 In the case of damage to an essential service, notify Consultant immediately and repair service under Consultant's direction. Inform Consultant of services encountered which require adjustment, relocation or abandonment and arrange for disconnection and capping of pipe.

1.4 GEOTECHNICAL SITE INVESTIGATION REPORT

.1 Review in detail geotechnical site investigation report.

.2 Information given in Geotechnical Site Investigation Report was obtained for use of Owner in execution of design. It is presented in good faith to assist Contractor. No guarantee is made as to its detailed accuracy for every site location.

1.5 LEVELS

.1 Existing grade levels shown on drawings are furnished in good faith for the guidance of the Contractor. Check and verify levels at site. Should the actual grade levels of the site be other than shown, no claims will be entertained unless notification is made in writing to the Consultant. Do not proceed with the work until Consultant's approval is received. Allow Consultant sufficient time to inspect such claim.

1.6 STORAGE, DELIVERY, HANDLING AND PROTECTION

.1 Stockpile materials in designated areas. Stockpile topsoil and each type of fill material separately to prevent integration. Stockpile granular materials so as to prevent segregation.

.2 Keep surrounding roads free of soil deposits from material hauling trucks. Load trucks carefully to prevent spillage and wind drift.

.3 To protect neighbourhood from wind-blown sand and dust, sprinkle with water entire excavated area and stockpiled excavated materials when required.

.4 Protect adjacent property from damage which may occur from any cause in the performance of the work of this Section.

.5 Do not interfere with use of adjacent buildings.

.6 Take precautions against movement, settlement or collapse of sidewalks, public services adjoining property and be liable for all damage to same.

.7 Before commencing work verify location of survey monuments in the areas in which the work is to be executed. Should any of the monuments be disturbed due to the work be responsible for the expenditures incurred in restoring the monuments.

.8 Take precautions against movement or settlement of existing building. Provide and place bracing and shoring necessary for the safety and support of the structure and execute the work in a manner to prevent movement, settlement, damage or injury caused thereby or resulting therefrom.

.9 Shoring and Trench Timbering:

.1 In addition to requirements of local authorities, carry out in accordance with requirements of the Occupational Health and Safety Act, RSO 1990 C.0.1 and regulations for construction projects, and all other applicable regulations of the Ontario Ministry of Labour. In addition, follow recommendations of the Construction Safety Association brochure, "Shoring and Timbering in Trenches, latest edition", wherever applicable.

.10 Shoring and Bracing:

.1 Erect and maintain necessary shoring and bracing for excavations in a manner that will properly retain banks of excavations and prevent cave-in. Shoring to be erected in a manner that will allow all other work to be carried out while shoring is still in place. Shoring installation shall be entirely clear of footings, foundations, walls or other such work so that it may be removed entirely or in sections when it is no longer required or when directed without causing any damage or injury to structural work that has been completed.

2 Products

2.1 MATERIALS

.1 Fill Material:

.1 For base under floor slabs and other locations as recommended by geotechnical investigation report, shall be Granular 'A' material in accordance with OPSS Form No. 1010, well grade and maximum aggregate size of 3/4". Material shall be maintained at optimum moisture content during placing and while compacting work is in progress, in strict accordance with inspection engineer's instructions and to his approval.

3 Execution

3.1 PREPARATION

.1 Clear and remove, from site, obstructions to excavating. Establish and maintain accurate lines and levels as required. Provide batter boards, line stakes and templates, and establish permanent reference lines and bench marks required.

3.2 EXCAVATION - GENERAL

.1 Excavate with due regard for the peculiarities of soil conditions and take precautions to protect adjacent foundations and property.

.2 Excavate and remove sod, debris, topsoil or fill deposited within the building area. Remove topsoil to its full depth over the areas to be excavated or graded.

.3 Stockpile topsoil in a neat pile where directed. Remove surplus topsoil not required for regrading or landscaping from the site.

.4 Stockpile excavated material approved for re-use on the site so that such material will not interfere with site drainage, drainage of adjacent properties, or building operations. Remove subsoil and excavated material not required for regrading outside the building from the site, including material excavated by other Sections.

.5 Excavate to extent, elevations and depths required for completion of work, leaving sufficient space for removal of formwork, application of and installation of weeping drains. Excavate and construct for slabs, ramps, and driveways, to lines, elevations and cross sections shown on drawings to allow finishing sections to install their work to required thicknesses.

.6 Keep excavation free of water by bailing, pumping or system of drainage as required, and provide pumps, suction and discharge lines of sufficient capacity. Maintain until such time as permanent drainage system is installed or until Consultant's approval for removal of equipment is obtained. Take all necessary measures to prevent flow of water into excavation.

.7 Protect bottom and sides of excavated pits and trenches from freezing.

.8 Keep bottoms of excavations clean and clear of loose materials leveled and stepped at changes of levels except excavations made for drainage purposes which are to slope as required.

.9 If removal of earth causes displacement of adjacent earth, remove disturbed earth at no additional cost to Owner.

.10 Remove soft, wet or unconsolidated ground, quicksand and organic material encountered in excavating and fill void with well compacted, clean, dry fill of quality as herein specified. Where these conditions occur under or near footings, special arrangements will be made by Consultant. Similarly treat wells, cesspools, pits, etc. if encountered.

.11 After completion of excavation and prior to placing concrete or fill, notify inspection engineer so they may make inspection of exposed bearing surfaces. In event founding levels are subjected to rain or other moisture after inspection and approval but prior to installation of concrete, notify inspection engineer to re-examine all exposed bearing surfaces. Do not place concrete until re-examination has taken place and approval given.

.12 Provide protection to keep surface against which concrete or fill is to be placed free of frost. Thaw frozen surfaces against which concrete or fill is to be placed to unfrozen depth. Remove thawed softened material to firm base at no extra cost to Owner.

.13 Excavate for footings to firm, undisturbed subsoil capable of safely supporting respective soil bearing values shown.

.14 Should nature of subsoil at depths shown prove to be unsatisfactory for placing of structural work thereon, then upon Consultant's written order, excavate to greater depth until satisfactory bottom is reached. Payment for such additional excavation and backfill will be on basis of contract unit prices.

.15 If excavations reveal seepage zones, springs or other unexpected subsurface conditions which may necessitate revisions or additions to any drainage system, inform Consultant immediately for remedial action.

.16 Excavated surfaces scheduled to receive concrete skim slabs shall be protected from excessive traffic and other disturbances and shall not be left exposed for extended periods of time. Coordinate work with Section 03 30 00 to allow for immediate installation of skim slabs.

3.3 TRENCH EXCAVATING

.1 Excavate with suitable machinery or by hand as may be necessary to depths and dimensions shown or required.

.2 Cut and trim sides of trenches evenly and as near vertical as possible, shore as required to prevent cave-ins.

.3 Keep bottoms of trenches clean and clear of loose material. Slope or grade as required. Hand trim at least last 4" of trench excavations to ensure minimum disturbance to load bearing value of trench bottoms.

3.4 BACKFILLING

.1 Proceed promptly with backfilling as building progresses and work to be backfilled has been inspected and approval to backfill obtained. Place backfill in 8" thick maximum layers. Compact each layer before placing next. Maintain optimum moisture content to achieve required densities.

.2 Backfill evenly on both sides of foundation walls to avoid unequal fill pressures on walls.

.3 Fill over-excavations under bearing surfaces and footings, or within pyramid enclosed by 7 in 10 slope from bearing surface with concrete of same strength as specified for footings. Fill over-excavation under all other areas with approved sand/gravel mixture and compact as directed. Fill over excavation at no additional cost to Owner.

.4 Withdraw shoring material during backfill.

.5 Place fill around foundation walls to that footings will have a minimum 5'-0" coverage, measured at 45 deg angle from bottom of footing to protect against frost until final grading is complete.

.6 Compaction equipment to be of size and type to permit required compaction without causing lateral forces resulting in displacement of foundation walls. Exercise caution in this regard to avoid movement of foundations.

.7 Backfill and fill shall not be placed over debris, organic matter, snow, ice or frozen ground. Fill shall not be placed at ambient air temperatures below 0EC without approval.

.8 Take care to avoid damage to waterproofing or displacement of waterlines, drains, conduit and other underground installations.

.9 Prior to placing fill for concrete floor slabs on earth, consolidate subgrade to obtain same compaction specified for fill material.

.10 Compact soil materials to not less than the following percentages of maximum dry unit weight in accordance with ASTM D 698.

Location	Fill Material	Max. Lift Thickness	Minimum Compaction
Under exterior slabs-on-grade	25 mm Crushed Gravel	6”	95%
Against exterior side of foundations	Native satisfactory clay, or imported clay suitable for backfill, to a minimum of 600 mm below rough grade.	6” lifts	100%
	Native satisfactory clay, or imported clay suitable for backfill.	6” lifts to 24” total	95%
Under paved areas	Native clay, or imported clay suitable for backfill to bring subgrade to sub-base level of road way, minimum 400 mm below final grade.	6”	100%
Under landscape areas	Native clay, or imported clay suitable for backfill, to a minimum 200 mm below final grade.	8”	95%
Other locations	Native clay, or imported clay suitable for backfill.	8”	98%

.11 Coordinate with Work of other Sections for the lines and levels of uncompacted subgrade required by those Sections.

.12 Compact with mechanical tampers, areas adjoining vulnerable building components which cannot be thoroughly compacted by drawn equipment.

.13 Install Granular 'A' where required, as recommended by Geotechnical Investigation Report.

3.5 TESTING

.1 Sequentially test each stage of backfill commencing at founding elevations and continuing through installation of subsequent lifts or material and compaction thereof.

.2 Do not proceed with installation of any material until preceding surface or layer meets design criteria. Owner will engage and pay for independent testing agency to conduct testing in addition to tests noted in paragraph above.

3.6 COMPACTION

.1 Density of fill in place shall be in accordance with latest revision of ASTM D698-91, 98% Standard Proctor Density for all fill unless specifically noted otherwise. Fill to underside of asphalt base - 98% Standard Proctor Density.

.2 Maintain optimum moisture content during backfill and fill compaction to achieve required density. Deposit in layers of such thickness that equipment being used for compacting can produce specified density.

.3 Puddling or flooding with water for consolidating granular fill will not be permitted. Addition of water is limited only to extent required to provide optimum moisture level of fill material.

.4 During and immediately after levelling, thoroughly compact each layer of fill by use of compaction equipment of size and type to permit required compaction without causing lateral forces resulting in displacement of foundation walls. Exercise caution in this regard to avoid movement of foundations.

.5 After a period adequate to reveal settlement has passed, place additional fill and compact in all depressions. Make good any subsequent settlement without extra cost to Owner.

3.7 WATER ON PREPARED SURFACES

.1 Promptly remove by approved methods, water rising from seeping or resulting from rainfall wherever such water is on surface of subgrade soil and compacted fill.

.2 Where proper drainage and pumping is not carried out as specified herein and any prepared subgrade soil under structural work, and any compacted fill under concrete slabs is softened or disturbed by water due to improper drainage and pumping, Contractor under this Section shall (A) without extra cost to Owner, remove unsatisfactory soil and fill; and (B) bear all incidental costs in connection with additional excavation, backfilling and structural work for footings and foundations, and additional excavation and placing and compacting of granular fill under concrete slab base course.

3.8 ROUGH GRADING

.1 Rough grade to profiles shown on required levels to allow installation of follow-up materials to produce final grades at levels indicated. Rough grade surface to be suitable to accept follow-up sections work.

3.9 DISPOSAL OF DEBRIS AND SURPLUS MATERIAL

.1 Remove from site and legally dispose of all rubbish, rocks and surplus materials resulting from site stripping, excavation and grading work.

.2 Vehicles employed in the cartage of this material shall not be loaded beyond the rated limits, nor in such a manner as to cause spillage. Any spillage or tire tracking occurring upon public property or upon the property of others, shall not be allowed to remain to become a hazard and a nuisance but shall be cleaned up immediately.

.3 Break rock, concrete and unit masonry into pieces not exceeding 24" in any dimension.

END OF SECTION

1 General

1.1 SUMMARY

.1 Supply and install chain link fencing, complete with swing gates, as indicated in this Section.

1.2 RELATED REQUIREMENTS

.1 Section 03 30 00: Cast-in-Place Concrete

1.3 QUALITY ASSURANCE

.1 Qualifications:

.1 Manufacturer and tradesmen executing the work of this Section shall have had a minimum five (5) years continuous Canadian experience in successful manufacture and installation of work of type and quality shown and specified. Submit proof of experience upon Consultant's request.

.2 Erection of chain link fencing and gates shall be by workers especially trained and experienced in this type of work. Have a senior, qualified representative at the job site to direct the work of this Section at all times.

1.4 SUBMITTALS

.1 Submit submittals in accordance with Section 01 33 00.

.2 Shop Drawings:

.1 Submit fully dimensional shop drawings to Consultant showing construction, assembly, elevations, sections and interfacing with work of other Sections.

.2 No work of this Section shall be fabricated until shop drawings and all other related submittals, documentation, certifications and samples as required by this Section, have been reviewed by Consultant.

.3 Details shall indicate metal thicknesses, fasteners and welds, all anchorage assemblies and components and erection details.

.3 Samples:

.1 Submit to Consultant for approval, samples of materials and components to be used in the systems, prior to fabrication of work together with name of manufacturer and technical literature. Submit 12" x 12" samples of chain link fence fabric in colour as selected by the Consultant.

2 Products

2.1 APPROVED MANUFACTURERS

.1 Subject to compliance with specifications, use products of one of the following:

.1 McGowan Fence and Supply Ltd., or;

.2 Lundy Fence, Division of IVACO Inc., or;

.3 Peel Fence Systems Inc., or;

.4 Approved equal.

2.2 MATERIALS

.1 Steel Pipe: Conforming to CAN/CGSB-138.2-M80.

.2 Fabric: No.9 gauge (0.148" nominal) ultra violet light resistant, P.V.C. coated, galvanized steel wire in 2" mesh, with both top and bottom selvages twisted and barbed, conforming to CAN/CGSB-138.1-M80.

.3 End, Corner, and Pull Posts: Galvanized steel, minimum sizes and weights as follows;

.1 Up to 6'-0" Fabric Height: 2.375" outside diameter pipe, 3.65 lbs/lin. ft.

.2 Over 6'-0" Fabric Height: 2.875" outside diameter pipe, 5.79 lbs/lin. ft.

.4 Line Posts: Galvanized steel, minimum sizes and weights as follows;

.1 Up to 6'-0" Fabric Height: 1.90" outside diameter pipe, 2.70 lbs/lin. ft.

.2 Over 6'-0" to 8'-0" Fabric Height: 2.375" outside diameter pipe, 3.65 lbs/lin. ft.

.3 Over 8'-0" Fabric Height: 2.875" outside diameter pipe, 5.79 lbs/lin. ft.

.5 Gate Posts: Galvanized steel, for single gate or double leaf gate as follows;

.1 Up to 6'-0" Fabric Height: 2.875" outside pipe diameter, 5.79 lbs/lin. ft.

.2 Over 6'-0" Fabric Height: 4" outside diameter pipe, 9.11 lbs/lin. ft.

.6 Top Rail and Intermediate Rails: Galvanized steel, manufacturer's longest lengths as follows:

.1 Typical: 1.66" outside diameter pipe, 2.27 lbs/lin. ft.

.2 Couplings: Expansion type, approximately 6" long.

.3 Attaching Devices: Means of attaching top rail securely to each gate, corner, pull, and end post.

.7 Sleeves: Galvanized steel pipe with inside diameter not less than 1/2" greater than outside diameter of pipe. Provide steel plate closure welded to bottom of sleeves of width and length not less than 1" greater than outside diameter of sleeve as follows;

.1 Up to 6'-0" Fabric Height: Provide sleeve not less than 12" long.

.2 Over 6'-0" Fabric Height: Provide sleeve not less than 24" long.

.8 Tension Wire: Minimum No.7 gauge galvanized steel, coated coil spring wire, located at bottom of fence fabric.

.9 Wire Ties: Minimum No.11 gauge galvanized steel.

.10 Post Brace Assembly: Manufacturer's standard adjustable brace at end posts and at both sides of corner and pull posts, with horizontal brace located at mid-height of fabric. Use same materials as top rail for brace, and truss to line posts with 0.375" diameter rod and adjustable tightener.

.11 Post Tops: Galvanized steel, weather tight closure cap for tubular posts, one cap for each post. Furnish cap with openings to permit passage of top rail.

.12 Stretcher Bars: Galvanized steel, one piece lengths equal to full height of fabrics with minimum cross section of 3/16" x 3/4" inch. Provide one stretcher bar for each gate and end post, and two for each corner and pull post.

.13 Stretcher Bar Bands: Manufacturer's standard.

.14 Gate Hardware:

.1 Swinging Gate Hardware:

.1 Hinges: Offset type hinges to permit 180E gate opening. Provide 1-1/2 pair of hinges for each gate leaf over 6'-0" height.

.2 Latches: Forked or plunger bar type to permit operation from both sides of gate, with padlock eye.

.15 Gate Cross-Bracing: 3/8" diameter galvanized steel adjustable length truss rods.

2.3 SETTING GROUT

.1 Concrete: Minimum 20 MPa. Refer to Section 03 30 00.

.2 Grout: Premixed, factory-packaged, non-staining, non-corrosive grout. Refer to Section 03 30 00. Provide type especially formulated for exterior application.

2.4 FINISHES

.1 Galvanize as follows:

.1 Fabric: Not less than 1.2 oz zinc/sq ft.

.2 Framing: Not less than 1.8 oz zinc/sq ft.

2.5 FABRICATION

.1 Fabricate swing gate perimeter frames of 1.90" outside diameter galvanized steel pipe. Provide horizontal and vertical members to ensure proper gate operation and for attachment of fabric, hardware, and accessories. Gates shall conform to CAN/CGSB-138.4-M82. Space frame members maximum 8'-0" apart.

.2 Assemble gate frames rigidly by welding or with special fittings and rivets. Use same fabric as specified for fence. Install fabric with stretcher bars at vertical edges. Bars may also be used at top and bottom edges. Attach stretchers to frame at 12" O.C. Install diagonal cross-bracing on gates as required to ensure frame rigidity without sag or twist.

.3 Attach hardware to provide security against removal or breakage.

.4 Fabricate swing gates, double gates and sliding gates as indicated on drawings.

3 Execution

3.1 INSTALLATION

.1 Install chain link fencing in strict accordance with CAN/CGSB-138.3-M80 and as specified herein.

.2 Space line posts at 10'-0" O.C. maximum.

.3 Methods for Setting Posts:

.1 Grade-Set Posts: Drill holes for post with auger or hand excavate. Excavate each post hole to minimum 12" diameter, or not less than 4 times the post diameter. Excavate to 4" below bottom of post. Set bottoms of posts 6" below "frost line". Hold, brace posts plumb, level while placing, consolidating and finishing concrete.

.4 Intermediate Rails: Provide centre rails where indicated. Install in one piece between posts and flush with post on fabric side, using offset fittings where necessary.

.5 Brace Assemblies: Install braces so posts are plumb with rod in tension.

.6 Tension Wire: Install tension wires through post cap loops before stretching fabric and tie to each post cap with minimum No.6 gauge galvanized wire. Fasten fabric to tension wire using No.11 gauge galvanized steel hog rings at 24" O.C.

.7 Fabric: Leave approximately 2" between finish grade and bottom selvage. Pull fabric taut and tie to posts, rails, and tension wires. Install fabric on security side of fence, and anchor to framework so fabric remains in tension after pulling force is released.

.8 Stretcher Bars: To secure end, and pull posts, thread through or clamp to fabric 4" O.C. and secure to posts with metal bands spaced on 12" O.C.

.9 Tie Wires:

.1 Use U-shaped wire conforming with diameter of pipe to which attached, clasping pipe and fabric firmly with ends twisted two full turns. Bend wire ends to minimize hazards to persons or clothing.

.2 Tie fabric to line posts with wire ties spaced 12" O.C. Tie fabric to rails and braces with wire ties spaced 24" O.C. Manufacturer's standard procedure will be accepted if of equal strength and durability.

.10 Fasteners: Install nuts for tension bands and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

.11 Install swing gates plumb, level and secure for full openings, without interference. Set all ground set hardware in concrete for secure anchorage. Adjust and lubricate all gate hardware for smooth and efficient operation.

END OF SECTION

1 General

1.1 SUMMARY

.1 This section includes requirements for supply and installation of perimeter foundation and under-slab drainage system consisting of fabric wrapped perforated drainage materials, non-perforated leads and drainage trench required for the following:

.1 Foundations.

.2 Underslab Areas.

1.2 RELATED REQUIREMENTS

.1 Section 07 11 13: Bituminous Dampproofing

.2 Section 31 23 33: Excavation, Trenching and Backfilling

1.3 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Action Submittals:

.1 Samples: Submit samples of materials to Consultant for review and acceptance as follows:

.1 Drainage Pipe: Provide a 305mm (12”) length of perforated and non-perforated pipe and end connection.

.2 Drainage Composite: Provide 406mm x 406mm (16” x 16”) length of each type of composite drainage panel specified.

.3 Filter Fabric: Provide 406mm x 406mm (16” x 16”) filter cloth sample for review and acceptance.

.2 Data Sheets: Manufacturer's descriptive literature and recommended method of installation.

.3 Certificates: Manufacturer's certificates attesting that products meet specification requirements.

.3 Informational Submittals:

.1 Certificates:

.1 Submit manufacturer's test data and certification that drainage materials meet project requirements a minimum of two (2) weeks before beginning work of this Section.

.2 Submit proposed source of granular bedding and filter materials a minimum of two (2) weeks before beginning work of this Section, indicate gradation and certification of expected flow rate of granular materials.

.2 Product Data: Submit manufacturer’s product literature for each product listed including manufacturer’s recommended installation procedures and any modifications required to suit installation conditions.

1.4 QUALITY ASSURANCE

.1 Contractor executing work of this Section shall employ installers having a minimum of five (5) years continuous Canadian experience in successful installation of work of type and quality shown and specified. Submit proof of experience upon Consultant's request.

.2 The underslab drainage system shall be inspected by the Consultant prior to backfilling work.

1.5 STORAGE, DELIVERY, HANDLING AND PROTECTION

.1 Deliver materials on manufacturer's original skids, or in original unopened protective packing.

.2 Protect materials during transportation, storage and installation to avoid physical damage.

2 Products

2.1 PIPING MATERIALS

.1 Drainage Piping:

.1 Perforated P.V.C. pipe conforming to CAN/CSA B1800-11, diameter indicated on the drawings. Diameters up to and including 150mm (6") shall be DWV pipe, Schedule 40. Diameters greater than 150mm (6") shall be DWV pipe, Series 100.

.2 Perforations shall be 13mm (1/2") diameter holes spaced at 150mm (6") on centre along the length of the pipe and alternating at 60 deg each side of the vertical centerline.

.3 Drainage system shall be complete with pipe couplings, 45 deg "wye" fittings, floor cleanouts, and necessary material for complete assembly of the drainage system.

.2 Cast Iron Piping: Cast iron pipe and fittings in accordance with CAN/CSA B70-12, size to accommodate drainage piping.

.3 Filter Cloth Membrane:

.1 Woven polypropylene geotextile, needle punched, filter cloth membrane. Basis of Design Product: Lotrak 1800 Series by Don & Low Limited, and distributed by Eco Minded Innovations (EMI); Contact: Richard Shanks, 416-882-1245.

.4 Cast Iron Cleanouts: Cast iron cleanout having round flanged couplings, cast iron housing; secured, medium duty loading class, cast iron cover; and cast iron ferrule and countersunk, brass cleanout plug.

.5 Sand: Clean, inorganic well graded natural concrete sand conforming to CAN/CSA-A23.1-09/A23.2-09.

.6 Gravel: Free from loam, or other deleterious materials with maximum particle size of 50mm (1") and maximum 5% passing No. 200 sieve.

.7 Accessories: Drainage piping couplings (for pipe that does not have bell connectors), end caps, and access covers, all as required for complete system.

2.2 WEEPING TILE COVER MATERIALS

.1 Geotextile Cloth: Polypropylene fibre, polyester fibre, or combination of both geotextile cloth having an nominal flow rate of 4,480 to 13,440 L/min/m^2 in accordance with ASTM D4491; non-woven, needle-punched continuous filament or woven, monofilament or multifilament and as follows:

.1 Trench Wrap: Flat material, width sufficient to wrap trench and overlap a minimum of 150mm (6").

.2 Pipe Wrap: Sock material, diameter sufficient to wrap drainage.

.2 Coarse Gravel: Gravel surrounding perforated drainage piping having the following nominal dimensions:

Sieve Size	Percent Passing
50mm (2”)	100
38mm (1-1/2”)	90 - 100
28mm (1-1/8”)	25 - 60
19mm (¾”)	0 - 15
10 mm (3/8”)	0 - 5

3 Execution

3.1 INSPECTION

.1 Check graded subgrade for conformity with elevations and cross-sections before placing drainage material.

.2 Check for unstable areas and areas requiring additional compaction.

.3 Notify Consultant of unsatisfactory surfaces and conditions.

.4 Do not begin installation of drainage material until deficiencies have been corrected.

3.2 INSTALLATION – FOUNDATION AND UNDERSLAB DRAIN PIPING

.1 Cut and excavate trenches receiving drainage piping to locations and levels to provide proper slope to outlets; dig trench having a minimum of 100mm (4") clearance on each side of drainage piping.

.2 Excavate for underslab drainage system after subgrade material has been compacted; prior to before drainage course has been placed; dig trench having minimum of 6" clearance on each side of drainage piping.

.3 Grade bottom of trench for correct drainage and lay filter cloth and place coarse gravel bed to pipe base elevation

.4 Join pipe with proper fittings and couplings to provide a tightly-fitted system, and as follows:

.1 Cap ends of lines and install cleanouts as indicated.

.2 Cleanouts are to be accessible from the surface and have a cover mounted flush with the floor.

.3 Install one cleanout for every 22860mm (75') of drainage piping where cleanouts are not indicated.

.4 Verify cleanout locations with Consultant on site; move as directed by Consultant.

.5 Place plugs in ends of uncompleted pipe at end of each day or when work stops.

.5 Place remainder of coarse gravel and wrap gravel with filter cloth.

3.3 BACKFILLING

.1 Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

.2 Verify installed drainage piping is fully functional and connected to storm drainage system; correct any deficiencies before starting backfilling operations.

.3 Place coarse gravel fill over and around non-perforated pipe to nominal compacted depth of 305mm (12") over pipe.

.4 Place remainder of fill in accordance with Section 31 23 33 for the specific location.

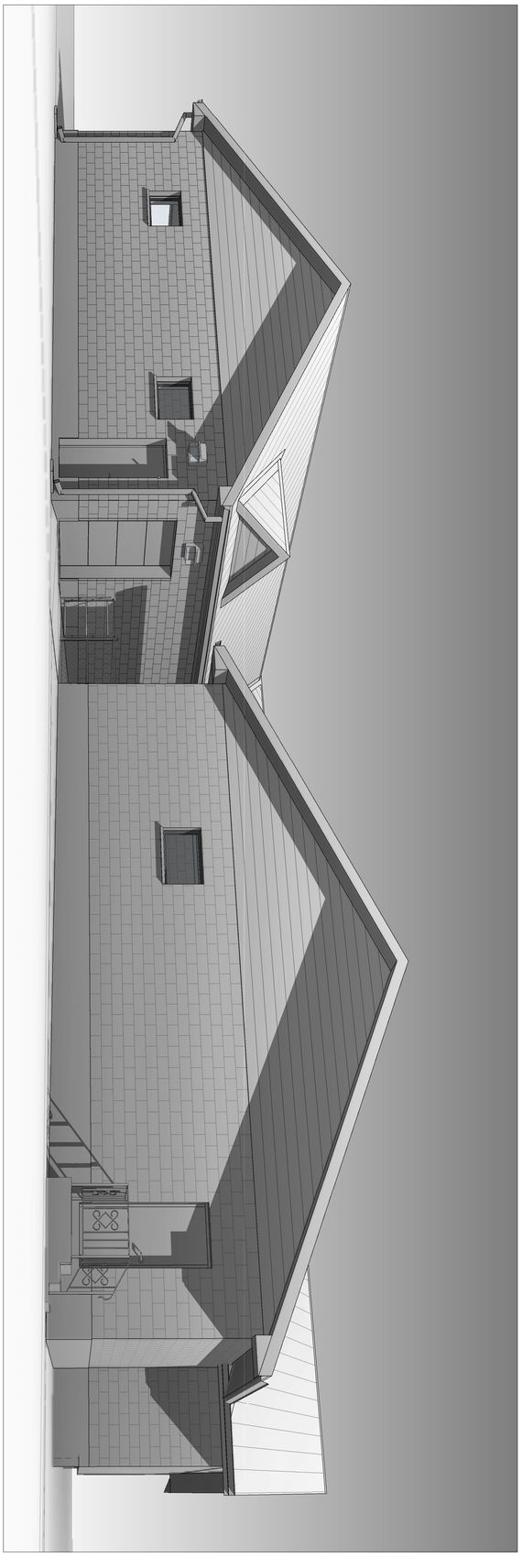
.5 Before placing concrete for slabs on grade, water compacted base; do not use polyethylene. Place interior slabs on premoulded vapour retarder membrane, installed in accordance with manufacturer's written instructions.

.1 Overlap sheet membrane seams 150mm (6") and tape using manufacturer's recommended 100mm (4") seam tape. Tape membrane edge to foundation wall to prevent membrane from moving and ensuring a continuous underslab vapour retarder.

3.4 PROTECTION

.1 Take extreme care during trenching operations, installation of drainage piping and backfilling not to damage or displace other utilities.

END OF SECTION



TOWNSHIP OF UXBRIDGE

GOODWOOD COMMUNITY CENTRE ADDITION

268 HIGHWAY 47, GOODWOOD, ONTARIO

ISSUED FOR CLIENT REVIEW 05/04/2018

AECOM

60240627

ASSEMBLIES

WALLS:

EW1

EXTERIOR WALL
- 190mm CMU
- 50mm THICK RIGID INSULATION (TAPE & SEAL ALL JOINTS)
- 38x89mm STUDS @ 406mm. FILL BETWEEN STUDS WITH 89mm THICK BATT INSULATION
- AIR/VAPOUR BARRIER
- 16mm ABUSE RESISTANT GYPSUM BOARD (PAINT)

GABLE SIDE (TOP HALF OF WALL)
- VINYL SIDING
- WEATHER BARRIER
- EXTERIOR GRADE T&G 12mm PLYWOOD
- PRE-ENGINEERED WOOD TRUSS (SEE STRUCT.)

M190

CMU WALL
- PAINT FINISH
- 190mm CMU
- HEIGHT TO U/S OF TRUSS (ALLOW FOR DEFLECTION)

FLOORS:

F1

GROUND FLOOR CONSTRUCTION:
- FLOOR FINISH, SEE SCHEDULES
- 125mm CONC. FLOOR SLAB (SEE STRUCT. DWGS. FOR MESH, REINF, GRANULARS)

ROOFS:

R1

ROOF CONSTRUCTION:
- 28 GA. STANDING SEAM METAL ROOF (MATCH EXISTING)
- ROOF UNDERLAYMENT
- MEMBRANE EAVE PROTECTION (300mm MIN. BEYOND INSIDE FACE OF EXTERIOR WALL & 915mm WIDE MIN. @ ROOF VALLEYS)
- 12mm EXT. GRADE PLYWOOD SHEATHING C/W H-CLIPS
- 38 x 89mm WOOD PURLINS @ 610mm MAX. O.C.
- PRE-ENGINEERED TRUSSES @ 610mm O/C (MAX.) (SEE STRUCT.)
- R60 (MIN.) BATT INSULATION
- 6 mil. POLYETHYLENE (AIR & VAPOUR BARRIER)
- (x2) LAYERS 16mm THICK GYPSUM BOARD FASTENED DIRECTLY TO TRUSSES

GENERAL NOTES:

CONTRACTOR TO MAKE GOOD ALL FINISHES DISTURBED TO INSTALL ALL COMPONENTS UNDER THIS CONTRACT. REFER TO ARCH., STRUCT., & ELECTRICAL DRAWINGS.

PROVIDE TEMPORARY HOARDING & DUST SCREENS AS REQUIRED TO COMPLETE WORK. MAINTAIN FIRE EXITS WHERE REQUIRED.

CONTRACTOR TO ENSURE CONTINUITY OF VAPOUR BARRIER AND ANY HOLES OCCURRING THRU SUCH CEILING-WALL VAPOUR BARRIERS FOR WIRES, PIPES, DUCTWORK, OR ELECTRICAL BOXES. VAPOUR BARRIER MUST BE TIGHTLY SEALED WITH TAPE, CAULKING OR OTHER SUITABLE MATERIAL. CONSULTANT TO REVIEW PRIOR TO INSTALLATION OF CEILING OR WALLBOARD.

FIRE STOPPING OF SERVICE PENETRATIONS - PIPING, TUBING, DUCTS, WIRING, CONDUIT, ELECTRICAL OUTLET BOXES THAT PENETRATE FIRE SEPARATIONS SHALL BE TIGHTLY FITTED AND SEALED WITH MINERAL WOOL, GYPSUM PLASTER OR PORTLAND CEMENT MATERIAL. CONSULTANT TO REVIEW PRIOR TO INSTALLATION OF CEILING OR WALLBOARD.

PROVIDE LATERAL SUPPORT & DEFLECTION AT TOP OF ALL NEW NON-LOAD BEARING MASONRY PARTITIONS.

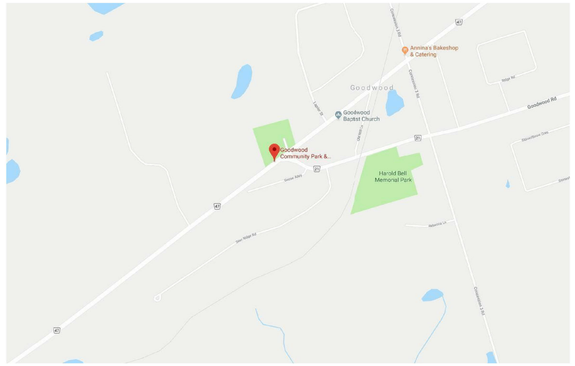
REMOVE & RESTORE OR REPLACE ALL CEILINGS (ONLY AS REQ'D) AFFECTED BY ACCESS TO SERVICES.

ALLOW FOR PREPARATION OF SUBSTRATE SUITABLE FOR INSTALLATION OF NEW FINISHES AS PER MANUFACTURERS REQUIREMENTS.

PROVIDE TEMPORARY 1.8m HIGH CONST.FENCE IF ANY OUTSIDE LAYDOWN AREA IS REQUIRED AS AGREED WITH CLIENT.

CONTRACTOR SHALL MAKE GOOD ANY DAMAGE TO EXISTING PAVED AREAS, CURBS, WALKWAYS AND OTHER SITE FEATURES DISTURBED OR DAMAGED BY THE WORK.

LOCATION PLAN



DRAWING INDEX

Name of Practice:
AECOM Canada ARCHITECTS LTD.
300 Water Street,
Whitby, ON L1N 9J2

Name of Project:
GOODWOOD COMMUNITY CENTRE ADDITION

Location:
268 HIGHWAY 47, GOODWOOD, ONTARIO

Item	Ontario Building Code Data Matrix Parts 3 or 9		Building Code Reference (Div B unless noted [A] for Div A or [C] for Div C)	
1	Project Description: ☐ New X Addition ☐ Alteration ☐ Change of Use	☐ Part 11 11.1 to 11.4	X Part 3 1.1.2. [A]	☐ Part 9 1.1.2. [A] & 9.10.1.3.
2	Major Occupancy(s) GROUP A, DIVISION 2		3.1.2.1.(1)	9.10.2.
3	Building Area (m²) Existing __485__ New _93_ Total _578		1.4.1.2. [A]	1.4.1.2. [A]
4	Gross Area Existing __485___ New 93 Total _578		1.4.1.2. [A]	1.4.1.2. [A]
5	Number of Storeys Above grade __1__ Below grade _____		1.4.1.2. [A]&3.2.1.1.	1.4.1.2[A] & 9.10.4
6	Number of Streets/Fire Fighter Access _____1_____		3.2.2.10. & 3.2.5.	9.10.20.
7	Building Classification ___3.2.2.25. ____		3.2.2.20.-.83	9.10.2.
8	Sprinkler System Proposed ☐ entire building ☐ selected compartments ☐ selected floor areas ☐ basement ☐ in lieu of roof rating X not required		3.2.2.20.-.83 3.2.1.5. 3.2.2.17. INDEX	9.10.8.2. INDEX
9	Standpipe required ☐ Yes X No		3.2.9.	N/A
10	Fire Alarm required ☐ Yes X No		3.2.4.	9.10.18.
11	Water Service/Supply is Adequate X Yes ☐No		3.2.5.7.	N/A
12	High Building ☐ Yes X No		3.2.6.	N/A
13	Construction Restrictions ☐ Combustible permitted ☐ Non-combustible required X Both Actual Construction X Combustible ☐ Non-combustible ☐ Both		3.2.2.20.-.83	9.10.6.
14	Importance Category X Low ☐ Med ☐ High ☐ Post-disaster		4.1.2.1.(3) 5.2.2.1.(2)	9.4.1.1. 4.1.2.1.(3) 5.2.2.1.(2)
	Site Class (A,B,C,D,E from Geotechnical Report) REFER TO GEOTECH. REPORT		4.1.8.4.	4.1.8.4.
	Earthquake importance factor (I_E) ____		T.4.1.8.5.	T.4.1.8.5.
	Acceleration based coefficient (Fa) _____		T.4.1.8.4.B	T.4.1.8.4.B
	5% Spectral Response Acceleration Sa (0.2) _____		4.1.8.4.(1) & SB-1, T.1.2.	4.1.8.4.(1) & SB-1, T.1.2.
	Seismic Hazard Index I_E Fa Sa (0.2) = _____		4.1.8.18.(1)	4.1.8.18.(1)
	Design for Seismic Required for Categories 6 to 21. Table 4.1.1.18. (Equal or Above 0.35?) (Yes or No) _____		4.1.8.18.(2)	4.1.8.18.(2), 9.20.1.2., 9.31.6.2.(3)
15	Mezzanine(s) Area m² _____N/A_____		3.2.1.1.(3)-(8)	9.10.4.1.

Building Code Data Matrix, Parts 3 or 9 July 2016
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16	Occupant load based on Basement: 1st Floor 2nd Floor 3rd Floor	☐ m²/person Occupancy _____ Occupancy _A2_____ Occupancy _____ Occupancy _____	X design of building Load _____ persons Load __149___ persons Load _____ persons Load _____ persons	3.1.17.	9.9.1.3.
17	Barrier-free Design	X Yes ☐ No (Explain) _____		3.8.	9.5.2.
18	Hazardous Substances	☐ Yes X No		3.3.1.2. & 3.3.1.19.	9.10.1.3.(4)
19	Required Fire Resistance Rating (FRR)	Horizontal Assemblies FRR (Hours)	Listed Design No. or Description (SG-2)	3.2.2.20.-.83 & 3.2.1.4.	9.10.8. 9.10.9.
		Floors ___3/4 ___ Hours			
		Roof _____3/4 ___Hours			
		Mezzanine __N/A____ Hours			
		FRR of Supporting Members	Listed Design No. Or Description (SG-2)		
		Floors ____3/4___ Hours			
		Roof _____3/4___ Hours			
		Mezzanine __N/A__ Hours			

20 Spatial Separation – Construction of Exterior Walls — 3.2.3. — 9.10.14.

Wall	Area of EBF (m²)	L.D. (m)	L/H or H/L	Permitted Max. % of Openings	Proposed % of Openings	FRR (Hours)	Listed Design or Description	Comb Const	Comb. Constr. Nonc. Cladding	Non-comb. Constr.
North	N/A									
South	N/A									
East	N/A									
West	N/A									

21 Plumbing Fixture Requirements

N/A: EXISTING FIXTURES TO REMAIN & NO CHANGE TO OCCUPANT LOAD.

Male/Female Count @ _____% / _____%, except as noted otherwise

	Occupant Load	BC Table Number	Fixtures Required	Fixtures Provided	Building Code Reference ☐ Part 3	☐ Part 9
Basement: Occupancy _____						
Occupancy _____						
1st Floor: Occupancy _____						
Occupancy _____						
2nd Floor: Occupancy _____						
Occupancy _____						
3rd Floor: Occupancy _____						
Occupancy _____						
(Adjust as Required for Additional Floors or Occupancies)						

Building Code Data Matrix, Parts 3 or 9 July 2016
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AECOM

PROJECT

GOODWOOD COMMUNITY CENTRE ADDITION

268 HIGHWAY 47
GOODWOOD, ONTARIO

CLIENT

TOWNSHIP OF UXBRIDGE
51 TORONTO STREET SOUTH
UXBRIDGE, ONTARIO
905-852-9181 tel 905-852-9674 fax
www.town.uxbridge.on.ca

CONSULTANT

AECOM Canada Architects Ltd.
300 Water Street
Whitby, Ontario L1N 9J2
905.668.9363 tel 905.668.0221 fax
www.aecom.com

REGISTRATION

ISSUE/REVISION

I/R	DATE	DESCRIPTION
2	05/04/2018	CLIENT REVIEW
1	04/18/2018	ISSUED FOR PERMIT

KEY PLAN

PROJECT NUMBER

60240627

SHEET TITLE

BUILDING INFORMATION SHEET

SHEET NUMBER

A-101

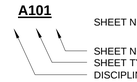
Last Plotted: 5/4/2018 1:47:38 PM
Filename: P:\60240627\900-CAD_GIS\930-BIM\3D-Models\08-A\60240627_ToUXBRIDGE_A17_GOODWOOD.rvt

ARCHITECTURAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
#	POUND OR NUMBER
&	AND
@	AT
A	
A/E	ARCHITECT / ENGINEER
AAP	ALARM ANNUNCIATOR PANEL
AB	ANCHOR BOLT
ABV	ABOVE
AC	AIR CONDITIONER / CONDITIONING
ACCS	ACCESSORIES
ACSDR	ACCESS DOOR
ACSFLR OR ACFL	ACCESS FLOOR
ACOUS	ACOUSTICAL
ACP	ACOUSTICAL CEILING PANEL
ACS	ACCESSIBLE
ACT	ACOUSTICAL CEILING TILE
AD	AREA DRAIN
ADA	AMERICANS WITH DISABILITY ACT
ADDL	ADDITIONAL
ADD	ADDENDUM
ADJ	ADJUSTABLE
ADJ	ADJACENT
ADMIN	ADMINISTRATION
AFC	ABOVE FINISH COUNTER
AFD	ACCORDIAN FOLDING DOOR
AFF	ABOVE FINISH FLOOR
AFFD	ACCORDIAN FOLDING FIRE DOOR
AFG	ABOVE FINISH GRADE
AGD	ALL GLASS DOOR
AGGR	AGGREGATE
AGW	ALL GLASS WINDOW / WALL
AHR	ANCHOR
AHU	AIR HANDELING UNIT
AIA	AMERICAN INSTITUTE OF ARCHITECTS
ALM	ALARM
ALMNT	ALIGNMENT
ALT	ALTERNATE
AL OR ALUM	ALUMINUM
AMEND	AMENDMENT
ANOD	ANODIZED
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ANUN	ANNUNCIATOR
AP	ACCESS PANEL
APC	ARCHITECTURAL PRECAST CONCRETE
APPVD	APPROVED
APROX	APPROXIMATE
AR	APRON RACK
ARCH	ARCHITECT / ARCHITECTURAL
AS	ADJUSTABLE SHELVES
ASPH	ASPHALT
ASST	ASSISTANT
ASSY	ASSEMBLY
ASTM	AMERICAN SOCIETY FOR TESTING MATERIALS
AUTO	AUTOMATIC
AV	AUDIO VISUAL / AUDIO VIDEO
AVG	AVERAGE
AWP	ACOUSTIC WALL PANEL
B	
B	BLANK
BA	BUILDING ACCESSORY
BA	BATH ACCESSORY
BC	BRICK COURSES
BD	BOARD
BFE	BOTTOM FOOTING ELEVATION
BIM	BUILDING INFORMATION MODEL
BITUM	BITUMINOUS
BKG	BACKING
BKT	BRACKET
BLGD	BUILDING
BL	BLACK
BLK	BLOCK
BLKG	BLOCKING
BLT	BORROWED LIGHT
BLW	BELOW
BM	BEAM
BMS	BALANCED MAGNETIC SWITCH
BMS	BUILDING MANAGEMENT / MAINTANCE SYSTEM
BO	BY OWNER
BOLL	BOLLARD
BOS	BOTTOM OF STEEL
BOT	BOTTOM
BR	BRICK
BRG	BEARING
BRLG	BRICK LEDGE
BRWL	BRICK WALL
BS	BOTH SIDES
BSMT	BASEMENT
BET OR BETW	BETWEEN
817	BULLETIN
BUR	BUILT-UP ROOFING
C	
C	CHANNEL
CAB	CABINET
CANTL	CANTILEVER
CAP	CAPACITY
CAS	CASEWORK
CAT	CATEGORY
CATV	CABLE ACCESSED TELEVISION
CB	CATCH BASIN
CC	CUBICLE CURTAIN
CCD	COILING COUNTER DOOR
818	CONSTRUCTION CHANGE DIRECTIVE
CCT	CUBICLE CURTAIN TRACK
CCTV	CLOSED CIRCUIT TELEVISION
CD	COILING DOOR
CDISP	CUP DISPENSER
CEM	CEMENT
CER	CERAMIC
CF	CUBIC FOOT
816	CUBIC FEET PER MINUTE
CG	CORNER GUARD
CGR	COILING GRILLE
CH	COAT HOOK / CLOTHES HOOK
CHEM	CHEMISTRY
CHAM	CHAMFER
CHR	CHAIR RAIL
CI	CAST IRON
CI	CONTRACTOR INSTALLED
CIP	CAST IN PLACE
CJ OR CJT	CONTROL JOINT
CHBD	CHALK BOARD
CL	CENTER LINE
CLS	CLASS
CLG	CEILING
CLO	CLOSET
CLR	CLEAR
CM	CONSTRUCTION MANAGER
CMU	CONCRETE MASONRY UNIT
CO	CLEAN / CLEAR OUT
CO	CASED OPENING
COL	COLUMN
COMB	COMBINATION/-ED
COMM	COMMUNICATION
CONC	CONCRETE
CONF	CONFERENCE
CONN	CONNECT/-ED/-ION
CONST	CONSTRUCTION
CONT	CONTINUE / CONTINUOUS
CONTR	CONTRACT / CONTRACTOR
CORD	COORDINATE
CORR	CORRIDOR
CPT	CARPET
CPTB	CARPET BASE
CR	CRASH RAIL
CR	CARDREADER
CRF	CONDUCTIVE RESILIENT FLOORING
CTSK	COUNTERSUNK
CSTN	CAST STONE
CT	CERAMIC TILE
CTB	CERAMIC TILE BASE
CTOP	COUNTERTOP
CTR	CENTER
CUH	CABINET UNIT HEATER
CW	CURTAIN WALL
CW	COLD WATER
CYL	CYLINDER
D	
D	DEPTH / DEEP
815	DOUBLE
DCS	DIAPER CHANGING STATION
DD	DESIGN DEVELOPMENT
DEFS	DIRECT APPLIED EXTERIOR FINISH SYSTEM
DEG	DEGREE
DEMO	DEMOLITION
DEP	DEPRESSION
DEPT	DEPARTMENT
DET	DETAIL / DETAILS
DF	DRINKING FOUNTAIN
DEPS OR DFS	DIRECT APPLIED FINISH SYSTEM
DGL	DECORATIVE GLASS/GLAZING
DIA	DIAMETER
DIAG	DIAGONAL
DIFF	DIFFUSER
DIM	DIMENSION
DIR	DIRECTOR
DISP	DISPENSER
DIST	DISTRIBUTION
DIV	DIVISION
DJT	DUMMY JOINT
DK	DARK
DKRM	DARK ROOM
DLO	DAY LIGHT OPENING
DN	DOWN
DP	DAMP PROOFING
DP	DEMOUNTABLE PARTITION
DP	DATA PROCESSING
DR	DOOR
DRCR OR DCR	DOOR OPERATOR CARD READER
DRHO	DOOR HOLD OPEN
DRLL	DOOR AND FRAME LEAD LINED
DRPP OR DPP	DOOR OPERATOR PUSH PLATE
DRRF	DOOR AND FRAME RF SHIELDING
DS	DOWNSPOUT
811	DRYWALL TRIM or WALL REVEAL TRIM
DW	DUMBWAITER
DW	DISHWASHER
DWG	DRAWING
DWLS	DOWELS
E	
E	EAST
E	EXISTING
EA	EACH
EC	ELECTRIC CABINET
EF	EXHAUST FAN
EF	EACH FREE
EH	EQUIPMENT HOOK
EHD	ELECTRIC HAND DRYER
EIFS	EXTERIOR INSUL AND FINISH SYSTEM
EJ OR EJT	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
EMER OR EMERG	EMERGENCY
ENCL	ENCLOSURE
ENG	ENGINEER
ENTR	ENTRANCE
EO	ELECTRICAL OUTLET
EOD	END OF DECK
EOS	END OF SLAB
EP	EXPLOSION PROOF
EP	ELECTRICAL PANEL
EPX	EPOXY
EQ	EQUAL
EQPT OR EQUIP	EQUIPMENT
ES	END SECTION
EST	ESTIMATE
EWC	ELECTRIC WATER COOLER
EXA	EXHAUST AIR
EXC	EXCAVATE/-RD/-ION
EXH	EXHAUST / EXHAUST HOOD
EXIST	EXISTING
EXP	EXPANSION
EXPD	EXPOSED
EXT	EXTERIOR
F	
FEC (R)	FIRE EXTINGUISHER CABINET (RECESSED)
FEC (SR)	FIRE EXTINGUISHER CABINET (SEMI-RECESSED)
FEW	FIRE EXTINGUISHER, WALL MOUNTED
F	FLUSH
FA	FIRE ALARM
FAA	FIRE ALARM ANNUNCIATOR
FAF	FLUID APPLIED FLOORING
FAST	FASTEN / FASTENER
FB	FIRE BLANKET
FBR	FACE BRICK
FCO	FLOOR CLEAN-OUT
FD	FLOOR DRAIN
FDISP	FOAM / GEL DISPENSER
766	FOAM DISPENSER
FDN OR FND	FOUNDATION
FDV	FIRE DEPARTMENT VALVE
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FFE	FURNITURE, FURNISHINGS AND EQUIPMENT
FFL	FINISH FLOOR LINE
FG	FULL GLASS
FGA	FULL GLASS ALUMINUM
FGL	FIBERGLASS
FGS	FOAM GASKET SEAL
FH	FIRE HOSE
FHC	FIRE HOSE CABINET
FHP	FULL HEIGHT PARTITION
FHV	FIRE HOSE VALVE
FIN	FINISH / FINISHED
FIXT	FIXTURE
788	FLOOR MAT
FLASH	FLASHING
FLEX	FLEXIBLE
FLG	FLANGE
FL	FLOOR
FLUOR	FLUORESCENT
FO	FIBEROPTICS
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUDS
FOW	FACE OF WALL
FP	FIRE PROOFING / FIREPROOF
FPL	FIREPLACE
FRC	FIBER REINFOIRCED CONCRETE
FRGP	FIBER REINFORCED GYPSUM BOARD
FR	FRAME / FRAMING
FRP	FIBERGLASS REINFORCED PLASTIC PANEL
FRS	FLUSHING RIM SINK
FRT	FIRE RETATDANT TREATED
FRZR	FREEZER
FS	FULL SIZE
FS	FLOOR SINK
FSTOP	FIRESTOPPING
FT	FOOT / FEET
FTG	FOOTING
FTR	FIN TUBE RADIATION
FURN	FURNITURE
FURR	FURRING
FUT	FUTURE
FV	FILM VIEWER
FVC	FIRE VALVE CABINET
FWF	FULLY WELDED FRAME
FWP	FABRIC WRAPPED PANEL
G	
G	GAS
GA	GAUGE
GAL	GALLON / GALLONS
GALV	GALVINIZED
GB	GRAB BAR
GBM	GRADE BEAM
GC	GENERAL CONTRACTOR
GD OR GDISP	GEL DISPENSER
GEN	GENERATOR
GEN	GENERAL
GFI	GROUND FAULT INTERRUPTER
GFRG	GLASS FIBER REINFORCED GYPSUM
GL	GLASS / GLAZING
G OR GMT	GROMMET
GMU	GLASS MASONRY UNIT
GND	GROUND
GPS	GRAPHIC PANEL SYSTEM
GR	GRADE
GRP	GROUP
GRT	GROUT
GT	GLASS TILE
GRV	GRAVEL
GW	GLASS WALL
GWB	GYPSUM WALL BOARD
GYP OR GYB	GYPSUM BOARD
GYP SHTG	GYPSUM SHEATHING
H	
HI	HIGH
H	HUMIDISTAT
HB	HOSE BIB
HC	HOLLOW CORE
HD	HEAVY DUTY
HD	HARD
HD	HAND DRYER
HDCP	HANDICAP
HDR	HEADER
HDWR	HARDWARE
HDWD	HARD WOOD
HDWG	HARDWARE GROUP
HG	HALF GLASS
HM	HOLLOW METAL
HMI	HOLLOW METAL INSULATED
HOR OR HORIZ	HORIZONTAL
HPC	HIGH PERFORMANCE COATING
HPT	HIGHPOINT
HR	HANDRAIL
HR	HOUR
HSKG	HOUSEKEEPING
HT	HEIGHT
HTR	HEATER
HVAC	HEATING, VENTILATING, AIR CONDITIONING
HW	HOT WATER
HWD	HARDWOOD
HWS	HAND WASH STATION
HYD	HYDRANT
I	
IBC	INTERNATIONAL BUILDING CODE
IC	INTERCOM
ID	INSIDE DIAMETER
IN	INCH
INCL	INCLUDE / INCLUDED
INSUL	INSULATION
INT	INTERIOR
ISOL	ISOLATION / ISOLATED
ISOLPP	ISOLATED POWER PANEL
J	
JAN	JANITOR
J OR JB	JUNCTION BOX
JST	JOIST
JT	JOINT
K	
KBD	KEYBOARD
KT	KEYBOARD TRAY
KIT	KITCHEN
KO	KNOCK-OUT PANEL
KS	KEY SWITCH
L	
L OR A	ANGLE
L/S	LIFE SAFETY
LAB	LABORATORY
LAM	LAMINATED
819	LOCAL AREA NETWORK
LAV OR L	LAVATORY
LB OR LBS	POUND / POUNDS
LCD	LIQUID CRYSTAL DISPLAY
LCD	LINEAR DIFFUSER
LED	LIGHT EMITTING DIODE
LEED	LEADERSHIP IN ENVIRONMENTAL DESIGN
LF	LINEAR FOOT / FEET
LF	LINE FIGURED
LG	LEDGE
LH	LEFT HAND
LHR	LEFT HAND REVERSE
LIB	LIBRARY
LIN	LINEAR
LKR	LOCKER
LL	LEAD LINER / LINED
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LMC	LINEAR METAL CEILING
LOC	LOCATION / LOCATE
LONG	LONGITUDINAL
LP	LOW POINT
LRB	LOCKER ROOM BENCH
LS	LAWN SPRINKLING
LT	LIGHT
LTG	LIGHTING
LTSW	LIGHT SWITCH
LVL	LEVEL
LVR	LOUVER
LWT	LIGHT WEIGHT
LWC	LINEAR WOOD CEILING
M	
M	METER / METERS
MACH	MACHINE
MAINT	MAINTENANCE
MAN	MANUAL
MATL	MATERIAL
MAX	MAXIMUM
MBH	MOP / BROOM HOLDER
MCU	MODULAR COOLING UNIT
796	MANUFACTURER CASEWORK
MDF	MEDIUM DENSITY FIBERBOARD
ME	MECHANICAL EQUIPMENT
MECH	MECHANICAL
MEMB	MEMBRANE
MEP	MECHANICAL, ELECTRICAL AND PLUMBING
MET OR MTL	METAL
797	METAL FABRICATION
798	METAL RAILING
MTLB	METAL BASE
MEZZ	MEZZANINE
MFR	MANUFACTURER
MH	MANHOLE
MHC	MATERIAL HANDELING CONVEYOR
M	MIDDLE
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELLANEOUS
MBD	MARKER BOARD
MLAM	METALIC LAMINATE
MLD OR MLDG	MOULDING
MLWK	MILLWORK
MM	MILLIMETER / MILLIMETERS
MO	MASONRY OPENING
MONO	MONOLITHIC
MP	METAL PANEL
MPC	METAL PAN CEILING
MPU	MULTI-PURPOSE UNIT
MR	MOISTURE RESISTANT
MT	MARKER TRAY
MTD	MOUNTED
MTR	MOTOR
MUL OR MULL	MULLION
MW	MICROWAVE
N	
N	NARROW
N	NORTH
NA OR N/A	NOT APPLICABLE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NUMBER
NOM	NOMINAL
NRC	NOISE REDUCTION COEFFICIENT
NT	NOTE
NTS	NOT TO SCALE
O	
OA	OVERALL
OBS	OBSCURE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
ORD	OVERFLOW ROOF DRAIN
OFF	OFFICE
OO	OWNER FURNISHED OWNER INSTALLED
OFS	OVERFLOW SCUPPER
OH	OVERHEAD
OP	OPERABLE PARTITION
OPER	OPERATOR
OPG OR OPNG	OPENING
OPP	OPPOSITE
799	ORNAMENTAL METAL ASSEMBLIES
800	ORNAMENTAL METAL RAILING
OSHA	OPPUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OF	OVERFLOW
801	OPERATEABLE WALL SYSTEM
OZ	OUNCE
P	
PTC-ROLL	PAPER TOWEL DISPENSER LARGE ROLL TYPE
PTC-WR	PAPER TOWEL DISPENSER AND WASTE RECEPTACLE
PART	PARTIAL
PAT	PATTERN
PB	PUSH BUTTON
PBD	PARTICLE BOARD
PRCST OR PC	PRECAST CONCRETE
822	PERSONAL COMPUTER
PCD	PAPER CUP DISPENSER
PCT	PORCELAIN TILE
TB	PORCELAIN CERAMIC TILE BASE
PED	PEDESTAL
PER	PERIMITER
PERP	PERPENDICULAR
PERF	PERFORATED
PF	PREFINISHED
PGL	PLASTIC GLAZING
PHYS	PHYSICAL
PIP	POURED IN PLACE
PL	PLATE
PLN	PROPERTY LINE
PLAM OR PL	PLASTIC LAMINATE
PLBG	PLUMBING
PLS OR PLAS	PLASTER
PLW OR PLYWD	PLYWOOD
PMF	PRESSURE METAL FRAMES
PNL	PANEL
803	PANELING
POP	POINT OF PRESENCE
PR	PAIR
821	PROPOSAL REQUEST
PRELIM	PRELIMINARY
PREP	PREPERATION
PRESS	PRESSURE
PRIM	PRIMARY
PROC	PROCEDURE
PROJ	PROJECTION
PROP	PROPERTY
PRV	POWER ROOF VENTILATOR
PRS	PROJECTION SCREEN
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PAINT
PT	POINT
PTC	PAPER TOWEL CABINET
PTD	PAPER TOWEL DISPENSER
PART OR PTN	PARTITION
PTR	PAPER TOWEL RECEPTACLE
PTR	PRINTER
PTS	PNEUMATIC TUBE STATION
PTDF OR PTWD	PRESSURE TREATED DOUGLAS FIR / WOOD
PULL	CABINET PULL
PVC	POLYVINYL CHLORIDE
804	PAVER
Q	
QT	QUARRY TILE
QTB	QUARRY TILE BASE
QTY	QUANITY
R	
R OR RAD	RADIUS
R	RISER
RA	RETURN AIR
RAD	RADIATION
RAD	RADIOLOGY
RB	RESILIENT BASE / RUBBER BASE
RH	ROBE HOOK
RC	REINFORCED CONCRETE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
RE	RELOCATE EXISTING
REC	RECESSED
RECP	RECEPTION
REF	REFERENCE
REFR	REFRIGERATOR
REG	REGISTER
REINF	REINFORCE/-ED/-ING
REM	REMOVE / REMOVABLE
REQD OR REQ	REQUIRE / REQUIRED
RESIL	RESILIENT
RET	RETAINING
REV	REVERSE
REV	REVISE/-ED/-ION
REX	REUSE EXISTING
RF	RESILIENT FLOOR
RF	RADIO FREQUENCY
RFG	ROOFING
RFI	REQUEST FOR INFORMATION
RFL	REFLECTED
RFS	ROOM FINISH SCHEDULE
RH	RIGHT HAND
RH	ROOF HATCH
RHR	RIGHT HAND REVERSE
RIUL	ROOM IN USE LIGHT
RM	ROOM
RMS	RECESSED MAT SYSTEM
RO	ROUGH OPENING
ROS	ROOM OPENING SCHEDULE
RS	ROUGH SLAB
RST	RUBBER / RESILIENT STAIR TREADS AND RISERS
806	RESILIENT TRANSITION STRIP
RWC OR RWL	RAIN WATER CONDUCTOR/ LEADER
RWD	REDWOOD
S	
SB-E	SUPPORT BRACKET - END
SB-M	SUPPORT BRACKET - METAL
SB-P	SUPPORT BRACKET - END PANEL
823	SOLID MINERAL PROFILE PANEL
S	SINK
S	SOUTH
767	STAIR ACCESSORY
SAF	SPRAY APPLIED FIRE PROOFING
SAN	SANITARY
SB	SHADOW BOX
SC	SHARPS CONTAINER
SC	SMOKE CURTAIN
SC	SOLID CORE
SC	SHOWER CURTAIN
SCD	SEAT COVER DISPENSER
SCH	SHOWER CURTAIN HOOK
SCHED	SCHEDULE
SCN OR SCR	SCREEN
SCR	SHOWER CURTAIN ROD
768	SPECIALTY CEILING SYSTEM
SD	SHOWER DRAIN
SD	SLIDING DOOR
SD	SMOKE DAMPER
SD	STORM DRAIN
SD	SMOKE DETECTOR
SDA	SPECIAL DOOR ASSEMBLY
SDISP OR SD	SOAP DISPENSER
SDP	SPRAYED DAMP PROOFING
SECT	SECTION
SECY	SECRETARY
SQFT OR SF	SQUARE FOOT / FEET
SF	STORE FRONT
SG	SMOKE GUARD
SHR	SHOWER
SHT	SHEET
SHTG	SHEATHING
SI	SUPPLEMENTAL INSTRUCTION
SIM	SIMILAR
SW	SLATWALL
SLNT	SEALANT
SL OR SLR	SEALER
SLV	SLEEVE
SM	SURFACE MOUNTED
SMH	SHOWER MAT HOLDER
SNC	SANITARY NAPKIN CABINET
SND	SANITARY NAPKIN DISPOSER
SND	SANITARY NAPKIN DISPENSER
SNR	SANITARY NAPKIN RECEPTACLE
SOG	SLAB ON GRADE
SP	STAND PIPE
SPEC	SPECIFICATIONS
SPKLR	SPRINKLER
SPK	SPEAKER
SPR	SINGLE PLY ROOFING
SQ	SQUARE
SQIN	SQUARE INCH
SQYD	SQUARE YARD
SR	SERVICE RECEPTOR
SS	SERVICE SINK
SS	SHOWER SEAT
SSDRIP	STAINLESS STEEL DRIP FLASHING
SSH	SHOWER SOAP HOLDER
SSF OR SSM	SOLID SURFACE MATERIAL or FABRICATION
SST OR SS	STAINLESS STEEL
STR	STREET
STA	STATION
STC	SOUND TRANSMISSION COEFFICIENT
STD	STANDARD
STL	STEEL
STN	STONE
STNB	STONE BASE
STLG	STONE LEDGE
STOR	STORAGE
STRUCT	STRUCTURAL / STRUCTURE
STS	STRUCTURAL STEEL
SUPV	SUPERVISOR
SUSP	SUSPENDED
SW	SWITCH
SWD	SOFTWOOD
769	SPECIALTY WALL SYSTEM
SYM	SYMETRICAL
SYN	SYNTHETIC
SYS	SYSTEM
T	
T	TOP
T	THERMOSTAT
T&B	TOP AND BOTTOM
TAN	TANGENT
TLB OR TB	TOWEL BAR
TBD	TO BE DETERMINED
TC	TOP OF CURB
TC	TIME CLOCK
TC	TOWEL CABINET
TDR	TRENCH DRAIN
TDISP	TISSUE DISPENSER
TEL	TELEPHONE
TEMP	TEMPORARY
TEMP	TEMPERATURE
TER	TERRAZZO
T&G	TOUNGE AND GROVE
TH	TISSUE HOLDER
THK	THICK / THICKNESS
THRES	THRESHOLD
THRU	THROUGH
TBD	TACKBOARD
T OR WC	TOILET
(T)	TEMPERED
TOC	TOP OF CONCRETE
TT	TOP TYPE
TOS	TOP OF SLAB
TOW	TOP OF WALL
TPD	TOILET PAPER DISPENSER
TPH	TOILET PAPER HOLDER
TPTN	TOILET PARTITION
TR	TREAD
TLR	TOWEL RING
TRANS	TRANSFORMER
TS	TUBE STEEL
TS	TUBE SECTION
TS	TRANSITION STRIP
TV	TELEVISION
TWF	THROUGH WALL FLASHING
TYP	TYPICAL
U	
UC	UNDERCUT
UC	UNDERCOUNTER
UCL	UNDER CABINET LIGHT
UFD	UNDER FLOOR DUCT
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORY
UNF OR UNFIN	UNFINISHED
UNO OR UON	UNLESS NOTED OTHERWISE / UNLESS OTHERWISE NOTED
UPH	UPHOLSTRY
UPS	UNINTERUPTABLE POWER SUPPLY
U OR UR	URINAL
US	UTILITY SHELF
USCN	URNIAL SCREEN
USGBC	UNITED STATES GREEN BUILDING COUNCIL
UTIL	UTILITY
V	
V	VOLT
VR OR VB	VAPOR RETARDER / BARRIER
VB	VACUUM BREAKER
VC	VALVE CABINET
VCO	VACUUM CLEANING OUTLET
VD	VOICE/DATA OUTLET
VENTIL OR VENT	VENTILATE / VENTILATION
VER	VERIFY
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VNR	VENEER
VOL	VOLUME
VST	VINYL STAIR TREADS AND RISERS
W	
W	WEST
W	WIDTH / WIDE
WF	WIDE FLANGE
W/	WITH
W/O	WITHOUT
WC	WATER CLOSET
WC	WALL COVERING
WD	WOOD
809	WOOD BLOCKING
WDB	WOOD BASE
810	WOOD FLOORING
WDP	WOOD PANEL
WDR OR WRR	WOOD RISER
WDT OR WRT	WOOD TREAD
WDW OR WIN	WINDOW
WDWLG	WINDOW LEAD GLASS
WDWRF	WINDOW RF SHIELDING
WG	WALL GUARD
WG	WIRE GLASS
WH	WALL HOSE / HYDRANT
WHTR	WATER HEATER
WHCH	WHEELCHAIR
WI	WROUGHT IRON
WK	WORK
825	WATER LINE
789	WALK-OFF MAT
WP	WALL PROTECTION
WP	WATERPROOF / WATERPROOFING
WPT	WORK POINT
WR	WATER RESISTANT
WR	WASTE RECEPTACLE
WS	WEATHERSTRIP
WSC	WALL SCONCE
WNSCT OR WSCT	WAINSCOT
WT	WEIGHT
WT	WINDOW TREATMENT
826	WINDOW TREATMENT TRACK
WWF	WELDED WIRE FABRIC
X	
XPS	EXPANDED POLYSTYRENE
Y	
YD	YARD
Z	
ZVB	ZONE VALVE BOX
ZVC	ZONE VALVE CABINET

SYMBOLOGY LEGEND

SEE SHEETS FOR SPECIFIC SYMBOLS



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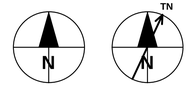
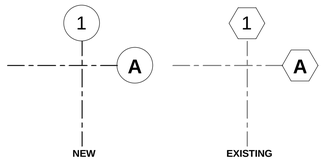
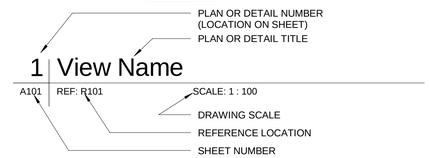


NORTH ARROW



GRID BUBBLES



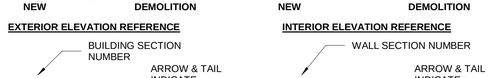
PLAN OR DETAIL TITLE

SCALE: 1:100

GRAPHIC SCALE

EXTERIOR ELEVATION REFERENCE

INTERIOR ELEVATION REFERENCE

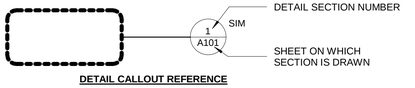


BUILDING SECTION REFERENCE

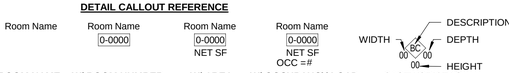
WALL SECTION REFERENCE

DEMOLITION SECTION REFERENCE

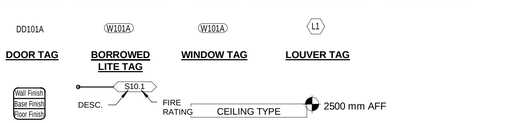
WALL SECTION REFERENCE



DETAIL CALLOUT REFERENCE



ROOM NAME | **W/ ROOM NUMBER** | **W/ AREA** | **W/ OCCUPANCY LOAD** | **CASEWORK TAG**



DOOR TAG | **BORROWED LITE TAG** | **WINDOW TAG** | **LOUVER TAG**

FINISH TAG | **WALL TAG** | **CEILING TAG**

SPOT ELEVATIONS | **LEVEL HEADS**

MATCHLINE REFERENCE | **CENTERLINE TAG**

REVISION CALLOUT AND CLOUD | **FLOW ARROW REFERENCE**

XX
X
KEYNOTES

##
NOTES

AECOM

PROJECT

GOODWOOD COMMUNITY CENTRE ADDITION

268 HIGHWAY 47
GOODWOOD, ONTARIO

CLIENT

TOWNSHIP OF UXBRIDGE

51 TORONTO STREET SOUTH
UXBRIDGE, ONTARIO
905-852-9181 tel 905-852-9674 fax
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CONSULTANT

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REGISTRATION

ISSUE/REVISION

2	05/04/2018	CLIENT REVIEW
1	04/18/2018	ISSUED FOR PERMIT
I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60240627

SHEET TITLE

NOTES ABBREVIATIONS LEGENDS

SHEET NUMBER

A-102

Project Management Initials: Designer: A.D Checked: A.S Approved: J.T ARCH D 24" x 36"
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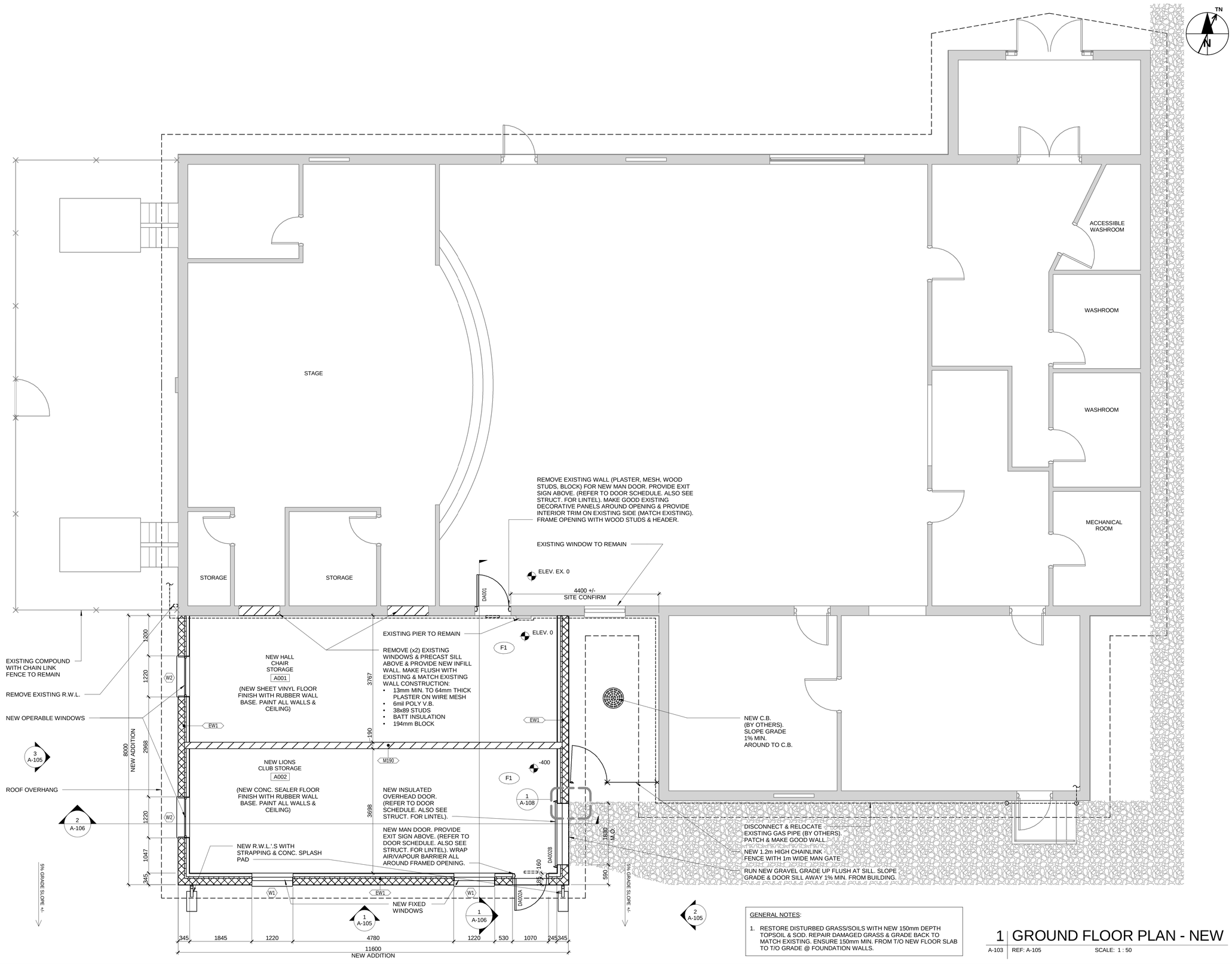

GENERAL NOTES:

1. RESTORE DISTURBED GRASS/SOILS WITH NEW 150mm DEPTH TOPSOIL & SOD. REPAIR DAMAGED GRASS & GRADE BACK TO MATCH EXISTING. ENSURE 150mm MIN. FROM T/O NEW FLOOR SLAB TO T/O GRADE @ FOUNDATION WALLS.

1 GROUND FLOOR PLAN - NEW

A-103 | REF: A-105 | SCALE: 1 : 50

AECOM

PROJECT

GOODWOOD COMMUNITY CENTRE ADDITION

268 HIGHWAY 47
GOODWOOD, ONTARIO

CLIENT

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KEY PLAN

PROJECT NUMBER

60240627

SHEET TITLE

GROUND FLOOR PLAN - NEW

SHEET NUMBER

A-103

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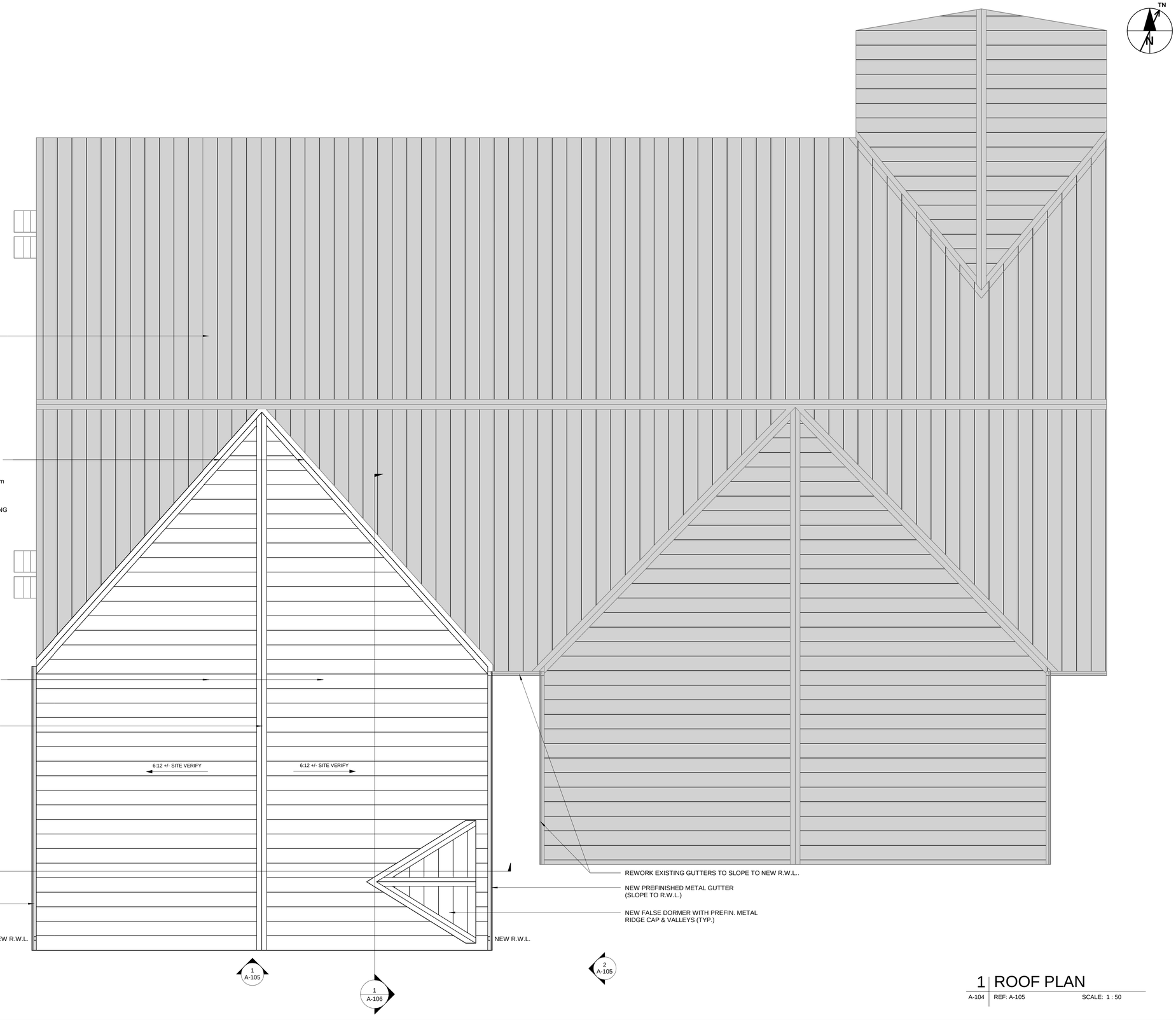

1 ROOF PLAN

A-104 | REF: A-105 | SCALE: 1 : 50

AECOM

PROJECT

GOODWOOD COMMUNITY CENTRE ADDITION

268 HIGHWAY 47
GOODWOOD, ONTARIO

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I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

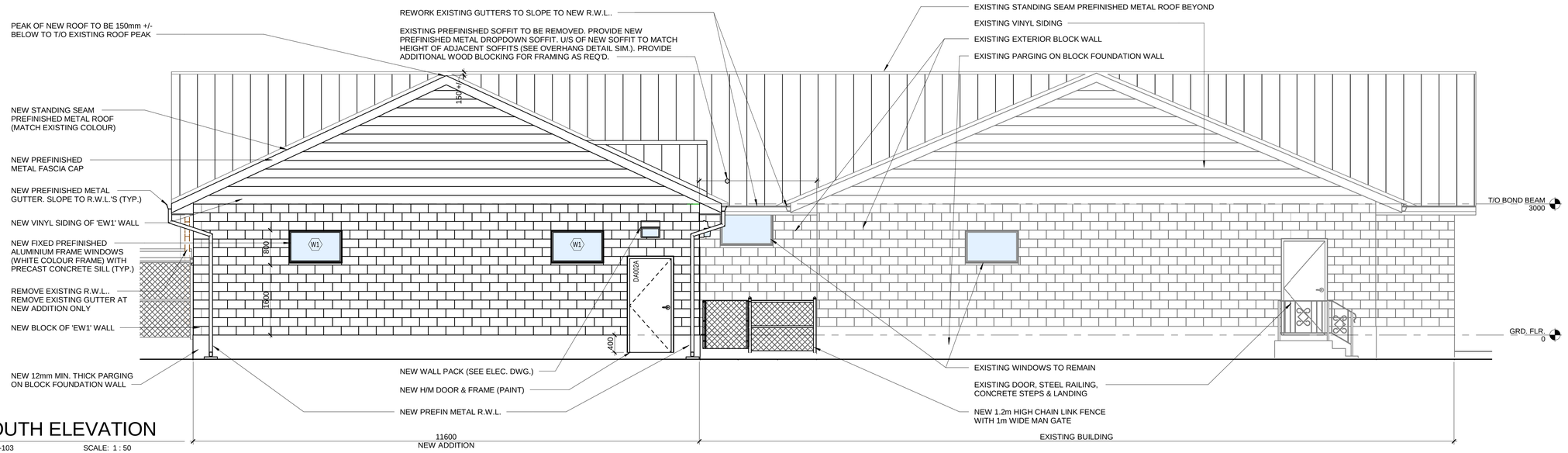
60240627

SHEET TITLE

ROOF PLAN - NEW

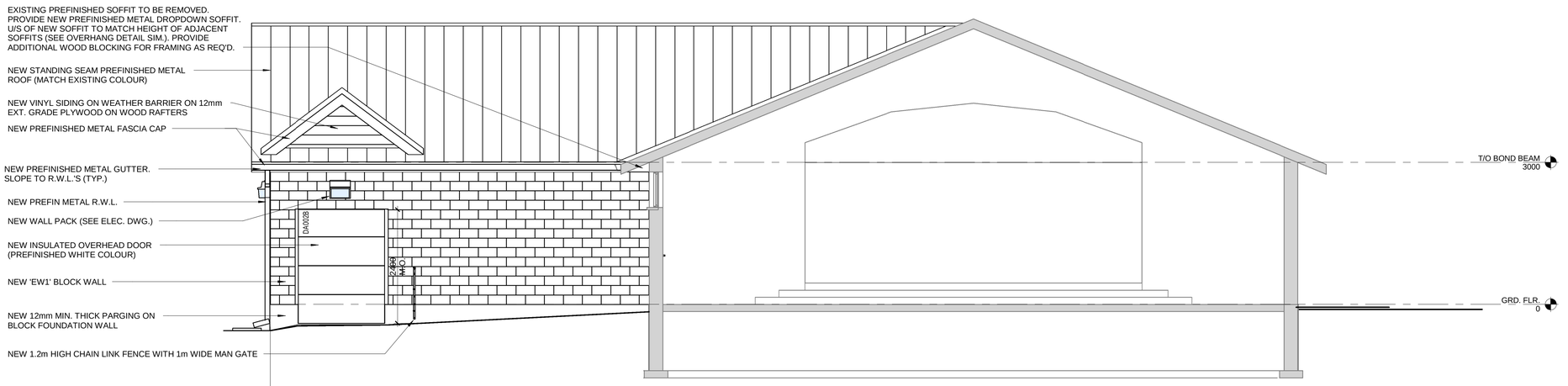
SHEET NUMBER

A-104



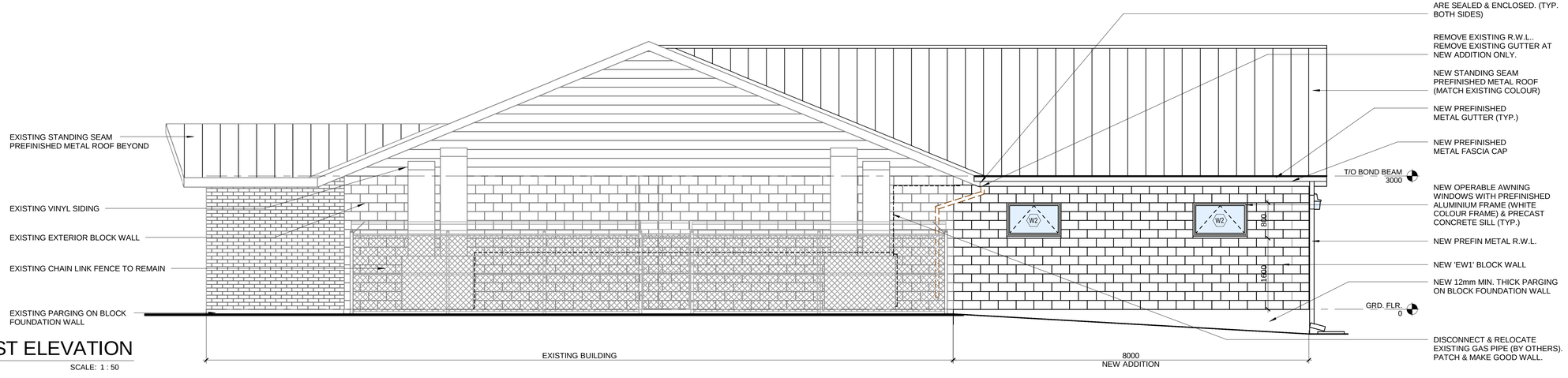
1 | SOUTH ELEVATION

A-105 | REF: A-103 | SCALE: 1 : 50



2 | EAST ELEVATION

A-105 | REF: A-103 | SCALE: 1 : 50



3 | WEST ELEVATION

A-105 | REF: A-103 | SCALE: 1 : 50

AECOM

PROJECT

GOODWOOD COMMUNITY CENTRE ADDITION

268 HIGHWAY 47
GOODWOOD, ONTARIO

CLIENT

TOWNSHIP OF UXBRIDGE
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1	04/18/2018	ISSUED FOR PERMIT

KEY PLAN

PROJECT NUMBER

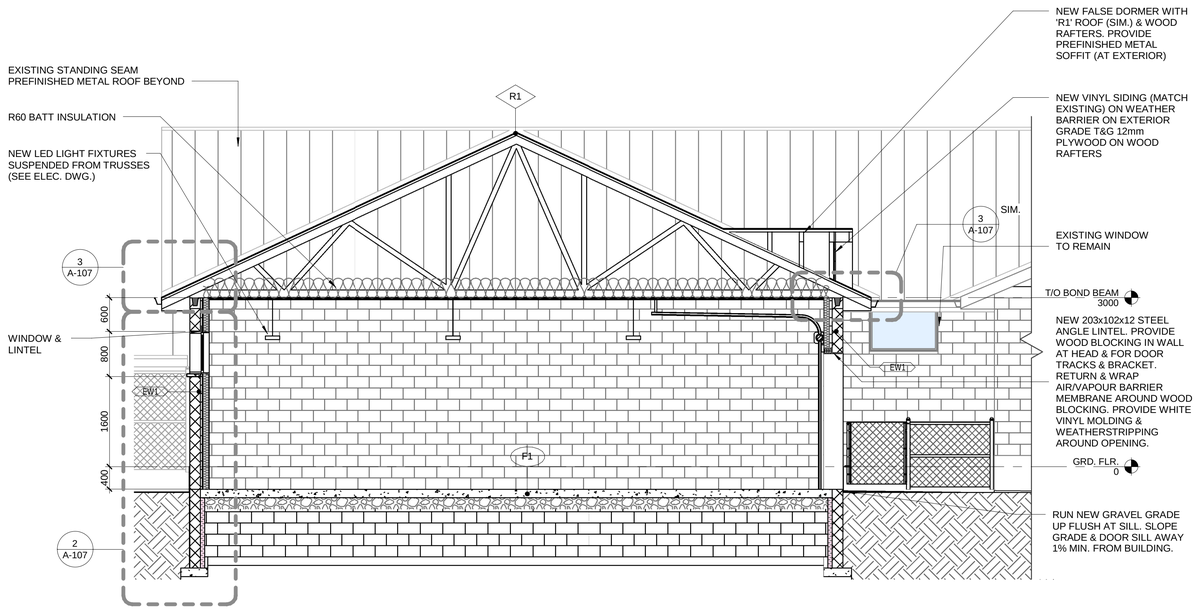
60240627

SHEET TITLE

ELEVATIONS

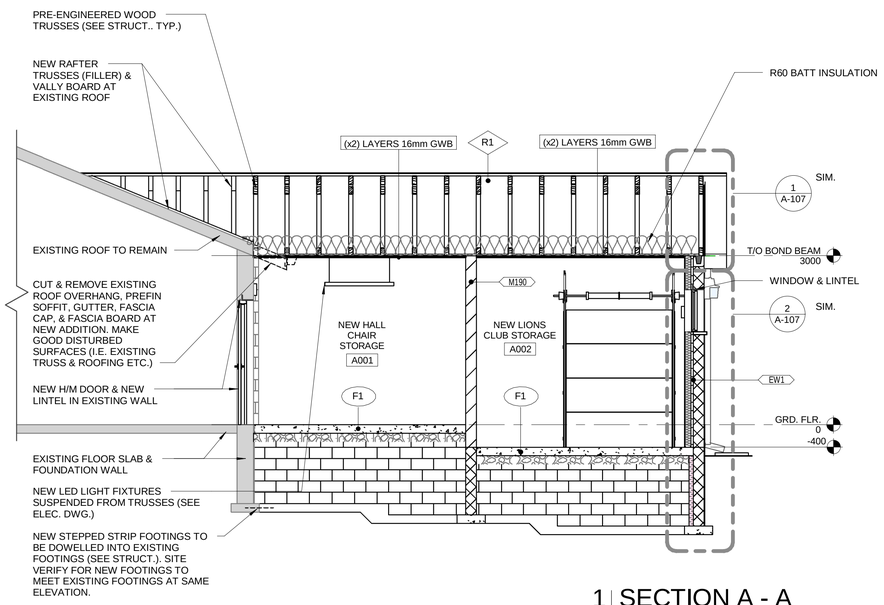
SHEET NUMBER

A-105



2 | SECTION B - B

A-106 | REF: A-103 | SCALE: 1 : 50



1 | SECTION A - A

A-106 | REF: A-103 | SCALE: 1 : 50

AECOM

PROJECT

GOODWOOD COMMUNITY CENTRE ADDITION

268 HIGHWAY 47
GOODWOOD, ONTARIO

CLIENT

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KEY PLAN

PROJECT NUMBER

60240627

SHEET TITLE

SECTIONS

SHEET NUMBER

A-106

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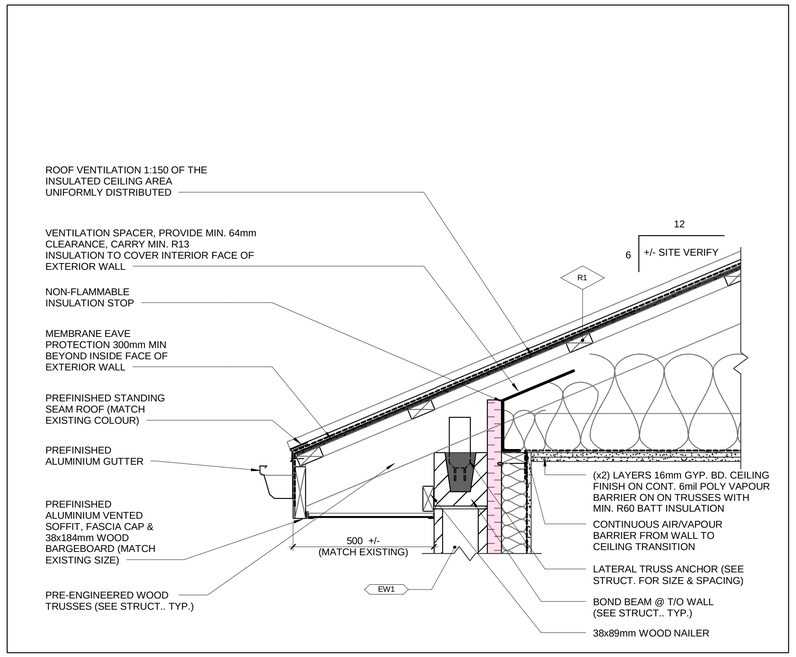
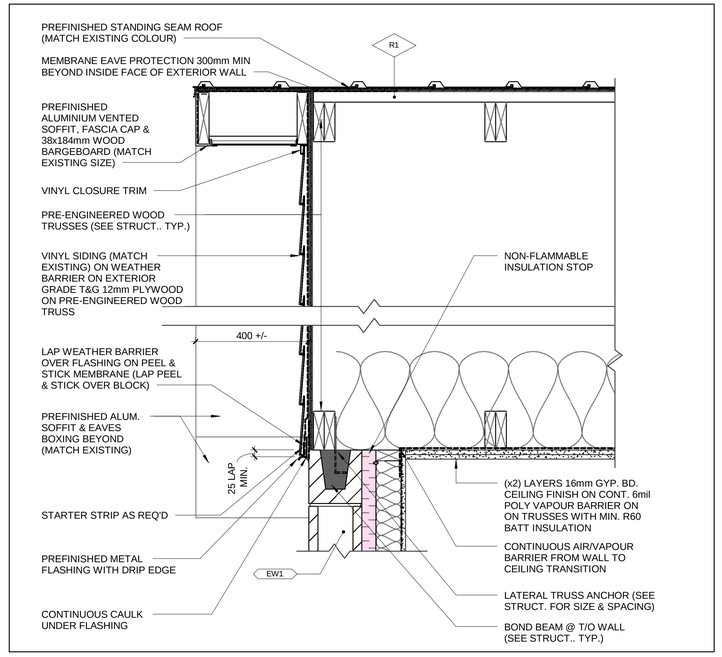


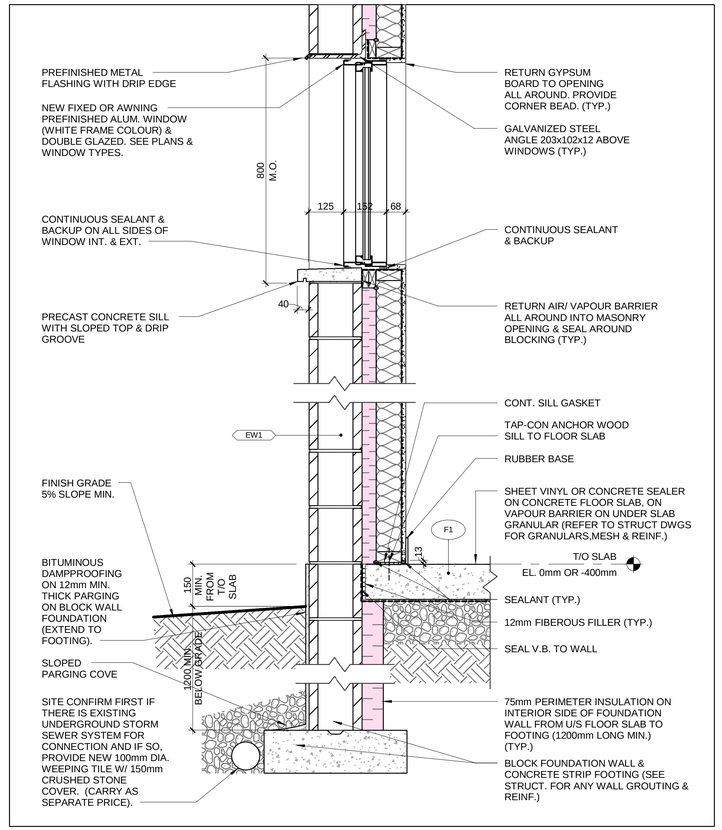
3 | WALL SECTION DETAIL - TYP. OVERHANG

A-107 | REF: A-106 | SCALE: 1 : 10



1 | WALL SECTION DETAIL - GABLE SIDE

A-107 | REF: A-106 | SCALE: 1 : 10



2 | WALL SECTION DETAIL - BASE & WINDOW

A-107 | REF: A-106 | SCALE: 1 : 10

AECOM

PROJECT

GOODWOOD COMMUNITY CENTRE ADDITION

268 HIGHWAY 47
GOODWOOD, ONTARIO

CLIENT

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REGISTRATION

ISSUE/REVISION

I/R	DATE	DESCRIPTION
2	05/04/2018	CLIENT REVIEW

KEY PLAN

PROJECT NUMBER

60240627

SHEET TITLE

TYPICAL DETAILS

SHEET NUMBER

A-107

Project Management Initials: Designer: Designer Checked: Checker Approved: Approver ARCH D 24" x 36"
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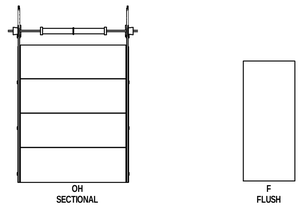
DOOR/OPENING SCHEDULE

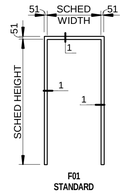
	DOOR									FRAME									
No.	TYPE	LEAFS	WIDTH (1)	HEIGHT	THICKNESS	MATERIAL	INSULATED	UNDERCUT	FINISH	TYPE	MATERIAL	DEPTH	FINISH	HEAD DETAIL	SILL DETAIL	JAMB DETAIL	FIRE RATING	HARDWARE GROUP	COMMENTS
A001	F	1	950	2150	45	HM			PT	F01	PS	146	PT					HG1	
A002A	F	1	950	2150	45	HM	√		PT	F01	PS	146	PT					HG2	
A002B	OH		1880	2440	51	MTL	√		PREFIN.	-	ALUM		PREFIN.						PROVIDE WEATHERSTRIPPING, LOCK

DOOR HARDWARE GROUP

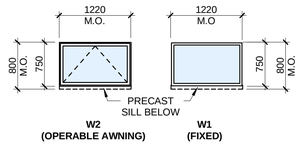
NAME	HINGES	CLOSER	DOORSTOP	LOCKSET	PASSAGE SET	CYLINDERS	EXIT DEVICE	PULLS	PUSH PLATE	KICKPLATE	THRESHOLD	WEATHERSTRIP	ASTRAGAL	FLUSH BOLT	AUTOMATIC OPERATOR	COORDINATOR	FUNCTION	COMMENTS
HG1	√		✓	✓						✓							STORAGE	
HG2	√	√		√		√	√			√	√	√					STORAGE	



DOOR PANEL TYPES

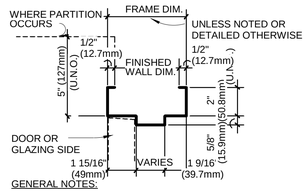


DOOR FRAME TYPES



WINDOW TYPES

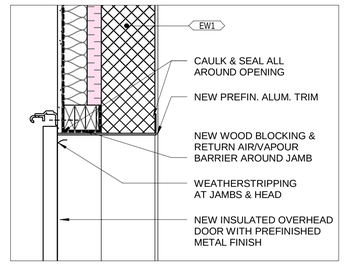
INSULATED GLAZING



GENERAL NOTES:

1. FRAMES ARE TO WELDED UNLESS NOTED OTHERWISE.
2. FRAME INFO SHOWN IS TYP. UNLESS NOTED OTHERWISE BY SPECIFIC DETAIL REFERENCE ON PLANS/SCHEDULE.

1. TYP HOLLOW METAL FRAME INFO



1 PLAN DETAIL - TYP. O/H DOOR JAMB

A-108 | REF: A-103 | SCALE: 1 : 10

AECOM

PROJECT

GOODWOOD COMMUNITY CENTRE ADDITION

268 HIGHWAY 47
GOODWOOD, ONTARIO

CLIENT

TOWNSHIP OF UXBRIDGE
51 TORONTO STREET SOUTH
UXBRIDGE, ONTARIO
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KEY PLAN

PROJECT NUMBER

60240627

SHEET TITLE

DOOR SCHEDULE AND DETAILS

SHEET NUMBER

A-108

Project Management Initials: Designer: A.D Checked: A.S Approved: J.T ARCH D 24" x 36"
Last Plotted: 5/4/2018 1:48:23 PM
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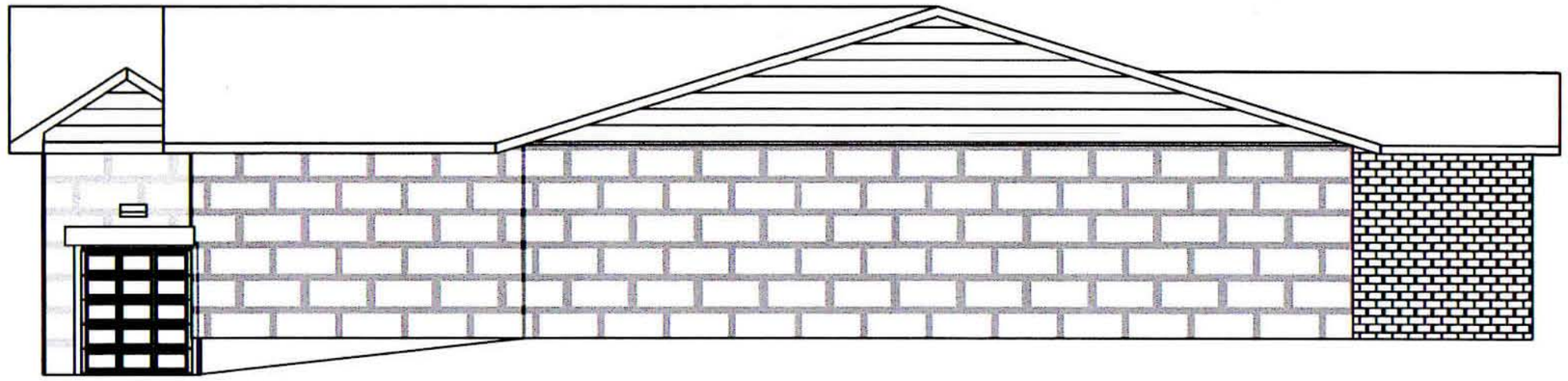
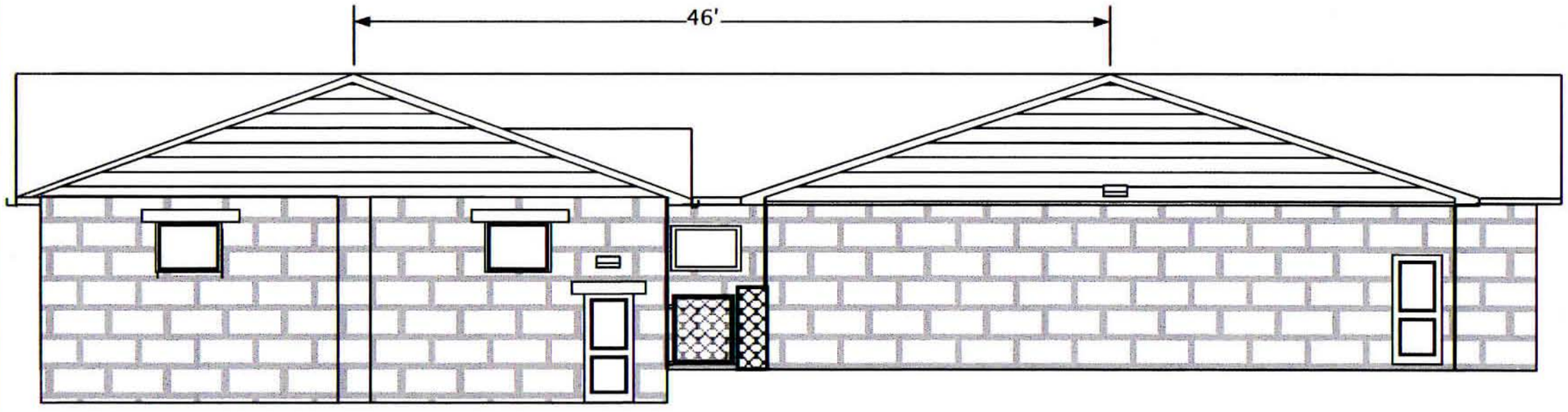


West Elevation



North Elevation

Note: 5" Eaves trough and down spout locations to be approved by Uxbridge Township Personnel before installation.

Orr Engineering Inc
P.O.Box 488
Uxbridge, ON
L9P 1M9

Customer

Township of Uxbridge

268 Highway 47
Goodwood, Ontario

Stamp

LICENSED PROFESSIONAL ENGINEER
COLLEEN E. ORR
PROVINCE OF ONTARIO

Notes

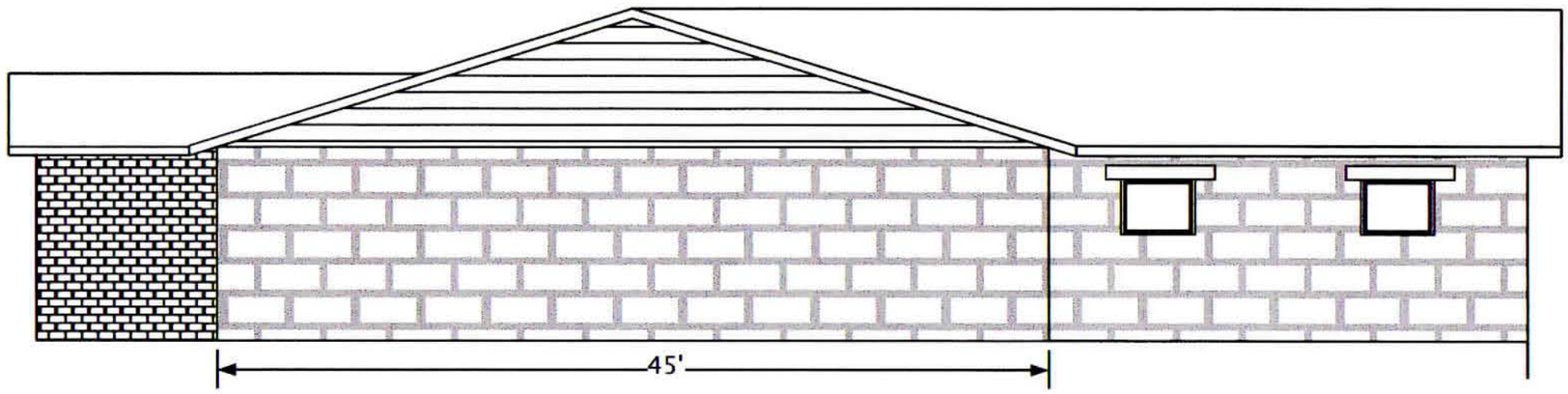
Revision	Date
MATCH ARCHITECTURAL	MAY/18

Scale 1/8" = 1'

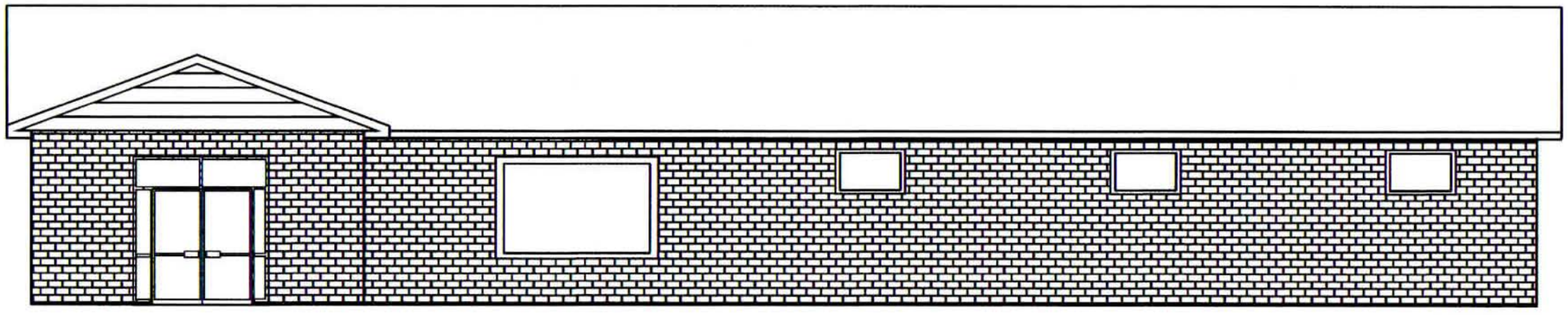
Project
ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL

Drawing Name
NORTH AND WEST ELEVATIONS

March 7, 2018



East Elevation



South Elevation

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PROVINCE OF ONTARIO

Notes

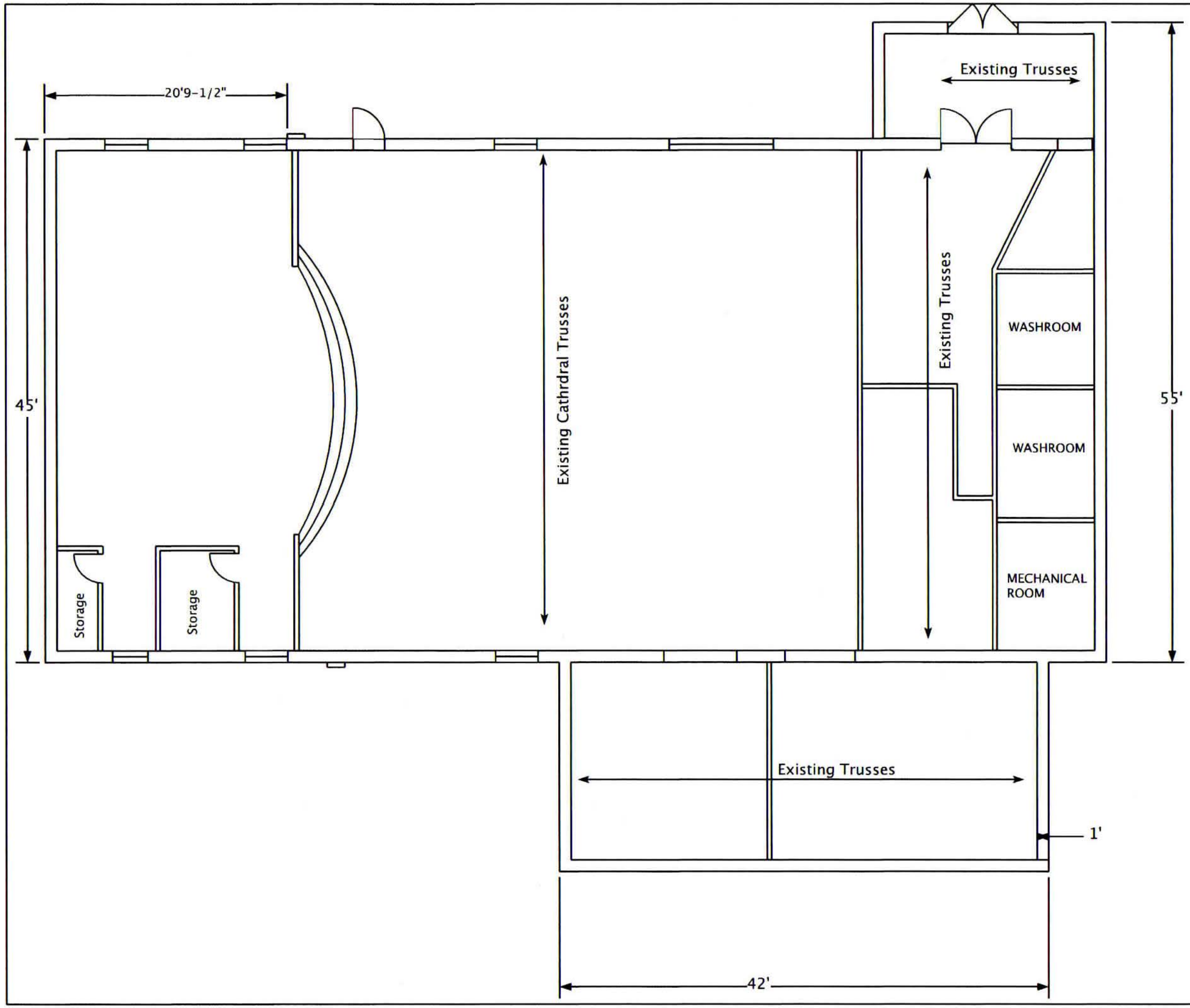
Revision	Date
MATCH ARCHITECTURAL	MAY/18

Scale: 1/8" = 1'

Project: ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL

Drawing Name: SOUTH AND EAST ELEVATIONS

March 7, 2018



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Township of Uxbridge

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Goodwood, Ontario

Scale	1/8" = 1'	
Revision		Date
MATCH ARCHITECTURAL		MAY/18

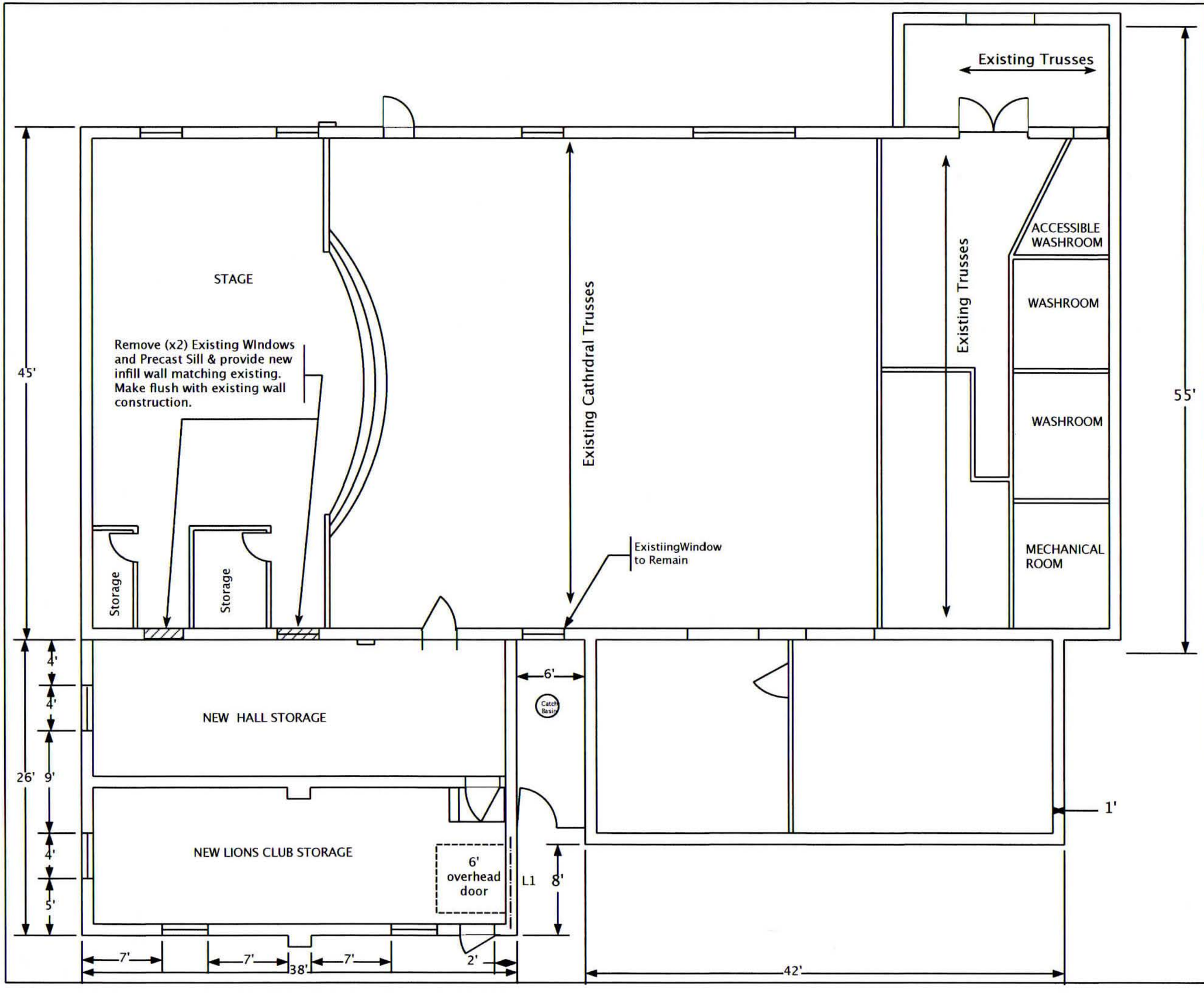
Project

ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL

Drawing Name

EXISTING FLOOR PLAN

March 7, 2018



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Township of Uxbridge

268 Highway 47
Goodwood, Ontario

Scale 1/8" = 1'

Revision	Date

Project
ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL

Drawing Name
PROPOSED FLOOR PLAN

March 7, 2018

EXISTING

NEW SECTION 1

UNEXCAVATED

12'

1'

NEW SECTION 2

UNEXCAVATED

12'

1'

PILASTER
FOOTING TO FOLOW
OUTLINE OF PILASTER

CONTROL JOINT

8" BLOCK WALL

18'

8"

38'

38'8"

Catch
Basin
Centered
in alley

18" X 6" POURED CONCRETE
STIP FOOTING

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Customer

Township of Uxbridge

Address

268 Highway 47
Goodwood, Ontario

Scale
1/4" = 1'

Revision	Date
MATCH ARCHITECTURAL	MAY/18

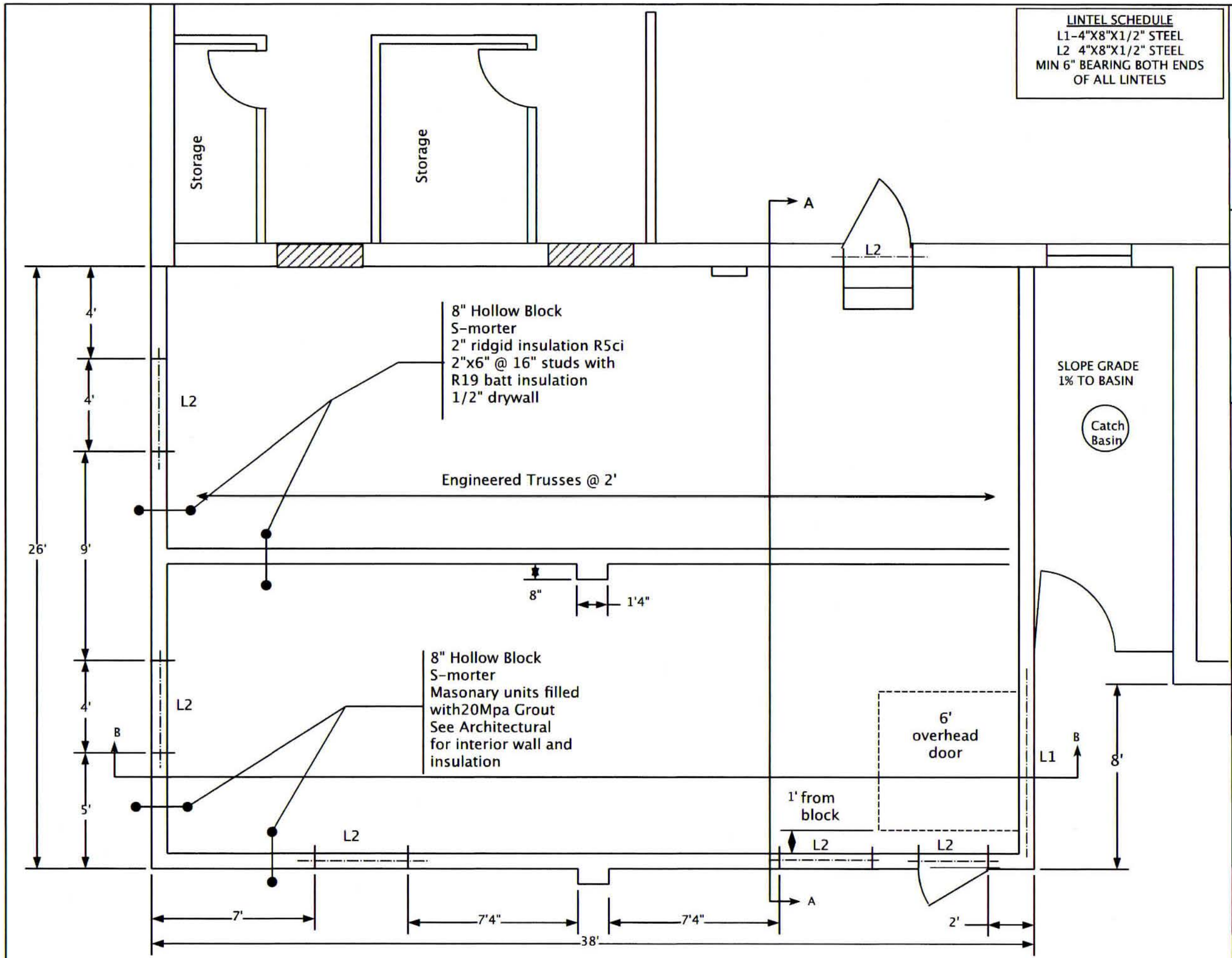
Project

ADDITION TO GOODWOOD
COMMUNITY CENTRE STRUCTURAL

Drawing Name

FOUNDATION PLAN

March 7, 2018



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L9P 1M9

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Customer

Township of Uxbridge

Address

268 Highway 47
Goodwood, Ontario

Scale 1/4" = 1'

Revision	Date

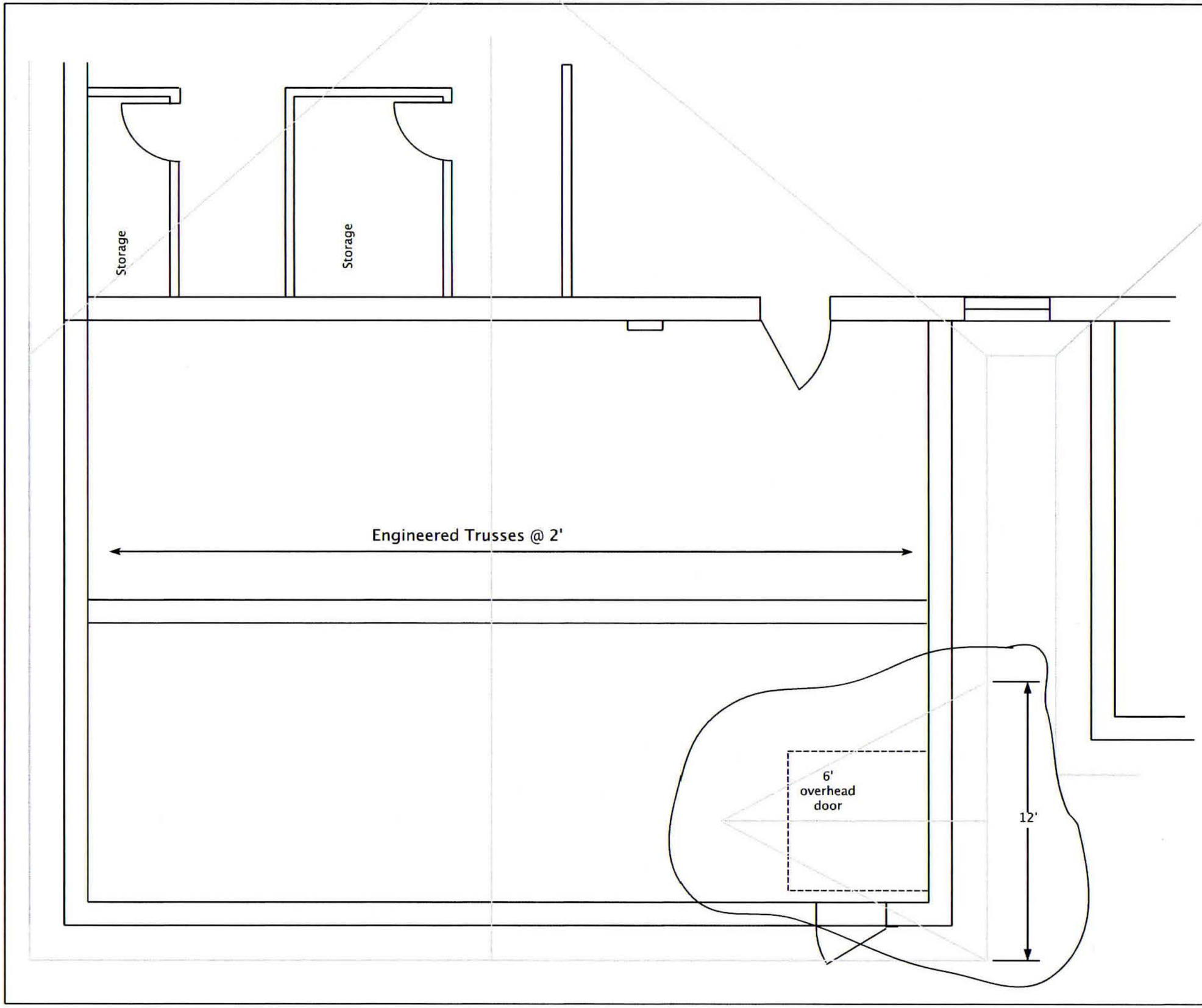
Project

ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL

Drawing Name

Floor Plan

March 7, 2018



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L9P 1M9

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LICENSED PROFESSIONAL ENGINEER
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PROVINCE OF ONTARIO
May 8/18

Customer

Township of Uxbridge

Address

268 Highway 47
Goodwood, Ontario

Scale 1/4" = 1'

Revision	Date
MATCH ARCHITECTURAL	MAY/18

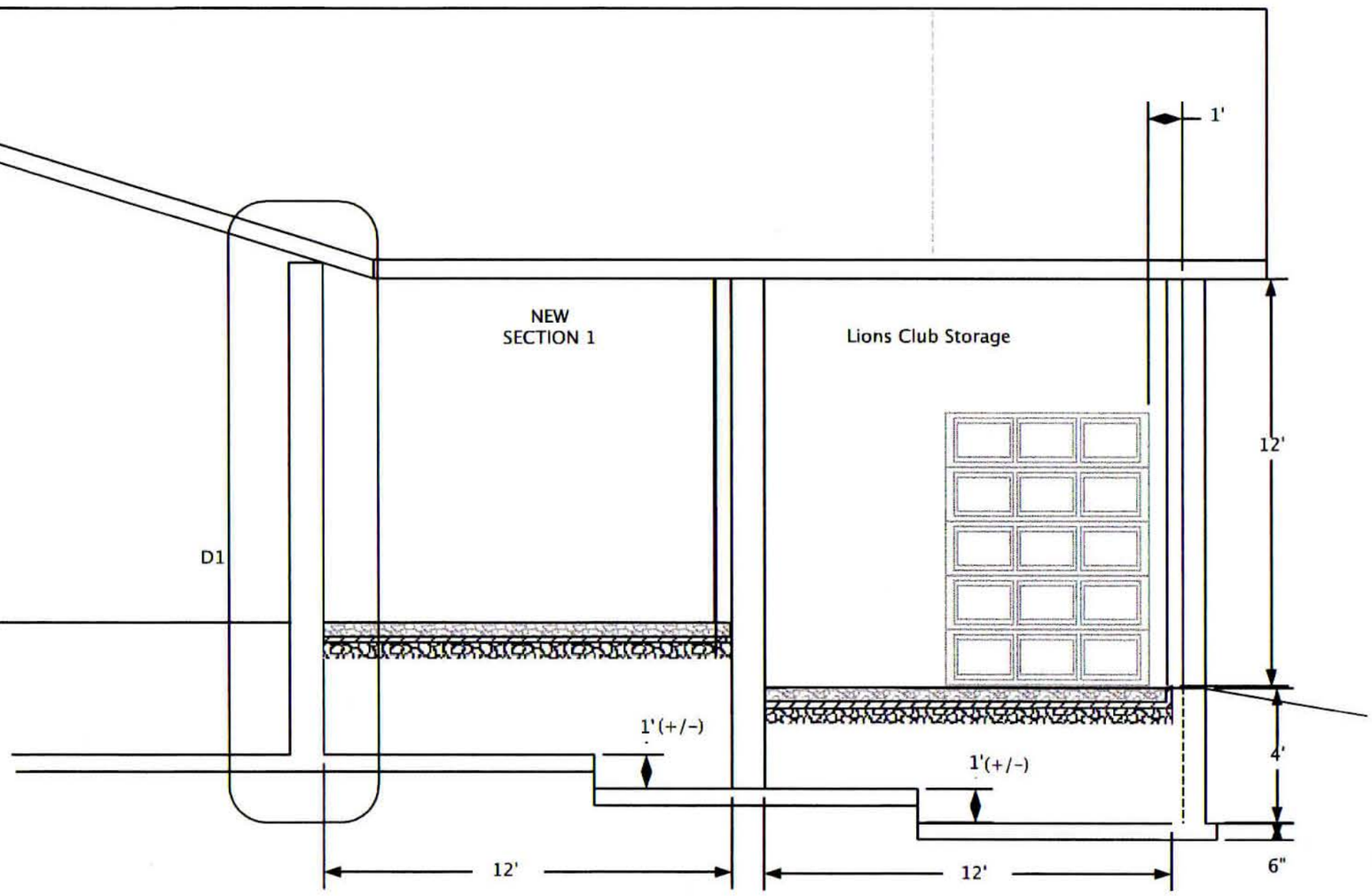
Project

ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL

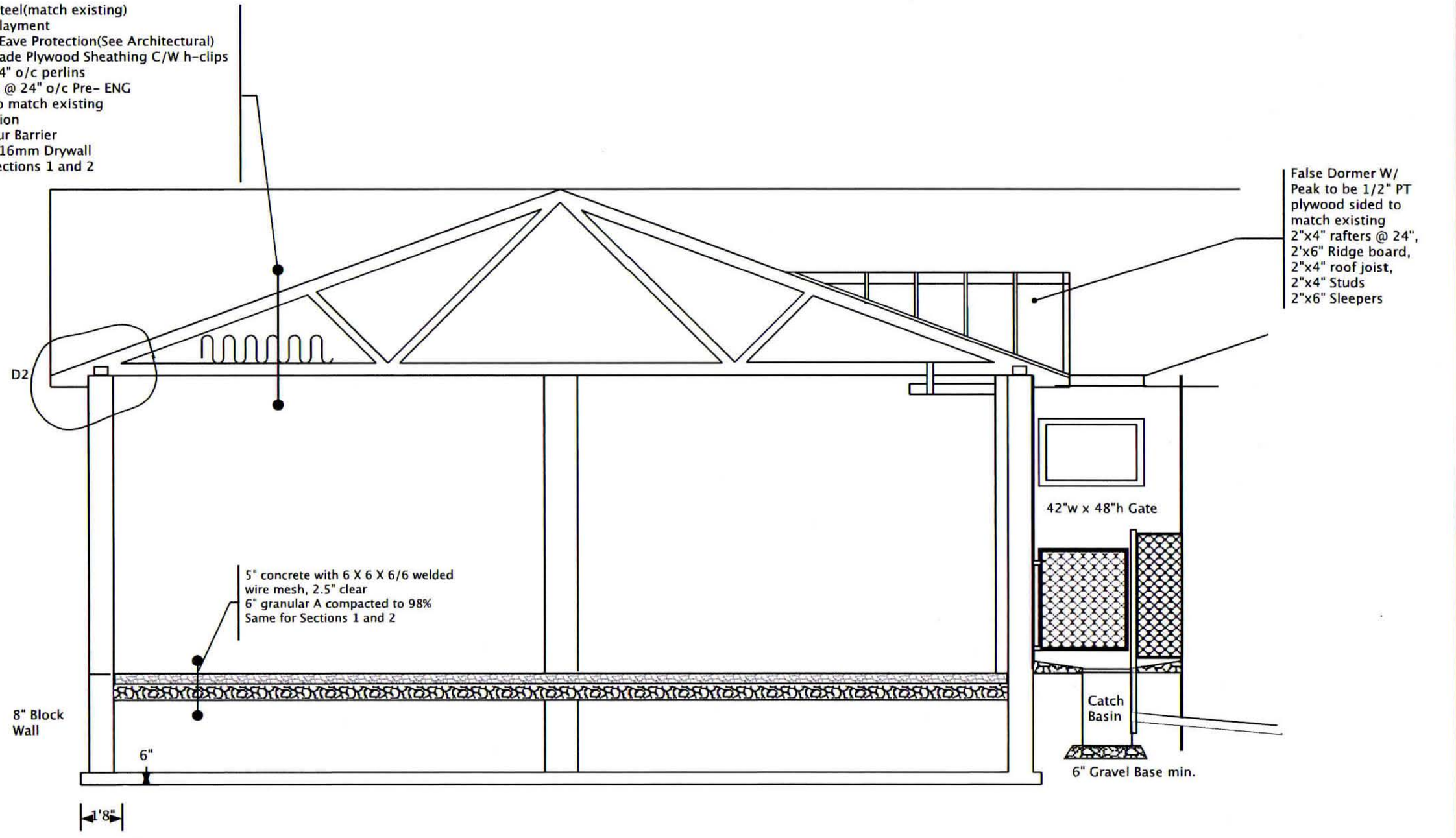
Drawing Name

PROPOSED ROOF LINES

March 7, 2018



Orr Engineering Inc P.O.Box 488 Uxbridge, ON L9P 1M9	Customer Township of Uxbridge Address 268 Highway 47 Goodwood, Ontario	Stamp LICENSED PROFESSIONAL ENGINEER COLLEEN E O... PROVINCE OF ONTARIO May 8/18	Notes	Revision MATCH ARCHITECTURAL	Date MAY/18	Scale 1/4" = 1' Project ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL Drawing Name SECTION A-A March 7, 2018 | 8 of 16



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Customer

Township of Uxbridge

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COLLEEN E. ORR
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Notes

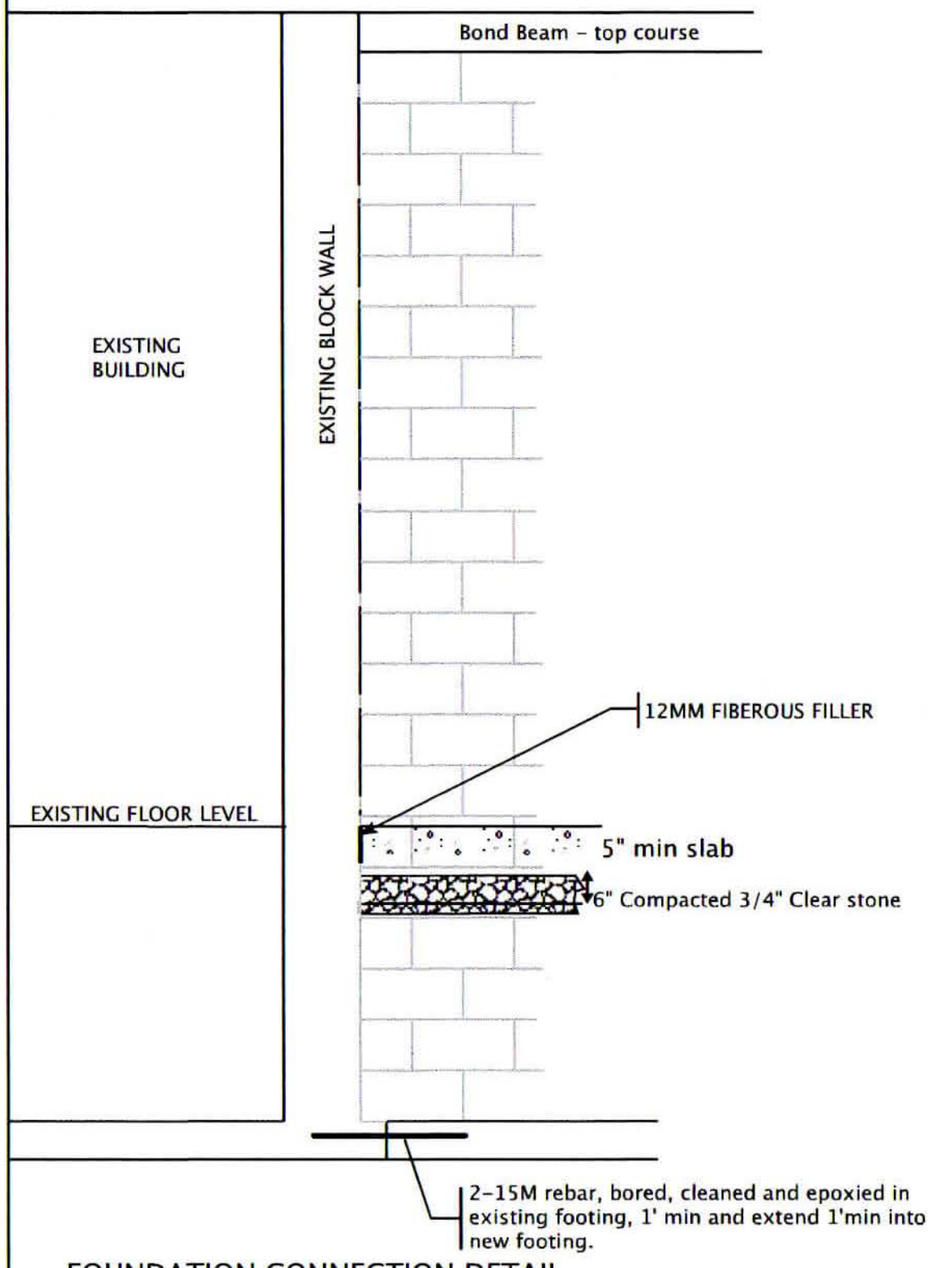
Revision | Date

Scale 1/4" = 1'

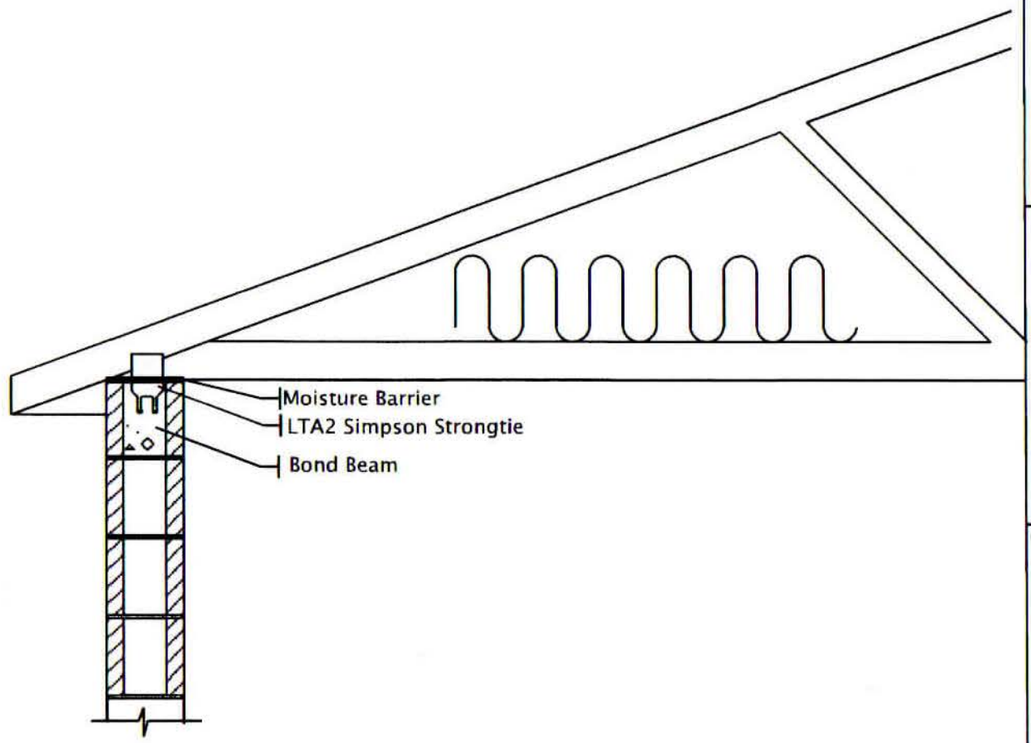
Project
ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL

Drawing Name
SECTION B-B

March 7, 2018



FOUNDATION CONNECTION DETAIL
D1



TRUSS CONNECTION DETAIL
D2

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Scale 1/2" = 1'

Revision	Date
MATCH ARCHITECTURAL	MAY/18

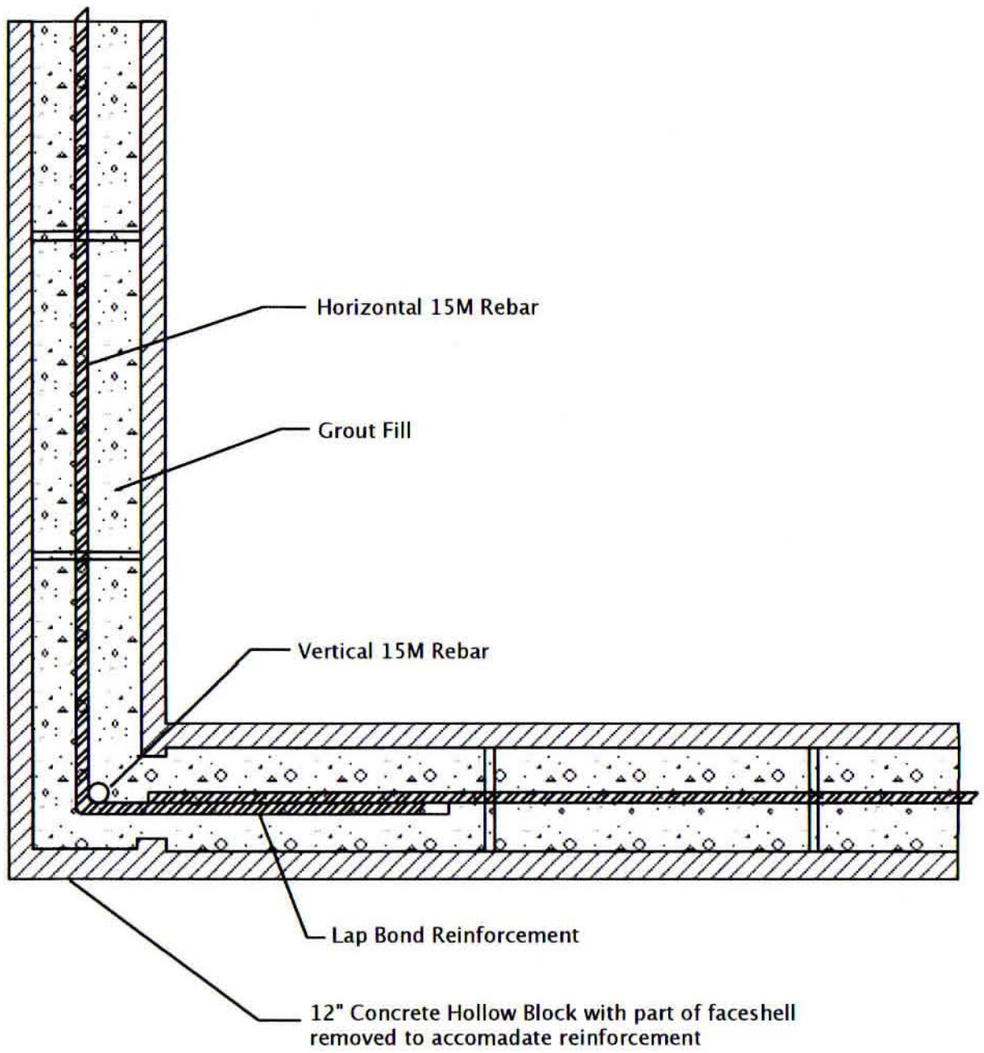
Project

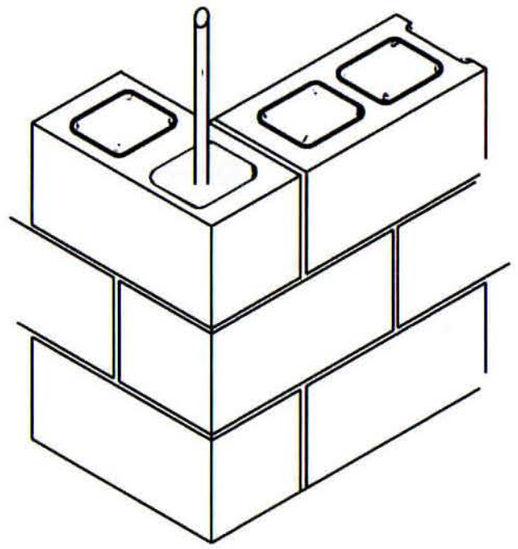
ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL

Drawing Name

DETAILS D1 & D2

March 7, 2018





MASONARY CORNER DETAIL

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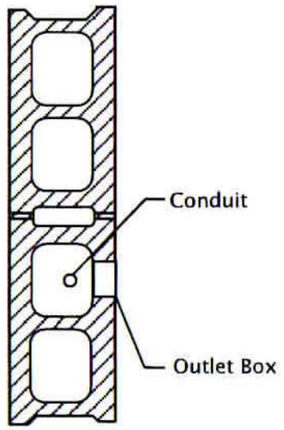
Revision	Date
MATCH ARCHITECTURAL	MAY/18

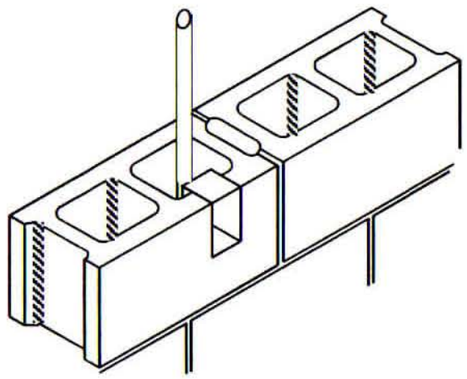
Scale NTS

Project
ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL

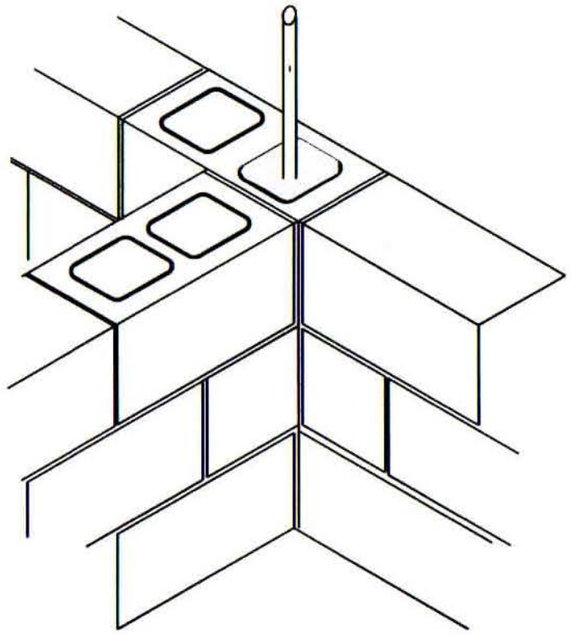
Drawing Name
Masonary Details - 1

March 7, 2018

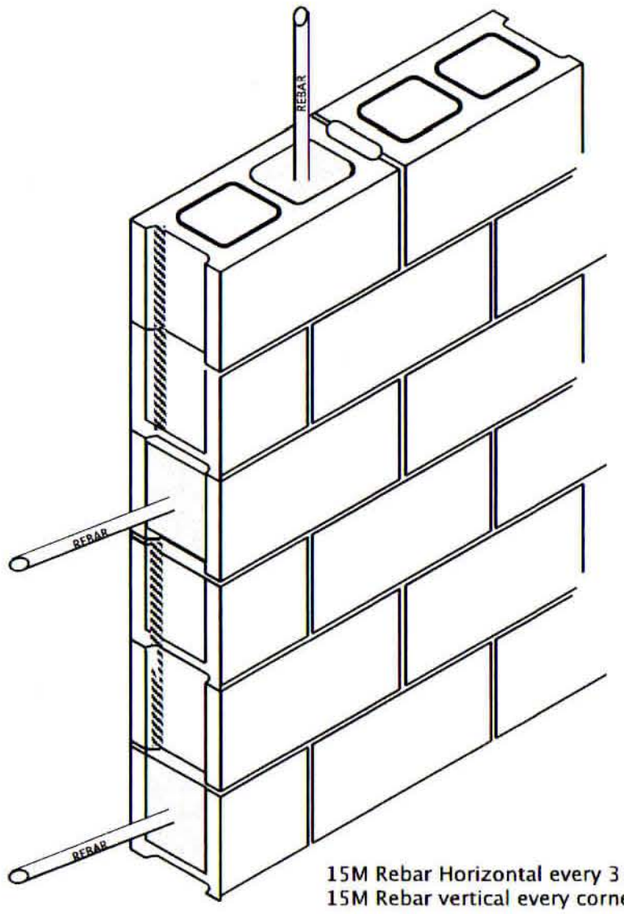




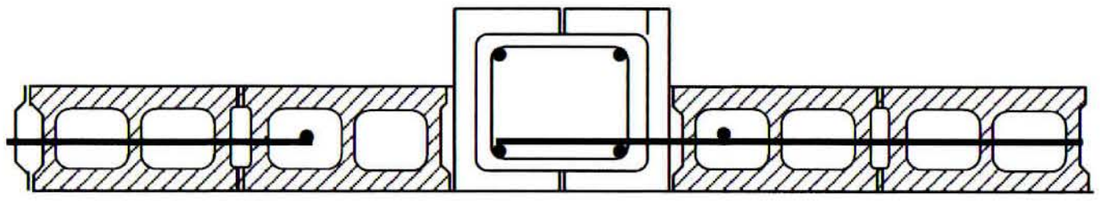
Outlet In Interior Block Wall Detail



Masonary Butted Wall Corner Using Same Size Units



15M Rebar Horizontal every 3 courses
15M Rebar vertical every corner, both sides of every opening and every 3 ' along walls



HORIZONTAL REINFORCEMENT DOES NOT CROSS JOINT

CONTROLL JOINT PILASTER

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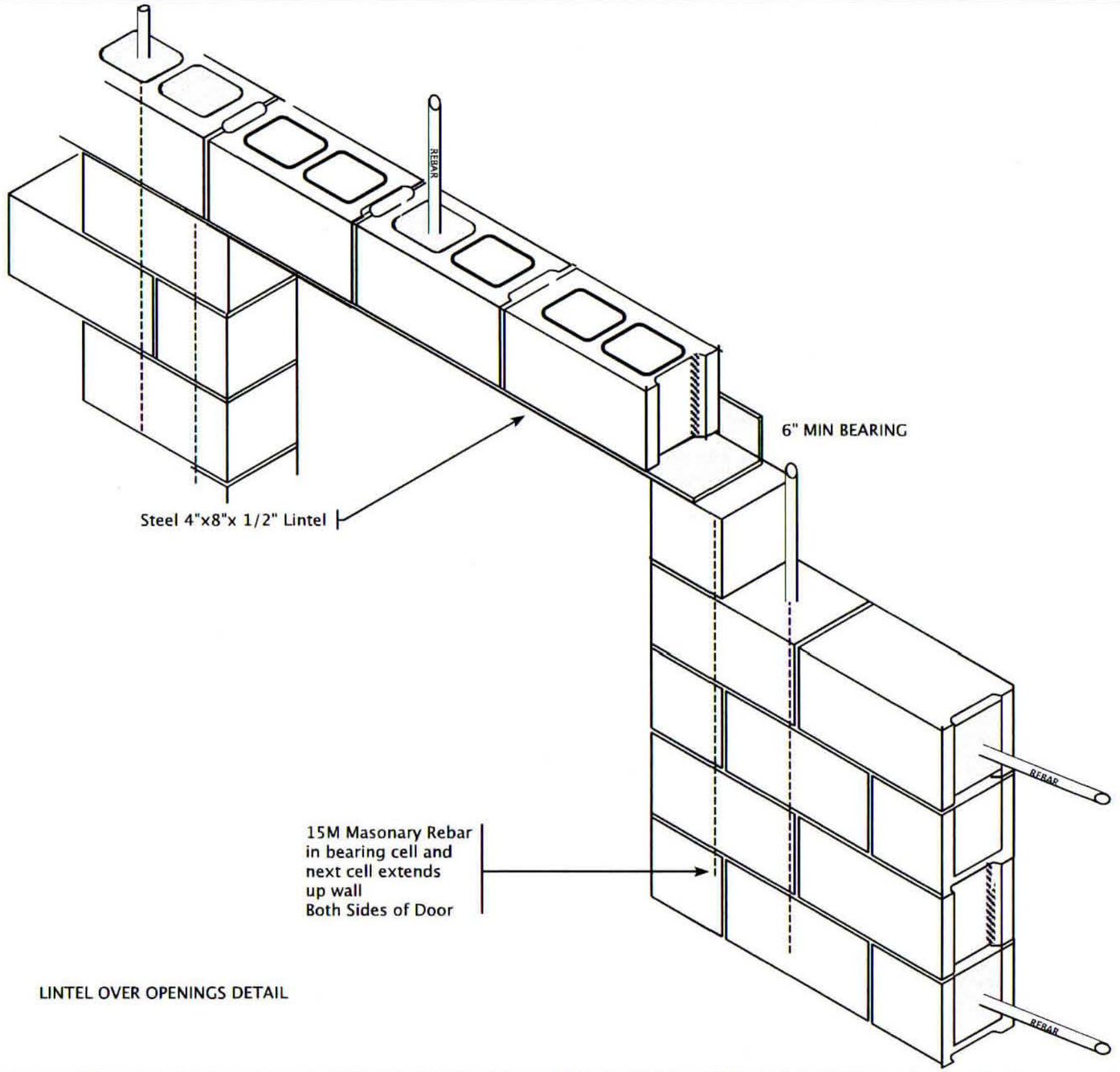
NTS

Revision	Date
MATCH ARCHITECTURAL	MAY/18

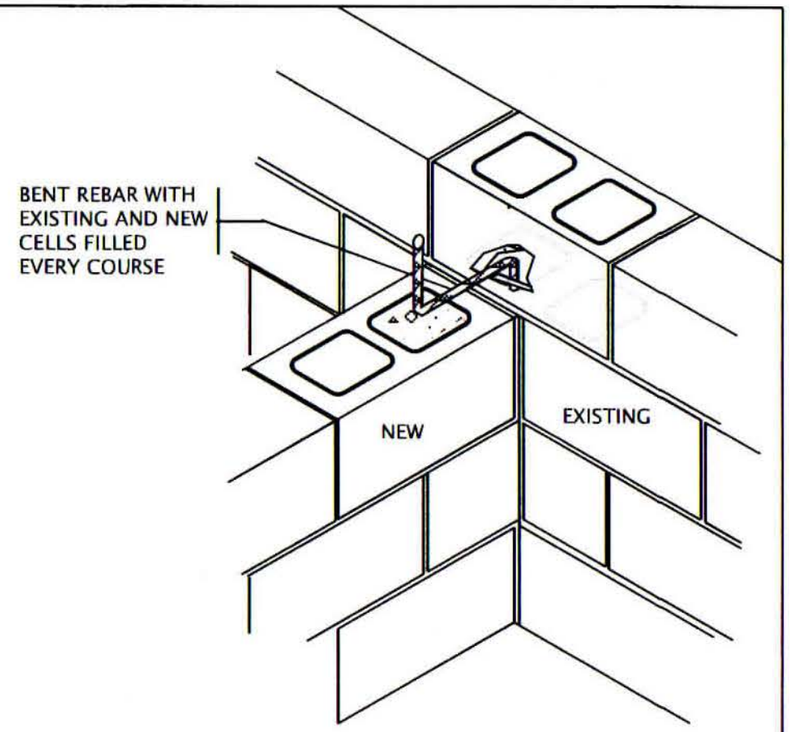
Project
ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL

Drawing Name
Masonary Details - 2

March 7, 2018



LINTEL OVER OPENINGS DETAIL



MASONARY BUTTED WALL TO EXISTING WALL

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Notes

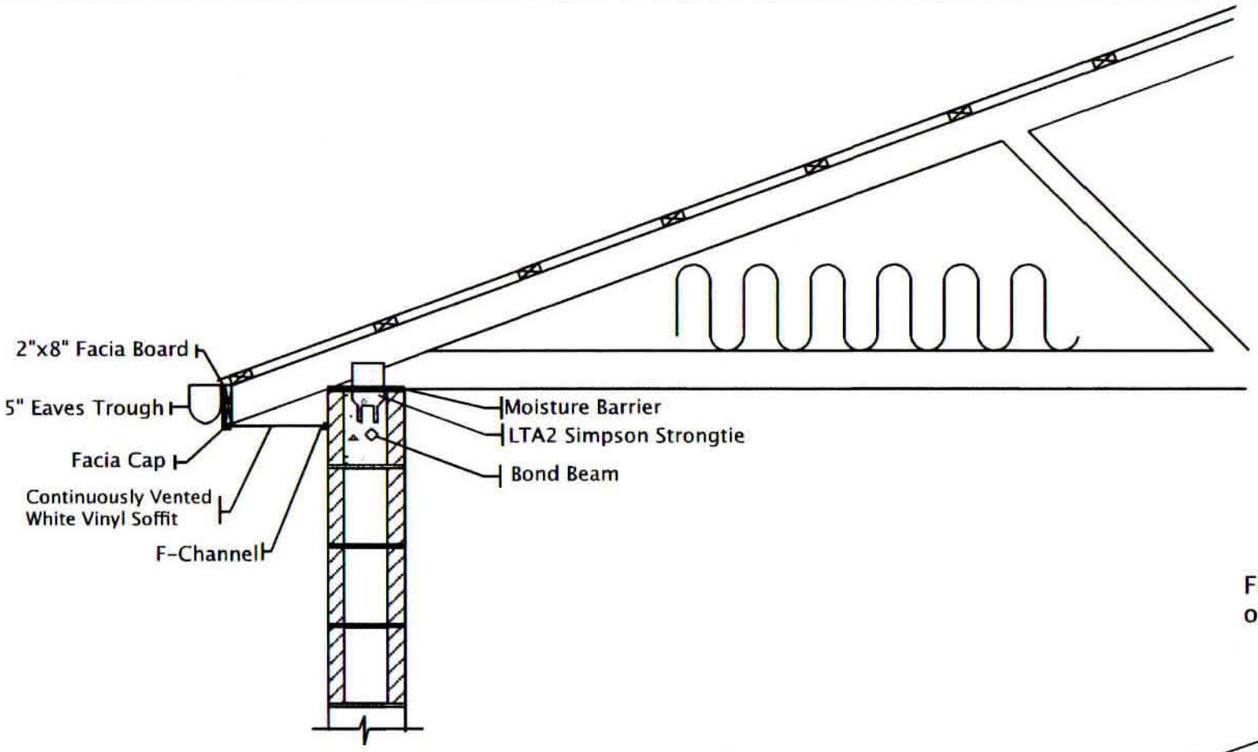
Revision | Date

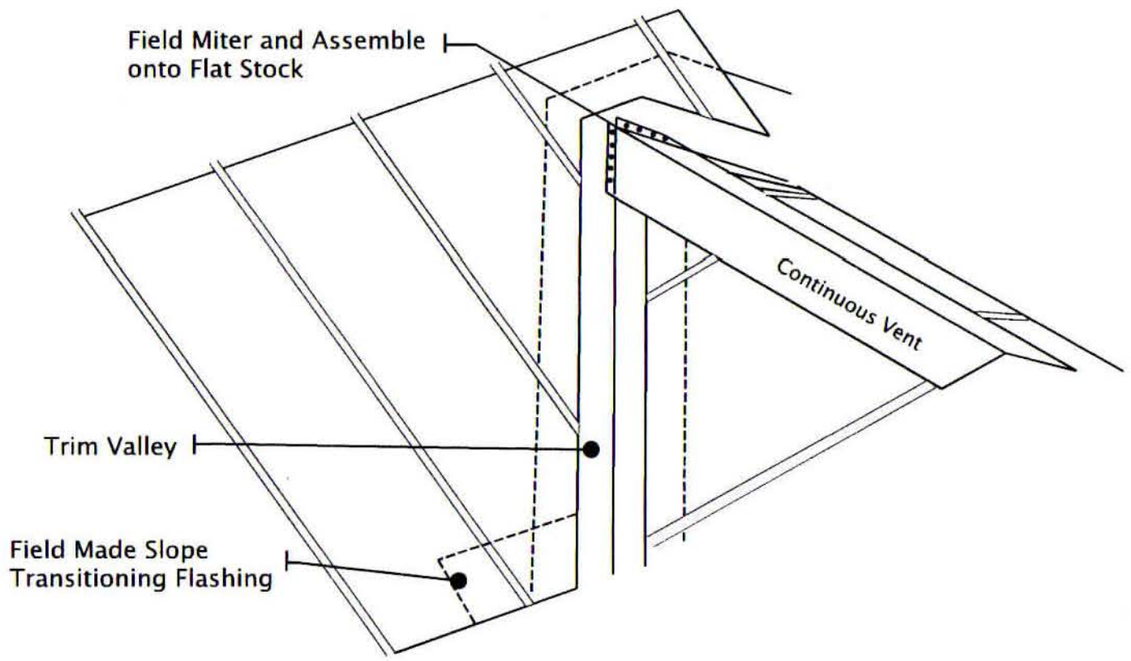
Scale: NTS

Project: ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL

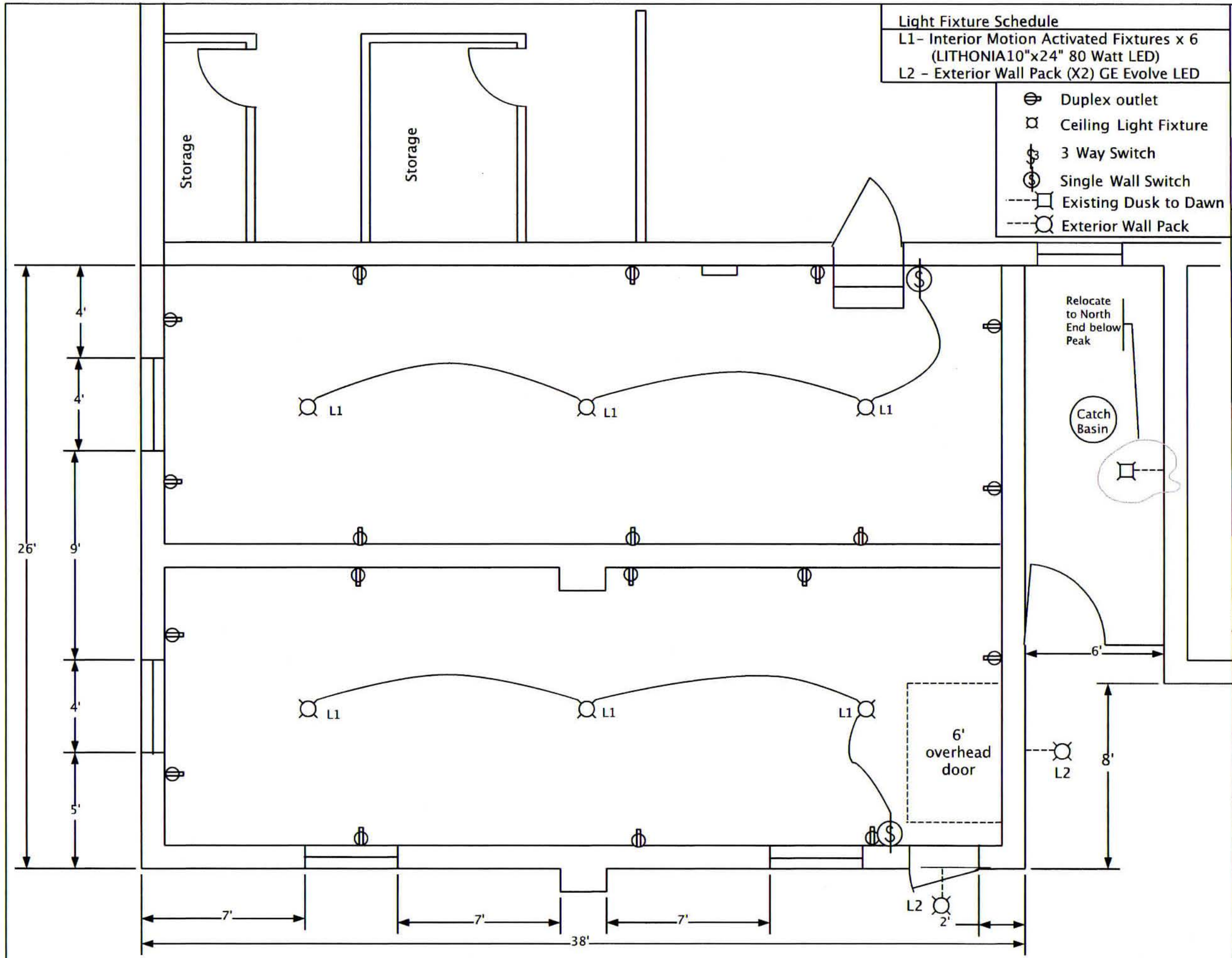
Drawing Name: Masonary Details - 3

March 7, 2018





Orr Engineering Inc P.O.Box 488 Uxbridge, ON L9P 1M9	Customer Township of Uxbridge Address 268 Highway 47 Goodwood, Ontario	Stamp LICENSED PROFESSIONAL ENGINEER COLLEEN E. ORR PROVINCE OF ONTARIO Mar 8/18	Notes	Revision MATCH ARCHITECTURAL	Date MAY/18	Scale Project ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL Drawing Name Roof Details March 7, 2018 | 14 of 16



Light Fixture Schedule

L1- Interior Motion Activated Fixtures x 6
(LITHONIA10"x24" 80 Watt LED)
L2 - Exterior Wall Pack (X2) GE Evolve LED

- Duplex outlet
- Ceiling Light Fixture
- 3 Way Switch
- Single Wall Switch
- Existing Dusk to Dawn
- Exterior Wall Pack

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May 8/18

Customer

Township of Uxbridge

Address

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Scale 1/4" = 1'

Revision	Date
MATCH ARCHITECTURAL	MAY/18

Project

ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL

Drawing Name

Lighting and Electrical Layout

March 7, 2018

General Notes

1. The most recent issue of any standard, codes or regulations mentioned in the drawings provided must be used, unless indicated other wise in the specifications.

2. All workmanship must conform to the most recent issue requirements of NBCC, OBC, applicable local building codes and CSA requirements.

3. The contractor responsibilities include:
- obtaining approvals from all required local authorities.
- safeguard all existing structures affected by the construction.
- obtaining field measurements required for fabrication.

4. Preserve fire rating when penetrating ceilings, floors and walls.

5. Drawings are not to be scaled.

6. To avoid damage to the existing roof, adequate protection (plywood sheets) must be provided by the contractor for the entire duration of the construction. Constructoin loads must not exceed a concentrated load of 1.3kN or uniform distributed load of 1.0 kPa.

7. All shop and installation drawings must be submitted to Orr Engineering by the contractor for review prior to fabrication of the materials.

8.Core drilling in areas occupied by tenants shall be coordinated with the buildings owner/manager and may be required to be completed outside normal working hours. Services damaged must be repaired by the contractor at his own expense.

9. Core drilling must not be done until and x-ray inspection, paid for by the contractor, has been completed to determine the proper location for the penetration. Core drilling is not allowed in column cap areas.

10. Drawings to be read in conjunction with all other contract documents including electrical drawings. No changes from the drawings are permitted unless authorized by the engineer.

Structural Steel Notes

1. All workmanship must conform with the latest edition of any applicable standards.

2. All structural steel to conform to CAN3-G40.21. Grade 300W, HSS to meet requirements of G40.21 Class H grade 350W.

3. All welding shall be completed in accordance with applicable CSA standards and performed by a fabricator certified to current CSA requirements.

4. All bolts to conform to ASTM specifications A325. Properly sized for the application and the threads to be excluded from the shear plane.

5. Holes additional to those shown on the structural drawings are not permitted in any structural member.

6. All structural steel to be hot dipped galvanized unless noted.

7.Apply (3) coats of zinc rich paint to all damaged galvanized surfaces.

8. Field modifications such as drilling of holes and welding to be avoided unless otherwise specified.

Concrete Notes

1. All workmanship must be in accordance with the latest edition of all applicable standards.

2. Reinforcing steel must be grade 400 deformed bars to CAN/CSA G30, 18, unless noted otherwise. Concrete cover to be 2" min. unless otherwise stated.

3. Welded steel must have a minimum yield strength of 40MPa and conform to CSA G30.5 (Provide in flat sheets only)

4. Bend and detail reinforcing steel as indicated in the Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Instituite of Canada.

5.Cast in place concrete to have a minimum 28 Day minimum compressive strength of 30MPa unless otherwise noted.

6. Slump at point of discharge to be 75mm unless otherwose stated.

7. All concrete exposed to freezing and thawing or de-icing chemicals must contain entrainment air.

8. All concrete exposed corner edges shall be chamfered 1" x 1".

9. All grout used shall be non-shrinking, installed to manufacturers instructions, unless otherwise noted.

10. Contractor is not to cut any reinforcment without permission from the structural engineer.

11. Load Bearing required is 3000 PSF to be verified on site by geotechnical engineer.

Wood Frame & Structural Timber Notes

1. All workmanship must be in accordance with the latest edition of the OBC and any other applicable standards.

2. Nails to conform to CSA C111-1974 galvanized for the exterior locations and treated lumber. Nailing pf frame per OBC tables 9.23.3.4 unless otherwise specified.

3. All lumber is to be S-P-F NO. 1(dressed Lumber) or better.

Masonary Notes

1. All workmanship must be in accordance with the latest edition of the NBCC, OBC and any other applicable standards.

2. Utilize type "S" mortar for all interior and exterior load bearing wlss. Conform to CSA STandard A179.

3. All metal materials used in masonary to be hot dipped galvanized.

4. Vertical masonry control to be installed at intervals less than 3 times the wall height with the minimum spacing of 39'4".

5. Provide all temporary shoring to existing masonry walls when cutting into openings.

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ADDITION TO GOODWOOD COMMUNITY CENTRE STRUCTURAL

Drawing Name

General Notes

March 7, 2018