ARCHITECTURAL SPECIFICATIONS

“ISSUED FOR TENDER”
Date: January 11, 2021

EEC STE. CROIX
DAY-CARE RENOVATIONS

LDM ARCHITECTS INC.
2528 Bayview Avenue
PO Box 35588
York Mills Plaza
Toronto, Ontario
M2L 2Y4

Tel: 416-303-8798

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

.2 The process for proposing and approving alternates or equals shall be the same process as for proposing and approving substitutions (refer to paragraph 1.2 below).

.3 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*.

.3 *Consultant's* services to review substitutions will be performed on an additional services basis to their contract with the *Owner*. Costs of these services will be discounted from any reductions in the *Contract Price* that might be forthcoming from the substitution. Therefore, to be acceptable, a substitution must present a reduction in the construction cost at least equal to the cost to the *Owner* of the *Consultant's* additional services to review the substitution. *Contractor* shall cover directly costs and administration associated with courier services, reproduction costs, and other direct costs associated with these substitution reviews.

.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.

.10 Detailed availability of maintenance services and sources of replacement materials and parts, including associate costs and time frames.

.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.

.6 Failure to order specified *Products* in adequate time to meet the approved construction schedule will not be a valid reason to submit a request for substitution. In accordance with GC 6.5 Delays, such delays remain the responsibility of the *Contractor*, and will not result in an extension to the *Contract Time* or be subject to reimbursement by the *Owner*.

.7 The *Owner* is under no obligation to consider *Product* or system substitutions recommended by the *Contractor*.

.8 Remove and replace substitutions incorporated into the *Work* without the *Consultant's*

PART 2 - PRODUCTS
Not applicable.

PART 3 - EXECUTION
Not applicable.

END OF SECTION

PART 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 pursuant to GC 2.2.7 through GC 2.2.10 (inclusive).

.1 An RFI shall not constitute notice of claim for a delay.
.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 there on, 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 5 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.

.3 If, at any time, the Contractor submits a large enough number of RFIs such that the Consultant cannot process these RFIs within 5 Working Days, the Consultant, will confer with the Contractor within 1 Working Day of receipt of such RFIs, and the Consultant and the Contractor will jointly prepare an estimate of the time necessary for processing same as well as an order of priority between the RFIs submitted. The Contractor shall accommodate such necessary time at no increase in the Contract Time and at no additional cost to the Owner.

.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.

.11 If an RFI inquiry is issued by the Contractor without due diligence in finding the information within the Contract Documents, it will be returned as such and a fee of $125.00 will be applied to such RFI from the Consultant to the Contractor.

PART 2 – PRODUCTS

Not applicable.

PART 3 – EXECUTION

Not applicable.

Date	# of Pages
To	From
Co.	Co.
Phone #	Phone #
Fax #	Fax #
Email	Email

Contractor's Request for Interpretation

Consultant's Supplemental Instructions

Project:

Owner:

To:

(Consultant's Representative)

Project No:

RFI No:

Date of Request:

Contractor:

Phone No./e-mail::

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

Attachments: _____
Requested by: _____

***Consultant's Supplemental Instruction*:**

Attachments: _____

Reply By: _____

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

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

By: **By:**

_____ _____

Consultant **Date** ***Contractor*** **Date**

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

END OF SECTION

1 GENERAL

1.1. Instructions

All sections of Division 1, as well as the CCDC contract between the Owner and the Contractor, apply to all trades working on the project.

1.2. Definitions

1.2.1 The word "Owner", where used in these Documents, shall mean:

Canada (represented by the Minister of Public Works and Government Services)

Client: Conseil Scolaire Catholique Monavenir (CSCM)

Stephane Gautier, Project Officer,
sgautier@cscmonavenir.ca
C: 647-394-3427

1.2.2 The word "Consultant", as specified in the General Conditions of the contract, shall mean:

STE. CROIX:

Architectural:
LDM Architects Inc.
201 Upper Highland Crescent
Toronto, Ontario, M2P 1T9
lida@ldmarchitetcts.com

Structural Engineer:
Maitland Spencer, P.Eng.
899 Vickerman way
Milton, Ontario
L9T Ok5
mait@maitlandspencer.ca

Mechanical & Electrical Engineers:
Regal Consulting Engineer Inc.
Mohammed K.Ahmed
2828 Kingsway Drive
Suite 201
Oakville, Ontario
L6J 7M2
mohammed@regal-eng.com>

2 EXAMINATION OF THE SITE

2.1 No claims for extra payments will be allowed for extra work made necessary, or difficulties encountered due to site conditions which were visible upon or reasonably inferable from an examination of the site and geotechnical investigation reports or existing drawings and specifications as made available prior to Bid closing.

3 SIGNAGE

3.1 Individual trades may not display advertising on the site.

4 SHOP DRAWINGS

4.1 Shop drawings by each Trade are required to take into account work of other Trades. In the event of conflict between shop drawings and resulting work by any Trades, it shall be the responsibility of the General Contractor to solve the conflict at no additional cost to the Owner.

4.2 All shop drawings must be reviewed by each particular Trade and stamped before submission to the General Contractor.

4.3 All shop drawings must indicate the following information:

- Name, Address, Phone and Fax Number of the Supplier
- Name of Contact Person
- Identification of Trade Section to which it applies

4.4 The General Contractor must in turn review and stamp all shop drawings before submission to the Consultant.

4.5 **Shop drawings that have not been reviewed and stamped by both the Subtrade and the General Contractor prior to submission will be returned promptly without being reviewed by the Consultant.**

4.6 Shop drawings must be prepared in the similar measurement system as to the Contract Documents (ie. metric shop drawings for metric documents and imperial shop drawings for imperial documents).

4.7 This review is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that the reviewer approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of his for efforts or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all Trades.

5 CUTTING AND PATCHING

5.1 Cutting, patching and provision of openings, shall be done by the architectural and structural trades who have training and experience with the type of construction and finishes involved, at the expense of the Subtrade requiring the cutting or patching. The subtrade requiring the cutting or patching shall be responsible for layout of the required cutting in a timely manner.

5.2 The expression "make good" refers to repair and restoration of new and existing work where applicable.

6 FIRE PROTECTION

6.1 These procedures shall be followed to minimize the possibility of fire and hazards due to fire during construction.

6.2 Temporary Buildings

Locate temporary buildings and storage areas in relation to their hazards and probability of damage to existing buildings under construction. Unless constructed of noncombustible materials, wherever possible locate them at least 10 metres away from buildings.

If constructed of combustible materials separate these structures into small detached units.

6.3 Access To Fire Extinguishing Equipment and Exits

6.3.1 Provide and maintain free access at all times from the street to fire hydrants and to outside connections for standpipes or other fire extinguishing equipment whether permanent or temporary. Do not place material or construction equipment within 3 metres of hydrants or connection, nor between them and centre line of the street.

6.3.2 Maintain free access at all times to control valves and hose on fire lines within building and to all portable extinguishers.

6.4 Fire Doors

Install fire doors and put into operating condition at the earliest possible time.

6.5 Rubbish

Remove flammable rubbish promptly from the premises. If removal is unavoidably delayed reduce fire hazards by wetting down. Disposal of waste material by burning on or near the premises is not permitted.

Clean up and remove rubbish into containers. Removal of containers and disposal off the site including all dumping fees will be the responsibility of the Contractor.

6.6 Welding and Cutting

Where electric or gas welding or cutting is to be done within 3 metres of, or above space that may be occupied by persons, or combustible material, use shielding of non-combustible material.

Maintain appropriate fire extinguishing equipment near all welding and cutting operations.

6.7 Storage of Paints, Oils and Gasoline

Store paints and volatile liquids in a separate shed, and inspect frequently. Place fire extinguisher at the door of paint storage shed.

Store gasoline outside under lock and key, well away from the structure.

6.8 Temporary Wiring

Inspect temporary wiring, drop cords or temporary extension cables frequently for defective insulation or connections.

7 OVERLOADING

Precautions shall be taken to prevent overloading of any part of the structure, falsework or scaffolding during operations. If doubt exists, obtain approval from Consultant.

8 POWDER ACTIVATED FASTENERS

Powder activated fastenings shall not be used on any portion of the Work unless approval for a specific use is obtained from the Consultant.

9 LOAD BEARING MEMBERS

Load bearing members shall not be cut, bored or sleeved without written approval of the Consultant. All cuts shall be made with clean, true and smooth edges.

Where required by the Consultant, reinforcement of any such openings shall be made at the Contractor's expense. Any such reinforcement shall be detailed by the Contractor and bear the stamp of a Professional Engineer.

10 RELATION TO OTHER TRADES

The Contractor shall ensure that all Trades leave chases, slots and reglets required by other Trades and build in frames, sleeves, anchors, bolts, etc. and provide cutting and making good as required. Trades supplying materials for installation on the project shall supply templates and information for their proper locations.

11 CODES, FEES, PERMITS AND CERTIFICATES

All work shall be executed, and all materials shall conform to and be inspected in strict accordance with all the laws, rules, and regulations of the local and provincial codes and all other authorities having jurisdiction.

In the event that material and/or systems specified do not meet these conditions, the Contractor shall bring it to the attention of the Consultant, in writing, before ordering or installing same.

If any Contractor chooses to carry out work in contravention of any Code or By-law, he shall be responsible for all changes required to obtain Code acceptance.

Each Contractor shall obtain all necessary permits and all notices, pay all fees in order that the work hereinafter specified may be carried out and he shall furnish any certificates necessary as evidence that the work installed conforms with the laws and regulations of all authorities having jurisdiction before final certificates are issued.

All changes and alterations required by an authorized inspector of any authority having jurisdiction shall be carried out in accordance with the terms and conditions of GC-16 of the General Conditions.

All equipment supplied must have approval of C.S.A., U.L.C., N.F.P.A., I.A.O., F.M., or F.I.A. and any other authority having jurisdiction.

12 WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM

12.1 The General Contractor and all his Subcontractors shall be trained in WHMIS and be able to submit proof of training if requested by the Consultant. This Contractor shall have material safety data sheets (MSDS) in his site office for all materials of all trades being used on the site.

END OF SECTION

1 GENERAL

1.1. Instructions

1.1.1 The Instructions, Available Information, the General Conditions of CCDC 2 2008, Supplementary Conditions and all Sections of Division 1 apply to and form part of this Section of the Specification.

2 WORK INCLUDED

2.1 Provide for all requirements related to setting out, co-ordination, administration, general construction, safety and protection of the work, workmen, Owner's personnel and the public, the ongoing and final cleaning, and any other work specified or indicated on the drawings.

3 PERMITS AND FEES

3.1 Expedite obtaining all permits referred to in Article GC 10.2.2 of the General Conditions.
3.2 Each trade is responsible to obtain any permits and licenses required for their work section as it relates to this project.

4 NOTICE OF PROJECT

4.1 Submit to the Ministry of Labour a Notice of Project indicating the project start date.

5 FIRE RATED DOORS, WALLS AND PENETRATIONS THROUGH FIRE RATED WALLS

5.1 Verify Fire Rated Doors, walls and penetrations through fire rated walls indicated on the Drawings as deficient, particularly with relation to location, type and quantity, with the Consultant prior to start the project. Make notes on the new door schedule and report any variation from drawings.

6 JOB SIGN

6.1 Fabricate a job sign according to the Standard Detail. Erect the sign at a location directed by the Consultant and at the termination of the project remove the sign and all supports from site.

7 SCHEDULE

7.1 A construction schedule prepared in industry standard software program such as Microsoft 'Project', Prolog, Primavera, must be submitted by the General Contractor at or before the first site meeting. The schedule must show a detailed breakdown of the work of all trades indicating sequence of systems; milestones, and critical dates. The schedule must include the Contractors reasonable expectations for delivery times and long-delivery items. The Owner will expect the work to proceed in accordance with the approved schedule.

8 PROJECT MEETINGS

8.1 Schedule and hold pre-construction, progress and pre-installation meetings throughout construction of work.

8.2 Pre-Construction Meeting

8.2.1 Attend pre-construction meeting, to be held prior to commencement of work at place and time to be announced by Consultant.

8.2.2 Agenda: Project co-ordination, administrative procedures, scheduling and other related subjects.

8.3 Progress Meetings

8.3.1 Schedule and administer bi-weekly progress meetings until Substantial Completion.

8.3.2 Make physical arrangements, prepare agenda, and distribute notice of each meeting to participants, and to Consultant three days in advance of meeting date.

8.3.3 The Contractor shall preside at meetings; record minutes, and distribute copies including shop drawings log and contract administration documents log to participants and to entities affected by decisions at meetings within 5 working days.

8.3.4 Locations of meetings: Project site office or other acceptable location.

8.3.5 The General Contractor shall provide adequate supply of fresh coffee and donuts at regularly scheduled project meetings as manufactured by Tim Horton's or approved alternate. Decaffeinated/low calorie substitutions are not permitted.

8.3.6 Minimum Agenda:

1. Approval of minutes of previous meetings.
2. Review of work progress.
3. Field observations, problems and decisions.
4. Identification of problems, which impede planned progress.
5. Review of Submittal Schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of Progress Schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Co-ordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on Progress Schedule and co-ordination.
13. Other business relation to the work.

8.4 Pre-Installation Meetings

8.4.1 Where required by the specifications or when deemed appropriate by the Contractor, hold pre-installation meetings with members of relevant trades involved to discuss installation of specific building products or elements.

8.5 Co-ordination Meetings with Tenant Contractors

8.5.1 From time to time and as directed by Owner, attend and participate in coordination meetings dealing with interfacing between tenant(s) contractors and Contractor.

8.6 Attendance at Meetings

8.6.1 Contractor, job superintendent, Subcontractors, and suppliers as appropriate to agenda, and authorized to act on behalf of the entity each represents; Owner, Consultant, Professional consultants and others may attend as appropriate.

9 PARKING

9.1 Comply with local parking regulations.

10 TRAFFIC CONTROL

10.1 Consult with authority having jurisdiction in establishing public thoroughfares to be used for site access haul routes.

10.2 Coordinate and comply with local authorities regarding necessary diversion of roads or sidewalks (if applicable).

10.3 Do not stack materials or supplies on existing roads or sidewalks.

10.4 Maintain access roads in good condition (if applicable).

10.5 Protect permanent site improvements to remain such as curbs, pavement and utilities.

10.6 Maintain access for fire-fighting equipment and access to fire hydrants.

11 SECURITY

11.1 Protect and secure site, building, materials and equipment from theft, vandalism and unauthorized entry.

12 PROTECTION OF INSTALLED WORK

12.1 Refer to various sections of Specifications for specific requirements regarding protection of installed materials.

12.2 Provide protective coverings at walls, projections, corners and jambs, sills and soffits of openings in and adjacent to traffic areas.

12.3 Protect finished floors and stairs from dirt, wear and damage.

12.4 Waterproofed and Roofed Surfaces

12.4.1 Restrict traffic to waterproofed and roofed surfaces and restrict material storage on these surfaces.

12.4.2 When traffic or material storage is unavoidable, follow recommendations for protection of surfaces from manufacturer of roofing or waterproofing material.

12.4.3 Keep waterproofed and roofed surfaces free of debris at all times.

12.5 Protect pre-finished work, including windows, louvers, finish hardware and doors from damage by mortar, paint, wallboard compounds and other construction materials and operations.

12.6 Replace or make good, to the satisfaction of the Consultant, any building surface or installed material damaged prior to acceptance by the Owner and/or due to failure to provide suitable protection.

13 FIRE PROTECTION

13.1 Provide and maintain, in good operating condition, adequate fire protection equipment suitable for fire hazards involved at convenient accessible locations during construction.

13.2 Avoid accumulations of combustible forms, form lumber and debris within building and vicinity.

13.3 Flammable Liquids

13.3.1 Store flammable or volatile liquids in open air or in small detached structures or trailers.

13.3.2 Closely supervise storage of paint materials and other combustible finishing and cleaning products.

13.3.3 Do not store oily rags in closets or other tight spaces.

13.4 Comply with recommendations regarding fire protection made by representatives of insurance company carrying insurance on the work or by local fire chief or fire marshal.

13.5 Prohibit smoking in vicinity of hazardous operations.

14 HOUSEKEEPING

14.1 Garbage Disposal

14.1.1 Keep building and site free from accumulations of garbage.

14.1.2 Remove cartons, crates, wrappings, lunch garbage and other garbage daily.

14.1.3 Provide dumpsters for each garbage type in accordance with the local regulations.

14.1.4 Do not burn paper, trash or other material on site.

14.1.5 Do not dispose of volatile wastes such as mineral spirits, oil or paint thinner in storm or sanitary sewers.

14.1.6 Remove salvaged materials from site unless otherwise specified.

14.2 Mud Control

14.2.1 Clean earth and debris spillage from trucking involved in construction operations.

14.2.2 Keep paved public streets and thoroughfares clean.

14.2.3 If earth or debris spillage from construction operations is deposited on paved streets or thoroughfares, wash down and clean soiled surfaces as directed by Owner or by authorities having jurisdiction.

15 RODENT AND VERMIN CONTROL

15.1 Retain an exterminator to protect premises from rodent and vermin infestation if deemed necessary by the Consultant.

15.2 Use extermination materials approved by local Health Department or other agency having jurisdiction.

16 ENVIRONMENTAL REQUIREMENTS

16.1 Noise Abatement

16.1.1 Comply with noise abatement ordinances.

16.1.2 Equip internal combustion engines and compressors with mufflers to reduce noise.

16.1.3 Execute work as quietly as practicable to avoid unnecessary disturbances to occupants within premises.

16.2 Dust Control

16.2.1 Execute work by methods to minimize raising dust from construction operations.

16.2.2 Provide positive means to prevent air-borne dust from dispersing into atmosphere.

16.3 Water Control

16.3.1 Provide methods to control surface and ground water to prevent damage to site or adjoining properties.

16.3.2 Control fill, grading and ditching to direct surface drainage away from excavations, pits, tunnels and other construction areas, and to direct drainage to proper runoff.

16.3.3 Maintain excavations free of water. Provide, operate and maintain pumping equipment.

16.4 Snow and Ice Control

16.4.1 Keep access to building and work areas clear of snow while work is in progress.

16.4.2 Do not allow snow or ice to accumulate over surfaces that can be damaged upon thawing.

16.4.3 Do not allow snow or ice accumulation to overload or otherwise endanger any part of work.

16.4.4 Take precautions against damage to materials stored and work installed in freezing weather.

16.5 Erosion and Sediment Control

16.5.1 Plan and execute construction by methods to control surface drainage from cut and fill and from borrow and waste disposal areas.

16.5.2 Prevent erosion and sedimentation.

16.5.3 Minimize amount of bare soil exposed at one time.

16.5.4 Provide temporary measures to prevent water flow.

16.5.5 Locate fill and waste areas to avoid erosive surface silts or clays.

17 CONSTRUCTION SAFETY

17.1 The General Contractor shall be liable for any costs, fines, penalties, etc., levied against the Owner or Consultant due to violation of the Construction Safety Act by this Contractor or any of his Subcontractors.

17.2 Pursuant to the latest amendments to Ontario's Occupational Health and Safety Act, include all cost for management and/or non-management representatives to attend Safety Committee meetings as often as required by legislation.

18 SAFETY STATEMENT AND PROGRAM

18.1 The General Contractor shall post his Safety Policy Statement on the project and submit to the Consultant a copy of this Safety Program.

END OF SECTION

PART 1- GENERAL

1.1 General

.1 *Provide* the *Work* in accordance with the *Contract Documents* and be responsible for delays or costs resulting from failure to properly inspect or coordinate the *Work*, and for replacement or corrective work required.

1.2 Identification of Systems

.1 *Provide* identification of electrical and mechanical system installations and other automated systems or equipment in compliance with *Contract Documents*.

1.3 Commissioning and Systems Demonstrations

.1 Provide testing, adjusting, balancing and certification and commissioning of mechanical and electrical installations and other automated systems or equipment in accordance with Section 01 77 00.

.2 Instruct *Owner's* designated representatives in operation and maintenance of mechanical and electrical installations and other automated systems or equipment, in accordance with Section 01 77 00.

1.4 Superintendence
This item should be confirmed and coordinated with the owner

.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*.

1.5 Dimensions

.1 Verify dimensions at the *Place of the Work* before commencing shop drawings. Before fabrication commences report discrepancies to *Consultant* in writing. Incorporate accepted variances on shop drawings and as-built records.

.2 Unconfirmed dimensions may be indicated on drawings, or elsewhere in the *Contract Documents*. Such dimensions may be shown with either a suffix or a prefix ± (plus or minus), or indicated with wording "SITE VERIFY', SITE CHECK" or such similar indication or notation or wording. Such dimensional indications or notations are placed onto drawings to enable *Contractor* to determine, in general terms only, the scope of the *Work*, and to assist in determining the *Contract Price*.

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

.4 Thicknesses shown on drawings are nominal only. Ascertain actual sizes on site.

.5 *Owner* will accept no claims for extra expense on the part of the Contractor by reason of noncompliance with paragraph 1.5 of this section.

1.6 Coordination

.1 Coordinate and ensure workers, *Subcontractors*, and *Suppliers* cooperate to ensure that the *Work* will be carried out expeditiously and in proper sequence.

.2 Make adjustments to allow adjustable work fit to fixed work.

1.7 Building Dimension, Templates, Built-ins, and Coordination

.1 Take necessary dimensions for the proper execution of the *Work*. Assume complete responsibility for the accuracy and completeness of such dimensions, and for coordination.

.2 *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.

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

.4 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.

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

.6 Check and verify dimensions referring to interfacing of services. Verify such dimensions with interconnected portions of the *Work*.

.7 Do not scale directly from drawings. Obtain clarification from *Consultant* if there is ambiguity or lack of information.

.8 Details and measurements of any work which is to fit or to conform to work installed shall be taken at the *Place of the Work*.

.9 Advise *Consultant* of discrepancies and omissions in the *Contract Documents*, that affect aesthetics, or that interfere with services, equipment or surfaces. Do not proceed with work affected by such items without clarification from *Consultant*.

.10 Prepare and submit setting drawings, templates and other information necessary for the location and installation of material, holes, sleeves, inserts, anchors, accessories, fastenings, connections and access panels.

.11 *Subcontractors* shall direct related *Subcontractors* on site of specific locations required for sleeves and openings.

PART 2 - PRODUCTS
Not applicable.

PART 3 - EXECUTION
Not applicable.

END OF SECTION

1 GENERAL

1.1 Section Includes

1.1.1 Schedules

1.1.2 Construction photographs

1.2 Construction Schedule

1.2.1 Submit initial schedules within 15 days after award of Contract and resubmit updated schedule with each application for payment.

1.2.2 Submit one translucent reproduction, plus two opaque copies to be retained by the Consultant.

1.2.3 Prepare schedule in the form of a horizontal bar chart.

1.2.4 Provide a separate bar for each trade or operation.

1.2.5 Provide horizontal time scale identifying the first work day of each week.

1.2.6 Format for Listings: the chronological order of the start of each item of work.

1.2.7 Identification of Listings: by specification Section numbers and subject titles.

1.2.8 Include the dates for the commencement and completion of each major element of construction, as well as all other operations which may occur over a period of time exceeding 3 weeks, ie.; Roughing In, Fixture Installation, etc.

1.2.9 Update schedule monthly and resubmit with each application for progress payment.

1.2.10 Updated schedule to show changes occurring since previous submission of schedule:

.1 Activities modified since previous submission.
.2 Revised projections of progress and completion.
.3 Other identifiable changes.

1.3 Additional Schedules

1.3.1 Concurrently with construction schedule, submit a schedule of values, a cash flow schedule, a shop drawing schedule and an equipment delivery schedule in formats acceptable to Consultant.

1.3.2 Cash Flow Schedule: broken down on a monthly basis, indicating anticipated monthly progress billings for duration of Contract.

1.3.3 Schedule of Values: to requirements of the Contract.

1.3.4 Submittal Schedule

.1 Refer to GC 3.10 – Shop Drawings
.2 Indicate anticipated submission dates and review periods for shop drawings, samples, lists of materials and other documentation.
.3 Highlight critical items, including latest date for submittal review by Consultant.
.4 Design sequences of submissions to reflect requirements of construction schedule.

1.3.5 Equipment Delivery Schedule: indicate list of manufactured equipment complete with order dates and anticipated delivery dates.

1.4 Progress Photographs

1.4.1 Concurrently, with monthly application for payment, submit three sets of four 200 x 250 mm sized colour photographs.

1.4.2 Digital submissions will be accepted in place of hard copy, provided the images are formatted as either Bitmap (.bmp) or JPEG (.jpg) image files.

1.4.3 Photographs shall be taken by a professional photographer.

1.4.4 Positions of photographs to be determined by Consultant.

1.4.5 Photographs will be properly exposed and in focus, with unobstructed views.

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

END OF SECTION

1 GENERAL

1.1. Work Included

1.1.1 Work of this Section includes, but is not limited to, the following:

1.1.1.1 Prepare and process Shop Drawings, Product Data and Sample submittals.

1.1.1.2 Provide sample installations and mock-ups.

1.2 Related Sections

1.2.1	Product Options	Section 01 62 00
	Closeout Procedures	Section 01 77 00

1.3 Project Conditions

1.3.1 Maintain reviewed Shop Drawings, Product Data and Samples at Project site, available for reference to Owner, Consultant and their representatives.

1.4 Submittal Procedures

1.4.1 Within 2 weeks of contract award, provide a schedule of shop drawings submittals complete with dates of proposed submission. Timing must be co-ordinated with required delivery times of each item/ assembly / system to meet the required construction schedule.

1.4.2 Submit Shop Drawings, Product Data and Samples to:

LDM Architects Inc., lida@ldmarchitects.com
201 Upper Highland Crescent
Toronto, Ontario, M2P 1T9

1.4.3 Shop Drawings:

1.4.3.1 Submit 3 originals of shop drawings submitted.

Consultant will mark up, in red, all 3 originals: 1 will be retained by the Consultant, 2 will be returned to the general contractor.

The Contractor will be responsible for reproducing and distributing all copies to his trades and suppliers.

Any additional red marked copies required by the contractor or sub-trades will be the responsibility of the general contractor.

1.4.4 Product Date (Catalog Cuts, Brochures, Performance Charts, Test Reports, Diagrams, Schedules and Other Standard Printed or Published Product Data and Letters):

1.4.4.1 Submit three (3) original copies of each.

1.4.4.2 Consultant will retain one (1) copy and return two (2) copies to the Contractor, one of which is to be left on site.

1.4.5 Samples

1.4.5.1 Submit three (3) samples or three (3) sets of samples unless otherwise indicated.

1.4.5.2 Consultant will retain one (1) sample and return two (2) samples to Contractor, one of which is to be left on site.

1.4.6 Product Data & Submittals

1.4.6.1 Furnish copies of submittals required by authorities having jurisdiction over portions of Work, by Owner's insurance carriers as requested by Owner, by Subcontractors and suppliers for coordination of Work and by other contractors whose Work is related.

1.4.6.2 Co-ordinate submittals into logical groupings to facilitate interrelation of Associated items.

1.4.6.3 Submit all colour samples of finishes as a single group, unless otherwise accepted by Consultant.

1.4.6.4 Submit all required product data from each Technical section at same time.

1.4.6.5 Identify each submittal and include the following information:

- Name of Project.
- Submittal number.
- Contractor.
- Subcontractor, manufacturer or supplier.
- Number and title or relevant Specification Section.
- Where printed materials describe more than one product or model, clearly identify item to be furnished

1.4.6.6 Show previous applicable changes to the project made by Addendum, Change Directive or Change Order.

1.4.6.7 Attach a transmittal to each submittal, containing the following information:

- Contractor's signature.
- Project name.
- List of submittal titles and number of copies.
- Date of submission.

1.4.6.8 Re-submittals:

- Make re-submittals in same form and number of copies as first submittal.
- Note date and content of previous submittal made for this item of Work on re-submittals.
- Note date and content of revision in title block and indicate extent of revision clearly.

1.5 Submittal Content

1.5.1 Shop Drawings and Product Data:

1.5.1.1 Illustrate fully requirements of Contract Documents.

1.5.1.2 Identify products, materials and equipment.

1.5.1.3 Shop drawing packages for a single system or group (for instance lighting fixtures; air handling components; plumbing) MUST be submitted as a single package, even if several manufacturers are involved. Such a package will NOT BE REVIEWED piecemeal; review will start once the entire package is submitted.

1.5.1.4 Show methods of assembly, dimensions, connections and other data required for fabrication, coordination and installation.

1.5.1.5 Clearly indicate relationship to adjoining Work, particularly in attachment to Building Envelope.

1.5.1.6 Reproductions of Contract Drawings are not acceptable as Shop Drawings, unless specifically authorized in writing by Consultant. If reproductions or Contract Drawings are accepted as Shop Drawings, the final product must match drawings exactly and must match adjoining work perfectly.

1.5.2 **Do not make changes on reproducibles returned to Contractor with Consultant's review stamp applied.**

1.5.3 Samples

1.5.3.1 Provide Samples physically identical with proposed material or product, unless otherwise authorized by Consultant.

1.5.3.2 If colour or pattern is specified to be selected from manufacturer's standard range, submit full range of manufacturer's standard finishes including available colours, textures, and patterns for Consultant's selection.

1.5.3.3 Submit samples to illustrate functional characteristics of products, including parts and attachments.

1.5.3.4 Submit Product Data for materials prior to or with material samples.

1.5.3.5 For natural materials, submit Sample sets showing full range of colour and texture anticipated in final Work.

1.5.4 Make notations of substitutions or deviations from requirements of Contract Documents in conspicuous manner on submittals.

1.6 Contractor's Review of Submittals

1.6.1 Prior to transmitting submittal, review and approve submittal, and affix Contractor's signature and stamp to submittal.

1.6.2 Consultant will not review submittals that do not bear the Contractor's signature and in the case of mechanical and electrical, the subtrades stamp and signature also. If it appears a review has not taken place, the submittal will be returned to the Contractor not reviewed.

1.6.3 By signing and submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents that he has approved, determined and verified dimension, quantities, field dimensions, relations to existing work, coordination with work to be installed later, coordination with information on previously accepted Shop Drawings, Product Data, Samples, or similar submittals and verification of compliance with requirements of Contract Documents.

1.6.4 In reviewing Shop Drawings, Product Data, Samples, and similar submittals, the Consultant shall be entitled to rely upon Contractor's representation that information in submittals is correct and accurate.

1.6.5 Submittals that are returned or rejected because of insufficient Contractor review or coordination will not be justification for a claim for extension of time.

1.7 Consultant's Review of Submittals

1.7.1 After receipt of submittal, Consultant will review it for conformance to Contract Documents and certify that this review has been performed by affixing Consultant's review stamp.

1.7.2 Review Time:

1.7.2.1 Allow not less than ten working days for processing and review of any one submittal except as noted below, and except when processing must be delayed for coordination with subsequent submittals. Consultant will advise Contractor promptly of such delay.

1. Allow an additional five working days for processing and review of submittals specified in DIVISIONS 5, 9, 15, and 16.
2. Identify those submittals for which review is necessary urgently.
3. Allow 4 weeks after submission of all samples in Division 9, for the Consultant to select finishes and prepare a colour schedule.

1.7.2.2 Review period beings on date of receipt of submittal by Consultant and extends to mailing date of return to Contractor.

1.7.3 Action Following Consultant's Review: Process submittals according to notations placed on them by Consultant.

1.7.3.1 Reviewed:

- Proceed with fabrication, purchase, or both, of items in submittal, subject to the minor revisions or clarifications if any, included in the Consultant's review.

1.7.3.2 Reviewed as Modified:

- Proceed with fabrication, purchase, or both, only after the original drawing has been corrected. Mechanical and Electrical Contractors to include corrected drawings in Maintenance and Operating Manuals.

1.7.3.3 Resubmit:

- Submission is rejected; therefore, fabrication and work indicated cannot proceed.
- Correct submission and resubmit.

1.7.3.4 Not Reviewed:

- Submission was not reviewed for one of the following reasons:
    - Contractors stamp was not found on submission (See 1.6).
    - In the Consultant's opinion, review was not necessary.

1.7.4 Limitations of Consultant's Review:

1.7.4.1 Consultant's review is not a complete check, but only review of general methods of construction and detailing, subject to limitations and requirements set forth in GC 3.11.5.

1.7.4.2 Consultant's review does not authorize changes in Contract Amount or Contract Time unless so stated in a separate Proposed Change or Change Directive. If the Contractor feels the shop drawings have changed the Contract Amount and /or Contract Time, he must notify the Consultant within 7 working days from date of Consultant's transmittal otherwise it will be assumed no change in contract amount or contract time will be considered.

1.7.5 After the Consultant's review of a submittal or re-submittal changes, will not be considered unless accompanied by an explanation acceptable to the Consultant concerning reason substitution is necessary.

1.8 Sample Installations and Mock-ups

1.8.1 Procedures: Where sample installations or mock-ups are required, comply with requirements of relevant Specification Section.

1.8.2 Sample Installations

1.8.2.1 Definition: A partial installation of selected materials for Consultant's approval of quality or work and visual acceptance of materials.

1.8.2.2 Construct sample installations prior to pre-installation meetings.

1.8.2.3 Maintain sample installations during construction as a standard for Work.

1.8.2.4 Properly finished and maintained sample installations may be incorporated into Work.

1.8.3 Mock-Ups

1.8.3.1 Definition: A sample panel specially erected near Project site or, upon the Consultant's approval or direction, at a remote location that incorporates several specified materials.

1.8.3.2 Construct mock-ups prior to ordering final materials.

1.8.3.3 Mock-ups display colour range, texture, bond, mortar colour and quality of work expected of materials incorporated in Work.

1.8.3.4 Mock-ups will be used by Consultant for final material selection.

1.8.3.5 Maintain approved mock-ups in good condition until completion of relevant Work and use as standard for Work.

1.8.3.6 Remove mock-ups from project site at completion of Project.

1.8.4 Testing Mock-Ups

1.8.4.1 Provide full scale assemblies of components specified as test specimens. Simulate actual

construction conditions as accurately as possible.

1.8.4.2 Provide extra materials required to replace any which fail during tests, except intentional failure tests beyond specified performance requirements. Provide sufficient stock of replacement materials at test site to complete tests without delay.

1.8.4.3 See relevant Specification Sections for testing requirements.

1.8.4.4 Shipping mock-up to test site:

1. Assemble test specimen in shop to verify completeness and adequacy.
2. Dismantle test specimen and ship to test site using same packing, loading procedures and mode of transportation as used for components shipped directly to Project site.

1.8.4.5 Assembling mock-ups at test site:

1. Retain same Installer, as will be assembling components at Project site to assemble test specimen at test site.
2. When possible, use personnel assigned to Project site to do assembly.

1.9 Certificates

1.9.1 Definition: Notarized certification of type specified.

1.9.2 Do not construe certification as relieving Contractor from furnishing satisfactory materials if, after test are performed on selected samples, material does not meet specified requirements.

1.9.3 Professional Certification:

1.9.3.1 When professional certification of performance criteria of materials, systems or equipment is required by Contract Documents, Owner and Consultant are entitled to rely on such certifications.

1.9.3.2 Neither Owner nor Consultant shall be expected to make independent examination or verification of professional certifications.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Health and safety considerations required to ensure that PWGSC shows due diligence towards health and safety on construction sites, and meets the requirements laid out in PWGSC/RPB Departmental Policy DP 073 - Occupational Health and Safety - Construction.

1.2 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.3 RELATED SECTIONS

.1 Section [01 33 00 - Submittal Procedures].

.2 Section [01 41 00 - Regulatory Requirements].

.3 Section [01 47 15 - Sustainable Requirements: Construction].

.4 Section [02 61 33 - Hazardous Materials]: Submission Requirements for WHMIS MSDS.

.5 Section [31 23 17 - Rock Removal].

1.4 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.3 Province of Alberta

.1 Occupational Health and Safety Act, R.S.A. [1980].

.4 Province of British Columbia

.1 Workers Compensation Act, (Occupational Health and Safety) Amendment, WCB. Reg. 185/99.

.5 Province of Manitoba

.1 Workplace Safety and Health Act, R.S.M. [1987].

.6 Province of New Brunswick

.1 Occupational Health and Safety Act, S.N.B. [1983].

.7 Province of Newfoundland and Labrador

.1 Occupational Health and Safety Act, R.S.N. [1990].

.8 Northwest Territories and Nunavut

□

.1 Safety Act, R.S.N.W.T. [1988].

.9 Province of Nova Scotia

.1 Occupational Health and Safety Act, S.N.S. [1996].

.10 Province of Ontario

.1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. [1990 June 2002].

.11 Province of Prince Edward Island

.1 Occupational Health and Safety Act, R.S.P.E.I. [1988].

.12 Province of Quebec

.1 An Act Respecting Occupational Health and Safety, R.S.Q. [1997(updated 1 June 2003)].

.2 Safety Code for the Construction Industry R.Q. S-2.1, r.6 [1997(updated 26 November 2002)].

.13 Province of Saskatchewan

.1 Occupational Health and Safety Act, 1993, S.S. [1993].

.14 Yukon Territory

.1 Occupational Health and Safety Act, R.S.Y. [1986].

1.5 SUBMITTALS

.1 Make submittals in accordance with Section [01 33 00 - Submittal Procedures] [___].

.2 Submit site-specific Health and Safety Plan: Within [7] days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation

.3 Submit 3 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative weekly.

.4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.5 Submit copies of incident and accident reports.

.6 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 61 33 - Hazardous Materials.

.7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 14 days after receipt of plan. Revise plan as appropriate and resubmit plan within 7 days after receipt of comments.

□

.8 Review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel.

.10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.6 FILING OF NOTICE

.1 File Notice of Project with Provincial or Territorial authorities prior to beginning of Work.

1.7 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.8 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.9 REGULATORY REQUIREMENTS

.1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.10 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

1.11 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.12 COMPLIANCE REQUIREMENTS

.1 Comply with Safety Act, General Safety Regulations, Ontario.

.2 Comply with Ontario Health and Safety Act and Regulations for Construction Projects, R.S.O..

□

.3 Comply with Occupational Health and Safety Act, Industrial and Commercial Establishments Regulation, R.R.Q. [___].

.4 Comply with Occupational Health and Safety Regulations, 1996.

.5 Comply with Occupational Health and Safety Act, General Safety Regulations, O.I.C.

.6 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.13 UNFORSEEN HAZARDS

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

1.14 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have working knowledge of occupational safety and health regulations.

.2 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

.3 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

1.15 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.

1.16 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction.

.2 Provide written report of action taken to correct non-compliance of health and safety issues identified.

.3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.17 BLASTING

.1 Blasting or other use of explosives is not permitted without prior receipt of written instruction by Departmental Representative.

.2 Do blasting operations in accordance with Section 31 23 17 - Rock Removal.

□

1.18 POWDER ACTUATED DEVICES

.1 Use powder actuated devices only after receipt of written permission from Departmental Representative.

1.19 WORK STOPPAGE

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

□

PART 1- GENERAL

1.1 General

1.1 REFERENCES AND CODES

1 Perform Work in accordance with the current National Building Code of Canada (NBC), Ontario Building Code (OBC), National Fire Code (NFC), and National Fire Protection Association (NFPA) including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

2 Meet or exceed requirements of:
1 Contract documents.
2 Specified standards, codes and referenced documents.

1.2 HAZARDOUS MATERIAL DISCOVERY

1 The contractor is to refer to Section 02 61 00 and review the attached Hazardous Building Materials Assessment reports for this project.
In the event that any hazardous material is discovered beyond what is identified in the report, all work is to stop immediately, and the contractor is to notify the consultants, owner and arrange for abatement according to all applicable laws and regulations.

1.3 BUILDING SMOKING ENVIRONMENT

1 Comply with smoking restrictions and municipal by-laws.

Part 2 - Product

Part 3 - Execution

.

END OF SECTION

1 GENERAL

1.1. Work Included

Provide any other temporary utilities, services, and facilities as needed, or as required by local Authorities.

Relocate temporary facilities and equipment as required by the progress of the Work.
Remove temporary materials, equipment and construction at completion of Work.

1.2 Temporary Light and Power:

Provide temporary power throughout the construction phase.

Any materials used for temporary lighting and power shall meet the Electric Safety Code and Ontario Hydro Inspection standards.

Provide sufficient lighting levels as required to suit particular locations and operations.

Pay all permits required.

1.3 Temporary Heat and Ventilation:

Carry out the work with all possible speed throughout all months from the date of commencement of the work until Total Performance is certified by the Consultant.

Provide temporary ventilation for comfort and protection of workmen and for proper drying of wet Work.

If required for a particular space, provide temporary heat by use of self-contained portable non-propane heating units.

Comply with codes, rules and regulations concerning operations of temporary heating units and with requirements of Owner's insurer.

Do not permit temperature to reach a level which will cause damage to Work.

Replace interior or exterior surfaces damaged by the use of space heaters with new materials or refinish at no cost to the Owner.

Do not use building ventilation system until occupancy is granted.

1.4 Temporary Weather Protection:

Provide protection at all times against weather, rain, wind, storms, frost or excessive heat. At the end of the day's work, cover new work liable to be damaged.
Any work or materials damaged as a result of lack of proper weather protection will be replaced by the Contractor at no cost to the Owner.

1.5 Construction Water:

Provide temporary connections, valves, piping and hoses required for construction operations.

1.6 Use of Permanent Systems:

Do not use newly installed heating systems for purposes of construction heat. Open ends of ductwork must be protected with tightly fitted poly sheeting to prevent dust migration into ductwork. The warranty of any temporarily used equipment must not be affected by such use, but must still be supplied as per the Contract Documents. Temporary filters must be used in any fan equipment and replaced with the permanent filters before substantial completion.

Correct damaged or malfunctioning parts of permanent systems, balance, change filters, clean and restore systems to good working condition before date of Substantial Completion and acceptance by the Owner.

1.7 Temporary Toilets:

Supply and maintain in sanitary condition sufficient temporary toilets that meet the latest edition of the Occupational Health and Safety Act for use of construction personnel for duration of Contract.

Do not use building's sanitary facilities for construction purposes.

Locate temporary toilets so that they are secluded from public view.

Remove temporary fixtures upon completion of Project.

1.8 Protection and Coordination of Existing Utilities:

Do not interrupt utilities located in or near Project which are providing services to general area without approval of Owner and coordination with local utility companies.

Provide Owner and local utility companies with at least 10 working days written notice for outages or connections to utilities.

Send proper notices, make necessary arrangements and perform other services required for care, protection and maintenance of public utilities, including mail boxes, fire plugs, telephone poles and wires, and other items of this character on or around building site.

Permit entrance of public utilities or other parties to Project so that they may perform their necessary Work.

1.9 ADVANCE NOTIFICATION

Seven (7) business days advance notification is required for any work affecting the building occupants such as the following:

- Mold remediation (removal) work / asbestos abatement (removal) work
- X-raying and core drilling
- Notification of start time for painting and carpet laying
- Notification of exterior work
- Notification of any noisy work that has to be done during the normal business hours of the occupants of the building / work site
- Notification of any building system shutdown (i.e. power, water etc.)
- Notification of any loss of use area (i.e. washroom shutdown, lunchroom etc.)

1.10 Temporary Barriers and Enclosures:

1.10.1 Site:

Site contractor has installed barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.

Construction Fence:

Maintain fence around construction site.
All fencing shall be removed at the completion of the Work.

1.10.2 Site Office:

Provide and maintain telephone service, fax service, and email to field office for duration of construction.

Provide meeting facility suitable for site meetings throughout the construction.

1.10.3 Temporary Storage:

Provide storage sheds as necessary for storage of trades equipment and materials within the hoarded worksite area only.
Store combustible materials apart from building materials.

1.10.4 Building Interior:

Provide and maintain temporary enclosures to separate Work areas from areas occupied by Owner or tenants to prevent penetration of dust, moisture and noise into occupied areas.

Construct using adequate framing and surface with plywood or gypsum board, and poly vapour barrier having closed joints and sealed edges at intersections with existing surfaces. Temporary doors and door hardware to be installed as shown on drawings.

Provide and maintain telephone service, fax service, and email to field office for duration of construction.

Dust barriers **must** be used at all times during dusty work. Poly Sheet Dust Barriers are to be sealed tight to floor and ceiling and / or to the filter mediums on return air grills etc.

1.10.5 Clean up after all work **must** be performed immediately and the area(s) are to be left in a clean and safe manner. Failure to clean properly may result in the Proponent being charged for cleaning services obtained by the Building Management and the Building Management may terminate the Proponents access.

2 WARRANTIES

Commencement of warranties for permanent systems will be date of Substantial Completion regardless of Contractor's use of such systems during construction period.

END OF SECTION

1 GENERAL

1.1 Section Includes

1.1.1 Product requirements.

1.1.2 Substitution procedures.

1.1.3 Owner-furnished products.

1.1.4 Delivery, storage and handling requirements.

1.2 Basic Product Requirements

1.2.1 Refer to GC 3.8 – Labour and Products.

1.3 Product Substitution Procedures

1.3.1 The Owner is under no obligation to consider Product or system substitutions recommended by the Contractor.

1.3.2 Requests for substitution during the course of construction may only be considered when submitted in sufficient time to permit proper evaluation by the Consultant.

1.3.3 When requesting Consultant review of a proposed Product substitution, demonstrate to the Consultant's satisfaction that the proposed substitute will perform equally as well as the specified product.

1.3.4 Accompany each application for substitution with a list of properties for the specified product and for the proposed substitute. NO application for Product substitution will be considered unless made in this way.

1.3.5 The clause "or accepted alternative", or other similar clauses, will not be construed as an invitation to submit substitutions or to unilaterally substitute Products in place of the specified Products and systems.

1.3.6 Remove and replace substitutions incorporated into the Work without the Consultant's written approval.

1.4 Owner-furnished Items

1.4.1 Owner's Responsibilities

.1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions and certificates to Contractor.
.2 Delivery supplier's bill of materials to Contractor.
.3 Arrange and pay for delivery to site in accordance with progress schedule.
.4 Inspect deliveries jointly with the Contractor.
.5 Submit claims for transportation damage.
.6 Arrange for replacement of damaged, defective or missing items.
.7 Arrange for manufacturer's field services; arrange for and deliver manufacturer's warranties and bonds to Contractor.

1.4.2 Contractor's Responsibilities

.1 Designate submittals and delivery date for each product in progress schedule.
.2 Review shop drawings, product date, samples, manufacturer's instructions and other submittals. Submit to Consultant notification of any observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
.3 Receive and unload products at site.
.4 Inspect deliveries jointly with Owner, record shortages and damaged or defective items.
.5 Handle Products at site, including uncrating and storage.
.6 Protect Products from damage and from exposure to elements.
.7 Assemble, install, connect, adjust and finish Products.
.8 Conduct installation inspections required by public authorities.
.9 Repair or replace items damaged by Contractor or Subcontractors on site.

1.5 Product Delivery Requirements

1.5.1 Ensure that Products are packaged, delivered and stored to prevent damage and to ensure that their moisture content is not increased beyond manufactured or specified installation limits.

1.5.2 Label packaged goods to completely describe contents.

1.5.3 Immediately review Product delivery requirements and anticipate foreseeable supply delays for any items.

1.5.4 In the event of failure to notify the Consultant at commencement of Work, the Consultant reserves the right t substitute more readily available products f similar character, at no increase in Contract Price.

1.6 Product Storage and Handling Requirements

1.6.1 Handle and store Products in a manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable. Provide all necessary protection for those materials that require it. All storage of material shall be performed in a neat and tidy manner.

1.6.2 Store packaged or bundle Product in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in the Work.

1.6.3 Do not allow Product to be placed in contact with the ground nor with other materials that could stain them. Store Product subject to damage from weather in weatherproof enclosures.

1.6.4 Store paint and other volatile substances in a separate structure located at least 15 metres from the building and equipped with a fire extinguisher.

1.6.5 Store materials within the building only as approved by Owner. Move materials stored within the building should they be a hindrance to the work or delivery of other materials.

1.6.6 Receive, handle, protect and store Products purchased by the Owner for the work as it is delivered to the premises.

1.6.7 Remove from site all flammable rubbish and packing materials such as sawdust, paint cans, wood shavings, etc.

END OF SECTION

1 GENERAL

1.1 Section Includes

1.1.1 Requirements and limitations for cutting and patching the Work.

1.2 Submittals

1.2.1 Submit written request in advance of cutting or alteration which affects:

1.2.1.1 Structural integrity of any element of Project.

1.2.1.2 Integrity of weather-exposed or moisture-resistant elements.

1.2.1.3 Efficiency, maintenance or safety of any operational element.

1.2.1.4 Visual qualities of sight-exposed elements.

1.2.1.5 Work of Owner or separate contractor.

1.2.2 Include in request:

1.2.2.1 Identification of Project.

1.2.2.2 Location and description of affected work.

1.2.2.3 Statement on necessity for cutting or alteration.

1.2.2.4 Description of proposed work, and products to be used.

1.2.2.5 Alternatives to cutting and patching.

1.2.2.6 Effect on work of Owner or separate contractor.

1.2.2.7 Written permission of affected separate contractors.

1.2.2.8 Date and time work will be executed.

1.3 Materials

1.3.1 Required for original installation.

1.3.2 Change in Materials: Submit request for substitutions in accordance with Section 01 60 00.

1.4 Preparation

1.4.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

1.4.2 After uncovering, inspect conditions affecting performance of work.

1.4.3 Beginning of cutting and patching means acceptance of existing conditions.

1.4.4 Provide supports to assure structural integrity of surroundings; devices and methods to protect other portions of project from damage.

1.4.5 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

1.5 Execution

1.5.1 Execute cutting, fitting and patching including excavation and fill to complete the Work.

1.5.2 Fit the several parts together, to integrate with other work.

1.5.3 Uncover work to install ill-timed work.

1.5.4 Remove and replace defective and non-conforming work.

1.5.5 Remove samples of installed work for testing.

1.5.6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical work.

1.5.7 Execute work by methods to avoid damage to other work, and which will provide proper surfaces to receive patching and finishing.

1.5.8 Employ suitable labour to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

1.5.9 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed with masonry materials without prior written approval.

1.5.10 Restore work with new products in accordance with requirements of Contract Documents.

1.5.11 Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.

1.5.12 At penetration of fire-rated wall, ceiling or floor construction, completely seal voids with firestopping and smoke seal materials, full thickness of the construction element.

1.5.13 Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.

END OF SECTION

1 WORK INCLUDED

1.1 General cleaning during construction and final cleaning prior to inspection for final inspection of work

1.2 Requirements for cleaning specified in this Section are in addition to specific cleaning requirements specified in various technical Specification Sections.

2 PRODUCTS

2.1 Cleaning Materials

2.1.1 Use materials which will not create hazards to health or property and which will not damage surfaces.

2.1.2 Use materials and methods which comply with requirements of local authorities having jurisdiction over Work and are recommended by manufacturer or fabricator of material being cleaned.

3 CLEANING DURING CONSTRUCTION

3.1 Maintain the work, at least on a daily basis, free from accumulations of waste material and debris.

3.2 Provide on-site dump containers for collection of waste materials, and debris. All waste to be sorted on site to maximize recyclability.

3.3 Remove waste materials and debris from site.

3.4 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

3.5 Vacuum clean interior building areas prior to start of finish painting and continue vacuum cleaning in each area on "as needed" basis until that area is ready for occupancy.

4 FINAL CLEANING

4.1 Exterior Cleaning:

.1 Remove debris, waste and surplus materials from site, and from drainage systems.

.2 Remove temporary protection and temporary construction.

.3 Remove stains, spills and foreign substances from exterior surfaces.

.4 Sweep and hose down paving and walks.

4.2 Interior Cleaning:

.1 Remove temporary protection, tags, labels and markings from materials, fixtures, accessories and equipment.

.2 Clean transparent and glossy materials to polished condition; remove foreign substances.

.3 Polish reflective surfaces to clear shine.

.4 Clean switch and outlet plates, finish hardware, handrails and metal trim of smudges, paint and soiling.

.5 Clean aluminum, stainless steel, bronze and similar metals according to instructions of metal manufacturer.

.6 Vacuum clean carpeted and similar soft surfaces.

.7 Clean resilient floors thoroughly with well-rinsed mop containing only enough moisture to remove surface dirt and dust; then buff dry by machine, bringing surfaces to sheen.

.8 Broom clean and vacuum concrete floors.

.9 Clean under and behind convectors and other equipment.

.10 Clean inside cabinets and other concealed areas.

.11 Repaint surfaces and items that cannot be cleaned.

.12 Do not remove 'ULC' labels or 'CSA Approved' labels.

4.3 Cleaning Glass:

.1 Wash and polish both sides of glass.

.2 Remove temporary labels.

.3 Employ window-cleaning firm or personnel experienced in window cleaning work.

4.4 Cleaning Mechanical and Electrical Equipment:

.1 Clean surfaces of equipment; remove excess lubrication.

.2 Clean plumbing fixtures to sanitary condition.

.3 Clean permanent filters of ventilating equipment and replace disposable filters when units have been operated during construction; in addition, clean ducts, blowers and coils when units have been operated without filters during construction.

.4 Light fixtures and lamps:

- Wipe light fixtures with anodized aluminum louvers or reflectors free of dust, grease and fingerprints,
- Using non-abrasive cloth and suitable cleaner, recommended by fixture manufacturer.
- Replace burnt-out bulbs with new specified bulbs.
- Replace construction bulbs with new specified bulbs.

5 DAMAGED MATERIALS

.1 Any materials damaged during final cleaning operation shall be replaced by the General Contractor. Extra stock, as supplied under contract, will not be used for this replacement purpose.

END OF SECTION

1 GENERAL

1.1 Work Included

Submittals and procedures required for closeout.

1.2 Related Work Specified Elsewhere

See Section 01 74 00 for final cleaning requirements.
See Section 01 78 00 for closeout submittals.

2 TAKE OVER PROCEDURES

For the purpose of closing out this construction project and the takeover of the project by the Owner from the Contractor, the "OAA/OGCA Take-Over Procedures" document will be used with the following additions, clarifications and modifications.

Provided below, for the General Contractor and Subcontractors benefit, is a list of minimum requirements for this contract closeout.

2.1 Contractor to notify Consultant, in writing, when he feels he meets the requirements of Substantial Performance as set out in the "Take-Over Procedures".

2.2 The Consultant, the Contractor and his required Subcontractors shall prepare a list of incomplete and unsatisfactory work.

2.3 Contractor shall make written application to the Consultant for Substantial Performance which must include all of the following:

- Statement that the contract is substantially performed in compliance with the Contract Documents.
- An invoice showing the amount of holdback owing accompanied by a Statutory Declaration and Workplace Safety and Insurance Certificate.
- Submission of closeout requirements.
- A statement of completion with cost values as described in the "Take-Over Procedures - 3.2 (d)."

2.4 If the Consultant finds the Contractor's application complete, he shall visit the project and verify the validity of the application.

2.5 If the application is approved by the Consultant, he shall issue a Certificate of Substantial Performance to the Owner and the Contractor.

2.6 The Contractor shall publish a copy of the Certificate of Substantial Performance in the "Daily Commercial News" and provide a copy to the Consultant.

2.7 The 45 day lien period begins on the day of publication with the holdback monies due, if no liens exist, on the forth-sixth (46th) day.

2.8 A lump sum amount of the contract will be left uncertified by the Consultant until all applicable certificates, warranties (including extended warranties), tax rebates, balancing report, demonstrations of systems, final cleaning and deficiencies have been received or completed to the satisfaction of the

Consultant. The lump sum amount retained for such purpose shall be the greater of the following:

a) The summation of:

i) 3 percent of the first $500,000 of the contract price,
ii) 2 percent of the next $500,000 of the contract price, and,
iii) 1 percent of the balance of the contract price.

b) $2,000.00

2.9 When all deficiencies have been completed and verified by the Contractor, he must notify the Consultant for further review. Upon becoming satisfied that all deficiencies have been corrected and upon receiving all certificates, warranties, balancing reports and tax rebates and upon verifying completeness of all final cleaning and demonstrations and upon receiving the Contractor's final invoice, a Final Payment Certificate" will be issued by the Consultant.

2.10 If the Contractor notifies the Consultant to re-review deficiencies, and upon visiting the project, the Consultant finds less than 75% completion of the outstanding listed deficiency items, it will be judged that the Contractor has not verified the deficiencies prior to notifying the Consultant. If this occurs, all future re-review hours will be charged to the Contractor on an hourly basis. The hourly rate charged will be $140.00 /hour, plus travel costs.

2.11 If all deficiencies are not completed within a reasonable period of time, the Consultant will invoke the requirements of GC 7.1, Owners right to perform work or stop the work or terminate contract.

2.12 The guarantee period(s) shall commence at the date Substantial Performance is obtained.

2.13 Assemble guarantees, warranties, affidavits and certificates required by Contract Documents for various materials, systems and equipment.

.1 Include copies of permits and certificates of inspection obtained by Contractor.

.2 Place documents in order and list each document on transmittal letter or form.

3 Closeout Requirements

3.1 Extra Stock and Parts

.1 Deliver to Owner extra stock of materials, spare parts and loose accessories required by Contract Documents.

.2 Include special tools for items such as thermostats and adjustable dampers and give instructions for use.

.3 Provide protective wrapping or packaging labeled with full identification of item. Materials are to be provided in unbroken cartons, or if not supplied in cartons, they shall be strongly packaged.

.4 Store neatly in the storage locations as predetermined by Owner.

3.2 Certificates

Provide to the Consultant any certificates required by all local authorities and all certificates of compliance or verification required throughout the specification. Any certificates obtained prior to the maintenance manual submission should be included in the manual. Any certificates obtained after the maintenance manual submission shall be sent to the Consultant prior to Final Payment Certification.

3.3 Warranties

Provide to the Consultant, all specified warranties, extended warranties and free manufacturer extended warranties as applies to each individual section. The warranty period(s) shall commence the date of Substantial Performance and be valid for the full duration specified. Warranties are to be sent to the Consultant prior to Final Payment Certification.

3.4 Demonstration of Systems

.1 Provide instruction to the Owner's operating and maintenance personnel, during regular work hours, on the care, operation and maintenance of all equipment and systems as specified in the applicable sections. Refer to the various sections of the specifications for the specific instructional requirements.

.2 All instructional periods shall be prior to the acceptance and handover of systems to the Owner for operation responsibility and also prior to Final Payment Certification.

.3 For equipment requiring seasonal operation, perform instructions for other seasons within six months.

.4 Use Information Manual for basis of instruction. Review contents of Manual with personnel in detail to explain operation and maintenance.

.5 Prepare and insert additional data in the Information Manual when need for such data becomes apparent during instruction.

.6 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance and shutdown of each item of equipment at equipment location.

.7 See Divisions 21, 23 and 26 for additional requirements.

END OF SECTION

1 GENERAL

1.1 Instructions

1.1.1 The Instructions to Bidders, Information Available to Bidders, the General Conditions of CCDC 2 - 2008, Supplementary Conditions and all Sections of Division 1 apply to form part of this Section of the Specification.

1.2 Related Work Specified Elsewhere

1.2.1 See Section 01 77 00 Contract Closeout for submittal of Project Record Documents.

2 PRODUCTS

2.1 Project As-Built Documents

2.1.1 General:

2.1.1.1 The Project As-Built Documents consist of As-Built Drawings, Shop drawings and As-Built Specifications.

2.1.1.2 Maintain Documents and Samples at Project site.

2.1.2 Secure from the Consultant one complete set of Contract Documents comprising the work in electronic format (dwg). Costs of these are the responsibility of the Contractor, which will be charged at a cost of $150 + HST per drawing.

2.1.3 Record the actual "as-built" details of the project on the white prints throughout the duration of the project.

2.1.3.1 Modify the electronic drawing files (dwg) comply to client’s CAD standards and specifications and accurately record all significant deviations from the Contract Documents in the Work, caused by site conditions and changes originated from all Consultants, Contractor/Subcontractor originated changes, Change Orders, Site Instructions, Supplementary Instructions, Addenda, instructions by correspondence and Jurisdictional Authority approvals.

2.1.3.2 Carefully record location of concealed elements which are required for maintenance, alteration work and building additions.

2.1.3.3 Eradicate all obsolete information.

2.1.4 Clearly mark each of project As-Built Drawings, "Project As-Built Copy" in the title block. Maintain in good condition, available at all times for inspection by the Consultant’s site representatives, and do not use for construction purposes.

2.1.5 Keep Project As-Built Drawings current and do not record irrelevant information.

2.1.5.1 Do not permanently conceal any work until the required information has been recorded.

2.1.5.2 Proof that the Project As-Built Drawings are current will consist of the Consultant’s site representatives making a visual check of the Project As-Built Drawings.

2.1.6 Completion of the Project As-Built Drawings to current stage of construction shall be considered a condition precedent for validation of any application for payment made by Contractor.

2.1.7 Date all entries with proper reference to the appropriate Change Order or approval number. Call attention to the entry by a "cloud" around the area or areas affected.

2.1.8 At Substantial Completion, submit one complete set of final "Reviewed" or "Reviewed-As-Modified" shop drawings, on which corrections have been recorded of changes made during fabrication and installation of unforeseen conditions. Do not include drawings which were "Returned and Resubmit."

2.1.9 Conversion of Schematic Layouts:

2.1.9.1 Drawings indicate mechanical and electrical conduits, circuits, piping, ducts and other similar items, in schematic form and do not indicate precise physical layout.

2.1.9.2 Indicate on As-Built Drawings, by accurate dimension, centerline of each run for relevant items.

2.1.9.3 Clearly identify items by accurate note such as "cast-iron drain", "galv. water pipe" or "return air duct".

2.1.9.4 Indicate by symbol or note, vertical locations of items such as "under slab", "in ceiling plenum" or "exposed".

2.1.9.5 Identify elements and locations with description that can be related reliably to Contract Documents.

2.1.10 Site Plan:

2.1.10.1 See Section 01 31 00 Instructions to the General Contractor for requirements for foundation verification and site compliance surveys.

2.2 Information Manual

2.2.1 Format:

2.2.1.1 Covers: Plastic covered, 3-ring, loose-leaf binders bearing title of Project and date on typed label.

2.2.1.2 Sheets: 8-1/2 inches x 11 inches, except pullout sheets may be neatly folded to 8-1/2 inches x 11 inches.

2.2.1.3 Organize contents into applicable sections of work to parallel project section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets.

2.2.1.4 Provide manual in three separate volumes: One for Divisions 21, 22, 23 Mechanical, one for Division 26 Electrical and one for all other Divisions.

2.2.1.5 Quantity: Provide three copies of each volume to Owner.

2.2.2 Contents:

2.2.2.1 Provide the following information for products and systems scheduled for inclusion in Manual:

- Names, addresses, phone and fax numbers
- Copy of hardware and finish schedule.
- Copies of final revised shop drawings of each trade. Reinforcing steel bar lists and structural steel detail drawings need not be part of this manual.
- Maintenance instructions for finished surface materials.

- Description, operation and maintenance instructions for equipment and systems, including complete list of equipment and parts list. Indicate nameplates information such as make, size, capacity and serial numbers.

- Materials used on the project as required by extras, alternates or substitutions showing name of manufacturer and source of supply.

2.2.2.2 Where required in technical Specification Sections, include, as applicable, the following additional information provided by manufacturer or fabricator:

- Written recommendations for cleaning agents, methods and precautions and recommended cleaning and maintenance schedules.

- Written operating and emergency procedure instructions for equipment and recommended maintenance procedures and schedules.

- Equipment or product catalog data, wiring diagrams, spare parts lists for each piece of equipment, accessories, controls and fixtures.

- Include name, address and telephone number of local representative for principal items of equipment.

2.2.2.3 Roofing and waterproofing systems:

- List manufacturer, installer, material properties and composition and details of installation.

- List every component of system including insulation and flashings.

- Provide manufacturer and installer recommendations for inspections, maintenance and repair.

2.2.2.4 Mechanical, plumbing and electrical systems: See Divisions 21, 22, 23 and 26 for requirements.

2.2.2.5 Provide additional information for the Information Manual as may be specified in the technical Specification Sections.

END OF SECTION

PART 1 – GENERAL

1.1 Extended Warranties

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

.1 Written warranties shall be furnished by individual manufacturer for particular product/system/assembly or by *Subcontractor* for a particular product/system/assembly/section of *Specifications* and specifically endorsed by warrantor to *Owner*.

.2 Warranty shall include for proper performance of the portion of the *Work* as defined by the scope of the applicable specification section to the extent that the design and *Contract Documents* permit such performance.

.3 Warranty shall be provided by *Subcontractor* unless warranty is specified to be provided by product manufacturer.

.4 The *Owner* shall promptly give the warrantor notice in writing of observed defects and deficiencies which occur during the warranty period.

.5 Warranty shall commence at date of *Substantial Performance of the Work*.

.6 Warranty specified shall be in addition to, and run concurrent with, other warranties required by the *Contract Documents*. Manufacturer's disclaimers and limitations on product warranty do not relieve *Contractor* of obligations under requirements of the *Contract Documents*.

.7 Submit warranty on warrantor’s standard form endorsed to *Owner* which includes the following information:

.1 Name and address of *Project*.

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

.3 Warranty period.

.4 Specific warranty terms as required in applicable portion of *Contract Documents*.

.5 Name and title of authorized signing officer and seal of warrantor.

PART 2 - PRODUCTS
Not applicable.

PART 3 - EXECUTION
Not applicable.

END OF SECTION

1 GENERAL

1.1 Instructions

1.1.1 The Instructions to Bidders, the General Conditions of CCDC 2 2008 Supplementary General Conditions and all Sections of Division 1 apply to and form part of this Section of the Specification.

1.1.2 This Contractor shall report in writing to the General Contractor any defects of surfaces or work prepared by other Trades which affect the quality or dimensions of this Contractor's work. Commencement of this Contractor's work shall imply complete acceptance of all work by other Trades.

1.2 Intent

1.2.1 This Contractor shall provide all articles, labour, materials, equipment, transportation, hoisting and incidentals noted, specified and required to complete the work of this section.

1.3 Work Included

1.3.1 This Contractor shall complete all the removal and demolition work as indicated on the drawings or specifically mentioned in these Specifications, including the following:

1.4 Work Excluded

1.4.1 All removal of asphalt and sidewalks etc. is covered under Earthwork Section 31 00 00.

1.4.2 Miscellaneous concrete/masonry required to be removed.

1.5 Examination

1.5.1 It shall be the responsibility of this Contractor to visit the site and note all characteristics and features affecting the work of this Section.

1.5.2 No allowance will be made for any difficulties encountered or any expenses incurred by this Trade on account of any conditions of this site or any item existing thereon which is visible or known to exist at the time of Tender.

1.5.3 Safety Requirements

1. Undertake the Work and effect arrangements required by authorities having jurisdiction for protection of public and workers.

2. Post danger signs conspicuously around property. Close doorways and thoroughfares giving access to area of demolition with barricades and hoarding as indicated or required.

3. Provide a competent, experienced supervisor in charge of the work and present at the *Place of the Work* whenever work is in progress.

4. Demolition of asbestos containing materials can be hazardous to health. Stop the *Work* and notify the *Owner* immediately should material resembling spray or trowel-applied asbestos, which has not already been identified, be encountered in the course of demolition work. Do not proceed until written instructions have been received from the *Owner* and *Consultant*.

5. Should any suspect PCBs or other hazardous materials be encountered which have not already been identified, stop the work in the immediate area which may disturb suspect materials.Immediately report any suspect asbestos, PCBs or other hazardous materials, not previously identified, to the Owner and Consultant.

1.6 Permits and Regulations

1.6.1 This Contractor shall arrange and pay for all permits, notices, and inspections necessary for the proper execution and completion of the demolition.

1.7 Protection

1.7.1 This Contractor shall be entirely responsible for, and make good all damage to adjoining properties and buildings, adjacent walks, curbs, etc.

1.7.2 This Contractor shall be entirely responsible for the safety of all persons lawfully engaged on the work when such injury is caused by negligence or any act of this Contractor or any person or persons engaged in the work of this Trade.

1.7.3 It shall be the responsibility of this Contractor to protect the public from injury during the course of demolition by providing suitable barriers, fences, coverings, guardrails, etc., that may be required by the Owner and/or Municipal Authorities.

1.8 Existing Services

1.8.1 This Contractor shall locate and disconnect, cap and plug all gas, water, sewer, hydro, telephone and other services as required. In each case the Utility Company involved shall be notified in advance and its approval obtained before commencing that portion of the work. Approximate locations of existing utilities have been indicated on the accompanying drawings. No responsibility is assumed by the Consultant for the exact locations as shown.

1.9 Clean-up

1.9.1 This Contractor shall leave the site in a clean and orderly condition to the satisfaction of the Consultant. If this Contractor fails to do so the Consultant may order excess debris to be removed at this Contractor's expense.

2 PRODUCTS

2.1 Salvage Material

2.1.1 All material from the demolition shall become the property of this Contractor unless noted, who shall remove all material and debris from the site as quickly as possible. Burning of debris on the site will not be permitted.

2.1.2 Remove and store items indicated or directed for salvage. Remove, handle and transport such items to storage area designated in the Contract Documents, to an area within the Place of the Work designated by Consultant, or to an area away from the Place of the Work as directed by the Consultant. Perform such work to prevent damage to the items during removal and in storage.

2.1.3 The *Owner* will review *Place of the Work* prior to commencement of demolition and instruct the *Contractor* the items to be retained for re-use or be turned over to the *Owner*.

2.1.4 Remove and store indicated items for future use by *Owner*. Remove, handle and transport such items to storage area indicated in the *Contract Documents* or to an area within the *Place of the Work* designated by *Consultant*. Perform such work carefully and with diligence to prevent any damage to the items during removal and in storage.

2.1.3 The following is a list of items to be retained and given to the Owner.

2.2 Provide separate price to 'omit' the salvaging of brick – this separate price is to be incorporated in the separate price for using new brick.

3 EXECUTION

3.1 General

3.1.1 Demolition shall be executed in an orderly and careful manner with due consideration for adjacent structures and finishes.

3.1.2 During demolition operations, work shall be kept wetted down thoroughly to prevent dust and dirt from rising. Water shall be provided for this purpose by this Contractor. Upon completion of work, any temporary water and power lines shall be removed.

3.1.3 All necessary precautions to guard against movement or settlement of the remaining structure shall be taken including all necessary bracing or shoring that is required.

3.2. Examination

1. Verify that utilities have been disconnected and capped.

2. Observe existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

3. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

4. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to *Consultant.*

5. Survey of existing conditions: Record existing conditions by use of photographs in accordance with Section 01 32 33.

3.3 Utility Services and Mechanical / Electrical Systems

1. Refer to Divisions 21, 22, and 23 and Divisions 26, 27, and 28 respectively.

3.4 Selective Demolition, General

1. Demolish and remove existing construction only to the extent required by new construction, and as otherwise indicated. Use methods required to complete the work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required.

Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.

4. Maintain adequate ventilation when using cutting torches.

5. Remove decayed, infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

6. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

7. Dispose of demolished items and materials promptly.

2. Dispose of demolished materials from *Project* site except where noted otherwise and in accordance with authorities having jurisdiction. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

3. Do not sell demolished material at the *Place of the Work*.

4. Clean existing surfaces specified to receive new applied finishes to assure proper adherence

END OF SECTION

1 GENERAL

1.1 REGULATORY REQUIREMENTS

1.1.1 A Designated Substances report for this site has been completed by the Owner to fulfill the requirements of:

.1 Export and Import of Hazardous Waste Regulations SOR/2002-300.

.2 National Fire Code of Canada [2005].

.3 Transportation of Dangerous Goods Act (TDG Act) [1999], (c. 34).

.4 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2003-400).

.5 The Designated Substances are identified in the Occupational Health and Safety Act (O. Reg. 213/91 as amended by O. Reg. 628/05.

1.2 DEFINITIONS

.1 Dangerous Goods: product, substance, or organism that is specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 Hazardous Material: product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.3 Hazardous Waste: any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.4 Workplace Hazardous Materials Information System (WHMIS): a Canada-wide system designed to give employers and workers information about hazardous materials used in workplace. Under WHMIS, information on hazardous materials is provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by combination of federal and provincial laws.

.5 All Contractors requesting bids from Subcontractors shall provide the required information to Subcontractors.

1.3 VALIDITY DATE

1.3.1 A designated substances survey for the area of construction has been conducted. Information provided is based on previous site visits to the building and sample information obtained from Owner's reports. Since that time, designated substances may have been removed from or added to the project area.

1.3.2 Prior to beginning work confirm with Owner that additional designated substances have not been brought to the project area.

1.3.3 Due to the nature of building demolition, some inherent limitations exist as to the possible

thoroughness of the designated substance survey. The survey did not include the demolition of floors, floor finishes, plaster ceilings or walls or other areas to examine concealed conditions. In addition, the survey does not refer to substances that may be present in the day-to-day usage of specialized equipment.

1.3.4 There is a possibility that materials may exist which could not reasonably be identified within the scope of this assessment, or which were not apparent during the site visit.

1.4 OCCUPATIONAL HEALTH AND SAFETY ACT

1.4.1 The following is an amendment to Bill 208 "An act to amend the Occupational Health and Safety Act, The Workers' Compensation Act" subsequently identified as amendment 18a. The following outlines the responsibilities of each party of the Contract as it relates to amendment 18a.

1.4.2 Duty of Project Owners: Before beginning a project, the Owner shall determine whether any designated substances are present at the project site and shall prepare a list of all designated substances that are present at the site.

1. Tenders: If any work on a project is tendered, the person issuing the tenders shall include, as part of the tendering information, a copy of the list referred to in subsection (1).

2. Idem: An Owner shall ensure that a prospective constructor of a project on the Owner's property has received a copy of the list referred to in subsection (1) before entering into a binding contract with the constructor.

1.4.3 Duty of Constructors: The constructor for a project shall ensure that each prospective contractor and subcontractor for the project has received a copy of the list referred to in subsection (1) before the prospective contractor or subcontractor enters into a binding contract for the supply of work on the project.

1. Liability: An Owner who fails to comply with this section is liable to the constructor and every contractor and subcontractor who suffers loss or damages as the result of the subsequent discovery on the project of a designated substance that the Owner ought reasonably to have known of but that was not on the list prepared under subsection (1).

2. Idem: A constructor who fails to comply with this section is liable to every contractor and subcontractor who suffers any loss or damages as the result of the subsequent discovery on the project of a designated substance that was on the list prepared under subsection (1).

2. WHMIS Inventory is available from the Owner through the office of the Consultant

2 DESIGNATED SUBSTANCES

2.1 REPORTS

2.1.1 The report is entitled "*Reassessment of Hazardous Building Materials Survey*" as completed by "*Maple Environmental Inc." for EEC. STE. CROIX.*

1. It is the Contractor's responsibility to review all existing DSS and Asbestos Surveys reports onsite

and implement the recommendations as well as hiring *environmental consultant for abatement procedures and any updates required on Asbestos Product Survey or Designated Substances (DSS) report(s).*

2.1.2 Abatement must be performed by a Certified Environmental Consultant who must determine risk level prior. The following must be prepared and provided to the Property Manager for approval prior to commencing abatement:

1. A report stating the type(s) of asbestos and the condition of the asbestos-containing material, and the location of the asbestos-containing material.

2. A summary report, written in plain language, concerning the asbestos work.

3. Written processes for the work to be undertaken, based on the friability of the asbestos-containing material, processes to be used, and the worksite. Processes shall be developed in accordance with the Canadian National Master Construction Specification (NMS), Sections 02 82 00.01 (Asbestos Abatement - Minimum Precautions), 02 82 00.02 (Asbestos Abatement - Intermediate Precautions), or 02 82 00.03 (Asbestos Abatement - Maximum Precautions).

4. Specifications, according to Canadian National Master Construction Specification (NMS) format mentioned in Section 6.2.2. Alterations to specifications, in order to accommodate specific federal and provincial requirements, shall be determined by environmental consultant based on work requirements.

5. Third-party liability insurance

6. Fit test certificate

7. Service provider’s site-specific safety plan

8. Notice of Project (For Type 3 projects and certain Type 2 projects. The contractor is responsible for such notification.

9. Copy of Workplace Safety and Insurance Board / Ministry of Labour clearance

10. Copy of trade certificates / competency cards

11. Other certificates where required (fall protection, confined space, man lift, etc.)

2.1.3 Also prior to the commencement of asbestos abatement work, the following precautions must be ensured:

2. Property Manager has received proof of adequate training for employees performing asbestos work and approved personal protective equipment is provided;

3. Containers for asbestos waste shall be labeled as asbestos waste and are held at a pre-determined, secure location in the building; and

4. The collection and disposal of asbestos-containing material waste is performed in accordance with the applicable provincial regulations.

2.1.4 All Services related to the design and preparation of specifications shall be performed by a qualified person with the appropriate training, experience, and insurance for asbestos-related work.

2.1.5 Upon completion of any project work which alters the amount or condition of asbestos-containing material in the building or engineering asset, a report will be prepared that indicates the work that has been completed. The inventory shall be updated.

2.1.6 If during the abatement procedure, a building occupant is or may have accidentally been, exposed to airborne asbestos as a result of disturbance of asbestos-containing material, or by inadvertent contact during regular maintenance, renovation or construction work, a qualified person shall be appointed to conduct a hazard investigation as defined by the Canada Occupational Health and Safety Regulations.

2.1.7 Environmental Consultant shall ensure that the abatement procedure, air monitoring, sampling, methodology must be performed in accordance with applicable Provincial and Federal Regulations, PSPC Asbestos Management Standard and Directive, O.Reg 278.05 , Canada Labour Code, Canada Occupational Health and Safety Regulations, Canadian Environmental Protection Act, Hazardous Materials Information Review Act, Hazardous Products Act, Canadian National Master Construction Specification (NMS) - Asbestos Abatement Precautions.

3 Execution

DISPOSAL

.1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.

.2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.

.3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.

.4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.

.5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

.6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.

.7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

.8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:

.1 Hazardous wastes recycled in manner constituting disposal.

.2 Hazardous waste burned for energy recovery.

.3 Lead-acid battery recycling.

.4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

MAPLE ENVIRONMENTAL INC.
ENVIRONMENT, HEALTH & SAFETY CONSULTANTS

REASSESSMENT OF HAZARDOUS BUILDING MATERIALS SURVEY REPORT

École élémentaire catholique Sainte Croix
351 Lafontaine Road West
Tiny (Lafontaine), Ontario

Presented to:

Conseil Scolaire Catholique MonAvenir
110 Drewry Avenue
Toronto, Ontario
M2M 1C8

October 2017

Maple Project No. 16302

482 South Service Rd. E. • Suite 116 • Oakville • Ontario • L6J 2X6 • Tel: 905-257-4408 • Fax: 905-257-8865
www.MapleEnvironmental.com

TABLE OF CONTENTS

1.0 INTRODUCTION

Maple Environmental Inc. ("Maple") was retained by Conseil scolaire catholique MonAvenir ("cscMonAvenir") to conduct a reassessment of hazardous materials within Sainte Croix located at 351 rue Lafontaine ouest, Tiny (Lafontaine), Ontario, (the "Site"). The reassessment of hazardous building materials includes:

- Asbestos-Containing Building Materials ("ACM")
- Lead
- Mercury
- Mould
- Polychlorinated Biphenyls ("PCB")
- Radioactive Sources
- Silica

A detailed survey for the presence of the listed hazardous building materials was initially performed by Maple in 2006. The purpose of the current reassessment was to confirm the condition of the known hazardous materials, make updates subject to renovation or remedial work that may have taken place since the time of the previous assessment and make recommendations as required. Reassessments are performed on an annual basis.

2.0 METHODOLOGY

The Site work was performed by Maple representative Ms. Sarah Doyle on July 10, 2017. The surveyors accessed each functional space where possible to assess the quantity and condition of hazardous materials identified during the initial hazardous materials survey for the property. The survey included a detailed assessment of all exposed hazardous materials and a representative assessment of concealed hazardous materials (i.e. above ceilings, pipe chases, etc.). It is important to note that concealed spaces were not entered in every room but rather in sufficient quantity to assess the overall representative condition of known hazardous materials.

Ceiling plenums and areas above accessible suspended ceiling systems were observed by removing ceiling tiles in various locations in the building. Drywall or plaster ceiling or wall spaces were accessed via existing access panels only.

2.1 Asbestos-Containing Building Materials ("ACM")

The scope of the reassessment included all friable asbestos products and all major non-friable asbestos materials. The term friable is applied to a material that can be readily reduced to dust or powder by hand or moderate pressure. Asbestos materials that are friable have a much greater potential to release airborne asbestos fibres when disturbed.

Ontario Regulation 278/05 applies to buildings with regards to maintenance, renovations or demolition work where ACM is present and may be disturbed. The regulation requires all buildings where asbestos has been used as part of the building to implement an Asbestos Management Program ("AMP") which has already been implanted for this site.

Regulation 278/05 requires that the detailed asbestos inventory already performed in all cscMonAvenir schools be updated annually. This report satisfies this requirement.

The recommendations and suggestions made as part of this report with respect to asbestos have taken into account several considerations described below. The evaluation takes into consideration the condition and accessibility of the asbestos material as well as other factors such as water damage, vibration, air movement, and general activities in the area.

Where ACM is found to be in Good condition and not likely to deteriorate or fall, the general recommendation would be to re-evaluate the condition of the material on an annual basis (required by Regulation 278/05). This recommendation can be subject to change if the material is located in a manner that persons untrained in asbestos awareness could physically damage it.

Where the ACM is found to be damaged (i.e. Fair or Poor condition), a recommendation to have the material cleaned-up, repaired, removed, enclosed, or encapsulated is offered. The recommendation will also indicate which asbestos procedure should be used to perform the remedial work (i.e. Type 1, Type 2, Type 3, or Glove Bag Asbestos Abatement procedures).

In each area or room inventoried, the technicians recorded the quantity, condition (Good, Fair, or Poor) and accessibility (A, B or C) of each suspect material.

The definitions for condition and accessibility items are as follows:

GOOD Material is intact with no visible signs of damage.

FAIR Material is visibly damaged but can be repaired.

POOR Material is damaged beyond repair and likely needs to be removed.

Access A Accessible to all occupants of the building

Access B Accessible to Maintenance personnel (i.e. by means of a ladder, Mechanical Room, pipe chase etc.)

Access C Not generally accessible (i.e. above a fixed ceiling system)

The original asbestos related information collected by the technicians was entered into tables and is presented on a room-by-room basis in the original report. If no changes were required to the data, the data was not included in the reassessment report. If the data changed, from the original assessment it was revised and included in its entirety as Appendix II of this report.

Drawings indicating location numbers of rooms referenced in the Room-by-Room data, and the location of asbestos-containing materials were included with the original report. If changes were required to the drawings as a result of this reassessment they were modified and included in their entirety as Appendix III of this report.

2.2 Lead

The investigation included a visual reassessment of lead based materials previously identified in the initial survey conducted by Maple. Other materials that possibly contain lead were identified by known historic use where relevant and as identified in the original assessment.

2.3 Mercury

The reassessment included a visual identification of switches, electrical controls, heating system thermostats, thermometers, and other components historically known to contain mercury.

2.4 Mould

The reassessment for mould was conducted in accordance with standard industry practice as set out in the Canadian Construction Association ("CCA") "Mould Guidelines for the Canadian Construction Industry" for a visual reassessment. Although there are no regulatory requirements in Ontario for such a reassessment, the CCA Guidelines, and similar guidelines from other agencies have been accepted as the industry standard by most experts, consultants, the Ontario Ministry of Labour, and the CCA.

All guidelines and protocols for mould investigations indicate that investigations should be performed largely on a visual basis with limited collection of bulk and/or air samples. The Ontario Ministry of Labour has consistently enforced the removal of all mould from buildings regardless of mould genus or species, and therefore bulk samples or air samples for confirmation of mould are not typically collected for investigative purposes where mould is visible.

2.5 Polychlorinated Biphenyls ("PCB")

The current survey included a reassessment of transformers and representative light fixture ballasts for determination of suspect PCB content. Where possible, serial numbers and codes from the manufacturer's labels of equipment were recorded and compared to manufacturer's literature for determination of PCB content. Samples of PCB liquids were not collected.

2.6 Radioactive Sources

Radioactive Sources, including: smoke detectors; test equipment; or other known sources, not including sources that generate radiation through input of energy (e.g. microwaves, x-ray machines, laser light sources) were identified. Sampling for radon or radon gas was not performed.

2.7 Silica

Free crystalline silica is associated with all concrete and masonry products, which were identified on a visual basis at the Site.

3.0 LIMITATIONS AND OMISSIONS FROM SCOPE

Due to the nature of building construction some limitations exist as to the possible thoroughness of any building materials inventory. The field observations, measurements, and analysis are considered sufficient in detail and scope to form a reasonable basis for the findings presented in this report. Maple warrants that the findings and conclusions contained herein have been made in accordance with generally accepted evaluation methods in the industry and applicable regulations at the time of the performance of the inventory.

It is possible that conditions may exist which could not be reasonably identified within the scope of the inventory or which were not apparent during the Site investigation. Maple believes that the information collected during the inventory period concerning the property is reliable. No other warranties are implied or expressed.

In addition, with respect to asbestos, during a standard reassessment, performed for the purposes of regulatory compliance, it is industry practice to exclude some non-friable materials in the inventory. Examples of such assumptions include; elevator brakes, roofing felts and mastics, high voltage wiring, mechanical packing and gaskets, underground services or piping, fire-doors, window caulking, levelling compound, and/or materials used in operating equipment.

It should be noted there was no access to Locations 29 and 35 during the time of the current reassessment.

4.0 REASSESSMENT FINDINGS

4.1 Asbestos

Confirmed asbestos-containing materials in the building include the following:

- Vinyl floor tiles (VFT-01, VFT-03)
- Acoustic ceiling tiles (AT-01)

Based on the findings of the current re-assessment survey, minor damage was noted on ACM vinyl floor tiles within the following Locations: 31 (2 SF) and 34 (9 SF). Additionally, minor damage and water staining was noted to be present on ACM acoustic ceiling tiles within Location 22 (1 tile) and Location 25 (1 tile).

Suspected asbestos-containing materials in the building include the following:

- Vinyl floor tiles (VFT-04, VFT-09)
- Mechanical insulation (parging cement)

Materials previously sampled and found NOT contain asbestos include the following:

- Plaster
- Drywall
- Vinyl floor tiles (VFT-02)

- Acoustic ceiling tiles (AT-02, AT-03)

During the current reassessment, the new portion of the school (constructed during 2010) was assessed via a walkthrough assessment. Asbestos-containing materials were not identified within this area during the initial survey. Further, no asbestos-containing materials were identified in this area during the current reassessment. The possibility of the presence of ACM in the building is unlikely based on the date of construction (Post 1985) although it is possible that non-friable ACM may be present that is not identified in this report.

For updated information regarding the specific locations, quantities, and conditions of asbestos-containing materials at the Site, please refer to Appendix II - Updated Room-by-Room Asbestos Inventory. The Updated Room-by-Room Asbestos Inventory refers to Location Numbers included in Appendix III - Updated Drawings.

4.2 Lead

No regulations currently exist in Ontario defining the lower limit of lead-containing material. The Ontario Ministry of Labour (MOL) has issued a guideline for lead abatement, entitled Guideline – Lead on Construction Projects (2004) which is considered enforceable. The Guideline does not specify what constitutes a material as "lead-containing". Instead it outlines procedures based on the concentration of airborne lead encountered during removal, as well as providing procedures and/or specific operations for lead-containing material removal. However, the Environmental Abatement Council of Ontario (EACO) Lead Guideline for Construction, Renovation, Maintenance or Repair indicates that paints containing 0.1% to 0.5% lead be considered "lead-containing" and paints with greater than 0.5% be considered "lead-based". Based on this criterion, low levels of lead should be assumed to be present within all paint finishes.

Peeling paints were observed in Locations 4, 8, 12, 13, 26, 27, and 34. The remainder of paint finishes were observed to be in GOOD condition.

It should be noted that lead may be present in wiring connectors, electric cable sheathing, mortar, ceramic tile glazing and solder joints on copper piping.

4.3 Mercury

Mercury is present as vapour within fluorescent light tubes. Also, liquid mercury is present within thermostats in various locations. Some thermostat switches were observed missing their covers.

4.4 Mould

Staining was observed on the ceiling tiles within the following Locations: 2 (5 tiles), 4 (2 tiles), 5 (1 tile), 22 (1 tile), and 25 (1 tile). It should be noted the stained ceiling tiles within Locations 22 and 25 are asbestos-containing.

Visible water staining was observed on the fiberglass pipe insulation within Location 18.

4.5 Polychlorinated Biphenyls ("PCB")

Fluorescent light fixtures were visually assessed for the presence suspect PCB content during the initial survey.

For light fixtures containing older style tubes an effort was made to determine the ballast code and compare the code to manufacture's specifications. Due to the age of the building, the style of the light fixtures present, and the fact that no major re-lamping has occurred, PCB is suspected to be present within fluorescent lamp ballasts at the Site.

Without assessment of each ballast in every light fixture it is not possible to obtain an accurate inventory of the quantity and location of PCB containing ballasts in the building.

Electrical transformers were observed at the Site. However the unit was enclosed within metal casing with a pad lock attached and preventing access to the unit. Maple was unable to determine if the transformer contains PCB fluids.

4.6 Radioactive Sources

Devices suspected to be radon sources (i.e. smoke detectors etc.) were not identified at the subject Site.

Recently, Health Canada published a guideline "Guide for Radon Measurement in Public Buildings". This guideline was adopted by the Government of Canada on June 9, 2007. Methods of measurement for radon within school buildings are specified in this guideline. A maximum average annual concentration of up to 200 Bq/m^3 is permitted and remedial measures are suggested if radon level exceeds the recommended limit.

4.7 Silica

Free crystalline silica in the form of common construction sand is a constituent of all concrete and masonry products present at the Site.

Cracked masonry blocks were observed throughout the site, particularly within the following Locations: 1, 3, 14, 16, and 36.

5.0 RECOMMENDATIONS

1. General recommendations as presented in the original report apply to this Site.
2. Monitor minor damage to ACM vinyl floor tiles within Location 31 (2 SF) and Location 34 (9SF) for future delamination.
3. Monitor minor damage to ACM acoustic ceiling tiles within Location 22 and Location 25 for future delamination.
4. Remove and replace stained ceiling tiles within Locations: 2 (5 tiles), 4 (2 tiles), and 5 (1 tile). The source of water intrusion should be addressed to prevent further staining and possible mould amplification.
5. Monitor water staining on fibreglass pipe insulation present within Location 18 (Electrical Room).
6. Prior to disturbing Vinyl Floor Tiles (12x12 Pink with White and Black Streaks and 12x12 White with Black Streaks) present within select locations as well as insulation on pipe fittings within Location 34 it is recommended that bulk sampling be performed for determination of potential asbestos content.
7. Stabilize peeling paints. Disturbance of paint found with a lead concentration should follow Type I lead abatement procedures, at a minimum, provided that; a) work does not include fume producing activities such as welding, burning, torching, etc., b) is not removed or demolished by scraping, sanding or striking c) airborne lead concentration are kept below 0.05 mg/m^3 and d) general dust suppression and worker protection procedures are utilized including; minimum N95 respirator, protective clothing, and proper worker hygiene. However, it may be prudent that air monitoring be conducted during the disturbance of lead-containing materials to ensure airborne levels of lead do not exceed the acceptable limit.
8. Complete radon testing in accordance with procedures outlined in "Guide for Radon Measurements in Public Buildings (Schools, Hospitals, Care Facilities, Detention Centres)" to determine the level of radon at the subject Site. It is important to note that this recommendation is based on the Health Canada guideline for due diligence, however this is not a regulatory compliance requirement.
9. Complete a reassessment of all asbestos-containing materials within twelve (12) months.

6.0 LIMITATION OF USE OF THIS REPORT

The Client acknowledges this report has been prepared for the exclusive use of Client and agrees that this report may not be used or relied upon by any third parties.

Any use not authorized by cscMonAvenir and Maple Environmental Inc. which any third party makes of this report, or any reliance on, or decision(s) to be made based on it, are the responsibility of such third parties and are without any liability of any nature to cscMonAvenir and Maple Environmental Inc. cscMonAvenir and Maple Environmental Inc. accept no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Sincerely,

MAPLE ENVIRONMENTAL INC.
Environment, Health and Safety Consultants

Prepared By:

Sarah Doyle
Project Technologist

Reviewed By:

Jason De Sousa
Project Manager

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APPENDIX I

UPDATED ROOM-BY-ROOM ASBESTOS INVENTORY

Quantities shown below
are based on visual approximations
only and may be subject to variation

cscMonAvenir
Sainte Croix,
351 Lafontaine Road West
Lafontaine, Ontario

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
1	Offices 103	G	Floor	VT-4	1x1 Pink with White and Black Streaks Vinyl Tiles	G	A	50	SF	Presumed	Limited to Washroom
			Floor	VT-6	1x1 Grey with Black and White Chunks Vinyl Tiles					New	
			Ceiling 1	AT-4	2x4 Random Fissures Acoustic Tiles					New	
			Ceiling 2		Plaster					ND	
			Wall		Masonry Block						Cracking thorughout.
			Wall		Drywall					ND	
			Structure		Steel						
			Pipe		Uninsulated						
			Pipe		Fibreglass						
			Duct		Uninsulated						
			Mechanical		Not Found						
Comments											

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
2	Lobby	G	Floor		Terrazzo						
			Ceiling		Plaster					ND	
			Ceiling	AT-3	2x4 Flecks and Pinholes Acoustic Tiles					New	
			Wall		Masonry Block						
			Wall		Brick						
			Structure		Steel						
			Pipe		Fibreglass						
			Duct		Uninsulated						
			Mechanical		Not Found						
Comments	Five (5) stained ceiling tiles										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
3	Gymnasium and Storage Room 104-04	G	Floor		Parquet Tile					ND	Gym Floor
			Floor	VT-1	1x1 Yellow with Light Yellow Streaks Vinyl Tiles	G	A	155	SF	CH	Equip. Storage. Minor damage at doorway.
			Ceiling		Tectume Tiles						In Gym
			Ceiling		Plaster					ND	In Storage
			Wall		Masonry Block						Cracking
			Structure		Steel						
			Pipe		Fibreglass						
			Pipe		Uninsulated						
			Duct		Not Found						
			Mechanical	HVAC	Uninsulated						
Comments	No access above plaster ceiling in Equipment Storage Room. No access above ceiling in Gym.										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
4	Corridor 100-E	G	Floor		Terrazzo						
			Ceiling	AT-3	2x4 Flecks and Pinholes Acoustic Tiles					ND	
			Ceiling		Tectume Tiles						
			Wall		Masonry Block						
			Structure		Steel						
			Pipe		Not Found						
			Duct		Uninsulated						
			Mechanical		Not Found						
Comments	Two (2) stained ceiling tiles. Peeling paint at beginning of corridor.										

G = Good
F = Fair
P = Poor

Access A = Accessible to all
Access B = Accessible to Maintenance Personnel
Access C = Not Generally accessible

CH = Chrysotile
AM = Amosite
ND = None Detected
SF = Square Feet

Quantities shown below
are based on visual approximations
only and may be subject to variation

cscMonAvenir
Sainte Croix,
351 Lafontaine Road West
Lafontaine, Ontario

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
5	Corridor 100-H	G	Floor		Terrazzo						
			Ceiling	AT-3	2x4 Flecks and Pinholes Acoustic Tiles					ND	
			Ceiling		Tectume Tiles						
			Wall		Masonry Block						
			Wall		Brick						
			Structure		Steel						
			Pipe		Fibreglass						
			Pipe		Uninsulated						
			Duct		Uninsulated						
			Mechanical		Not Found						
Comments	**One (1) stained ceiling tile.**										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
6	Boy's Change Room 104-03	G	Floor	VT-6	1x1 Grey with Black and White Chunks Vinyl Tiles					New	
			Ceiling		Drywall					ND	
			Wall		Masonry Block						
			Structure		No Access						
			Pipe		Not Found						
			Duct		Not Found						
			Mechanical	Radiator	Not Insulated						
Comments	**No access above ceiling. Assume ACM present.**										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
7	Girl's Change Room 104-05	G	Floor	VT-6	1x1 Grey with Black and White Chunks Vinyl Tiles					New	
			Ceiling		Drywall					ND	
			Wall		Masonry Block						
			Structure		No Access						
			Pipe		Not Found						
			Duct		Not Found						
			Mechanical	Radiator	Not Insulated						
Comments	**No access above ceiling. Assume ACM present.**										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
8	Boy's Washroom 111	G	Floor		Terrazzo						
			Ceiling		Drywall					ND	Peeling Paint
			Wall		Masonry Block						Peeling Paint
			Structure		Steel						
			Pipe		Not Found						
			Duct		Uninsulated						
			Mechanical	Radiator	Not Insulated						
Comments	**No access to pipe chase. Assume ACM present.**										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
9	Girl's Washroom 109	G	Floor		Terrazzo						
			Ceiling		Drywall					ND	Peeling Paint
			Wall		Masonry Block						
			Structure		Steel						
			Pipe		Not Found						
			Duct		Uninsulated						
			Mechanical	Radiator	Not Insulated						
Comments	**No access to pipe chase. Assume ACM present.**										

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F = Fair
P = Poor

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Access B = Accessible to Maintenance Personnel
Access C = Not Generally accessible

CH = Chrysotile
AM = Amosite
ND = None Detected
SF = Square Feet

Quantities shown below
are based on visual approximations
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cscMonAvenir
Sainte Croix,
351 Lafontaine Road West
Lafontaine, Ontario

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
10	**Caretaker's Room 110**	**G**	Floor		Terrazzo						
			Ceiling		Drywall					ND	
			Wall		Masonry Block						
			Structure		Steel						
			Pipe		Fibreglass						
			Pipe		Uninsulated						
			Pipe		PVC						
			Duct		Not Found						
			Mechanical	HWT	Uninsulated						
Comments											

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
11	**Jardin Classroom 112 and Washroom**	**G**	Floor	VT-2	1x1 Orange with White Chunks Vinyl Tiles					ND	
			Floor	VT-4	1x1 Pink with White and Black Streaks Vinyl Tiles	G	A	400	SF	Presumed	Minor damage at back door.
			Ceiling		Drywall					ND	
			Wall		Masonry Block						
			Wall		Ceramic Tile						In Washroom
			Structure		Steel						Peeling Paint
			Pipe		Uninsulated						
			Duct		Not Found						
			Mechanical	HVAC	Uninsulated						
Comments	**No access to pipe chase and above drywall ceiling. Assume ACM present.**										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
12	**Classroom 113**	**G**	Floor	VT-5	1x1 White with Brown Chunks Vinyl Tiles					New	
			Ceiling		Not Found						
			Wall		Masonry Block						
			Wall		Wallboard						
			Wall	Column	Wood						
			Wall	Bulkhead	Plaster					ND	
			Structure		Steel						Peeling Paint
			Pipe		Not Found						
			Duct		Not Found						
			Mechanical	HVAC	Uninsulated						
Comments											

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
13	**Classroom 114**	**G**	Floor	VT-5	1x1 White with Brown Chunks Vinyl Tiles					New	
			Ceiling		Not Found						
			Wall		Masonry Block						Peeling Paint and Cracks
			Wall		Wallboard						
			Wall	Column	Wood						
			Wall	Bulkhead	Plaster					ND	
			Structure		Steel						Peeling Paint
			Pipe		Not Found						
			Duct		Not Found						
			Mechanical	HVAC	Uninsulated						
Comments											

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F = Fair
P = Poor

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Access B = Accessible to Maintenance Personnel
Access C = Not Generally accessible

CH = Chrysotile
AM = Amosite
ND = None Detected
SF = Square Feet

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only and may be subject to variation

cscMonAvenir
Sainte Croix,
351 Lafontaine Road West
Lafontaine, Ontario

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
14	Library 108, Offices 108-01 and 108-02	G	Floor	VT-6	1x1 Blue with Dark Blue and White Chunks Vinyl Tiles					New	
			Floor	VT-5	1x1 White with Brown Chunks Vinyl Tiles					New	
			Ceiling	AT-3	2x4 Flecks and Pinholes Acoustic Tiles					ND	
			Ceiling	AT-1	2x4 Width-wise Fissures and Pinholes Acoustic Tiles	G	B	24	SF	AM	
			Wall	Bulkhead	Drywall					ND	Minor paint peeling
			Wall		Masonry Block						Cracking
			Structure		Steel						
			Pipe	All	Uninsulated						
			Pipe	Straight	Fibreglass						
			Duct		Uninsulated						
			Mechanical		Not Found						
Comments											

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
15	Classroom 105	G	Floor	VT-5	1x1 White with Brown Chunks Vinyl Tiles					New	
			Ceiling		Not Found						
			Wall		Masonry Block						
			Wall		Wallboard						
			Wall	Column	Wood						
			Wall	Bulkhead	Plaster					ND	
			Structure		Steel						Minor peeling paint
			Pipe		Not Found						
			Duct		Not Found						
			Mechanical	HVAC	Uninsulated						
Comments											

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
16	Classroom 107	G	Floor	VT-5	1x1 White with Brown Chunks Vinyl Tiles					New	
			Ceiling		Not Found						
			Wall		Masonry Block						Cracking
			Structure		Steel						Peeling Paint
			Pipe		Not Found						
			Duct		Not Found						
			Mechanical	HVAC	Uninsulated						
Comments											

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
17	Classroom 106	G	Floor	VT-5	1x1 White with Brown Chunks Vinyl Tiles					New	
			Ceiling		Not Found						
			Wall		Masonry Block						
			Wall		Wallboard						
			Wall	Column	Wood						
			Wall	Bulkhead	Plaster					ND	
			Structure		Steel						Minor Peeling Paint
			Pipe		Not Found						
			Duct		Not Found						
			Mechanical	HVAC	Uninsulated						
Comments											

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
18	Electrical Room	G	Floor	VT-1	1x1 Yellow with Light Yellow Streaks Vinyl Tiles	G	A	150	SF	CH	
			Floor	VT-9	1x1 White with Black Streaks Vinyl Tiles	G	A	10	SF	Presumed	
			Floor		1x1 White with Beige Chunk					New	
			Ceiling		Not Found						
			Wall		Masonry Block						
			Wall		Concrete						
			Structure		Steel						
			Pipe	Straight	Fibreglass						
			Pipe	Fitting	Not Found						
			Duct		Not Found						
			Mechanical		Not Found						
Comments	**One (1) LF of stained fibreglass pipe insulation.**										

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Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
19	Water Meter Room 199	G	Floor		Concrete						
			Ceiling		Not Found						
			Wall		Masonry Block						
			Structure		Steel						
			Pipe	All	Not Insulated						
			Pipe		Fibreglass						
			Pipe		PVC						
			Duct		Not Found						
			Mechanical		Not Found						
Comments											

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
20	Storage 116	G	Floor	VT-3	9x9 Vinyl Tiles	G	A	100	SF	CH	
			Floor		1x1 White					New	
			Ceiling		Plaster					ND	
			Wall		Plaster					ND	
			Structure		No Access						
			Pipe		Not Found						
			Duct		Not Found						
			Mechanical		Not Found						
Comments	No access above ceiling. Assume ACM present										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
21	Storage 117	G	Floor	VT-3	9x9 Vinyl Tiles	G	A	40	SF	CH	
			Floor		1x1 Light Grey Chunk					New	
			Ceiling		Plaster					ND	
			Wall		Masonry Block						
			Structure		No Access						
			Pipe		Not Found						
			Duct		Not Found						
			Mechanical		Not Found						
Comments	No access above ceiling. Assume ACM present.										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
22	Washroom 118	G	Floor	VT-1	1x1 Yellow with Light Yellow Streaks Vinyl Tiles	G	A	45	SF	CH	
			Floor		1x1 White with Beige Chunk					New	
			Ceiling	AT-1	2x4 Width-wise Fissures and Pinholes Acoustic Tiles	G	B	32	SF	AM	
			Ceiling	AT-1	2x4 Width-wise Fissures and Pinholes Acoustic Tiles	P	B	1	Each	AM	Stained Tile
			Ceiling	AT-3	2x4 Flecks and Pinholes Acoustic Tiles					New	
			Wall		Plaster					ND	Peeling Paint
			Structure		No Access						
			Pipe		Not Found						
			Duct		Uninsulated						
			Mechanical		Not Found						
Comments	No access above ceiling. Assume ACM present. Washroom is no longer in use by school. One (1) stained ACM tile.										

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Lafontaine, Ontario

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
23	Northeast Corridor 100-1	G	Floor		Terrazzo						
			Ceiling	AT-2	1x1 Medium and Large Holes Acoustic Tiles					ND	
			Wall		Plaster					ND	
			Structure		No Access						
			Pipe		Not Found						
			Duct		Not Found						
			Mechanical		Not Found						
Comments	No access above ceiling. Assume ACM present.										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
24	East Corridor	G	Floor		Terrazzo						
			Ceiling	AT-2	1x1 Medium and Large Holes Acoustic Tiles					ND	
			Wall		Plaster					ND	
			Structure		No Access						
			Pipe		Not Found						
			Duct		Not Found						
			Mechanical		Not Found						
Comments	No access above ceiling. Assume ACM present.										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
25	Staff Room 119	G	Floor	VT-6	1x1 Grey with Black and White Chunks Vinyl Tiles					New	
			Ceiling 1	AT-1	2x4 Width-wise Fissures and Pinholes Acoustic Tiles	G	B	450	SF	AM	
			Ceiling 2		Plaster					ND	
			Wall		Plaster					ND	
			Wall		Drywall					ND	
			Structure		No Access						
			Pipe		Uninsulated						
			Duct		Uninsulated						
			Mechanical		Not Found						
Comments	No access above ceiling. Assume ACM present. One (1) stained ceiling tile.										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
26	Classroom 120	G	Floor	VT-5	1x1 White with Brown Chunks Vinyl Tiles					New	
			Ceiling	AT-2	1x1 Medium and Large Holes Acoustic Tiles					ND	
			Ceiling		Plaster					ND	In closet
			Wall		Plaster					ND	
			Wall	Column	Wood						
			Structure		No Access						
			Pipe		Not Found						
			Duct		Uninsulated						
			Mechanical	HVAC	Uninsulated						
Comments	No access above ceiling. Assume ACM present. Peeling paintunder shelf at north corner.										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
27	Classroom 121	G	Floor	VT-4	1x1 Pink with White and Black Streaks Vinyl Tiles	G	A	1000	SF	Presumed	
			Ceiling	AT-2	1x1 Medium and Large Holes Acoustic Tiles					ND	Starting to peel, monitor conditions
			Ceiling		Plaster					ND	In closet. Peeling Paint
			Wall 1		Plaster					ND	
			Structure		No Access						
			Pipe		Uninsulated						
			Duct		Uninsulated						
			Mechanical	HVAC	Uninsulated						
Comments	Very limited access above ceiling. Assume ACM present. Peeling paint at SW corner.										

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Lafontaine, Ontario

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
28	Classroom 122	G	Floor	VT-6	1x1 Grey with Black and White Chunks Vinyl Tiles					New	
			Ceiling	AT-2	1x1 Medium and Large Holes Acoustic Tiles					ND	
			Ceiling		Plaster					ND	In closet
			Wall		Plaster					ND	
			Wall		Drywall					ND	In closet
			Structure		No Access						
			Pipe		Not Found						
			Duct		Uninsulated						
			Mechanical	HVAC	Uninsulated						
Comments	No access above ceiling. Assume ACM present.										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
29	Classroom 123	G	Floor	VT-6	1x1 Blue with Dark Blue and White Chunks Vinyl Tiles					New	
			Ceiling	AT-2	1x1 Medium and Large Holes Acoustic Tiles					ND	
			Ceiling		Plaster						
			Wall		Plaster					ND	In closet
			Structure		No Access						
			Pipe		Uninsulated						
			Duct		Uninsulated						
			Mechanical	HVAC	Uninsulated						
Comments	No access above ceiling. Assume ACM present. No Access at time of 2017 Reassessment.										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
30	Caretaker Storage 124	G	Floor		1x1 White with Beige Chunk					New	
			Ceiling		Plaster					ND	
			Wall		Plaster					ND	
			Structure		No Access						
			Pipe		Uninsulated						
			Duct		Not Found						
			Mechanical		Not Found						
Comments	No access above ceiling. Assume ACM present										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
31	Washroom 125	G	Floor	VT-3	9x9 Vinyl Tiles	G	A	30	SF	CH	
			Floor	VT-3	9x9 Vinyl Tiles	P	A	2	SF	CH	Minor damage
			Ceiling		Drywall					ND	Minor peeling paint.
			Wall		Plaster					ND	
			Wall		Ceramic Tile						
			Structure		Wood						
			Pipe		Uninsulated						
			Duct		Uninsulated						
			Mechanical		Not Found						
Comments											

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
32	New Addition 100, Offices 101, Infirmerie and 102	G	Floor	VT-8	1x1 White with Blue and Brown Chunk Vinyl Tiles					New	
			Floor		Ceramic Tile						
			Ceiling	AT-3	2x4 Flecks and Pinholes Acoustic Tiles					New	
			Wall		Drywall					New	
			Wall		Ceramic Tile						
			Structure		Steel						
			Pipe		Fibreglass						
			Duct		Not Insulated						
			Mechanical	Tank	Uninsulated						
			Mechanical	Radiator	Not Insulated						
Comments											

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Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
33	Kitchen	G	Floor	VT-9	1x1 White with Black Streaks Vinyl Tiles	G	A	140	SF	Presumed	
			Ceiling		Drywall					ND	
			Wall		Masonry Block						
			Wall	Column	Plaster					ND	
			Structure		Steel						
			Pipe		Fibreglass						
			Pipe		Uninsulated						
			Duct		Not Found						
			Mechanical		Not Found						
Comments											

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
34	Stage	G	Floor	VT-9	1x1 White with Black Streaks Vinyl Tiles	G	A	50	SF	Presumed	At Stairs
			Floor	VT-1	1x1 Yellow with Light Yellow Streaks Vinyl Tiles	G	A	850	SF	CH	
			Floor	VT-1	1x1 Yellow with Light Yellow Streaks Vinyl Tiles	P	A	9	SF	CH	At North side of stage (Minor)
			Floor		1x1 White					New	Along front of stage
			Ceiling		Not Found						
			Wall		Masonry Block						Paint bubbling at back wall
			Structure		Metal						
			Pipe	Straight	Fibreglass						
			Pipe	Straight	Uninsulated						
			Pipe	Fitting	Insulation	G	C	1	Each	Presumed	At Stairs
			Pipe		PVC						
			Duct		Not Found						
			Mechanical		Not Found						
Comments											

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
35	Laundry 126 & Corridor	G	Floor	VT-3	9x9 Vinyl Tiles	G	A	130	SF	CH	
			Floor	VT-3	9x9 Vinyl Tiles	P	A	2	SF	CH	By Radiator
			Ceiling		Drywall					ND	
			Wall		Plaster					ND	Paint Peeling in Corridor
			Wall		Drywall					ND	
			Structure		No Access						
			Pipe		Uninsulated						
			Duct		Uninsulated						
			Mechanical		Not Found						
Comments	No access during 2017 reassessment. No access above ceiling. Assume ACM present. Baseboards missing by sink and east wall.										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
36	Southeast Lobby 100-J	G	Floor		Terrazzo						
			Ceiling		Drywall					ND	
			Wall		Brick					ND	
			Wall		Masonry Block						Cracking
			Structure		Metal						
			Pipe		Uninsulated						
			Pipe		Fibreglass						
			Duct		Uninsulated						
			Mechanical		Not Found						
Comments	Limited acess above ceiling. Assume ACM present. No access at time of 2017 reassessment.										

Loc No.	Room Name	Level	Building System	Sub System	Description	Condition G/F/P	Access A/B/C	Quantity	Unit	ACM	NOTES
37	Building Exterior	G	Floor		Not Applicable						
			Ceiling		Not Applicable						
			Wall		Brick						
			Wall		Plaster					ND	
			Structure		Not Applicable						
			Pipe		Uninsulated						
			Duct		Not Found						
			Mechanical		Not Found						
			Other	Soffit	Metal						
			Other	Soffit	Plaster					ND	
Comments											

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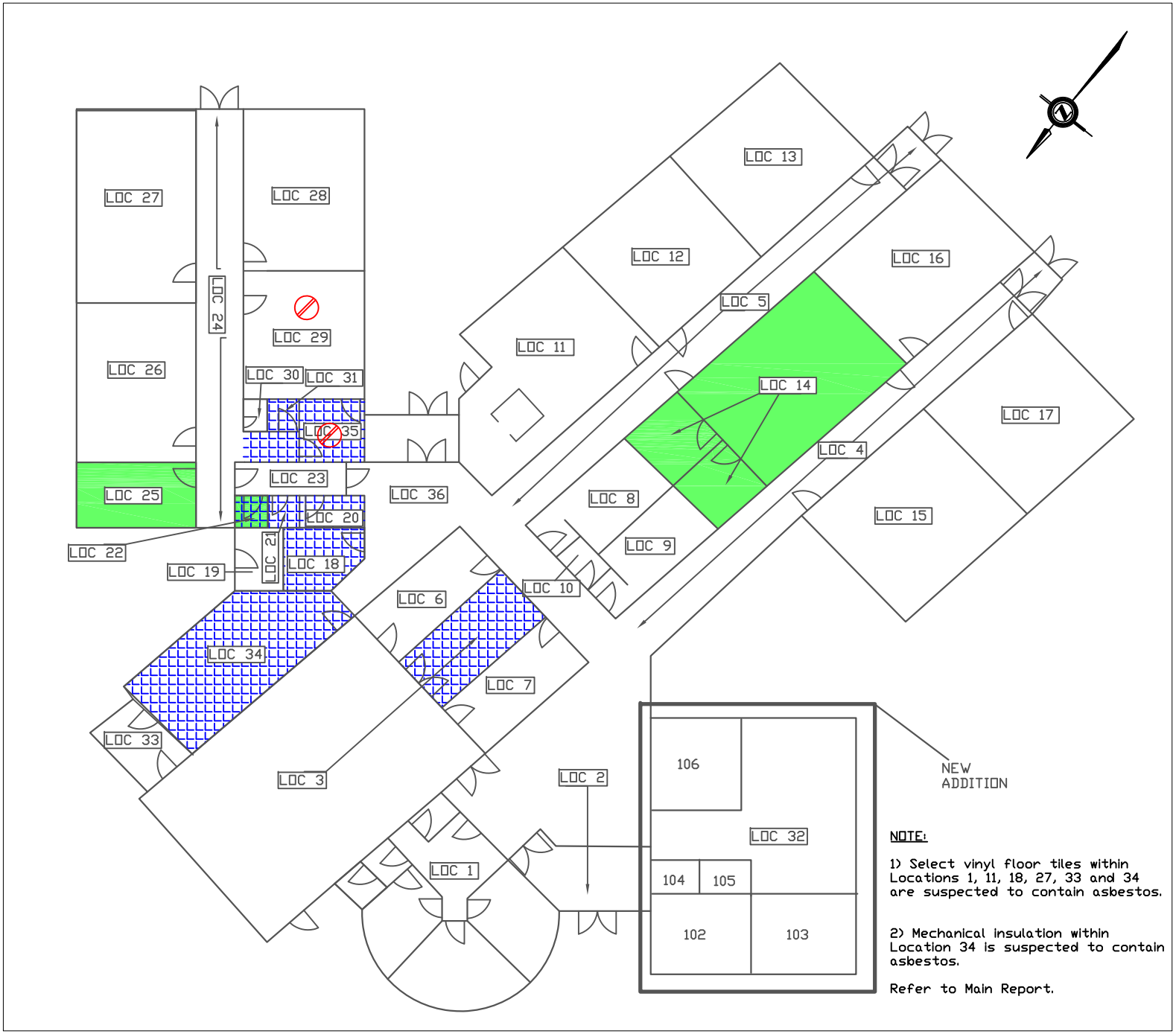
APPENDIX II

UPDATED DRAWINGS



MAPLE ENVIRONMENTAL INC.
ENVIRONMENT, HEALTH & SAFETY CONSULTANTS
482 South Service Rd E - Suite 116 - Oakville - Ontario - L6J 2X6
Tel: 905 257 4408 - Fax: 905 257 8865
www.MapleEnvironmental.com

LOC #

CONFIRMED ACM

SYMBOL	DESCRIPTION
	VINYL FLOOR TILE
	ACOUSTIC CEILING TILE
NOTE	VINYL FLOOR TILE
NOTE	MECHANICAL INSULATION
	NO ACCESS INTO ROOM

Asbestos Containing Materials are Assumed to be Present within Rooms with No Access and/or Rooms with No Access Above Ceiling.

For Detailed Information as to Location, Type, Quantity, Condition and Access to ACM, Please Refer to the Room-by-Room Sheets Provided in Appendix I of the Report.

Drawn By:	Chkd By:	cscMonAvenir Sainte Croix Ground Floor
S. Doyle	J. De Sousa	

HAZARDOUS BUILDING MATERIALS REASSESSMENT SURVEY

cscMonAvenir
Sainte Croix
Ground Floor

Project No.	Sheet
16302	AS-01-01
Date: OCTOBER/2017	
Scale: NTS	

Drawn by: S. Doyle October 2017 cscMonAvenir, Sainte Croix, 351 Lafontaine Street West, Lafontaine, ON, Ground Floor

1 GENERAL

1.1 Instructions

The General Conditions, Supplementary Conditions and the requirements of Division 1 form part of this Section.

1.2 Section Includes

This section includes the fabrication and placement of steel reinforcing for concrete work.

1.3 Related Sections

Section 03 10 00	Concrete Formwork and Falsework
Section 03 30 00	Cast-in-Place Concrete

1.4 Reference Standards

1.4.1 Do reinforcing work to CAN/CSA-A23.1-04 and CAN/CSA-A23.3-M84 and welding or reinforcing to CSA W186-M1990, except where otherwise specified.

1.4.2 Upon request, provide the Consultant with a certified copy of mill tests of steel supplied, showing physical and chemical analysis.

1.5 Submittals

1.5.1 Submit shop drawings to the Consultant for review in accordance with Division 1.

1.5.2 Prepare shop drawings according to RSIC Manual of Standard Practice for Detailing Reinforced Concrete Structures (CSA A 23.3).

1.5.3 Clearly indicate bar sizes, spacings, location and quantities of reinforcement, welded wire fabric, chairs, spacers and hangers with identifying code marks to permit correct placement without reference to structural drawings.

1.5.4 Provide details to show placement of reinforcing where special conditions occur.

1.5.5 Shop drawings should not contain reproductions of Contract drawings.

1.6 Unit Prices

1.6.1 Provide unit prices in accordance with Division 1.

1.6.2 Unit price shall include the supply and installation of reinforcing bars, ties, etc., and shall include the cost of shop drawing revisions and all labour, plant and material necessary.

2 PRODUCTS

2.1 Materials

2.1.1 Reinforcing steel: new billet steel deformed bars, conforming to CAN/CSA-G30.10-M, Grade 400R, unless indicated otherwise. Bars shall be from straight stock only.

2.1.2 Chairs, bolsters, bar supports, spacers: adequate for strength and support of reinforcing construction

conditions. Supports shall be of a non-corroding type.

2.1.3 Tie Wire: to ASTM A82, minimum 3 mm size, annealed type.

3 EXECUTION

3.1 Site Fabrication

3.1.1 Fabricate reinforcing steel according to CAN/CSA-A23.1-M04, and RSIC Manual of Standard Practice.

3.1.2 The Consultant is to approve locations of reinforcement splices not indicated on drawings. Locate reinforcement splices at point of minimum stress. Fabricate splices with lap length as indicated on the drawings.

3.1.3 Fabricate reinforcing steel within the following tolerances:
- a) Sheared length: plus or minus 25mm (1")
- b) Stirrups, ties and spirals: plus or minus 13mm (1/2")
- c) Other bends: plus or minus 25mm (1")

3.1.4 Ship bundles of bar reinforcement clearly identified in accordance with bar lists.

3.1.5 Substitutes of different size bars will be permitted only upon written approval of the Consultant.

3.2 Placing Reinforcement

3.2.1 Place, support and space reinforcement in alignment to position indicated and as follows:

1. Slabs-on-grade, beams, structural slabs, support reinforcement on and secure to supports.
2. Place reinforcement continuous through construction joints.
3. Welding of reinforcing steel is not permitted.
4. Do not field bend reinforcement except where indicated or approved by Consultant. Bend reinforcing without heat applying at a slow and steady pressure. Replace reinforcement that has developed cracks or splits.
5. Do not field cut reinforcement without prior written approval of Consultant.
6. Obtain Consultant's approval of reinforcing steel and placing of reinforcement prior to placing concrete.
7. Preserve clear space between bars of not less than 1.5 times the nominal diameter of the larger bar.
8. Do not allow the clear distance between bars to be less than 40 mm.

3.3 Cleaning

3.3.1 Clean reinforcing in accordance with CAN/CSA-A23.1-M90.

END OF SECTION

1 GENERAL

1.1 Section Includes

1.1.1 Cast in place concrete.

1.2 Related Sections

1.2.1 Section 32 11 23 – Aggregate Base Courses: prepared granular base below concrete slabs-on-grade.

1.2.2 Section 02 75 50 – Reinforced Cement Concrete Pavement: exterior concrete slabs, pads and pavements.

1.2.3 Section 03 10 00 – Concrete Forming and Accessories: erection and removal of formwork.

1.2.4 Section 03 20 00 – Concrete Reinforcing: reinforcing.

1.2.4 Section 03 35 00 – Concrete Finishing.

1.2.6 Section 05 10 00 – Structural Metal Framing: grouting beneath steel columns and bearing plates.

1.2.7 Section 05 50 00 – Metal Fabrications: concrete inserts.

1.2.8 Section 07 13 00 – Sheet Waterproofing: waterproofing membrane.

1.2.9 Section 08 10 00 – Doors and Frames: hollow metal frames set in concrete.

1.2.10 Section 14 24 00 – Hydraulic Elevators: hoistway.

1.3 Unit Prices

1.3.1 Submit unit prices to requirements of Section 01 20 00.

1.3.2 Base unit prices for concrete on the supply of concrete to the strengths specified; placed, vibrated and finished. Do not include costs for the supply, installation and removal of formwork, and the supply and installation of reinforcing in these unit prices.

1.3.3 Unit Prices:

.1 Cost per cubic metre for the placement of concrete walls.
.2 Cost per cubic metre for the placement of concrete slabs-on-fill.
.3 Cost per cubic metre for the placement of concrete footings.

1.4 References

1.4.1 CSA A5-98: Portland Cement.

1.4.2 CSA A23.1-00: Concrete Materials and Methods of Concrete Construction.

1.4.3 CSA A23.2-00: Methods of Test for Concrete

1.4.4 CSA A23.3-94: Design of Concrete Structures for Buildings.

1.4.5 CAN3-A266.1-M78: Air-Entraining Admixtures for Concrete.

1.4.6 CAN3-A266.2-M78: Chemical Admixtures for Concrete.

1.4.7 CAN3-A266.4-M78: Guidelines for the Use of Admixtures in Concrete.

1.4.8 CSA A266.5-M1981: Guidelines for the Use of Superplasticizing Admixtures in Concrete.

1.4.9 CAN3-A266.6-M85: Superplasticizing Admixtures for Concrete.

1.5 Submittals

1.5.1 Submit samples to the Testing Laboratory for testing to requirements of Section 01 40 00.

1.5.2 Submit complete and accurate records of concrete operations to requirements of Section 01 70 00.

1.5.3 Mix Design: Design concrete to prevent segregation and excessive bleeding. Submit mix designs for approval. Provide any necessary evidence that the mix designs will provide the desired properties.

1.5.4 Record Documents: Indicate date, location, shoring, reshoring and shoring removal, quantity, air temperature, weather and test samples taken.

1.6 Environmental Requirements

1.6.1 Cold Weather Requirements

.1 When the air temperature is at or below 5 degrees Celsius or when there is a probability of it falling to that limit within 24 hours of placing, the concrete temperature shall be maintained in accordance with CSA A23.1, Curing and Protection.

.2 In cold weather, concrete shall be delivered to the work having a temperature of not less than 18 degrees Celsius and not more than 32 degrees Celsius.

.3 Provide approved heating equipment. Protect concrete surfaces from direct exposure to the combustion gases of heaters.

.4 The housing, covering, or other protection used in connection with curing shall remain in place and intact at least twenty-four hours after the artificial heating is discontinued. No dependence shall be placed on salt or other chemicals for the prevention of freezing.

1.6.2 Hot Weather Requirements

.1 When the air temperature is at or above 25 degrees Celsius or when there is a probability of it rising to 25 degrees Celsius during the placing period, special effort shall be made to maintain the concrete temperature in accordance with CSA A23.1, Curing and Protection.

.2 In hot weather, concrete shall be delivered to the work having a temperature of not less than 10 degrees Celsius and not more than 27 degrees Celsius.

.3 Take suitable precautions to avoid drying of the concrete prior to finishing operations. Provide windbreaks, sunshades, fog sprays or other devices.

1.7 Delivery, Storage and Handling

1.7.1 Store materials to requirements of CSA A23.1.

2 PRODUCTS

2.1 Concrete Materials

2.1.1 Portland Cement: to CSA A5, Type 10

2.1.2 Fine and Coarse Aggregate: to CSA A 23.1.

2.1.3 Water: potable, to CSA A23.1.

2.2 Admixtures

2.2.1 Air Entrainment Admixture: to CAN3-A266.1-M.

2.2.2 Chemical Admixture: to CAN3-A266.2-M.

2.2.3 Superplasticizer Admixture: to CAN3-A266.6-M.

2.3 Concrete Accessories

2.3.1 Grout: non-shrink type; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 50 MPa at 28 days.

2.3.2 Saw Cut Fill: two-part, epoxy urethane, catalyst cured, self-levelling joint filler, minimum cured Shore A Hardness of 80; eg. Loadflex by Sika Canada Inc.

2.3.3 Isolation Joint: closed cell compressible foam, eg. Sealtight Ceramar by W.R. Meadows.

2.3.4 Bonding Agent: acrylic emulsion; eg. Sealtight Intralok by W.R. Meadows.

2.4 Concrete Mixes

2.4.1 Mix concrete to requirements of CSA A23.1.

2.4.2 Coarse Aggregate: not more than 19 mm and not less than 8 mm in size, except for concrete on steel deck where size of aggregates shall be not more than 8 mm.

2.4.3 Concrete Exposed to De-Icing Chemicals: water/cement ratio not to exceed the values indicated in CSA A23.1, Table 14; Class C1 or C2.

2.4.4 Determine concrete strengths from standard cylinders, sampled, cured and tested at 28 days in accordance with CSA A23.2.

2.4.5 Refer to Structural Drawings for strength of concrete required for various locations, but in all cases, the minimum 28 day strength shall be not less than 20 MPa.

2.4.6 Provide concrete with an average slump of 75 mm, plus or minus 25 mm.

2.4.7 Accelerating Admixtures: used during cold weather subject to Consultant approval. If approved, the use of admixture will not relax the cold weather placement requirements of CSA A23.1. Do not use calcium chloride.

2.4.8 Set-retarding Admixture: used during hot weather subject to Consultant approval, to allow for proper finishing of concrete.

2.4.9 Concrete Exposed to Weather: provide 5 to 8 percent air entrainment.

3 EXECUTION

3.1 Examination

3.1.1 Verify that site conditions are ready to receive work.

3.1.2 Ensure that footing excavations and skim slabs are free of frost or water before placing concrete. If a sump is required for pumping water from the excavation, excavate it outside the area of the footing.

3.1.3 Ensure all forms are rigid and structurally safe, and all reinforcing steel, formwork, sleeves, anchor bolts and other items are installed in accordance with the Contract Documents.

3.1.4 Ensure that all trades have checked the security and location of all component required in the concrete by those trades.

3.1.5 Beginning of installation implies acceptance of site conditions.

3.2 Preparation

3.2.1 Notify Consultant at least 24 hours before each placement of concrete.

3.2.2 Remove any wet or disturbed soil just prior to placing concrete.

3.2.3 Set sleeves, ties, anchor bolts, pipe hangers and other inserts, openings and sleeves in concrete work, as required by other Sections. Sleeve, openings, etc., greater than 100 mm square or in diameter not indicated on the structural drawings must be approved by the Consultant.

3.2.4 Set all frames in concrete.

3.3 Installation

3.3.1 Place concrete to requirements of CSA A23.1.

3.3.2 Maintain records of poured concrete items. Record date, location of pour, quantity, air temperature and test samples taken.

3.3.3 Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Apply bonding agent in accordance with manufacturer's recommendations.

3.3.4 Pour concrete continuously between predetermined construction and control joints.

3.3.5 Pour floor slabs in checker board or saw cut pattern indicated on drawings. Saw cut joints within 24 hours after finishing. Use 5 mm thick blade, cutting into slab ¼ of its thickness.

3.3.6 In location where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solidly with non-shrink grout.

3.3.7 Maintain concrete cover around reinforcing as follows:

.1 Column Ties: 40 mm.
.2 Concrete Placed Against Formwork: 40 mm.
.3 Walls exposed to weather or backfill: 75 mm.

.4 Footing or concrete formed against earth: 75 mm.
.5 Slabs on fill: 40 mm.

3.3.8 Separate slabs-on-grade from vertical surfaces with isolation joint filler. Extend joint filler from bottom of slab to within 13 mm of finished slab surface.

3.4 Screeding

3.4.1 Screed floor slabs-on-fill level, maintaining surface flatness of maximum 2 mm per metre.

3.5 Field Quality Control

3.5.1 Perform field inspection and testing as described in Section 01 40 00.

3.5.2 Test concrete to requirements of CSA A23.2.

3.5.3 Supply additional labour required to assist the Testing Laboratory in making such tests. Pay for cost of such material and labour.

3.5.4 Conduct slump tests in accordance with CSA A23.2; Test A23.2-5C.

3.5.5 Conduct slump tests in conjunction with sampling of concrete for cylinder tests. If the slump is excessive, remove the balance of that concrete from the site without further instructions.

3.5.6 If Consultant suspects that the slump of concrete is excessive, carry out additional slump tests in the presence of the Consultant and a representative of the independent inspection agency. No further concrete shall be placed until the test is carried out. Remove concrete with excessive slump from the site. Provide a slump testing equipment on the site, readily available for this testing.

3.6 Patching

3.6.1 Patch imperfections as directed by Consultant.

3.7 Defective Concrete

3.7.1 Modify or replace concrete not confirming to required lines, details and elevations.

3.7.2 Repair or replace concrete with excessive honeycombing and other defects.

3.8 Concrete Finishing

3.8.1 Provide concrete surfaces to be left exposed with sack rubbed finish.

3.8.2 Refer to Section 03 35 00 for finishing floor slabs.

3.9 Curing and Protection

3.91 Beginning immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, or mechanical injury.

END OF SECTION

1 GENERAL

1.1 SECTION INCLUDES

Sealer, hardener and polishing for cast-in-place concrete.

1.2 RELATED SECTIONS

Section 03300 - Cast-In-Place Concrete.

Section 09639 - Concrete Hardening/Sealing.

REFERENCES

ASTM International (ASTM):

1. ASTM C779: Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.
2. ASTM G23-81: Ultraviolet Light and Water Spray.
3. ASTM C805: Impact Strength.
4. CAN3-A266.2-M78: Chemical Admixtures for Concrete.

1.3. SUBMITTALS

1.3.1. Submit under provisions of Section 01300.

1.3.2. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Manufacturer's specifications and test data.
2. Special concrete finishes describing product to be provided, giving manufacturer's name and product name for the specified material proposed to be provided under this section.
3. Manufacturer's recommended installation procedures; which when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.
4. Special concrete finishes technical data sheet giving descriptive data, curing time, and application requirements.
5. Special concrete finishes manufacturer's Material Safety Data Sheet (MSDS) and other safety requirements.

1.3.3. Test Reports: Provide certified test reports, prepared by an independent testing laboratory, confirming compliance with specified performance criteria.

1.4. QUALITY ASSURANCE

1.4.1. Installer Qualifications:

1. Use an experienced installer and adequate number of skilled workmen who are thoroughly trained and experienced in the necessary craft.

2. Provide letter of certification from concrete finish manufacturer stating that installer is a certified applicator of special concrete finishes, and is familiar with proper procedures and installation requirements required by the manufacturer.
3. Applicator shall be familiar with the specific requirements and the methods needed for proper performance of work of this Section.

1.4.2. Mock-Up: Provide a mock-up for evaluation of workmanship and appearance.

1. Apply mock-ups of each type finish, to demonstrate typical joints, surface finish, color variation (if any), and standard of workmanship.

2. Build mock-ups approximately 50 square feet (4.5 sq. m) in the location indicated or if not indicated, as directed by the Architect.

3. Notify Architect seven days in advance of dates and times when mock-ups will be constructed.

4. Obtain from the Architect approval of mock-ups before starting construction.

5. If the Architect determines that mock-ups do not meet requirements, demolish and remove them from the site and cast others until mock-ups are approved.

6. Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed work.

7. Approved mock-ups may become part of the completed work if undisturbed at time of substantial completion.

1.5. DELIVERY, STORAGE, AND HANDLING

1.5.1. Store products in manufacturer's unopened packaging until ready for installation.

1.5.2. Deliver materials in original containers, with seal's unbroken, bearing manufacturer labels indicating brand name and directions for storage.

1.6. WARRANTY

Provide manufacturer's 10 years limited warranty.

2 PRODUCTS

2.1. Acceptable Manufacturer:

2.1.1. BASF Lapidolith

2.1.2. Curecrete, Ashford Formula

2.2. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.3. HARDENING/SEALING AGENT

Product shall be a chemical reactive concrete stabilizer which enhances the concrete density and hardness allowing the concrete to be finished to match to

level 1. Non-flammable, water-based, nontoxic. Meets USDA and VOC compliance

Finish: Level 1 - Hard-shell satin finish.

2.4. Performance Criteria:

1. Abrasion Resistance: ÅSTM C779 - Up to 400 percent increase in abrasion resistance.
2. Impact Strength: ÅSTM C805 - Up to 21 percent increase impact strength.
3. Ultra Violet Light and Water Spray: ÅSTM G23 - No adverse effect to ultra violet and water spray.
4. Reflectivity: Up to 30 percent increase in reflectivity.
5. Co-efficient of Friction: All levels of finish to exceed OSHA and ADA recommendations for wet and dry hard surfaces.

2.5. Neutralizing Agent: Tri-sodium phosphate.

2.6. Water: Potable.

3 EXECUTION

3.1. EXAMINATION

3.1.1 Examine substrate, with installer present, for conditions affecting performance of finish. Correct conditions detrimental to timely and proper work. Do not proceed until unsatisfactory conditions are corrected.

3.1.2. Verify that base slab meet finish and surface profile requirements in Division 3 Section Cast-In-Place Concrete.

3.1.3. Prior to application, verify that floor surfaces are free of construction laitance.

3.2. PREPARATION

3.2.1. Protection:

1. No satisfactory chemical or cleaning procedure is available to remove petroleum stains from the concrete surface. Prevention is therefore essential.
2. All hydraulic powered equipment shall be diapered to avoid staining of the concrete.
3. No trade shall park vehicles on the inside slab. If necessary to complete their scope of work, drop cloths shall be placed under vehicles at all times.
4. No pipe cutting machine shall be used on the inside floor slab.
5. Steel shall not be placed on interior slab to avoid rust staining.
6. Acids and acidic detergents shall not come into contact with slab.
7. All trades informed that the slab shall be protected at all times.

3.2.2 Environmental Limitations:

1. Comply with manufacturers written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation, and other conditions affecting topping performance.
2. Concrete Floor Flatness rating recommended at least 40, where possible.
3. Concrete Floor Levelness rating recommended at least 30, where possible.
4. Concrete shall be cured a minimum of 45 days or as directed by the manufacturer before application can begin.
5. Application shall take place 10 days prior to installation of equipment and substantial completion, thus providing a complete, uninhibited concrete slab for application.

3.2.3. Close areas to traffic during floor application and after application, for time period recommended in writing by manufacturer.

3.3. APPLICATION

3.3.1. Start of the floor finish applications shall be in the presence of manufacturer's technical representative.

3.3.2. Follow manufacturer's installation instructions. Dispense special concrete finish material from factory numbered and sealed containers. Maintain record of container numbers.

3.3.3. Sealing, Hardening and Polishing of Concrete Surface:

1. Concrete shall be in place a minimum of 45 days or as directed by the manufacturer before application can begin.
2. Application shall take place at least 10 days prior to racking and other in-store accessory installation, providing a complete, uninhibited concrete slab for application
3. Applicable procedures shall be followed as recommended by the product manufacturer and as required to match approved test sample.
4. Achieve waterproofing, hardening, dust-proofing, and abrasion resistance of the surface without changing the natural appearance of the concrete, except for the sheen.
5. Polishing to provide a Honed finish, with a smooth satin like “ eggshell “, Non Reflective surface to expose the fine aggregate, three coats surface sealer.

3.4. WORKMANSHIP AND CLEANING:

3.4.1. The premises shall be kept clean and free of debris at all times. Remove spatter from adjoining surfaces, as necessary. Repair damages to surface caused by cleaning operations.

3.4.2. Remove debris from jobsite. Dispose of materials in separate, closed containers in accordance with local regulations.

3.5. PROTECTION:

3.5.1. Protect finished work until fully cured in accordance with manufacturer's recommendations.

END OF SECTION

1 GENERAL

1.1 Instructions

1.1.1 The Instructions to Bidders, the General Conditions of CCDC 2 2008 Supplementary General Conditions and all Sections of Division 1 apply to and form part of this Section of the Specification.

1.1.2 Report in writing to the General Contractor any defects of surfaces or work prepared by other trades which affect the quality or dimensions of this Contractor's work. Commencement of this Contractor's work implies complete acceptance of all work by other trades.

1.2 Intent

1.2.1 Provide all articles, labour, materials, equipment and transportation to complete the work of this Section.

1.3 Section Includes

1.3.1 Provide all masonry and related products including but not limited to the following:

- Concrete unit masonry.
- Mortar and mortar aggregate.
- Mortar net.
- Fill interior metal door frames with grout.
- Masonry lintels and reinforcement.
- Steel Angle Lintels for all door and window openings located in masonry walls. Provide angles in accordance with the General Notes on the Structural Drawings unless noted otherwise.
- Brick vents and weep holes.
- Cavity wall ties.
- Dampproofing course.
- Control joints in masonry walls.
- Concrete fill and mortar fill in the cells of the block and installation of bond beams.
- Reinforcing in cells of concrete unit masonry for reinforced masonry construction.
- Masonry reinforcement, ties, anchors, connectors and accessories.
- Concealed composite masonry flashing and air/vapour barrier membrane required for tie-ins.
- Stainless steel sheet backing.
- Backpainting of hollow metal door frames occurring in exterior masonry walls.
- Acrylic cement parging on all exposed foundation walls.

1.3.2 The summarized breakdown of the above mentioned work does not set out all the work of this Section of the Contract but rather outlines the essentials. Provide any masonry work indicated on the drawings or hereinafter specified, all whether enumerated above or not.

1.4 Products Installed But Not Supplied Under This Section

1.4.1 Build, bed and secure into the masonry work the following materials which are supplied by other trades.

- Masonry inserts, hangers, anchors, sleeves, bolts, etc.

1.5 Related Sections

1.5.1

- Cast-in-place Concrete	Section 03 30 00
- Miscellaneous Metal	Section 05 50 00
- Sealants	Section 07 90 00

- Hollow Metal Frames	Section 08 10 00
- Built in Items Required to be Built Into Masonry	Division 23 & 26

1.6 References

1.6.1 The work covered by this Section unless otherwise notes or detailed, shall be governed by the latest editions of the following publications.

CAN 3-A5/A8/A362-M93	Portland Cement/Masonry Cements /Blended Hydraulic Cements
CAN CSA-A82.2-M92	Methods of Sampling and Testing Brick
A443-1989	Terms and Definition for use in CSA Masonry Standards.
CAN CSA-A179-M94	Mortar and Grout for Unit Masonry
ASTM C207	Hydrated Lime Type F
CAN/CSA-S304-1-95	Masonry Design for Buildings
CAN/CSA-S371-M94	Masonry Construction for Buildings
CSA A370-94	Connectors for Masonry
CAN/CSA-A369.1-M90	Method of Test for Compressive Strength of Masonry Prisms
N.B.C. - 2015	National Building Code
O.B.C. - 2012	Ontario Building Code
Portland Cement Association	Concrete Masonry Handbook 1991
Compendium of The Everyday Detail Sheets	The Ontario Masonry Promotion Fund.

1.7 Examination

1.7.1 Prior to the commencement of work, examine all areas which are to receive the work of this Section. Report all misalignments that may affect this work to the Consultant for correction.

1.8 Relationship To Other Trades

1.8.1 Cooperate with all other trades leaving all chases, slots and reglets and building in all frames, sleeves, anchors, bolts, etc. as supplied by others.

1.9 Submittals

1.9.1 Mock-Ups and Samples

1.9.1.1 Submit a mock-up of an exterior wall assembly on site overall size to be approximately 4’ high by 6’ long. Build jointing as specified for masonry cladding. The panel shall show the range of colour and pattern and be representative of the quality of work by this Contractor. Final wall assembly work shall

not commence until the mock-up has been approved by the Consultant. If the panel is not satisfactory, erect a further mock-up or mock-ups until the range, pointing, joints, etc. are satisfactory to the Consultant.

1.9.1.2 Provide a list of products to be used in the work of this section, including insulation manufacturer, mortar supplier, concrete unit masonry supplier, and air barrier products for review by the Consultant.

1.10 Delivery, Storage and Handling

1.10.1 Deliver materials to job site in dry condition.

1.10.2 Keep materials dry until use.

1.10.3 Deliver all cement, lime and other packaged materials in original unbroken and undamaged packages with the marker's name and brand distinctly marked therein, and upon delivery store in a shed until used on the work.

1.10.4 Deliver all concrete masonry units to the site palletized and protected with Shrink-Film.

1.10.5 Store or pile mortar aggregate on a plank platform and protect from dirt and rubbish.

1.10.6 Store concrete masonry units off the ground with care to avoid damage. Damaged units will not be acceptable for face work.

1.10.7 Do not double stack cubes or concrete masonry.

1.11 Dimension

1.11.1 Build all work plumb, true, level and square, accurately to the dimensions shown and with all angles and reveals at right angles to faces unless distinctly shown otherwise.

1.12 Clean-up

1.12.1 Upon completion of the work of this Section, remove all surplus materials and debris caused by the work of this Trade from the site to the satisfaction of the Consultant.

1.13 Guarantee

1.13.1 Provide a written guarantee of work of this Section against defects in material and quality of work for a period of one (1) year from the date of publication of the Certificate of Substantial Performance.

1.14 Standard Details

1.14.1 Refer to Section 01 81 00 of the Specifications for Standard Details which govern the work of this Section.

2 PRODUCTS

2.1 Materials

2.1.1 Use only new and in perfect condition material and the best obtainable of the various kinds specified hereinafter.

2.1.2 Use Only freshly made Portland Cement of Canadian manufacturer conforming to C.S.A. Standard A5.

2.1.3 Use white stainless masonry cement freshly made and conforming to C.S.A. Standard Specification.

2.1.4 Masonry cement shall be as manufactured by Lafarge Cement or other, conforming to C.S.A. Standard A8.

2.1.5 Mortar aggregate shall conform to CSA Standard test method A23.2-2A and shall be natural pit sand consisting of sharp gritty particles of hard durable stone from fine to coarse to the approval of the Consultant. Sand shall be free from loam, clay, vegetable or organic matter, acid, alkali, salt or other soluble or deleterious matter.

2.1.6 Manufacturers of decorative, lightweight and concrete masonry units having Product considered acceptable for use:
.1 Atlas Block.
.2 Boehmers Block.
.3 Lafarge Canada.
.4 Permacon Group.
.5 Richvale York Block Inc.
.6 Simcoe Block.

2.1.7 Substitutions: refer to Instructions to Bidders and Section 01 60 00.

2.2 Lightweight Concrete Unit Masonry

2.2.1 Use lightweight concrete unit masonry based on CAN/CSA-A165.1 M94 for all load bearing masonry walls.

2.2.2 Minimum physical properties for concrete masonry units shall be – H/15/D/M. and S/15/D/M. Where fire resistance ratings are required type “D” light weight block shall conform to the requirements of OBC & NBC Supplement.

2.3 Mortar Types

2.3.1 Use Type S Mortar for all load bearing walls (compressive strength 1232 psi).

2.3.2 Use Type N Mortar for stone, colour to Architect’s selection, per manufacturer’s specifications and requirements.

2.3.3 Mortar types shall conform to CSA A179, test methods to give the noted compressive strengths when cured.

2.3.4 Colour of mortar as directed by the Consultant, intended to mix some yellow/red pigments = not natural grey. Mortar pigments shall be Harcos Pigments Canada, or Bayferrox Pigments by Bayer. Loading shall be as directed by the Consultant (6% maximum).

2.4 Masonry Reinforcing

2.4.1 Provide vertical masonry reinforcement in all concrete block walls, plus matching dowels from supporting structure, as indicated on structural drawings. If not indicated on structural drawings, provide as follows:

240 mm block – 15 m @ 600 o/c
190 mm block – 15 m @ 800 o/c

2.6 Brick Vents or Weepholes

2.6.1 Brick vents or weepholes shall be Goodco P.V.C. brick vents with louvers as manufactured by J.E. Goodman Sales Limited, or DA 1069 cell vent as manufactured by Dur-O-Wall or weephole ventilator as manufactured by Blok-Lok.

2.7 Mortar Net

2.7.1 High density polyethylene 1" thick x 10" high x continuous mortar net as manufactured by Mortar Net USA Ltd. And supplied by Form & Build Supply Ph. 519-743-2210.

2.8 Dampproofing Course

2.8.1 Dampproofing course where indicated shall be Bakor "Blue Skin AG" flexible waterproofing membrane, .508 mm thick, or approved alternate.

2.9 Flexible Membrane Flashing

2.9.1 Membrane flashing shall be ABlue Skin AG@ by Bakor, or approved alternate.

2.10 Adhesive

2.10.1 For adhering flexible membrane flashings to the wall air/vapour barrier (at edges, openings, etc.), use Air Bloc 21 by Bakor.

2.10.2 For adhering flexible membrane flashings to wood or metal, use CA-106.

2.11 Concealed Composite Masonry Flashing and Air/Vapour Barrier Membrane

2.11.1 Air/vapour barrier to seal between masonry and door frames, window frames, copings, around openings, at similar locations etc. and over steel columns to provide a continuous impermeable barrier to air and moisture infiltration or exfiltration and shall be Bakor "Blueskin AG" or approved alternate.

2.12 Stainless Steel Backing

2.12.1 24 gauge stainless steel sheet backing behind all through-wall flexible flashings and as indicated on the drawings.

2.13 Through-Wall Flashings

2.13.1 At every location where a flexible membrane flash crosses a cavity, provide continuous stainless steel flashing support for the membranes. At joints in sheet metal, overlap material 6" and adhere with sealant.

2.14 Control Joints

2.14.1 Control joints shall be in accordance with concrete masonry handbook, 1991 edition published by Portland Cement Association and as detailed on Standard Details in Section 01 81 00.

2.15 Shop Paint

2.15.1 Shop paint for steel angle lintels shall conform to Canadian Specifications Board Specification 1-GP-40d
Primer: Structural Steel, Oil Alkyd Type.

2.16 Sealants

2.16.1 All sealants shall be done under Section 07 90 00, except those required for construction of flashings.

2.17 Hollow Metal Door Frame Coating

2.17.1 Tremco 'Instant Patch'.

3 EXECUTION

3.1 Protection

3.1.1 Cover walls under construction exposed to the elements with waterproof materials at the end of each day's work and keep covered until the work is continued.

3.1.2 Protect face work liable to become splashed or marked.

3.1.3 Construct and maintain temporary protection as required to permit continuous progress of the work. Areas so protected shall be of sufficient size to permit progress of all work necessary to maintain an orderly and efficient sequence of construction operations.

3.1.4 Provide temporary lighting at levels adequate to permit work to be performed in accordance with this Specification.

3.1.5 Give adequate notification to the Consultant and all Sub-contractors prior to the erection and removal of temporary protective enclosures.

3.2 Mixing and Retempering

3.2.1 Machine mix masonry cement mortar in a drum type mixer for not less than 3 minutes and not more than 5 minutes with only enough water to produce a workable consistency.

3.2.2 Stiffened mortar due to the evaporation of water may be retempered within 2 hours of original mixing provided the temperature is not over 77 Deg. F. If the temperature is over 77 Deg. F., it may only be retempered within one hour of the original mixing.

3.3 Dampproofing

3.3.1 Adhere membranes to concrete.

3.4 Quality of Work

3.4.1 Perform work by skilled workmen under the continuous supervision and direction of skilled and experience foremen in each branch of the work. At least one thoroughly experienced and competent man is to be in charge of all mortar mixing.

3.4.2 Set out and build masonry work to the respective dimensions called for on drawings. Build and lay work true in line, plumb, square and level; align vertical joints. Keep angles, reveals etc., strictly true and square and plumb.

3.4.3 All masonry courses to be of uniform height, and both vertical and horizontal joints to be of equal and uniform thickness.

3.5 Concrete Unit Masonry

3.5.1 Lay units in face shell mortar bedding, plumb, level and true in line, in running bond and properly jointed with other connecting work. Units with open cells exposed in walls will not be permitted.

3.5.2 Remove excess mortar and objects. Exercise special care to prevent breaking block corners and the tooled joints shall be made uniform on exposed work.

3.5.3 While laying units, avoid over-plumbing and pounding of the corners and jambs to fit stretcher units after they are set in position. Where an adjustment must be made after the mortar has started to harden, remove mortar and replace with fresh mortar.

3.5.4 Tie tee shaped intersecting walls together with truss type masonry reinforcing and not with a masonry bond. Rake, tool and seal joints as per Standard Details in Section 01 81 00.

3.6 Mortar Joints

3.6.1 Mortar joint thickness shall conform to CAN3-A371 standard, Clause 5.2.5.

3.6.2 Mortar joints shall be straight, clean and uniform in thickness. Tool as specified below.

3.6.3 Tool both horizontal and vertical joints to produce a dense, slightly concave curved surface well bonded to the unit at the edges except as noted following.

3.7 Pointing

3.7.1 Point and fill holes and cracks in exposed mortar joints. Cut out defective joints, refill solidly with mortar and tool to form a neat joint to match existing.

3.8 Concrete Unit Masonry Reinforcing

3.8.1 Continuously reinforce and tie together with reinforcing in every second block bed joint, all concrete unit masonry according to the Standard Details. In addition, place horizontal reinforcing in first and second bed joints above and below openings. The first bed joint immediately above and below openings shall have continuous reinforcing. In second bed joint, the reinforcing shall extend 24" beyond each side of the opening. Refer to section 01 81 00 for Standard Details.

3.8.2 Place continuous reinforcing in the second bed joint below the top of the wall. Refer to section 01 81 00 for Standard Details.

3.8.3 Lap reinforcement a minimum of 6" at splices, and cut and bent at corners. Overall width of reinforcement shall be according to the manufacturer's recommendations for the various wall thicknesses.

3.8.4 Do not use crimped metal wall ties.

3.9 Control Joints

3.9.1 Provide control joints at locations in accordance with Portland Cement Association Concrete Masonry Handbook and determined by the Consultant unless indicated on the drawings to maintain construction integrity.

3.9.2 Break vertical mortar bond with building paper.

3.9.3 Prime control joint to prevent drying out of caulking material.

3.9.4 Provide 2:1 W:D joint for sealant trade Section 07 90 00.

3.9.5 To form control joints in interior block walls, fill completely with mortar the core of a full height vertical joint after inserting a strip of building paper to keep the mortar from bonding to one side. See Standard Details in Section 01 81 00.

3.10 Building-In

3.10.1 Co-operate with all other sections of the work in the setting of all metal, wood, and wood buck frames for louvres, pressed metal screens and doors, etc. All pressed metal and wood frames for doors and screens in masonry and concrete shall be set and braced by others. Be responsible for and ensure that all frames are set plumb, true and accurately remain in position. Solidly build-in all frames and anchor with the backs of all jambs solidly packed with mortar unless otherwise noted on the drawings.

3.10.2 Solidly build-in all items of all other trades located in or anchored to the masonry work and ensure that all are set square and true in the walls and partitions.

3.10.3 Back paint exterior door frames and frames in high humidity areas with one coat of Tremco "Instant Patch".

3.11 Bearing

3.11.1 Fill concrete masonry units acting as bearing structural members solid with 2900 p.s.i. concrete for a width and depth equal to 3 times the length of bearing.

3.11.2 Use solid concrete masonry units where indicated on the drawings.

3.12 Beams and Lintels

3.12.1 All steel beam lintels will be supplied under Section 05 10 00.

3.12.2 Provide all steel angle lintels for openings in masonry walls. Provide these lintels in accordance with the General Notes on the Structural Drawings.

3.12.3 Clean all steel lintels by scraping, wire brushing or other effective means to remove loose scale, rust, grease, oil or other foreign matter.

3.12.4 Apply one coat of paint in the shop.

3.12.5 Angle lintels shall have a bearing of not less than 6" at each end.

3.13 Weep Hole Vents

3.13.1 Provide weep hole vents in vertical joints immediately over flashings, in exterior wythes of cavity wall and masonry veneer wall construction, at maximum horizontal spacing of 2'-0" O.C. Mortar or debris must not plug holes.

3.14 Vent Holes

3.14.1 Provide vent holes in vertical joints at top of walls and/or immediately below flashings, in exterior wythes of cavity wall and masonry veneer wall construction, at maximum horizontal spacing of 2'-0" O.C. Mortar or debris must not plug holes.

3.15 Field Testing

3.15.1 On completion of masonry cavity walls, and prior to installing parapets, perform a hose test at 5 intervals along length of walls by inserting water hose into top of cavity wall; have Consultant review the test in progress; once the Consultant is satisfied that the cavities are clear and free draining.

3.16 Masonry Flashing

3.16.1 Provide flashings in masonry in accordance with CAN3-A371 as follows:

3.16.2 Provide flashings over shelf angles, and steel lintel angles at wall openings as indicated on the drawings.

3.16.3 In double wythe walls and veneered walls, carry flashings from front edge of masonry, under outer wythes, then up backing not less than 6" and as follows:

1. For masonry backing embed flashing 1" in joint.

2. For concrete backing, insert flashing into reglets and seal joint.

3. For frame backing, secure flashing to studs behind moisture barrier.

3.16.4 Lap joints 6" and seal with compatible adhesive.

3.16.5 Flashing over openings shall be Adams at both ends to prevent water from travelling horizontally past the flashing ends.

3.16.6 Horizontal (base) flashing shall be returned a minimum of 4" around corner to overlap abutting flashing. Overlapped flashing shall be sealed with compatible adhesive.

3.16.7 Protect base wall flashing from mortar droppings.

3.17 Sheet Metal Work

3.17.1 Cut and form reglets in masonry walls as required for the securing of flashings.

3.18 Provisions For Other Trades

3.18.1 Provide all openings and lintels in masonry walls where required or indicated including those required by the Mechanical and Electrical Trades. Locations of such openings shall be the responsibility of the trade involved.

3.18.2 Accurately locate and neatly finish chases and openings to the required sizes.

3.18.3 Do not cover pipe, conduit chases or enclosures until advised that the work has been inspected and tested.

END OF SECTION

1 GENERAL

1.1 Section Includes

1.1.1 Structural steel framing, including steel support members, suspension cables, sag rods, struts, base plates, expansion joint plates, and lintels.

1.1.2 Grouting beneath base plates.

1.2 Related Sections

1.2.1 Section 03 30 00 – Cast-in-Place Concrete: casting anchors into concrete.

1.2.2 Section 04 20 00 – Unit Masonry: embedding anchors into masonry and the placement of loose lintels.

1.2.3 Section 05 20 00 – Steel Joists: open web steel joists.

1.2.4 Section 05 30 00 – Steel Deck: steel roof deck.

1.2.5 Section 05 41 00 – Lightweight Steel Framing.

1.2.6 Section 05 50 00 – Metal Fabrications: non-framing steel fabrications affecting structural steel work.

1.2.7 Section 05 51 00 – Metal Stairs: structural steel for stairs.

1.2.8 Section 07 81 20 – Spray-Applied Fire-Resistive Materials: fireproof coatings.

1.3 References

1.3.1 ASTM A307-00: Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.

1.3.2 ASTM A325-00: Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

1.3.3 CAN/CSA-G40.20-98: General Requirements for Rolled or Welded Steel Structural Quality Steel.

1.3.4 CAN/CSA-G40.21-98: Structural Quality Steel.

1.3.5 CAN/CSA-G164-M92 (R1998): Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3.6 CSA S16.1-94: Limit States Design of Steel Structures.

1.3.7 CSA W47.1-92 (R2001): Certification of Companies for Fusion Welding of Steel Structures.

1.3.8 CSA W48.1-M1991: Carbon Steel Covered Electrodes for Shielded Metal Arc Welding.

1.3.9 CSA W48.4-95: Solid Carbon Steel Filler Metals for Gas Shielded Arc Welding.

1.3.10 CSA W48.5-M1990: Carbon Steel Electrodes for Flux- and Metal-Cored Arc Welding.

1.3.11 CSA W55.3-1965: Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

1.3.12 CSA W59-M1989 (R2001): Welded Steel Construction (Metal Arc Welding).

1.3.13 CAN/CGSB-1.40-97: Anticorrosive Structural Steel Alkyd Primer.

1.3.14 CGSB 85-GP-16M: Painting Galvanized Steel.

1.3.15 Canadian Institute of Steel Construction: Handbook of Steel Construction.

1.4 System Description

1.4.1 Maximum Live Load Deflection: 1/360 of span.

1.4.2 Maximum Dead Load Deflection: 1/240 of span.

1.5 Submittals

1.5.1 Submit shop drawings and mill test reports as described in Section 01 33 00.

1.5.2 Shop Drawings: Indicate profiles, sizes, spacing, and locations of structural members, openings, attachments, fasteners, connections, cambers and loads.

1.5.3 Shop drawings must bear the stamp and signature of the structural steel design engineer.

1.5.4 Mill Test Reports: properly correlated to the materials.

1.6 Quality Assurance

1.6.1 Design Engineer: a professional structural engineer, experienced in structural steel design and licensed in the Place of the Work.

1.6.2 Welding: individual or organization certified by the Canadian Welding Bureau to requirements of the requirements of CSA W47.1 or CSA W55.3 or both as applicable.

1.6.3 Fabrication: company specializing in fabricating structural steel to requirements of CSA S16.1 with a minimum of five years documented experience.

2 PRODUCTS

2.1 Materials

2.1.1 Structural Steel: to CAN/CSA-G40.20, and CAN/CSA-G40.21, as follows:
.1 Angles, Channels, Plates, etc: Grade 300W.
.2 W-Shapes: Grade 350W.
.3 Structural Steel Tubing (HSS): Grade 350W, Class H.

2.1.2 High Strength Bolts: to ASTM A325, including suitable nuts and plain hardened washers, hot dipped galvanized for exterior members.

2.1.3 Machine Bolts: to ASTM A307, externally and internally threaded standard fasteners.

2.1.4 Welding Materials: to CSA W59-M.

2.1.5 Grout: non-shrink type, premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 62 MPa at 28 days: eg. Sika Grout 212 HP by Sika Canada Inc.

2.1.6 Ferrous Metal Primer: to CAN/CGSB-1.40, Grey colour.

2.1.7 Galvanized Metal Primer: to CGSM 85-GP-16M, Grey colour.

2.2 Fabrication

2.2.1 Fabricate structural steel to requirements of CSA S16.1.

2.2.2 Hot dip galvanize structural members used in exterior roof and wall assemblies.

2.2.3 Continuously seal joined members by intermittent welds and plastic filler.

2.2.4 Grind exposed welds smooth.

2.2.5 Perform welding to CSA W59-M. Make Good welds which show inclusions, porosity, lack of fusion penetration beyond the tolerances set out in CSA W59.1-M.

2.2.6 For manual arc welding use low hydrogen electrodes of the E-70 XX series. For semi-automatic welding of tubular joints use processes described in CSA W48.4-M and CSA W48.5-M.

2.2.7 Perform gas cutting by machine where practicable, to CSA W59-M.

2.2.8 Bear angle lintels not less than 200 mm at each end. Bolt or weld angles together where the upstanding legs are back to back.

2.2.9 Temporarily bolt spandrel bean angles to clip tees through vertically slotted holes. After erection and final adjustment, weld angles to clips and remove the bolts.

2.2.10 At any time before the detailed shop drawings are complete and reviewed, provide punched holes from 11 mm to 26 mm OD for the convenience of other trades in attaching wood or other materials. Holes for lagging shall be for 17 mm bolts spaced at 600 mm OC and where in both sides of a flange shall be staggered.

2.2.11 Unless otherwise specified, make holes 2 mm larger than the nominal diameter of the fastener. Holes may be punched, sub-punched, drilled or reamed as permitted in CSA S16.1.

2.2.12 Provide holes for pipes and ducts and the reinforcing for same as indicated on the drawings. Cutting of the steel frame in the field shall be done only when directed by the Consultant.

2.2.13 Finished members shall be true to line and free from twists, bends and open joints. All stiffeners, connection clips and seats shall be kept within the extremities of the relative members and shall not project through exposed or finished surfaces.

2.3 Shop Finishing

2.3.1 Clean and prepare structural steel members for finishing.

2.3.2 Use power tool cleaning to SSPC SP-3 for steel exposed to view.

2.3.3 Shop coat structural steel to CISC.CPMA 1-73a.

2.3.4 Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.

2.3.5 Galvanizing: to CAN/CSA-G164-M, hot dipped method, minimum 380 g/m² zinc coating.

3 EXECUTION

3.1 Examination

3.1.1 Verify that field conditions are acceptable and are ready to receive work.

3.1.2 Commencement of installation implies acceptance of existing conditions.

3.2 Preparation

3.2.1 Where masonry walls abut columns or beams, install anchor slots and anchors to tie in masonry. Verify exact location required.

3.2.2 Supply necessary anchor bolts, together with an anchor bolt setting diagram detailing proper installation. Once installed, verify that anchor bolts have been installed according to the setting diagram prior to commencing steel work.

3.3 Erection

3.3.1 Erect structural steel to requirements of CSA S16.1.

3.3.2 Allow for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.

3.3.3 Field weld components indicated on the shop drawings to requirements of CSA W59-M.

3.3.4 Do not field cut or alter structural members without approval of Consultant.

3.3.5 Grind exposed welds smooth.

3.3.6 After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.3.7 Assemble bolted parts together solidly. Do not separate with gaskets or any other interposed compressible material.

3.3.8 Ensure joint surfaces including those adjacent to bolt heads, nuts, and washers shall be free of scale (tight mill scale accepted), burrs, dirt, and foreign material that would prevent solid seating of the parts.

3.3.9 Tighten bolts to provide the minimum bolt tension recommended in CSA S16.1. Bolts may be torqued using the “turn of the nut” method or by a Direct Tension Indicator.

3.3.10 Do not distort or enlarge holes as a result of drifting done during assembly to align holes. Holes in adjacent parts shall match sufficiently well to permit easy entry of bolts.

3.3.11 Where required, holes, other than oversize or slotted holes may be enlarged to permit the admission of bolts by a moderate amount of reaming. Do not enlarge holes by “burning” using welding equipment.

3.3.12 Gross mismatch of holes shall be cause for rejection.

3.3.13 Grout under baseplates to requirements of Section 03 30 00.

3.4 Tolerances

3.4.1 Maximum Variation from Plumb: 6 mm per storey, non-cumulative.

3.4.2 Maximum Offset from True Alignment: 6 mm.

3.5 Field Quality Control

3.5.1 Perform field inspection and testing as described in Section 01 40 00.

3.5.2 Inspect steel, welds and bolted connections for structural integrity.

3.6 Cleaning

3.6.1 Thoroughly clean welds between passes and upon completion of slag with a descaling stool and wire brush.

3.6.2 Ensure exposed steel connections, alignment, welding, etc. is neat and thoroughly cleaned.

3.6.3 After final erection, thoroughly clean and paint field joints with a coat of shop primer. Where the shop coat has been rubbed off during erection, apply a touch-up coat of primer.

END OF SECTION

1 GENERAL

1.1 Description of System

1.1.1 Lightweight Structural Steel Framing includes Wind Bearing Studs.

Wind Bearing Studs includes:

1. Wall studs subjected to lateral loads (no axial load other than self weight and the weight of applied finishes).
2. Steel bridging.
3. Deflection heads
4. Top and bottom track.
5. Head and sill members and jamb studs for wall openings.
6. Stud, bridging and track connections.
7. Top and bottom track connections to main structure including detailing to accommodate deflections.

1.2 Related Work Described Elsewhere

1. Section 09 29 00 Cement Board / Dens Glass Sheathing

2. Section 07 21 00 Insulation

3. Accessories (e.g. brick ties, furring channels).

1.3 Referenced Standards

1. Referenced standards refer to the latest edition except where specified otherwise.
2. Where referenced standards conflict with this specification, this specification governs.

3. The following standards are referenced in this specification.

- Ontario Building Code
- National Building Code of Canada
- Canadian Standards Association
- CAN3-S136 Cold Formed Steel Structural Members W47.1 Certification of Companies for Fusion Welding of Steel Structures
- W59 Welded Steel Construction (Metal Arc Welding)
- American Society for Testing and Materials (ASTM)
- ASTM A525 M General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot Dip Process
- ASTM A591 Steel Sheet, Cold-Rolled, Electrolytic Zinc-Coated
- ASTM A792 M General Requirements for Steel Sheet, Aluminum-Zinc Alloy Coated by the Hot-Dip Process
- American National Standards Institute/American Welding Society (ANSI/AWS)
  ANSI/AWS D1.3 Structural Welding Code - Sheet Steel
- Canadian General Standards Board (CGSB)
  CGSB 1-GP-181M Standard for Coating, Zinc Rich, Organic Ready Mix

4. Design Criteria:

1. Design is based on Limit States Design principles using factored loads and resistances in accordance with the National Building Code of Canada and CAN3-S136.

2. Provide bridging to prevent member rotation and member translation perpendicular to the minor axis. Provide for secondary stress effects due to torsion between lines of bridging. Collateral sheathing may be used to help restrain member rotation and translation perpendicular to the minor axis.

3. Maximum deflections under specified loads shall conform to the following:

    1. Wall studs: L/360.
    2. Joists: L/360.

4. The spacing of members shall not exceed the following:
    - Wall studs - 600 mm o/c.
    - Joists - 600 mm o/c. or as shown on the drawings.

5. Allow for movement of the structure. Design wind bearing stud end connections to accommodate floor/roof deflections such that the studs are not loaded axially. Allow for 10 mm minimum deflection at all locations.

6. Connections between lightweight steel framing members shall be by bolts, welding or sheet metal screws.

7. Resistances to sheet metal screws shall be based on the manufacturer's lower bound test values multiplied by the appropriate resistance factor, $ø_c$, given in CAN3-S136.

5. Submittals

1. Submit 3 certified copies of mill reports covering chemical and mechanical properties, and coating designation of steel used in this work.

2. Submit 2 representative pieces of all framing component parts including mechanical fasteners if used. The length of pieces submitted need not exceed 300 mm. Tag pieces with the name of the part, the metal thickness exclusive of coating and the manufacturer.

3. Submit 6 copies of shop drawings. Shop drawings shall bear professional seal of design engineer who has designed the framing including connections.

4. Include all necessary shop details and erection diagrams. Indicate member sizes, locations, thicknesses, exclusive of coating, coatings and materials. Include connection details for attaching framing to itself and for attachment to the structure. Show splice details where permitted. Indicate dimensions, openings, requirements of related work and critical installation procedures. Show temporary bracing required to erection purposes.

5. Do not fabricate until all submittals in 1.5.3 are reviewed.

2 PRODUCTS

2.1 Acceptable Manufacturers

1. Bailey Metal Products Ltd., CSM Canadian Steel Manufacturing Inc., or approved equal.

2.2 Materials

1. Steel shall have metallic coatings that conform to one of the following ASTM Standards.

   - A 525 M - General
   - A 591 - Steel Sheet, Cold-Rolled, Electrolytic Zinc-Coated
   - A 792M - General Requirements for Steel Sheet, Aluminum-Zinc Alloy Coated by the Hot-Dip Process.

2. Steel shall conform to the requirements of CAN3-S136 and shall be identified as to specification, type, grade and mechanical properties.

3. Roof and wall members forming part of the exterior building envelope shall have a minimum coating of Z180 galvanizing in accordance with A 525M. Other coatings (e.g. aluminum-zinc alloy) providing equal or better corrosion protection may be used.

4. Interior members not forming part of the exterior building envelope shall have a minimum coating of Class C electro-galvanizing in accordance with A 591. Other coatings (e.g. electro-deposited zinc, chromate treated; zinc-iron alloy; aluminum-zinc alloy) providing equal or better corrosion protection may be used.

5. Sheet metal screws shall have a minimum coating thickness of .008 mm f zinc or cadmium. Other coatings providing equal or better corrosion protection may be used.

6. Welding electrodes shall be of the 480 MPa minimum tensile strength series (e.g. E48XXX, E480S-X).

7. Zinc rich paint for touching up welds and damaged metallic coatings shall conform to CGSB-1-GP-181M.

8. The minimum steel thickness exclusive of coating shall be as follows:
   - Exterior wall studs - 1.52 mm (16 ga.)
   - Roof joists - 1.52 mm (16 ga.)

3 EXECUTION

3.1 General

1. Fabrication and erection shall conform to the approved shop drawings. Modifications required to accommodate as-built conditions (other than minor dimensional changes) shall be submitted for approval.

3.2 Welding

1. Companies engaged in welding shall be certified by the Canadian Welding Bureau to CSA Standard W47.1. Companies shall have welding procedures approved and welders qualified

for the base material types and thicknesses that are to be welded.

2. Welds shall conform to CSA W59 and/or ANSI/AWS D1.3, whichever is applicable.

3. For material less than 3 mm thick, shop drawings may show nominal weld leg sizes. For such material, the effective throats of welds shall not be less than the thickness of the thinnest connected part.

4. Touch-up welds with zinc rich paint.

3.3 Screws

1. Steel screws shall equal or exceed the minimum diameter indicated on the shop drawings.

2. Penetration beyond joined materials shall be not less than 3 exposed threads.

3. Thread types and drilling capability shall conform to the manufacturer's recommendations.

4. Screws covered by sheathing materials shall have low profile heads.

3.4 Fabrication

1. Provide cut-outs centered in the webs of wall members to accommodate services. Unreinforced cut-outs shall be manufacturer’s standard openings only.

2. The steel thickness exclusive of coating shall be marked on each member by embossing, stamping with indelible ink or by colour coding.

3.5 Storage of Materials

1. Products shall be protected from conditions that may cause physical damage or corrosion.

3.6 Erection

1. Methods of construction may be either piece by piece (stick-built) or by fabrication into panels either on or off site.

2. Lightweight steel framing shall be erected true and plumb within the specified tolerances. 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 Erector shall ensure that during erection a margin of safety consistent with the requirements of the National Building Code and CAN3-S136 exists in the uncompleted structure.

3. Erection Tolerances:

    1. For the purposes of this section, camber is defined as the deviation from straightness of a member of any portion of a member with respect to its major axis, and sweep is defined as the deviation from straightness of a member of 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 rafters and joists, out of straightness (camber and sweep) shall not exceed 1/1000th of the member length.

4. For track, camber shall not exceed 1/1000th of the member length.

5. Studs shall seat into top and bottom tracks. The gap between the end of the stud and the web of the track shall not exceed 1.5 mm for axial load bearing studs or 4 mm for wind bearing studs.

6. Align adjacent prefabricated panels to provide surface continuity at the interface.

7. Spacing of studs shall not be more than 3 mm from the design spacing. The cumulative error in spacing shall not exceed the requirements of the finishing materials.

4. Make all field measurements necessary to ensure the proper fit of all members.

5. Cutting of members may be by saw or shear. Torch cutting is not permitted.

6. Insulation equal to that specified shall be placed in all jamb and header assemblies that will be inaccessible after their installation into the wall. Ensure that insulation is kept dry and not compressed.

7. Handling and lifting of prefabricated panels shall not cause permanent distortion to any member or collateral material.

END OF SECTION

1 GENERAL

1.1 Instructions

1.1.1 The Instructions to Bidders, the General Conditions of CCDC 2, 2008 Supplementary General Conditions and all Sections of Division 1 apply to and form part of this Section of the Specification.

1.1.2 Report in writing to the General Contractor any defect of surfaces or work prepared by other trades which affect the quality or dimensions of this Contractor's work. Commencement of this Contractor's work implies complete acceptance of all work by other trades.

1.2 Intent

1.2.1 Provide all articles, labour, materials, equipment, transportation, hoisting and incidentals specified or required to complete the work of this Section.

1.3 Guarantee

1.3.1 Provide a written guarantee for work of this Section against defects in material and quality of work for a period of one (1) year from the date of publication of the Certificate of Substantial Performance.

1.4 Section Includes

1.4.1 Provide all miscellaneous metal items as detailed on the Architectural drawings, specified herein or required for the proper execution of the project including those listed below. Provide each item complete with all the required anchorage and such accessories necessary for proper installation and correlation with the adjoining work.

1.4.2 Itemized List:

- Angle supports for cabinets/vanities/seats/benches/shelves and Lab accessories complete with wall anchors.
- Steel gratings/cover plates complete with angle frames and anchors for trenches.
- All steel framing required by architectural details including beams and column, anchor bolts and lintels.
- Support angles at wide end of P.Lam. Window sills.
- Steel pipe for bollards at overhead door.
- Framing for support of interior ceiling
- Miscellaneous framing for sloped ceiling details.
- Steel framing not shown on structural drawings but required by architectural details.

1.5 Related Work Excluded From This Section

Metal Deck	Section 05 30 00
Unit Masonry	Section 04 20 00
Structural Steel	Section 05 10 00

1.6 By-laws

1.6.1 The design, fabrication and erection of all miscellaneous metal work shall conform to the requirements of the Ontario Building Code and any other applicable local building by-laws.

1.7 Reference Publications

1.7.1 Conform to the latest edition of the following publications.

1.7.2 C.S.A. Standards

G164-M1981	Hot Dip Galvanizing of Irregularly Shaped Objects
CAN/CSA G40-21–13	Structural Quality Steels
W47.1–09	Certification of Companies for Fusion Welding of Steel Structures
W59–13	Welded Steel Construction (Metal Arc Welding)
HA Series – M1980	CSA Standards for Aluminum & Aluminum Alloys

1.7.3 C.G.S.B. Specification

1-GP-40M – M89	Primer, Structural Steel, Oil Alkyd Type

1.7.4 A.S.T.M. Specifications

A36 – Latest Edition	Structural Steel

1.7.5 Ontario Regulations

Ontario Building Code – 2006

1.8 Submittals

1.8.1 Shop Drawings

1.8.1.1 Submit one (1) sepia and one (1) copy of all miscellaneous metal shop drawings for the Architect's review before any work is commenced.

1.8.1.2 Shop drawings should include large scale details complete with welding information, sizes, dimensions, support and anchoring.

1.8.1.3 This review is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that the reviewer approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all Trades.

1.9 Examination and Field Measurements

1.9.1 Prior to fabrication, verify all existing conditions which may affect the work of this Section and take any field measurements necessary to ensure a perfect fit of all miscellaneous metal items. Report all

deficiencies and misalignments to the Consultant for correction. Commencing work implies acceptance of existing corrections.

1.10 Rejections

1.10.1 Correct, remove and/or replace defective materials or poor quality of work at your expense, be responsible for the cost of additional work of other trades affected by this replacement.

1.11 Relation to Other Trades

1.11.1 Supply all items to be built into the work for the anchorage of miscellaneous metal work including templates or information required for sleeves or openings to the Trade involved at the proper time.

1.12 Clean-up

1.12.1 Remove from the site upon completion of the work of this Section, all surplus material and debris caused by the work of this Trade to the satisfaction of the Consultant.

1.13 Standard Details

1.13.1 Refer to Section 01 81 00 for the Specifications for Standard Details which govern the work of this Section.

2 PRODUCTS

2.1 Materials

2.1.1 Steel Sections and plates in accordance with C.S.A. Specification G40.21.

2.1.2 Shop paint in accordance with C.G.S.B. Specification 1-GP-40M – 1989, Oil Alkyd Type Primer.

2.1.3 Hot dip all materials that are specified to be galvanized after fabrication according to C.S.A. Specification G164-M92 (R2003).

2.1.4 Architectural Aluminum Shapes: Alloy and Temper, Alcan 50S-T5.

2.1.5 All exterior steel to be G90 galvanized, after all fabrication is complete.

2.1.6 Structural Aluminum: Alloy Alcan B51S and 65S.

3 EXECUTION

3.1 Quality of Work and Fabrication

3.1.1 Fabricate miscellaneous metal work in accordance with the reviewed shop drawings and specifications.

3.1.2 Welding in accordance to the requirements of C.S.A. Specification W59 and be carried out by a fabricator fully approved by the Canadian Welding Bureau to the requirements of C.S.A. Specification W47.1. All exposed welds shall be continuous in length and filed or ground smooth and flush.

3.1.3 Provide the best grade of modern shop and field practice as produced by recognized fabricators specializing in this work. Accurately fit joints and intersecting members made in true planes with adequate fastening. Erect all items plumb, true, square, straight, level and accurate to sizes detailed and free from distortion or defects detrimental to appearance and/or performance.

3.1.4 After fabrication, clean and scrape all surfaces to remove rust, mill scale, oil and grease of extraneous material.

3.1.5 Ground smooth all exposed shop welding to the acceptance of the architect. Poor quality or unsightly appearance of welding will be rejected at no extra cost to the Owner.

3.2 Shop Painting

3.2.1 Shop paint all items supplied with the specified material.

3.3 Erection

3.3.1 Install miscellaneous metal items as required by welding, bolting or lagging to the building structure.

3.3.2 Erect all items square, plumb, straight and true, accurately fitted with tight joints and intersections.

3.3.3 Keep Field Welding to a minimum.

3.3.4 All shop weld fabrications supplied to the site without ground smooth welds will be rejected.

3.3.5 Provide all necessary anchor bolts, washers, nuts, lag screws, expansion shields, toggles, straps, sleeves, brackets etc. required to complete the installation to the satisfaction of the Consultant.

3.4 Cutting and Patching

3.4.1 Carry out all cutting and drilling of concrete and masonry required for the installation of miscellaneous metal items. Carry out all making good after by the Trade whose work was affected at your own expense.

3.5 Field Touch-up

3.5.1 Upon completion of erection, all areas from which shop paint has been scraped or chipped, including bolts, nuts, welds, etc. shall receive on coat of primer as previously specified.

3.5.2 Touch-up all hot dip galvanized materials with galvafroid paint.

3.5.3 Ground smooth and prime paint all field welded connections.

END OF SECTION

1 GENERAL

1.1 Instructions

1.1.1 The Instructions to Bidders, the General Conditions of CCDC 2 2008 Supplementary General Conditions and all Sections of Division 1 apply to and form part of this Section of the Specification.

1.1.2 Report in writing to the General Contractor any defects of surfaces or work prepared by other trades which affect the quality or dimensions of this Contractor's work. Commencement of this Contractor's work shall imply complete acceptance of all work by other trades.

1.2 Intent

1.2.1 Provide all articles, labour, materials, equipment, transportation, hoisting and incidentals noted, specified or required to complete the work of this Section.

1.3 Guarantee

1.3.1 Provide a written guarantee of work of this Section against defects in material and quality of work for a period of one (1) year from the date of publication of the Certificate of Substantial Performance.

1.4 Section Includes

1.4.1 Provide all of the rough and finished carpentry indicated on the working drawings or specified herein, including but not limited to the following:

1.4.2 Rough Carpentry

Wood nailers and blocking.
Wood furring.
Pressure treated wood curbs and blocking for Mechanical and Electrical equipment.
Hardware for anchoring rough carpentry to masonry, concrete, steel, etc.

1.4.3 Accept delivery, store and install the following:

- Hollow Metal Doors & Door Frames	Section 08 11 00
- Wood Doors	Section 08 14 00
- Finishing Hardware	Section 08 70 00
- Interior Door Signs	Section 08 70 00
- Washroom Accessories	Section 08 70 00

1.5 Related Sections

Millwork and Casework including Millwork Hardware.	Section 06 40 00
Hollow Metal Doors and Frames	Section 08 10 00
Wood Doors	Section 08 20 00
Finishing Hardware	Section 08 70 00
Painting	Section 09 90 00

1.6 By-laws

1.6.1 The design, fabrication and erection shall conform to the requirements of the Ontario Building Code and any other applicable local building by-law.

1.7 Reference Publications

1.7.1 This Specification makes reference to the latest edition of the following publications listed below.

.1 American National Standards Institute (ANSI)

.2 American Society for Testing and Materials (ASTM)

.1 ASTM A653/A653M-[01a], Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM C36/C36M-[01], Specification for Gypsum Wallboard.

.3 ASTM C578-[01], Specification for Rigid, Cellular Polystrene Thermal Insulation.

.4 ASTM C1289-[01], Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.

.5 ASTM D1761-[00], Standard Test Methods for Mechanical Fasteners in Wood.

.6 ASTM D5055-[00], Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists.

.7 ASTM D5456-[01ae1], Specification for Evaluation of Structural Composite Lumber Products.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-11.3-[M87], Hardboard.

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

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

.4 CAN/CGSB-71.26-[M88], Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems.

.4 Canadian Standards Association (CSA)

.1 CSA A123.2-[M1979(R1999)], Asphalt Coated Roofing Sheets.

.2 CAN/CSA-A247-[M86], Insulating Fiberboard.

.3 CSA B111-[1974], Wire Nails, Spikes and Staples.

.4 CAN/CSA-G164-[M92], Hot Dip Galvanizing of Irregularly Shaped Articles.

.5 CSA O112 Series-[M1977], CSA Standards for Wood Adhesives.

.6 CSA O121-[M1978], Douglas Fir Plywood.

.7 CAN/CSA-O122-[M89], Structural Glued-Laminated Timber.

.8 CAN/CSA-O141-[91], Softwood Lumber.

.9 CSA O151-[M1978], Canadian Softwood Plywood.

.10 CSA O153-[M1980], Poplar Plywood.

.11 CAN/CSA-O325.0-[92(R1988)], Construction Sheathing.

.12 CAN3-O437 Series-[93], Standards on OSB and Waferboard.

.5 National Lumber Grades Authority (NLGA)
.1 Standard Grading Rules for Canadian Lumber [2000].

.6 Truss Design and Procedures for Light Metal Connected Wood Trusses, Truss Plate Institute of Canada.

1.8 Submittals

1.9 Delivery, Storage and Handling

1.9.1 Store all materials under waterproof cover both in transit and on the site in such a manner as to cause no damage to other materials, to any existing building or property or to the new structure.

1.9.2 Co-ordinate delivery schedule of material with the suppliers.

1.9.3 Pile doors flat on level supports to prevent damage. Protect face of first door by placing plywood or cardboard between supports and door. Cover the top door and edges in a similar manner.

1.9.4 Store doors in a dry, well ventilated area. Doors stored for an extensive period of time shall have top and bottom edges sealed.

1.9.5 Lift doors on and off piles, never drag across each other to prevent surface damage and scratching. Do not stand doors on ends for storage.

1.10 Rejections

1.10.1 Defective materials or quality of work whenever found, at any time prior to final acceptance of the work, shall be rejected. Inspection will not relieve this Contractor of responsibility, but is a precaution against oversight or errors. Defective materials shall be removed and replaced by this Contractor at his own expense, and he shall be responsible for the cost of the work of other trades affected by this replacement.

1.11 Co-operation with Other Trades

1.11.1 Give sufficient notice to the Painting Contractor so that untreated or unprimed carpentry items or material can be primed immediately upon delivery to the site.

1.11.2 Supply fastenings with installation locations and necessary templates to other trades to which wood is to be secured.

1.12 Clean-up

1.12.1 Upon completion of the work of this Section, remove all surplus material and debris caused by the work of this Trade from the site to the satisfaction of the Consultant.

1.13 Guarantee

1.13.1 Provide a written guarantee of work of this Section against defects in material and quality of work for a period of one (1) year from the date of publication of the Certificate of Substantial Performance.

1.14 Standard Details

1.14.1 Refer to Section 01 81 00 of the Specifications and the Drawings for Standard Details which govern the work of this Section.

2 PRODUCTS

2.1 Materials

2.1.1 All lumber for rough carpentry shall be well seasoned stock, free from shakes, splits, dry rot, mildew or other defects which would impair its strength or durability. For exterior applications and for parapets, use pressure treated lumber.

2.1.2 Unless otherwise specified, all rough lumber shall be well seasoned No. 1 Eastern Spruce conforming to N.L.G.A. grading rules.

2.1.3 Douglas Fir plywood: To C.S.A. 0121-M1978 (sanded G2S Grade "A" veneer). (Unsanded SAG Grade "C" veneer).

2.1.4 Use exterior grade plywood in all exterior applications and for building curbs and parapets.

2.1.5 Plastic laminate: to CAN3-A172-M79, Type HD, 1/16" thickness, velour or satin finish, solid colour. Use scratch resistant surface, FIN-SA (41) by Formica, 90 finish by Wilsonart or equal for window sills.

2.1.6 Approved manufacturers: Formica, Wilsonart, Arborite Nevamar and Laminart.

2.2 Acoustic Panels:

2.2.1 “Tectum” 1 inch thick panels as shown on drawings.

3 EXECUTION

3.1 Quality of Work

3.1.1 Machine sand all exposed surfaces of finished woodwork to an even smooth surface ready for finishing; fit all joints and mitres accurately with nail heads set and ready for finishing.

3.1.2 Back out flat members of trim to prevent warping.

3.1.3 Hand sand all finished materials, after erection to remove roughness, machine marks or other blemishes.

3.1.4 Apply plastic laminate to Architectural Wood Manufacturers Association Standards. Use lengths adequate for longest dimension of surface to be covered. Splices within lengths of 8'-0" will be rejected.

3.1.5 Protect all exposed and finished woodwork after installation against damage during the progress of the work.

3.1.6 Provide mineral wool insulation where required at curbs, parapets then in locations as shown on the architectural drawings and details.

3.1.7 Provide membrane flashing (Blue Skin as manufactured by Bakor) to ensure continuity of the air barrier and or air/vapour barrier on locations such as wood, curbs and stud wall curbs as shown on drawings and details.

3.2 Fastenings

3.2.1 Fastenings to solid masonry or concrete surfaces shall be with expansion shields and lag screws, unless otherwise specified, and to steel with bolts and nuts. Wood or inorganic fibre plugs shall not be permitted. Powder activated fasteners and staples shall not be used unless permitted by the Consultant.

3.3 Finishing Hardware

3.3.1 Finishing hardware shall be supplied by the Hardware Supplier under the work of Section 08 70 00 and installed by this Contractor.

3.3.2 Mortise and neatly fit finishing hardware. Cut mortises straight and sharp without ragged edges and size accurately to accommodate the hardware. Where mortising and application have not been done in a first class workmanlike manner such work shall be replaced.

3.3.3 Install hardware in accordance with the manufacturer's recommendations.

3.3.4 Examine and adjust as required all doors and other moveable parts prior to completion of the building.

3.3.5 Hang doors 1½ pairs of butts, unless otherwise shown in the hardware list to be provided under Section 08 70 00. Neatly and accurately fit all finishing hardware.

3.4 Wood Blocking

3.4.1 Construct all wood blocking as on the Architectural Drawings.

3.4.2 Accurately fit all work to sit level and true and securely fastened.

3.4.3 Apply wood copings, nailing strips, etc. to complete approval of the Roofing Contractor insofar as his/her work is affected.

3.4.4 Fire Retardant Treated Plywood and Wood Blocking
- .1 Electrical Equipment Mounting Boards (minimum 20mm thick plywood and blocking)
- .2 Blocking for Architectural Woodwork.
- .3 Blocking for Fire rated Doors and frames
- .4 Blocking for Washroom Accessories.

3.5 Wood Preservative

3.5.1 Treat all wood nailers, blocking, wood sills, etc. in contact with concrete or masonry with green Pentox to ensure full protection against rot and decay.

3.5.2 Apply two coats of preservative to new surfaces when treated lumber is cut or sawn for fabrication or drilled and countersunk for bolts etc.

3.6 Pressure Treated Wood Curbs

3.6.1 Treat all wood curbs and blocking for roof ventilators, Electrical and Mechanical equipment on the roof.

3.7 Wood Doors

3.7.1 Installation of wood doors supplied under Section 08 14 00 shall be carried out by workmen skilled in this trade and done in strict accordance with the manufacturer's direction to produce a first class installation.

3.7.2 Condition doors to the average humidity of the location before hanging.

3.7.3 Trim square and accurately as to size, individually inspect, bench, belt sand and label all doors.

3.7.4 Cut down doors to fit openings smaller than those for which they are manufactured.

3.7.5 Trim equally from door sides when planning to fit. Trim equally from top and bottom if height is to be reduced more than 3/4", never more than 3/4" from bottom.

3.7.6 Bevel the lock edge of the door, approximately 1/8" for a 2" thick door, for proper clearance.

3.7.7 Seal all door edges and routing for hardware.

3.7.8 Hang doors so that they will operate freely, without tension or free swing. Allow 3/16" clearance in overall opening width and 1/8" clearance at top to allow for swelling in extreme humidity.

3.8 Wood Fencing

3.8.1 Materials as specified on drawings.

3.9 Hollow Metal Doors

3.9.1 Installation of hollow metal doors supplied under Section 08 11 00 shall be carried out by workmen skilled in this trade and done in strict accordance with the manufacturer's direction to produce a first class installation.

3.9.2 Hang doors so that they will operate freely, without tension or free swing.

3.10 Hollow Metal Door Frames

3.10.1 Set hollow metal frames, supplied under Section 08 11 00, plumb, square, level and at correct elevation. Brace solidly in position while being installed.

3.10.2 Provide a temporary horizontal wood spreader at the mid height of the door opening to ensure the frame remains plumb and true until surrounding partitions are complete.

END OF SECTION

1 GENERAL

1.1.1 Section Includes

Installation of Wood Doors & finishing hardware
Installation of Hollow Metal Doors & Screens
Repair & reconfiguration of existing finished wood items
Plastic laminate window sills
Stairs
Railing
Shelving

1.1.2 Related Sections

Finishing Hardware for Millwork	Section 06 40 00
Rough Carpentry	Section 06 10 10
Hollow Metal Doors & Frames	Section 08 10 00
Wood Doors	Section 08 20 00
Glass & Glazing	Section 08 80 00
Finishing Hardware	Section 08 70 00
Painting	Section 09 90 00

1.2 QUALITY ASSURANCE

1.2.1 Produce the work according to the standards of the Architectural Woodwork Manufacturer's Association of Canada (AWMAC) Quality Standards Illustrated 2003.

1.2.2 NLGA Grading rules

1.2.3 Use only No added Formaldehyde products in all cases where such products are available.

1.3 REFERENCE STANDARD

.1 American National Standards Institute (ANSI)

.1 ANSI A208.1-[99], Particleboard.
.2 ANSI A208.2-[94], Medium Density Fibreboard (MDF).

.2 American Society for Testing and Materials (ASTM)

.1 ASTM E1333-[96], Test Method for Determining Formaldehyde Concentrations in Air and Emissions Rates from Wood Products Using a Large Chamber.

.3 Architectural Woodwork Manufacturers Association of Canada (AWMAC)

.1 AWMAC Quality Standards for Architectural Woodwork [1994].

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-11.3-[M87], Hardboard.

.5 Canadian Standards Association (CSA)

.1 CAN/CSA-A247-[M86(R1996)], Insulating Fibreboard.
.2 CSA B111-[74(R1998)], Wire Nails, Spikes and Staples.
.3 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.4 CSA O115-[M82(R2001)], Hardwood and Decorative Plywood.

.5 CSA O121-[M78(R1998)], Douglas Fir Plywood.

.6 CAN/CSA O141-[91(R1999)], Softwood Lumber.

.7 CSA O151-[M78 (R1998)], Canadian Softwood Plywood.

.8 CSA O153-[M80 (R1998)], Poplar Plywood.

.9 CSA Z760-[94], Life Cycle Assessment.

.6 International Organization for Standardization (ISO)

.1 ISO 14040-[97], Environmental Management-Life Cycle Assessment - Principles and Framework.

.2 ISO 14041-[98], Environmental Management-Life Cycle Assessment - Goal and Scope Definition and Inventory Analysis.

.7 National Hardwood Lumber Association (NHLA)

.1 Rules for the Measurement and Inspection of Hardwood and Cypress [January 1996].

.8 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber [2000].

.9 Underwriters Laboratories of Canada (ULC)

.1 CAN4-S104-[80(R1985)], Fire Tests of Door Assemblies.

.2 CAN4-S105-[85(R1992)], Fire Door Frames, meeting the Performance Required by CAN4-S104.

1.4 SUBMITTALS

1.4.1 Samples

1.4.1.1 Submit samples of timber & products used when requested by Architect

1.4.1.2 Do not commence work until reviewed samples have been returned.

1.4.2 Shop Drawings

1.4.2.1 Submit shop drawings in accordance with Section [01 33 00 Submittal Procedures].

1.4.2.2. Indicate details of construction, profiles, jointing, fastening and other related details.

1.4.2.3 Indicate materials, thicknesses, finishes and hardware.

1.5 REJECTIONS

1.5.1 Defective materials or poor quality of work, whenever found at any time prior to final acceptance of the work, shall be rejected regardless of previous inspection. Inspection will not relieve responsibility but is a precaution against oversight and error.

1.5.2 Remove and replace defective materials and make good work of other trades affected by this replacement, at no additional cost to the Owner.

1.6 EXAMINATION

1.6.1 Report to the <CP>, in writing, all defects of surfaces or work prepared by other trades and/or

unsatisfactory site conditions.

1.6.2 Thoroughly examine all surfaces to see that they are secure, rigid, true and not liable to impair performance or appearance.

1.6.3 Commencement of work implies total acceptance of surface and site conditions.

1.6.4 Prior to fabrication, verify any field measurements necessary to ensure a perfect fit.

2 PRODUCTS

2.2.1 Provide new materials only, free from defects impairing physical or appearance performance.

2.2.2 Obtain the Architect's approval before attempting to substitute materials. Only materials that are shown by the contractor to be as good as or better than the products specified will be accepted. Materials

2.2.3 Softwood lumber: to CSA 0141-1970 and National Lumber Grades Authority requirements, with maximum moisture content of 9% for interior work, Douglas Fir or Ponderosa Pine species, to AWMAC Custom grade.

2.2.4. Hardwood lumber for finished solid wood items: - Red or White Birch to AWMAC Premium Grade. To National Hardwood Lumber Association (NHLA) requirements, moisture content of maximum 9% for interior work.

2.2.5 Hardwood plywood: to CSA 0115-1991 and AWMAC Standards.
Plywood shall be G1S or G2S when both faces are exposed.

2.2.6 Canadian softwood plywood: to CSA 0151-M1978 Pine species, Type II bond, veneer core, G2S grade "A".

2.2.7 Douglas fir plywood: To CSA 0121-M1978 sanded, G1S; or G2S grade where plywood is exposed on 2-sides.

3 EXECUTION

3.3.1 Finished Woodwork

Conform to AWMAC Millwork standards for Custom Grade work

3.3.2 Wood work: Cut & fit accurately, neatly, and true to line. Cope inside corners of wood base, screw fasten at 400 oc minimum, countersink & fill

3.3.3 Securement:

Secure woodwork and other products in accordance with manufacturer's recommendations for best results, in accordance with AWMAC standards, the Drawings, and the reviewed shop drawings.

3.3.4 Installation of products from other sections:

Collect and review shop drawings of all such work. Install in accordance with reviewed drawings and manufacturer's installation instructions.

Doors and frames are prepared for hardware.

Hang doors & screens plumb and accurately within openings, shimming as necessary, free of hinge bound conditions.

Install access doors as required by Mechanical & Electrical divisions.

Install all hardware except for cabinet hardware.

Install washroom & janitor accessories where required

3.3.5 Stairs.

Install stairs to location and details as indicated.

3.3.6 Handrails, wall rails and bumper rails.

.1 Make joints hair line, dowelled and glued.

.2 Support brackets will be provided under Section 05 59 00 for installation under this Section.

.3 Install brackets at ends and at 400 mm o.c. maximum at intermediate spacings.

.4 Install metal backing plates between studs at bracket locations to ensure proper support for brackets and bolts or self-tapping screws.

.5 Secure using counter sunk screws plugged with matching wood plugs.

.10 Shelving.

.1 Install shelving on [ledgers] [shelf brackets].

.11 Hardware.

.1 Install hardware where indicated.

END OF SECTION

1 GENERAL

1.1 Report in writing to the General Contractor any defects of surfaces or work prepared by other trades which affect the quality or dimensions of this Contractor's work. Commencement of this Contractor's work shall imply complete acceptance of all work by other trades.

1.2 Section Includes

Provide all millwork and casework as shown on the drawings. These items include

Architectural Casework:
- Wood veneer faced items
- Plastic laminate faced cabinets
- Thermofused melamine cabinets
- Countertops

Finishing Hardware for Millwork

1.1 Related Sections

Rough & Finished Carpentry	Section 06 10 00
Wood Doors	Section 08 14 00
Glass & Glazing	Section 08 80 00
Painting	Section 09 90 00

1.2 Quality Assurance

1.2.1 For fabrication and installation of architectural woodwork, use only personnel who are completely trained and experienced in this field.

1.2.2 If there is a conflict between specification and drawings, specification takes precedence.

1.2.3 Produce the work according to millwork standards of the Architectural Woodwork Manufacturer's Association of Canada (AWMAC) Quality Standards - Edition2, 2014.

1.2.4 Any items of millwork not given a specific quality grade shall be built to AWMAC "Custom grade" standards.

1.2.5 Use only No added Formaldehyde products in all cases where such products are available.

1.3 Reference Standard

AWMAC	Quality Standards Illustrated 2003
ANSI-A208.1-99	
NEMA	
CSA A172	High Pressure Paper Base Decorative Laminates
CSA 0121	Douglas Fir Plywood
CSA 0141	Softwood Lumber
CSA 0115	Hardwood Plywood
CAN3 CSA 0188.1 M78	Interior Mat Formed Wood Particle Board

1.4 Submittals

1.4.1 Shop Drawings

1.4.1.1 Requirements for shop drawings submission are described in Section 01 33 00, specifically provide the following:

- General arrangement in plan and elevation
- Locations of required blocking (which will be provided by Section 06 10 00)
- Location of all related service outlets
- Details of connections, attachments, anchors as applicable
- Where surfaces require splicing of finish surface material, submit drawing showing locations of splices
- Direction of wood grain to be shown in all cases where wood is used
- Locations and sizes for cutouts and holes for plumbing fixtures ,faucets ,soap dispensers ,waste receptacle and other items installed in quartz surfaces.
- Indicate dimensions shown on the contract drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements
- Provide alternate sketches to designer for resolution of such conflict (minor dimension changes and difficult installations will not be considered changes to the contract)
- Seam locations.

1.4.2 Samples

1.4.2.1 For casework submit two (2) samples of drawer case, door material (cut through to show core), countertop profile, nosing, edgebanding, for the Architect's review.

1.4.2.2 For wood trim, submit two (2) samples of each profile for the Architect's review.

1.4.2.3 For custom woodwork, submit two (2) samples 300mm x 300mm of each wood veneer selection.

1.4.2.4 Submit cut sheets of all hardware including product name and specifications for the Architect's review:

1.4.2.5 Do not commence work until reviewed samples have been returned.

1.5 Mock-Up

1.5.1 Provide a full size sample of typical casework carcass, complete with doors, drawers, countertop, finishes & hardware; cut in half to expose the core material for approval by the architect.

1.6 Rejections

1.6.1 Defective materials or poor quality of work, whenever found at any time prior to final acceptance of the work, shall be rejected regardless of previous inspection. Inspection will not relieve responsibility but is a precaution against oversight and error.

1.6.2 Remove and replace defective materials and make good work of other trades affected by this replacement, at no additional cost to the Owner.

1.7 Examination

1.7.1 Report to the Architect, in writing, all defects of surfaces or work prepared by other trades and/or unsatisfactory site conditions.

1.7.2 Thoroughly examine all surfaces scheduled to receive Architectural Woodwork to see that they are secure, rigid, true and not liable to impair performance or appearance.

1.7.3 Commencement of work implies total acceptance of surface and site conditions.

1.7.4 Prior to fabrication, verify any field measurements necessary to ensure a perfect fit.

1.8 Delivery, Storage and Handling

1.8.1 Deliver and store all millwork and casework under waterproof cover, both in transit and on the site.

1.8.2 Store in a dry well ventilated area that does not hinder the work of other trades.

1.8.3 This contractor and the General Contractor shall be jointly responsible to ensure that millwork is not delivered to the site until areas achieve a maximum air moisture content of 15%, or such moisture level to ensure that the woodwork will not be damaged due to excessive moisture and/or changes in moisture content.

1.8.4 Any items which are chipped, bent, scratched or otherwise damaged at the time of installation are to be removed and replaced with new materials.

1.9 Job Conditions

1.9.1 Co-operate in co-ordinating work of related Sections in order that the work may proceed in an orderly and effective manner.

1.10 Warranty

1.10.1 The contractor warrants that all materials and workmanship shall be of the quality, quantity specified and shown, and that any defect due to improper workmanship or material discovered and made known to him by the Owner, within one year from the date of substantial performance, shall be repaired or replaced by him, to the Designer's and Owner's satisfaction, without additional expense to the Owner.

1.10.2 For Solid Surfaces provide manufactures 10- year warranty against defects in materials, warranty shall provide material to repair or replace defective materials

1.11 Clean-up

1.11.1 Promptly as the work proceeds, and upon completion, clean-up and remove from the premises all rubbish and surplus materials resulting from the foregoing work.

2 PRODUCTS

2.1 General

2.1.1 Provide new materials only, free from defects impairing physical or appearance performance.

2.1.2 Obtain the Architect's approval before attempting to substitute materials. Only materials that are shown by the contractor to be as good as or better than the products specified will be accepted. Review Division 1 specification requirements regarding substitution. The Architect will not conduct research to determine equivalence - if a substitute is requested, it must be accompanied by supporting documentation to show its equivalence. Acceptance is the prerogative of the Architect.

2.2 Materials

2.2.1 Softwood lumber: to CSA 0141-1970 and National Lumber Grades Authority requirements, with maximum moisture content of 9% for interior work, Douglas Fir or Ponderosa Pine species, to AWMAC

Custom grade.

2.2.2. Hardwood lumber for finished solid wood items: - Red or White Birch to AWMAC Premium Grade. To National Hardwood Lumber Association (NHLA) requirements, moisture content of maximum 9% for interior work.

2.2.3 Hardwood plywood: to CSA 0115-1991 and AWMAC Standards.
Plywood shall be G1S or G2S when both faces are exposed. Face veneer shall be flich matched
Type of veneer:
- rotary cut, birch, paint grade.

2.2.1.1 Canadian softwood plywood: to CSA 0151-M1978 Pine species, Type II bond, veneer core, G2S grade "A".

2.2.1.2 Douglas fir plywood: To CSA 0121-M1978 sanded, G1S; or G2S grade where plywood is exposed on 2-sides.

2.2.1.3 Composition board core plywood.

2.2.1.4 Medium density fibreboard (MDF) ANSI A208.2.

2.2.1.5 Plastic Laminate NEMA LD3-95 GRADE VGL-HGL Plastic Laminate G48 General Purpose

2.3 Casework

2.3.1 Custom Grade Cabinets: Use this spec for all casework

Surface finish – Melamine NEMA LD3-95 GRADE VGL-HGL Plastic Laminate G48 General Purpose Grade, nominal thickness 1.2mm / 0.048”
Substrates – (1) High Density Fibreboard (HDF) core- Moisture resistant
(2) Medium Density Fiberboard (MDF)- Moisture resistant
(3) Composition core plywood – Moisture resistant
Panel edging:
Doors: Laser/Hot Air edge banding in ABC, seamless, colour matching face colour
Other area: PVC Thin edge in colour matching face colour
Bench: Solid edge banding-10mm thick solid matching wood strip om plywood edges 12mm or thicker, exposed in final assembly. Strips same width as plywood.

Colour – same colour both sides of all surfaces, selected from manufacturer’s non-stock colour range
Finish texture: suede
Material thickness:
Door fronts: 19mm, *Flush- PA105*
Drawer box: Blum Metabox 320M
Drawer Front: 19mm
Gables (end, exposed): 19mm
Gables (interior stiffeners): 19mm
Shelves (interior of case): 19mm
Shelves (exposed to view): 25mm
Back panel: 12.7mm
Case:19mm
Toe Kick: 19mm HPL on veneer core plywood
Bench Panels: 19mm, hardwood white Birch Plywood, good both sides with solid wood nosing

Acceptable manufacturers: Dorr, Rehau, Uniboard (Panval), Tafisa, Steven Wood, Pionite (Panolam), Nevamar

2.4 Countertops:

2.4.1 Vanity:
Coved splash joint, No-drip front edge.
Nosing depth: 25mm
Material thickness: 19mm
Surface finish: suede
Surface: HPL on Moisture resistant MDF substrate
Colour: TBD non stock

2.4.2 Counters:
Coved splash joint, Square edge, No-drip front edge
Nosing depth: 25mm
Material thickness: 19mm
Surface finish: suede
Surface: Post-Formed HPDL Finish on 19mm Moisture resistant Veneer Core Plywood Substrate
Colour: TBD non stock
Change Table Guard: Post-Formed HPDL Finish on 25.4mm Moisture resistant Veneer Core Plywood Substrate, rounded edge, combined heights as shown on drawings

2.4.3 Other Work Surfaces:
Square edge, No-drip front edge.
Self-edge with wide build-up Nosing depth: 30mm
Material thickness: 19mm
Surface finish: suede
Surface: Solid surfacing – Quartz or Corian by Dupont, or equivalent
Colour: TBD, non stock

2.5 Backer Sheet:
Backer standard .028 thick.
All panels shall be balanced with 0.5mm (0.030) backing sheet manufactured by the same manufacturer as the facing sheet.
Core CSA 0115-M1982 (G/S0) or CSA0121-M1978 Grade “B” or CAN3-0188.1-M78, Grade R.

2.6 Particleboard:
Particleboard, CSA-0118-1975, Type 11, Grade R, minimum 690 K8/m3, 4.5 to 8% moisture content.

2.7 Melamine Panels:
Melamine resin impregnated sheet thermally fused to rigid particleboard substrate. General-purpose (GP) grades 120-gram weight paper required when available.
Colour to be white or as noted on the drawings.

2.8 Edging Material:
Edging with a pre-applied functional layer allowing for seamless joint between the edgeband and the board apply with hot air or laser.
a- Doors: 1.3-1.7mm seamless laser edge banding.
b- Other surfaces: Rigid PVC with a measured degree of hardness of “ 95 shore D” and thickness of “3mm (+0.15mm, -0.2mm)” with the primer side having a concave measuring 0.10 to 0.25mm.
Edging adhesive Ethylene vinyl acetate thermalset adhesive with a temperature resistance of not less than 100 degrees C; A Processing range of 190 degrees – 200 degrees C and natural in colour.

Edging is to be applied using only equipment designed for the application of thick PVC in strict accordance with the specifications of both the thick PVC and hot-melt adhesive manufactures. All edges and all corners of this 3mm PVC edgebanding are to be machined to a 3mm radius for all cabinet parts.
Care should be taken during application to achieve the thinnest glueline possible

2.9 Millwork hardware:

2.9.1 Millwork hardware as follows shall be supplied and installed by this Contractor:

- Hinges: Grass series 1200 or Eyromat 3955 by Hettich or approved equal, self-closing 176 Deg. opening complete with appropriate base plates to suit application. All cupboard doors shall have 2 rubber cushions. Use additional hinges as required for closet doors higher than 100mm. Do not use exposed hinges. Hinge size, quantity and type to be according to door weight and height.
  Wooden gate: 19mm Door: Piano hinge 3”x72” NP
  35mm Door: TA2714

- Finger guard:
  NG-2248A, length according to door height.
  KN W-90

- Drawer & Door Pulls:
  Integrated Handel- P105A (Dorr)
  Recessed pull for pocket door: BP8971128195 by Richelieu
  TBD: Allow $10 per pull otherwise noted.

  Drawer Boxes: Blum Metabox 320M integrated runner system using epoxy steel carcasses, adjustable front fixing brackets and 12mm melamine with 3mm PVC on all exposed edges for bottoms and back panels. Install screws to all pre-drilled holes. Use deepest Metabox possible for space available.

- Drawer Slides (for casework drawers):

- Use full extension heavy duty, self closing, holds drawer ina closed position roller/bearing slide capable of carrying a minimum weight of <M 46 kg.> <I 100 lb.> load @500mm, 3832EHDSC, by K & V or Accuride,

- Retractable stairs slide:
  Over travel slides, easy close & hold-in detent features-3634EC, by Accuride

- Non-Marking wheels:
  F25749 Casters by Richelieu

- Recessed Stainless-Steel Pilasters:
  Metalwork BZ120 of approved equal.

- Projection Brackets and Standards: KV 87 x 187 bracket sized to suit shelf; brackets shall have 211 or 212 shelf resets depending on shelf material, glass shelves shall have rubber cushions.

- Door or Drawer Locks:
  Drawer locks: Olympus 078 or National Cabinet Lock C8702 or Corbin CCl 02066, keyed as directed by Client. Door locks shall conform to keying schedule prepared by Hardware Consultant.

Cabinet locks: Olympus 078 or National, Cabinet Lock C8702 or Corbin CCL 02067, keyed as directed by Client. Cabinet locks shall conform to keying schedule prepared by Hardware Consultant..
See drawings for location of millwork that is to be locked. keyed as directed by Client.

Slide bolt: 60mm long barrel bolt, Nickle plated: Hafele 252.70.722.

Surface bolt (inactive door of locked pair): 150mm long, Solid Brass, GH F779-6 C15

- Approved Manufacturers: Accuride, Grass, Hager, Hafele and Hettich.

- Shelf support - Richelieu - # 5834-180 for 32mm spaced holes in all gables or recessed pilaster strips see drawings.

- Door Bumper - Richelieu # AMP5312-11.

- Elbow Catch - Richelieu # BP3675-2G.

- Toe Kick Vent - Richelieu # 010533-30.

- Rough Hardware - Nails, screws, bolts, lag screws, anchors, special fastening devices and supports required for erection of carpentry components. Use galvanized components if exposed to exterior atmosphere. Galvanize in accordance with the requirements of SAG164-M1981. Install all hardware to manufacturer specifications.
  Nails and staples: to CSA B111
  Wood screws: stainless steel, type and size to suit application.

- Coat hooks: Double Wardrobe Hook: Ives 582 Satin, Nickel Plated, clear coated.
  Cubbies: Henckle Safety Hooks, various colours TBD
  GSH 307 x 115mm brushed stainless steel.

- Closet/Coat rod: 32mm x 2mm wall thickness, Richelieu 1215608174 Matt Chrome aluminum 14 ga. or GSH 138-2 chrome plated.

- Closet Rod: Richelieu 1215608174

- Closet Rod Support: Open type, Screw mounted, Richelieu 2215602174

- Cable grommets:
  Plastic countertop fitting for computer/telephone/power cables: 2-part cable set with spring closure top, 60mm diameter: by Hafele; 429.97.231 colours selected by Architect
  Pop-Up Grommet: • Rotate over for access to Power, flip back when not in use, 2 Power Outlets, 1 Dual USB Charger, Soft Touch texture, UL Listed, Mockett PCS73/USB, colours selected by Architect

- Keyboard slides: K & V 8100, length to suit.

- Hardware Finish: Unless otherwise indicated chrome or nickel plated.

3 EXECUTION

3.1 Preparation and Protection

Protect work of other trades from damage.

Make good any resulting damage, to the satisfaction of the Architect, at no additional cost to the Owner.

3.2 Fabrication

3.2.1 All casework to be constructed using hardwood dowels, glue and biscuits.

3.2.2 Fabrication Cabinet Carcass:

- Flush frameless construction to AWMAC Standard “Custom grade” c/w 3mm thick PVC edge banding on exposed edges. All exposed edge banding c/w 3mm radiuses edges and corners.
- Adjustable shelves c/w clips and drilled holes at 32mm centers. Base cabinet’s c/w 1 shelf, wall cabinet’s c/w 2 shelves, and tall cabinet’s c/w 5 shelves, the center shelf is fixed unless drawings show otherwise
- Factory install all hardware firmly into position for long life under hard use. Install 2 hinges on doors up to 1 meter in height, 3 hinges to 1.5 meter in height and 4 hinges for doors greater than 1.5 meters in height or shown otherwise.
- Install neoprene or rubber bumpers, at all cabinet doors and drawers.
- Fabricate toe kicks from 19mm waterproof veneer core ply, fir or spruce

3.2.3 Counter Tops:

- Counter tops apply Tremco Tremsil 200 silicone sealant at junction of plastic laminate when tops are joined. All joints to be over a gable or supported other wise.
- Use draw bolts in counter top joints.
- Apply a small bead of mildew-resistant paintable silicone sealant at junction of plastic laminate counter back and adjacent wall finish.

3.2.4 Frame materials with tight joints held in place by tight joint fasteners.

3.2.5 Do not exceed 600mm maximum width of cabinet without a divider or as specified otherwise.

3.2.6 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings. Design units to fit together if site assembly is required.

3.2.7 Conceal joints and connections where possible. Joints made on site shall be equal in quality of work to joints made in the shop.

3.2.8 Apply plastic laminate to substrates where indicated to Architectural Woodwork Manufacturers Association of Canada (AWMAC) standards, using PVA glue (NO VOC, No formaldehyde). In certain cases, where melamine is required on inside surface and HPL on exterior surface, it is permitted to apply HPL over top of the melamine surface, with proper preparation and application methods.

3.2.9 Apply plastic laminate to edges first, trim flush with face and apply face laminate lapping edge. Chamfer edge of face laminate 20 deg.

3.2.10 Edging is to be applied using only equipment designed for the application of thee thick PVC in strict accordance with the specifications of both the thick PVC and hot-melt adhesive manufacturers. All edges and all corners of this 3mm PVC edgebanding are to be machined to a 3mm radius for all cabinet parts.

3.2.11 Care should be taken during application to achieve the thinnest glueline consistent with a good bond without causing skips or unspread areas.

3.2.12 Finish all exposed edges with 3mm thick PVC edge banding material, applied by an Edge-Bander using hot-melt adhesive. Colour to match the melamine. Radius all exposed edges and corners.

3.2.13 Cover all exposed edges of plywood with <M 10mm><I 3/8"> solid matching wood strip.

3.2.14 Install finishing hardware to manufacturer's specifications. All casework drawers shall be installed with drawer slides.

3.2.15 Machine sand all exposed surfaces of finished woodwork to an even smooth surface ready for finishing; fit all joints and mitres accurately.

3.3 Installation

3.3.1 Site measure all locations where millwork / casework is to be installed. Determine any roughins (examples are receptacles, thermostats, data outlets, etc.) which will cause interference with the millwork items as designed, and make adjustments fro them in the millwork construction.

3.3.2 Set and secure all materials and components in place, rigid plumb and square.

3.3.3. Provide all furring strips and strapping required to fix millwork and casework to walls, etc.

3.3.4 Use draw bolts in counter top joints.

3.3.5 Except for economy grade cabinets, filler pieces may NOT be used: all cabinets must be built to fit the site measured openings.

3.3.6 Ensure that millwork items fit accurately into the built spaces. Where joints greater than 6mm occur between cabinets and adjacent construction, provide new elements to produce an accurate fit.

3.3.7 Apply a small bead of mildew-resistant silicone sealant at junction of plastic laminate counter back and adjacent wall finish.

3.3.8 After installation, fit and adjust operating hardware for wood and laminated plastic cabinet door, drawers and shelves.

END OF SECTION

1 GENERAL

1.1 Section Includes

1.1.1 Batt and blanket insulation, thermal and acoustic types.

1.2 Related Sections

1.2.1 Section 04 20 00 – Unit Masonry: insulation as an integral part of the cavity wall system.

1.2.2 Section 07 81 00 – Spray-Applied Fire Resistive Materials: sprayed fireproofing insulation.

1.2.3 Section 07 84 00 – Firestopping: firestop insulation.

1.2.4 Section 09 25 00 – Gypsum Board: gypsum board attachment.

1.3 References

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

1.3.2 CAN/ULC-S701-01: Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.3.3 CAN/ULC-S702-1997: Standard for Thermal Insulation, Mineral Fibre, for Buildings.

1.3.4 CSC Tek-Aid 07 21 00 – Building Insulation.

1.4 Regulatory Requirements

1.4.1 Conform to applicable code for combustibility, flame and smoke performance requirements of polystyrene insulations.

1.5 Delivery, Storage and Handling

1.5.1 Store, handle and protect Products to requirements of Section 01 60 00.

1.5.2 Minimize time plastic-type insulation Products are stored or exposed to sunlight at project site.

1.5.3 Store Products away from construction activity and sources of ignition.

1.5.4 Protect Products from damage during handling, installation and at point of installation.

1.6 Environmental Requirements

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

2 PRODUCTS

2.1 Manufacturers

2.1.1 Manufacturers of non-rigid and semi-rigid mineral fiber insulation having Product considered acceptable for use:
.1 Owens-Corning Canada Inc.
.2 Roxul.
.3. Johns Manville

2.1.2 Manufacturers of rigid expanded polystyrene insulation having Product considered acceptable for use:
.1 PlastiFab Ltd.
.2 BASF.

2.2 Materials

2.2.1 Mineral Fiber Acoustical and Thermal Batt Insulation: to CAN/ULC-S702, Type 1; non-rigid, friction fit type, manufactured from glass, rock or slag:
.1 Aged Thermal Resistance: RSI 0.67 per 25 mm of thickness.
.2 Facing: Unfaced.
.3 Board Size: 610 x 1 200 mm.
.4 Nominal Density: 32 kg/m³ .
.5 Combustibility: Noncombustible to CAN/ULC-S114.
.6 Surface Burning Characteristics: to CAN/ULC-S102, maximum flame spread of 15, smoke developed of 5.
.7 Thickness: as indicated on Drawings.
.8 Manufacturer and Product Name: eg. Fiberglas AF110 by Owens-Corning Canada Inc.

2.3 Accessories

2.3.1 Mechanical Fasteners: stainless steel screw type fastener, c/w moulded plastic disc washer, minimum 75 mm diameter.

2.3.2 Adhesive (for Polystyrene): to CGSB 71-GP-24M, Type 1.

2.3.3 Adhesive: mastic type, synthetic rubber base, fungi resistant, gun or trowel application, application temperature 12 degrees C to 50 degrees C.

2.3.4 Tape: polyester self-adhering type; translucent; 50 mm wide.

3 EXECUTION

3.1 Examination

3.1.1 Verify that site conditions are ready to receive work.

3.1.2 Beginning of installation means acceptance of site conditions.

3.2 Rigid Board Insulation

3.2.1 Unless specified otherwise, secure all rigid board insulation with an approved adhesive.

3.2.2 Apply adhesive in three continuous beads per board length.

3.2.3 Place membrane surface of insulation solidly against substrate and securely fasten.

3.2.4 Stagger side and end joints. Butt edges and ends tight to adjacent board and to protrusions.

3.3 Semi-Rigid Board Insulation

3.3.1 Unless specified otherwise, secure semi-rigid insulation with an approved mechanical fastening system.

3.3.2 Install insulation boards on wall surface horizontally.

3.3.3 Install insulation boards with factory applied membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.

3.3.4 Place membrane surface of insulation solidly against substrate or supports and securely fasten with minimum 5 fasteners per board.

3.3.5 Do not crush insulation face or puncture facing with fasteners.

3.3.6 Stagger side and end joints.

3.3.7 Butt edges and ends tight to adjacent board and to protrusions.

3.4 Batt and Blanket Insulation

3.4.1 Install batt insulation in spaces without gaps and voids.

3.4.2 Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation.

3.4.3 Place vapour retarder on warm side of insulation to requirements of Section 07 26 00.

3.5 Field Quality Control

3.5.1 Notify Consultant and roofing inspector to inspect roof and wall insulation before, during and upon completion of installation.

3.6 Protection

3.6.1 Protect all insulation edges at the end of each working day.

3.6.2 Protect all insulation in areas where welding will be carried out. Replace all insulation damaged by other trades at the cost of those responsible.

3.6.3 Protect insulation requiring a thermal barrier to requirements of local and provincial legislation.

END OF SECTION

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1 GENERAL

1.1 GENERAL REQUIREMENTS

1. The General Conditions of the Contract, Supplementary Conditions, and the General Requirements of Division 1, form part of this section, and must be read in conjunction with the requirements of this section, and all related sections.

2. The work of this section, and related work specified in other sections shall comply with all requirements of Division 1 – General Requirements.

1.2 SECTION INCLUDES

1. Provision of all labour, materials, equipment and incidental services necessary to provide rigid board insulation.

1.3 RELATED SECTIONS

1. Sheet Vapour Retarders Section 07 26 00
2. Air Barriers Section 07 27 00
3. Batt and Blanket Insulation Section 07 21 16
4. Insulation in Window Systems Section 08 50 50
5. Gypsum Board Assemblies Section 09 21 16
6. Insulation for Mechanical Work Division 21, 22, 23 & 25

1.4 REFERENCES

1. CAN/ULC-S102; Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
2. CAN/ULC-S114; Determination of Non-combustibility of Building Materials.
3. CAN/ULC-S701-01; Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
4. CAN/ULC-S702-97; Standard for Mineral Fibre Thermal Insulation for Buildings.
5. CAN/ULC-S704-01; Standard for Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced.
6. CAN/ULC-S770-00; Standard for Determination of Long-Term Thermal Resistance of Closed-Cell Thermal Insulation Foams.
7. CGSB 71-GP-24; Adhesive, Flexible, for Bonding Cellular Polystyrene Insulation.

1.5 SUBMITTALS

1. Samples: Submit samples of insulation furring system channels, fasteners and accessories, in accordance with Section 01 13 01.

2. Product Data: Submit manufacturer's printed product literature, MSDS sheets, and application instructions for insulation materials in accordance with Section 01 33 01.

1.6 DELIVERY, STORAGE AND HANDLING

1. Deliver materials to the site in their original unopened packages, bearing all manufacturer's labels.

2. Protect packages from damage, and materials from effects of weathering.

2 PRODUCTS

2.1 INSULATION

1. General Application: extruded closed-cell polystyrene, to CAN/ULC-S701 Type 4, square edges, thickness as shown on the drawings, and as follows;
    1. Board size: 1220mm x 2440mm.
    2. Compressive strength: 210kPa.
    3. Flame Spread: less than 50, to CAN/ULC-S102.
    4. Vapour Permeance: 60ng/Pa s m2 maximum.
    5. Dimensional stability: 1.5% maximum linear change at 70°C and 97% relative humidity for 7 Days.
    6. Curing Time: minimum 24 hours, plus 24 hours per 25mm of thickness before Shipment from manufacturer.
    7. Long Term Thermal Resistance (LTTR)
        1. 0.87 for 25mm thickness of board.
        2. RSI 1.84 for 50mm thickness of board.
        3. RSI 2.81 for 75mm thickness of board.
    8. .8 Acceptable Products
        1. STYROFOAM™ SM™, by Dow Chemical Canada Inc., or
        2. CELFORT® 300, by Owens-Corning Canada Inc.

2. Foundation Insulation Application
    1. Polystyrene: extruded closed-cell polystyrene to CAN/ULC-S701, Type 4, square edges, with integral grooved drainage system, thickness as shown on the drawings;
        1. Board size: 1220mm x 2440mm.
        2. Compressive strength: 210kPa.
        3. Flame Spread: less than 50, to CAN/ULC-S102.
        4. Vapour Permeance: 60ng/Pa s m2 maximum.
        5. Dimensional stability: 1.5% maximum linear change at 70°C and 97% relative humidity for 7 days.
        6. Curing Time: minimum 24 hours, plus 24 hours per 25mm of thickness before shipment from manufacturer.
        7. Long Term Thermal Resistance (LTTR)
            1. RSI 0.87 for 25mm thickness of board.
            2. RSI 1.84 for 50mm thickness of board.
            3. RSI 2.81 for 75mm thickness of board.
        8. Acceptable Products;
            1. STYROFOAM™ SM™, by Dow Chemical Canada Inc., or
            2. CELFORT® 300, by Owens-Corning Canada Inc.
            3.

2.2 ADHESIVES

1. For polystyrene: to CGSB 71-GP-24M.

3 EXECUTION

3.1 QUALITY OF WORK

1. Install insulation after building substrate materials are dry.

2. Install insulation to maintain continuity of thermal protection to building elements and spaces.

3. Fit insulation tightly around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

4. Keep insulation minimum 75mm from heat emitting devices such as recessed light fixtures.

5. Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.

6. Offset both vertical and horizontal joints in multiple layer applications.

7. Do not enclose insulation until it has been inspected and approved by Consultant.

3.2 EXAMINATION

1. Examine substrates and immediately inform Consultant in writing of defects.
2. Prior to commencement of work ensure substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

3.3 INSTALLATION

1. General Application
    1. Apply adhesive to substrate by notched trowel in accordance with manufacturer's instructions.
    2. Embed insulation boards into adhesive, prior to skinning of adhesive.
    3. In addition to adhesive. Install mineral fibre insulation boards with insulation clips, 4-6 per board minimum, fit boards tight, cut off fastener spindle 3mm beyond disc.
    4. Leave unbonded joints in insulation board over line of expansion and control joints.

2. Perimeter Foundation Insulation
    1. Exterior application: extend boards vertically below finish grade down to top of footings.
    2. Install on exterior face of perimeter foundation wall with adhesive.

END OF SECTION

1 GENERAL

1.1 Section Includes

1.1.1 Metal flashing.

1.1.2 Counterflashing at roof mounted mechanical equipment, vent stacks, roof hatches, and skylights.

1.2 Related Sections

1.2.1 Section 03 30 00 – Cast-in-Place Concrete: flashing inserts.

1.2.2 Section 04 20 00 – Unit Masonry: through wall flashings.

1.2.3 Section 07 41 00 – Metal Roof and Wall Panels: prefinished metal.

1.2.4 Section 07 53 00 – Elastomeric Sheet Roofing: flexible flashings.

1.2.5 Section 07 72 00 – Roof Hatches.

1.2.6 Section 07 90 00 – Joint Sealers.

1.2.7 Section 08 96 00 – Sloped Glazing Assemblies.

1.3 References

1.3.1 ASTM A653/A653M-99: Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

1.3.2 ASTM B32-00: Standard Specification for Solder Metal.

1.3.3 CAN/CGSB-1.108-M89: Bituminous Solvent Type Paint.

1.3.4 Sheet Metal and Air Conditioning Contractors National Association Inc. (SMACNA): Architectural Sheet Metal Manual.

1.4 Submittals

1.4.1 Submit a typical 300 mm long sample of flashing material to requirements of Section 01 33 00.

1.4.2 Sample shall indicate design method of locking and method of anchoring and corner section fabricated from materials specified.

1.5 Quality Assurance

1.5.1 Applicator: company or individual engaged in applying roofing membrane to standard practices and details of SMACNA.

1.6 Warranty

1.6.1 Submit an extended five years warranty, protecting against leakage, joint spalling and similar defects.

2 PRODUCTS

2.1 Materials

2.1.1 Prefinished Sheet Steel: 0.46 mm thick steel; flat sheet stock; to ASTM A653/A653M, Grade 230; prefinished.

2.1.2 Sheet Metal: 0.46 mm thick steel; flat sheet stock, to ASTM A653/A653M, Grade 230.

2.1.3 Nails: manufacturers standard corrosion resistant type, material to suit metal flashing.

2.1.4 Cleats, Starter Strips & Back-Up Plates: same metal and thickness as metal flashing: cleats minimum 38 mm wide and interlocked with metal flashing; starter strips, continuous. Back-up plates minimum 300 mm wide where adjacent lengths of cap flashing meet, fabricated of same material thickness and finish as cap flashing.

2.1.5 Screws, Bolts & Expansion Shields: non-ferrous metal compatible with adjacent surfaces. Exposed fastenings; same materials as metal surfaces through which they penetrate. Use cadmium plated screws with round heads suitable for soldering for galvanized work.

2.1.6 Solder: to ASTM B32, 50 percent block tin, 50 percent pig lead.

2.1.7 Flux: commercial hydrochloric acid cut with zinc, or 10-20 percent solution of orthophosphoric acid in water, for use with galvanized work.

2.1.8 Sealant: as specified under Section 07 90 00.

2.1.9 Flashing Paint: to CAN/CGSB-1.108-M; quick drying asphaltic base paint; eg. Primer 910-02 by Bakor.

2.2 Fabrication

2.2.1 Shop fabricate flashing components as much as possible to requirements of applicable requirements of SMACNA Architectural Manual.

2.2.2 Form sheet metal on bending brake. Perform shaping, trimming and hand seaming on bench, where practicable, using proper sheet metal working tools.

2.2.3 Fabricate material in clean shops, located away from areas where carbon steel is torch cut, ground, or cut with abrasive wheels to ensure that carbon steel dust will not be embedded in prefinished surfaces. Clean tools and dies which has been used on carbon steel prior to fabrication to prevent contamination of surface with carbon steel dust.

2.2.4 Form sections square, true and accurate to size. Flashings shall be free from distortion, waves, twists, buckles or other defects detrimental to appearance and performance.

2.2.5 Allow for thermal movement when forming, installing, interlocking and soldering sheet metal work to avoid buckling, fullness of metal straining of joints or seams. Maximum length of flashing pieces; 2 400 mm. Double back exposed edges at least 12 mm for appearance and stiffness.

2.2.6 Fabricate flashings, copings, closures, plastic boxes, pipe sleeves and flashings for roof mounted equipment to details shown, unless otherwise indicated.

2.2.7 Wipe and wash clean soldered joints immediately after joint is soldered to remove acid.

2.2.8 Where soldered joints are absolutely necessary and where approved for use in prefinished metal, clean paint off both surfaces before soldering for minimum area necessary.

2.3 Finishes

2.3.1 Do not prime surfaces in direct contact bond with concrete or where field welding is required.

2.3.2 Prime paint items with two coats.

2.3.3 Galvanizing: to CAN/CSA-G164-M, ho dipped method, minimum 380 g/m² zinc coating.

2.3.4 Shop Painted Finish: baked ceramic pigmentation coating, applied to a minimum 0.025 mm dry film thickness and having a specular gloss of 30 (plus or minus 5) gloss units when measured with a Gardner 60 degree gloss metre; eg. Colorite HMP by Valspar, manufacturer's extended colour range, as indicated on Drawings.

3 EXECUTION

3.1 Examination

3.1.1 Inspect the work of preceding trades and report any discrepancies.

3.1.2 Commencement of work implies acceptance of conditions.

3.2 Installation

3.2.1 Install sheet metal flashings with joints lapped, locked, cleated with "S" cleats and caulked or soldered as required. Hem exposed edges 12 mm. Type of joints used shall be adequate for various conditions, subject to approval.

3.2.2 Fabricate exposed fastening in such a manner to prevent water penetration at point of fastening.

3.2.3 Provide starter strips where indicated or required to present true, non-waving, leading edge. Anchor to back-up to provide rigid, secure installation.

3.2.4 Make end joints where adjacent lengths of metal flashing meet using 300 mm long back-up flashing secured in place before installing flashing. Apply beads of caulking compound on face of back-up plate to seal ends of metal flashing. Leave 12 mm wide space between end of adjacent lengths of metal flashings. Fabricate back-up of same material and finish as mental flashing with which it is being used. Make back-up plate exact profile of flashing allowing for thickness of flashing points.

3.2.5 Form metal fascia with inner edge extended over fascia top and down cant to meet roofing aggregate. Nail with roofing nails and neoprene washers at 300 mm OC. Avoid placing nail in face of fascia, through membrane or flashing.

3.2.6 Interlock counter flashing pieces with prefinished metal base flashing and fold locking seam into position ensuring complete sealing. Continue counter flashing down to hemmed and sprung position at base of cant and junction of aggregate.

3.2.7 Provide underlay of resin sized paper under sheet metal installed over masonry, concrete or wood. Lay underlay dry as sheet metal work is installed. Secure in place and lap joints 100 mm.

3.2.8 Imperfections in sheet metal work such as holes, dents, creases or oil-canning is cause for rejection.

3.2.9 Repair damaged sheet metal work, wash entire installation down, and leave in neat condition.

3.2.10 Provide all flashings required for proper execution and completion of the work in an acceptable manner, including metal flashing around mechanical and other equipment occurring on the roof.

END OF SECTION

1 GENERAL

1.1 Section Includes

1.1.1 Spray-applied fire resistive materials.

1.1.2 Refractory board fire protection.

1.2 Related Sections

1.2.1 Section 05 10 00 – Structural Steel.

1.2.2 Section 05 30 00 – Steel Deck.

1.2.3 Section 07 21 00 – Building Insulation.

1.2.4 Section 07 84 00 – Firestopping and Smoke Deals.

1.2.5 Section 09 25 00 – Gypsum Board.

1.3 References

1.3.1 ASTM E84: Surface Burning Characteristics of Building Materials.

1.3.2 ASTM E119: Fire Tests of Building Construction and Materials.

1.3.3 ASTM E605: Thickness and Density of Sprayed Fire-Resistive Materials Applied to Structural Members.

1.3.4 ASTM E736: Cohesion / Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.

1.3.5 ASTM E759: Effect of Deflection of Sprayed Fire-Resistive Materials Applied to Structural Members.

1.3.6 ASTM E760: Effect of Impact on the Bonding of Sprayed Fire-Resistive Materials Applied to Structural Members.

1.3.7 ASTM E761: Compressive Strength of Sprayed Fire-Resistive Materials Applied to Structural Members.

1.3.8 ASTM E859: Air erosion of Sprayed Fire-Resistive Materials Applied to Structural Members.

1.3.9 CAN/ULC-S101: Standard Methods of Fire Tests of Building Construction and Materials.

1.3.10 CAN/ULC-S114-M80: Standard Test Method for Determination of Noncombustibility in Building Materials.

1.3.11 Underwriters Laboratories of Canada (ULC) List of Equipment and Materials.

1.3.12 AWCI Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire-Resistive Materials.

1.4 Design Requirements

1.4.1 Spray-Applied Fire Resistive Coating

.1 Deflection: When tested in accordance with ASTM E759, the material shall not crack or delaminate when the non-concrete topped galvanized deck to which it is applied is subjected to a one time vertical centerload resulting in a downward deflection of 1/120th of the span.
.2 Bond Impact: When tested in accordance with ASTM E760, the material shall not crack or delaminate from the concrete topped galvanized deck to which it is applied.
.3 Cohesion/Adhesion (bond strength): When tested in accordance with ASTM E736, the material applied over uncoated or galvanized steel shall have a minimum bond strength of 4.8 kPa.
.4 Air Erosion: When tested in accordance with ASTM E859, the material shall not be subject to losses from the finished application greater than 0.27 grams per square meter.
.5 Compressive Strength: When tested n accordance with E761, the material shall not deform more than 10 percent when subjected to a crushing force of 35.9 kPa.
.6 Corrosion Resistance: When tested in accordance with ASTM E937, the material shall not promote corrosion of steel.
.7 Non-combustibility: When tested in accordance with ASTM E136 or CAN/ULC-S114-M, the material shall be noncombustible.
.8 Surface Burning Characteristics: When tested in accordance with ASTM E84 or CAN/ULC-S102, the material shall exhibit the following surface burning characteristics:
.1 Flame Spread = 0
.2 Smoke Developed = 0
.9 Density: When tested in accordance with ASTM E605, the material shall meet the minimum individual and average density values as listed in the appropriate UL/ULC design or as required by the authority having jurisdiction, or shall have a minimum average of 208 kg/m^3.
.10 The material shall have been tested and reported by Underwriters Laboratories of Canada (ULC) in accordance with the procedures of CAN/ULC-S101.
.11 Spray-applied fire resistive materials shall be applied at the required thickness and density to achieve the ratings as noted on the drawings.

1.5 Quality Assurance

1.5.1 Installer: a firm with expertise in the installation of fire protection or similar materials; licensed or otherwise approved by the spray-applied fire resistive material manufacturer.

1.6 Submittals

1.6.1 Manufacturer's Data: Submit manufacturer's product data in accordance with Section 01 33 00.

1.6.2 Include certifications, to show compliance with Contract Documents.

1.6.3 Test Data: Submit independent laboratory test results for all specified performance criteria.

1.7 Delivery, Storage and Handling

1.7.1 Deliver materials to the project in manufacturer's unopened packages, fully identified as to trade name, type and other identifying data. Packaging shall bear the UL labels for fire hazard and fire-resistive classifications.

1.7.2 Store materials above ground, in a dry location, protected from the weather. Damaged packages found unsuitable for use should be rejected and removed from the Project.

1.8 Project Conditions

1.8.1 When the prevailing outdoor temperature at the building is less than 4 degrees Celsius, maintain a minimum substrate and ambient temperature of 4 degrees Celsius prior to, during and a minimum of 24 hours after application of the spray-applied fire resistive material.

1.8.2 If necessary for job progress, provide heated protective enclosures to maintain temperatures. Refer to Section 01 50 00.

1.8.3 Provide adequate ventilation of not less than 4 air changes per hour to allow proper drying of the spray-applied fire resistive material during and subsequent to its application.

1.9 Sequencing / Scheduling

1.9.1 Perform all fire protection work on a given floor prior to proceeding with the fire protection work on the
next floor.

1.9.2 Coordinate and schedule the fire protection work to avoid delays in job progress.

1.9.3 Do not install board fire protection on structural members until piping and other construction behind the fire protection has been completed, uninterrupted coverage can be provided and the need for subsequent cutting and patching can be eliminated.

2 PRODUCTS

2.1 Manufacturers

2.1.1 Manufacturers of fire-resistive materials having Product considered acceptable for use:
.1 Cafco Industries Inc.
.2 AD Fire Protection Systems.
.3 Grace Canada Inc.

2.1.2 Substitutions: refer to Instructions to Bidders and Section 01 60 00.

2.2 Materials

2.2.1 Spray-Applied Fire Resistive Material: free of all forms of asbestos, including actinolite, amosite, anthophyllite, chrysotile, corcidolite and tremolite; eg. Cafco Blazeshield DC/F by Cafco Industries Inc.

2.2.2 Refractory Mineral Wood Board Fire Protection: Rigid boards of 9 pcf nominal density; produced from asbestos free materials by combining refractory mineral wood manufactured from slag with thermosetting resin binders to comply with ASTM C612 for Class 4 and as follows:
.1 Thermal Conductivity (R Value): 4.25 at 75 degrees F (23.9 degrees Celsius).
.2 Surface Burning Characteristics: Flame Spread and Smoke developed ratings of 15 and 5, respectively.

2.2.3 Fastening Accessories: For each fire resistive assembly in which mineral wood board fire protection serves as rigid fire protection, provide a board fastening system complying with the related UL design or other acceptable testing and inspecting organization’s report; eg. Cafco-board Mineral Wood Board Fire Protection by Cafco Industries Inc.

2.2.4 Water: Potable.

3 EXECUTION

3.1 Examination

3.1.1 Ensure all surfaces to receive fire protection are free of oil, grease, loss mill scale, dirt, paint/primers (other than those listed and tested) or other foreign materials which would impair satisfactory bonding to the surface.

3.1.2 Ensure clips, hangers, supports, sleeves and other attachments to the substrate are to be placed by others prior to the application of spray-applied fire resistive materials.

3.1.3 Ensure that the installation of ducts, piping, conduit or other suspended equipment shall not take place until the application of sprayed fire protection is complete in an area.

3.1.4 Notify Consultant of unsuitable conditions prior to the application of the spray-applied fire resistive material.

3.2 Application

3.2.1 Apply fire resistive materials in accordance with the manufacturer's written application instructions.

3.2.2 Do not apply fire protection to steel floor decks prior to the completion of concrete work on that deck.

3.2.3 Do not apply sprayed fire protection to the underside of roof deck until the roof is completely installed and tight, all penthouses are complete, all mechanical units have been placed, and all roof traffic has be ceased.

3.2.4 Provide masking, drop cloths or other suitable coverings o prevent overspray from coming in contact with surfaces not intended to be sprayed.

3.2.5 Apply bonding materials as per the identified ULC fire resistance design and the manufacturer's written recommendations.

3.2.6 Topcoat materials shall be the type recommended and approved by the manufacturer of each spray-applied fire resistive material required for the applications indicated.

3.2.7 Install mineral wood board fire protection to comply with requirements for thicknesses, number of layers, construction of joints and corners, and fastening methods referenced in the appropriate fire resistance design indicated.

3.2.8 Coordinate installation of board fire protection with other construction to minimize cutting into, or removal of, already installed board material.

3.3 Field Quality Control

3.3.1 Test the spray-applied fire resistive material for thickness and density in accordance with one of the following procedures:

.1 ASTN E605 – Standard Test Method for Thickness and Density of Sprayed Fire-Resistive Materials Applied to Structural Members.

.2 AWCI Standard Practice for the Testing and Inspection of Field-applied Sprayed Fire-Resistive Materials.

3.4 Adjusting and Cleaning

3.4.1 Make Good damaged fire protection.

3.5 Protection

3.5.1 Provide final protection and maintain conditions in a manner acceptable to Consultant and authorities having jurisdiction. Ensure fire protection is not damaged at time of Substantial Performance of the Work.

END OF SECTION

1 GENERAL

1.1 Section Includes

1.1.1 Firestopping and smoke seals through penetrations at wall, floor and roof openings.

1.2 Related Sections

1.2.1 Section 03 30 00 – Cast-in-Place Concrete: penetrations in rated concrete assemblies.

1.2.2 Section 04 20 00 – Unit Masonry: penetrations in rated masonry assemblies.

1.2.3 Section 05 50 00 – Metal Fabrications: fire rated sleeves.

1.2.4 Section 07 81 00 – Spray-Applied Fire Resistive Material: sprayed fireproofing.

1.2.5 Section 07 90 00 – Joint Sealers: non-rated joint sealants.

1.2.6 Section 09 25 00 – Gypsum Board: penetrations in rated gypsum board assemblies.

1.2.7 Section 15 25 00 – Mechanical Insulation: service penetrations in rated assemblies.

1.2.8 Section 16 05 00 – Basic Electrical Materials & Methods: service penetrations in rated assemblies.

1.3 References

1.3.1 CAN/CGSB-19.13-M87: sealing Compound, One Component, Elastomeric, Chemical Curing.

1.3.2 CAN/CGSB-19.24-M90: Multicomponent, Chemical Curing Sealing Compound.

1.3.3 CAN/ULC-S102-M88: Surface Burning Characteristics of Building Materials and Assemblies.

1.3.4 can4-s115-m85: Fire Tests of Fire Stops.

1.3.5 ASTM E84: Surface Burning Characteristics of Building Materials.

1.3.6 ASTM E119: Fire Tests of Building Construction and Materials.

1.3.7 ASTM E814: Fire Tests of Through-Penetration Fire Stops.

1.3.8 Underwriters' Laboratories of Canada: List of Equipment & Materials.

1.4 System Description

1.4.1 Seal empty holes and penetrations at floors, fire rated walls and smoke barrier walls.

1.4.2 Seal holes accommodating penetrating items such as cables, cable trays, pipes, ducts and conduits.

1.4.3 Seal penetration system used to maintain the integrity of time rated construction by providing a sealant against the spread of heat, flame and smoke.

1.4.4 Systems shall be UL classified or listed by Warnock-Hersey International for the appropriate required time rating.

1.5 Submittals

1.5.1 Submit shop drawings and product data to requirements of Section 01 33 00.

1.5.2 Product Data: sealant manufacturer's installation instructions and standard drawings, indicating ULC or WHI test designations.

1.5.3 Shop Drawings: Indicate sizes of openings, nature of penetrations, and tested methods of firestop and smoke seal protection being proposed.

.1 Shop Drawings are to be sealed, signed and dated by a registered professional engineer licensed to practice in the Place of the Work and having a minimum of 10 years documented experience designing firestop and smoke seal systems.

.2 Submit shop drawings to Consultant and t the authority having jurisdiction for their review and approval.

1.5.4 Submit the sealant manufacturer's letter of certification, to requirements of Section 01 33 00, Verifying that Products meet or exceed specified requirements.

1.5.5 Submit a certified laboratory report, to requirements of Section 01 33 00, indicating that Products Proposed for use conform to the requirements of ASTM E814 and CAN4-S115-M, and are classified by the Underwriter's Laboratories of Canada or Warnock-Hersey International.

1.6 Quality Insurance

1.6.1 Use only an approved applicator acceptable to sealant material manufacturer.

1.6.2 Firestopping compounds shall not contain volatile solvents or require special application to protect Plastic pipe from firestopping compound.

1.7 Mock-Ups

1.7.1 Construct job site mock-up to requirements of Section 01 40 00.

1.7.2 Apply one sample seal on representative substrates on each site for each fire rating required at each type of wall, floor or roof construction.

1.7.3 Comply with project requirements as to thickness and density of application to achieve fire rating.

1.7.4 Proceed with installation only after Consultant has reviewed and accepted mock-up.

1.7.5 Acceptable mock-up may remain as part of the complete work as standard.

1.8 Delivery, Storage and Handling

1.8.1 Deliver all materials to the Site in their original unopened packages.

1.8.2 Store materials in an enclosed shelter, preventing damage to containers.

1.9 Project Conditions

1.9.1 Do not apply sealants when temperature of substrate material and surrounding air is below 5 degrees Celsius.

1.9.2 Maintain sealant at a minimum 18 degrees Celsius for best workability.

1.10 Pre-Installation Conference

1.10.1 Prior to commencement of firestopping, arrange and conduct a pre-installation meeting to discuss proposed methods and materials to be used.

1.10.2 Representatives of the Owner, Consultant, Contractor, Installer, Manufacturer and the authority having jurisdiction are to be in attendance. Do not conduct meeting unless all identified parties are present.

2 PRODUCTS

2.1 Manufacturers

2.1.1 Manufacturers of firestop sealants having Product considered acceptable for use:
- .1 3M.
- .2 AD Fire Protection.
- .3 Hilti Canada.
- .4 Tremco.
- .5 The Rectorseal Corporation.

2.1.2 Substitutions: refer to Instructions to Bidders and Section 01 60 00.

2.2 Materials

2.2.1 Firestop Sealant Type A: non-sag; asbestos-free; single component sealant composed of high temperature ceramic fibers and organic silica binders; ULC labeled; to CAN4-S115-M and CAN/ULC-S102-M.

2.2.2 Firestop Sealant Type B: three components; epoxidized polyurethane terpolymer; accommodating joint
movement of +40/-25%; ULC labeled; to CAN/CGSB-19.24-M and CAN4-S115-M.

2.2.3 Firestop Sealant Type C: three components; self-levelling; chemically curing polyurethane sealant; ULC labeled; to CAN4-S115-M.

2.2.4 Firestop Sealant Type D: single component; low modulus; silicone rubber; moisture curing; ULC labeled; to CAN/CGSB-19.13-M and CAN4-S115-M.

2.2.5 Firestop Sealant Type E: single component; modified polyurethane; moisture curing; ULC labeled; to CAN/CGSB-19.13-M and CAN4-S115-M.

2.2.6 Primer: as recommended by sealant manufacturer for specific material, substrate and end use.

2.2.7 Firestop Insulation: to CAN/ULC-S702, Type 2; mineral fiber manufactured from rock or slag, suitable for manual application:
- .1 Density: 72 kg/m^3 when tested to ASTM C303.
- .2 Combustibility: Noncombustible to CAN/ULC-S114.
- .3 Melt Temperature: >1175 degrees C.
- .4 Surface Burning Characteristics: to CAN/ULC-S102, maximum flame spread of 0, smoke developed of 0.
- .5 Moisture Sorption: 0.04 percent when tested to ASTM C1104.
- .6 Smoulder Resistance: 0.01 percent when tested to CAN/ULC-S129.

2.3 Components

2.3.1 Provide firestopping and smoke sealing systems to requirements of CAN4-S115-M and as described

Below:

.1 Asbestos free materials and systems fully capable of maintaining an effective barrier against gases, flame and smoke in compliance with CAN4-S115-M, not exceeding opening sizes stated.

.2 Service Penetration Assemblies: certified by CAN4-S115-M and used by ULC Guide 40 U19. Service components listed as certified in this guide are noted under Label Service of ULC.

2.3.2 Fire resistance rating of fire stopping material assembly must meet or exceed the fire resistance rating of the floor and wall section being penetrated.

2.3.3 Firestopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal; do not use a cementitious or rigid seal at such locations.

2.3.4 Damming and back up 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.

2.3.5 Sealants: for vertical joints shall be non-sagging type.

3 EXECUTION

3.1 Examination

3.1.1 Confirm compatibility of surfaces to receive sealant materials.

3.1.2 Verify that surfaces of openings are sound, clean, dry and ready to receive application of sealant.

3.1.3 Verify that penetration elements are securely fixed and properly located.

3.1.4 Commencement of installation means acceptance of existing conditions.

3.2 Preparation

3.2.1 Protect adjacent surfaces and equipment from damage.

3.2.2 Clean contact surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of sealant.

3.2.3 Remove incompatible materials which affect bond by scraping, brushing, water or solvent cleaning, or sandblasting.

3.3 Application

3.3.1 Install mineral fiber insulation in compacted thicknesses required by ULC design. Compress insulation approximately 33 percent.

3.3.2 Apply sealant in strict accordance with manufacturer's instructions and ULC certification.

3.3.3 Coordinate and cooperate with adjacent, contiguous and related materials trades, such as concrete, drywall, plumbing, conduit, electrical wiring, communication systems, etc., to ensure a proper and timely installation.

3.3.4 Seal holes or voids made by penetrating items to ensure an effective fire and smoke barrier.

3.3.5 Seal all intersections and all penetrations of floors, ceilings, walls and columns.

3.3.6 Seal around all cutouts for lights, cabinets, pipes and plumbing, ducts, electrical boxes, etc.

3.3.7 Wrap non-insulated heated pipes that may be subject to movement with a non-combustible smooth material to permit the pipe to move without damaging the firestopping and smoke seal.

3.3.8 Maintain the integrity of any insulation and vapour retarders on insulated pipes and ducts at the fire separation.

3.3.9 Where floor openings exceed 100 mm in width and may be subjected to traffic or loading, install cover late systems capable of supporting same loading as floor.

3.4 Field Quality Control

3.4.1 Perform field testing and inspection as described in Section 01 40 00.

3.4.2 Examine finished penetrations to ensure proper installation before concealing or enclosing any areas of work.

3.4.3 Keep areas of work accessible until inspection has been completed.

3.4.4 Manufacturer's Field Service: inspect to verify and confirm that systems installation is in strict accordance with manufacturer's and ULC requirements.

3.4.5 Correct unacceptable work and provide further inspection to verify compliance with requirements.

3.5 Cleaning

3.5.1 Immediately remove all spots, smears, stains, residues, adhesives, etc., from the work of this Section and from upon adjacent areas or surfaces which resulted from the work of this Section.

3.5.2 Upon completion of the work of this Section, remove from site all debris, trash, containers, residue, remnants and scraps which result from the work of this Section.

3.5.3 Cleaning to be free of volatile solvents. Leave the Work in a clean and satisfactory condition.

3.6 Protection

3.6.1 After installation, and until Owner occupancy, protect the rated firestop systems from damage.

3.6.2 Make Good damaged firestop assemblies.

END OF SECTION

1 GENERAL

1.1 Instructions

1.1.1 Comply with the requirements of the Instructions to Bidders, the General Conditions of CCDC 2 2008 Supplementary General Conditions and all Sections of Division 1.

1.1.2 Report in writing to the <General Contractor / Project Manager> any defects of surfaces or work prepared by other trades which affect the quality or dimensions of this Contractor's work. Commencement of this Contractor's work shall imply complete acceptance of all work by other trades.

1.2 Section Includes

1.2.1 Remove sealant from existing joints indicated and clean joints.

1.2.2 Seal all areas indicated on drawings, in list following and where required to make building watertight and weathertight:

- Exterior and interior of masonry control joints. If these are not indicated assume <M 8000 mm><I 26'-0"> on centres for full height of wall.
- Abutting masonry walls.
- Both sides of hollow metal frames.
- Interior and exterior of aluminum window and door frames.
- All pipes, grilles and equipment passing through walls.
- Joint where two different materials abut.
- Exterior carpentry (fascias, trim).
- Plumbing fixtures.
- Firestopping at all penetrations through fire rated walls and floor assemblies with ULC approved systems.
- Acoustical sealants.
- The perimeter of house keeping concrete pads for mechanical and electrical equipment.

1.1 Related Sections

Sealant related to:

Precast concrete	Section 03 45 00
Firestopping	Section 07 25 00
Roof installation	Section 07 50 00
Concealed between aluminum work	Section 08 40 00
Curtain wall	Section 08 45 00
Glazing	Section 08 80 00

1.2 Quality Assurance

1.2.1 Installation of sealant and caulking work shall be carried out by a recognized specialized applicator having skilled mechanics, thoroughly trained and competent in all phases of caulking work, and a

member in good standing of the Caulking Contractor's Association of Ontario.

1.2.2 Submit product data and samples of sealant and backing, for Architect's approval.

1.2.3 Submit manufacturers data, tests and information.

1.2.4 A representative of the sealant material manufacturer shall be present when sample is applied and visit the site during application to ensure that all work is carried out according to the manufacturer's printed instruction. Manufacturer representative shall attend meeting with contractor, consultant and installer.

1.2.5 Submit written statement of products to be used for each application from the selected sealant manufacturer prior to commencing the application.

1.3 Reference Standards

1.3.1 CGSB Specification CAN/CGSB-19.13-M87 ASTM C.920 Type S Grade NS, Class 25, use NT, M, A, O one component, elastomeric, chemical curing.

1.3.2 CGSB Specification CAN/CGSB-19.24-M90 Type 2 Class B and ASTM C920 Type M Grade NS, Class 25, use NT, M, A and 0.

1.4 Rejections

1.4.1 Defective materials or quality of work whenever found at any time prior to final acceptance of the work, shall be rejected regardless of previous inspection. Inspection will not relieve responsibility but is a precaution against oversight and error. Remove and replace defective materials, and the work of other trades affected by this replacement, at no additional cost.

1.5 Examination

1.5.1 Report to the Architect, in writing, defects of surfaces or work prepared by other trades and unsatisfactory site conditions.

1.5.2 Commencement of work implies total acceptance of surface and site conditions.

1.5.3 Thoroughly examine surfaces scheduled to receive sealants to ensure that they are dry, clean, level; free from cracks, ridges, dusting, scaling, carbonation, mortar droppings, parging, curing compounds, rust, grease, oil, paint or other foreign material likely to impair adhesion, performance or appearance.

1.5.4 Test substrate for adhesion and staining if any doubt exists.

1.6 Delivery, Storage and Handling

1.6.1 Deliver and store materials in undamaged and original containers, with labels intact and showing the manufacturer's name, brand, colour, etc.

1.6.2 Ensure material at time of use is still within recommended shelf life.

1.6.3 Maintain storage area at a temperature in accordance with manufacturer's recommendations.

1.7 Guarantee

1.7.1 Provide written guarantee of work of this Section against delamination, cracking, running, loss of adhesion, blistering, peeling, colour change and staining for a period of two (2) years from the date of Completion.

1.7.2 Provide Manufacturer Warranty for a period of 10 years from date of Completion.

1.8 Standard Details

1.8.1 Refer to Section 01 81 00 of the specification for Standard Details which govern the work of this Section.

2 PRODUCTS

2.1 General

2.1.1 Use 600 ml sausage packs instead of cartridge tubes whenever possible.

2.1.2 Materials shall be new and in perfect condition, free from defects impairing physical or appearance performance, and shall meet requirements of applicable C.G.S.B. specifications. Surfaces to receive sealants to be dry, clean and free of contaminants.

2.2 Materials

2.2.1 Sealant A - 2 part, polysulphide; CAN CGSB 19.24 M80, Type 2, Class B

2.2.2 Sealant B - (non-sag, non glazing) 2 part, polysulphide; CAN CGSB 19.24 M80, Type 2, Class A

2.2.3 Sealant C - (non-sag, for glazing) 1 part, acrylic emulsion latex CGSB 19-GP.17M.

2.2.4 Sealant D - 1 part, chemical curing, silicone (CBSB 19-GP-22M)

2.2.5 Traffic Decks - Swimming Pool Joints

Sealant: Multicomponent, Polyurethane Base
Type 1 (self-levelling)
Use: traffic decks - horizontal joints
swimming pool joints

Sternsons RC-270 Sikaflex 2C SL manufactured by
Sika Chemical, PRC Chemicals.
Uraflex 2 manufactured by Sternson Ltd.

Type 2 - (Non-Sag)
Use: Vertical swimming pool joints
Water Immersion

Permapol RC-270 SL manufactured by PRC Chemicals.
Sikaflex 2C NS manufactured by Sika Chemical.

2.2.6 Joints In Bathrooms, Laundries, Etc.

Sealant: Mildew Resistant
Silicone Sanitary Sealant (1702 Series) manufactured by Canadian General Electric.
786 manufactured by Dow Corning.
Tremoil 600 by Tremco

2.2.7 Sealing Around Piping, Ductwork, Conduit, Etc. Passing Through Fire Rated Walls & Floors

Sealant: One-part silicone elastomer.
Pensil 851 by General Electric Silicones.
Fire stop No. 2000 by Dow Corning.
Fyre - Sil by Tremco.
Fire stop by Hilti

2.2.8 Sealing Around Multiple Cables & Conduits Passing Through Fire Rated Walls & Floors

Sealant: Two-part silicone elastomer.
Fire stop foam No. 2001 manufactured by Dow Corning.

2.2.9 Acoustical Caulking

Sealant: Blend of synthetic rubbers.
Use: Acoustical caulking around perimeter of partitions and electrical boxes, panels, etc. & openings in partition systems requiring acoustical treatment in locations as follows:

Non-hardening acoustical sealant by Tremco.

2.2.10 Thinners and Primers: type compatible with appropriate sealant and substrate as recommended by manufacturer.

2.2.11 Cleaning material: As recommended by manufacturer.

2.2.12 Joint backing material: preformed, compressible, resilient, non-staining foam compatible with primers, sealants, outsize 30%, polyethylene, extruded closed cell foam, Shore "A" hardness 20, tensile strength 20-30 psi, such as PRC Backer Rod or equal. Outsize 50%, polyethylene, extruded open cell foam, Shore "A" hardness 10, tensile strength 140-150 psi, such as PRC open cell.

2.2.13 Bond breaker: where joint configuration does not allow for proper depth/width ratio with the use of backer rod (see Section 3.2.5.) - a pressure sensitive plastic tape such as 3M #226 or #481 which will not bond to the sealant shall be placed at the back of the joint.

2.2.14 Sealant colours shall be selected by the Architect from manufacturer's standard selection.

3 EXECUTION

3.1 Examination and Protection

3.1.1 Verify at the site that joints and surfaces have been provided as specified under the work of other sections; and that joint conditions will not adversely affect execution, performance or quality of completed work; and that they can put into acceptable condition by means of preparation specified in this section.

3.1.2 Ascertain that sealers and coatings applied to sealant substrates are compatible with sealant used and that full bond between the sealant and substrate is attained.

3.1.3 Request samples of the sealed or coated substrate from their fabricators for testing of compatibility and bond if necessary.

3.1.4 Verify that specified environmental conditions are ensured before commencing work.

3.1.5 Ensure that releasing agents, coating or other treatments have either not been applied to joint surfaces or that they are entirely removed.

3.1.6 Defective work resulting from application to unsatisfactory joint conditions will be considered the responsibility of those performing the work of this section.

3.1.7 Protect the work of other trades from damage resulting from work of this trade; make good any resulting damage, to the satisfaction of the Architect, at no additional cost.

3.2 Preparation

3.2.1 Remove dust, paint, loose mortar and other foreign matter and dry joint surfaces.

3.2.2 Remove dust, silt, scale and coating from ferrous metals by wire brush, grinding or sandblasting.

3.2.3 Remove oil, grease and other coating from non-ferrous metals.

3.2.4 Prepare concrete, masonry, glazed and vitreous surfaces as recommended by sealant manufacturer.

3.2.5 Examine joint sizes and correct to achieve proper width/depth ratio. See Standard Detail.

3.2.6 For joints wider than <M 50 mm> <I 2">, the sealant manufacturer's representative shall be contacted.

3.2.7 Install backer rod or apply bond breaker tape to achieve correct joint configuration.

3.2.8 Where necessary to prevent staining, mask adjacent surfaces with tape prior to priming and/or caulking.

3.2.9 Prime sides of joint in accordance with manufacturer's directions, immediately prior to sealing.

3.2.10 Before any caulking or sealing is commenced, a test of the material shall be made for indications of staining or poor adhesion.

3.2.11 At locations where another surface will cover the sealed joint (e.g. cove base) ensure the sealant is finished flush with adjacent surfaces.

3.3 Quality of Work

3.3.1 Quality of work shall be in accordance with good practice and in strict compliance with the recommendations of the manufacturer of materials being used.

3.3.2 Check work area for adequate light and heat.

3.3.3 Carefully mask adjacent surfaces, materials and items not scheduled to receive sealant, taking care to see that masking remains intact until application is complete. Remove masking immediately upon completion of caulking.

3.3.4 Do not apply sealant to substrate until thoroughly cured and dried.

3.4 Application

3.4.1 Prime sides of joints before placing joint backing. Use bond breaker where joint backing not required.

3.4.2 Sealant Application:

Sealant A	-	Masonry to metal Masonry to masonry Masonry to stucco Masonry to wood Metal to metal Wood to stucco
Sealant B	-	Glass to all materials
Sealant C	-	Gypsum board to gypsum board Gypsum board to wood
Sealant D	-	Plumbing fixtures to walls/floor

3.4.3 Mix and apply sealant in strict accordance with manufacturer's directions and under supervision of manufacturer's field representative.

3.4.4 Sealants shall be of gun grade or knife grade consistency to suit joint condition.

3.4.5 Apply sealants in accordance with manufacturer's directions, using a gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid, in accordance with Standard Detail.

3.4.6 Form surface of the sealant with full bead, smooth, free from ridges, wrinkles, sags, and embedded impurities. Neatly tool surface to a slight concave joint.

3.4.7 Clean adjacent surfaces immediately and leave work neat and clean. Remove excess and droppings using recommended cleaners as work progresses. Remove masking tape immediately after tooling of joints.

3.4.8 In masonry cavity construction with an air seal, vent sealed joints from cavity to beyond external face of wall.

3.4.9 Superficial pointing with the skin bead is not acceptable.

3.4.10 Provide test results of pull test performed by the manufacturer representative before completion of sealant work.

3.4.11 Promptly, as the work proceeds and upon completion, clean-up and remove from the site all masking tapes, rubbish and surplus material resulting from work of this trade to the satisfaction of the Architect.

END OF SECTION

1 GENERAL

1.1 Instructions

1.1.1 The Instructions to Bidders, the General Conditions of CCDC 2, 2008 Supplementary General Conditions and all Sections of Division 1 apply to and form part of this Section of the Specification.

1.1.2 Report in writing to the General Contractor any defects of surfaces or work prepared by other trades which affect the quality or dimensions of this Contractor's work. Commencement of this Contractor's work shall imply complete acceptance of all work by other trades.

1.2 Section Includes

1.2.1 Supply only of:

1.2.1.1 Steel Frame Products including regular and heavy duty frames, transom frames (glazed or paneled), side light and window assemblies, fire labeled and non-labelled as indicated on drawings and door schedule.

1.2.1.2 Steel doors, swing type, flush, glazed or louvred, fire labeled, regular and heavy duty, and non-labelled as indicted on drawings and door schedule.

1.3 Related Work Not Included in this Section:

Building in (and grouting) frames into concrete unit masonry.	Section 04 20 00
Installation of frames, doors, surface mounted hardware and finishing hardware.	Section 06 10 00
Joint Sealing (joints between frames & other building components).	Section 07 92 10
Acoustic Doors	Section 08 34 80
Supply of finishing hardware.	Section 08 70 00
Door hardware	Section 08 71 10
Glazing	Section 08 80 50
Gypsum Wall Board Partitions.	Section 09 29 00
Painting	Section 09 91 00
Louvers and vents.	Section 10 00 00
Wiring and/or conduit for electronic hardware in steel frame product.	Section 26 00 00

1.4 Requirements Of Regulatory Agencies

1.4.1 Install fire labeled steel doors and frames products in accordance with NFPA – 80, current edition except where specified otherwise.

1.5 Submittals

1.5.1 Shop Drawings

1.5.1.1 Submit one (1) sepia and three (3) copies of the shop drawings for the Consultant's review, indicating type of door, material, steel core thickness, mortises, reinforcements and glazed openings and details.

1.5.1.2 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and in door schedule.

1.5.1.3 Do not commence work until reviewed drawings have been returned.

1.6 Warranty

1.6.1 Materials and quality of work shall be warranted by Manufacturer in accordance with the CSDFMA member's standard warranty for steel doors and frames.

1.7 Quality Assurance

1.7.1 Supply material manufactured to standards of Canadian Steel Door and Frame Manufacturers Association "Canadian Manufacturing Standards for Steel Doors and Frames" – 1/78.

1.7.2 Fire rated doors frames glazing stops and fire door hardware shall bear U.L.C. labels. Refer to architectural drawings for location of fire rated assemblies. All hollow metal work in fire separations and fire walls shall be in accordance with NFPA 80 – latest edition of Standard for Fire Doors and Windows and CAN4-S104. See Schedule for doors requiring a temperature rise limit.

1.8 Rejections

1.8.1 Defective materials whenever found at any time prior to final acceptance of the work shall be rejected regardless of previous site review. Site review will not relive Contractor from responsibility but is a precaution against oversight and error.

1.8.2 Remove and replace defective materials and work of other trades affected by this replacement at no additional cost to the Owner.

2 PRODUCTS

2.1 Manufacturers

2.1.1 Macotta.

2.1.2 S.W. Fleming.

2.1.3 Baron Metal Industries.

2.1.4 Artek Door Limited.

2.1.5 Daybar.

2.2 Materials

2.2.1 Doors

2.2.1.1 Acceptable Materials:

Only steel doors and frames product manufacture by CSDFMA members are eligible for use on this project.

2.2.1.2 Minimum requirements for fire doors are that individual manufacturer's proprietary designs must be successfully tested in accordance with the provisions contained in the Standard Method for Fire Tests of Door Assemblies CAN4-S104-M.

2.2.1.3 Fire Rated Doors assembly and fire rated glazing stops, material and construction approved by ULC.

2.2.1.4 Regular Interior Door Faces: 1.2 mm base thickness as Commercial grade steel to ASTM A568-81, Class 1, hot-dip galvanized to ASTM A527-80, coating designation to ASTM A525-81, ZF75 (A25), known commercially as "Colourbond", "Satincoat" or "Galvanneal". Minimum base steel thickness shall be as per Table 1 / CSDFMA.

2.2.1.5 Exterior Door Faces: 1.6 mm base thickness Commercial grade steel to ASTM A568-81, Class 1, hot-dip galvanized to ASTM A527-80, coating designation to ASTM A525-81, ZF75 (A25), known commercially as "Colourbond", "Satincoat" or "Galvanneal". Minimum base steel thickness shall be as per Table 1 / CSDFMA.

2.2.1.6 Use Z275 (G90) fully galvanized door faces on doors indicated on Door Schedule.

2.2.1.7 Heavy duty doors: 16 gauge base thickness faces to ASTM-A568-81, Class 1, hot dip galvanized to A527-80, with internal welded steel stiffeners at 5" crs.

2.2.1.8 Cores for non-insulated interior doors: honeycomb structural core consisting of kraft paper having 20 mm cell size to thickness indicated to ULC Guide 40U8.8.

2.2.1.9 Cores for insulated exterior doors: rigid, modified polyurethane or poly/isocyanurate insulation, min. insulation value of RSI 1.9.

2.2.2 Frames

2.2.2.1 Frames: 1.6 mm base thickness steel, zinc wipe coated steel for interior door frames and fully galvanized (G90) for exterior door frames.

2.2.2.2 Frames shall be blanked, reinforced, drilled and tapped for mortised, templated hardware minimum steel thickness.

2.2.2.3 Mortised cutouts shall be protected with steel guard boxes minimum steel thickness 1.2 mm.

2.2.2.4 Frames shall be reinforced, where required, for surface mounted hardware. Drilling and Hardware reinforcing minimum steel thickness 3.5 mm, tapping is by others, on site, at time of installation.

2.2.2.5 Provide for appropriate anchorage to floor and wall construction. Each wall anchor shall be located immediately above or below each hinge reinforcement on the hinge jamb and directly opposite on the strike jamb. For rebate opening heights up to and including 1520 mm (60") provide two (2) anchors, and an additional anchor for each additional 760 mm (30") of height or fraction thereof, except as indicated below. Frames in previously placed concrete masonry or structural steel shall be provided with anchors located not more than 150 mm (6") from the top and bottom or each jamb, and intermediate anchors at 660 mm (26") on centre maximum. Minimum anchors steel thickness 1.6 mm.

2.2.2.6 Each door opening shall be prepared for single grey or black stud neoprene door silencers, three (3)

for single door openings, two (2) for double door openings.

2.2.2.7 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.

2.2.2.8 Fire labeled frame products shall be provided for those openings requiring fire protection ratings, as scheduled on the drawings. Such products shall be tested in strict conformance with CAN4-S104, ASTM E-152 or NFPA 252 and listed by a nationally recognized agency having a factory inspection service and shall be constructed as detailed in Follow-Up Service Procedures / Factory Inspection Manuals issued by the listing agency to individual manufacturers.

2.2.2.9 Corrugated Steel Frame Tee Anchors: Thickness and design approved by ULC.

2.2.2.10 Glazing Stops in Fire Rated Frames: Commercial grade 1.5 mm sheet steel thickness and ULC approved design. All approved design.

2.2.2.11 Glazing Stops-Non-Fire Rated Doors and Frames: Minimum 0.8 mm base thickness sheet metal with zinc finish as per door, tamperproof on exterior doors, screw fixed on interior doors.

2.2.2.12 Reinforcing Channel: To CSA G40.21-M, type 300W.

2.2.2.13 Primer: For touch up, rust inhibiting primer to CGSB 1-GP-181M.

2.2.2.14 Frame Thermal Breaks, rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.

2.2.2.15 Exterior Top Caps: rigid polyvinyl chloride extrusion conforming to CGSB 41-GP-19 Ma.

2.2 Fabrication

2.3.1 Fabricate doors, panels, screens, and frames as detailed in accordance with Canadian Steel Door and Frame Manufacturers Association, “Specifications for Commercial Steel Doors and Frames”, for insulated, hollow steel and honeycomb core construction, except where specified otherwise.

2.3.2 Fabricate fire rated doors and frames in accordance with details, approved shop drawings, and ULC requirements at the time of printing.

2.3.3 Provide temperature rise doors where indicated in the door schedule. Doors shall have fire rated mineral cores as manufactured by RODIX or Georgian Pacific.

2.3.4 Stiffen regular duty interior doors with honeycomb core, laminated to face sheets under pressure. Insulate exterior doors, using manufacturer’s recommended adhesive and pressure.

2.3.5 Fabricate interior doors and frames of wipe coat galvanized steel.

2.3.6 Fabricate interior steel frames in minimum thickness of 1.6 mm thick sheet steel.

2.3.7 Fabricate exterior steel frames in minimum thickness of 1.6 mm thick sheet steel. Fabricate exterior steel frames as thermally broken units.

2.3.8 Grind welded corners and joints to flat plane, fill with metallic paste filler and sand to uniform smooth finish.

2.3.9 Close tops of exterior doors with steel caps in minimum thickness 1.6 mm so they are flush with face edges. Close top of interior doors with PVC caps.

2.3.10 Mortise, reinforce, drill and tap doors and reinforcements to receive hardware using templates provided by finish hardware supplier.

2.3.11 Doors shall have edge seams mechanically interlocked, adhesive assisted. Seams may be unfilled and visible.

2.3.12 Make provision for glass where indicated and provide glazing stops.

2.3.13 Provide astragals for pairs of doors in accordance with ULC requirements.

2.3.14 Protect strike and hinge reinforcements using guard boxes welded to frames.

2.3.15 Weld in two channel spreaders per frame, to ensure proper frame alignment.

2.3.16 Provide for anchorage of frames to floor. Provide 1.6 mm angle clips, with two holes for floor anchorage welded to frame.

2.3.17 Reinforce head of frames wider than 1200 mm.

2.3.18 Provide frames with manufacturer's proprietary anchorage system suitable to secure frame rigidly to wall assembly. Secure frames set into previously constructed concrete or masonry openings by countersunk expansion bolts at same centres as for adjustable Tee-anchors. Reinforce frame at fastening location to prevent indentation of frame by fastening device.

2.3.19 Construct rail and stile doors in same manner as flush doors.

2.3.20 Construct matching panels in same manner as doors.

2.3.21 Touch up galvanized doors and frames with primer where galvanized finish damaged during fabrication.

2.3.22 Chemically treat surface of plain steel doors and frames and apply one coat of primer.

2.3.23 Attach ULC labels to doors and frames requiring fire rating.

2.3.24 Install three bumpers on strike jamb for each single door and two bumpers at head for pairs of doors.

3 EXECUTION

3.1 Installation

3.1.1 This part does not apply to this Section. Doors and frames shall be installed by Section 06 10 00, Rough and Finished Carpentry.

END OF SECTION

1 GENERAL

1.1 Section Includes

1.1.1 Aluminum doors and frames.

1.1.2 Vision glass.

1.2 Related Sections

1.2.1 Section 07 26 00 – Vapour Retarders: perimeter vapour seal between glazing and adjacent construction.

1.2.2 Section 07 27 00 – Air Barriers: perimeter air seal between glazing and adjacent construction.

1.2.3 Section 07 90 00 – Joint Sealers.

1.2.4 Section 08 52 00 – Aluminum Windows.

1.2.5 Section 08 70 00 – Finish Hardware: door hardware schedule.

1.2.6 Section 08 80 00 - Glass and Glazing.

1.2.7 Section 08 91 00 – Glazed Aluminum Curtain Wall.

1.2.8 Section 08 96 00 – Sloped Glazing Assemblies.

1.3 References

1.3.1 ASTM A269-00: Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Services.

1.3.2 ASTM B221-00: Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

1.3.3 ASTM B221-00: Standard Specification for Aluminum and Aluminum-Alloy Extruded Bards, Rods, Wire, Profiles and Tubes.

1.3.4 CAN/CSA-G164-M92: Hot Dip Galvanizing or Irregularly Shaped Articles.

1.4 System Description

1.4.1 Aluminum entrances system includes tubular aluminum sections, factory prefinished, vision glass, related flashings, anchorage and attachment devices.

1.4.2 Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall as calculated to applicable codes.

1.4.3 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

1.5 Submittals

1.5.1 Submit shop drawings and product data to requirements of Section 01 30 00.

1.5.2 Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work and expansion and contraction joint location and details.

1.5.3 Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass, door hardware, internal drainage and thermal break details.

2 PRODUCTS

2.1 Manufacturers

2.1.1 Kawneer.

2.1.2 Commercial Aluminum.

2.1.3 Alumicor.

2.2 Materials

2.2.1 Extruded Aluminum: to ASTM B221, 6063-T54 alloy.

2.2.2 Sheet Aluminum: to ASTM B209, 3003-H14 alloy.

2.2.3 Sheet Steel: galvanized to requirements of CAN/CSA-G164-M.

2.2.4 Steel Sections: shaped to suit mullion sections.

2.2.5 Fasteners: stainless steel.

2.2.6 Thermal Break: rigid polyvinyl chloride.

2.2.7 Touch-Up Primer: Zinc rich type.

2.3 Components

2.3.1 Thermally-Broken Frame: curtain wall framing, as specified in Section 08 91 00.

2.3.2 Non-thermally Broken Frame: extruded aluminum sections, 44.5 x 114.3 mm nominal dimension; flush glazing stops; drainage holes; internal weep drainage system; clear anodized finish; eg. Kawneer Tri-Fab VG 450.

2.3.3 Thermally-Broken Doors: extruded aluminum sections, 57.2 mm thick, 88.9 mm wide top rail, 88.9 mm wide vertical stiles, 165.1 mm wide bottom rail; thermally broken with interior tubular section insulated from exterior; rectangular glazing stops; bronze anodized finish; eg. Kawneer 360 Insulclad.

2.3.4 Non-thermally Broken Doors: extruded aluminum sections, 44.5 mm thick, 88.9 mm wide top rail, 88.9 mm wide vertical stiles, 165.1 mm wide bottom rail; beveled glazing stops; clear anodized finish; eg. Kawneer 350 Medium Stile.

2.3.5 Flashing: 2.0 mm thick sheet aluminum, finish to match mullion sections where exposed.

2.3.6 Glass and Glazing Materials: As specified in Section 08 80 00 of Types described below:
.1 Glass in Exterior Doors: Type SG-B.
.2 Glass in Interior Doors and Lights: Type FG-C.

2.3.7 Sealant and Backing Materials: as specified in Section 07 90 00 , to the following types:
.1 Interior Framing and Adjacent Materials: interior general purpose sealant.
.2 Glazing: glazing sealant.

2.4 Hardware

2.4.1 Push / Pull Handles: 25 mm OD stainless steel, straight D-wrap style, 230 mm centres.

2.4.2 Hinges: 114.3 x 101.6 mm size, commercial quality steel, radius corner standard template butt style, 5 knuckle construction with two stainless steel ball bearings and non-rising removable pin; 1-1/2 pairs per door leaf.

2.4.3 Push Bars: 25 mm OD stainless steel, double bend, 57 mm from face of door.

2.4.4 Panic Device: rim type, manufacturer's standard type to suit application; finish to match door and frame.

2.4.5 Drop Arm Holder: cast aluminum, surface-mounted, pivoting rubber-tipped holder-arm; No.28 finish.

2.4.6 Weatherstripping, Sill Sweep Strips, Thresholds: Manufacturers standard type to suit application, finish to match door and frame.

2.4.7 All other finish hardware is supplied under Section 08 70 00. This may include automatic door operators, locks and cylinders.

2.5 Fabrication

2.5.1 Fabricate components with minimum clearances and shim spacing around assembly perimeter.

2.5.2 Make joints flush, hairlines, and weatherproof.

2.5.3 Arrange fasteners and attachments to conceal from view.

2.5.4 Prepare components with internal reinforcement for specified door hardware and door operator hinge hardware.

2.5.5 Also prepare doors and frames to receive commercial grade cylindrical locksets and power operated opening and closing devices as specified in Section 08 70 00. Blank, mortise, reinforce, drill and tap doors to receive templated hardware required by hardware schedule.

2.6 Shop Finishing

2.6.1 Exposed Aluminum Surfaces: Anodized to AA-M12C22A31, Class II Clear Anodic Oxide treatment, No. 17.

2.6.2 Stainless Steel Tubing: to US32D, Rubbed Finish.

2.6.3 Concealed Steel Items: Galvanized to 610 g/m² to requirements of CAN/CSA-G164-M.

3 EXECUTION

3.1 Examination

3.1.1 Verify wall openings and adjoining air and vapour seal materials are ready to receive work.

3.2 Installation

3.2.1 Install doors and frames to requirements of manufacturer's instructions.

3.2.2 Permanently fasten frames to building structure.

3.2.3 Align assembly plumb and level, free of warp or twist.

3.2.4 Maintain assembly dimensional tolerances, aligning with adjacent work.

3.2.5 Coordinate attachment and seal of perimeter air and vapour barrier materials.

3.2.6 Install hardware using templates provided.

3.2.7 Install exterior glass as described in Section 08 80 00, to exterior wet/dry method of glazing.

3.2.8 Install interior glass as described in Section 08 80 00 to interior dry method of glazing.

3.2.9 Install perimeter sealant to requirements of Section 07 90 00.

END OF SECTION

1 GENERAL

1.1 Section Includes

1.1.1 Wood doors; non-rated and fire rated.

1.2 Related Sections

1.2.1 Section 06 20 00 – Finish Carpentry: installation of wood doors and finish hardware.

1.2.2 Section 08 10 00 – Hollow Metal Doors and Screens.

1.2.3 Section 08 70 00 – Finish Hardware: door hardware.

1.2.4 Section 08 80 00 – Glass and Glazing: door glazing.

1.2.5 Section 09 90 00 – Painting and Finishing: field finishing of doors.

1.3 References

1.3.1 ANSI A208.1-99: Particleboard.

1.3.2 ANSI/NFPA 80 -1999: Fire Doors and Fire Windows.

1.3.3 Architectural Woodwork Manufacturers Association of Canada (AWMAC): Quality Standards for Architectural Woodwork.

1.3.4 CAN/CSA-O132.2 Series-90: wood Flush Doors.

1.3.5 Underwriters Laboratories of Canada: List of Equipment and Materials.

1.4 Submittals

1.4.1 Submit shop drawings to requirements of Section 01 33 00.

1.4.2 Shop Drawings: Indicate door elevations, stile and rail reinforcement, internal blocking for hardware attachment, and cutouts for glazing.

1.5 Quality Assurance

1.5.1 Conform to requirements of AWMAC Quality Standard – Architectural Grade.

1.5.2 Installed Doors to conform to National Fire Protection Association requirements for fire rated class indicated in schedule.

1.6 Delivery, Storage and Handling

1.6.1 Pile doors flat on level supports to prevent warping.

1.6.2 Protect face of first door unit by placing plywood or cardboard between supports and door. Cover the top door unit in a similar manner.

1.6.3 Store doors in a dry, well-ventilated area. Doors stored for an extensive period of time shall have top and bottom edges sealed.

1.7 Warranty

1.7.1 Provide a three-year extended warranty under the Contract.

1.7.2 Warranty: include coverage of warping beyond installation tolerances indicated in this Section, and delamination or degradation of veneer.

2 PRODUCTS

2.1 Manufacturers

2.1.1 Baillargeon.

2.1.2 Cambridge Door Co.

2.1.3 Door-Lam.

2.1.4 Weyerhaueser.

2.2 Manufactured Units

2.2.1 Solid Core Flush Doors: to CAN/CSA-O132.2; 44 mm thick; wood veneer faces, fire rated as indicated on Drawings.

2.3 Components

2.3.1 Core Solid, Non-Rated: AWMAC Particleboard Core Type: 448 kg/m³ solid particleboard core to ANSI A208.1; solid lumber stiles and rails bonded to core.

2.3.2 Core Solid, Fire Rated: homogeneous incombustible mineral core; ULC labeled; solid lumber stiles and rails bonded to core.

2.3.3 Face Assembly Adhesive: Type I – Waterproof.

2.3.4 Core Assembly Adhesive: Type II – Water-resistant.

2.3.5 Cross-banding: 1.6 mm thick hardwood veneer.

2.3.6 Glass Stops: wood, designed to confirm to ULC requirements.

2.3.7 Veneer Facing: AWMAC Custom Grade, Red Oak species, flat cut veneer, with book end matched grain, suitable for transparent finish.

2.4 Fabrication

2.4.1 Provide flush doors with 13 mm thick edge strips of wood species to match face veneer.

2.4.2 Prepare doors for heavy weight oversize butt hinges, cylindrical locksets, rim and concealed vertical rod / mortise lock case exit devices, surface door closers and concealed overhead stops. Coordinate with Section 08 70 00.

2.4.3 Provide and prepare openings for glass lights.

3.0 EXECUTION

3.1 Examination

3.1.1 Verify that site conditions are ready to receive work.

3.1.2 Beginning of installation means acceptance of site conditions.

3.2 Installation

3.2.1 Machine cut relief hinges and closures and coring for handsets and cylinders.

3.2.2 Trim door width to a maximum of 5 mm.

3.2.3 Trim door height by cutting equally on top and bottom edges to a maximum of 19 mm.

3.2.4 Prepare doors to receive finish hardware to requirements of AWMAC requirements.

3.3 Tolerances

3.3.1 Maximum Diagonal Distortion: 1.5 mm measured with straight edge, corner to corner.

END OF SECTION

1 GENERAL

1.1 Section Includes

1.1.1 Access panels; non-rated and fire rated.

1.2 Related Sections

1.2.1 Section 09 25 00 – Gypsum Board.

1.2.2 Section 09 90 00 – Painting and Finishing: site finishing.

1.3 References

1.3.1 Underwriters Laboratories of Canada: List of Equipment and Materials.

1.4 Submittals

1.4.1 Submit shop drawings and certification reports to requirements of Section 01 33 00.

1.4.2 Shop Drawings: Indicate profiles, accessories, location and dimensions.

1.4.3 Fire Test Certification Report: certifying performance with specified fire rating requirements.

1.5 Quality Assurance

1.5.1 Installed access doors and panels to conform to National Fire Protection Association requirements for fire rated class indicated in schedule.

1.6 Delivery, Storage and Handling

1.6.1 Store materials in a dry, protected, well-vented area.

1.6.2 Remove protective wrapping immediately after installation.

2 PRODUCTS

2.1 Manufacturers

2.1.1 Manufacturers of fire-rated access panels having Product considered acceptable for use:
.1 Acudor Access Doors.
.2 Bilco Canada.
.3 Mifab Manufacturing Inc.
.4 The Williams Brothers Corporation.

2.1.2 Substitutions: refer to Instructions to Bidders and Section 01 60 00.

2.1.3 Access Doors

2.1.3.1 Sizes: Except as indicated otherwise, to be minimum sizes as follows:
.1 For body entry: [600 x 600] mm.
.2 For hand entry: [300 x 300] mm.

2.1.3.2 Construction: Rounded safety corners, concealed hinges, screwdriver latch, anchor straps, able to

open 180°.

2.1.3.3 Materials

.1 Tiled or marble surfaces: Stainless steel with brushed satin or polished finish as directed by Consultant.
.3 Other areas: Prime coated steel.

2.2 Manufactured Units

2.2.1 Fire-Rated Access Panel: 1-1/2 hour B-label with maximum temperature rise of 110 degrees C (250 degrees F); self-closing and self-latching type, suitable for both horizontal or vertical installation in gypsum board partitions or bulkheads; eg. Model WB-FR Standard Fire Rated Access Door with Drywall Bead by The Williams Brothers Corporation.

2.2.2 Non-Rated Access Panel: suitable for both horizontal or vertical installation in gypsum board partitions or bulkheads; eg. Model WB-DW Access Door for Drywall Surfaces by The Williams Brothers Corporation.

2.3 Components

2.3.1 Fire-rated Door: minimum 48 mm deep, fabricated 1.2 m thick sheet steel, insulated.

2.3.2 Non-Rated Door: 1.9 mm thick sheet steel.

2.3.3 Insulation for Fire-Rated Door: non-rigid mineral fibre, from rock or slag, to CAN/ULC S702, Type 1; filling door cavity.

2.3.4 Box Frame: minimum 1.5 mm thick sheet steel, complete 25 mm wide perforated flange of 0.61 mm thick galvanized steel for mounting purposes in gypsum board enclosures.

2.3.5 Closer for Fire-Rated Door: Automatic, spring-type.

2.3.6 Closer for Fire-Rated Door: fully concealed, 170 degree opening pivot-type.

2.3.7 Hinge for Fire-Rated Door: fully concealed, piano type.

2.3.8 Latch for Fire-Rated Door: self-latching direct action lock opposite hinge; lock designed to accept both key and knurled knob included with each door.

2.3.9 Latch for Non-Rated Door: flush, stainless steel cam designed to be operated with a screwdriver.

2.4 Shop Finishes

2.4.1 Steel: electrostaically applied baked grey enamel primer over rust-inhibiting phosphate treatment.

3.0 EXECUTION

3.1 Examination

3.1.1 Verify that site conditions are ready to receive work.

3.1.2 Beginning of installation means acceptance of site conditions.

3.2 Preparation

3.2.1 Coordinate installation with gypsum board as specified in Section 09 25 00.

3.2.2 Coordinate locations with mechanical and electrical Subcontractors.

3.3 Installation

3.3.1 Install to requirements of manufacturer's instructions, for long life under hard use.

END OF SECTION

1 GENERAL

1.1 Section Includes

1.1.1 Aluminum windows, shop fabricated; fixed sash, site glazed.

1.1.2 Exterior perimeter sealant.

1.2 Related Sections

1.2.1 Section 07 26 00 – Vapour Retarders: connection to building vapour retarder envelope.

1.2.2 Section 07 27 00 – Air Barriers: connection to building air barrier envelope.

1.2.3 Section 07 41 00 – Metal Roof and Wall Panels.

1.2.4 Section 07 90 00 – Joint Sealers: interior caulking.

1.2.5 Section 08 12 00 – Aluminum Doors and Frames.

1.2.6 Section 08 80 00 – Glass and Glazing: site glazing.

1.2.7 Section 08 91 00 – Glazed Aluminum Curtain Wall.

1.2.8 Section 08 96 00 – Sloped Glazing Assemblies.

1.3 References

1.3.1 Aluminum Association (AA), Designation System for Aluminum Finishes (2000)

1.3.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40-[97], Anticorrosive Structural Steel Alkyd Primer.
.2 CAN/CGSB-79.1-[M91], Insect Screens.

1.3.2 Canadian Standards Association (CSA) International

.1 CSA-A440-[00]/A440.1-[00], A440-[00], Windows / Special Publication A440.1-[00], User Selection Guide to CSA Standard A440-[00], Windows.
.2 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.
.3 CAN/CSA-Z91-[M90(R2000)], Safety Code for Window Cleaning Operations

1.4 System Description

1.4.1 Windows: extruded aluminum frame and sash sections, shop fabricated, vision glass, related flashings, anchorage and attachment devices.

1.4.2 Configuration: as indicated on the Window Schedule.

1.4.3 Air Tightness: to CAN/CSA-A440-M, Class Fixed.

1.4.4 Water Tightness: to CAN/CSA-A440-M, Blass B7.

1.4.5 Wind Load Resistance: to CAN/CSA-A440-M, Class C5.

1.4.6 Condensation Resistance Temperature Index: to CAN/CSA-A440-M, Class I_f=66.

1.4.7 Drain water entering joints, condensation occurring in glazing channel, or migrating moisture occurring within system, to the exterior by a weep drainage network.

1.4.8 Design intermediate members within units to be either solid or tubular design to suit wind loading, weight carrying requirements and wind deflection limitations.

1.4.9 Design coupling mullions to permit unit module construction and provide for thermal expansion. When required, reinforce wind load carrying members with steel reinforcement suitably treated to prevent electrolytic action.

1.5 Submittals

1.5.1 Submit shop drawings to requirements of Section 01 33 00.

1.5.2 Provide authentic original documentation verifying that the window assemblies meet all requirements of the CAN/CSA-A440-M.

1.5.3 Show detailed window assembly, including:
.1 Large scale details of members and materials, of brackets and anchorage devices and of connection and jointing details;
.2 Fully dimensioned layouts for positioning of brackets and anchorage devices to structures;
.3 Dimensions, gauges, thicknesses;
.4 Glazing details, description of materials including catalogue numbers, products and manufacturer's names;
.5 Aluminum alloy and temper designations;
.6 Finish specifications and all other pertinent data.

1.5.4 Provide documentation of thicknesses, profiles and descriptions of all components used in the window assembly; engineering calculations verifying the window assembly has been designed, constructed and attached to withstand all forces anticipated for this project as required by applicable codes.

1.6 Quality Assurance

1.6.1 Fabricator: a company specializing in the work of this Section, with a minimum of five years documented experience.

1.7 Delivery, Storage and Handling

1.7.1 Take precautionary measures and adequately protect aluminum and aluminum finishes to prevent damage thereto during fabrication, storage, shipping, handling and installation.

1.7.2 Deliver, handle and store units by methods approved by manufacturer. Protect from damage and staining.

1.8 Warranty

1.8.1 Provide a 5 year extended warranty under provisions of the Contract.

1.8.2 Warranty: include coverage of insulated glass units from seal failure, interpane dusting or misting, and replacement of same.

2 PRODUCTS

2.1 Manufacturers

2.1.1 Manufacturers of site glazed aluminum windows having Product considered acceptable for use:
.1 Kawneer.
.2 Commercial Aluminum.
.3 Alumicor.
.4 Aluflam

2.2 Materials

2.2.1 Extruded Aluminum: to ASTM B221, 6063 alloy, T5 temper.

2.2.2 Sheet Aluminum: to ASTM B209, 3003 alloy, H14 temper.

2.2.3 Sheet Steel: galvanized to CAN/CSA-G164-M.

2.2.4 Steel Sections: shaped to suit mullion sections.

2.2.5 Fastener: stainless steel.

2.2.6 Bituminous Coating: fibred asphalt emulsion.

2.2.7 Thermal Break: rigid polyvinyl chloride.

2.2.8 Touch-Up Primer: Zinc rich type.

2.2.9 Perimeter Sealant: exterior weatherseal sealant, as specified under Section 07 90 00.

2.2.10 Foam Sealant: post-expanding type, as specified in Section 07 27 00.

2.2.11 Vapour Retarder: as specified under Section 07 26 00.

2.2.12 Fire-Rated, Narrow profile Aluminum Frames: 45/60/120 Minutes in accordance with CAN/ULCS101

2.3 Components

2.3.1 Jamb Frame: 34.9 x 108 mm nominal dimension; thermally broken with interior tubular section insulated from exterior; applied glazing stops; drainage holes; internal weep drainage system.

2.3.2 Mullion Frame: 57.2 x 108 mm nominal dimension; thermally broken with interior tubular section insulated from exterior; applied glazing stops; drainage holes; internal weep drainage system.

2.3.3 Sill: extruded aluminum, purpose made design; sufficient depth to extend beyond wall face, single piece to span each opening width; complete with drip edge profile.

2.3.4 Flashing: 2.0 mm thick aluminum, finish to match mullion sections where exposed.

2.3.5 Glass and Glazing Materials: as specified in Section 08 80 00, Type SG-A.

2.4 Fabrication

2.4.1 Fabricate framing, mullions and sashes to requirements of CAN/CSA-A440-M.

2.4.2 Fabricate components with minimum clearances and shim spacing around perimeter of assembly.

2.4.3 Make joints flush, hairline, and weatherproof.

2.4.4 Arrange fasteners and attachments to conceal from view.

2.4.5 Prepare components with internal reinforcement for operating hardware.

2.4.6 Overlap and seal glazing flanges of abutting members for the entire depth and width of the flanges to provide a solid unbroken air and water barrier. Glass stops shall be screwless, lock-in type.

2.4.7 Provide fully resilient settings for glass and panels by use of EPDM elastomeric glazing gaskets on both sides of glass installed in window frames.

2.5 Shop Finishing

2.5.1 Exposed Aluminum Surfaces: Anodized to Aluminum Association Specification AA-M12C22A31, Class II Clear Anodic Oxide Treatment, No. 17.

2.5.2 Concealed Steel Items: Galvanized to 610 g/m² in accordance with CAN/CSA-G164-M.

3 EXECUTION

3.1 Examination

3.1.1 Verify wall openings and adjoining air and vapour seal materials are ready to receive work of this Section.

3.2 Preparation

3.2.1 Apply a heavy coat of bituminous paint on surfaces of aluminum placed in contact with concrete, mortar, plaster, or dissimilar metals.

3.2.2 Provide fastenings and anchors required to be built in to adjacent work to other Sections.

3.3. Installation

3.3.1 Securely install windows in correct location, level, square, plumb, free from distortion, properly aligned and at proper elevations.

3.3.2 Make joints neat, fine and weathertight.

3.3.3 Allow for expansion and contraction of components.

3.3.4 Provide additional mouldings and closures necessary.

3.3.5 Use appropriate fastening components compatible with the material of the supporting sub-structure.

3.3.6 Install glass as specified in Section 08 80 00, to exterior wet/dry method of glazing.

3.3.7 Seal perimeter of frame as specified in Section 07 90 00.

3.4 Cleaning

3.4.1 Clean glass and aluminum surfaces.

3.4.2 Do not scratch or damage surfaces.

3.4.3 Do not remove protective cover from framing until final cleaning operations.

3.5 Protection

3.5.1 Provide protective coatings on all surfaces subject to damage and mark all glass with white washable paint.

END OF SECTION

1 GENERAL

1.1 Section Includes

1.1.1 General contractor to provide (supply and install) Door hardware and keying as per Door hardware schedule attached and listed below.

1.1.2 Supply temporary locking cylinders and keys for construction purposes. Locks used for Contractor security shall be keyed as required to conform to building operations' security requirements.

1.2 Related Work

- Metal Doors and Frames	Section 08 11 00
- Wiring and / or conduit for electronics	Division 26 (Elec)
- Wood Doors	Section 08 14 00

1.3 Submittals

1.3.1 Hardware schedule

Requirements for shop drawings submission are described in Section 01 33 00, specifically provide the following:

Submit 3 hard copies of the hardware schedule for the Architect's review, indicating each door and all items associated therewith.
(Approved Manufacturer - Trillium Architectural Products Ltd. 416-391- 5555)

See attached Finished Hardware Schedule provided for reference.

1.4 References

1.4.1 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).

CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): standard hardware location dimensions.

1.4.2 Canadian General Standards Board (CGSB).

CAN/CGSB-69.17-[M86(R1993)], Bored and Preassembled Locks and Latches.

CAN/CGSB-69.18-[M90]/ANSI/BHMA A156.1-[1981], Butts and Hinges.

CAN/CGSB-69.19-[93]/ANSI/BHMA A156.3-[1984], Exit Devices.

CAN/CGSB-69.20-[M90]/ANSI/BHMA A156.4-[1986], Door Controls (Closers).

CAN/CGSB-69.21-[M90]/ANSI/BHMA A156.5-[1984], Auxiliary Locks and Associated Products.

CAN/CGSB-69.22-[M90]/ANSI/BHMA A156.6-[1986], Architectural Door Trim.

CAN/CGSB-69.24-[M90]/ANSI/BHMA A156.8-[1982], Door Controls - Overhead Holders.

CAN/CGSB-69.26-[96]/ANSI/BHMA A156.10-[1991], Power-operated Pedestrian Doors.

CAN/CGSB-69.28-[M90]/ANSI/BHMA A156.12-[1986], Interconnected Locks and Latches.

CAN/CGSB-69.29-[93]/ANSI/BHMA A156.13-[1987], Mortise Locks and Latches.

CAN/CGSB-69.30-[93]/ANSI/BHMA A156.14-[1991], Sliding and Folding Door Hardware.

CAN/CGSB-69.31-[M89]/ANSI/BHMA A156.15-[1981], Closer/Holder Release Device.

CAN/CGSB-69.32-[M90]/ANSI/BHMA A156.16-[1981], Auxiliary Hardware.

CAN/CGSB-69.33-[M90]/ANSI/BHMA A156.17-[1987], Self-closing Hinges and Pivots.

CAN/CGSB-69.34-[93]/ANSI/BHMA A156.18-[1987], Materials and Finishes.

CAN/CGSB-69.35-[M89]/ANSI/BHMA A156.19-[1984], Power Assist and Low Energy Power Operated Doors.

CAN/CGSB-69.36-[M90]/ANSI/BHMA A156.20-[1984], Strap and Tee Hinges and Hasps.

1.5 Warranty

Materials and quality of work shall be warranted by Manufacturer in accordance with the CSDFMA member's standard warranty for steel doors and frames.

1.6 Rejections

Defective materials whenever found at any time prior to final acceptance of the work shall be rejected regardless of previous site review. Site review will not relieve Contractor from responsibility but is a precaution against oversight and error.

Remove and replace defective materials and work of other trades affected by this replacement at no additional cost to the Owner.

2 PRODUCTS

2.1 LOCKSETS, LATCHSETS, DEADLOCKS

1. Grade 1 Deadbolt
   .1 ANSI/BHMA-A156.5, Grade 1 deadbolt supplied with solid brass or bronze trim rings and 25mm throw high-strength, steel alloy deadbolt with hardened steel roller resistant to sawing and kick-in attacks. Metal shield protects bolt from attack through the door as well as hardened steel balls that protect mounting screws from drill attack.Exclusive wood frame reinforcer protects wood jamb against kick-in attacks.

2. Grade 1 Cylindrical
   .1 Bored and preassembled locks and latches: to CAN/CGSB 69.17ANSI/BHMA-A156.2, series 2000 preassembled lock Grade 1 and series 4000 bored lock, grade 1, extra heavy duty residential, commercial, institutional and industrial applications.
   Latch bolts to be steel with minimum 13mm throw deadlocking on keyed and exterior functions. 19mm throw anti-friction latch bolt on pairs of fire doors.
   Provide manufacturer's standard wrought box strike for each latch or lock, with curved lip extended to protect frame. Lock case to be steel. Locks to incorporate one piece spring cage and spindle. Precision solid brass 6-pin cylinder with nickel silver keys. All levers to be solid with no plastic inserts. Locks and latch sets tested to exceed 3,000,000 cycles.

3. Grade 1 Mortise
   .1 Mortise locks and latches: to CAN/CGSB 69.29, series 1000 mortise lock, ANSI/BHMA-A156.13, Grade 1 Operational, Grade 1 Security, mortise lock for Commercial and institutional buildings.
   Lock cases to have a high strength steel alloy cylinder retainer with a captured ¼-20 set screw. Lock case to be field reversible without chassis disassembly. Supply locksets with lock cases manufactured from 2.7mm steel with internal components of steel with zinc-dichromate plating for corrosion resistance. Case cover to be secured with four screws for increased rigidity.
   Locks are to feature a full 19mm throw two piece stainless steel mechanical anti-friction latchbolt with 25mm throw deadbolt constructed of sintered stainless steel. Deadbolt to remain a minimum of 16mm within lock case when fully extended. All mortise locks are to feature external spring cages. Stop works functions to be by turn unit. Lock cases with stop works on edge of lock case will not be accepted. Spindles to be such that if forced it will twist first, then break (approx. 81.3

N/m of torque).

.4 All Grade 1 and Grade 2 cylindrical lever locksets shall have a free wheeling or clutch mechanism so the lever moves when in the locked position without retracting the latch bolt.

.5 Interconnected locks and latches: to CAN/CGSB 69.28, series 5000, grade 1

.6 *Match to Existing as stated in Hardware Schedule.*

.7 Acceptable Locks:

Schlage-Locks-Ingersoll- Rand Door Hardware
Best Universal Locks Limited
Sargent of Canada Ltd.
Mortise Locks and Latches, shall comply with ANSI/BHMA A156.13

. .1 Heavy duty Mortise type. Series 8200, grade 1. Lever design to be tubular (121mm long),
76mm overall projection, with end returning to 13mm from face of door.
65mm diameter round wrought roses. Provide dust boxes behind all strikes.
.2 Schlage Heavy Duty, Classroom security lock (PD-6 Pin) ND75PD-SPA
.3 IC Core to match existing School hardware & keying System

a. Acceptable products:
1*) Schlage heavy duty mortise "D" series. Rhodes lever design.*
VonDuprin, lever#03 design.
2) Functions as specified.
3) *Acceptable products: to match Owners standard cylinder*.

2.2 SURFACE/FLUSH BOLTS

1. Surface/Flush Bolts: ANSI/BHMA-A156.16, Grade 1.
.1 Surface Bolts
.1 Surface bolts to have 25mm throw with vandal-resistant concealed mounting. Units to be constructed of heavy duty steel and be ULC listed up to three (3) hours when used on the inactive door of a pair up to 2440mm in height.

2. Manual Flush Bolts-Metal Doors
.1 Manual flush bolt for metal doors to be ULC listed for 3-hour fire doors with 13mm Diameter bolt tip, 19mm throw. Rod length to be 305mm. Supply dustproof strikes with all flushbolts.

3. Manual Flush Bolt-Wood Doors
.1 Manual flush bolt for wood doors to be ULC listed for 90min fire doors with 19mm throw with a 22mm vertical adjustment. Supply dustproof strikes with all flushbolts.

4. Automatic Flush Bolts-Metal Doors
.1 Automatic flush bolts for metal doors, fully automatic, ULC listed for 3 hour fire doors, low actuation forces, top bolt has spring tension, non-handed with 19mm throw with a 22mm vertical adjustment. Optional rod length for non-rated openings. Auxiliary fire latch that eliminates the bottom bolt for ULC listed doors. Supply dustproof strikes with all flushbolts.

5. Automatic Flush Bolts- Wood Doors
.1 Automatic flush bolts for wood doors to be fully automatic ULC listed for 90min fire doors, low actuation forces, top bolt has spring tension, non-handed with 19mm throw with a 22mm vertical adjustment. Auxiliary fire latch that eliminates the bottom bolt for ULC listed doors (20min only). Supply dustproof strikes with all flushbolts.

2.3 Door Closers:

LCN-Closers-Ingersoll- Rand Door Hardware
Sargent of Canada Ltd.
Dorma Door Controls Ltd.

.1 *Heavy duty. Full rack and pinion hydraulic action. Cast iron cylinder body. Adjustable spring power and back check. Full plastic cover. Provide adapter plates as required. All door closers on metal doors are to be installed using machine screws and NOT self* tapping screws.

.2 Provide adapter plates as required for proper installation of door closers.
- DEL - delayed action.
- EDA - extra duty arm
- LPA - less parallel arm

3. LCN “4040” series as listed.

2.4 EXIT DEVICES

1. Narrow Style: to CAN/CGSB 69.19, ANSI/BHMA-A156.3, Grade 1 ULC listed for panic hardware and fire exit hardware.
Supply exit devices with smooth mechanism case and “the quiet one” fluid dampener to eliminate noise associated with exit device operations. Non-handed device with touchpad assemblies with no exposed fasteners and cast end caps, reinforced aluminum with stainless steel touchpad and raised edge to minimize pinching. Fits door stiles as narrow as 45mm.

2. Heavy Duty: to CAN/CGSB 69.19, ANSI/BHMA-A156.3, Grade 1 ULC listed for panic hardware and fire Exit Devices exit hardware.

Supply exit devices and fire exit devices featuring coil compression springs on all device mechanism subassemblies and dead latching mechanisms for all active latchbolts. Supply exit devices with smooth mechanism case and “the quiet one” fluid dampener to eliminate noise associated with exit device operations. Non-handed device with touchpad assemblies with no exposed fasteners and cast end caps, reinforced aluminum with stainless steel touchpad and raised edge to minimize pinching. Roller strikes to be standard on all rim and surface vertical rod devices. Doors greater than 914mm wide supply long bar exit devices, doors 2134mm high and greater supply extension rods. 1,000,000cycle testing independently certified by ETL.

3. Device Trim

.1 Supply device trim featuring recessed cylinder mounting and coil compression spring design with shear pin protection for all lever designs. Similar lever designs for exits as specified for locksets.

.4 Mullions Non-Rated

.1 Aluminum mullions complete with mullion stabilizers prepared with strikes for use with all rim devices to provide single door performance and security on double door applications.
.2 Steel mullion prepared for two strikes for use with all rim devices and key removable kit to provide quick removal to provide single door performance and security on double door applications.

.5 Mullions Rated

.1 Fire rated ULC approved mullion for up to three hour openings up to 2.4m x 2.4m using rim devices prepared for strikes. Supply with key removable kit to provide quick removal to provide single door performance and security on double door applications.

.6 Exit devices installed on exterior doors must have dead latching bolts to ensure tamper proof security.

.7 Auxiliary item: door co ordinator, type 21, for pairs of doors with overlapping astragals.

.8 Acceptable products: *Match to Existing*

Von Duprin Exit Devices – Ingersoll – Rand Door Hardware
Magnokrom Inc.
American Device Mrg. Co.
ADAPTABLE TO UNICAN DEVICE

2.5 Door Holders:

Magnokrom Inc.
Glynn-Johnson Ingersoll – Rand Door Hardware
Canadian Builders Hardware Manufacture Ltd.

2.6 Hinges: Hager Hinges Canada Ltd.
Stanley Hardware
Mont-Hard (Canada) Inc.

.1 Acceptable product: Hinges listed are by Hager Companies
BB 2222 for Interior Standard Duty
BB 1191 for Exterior Standard Duty
BB 1168 for Interior Heavy Duty
BB 1199 for Exterior Heavy Duty
Finish Interior 619
Finish Exterior 630
**To be used on doors larger than 30"x 70" or on high usage doors*

2.7 Cylinders, Keyways: Abloy M.S.G. or M.S.G. PRO

Cylinders shall comply with ANSI/BHMA A156.5
.1 Acceptable products: to match Owners standard cylinder.
.2 IC Core to match existing School hardware & keying System

2.8 Architectural Door Trim. Armor and kick plates shall comply with ANSI/BHMA A156.6
.1 Type J101 and J102: Bevelled edges. 1.27mm material thickness. Type 304 stainless steel.
Height as specified x length to suit.
a. Acceptable product: Kick plates listed are by Hager Companies

2.9 Floor / Wall stops shall comply with ANSI/BHMA A156.16
.1 Cast brass or bronze material except where specified zinc die cast..
.2 Rear portion of heavy duty one piece cast floor stops shall have a stud to prevent rotation.
Rise to suit door undercut.
.3 Wall stops shall have a metal back plate secured to wall with (2) screws and shields.
Housing and rubber insert fits over back plate and is secured with inconspicuous set screw.
No screws or holes shall be visible on face of bumper.

a. Acceptable product: Floor and wall stops listed are by Hager Companies
HA 1119 for metal doors
HA 1118 for wood doors
Finish 619
Gallery Specialty hardware Ltd. No.209

2.10 Guide & Guide track for Pocket Doors:
.1 Sliding Aluminum Track C104
.2 Quick Release Hanger C-911

.3 Guide Track and roller guide C914 & C913
.4 Stop and catch: CDC-911 Track mounted

2.11 Sliding & Guide track for Sliding Doors:
.1 Sliding Track C108
.2 Quick Release Hanger C-911
.3 Guide Track and roller guide C914 & C913
.4 Stop and catch: CDC-911 Track mounted
.5 Fascia & Side channels

2.12 Smoke gasket shall comply with ANSI/BHMA A156.22
.1 Perimeter seal consists of a tear drop shaped 12.7mm wide x 6.35mm self adhesive silicone at jambs and head.
a. Acceptable product: Gasket listed is by K.N Crowder

2.13 Door Lite Kit shall comply with ANSI/BHMA A156.6, A156.18, A156.20
Acceptable product by Anemostat LoPro, 40-60 Minute Fire Rated

2.14 Thresholds:
.1 Supply extruded aluminum thresholds to ensure the sweep or door bottom makes full contact. Supply thermally broken thresholds for all exterior door openings.

.2 Threshold height shall not exceed 13mm for barrier-free path of travel.

2.15 PULLS AND PLATES

1. Supply door trim to CAN/CGSB 69.22, designated by letter J as listed in hardware schedule. Supply pulls with back to back (BTB) or through bolt mounting as required. When push plates are listed with door pulls, install the push plate to conceal
the through bolt.

2. All kickplates, push plates, and bumper plates must have all sides beveled and corners rounded to
ensure no sharp edges. Supply double-sided tape for adhesive-mount.

3. Kick plates will be minimum 0.127mm thick unless listed otherwise; size to be door width less 35mm
for single door, and less 25mm for pairs of doors. Heights as scheduled.

2.16 ELECTRONIC HARDWARE

.1 Keyswitch
.1 Keyswitch housing to be cast zinc to protect against vandalism, housing to provide a concealed rear mounting attachment which cannot be compromised when the cylinder is attached with a set screw. Standard stainless steel cover plate.

.2 Electric Strikes
.1 ANSI/BHMA-A156.31, Grade 1. Electric strikes to be ULC listed burglary-resistant and Electric strike for fire doors and frames; "A" label for single doors and "B" label for double doors. Electric strikes to be stainless steel construction, non-handed available in 12V or 24V AC or DC with continuous duty solenoid and accept 19mm throw latchbolts. Strike box to be adjustable to compensate for any misalignment of the door or frame with two piece plug connector for ease of installation.

Contractor to carry FMC for Card reader and security system for this project:
.1 Door Electric Strike, Universal, 12/24 VDC: HES-9600-630
.2 Reader Access Control Module: DSC-PC4820
.3 AWI SR-2400, GRAY, AWID LOGO, MULTI PROT: APL-SR2400GRMP
.4 SQUARE BOX: IBVBC52151K

.3 Magnetic Locks

.1 ANSI/BHMA-A156.23, Grade 1. Electromagnetic locks to be field selectable dual voltage 12/24VDC with a minimum holding force of 7,339N, residual magnetism within one second of 17.8N maximum and inductive kickback not to exceed 53 volts peak. Electromagnetic locks to be powered by filtered and regulated power supply. Electromagnetic locks used on labeled fire door assemblies shall be ULC listed as auxiliary locks, rated for A-label openings. Housings shall not project more than 45mm into the door opening. Electromagnetic locks to be furnished with an adjustable mounting bracket for accurate Installation and furnished with an integral circuit board with terminal strip for accurate wiring.

.4 Power Supplies

.1 Power supplies to be Underwriter Laboratories (UL) listed for general-purpose use tested to meet UL1012 specifications. Power supplies to have 12/24V DC field selectable output voltage with output current of 3 amps at 12V DC and 2 amps at 24V DC with supply output voltage filtered and regulated. The power supply to be inherently modular by design for ease of installation and to provide flexibility for future system modifications when necessary.

.5 Include power supplies that are compatible with magnetic lock and have a NFPA-101 fire alarm release. Reset key switch will be centrally located and will re-arm all the magnetic locks in the building.

.6 Access control will be frame-mounted stand-alone keypad complete with adjustable time delay. Units will have all functions keypad programmable, 12 or 24 volt AC/DC with a code length of 3-6 digits.

.7 Electronic hardware will be supplied and installed by this section, including all low voltage Device wiring.

2.17 DOOR OPERATORS AND CONTROLS

1. Heavy Duty Electric Operator (Pull Side Mount): to CAN/CGSB 69.26 and ANSI/BHMA-A156.10 &19, non-sized (1-4) and non-handed cylinder body to have 38mm piston diameter with 17.5mm double heat-treated shaft. Track arm to have single lever arm with low friction track and roller assembly. Power operator to include:

.1 Provisions for separate conduits to carry high and low voltage wiring in compliance with the National Electrical code; Power assist and low energy power operated doors: to CAN/CGSB 69.35

.2 Second Chance Function: program within the on-board computer monitoring resistance during opening cycle. If resistance is present operator pauses for a few seconds, then attempts to open door again. If resistance does not exist door will open normally. However if resistance still exists, door will pause and the unit will time out and door will close.

.3 Breakaway Drive System: System within the motor/clutch assembly. If the door is forced Closed while in the opening cycle, the clutch slips preventing damage to the operator, door and frame.

.4 Soft Start Motor Control: required for controlled start once actuator is depressed to extend The service life of all drives components.

.5 Built in Power Supply to deliver 12V and 24V outputs up to a maximum of 1.0 amp.

.6 Certified by ULC for use on labeled doors, Auxiliary locks and associated products: to CAN/CGSB 69.21, designated by letter E and numeral identifiers

.7 Independent adjustments for all electrically controlled functions within controller module.

.8 Automatic swing door operators, self contained, surface mounted system. Besam SW-200 for single and pair doors where indicated

.9 Operator Housing: The operator shall be completely contained in a 150 mm x 150 mm extruded aluminum housing. The housing shall extend across entire door opening. Where located on a leaf of a double door, it shall extend over both doors. All aluminum sections shall be of 6006-T6 alloy and shall have a minimum wall thickness of 0.156". All exposed surfaces shall be finished to match existing door frames. The operator housing shall provide a seal against dust, dirt and moisture. Operator housing shall extend the full width of the door frames. Finish: anodized aluminum

.10 Electrical Motor: Electric motor shall be minimum 1/8 horsepower, 120 V and shall be equipped standard with a built in thermal overload protection and shall not exceed 5 amps.

.11 Operator Assembly: Operator shall be non-handed and the power transmission shall be servo unit type with one moving part. Helical/mesh or chain driven system will not be accepted.
Mount operators on either push or pull sides of doors as required to place them inside rooms. Actuation of operators by card readers and motion detectors.

.12 Electric Control: A self-contained, 100% solid-state integrated circuit shall control the operation and switching of the swing door power operator. The electronic control shall provide low voltage power supply for all means of operation. No external or auxiliary low voltage source shall be allowed. The control shall include time delay (adjustable between 1 to 60 seconds) for normal cycle. Plug-in relays, resistors, contracts, etc., will not be accepted.
Control boxes: complete with electric strike relay.

.13 The automatic door operator shall be equipped with following features for each one in order to keep locked when occupied for individual/universal washrooms:
ITI 200S, MP Relay and OWL (occupied when lit), push to Lock/Unlock from inside.

2. Push Buttons

.1 Wall Type

.1 Wall plate switch to be hard-wired either 12V DC or 24V DC actuator with round, stainless steel touch plate in either 114mm or 152mm diameters or 4 ½" square. Engraved blue filled handicap symbol conforms to most accessibility codes. Units to include heavy grade components for vandal resistant mounting and weather resistant switch standard.

.2 Universal washrooms: Flush mount aura™ illuminated push plate switch system, advanced logic control, 4 1/2" illuminated push plate switch (push to lock), with sign, 4 1/2" illuminated push plate (wheelchair symbol & push to open) with sign, magnetic door contact.

3. Low energy door operators will be supplied and installed by factory trained installers. Hardware supplier will coordinate the installation of the door operators and include the cost of labour for this work.

2.18 CONTROLS

.1 Universal washrooms to be equipped with: CX-EMF-2 Advanced Logic Control, CM-45/855SE1 Flush 4 ½" 'Push To Lock' Illuminated Push Plate Switch with sign, CM-45/455SE1 Flush 4 ½" Illuminated Wheelchair & 'Push to Open' Push Plate with sign, CM-45/4 'Push to Open' 4-1/2" square Push Plate Switch, CM-55CBL Flush square mounting box for CM-45/4, CM-450R/12 'PRESS FOR EMERGENCY ASSISTANCE' mushroom push button, CX-MDA Magnetic Door Contact, CM-AF501SO LED annunciator with adjustable sounder, CM-AF141SO LED Dome light with adjustable sounder AND CM- SE21 white panel sign (6" X 10 5/8" (152mm X 270mm).

2.19 Hardware List

.1 For this project: *Refer to attached Hardware schedule*
Hollow Metal Doors
Overhead Door Closer/w Hold Open
Wall/Floor Stops
Push Plates Tape Applied
Automatic Door Operator & Push Buttons
Door Lite Kit
Hinges
Lockset
Door Gasket
Keying
Kickplate
Cylinder
Card Reader & Electric Strike
Aiphone System
Sliding track, Guide track & Guide for Sliding and Pocket Doors
Aluminum Thresholds

Note: Contractor to grout closer cement boxes into floor where applied

2.2.2 FINISHES

Materials and Finishes shall comply with ANSI/BHMA A156.18

Hinges	619/630	Satin Nickel Plated / Satin Stainless Steel
Locksets	626	Satin Chromium plated
Cylinders	630	Satin Stainless Steel
Door Closers	689	Powder Coat Aluminum
Floor/ Wall Stops	619	Satin Nickel Plated
Push Plate	630	Satin Stainless Steel
Kick Plate	630	Satin Stainless Steel

3 EXECUTION

3.1 EXAMINATION

1. Ensure that doors and frames are properly prepared and reinforced to receive finish hardware prior to installation.

.2. Ensure that door frames and finished floor are sufficiently plumb and level to permit proper engagement and operation of hardware.

.3. Submit to Consultant in writing a list of deficiencies determined as part of inspection required in 3.3.1 and 3.3.2, prior to installation of finished hardware.

3.2 INSTALLATION

.1 Install hardware to ANSI/DHI-A115.1G.

2. Install hardware at mounting heights as specified in the manufacturers templates or specific references in approved hardware schedule or approved elevation drawings. Where mounting height is not otherwise specified herein, install hardware at the following mounting heights:

.1 Locksets: 1015mm.
.2 Exit device: 1015mm.
.3 Push/Pull: 1065mm.
.4 Deadlock: 1200mm.
.3 Install hardware using only manufacturer supplied and approved fasteners in strict adherence With manufacturers published installation instructions.

.4 Ensure that all locksets / latchsets / deadlocks are of the correct hand before installation to ensure that the cylinder is in the correct position. Handing is part of installation procedure.

.5 Ensure that all exit devices are of the correct hand and adjust device cam for proper outside trim function prior to installation. Handing is part of installation procedure.

.6 Follow all manufactures installation instructions. Adjustment is inclusive of spring power, closing speed, latching speed and back-check at the time of installation.

.7 Delayed action door closers are to be adjusted to forty (40) second delay for handicapped accessibility and movement of materials. Time period to be approved by Owner.

.8 Install head seal prior to installation of parallel arm mounted door closers and push side mounted door stops/holders.

.9 Counter sink through bolt of door pull under push plate during installation.

.10 Mount all closers, automatic operators and hold-open devices with through bolts, as indicated in the finish hardware schedule.

.11 Where door stop contacts door pulls, mount stop to strike bottom of pull.

.12 Remove construction locks when directed by Consultant; install permanent cores and check operation of all locks.

.13 Other trades installing hardware must follow all manufacturers' instructions including door closer adjustment, handing of locksets as required, and degree of door swing.

.14 Hardware Distributor will include all labour to terminate secondary low voltage wire runs at all door control devices supplied by this section, including but not limited to; door operators, magnetic locks, push button code entry units (keypads), request to exit switches, electric strikes and any associated electrical equipment. Ensure system is tested and complete for Owner's use. Provide staff training for push button code system (keypads) including all programming function and maintenance.

15.Hardware Distributor will instruct the installer as to how various newer or unusual items that are required to be installed for proper performance.

3.3 FIELD QUALITY CONTROL

1. Perform bi-monthly on-site inspections during hardware installation and provide inspection reports listing progress of work, unacceptable work and corrective measures. Repair or replace as directed by the Consultant.

.2 Upon completion of hardware installation, arrange with the Owner to instruct the Owner's personnel in the proper operation, adjustment, and maintenance of all finish hardware supplied under this Contract.

.3 Before completion of the Work but after finish hardware installation has been completed, submit a certificate to the Consultant stating that final inspection has been made and that all hardware has been checked for installation and operation by representatives of both the Hardware Supplier and the Hardware Distributor, and that operation and maintenance of all hardware have been fully demonstrated to the satisfaction of the Owner's personnel.

3.4 ADJUSTING AND CLEANING

1. Check and make final adjustments to each operating item of hardware on each door to ensure proper operation and function. Fire doors are required to close and latch automatically from an open position

.2. Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, Safety, fire and smoke rated doors and for weather tight closure.

2. All hardware to be left clean and free of disfigurements.

3. Check all locked doors against approved keying schedule.

3.5 PROTECTION

1. Protect hardware from damage during construction period by removing and reinstalling or where necessary, using temporary hardware to maintain finish in new condition and maintain manufacturers warranty.

END OF SECTION

Trillium Architectural Products Ltd.

52 Prince Andrew Place
Toronto, ON, Canada, M3C 2H4
416-391-5555 Phone
416-391-5065 Fax
www.trillium.group

Project#: P000045928

SCHEDULE OF FINISHING HARDWARE
FOR
EEC STE CROIX
351 LAFONTAINE RD
TINY, ON

PROJECT CONSULTANT: GEOFF MAINPRIZE, AHC/CDC gmainprize@trillium.group
HARDWARE DETAILER: JOE BORROMEO jborromeo@trillium.group

Start Date: 04-Jun-2018

Revised:	10-Mar-2020	Revised Pre tender hardware schedule
	21-Feb-2020	Revised Pre tender hardware schedule
	08-Jan-2020	Revised Pre tender hardware schedule
	17-Dec-2019	Revised Pre tender hardware schedule
	06-May-2019	Revised pre tender hardware schedule
	01-May-2019	Revised pre Tender Hardware Schedule
	30-Apr-2019	Revised pre Tender Hardware Schedule
	03-Jul-2018	Revised pre tender hardware schedule
	27-Jun-2018	Revised pre tender hardware schedule

Finish Code	BMHA Code	Description
C10	612	Satin Bronze, Clear Coated
C10B*	613*	Dark Oxidized Satin Bronze, Oil Rubbed*
C14	618	Bright Nickel Plated, Clear Coated
C15	619	Satin Nickel Plated, Clear Coated
C19	622	Flat Black Coated
C20	623	Light Oxidized Statuary Bronze, Clear Coated
C20	690	Dark Bronze Painted
C20A	624	Dark Oxidized Statuary Bronze, Clear Coated
C26	625	Bright Chromium Plated
C26D	626	Satin Chromium Plated
C27	627	Satin Aluminium, Clear Coated
C28 or AL	628	Satin Aluminium, Clear Anodized
C28 or AL	689	Aluminium Painted
C2G	603	Zinc Plated
C3	605	Bright Brass, Clear Coated
C32	629	Bright Stainless Steel
C32D	630	Satin Stainless Steel
C4	606	Satin Brass, Clear Coated
C5	609	Satin Brass, Blackened, Satin Relieved, Clear Coated
C9	611	Bright Bronze, Clear Coated
CP	600	Primed For Painting
EAD	EAD	Brass Painted
EB	EB	Dark Bronze Painted
ED	ED	Black Painted
EN	EN	Aluminium Painted
K29	K29	Black Anodized Aluminium
K40	K40	Dark Bronze Aluminium

*This finish will vary in colour from item to item and will wear according to use.

Note: The base material (brass, bronze, steel, aluminium) determines which finishes are available (eg, aluminium finishes are only available on products made of aluminium)

1 SGL DOOR D1 **PRESCHOOL ROOM** **RH**

965mm x 2030mm x 45mm

DOOR TYPE: FIRELITE VISION PANEL

WOOD DOOR / HOLLOW METAL FRAME

3/4 HR FIRE LABEL

3	EACH	HINGE	MPB 79 4.5 X 4 C26D
1	EACH	CLASSROOM LOCKSET - DBL CYL.	CYLINDRICAL ND75PD SPA 626
1	EACH	CYLINDER	BASE BUILDING KEYWAY
1	EACH	KEYING	GMK TO BUILDING SYSTEM
1	EACH	DOOR CLOSER	1431 UO EN - SURFACE MOUNTED
1	EACH	KICKPLATE	GSH80A 8in X 36.5in TAPE C32D
1	EACH	KICKPLATE	GSH80A 8in X 37in TAPE C32D
1	EACH	FLOOR STOP	GSH209 C26D
18	FEET	DOOR GASKET	S88 BLACK

1 SGL DOOR D2 **CORRIDOR TO NEW TODDLER RM120** **LH**

965mm x 2030mm x 45mm

DOOR TYPE: FIRELITE VISION PANEL

WOOD DOOR / HOLLOW METAL FRAME

3/4 HR Fire Label

3	EACH	HINGE	MPB 79 4.5 X 4 C26D
1	EACH	CLASSROOM LOCKSET - DBL CYL.	CYLINDRICAL ND75PD SPA 626
2	EACH	CYLINDER	BASE BUILDING KEYWAY
2	EACH	KEYING	GMK TO BUILDING SYSTEM
1	EACH	DOOR CLOSER	1431 UO EN - SURFACE MOUNTED
1	EACH	KICKPLATE	GSH80A 8in X 36.5in TAPE C32D
1	EACH	KICKPLATE	GSH80A 8in X 37in TAPE C32D
1	EACH	FLOOR STOP	GSH 209 C26D
18	FEET	DOOR GASKET	S88 BLACK

1 SGL DOOR D3 **NEW DAYCARE OFFICE 121A** **RH**

965mm x 2030mm x 45mm

DOOR TYPE: FIRELITE VISION PANEL

WOOD DOOR / HOLLOW METAL FRAME

3/4 HR Fire Label

3	EACH	HINGE	MPB 79 4.5 X 4 C26D
1	EACH	CLASSROOM LOCKSET - DBL CYL.	CYLINDRICAL ND75PD SPA 626
2	EACH	CYLINDER	BASE BUILDING KEYWAY
2	EACH	KEYING	GMK TO BUILDING SYSTEM
1	EACH	DOOR CLOSER	1431 UO EN - SURFACE MOUNTED
1	EACH	KICKPLATE	GSH80A 8in X 36.5in TAPE C32D
1	EACH	KICKPLATE	GSH80A 8in X 37in TAPE C32D
1	EACH	FLOOR STOP	GSH 209 C26D
18	FEET	DOOR GASKET	S88 BLACK

WOODEN GATE D4

NOTE:

ALL DOOR AND HARDWARE WOODEN GATE SUPPLIER EXCEPT ADD THE FOLLOWING;

1	EACH	PIANO HINGE	3in X 72in NP
1	EACH	SURFACE BOLT - 6in	F779-6 C15
2	EACH	FINGER GUARD	NG-2248A 1067mm

EXISTING PAIR OF DOORS D5 **ENTRANCE**

EXISTING HM DOOR / EXISTING HM FRAME

NOTE:

REUSE EXISTING DOOR, FRAME AND HARDWARE AND ADD THE FOLLOWING; Contractor to verify existing, shall re prep, patch and fill door/frame if required.

1	EACH	CARD READER BY OTHERS	CARD READER BY OTHERS
1	EACH	ELECTRIC STRIKE	9600 12/24VDC 630
1	EACH	DOOR CLOSER	4040XP RW/PA 689

NOTE:

All electrical rough-in, including low voltage wire, cable, 120V power supply, conduit, back boxes and blocking not included, by others.

1 POCKET DOOR D6 **NEW WASHROOM 121D**

1050mm x 2030mm x 45mm

WOOD DOOR / FRAMELESS

2	EACH HANGERS	C911
1	EACH SLIDING TRACK	C104 84in ALUMINUM
1	EACH GUIDE TRACK	C914 X 42IN
1	EACH GUIDE	C913
2	EACH RICHELIEU RECESSED PULL	BP8971128195
2	EACH STOP AND CATCH	CDC-911 TRACK MOUNTED

1 POCKET DOOR D7 **NEW WASHROOM 121D**

1050mm x 2030mm x 45mm

WOOD DOOR / FRAMELESS

2	EACH HANGERS	C911
1	EACH SLIDING TRACK	C104 84in ALUMINUM
1	EACH GUIDE TRACK	C914 X 42IN
1	EACH GUIDE	C913
2	EACH RICHELIEU RECESSED PULL	BP8971128195
2	EACH STOP AND CATCH	CDC-911 TRACK MOUNTED

EXISTING PAIR OF DOORS D8 **ENTRANCE**

EXISTING HM DOOR / EXISTING HM FRAME

NOTE:

REUSE EXISTING DOOR, FRAME AND HARDWARE AND ADD THE FOLLOWING;

1	EACH CARD READER BY OTHERS	CARD READER BY OTHERS
1	EACH ELECTRIC STRIKE	9600 12/24VDC 630
1	EACH DOOR CLOSER	4040XP RW/PA 689

NOTE:

Contractor to verify existing, shall re prep, patch and fill door/frame if required.

EXISTING DOOR D9 **PRESCHOOL ROOM**

EXISTING HM DOOR / EXISTING HM FRAME

NOTE:

REUSE EXISTING DOOR, FRAME AND HARDWARE AND ADD THE FOLLOWING;

1 EACH DOOR CLOSER 4040XP SHCUSH 689

NOTE:

Contractor to verify existing, shall re prep, patch and fill door/frame if required.

1 GENERAL

1.1 Work Included:

a. Supply glazing units to other Sections.

b. Glaze hollow metal screens, doors and wood doors.

c. Mirrors.

1.2 Related Work Specified Elsewhere:

a. Hollow metal frames and screens supplied by Section 08 11 00, Standard Steel Doors and Frames, and installed by Section 06 10 00, Finish Carpentry;

b. Metal doors installed by Section 06 10 00, Finish Carpentry, glazed by this Section;

c. Sealants and sealing shall conform to Section 07 92 10, Joint Sealing;

1.3 References

1.3.1 American National Standards Institute (ANSI).

ANSI/ASTM E330-[02], Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

1.3.2 American Society for Testing and Materials International, (ASTM).

ASTM C542-[94(1999)], Specification for Lock-Strip Gaskets.

ASTM D790-[02], Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

ASTM D1003-[00], Test Method for Haze and Luminous Transmittance of Plastics.

ASTM D1929-[96(R2001)e1], Test Method for Determining Ignition Temperature of Plastics.

ASTM D2240-[02b], Test Method for Rubber Property - Durometer Hardness.

ASTM E84-[01], Test Method for Surface Burning Characteristics of Building Materials.

ASTM F1233-[98], Test Method for Security Glazing Materials and Systems.

1.3.3 Canadian General Standards Board (CGSB).

CAN/CGSB-12.1-[M90], Tempered or Laminated Safety Glass.

CAN/CGSB-12.2-[M91], Flat, Clear Sheet Glass.

CAN/CGSB-12.3-[M91], Flat, Clear Float Glass.

CAN/CGSB-12.4-[M91], Heat Absorbing Glass.

CAN/CGSB-12.5-[M86], Mirrors, Silvered.

CAN/CGSB-12.6-[M91], Transparent (One-Way) Mirrors.

CAN/CGSB-12.8-[97], Insulating Glass Units.

CAN/CGSB-12.9-[M91], Spandrel Glass.

CAN/CGSB-12.10-[M76], Glass, Light and Heat Reflecting.

CAN/CGSB-12.11-[M90], Wired Safety Glass.

CAN/CGSB-12.12-[M90], Plastic Safety Glazing.

CAN/CGSB-12.13-[M91], Patterned Glass.

1.3.4 Canadian Standards Association (CSA International).

CSA A440.2-[98], Energy Performance Evaluation of Windows and Sliding Glass Doors.

CSA Certification Program for Windows and Doors [2000].

1.3.5 Environmental Choice Program (ECP).

CCD-045-[95], Sealants and Caulking.

1.3.6 Flat Glass Manufacturers Association (FGMA).

FGMA Glazing Manual - [1997].

1.3.7 Laminators Safety Glass Association (LSGA).

LSGA Laminated Glass Design Guide [2000].

1.4 Quality Assurance

1.4.1 Conform to the requirements of the following:

a. Glazing Recommendations for Sealed Insulating Glass Units, published by the Insulated Glass Manufacturers Association of Canada (IGMAC).

b. Glazing Sealing Systems Manual, published by the Flat Glass Marketing Association, U.S.A.

c. NFPA 80, Fire Doors and Windows, published by National Fire Protection Association Inc.

1.5 Product, Delivery, Storage, and Handling

1.5.1 Provide adequate protection to glass, glazing units, mirrors and other materials until received by Sections installing same or until installation completed by this Section. Provide protection of mirrors until completion of the Work. Use strippable coatings if necessary.

1.6 Job Conditions

16.1 Co-ordination with Other Trades:

Co-ordinate with work of related trades into which glass of this Section will be installed. Exchange shop drawings with such trades, and ensure that conditions are suitable to accept glazing while meeting requirements of this Specification.

1.7 Warranty

Warrant mirrors against spoilage of silvering for **ten years**.

2 PRODUCTS

2.1 Materials

2.1.1 Standard Glass: Float glass, min. 6mm thick, conforming to CAN2-12.3-M.

2.1.2 Tempered Glass: 6 mm thick Tempered (or clear as noted) with Low E. U value: 1.44. SHG: 0.30 (solar head gain co-ef). VT: 0.61 (visible transmission).

2.1.3 FireLite Glass: Tempered, clear fire rated glass fabricated with FireLite, standard quality, by Percision Glass Services Inc., Thicknesses 8mm. Sandblasted with clear protective coat where indicated in schedules.

2.1.4 Insulated Glazing Units

Exterior Light – 6 mm thick, solar bronze
Interior Light – 6 mm thick clear

Spacer to be 13 mm low conductivity polyiso butylene.
Provide low E-3, and Argon filled airspace.

2.1.5 Wired Glass: 6mm thick, clear Georgian wired glass, conforming to CAN2-12.11-M, Type I (polished both sides-transparent), Style 3 (square).

2.1.6 Bullet Resistant Glass: 10 mm Pyrostop Bullet Resistant Glass by Pilkington complete with cutout for speaker.

2.1.7 Insulated Glazing Units

Exterior Light – 6 mm thick, solar bronze
Interior Light – 6 mm thick clear
Spacer to be 13 mm low conductivity polyiso butylene.
Provide low E-3, and Argon filled airspace.

2.1.8 Mirrors: Silvered, 6mm thick, conforming to CAN2-12.5-M, Type 1A polished float, polished edges. guaranteed for 10 years against silver spoilage.

2.1.9 Joint Sealers in conformance with Section 07900:

a. Pre-Shim Tape: Sealer Type 10.
b. Glazing Gasket: Sealer Type 11.
c. Sealant for Exterior Glazing: Sealer Type 8.
d. Plain Glazing Tape: Sealer Type 9.
e. Sealant and Tape for Plastic Glazing: as recommended by manufacturer.

2.1.10 Setting Blocks:

a. Setting Blocks for Fire-Rated Screens and Doors: High density, fully compressed, asbestos board, full length of glazed opening by width to span from fixed stop to other side of glass, thickness to suit glass, bite and opening.
b. Setting Blocks for Non-Fire-Rated Screen, Doors and Windows: EDPM 90 durometer, 100mm long by width to span from fixed stop to other side of glass, thickness to suit glass, bite and opening.

2.1.11 Fasteners: Stainless steel.

2.2 Fabrication

2.2.1 Label each light of glass with the registered name of the product and the weight and quality of the glass.

2.2.2 Job check dimensions before cutting materials.

2.2.3 Minimum bite or lap of glass on stops and rabbets as recommended by glass manufacturer.

2.2.4 Furnish glass to sizes and thickness as indicated on drawings or noted in each Section.

3.0 EXECUTION

3.1 Preparation

3.1.1 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.

3.2 Installation

3.2.1 Windows: Glaze in conformance with IGMAC Detail entitled 'Pre-Shim Tape Exterior, Series H2', except omit heel bead.

3.2.2 Interior Doors and Screens: Glaze in conformance with FGMA Setting No. 43 (setting blocks, plain glazing tape both sides, one removable stop).

3.2.3 Install wired glass with wires parallel to sides of opening.

3.2.4 Glaze using compound, or glazing tapes, or gaskets to secure glass in frame and render airtight and vibration free.

3.2.5 Replace loose stops to their original position, tighten all screws.

3.2.6 Mirrors
Provide 1 20"W x 30"H rectangular mirror above each single vanity. Provide 1 rectangular mirror 30" high by width of vanity for vanities with multiple sinks.
Mounting height: set bottom of mirror slightly above edge of splashback, using tamperproof fastenings.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 07 90 00 - Joint Sealers.

.2 Section 23: Louvres connected to ductwork.

.3 Section 26 : Electrical power supply.

1.2 REFERENCES

.1 Aluminum Association

.1 Designation System for Aluminum Finishes - [1997].

.2 American Society for Testing and Materials (ASTM)

.1 ASTM A 167-[94], Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM A 366M-[91(R1993)], Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.

.3 ASTM A 653/A653 M-[90], Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.4 ASTM B 32-[95], Specification for Solder Metal.

.5 ASTM B 370-[92], Specification for Copper Sheet and Strip for Building Construction.

.6 ASTM D 523-[89(1993)], Test Method for Specular Gloss.

.7 ASTM D 822-[89], Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.

.3 Canadian General Standards Board (CGSB)

.1 CGSB 1-GP-121M-[93], Vinyl, Pretreatment Coating for Metals (Vinyl Wash Primer).

.4 CAN/CGSB-93.1-[M85], Sheet Aluminum Alloy, Prefinished, Residential.

1.3 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section [01 33 00 - Submittal Procedures].

.2 Indicate fabrication and erection details, including anchorage, accessories, and finishes.

1.4 SAMPLES

.1 Submit samples in accordance with Section [01 33 00 - Submittal Procedures].

.2 Submit duplicate samples of [each type of] louvre [and vent] showing colour and finish.

.3 Show frame detail, screening and finish.

□

1.5 CLOSEOUT SUBMITTALS

.1 Provide operation and maintenance data for manual or motorized operated louvres for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

Part 2 Products

2.1 MATERIALS

.1 Aluminum sheet: mill finish plain utility sheet.

.2 Aluminum extrusions: Aluminum Association alloy AA6063-T5.

.3 Nails and fasteners: same material as fabricated items.

.4 Gaskets: vinyl.

.5 Primer: to CGSB 1-GP-121M for aluminum surfaces.

.6 Screens

.1 Insect screens: 0.3 mm diameter aluminum wire mesh with 60% free area, secured to aluminum frame.

.2 Birdscreens: crimped aluminum wire cloth secured to 2 mm thick extruded aluminum frame mitered at corners and secured with corner locks

.7 Extruded aluminum louvres.

.1 Construct louvres from aluminum extrusions of minimum 3 mm thickness to sizes and shapes indicated.

.2 Arrange blades, mullions and frame extrusions as indicated.

.3 Install concealed vertical stiffeners spaced to meet required loads.

.4 Complete louvre assembly to have 50 % free area.

.5 Blade style: weather resistant

.6 Frame depth: to match to wall depth

.8 Door louvres.

.1 Construct door louvres from aluminum extrusions. Minimum free area of 35 %. Provide fasteners to suit louvre material.

.2 Use standard blades.

.3 Provide separate adjustable trim member for clamping louvre in opening.

.4 Miter frame and trim members at corners and secure rigidly with corner brackets.

.5 Secure interior frame with countersunk screws.

.9 Brick vents.

.1 Construct brick vents from aluminum extrusions minimum 3 mm thick with 6 mm structural ribs and channel profile. Sizes of brick vents as indicated. Minimum free area of 30 %.

.2 Attach insect screen to interior face of vent.

.3 Provide weepholes at 125 mm oc.

□

.4 Apply protective masking cover on exposed surfaces before shipping.

.5 Acceptable Product: McGill Brick Vents BV145 or approved equal

.10 Louvred penthouses.

.1 Construct penthouse louvres from extruded aluminum stormproof blades of minimum 3 mm thickness.

.2 Continuously heliarc weld at corners sills, blades and head members. Support by structural aluminum angles on interior as indicated.

.3 Provide one piece weatherproof roof of 2 mm thick aluminum sheet reinforced with 50 x 50 x 6 mm aluminum angles at 1200 mm oc. Insulate underside of roof with minimum 6mm thick sound deadening and anti-condensation coating.

2.2 FINISHES

.1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.

.1 Conform to AAMA605.2 fluoropolymer coating to colour as selected by consultant.

.2 Colour to match *existing window frames*

.2 Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.

Part 3 Execution

3.1 INSTALLATION

.1 Install louvres and vents where indicated.

.2 Set adjustable louvre blades for uniform alignment in open and closed positions.

.3 Adjust louvres so moving parts operate smoothly.

.4 Attach bird, insect screen to inside face of louvre or vent.

.5 Repair damage to louvres and vents to match original finish.

END OF SECTION

□

1 GENERAL

1.1 Section Includes

1.1.1 Metal stud wall framing and channel ceiling framing.

1.1.2 Gypsum board, including moisture-resistant, fire-rated and non-rated types.

1.1.3 Gypsum sheathing and soffit board.

1.1.4 Tile backer board.

1.1.5 Acoustic insulation and sealant.

1.2 Related Sections

1.2.1 Section 05 41 00 – Lightweight Steel Framing: structural metal stud framing.

1.2.2 Section 06 10 00 – Rough Carpentry: wood blocking.

1.2.3 Section 07 21 00 – Building Insulation: acoustic insulation.

1.2.4 Section 07 90 00 – Joint Sealers: acoustic sealant.

1.2.5 Section 08 10 00 – Standard Steel Frames: hollow metal frames.

1.2.6 Section 08 31 00 – Access Doors and Panels: access panels framed in gypsum board partitions.

1.2.7 Section 09 90 00 – Painting & Finishing: site finishing, and latex seal coat.

1.3 Unit Prices

1.3.1 Provide unit prices to requirements of Section 01 20 00.

1.3.2 Base unit prices on gypsum board installed, taped and ready for finish.

1.3.3 Do not include the supply and installation of metal framing and other support.

1.4 References

1.4.1 ASTM C36/C36M-01: Standard Specification for Gypsum Wallboard.

1.4.2 ASTM C442/C442M-01: Standard Specification for Gypsum Backing Board, Gypsum Coreboard, and gypsum Shaftliner Board.

1.4.3 ASTM C475-01: Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

1.4.4 ASTM C514-01: Standard Specification for Nails for the Application of Gypsum Board.

1.4.5 ASTM C630/C630M-01:Standard Specification for Water-Resistant Gypsum Backing Board.

1.4.6 ASTM C645-00: Standard specification for Nonstructural Steel Framing Members.

1.4.7 ASTM C840-01: Standard Specification for Application and Finishing of Gypsum Board.

1.4.8 ASTM C954-00: Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in thickness.

1.4.9 ASTM C1047-99: Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

1.4.10 ASTM C1178/C1178M-01: Standard Specification for Glass Mat Water-Resistant Gypsum Backing Panel.

1.4.11 ASTM C1278/C1278M-01: Standard Specification for Fiber-Reinforced Gypsum Panel.

1.4.12 ASTM C1280-99: Standard Specification for Application of Gypsum Sheathing.

1.4.13 Canadian Gypsum Company: Handbook of Drywall Construction.

1.4.14 CAN/CGSB-71.25-M88: Adhesive, for bonding Drywall to Wood Framing and Metal Studs.

1.4.15 Underwriters Laboratories of Canada: List of Equipment and Materials.

1.5 Quality Assurance

1.5.1 Applicators: company specializing in applying the work of this Section with a minimum of five years documented experience.

2 PRODUCTS

2.1 Manufacturers

2.1.1 Manufacturers of gypsum board having Product considered acceptable for use:
.1 BPB.
.2 Canada Gypsum Company.
.3 G-P Gypsum Corporation.

2.1.2 Manufacturers of gypsum-based tile backer board having Product considered acceptable for use:
.1 G-P Gypsum Corporation.

2.2 Framing Materials

2.2.1 Studs and Tracks: to ASTM C645, 0.55 mm thick galvanized sheet steel, ‘C’ shape, with serrated faces. Provide knock-outs for electrical trades.

2.2.2 Furring, Framing and Accessories: to ASTM C645, galvanized steel channel sections designed to perform their intended function.

2.3 Gypsum Board Materials

2.3.1 Gypsum Board: to ASTM C36; tapered edges, ivory faced.

2.3.2 Fire Rated Gypsum Board: to ASTM C36, Type X; tapered edges, ivory faced, ULC labeled.

2.3.3 Moisture Resistant Gypsum Backing Board: to ASTM C630; tapered edges, water resistant core covered in water repellent paper, green faced.

2.3.4 Gypsum Backing Board: to ASTM C442; 12.7 mm thick; square edges.

2.3.5 Gypsum Sheathing and Soffit Board: to ASTM C1278; water resistant type, 15 mm thick; square edges; Fibrerock Brand Aqua Tough Sheathing by Canadian Gypsum Company.

2.3.6 Gypsum Tile Backer Board: 12.7 mm thick, silicone treated gypsum core, glass fiber mesh facers both sides, copolymer coating on face side, square edges; to ASTM C1178; Dens-Shield by G-P Gypsum Corporation.

2.4 Accessories

2.4.1 Nail Fasteners: galvanized steel; to ASTM C514.

2.4.2 Steel Drill Screws: galvanized steel: to ASTM C954.

2.4.3 Adhesive: to CAN/CGSB-71.25-M.

2.4.4 Joint Materials: to ASTM C475; reinforcing tape, joint compound, adhesive, water, fasteners.

2.4.5 Corner Beads, Casing Beads and Edge Trim: to ASTM C1047; PVC type.

2.4.6 Acoustic Insulation: mineral fibre acoustical batt insulation, as specified under Section 07 21 00.

2.4.7 Sealant: acoustical sealant, as specified under Section 07 90 00.

3 EXECUTION

3.1 Examination

3.1.1 Verify that site conditions are ready to receive work.

3.1.2 Verify latex seal coat has been applied to ceiling surfaces designated t receive texture spray finish.

3.1.3 Commencement of installation implies acceptance of site conditions.

3.2 Metal Stud and Furring Installation

3.2.1 Install studding to requirements of ASTM C840, and manufacturer’s instructions.

3.2.2 Metal Stud Spacing: 400 mm OC.

3.2.3 Partition Heights: Full height to floor or roof construction above. Install additional bracing for partitions extending above ceiling.

3.2.4 Erect furring for direct attachment to concrete block walls and concrete walls, ceilings and soffits.

3.2.5 Install furring as required for fire resistance ratings indicated.

3.3. Ceiling Framing Installation

3.3.1 Install to ASTM C840, and manufacturer’s instructions.

3.3.2 Install ceiling framing independent of walls, columns, and above ceiling work.

3.3.3 Laterally brace entire suspension system.

3.4 Acoustical Accessories Installation

3.4.1 Install resilient channels at maximum 600 mm OC.

3.4.2 Place acoustical insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.

3.4.3 Install acoustical sealant within partitions to requirements of manufacturer's instructions.

3.5 Board Installation

3.5.1 Install gypsum board sheathing to ASTM C1280.

3.5.2 Install gypsum board to ASTM C840.

3.5.3 Install gypsum soffit board perpendicular to supports.

3.5.4 Screw fasten boards to furring or framing.

3.5.5 Double Layer Applications: Use gypsum backing board for first layer, place perpendicular to framing or furring members. Place second layer perpendicular to first layer.

3.5.6 Place corner beads at external corners. Place edge trim where gypsum board abuts dissimilar materials. Fasten with nail attachment, unless specified otherwise.

3.5.7 Finished work shall be plane and free from all depressions, ready to receive paint finish by others.

3.5.8 Provide bulkheads where changes of ceiling or height occur. Include all necessary channel framing, etc.

3.5.9 Provide all furring required by the drawings or any furring necessary to conceal exposed pipes or ducts. Refer to mechanical and electrical drawings to determine extent of work necessary.

3.6 Joint Treatment

3.6.1 Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

3.7 Control Joints

3.7.1 Provide control joints where indicated on Drawings and where gypsum board assemblies abut dissimilar construction.

3.7.2 Break continuity of gypsum board and framing system at control joints. Provide continuous metal control joint profile.

3.8 Relief Joints

3.8.1 Provide relief joints where indicated on the Drawings and where gypsum board assemblies abut dissimilar construction.

3.8.2 Stop gypsum board 6 mm from abutting construction at dissimilar building elements, unless indicated otherwise.

3.8.3 Provide a thermal break where gypsum board comes into contact with frames. Adhere self-adhering tape to casing bead and compress during installation of gypsum board.

3.8.4 Provide reveal mouldings where gypsum board ceilings meet curved wall surfaces, and where indicated on the Drawings.

END OF SECTION

1 GENERAL

1.1 Instructions

1.1.1 The Instructions to Bidders, the General Conditions of CCDC 2, 2008 Supplementary General Conditions and all Sections of Division 1 apply to and form part of this Section of the Specifications.

1.1.2 Report in writing to the General Contractor any defects of surfaces or work prepared by other Trades which affect the quality or dimensions of this Contractor's work. Commencement of this Contractor's work implies complete acceptance of all work by other Trades.

1.2 Intent

1.2.1 Provide all articles, labour, materials, equipment, transportation, hoisting and incidentals noted, specified or required, to complete the work of this Section.

1.3 Related Sections

Masonry Walls	Section 04 20 00
Drywall	Section 09 25 00
Plumbing	Division 22
Joint Sealing	Section 07 92 00

1.4 Section Includes

1.4.1 Provide all Ceramic Tile and required accessories as indicated on the drawings, room finish schedule, and colour schedule.

1.5 Samples

1.5.1 Submit samples of all tiles in colours and/or types specified for review by the Consultant.

1.6 Rejections

1.6.1 Defective materials or quality of work whenever found at any time prior to acceptance of the work shall be rejected regardless of previous inspection. Inspection will not relieve responsibility, but is a precaution against oversight and error.

1.6.2 Remove and replace defective materials and work of other trades affected by this replacement, at no additional cost to the Owner.

1.7 Performance

1.7.1 Install tiles to comply with ANSI A 108.5 (80% uniform bonding mortar contact between the tile and the substrate. 95% uniform bonding mortar contact for exterior application).

1.7.2 Provide only those products that meet or exceed the performance standard of CAN/C.G.S.B 75.1 – M88, as follows:

1.7.2.1 Factor of sliding friction on a dry surface using a leather test surface to be 0.50.

1.7.2.2 Factor of sliding friction on a wet surface using a leather test surface to be 0.60.

1.7.2.3 Factor of sliding friction on a dry surface using a rubber test surface to be 0.70.

1.7.2.4 Factor of sliding friction on a wet surface using a rubber test surface to be 0.65.

1.7.3 Provide only those products that meet or exceed the performance standards of the following ASTM designations:

References

.1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)

- .1 ANSI A108.1-[99], Specification for the Installation of Ceramic Tile (Includes ANSI A108.1A-C, 108.4-.13, A118.1-.10, ANSI A136.1).
- .2 CTI A118.3-[92], Specification for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive (included in ANSI A108.1).
- .3 CTI A118.4-[92], Specification for Latex Portland Cement Mortar (included in ANSI A108.1).
- .4 CTI A118.5-[92], Specification for Chemical Resistant Furan Resin Mortars and Grounts for Tile Installation (included in ANSI A108.1).
- .5 CTI A118.6-[92], Specification for Ceramic Tile Grounts (included in ANSI A108.1).

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

- .1 ASTM C144-[99], Specification for Aggregate for Masonry Mortar.
- .2 ASTM C 207-[91(1997)], Specification for Hydrated Lime for Masonry Purposes.
- .3 ASTM C847-[95(2000)], Specification for Metal Lath.
- .4 ASTM C979-[99], Specification for Pigments for Integrally Coloured Concrete.

.3 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-51.34-[M86(R1988)], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .2 CGSB 71-GP-22M-[78], Adhesive, Organic, for Installation of Ceramic Wall Tile.
- .3 CAN/CGSB-75.1-[M88], Tile, Ceramic.
- .4 CAN/CGSB-25.20-[95], Surface Sealer for Floors.

.4 Canadian Standards Association (CSA International)

- .1 CAN/CSA-A3000-[98], Cementitious Materials Compendium (Consists of A5-98, A8-98, A23.5-98, A362-98, A363-98, A456.1-98, A456.2-98, A456.3-98).
- .2 CSA A123.3-[98], Asphalt Saturated Organic Roofing Felt.

.5 Terrazzo Tile and Marble Association of Canada (TTMAC)

- .1 Tile Specification Guide 09300 [2000], Tile Installation Manual.
- .2 Tile Maintenance Guide [2000].

1.8 Material, Storage and Handling

1.8.1 Deliver and store all tile and required installation materials in original cartons, clearly marked as to type, colour and manufacturer.

1.8.2 Store materials in a warm, dry area.

1.8.3 The Tile Contractor will be responsible to insure the timely arrival of installation materials on site and he will order the appropriate approved materials with sufficient lead time to insure that no delays are incurred due to later material procurement.

1.9 Guarantee

1.9.1 The installer will guarantee installation of all ceramic tiles and floor assembly against defective material, discolouration, cracking, spalling and quality of work detrimental to the physical and aesthetic performance of this installation. Guarantee shall be for a period of one (1) year from the date of publication of the Certificate of Substantial Performance.

1.9.2 The manufacturer of the materials chosen for each “assembly” will provide a written guarantee that the products used on each assembly will be free from manufacturing defects so that these products will not breakdown or deteriorate for a period of five years from the date of the installation when installed in accordance with the manufacturers written specifications and guide lines.

1.10 Cleaning and Protection

1.10.1 Protect the ceramic tile work during the period of construction.

1.10.2 Remove all excess material and debris from the site and thoroughly wash and clean the tile work upon completion of the ceramic tile installation.

1.10.3 Protect the finish floor installation with a suitable and durable material or by keeping traffic off the floor until the area is ready for occupancy.

1.11 Maintenance

1.11.1 Submit three (3) copies of the manufacturer’s maintenance instructions, for ceramic floor and wall tile, to the Consultant upon completion of the ceramic installation.

1.11.2 Do not use muriatic acid for cleanup.

1.12 Submittals

1.12.1 Submit copies of manufacturer test and performance data for all tiles specified for the Consultant’s review. Do not commence work until data sheets are reviewed.

1.13 Schedule

1.13.1 Ceramic tile as indicated on room finish schedule.

2 PRODUCTS

2.1 Materials

2.1.1 Provide new materials in perfect condition free from defects impairing performance and appearance.

2.1.2 Ceramic Tile

2.1.2.1 Ceramic Wall Tile:

Size: 4”x16”
Type: Olympia, CDC Series
Colour: In two (2) colours as per pattern layout, “Tender Grey Matte” and “Taupe Matte”.
To be approved by Owner/Architect.

2.1.2.4 Ceramic BaseTile:
Size: 4” high, 4’’ x 16’’
Type: Olympia, CDC Series
Colour: In two (2) colours as per pattern layout, “Tender Grey Matte” and “Taupe Matte”.
To be approved by Owner/Architect.

2.1.4 Grout:

Floor - Epoxy Grout: Latapoxy SP100 stainless epoxy grout.
The epoxy grout shall be resistant to urine, acids, alkalis, petroleum distillates, oil, solvents, food wastes and shall meet the required physical properties. Epoxy installation materials must be non-toxic, low odour, water cleanable and manufactured to exceed ANSI A118.3 – 1996.

Wall - Latex Grout ANSI 118.6 for Latex Portland Cement Grout.

Grout Colour –

Type: TBD

2.1.5 Threshold:

.1 Aluminum/Gray Granite match to flooring, 100mm x 1200mm x19mm Single Bevel. Cut to suite door width.

2.1.6 Adhesives: Wall and Floor/Concrete, Blockwall, Cement Backer Board, Drywall Laticrete 4237 Latex thin-set. Mortar additive mixed with Laticrete 211 Crete Filler power. (ANSI A118.4 for Latex Thinset Mortars).

2.1.7 Mortar bed: Use cementituous mortar bed laticrete 3701 wherever required to achieve slopes to floor drains.

2.1.8 On Plywood Substrates: Laticrete 333 super flexible admix with Laticrete Drybond floor / wall thinset, or Latapoxy 210 modified epoxy adhesive.

2.1.9. Transition Trim (in locations where tile meets wall paints or flooring with different material):

Type:
Wall : Rondec 6mm radius, finish anodized aluminum, at all wall tile outside corners. TBD
Floor: Floor Tile to Carpet: -RENO-AETK,.
Floor Tile to Resilient/VCT Flooring: -RENO-U-AEU

Colour: TBD
To be approved by Owner/Architect

2.1.10 Waterproof Membrane:

.1 0.008 inch (0.2 mm) thick, orange polyethylene membrane, with polypropylene fleece laminated on both sides, which is listed by cUPC to meet or exceed requirements of the "American national standard specifications for load bearing, bonded, waterproof membranes for thin-set ceramic tile and dimension stone installation A118.10 and is listed by cUPC, and is evaluated by ICC-ES (see Report No. ESR-2467).

.2 Seams and Corners material 0.004 inch (0.1 mm) thick, orange polyethylene membrane, with polypropylene fleece laminated on both sides. Width: 5 inch (125 mm).

2.1.11 Floor Drain with Integrated Bonding Flange:

.1 Type:
.1 Stainless steel low profile linear floor drain with 50 mm (2 inch) no-hub outlet, and grate assembly. Grate assembly includes stainless steel grate, height adjustment collar, and lateral adjustment ring with trapezoid perforations.
.2 Stainless Steel Trench drain: Steel Grate and Channel, GeoTop 20DLG
.2 Drain listed by UPC to meet requirements of "International Association of Plumbing and Mechanical Officials Interim Guide Criteria for Floor Drain with Integrated Bonding Flange" (IGC 195), listed by CSA to meet requirements of the Canadian Standards Association standard, "Floor, Area, and Shower Drains, and Cleanouts for Residential Construction" (CSA B79), Drain detail as referenced in method B422 of the Tile Council of North America Handbook for Ceramic Tile Installation.
.3 Drain Channel Housing Material: Stainless Steel.
.4 19mm Frame Material: Stainless Steel.
.5 Grate Material and Finish: E-Stainless Steel Type 304 = V2A.
.6 Nominal Grate Size:Grate B perforated.
.7 Drain Outlet:
50 mm (2 inch) centre outlet
3 inch (75 mm) outlet.

2.1.12 Waterproof Building Panel for Ceramic Tile:

.1 Cement BOARD, CBu, Tile Backer Board on both sides for thin-set ceramic tile and dimension stone
.2 Panel Thickness: 5/8 inch (16mm).
.3 Panel Size: 48 inch by 96 inch (122 by 244 cm).
.4 Waterproof

3 EXECUTION

3.1 Examinations

3.1.1 Before starting the work, examine existing surfaces to be covered and report to the Consultant, in writing, all defects of work prepared by other Trades and unsatisfactory existing conditions.

3.1.2 Do not commence until surfaces specified to receive tile are dry, clean, level: free from cracks, ridges, dusting, scaling, carbonation, mortar droppings, parging, curing compounds, grease, oil, or other foreign material liable to impair adhesion, performance or appearance.

3.1.3 Commencement of work implies total acceptance of all surface conditions by the Ceramic Tile Contractor.

3.1.4 Dry or dusty concrete or masonry surfaces shall be wet down or washed and excess water removed just prior to the application of finish.

3.1.5 Waive the right to any after claims by failure to comply with the above procedure of examination.

3.2 Breakage

3.2.1 Make good any and all breakage resulting from faulty materials or installation.

3.3 Quality of Work

3.3.1 Ceramic tile application shall comply with Manual No. 200-1979 prepared by the Terrazzo, Tile and Marble Association of Canada, the Tile Council of America Handbook for Ceramic Tile Installation and ANSI Standards.

3.3.2 Provide 80% uniform bonding mortar contact between the tile and the substrate for interior applications and 95% uniform bonding mortar for exterior application.

3.3.3 Install ceramic tiles over a “crack-free” substrate. All concrete joints or cracks should be in direct alignment with the tile expansion joints (“direct” being off ¼” is not direct) ANSI Standards.

3.3.4 Control Joints

3.3.4.1 For interior ceramic tile the control joint should be placed every 16’ – 20’ apart.

3.3.4.2 All control joints should also be placed around perimeter, around columns and where tile abuts other hard materials. Control joints must always be placed directly over all slabe control and expansion joints.

3.3.5 The ambient air temperature and structural base temperature should be no less than 56 Deg. F. during application of ceramic tile and during curing period. Epoxy mortars and grouts require temperature between 50 °F and 90 °F.

3.3.6 Neatly cut tile around fitments, fixtures and drains. Form intersections, corners and returns accurately.

3.3.7 Make joints in tile uniform in width, subject to normal variance in tolerance allowed in tile size. Joints shall be watertight without voids, cracks, excess mortar, or grout. Joints between sheets to be of same width as joints between individual tiles.

3.3.8 All internal angles of base to be square. External angles to be bullnose. Bullnose to be from full size tile.

3.3.9 Where floor tile is required to be laid so floor slopes to drains it will be this Contractor’s responsibility to ensure that the slopes are achieved and that no water ponds or lodges behind ridges. Use Laticrete 3701 Latex (or equal by Mapie) with 226 thick bed mortar mix for a 5 year warranty mortar bed. A site mix must be fortified with a latex admix.

3.3.10 Sound tile after setting; remove and replace hollow backed tile.

3.3.11 Allow minimum 24 hours after setting prior to grouting. Do not permit foot traffic for a minimum of 48 hours.

3.3.12 Completed work shall be free of broken, damaged or faulty tile.

3.3.13 Carry out layout of tile in accordance with the Consultant's approved tile colour percentages and patterns.

3.3.14 Pattern to be uninterrupted through doorways.

3.3.15 All tiles should be fully embedded with at least 95% coverage of mortar on the back of tiles. 8" x 8" tiles or larger will be installed with "back buttering to provide good adhesion".

3.4 Specific Installations

3.4.2 Where wall tile is called for, install tile from floor to 7'-6" ± above finished floor. Use RE and REX at top row.

3.4.3 Trim required where surface of wall tile meets surface for wall paint and surface of floor tiles meet carpet.

3.4.4 Adjust thickness of mortar bed by adding more as required, where thickness of tiles are different, to provide a plan vertical surface; underneath of cooper mosaic.

END OF SECTION

1 GENERAL

1.1 Instructions

1.1.1 The Instructions to Bidders, the General Conditions of CCDC 2, 2008 Supplementary General Conditions and all Sections of Division 1 apply to and form part of this Section of the Specifications.

1.1.2 Report in writing to the General Contractor any defects of surfaces or work prepared by other Trades which affect the quality or dimensions of this Contractor's work. Commencement of this Contractor's work implies complete acceptance of all work by other trades.

1.2 Intent

1.2.1 Provide all articles, labour, materials, equipment, transportation, hoisting and incidentals noted, specified or required, to complete the work of this Section.

1.3 Section Includes

1.3.1 Provide all acoustic tile and required accessories as indicated on the working drawings, room finish schedule, including but not limited to the following:

- Acoustic Tile
- "T" Grid Suspension System
- Hold Down Clips to Achieve Specified Fire Rating
- Sound Attenuation Blankets above Ceiling
- Wall moulds for valance lighting
- Ventilation panels in soffit of Entrance Vestibule #138

1.4 Related Sections

Plywood Panelling and Suspension	Section 06 40 00
Gypsum Board	Section 09 25 00
Installation of Mechanical Grilles, Louvres, etc.	Division 15
Installation of Electrical Equipment, Lights, etc.	Division 16

1.5 Samples

1.5.1 Submit minimum 1' -0 x 1' -0 samples of acoustic tile, as required for completion of the work for the Consultant's review before proceeding with the acoustic tile work.

1.5.2 Submit samples of acoustic products in type specified for approval by the Consultant.

1.6 Rejections

1.6.1 Defective materials or quality of work whenever found at any time prior to acceptance of the work shall be rejected regardless of previous inspection. Inspection will not relieve responsibility, but is a precaution against oversight and error.

1.6.2 Remove and replace defective materials and work of other Trades affected by this replacement, at no additional cost to the Owner.

1.7 Performance

1.7.1 Acoustic materials shall be Type 111, Class A according to Federal Specification SS-S118B.

1.7.2 Suspension system shall comply with ASTM C636-86 “Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels”.

1.7.3 Design and install the ceiling system to support the weight of the light fixtures, maximum deflection of 1/360 of the span. A letter shall be submitted by the Ceiling Contractor stating that the ceiling system is capable of supporting the light fixtures. This letter is required to obtain Ontario Hydro-Electric Commission approval.

1.8 Delivery, Storage and Handling

1.8.1 Deliver acoustic tile and materials in undamaged and original containers and make certain that the storage area is dry.

1.9 Guarantee

1.9.1 Guarantee the installation against defective material or quality of work for a period of one year from the date of the publication of the Certificate of Substantial Performance.

1.10 Cleaning and Protection

1.10.1 Be responsible for protection of all materials and work of this trade from damage during period of construction.

1.10.2 Be responsible for the protection of the work of other Contractors (trades) from damage resulting from work of this trade. He shall make good any resulting damage, to the satisfaction of the Consultant, at his own expense.

1.10.3 Promptly, as the work proceeds and on completion, clean-up and remove from the premises all rubbish and surplus materials resulting from the foregoing work.

1.11 Reflected Ceiling Plan

1.11.1 Refer to the reflected ceiling plan for required ceiling layout, location of lighting fixtures, diffusers, return air grilles and vents.

1.12 Extra Stock

1.12.1 Furnish the Owner with 2 percent extra stock of each type of ceiling tile to be used for future repair work.

1.13 Maintenance Instructions

1.13.1 Furnish two copies of the manufacturer’s maintenance directions for each type of acoustic panel or tile.

2 PRODUCTS

2.1 Materials

2.1.1 Provide new materials in perfect condition, free from defects impairing physical and aesthetic performance.

2.2 Acoustic Ceiling No. One – General

2.2.1 Suspension system shall be 15/16" Acoustical panels shall be "LYRA" Plant-based square lay-in as Manufactured by Armstrong; 2'x2' and 2'x4' according to ceiling plan layout.

2.2.2 Acoustical Cloud System:
Formation Rectangle:
Ceiling panel: Calla Square Lay-in, colour white
Suspension system: DC FlexZone™ Silhouette 1/4" Reveal 9/16"
Trim : Axiom Vector- Inverted- 4"

1. *Existing – Adjust and clean or match the new to existing where indicated to ensure continuity in the same space*

3 EXECUTION

3.1 Examinations

3.1.1 Report to the Consultant, in writing, all defects of work prepared by other trades and on unsatisfactory site conditions.

3.1.2 Do not commence the work of this Division until this Contractor has thoroughly examined all areas to receive an acoustic tile installation and has ascertained the compatibility of the installation of his material with the other trades involved directly or indirectly with this work, and has found the areas in a condition suitable for the commencement.

3.1.3 Consult and co-operate with trades whose work precedes or follows his work to permit an orderly and effective procedure in the execution of the work of this section.

3.1.4 Commencement of the work of this Section implies total acceptance of all applicable conditions by the Acoustic Tile Contractor.

3.1.5 Waive the right to any after claims by failure to comply with the above procedure of examinations.

3.2 Quality of Work and Application

3.2.1 Install the tile and suspension system in accordance with the manufacturer's specifications using tradesmen with necessary training and experience certified by this manufacturer.

3.2.2 Plumb and square finish work with adjoining work.

3.2.3 Lay the work out, in accordance with the Consultant's approved reflected ceiling plan, symmetrical with each area to obtain uniform borders of at least half the acoustic panel size.

3.2.4 Distribute variations in shades of finish from several cartons of panels uniformly over the ceiling area.

3.2.5 Erect the suspension system level with tolerance of 1/8" in 12'.

3.2.6 Exposed main trees shall be as long in length as practical to minimize joints. Joints shall be tight, square flush, and reinforced with splines. Distribute jointing over the ceiling area.

3.2.7 Use edge moulding or shadow moulding where ceiling abuts vertical surfaces as indicated on the drawings. Use corner moulding along external edges at ceiling steps.

3.2.8 Secure acoustic panel with hold-down clips in areas where differential air pressures occurs and where specified for specific rooms.

END OF SECTION

1 GENERAL

1.1 Section Includes

Sheet Vinyl Floor Covering with Backing
Resilient Linoleum Sheet Flooring
Resilient base for linoleum

1.2 SUBMITTALS

1.2.1 General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specifications Sections

1.2.2 Product Data: Submit 3 copies of manufacturer's technical data and installation instructions for each type of resilient flooring and accessory.

1.2.3 Linoleum flooring must be ordered a minimum of sixty (60) days prior to start of scheduled installation. Any and all costs associated with noncompliance for instance air freight, etc will be the full responsibility of the floorcovering contractor

1.2.4 Shop Drawings:
Show locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
Show details of special patterns.

1.2.5 Samples: Submit 3 sets of samples of each type, color and finish of resilient flooring and accessory required, indication full range of color and pattern variation. Provide 6"x9" samples of sheet flooring and 6" long samples of accessories.

1.2.6 Closeout Submittals: Submit 3 copies of Maintenance and operations data including methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.

1.2.7 Flame Spread Certification: Submit manufacturer's certification that resilient flooring furnished for areas indicated to comply with required flame spread rating has been tested and meets or exceeds indicated standard.

1.2.8 Replacement Material: After completion of work, deliver to project site replacement materials from same manufactured lot as materials installed, and as follows:
Sheet Flooring: Not less than 50 square feet of each type, pattern and color installed.
Resilient Base: Not less than 10 linear feet for each 500 linear feet or fraction thereof of each different type and color installed.

1.3 QUALITY ASSURANCE

1.3.1 Manufacturer: Whenever possible, provide each type of resilient flooring as provided by a single manufacturer, including recommended primers, adhesives, sealants, and leveling compounds.

1.3.2 Installer Qualifications: Installer experienced in performing work of this section who as specialized in installation of work similar to that required for this project.

1.3.3 Regulatory Requirements: Provide products with the following fire-test response characteristics as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities have jurisdiction.

1.3.4. Standard of Quality: For the purpose of evaluating the quality of workmanship, a mock up installation of the specified floorcovering shall be provided by the Floorcovering Contractor in an area designated by the architect. Upon approval, this test installation shall then be considered the standard of quality and basis of comparison for the balance of the project. Areas found to be deficient by specification standards or application procedures shall be repaired/replaced at contractor's expense.

1.3.5 References

.1 American Society for Testing and Materials (ASTM)
.1 ASTM F 1303-95, Specification for Sheet Vinyl Floor Covering with Backing.

1.4 WARRANTY

Manufacturer's Warranty: Submit manufacturers standard warranty document.
Warranty Period: Five (5) year limited warranty commencing on Date of Substantial completion.
Warrant resilient sheet flooring with Warrantee manufacturer's extended warrantee in addition to standard warranty.

1.5 DELIVERY, STORAGE, AND HANDLING

Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

Storage and Protection: Store materials protected for exposure to harmful weather conditions and at a temperature and humidity conditions recommended by manufacturer.

- Materials should be stored in areas that are fully enclosed, weather tight with the permanent HVAC system set at a uniform temperature of at least 68 degrees F (20 degrees C) for 72 hours prior to, during and after installation.

- The manufacturer recommends moving resilient floorcovering and installation accessories into spaces where they will be installed at least 48 hours before installation, unless longer conditioning periods are required by manufacturer in writing.

1.6 PROJECT CONDITIONS

1.6.1 Substrate Conditions:
The flooring contractor must inspect and accept the substrate as prepared, or prepare the substrate to suit the manufacturer's recommendations. This includes filling in joints of underlayment, creating level conditions with leveler, and repairs as necessary.

1.6.2 Environmental Requirements/Conditions: In accordance with manufacturer's recommendations. Areas to receive flooring shall be clean, fully enclosed, weather tight with the permanent HVAC set at a uniform temperature of at least 68 degrees F (20 degrees C). The flooring material should be conditioned in the same manner.

1.6.3 Temperature Requirements: Maintain air temperature in spaces where products will be installed for time period before, during, and after installation as recommended by manufacturer.

1.6.4 Temperature Conditions: 68 degrees F (20 degrees C) for 72 hours prior to and during and for not less than 48 hours after installation.

1.6.5 Close spaces to traffic during resilient flooring installation and for time period after installation recommended in writing by the manufacturer.

1.6.6 Install resilient flooring material and accessories after other finishing operations, including painting, have been completed.

1.6.7 Where demountable partitions and other items are indicated for installation on top of sheet resilient flooring material, install flooring material before these items are installed.

1.7 ACCEPTABLE MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include but are not limited to, the following:
Linoleum Sheet Flooring:
Match to Existing where noted.
Sports flooring, MondoFunctional, Forbo Linoleum Marmoleum Piano with Topshield. Alternatives will be considered provided they meet or exceed the specification criteria contained herein. The Architect shall be the sole determinant of equivalency.

2.0 MATERIALS

Colors and Patterns: Refer to color schedule.

Linoleum Sheet Flooring: Meets or exceeds ASTM F2034 for Linoleum Sheet Flooring, Static Load Limit 450 pounds per square inch (per ASTM F970), ASTM E-682/NFPA 258—450 or less. ASTM E-648/NFPA 253—Class 1. Material to be constructed with a minimum 45% Post Industrial Recycled Content per FTC – Part 260 -- GUIDES FOR THE USE OF ENVIRONMENTAL MARKETING CLAIMS and be considered Rapidly Renewable per USGBC LEED M&R Credit 6.0

2.1 ACCESSORIES

Adhesive: Must meet or exceed the VOC limits of South Coast Air Quality Management District Rule #1168.

a. Forbo Linoleum's L910 (Sheet only)

Heat Welding: use Manufacturers recommended heat-welding thread for areas that require by specification for hygienic seams (sheet only).

b. Solid Color Weld

Resilient Edge Strips: 1/8" thick, homogeneous vinyl or rubber composition, tapered or bull nose edge, color to match flooring, or as selected by Architect from standard colors available, no less than 1" wide.

Metal Edge Strips: Of width shown and of required thickness to protect exposed edge of resilient flooring. Provide units of maximum available length, to minimize number of joints.

Wall Base: Provide rubber wall base complying with FS SS-W-40, Type I: 4" high, colour to match linoleum colour.

Leveling and Patching Compounds: Portland Cement types as recommended by flooring manufacturer: Mapei "Plani Patch"

Maintenance Products: (As required in Section 3.5)

c. Neutral Cleaner: "Stride" by Johnson Wax Professional.
d. Finish: matte satin "Carefree" by Johnson Wax Professional

3 EXECUTION

3.1 INSPECTION

Installer must examine areas and conditions under which resilient flooring and accessories are to be installed and must notify General Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Owner and Architect.

3.2 PREPARATION

Surface Preparation:

General: Broom clean or vacuum surfaces to be covered and inspect subfloor. Start of flooring installation indicates acceptance of subfloor conditions and full responsibility for completed work.

Floor Substrate: Prepare floor substrate to be smooth, rigid, flat, level, permanently dry, clean and free of foreign materials such as dirt, paint, grease, oils, solvent, curing and hardening compounds, sealers, asphalt and old adhesive residue.

3.3 INSTALLATION

3.3.1 Adhesive Flooring Installation:

3.3.2 Install Flooring material following manufacturer's installation recommendations.

Linoleum Sheet: Apply adhesive using 1/16" x 1/16" x 1/16" square notch trowel and lay flooring into wet adhesive and roll with a 100 pound roller to ensure proper bonding,

Follow manufacturers recommendations for open and working time.

For wet areas and/or heavy rolling traffic refer to manufacturer recommendations for adhesive type and requirements

Adhesive Material Installation: Use trowel as recommended by flooring manufacturer for specific adhesive. Spread at a rate of approximately 150 sq. ft/gallon as recommended by flooring manufacturer.

3.3.3 Installation Techniques:

Where demountable partitions and other items are indicated for installation on top of finished flooring, install flooring before these items are installed.

Scribe, cut, fit flooring to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture, including pipes, outlets, edgings, thresholds, nosing and cabinets.

Extend flooring into toe spaces, floor reveals, closets and similar openings.

Install flooring on covers for telephone and electrical ducts, and similar items occurring within finish floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers.

Adhere resilient flooring to substrate without producing open cracks, voids, raising and puckering at joints, telegraphing to adhesive spreader marks, or other surface imperfections in completed installation.

Use adhesive applied to substrate in compliance with flooring manufacturer's recommendations, including those for trowel notching, adhesive mixing and adhesive open and working times.

Roll resilient flooring as required by resilient flooring manufacturer.

Heat weld if required by specification

3.4 FIELD QUALITY REQUIREMENTS

Manufacturer's Field Services: Upon Owner and Architects request, and with a minimum 72 hours notice, provide manufacturer's field service consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions

3.5 CLEANING

3.6 General Contractor to be responsible for performing initial maintenance to prepare flooring for occupancy following requirements based on procedures listed below.

Option A: For product incorporating Forbo Marmoleum's Topshield Occupancy Ready Surface

Sweep or dust all floors.

Scrub floor using "Stride" neutral cleaner. Rinse floor thoroughly.

Option B: For all other linoleum products types not incorporating an Occupancy Ready Surface (should require an add to bid documents for additional maintenance products and services)

Sweep or dust all floors

Scrub floor using "Stride" neutral cleaner. Rinse floor thoroughly. Apply one (1) coat of "Linobase" sealer. Allow 45 minutes between coats.

Apply two (2) coats of "Carefree" Matte-Satin or Gloss (Specify one) finish. Allow 45 minutes between coats.

Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Perform initial maintenance on installed products in accordance with manufacturer's instructions, prior to owner's acceptance. Remove construction site debris from project site and legally dispose of debris.

a. Remove visible adhesive and other surface blemishes using cleaning methods recommended by flooring manufacturer.
b. Sweep vacuum floor after installation.
c. Do not perform initial maintenance for a minimum of 5 days after installation has been completed. This is to allow the adhesive the proper time to set.
d. Damp mop flooring to remove black marks and soil.

3.7 PROTECTION

Protect installed product and finish surfaces from damage during construction. Remove and legally dispose of protective covering at time of Substantial Completion.

END OF SECTION

1 GENERAL

1.1 Refer to Master Specification, Division 1 - General Requirements, Section 01 11 00 -Summary of Work.

1.2 Related Work

1.2.1 Divisions 15 and 16: Floor access covers

1.3 References

1.3.1 .1 American Society for Testing and Materials (ASTM)
.1 ASTM F 1066-04, Specification for Vinyl Composition Floor tile.
.2 ASTM F1344-[00], Specification for Rubber Tile.

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-25.20-95, Surface Sealer for Floors.
.2 CAN/CGSB-25.21-95, Detergent-Resistant Floor Polish.

1.4 Warranty/Guarantee

1.4.1 A five (5) year manufacturer's written warranty is required on all resilient sheet flooring.

1.4.2 The installing contractor is to guarantee the materials and installation for one year from date of substantial completion. This guarantee is to cover material failure and installation failures i.e. loose sheeting flooring, loose base, joints opening up, etc.

1.5 Samples

1.5.1 Submit samples in accordance with Section 01330 - Submittal Procedures.

1.5.2 Submit duplicate tile in size specified, 300mm long base.

1.6 Submittals

1.6.1 Provide maintenance data for resilient Submittals flooring for incorporation into manual specified in Section 01780 – Closeout Submittals.

1.7 1.7 Site Conditions/Property Lines

1.7.1

1.8 1.8 Environmental Requirements

1.8.1 Maintain air temperature and structural base temperature at flooring installation area above 20 C. for 72 hours before, during and 48 hours after installation.

2 PRODUCTS

Note: Only new materials are to be used. No seconds or substandard materials will be accepted

2.1 Vinyl composition tile: to ASTM F 1066, Composition 1 - non asbestos Class 2 – through pattern tile, plain, 3mm, 600 x 600mm size, in colour selected by Consultant. Obtain Consultant's approval for 300 x 300 size in specific locations. Provide static disseminating tile in specified locations.

2.1.1 Accepted material:
.1 Armstrong Tile or approved equal. Colours to be selected by Consultant.
.2 Colours to be selected by Consultant, to match Armstrong Excelon Imperial Texture.
.3 Acceptable alternates: equal by Flextile Ltd., or Johnsonite Azrock Collection.
.4 Match to Existing where noted.

Note: No seams are permitted in activity rooms and washroms. Seams in kitchens are only permitted under fridge's and stoves, or in closets.

2.2 Base to be supplied and installed at new sheet flooring. Base to be rubber, coved, minimum 1200mm length and 100mm high x 3mm thick, including premoulded end stops and external corners for coved base only. Base Colour to be selected by the owner at contract award

2.3 Adhesives to be waterproof, applied strictly in accordance to flooring manufacturer's directions. Caulking to be a silicone based product

2.4 Joint Sealer to be S200 Epoxy for all vinyl sheet flooring joints. Place epoxy under all seams, and joints, and heat seal.

2.5 Metal Edge must be of good quality aluminium nap lock or aluminium strip as required at the joint of carpet, tile or sheet vinyl. At all lift out access covers and crawl space hatches, use extruded aluminium, 3/4", smooth "T" mould with mitre corner.

2.6 Floor Filler and Leveller: white premix latex requiring water only to produce cementitious paste as recommended by flooring manufacturer for use with their product. when required, as approved by manufacturer.

2.7 Metal edge strips: aluminum extruded, smooth, mill finish with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

2.8 Sealer: to CAN/CGSB 25.20, Type 2-water based type recommended by flooring manufacturer.

2.9 Wax: to CAN/CGSB-25.21 type recommended by flooring manufacturer

2.10 Underlayment to be “thick, GIS fir Plywood approved for underlayment. No particle board or compressed board will be accepted.

2.11 Sheet flooring Insert

.1 Sports Flooring: 21mm PVC top coat fiberglass Insert mesh reinforcing interlayer, 4.4mm PVC Closed cell foam with total thickness of 6.5mm, colour as selected by Consultant.
.1 Acceptable product: Gerflor Taraflex Sport M.

.2 Reducer Strip: vinyl, to transition from sheet flooring insert to vinyl composition tile, colour to be selected by consultant

3 EXECUTION

3.1 Inspection

3.1.1 Installation of flooring and base shall be carried out in strict accordance with manufacturer's direction and work shall be performed by a contractor experienced with the installation of this material.

3.1.2 Provide all labour, materials, plant, incidentals, equipment and all other services for new resilient sheet flooring and base as specified herein.

3.1.3 Remove all doors as required to do the work and reinstall upon completion. Undercut all doors as required to ensure proper operation. Tape doors prior to cutting to protect edges.

3.1.4 At bathrooms and washrooms, remove toilets and reinstall with new Wax Seal Gasket, new bolts and plumbing supply line to toilet.

3.1.5 Remove and reinstall all door thresholds where applicable.

3.1.6 The existing flooring, is not manufactured using asbestos fibres. Secure all open joints, remove all loose areas, cut out delaminating seams and fill and prepare surface for underlayment as per 3.2 subfloor treatment and underlayment.

3.1.7 The existing flooring is not manufactured using asbestos fibres. Remove existing floor and base materials carefully to not damage existing walls and subfloor. Dispose of all materials removed legally off site. Remove all blemishes, fill all cracks, low spots, holes and other defects with floor filler, leveller, sand and install underlayment as per 3.2 subfloor treatment and underlayment.

3.1.8 The existing flooring has been tested and found to contain asbestos fibre. The existing flooring has not been disturbed. Secure all open joints, loose areas, fill and prepare the surface for underlayment as per 3.2 subfloor treatment and underlayment. Do prep work in accordance with WCB guidelines.

Note: This option will coverup the exiting floor material. In future refloors, the new flooring will have to be removed and underlay prepped for reflooring.

3.1.9 At concrete floors where no asbestos fibre in flooring. Strip out existing flooring using mechanical stripper. Remove all blemishes, fill all cracks, low spots, holes, and other defects with floor filler, leveller, and sand floor as required.

3.1.10 At concrete floors where flooring has been tested and found to contain asbestos fibre. The flooring contractor shall arrange and pay for the services of a contractor trained in asbestos abatement to do all removal and disposal of flooring. This shall be done in accordance with the occupational safety and health regulations on asbestos and the safe handling of asbestos manual of standard practices, latest edition, as set out by Worker's Compensation Board of British Columbia. (For a list of approved contractors contact the Asbestos Abatement Association - telephone 276-0060). Once the flooring has been removed and area is safe to work in, the flooring contractor shall fill all blemishes, low spots, holes, and other defects with floor filler, leveller, grind down high spot, and proceed with new flooring application.

3.1.11 Once the flooring has been removed and area is safe to work in, the flooring contractor shall fill all blemishes, low spots, holes, and other defects with floor filler, leveller, grind down high spots and proceed with new flooring application.

3.2 Subfloor Treatment and Underlayment

3.2.1 Existing floor areas to receive sheet vinyl shall be checked thoroughly and where applicable all loose sheet vinyl is to be removed and area patched. All existing subfloors in the field of work shall be checked and renailed to remove all squeaks. Secure all loose materials using 2 1/4" ring nails or 1 1/2" screws. Fill all blemishes and sand prior to installing new underlayment as specified in 2.0 Products.

3.2.2 Underlayment as specified shall be fastened using 1 1/4" ring nails at 6" o.c. on board face.

3.3 Flooring Application

3.3.1 Apply adhesive uniformly, using recommended trowel to manufacturer specification, do not spread more adhesive than can be covered by flooring before initial set takes place.

3.3.2 Lay sheet flooring as per manufacturer's instructions with seams parallel to building lines to produce minimum number of seams.

3.3.3 Cut sheet flooring neatly around fixed objects.

3.3.4 Terminate sheet flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.

3.3.5 Install sheet flooring in pan type floor access covers and to crawl space access hatches, with metal edge as specified. Supply and install lift out pull ring on all crawl space covers.

3.3.6 Install metal edge strips at unprotected or exposed edges where flooring terminates or abuts carpet or other material.

3.3.7 Remove, lift and reinstall all electric baseboard heaters, heater covers, floor grilles and registers and reinstall fastening securely and safely as required.

3.3.8 Extend flooring into recesses, closets, in the same material as adjacent floor.

3.4 Base Application

3.4.1 Set base tightly against wall and floor surfaces using an approved adhesive to hold base firmly to wall at all locations. Use lengths as long as practicable and not less than 20" or 500mm.

Note: Contact cement is not acceptable for this application.

3.4.2 Install straight and level scribing to fit door frames and other objects

3.4.3 Mitre internal corners, back cut and shape external corners.

3.4.4 At kitchen cabinets and vanities supply and install " coved base cut to fit base of cabinets.

3.5 Cleaning

3.5.1 On completion of installation, floor is to be left clean and free of all marks.

3.5.2 Remove excess adhesive from floor, base and wall surfaces without damaging new floor or walls.

3.5.3 The floor is to be sealed with two (2) coats of Johnson "Over and Under", or equal, applied to manufacturers specifications. The second coat must be applied at right angles to the original. Upon completion inspect the floor to ensure a smooth, even coat throughout.

END OF SECTION

1 GENERAL

1.1 Section Includes

- Complete painting of all surfaces noted on drawings and in Room Finish Schedule
- Mechanical and electrical conduit, piping and ductwork including hangers in exposed locations.

1.2 Related Sections

Shop painting of Structural Steel	Section 05 10 00
Shop painting of Miscellaneous Metal Work	Section 05 99 00
Caulking	Section 07 90 00
Special Coatings	Section 09 80 00

1.3 Quality Assurance

1.3.1 Employ fully trained workmen who are regularly employed in this field.

1.3.2 Arrange for testing of paint/coatings by product manufacturer. Obtain in writing from manufacturer representative, approval of surface preparation methods, and obtain reports that materials and application methods conform to specification.

1.3.3 Comply with VOC limits set out by Green Seal Organization for all non-alkyd and non-epoxy coatings/paints.

1.4 **Referenced Standards**

Green Seal Certified Products:

CAN CGSB 1.100-99	Interior Flat Paint Latex
CAN CGSB 1.119.95	Interior Latex Primer-Sealer
CAN CGSB 175.97	Polyurethane Interior Coating
CAN CGSB 1.195-99	Interior Latex Semi-gloss Paint
CAN CGSB 1.209.93	Low Sheen Latex Interior Paint

ECP Environmental Choice Program:

ECP 07.89	Water-borne Surface Coatings
ECP 02.89	Solvent-borne Paints
MPI	Master Painters Institute Manual
SSPC	Steel Structures Painting Council

1.5 Samples

1.5.1 Submit brushouts <M 150 mm x 150 mm> <I 6" x 6">of each paint application, labelled as to product and location. Proceed with painting and staining mock-up only when colour and finish has been approved.

1.5.2 Mock-Up

1.5.2.1 At site, Consultant will locate testing area to establish standard of workmanship, texture, gloss and coverage. Apply 300mm x 300mm (12" x 12") samples of each finish on each type of surface to be coated with correct material, number of coats, colour, texture and degree of gloss required or apply full size test samples in areas designated by Consultant of each finish on each type of surface to be coated with correct material, number of coats, colour, texture and degree of gloss required. Provide additional samples, if required, to obtain approval. Do not continue painting until samples have been approved. Approved panels shall become standard of comparison for painting work on site. Approved full size

sample panels may become integral part of finished work if permitted by Consultant.

1.6 Rejections

1.6.1 Defective materials or quality of work, whenever found, at any time prior to acceptance of the work, shall be rejected regardless of previous inspection. Inspection will not relieve responsibility, but is a precaution against oversight or errors.

1.6.2 Remove and replace defective materials and work of other trades affected by this replacement, at no additional cost to the Owner.

1.7 Examination

1.7.1 Report to the Architect, in writing, all defects of surfaces or work prepared by other trades and on unsatisfactory site conditions.

1.7.2 Thoroughly examine all surfaces scheduled to receive paint to see that they are dry, clean, free from cracks, scaling, grease, oil, or other foreign materials liable to impair adhesion, performance or appearance. Take moisture readings.

1.7.3 Commencement of work implies total acceptance of all surface conditions.

1.8 Material, Storage and Handling

1.8.1 Bring materials to the site in the original unopened containers labelled to indicate the name of the manufacturer, brand, colour and quality of the contents.

1.8.2 Store thinners, loose soaked rags and similar combustible materials in closed containers. Remove from site or store in an assigned area.

1.8.3 Store paint materials at temperatures recommended by manufacturer.

1.9 Job Conditions

1.9.1 Co-operate in co-ordinating the work of other Sections with the work of this Section, so that the work may proceed in an orderly and effective manner.

1.9.2 If requested, provide proof of purchase of all paint materials needed for the job.

1.9.3 Maintain minimum interior temperature of 18□C during application and drying of paint, and maintain until handover to owner.

1.9.4 Do not paint when ambient air and surface temperatures are less than 15□C for 24 hours before or during painting application.

1.10 Scheduling

1.10.1 Unoccupied Areas: Cooperate with other trades to minimize touch-ups, but to ensure completion prior to installation of floor coverings and furniture.

1.10.2 Occupied Areas: schedule painting to prevent disruption to occupants. Painting shall be carried out as arranged and agreed with owner.

1.11 Alkalinity and Moisture Testing

1.11.1 Perform no painting or decorating work when the maximum moisture content of the substrate exceeds:

- 12% for concrete and masonry (clay and concrete brick/block).
- 15% for wood.
- 12% for plaster and gypsum board.

1.11.1 Conduct all moisture tests using a properly calibrated electronic moisture meter. Test concrete floors for moisture using a cover patch test.

1.11.2 Test concrete, masonry and plaster surfaces for alkalinity as required.

1.11.3 Extra Paint

1.11.1 Leave 1 litre of each finish material in each colour used on the jobsite, properly labelled.

1.12 Clean-up

1.12.1 Upon completion of the work of this Section, remove from the site all surplus material and debris caused by the work of this trade to the satisfaction of the Architect.

1.13 Guarantee

1.13.1 Provide a written guarantee of work of this Section against defects in material and quality of work for a period of one (1) year from the date of publication of the Certificate of Substantial Performance.

2 PRODUCTS

2.1 General

2.1.1 Provide new materials in perfect condition, free from defects impairing physical performance and appearance.

2.1.2 No claim as to unsuitability or unavailability of any material specified, or unwillingness to use same, or inability to produce first class work with same will be entertained unless such claims are made in writing and submitted with tender.

2.1.3 Select materials for application on each type surface from a single manufacturer.

2.2 Hollow Metal Doors Backpainting

2.2.1 Tremco “Instant Patch”.

2.3 Finish and Colours

2.3.1 The Architect will issue a schedule of the colours of paint and other finishes as required by job progress.

2.3.2 Gloss/Sheen Ratings:

2.3.2.1 Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following MPI values:

Gloss Level	Description
G1	Matte or flat finish
G2	Velvet finish
G3	Eggshell finish
G4	Satin finish
G5	Semi-gloss finish
G6	Gloss finish
G7	High-gloss finish

2.3.2.2 Gloss level ratings of all painted surfaces shall be as specified herein and as noted on finish schedule.

2.3.3 The submitted brushouts and approved mock-up shall be the only determining factors in assessing approved colour tone and shade.

2.3.4 Interior colours will be based on two base colours and three accent colours with a maximum of two deep or bright colours. No more than three colours will be selected in each area. Note that this does not include pre-finished items by others, e.g. aluminum or vinyl windows, aluminum doors and handrails, etc.

2.3.5 Unless otherwise noted or scheduled, wall shall be painted the same colour within a given area.

2.3.6 Ceilings (except those having a spray textured coating) shall be painted white

2.3.7 Corridors shall be painted <the same colour on all floors><different colours on alternate floors> with two (2) separate colour schemes prepared for doors and trim.

2.4 Gloss levels:

2.4.1 Except as described below or indicated on the finish schedule, interior walls and ceiling surfaces shall be painted in accordance with the following criteria over appropriate prime / sealer coat:

2.4.1.1 All areas (except as noted): Washable latex with G3 (eggshell) finish.

2.4.1.2 Laundry rooms, wash rooms, kitchens and playrooms - washable latex with G5 (semi-gloss) finish.

2.4.2 Doors, frames and trim shall be refinished in transparent stain and polyurethane varnish

2.4.3 Window frames other than aluminum units, including trim and sills shall be painted a different colour than walls. Unless otherwise noted or scheduled all window frames, trim and sills shall be painted using a G5 (semi-gloss) finish.

2.4.4 Access doors, prime coated butts and other prime painted hardware (e.g. door closers), registers, radiators and covers, exposed piping and electrical panels shall be painted to match adjacent surfaces (i.e. same colour, texture and sheen), unless otherwise noted or where pre-finished.

2.4.5 Plywood service panels (e.g. electrical, telephone and cable vision panels) including edges shall be back-primed and painted <flat grey>< to match painted wall mounted on>.

2.4.6 The inside of light valances shall be painted gloss white.

2.4.7 The inside of all ductwork behind louvres, grilles and diffusers for a minimum of 460mm (18") or beyond sight line, whichever is greater, shall be painted using flat black (non-reflecting) paint.

2.5 Mixing and Tinting

2.5.1 Deliver paints and enamels ready mixed to jobsite. Job mix and tint only when approved by the Architect.

2.5.2 Tint undercoats and each finish coat progressively to enable confirmation of number of coats.

2.6 Approved Manufacturers

2.6.1 Use only top line of products from any manufacturer.

2.6.2 Interior Latex Primer Sealer

ICI Paints “CYW Designers Touch”
ICI Paints “ICI dulux”
Para - “PrimeTech Hi-Hide Latex Primer”

2.6.3 Interior Latex Eggshell

Benjamin-Moore & Co. Limited “Regal Aquavelvet”
ICI Paints “CIL Professional Interior Latex”
ICI Paints “Glidden Ultra Interior Latex”
PPG “Satin Latex Interior Acrylic”
Sherwin Williams-MPI-52 Gloss Level 3 Interior Latex Eggshell

2.6.4 Interior Latex Flat (Ceilings)

Benjamin-Moore & Co. Limited “Moorespec”
ICI Paints “CYW Designer Touch”
PPG “Speedhide”

2.6.5 Interior Latex Semi-gloss

Sherwin Williams Promar 2000 Interior Semi-gloss Latex
PPG “Pure Performance” Interior Semi-gloss Latex

2.6.6 Galvanized Primer (Interior)

Benjamin-Moore & Co. Limited “Acrylic Metal Primer”
ICI Devoe “Devflex”
Para “Waterborne Galvanized Primer”
PPG “Pitt Tech” DTM High Performance Primer

2.6.7 Wood Stain Blocker / Gypsum Primer

Benjamin-Moore & Co. Limited “Freshstart” 100% Acrylic Primer
ICI Paints CIL Professional Interior Acrylic Stain Bloc
PPG “Seal Grip” Acrylic Latex Stain Blocking Primer
Sherwin Williams “PrepRite” Pro Block Latex Interior/Exterior Primer/Sealer

2.6.8 Interior Wood Lacquer

ICI Paints “Woodpride” Interior Aquacrylic Gloss/Satin Varnish

2.6.9 Paint and Interior Stain for Other Products Not Specifically Listed

Benjamin-Moore & Co. Limited
Glidden Company
Olympic Stain, Comerco Inc.
Pittsburgh Paints
Pratt & Lambert Inc.

2.6.10 Exterior Stains

Olympic Stain, Comerco Inc.
Pratt & Lambert Inc.
Glidden Company Stains

2.6.11 Fire Retardant Coating

Ocean Fire Retardants Inc.
Pratt & Lambert Inc.
Sico Ltd.
Glidden Company
Laco Ad Film

2.7 Paint and Stain Applications for Various Uses

2.7.1.1 Metals

1-coat interior primer (delete if metal is factory primed)
2-coats finish G4

2.7.1.2 Painted Woodwork

1-coat interior primer
2-coats finish G4

2.7.1.3 Woodwork to be Stained and Varnished

Finish:
1 coat sap sealer
1-coat paste filler (only if necessary to repair damage or knots)
1-coat transparent wood stain
1-coat varnish G4

2.7.1.4 Plaster & Drywall

1-coat latex primer
2-coats finish G3 / G5

3 EXECUTION

3.1 Verification of Surface Conditions

3.1.1 Start work only when surfaces and conditions are satisfactory for production of quality work. Report to Consultant in writing any surfaces which are found to be unsatisfactory. Commencement of work shall imply acceptance of substrate surfaces.

3.1.2 Ensure temperature of surfaces to be finished between 10□C and 20□C (50□F and 68□F) and surfaces are dry and free of dirt, grease or other contaminants that may affect applied finish.

3.1.3 Verify moisture content of surfaces with electronic moisture metre. Do not proceed without written directions if moisture reading is higher than 12-15%.

3.1.4 If substrate is steel, do not apply coatings over moisture or when surface temperature is within 3□C (5□F) of dew point.

3.1.5 If substrate is wood, do not stain or paint if moisture reading is higher than 12%. Inspect work to assure surfaces are smooth, free from machine marks and nailheads have been countersunk.

3.1.6 If substrate is plaster or masonry, allow to cure for 30 to 90 days. Ensure that moisture content is below 12% and test for alkalinity and neutralize (pH 6.5-7.5) before proceeding with priming.

3.1.7 If substrate is gypsum board, inspect to ensure joints are completely filled and sanded smooth. Inspect surfaces for “nail popping”, screw heads not recessed and taped, breaks in surface or other imperfections and have repaired as required.

3.2 Protection

3.2.1 Remove finish hardware, electrical switch and outlet covers, receptacle plates, fittings and fastenings, to protect from paint splatter. Mask items not removable. Use sufficient drop cloths and protective coverings for full protection of floors, furnishings, mechanical, electrical and special equipment, all other components of building which do not require painting or to be removed, from paint spotting and other soiling. Re-install items when paint is dry. Clean any components that are paint spotted or soiled.

3.2.2 Keep waste rags in covered metal drums containing water and remove from building at end of each day.

3.2.3 Prohibit traffic, where possible, from areas where painting is being carried out and until paint is cured. Post “wet paint” or other warning signage during and on completion of work.

3.2.4 When handling solvent coating materials, wear approved vapour/particulate respirator as protection from vapours. Dust respirators do not provide protection from vapours.

3.3 Surface Preparation

3.3.1 Remove dust, grease, rust and extraneous matter from surfaces (except rust occurring on items specified to be primed under other Sections shall be removed and work re-primed under those Sections). Vacuum (fibre acoustic tile and) insulation covering surfaces. Vacuum clean floors before painting; wipe clean adjacent surfaces and surfaces to be painted before work is commenced to prevent dust and debris damage to wet paint.

3.3.2 Remove mildew by scrubbing affected area with solution of tri-sodium-phosphate (TSP)(150g) and bleach (125g) in 3.5L water. Rinse will with clean water and allow to dry. If condition is serious, source out finishes with extra mildew resistance.

3.3.3 For metals surface preparation, use method to suit surface condition and conform to level of cleaning based on (SSPC), recommended metal cleaning procedures most commonly used to suit site conditions. If materials require removal of coatings by solvents, do this preparation outdoors before the material is installed.

3.3.3.1 SSPC-SP2 (Hand Tool Cleaning): Use of scrapers, sandpaper, wire brushing or hand impact tools to remove loose mill scale, non-adherent rust and scaling paint or other foreign matter. Do not use hand tool cleaning procedure for areas subject to corrosive environment or on surfaces for vinyl chloride top coating. Remove weld flux and spatter to avoid localized paint failure.

3.3.1 Hot Dipped Galvanized Steel (Unweathered):

3.3.1.1 Allow to weather minimum of 26 weeks and xylene clean to SSPC-SP1 specified herein prior to coating to remove dust, dirt, grease, oxides and other foreign material. Remove silicates or similar surface treatments or any deposits of white rust by sanding or similar abrasive methods (bronze wool). Use of acetic acid to prepare galvanized surfaces is not acceptable.

3.3.2 Galvanized Steel (Weathered):

3.3.2.1 Remove dust, dirt, grease, oxides and other foreign material and clean to SSPC-SP1 specified herein prior to coating.

3.3.3 Galvanized Steel (Pre-treated)(Non-crystal Appearance):

3.3.3.1 Follow manufacturer’s recommendations for preparation, priming and coating of pre-treated galvanized steel.

3.3.4 Woodwork for Painting:

3.3.4.1 Seal all knots and sapwood in surfaces to receive paint with alcohol-based primer-sealer. Sand smooth rough surfaces of all woodwork to be finished and clean surfaces free of dust before applying first coat. Fill nail holes, splits and scratches with non-shrinking filler after first coat is dry. Remove salt deposits that may appear on wood surfaces treated with fire retarder.

3.3.5 Previously Finished Surfaces:

3.3.5.1 Clean existing interior and exterior surfaces to be repainted or varnished to provide bond. Remove rust, scale, oil, grease, mildew, chemical and other foreign matter. Remove loose paint and fill flush with suitable patching material. Clean off bubbled, cracked, peeling or otherwise defective paint by stripping with suitable environmental strippers or by burning. Do not burn off paints suspected of having lead content. Treat residue from stripping as hazardous waste. Flatten gloss paint and varnish with sandpaper and wipe off dust. If previous coating have failed so as to affect proper performance or appearance of coatings to be applied, remove previous coatings completely and prepare substrates properly and refinish as specified for new work. Leave entire surface suitable to receive designated finishes and in accordance with finish manufacturer’s instructions.

3.3.6 Concrete Block Masonry:

3.3.6.1 Fill voids and cracks in masonry block wall to provide uniform surface for subsequent coats.

3.3.6.2 Where necessary to neutralize surfaces, wash or paint with a solution of <M 1.36 kg.> <I 3 lbs.> of zinc sulphate to <M 4.5 litres> <I 1 gallon> of water. Brush off any crystalline residue on drying.

3.3.7 Existing Plaster:

3.3.7.1 Clean dry, free from dust, dirt, powdery residue, grease, oil, wax or any other contaminant accumulated since application. Do not sand plaster before painting.

3.3.7.2 Cut out scratches, cracks and abrasions, undercut if cracks are large. Fill with approved patching plaster or spackling compound. Bring flush with adjoining surface. When dry sand smooth and seal before applying prime coat.

3.3.8 Gypsum Board:

3.3.8.1 Examine surfaces after for imperfections showing through and fill small nicks or holes with patching compound and sand smooth. Examine surfaces after priming for imperfections showing through. Clean surfaces dry, free of dust, dirt, powdery residue, grease, oil, wax or any other contaminants. Sand and dust as necessary prior to painting.

3.4 During work of this Section cover finished floors, walls, ceilings, and other work in vicinity and protect from paint and damage.

3.5 Clean adjacent surfaces which have been painted, soiled or otherwise marred.

3.6 Application

3.6.1 Spraying not allowed without written permission.

3.6.2 Paint entire plane of areas exhibiting incomplete or unsatisfactory coverage and of areas which have been cut and patched. Patching not acceptable.

3.6.3 Do not paint baked enamel, chrome plated, stainless steel, aluminum or other surfaces finished with final finish in factory. Finish paint all primed surfaces.

3.6.4 Advise Consultant when each applied paint coat can be inspected. Do not re-coat without inspection. Tint each coat slightly to differentiate between applied coats.

3.6.5 Sand smooth enamel and varnish undercoats prior to re-coating.

3.6.6 Apply primer coat soon after surface preparation is completed to prevent contamination of substrate.

3.6.7 Prime woodwork designated for painting as soon as possible after delivery to site and before installation. Prime all cut surfaces, whether exposed or not, i.e. all 6 edges of wood doors, before installation. Prime all cut surfaces of woodwork to receive transparent finish with 1 coat of transparent finish reduced 25%.

3.6.8 Fill open grain wood with filler tinted to match wood and work well into grain. Wipe excess from surface before filler sets.

3.6.9 Apply primer-sealer coats by brush or roller. Permit to dry in accordance with manufacturer’s recommendations before applying succeeding coats. Touch-up suction spots and sand between coats with No. 120 sandpaper.

3.6.10 Apply primer coat to unprimed ferrous metal surfaces.

3.6.11 Apply final coats on smooth surfaces by roller or brush. Hand brush wood trim surfaces.

3.6.12 Apply additional paint coats, beyond the number of coats specified for any surface, to completely cover

and hide the substrate and to produce a solid, uniform appearance.

3.6.13 Allow each coat of paint to cure and become dry and hard before application of succeeding coats (unless manufacturer's directions require otherwise).

3.6.14 Before finishing paint coats are applied, inspect and touch-up shop coats of primers previously applied by other trades or fabricators.

3.6.15 Apply paint in accordance with manufacturer's directions.

3.6.16 Provide paint coating thicknesses indicated, measured as minimum dry film thicknesses.

3.7 Existing Spaces

3.7.1 Refinish existing surfaces of rooms or areas which have been damaged, altered or otherwise specified. Use same procedure as for new work but primer (or filler, stain and sealer in case of varnish finish) may be omitted. Prepare existing surfaces as specified herein. Finish shall match previous finish.

3.7.2 Paint or repaint rooms or areas where noted on room finish schedule and/or as indicated on drawings.

3.7.3 Repaint surfaces entirely between changes of plane.

3.7.4 Extend painting to a suitable boundary to avoid a "patched" effect. Sand, wire brush, or scrape such existing finished surfaces to remove loose paint and to reduce gloss. Also clean existing films of dirt, grease or wax. If metallic surfaces are rusted, remove loose scale to provide a firm surface. Patch and sand cracks and other imperfections.

3.7.5 Provide paint to interior existing spaces effected by alterations and shelled-in spaces in accordance with following:

3.7.5.1 Paint walls to the nearest inside and outside corners for the full wall height.

3.7.5.2 Paint columns floor to ceiling.

3.7.5.3 Paint full ceilings to the nearest wall or bulkhead.

3.7.5.4 Unless indicated otherwise match the existing colour.

3.7.5.5 Where room finish schedule indicates existing and /or new wall finishes to be painted, existing surfaces such as, existing door and frames, mechanical supply and return air grilles (both on walls and ceilings), access doors and electrical panels which has been previously painted shall be painted for a complete finish room. If the room finish schedule indicates "-" it denotes the entire room need not be painted, only the patched areas to be painted.

3.7.6 Apply at least the number of coats specified to produce a finish of even colour, texture and sheen.

3.7.7 Lightly sand all finishes between coats and clean.

Finish tops, bottoms and edges of doors, after doors are fitted.

3.7.8 Finish interior of closets (except millwork closets) same as nearest or adjoining surface unless otherwise directed by the Architect.

3.7.9 Fill screw heads, holes and other defects in metal work with mineral filler. Putty nail holes, cracks and

other defects in work, other than metal to match finish intended.

3.7.10 Spray work may be acceptable for certain surfaces with Architect's written permission. Roller application of paint is acceptable over drywall and concrete block surfaces. Apply all other finishes by brush.

3.7.11 Should spray work be permitted, take every precaution necessary to preserve the health of the employees by complying with regulations issued by Provincial or Federal Governments governing the use of materials prejudicial to health.

3.8 Re-touching

3.8.1 Make a close inspection of all surfaces decorated, after completing this work, and ensure that they are properly and perfectly re-touched where damaged before removing equipment.

3.9 Clean-up

3.9.1 Do not wash brushes, rollers, clothes etc. in running water; fill 2 suitably sized containers with clean water. Use first clean and second clean process for all paint. Final rinse only may be in running water.

3.9.2 Keep closed container of paint thinners on hand for ongoing cleaning. Do not dispose of paint thinners to sewer; take off site at end of each day and take to hazardous waste disposal depot.

3.9.3 Collect all emulsion from cleaning into containers and recycle or dispose at hazardous waste disposal depot, in accordance with local, provincial and federal environmental regulations.

3.9.4 Provide proof of proper disposal by receipt from hazardous waste disposal depot.

4 PAINT COLOUR SCHEDULE

Electrical Conduit - Colour to match wall or ceiling finish.

The following is a colour schedule of architectural finishes.

END OF SECTION

1 GENERAL

1.1 Instructions

1.1.1 The Instructions to Bidders, the General Conditions of CCDC 2, 2008 Supplementary General Conditions and all Sections of Division 1 apply to and form part of this Section of the Specification.

1.1.2 Report in writing to the General Contractor any defects of surfaces or work prepared by other trades which affect the quality or dimensions of this Contractor's work. Commencement of this Contractor's work shall imply complete acceptance of all work by other trades.

1.2 Intent

Provide all articles, labour, materials, equipment, transportation, hoisting and incidentals noted, specified or required, to complete the work of this Section.

1.2.1 Section Includes:

- Shelf and cabinet
- Signage
- Fire extinguishers
- Wall Louvers
- Grilles
- Coat racks
- Access panels for drywall ceilings
- Access panels for plumbing access
- Steel shelving
- Aluminum signs and letters

1.3 Related Work Not Included in this Section:

Supply of finishing hardware:	Section 08 70 00
Thresholds	

1.4 Rejections

1.4.1 Defective materials or quality of work, whenever found, at any time prior to acceptance of the work, shall be rejected regardless of previous inspection. Inspection will not relieve responsibility but is a precaution against oversight or errors.

1.4.2 Remove and replace defective materials and work of other trades affected by this replacement, at no additional cost to the Owner.

1.5 Performance

1.5.1 Design products to meet or exceed the performance criteria of the applicable C.G.S.B. Specification.

1.6 Material Storage

1.6.1 Deliver and store materials undamaged in original cartons or wrappings.

1.6.2 Store material in a secure, dry area.

1.7 Guarantee

1.7.1 Provide a written guarantee or work of this Section against defects in material and quality of work for

1.8 Cleaning and Protection

1.8.1 Be responsible for protection of all manufactured specialty work during period of construction.

1.8.2 Upon completion of installation of all manufactured specialty items, remove all excess material, empty cartons, wrappings, etc. and remove any dirt spots and foreign material from the installed items, leaving them in a clean, usable condition.

1.9 Submittals

1.9.1 Shop Drawings

1.9.1.1 Submit 3 copies of all shop drawings for the Consultant's review before any work commences.

1.9.1.2 This review is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that the reviewer approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of his responsibility of errors or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all Trades.

1.10 Clean-up

1.10.1 Upon the completion of work, remove from the site all surplus materials and debris caused by this work and leave the site in a clean condition to the satisfaction of the Consultant.

2 PRODUCTS

2.1 Materials

2.1.1 Provide new materials in perfect condition, free from defects impairing strength, durability or appearance.

2.1.2 Refer to the Architectural plans for location and required quantity of items specified.

2.2 Steel Shelving

2.2.1 Stainless Steel Shelving. 5" (depth)X 24" (long) : B-295X16 or equal approved

2.3 Signs

2.3.1 Aluminum Signs

Aluminum signs for Barrier-free washroom, safety and room numbers, wall mounted including tactile characters and numbers, uncontracted Braille comply with AODA requirements.

2.4 Accessories

REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A167-[99], Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM B456-[95], Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

.3 ASTM A653/A653M-[99], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.4 ASTM A924/A924M-[99], Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.81-[M90], Air Drying and Baking Alkyd Primer for Vehicles and Equipment.

.2 CAN/CGSB-1.88-[92], Gloss Alkyd Enamel, Air Drying and Baking.

.3 CAN/CGSB-12.5-[M86], Mirrors, Silvered.

.4 CGSB 31-GP-107Ma-[90], Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.

.3 Canadian Standards Association (CSA)

.1 CAN/CSA-B651-[95], Barrier-Free Design.

.2 CAN/CSA-G164-[M92], Hot Dip Galvanizing of Irregularly Shaped Articles.

2.4.1 Coat Hook

Cubbies and kids area: Henkel Safety Hook, 2 Colours TBD by Architect

912 or equal approved

2.4.2 Closet Rod & Closet Rod Support

Richelieu 30147850 & 2215602174

2.4.2 Mirror- 780 Tempered Glass/Stainless – Sizes TBD by Architect –refer to washrooms elevation.

3 EXECUTION

3.1 Examinations

3.1.1 Report to the Consultant, in writing, all defects of work prepared by other trades and on unsatisfactory site conditions.

3.1.2 Do not commence the work of this Division until surfaces, area, conditions specified or indicated on drawings, to receive manufactured specialties, are compatible with the manufacturer's installation requirements.

3.1.3 Commencement of work implies total acceptance of all preliminary installation requirements by the Contractor installing manufactured specialty items.

3.1.4 Waive any after claims by failure to comply with the above procedure of examination.

3.2 Quality of Work and Installation

3.2.1 Carry out installation of manufactured specialty items by tradesmen with the necessary training and experience and certified by the manufacturer or by the General Contractor's own forces with strict adherence to the manufacturer's printed installation instructions and/or shop drawings.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedure.

.2 Section 01 74 19 - Construction/Demolition Waste Management And Disposal.

.3 Section 01 45 00 - Quality Control.

.4 Section 01 78 00 - Closeout Submittal.

.5 Section 03 30 00 - Cast-in-Place Concrete: Concrete for elevator machine foundation, and pit.

.6 Section 26 - Electrical Services including disconnect and fused switches at machine room, standby power source, transfer switch, and connection from auxiliary contacts in transfer switch to controller, telephone service to elevators.

1.2 REFERENCES

.1 American National Standards Institute (ANSI)

.1 ANSI A17.1-[1996], Safety Code for Elevators and Escalators.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB 1.40-[97]-Anti Corrosive Structural Steel Alkyd Primer.

.2 CAN/CGSB 1.104-[91], Semi Gloss Alkyd Air Drying Baking and Enamel.

.3 Canadian Standards Association (CSA)

.1 CSA C22.1-[98], Canadian Electrical Code, Part I (18th edition), Safety Standard for Electrical Installations

.2 CSA W59-[1989 (R1998)], Welded Steel Construction (Metal Arc Welding) (Imperial version).

.3 CAN/CSA B44-[00], Safety Code for Elevators.

.4 CAN/CSA B355 Lifts for Persons with Physical Disabilities

1.3 SYSTEM DESCRIPTION

.1 Provide Chain/oil hydraulic platform lifts with 1 pistons per platform.

.2 Platform: 914mm wide x 1524mm deep (refer to manual.)

.3 Rated load: 750 lb (340 kg). uniformly distributed on top of platform. Design lift platform to remain level at any position in its travel.

.4 Travel: 910 mm and serving 1 landing.

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.5 Speed: 5.2 m/min. minimum, in "up" direction and 0.15 m/s in "down" direction with rated load in both directions.

1.4 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedure].

.2 Indicate:

.1 Pit: showing bumpers, edge angle, drain, bucket sump, cylinder sleeve, sloped floor, removable hand rails, waterproofing and truck bumpers.

.2 Platform: size, travel, skirts, bridge plates, removable safety posts and chains, access panels, cylinder, two post equalizer and cylinder support.

.3 Power units: space, size and location.

.4 Control station location.

.5 Location of disconnect switch and electric power requirements.

1.5 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for platform lift maintenance for incorporation into maintenance manual specified in Section 01 78 00 - Closeout Submittal].

.2 Include:

.1 Description of platform lift system's method of operation.

.2 Manufacturers instructions covering maintenance requirements and parts catalogue giving complete list of repair and replacement parts with cuts and identifying numbers.

.3 Legible schematic wiring diagrams covering electrical equipment as supplied and installed, including changes made in final work, with symbols listed corresponding to identity or markings on equipment.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with [Section 01 74 00 - Construction/Demolition Waste Management And Disposal.

.2 Divert unused metal, wiring and conduit materials from landfill to a metal recycling facility.

.3 Dispose of unused paint material at official hazardous material collections site approved.

.4 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in other locations where it will pose health or environmental hazard.

.5 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.6 Dispose of packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

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Part 2 PRODUCTS

2.1 Hydraulic Vertical Platform Lift, Savaria, model V-1504 EN, Aluminum enclosure completed with laminated glass inserts, two stop kit, Left mass, Type 2-180 (thru-cab), exit/entrance, Mid-Size, RAL powder coat finish, full height door frame with laminated glass at lower level and 42" high enclosure and gate at upper level.

.1 Pit size: 1681mm wide x 1437mm deep

.2 Platform/ Clear inside Cab size: 914mm width x 1524mm length

Contact: 905-791-5555, kevinw@savaria.com

2.2 COMPONENTS

.1 Use major components from standard product line of one manufacturer, or combine with products of another manufacturer provided such items are designed and produced under co-ordinated specifications to ensure safe and smooth operating system.

.2 Use components which have performed satisfactorily together under conditions of normal use in not less than two other installations of similar design and for a period of at least one year. Furnish to [Engineer] [Consultant] names and addresses of owners or managers of buildings, in which proposed combination of major components has so performed.

.3 Major components means cylinder and plunger, motor, pumping unit, controller, operation and control systems.

2.3 ELECTRICAL WIRING, CONDUIT AND FITTINGS

.1 Use steel compression type fittings where electrical metallic tubing is used. Do not use fittings with set screws.

.2 Do not use rigid pvc (unplasticized) conduit.

.3 All wiring and electrical connections shall comply with applicable codes. Insulated wiring shall have flame-retardant and moisture-proof outer covering and shall be run in conduit or electrical wireways if located outside the unit enclosure. Quick disconnect harnesses shall be used when possible.

2.4 POWER SUPPLY

.1 Power supply: 120 VAC, Single phase, 60 Hz., equipped with negative pressure switch & pit switch kit

.2 Lighting supply: 110 V, 15 amps

.3 Do not parallel conductors to increase current carrying capacity, unless individually fused.

.4 Do not use armoured flexible metal conduit as grounding conductor.

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2.5 LUBRICATION

.1 Provide means of lubricating bearings requiring periodic lubrication.

.2 When used, provide grease fittings to fit same gun.

.3 Use grease cups of automatic feed compression type.

.4 Points of lubrication to be visible and accessible.

2.6 CYLINDER AND PLUNGER

.1 Construct plunger of selected steel tubing machined true and finished to surface finish of 0.0008 mm Roughness Height Rating or better. Telescopic plungers are not acceptable.

.2 At top of cylinder provide stuffing box and packing gland with seal or self-adjusting packing not requiring external adjustment and which effectively prevents leakage.

.3 Provide means to automatically return oil which leaks past packing, to storage tank. Filter oil if exposed to atmosphere.

.4 Provide safety bulkhead on cylinder to ANSI A17.1.

.5 Install cylinder and plunger plumb. Operate with minimum friction.

.6 The plunger shall be constructed of a steel shaft of proper diameter machined true and smooth. The plunger shall be provided with a stop electrically welded to the bottom to prevent the plunger from leaving the cylinder.

2.7 ELECTRO- HYDRAULIC SYSTEM

.1 Provide hydraulic system consisting essentially of hydraulic pump, hydraulic cylinder and piston, pressure relief valve, fluid reservoir, valves, and connections. Minimize leakage from hydraulic system. Install drip pan under reservoir pump and other leakage areas.

.2 Work described in this section includes providing equipment, incidental material and labor required for complete, operable hydraulic platform lift installation. Lifts shall be erected, installed, adjusted, tested and placed in operation by lift system manufacturer, or manufacturer's authorized installer.

.3 Operate pump continuously in "up" direction, "down" travel shall be by gravity.

.4 Include:

.1 Stop to prevent piston from leaving cylinder in case of limit switch failure.

.2 Oil seals, wipers, guide bearings, gaskets, oil connections, and air elimination means.

.3 Pump suction-line strainer.

.4 Fluid-level gauge with minimum fluid level clearly indicated.

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.5 Reservoir with valved drain, filling opening filter and cover, and reservoir vent that will not allow entrance of dust.

.6 Safety orifice at cylinder to control oil flow in case of pipe breakage.

.7 Cable equalizers, rack and pinion equalizers, sliding bolsters, or other means approved by [Engineer] [Consultant], to prevent binding wear and misalignment due to unequal piston movement.

2.8 **Roller Chains:** Two No.50 roller chains with 5/8 inch (16 mm) pitch. Minimum breaking strength 6100 lb (2773 kg) each.

2.9 **Leveling Device:**

.1 The lift shall be provided with an anti-creep device which will maintain the carriage level within 1/2 inch (12 mm) of the top landing.

.2 All limit switch and leveling device switches shall be located in a position to be inaccessible to unauthorized persons. They shall be located behind the mast wall and be accessible through removable panels.

2.10 **Guide Yoke:** The 2:1 guide yoke/sprocket assembly shall be supplied with two sprockets, roller guide shoes, bearings and guards.

2.11 **Call Stations:** Provide key-controlled call stations for upper level and lower level on a stainless steel plate (Type 304 #4 stainless steel finish).

2.12 **Terminal Stopping Devices:** Normal terminal stopping devices shall be provided at top and bottom of runway to stop the car positively and automatically. Micro switches shall not be used.

2.13 **Guide Rails and Brackets:** Steel 'C" guide rails and brackets shall be used to guide the platform and sling. Guide rails shall form part of the structural integrity of the unit and be integral to the mast enclosure, ensuring stability and minimum platform deflection when loaded.

2.14 **Car Sling:** Car sling shall be fabricated from steel tubing 44 inches (1116 mm) high with adequate bracing to support the platform and car enclosure. Roller guide shoes shall be mounted on the top and bottom of the car sling to engage the guide rails. Guide shoes shall be roller type with 3 inches (76 mm) diameter wheels.

2.15 **CONTROL SYSTEM**

.1 Control platform lift by heavy duty, continuous pressure push-button station located where indicated.

.2 Push buttons to be clearly and permanently identified "UP" and "DOWN" or "RAISE" and "LOWER" in French and English wording w/illuminated directional buttons.

.3 Provide accurately emergency stop switch and Audible alarm, controlled stopping in both up and down directions and maintain platform in any position at which it is stopped until direction button is pressed.

.4 Provide approved limit switch to limit up travel of platform.

.5 Equipped with Keyed operational kit, both Lower land Upper landing call station push-buttons.

2.16 PUMPING UNIT AND CONTROL:

.1 The pumping unit and control shall be enclosed in the tower. The controller and pump unit shall be pre-wired and tested prior to shipment. The controller is to be electronic-free with relay logic operation for ease of maintenance and service. Pump unit shall incorporate the following features :

.1 Smooth stops at each landing.

.2 Adjustable pressure relief valve.

.3 Manually operable down valve to lower lift in the event of an emergency. This valve shall be activated from outside of the hoistway through a keyed box.

.4 Pressure gauge isolating valve, manually operable.

.5 Gate valve to isolate cylinder from pump unit.

.6 Electrical solenoid for down direction control.

.7 Emergency lowering by battery power, from the car control.

2.17 PLATFORM

.1 Construct platform of welded, formed steel and structural steel shapes and plates. Make upper surface of level non-skid steel floor plate.

.2 Include:

.1 Structural bolster assemblies and platens as necessary.

.2 Access panel, flush with and of same material as platform surface, located for easy access to pit, large enough for a person to pass through.

.3 Recessed mounting sockets of proper size around perimeter of upper platform surface to hold removable pipe posts fitted with chains having snap fasteners.

.4 Vertical sheet steel safety skirts of minimum 3 mm thickness attached to four platform sides and of depth to provide full protection when platform is in its uppermost position. Do not telescope skirts due to possible binding or jamming. Provide removable pit access panel in one skirt, large enough for a person to pass through on truck loading side of platform.

.5 Two 0.35 m wide x 0.75 m long reinforced bridge plates hinged to vehicle unloading edge of platform, light enough for person to handle with comparative ease and capable of carrying specified power truck roll-over impact load. Bevel edges which rest on vehicle bed to facilitate movement of wheeled vehicles. Design them so that they may be lifted off vehicle bed and rotated 180^{o} to lie flat on top of lift platform.

.6 Approved type of non-rotating device to keep platform in alignment at all times during its travel and to operate smoothly and resist rotational forces. Design telescoping devices to minimize possibility of jamming and damaging equipment.

2.18 CAR ENCLOSURE

.1 Side guards of platform shall have a steel frame with a powder coat finish and steel panel inserts to a minimum of 42 inches (1067 mm) above the upper landing.

.2 No platform gate required, to allow for ease of operation.

.3 Upper gate shall be 42 inches high by 36 inches wide, with laminated glass inserts and shall be equipped with interlock, spring hinges and kick plate. Lower door shall be 80 inches high by 36 inches wide, with laminated glass inserts and shall be equipped with interlock, hydraulic closer and kick plate on both sides. The inside kick plate shall be made of steel.

.4 Doors and gates shall be flush mounted inside the hoistway as to avoid pinch points and shear hazards.

.5 Handrail: A single handrail, with 1-1/2 inches (38 mm) diameter rail and with both ends returned to the side guard, shall be located on the control wall of the carriage, conform to AODA requirements.

2.19 FINISH

.1 Ferrous metal:

.1 Clean metal surfaces, treat with phosphate.

.2 Apply one coat of primer in accordance with CAN/CGSB 1.40.

.3 Apply [one] coat of paint finish in accordance with CAN/CGSB 1.104.

.2 Fasteners:

.1 Zinc or cadmium finish.

2.20 TESTS, INSPECTION

.1 Where welding is used for cylinder and pressurized piping, use welders fully qualified for pressure vessel welding.

.2 Where deemed necessary by [Engineer] [Consultant], subject welds to radiographic or other non-destructive inspection.

.3 Inspection and testing will be carried out by a firm designated by [Engineer] [Consultant].

.4 [Owner] [Engineer] will pay costs of tests as specified in Section [01 45 00 - Quality Control].

Part 3 EXECUTION

3.1 EXAMINATION

.1 Do not begin installation until hoistway and machine room has been properly prepared.

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.2 Site dimensions shall be taken to verify that tolerances and clearances have been maintained and meet local regulations.

.3 If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 EXCAVATION

.1 [Excavate] [Drill] for cylinder.

.2 Arrange access to site with truck mounted drilling rig where such is necessary.

.3 Where necessary due to soil conditions, install casing and backfill with sand.

3.3 PREPARATION

.1 Clean surfaces thoroughly prior to installation.

.2 Prepare surfaces and cast in place concrete pit using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.4 LIFT INSTALLATION

.1 Install all the components of the lift system that are specified in this section to be provided, and that are required by jurisdictional authorities to license the lift.

.2 Trained employees of the lift contractor shall perform all installation work of this section.

.3 Adjust lift for proper operation and clean unit thoroughly.

.4 Instruct users in operation procedures and Owner's maintenance person in trouble-shooting and maintenance procedures

3.5 CYLINDER CORROSION PROTECTION

.1 Protect cylinder against corrosion including chemical and electrolytic corrosion.

.2 Cathodic protection:

.1 Cathodically protect cylinder by applying electrical potential on cylinder of reverse polarity and current to prevent deterioration of exterior of cylinder.

.2 Design and install cathodic protection system and cylinder coating under direction of professional corrosion control engineer.

.3 Provide pilot light to indicate system is in operation and control and metre to adjust and indicate amount of cathodic protection being applied.

.4 Submit details of system to [Engineer] [Consultant] for approval.

.5 Adjust cathodic protection system for optimum operation.

.3 Protect fasteners against corrosion with zinc or cadmium coating.

.4 Protect installed products until completion of project.

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.5 Touch-up, repair or replace damaged products before Substantial Completion.

3.6 FIELD QUALITY CONTROL

.1 Perform and meet tests required by [Engineer] [Consultant] [authorities having jurisdiction].

.2 Supply instruments and carry out additional specified tests to approval of [Engineer] [Consultant].

.3 Submit to [Engineer] [Consultant] test and approval certificates issued by jurisdictional authorities.

.4 Test stop ring and hydraulic system by operating platform with rated load in up direction against stop ring at rated speed.

.5 Protect installed products until completion of project.

.6 Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

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