

UCDSB project no. 25-101
SOUTH GRENVILLE DHS
ROOF REPLACEMENT
AND IMPROVEMENTS

1000 EDWARD ST N, PRESCOTT, ON K0E 1T0

SPECIFICATIONS
ISSUED FOR TENDER
APRIL 14, 2026

Volume 1 of 2
Architectural Specifications
division 0 - division 32 incl.

SOUTH GRENVILLE DHS
ROOF REPLACEMENT
AND IMPROVEMENTS
1000 EDWARD ST N, PRESCOTT, ON K0E 1T0

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Specifications and Drawings

for

South Grenville DHS

1000 Edward St N
Prescott, ON K0E 1T0

prepared for

Upper Canada District School Board

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prepared by

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Reports and Studies:

Hazardous Building Materials Assessment, South Grenville District High School, 1000 Edward Street, Prescott, Ontario. Pinchin File 302783.041 - Dated August 9, 2023.

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.1 ARCHITECTURAL DRAWINGS

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A001	General and OBC Matrix	IFTP	10 APR 26
A101	Demolition Plans	IFTP	10 APR 26
A102	Demolition Plans	IFTP	10 APR 26
A103	Enlarged Demolition Plans and Details	IFTP	10 APR 26
A110	Construction Plans	IFTP	10 APR 26
A111	Construction Plans	IFTP	10 APR 26
A112	Enlarged Construction Plans and Details	IFTP	10 APR 26
A201	Roof Plan	IFTP	10 APR 26
A401	Sections and Details	IFTP	10 APR 26
A601	Doors and Windows	IFTP	10 APR 26
A602	Interior Elevations and Millwork	IFTP	10 APR 26

.2 ROOFING DRAWINGS

Dwg No.	Drawing Title	Issued for	Date
KP-1	Roof Area Key Plan	IFTP	10 APR 26
RP-1	Roof Plan – Area K	IFTP	10 APR 26
RP-2	Roof Plan – Area L	IFTP	10 APR 26
RP-3	Roof Plan – Area M	IFTP	10 APR 26
RP-4	Roof Plan – Area P	IFTP	10 APR 26
RP-5	Roof Plan – Area Q	IFTP	10 APR 26
RP-6	Tapered Insulation Plan 1	IFTP	10 APR 26
RP-7	Tapered Insulation Plan 2	IFTP	10 APR 26
A1	Roof Drain Detail	IFTP	10 APR 26
A2	Plumbing Vent Detail	IFTP	10 APR 26
A3	Landing Pad Detail	IFTP	10 APR 26
A4	Exhaust Fan Detail	IFTP	10 APR 26
A5	HVAC Unit Detail	IFTP	10 APR 26
A6	Overflow Scupper Detail	IFTP	10 APR 26
A7	Parapet Detail	IFTP	10 APR 26
A8	Pipe Enclosure Detail	IFTP	10 APR 26
A9	Expansion Joint Detail	IFTP	10 APR 26
A10	Roof/Wall Intersection Detail	IFTP	10 APR 26
A11	Mech. Gooseneck Vent Detail	IFTP	10 APR 26
A12	Control Joint Detail	IFTP	10 APR 26
A13	Roof/Wall Intersection Detail	IFTP	10 APR 26
A14	Roof/Window Intersection Detail	IFTP	10 APR 26
RA-1	New Typical Roof Assemblies	IFTP	10 APR 26
RA-2	New Typical Roof Assemblies	IFTP	10 APR 26
SK1	Base Flashing Fasteners & Reinforcing Membrane Detail	IFTP	10 APR 26

.3 STRUCTURAL DRAWINGS

Dwg No.	Drawing Title	Issued for	Date
S1	General Notes Roof Replacement	IFTP	10 APR 26
S2	Typical Details	IFTP	10 APR 26
S3	Key Plan Roof Replacement	IFTP	10 APR 26

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S5	Part Floor Plans Roof Replacement	IFTP	10 APR 26
S6	Sections & Details New Ramp & Stair	IFTP	10 APR 26

.4 MECHANICAL DRAWINGS

Dwg No.	Drawing Title	Issued for	Date
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M0.2	MECHANICAL AREA OF WORK	IFTP	10 APR 26
M0.3	WEST WING ROOMS 143 & 145 GROUND FLOOR & ROOFTOP PLUMBING & UTILITIES DEMO.	IFTP	10 APR 26
M1.1	WEST WING ROOMS 135, 136, & 139 GROUND FLOOR & ROOFTOP PLUMBING & UTILITIES DEMO.	IFTP	10 APR 26
M1.2	NORTH WING GROUND FLOOR & ROOFTOP PLUMBING & UTILITIES DEMOLITION	IFTP	10 APR 26
M1.3	WEST WING ROOMS 143 & 145 GROUND FLOOR & ROOFTOP PLUMBING & UTILITIES NEW WORK	IFTP	10 APR 26
M1.4	WEST WING ROOMS 135, 136, & 139 GROUND FLOOR & ROOFTOP PLUMBING & UTILITIES NEW WORK	IFTP	10 APR 26
M1.5	NORTH WING GROUND FLOOR & ROOFTOP PLUMBING & UTILITIES NEW WORK	IFTP	10 APR 26
M1.6	EAST WING GROUND FLOOR, SECOND FLOOR & ROOFTOP PLUMBING & UTILITIES DEMOLITION	IFTP	10 APR 26
M1.7	WEST WING ROOMS 143 & 145 GROUND FLOOR & ROOFTOP HVAC DEMOLITION	IFTP	10 APR 26
M2.1	WEST WING ROOMS 135, 136, & 139 GROUND FLOOR & ROOFTOP HVAC DEMOLITION	IFTP	10 APR 26
M2.2	NORTH WING GROUND FLOOR & ROOFTOP HVAC DEMOLITION	IFTP	10 APR 26
M2.3	EAST WING GROUND FLOOR, SECOND FLOOR & ROOFTOP HVAC DEMOLITION	IFTP	10 APR 26
M2.4	WEST WING ROOMS 143 & 145 GROUND FLOOR & ROOFTOP HVAC NEW WORK	IFTP	10 APR 26
M2.5	WEST WING ROOMS 135, 136, & 139 GROUND FLOOR & ROOFTOP HVAC NEW WORK	IFTP	10 APR 26
M2.6	NORTH WING GROUND FLOOR & ROOFTOP HVAC NEW WORK	IFTP	10 APR 26
M2.7	EAST WING GROUND FLOOR, SECOND FLOOR & ROOFTOP HV	IFTP	10 APR 26

.5 ELECTRICAL DRAWINGS

Dwg No.	Drawing Title	Issued for	Date
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E1.1	GROUND FLOOR - PARTS 1&9 - ARE ALARM - DEMOLITION WORK	IFTP	1 APR 26
E1.2	GROUND FLOOR - PARTS 1&9 - ARE ALARM - NEW WORK	IFTP	1 APR 26
E1.3	GROUND FLOOR - PARTS 2&3 - ARE ALARM - DEMOLITION WORK	IFTP	1 APR 26
E1.4	GROUND FLOOR - PARTS 2&3 - ARE ALARM - NEW WORK	IFTP	1 APR 26
E1.5	GROUND FLOOR - PARTS 4&8 - ARE ALARM - DEMOLITION WORK	IFTP	10 APR 26
E1.6	GROUND FLOOR - PARTS 4&8 - FIRE ALARM - NEW WORK	IFTP	10 APR 26
E1.7	GROUND FLOOR - PARTS 6&7 - FIRE ALARM - DEMOLITION WORK	IFTP	10 APR 26
E1.8	GROUND FLOOR - PARTS 6&7 - FIRE ALARM - NEW WORK	IFTP	10 APR 26
E1.9	GROUND FLOOR - PARTS 5&10 - FIRE ALARM - DEMOLITION WORK	IFTP	10 APR 26
E1.10	GROUND FLOOR - PARTS 5&10 - FIRE ALARM - NEW WORK	IFTP	10 APR 26
E1.11	GROUND FLOOR - PARTS 2&3 - LIGHTING - DEMOLITION WORK	IFTP	10 APR 26
E1.12	GROUND FLOOR - PARTS 2&3 - LIGHTING - NEW WORK	IFTP	10 APR 26
E1.13	GROUND FLOOR - PARTS 1&1 - LIGHTING - DEMOLITION & NEW WORK	IFTP	10 APR 26
E1.14	GROUND FLOOR - PARTS 2&3 - POWER & SYSTEMS - DEMOLITION WORK	IFTP	10 APR 26
E1.15	GROUND FLOOR - PARTS 2&3 - POWER & SYSTEMS - NEW WORK	IFTP	10 APR 26
E1.16	GROUND FLOOR - PARTS 1&1 - POWER & SYSTEMS - DEMOLITION & NEW WORK	IFTP	10 APR 26
E2.1	SECOND FLOOR - PARTS 1&9 - FIRE ALARM - DEMOLITION WORK	IFTP	10 APR 26
E2.2	SECOND FLOOR - PARTS 1&9 - FIRE ALARM - NEW WORK	IFTP	10 APR 26
E2.3	SECOND FLOOR - PARTS 2&3 - FIRE ALARM - DEMOLITION WORK	IFTP	10 APR 26
E2.4	SECOND FLOOR - PARTS 2&3 - FIRE ALARM - NEW WORK	IFTP	10 APR 26
E2.5	SECOND FLOOR - PARTS 4&8 - FIRE ALARM - DEMOLITION WORK	IFTP	10 APR 26
E2.6	SECOND FLOOR - PARTS 4&8 - FIRE ALARM - NEW WORK	IFTP	10 APR 26
E2.7	SECOND FLOOR - PARTS 6&7 - FIRE ALARM - DEMOLITION WORK	IFTP	10 APR 26
E2.8	SECOND FLOOR - PARTS 6&7 - FIRE ALARM - NEW WORK	IFTP	10 APR 26
E2.9	SECOND FLOOR - PART 5 - FIRE ALARM - DEMOLITION WORK	IFTP	10 APR 26
E2.10	SECOND FLOOR - PART 5 - FIRE ALARM - NEW WORK	IFTP	10 APR 26

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E2.11	SECOND FLOOR - LIGHTING - DEMOLITION & NEW WORK	IFTP	10 APR 26
E2.12	SECOND FLOOR - POWER & SYSTEMS - DEMOLITION & NEW WORK	IFTP	10 APR 26
E3.1	ROOFTOP - POWER & SYSTEMS - DEMOLITION WORK	IFTP	10 APR 26
E3.2	ROOFTOP - POWER & SYSTEMS - NEW	IFTP	10 APR 26

END OF SECTION

PART 1- GENERAL

1.1 REQUIREMENTS INCLUDED

- .1 Requirements and limitations for cutting and patching the Work and making good.

1.2 RELATED WORK

- .1 General Instructions Section 00 21 14
- .2 Common Product Requirements Section 01 61 00
- .3 Individual Sections: cutting and patching incidental to work of the particular section. Advance notification to other sections required.
- .4 Drawings and notes on drawings, including printed notes specifically referring to "cutting, patching and making good".

1.3 SUBMITTALS

- .1 Submit written request in advance of cutting or alteration which affects:
 - .1 Structural integrity of any element of Project.
 - .2 Integrity of weather-exposed or moisture-resistant elements.
 - .3 Efficiency, maintenance, or safety of any operational element.
 - .4 Visual qualities of sight-exposed elements.
- .2 Include in request:
 - .1 Identification of Project.
 - .2 Location and description of affected work.
 - .3 Statement on necessity for cutting or alteration.
 - .4 Description of proposed work, and products to be used.
 - .5 Alternatives to cutting and patching.
 - .6 Written permission of affected separate contractor.
 - .7 Date and time work will be executed.

1.4 GENERAL

- .1 Execute cutting, fitting, and patching, including excavation and fill, to complete the work.
- .2 Fit the several parts together, to integrate with other work.
- .3 Uncover work to install ill-timed work.
- .4 Remove and replace defective and non-conforming work.
- .5 Remove samples of installed work for testing.
- .6 Provide openings in non-structural elements of work for penetrations of mechanical and

electrical work.

1.5 INSPECTION

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.

1.6 PREPARATION

- .1 Provide supports to assure structural integrity of surroundings; devices and methods to protect other portions of project from damage.
- .2 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

1.7 PERFORMANCE

- .1 Execute work by methods to avoid damage to other work, and which will provide proper surfaces to receive patching and finishing.
- .2 Use material to match existing.
- .3 For a change in material submit request for substitution under provisions of Section 01600.
- .4 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- .5 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed without prior approval.
- .6 Restore work with new products in accordance with requirements of Contract Documents.
- .7 Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .8 At penetration of fire-rated wall, ceiling, or floor construction, completely seal voids with the specified fire-rated material, full thickness of the construction element.
- .9 Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.

END OF SECTION

1 PERMITS, FEES, AND CERTIFICATES

- .1 The Building Permit will be paid for by the Owner.
- .2 Provide the Authorities with such plans and information as may be required for the issuance of Acceptance Certificates.
- .3 Obtain all Inspection Certificates required by Authorities having jurisdiction. Hand over copies of Certificates to the Architect.

2 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each of the following:
 - .1 Contract drawings, with items of Addenda updates at each location on drawings.
 - .2 Regulatory Authority approved and Drawings, Permits, Certificates, etc.
 - .3 Contract Specification.
 - .4 Reviewed shop drawings.
 - .5 Change Orders and Site Instructions.
 - .6 Other modifications to Contract.
 - .7 Field test reports.
 - .8 Copy of approved work schedule.
 - .9 Manufacturers' installation and application instructions.
 - .10 Record set of As-built Drawings.
 - .11 Minutes of Project Meeting.

3 WORK SCHEDULE

- .1 Provided within ten (10) working days after Contract award, construction network diagram showing anticipated progress stages and final completion of work within time period required by Contract Documents. Reference Construction Progress Schedule Section 01 32 16.
- .2 The Contractor shall include for all regular, double shift and weekend work required to meet completion dates, as advised during the pre-bid project briefing and as scheduled in the Instructions to Bidders.

4 COST BREAKDOWN AND CASH FLOW PLAN

- .1 Before submitting first Progress Claim, submit a breakdown of Contract price in detail as directed by the Architect. After approval by the Architect cost breakdown will be used as basis for progress payment.
- .2 The Cash Flow Plan, if requested, will indicate anticipated progress payments. It will be formatted similar to that used by the Contractor for progress payments. The Cash Flow Plan will be updated and submitted to the Architect concurrent with each request for progress payments.

5 CONTRACTOR'S USE OF SITE

- .1 Refer to Section 01 52 00 for Construction Facilities, Section 01 51 00 Temporary Utilities, and Section 01 56 00 Temporary Barriers and Enclosures.
- .2 Do not unreasonably encumber site with materials or equipment.
- .3 Obtain and pay for use of additional storage or work areas needed for operations.

6 CODES AND STANDARDS

- .1 Perform work in accordance with Ontario Building Code, and any other code of National, Provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- .2 Meet or exceed requirements of contract documents, specified standards, codes and referenced documents.

7 PROJECT MEETINGS

- .1 Hold project meetings at times and locations approved and chaired by Architect. Prepare minutes of all meetings.
- .2 Notify all parties concerned of meetings.
- .3 The recorded minutes will form part of the project record and shall be distributed to all parties within seven (7) days of meeting.

8 TELECOMMUNICATIONS

- .1 It is the Contractor's responsibility to co-ordinate and pay for his own telecommunication services.

9 GENERAL COMPLIANCE

- .1 Comply with all Canadian Construction Document CCDC 2 (2020) General and Supplementary Conditions.
- .2 It is the Contractor's responsibility to co-ordinate interdependent trades' activities between Divisions, with special attention to Mechanical and Electrical Divisions.

10 LOCATION OF EQUIPMENT AND FIXTURES

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform the Architect of impending installation and obtain his approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by the Architect.
- .5 The Contractor will take all necessary steps to have equipment that was removed or replaced as part of any Work disposed of or decommissioned in accordance with appropriate disposal or decommissioning processes, applicable laws, and in accordance with commercially reasonable environmental practices.
- .6 The contractor will provide before and after pictures of equipment nameplates.
- .7 The Contractor must submit written proof or evidence or acknowledgement that the disposal of all materials was done in accordance with all current disposal requirements.

- .1 Acceptable Documents are invoices OR disposal certificates from the disposal facility. This documentation must be on the disposal facility's letterhead, invoice, or certificate. Minimum Information Required:
 - .1 building name and address
 - .2 equipment description (lamps, motors, cooling equipment, etc.)
 - .3 equipment quantities
 - .4 disposal facility name

11 LINES AND LAYOUT

- .1 The Contractor shall employ a qualified Ontario Land Surveyor who will establish and lay out in the field all main lines and levels of the project and assume for the Contractor the responsibility for their accuracy and well-being and by such procedure will absolve the Architect and Owner from any costs whatsoever to rectify from any cause.
- .2 The surveyor shall verify the known Geodetic elevation and transfer that elevation to a sufficient number of benchmarks or permanent monuments on the site to minimize any inaccuracy of long range shooting. He will correlate such Geodetic elevation with the elevations in use by all public utilities within the area and particularly adjacent to the project.
- .3 The Contractor shall also employ and pay the Ontario land Surveyor to provide a post-construction survey upon completion of foundations and site work showing "As-built" dimensions, location, angles and geodetic elevations of the work.

12 CONCEALMENT

- .1 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas unless specifically noted to be exposed.
- .2 If any doubt arises as to means of concealment, or intent of Contract Documents in this connection, request clarification from Consultant before proceeding with portion of work in question.

13 CUTTING, FITTING AND PATCHING

- .1 Refer also to Section, Cutting, Patching and Making Good.
- .2 Execute cutting (including excavation), and fitting and patching required to make work fit properly.
- .3 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.
- .4 Obtain Architect's approval before cutting, boring or sleeving load-bearing members.
- .5 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.
- .6 Fit work airtight to pipes, sleeves, ducts and conduits.
- .7 Carefully read all notes on drawings and comply as required.
- .8 At penetration of fire-rated wall, ceiling, or floor construction, completely seal voids with fire-rated material, the specified full thickness of construction element.
- .9 Cut rigid materials using power saw or core drill. Pneumatic or impact tools not allowed.

14 EXISTING SERVICES

- .1 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities and the Owner, with minimum of disturbance to pedestrians, vehicular traffic and the operation of the existing building.
- .2 Before commencing work, establish location and extent of service lines in area of work and notify the Architect of findings.
- .3 Submit schedule to and obtain approval from governing authorities and the Owner for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties. Provide a minimum five (5) working days notice of pre-scheduled interface activities affecting utility services or adjacent use of properties.
- .4 Where unknown services are encountered, immediately advise the Architect and confirm findings in writing.
- .5 Record locations of maintained, re-routed and abandoned service lines.

15 EXAMINATION OF DRAWINGS, SPECIFICATIONS AND SITE

- .1 Where a discrepancy between various consultants' drawings exists, the most stringent requirement shall prevail.
- .2 Defects in work prepared by the Contractor or Sub-contractor affecting the work of another contractor shall be reported to the Architect. Failure to report or commencement of further work over the defect shall mean acceptance of the condition. The Contractor shall hold the Owner harmless from costs arising from these defects and their remedies.

16 DIVISION OF WORK

- .1 Work specified in the Specification has been divided into Sections for convenience only. Division of work among Sub-contractors and suppliers is solely the Contractor's responsibility and Consultant assumes no responsibility to act as an arbiter to establish subcontract limits between Sections or Divisions of work.
- .2 Tender Documents are issued as a whole, and no distinction shall be made between architectural, mechanical, electrical, etc portions of the work. Information shown in any part of the tender documents shall be binding and General Contractor is required to coordinate work among various sub-trades.
- .3 The Contractor shall examine all drawings, all sections of the specifications, the site, and existing building for information affecting the work, and project schedule.

17 COOPERATION

- .1 The Contractor and his Sub-contractors shall be familiar with each other's work wherein it affects their own work.
- .2 The Contractor shall be responsible for the scheduling of materials and the exchange of information between himself and his Sub-contractors for the execution and completion of the

work, i.e., shop drawings, progress schedules, articles to be built-in, location of openings.

- .3 By custom or precedent, the Contractor and the Sub-contractors shall make allowances in their work to accommodate each other's work, i.e., cutting, patching, and building in.
- .4 The Contractor shall hold the Owner harmless from costs or damages resulting from failure to cooperate as outlined herein.

18 EMERGENCY CALL-OUT PROCEDURES

- .1 The Contractor will provide the Architect and Owner with up-to-date emergency call-out procedures and numbers.

19 SAFETY REGULATIONS

- .1 The Contractor will comply with all municipal, provincial and federal regulations. Also refer to Section 01 35 29 Health and Safety Requirements.

20 PARKING

- .1 For the duration of the project, provide adequate parking for trade contractors. Provide designated parking spaces for the Owner (1), Architect (1) and Consultants (3).

21 MAINTAIN, CO-ORDINATE WITH WASTE AUDIT SECTION

- .1 Except as directed by the Owner or noted on documents, all waste and redundant materials become the property of the Contractor and will be removed at the Contractor's expense from the Owner's property.
- .2 Removed materials will be disposed of in accordance with the latest applicable municipal, provincial, or Federal Government regulations.
- .3 For hazardous waste, the Contractor will provide the Consultant with copies of all completed transportation manifests.

22 ADDITIONAL DRAWINGS

- .1 The Architect may furnish additional drawings to assist proper execution of work. These drawings will be issued for clarification only. Such drawings shall have same meaning and intent as if they were included with plans referred to in Contract Documents.

23 WORKMANSHIP

- .1 Workmanship shall be best quality, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Architect if required work is such as to make it impractical to produce required results.
- .2 Do not employ an unfit person or anyone unskilled in their required duties.
- .3 Decisions as to quality or fitness of workmanship in cases of dispute rest solely with Architect, whose decision is final.

24 PROTECTION OF BUILDING FINISHES AND EQUIPMENT

- .1 New Construction:

- .1 Provide protection for finished and partially finished building finishes and equipment during performance of work.
 - .2 Provide necessary screens, covers, hoardings as required.
 - .3 Be responsible for damage incurred due to lack of or improper protection.
- .2 Existing Landscaping and Property:
- .1 Ensure that no damage is caused to existing pavements, fences, curbs, grounds, plants, property, utilities, services, and finishes designated to remain during the progress of the work. Repair and make good any damage caused at no extra cost to the Owner. Do not proceed with remedial work without written permission of the Architect.
 - .2 Keep municipal access roads clean of mud and debris resulting from construction traffic.
 - .3 Prevent soiling of pavement due to spillage, mixing of material or any cause. Make good any damage caused.
 - .4 Protect work during periods of suspension, regardless of reason for suspension.

END OF SECTION

PART 1- GENERAL

1.1 RELATED REQUIREMENTS

.1	Section 01 32 16	Construction Progress Schedule
.2	Section 01 35 00	Traffic Control
.3	Section 01 35 29	Health and Safety Requirements
.4	Section 01 35 43	Environmental Procedures
.5	Section 01 41 00	Regulatory Requirements
.6	Section 01 45 00	Quality Control
.7	Section 01 51 00	Temporary Utilities
.8	Section 01 52 00	Construction Facilities
.9	Section 01 56 00	Temporary Barriers and Enclosures

1.2 ACCESS AND EGRESS

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.4 SCHEDULING AND CONTRACTORS USE OF SITE

- .1 Use of site for execution of the work and as otherwise noted or indicated.
- .2 Dates and Hours of work.
 - .1 The school is available from 7:00 am to 10:30 pm each day. During school hours (9:25 am to 3: 50 pm) commencing April 2026, work can be performed in the following locations as scheduled with Project Manager.
- .3 Dates and Hours of various portions of the work.
 - .1 Coordinate with UCDSB Project Manager for final schedule
 - .2 The existing daycare is operational throughout the calendar year.
 - .3 Work in the existing school and roof over the existing building to be completed over the summer months (June to August)
 - .4 Contractor Mobilization can start on April 1, 2026 and all work is to be substantially completed on July 3, 2028
 - .5 Close-out reporting is due September 1, 2029
 - .6 Balance of site works start date is to be determined by General Contractor and is to be substantially complete by October 4, 2028
 - .7 Occupancy and handover of the site to the owner is to be completed by September 1, 2028
 - .8 All playgrounds and sports field to be fully accessible and available for student use during school calendar.
 - .9 Installation of security cameras and wiring can be performed on school days after 3:50 PM.
 - .10 The school is available for scheduled weekend work.
 - .11 Custodian work hours are from 7 am to 3 pm. Contractor may be responsible to disarm and arm the security system each day.
 - .12 Arrange with UCDSB Project Manager for security codes and access.
- .4 Confine operation, storage access and parking to owner's discretion.

- .5 Do not unreasonably encumber site with materials or equipment.
- .6 Move stored products or equipment which interferes with operations of owner or other contractors.
- .7 Obtain and pay for additional storage or work areas needed for operations.
- .8 Maintain project grounds and public areas free of rubbish and waste materials.

1.3 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with the Owner and Consultants to facilitate work as stated.
- .2 Hours of work: Custodian summer work hours are 7:00 AM to 3:00 PM. After hours and weekend access can be arranged with School Board. Owner to provide contractor with keys and security code if required.
- .3 Maintain existing services to building and provide for personnel and vehicle access.
- .4 Where security is reduced by work provide temporary means to maintain security.
- .5 Closures: protect work temporarily until permanent enclosures are completed.

1.4 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to building operations, occupants and normal use of premises. Arrange with Owner and Consultant to facilitate execution of work.

1.5 EXISTING SERVICES

- .1 Notify Owner, Consultant and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Owner a minimum of 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.
- .3 Provide for personnel, pedestrian and vehicular traffic.
- .4 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.6 SPECIAL REQUIREMENTS

- .1 Submit schedule in accordance with Section 01 32 16 Construction Progress Schedule.

1.7 SECURITY

- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.

1.8 BUILDING SMOKING ENVIRONMENT

- .1 Smoking is not permitted, as per the Smoke-Free Ontario Act.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 Owner/Contractor Agreement.
- .2 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2020, Stipulated Price Contract.

1.2 APPLICATIONS FOR PROGRESS PAYMENT

- .1 Refer to CCDC2-2020
- .2 Make applications for payment on account as monthly as Work progresses.
- .3 Date applications for payment last day of agreed monthly payment period and ensure amount claimed is for value, proportionate to amount of Contract, of Work performed and Products delivered to Place of Work at that date.
- .4 Submit to Consultant, at least 14 days before first application for payment. Schedule of values for parts of Work, aggregating total amount of Contract Price, to facilitate evaluation of applications for payment.

1.3 SCHEDULE OF VALUES

- .1 Refer to CCDC 2-2020.
- .2 Provide schedule of values supported by evidence as Consultant may reasonably direct and when accepted by Consultant, be used as basis for applications for payment.
- .3 Include statement based on schedule of values with each application for payment.
- .4 Support claims for products delivered to Place of Work but not yet incorporated into Work by such evidence as Consultant may reasonably require to establish value and delivery of products.

1.4 PREPARING SCHEDULE OF UNIT PRICE TABLE ITEMS

- .1 Submit separate schedule of unit price items of Work requested in Bid form.
- .2 Make form of submittal parallel to Schedule of Values, with each line item identified same as line item in Schedule of Values. Include in unit prices only:
 - .1 Cost of material.
 - .2 Delivery and unloading at site.
 - .3 Sales taxes.
 - .4 Installation, overhead and profit.
- .3 Ensure unit prices multiplied by quantities given equal material cost of that item in Schedule of Values.

1.5 PROGRESS PAYMENT

- .1 Refer to CCDC 2-2020.
- .2 Consultant will issue to Owner, no later than 10 working days after receipt of an application for payment, certificate for payment in amount applied for or in such other amount as Consultant determines to be due. If Consultant amends application, Consultant will give notification in writing giving reasons for amendment.

1.6 SUBSTANTIAL PERFORMANCE OF WORK

- .1 Refer to CCDC 2-2020.
- .2 Prepare and submit to Consultant comprehensive list of items to be completed or corrected and apply for a review by Consultant to establish Substantial Performance of Work or substantial performance of designated portion of Work when Work is substantially performed if permitted by lien legislation applicable to Place of Work designated portion which Owner agrees to accept separately is substantially performed. Failure to include items on list does not alter responsibility to complete Contract.
- .3 Prepare application in accordance with OAA/OGCA Document 100.
- .4 No later than 10 working days after receipt of list and application, Consultant will review Work to verify validity of application, and no later than 10 working days after completing review, will notify Contractor if Work or designated portion of Work is substantially performed.
- .5 Consultant shall state date of Substantial Performance of Work or designated portion of Work in certificate.
- .6 Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Consultant, establish reasonable date for finishing Work.
- .7 Publish Substantial Performance in Daily Commercial News and provide publication certificate to the Owner and Consultant.

1.7 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF WORK

- .1 Refer to CCDC 2-2020.
- .2 Refer to OAA/OGCA Document 100.
- .3 After issuance of certificate of Substantial Performance of Work:
 - .1 Submit application for payment of holdback amount.
 - .2 Submit sworn statement that accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred in Substantial Performance of Work and for which Owner might in be held responsible have been paid in full, except for amounts properly retained as holdback or as identified amount in dispute.
- .4 After receipt of application for payment and sworn statement, Consultant will issue certificate for payment of holdback amount.

1.8 FINAL PAYMENT

- .1 Refer to CCDC 2-2020.
- .2 Submit application for final payment when Work is completed.
- .3 Consultant will, no later than 10 working days after receipt of application for final payment, review Work to verify validity of application. Consultant will give notification that application is valid or give reasons why it is not valid, no later than 10 working days after reviewing Work.
- .4 Consultant will issue final certificate for payment when application for final payment is found valid.

END OF SECTION

PART 1 – GENERAL

1.1 ADMINISTRATIVE

- .1 Schedule and administer project meetings throughout the progress of the work at the call of Consultant.
- .2 Distribute written notice of each meeting four days in advance of meeting date Consultant.
- .3 Provide physical space and make arrangements for meetings.
- .4 Preside at meetings.
- .5 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .6 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and, affected parties not in attendance.
- .7 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

- .1 Within seven (7) days after issuance of Purchase Order by the Owner, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Owner, Consultants, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3 Establish time for MS Teams meeting and notify parties concerned minimum 5 days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work: in accordance with Section 01 32 16 - Construction Progress Schedule.
 - .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
 - .5 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
 - .6 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
 - .7 Owner provided products.
 - .8 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .9 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
 - .10 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
 - .11 Monthly progress claims, administrative procedures, photographs, hold backs.

- .12 Appointment of inspection and testing agencies or firms.
- .13 Insurances, transcript of policies.
- .6 During construction coordinate use of site and facilities through Consultant's procedures for intra-project communications: Submittals, reports and records, schedules, coordination of drawings, recommendations, and resolution of ambiguities and conflicts.
- .7 Comply with instructions of Owner for use of temporary utilities and construction facilities.

1.3 PROGRESS MEETINGS

- .1 During course of Work, schedule progress meetings as required for the duration of the project.
- .2 Contractor, major Subcontractors involved in Work, Owner and Consultants are to be in attendance.
- .3 Notify parties minimum 5 days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.

END OF SECTION

PART 1- GENERAL

1.1 SECTION INCLUDES

- .1 Schedule, form, content.
- .2 Critical path scheduling.

1.2 SCHEDULES REQUIRED

- .1 Contractor shall submit their Construction Schedule for review within seven days after award of contract utilizing the critical path method. This schedule shall be updated monthly with both hard copy and electronic copy forwarded to the Consultant. Monthly updates must include actual percentages complete. The Construction Schedule will be shown as a line item on the Contractor's Cost Breakdown. Failure to provide monthly updates may result in the contractor's request for payment being returned.
- .2 The CPM Schedule shall include complete sequence of construction activities.
- .3 Include dates for commencement and completion of each major element of construction.
- .4 Show projected percentage of completion of each item as of first day of month.
- .5 Indicate progress of each activity to date of submission schedule.
- .6 Show changes occurring since previous submission of schedule:
 - .1 Major changes in scope.
 - .2 Activities modified since previous submission.
 - .3 Revised project icons of progress and completion.
 - .4 Other identifiable changes.
- .7 Provide a narrative report to define:
 - .1 Problem areas, anticipated delays and impact on schedule.
 - .2 Corrective action recommended and its effect.

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 SECTION INCLUDES

- .1 Shop drawings and product data.
- .2 Samples.
- .3 Certificates and transcripts.

1.2 ADMINISTRATIVE

- .1 Submit electronically, to Consultant within 14 days from award, submittals listed for review. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Work affected by submittal shall not proceed with until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are coordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.
- .10 Keep one reviewed copy of each submission on site.

1.3 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Provide Professional Engineer's stamp and signature, on the front face of the submission where specific sections of the specification so direct. Note that formal drawings will not be reviewed unless the noted Professional Engineer's stamp and signature is present. Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where

SUBMITTAL PROCEDURES

articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

- .4 Photocopies, Scans, PDF's of the original Tender Documents, will not be accepted for Shop Drawings.
- .5 Allow 15 working days for Consultant's review of each submission.
- .6 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .7 Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.
- .8 Accompany submissions with transmittal letter, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .9 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .10 Shop drawings to be originals prepared by the Contractor, Subcontractor, Supplier or Distributor, which illustrate the appropriate portion of the Work; showing fabrication, layout, setting or erection details, as specified in the appropriate Sections.
- .11 Drawings and product data may be submitted in PDF format and sent to the Consultants via email with appropriate transmittals. Project Administrator is to include the Project Manager with copies of all Shop Drawing submissions. If PDF submissions are distributed via email, copy in (c.c.), the appropriate Consultants.

SUBMITTAL PROCEDURES

- .12 Electronic PDF shop drawings must be properly titled by the General Contractor or will be returned. Filing must start with the shop drawing number and must include the title of the Submission; Example: 05 55 00 - 01 Steel Stairs
- .13 Identify content of shop drawings by reference to specification Section numbers.
- .14 Identify details by reference to sheet and detail numbers shown on the Contract Drawings.
- .15 If hard copies are used, submit 3 reproducible drawing and/or data packages.
- .16 After Consultant's review, distribute copies.
- .17 Schedule shop drawing submissions at least twenty (20) days before the dates reviewed submissions will be needed.
- .18 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.
- .19 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Consultant.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within [3] years of date of contract award for project.
- .20 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Consultant.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
- .21 Submit electronic copies of manufacturers instructions for requirements requested in specification Sections and as requested by Consultant.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .22 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Consultant.
- .23 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .24 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Consultant.
- .25 Delete information not applicable to project.
- .26 Supplement standard information to provide details applicable to project.
- .27 If upon review Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation

of Work may proceed.

- .28 The review of shop drawings by Consultant is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that Consultant approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.4 SAMPLES

- .1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Consultant's business address.
- .3 Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .6 Make changes in samples which Consultant may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5 MOCK-UPS

- .1 Erect mock-ups in accordance with 01 45 00 - Quality Control.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES

- .1 Ministry of Transportation, Ontario (MTO), Ontario Traffic Manual, Book 7: Temporary Conditions-01
- .2 U.S. Department of Transportation, Manual of Uniform Traffic Control Devices for Streets and Highways (UTCD) - 2009
- .3 Applicable Municipal By-Laws

1.2 PROTECTION OF PUBLIC TRAFFIC

- .1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.
- .2 When working on travelled way:
 - .1 Place equipment in position to minimize interference and hazard to travelling public.
 - .2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
 - .3 Do not leave equipment on travelled way overnight.
- .3 Close lanes of road only after receipt of written approval from Consultant.
 - .1 Before re-routing traffic erect suitable signs and devices to Ontario Traffic Manual, Book 7: Temporary Conditions.
- .4 Keep travelled way graded, free from pot holes and of sufficient width for required number of lanes of traffic.
 - .1 Provide 7 m wide minimum temporary roadway for traffic in two-way sections through Work and on detours.
 - .2 Provide 5 m wide minimum temporary roadway for traffic in one-way sections through Work and on detours.
- .5 Provide gravelled detours or temporary roads to facilitate passage of traffic around restricted construction area: Grade for detour in accordance with Provincial and Municipal Regulations.

1.3 INFORMATIONAL AND WARNING DEVICES

- .1 Provide and maintain signs, [flashing warning lights] and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.
- .2 Supply and erect signs, delineators, barricades and miscellaneous warning devices to Manual of Uniform Traffic Control Devices for Streets and Highways and Ontario Traffic Manual, Book 7: Temporary Conditions.
- .3 Place signs and other devices in locations recommended in Manual of Uniform Traffic Control Devices for Streets and Highways and Ontario Traffic Manual, Book 7: Temporary Conditions.
- .4 Meet with Consultant prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of Consultant.

- .5 Continually maintain traffic control devices in use:
- .1 Check signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
- .2 Remove or cover signs which do not apply to conditions existing from day to day.

1.4 CONTROL OF PUBLIC TRAFFIC

- .1 Provide competent flag personnel, trained in accordance with, and properly equipped to Manual of Uniform Traffic Control Devices for Streets and Highways and Ontario Traffic Manual, Book 7: Temporary Conditions for situations as follows:
 - .1 When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.
 - .2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.
 - .3 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.
 - .4 Where temporary protection is required while other traffic control devices are being erected or taken down.
 - .5 For emergency protection when other traffic control devices are not readily available.
 - .6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
 - .7 At each end of restricted sections where pilot cars are required.
 - .8 Delays to public traffic due to contractor's operators: 15 minutes maximum.
- .2 Where roadway, carrying two-way traffic, is restricted to one lane, for 24 hours each day, provide portable traffic signal system.
 - .1 Adjust, as necessary, and regularly maintain system during period of restriction.
 - .2 Ensure signal system meets requirements of Manual of Uniform Traffic Control Devices for Streets and Highways and Ontario Traffic Manual, Book 7: Temporary Conditions.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES

- 1 The Occupational Health and Safety Act- Revised Statutes of Ontario, Revised Regulation s851/90, amended to O. Reg 98/11.
- .2 Hazardous Projects Act and the Canada Labour Code, most recent edition.
- .3 Occupational Health and Safety Regulation for Construction Projects. Revised Statutes of Ontario, Regulation 213-91 as amended by O.Reg. 443/09.
- .4 The Workplace Safety and Insurance Act. 1997 as amended by 1997, c. 26, Sched.:1998, c. 36,: 1999, c.6, s. 67; 2000, c 26, Sched. 1; 2001, c. 9 Sched.1, s. 4; 2002, c. 8, Sched. P.s 8; 2002, c. 18, Sched. J, s. 5; 2004, c. 8, ss. 46, 47, (2); 2004, c. 17, s. 32; 2005, c. 5, s. 73; 2005, c. 29 s. 7; 2006, c. 13, s. 4; 2006, c.19, Sched. M, s. 7.
- .5 Ontario Building Code Act S.O. 1992, c. 23, and Ontario Regulation 403/97 as amended to O. Reg. 422/06.
- .6 The Ontario Fire Code, O. Reg. 388/97 as amended by 315/01.
- .7 Regulation 447 - Environmental Protection Act as amended to O. Reg. 237/07.
- .8 Workplace Safety and Insurance Board, Regulation 1101, First Aid requirements.
- .9 National Building Code 2010, Part 8; Safety Measures at construction and Demolition Sites.

1.2 ACTION AND INFORMATIONAL 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 Post in the Site Trailer site health and safety inspection reports of Contractor's authorized representative.
- .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
- .7 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations. Post on Site.

1.3 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of Work and provide electronic copy to Owner.

1.4 SAFETY ASSESSMENT

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

1.5 REGULATORY REQUIREMENTS

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

1.6 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.

1.7 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.

1.8 COMPLIANCE REQUIREMENTS

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

1.9 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 having jurisdiction and advise the Owner verbally and in writing.

1.10 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 site-related working experience specific to activities associated with the Project.
 - .2 Have working knowledge of occupational safety and health regulations.
 - .3 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.
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .5 Be on site during execution of Work and report directly to and be under direction of site supervisor.

1.11 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.
- .2 Post 'Construction Zone' signs in all locations where work is being performed.

1.12 CORRECTION OF NON-COMPLIANCE

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

1.13 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.

1.14 FALL PROTECTION

- .1 Comply with Occupational Health and Safety Act and Regulations for Construction projects, Section 26, as described herein but limited too:
 - .1 Fall protection will be required when a worker is exposed to a fall of more than 3 meters.
 - .2 Fall protection shall be in the form of:
 - .1 Guardrail system
 - .2 Travel restraint system
 - .3 Fall restricting system
 - .4 Fall arrest system
 - .3 The components of any system listed above shall be designed by a professional engineer in accordance with good engineering practice, and shall meet the requirements of any of the National Standards of Canada that are applicable.
- .2 A wood guardrail system shall consist of a top rail, intermediate rail, and a toe board. The top rail shall be located at least 0.9m but no more than 1.1m above the surface on which the system is installed. The toe board shall extend at least 89mm above the surface on which the system is installed. The maximum distance between two adjacent posts of the guardrail system shall be 2.4m. Wood shall be SPF construction grade quality or better. Members shall be at least 38mm by 89mm. Members to resist prescribed point loads.
- .3 A travel restraint system shall consist of a full body harness (with adequate attachment points) or a safety belt. The full body harness or safety belt shall be attached by a lifeline or lanyard to a fixed supportable able to resist the prescribed static and dynamic forces.
- .4 A fall restrict system shall consist of assembly of components attached to a fixed support able to resist the prescribed static and dynamic forces. Worker's free fall distance must not exceed 0.6m.
- .5 A fall arrest system shall consist of a full body harness with adequate attachment points and a lanyard equipped with a shock absorber. The fall arrest system shall be attached by a lifeline or lanyard to a fixed support able to resist the prescribed static and dynamic forces. The fall arrest system shall be arranged so that a worker cannot hit the ground or an object or level below the work. The worker who falls not be subjected to a fall arrest force greater than 8 kilonewtons.

1.15 SAFETY AND SECURITY REQUIREMENTS

- .1 Enforce use of CSA approved hardhats and safety boots for all entering or working on construction site.
- .2 The contractor shall remove from the site any persons not observing or complying with safety requirements.
- .3 The Contractor will report to the Owner's representative, and jurisdictional authorities, any accident or incident involving the Contractor, the Owner's staff, or the public; personnel and/or property, arising from the Contractor's execution of the work.
- .4 The Contractor will include all provisions of the Contract in so far as they are pertinent in any

HEALTH AND SAFETY REQUIREMENTS

- agreement with Sub-contractors, and hold all Sub-contractors equally responsible for safe work performance.
- .5 Delays in the progress of the Work arising out of infractions of legislation or Contract health and safety requirements are the responsibility of the Contractor.
- .6 Provide and maintain adequate lighting where workmen or public may be subject to hazards and in all working areas.
- .7 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials, and regarding labelling and the provision of material safety data sheets.
- .8 In addition to the requirements of the Occupational Health and Safety Act, and Regulations for Construction Projects, provide temporary safeguards and protection against:
 - .1 Accident or injury to any workmen or other persons on the site, adjacent work and property, roads and walks.
 - .2 Damage to any part of the work and to any adjoining or adjacent structure, properties, pavements, walks, services, and other similar items by frost, weather, overloading, and any other cause resulting from the execution of the work.
- .9 Make good with material identical with existing and adjoining surfaces any damage resulting from the execution of the work to any part of the work or any buildings, pavements, landscaping, poles, hydrants, services, etc., on or surrounding the site.
- .10 Fire extinguisher must be on hand at all times when propane torch or other flame/heat producing device is being used.
- .11 The Contractor shall be responsible to insure that all individuals accessing the roof is properly trained in "Working at Heights" as required by the Ministry of Labour of Ontario. Anyone not in possession of a certification card should not be allowed on the roof.
- .12 Post Construction area Signs, Authorized personal only. Hard hats and Safety shoes to be worn beyond this point.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 Definitions:
 - .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
 - .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.
- .2 Reference Standards:
 - .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2020 Stipulated Price Contract.
 - .2 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832/R-92-005-92, Storm Water Management for Construction Activities, Chapter 3.
 - .2 EPA General Construction Permit (GCP) 2012.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Before commencing construction activities or delivery of materials to site, prepare Environmental Protection Plan.
- .3 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .4 Address topics at level of detail commensurate with environmental issue and required construction tasks.

1.3 FIRES

- .1 Fires and burning of rubbish on site is not permitted.
- .2 Provide supervision, attendance and fire protection measures as require.

1.4 DRAINAGE

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .4 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances

in accordance with local authority requirements.

1.5 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties as indicated.
- .2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m minimum.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
 - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.
- .5 Restrict tree removal to areas indicated Consultant.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES AND CODES

- .1 Perform Work in accordance with Ontario Building Code 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 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify Owner.
- .1 Prior to starting demolition work, refer to 'Hazardous building materials assessment report' for location and proper removal procedure of Hazardous materials. Pre and post air monitoring to be provided for removals. Results to be turned over to owner upon completion.
- .2 PCB: Polychlorinated Biphenyl: stop work immediately when material resembling Polychlorinated Biphenyl is encountered during demolition work. Notify Owner.
- .3 Mould: stop work immediately when material resembling mould is encountered during demolition work. Notify Owner.

1.3 BUILDING SMOKING ENVIRONMENT

- .1 No smoking is allowed within the limits of Owner's property, as per the Smoke-Free Ontario Act.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
- .1 CCDC 2-2020, Stipulated Price Contract.

1.2 SECTION INCLUDES

- .1 Inspection and testing, administrative and enforcement requirements.
- .2 Equipment and system adjust and balance.

1.3 INSPECTION

- .1 Allow Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant, instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Consultant will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, the Owner shall pay cost of examination and replacement.
- .5 The General Contractor must have their own quality control.

1.4 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by Owner for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Owner.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant at no cost to Owner. Pay costs for re-testing and re-inspection.

1.5 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

1.6 PROCEDURES

- .1 Notify appropriate agency and Consultant in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.7 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of Consultant it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Consultant.

1.8 REPORTS

- .1 Submit copies of inspection and test reports to Consultants and Owner.
- .2 Provide copies to subcontractor of work being inspected or tested, and manufacturer or fabricator of material being inspected or tested.

1.9 TESTS AND MIX DESIGNS

- .1 Furnish test results and mix designs as requested and those required by law of Place of Work.

1.10 MOCK-UPS

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations acceptable to Consultant. Coordinate on Site.
- .3 Prepare mock-ups for Consultant's review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 Remove mock-up at conclusion of Work or when acceptable to Consultant. Mock-ups may remain as part of Work if approved by Consultant.

1.11 MILL TESTS

- .1 Submit mill test certificates as requested.

1.12 EQUIPMENT AND SYSTEMS

- .1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.
- .2 Refer to Section 01 78 00 for definitive requirements.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES

- .1 U.S. Environmental Protection Agency (EPA) / Office of Water
- .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.3 INSTALLATION AND REMOVAL

- .1 Provide temporary utilities controls in order to execute work expeditiously.
- .2 Remove from site all such work after use.

1.4 DEWATERING

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.5 WATER SUPPLY

- .1 Owner will provide continuous supply of potable water for construction use.
- .2 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.
- .3 Permanent water supply system installed under this Contract may be used for construction requirements with prior approval of Owner provided that guarantees are not affected. Make good damage.

1.6 TEMPORARY POWER AND LIGHT

- .1 Owner will provide and pay for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 230 volts 30 amps.
- .2 If additional power is required, arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.
- .3 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

1.7 TEMPORARY COMMUNICATION FACILITIES

- .1 Provide and pay for temporary communication necessary to complete the project.

1.8 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.

- .2 Burning rubbish and construction waste materials is not permitted on site.

1.9 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction or that complies with EPA 832/R-92-005, whichever is more stringent.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
- .1 CCDC 2-2020

- .2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
- .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-0121-M1978(R2003), Douglas Fir Plywood.
 - .3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
 - .4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.

- .4 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.3 INSTALLATION AND REMOVAL

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which have to be graveled to prevent tracking of mud.
- .3 Indicate use of supplemental or other staging area.
- .4 Provide construction facilities in order to execute work expeditiously.
- .5 Remove from site all such work after use.

1.4 SCAFFOLDING

- .1 Scaffolding (including overhead protection) in accordance with CAN/CSA-S269.2., local and provincial authorities having jurisdiction.

1.5 SITE ENCLOSURE

- .1 Protect public and workers from injury.
- .2 Provide and maintain required barricades, guardrails, and guardlights in accord with applicable regulations.
- .3 For the duration of project, provide 6ft high, heavy-duty steel construction fence around the

construction site. Provide lockable gate for access to work area and material deliveries. Lock for gated access area to be provided by Owner.

1.6 ENCLOSURE OF STRUCTURE

- .1 Provide temporary weathertight enclosures and protection for exterior openings until permanently enclosed.
- .2 Erect enclosures to allow access for installation of materials and working inside enclosure.
- .3 Design enclosures to withstand wind pressure and snow loading.

1.7 TEMPORARY STAIRS

1. Furnish and maintain all equipment such as stairs, ladders, ramps, scaffolds, swing stages, runways, derricks, chutes, elevators, etc. as required for proper execution of work.
2. Construct and maintain scaffolding in rigid, secure and safe manner. Erect scaffolding independent of walls. Remove promptly when no longer required.
3. Provide all necessary temporary barricades, fencing, guardrails, night lights, overhead protection and barriers as necessary for the work.
4. Where such structures are of a complicated nature, employ the services of a Registered Professional Engineer to design such scaffolding, framework, or other temporary supports.

1.8 HOISTING

- .1 Provide, operate and maintain hoists and/or cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
- .2 Hoists / cranes to be operated by qualified operator.

1.9 SITE STORAGE/LOADING

- .1 Refer to CCDC 2
- .2 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .3 Provide in an area designated by the Owner adequate weathertight sheds with raised floors, for storage of materials, tools and equipment which are subject to damage by weather.
- .4 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.10 CONSTRUCTION PARKING

- .1 Parking may be permitted on site with Owner's permission.
- .2 Provide and maintain adequate access to project site.
- .3 Clean runways and taxi areas where used by Contractor's equipment.

1.11 SECURITY

- .1 If required, provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

1.12 OFFICES

- .1 Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.
- .2 Provide marked and fully stocked first-aid case in a readily available location.
- .3 Subcontractors to provide their own offices as necessary. Direct location of these offices.

1.13 EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.14 SANITARY FACILITIES

- .1 Contractors and subcontractors are not permitted to use existing sanitary facilities.
- .2 General Contractor is to provide their own washroom facilities.
- .3 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.15 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Provide access and temporary relocated roads as necessary to maintain traffic.
- .2 Maintain and protect traffic on affected roads during construction period.
- .3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .4 Protect travelling public from damage to person and property.
- .5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .7 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .8 Dust control: adequate to ensure safe operation at all times.
- .9 Remove, upon completion of work.

1.16 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Stack stored new or salvaged material not in construction facilities.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
 - .2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA-O121-M1978(R2003), Douglas Fir Plywood.

1.2 INSTALLATION AND REMOVAL

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

1.3 HOARDING AND STEEL FENCE

- .1 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
- .2 Erect temporary site enclosure using new 2.4 m high steel fence ("Quick Fence" or equal). Provide one lockable truck gate. Maintain fence in good repair.
- .3 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.4 GUARD RAILS AND BARRICADES

- .1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs, and where required.
- .2 Provide as required by governing authorities and as directed by Architect.

1.5 WEATHER ENCLOSURES

- .1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.
- .2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.
- .3 Design enclosures to withstand wind pressure.

1.6 DUST TIGHT SCREENS AND FIRE RATED PARTITIONS

- .1 Provide dust tight screens insulated partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.
- .2 Provide dust tight screens insulated partitions between Owner occupied areas and construction activities and as shown on the drawings.

TEMPORARY BARRIERS AND ENCLOSURES

- .3 All partitions to be 1hr fire rated partitions.
- .4 Maintain and relocate protection until such work is complete.

1.7 ACCESS TO SITE

- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.8 PUBLIC TRAFFIC FLOW

- .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.9 FIRE ROUTES

- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.10 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

1.11 PROTECTION OF BUILDING FINISHES

- .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Confirm with Consultant locations and installation schedule 3 days prior to installation.
- .4 Be responsible for damage incurred due to lack of or improper protection.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2020 .
- .2 Within text of each specifications section, reference may be made to reference standards.
- .3 Conform to these reference standards, in whole or in part as specifically requested in specifications. Conform to latest date of issue of referenced standards in effect on date of submission of Bids (even if it differs from the date in the spec).
- .4 If there is question as to whether products or systems are in conformance with applicable standards, Consultant reserves right to have such products or systems tested to prove or disprove conformance.
- .5 Cost for such testing will be born by Owner in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.2 QUALITY

- .1 Refer to CCDC 2.
- .2 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .3 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .4 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .5 Should disputes arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.
- .6 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .7 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.3 AVAILABILITY

- .1 Immediately upon issuance of Purchase Order, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

- .2 In event of failure to notify Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Consultant reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 STORAGE, HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction Consultant.
- .9 Touch-up damaged factory finished surfaces to Consultant's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.5 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.

1.6 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Consultant to require removal and re-installation at no increase in Contract Price or Contract Time.
- .4 **Include for all labour and material (beyond the requirements of tender documents) required by the manufacturer for proper installation.**

1.7 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.

- .2 Do not employ anyone unskilled in their required duties. Consultant reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

1.8 CO-ORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.9 CONCEALMENT

- .1 In finished areas conceal pipes, ducts and wiring in walls and ceilings, except where indicated otherwise.
- .2 Before installation inform Consultant if there is interference. Install as directed by Consultant.

1.10 REMEDIAL WORK

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.11 LOCATION OF FIXTURES

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform Consultant of conflicting installation. Install as directed.

1.12 FASTENINGS

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.13 FASTENINGS - EQUIPMENT

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.14 PROTECTION OF WORK IN PROGRESS

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

1.15 EXISTING UTILITIES

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.
- .3 Locate all existing utilities before commencing work.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2020.
- .2 Owner's identification of existing survey control points and property limits.

1.2 QUALIFICATIONS OF SURVEYOR

- .1 Qualified registered land surveyor, licensed to practice in Province of Ontario.

1.3 SURVEY REFERENCE POINTS

- .1 Existing base horizontal and vertical control points are designated on drawings.
- .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice Consultant.
- .4 Report to Consultant when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

1.4 SURVEY REQUIREMENTS

- .1 Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
- .2 Establish lines and levels, locate and lay out, by instrumentation.
- .3 Stake for grading, fill and topsoil placement and landscaping features.
- .4 Stake slopes and berms.
- .5 Establish pipe invert elevations.
- .6 Stake batter boards for foundations.
- .7 Establish foundation column locations and floor elevations.
- .8 Establish lines and levels for mechanical and electrical work.

1.5 EXISTING SERVICES

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant of findings.
- .2 Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Consultant.

1.6 LOCATION OF EQUIPMENT AND FIXTURES

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Consultant of impending installation and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment.

1.7 RECORDS

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.
- .3 Record locations of maintained, re-routed and abandoned service lines.

1.8 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit name and address of Surveyor to Consultant.
- .2 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.9 SUBSURFACE CONDITIONS

- .1 Promptly notify Consultant in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.
- .2 After prompt investigation, should Consultant determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

END OF SECTION

PART 1- GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit written request in advance of cutting or alteration which affects:
 - .1 Structural integrity of elements of project.
 - .2 Integrity of weather-exposed or moisture-resistant elements.
 - .3 Efficiency, maintenance, or safety of operational elements.
 - .4 Visual qualities of sight-exposed elements.
 - .5 Work of Owner or separate contractor.
- .3 Include in request:
 - .1 Identification of project.
 - .2 Location and description of affected Work.
 - .3 Statement on necessity for cutting or alteration.
 - .4 Description of proposed Work, and products to be used.
 - .5 Alternatives to cutting and patching.
 - .6 Effect on Work of Owner or separate contractor.
 - .7 Written permission of affected separate contractor.
 - .8 Date and time work will be executed.

1.2 MATERIALS

- .1 Required for original installation.
- .2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

1.3 PREPARATION

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

1.4 EXECUTION

- .1 Execute cutting, fitting, and patching to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.

- .5 Remove samples of installed Work for testing.
- .6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .7 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .8 Where warranty is still valid, employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- .9 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .10 Restore work with new products in accordance with requirements of Contract Documents.
- .11 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .12 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material in accordance with Section 07 84 00 - Firestopping, full thickness of the construction element.
- .13 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.
- .14 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

END OF SECTION

PART 1- GENERAL

1.1 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Owner. Do not burn waste materials on site.
- .3 Clear snow and ice from access to building, bank/pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Clean interior areas prior to start of finishing work and maintain areas free of dust and other contaminants during finishing operations.
- .7 Store volatile waste in covered metal containers and remove from premises at end of each working day.
- .8 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .9 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .10 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.2 FINAL CLEANING

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove all waste products and debris caused by the work and leave work area clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Owner. Do not burn waste materials on site.
- .5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .6 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .7 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures,

- furniture fitments, walls, and floors.
- .8 Clean lighting reflectors, lenses, and other lighting surfaces. Lenses to be cleaned inside and out.
 - .9 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
 - .10 Clean floor in preparation for sealing and waxing by Owner.
 - .11 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
 - .12 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
 - .13 Remove dirt and other disfiguration from exterior surfaces.
 - .14 Clean and sweep roofs, gutters, areaways, and sunken wells.
 - .15 Sweep and wash clean paved areas.
 - .16 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
 - .17 Clean roofs, downspouts, and drainage systems.
 - .18 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
 - .19 Use magnetic sweeping tools in all exterior work areas.

END OF SECTION

PART 1- GENERAL

1.1 REGULATORY AGENCIES

- .1 The Ontario Ministry of Environment (OME) in AGENCIES accordance with Section 7 of Ontario Regulation 103/94 requires a source separation program for the waste that will be generated in the construction or demolition of a structure.
- .2 The source separation program required shall:
 - .1 Deal separately with each of the categories of waste set out in Part III of the Schedule that have been source separated from other kinds of waste and also from each other category of waste in Part III; or
 - .2 Provide for removal from the building site of any commingled categories of waste set out in Part III of the Schedule and for the immediate separation of such waste from all other kinds of waste and also from each category of waste in Part III, at
 - .1 permanent premises of the person undertaking the construction project
 - .2 permanent premises of the person on whose behalf the construction project is undertaken or
 - .3 a waste disposal site operating under the authority of a certificate of approval
- .3 The source separation program shall be implemented before construction work begins on site.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Prepare and submit a Waste Reduction Workplan. Describe management of construction wastes. Identify materials which can be recycled, reused and indicate methods proposed for reducing, reusing and recycling wastes.

1.3 WASTE COLLECTION AND DISPOSAL

- .1 Separate and salvage materials suitable for reuse and/or recycling from general waste stream.
- .2 Provide on site facilities for collection, handling and storage of anticipated quantities of reusable and/or recyclable materials.
- .3 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.
- .4 Collect, handle, store on site and transport off site, salvaged materials, salvaged for reuse and/or recycling in separate condition. Transport to authorized reuse/recycling location.
- .5 Separate non salvageable materials from salvaged items. Transport and deliver non salvageable

items to licensed disposal facility.

- .6 Burying, burning, selling waste materials on site is prohibited.
- .7 Disposals of liquid wastes into waterways, sewers is prohibited.
- .8 Unless specified otherwise, materials for removal become Contractor's property.
- .9 Clean up work, storage and waste collection areas as work progresses.

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 REFERENCES

- .1 OAA/OGCA Document 100.
- .2 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2020, Stipulated Price Contract.
- .3 Canadian Environmental Protection Act (CEPA)
 - .1 SOR/2008-197, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Consultant in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Consultant's inspection.
 - .2 Consultant's Inspection:
 - .1 Consultant and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Equipment and systems: tested, adjusted and balanced and fully operational.
 - .4 Certificates required by ESA, Municipal Authorities, Provincial Authorities, TSSA, etc: submitted.
 - .5 Operation of systems: demonstrated to Owner's personnel.
 - .6 Commissioning of mechanical systems: completed and copies of final Commissioning Report submitted to Consultant.
 - .7 Work: complete and ready for final inspection.
- .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Consultant, and Contractor.
 - .2 When Work incomplete according to Consultant, complete outstanding items and request re-inspection.
- .5 Declaration of Substantial Performance: when Consultant considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
- .6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
- .7 Final Payment:
 - .1 When Consultant considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

- .2 Refer to CCDC 2: when Work deemed incomplete by Consultant, complete outstanding items and request re-inspection.
- .8 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.3 FINAL CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

.1 OPERATION AND MAINTENANCE MANUALS

- .1 On completion of project, prepare for the UCDSB One (1) copy of an Operations Data and Maintenance Manual and One Thumb Drive, made up as follows:
 - .1 Bind data in a vinyl hard covered, 3 ring loose leaf binder for 8-1/2" X 11" size paper.
 - .2 Enclose title sheet, labelled "Operation Data and Maintenance Manual", project name, date and list of contents. Provide a title on the Cover and a tile on the vertical edge on all binders.
 - .3 Organize the contents into applicable sections of work to parallel the project specification break-down. Mark each section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets.
- .2 The following information plus the data specified will be included:
 - .1 Maintenance instructions for finished surfaces and materials.
 - .2 Copies of hardware and paint schedules.
 - .3 Description, operation and maintenance instructions for equipment and systems, including a complete list of equipment and parts lists. Indicate the nameplate information such as make, size, capacity and serial number.
 - .4 Names and addresses of subcontractors and suppliers, including names and phone numbers of contact personnel and 24-hour emergency telephone contacts.
 - .5 Guarantees, warranties and bonds showing:
 - .6 The name and address of the project.
 - .7 Guarantee commencement date (date of Final Certificate for Payment).
 - .8 Duration of guarantee.
 - .9 Clear indication of what is being guaranteed and what remedial action will be taken under the guarantee.
 - .10 Signature and seal of Contractor.
 - .11 Additional materials and products used in the project, listed under various Sections showing the names of the manufacturers and sources of supply.
- .3 The Contractor's Submittal:
 - .1 Provide One (1) copy of the information and data. Each set shall be organized and presented in accordance with the requirements of 1.1 and 1.2 above.
 - .2 Operation Data and Maintenance Manuals are part of the Contract.
\$ 5,000 will be held in a fund until all documents have been received and approved by the Consultant. Contractor to include this value, in the Progress Draw breakdown.
 - .3 Neatly type lists and notes. Use clear drawings, diagrams and manufacturers' literature.
 - .4 Include one complete set of final shop drawings (bound separately) indicating corrections and changes made during fabrication and installation.
 - .5 Include a complete set of warranties and maintenance service agreements.
 - .6 Include the requirements of all Divisions of the specifications in compiling the maintenance manuals.

2 WARRANTIES

- .1 Provide duplicate notarized copies of warranties called for in the applicable specifications Sections.
- .2 Refer to individual sections of the specifications for specific requirements of the warranties.
- .3 Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.
- .4 Provide Table of Contents for inclusion in the Operation & Maintenance Manual specified herein.
- .5 Submit warranties immediately after the issuance of the Certificate of Substantial Completion, to facilitate

release of holdback monies.

- .6 For items of work delayed beyond the date of Substantial Performance of the Work, provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as the start of the warranty period.
- .7 If the validity of an extended warranty is related to proper maintenance and servicing of equipment, etc., provide full details in maintenance manuals.

3 MAINTENANCE SERVICE

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

4 AS-BUILT AND PROJECT RECORD DRAWINGS

- .1 As-Built Drawings:
 - .1 The contractor is to retain one set of full size prints for recording all as-built conditions every month.
 - .2 Maintain As-Built Drawings and record accurately significant deviations from the Contract Documents caused by site conditions and changes ordered by the Consultant.
 - .3 Mark changes in red ink.
 - .4 Where applicable, record the following information:
 - .1 Depths of various elements of foundations in relation to finish ground floor.
 - .2 Horizontal and vertical locations of underground utilities and appurtenances referenced to a permanent surface improvement.
 - .3 Locations of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by Change Order, Additional Instruction or order for minor change in the Work.
 - .5 Each Subcontractor shall provide the Contractor with the as-built information applicable to the work of that subcontract.
- .2 Project Record Drawings:
 - .1 At the completion of the project and prior to final inspections submit the As-Built Drawings to the Consultant and the specialist sub-consultants for the production of Project Record Drawings by revising the electronic drawing files to incorporate the as-built information provided by the Contractor.
 - .2 Contractor's Submittal: Project Record Drawings are part of the Contract in both PDF and CAD. Note \$ 5,000 will be retained until all documents have been satisfactorily completed & received by the

Project Manager.

5 SPARE PARTS AND MAINTENANCE MATERIALS

.1 Quality:

- .1 Spare parts, maintenance materials and special tools provided shall be new, not damaged or defective, and of the same quality and manufacture as materials and products provided in the Work.
- .2 If requested, furnish evidence as to type, source and quality of products provided.
- .3 Defective materials and products will be rejected, regardless of previous inspections. Replace materials and products at no additional cost to the Contract.

.2 Storage, Handling and Protection:

- .1 Store spare parts, maintenance materials and special tools in a manner which will prevent damage, or deterioration.
- .2 Store in original and undamaged condition with the manufacturer's seals and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at no additional cost to the Contract

.3 Spare Parts:

- .1 Provide spare parts in quantities specified in the individual specification Sections.
- .2 Provide items of the same manufacture and quality as items in the Work.
- .3 Deliver to the Project Site, place and store where directed by the Project Manager.
- .4 Receive and catalogue all items. Submit an inventory listing to the Consultant. Include the accepted listings in the Operation and Maintenance Manual.
- .5 Obtain receipts for delivered products and submit receipts prior to final payment.

.4 Maintenance Materials:

- .1 Provide maintenance and extra materials in quantities specified in individual specification Sections.
- .2 Provide items of same the manufacture and quality as items in the Work.
- .3 Provide materials from the same production run as installed materials.
- .4 Deliver to the Project Site, place and store where directed by the Project Manager.
- .5 Submit an inventory listing in the Operation and Maintenance Manuals.
- .6 Obtain receipts for delivered products and submit receipts prior to final payment.

.5 Special Tools:

- .1 Provide special tools in quantities specified in the individual specification Sections.
- .2 Provide items with tags identifying their function and the equipment with which they are associated.
- .3 Deliver to the Project Site, place and store where directed by the Project Manager.
- .4 Receive and catalogue all items. Include the accepted listings in the Operation and Maintenance Manual specified herein.

END OF SECTION

PART 1- GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

- .1 Demonstrate operation and maintenance of equipment and systems to Owner's personnel two weeks prior to date of substantial performance.
- .2 Owner: provide list of personnel to receive instructions, and co-ordinate their attendance at agreed-upon times.
- .3 Preparation:
 - .1 Verify conditions for demonstration and instructions comply with requirements.
 - .2 Verify designated personnel are present.
 - .3 Ensure equipment has been inspected and put into operation.
 - .4 Ensure testing, adjusting, and balancing has been and equipment and systems are fully operational.
- .4 Demonstration and Instructions:
 - .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment.
 - .2 Instruct personnel in phases of operation and maintenance using operation and maintenance manuals as basis of instruction.
 - .3 Review contents of manual in detail to explain aspects of operation and maintenance.
 - .4 Prepare and insert additional data in operations and maintenance manuals when needed during instructions.
- .5 Time Allocated for Instructions: ensure amount of time required for instruction of each item of equipment is adequate.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, Owner's approval.
- .3 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.
- .4 Give time and date of each demonstration, with list of persons present.
- .5 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

1.3 QUALITY ASSURANCE

- .1 When specified in individual Sections requiring manufacturer to provide authorized representative to demonstrate operation of equipment and systems:
 - .1 Instruct Owner's personnel.
- .2 Provide written report that demonstration and instructions have been completed.

END OF SECTION

PART 1- GENERAL

1.1 SECTION INCLUDES

- .1 Partial Demolition of Existing Features throughout the existing building and site.
- .2 Methods and procedures for demolishing, salvaging, recycling and removing items designated to be removed in whole or in part, and for backfilling resulting trenches and excavations.
- .3 Physical detachment of materials from structure and may include: prying, pulling, cutting, unscrewing.
- .4 Removal and disposal of all demolition waste.
- .5 Work described in Section 01 73 00 Execution

1.2 REFERENCES

- .1 National Building Code of Canada (NBC), Part 8 - Safety Measures at Construction and Demolition Sites (2005) and with local authority having jurisdiction.
- .2 CSA International: CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
- .3 U.S. Environmental Protection Agency (EPA)/Office of Water: EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 GENERAL INTENT

- .1 Demolition of building features and structures are demolished, and the debris is removed such that:
 - .1 the demolition is completed in a manner and within the timeframes established in the Project Schedule
 - .2 the surfaces remaining after demolition are safely filled and free of protrusions and abrupt edges.
 - .3 if the equipment is removed, then all the equipment, the electrical, mechanical, and process systems equipment related to the equipment will be removed from the remainder of the Buildings in an acceptable manner so as not to damage the buildings.
 - .4 all demolition debris has been removed and disposed of in accordance with applicable law.
 - .5 below grade structures and equipment are to be opened, metal and debris removed, and the resulting holes filled and made safe.
 - .6 Any disturbed adjacent surfaces shall be repaired.
 - .7 the equipment will be removed through existing openings or through openings created in preparation for new curtain walls. No additional openings to be made to building envelope. When removing the equipment, all of the exterior electrical, mechanical, and process systems equipment related to the equipment will also be removed.
- .2 Demolition includes, but is not limited to:

- .1 Removal of doors, windows and frames, interior partitions as required to accommodate new construction.
- .2 Removal of exterior site features interfering with new construction such as sidewalks, retaining walls, underground pipes, utilities, etc.
- .3 Removal of interior finishes adjacent to demolition to the extent of nearest "natural break" (i.e. floor tile, material seams, room corners, doorways, etc.) which allow for installation of new finishes.
- .4 Removal of masonry for the support of new steel framing members and lintels.
- .5 Removal of pipes, conduits, ducts, other mechanical and electrical work as required to accommodate new construction.
- .6 Remove all exposed conduit and wiring back to the panel from which it is served. Mark all disassociated breakers "spare". Unless otherwise noted, the Contractor shall fill and patch all wall, floor, and ceiling openings resulting from this demolition work with materials and finishes identical to adjacent materials and finished.
- .7 Unless otherwise noted, remove all wiring devices, fixtures, controls, circuitry (conduit and wiring), etc., made obsolete by the demolition within or around the building.
- .8 The Contractor shall relocate all existing piping, circuitry (conduit and wiring), ductwork, etc., which impedes the installation of new materials and equipment, unless otherwise noted.
- .9 Demolish, remove, demount, and disconnect the following:
 - .1 Inactive and obsolete piping, fitting and specialties, equipment, ductwork, controls, fixtures, and insulation.
 - .2 Piping and ducts embedded in floors, wall, and ceiling may remain if such materials do not interfere with new installation. Remove materials above accessible ceilings. Drain and cap piping and ducts allowed to remain.

1.4 PRE-BID SURVEY

- .1 Conduct a complete and comprehensive survey of existing conditions to identify all features to be demolished. In submitting the Bid for this project the Contractor acknowledges that he/she have inspected the site and have made their own assessment of the prevailing site conditions, including the position of all existing services, the extent of all demolition, etc., the nature of the access together with the requirements of all other works necessary to facilitate the completion of the contract.
- .2 Verify that utilities have been disconnected and capped.
- .3 Survey existing conditions and correlate with requirements indicated to determine extent of demolition required.
- .4 Survey the condition of the building to determine whether removing any element might result in a structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during demolition.
- .5 Perform surveys as the Work progresses to detect hazards resulting from demolition activities.
- .6 Owner will provide adequate access to the building to all contractors in order to carry out the pre-bid survey. Contact Owner to arrange access to school site

1.5 SITE CONDITIONS

- .1 Review "Designated Substance Report" and take precautions to protect workers and environment.

- .2 If material resembling spray or trowel-applied asbestos or other designated substance be encountered, stop work, take preventative measures, and notify the Owner immediately. Proceed only after receipt of written instructions have been received from the Owner.
- .3 Notify Owner before disrupting building access or services.
- .4 Remove all base structures to be deconstructed on their condition at time of site visit during Bid period. Be responsible for provision of services required for deconstruction. Conduct comprehensive survey of items to be demolished.
- .5 Employ necessary means to assess site conditions and structures to determine quantity and locations of hazardous materials.
- .6 Investigate site and structures to determine dismantling, processing and storage logistics required prior to beginning of Work.
- .7 Develop strategy for deconstruction to facilitate optimum salvage and disposal.

PART 2 - EXECUTION

2.1 EXAMINATION

- .1 Inspect building and site with and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.
- .4 Disconnect, cap, plug or divert, as required, existing public utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.
 - .1 Immediately notify Consultant and utility company concerned in case of damage to any utility or service, designated to remain in place.
 - .2 Immediately notify the Consultant should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

2.2 PREPARATION

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to: specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.

2.3 PROTECTION

- .1 Prevent movement, settlement, or damage to adjacent structures, utilities, landscaping features, parts of building to remain in place, etc. Provide bracing and shoring required.
- .2 Keep noise, dust, and inconvenience to occupants to minimum.
- .3 Protect building systems, services and equipment.
- .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .5 Take precautions to guard against damage to adjacent work. Be liable for any damage or injury caused.
- .6 Ensure safe passage around and through area of demolition.
- .7 Protect temporarily suspended work that is without continuous supervision to prevent access by unauthorized persons.
- .8 Do Work in accordance with Section 01 35 29 - Health and Safety Requirements.

2.4 DEMOLITION

- .1 Remove items as indicated.
- .2 Removal of Pavements, Curbs and Gutters:
 - .1 Square up adjacent surfaces to remain in place by saw cutting or other method.
 - .2 Protect adjacent joints and load transfer devices.
 - .3 Protect underlying and adjacent granular materials.
- .3 Remove parts of existing building to permit new construction.
- .4 Trim edges of partially demolished building elements to tolerances to suit future use.
- .5 Carry out demolition work in a manner to least inconvenience adjacent occupied building area.
- .6 Disconnect all electrical and telephone service lines in the areas to be demolished. Post warning signs on all electrical lines and equipment which must remain energized to serve other areas during period of demolition. Disconnect electrical and telephone service lines in demolition areas to the requirements of local authority having jurisdiction.
- .7 Disconnect and cap all mechanical services in accordance with requirements of local authority having jurisdiction. Natural gas supply lines shall be removed by the gas company or by a qualified tradesman in accordance with gas company instructions.

2.5 REMOVAL FROM SITE

- .1 Except for items or materials indicated to be reused, salvaged, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's expense.
- .2 Transport material designated for alternate disposal in accordance with applicable regulations.
- .3 Dispose of materials not designated for alternate disposal in accordance with applicable regulations.

2.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning. Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Remove debris, trim surfaces and leave work site clean, upon completion of Work.
- .4 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants

and building materials.

- .5 Remove all tools and equipment from site.
- .6 Repair demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.
- .7 Refer to demolition drawings and specifications for items to be salvaged for reuse.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1	Section 03 30 00	Cast-In-Place Concrete
.2	Section 04 05 12	Masonry Mortar and Grout
.3	Section 04 05 19	Masonry Anchorage and Reinforcing
.4	Section 04 05 23	Masonry Accessories
.5	Section 04 21 13	Brick Masonry
.6	Section 04 22 00	Concrete Unit Masonry
.7	Section 05 50 00	Metal Fabrications
.8	Section 07 92 00	Joint Sealants
.9	Section 08 11 16	Metal Doors and Frames

1.2 REFERENCES

- .1 ASTM International ASTM A 496/A 496M-07, Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
- .2 Do masonry work in accordance with CSA A371-94 except where specified otherwise. Maintain a copy of this standard on job site during masonry work.
- .3 CSA International
 - .1 CAN/CSA-A82-06, Fired Masonry Brick Made From Clay or Shale.
 - .2 CAN/CSA-A165 SERIES-04(R2009), CSA Standards on Concrete Masonry Units covers: A165.1, A165.2, A165.3.
 - .3 CAN/CSA-A179-04(R2009), Mortar and Grout for Unit Masonry.
 - .4 CAN/CSA-A370-04(R2009), Connectors for Masonry.
 - .5 CAN/CSA A371-04(R2009), Masonry Construction for Buildings.
 - .6 CSA G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
 - .7 CSA S304.1-04(R2009), Design of Masonry Structures.
- .4 Health Canada / Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .5 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards, SCAQMD Rule 1113-A2007, Architectural Coatings.

1.3 SOURCE QUALITY CONTROL

- .1 Submit laboratory test reports certifying compliance of masonry units and mortar ingredients with specification requirements.
- .2 For clay units, in addition to requirements set out in referenced CSA and ASTM Standards, include data indicating initial rate of absorption for units proposed for use.

1.4 SAMPLES

- .1 Submit samples in accordance with the following:
 - .1 Two (2) of each type of masonry unit specified
 - .2 One (1) of each type of masonry accessory specified
 - .3 One (1) of each type of masonry reinforcement and tie proposed for use
 - .4 Other items required for testing purposes

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials to job site in dry condition.
- .2 Keep materials dry until use, except where wetting of bricks is specified.
- .3 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

1.6 COLD WEATHER REQUIREMENTS

- .1 When air temperature is below 5 degrees C take following precautions in preparing and using mortar:
 - .1 Heat sand slowly and evenly. Do not use scorched sand, having a reddish cast, in mortar
 - .2 Heat water to 70 degrees C maximum
 - .3 After combining heated ingredients maintain temperature of mortar between 5 degrees C and 50 degrees C until used
 - .4 Protect mortar from rain and snow
- .2 Maintain dry beds for masonry and use dry masonry units only. Do not wet masonry units in cold weather
- .3 When air temperature is below -4 degrees C protect and heat masonry to maintain air temperature above 0 degrees C on both sides of walls
- .4 When air temperature is below -4 degrees C, erect windbreaks to prevent differential freezing of walls

1.7 HOT WEATHER REQUIREMENTS

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

1.8 PROTECTION

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

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Masonry materials are specified in related Sections indicated in 1.1 Related Requirements.

PART 3- EXECUTION

3.1 WORKMANSHIP

- .1 Build masonry plumb, level, and true to line, with vertical joints in alignment
- .2 Lay out coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting
- .3 Full head joints shall be attained by buttering both ends of each unit. Slushing of head joints after the unit is in place is not permitted

3.2 TOLERANCES

- .1 Deviation in joint thickness: +/- 3 mm (1/8")
- .2 Walls to receive thinset ceramic tile: plumb within 1:600.

3.3 EXPOSED MASONRY

- .1 Remove chipped, cracked, and otherwise damaged units in exposed masonry and replace with undamaged units.

3.4 JOINTING

- .1 Allow joints to set just enough to remove excess water, then tool with a round stainless-steel jointer to provide smooth, compressed, uniformly concave joints.
- .2 Strike flush all joints concealed in walls and joints in walls to receive plaster, tile, insulation, or other applied material except paint or similar thin finish coating.

3.5 JOINING OF WORK

- .1 Where necessary to temporarily stop horizontal runs of masonry and in building corners:
 - .1 Step back masonry diagonally to lowest course previously laid
 - .2 Do not "tooth" new masonry
 - .3 Fill in adjacent courses before heights of stepped masonry reach 1200 mm (4'-0")

3.6 CUTTING

- .1 Cut out neatly for electrical switches, outlet boxes, and other recessed or built-in objects
- .2 Make cuts straight, clean, and free from uneven edges

3.7 BUILDING-IN

- .1 Build in items required to be built into masonry
- .2 Prevent displacement of built-in items during construction. Check plumb, location, and alignment frequently, as work progresses

- .3 Brace door jambs to maintain plumb. Fill spaces between jambs and masonry with mortar

3.8 WETTING OF BRICK

- .1 Except in cold weather, wet clay bricks having an initial rate of absorption exceeding one g/min/1000 mm²: wet to uniform degree of saturation, three (3) to twenty-four (24) hours before laying, and do not lay until surface is dry.
- .2 Wet tops of walls built of bricks qualifying for wetting, when recommencing work on such walls.

3.9 SUPPORT OF LOADS

- .1 Use 20 MPa concrete to Section 03 30 00: Cast-in-Place Concrete, where concrete fill is used in lieu of solid units
- .2 Use grout to CSA A179-M94 where grout is used in lieu of solid units
- .3 Install metal lath strips below voids to be filled with grout; keep strips 25 mm, 1" back from faces of units.

3.10 PROVISION FOR MOVEMENT

- .1 Leave 20 mm space between top of non-load bearing walls and partitions and structural steel elements, including but not limited to steel deck. Do not use wedges
- .2 Reinforce and grout solid cores on each side of control joint in concrete masonry.

3.11 LOOSE STEEL LINTELS

- .1 Provide and install loose steel lintels on all exterior openings. Centre over opening width. Provide minimum bearing of 150 mm on each side, unless noted otherwise. Provide minimum L75x75x10mm unless noted otherwise. All exterior steel lintels to be hot dip galvanized.

3.12 FILLING CORES

- .1 Place and grout reinforcing in accordance with CSA A371-94 and as indicated
- .2 Grout all block cores which are reinforced.
- .3 Grout parapet walls solid down to top of structural deck
- .4 Grout block cores solid for two courses below bearing points of structural and stair members, and as indicated on drawings.

3.13 OPENINGS

- .1 At all openings form, brace, and set lintel blocks for concrete block lintels. Provide min. 200 mm bearing. Install reinforcing and concrete as per structural drawings or if not shown, use two 15 M bars for lintels up to 1.2 m wide. Use 400 mm deep lintel and four 15 M bars for lintels up to 2.4 m wide
- .2 At all openings in block masonry walls exceeding 600 mm in depth, fill core at each side and for 600 mm past the top and bottom of opening with grout and reinforce with reinforcing as specified

for wall. Similarly treat openings over 1.2 m in depth but extend grout and reinforcement the full storey height.

3.14 CONTROL JOINTS

- .1 Provide continuous vertical shrinkage control joints in block masonry walls at locations indicated or at max. 9 m o.c. in approved locations and between masonry walls supported on slab on grade and walls supported on structural foundation. Rake out 8 mm, ready for caulking. Use "Chicago" joint.
- .2 Provide continuous vertical control joints in brickwork at locations indicated or at max. 15 m o.c. at max. 5.7 m from wall corners, in approved locations.
- .3 Stop horizontal masonry reinforcing 25 mm from each side of control joints
- .4 Bond beam reinforcing to be continuous across control joints. Provide half block and vertical joint across bond beam
- .5 Keep control joints free of mortar. Caulk joint. Provide backer rod.

3.15 CAVITY WALLS

- .1 Provide purpose made grey plastic weep hole vents. Provide above shelf angles, beams, dampproof courses and flashings and at bottom of cavities. Locate at max. 600 mm o.c
- .2 Place 10 mm dia. plastic vent tubes in exterior joints at top of cavities. Provide at 400 mm o.c. Slope to drain out at 1:4
- .3 Keep cavity free of mortar and mortar droppings. Place wood strip on ties or reinforcement to catch all mortar droppings. Remove as work progresses. Back slope mortar beds at cavities just sufficient to minimize mortar projection into cavity.
- .4 Omit every third brick of the first course until masonry work is completed. Clean the cavity of the mortar droppings then replace the omitted brick.
- .5 Provide continuous metal cavity air stops to details shown on drawings, secure at maximum 600 mm o.c., through a continuous bead of sealant.

3.16 TESTING

- .1 Inspection and testing will be carried out by Testing Laboratory designated by the Owner
- .2 Owner will pay costs for testing.

END OF SECTION

1.1 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CAN/CSA A179-04, Mortar and Grout for Unit Masonry.
 - .3 CAN/CSA A371-04, Masonry Construction for Buildings.
 - .4 CAN/CSA-A3000-03, Cementitious Materials Compendium; CAN/CSA-A3002-03, Masonry and Mortar Cement.
- .2 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
 - .1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Provide manufacturer's printed product literature, specifications and datasheets. Include product characteristics, performance criteria, and limitations.
 - .3 Provide Workplace Hazardous Materials Information System (WHMIS) - Material Safety Data Sheets (MSDS) in accordance with Section 01 35 29 - Health and Safety Requirements. Indicate VOC's mortar, grout, parging, colour additives and admixtures. Expressed as grams per litre (g/L).
- .2 Samples: Provide samples of mortar and coloured mortar.
- .3 Manufacturer's Instructions: Provide manufacturer's installation instructions.

1.3 QUALITY ASSURANCE

- .1 Test Reports: certified test reports including sand gradation tests in accordance with CAN/CSA A179 showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.
- .4 Mock-ups: Construct mock-ups in accordance with Section 01 45 00 - Quality Control supplemented as follows:
 - .1 Construct mock-up sample panel of pointing.
 - .2 Sample panel: 3000 mm x 3000 mm using proposed procedures, colours, texture, finish and workmanship.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store and handles masonry mortar and grout materials in accordance with Section 01 61 00 - Common Product Requirements, supplemented as follows:
 - .1 Deliver prepackaged, dry-blended mortar mix to project site in labelled plastic-lined bags each bearing name and address of manufacturer, production codes or batch numbers, and colour or formula numbers.
 - .2 Maintain mortar, grout and packaged materials clean, dry, and protected against dampness, freezing, traffic and contamination by foreign materials.

1.5 SITE CONDITIONS

- .1 Ambient Conditions: maintain materials and surrounding air temperature to:
 - .1 Minimum 5 degrees C prior to, during, and 48 hours after completion of masonry work.
 - .2 Maximum 32 degrees C prior to, during, and 48 hours after completion of masonry work.
- .2 Weather Requirements: CAN/CSA A371 - Recommended Practices and Guide Specifications for Hot and Cold Weather Masonry Construction.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Use same brands of materials and source of aggregate for entire project.
- .2 Cement:
 - .1 Portland Cement: to CAN/CSA-A3000.
 - .2 Masonry Cement: to CAN/CSA-A3002 and CAN/CSA A179.
 - .3 Mortar Cement: to CAN/CSA-A3002 and CAN/CSA A179.
 - .4 Packaged Dry Combined Materials for mortar: to CAN/CSA A179.
- .3 Aggregate: supplied by one supplier.
 - .1 Fine Aggregate: to CAN/CSA A179. Use aggregate passing 1.18 mm (1/16") sieve where 6 mm (1/4") thick joints are indicated.
 - .2 Coarse Aggregate: to CAN/CSA A179.
- .4 Water: clean and potable.
- .5 Lime: Quick Lime to CAN/CSA A179. Hydrated Lime to CAN/CSA A179.
- .6 Bonding Agent: epoxy type.
- .7 Polymer Latex: organic polymer latex admixture of butadiene-styrene type non-emulsifiable bonding admixture.
- .8 Dirt resistant additives: aluminum tristearate, calcium stearate or ammonium stearate.
- .9 Concrete: CSA A23.1, A23.2-2000. Fill bond beams and lintels with 20 MPa pea gravel concrete.
- .10 Grout: to CSA A179-94 (R1999) Table 3.
- .11 Dry-block II mortar admixture: water repellent, bond enhancing admixture by Grace Construction Products Tel: (414) 354-4400, equal or better as recommended by manufacturer of SMU units.

2.2 MORTAR MIXES

- .1 Mortar for exterior masonry above grade:
 - .1 Loadbearing: type S based on proportion specifications.
 - .2 Non-Loadbearing: S based on proportion specifications.
- .2 Mortar for interior masonry:
 - .1 Loadbearing: type S based on proportion specifications.
 - .2 Non-Loadbearing: N based on proportion specifications.

MASONRY MORTAR AND GROUT

- .3 Mortar for Parapet walls, chimneys, unprotected walls: type S based on proportion specifications, 12 MPa full bed, CAN/CSA A179.
- .4 Mortar for special masonry unit (SMU) veneer: Dry-block II mortar admixture: water repellent, bond enhancing admixture as recommended by Manufacturer of SMU units. Contractor to submit shop drawings for this product.
- .5 Pointing Mortar: CAN/CSA A179, Type S using property specification with maximum 2 percent ammonium stearate or calcium stearate per cement weight.
- .6 Stain Resistant Pointing Mortar: one part Portland cement, 1/8 part hydrated lime, and two parts graded (80 mesh) aggregate, proportioned by volume. Add aluminum tristearate, calcium stearate, or ammonium stearate to 2 percent of Portland cement by weight.
- .7 Mortar For Glass Block Masonry: CAN/CSA A179, Type S, using the property specification.
- .8 Pointing Mortar For Glass Block Masonry: CAN/CSA A179, Type S, using the property specification.
- .9 Parging mortar: type S to CAN/CSA A179.
- .10 Mortar for foundation walls, manholes, sewers, pavements, walks, patios and other exterior masonry at or below grade: type M based on proportion specifications, CAN/CSA A179.
- .11 Following applies regardless of mortar types and uses specified above:
 - .1 Mortar for calcium silicate brick and concrete brick: type O based on proportion specifications.
 - .2 Mortar for stonework: type N based on proportion specifications.
 - .3 Mortar for grouted reinforced masonry: type S based on proportion specifications.

2.3 MORTAR MIXING

- .1 Use pre-blended, pre-coloured mortar prepackaged under controlled factory conditions. Ingredients batching limitations to be within 1% accuracy.
- .2 Mix mortar ingredients with Motar Silo System and in accordance with CAN/CSA A179 in quantities needed for immediate use.
- .3 Maintain sand uniformly damp immediately before mixing process.
- .4 Add mortar colour and admixtures in accordance with manufacturer's instructions. Provide uniformity of mix and colouration.
- .5 Do not use anti-freeze compounds including calcium chloride or chloride based compounds.
- .6 Do not add air entraining admixture to mortar mix.
- .7 Use a batch type mixer in accordance with CAN/CSA A179.
- .8 Pointing mortar: prehydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp unworkable mix that will retain its form when pressed into ball. Allow to stand for not less than 1 hour no more than 2 hours then remix with sufficient water to produce mortar of proper consistency for pointing.
- .9 Re-temper mortar only within two hours of mixing, when water is lost by evaporation.

- .10 Use mortar within 2 hours after mixing at temperatures of 32 degrees C, or 2-1/2 hours at temperatures under 5 degrees C.

2.4 GROUT MIXES

- .1 Bond Beams: grout mix 10 to 12.5 MPa strength at 28 days; mixed in accordance with CAN/CSA A179 fine grout.
- .2 Lintels: grout mix 10 to 12.5 MPa strength at 28 days mixed in accordance with CAN/CSA A179 fine grout.
- .3 Grout: Minimum compressive strength of 12.5 MPa at 28 days. Maximum aggregate size and grout slump: CAN/CSA A179.

2.5 GROUT MIXING

- .1 Mix batched and delivered grout in accordance with CAN/CSA-A23.1 transit mixed.
- .2 Mix grout ingredients in quantities needed for immediate use in accordance with CAN/CSA A179 fine grout.
- .3 Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- .4 Do not use calcium chloride or chloride based admixtures.

2.6 MIX TESTS

- .1 Testing Mortar Mix:
 - .1 Test mortar to requirements of Section 01 45 00 - Quality Control, and in accordance with CAN/CSA A179, for mortar based on proportion specification. Test prior to construction and during construction for:
 - .1 Compressive strength.
 - .2 Consistency.
 - .3 Mortar aggregate ratio.
 - .4 Sand/cement ratio.
 - .5 Water content and water/cement ratio.
 - .6 Air content.
 - .7 Splitting tensile strength.
- .2 Testing Grout Mix:
 - .1 Test grout to requirements of Section 01 45 00 - Quality Control, and in accordance with CAN/CSA A179, for grout based on proportion specification. Test prior to construction and during construction for:
 - .1 Compressive strength.
 - .2 Sand/cement ratio.
 - .3 Water content and water/cement ratio.
 - .4 Slump.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Request inspection of spaces to be grouted.

3.2 PREPARATION

- .1 Apply bonding agent to existing concrete surfaces.
- .2 Plug clean-out holes with block masonry units. Brace masonry for wet grout pressure.

3.3 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.4 CONSTRUCTION

- .1 Do masonry mortar and grout work in accordance with CAN/CSA A179 except where specified otherwise.
- .2 Apply parging in uniform coating not less than total 25 mm thick.

3.5 MIXING

- .1 All pointing mortar can be mixed using a regular paddle mixer. Only electric motor mixers are permissible. Mixers run on hydrocarbons are not permitted, due to fumes, Clean all mixing boards and mechanical mixing machine between batches.
- .2 Mortar must be weaker than the units it is binding.
- .3 Contractor to appoint one individual to mix mortar, for duration of project. In the event that this individual must be changed, mortar mixing must cease until the new individual is trained, and mortar mix is tested.

3.6 MORTAR PLACEMENT

- .1 Install mortar to manufacturer's instructions.
- .2 Install mortar to requirements of CAN/CSA A179.
- .3 Remove excess mortar from grout spaces.

3.7 GROUT PLACEMENT

- .1 Install grout in accordance with manufacturer's instructions.
- .2 Install grout in accordance with CAN/CSA A179.
- .3 Work grout into masonry cores and cavities to eliminate voids.

- .4 Do not install grout in lifts greater than 400 mm, without consolidating grout by rodding.
- .5 Do not displace reinforcement while placing grout.

3.8 FIELD QUALITY CONTROL

- .1 Test and evaluate mortar prior to construction and during construction in accordance with CAN/CSA A179.
- .2 Test and evaluate grout prior to construction and during construction to CAN/CSA A179; test in conjunction with masonry unit sections specified.

3.9 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .2 Remove droppings and splashings using clean sponge and water.
- .3 Clean masonry with low pressure clean water and soft natural bristle brush.

3.10 PROTECTION OF COMPLETED WORK

- .1 Cover completed and partially completed work not enclosed or sheltered with waterproof covering at end of each work day. Anchor securely in position.

END OF SECTION

PART 1- GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 04 04 99 Masonry Procedures.
- .2 Section 04 05 12 Masonry Mortar and Grout.

1.2 REFERENCES

- .1 ASTM International Inc.
 - .1 ASTM A 36/A 36M-05, Standard Specification for Carbon Structural Steel.
 - .2 ASTM A 82/A 82M-05a, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - .3 ASTM A 167-99(R2004), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .4 ASTM A 307-04, Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
 - .5 ASTM A 580/A 580M-06, Standard Specification for Stainless Steel Wire.
 - .6 ASTM A 641/A 641M-03, Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - .7 ASTM-A666-03, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- .2 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CAN/CSA A179-04, Mortar and Grout for Unit Masonry.
 - .3 CAN/CSA A370-04, Connectors for Masonry.
 - .4 CAN/CSA A371-04, Masonry Construction for Buildings.
 - .5 CAN/CSA G30.18-M92(R2007), Billet-Steel Bars for Concrete Reinforcement.
 - .6 CSA-S304.1-04, Design of Masonry Structures.
 - .7 CSA W186-M1990(R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature, specifications and datasheets illustrating products to be incorporated into project for specified products.
 - .2 Provide Workplace Hazardous Materials Information System (WHMIS) - Material Safety Data Sheets (MSDS) in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Shop Drawings:
 - .1 Provide shop drawings in accordance with Section 01 33 00 - Submittal Procedures. Provide drawings stamped and signed by professional engineer registered or licensed in Province of Ontario.
 - .2 Clearly indicate bar size, spacing, location, quantities of reinforcement and mesh, with identifying code marks in order to permit correct placement without reference to structural

- drawings, to "Reinforcing Steel Manual of Standard Practice" by Reinforcing Steel Institute of Canada, First Canadian Edition 1992.
 - .3 Detail placement of reinforcing where special conditions occur.
 - .4 Show walls and beams in full elevation with duct and other openings, and mechanical and electrical conduits/piping indicated. Detail all reinforcing.
 - .5 Design and detail lap lengths and reinforcing development lengths to CSA A23.3-94, unless otherwise specified on drawings.
 - .6 Provide shop drawings detailing bar bending details, anchorage details lists and placing drawings.
 - .7 On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and connectors.
- .4 Samples: Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .5 Manufacturer's Instructions: Provide manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 FIELD MEASUREMENTS

- .1 Make field measurements necessary to ensure proper fit of members.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store and handle masonry anchorage and reinforcing materials in accordance with Section 01 61 00 - Common Product Requirements. Deliver reinforcement and connectors, identified in shop and placement drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Bar reinforcement: Steel to CAN/CSA A371 and CAN/CSA G30.18.
- .2 Connectors: to CAN/CSA A370 and CSA-S304.1.
- .3 Corrosion protection: to CSA-S304.1, galvanized to CSA-S304.1 and CAN/CSA A370.
- .4 Fasteners: installed post-construction:
 - .1 Screw Shields and Plugs: nylon, vibration-resistant, chemical-resistant, water-resistant, install in mortar joints.
 - .2 Bolts and Screws: size and type to suit application, locate where indicated.
 - .3 Nails: case-hardened cut or spiral nails, size and type to suit fastening application.
 - .4 Powder-Driven Fasteners: pin styles and lengths to suit fastening application in accordance with manufacturers use, load and hold recommendations.
 - .5 Adhesives: epoxies, mastics and contact cements for fastening applications, use in accordance with manufacturers' recommendations.

- .5 Ties: hot dip galvanized to CAN/CSA A370 Table 5.2 steel finish.
- .6 Horizontal reinforcing: truss type, as manufactured by Blok-Lok. See Structural Drawings for sizes. Rod extension to suit the wall cavity. Provide complete with "U" shaped 4.76 mm dia. double adjustable tie.
- .7 Adjustable steel stud veneer anchors: Model # 10-18 as manufactured by Bailey Metal Products Ltd., sizes to suit studs.
- .8 Horizontal and vertical reinforcing: deformed bars conforming to CSA G30 Series, $F_y=58$ KSI (400 MPa).
- .9 Miscellaneous individual brick masonry veneer ties: hot dipped, galvanized, straps, slotted heavy-duty rap-ties as manufactured by Fero.
- .10 Epoxy adhesive system: Hilti HIT Adhesive Anchoring System to suit the application.

2.2 FABRICATION

- .1 Fabricate reinforcing in accordance with CAN/CSA-A23.1 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .2 Fabricate connectors in accordance with CAN/CSA A370.
- .3 Weld reinforcement in accordance with CSA W186.
- .4 Ship reinforcement and connectors clearly identified in accordance with drawings.

2.3 SOURCE QUALITY CONTROL

- .1 Provide certified copy of mill test report of reinforcement steel and connectors, showing physical and chemical analysis, minimum 3 weeks prior to commencing reinforcement work.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 PREPARATION

- .1 Direct and coordinate placement of metal anchors for masonry supplied to other Sections.

3.3 INSTALLATION

- .1 Supply and install masonry connectors and reinforcement in accordance with CAN/CSA A370, CAN/CSA A371, CAN/CSA-A23.1 and CSA-S304.1 unless indicated otherwise.
- .2 Prior to placing concrete, mortar or grout, obtain Consultant's approval of placement of reinforcement and connectors.
- .3 Supply and install additional reinforcement to masonry as indicated.

3.4 BONDING AND TYING

- .1 Bond walls of two or more wythes using metal connectors in accordance with CSA-S304.1, CAN/CSA A371 and as indicated.
- .2 Tie masonry veneer to backing in accordance with NBC, CSA-S304.1, CAN/CSA A371 and as indicated.
- .3 Use Block-Loc hot-dipped galvanized ties, BL-30 single wythe and BL 37 (adjustable) for veneer wall ties.
- .4 At locations of masonry veneer over steel stud walls, install adjustable veneer anchors type.
- .5 Install unit, adjustable, single wythe and multiple wythe joint reinforcement in accordance with CAN/CSA A370 and CAN/CSA A371 and manufacturer's instructions.
 - .1 Bond walls of two or more wythes using metal connectors in accordance with CAN/CSA A371 and as indicated.
 - .2 Install horizontal joint reinforcement maximum 400 mm on centre.
 - .3 Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 400 mm each side of opening.
 - .4 Place joint reinforcement continuous in first and second joint below top of walls.
 - .5 Lap joint reinforcement ends minimum 150 mm.
 - .6 Connect stack bonded unit and joint corners and intersections with strap anchors 400 mm on centre.

3.5 HORIZONTAL REINFORCING

- .1 In all interior non-loadbearing block walls, install truss type horizontal reinforcing at spacings and size indicated on the structural drawings. The width of trusses shall be 50 mm less than the width of blocks. For example, for a 150 mm

3.6 EARTHQUAKE REINFORCEMENT

- .1 Reinforce loadbearing masonry in accordance with OBC and as indicated on the drawings.
- .2 Reinforce the following masonry elements in accordance with CAN3-S304-M84 and as indicated on structural drawings and specifications:
 - .1 Loadbearing and lateral load-resisting masonry
 - .2 Masonry enclosing elevator shafts and stairways
 - .3 Masonry used as exterior cladding
 - .4 Masonry partitions

3.7 REINFORCED LINTELS AND BOND BEAMS

- .1 Reinforce masonry beams, masonry lintels and bond beams as indicated.
- .2 Place and grout reinforcement in accordance with CSA-S304.1, CAN/CSA A371, and CAN/CSA A179.
- .3 Support and position reinforcing bars in accordance with CAN/CSA A371.

3.8 GROUTING

- .1 Grout masonry in accordance with CSA-S304.1, CAN/CSA A371 and CAN/CSA A179 and as indicated.

3.9 ANCHORS

- .1 Supply and install metal anchors in accordance with CAN/CSA A370 and CAN/CSA A371 and as indicated.

3.10 LATERAL SUPPORT AND ANCHORAGE

- .1 Supply and install lateral support and anchorage in accordance with CSA-S304.1 and as indicated.

3.11 MOVEMENT JOINTS

- .1 Reinforcement will not be continuous across movement joints unless otherwise indicated.
- .2 Stop reinforcing 25 mm short of each side of control joints unless otherwise indicated.

3.12 FIELD BENDING

- .1 Do not field bend reinforcement and connectors except if authorized by Consultant.
- .2 When field bending is authorized, bend without heat, applying a slow and steady pressure.
- .3 Replace bars and connectors which develop cracks or splits.

3.13 FIELD QUALITY CONTROL

- .1 Site inspections.
- .2 Obtain Structural Engineer's approval of placement of reinforcement and connectors, prior to placing mortar and grout.

3.14 FIELD TOUCH-UP

- .1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcement steel and connectors with compatible finish to provide continuous coating.

3.15 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning. Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1- GENERAL

1.1 RELATED REQUIREMENTS

- | | | |
|----|------------------|-------------------------------|
| .1 | Section 04 04 99 | Masonry Procedures |
| .2 | Section 04 05 23 | Masonry Accessories |
| .3 | Section 04 21 23 | Brick Masonry |
| .4 | Section 07 62 00 | Sheet Metal Flashing and Trim |

1.2 REFERENCES

- | | |
|----|--------------------------------------------------------------------------------------------------------------------------------------------|
| .1 | ASTM International Inc. |
| .1 | ASTM D 2240-05, Standard Test Method for Rubber Property - Durometer Hardness. |
| .2 | Canadian Standards Association (CSA International) |
| .1 | CAN/CSA A371-04, Masonry Construction for Buildings. |
| .2 | CAN/CSA-ISO 14021-00(R2204), Environmental Labels and Declarations - Self Declared Environmental Claims (Type II Environmental Labelling). |
| .3 | South Coast Air Quality Management District (SCAQMD), California State (SCAQMD) |
| .1 | SCAQMD Rule 1168-05, Adhesives and Sealants Applications. |

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- | | |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| .1 | Provide submittals in accordance with Section 01 33 00 - Submittal Procedures. |
| .2 | Product Data: Provide manufacturer's printed product literature, specifications and datasheets. Include product characteristics, performance criteria, and limitations. |
| .3 | Shop Drawings: Provide shop drawings in accordance with Section 01 33 00 - Submittal Procedures. Provide drawings stamped and signed by professional engineer registered or licensed in Province of Ontario. Shop drawings consist of flashing and installation details. Indicate sizes, spacing, location and quantities of fasteners. |
| .4 | Samples: Provide masonry accessory samples in accordance with Section 01 33 00 - Submittal Procedures. |

1.4 FIELD MEASUREMENTS

- | | |
|----|--------------------------------------------------------------------|
| .1 | Make field measurements necessary to ensure proper fit of members. |
|----|--------------------------------------------------------------------|

1.5 DELIVERY, STORAGE, AND HANDLING

- | | |
|----|-------------------------------------------------------------------------------------------------------------------------------------------|
| .1 | Deliver, store and handle masonry accessories in accordance with, Section 01 61 00 - Common Product Requirements supplemented as follows: |
| .1 | Keep fillers and adhesives dry, protected against dampness, and freezing. |
| .2 | Store packaged materials off ground and in accordance with manufacturer's written instructions. |

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Movement joint filler: purpose-made elastomer, outsized 30% to 50%, 20 durometer hardness to ASTM D 2240 of size and shape indicated. Use low VOC products in compliance with the SCAQMD Rule 1168.
- .2 Lap adhesive: recommended by masonry flashing manufacturer. Use low VOC products in compliance with the SCAQMD Rule 1168.
- .3 Mechanical fasteners: recommended by flashing manufacturer to suit project requirements.
- .4 Fire Stop Material: "Fire Stop" as manufactured by AA/D Distributors.

PART 3- EXECUTION

3.1 APPLICATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION: MATERIALS

- .1 Install continuous movement joint fillers in movement joints at locations indicated on drawings.
- .2 Lap adhesive: apply adhesive to flashing lap joints.
- .3 Mechanical fasteners: install fasteners to suit application and in accordance with manufacturer's written installation instructions.

3.3 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning. Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1- GENERAL

1.1 RELATED REQUIREMENTS

- | | | |
|----|------------------|-----------------------------------|
| .1 | Section 04 05 12 | Masonry Mortar and Grout |
| .2 | Section 04 05 19 | Masonry Anchorage and Reinforcing |
| .3 | Section 04 05 23 | Masonry Accessories |
| .4 | Section 04 22 00 | Concrete Unit Masonry |

1.2 REFERENCES

- .1 ASTM International Inc.
 - .1 ASTM C 73-05, Standard Specification for Calcium Silicate Brick (Sand-Lime Brick).
 - .2 ASTM C 216-07a, Standard Specification for, Facing Brick (Solid Masonry Units Made of Clay or Shale).
- .2 Brick Industry Association (BIA): Technical Note No. 20-2006, Cleaning Brick Work.
- .3 Canadian Standards Association (CSA International)
 - .1 CAN/CSA A82-06, Fired Masonry Brick Made From Clay or Shale).
 - .2 CAN/CSA-A165 Series-2004, CSA Standards on Concrete Masonry Units.
 - .3 CAN/CSA A371-04, Masonry Construction for Buildings.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data: Provide manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Manufacturer's Instructions: Provide manufacturer's installation instructions.
- .4 Samples: Provide unit samples in accordance with Section 01 33 00 - Submittal Procedures.

1.4 SITE CONDITIONS

- .1 Ambient Conditions: assemble and erect components only when temperature is above 4 degrees C.

PART 2 - PRODUCTS

2.1 FACE BRICK

- .1 Fired clay brick: shall conform to CAN/CSA A82.1-M87
 - .1 Type: FBX Grade SW
 - .2 Compressive strength: 16 MPA minimum
 - .3 Size: metric modular brick (57 x 190 x 90mm) and special shapes as required
 - .4 Colour and texture: shall match approved sample in Architect's office
 - .5 Acceptable material: Architectural Brick Series by Brampton Brick or Hanson Brick or equivalent.
 - .6 Brick colour and texture: To match existing bricks.

PART 3- EXECUTION

3.1 EXAMINATION

- .1 Verify surfaces and conditions are ready to accept work of this Section.
- .2 Commencing installation means acceptance of existing substrates.

3.2 PREPARATION

- .1 Protect adjacent finished materials from damage due to masonry work.

3.3 APPLICATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.4 INSTALLATION

- .1 Construction to conform to CAN/CSA A371.
- .2 Bond: running stretcher or as indicated on drawings.
- .3 Coursing height: 200 mm for three (3) bricks and three (3) joints.
- .4 Jointing: concave where exposed or where paint or similar thin finish coating is specified.
- .5 Mixing and blending: mix units within each pallet and with other pallets to ensure uniform blend of colour and texture. Remove black flashed units.
- .6 Carry up all walls in a uniform manner without any one wall raised more than 1200 mm above another at one time.
- .7 Except where noted otherwise, set masonry units in running bond and tooth bond all intersections of walls and partitions. Lay masonry with voids and webs aligned with the block below.
- .8 Where brick and SMU work are to be exposed, courses shall be level, and alternate vertical joints shall be aligned. Joints shall be slightly tooled concave. Use stainless steel jointing tools.
- .9 The maximum joint thickness shall be 10 mm. Where the specified horizontal reinforcing will cause the joint thickness to exceed 10 mm cut the webs of the masonry unit to accommodate the reinforcing and to achieve a maximum joint thickness of 10 mm.
- .10 Machine cut with a carborundum saw all exposed masonry units which are adjusted in size.
- .11 Where shown on the drawings or called for in the Specifications, build-in reglets to receive flashings. Leave reglet free of mortar, caulk.
- .12 Cut and make good all openings or chases required by other trades. Where conduits or pipes occur in masonry work, take special care to ensure that final finish of masonry is presentable; secure the cooperation of other trades to ensure this result.
- .13 Provide steel angle lintels at all openings in 90 mm masonry veneers unless shown otherwise on the drawings. Minimum L 75x75x10mm (200mm beyond each jamb).
- .14 Provide temporary bracing of walls during and after erection until permanent lateral support is in

place.

- .15 Clean unglazed clay masonry as work progresses. Upon completion of masonry, fill holes and cracks, remove loose mortar and repair defective work.

3.5 MORTAR COLOURS

- .1 Up to two (2) different mortar colours will be selected by the Architect at a later date
- .2 Mortar colour will be similar to the adjacent brick and/or match existing.

3.6 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .3 Pressure wash to the satisfaction of the Consultant.

3.7 DAMAGE DURING INSTALLATION

- .1 Do not install defective units. Replace any units damaged by contractor at contractor's expense. All damaged units not reported as damaged upon inspection at time of delivery are presumed to have been damaged by contractor or improper job site handling. Do not allow units to be mishandled. Keep cap cover on all units until installed. Contractor, at his expense, shall remove any scratches, tar or dirt caused by mishandling.

END OF SECTION

PART 1- GENERAL

1.1 RELATED REQUIREMENTS

- | | | |
|----|------------------|-----------------------------------|
| .1 | Section 04 05 12 | Masonry Mortar and Grout |
| .2 | Section 04 05 19 | Masonry Anchorage and Reinforcing |
| .3 | Section 04 05 23 | Masonry Accessories |

1.2 REFERENCES

- .1 ASTM International Inc.: ASTM E 336-07, Standard Test Method for Measurement of Airborne Sound Attenuation Between Rooms in Buildings.
- .2 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A165 Series-2004, CSA Standards on Concrete Masonry Units covers: A165.1, A165.2, A165.3.
 - .2 CAN/CSA A371-04, Masonry Construction for Buildings.
 - .3 CSA S304.1-04, Design of Masonry Structures.
- .3 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD): SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
- .4 Underwriters' Laboratories of Canada (ULC): CAN/ULC-S101-07, Standard Methods of Fire Endurance Tests of Building Construction and Materials.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data: provide product data, including manufacturer's printed data sheets and catalog pages illustrating products to be incorporated into project for specified products.
- .3 Provide Manufacturer's Written Instructions.
- .4 Submit shop drawings for structural masonry in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups and in accordance with CAN-A23.4-00 and CAN-A23.1/A23.2-00. Each drawing submitted shall bear stamp and signature of qualified professional engineer registered in the Province of Ontario. Indicate the following:
 - .1 Formwork
 - .2 Design calculations for items designated by manufacturer
 - .3 Tables and bending diagrams of reinforcing steel
 - .4 Methods of handling and placing
 - .5 Relationship to adjacent material
 - .6 Methods of lifting and erection
 - .7 Openings, sleeves, inserts and related reinforcement, joint and connection details.

PART 2 – PRODUCTS

2.1 MATERIALS

- .1 Standard cellular masonry units shall conform to CAN/CSA-A165 Series (CAN/CSA-A165.1)
 - .1 Classification: H/15/A/M for standard weight, hollow units, 8.3 MPa
 - .2 Size: metric modular
 - .3 Special Shapes: Provide purpose made shapes for lintels, bond beams, corners and 190 mm long units. Provide bullnose units for all vertical and horizontal corners. Use solid concrete masonry units at interior window sills and top course of partial height walls. Use solid concrete masonry units at top course of partial height walls. All corner units shall have 190 mm return
 - .4 Use Shouldice 424 Rock Sill, Sloped away from the wall, Tex Stone Face for exterior window sills

2.2 TOLERANCES

- .1 Tolerances for standard concrete unit masonry tolerances in accordance with CAN/CSA A165.1, supplemented as follows:
 - .1 Maximum variation between units within specific job lot not to exceed 2 mm.
 - .2 No parallel edge length, width or height dimension for individual unit to differ by more than 2 mm.
 - .3 Out of square tolerance not to exceed 2 mm.
- .2 Tolerances for architectural concrete masonry units in accordance with CAN/CSA A165.1, supplemented as follows:
 - .1 Maximum variation in length or height between units within specific job lot for specified dimension not to exceed 2 mm.
 - .2 No parallel edge length, width or height dimension for individual unit to differ by more than 2 mm.
 - .3 Out of square tolerance not to exceed 2 mm.
 - .4 Maximum variation in width between units within specific job lot for specified dimension not to exceed 2mm.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verify surfaces and conditions are ready to accept work of this Section.
- .2 Commencing installation means acceptance of existing substrates.

3.2 PREPARATION

- .1 Protect adjacent finished materials from damage due to masonry work.

3.3 INSTALLATION

- .1 Bond: running, except where indicated otherwise

- .2 Jointing: concave
- .3 Coursing height: 200 mm for one (1) block and one (1) joint
- .4 Carry up all walls in a uniform manner without any one wall raised more than 1200 mm above another at one time.
- .5 Except where noted otherwise, set masonry units in running bond and tooth bond all intersections of walls and partitions. Lay blocks with voids and webs aligned with the block below. See drawings for special patterns.
- .6 Where brick and block work are to be exposed, courses shall be level, and alternate vertical joints shall be aligned. Joints shall be slightly tooled concave. Use stainless steel jointing tools.
- .7 Chipped blocks shall not be used where block work, either painted or unpainted, is to be exposed.
- .8 The maximum joint thickness shall be 10 mm. Where the specified horizontal reinforcing will cause the joint thickness to exceed 10 mm cut the webs of the blocks to accommodate the reinforcing and to achieve a maximum joint thickness of 10 mm.
- .9 Machine cut with a carborundum saw all exposed masonry units which are adjusted in size.
- .10 Carry all walls and partitions up to the underside of construction above and finish against underside of roof deck or floor slab above (in accordance with details shown on the drawings). Pack all voids between top of walls or partitions and metal deck with firestopping material.
- .11 Where shown on the drawings or called for in the Specifications, build-in reglets to receive flashings. Leave reglet free of mortar.
- .12 Cut and make good all openings or chases required by other trades. Where conduits or pipes occur in masonry work, take special care to ensure that final finish of masonry is presentable; secure the cooperation of other trades to ensure this result.
- .13 Where mechanical or electrical work occurs in walls, the walls shall be thickened to suit and to maintain required fire, smoke, and sound separations. Refer to mechanical and electrical drawings. Do not form horizontal chases.
- .14 Build-in sleeves as required.
- .15 As required, all conduits, etc., provided and erected by other trades, shall be built-in without breaking bond.
- .16 Close masonry walls tightly around all penetrations which occur through them in ceiling spaces. Build in around fire dampers in accordance with the requirements of the Underwriters' Laboratory of Canada.
- .17 At all openings in masonry walls completely fill hollow units with concrete at the jambs and reinforce vertically.
- .18 Provide lintel blocks with steel reinforcing at all openings in masonry walls unless shown otherwise on the drawings.
- .19 Provide steel angle lintels at all openings in 90 mm masonry veneers unless shown otherwise on the drawings.
- .20 Build-in steel door frames and fill frames with mortar as walls are brought up.

- .21 As required, break out block cores in order to install horizontal and vertical reinforcing as specified.
- .22 Set bearing plates for joists, beams, etc., at locations and elevations indicated on the structural drawings.
- .23 Provide temporary bracing of walls during and after erection until permanent lateral support is in place.

3.4 REINFORCEMENT

- .1 Install reinforcing in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.
- .2 Install horizontal and vertical reinforcing as indicated on the structural drawings.
- .3 Construct reinforced concrete block wall panels one (1) storey high before placing reinforcement and grouting.
- .4 Provide clean-out ports as required for "high-lift grouting".
- .5 Do not grout reinforced cores until clean-out port and reinforcing have been reviewed by Engineer.

3.5 CONCRETE MASONRY LINTELS

- .1 As called for on the drawings, concrete masonry lintels shall be installed in the openings. Fill all lintels and bond beams with 20 MPA 3000 psi concrete. As indicated on Structural Drawings, provide bearing for all lintels.

3.6 CONSTRUCTION

- .1 Cull out masonry units, in accordance with CAN/CSA A165 and approved range of colour samples, with chips, cracks, broken corners, excessive colour and texture variation.
- .2 Build in miscellaneous items such as bearing plates, steel angles, bolts, anchors, inserts, sleeves and conduits.
- .3 Construct masonry walls using running bond unless otherwise noted.
- .4 Build around frames previously set and braced. Fill behind hollow frames within masonry walls with mortar or grout and embed anchors.
- .5 Fit masonry closely against electrical and plumbing outlets so collars, plates and covers overlap and conceal cuts.
- .6 Install movement joints and keep free of mortar where indicated.
- .7 Hollow Units: spread mortar setting bed from outside edge of face shells. Gauge amount of mortar on top and end of unit to create full joints, equivalent to shell thickness. Avoid excess mortar.
- .8 Solid Units: apply mortar over entire vertical and horizontal surfaces. Avoid bridging of airspace between brick veneer and backup wall with mortar.
- .9 Ensure compacted head joints. Use full or face-shell joint as indicated.
- .10 Tamp units firmly into place.

- .11 Do not adjust masonry units after mortar has set. Where resetting of masonry is required, remove, clean and reset units in new mortar.
- .12 Tool exposed joints concave; strike concealed joints flush.
- .13 After mortar has achieved initial set up, tool joints.
- .14 Do not interrupt bond below or above openings.

3.7 REPAIR/RESTORATION

- .1 Upon completion of masonry, fill holes and cracks, remove loose mortar and repair defective work.

3.8 PROTECTION

- .1 Brace and protect concrete unit masonry.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM A 53/A 53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A 269-08, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - .3 ASTM A 307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 CSA International
 - .1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA S16-09, Design of Steel Structures.
 - .4 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - .5 CSA W59-M03(R2008), Welded Steel Construction (Metal Arc Welding) Metric.
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

1.3 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties. Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .2 Shop drawings shall bear the stamp of an independent qualified professional structural engineer, registered in the Province of Ontario. Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Deliver materials to site in original factory packaging.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

- .2 Replace defective or damaged materials with new.

1.5 DESIGN CRITERIA

- .1 Provide structural design for all work listed in item .2 below
- .2 Detail and fabricate work in accordance with Section 4 of The Ontario Building Code:
- .1 Lintels and shelf angles.
 - .2 Access ladders
 - .3 Tubular HSS steel supports for pressed steel frames and screens.
 - .4 Lateral support nonloadbearing masonry walls.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Steel sections and plates: to CSA G40.20/G40.21, Grade 300W.
- .2 Steel pipe: to ASTM A 53/A 53M
- .3 Welding materials: to CSA W59.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Bolts and anchor bolts: to ASTM A 307.
- .6 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA G164-M92 (R1998).
- .7 Shop Coat Primer for Interior Steel: to CAN/CGSB-1.40-97
- .8 Zinc Primer: Zinc rich, ready mix to CAN/CGSB-1-181-99.
- .9 Shop Coat Primer for Exterior Exposed Steel: Organic zinc rich epoxy primer: two component polyamide epoxy zinc-rich coating. Acceptable Material: Sherwin Williams Zinc Clad IV, B69A8/B69V8.
- .10 Grout: non-shrink, non-metallic, flowable, 24 h, MPa 15, pull out strength 7.9 MPa.

2.2 FABRICATION

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 ISOLATION COATING

- .1 Isolate aluminum from following components, by means of bituminous paint:
- .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
 - .2 Concrete, mortar and masonry.

.3 Wood.

2.4 SHOP PAINTING

- .1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items. Except where hot dip galvanizing is specified, clean to SSPC SP-10 near-white blast cleaning and prime paint exterior steel items after fabrication, apply organic zinc-rich epoxy primer.
- .2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C.
- .3 Clean surfaces to be field welded; do not paint.

2.5 ANGLE LINTELS

- .1 Steel angles: galvanized, sizes indicated for openings. Provide 150 mm minimum bearing at ends. Provide steel angles above all openings in masonry veneer. Minimum angle to be L 75x75x10mm.
- .2 Weld or bolt back-to-back angles to profiles as indicated.
- .3 Hot dip galvanized for exterior applications and prime painted for interior work.

2.6 LATERAL SUPPORT, NON-LOAD BEARING MASONRY WALLS

- .1 Provide masonry lateral support brackets on both sides at the top of all non-load bearing masonry walls.
- .2 Also, provide for anchoring to the underside of steel beams, structural supports and steel joists.
- .3 Prime paint after fabrication.

2.7 BRACKET SUPPORTS FOR WALL COUNTERS

- .1 For installation to concrete or concrete block: fabricate bracket supports from 50.8 mm x 50.8 mm x 3.81 mm steel tubing to shape and size indicated. Close off ends.
- .2 For installation at drywall partitions: fabricate from 50.8 mm x 50.8 mm x 3.81 mm steel tubing to shape and size indicated welded to 76.2 mm x 76.2 mm x 6.35 mm posts complete with baseplates for anchoring into concrete slab.
- .3 Prime paint after fabrication.
- .4 Powder coat all exposed bracket support.

PART 3- EXECUTION

3.1 EXAMINATION

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

- .2 Inform Consultant of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 ERECTION

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage acceptable to Consultant such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Supply components for work by other trades in accordance with shop drawings and schedule.
- .6 Make field connections with bolts to CSA S16 or Weld field connection.
- .7 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.
- .8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion.
- .9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.3 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

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PART 1 – SCOPE OF WORK

- | | |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1.1</u>
<u>Related</u>
<u>Sections</u> | <ul style="list-style-type: none">.1 General Requirements – See applicable specification section.2 Safety Requirements – See applicable specification section.3 Preformed Metal Cladding – Section 074650.4 Modified Bitumen Membrane Roofing – Section 075200.5 Sheet Metal Flashing – Section 076200.6 Electrical and Mechanical Requirements – See applicable specification section |
| <u>1.2</u>
<u>General</u> | <ul style="list-style-type: none">.1 Provide wood blocking for roofing, equipment curbs and sheet metal work as indicated on detail drawings, as noted herein and as required to provide a high-quality finished product. |
| <u>1.3</u>
<u>Anchors &</u>
<u>Fasteners</u> | <ul style="list-style-type: none">.1 Co-ordinate the location and installation of anchors and fasteners. Confirm types of fasteners to be utilized with Consultant..2 Do not use metals in combination that may cause galvanic corrosion..3 Use non-corrosive or galvanized steel fastenings as approved by Consultant, or as otherwise specified..4 Space anchors within load bearing or shear capacity. |
| <u>1.4</u>
<u>Quality</u>
<u>Assurance</u> | <ul style="list-style-type: none">.1 Lumber shall bear the grading stamp of an agency certified by the Canadian Lumber Standards Administration Board..2 Plywood identification; by grade mark in accordance with applicable CSA Standards..3 Ontario Building Code (OBC) – current edition |
| <u>1.5</u>
<u>Precautions</u> | <ul style="list-style-type: none">.1 All wood blocking must be sealed in with self-adhering vapour barrier membrane, as detailed, the same day any wood blocking is installed. Refer to Sections 07 52 00.3.4.1 & 07 52 00.4.4.1. |

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PART 2 – MATERIALS

2.1 **Dimensional** **Lumber &** **Plywood**

- .1 To CAN/CSA-0141 (latest revision) and CAN3-086-M (latest revision) and to National Lumber Grades Authority Standard Grading Rules (latest revision)-grade Category as follows:
- .2 Roofing framing and blocking: species group **PRESSURE TREATED – “CONSTRUCTION GRADE”**
- .3 To CSA 0151 (latest revision), Canadian Softwood Plywood, species group – **PRESSURE TREATED - “CONSTRUCTION GRADE”**
- .4 **Note: All plywood to be 19mm unless noted otherwise.**

2.2 **Fasteners**

- .1 **All fasteners must be designed and approved for use with ACQ/CCA Pressure-Treated Lumber**
- .2 **Wood Construction:** Construction Screws #8 or greater carbon steel with duradize treating and approved for use with ACQ/CCA (Pressure-Treated) lumber. Standard of Acceptance: **Paulin Flat-Head Socket Deck Screw or approved equivalent**
- .3 **Steel Deck Attachment:** Corrosion resistant # 12 hex head screws with Cathodic epoxy e-coat and approved for use with ACQ/CCA (Pressure-Treated) lumber. Standard of Acceptance: **Dekfast #12 Hex Head or approved equivalent.** Contractor to consider fastener spacing @ 300mm (12”) OC staggered.
- .4 **Concrete Deck Attachment:** Fasteners designed to securely anchor to the concrete deck and approved for use with ACQ/CCA (Pressure-Treated) lumber. Standard of Acceptance: **Heavy-Duty Tapcon Screw Anchors or approved equivalent (Anchors to be a minimum of 3/8” diameter).** Testing with fasteners to be completed on site prior to the final securement of any item. Contractor to consider fastener spacing @ 300mm (12”) OC staggered.
- .5 **Concrete / Masonry Wall Attachment:** Fasteners designed to securely anchor to the concrete / masonry wall. Zinc plated steel pin & zinc-aluminium anchor body. Minimum ¼” diameter. Anchors must be suitable length to securely fasten new material to substrate. Standard of Acceptance: **Nail Drive Anchors / Pin Bolts by Ucan or approved equivalent.**

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2.2 Cont'd

- .6 **Misc. Fasteners: to steel** - use self-drilling screws; **to solid masonry or concrete** - use expansion shields, friction fit pins or lag bolts. Use lead or in-organic fibre plugs with specified screws in concrete or masonry.

2.3
Wood
Preservative

- .1 Surface-applied wood preservative: copper naphthenate or 5% Pentachlorophenol solution, water repellent preservative To CSA 080-M1983 (latest revision). – Standard of Acceptance: **Copper-Green Wood Preservative or approved equivalent**

2.4
Gypsum
Sheathing

- .1 Gypsum sheathing board ASTM C1396/C1396M. Board to be 13mm thick, exterior grade sheathing formulated to be fire-resistant

PART 3 – APPLICATION

3.1
Securement

- .1 Secure to substrate with fasteners as specified above and designed for use with ACQ/CCA pressure treated lumber. Fasteners placed in a minimum of two (2) rows at 300mm centers or as otherwise detailed.
- .2 Fasteners should penetrate substrate a minimum of 13mm.
- .3 Double the amount of fasteners required for a distance of 2.4m from all outside corners.

3.2
Fastening

- .1 All screws shall be long enough so that not less than half their length penetrates into the second member.
- .2 Splitting of wood members shall be minimized by staggering the fasteners in the direction of the grain and by keeping nails well in from the edges.

3.3
Wood
Blocking

- .1 Comply with more stringent requirements as required by drawings or Ontario Building Code requirements. Increase number and spacing of all fasteners by 50% for 2400 mm from all outside roof corners.
- .2 Install fasteners to the design intent to hold all wood blocking permanently in place to prevent warping, deflection and to resist all wind and weather conditions.

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3.3 Cont'd

- .3 Secure wood to metal deck in a staggered pattern with each row spaced at maximum 300 mm OC with specified fasteners at maximum 300 mm OC. Secure bottom plate / member with minimum two rows of No. 12 galvanized / coated steel screws at maximum spacing of 300 mm OC. Screws shall be of sufficient length to penetrate top flute of decking a minimum 13 mm and a maximum of 19 mm. Most stringent requirement shall govern
- .4 Install fasteners in two rows in the direction of the grain, offset one to another in a staggered fashion by approximately 50%. All fasteners shall be placed minimum 10 mm from any edge of framing.
- .5 Unless specified otherwise, the number of fasteners shall be doubled at all outside parapet corners, for a distance of 3 m from the corner.
- .6 For any exposed fastening, provide touch-up paint as required to coat all exposed surfaces of screws damaged during the driving process.

3.4
Plywood

- .1 Install plywood where indicated on drawings.
- .2 Leave a space of 2mm between sheets to allow for material expansion.
- .3 Every piece shall have a minimum of 2 fasteners. Minimum distance between 2 fasteners shall be half their length and the minimum distance from the edge of the plywood shall be a quarter of their length

3.5
Wood
Preservative

- .1 Treat surfaces of material with wood preservative, before installation
- .2 Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface for minimum (three) 3-minute soak on lumber and (one) 1-minute soak on plywood.
- .3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.
- .4 **Applied preservative must be completely dry/cured prior to the installation of any subsequent overlying material layers**

3.6
Gypsum
Sheathing

- .1 Mechanically fasten boards to interior of curbs, hatches, and skylights. Install joint tape over all joints. Plaster with a minimum of two coats of drywall compound, sand and paint as indicated on the drawings.

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3.7
New
Construction

- .1 Maximum spacing between studs to be as indicated on drawings.
Align and plumb faces of furring and blocking to tolerance of 1:600.
- .2 **Roof Curbs:** build curbs to a minimum height of 400mm above finished roof surface or as indicated. Most stringent requirement shall govern
- .3 **Walls, Control Joints & Expansion Joints:** build walls / joints to a minimum height of 150mm above the finished roof surface or as indicated. Match height of parapet as indicated on drawings. Most stringent requirement shall govern
- .4 **Parapet Walls:** build parapet walls to a minimum height of 150mm above the finished roof surface or as indicated. Parapet wall heights to match between adjacent / N.I.C. & contract roof areas. Most stringent requirement shall govern
- .5 **Mechanical Sleepers:** build sleepers to a minimum height of 400mm above finished roof surface or as indicated. Most stringent requirement shall govern

-END OF SECTION-

PART 1- GENERAL

1.1 REFERENCES

- .1 Unless otherwise shown on the drawings, or called for in this specification, all millwork construction shall comply with Architectural Woodwork Manufacturers Association of Canada - Latest Edition, Custom Grade Standards for Flush Overlay Casework, Part 300.
- .2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI): Architectural Woodwork Quality Standards Illustrated, 8th edition, Version 1.0 (2009).
- .3 Canadian General Standards Board (CGSB): CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
- .4 CSA International
 - .1 CSA B111-74(R2003)], Wire Nails, Spikes and Staples.
 - .2 CSA O112.10-08, Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure).
 - .3 CSA O115-M1982 (R2001) hardwood and Decorative Plywood
 - .4 CSA O121-08, Douglas Fir Plywood.
 - .5 CSA O141-05(R2009), Softwood Lumber.
 - .6 CSA O151-09, Canadian Softwood Plywood.
 - .7 CSA O153-M1980(R2008), Poplar Plywood.
- .5 National Hardwood Lumber Association (NHLA): Rules for the Measurement and Inspection of Hardwood and Cypress 2011.

1.2 FACTORY FINISHING

- .1 All "exposed" and "semi-exposed" surfaces of millwork shall be prefinished at the Contractor's plant prior to shipping to the job site. Touch up on site as required after installation is completed. Finishing shall be carried out in conformance with Part 600, "Factory Finishing" of the AWMAC Quality Standards for Architectural Woodwork, 1998.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Before any millwork work is fabricated, submit to the Architect, for review, shop drawings fully illustrating the millwork.

1.4 EXAMINATION AND COORDINATION

- .1 Examine all the drawings and specifications to determine the extent of the work.
- .2 Coordinate with other trades for incorporation of mechanical, electrical, or other items into millwork.

1.5 MOISTURE CONTENT

- .1 Ensure that moisture content for millwork does not exceed 6%

1.6 QUALITY ASSURANCE

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

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .1 Protect millwork against dampness and damage during and after delivery.
 - .2 Store millwork in ventilated areas, protected from extreme changes of temperature or humidity.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location and in accordance in clean, dry, well-ventilated area.
 - .2 Store and protect architectural woodwork from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Softwood lumber: to CSA 0141-1970 and National Lumber Grades Authority requirements, with maximum moisture content of 6% for interior work, yard lumber select for paint finish pine species, to AWMAC custom grade.
- .2 Hardwood lumber: to National Hardwood Lumber Association (NHLA) requirements, moisture content of maximum 6% for interior work, oak or maple species, (confirm with owner if maple or oak to be used), to AWMAC custom grade.
- .3 Plywood:
 - .1 HARDWOOD VENEER CORE PLYWOOD: CSA 0115-M1982, Type II, select architectural grade, rotary cut veneer, "uniform light".
 - .2 DOUGLAS FIR PLYWOOD: CSA 0121-M1978, Veneer Core, Type 1
 - .3 Plywood shall comply with the following:
 - .1 G2S for doors and panels exposed to view on both sides
 - .2 G1S for members exposed to view on one (1) side
 - .3 S2S for items not exposed to view
- .4 GLUES: CSA 0112.5-M1977
- .5 PRESERVATIVE: CSA 080-M1983
- .6 POST FORMED COUNTERTOPS: To match Bélanger profile 2300.

- .7 SOLID LUMBER;
 - .1 Rough Carpentry - of any appropriate species shall conform to CSA 0141 and NLGA requirements. Construction or Appearance grade lumber or yard lumber selected for paint finish. Millwork exposed - Maple, conforming to AWMAC custom grade standards.
- .8 MAPLE (for all hardwood and hardwood edging):
 - .1 Maple: 38 mm thick, hard "select white" natural, free of defects at exposed faces.
- .9 Nails and staples: to CSA B111.
- .10 Wood screws: stainless steel, type and size to suit application.
- .11 Splines: wood.
- .12 Sealant: clear silicone.

2.2 FABRICATION

- .1 Set nails and countersink screws apply plain wood filler to indentations, sand smooth and leave ready to receive finish.
- .2 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.
- .3 Shelving to cabinetwork to be adjustable unless otherwise noted.
- .4 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.
- .5 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.
- .6 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .7 Ensure adjacent parts of continuous laminate work match in colour and pattern.
- .8 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 2400 mm. Keep joints 600 mm from sink cutouts.
- .9 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.
- .10 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
- .11 Apply laminate backing sheet to reverse side of core of plastic laminate work.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for architectural woodwork installation in accordance with

manufacturer's instructions.

- .1 Visually inspect substrate. Inform Consultant of unacceptable conditions immediately upon discovery.
- .2 Proceed with installation only after unacceptable conditions have been remedied.

3.2 HARDWARE INSTALLATION

- .1 Supply and install all finish hardware listed in Section 08 70 05 Cabinet and Miscellaneous Hardware.

3.3 INSTALLATION

- .1 Do architectural woodwork to Quality Standards of AWMAC.
- .2 Supply and install built-in and unit cabinetwork as shown on drawings.
- .3 Mortise, dowel, block, and glue all joints.
- .4 Ensure that the work is finished solid, square, and level with all drawers and doors operating properly.
- .5 Wood for cabinetwork shall be without defects in any exposed parts.
- .6 Prior to manufacture of cabinetwork, determine from the millwork hardware section items specified for use by this trade. Supply and installation of hardware shall be by the millwork manufacturer.
- .7 Select veneer to provide bookmatch.
- .8 Install prefinished millwork at locations shown on drawings. Position accurately, level, plumb straight.
- .9 Fasten and anchor millwork securely. Supply and install heavy duty fixture attachments for wall mounted cabinets.
- .10 Use draw bolts in countertop joints.
- .11 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.
- .12 At junction of plastic laminate counter back splash and adjacent wall finish, apply small bead of sealant in accordance with Section 07 92 00 - Joint Sealants.
- .13 Apply bituminous coating over wood framing members in contact with masonry or cementitious construction.
- .14 Fit hardware accurately and securely in accordance with manufacturer's written instructions.

3.4 PREPARATION

- .1 Provide all rough hardware required for the proper execution of the work and provide and use all requisite screws, nails, bolts, holdfasts, and accessories not otherwise specified.
- .2 Backpaint all woodwork in contact with masonry, precast, and cured concrete. Apply preservative to all wood in contact with the ground, mortar, and concrete not completely dry and cured.
- .3 Where required, provide and set rough wood bucks to openings. These shall be anchored to the walls with approved type metal anchors.

- .4 Provide blocking in existing stud spaces as required for installation of all items, including (but not limited to): Sinks, vanities, countertops, washroom accessories, benches, shelves, millwork and equipment. Reinstate affected surfaces to seamless appearance using CGC VHI Board, thickness as required to suit. Where existing surfaces are affected, prepare and repaint entire surface to match existing in accordance with M.P.I. printed best practices.
- .5 Carefully plug the walls where necessary for securing other work where metal plugs have not been provided by other trades, and provide all necessary nailing strips or blocks required.

3.5 GENERAL MILLWORK WORKMANSHIP

- .1 Millwork shall be preassembled in the shop as far as practicable and delivered to the building ready to be set in place. Finished items shall be carefully worked to details, sanded free of surface defects and machine marks. Conceal nails and screws and include blocking and gluing, all as commensurate with first class durable work. Trim shall be cleanly cut with all mitres accurately made and fitted.
- .2 All hardwood and hardwood veneer to have concealed fastenings where possible. Otherwise recess screws and bolts and plug holes with minimum 6mm thick wood plugs (species, colour, grain and grain orientation to match hardwood). Sand plugged areas smooth to receive finish. Where finishing nails are used, inset nails at regular intervals in straight lines for neat and even appearance. Apply filler (colour to match wood) and sand smooth ready to receive finish.
- .3 Frames and finish of every sort shall not be set until moisture contributing finishes are dry and relative humidity in the building approximates normal conditions. Work shall be fitted and scribed to other finished work in a careful manner with all necessary precautions taken to avoid defacing adjacent surfaces.
- .4 A hardwood edge shall be glued and nailed to exposed edges of plywood.
- .5 Members shall be erected in pieces as long as possible with inconspicuous joints.
- .6 SITE DIMENSIONS AND CONDITIONS shall be the responsibility of the Contractor and no extra will be allowed for material which does not fit the required conditions.
- .7 All nails shall be long enough so that at least half their length penetrates the second member. Avoid splitting of wood by staggering the nails in the direction of the grain and keep nails as far away from edges as possible.

3.6 PROTECTION

- .1 Protect millwork and cabinet work from damage until final inspection.
- .2 Protect installed products and components from damage during construction.
- .3 Repair damage to adjacent materials caused by architectural woodwork installation.

END OF SECTION

PART 1- GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit duplicate samples of joints, edging and cutouts in accordance with Section 01 33 00 - Submittal Procedures.

1.2 MAINTENANCE DATA

- .1 Provide maintenance data for plastic laminate work for incorporation into Operation and Maintenance Manual specified in Section 01 78 00.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Cover finished laminated plastic surfaces with heavy kraft paper or put in cartons during shipment. Protect installed laminated surfaces by approved means. Do not remove until immediately before final inspection.
 - .3 Do not store or install materials in areas where relative humidity is less than 25% or greater than 60% at 22 degrees C.
 - .4 Shop assemble work for delivery to site in size easily handled and to assure passage through building openings.
 - .5 Store and protect laminate, adhesive, and core materials from nicks, scratches, and blemishes.
 - .6 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Laminated plastic for flatwork: to CAN3-A172-M79, Grade GP-R, 1.27 mm thick; based on solid or printed pattern colour range by Wilsonart and Arborite with suede finish.
- .2 Laminated plastic for postforming work: to CAN3-A172, Grade PF, 1.27 mm thick, based on printed pattern, full colour range by Wilsonart with matte finish.
- .3 Laminated plastic colours:
 - PL-1** – Raw Cotton 4947-38
 - PL-2** – Norwegian Ash 8241
- .4 Plywood core: to CSA 0151 solid two sides, 19 mm thick.
- .5 Laminated plastic liner sheet: supplied by same manufacturer as facing sheet, not less than 0.76 mm thick, white colour.
- .6 Laminated plastic adhesive: urea resin adhesive to CSA 0112.5-M1977

- .7 Sealer: water resistant sealer or glue acceptable to laminate manufacturer.
- .8 Sealant: in accordance with Section 07 92 00, colour shall be selected later by Architect.

2.2 FABRICATION

- .1 Comply with NEMA LD3, Annex A.
- .2 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .3 Ensure adjacent parts of continuous laminate work match in colour and pattern.
- .4 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 3000 mm. Keep joints 600 mm from sink cutouts.
- .5 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.
- .6 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
- .7 Apply laminate backing sheet to reverse side of core of plastic laminate work.
- .8 Apply laminated plastic liner sheet to interior of cabinetry.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for laminate, adhesive, and core materials installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

- .1 Install work plumb, true and square, neatly scribed to adjoining surfaces.
- .2 Make allowances around perimeter where fixed objects pass through or project into laminated plastic work to permit normal movement without restriction.
- .3 Use draw bolts and splines in countertop joints. Maximum spacing 450 mm on centre, 75 mm from edge. Make flush hairline joints.
- .4 Provide cutouts for inserts, grilles, appliances, outlet boxes and other penetrations. Round internal corners, chamfer edges and seal exposed core.
- .5 At junction of laminated plastic counter back splash and adjacent wall finish, apply small bead of sealant.

END OF SECTION

PART 1- GENERAL

1.1 Related Documents

- .1 Drawings and general provisions of the Contract, including General Conditions and Division 1.

1.2 Summary of Work

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to supply and install board insulation, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Work:
 - .1 Section 03 30 00 - Cast-in-Place Concrete.
 - .2 Section 31 23 10 - Excavating, Trenching and Backfilling.

1.3 Reference Standards

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM E84-10a, Standard Test Method for Surface Burning Characteristics of Building Materials.
- .2 Underwriters' Laboratories of Canada (ULC):
 - .1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene Boards and Pipe Covering.

1.4 Delivery, Storage & Handling

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

1.5 Submittals

- .1 Provide product information as per section 01 33 00 submittal procedure.

1.6 Extent of Work

- .1 At locations as per drawings:
 - .1 Install 50mm board insulation under new asphalt/concrete as shown on drawings.
 - .1 Below Grade: Extruded polystyrene board to CAN/ULC-S701, Type IV, square ends, shiplap edges except where otherwise indicated, thickness as indicated. Minimum RSI 0.87 m².oC/W per 25.4 mm thickness, compressive strength 210 kPa. Standard of Acceptance: Styrofoam SM.
 - .2 Under Slab on Grade: Extruded polystyrene board to CAN/ULC-S701, Type IV, square ends, shiplap edges except where otherwise indicated, thickness as indicated. Minimum

RSI 0.87m².oC/W per 25.4 mm thickness, compressive strength 275 kPa.
Standard of Acceptance: Styrofoam High Load-40.

PART 2- PRODUCTS

2.1 Insulation

Below Grade, Insulation shall be Styrofoam SM, extruded polystyrene insulation board as manufactured by Dow Chemical of Canada or the equivalent as manufactured by Esso Building Products of Canada or as manufactured by Owens Corning. Board size and extent shall be as indicated on Architectural Drawings.

Under Slab on Grade, Insulation shall be Styrofoam Highload 40, extruded polystyrene insulation board as manufactured by Dow Chemical of Canada or the equivalent as manufactured by Esso Building Products of Canada or as manufactured by Owens Corning. Board size and extent shall be as indicated on Architectural Drawings.

PART 3 - EXECUTION

3.1 Manufacturer's Instructions

Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 Workmanship

- .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 tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.
- .4 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.
- .5 Offset both vertical and horizontal joints in multiple layer applications.
- .6 In addition to adhesive, install insulation boards with insulation clips and disk, 6 per 600 x 1200 mm board minimum, fit boards tight, cut off fastener spindle 3 mm beyond disk.
- .7 Leave insulation board joints unbonded over line of expansion and control joints. Bond a continuous 150 mm wide blue skin strip over expansion and control joints using compatible adhesive before application of insulation.
- .8 Coordinate with the excavating, trenching and backfilling contractor to ensure suitable preparation of the subgrade to receive below-grade horizontal insulation.
- .9 Do not enclose insulation until it has been inspected and approved by Consultant.

3.3 Examination

- .1 Examine substrates and immediately inform Consultant in writing of defects.
- .2 Prior to commencement of work ensure that substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C 553-02, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.
 - .2 ASTM C 665-01e1, Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - .3 ASTM C 1320-05, Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.
- .2 Canadian Standards Association (CSA International): CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .3 Underwriters Laboratories of Canada (ULC): CAN/ULC-S702-1997, Standard for Mineral Fibre Insulation.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures. - PRODUCTS

1.3 INSULATION

- .1 Install Insulation as follows (unless otherwise noted on the drawings):
 - .1 Exterior Cavity Wall Assemblies: 100mm Rockwool Cavity Rock DD.
 - .2 Exterior Framed Cavity Wall Assemblies: Rockwool Comfortball
 - .3 Insulation for Curtain Wall System and Metal Panels: 100mm Rockwool Curtain Rock
 - .4 All interior Wall Partitions: Rockwool AFB (Acoustical Fire Batts).
 - .5 Roof Insulation: Refer to FSA specification section 07 21 16

1.4 ACCESSORIES

- .1 Insulation clips: Impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self locking type.
- .2 Nails: galvanized steel, length to suit insulation plus 25 mm, to CSA B111.
- .3 Staples: 12 mm minimum leg.
- .4 Tape: as recommended by manufacturer.

PART 2 - EXECUTION

2.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

2.2 INSULATION INSTALLATION

- .1 Install insulation to maintain continuity of thermal protection to building elements and spaces and to ASTM C 1320.
- .2 Completely fill cavities with insulation where indicated on drawings.
- .3 Lap ends and side flanges of membrane over framing members. Retain in position with insulation clips installed as recommended by manufacturer. Tape seal butt ends and lapped side flanges. Do not tear or cut vapour barrier.
- .4 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .5 Do not compress insulation to fit into spaces.
- .6 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN/ULC-S604 Type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 Type B and L vents.
- .7 Do not enclose insulation until it has been inspected and approved Consultant.

2.3 INSTALLATION OF SEMI-RIGID CAVITY WALL INSULATION

- .1 Apply the specified 100 mm thick semi-rigid insulation to the outer face of the inner wythe of cavity walls over Blueskin air barrier with both, adhesive and mechanical fasteners.
- .2 Make applications at temperatures over 5 degrees C. only.
- .3 Ensure air barrier has cured prior to installation of insulation.
- .4 Apply adhesive to the insulation boards in continuous strips running from one side of the board to the other in a serpentine patterns to restrict movement of air behind the insulation. Strips shall be placed 15 cm (6") apart and applied in a 12 mm (2") diameter bead. Press insulation firmly into place to ensure full contact with substrate.
- .5 Butt panels together firmly to seal edges. Where masonry cavity wall ties occur at insulation joints, ensure a snug fit of insulation boards around penetrating ties.
- .6 Stagger joints.
- .7 Press into place firmly with a sliding motion to ensure full contact with substrate.
- .8 Strike off excess adhesive.
- .9 Insulation shall be installed in a continuous unbroken manner. Make terminations of insulation tight, using adhesive, where it abuts other surfaces. Make insulation tight against all penetrating items by using adhesive.
- .10 Do not enclose insulation until it has been reviewed by the Consultant.
- .11 Provide minimum six (6) mechanical fasteners at edges and field of insulation boards, provide additional fasteners at all building corners and bottom row of insulation.

BATT AND BLANKET INSULATION

END OF SECTION

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PREFORMED METAL CLADDING
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PART 1 – GENERAL

- | | |
|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1.1</u>
<u>Related</u>
<u>Sections</u> | <p>.1 General Requirements – See applicable specification section</p> <p>.2 Safety Requirements – See applicable specification section</p> <p>.3 Rough Carpentry – Section 061000</p> <p>.4 Modified Bitumen Membrane Roofing – Section 075200</p> <p>.5 Sheet Metal Flashing – Section 076200</p> <p>.6 Joint Sealant – Section 079200</p> <p>.7 Electrical and Mechanical Requirements – See applicable specification section</p> |
| <u>1.2</u>
<u>Quality</u>
<u>Assurance</u> | <p>.1 All metal cladding works (i.e. site measuring, fabrication & installation) are to be completed by a licenced sheet metal worker registered with the Ontario College of Trades (Construction Sector – Sheet Metal Worker 308-A). Prime Contractor to provide all identification and documentation as requested prior to commencing any works on site.</p> |
| <u>1.3</u>
<u>References</u> | <p>.1 ANSI B18.6.4-1981 Screws, Tapping and Metallic Drive, Inch Series, Thread Forming and Cutting.</p> <p>.2 CSA B111-1974 Wire Nails, Spikes and Staples.</p> <p>.3 CGSB 93-GP4M-78 Siding, Soffits and Fascia, Steel, Galvanized, Prefinished.</p> |
| <u>1.4</u>
<u>Samples</u> | <p>.1 Submit samples in accordance with Section 010050 – General Requirements.</p> <p>.2 Submit duplicate 36" x 36" samples of siding material, of colour and profile specified.</p> |
| <u>1.5</u>
<u>Shop</u>
<u>Drawings</u> | <p>.1 Submit shop drawings in accordance with Section 010050 – General Requirements.</p> <p>.2 Indicate dimensions, profiles, attachment methods, schedule of wall elevations, trim and closure pieces, metal furring, and related work.</p> |

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- 1.6**
Mock-Up
- .1 Complete on-site mock-up(s) of all specified sheet metal cladding profiles and details for approval prior to proceeding with any works. Mock-up to identify: proposed profile & colour, proposed method of installation & attachment and proposed flashings, trims and accessories.
 - .2 Submit samples if approval of substitutions is requested.

PART 2 – PRODUCTS

- 2.1**
Steel
Cladding
- .1 Strip siding: to CGSB 93-GP-4M, vertical profiled.
 - .2 Finish coating: exterior pre-painted baked finish.
 - .3 Colour: **To match existing**
 - .4 Gloss; as per Manufacturer's specifications.
 - .5 Thickness: **To match existing**
 - .6 Profile: **To match existing**
 - .7 Acceptable Material: Ideal Roofing or approved equivalent.

- 2.2**
Accessories
- .1 **Exposed trim:** pre-fabricated inside corners, pre-fabricated outside corners, cap strip, drip cap, sill flashing, under-sill trim, flashings, starter strip and door /window trim of same material, colour, gloss and gauge as cladding, with fastener holes pre-punched. All exposed edges must be hemmed.
 - .2 **Closure:** closure to match profile of steel roof panels of same material, colour and gloss having a nominal core thickness: **24-gauge (0.71mm)**
 - .3 **Isolation coating:** alkali resistant bituminous paint.
 - .4 **Touch-up paint:** as recommended by pre-finished material manufacturer.

- 2.3**
Framing
Girts
- .1 Framing girts to be manufactured from the same type of material as used for cladding & shall be **20-gauge (1.00 mm)**. Framing girts to be manufactured in an "omega" profile as indicated

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2.4
Fasteners

- .1 **Cladding Fasteners:** to CSA B111 #14 or greater, non-corroding with hexagonal head and neoprene washer of same type of material as used for cladding. Colour and finish to match cladding. Fasteners must be specifically designed and suitable length to firmly secure new materials to substrate.
- .2 **Exposed Trim Fasteners:** same type of material as used for cladding with low profile head. Colour and finish to match cladding. Fasteners must be specifically designed and suitable length to firmly secure new materials to substrate.
- .3 **Framing Girt Fasteners:** same type of material as used for cladding with low profile head. Fasteners must be specifically designed and suitable length to firmly secure new materials to substrate.

2.5
Sealant

- .1 Sealants: as per Section 079200 – Joint Sealant.

PART 3 – EXECUTION

3.1
Fabrication

- .1 All associated trims, flashings and other items shall be as detailed, supplemented by recommendations of the S.M.A.C.N.A. Architectural Manual.
- .2 All free edges of metal flashing shall be strengthened by a fold at least 13mm wide, set out slightly and presenting a straight line and neat finish. Form flashings in 2.4m lengths, making allowance for expansion. When flashings exceed 600mm in height form flashing in 1.2m lengths.
- .3 Metal shall be formed on a bending brake, shaping trimmed and hard seaming shall be done on bench, as far as practicable, with proper sheet metal working tools. Angles of bends and folds for interlocking metal shall be made with full regard to expansion and contraction to avoid buckling or fullness in service and to avoid damaging surfaces of metal.
- .4 Dry joints are to be tight but not dented so as to permit slight adjustments of sheets and yet remain watertight.
- .5 Lock seams at all corners.
- .6 Apply isolation coating to metal surfaces to be embedded in concrete or mortar, and between dissimilar metals.

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3.2
Installation

- .1 Install cladding in accordance with CSGB 93-GP-5M, and manufacturer's written instructions.
- .2 Install and secure all Z-bar framing as required. Fasten cladding to Z-bar framing material as required. Z-bar to be secured to substrate with fasteners designed for specific application. Gauge of girts to be as required by manufacturer and spaced at 600mm OC max.
- .3 Install continuous starter strips, pre-fabricated inside and outside corners, edgings, drips, caps, flashings, sills, trims and window/door opening flashings as required.
- .4 Install all related pre-fabricated inside and outside corners, edgings, drips, caps, flashings, sills, trims and window/door opening flashings as required with carefully formed and profiled work.
- .5 Maintain joints in exterior cladding, true to line, tight fitting, hairline joints.
- .6 Attach components in manner not restricting thermal movement.
- .7 Caulk junctions with adjoining work with sealant. Do work in accordance with Section 079200-Joint Sealant.
- .8 Exposed raw/cut edges along the new cladding panels are not acceptable. All raw/cut edges to be fully concealed by overlapping factory finished panel, trim, flashing, pre-fabricated detail, etc.
- .9 Cutting of cladding panels must be completed in a manner that does not damage the panel or paint finish in any location.

-END OF SECTION-

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PART 1 – SCOPE OF WORK

- | | |
|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1.1</u>
<u>Related</u>
<u>Sections</u> | <ul style="list-style-type: none">.1 General Requirements – See applicable specification section.2 Safety Requirements – See applicable specification section.3 Rough Carpentry – Section 061000.4 Preformed Metal Cladding – Section 074650.5 Sheet Metal Flashings – Section 076200.6 Plumbing – Section 224200.7 Electrical & Mechanical Requirements – See applicable specification section |
| <u>1.2</u>
<u>General</u> | <ul style="list-style-type: none">.1 Provide the necessary labour and materials to complete the removal of the existing roofing system, sheet metal flashings, wood blocking, Insulation, vapour barrier, deck sheathing, etc. down to the structural roof deck..2 Provide the necessary labour and materials to allow for all modifications to the electrical services, mechanical equipment, and natural gas piping system required to complete the project, as per applicable mechanical & electrical specification section |
| <u>1.3</u>
<u>Roof</u>
<u>Assembly</u> | <ul style="list-style-type: none">.1 Supply all labour and materials necessary to complete the new Modified Bitumen Membrane roof system, as specified and detailed within the roof section as indicated on the drawings. |

New Typical Roof Assembly for Roof Areas # “K, L, M & Q” shall be:

- **New 2-Ply Modified Bitumen Membrane Flashings**
- **New 2-Ply Modified Bitumen Membrane System**
- **New 6mm (1/4”) Asphaltic Protection Board**
- **New 2% Tapered Insulation System**
- **New 50mm (2”) Secondary Thermal Insulation**
- **New 75mm (3”) Base Thermal Insulation**
- **New Vapour Barrier**
- **New 16mm (5/8”) Deck Sheathing**
- **New Steel Deck (as per Structural)**

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New Typical Roof Assembly for Roof Area # “P” shall be:

- **New 2-Ply Modified Bitumen Membrane Flashings**
- **New 2-Ply Modified Bitumen Membrane System**
- **New 6mm (1/4”) Asphaltic Protection Board**
- **New 2% Tapered Insulation System**
- **New 50mm (2”) Secondary Thermal Insulation**
- **New 75mm (3”) Base Thermal Insulation**
- **New Vapour Barrier**
- **New 16mm (5/8”) Deck Sheathing**
- **New Acoustic Steel Deck (as per Structural) w/ New Flute Filler Insulation**

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1.4
Roof
Assembly
Flashings

- .1 Supply all labour and materials necessary to complete the new Modified Bitumen Membrane Roof Flashings, as specified and detailed herein and as indicated on the detail drawings.

1.5
Precautions

- .1 Roofing shall not be carried out when materials are damp and base sheet shall not be applied when ambient temperature is less than minus ten (-10) degrees Celsius. (Postpone roofing work when inclement weather appears imminent).
- .2 Fasteners/Adhesives for each component of the roof assembly (deck sheathing, insulation, sloped insulation, overlay board, roofing membranes): as recommended by roofing system manufacturer to suit structural roof deck as applicable, and as required to meet CSA A123.21 wind uplift criteria. Prime Contractor to provide all wind uplift information as per the manufacturer's specifications and project specific standards/requirements.
- .3 **Prime Contractor may not employ the use of ride-on type roofing equipment (i.e. Labour Saver, Dingo, Bobcat, Garlock, Skid-Steer or similar) in any location throughout the project. Do not overload the roof decks with materials and/or equipment in any location. Prime Contractor to assume all risks associated with damage to existing roofing and structure as a result of materials/equipment storage, usage and installation.**
- .5 Apply each part of roofing system only when surfaces are clean and dry.
- .6 Conduct, operations to leave deck exposed for minimum period of time. Protect, as required, to prevent water infiltration or environmental damage to building interior. At no time shall the deck be left exposed overnight.
- .7 Insulation shall not be left exposed to the elements no shall more be laid\ than can be completely covered in the same day.
- .8 Provide temporary membrane to render all insulation watertight if for some unforeseen reason work cannot be completed as specified. Remove temporary membrane completely prior to any further roofing operations.
- .9 Where work must continue over finished roofing membrane, protect surface with plywood sheets.

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- .10 Strictly adhere to all safety guidelines for the torching of Modified Bituminous Membrane.
- .11 Any sharp projections, that in the opinion of the Consultant may penetrate the vapour barrier, shall be ground smooth and flush.
- .12 All aspects of the re-roofing operation shall follow in close sequence. No part of the operation shall be so far ahead of the succeeding part that the latter cannot be finished that working day.

1.6
Warranty

- .1 Prior to award of the project, Prime Contractor must provide a copy of their certification in good standing with their chosen material manufacturer. Prime Contractor must also provide in writing, their ability to issue the specified warranty.
- .2 All roof system components / materials must be sourced from one (1) manufacturer.
- .3 Warranties as noted below must be provided directly by material manufacturer. Material supplier issued warranties are not acceptable and will not be considered.
- .4 Remedy all defects in the Modified Bituminous Membrane Roofing and Membrane Flashings installed hereunder which appear within a period of **Five (5) Years** from date of substantial completion. In addition, submit Membrane Manufacturer's **15-Year Full System Warranty (No Dollar Limit)** upon completion of project. Standard of Acceptance: **15-Year Platinum Warranty by Soprema or approved equivalent**
- .5 Make all necessary repairs and replacements within **48 hours** of receipt of written notification. Provide a written warranty confirming above, issued on the corporate letterhead, signed and sealed by an authorized signing officer.
- .6 Nothing contained in this article shall be construed as in any way restricting or limiting the liability in common law and statutory liability of the Prime Contractor.

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PART 2 – MATERIALS

2.1

Deck Sheathing

- .1 **Glass Mat Gypsum Roof Board:** Pre-primed with fibreglass mats front & back mechanically bonded to a high-density gypsum core. Boards to be 1.2 m x 2.4 m (4' x 8'), thickness 16 mm (5/8") with pre-primed surface. Standard of acceptance: **Dens Deck Prime Roof Board or approved equivalent.**

2.2

Adhesive

- .1 **Adhesive:** low-rise, 2-component, polyurethane adhesive. Used for securing roof board to structural deck, insulation to vapour retarder, protection board to insulation. Standard of acceptance: **Duotack by Soprema or approved equivalent.** Strictly follow minimum temperature application as per the manufacturer's guidelines. **Note: All adhesive must be installed with a manufacturer approved applicator.**

2.3

Bitumen & Primers

- .1 **Self-Adhesive Membrane Primer:** composed of SBS synthetic rubbers, adhesive enhancing resins and volatile solvents designed for use with self-adhesive waterproofing membranes on most substrates. Standard of Acceptance: **Elastocol Stick by Soprema or approved equivalent.**
- .2 **Black Bituminous Primer:** to be composed of asphalt modified bitumen with thermoplastic polymers and volatile solvents. Standard of Acceptance: **Elastocol 500 by Soprema or approved equivalent.**
- .3 **Roofing Cement:** with water displacing characteristics, to ensure an effective bond to both wet and dry surfaces. The ability to adhere during inclement weather conditions. Composed of selected asphalts, mineral fillers combined with refined solvent, and special chemical ingredients to create a water displacement quality. Standard of Acceptance: **Karnak Amphibikote 155 (wet and dry) or approved equivalent**

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2.4
Vapour & Air
Barrier
Membranes

- .1 **Air Barrier:** self-adhesive membrane composed of SBS modified bitumen and a tri-laminated woven polyethylene facer. Underface covered with a silicone release paper or film. Top face is covered by a thin poly-film. Standard of Acceptance: **Soprasedal Stick 1100T by Soprema or approved equivalent.**
- .2 **Underneath Parapets, Curbs and Walls:** composed of SBS modified bitumen reinforced with composite reinforcement. The surface is sanded. The underface, self-adhesive, is covered with a release protection film. Membrane to be a minimum of 3mm thick. Standard of Acceptance: **Sopralene Stick HR 40 by Soprema or approved equivalent.**
- .3 **Roof Field:** membrane composed of a non-woven polyester reinforcement and SBS modified bitumen. Membrane to be a minimum of 3.5mm thick. Standard of Acceptance: **Sopralene 180 SP 3.5 by Soprema or approved equivalent**

2.5
Batt/ Blanket
Insulation

- .1 **Batt/Blanket Insulation:** semi-rigid stone wool batt insulation for exterior wood and steel stud applications. To be non-combustible and fire resistant. Standard of Acceptance: **Comfortbatt by Rockwool or approved equivalent**

2.6
Acoustic Deck
Insulation

- .1 Insulation filler, made of custom-cut rigid mineral wool (stone wool). Mineral fibers are composed of basalt rock and steel slag, providing fire-resistant properties. To be custom cut to neatly and accurately match existing deck profiles and fill all deck flutes without gaps or voids. Standard of Acceptance: **Soprarock Flute Filler by Soprema or approved equivalent.**

2.7
Thermal
Insulation

- .1 **Thermal Insulation: (thicknesses as indicated)** closed cell polyisocyanurate foam bonded on top and bottom sides to an organic/inorganic facer. Board size not to exceed 1200mm x 1200mm. Insulation to meet CAN/CGSB 51.26-M and CAN/ULC-S704. Standard of Acceptance: **Sopra-Iso by Soprema or approved equivalent**

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2.8
Tapered
Insulation

- .1 Standard of Acceptance: **Soprema Tapered Polyisocyanurate Insulation or approved equivalent**
- .2 Tapered Polyisocyanurate (**2% as per applicable tapered insulation roof plan(s)**): tapered insulation system to be fabricated from Polyisocyanurate only. Modules shall be factory cut to correct slopes and clearly marked, similar to provided applicable roof plan(s). All valleys, corners, angles, crickets, details, etc. must be factory mitred. Slope(s) to meet specification requirements and Consultant's approval. Slopes to be 4-way directional and a minimum 38mm (1.5") thickness, commencing at each roof drain/sump location as described. Shop drawings indicating: layout, thicknesses, type of material and average R-Value(s) to be submitted for approval prior to material ordering / fabrication.
- .3 Tapered insulation system must cover the entire field surface area of each contract roof section similar to applicable tapered insulation roof plan. Tapered insulation package must be designed with a continuous upwards slope beginning at each roof drain/sump location and extend to the contract roof area perimeters. Tapered insulation package may not contain any: flat areas, breaks or interruptions. Reduction or removal of specified base or secondary thermal insulation layer(s) will not be accepted. Tapered insulation system must commence above the thermal insulation layer(s) (as indicated - "typical new roof assemblies") within all locations. Tapered insulation system is independent of thermal insulation layer(s) and may not be incorporated into or form part of the thermal insulation layer(s).
 - .1 Submit the manufacturer's latest specifications including compliance data. **Only manufacturer's data sheets will be acceptable.**
 - .2 **Crickets:** Modules shall be factory cut/mitred to correct slopes and clearly marked. Cricket leading edges to terminate at 0.
 - .3 **Sumps:** Modules shall be factory cut/mitred to correct slopes and clearly marked. All drains must be sumped a maximum of 1200mm x 1200mm (4' x 4'), with a minimum 2% slope. All sumps to be a minimum of 13mm (0.5") and maximum of 38mm (1.5") thick.
 - .4 Insulation slopes and thickness shall be as indicated on the detailed drawings and roof plan and shall be a distinct separate layer with joints staggered over the thermal insulation layer(s). Ensure sump drops in elevation minimum 2%. Chamfer sump edges to receive protection board.

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2.9
Protection
Board

- .1 6mm (1/4") thick asphaltic roofing board composed of a mineral fortified asphaltic core between 2 asphaltic saturated fibreglass liners. Board size to be 1220mm x 1520mm. Standard of Acceptance: **Sopraboard by Soprema or approved equivalent.**

2.10
Modified
Bitumen
Membrane

- .1 Two (2)-ply system made from prefabricated modified bitumen membranes containing minimum 15% of elastomer Styrene Butadiene Styrene (SBS) and reinforced with non-flammable, fireproof and stress resistant insert of glass fibre or polyester.
- .1 **Membrane Base Ply:** base sheet membrane composed of SBS modified bitumen and non-woven polyester reinforcement. Both sides are covered with thermofusible plastic film. Standard of Acceptance: **Sopralene Flam 180 by Soprema or approved equivalent**
- .2 **Membrane Cap Ply:** cap sheet membrane composed of SBS modified bitumen and non-woven polyester reinforcement. Surface protected by coloured granules and underface covered with thermofusible plastic film. Standard of Acceptance: **Sopralene Flam 250 GR by Soprema or approved equivalent**
- .3 **Membrane Base Flashings:** base sheet membrane composed of SBS modified bitumen and glass mat reinforcement. Surface covered with thermofusible plastic film and self-adhesive underface covered with a silicone release film. Standard of Acceptance: **Sopraflash Flam Stick by Soprema or approved equivalent.**
- .4 **Membrane Base Flashings (over existing compatible membrane surfaces):** base sheet membrane composed of SBS modified bitumen and non-woven polyester reinforcement. Both sides are covered with thermofusible plastic film. Standard of Acceptance: **Sopralene Flam 180 by Soprema or approved equivalent**
- .5 **Membrane Cap Flashings:** cap sheet membrane composed of SBS modified bitumen and non-woven polyester reinforcement. Surface protected by coloured granules and underface covered with thermofusible plastic film. Standard of Acceptance: **Sopralene Flam 250 GR by Soprema or approved equivalent.**

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- .6 **Reinforcing Membrane:** base sheet membrane composed of SBS modified bitumen and a non-woven polyester reinforcement. Both sides are covered with a thermofusible plastic film. Standard of Acceptance: **Sopralene Flam 180 by Soprema or approved equivalent**
- .7 **Sacrificial/ Traffic Membrane:** cap sheet membrane composed of SBS modified bitumen and non-woven polyester reinforcement. Surface protected by coloured granules and underface covered with thermofusible plastic film. Standard of Acceptance: **Sopralene Flam 250 GR by Soprema or approved equivalent**
- .2 Low temperature Requirements
Grade 2 material to pass low temperature requirements at -30°C to CGSB 37-GP-56M.
- .3 Test Results
Test results from a certified independent laboratory showing conformance to above requirements shall be submitted with tender documents or within 48 hours of tender closing, **if requested.**
- .4 Standard of Acceptance
S.B.S. Modified Bitumen Membranes as manufactured by the following: Soprema, IKO & Johns Manville only

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2.11
Roof
System
Accessories

1. **Roofing Nails:** to CSA B111, Table 12, of electrogalvanized steel, sufficient length to penetrate wood substrate at least 25mm
Nails to have a minimum head diameter or 25mm. Standard of Acceptance: **Electrogalvanized Bulk Roofing Nails by Canada Fine Parts & Supplies or equivalent**
2. **Round Top Cap Nails:** In compliance with CSA B-III1979 standard, table 12, nails shall be made of galvanized steel, long enough to penetrate the wood blocking by a minimum 25 mm (1") depth on flashings and parapet walls. **45 mm (1-3/4") Electrogalvanized Bulk Metal Cap Hand Nails by Canada Fine Parts & Supplies or approved equivalent**
3. **Deck Sheathing/ Base Flashing Fasteners:** Corrosion resistant # 12 screws and hexagonal steel plates. Standard of Acceptance: **Dekfast Pre-Assembled Screws & Plates or equivalent**

NOTE (Base Flashing Fasteners): In locations where the substrate causes interference with the above noted fasteners, Contractor is responsible to supply and install the appropriate length and diameter of fastener to properly support and secure the stress plate and underlying membrane.

4. **Plumbing Vent Flashings:** 1-piece aluminum construction with flashing sleeve and integral flange, matching aluminum hood and perforated collar, pre-molded urethane insulation liner and EPDM base seal. Standard of Acceptance: **SJ-31 Vandal Proof Stack Jack Flashing by Thaler Roofing Specialties only. Extend vent pipe as required. Extend vent pipe from below deck if required to match height of new flashing**
5. **Mechanical Stack Flashing:** Pre-fabricated galvanized steel tall cone flashing with integrated flange c/w metal storm collar, height to suit detail (minimum 14" tall), all joints fully solder welded.
6. **Mechanical / Electrical Outlet Flashing:** Pre-fabricated 1-piece aluminum construction with integral flange, factory insulated and rigid PVC hood seal. Standard of Acceptance: **Flash-Tite Wire Outlet Post by Lexcor or approved equivalent.**
7. **Liquid Membrane Flashing:** one-component polyurethane and bitumen liquid membrane, and a flexible 100g/m² woven polyester membrane. Standard of Acceptance: **Alsan Flashing & 6" Reinforcement Mesh by Soprema or approved equivalent**

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- .8 **Misc. Accessory Flashing:** precast blocks made of polyester resin
Standard of Acceptance: **Sopramastic Blocks by Soprema or approved equivalent.**
- .9 **Accessory Flashing Filler:** is a polyether-based resin, single-component, moisture cure elastomer sealing mastic. Odourless and to have low VOC content. Standard of Acceptance: **Sopramastic PF by Soprema or approved equivalent**
- .10 **Accessory Adhesive:** polyether-based resin, single-component, moisture cure elastomer sealing mastic and adhesive with low VOC content.
Standard of Acceptance: **Sopramastic SP2 by Soprema or approved equivalent**
- .11 **Mastic:** solvent-based mastic containing SBS modified bitumen, fibres and mineral fillers. **Sopramastic by Soprema or approved equivalent**
- .12 **Loose Granules:** composition and colour to match granule surface of roofing membranes. Granules to be embedded into heated asphalt surfaces at joints between rolls or at any other locations where the bitumen bleed-out exceeds the manufacturer's recommendations. Standard of Acceptance: **Granules by Soprema or approved equivalent.**
- .13 **Pre-Cast Concrete Paver:** to CSA A231.1, exposed aggregate surface, 600mm x 600mm (24" x 24") size 50mm (2") thick. Colour and finish to be approved by Owner.
- .14 **Bird Screen (Gooseneck Vents):** 20mm x 20mm galvanized wire mesh.
- .15 **Protection Mats:** 19 mm x 1.22m x 1.8 m rubber matting manufactured from recycled materials. Standard of acceptance: **Magnum Mat by North West Rubber or approved equivalent.**
- .16 **Flame Guard Tape (**Only Where Required):** composed of SBS modified bitumen and a glass mat reinforcement with a sanded surface and self-adhesive underface with a silicone release film. A minimum width of 150 mm for installation at protection boards and vertical transitions.
Standard of Acceptance: **Sopraguard Tape by Soprema or approved equivalent.**

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- .17 **Cement Board:** formed in continuous process of aggregated portland cement slurry with polymer-coated, glass-fiber mesh completely encompassing edges, back and front surfaces. The edges are formed smooth with poly-propylene fabric-wrapped edge. Ends are square cut. Boards to be 1.2 m x 2.4 m (4' x 8'), thickness to be 16 mm (5/8"). Standard of Acceptance: **Durock Cement Board with Edgeguard by CGC or approved equivalent**
- .18 **Cement Board Fasteners:** Corrosion resistant fasteners specifically designed for application and securement to wood substrate. Fastener to be suitable length to securely fasten cement board in-place. Standard of Acceptance: **Durock Cement Board Fasteners by CGC or approved equivalent**
- .19 **Fibreglass Tape:** exterior tape designed to reinforce joints and corners of cement board panels. Tape is 4" wide & self-adhesive. Made of alkali-resistant glass-fiber mesh. Standard of Acceptance: **Durock Exterior Fibreglass Tape by CGC or approved equivalent**
- .20 **Free Standing Supports:** engineered prefabricated support made of high-density polypropylene plastics with UV Protection. HDG structural steel frame, rollers and hardware. Support to be appropriately sized to support item (i.e. gas, electrical, refrigeration). Standard of Acceptance: **PP-10 w/ Roller, PP-10 with Chanel, RB-18 or other by Portable Pipe Hangers only. Contractor may NOT substitute PP-10 for SS8-C or SS8-R pipe supports.**
- .21 **High Temperature Gasket/Sealant** – single component, room temperature vulcanizing RTV gasketing compound to provide “formed-in-place” gaskets for mechanical assemblies. Product to resist aging, weathering and thermal cycling without hardening, shrinking or cracking. (up to 750°F intermittent). Standard of Acceptance: **Optimum Red by Permatex or approved equivalent**
- .22 **Steel Channel & Clamps:** 1-5/8" x 1-5/8", 12-gauge pre-galvanized steel channel with pre-punched holes. Pre-galvanized steel clamps to suit channel and designed to secure component as required (i.e. gas line). Standard of Acceptance: **P1000HS Unistrut by Atkore or approved equivalent.**

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- .23 **Expansion Joint:** monolithic expansion joint made of EPDM-based synthetic rubber consisting of two (2) flanges coated on the surface and underface with a woven oxidized and stabilized polyacrylonitrile, with an expandable core. Expansion joint to be custom manufactured to suit all site conditions, including but not limited to: 90-degree, angled, cross, T-shaped and curved transitions, as well as continuously in other directions. Expansion joint to be manufactured with a minimum expansion/contraction as noted. Contractor responsible to complete accurate field measurements for the fabrication of this product to meet all project requirements. Standard of Acceptance: **Soprajoint Plus 75 by Soprema or approved equivalent.**
- .24 **Expansion Joint Fasteners:** Hardened carbon steel # 14 Phillips head fasteners with anticorrosion coating. 2" membrane stress plates manufactured from heavy gauge galvalume with special barbs and ribs. Standard of Acceptance: **Soprafix Pre-Assembled Screws & Plates by Soprema**
- .25 **Cross-Over Access Stair:** Crossover Stairs c/w galvanized roll formed tubular substructure, galvanized slip resistant traction grip stair treads, injection molded high-density polypropylene rooftop support bases and rubber rooftop support pads, c/w top and intermediate handrails, toe boards. Stairs to be min. 900 mm wide. Stairs must meet or exceed OBC 2016 & TSSA codes and requirements. Tread width of 10" – 11" minimum. Riser height of 7-7/8" – 8" maximum. Note: Contractor must order and install the appropriate premanufactured stairs to meet above noted requirements and accommodate the updated site conditions i.e. height of existing wall to both roof elevations. The height of the roof levels plus 300 mm (12") (minimum) – refer to manufacturer's representative and specifications to qualify all requirements. Standard of Acceptance: **PHP Crossover Stairs by Portable Pipe Hangers (Canada) Inc. or approved equivalent.**

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PART 3 – APPLICATION

3.1 **Surface** **Inspection &** **Preparation**

- .1 After removal of the existing roof system assemblies and before commencing the work of this section, conduct an inspection of the entire substrate with the Consultant and the Roofing Contractor to approve the condition of the substrate. Ensure that the deck and all parts of the structure that are to be covered with roofing membrane possess a smooth surface with an even finish, free of excessive moisture, ridges, hollows and sharp corners. **Obtain letter from roof material manufacturer's accepting substrate.** Before commencing works, ensure that all surfaces are smooth, dry, clean and free of ice and debris. The deck must be free of contamination by materials which could affect the adhesion of the roofing or the physical integrity of the membrane itself. No salt or calcium shall be used to remove ice or snow
- .2 Ensure that the work has been properly completed, that there is a proper slope as indicated, with minimal ponding that may occur.
- .3 Commencement of roofing installation shall be construed as acceptance of the substrate, and thereafter the Contractor shall be fully responsible for satisfactory work as required herei

3.2 **Installation**

- .1 Do not install materials under conditions of rain, snow or fog.
- .2 Install roofing elements on clean and dry surfaces, in accordance with the manufacturer's requirements and recommendations.
- .3 Perform work on a continuous basis as surface and weather conditions allow.
- .4 Protect adjoining surfaces against any damage that could result from roofing installation.

3.3 **Equipment**

- .1 Maintain all equipment and tools in good working order.
- .2 Use torch types recommended by the membrane manufacturer.

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3.4
Protection

- .1 **Cover walls and adjacent work where materials are hoisted or used.**
- .2 Use warning signs and barriers. Maintain in good order until completion of work.
- .3 Clean off drips and smears of bituminous material.
- .4 Dispose of rainwater off roof and away from face of building until roof drains or hoppers installed and connected.
- .5 Do not permit traffic across finished roof area unless protected by catwalks, prevent traffic over above roof level. Comply with precautions deemed necessary by the Consultant. Repair damage caused by non-compliance with Consultants requirements.
- .6 Where work must continue over finished roofing membrane, protect the surface with minimum 1/2" thick plywood sheets.
- .7 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed and incomplete work.
- .8 Install water cut-offs at the end of a day's work, remove same prior to continuing roof application.

3.5
Primer
Application

- .1 Treat all surfaces to be roofed with Primer to improve adhesion. Apply by brush or roller at a rate of 350 g/m². Ensure all surfaces are thoroughly covered and primer is allowed to properly flash-off prior to any membrane application.
- .2 Note that the drying time of the primer is related to the ambient temperature and may vary from a few hours to a whole day. Do not proceed until the primer is dry.
- .3 Apply to all metal surfaces (aluminum, copper, etc.,) prior to any membrane installation.
- .4 Apply primer on all substrates that are to receive self-adhering, torch applied & asphalt applied membranes.
- .5 All primer to be installed as per manufacturer's Guidelines and recommendations.

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3.5 Cont'd

- .6 **Surfaces of gypsum sheathing must be fully coated with black bituminous primer (Elastocol 500) to a full, even and consistent finish prior to any membrane applications (voids or uncoated areas are not acceptable). Contractor must follow manufacturer recommended installation procedures and quantities.**

3.6
Acoustic
Deck
Insulation
Installation

- .1 Insulation must be custom cut to neatly and accurately match existing deck profile(s) and fill all deck flutes without gaps or voids.
- .2 Install custom cut and sized insulation within all deck flutes throughout acoustic deck location(s)
- .3 Insulation to be neatly installed in a loose laid manner with all joints tightly abutted together, without voids or gaps

3.7
Deck
Sheathing
Installation

.1 Steel Deck Roof:

- .1 Inspect the underside of the deck to ensure fasteners will not be visible, damage the structure or interior surfaces, affect electrical and mechanical services. Fasteners to penetrate top flute of the deck maximum 20 mm.
- .2 Advise Consultant of any unusual circumstances affecting the work. Be responsible and correct all damage caused by work to match existing materials and finish.
- .3 **Mechanically fasten each board to the steel deck as required by roofing system manufacturer to meet all current wind uplift criteria.**
- .4 Attach 16mm (5/8") gypsum sheathing over steel deck as indicated herein. Install gypsum sheathing boards with long side perpendicular to flutes of deck. Stagger joints in boards. Terminate ends of boards on top of the flutes.
- .5 Secure to top flute of steel deck with screws spaced in pattern to meet manufacturer wind uplift criteria. Use screw-type anti-backout corrosion resistant fasteners with metal plates as generally approved or required by the gypsum manufacturer.
- .6 Prime metal plates that will be covered with bitumen roofing. Ensure primer is tack-free before proceeding.

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3.8
Vapour
Barrier
Installation

- .1 Prior to installation of field vapour barriers, install self-adhering vapour barrier at all parapets, walls, curbs, and other vertical surfaces, as detailed on the drawings. Set the vapour barrier removing the release paper and applying pressure to the entire surface with a steel roller. Apply vapour barrier with 75mm side laps. Extend vapour barrier 150mm onto the roof deck.
- .2 Install **1-ply of Roof Field Vapour Barrier** fully torch applied over surface of deck sheathing.
- .3 Install batt insulation at openings in deck and carefully apply temporary covers at openings to prevent bleeding of bitumen into building.
- .4 Starting at low point and laying across roof slope fully adhere vapour barrier to surface of sheathing using proper shingling methods. Lap sides 75 mm and ends 150 mm.
- .5 Apply the vapour retarder following the manufacturer's guidelines. Ensure application is free of air pockets, wrinkles, fishmouths, or tears. Check all seams and repair areas where adhesion is lacking and repair them with approved methods.
- .6 Apply a single ply vapour barrier extending up and onto the parapet coping as detailed.

3.9
Thermal &
Tapered
Insulation
Installation

- .1 Install insulation to meet thickness as indicated herein and indicated on the drawings (thicknesses as indicated).
- .2 At drain location(s), install 2% sloped insulation sump in a single layer. Finish insulation sump flush with top of surrounding insulation, size to be as indicated herein and on drawings.
- .3 Install all insulation layers (base, secondary, fillers, tapered, etc.) with 2-part urethane adhesive as required by roofing system manufacturer to meet all current wind uplift criteria. Fit boards tightly together. All gaps between boards shall be filled with insulation. Stagger all joints in boards by a minimum of 300mm (12"). Stagger all joints from each other and from the layer below.
- .4 All insulation panels to be neatly cut at projections and points of termination. Replace all broken, damaged or misfit boards as work progresses.

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3.9 Cont'd

- .5 Where necessary, back-cut insulation to allow it to conform and stay bonded to irregular surfaces without bridging. Subsequent to placement, walk insulation into place to ensure positive bonding is achieved.

3.10 **Protection** **Board** **Installation**

- .1 Install 6mm (1/4") protection board by embedding into beads of 2-part urethane adhesive over the surface of the polyisocyanurate foam insulation. Adhere overlay board to insulation with adhesive at the rate and pattern specified as for insulation (above).
- .2 Place boards in parallel rows with end joints staggered. Lay out in rows in the same direction as the polyisocyanurate foam.
- .3 Do not install more insulation than can be completely roofed in the same day.

3.11 **Roof** **Membrane** **Installation**

- .1 **Base Ply Membrane:** Allow membrane rolls to relax before installation. Torch apply base ply membrane over the Protection board, overlap rolls 75 mm on sides and 150 mm on ends and in shingle-fashion up from bottom of slope. Ensure application is free of air pockets, wrinkles, fishmouths, or tears. Torch seal all seams. Check all seams and repair using a torch.
- .2 **Cap Ply Membrane:** Torch adhere cap ply membrane to base sheet, using proper shingling methods. Stagger seams in cap sheet a minimum 300 mm with those of the base sheet. Lap sides 75 mm and ends 150 mm. Degranulate surface granules where cap sheet is to be lapped by cap flashings or other overlying membrane. Ensure application is free of air pockets, wrinkles, fishmouths, or tears. Check all seams and repair areas where adhesion is lacking, and repair them, using a torch.
- .3 **Base Ply Flashings:** All membrane flashings are to be 2-ply application. Self-adhere all base ply flashings, ensure all deficiencies have been corrected within the membrane below prior to installation of new base ply flashings. Stagger joints at least 100 mm with those of the base ply. Use maximum 1 m lengths of membrane. Check all seams in base ply after application and repair areas where adhesion is lacking, using a torch.

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3.11 Cont'd

- .4 **Base Ply Flashings (over existing compatible membrane surface):** All membrane flashings are to be 2-ply application. Clean, prepare and fully degranulate existing membrane surfaces. Fully torch apply all base ply flashings, ensure all deficiencies have been corrected within the membrane below prior to installation of new base ply flashings. Stagger joints at least 100 mm with those of the base ply. Use maximum 1 m lengths of membrane. Check all seams in base ply after application and repair areas where adhesion is lacking, using a torch.
- .5 **Base Flashing Fasteners:** Upon completion of base ply flashing membrane applications, install a minimum of two (2) equally spaced rows of pre-assembled fasteners & plates, spaced at 450mm (18") OC as per sketch example (SK1). Locations include but are not limited to: parapets, penetrations, curbs, control joints, expansion joints, raised walls, roof separators, etc. At locations where detail exceeds 450mm (18") in height, additional rows of fasteners are to be installed at every 450mm (18") interval from second fastener row to the top of detail. All fastener and plate locations to be fully coated with black bituminous primer.
- .6 **Reinforcing Membrane:** Upon completion of base ply flashing membrane and base flashing fastener applications, install a torch applied membrane reinforcing ply at all 90-degree intersections. Install as specified for base ply membrane (above). Locations include but are not limited to: parapets, penetrations, curbs, control joints, expansion joints, raised walls, roof separators, etc. Membrane reinforcing ply to extend onto roof surface a minimum of 150mm (6") and carry up the vertical surface to the upper leading edge (maximum of 18"). Base flashing fasteners in excess of the first two (2) rows are to receive a minimum 200mm x 200mm (8" x 8") cover patch of the same material. See sketch example (SK1)
- .7 **Cap Ply Flashings:** After base ply flashings are complete, cap ply flashings shall be laid in strips maximum 1 m wide and torch applied. Overlap 75 mm on sides and 150 mm onto flat roof area. Use chalk line to measure and neatly embed granules (where applicable) at overlay onto cap sheet.
- .8 Stagger joints minimum 100 mm from joints in cap sheet, and minimum 300 mm from joints in base sheet flashings. Degranulate as required where other membrane work is to overlay granulated membrane surfaces.

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3.11 Cont'd

- .9 **NOTE: Membrane Applications Over Existing Compatible Membrane Surfaces:** New membrane applications over existing compatible membrane surfaces to be fully torch applied – both layers (180 Flam & 250 GR). Ensure existing substrates are fully cleaned, prepared and degranulated (where applicable) as per manufacturer requirements.

3.12 **Vent** **Flashings**

- .1 Install spun aluminum vent stack covers at all existing vent pipes. Extend existing vent pipes as required to a minimum height of 400mm above the completed membrane surface. Extension to be same material as existing vent pipe. Provide sufficient allowance for pipe expansion or contraction.
- .2 Prime aluminum flange, center over existing vent stack and set into torch softened base sheet. Flash with one (1) ply of reinforcing membrane, to extend a minimum of 200mm beyond flange. Complete installation with the application of the cap sheet membrane.

3.13 **Roof** **Drains**

- .1 Co-ordinate the roof drain installation with Plumbing/Mechanical works.
- .2 Ensure the integrity of the vapour barrier is maintained, where applicable.
- .3 Install base sheet, 1 ply of reinforcing membrane (180 gram/m², torch applied) 1.0m x 1.0m centered over the drain and then complete the cap sheet application over the first two plies. Extend the cap sheet under the clamping ring.

- .4 Trim roofing membrane and set clamping ring.

3.14 **Sacrificial** **Membrane**

- .1 Install sacrificial membrane at all locations as indicated and or required. All locations to be fully-adhered via torch application.
- .2 Sacrificial membrane to be extended 75 mm (3") beyond protection matting in all directions

3.15 **Free-Standing** **Mechanical** **Supports**

- .1 Install free standing gas pipe supports where indicated on the drawings. Spacing will vary depending on pipe size. For spacing requirements see Mechanical specifications.
- .2 Install sacrificial membrane, fully-adhered via torch application, at pipe support location. Place support on 19 mm protection mat/pad and adjust roller height to suit site condition. Install steel clamp to secure pipe to support.

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3.16
Protection
Mats

- .1 19mm rubber protection mats to be installed at all locations as indicated and or required.
- .2 Protection mats to be installed in full size pieces (1.22m x 1.8m) and as per manufacturer's instructions. Leave a 25 mm (1") gap between pieces for expansion.
- .3 Protection mats to be fully adhered in all locations with manufacturer approved adhesive.

3.17
Pavers

- .1 Install pavers as detailed and where indicated on the drawings.
- .2 Install protective membrane, fully-adhered via torch application, at paver/protection mat locations. Place paver on 19 mm rubber protection mat and ensure pavers are level after installation.

3.18
Roof Top
Mechanical
Units

- .1 Disconnect existing mechanical units and remove from structural support (i.e. curb, frame, stand, legs, posts or other) by means of crane. Store units in an appropriate manner
- .2 **Build/install new roof curb detail, where indicated on project drawing(s). Top of all curbs to be a minimum of 400mm above finished roof surface, as detailed.**
- .3 To extend ductwork (where applicable), remove last piece of ductwork and replace with new piece. Fabricate new piece to proper shape and dimensions to suite new site conditions. See Mechanical specifications
- .4 Reinstall unit on curb and reconnect.
- .5 Extend all gas and electrical services as required. See Mechanical specifications.

3.19
Sheet
Metal
Flashings

- .1 Metal flashings are specified in Section 076200. Co-ordinate this work with that section.

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3.20
Liquid
Membrane

- .1 Prepare surfaces as recommended by manufacturer; surfaces must be clean, dry, and free of dirt, dust, and particles.
- .2 Apply a base coat of liquid membrane onto surfaces, 150mm from joints, angles, or openings.
- .3 Install reinforcing membrane on service conduit and onto vertical surface; notch reinforcing membrane to allow for better tie-in detail on vertical surface. Apply liquid membrane flashing membrane over reinforcing membrane.
- .4 Install reinforcing membrane on vertical surface round service conduit and over previously installed reinforcing membrane. Apply liquid membrane flashing over second reinforcing membrane.
- .5 Apply finish coat of liquid membrane over dry, previously applied liquid membrane.
- .6 Apply liquid membrane flashing as recommended by the manufacturer, and following written instructions

3.21
Completion
of Days Work

- .1 Install a water tie-off at the edge of completed roofing work at the end of the day, to prevent water entry. Remove this completely at the start of the next days work. Inspect all exposed membrane to assure that it is left in a watertight condition overnight. Ensure that drainage is provided to prevent buildup of water on partially completed works.
- .2 Provide a fire watch on the site, after torching work has been completed for the day, for at least two (2) hours at the end of each day. Walk the entire day's production area to check for smoke and or hot spots using a hand-held infrared thermometer.
- .3 Inspect all laps of the membrane application to ensure they are properly bonded. Repair any deficiencies prior to leaving the site for the day.
- .4 Base sheet applications should not be left exposed overnight unless all seams are torch welded prior to leaving the work site.

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3.22
Cleaning

- .1 Upon completion of the work of this Section remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Clean any drips, spills and surplus material from adjacent surfaces and make good any damage caused by the work of this Section.

3.23
General

- .1 Patching the cap sheet membrane shall be carried out utilising patches with a minimum size of 450mm x 100mm.
- .2 Minimum length of cap sheet on flat run of roof shall not be less than 1000 mm.
- .3 Wrinkled or deformed ends of cap sheets rolls will not be tolerated and therefore, must be discarded prior to application.
- .4 Following completion of new roofing, torch soften and apply a liberal application of approved bulk type mineral granules to cap sheet membrane edges where asphalt has extruded or flowed beyond clean lines and to all surface damage.
- .5 Splices in delivered rolls of membrane are to be removed. Cut back the roll 450mm on both sides of the splices and remove prior to installation

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SPECIAL CONDITIONS

SCOPE

1. Roof Areas “K, L, M, P & Q” are to be replaced as part of this project. Refer to SGDHS drawings, dated February 2026. Refer to Key Plan KP-1 and Roof Plans RP-1 through RP-7
2. **Facility Protection (VERY IMPORTANT):** Interior and exterior of facility must be fully secured at all times and fully restrict any unauthorized access. Additionally, interior and exterior of facility must be fully weather protected and remain watertight at all times for the duration of the project. Prime Contractor must install all temporary protective measures as required for the duration of the project
3. **Temporary Waterproofing (VERY IMPORTANT):** Facility must be fully protected and must remain fully watertight throughout all phases of the work for the duration of the project. Prime Contractor must install all temporary measures / waterproofing as required to maintain watertightness throughout all phases of the work for the duration of the project. Temporary waterproofing materials, methods, procedures, etc. are the Prime Contractor’s sole responsibility.
4. **Roof Access & Staging / Storage:** Existing Siporex & N.I.C. roof areas may NOT be used for any type of project storage or staging. Materials at existing Siporex roof areas to be hoisted on a daily basis as required. Prime Contractor may only use N.I.C. roof areas for the purpose of construction access. Any N.I.C. roof area used for construction access must be fully protected from all types of traffic. Protection to consist of 19mm (3/4”) plywood sheathing and 50mm (2”) extruded polystyrene insulation (XPS). No equipment, material, personnel, etc. may be in direct contact with the existing membrane surface.
5. **Site Review & Evaluation:** Prime Contractor and their chosen sub-contractor(s) are fully responsible to carefully review the site and satisfy themselves of all requirements to complete the project scope of work as per the provided contract documents. All works to be completed to the full satisfaction and sole discretion of UCDSB/Project Architect.

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6. The Prime Contractor must carefully examine the contract documents (all disciplines) and each location of the proposed work. The Prime Contractor is fully responsible to verify and confirm all dimensions and site conditions prior to submitting a tender bid. Additionally, the Prime Contractor is fully responsible to co-ordinate and confirm all project works as per the contract documents (all disciplines) with selected sub-contractor(s) to ensure all project elements and requirements have been considered, co-ordinated & included for within the submitted tender bid. The Prime Contractor may not claim, after submission of the tender bid, for any misinterpretations, errors or omissions with respect to the conditions imposed by the Contract Documents or Design Drawings.
7. **Roofing Document Package:** Roof plans RP-1 to RP-5 indicate existing conditions & existing roof penetration locations only throughout contract roof areas. Detail call-outs throughout roof plans RP-1 to RP-5 and associated roofing details (A1 to A14) are examples of new required detailing (architectural, electrical, mechanical, structural, etc.) throughout the contract roof areas and do not necessarily indicate exact location(s). Tapered insulation roof plans RP-6 & RP-7 indicate new and relocated roof drain locations throughout contract roof areas. Prime Contractor must carefully co-ordinate all roofing works throughout the project with architectural, electrical, mechanical & structural disciplines / trades & contract documents for the successful completion of the project
8. **Tapered Insulation:** Included tapered insulation drawings (RP-6 & RP-7) are diagrammatical only and indicate the general / approximate location of all new & re-located roof drain locations. Actual tapered insulation design, layout, thicknesses, etc. may differ due to site conditions, interferences and finalised roof drain locations. Prime Contractor must endeavour to complete all roof drain installations throughout the contract roof area(s) immediately upon structural roof deck replacement. Prime Contractor is responsible to provide detailed measurements ("X" & "Y" axis) of each finalised roof drain location to chosen tapered insulation manufacturer for the purpose of tapered insulation design and manufacturing. Contractor must provide detailed shop drawings to project consultant for review & approval prior to production of tapered insulation system. Shop drawings must indicate system design, including but not limited to: layout, slopes thicknesses, sumps, crickets, etc. Extra costs for revised tapered insulation design, layout and installation to suit actual site conditions will not be considered.

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9. **Roofing Daily Temporary Termination Points:** All daily termination points of new vapour barrier / new roof system along tie-in to existing vapour barrier / existing roof system must be fully sealed and must remain fully watertight for the duration within each location.
10. **N.I.C. Roof Tie-In Locations:** At tie-in locations to existing roof system, neatly cut and remove existing insulation and sub-components as required to complete all detailing – minimum of 450mm (18"). Fully degranulate all existing membrane surfaces as required to ensure adequate tie-in and seals. Ensure vapour barrier continuity is maintained and ensure adequate overlapping and seals of new to existing vapour barrier – minimum 150mm (6") overlap. Upon completion of construction works, reinstate all insulation and sub-components to match original. Fill any voids or gaps with spray foam or batt insulation. Replace all components with new to match within all required location(s). Provide overlapping compatible membrane seals – minimum of 300mm (12").
11. **Expansion Joint Temporary Tie-In (Phase 1 to Phase 3 - Roof "L" to Roof "M"):** At roof tie-in location, neatly cut and remove existing insulation and sub-components along Phase 3 – Roof "M" as required to complete all detailing – minimum of 450mm (18"). Fully degranulate all existing membrane surfaces as required to ensure adequate tie-in and seals. Provide temporary insulated stud wall on Phase 3 – Roof "M" side as required. Phase 1 – Roof "L" to be completed as per applicable detailing in a permanent manner. Ensure vapour barrier continuity is maintained and ensure adequate overlapping and seals of new to existing vapour barrier – minimum 150mm (6") overlap. Upon completion of construction works, reinstate all insulation and sub-components to match original. Fill any voids or gaps with spray foam or batt insulation. Replace all components with new to match within all required location(s). Provide overlapping compatible membrane seals – minimum of 300mm (12"). Provide temporary expansion joint membrane and sheet metal flashing between Phase 1 & Phase 3 roof sides. Ensure detailing remains watertight until commencement of Phase 3 – Roof "M". Upon completion of Phase 3 – Roof "M" all detailing to be completed as noted, specified & indicated in a permanent manner

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12. **Test Openings (Roof Areas “L” & “M”):** Prior to ordering roofing materials for the project, Prime Contractor must complete a minimum of three (3) test openings below the existing window locations. Test openings to determine height from existing structural roof deck to underside of window-sill / window opening. These test openings must be completed with the roof consultant present. Upon receipt of site information at test opening locations, adjustments to overall roof assemblies may be required.
 13. **Parapet Detail (A7):** Included parapet detail (A7) is diagrammatical only and indicates the general / approximate existing detailing in relation to the new steel roof deck vs. the height of the existing perimeter masonry. New roof deck elevations & existing perimeter masonry heights may differ due to site conditions. Prime Contractor must supply and install all new required pressure treated wood blocking & wood sheathing to match height of existing masonry and to provide a level mounting surface for installation of new main parapets as detailed. Proposed extra costs for supply and installation of additional wood blocking and/ or wood sheathing to achieve parapet design requirements will not be considered.
 14. **Additional Notes:** See the following additional notes to form part of the roofing package for this project:
 - A) Carefully co-ordinate all roofing works as noted herein with the associated contract documents of all other trades / disciplines.
 - B) Co-ordinate installation of new scupper locations with Architect and Owner. Refer to applicable detail
 - C) Complete all roofing related architectural, electrical, mechanical & structural installations throughout the contract roof sections as per project architectural, electrical, mechanical & structural drawings & specifications. Refer to applicable roofing details.
 - D) Replace / install all mechanical: curbs, sleepers, penetrations, etc. throughout the contract roof sections as indicated. Refer to applicable details

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- E) Electrical/mechanical connections that exit roof system externally must be terminated through a separate “pipe enclosure” detail – refer to applicable detail. Supply and install new pipe enclosure detail within all required locations as per mechanical engineer. Refer to project mechanical & electrical drawings. Refer to applicable roofing detail. Increase pipe enclosure height as required by mechanical engineer to accommodate work of other disciplines.
- 15. Noted test cut evaluations are for information/reference purposes only. Prime Contractor to complete tests cuts at each contract roof section to determine actual site conditions. This is to be completed at the Prime Contractor’s own expense. Proposed extras for discrepancies between provided test cut information and actual site conditions will not be considered. Upon commencement of project, Prime Contractor assumes full responsibility for existing roof system site conditions, which includes but is not limited to: existing roof assembly, level of saturation, weight, embrittlement, quantity of dust, etc.
- 16. Replace existing roof system with new System – Soprema, IKO & Johns Manville roof system only, as identified herein. Confirm structural deck in applicable roof area.
- 17. **Staging Area:** Prime Contractor to set-up all required temporary fencing to completely enclose and secure the set-up/staging/hoisting area. Prime Contractor is fully responsible for the safety and security of this area. If equipment (i.e. mechanical units) are to be stored within this area, Prime Contractor must ensure all items are secured and safe from theft, vandalism, etc.
- 18. **Interior Protection:** Prime Contractor to supply and install all required interior protection below all roof areas to ensure full and complete shelter of all interior items and surfaces. Prime Contractor to move/re-locate all interior items (i.e. furniture, equipment, fixtures, electronics, etc.) to complete the interior protection. Prime Contractor to complete full interior clean-up upon completion of roofing operations and return all items to original locations and condition.

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19. Remove and discard all “not-in-use” roof details as determined by the UCDSB Project Manager and as per the contract documents. Confirm all “not-in-use details with UCDSB Project Manager prior to removal.
20. Prime Contractor must remove all existing screw fasteners with a drill where existing. No damage to the existing fasteners or deck will be tolerated.
21. Install new perimeter construction detailing (i.e. parapets, control/expansion joints, walls, etc.) – refer to typical detailing. Prime Contractor shall be responsible to construct all new perimeter detailing as per the contract documents to achieve all requirements as described. Prime Contractor must review and confirm all site conditions prior to pre-constructing any new perimeter detailing.
22. Disconnect, lift (via crane or boom truck) and re-connect any and all roof top equipment as well as all other equipment, lines (gas, refrigeration, communication, electrical) and electrical requirements for this project. Supply plywood and extruded polystyrene insulation for the temporary roof top storage of the roof top units, while the waterproofing is being completed. Also supply plywood and tarps for the temporary waterproofing of open curbs and ducts.
23. **Base Membrane Flashing Fasteners & Reinforcing Membrane:** Prior to the installation of any granulated cap membrane, **Prime Contractor must ensure the installation of the base flashing fasteners and reinforcing membrane is completed within all locations as described herein.** Consultant must be provided a minimum of 48hrs. advanced notice from the Prime Contractor to arrange a site review to confirm the applications. Prime Contractor may not proceed with any granulated cap membrane applications without the approval to proceed from the project consultant. Failure to comply with this directive will result in the removal and replacement of all required membrane layers as instructed. All required remedial works will be at the Prime Contractor’s own expense.

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24. All roof top mechanical units and curbs (regardless of operation) are to be completed to a minimum height of 400 mm above the finished roof surface.
 25. Prime Contractor shall supply and install the required mechanical flashings where required at all mechanical pipe details (i.e. tall cones, plumbing vent flashings, etc.). All joints must be soldered within the mechanical galvanized metal flashing detail, with applied shrouds / storm collars where required
 26. At ALL roof access locations (i.e. hatches, ladders, stairs, doorways, etc.) install landing pad as per applicable detail
 27. **Expansion Joint:** New pre-manufactured expansion joint to be installed along all expansion locations as detailed and indicated. Expansion joint to be custom manufactured to suit all site conditions, including but not limited to: 90-degrees, angled, cross, T-shaped and curved transitions, as well as continuously in other directions. Expansion joint to be manufactured with a minimum expansion/contraction as noted herein. Contractor responsible to complete accurate field measurements for the fabrication of this product to meet all project requirements. Contractor to contact material manufacturer for assistance with measuring, ordering and installation of the expansion joint. Expansion joint to be installed as per all manufacturer installation instructions and directives to ensure warranty compliance.

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28. **Cross-Over Access Stair:** Supply and install new crossover access stairs as specified herein within the following locations: between Roof Areas “K & “L”, between Roof Areas “L” & “M”, between roof areas “M” & N.I.C. “H” & between Roof Areas “P” & N.I.C. “N” to suit site conditions. Final location(s) of all cross-over stairs to be determined & approved by owner. Stair support bases (all locations) to be supported on a fully torch applied sacrificial membrane layer, ¾” adhered rubber matting & concrete paver. Additionally new landing pad (minimum 4’ x 4’ footprint) consisting of fully torch applied sacrificial membrane layer & ¾” adhered rubber matting to be installed at base of each access stair location (both sides). **Prime contractor must provide shop drawings of all cross-over stair locations for review and approval stamped by a professional engineer licensed in the Province of Ontario prior to any fabrication, installation, etc. At N.I.C. Roof Areas “H” & “N”, Prime Contractor must ensure all supplied and installed materials match existing manufacturer in order to maintain warranty compliance.**
29. **Testing:** any hazardous material testing requested by the Prime Contractor over and above what is documented in the provided DSR report is to be completed at the sole expense of the Prime Contractor. If any requested testing yields a positive result, the UCDSB will cover the Prime Contractor’s expenses for said tests. The UCDSB will arrange for any testing requested by the Prime Contractor.
30. **Drain Flushing:** All existing and new roof drain locations within the contract roof areas and any additional roof area(s) used for mobilization, storage, staging, etc. are to be flushed and checked for positive drainage upon completion of roofing works. Prime Contractor to retain the services of a qualified sub-contractor specializing in this type of work. All required water for the flushing works is to be provided by the sub-contractor. The use of water from the work site is prohibited. Upon completion, sub-contractor to provide a detailed report, indicating all drains locations are flowing at maximum capacity and no blockages of any type remain. The Prime Contractor shall be fully responsible for the acts, performance and omissions of its sub-contractor and their employees or agents

-END OF SECTION-

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PART 1 – SCOPE OF WORK

- | | |
|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1.1</u>
<u>Related</u>
<u>Sections</u> | <p>.1 General Requirements – See applicable specification section</p> <p>.2 Safety Requirements – See applicable specification section</p> <p>.3 Rough Carpentry – Section 061000</p> <p>.4 Preformed Metal Cladding – Section 074650</p> <p>.5 Modified Bitumen Membrane Roofing – Section 075200</p> <p>.6 Joint Sealants – Section 079200</p> <p>.7 Electrical & Mechanical Requirements – See applicable specification section</p> |
| <u>1.2</u>
<u>Quality</u>
<u>Assurance</u> | <p>.1 All sheet metal flashing works (i.e. site measuring, fabrication & installation) are to be completed by a licenced sheet metal worker registered with the Ontario College of Trades (Construction Sector – Sheet Metal Worker 308-A). Prime Contractor to provide all identification and documentation as requested prior to commencing any works on site.</p> |
| <u>1.3</u>
<u>General</u> | <p>.1 Install all sheet metal caps, counter flashings, siding and all other metal flashings required to complete roofing installation.</p> <p>.2 Form to profiles as detailed upon the drawings, or as required to suite site conditions.</p> |
| <u>1.4</u>
<u>Mock-Up</u> | <p>.1 Complete on-site mock-up(s) of all specified sheet metal flashing profiles for approval prior to proceeding with any works. Mock-up to identify: proposed colour & proposed method of shaping, forming, jointing and fastening.</p> <p>.2 Submit samples if approval of substitutions is requested.</p> |
| <u>1.5</u>
<u>Workmanship</u> | <p>.1 Sheet metal flashing work shall be carried out in accordance with the best standard practices; with joints locked, cleated, caulked as required and exposed edges hemmed. Ample allowance shall be made in all work for expansion and contraction.</p> <p>.2 Mitred corners shall be straight and true to profiles shown on drawings, with flat surfaces free of distortion and free of face nailing.</p> |
| <u>1.6</u>
<u>References</u> | <p>.1 Standard practices, unless otherwise noted herein, shall be deemed to constitute recommended procedures published in the S.M.A.C.N.A. Architectural Manual.</p> |

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1.7
Warranty

- .1 Remedy all defects in the Sheet Metal Flashings installed hereunder, which appear within a period of **Five (5) years** from the date of substantial performance.
- .2 Make all necessary repairs and replacement within 48 hours of receipt of written notification.
- .3 Provide a written warranty confirming the above, issued on the corporate letterhead, and sealed by an authorized company official.
- .4 Nothing contained in the Article shall be construed as in any way restricting or limiting the liability in Common Law and statutory liability of the Prime Contractor.

PART 2 – PRODUCTS

2.1
Metal
Flashings

- .1 Metal flashing shall be **26 gauge (0.55mm)** commercial galvanized to STM A653/A653M. Coating designation G90, PPD. Standard of Acceptance: **Perspectra Plus Series – Weather XL**. Colour selected by Consultant/Board from manufacturer's standard range.
- .2 Where metal flashing is in contact with dissimilar metal, use separation sheet or backpaint to suitable thickness (as approved by Consultant) to prevent galvanic corrosion.

2.2
Caulking

- .1 Sealing compound: one component polyurethane base caulking compound to CGSB 19.13-M. Standard of Acceptance: **Tremco Dymonic, Sonneborn NP1 or approved equivalent**. Sealing compound to be installed in accordance with manufacturer's recommendations.

2.3
Starter
Clip

- .1 Starter strips to be manufactured from the same type of material used for cap and counter flashings and shall be **24-gauge (0.71mm)**.

2.4
Framing
Girts

- .1 Framing girts to be manufactured from the same type of material used for cap and counter flashings & shall be **22-gauge (0.85mm)**.

2.5
Fastening
Cleats

- .1 Fastening cleats to be manufactured from the same type of material used for cap and counter flashings and shall be **24 gauge (0.71mm)**. Space at 600mm o/c.

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2.6
Fastening
Bars

- .1 Fastening bars to be manufactured from the same type of material used for cap and counter flashings & shall be **18-gauge (1.21mm)** & pre-drilled at 400mm o/c.

2.7
Fasteners

- .1 **Exposed Fasteners:** to CSA B111 #14 or greater, non-corroding with hexagonal head and neoprene washer of same material type as used for sheet metal flashing. Colour and finish to match sheet metal flashing. Fastener must be specifically designed and suitable length to firmly secure new materials to substrate.
- .2 **Concealed Fasteners:** to CSA B111 #10 or greater, non-corroding of same material type as used for sheet metal flashing. Pan / flat head screw of length and thickness suitable to firmly secure new materials to substrate.
- .3 **Framing Girt Fasteners:** Corrosion resistant # 14 screw with recessed truss head of same material type as used for framing girts. Fastener must be specifically designed and suitable length to firmly secure new materials to substrate.

2.8
Accessories

- .1 **Isolation coating:** alkali resistant bituminous paint.
- .2 **Touch-up paint:** as recommended by pre-finished material manufacturer

PART 3 – EXECUTION

3.1
General

- .1 Metal flashing shall be as detailed, supplemented by recommendations of the S.M.A.C.N.A. Architectural Manual.
- .2 All raw edges of metal flashing shall be strengthened by a fold at least 13mm wide, set out slightly and presenting a straight line and neat finish. Form flashings in 2.4m lengths, making allowance for expansion. When flashings exceed 600mm in height form flashing in 1.2m lengths.
- .3 Metal shall be formed on a bending brake, shaping trimmed and hard seaming shall be done on bench, as far as practicable, with proper sheet metal working tools. Angles of bends and folds for interlocking metal shall be made with full regard to expansion and contraction to avoid buckling or fullness in service and to avoid damaging surfaces of metal.
- .4 Dry joints are to tight but not dented so as to permit slight adjustments of sheets and yet remain watertight.

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3.1 Cont'd

- .5 Lock seams at all corners.
- .6 Do not install fasteners through cant strips.
- .7 Apply isolation coating to metal surfaces to be embedded in concrete or mortar, and between dissimilar metals.

3.2
Anchors &
Fasteners

- .1 Space exposed fasteners evenly and in an organized pattern, keep number to a minimum. Where exposed to view, use metal fasteners of same material, colour, texture and finish as the metal on which they occur.
Obtain approval before installing any exposed fasteners.

3.3
Cap
Flashing

- .1 Supply and install continuous metal starter strips, secure at 600mm O.C. maximum of 50mm above drip edge, with fastener of sufficient length to penetrate a minimum of 25mm into substrate.
- .2 Supply and install metal cleats at specified spacing. Use fasteners of sufficient length to penetrate a minimum of 25mm into substrate.
- .3 Use concealed fastenings except where approved by Consultant.
- .4 Secure sections of metal ***in S-lock joints on all faces*** and allow for sufficient expansion and contraction between each piece. Ensure drip edges are inserted into the drip of the adjacent section.
- .5 Form cap flashings to profiles as shown on the detail drawings. Ensure positive drainage to the interior (roof surface) areas.
- .6 Where height of metal fascia exceeds 150mm, provided stiffening breaks every 150mm maximum. Breaks to be located at equal distance from the top and bottom of the fascia, and from each other.

3.4
Fastening
Bars

- .1 Install metal fastening bars where detailed, secured at 300mm o/c with self-tapping flat head screws. Fastener length to be 19mm. **Fasteners to be approved by Consultant.**

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3.5
Reglets

- .1 Reglets that are not of sufficient height are not to be reused. New reglets are to be cut a minimum of 400mm above finished roof surface and are to be a minimum of 19mm wide and 25mm deep. **Reglets to be cut prior to the application of the membrane flashings.**
- .2 For existing reglets greater than 400mm above finished membrane, clean out and secure new metal flashing and caulk. (minimum height shall be 450mm or as detailed).
- .3 Prime reglet prior to the application of the membrane flashings.
- .4 Turn top edge of metal flashing into walls, secure with lead wedge or friction fit pins into reglet and caulk joint at wall.
- .5 Secure sections of metal ***in S-lock joints on all faces*** and allow for sufficient expansion and contraction between each piece. Ensure drip edges are inserted into the drip of the adjacent section.

3.6
Caulking

- .1 Install caulking in accordance with manufacturer's latest recommendations and guidelines.
- .2 Provide foam backer rod for joints greater than 19mm wide and 25mm deep, prior to installing caulking compound.
- .3 Tool finish to satisfaction of Consultant.

3.7
Clean-up

- .1 Finished sheet metal flashing work shall be clean and left in neat, workmanlike condition. Adjoining materials shall be properly cleaned of all soil caused by this trade, debris/soil shall be removed from site to the satisfaction of the Consultant.

-END OF SECTION-

PART 1- GENERAL

1.1 REFERENCES

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS): Material Safety Data Sheets (MSDS).
- .2 Underwriter's Laboratories of Canada (ULC): ULC-S115-1995, Fire Tests of Fire stop Systems.

1.2 DEFINITIONS

- .1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.
- .2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.
- .3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.
- .4 Tightly Fitted; (ref: NBC Part 3.1.9.1.1 and 9.10.9.6.1): penetrating items that are cast in place in buildings of noncombustible construction or have "0" annular space in buildings of combustible construction. Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

PART 2- PRODUCTS

2.1 MATERIALS

- .1 Fire stopping and smoke seal systems: in accordance with CAN-ULC-S115.
 - .1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CAN- ULC-S115 and not to exceed opening sizes for which they are intended.
 - .2 Fire stop system rating: Generally one (1hr) and two (2hr) hours. For assemblies noted on the OBC Matrix and drawings.
- .2 Service penetration assemblies: systems tested to CAN-ULC-S115 and listed in ULC Guide No. 40 U19.
- .3 Service penetration fire stop components: certified by test laboratory to CAN-ULC-S115 and listed in ULC Guide No. 40 U19.13 and ULC Guide No. 40 U19.15 under the Label Service of ULC. (Prefix SP)
- .4 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.
- .5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables:

elastomeric seal.

- .6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- .10 Sealants for vertical joints: non-sagging.
- .11 Approved Manufacturers: As listed in the ULC rated systems for each specified application.

2.2 FIRE RATED EXPANSION JOINT

- .1 The work shall consist of furnishing and installing waterproof, fire rated expansion joints in accordance with the details shown on the plans and the requirements of the specifications. Preformed sealant shall be silicone pre-coated, preformed, pre-compressed, self-expanding, sealant system.
- .2 Vertical and Horizontal Fire Rated Sealant System to be installed between new addition and the existing building.
- .3 Submittals:
 - .1 Standard Submittal Package – Submit typical expansion joint drawing(s) indicating pertinent dimensions, general construction, expansion joint opening dimensions and product information.
 - .2 All products must be identified by a ULc listing number and must be listed in the ULC Online Certification Directories as proof that they have been tested according to UL 2079 and manufactured under UL's "Follow Up" service.
 - .3 All products must be certified by independent laboratory test report to exceed the requirements of curtain wall performance tests ASTM E330, E283-04, and E331. Product must meet or exceed hurricane-force wind loading with no deflection at both positive and negative pressures up to 4954 Pascals - equal to 200 mph winds (ASTM E330-02-procedure A).
 - .4 All products must be certified by independent laboratory test report to ASTM E90-09 and to meet or exceed an STC 62 in STC 68 wall and OITC 52 rating in an OITC 52 wall.
 - .5 All products must be certified by independent laboratory test report to be free in composition of any waxes or wax compounds using FTIR and DSC testing.
 - .6 All products shall be certified in writing to be: a) capable of withstanding 150°F (65°C) for 3 hours while compressed down to the minimum of movement capability dimension of the basis-of-design product (-25% of nominal material size) without evidence of any bleeding of impregnation medium from the material; and b) that the same material after the heat stability test and after first being cooled to room temperature will subsequently self-expand to the maximum of movement capability dimension of the basis-of-design product (+25% of nominal material size) within 24 hours at room temperature 68°F (20°C).
- .4 Basis of Design:
 - .1 All joints shall be designed to meet the specified performance criteria of the project as manufactured by: (USA & International) EMSEAL JOINT SYSTEMS, LTD 25 Bridle Lane,

FIRE STOPPING AND SMOKE SEAL

- Westborough, MA 01581-2603, Toll Free: 800-526-8365. (Canada) EMSEAL, LLC 120 Carrier Drive, Toronto, Ontario, Canada M9W 5R1 Toll Free: 800-526-8365.
- .2 Alternate manufacturers must demonstrate that their products meet or exceed the design criteria and must submit certified performance test reports performed by nationally recognized independent laboratories as called for in section 1.02 Submittals. Submittal of alternates must be made three weeks prior to bid opening to allow proper evaluation time.
 - .3 All product must meet ULc system no. JF132 (for vertical separations) and JF131 (for horizontal separations) for the WFR2 system.
- .5 Products:
- .1 Provide watertight, energy-efficient, 2 hour fire rated, exterior and interior joints in vertical-plane walls (above-grade). Typical locations include applications for interior wall joints where a 2 hour fire rating is required or desired. System shall perform waterproofing, fire-rating, movement-accommodation functions as well as contribute to thermal insulation and sound attenuation as the result of a single installation and without the addition of ancillary fire-blankets, mineral wool, coverplates, etc.
 - .2 Provide EMSHIELD WFR2 as manufactured by EMSEAL JOINT SYSTEMS LTD and as indicated on drawings for vertical expansion joint locations.
 - .3 Sealant shall be silicone pre-coated, preformed, pre-compressed, self-expanding, 2 hour-rated, sealant system. Sealant system shall be comprised of the following components:
 - .1 fire-retardant-impregnated foam pre-coated on both sides with an intumescent fire-proofing material and pre-coated at the outer layers with waterproof silicone
 - .2 field-applied epoxy adhesive primer,
 - .3 field-injected silicone sealant bands
 - .4 Material shall be capable of movements of +25%, -25% (50% total) of nominal material size. Standard sizes from 1/2" (25 mm) to 6" (250 mm). Depth of seal is 4" (100 mm) for WFR2.
 - .5 Silicone external color facings to be low-modulus, waterproof silicone factory-applied to the foam while it is partially pre-compressed to a width greater than maximum joint extension and cured before final compression. When compressed to final supplied dimension, a bellow(s) to handle movement must be created in the silicone coating. Silicone coatings to be available in a range of not less than 26 standard colors for coordination with typical building materials. Separate colors may be chosen for each coated surface.
 - .6 Select the sealant system model appropriate to the movement and design requirements at each joint location that meet the project specification or as defined by the structural engineer of record.
- .6 Fabrication:
- .1 EMSHIELD WFR2 by EMSEAL JOINT SYSTEMS LTD must be supplied precompressed to less than the joint size, packaged in shrink-wrapped lengths (sticks).
 - .2 Directional changes and terminations into horizontal plane surfaces to be provided by factory-manufactured universal-90-degree single units containing minimum 12-inch long leg and 6-inch long leg or custom leg on each side of the direction change or through field fabrication in strict accordance with published installation instructions.
- .7 Installation:
- .1 The General contractor shall provide properly formed and prepared expansion joint openings constructed to the exact dimensions and elevations shown on the contract drawings. Deviations from these dimensions will not be allowed without the written consent of the engineer of record.
 - .2 The contractor shall clean the joint opening of all contaminants immediately prior to installation of expansion joint system. Repair spalled, irregular or unsound joint surfaces

using accepted industry practices for repair of the substrates in question. Remove protruding roughness to ensure joint sides are smooth. Ensure that there is sufficient depth to receive the full depth of the size of the EMSHIELD WFR2 / EMSHIELD WFR3 being installed plus at least ¼-inch (6mm) for the application of corner beads. Refer to Manufacturers Installation Guide for detailed step-by-step instructions.

- .3 No drilling, or screwing, or fasteners of any type are permitted to anchor the sealant system into the substrate.

2.3 EXPANSION JOINT COVER

- .1 For 50mm and 75mm joints, supply Aluminum Expansion Joint Covers. Provide Models ASM 200 and ASM 300 (depending on the application), as manufactured by C/S Construction Specialties, and distributed by C/S Canada, 895 Lakefront Promenade, Mississauga, Ontario, L5E 2C2, T. (888) 895-8955.
- .2 Material:
 - .1 Extrusion – C/S uses multiple alloys & tempers which are established to be the most appropriate for the given use of individual parts. Will be one of the following:(6063-T5, T6, T52) (6061-T5, T6, T51) (6105-T5, T6) (6005-T5) (6005A-T5, T6).
 - .2 Duroflex Gasket: Single Durometer – 80 Shore A, ASTM D2000; Colour Gray.
- .3 Finish: Clear Anodized Finish.
- .4 Install anchor clips with the anchor bolts as supplied by C/S. The cover plate engages a “J-Hook” and locking channel for attachment. For complete installation instructions contact manufacturer.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 PREPARATION

- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.
- .2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.
- .3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.
- .4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.3 INSTALLATION

- .1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing.
- .2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are

maintained.

- .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
- .4 Tool or trowel exposed surfaces to neat finish.
- .5 Remove excess compound promptly as work progresses and upon completion.

3.4 SEQUENCES OF OPERATION

- .1 Proceed with installation only when submittals have been reviewed by Consultant.
- .2 Install floor fire stopping before interior partition erections.
- .3 Metal deck bonding: fire stopping to precede spray applied fireproofing to ensure required bonding.
- .4 Mechanical pipe insulation: certified fire stop system component. Ensure pipe insulation installation precedes fire stopping.

3.5 FIELD QUALITY CONTROL

- .1 Inspections: notify Consultant when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.
- .2 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports.
 - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.6 SCHEDULE

- .1 Firestop and/or smoke seal at:
 - .1 All penetrations through masonry, concrete, and gypsum board partitions and walls that form part of a "rated" or "unrated" fire separation.
 - .2 Between roof deck at all walls and underside that form part of a "rated" or "unrated" fire separation.
 - .3 Edge of floor slabs at curtain wall and precast concrete panels.
 - .4 Top of fire-resistance rated masonry and gypsum board partitions.
 - .5 Intersection of fire-resistance rated masonry and gypsum board partitions that form part of a fire separation or "unrated" fire separation.
 - .6 Control and sway joints in masonry and gypsum board partitions and walls that form part of a "rated" or "unrated" fire separation.
 - .7 Penetrations through fire-resistance rated floor slabs, ceilings and roofs
 - .8 Openings and sleeves installed for future use through a "rated" or "unrated" fire separation.
 - .9 Around mechanical and electrical assemblies penetrating a "rated" or "unrated" fire separation.
 - .10 Rigid ducts: greater than 129 cm²: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of a "rated" or "unrated" fire separation.

- .11 Other areas as shown on drawings.

3.7 CLEANING

- .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Remove temporary dams after initial set of fire stopping and smoke seal materials.
- .3 Protect the system and its components during construction. Subsequent damage to the expansion joint system will be repaired at the general contractor's expense. After work is complete, clean exposed surfaces with a suitable cleaner that will not harm or attack the finish.

END OF SECTION

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PART 1 – GENERAL

- | | | |
|-----------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1.1</u> | .1 | General Requirements – See applicable specification section |
| <u>Related</u> | .2 | Safety Requirements – See applicable specification section |
| <u>Sections</u> | .3 | Preformed Metal Cladding – Section 074650 |
| | .4 | Modified Bitumen Membrane Roofing – Section 075200 |
| | .5 | Sheet Metal Flashings – Section 076200 |
| | .6 | Electrical & Mechanical Requirements – See applicable specification section |
| | | |
| <u>1.2</u> | .1 | CAN/CGSB-19.1-M87 Sealing Compound, One Component, Urethane Base, Solvent Curing. |
| <u>References</u> | | |
| | | |
| <u>1.3</u> | .1 | Deliver and store materials in original wrapping and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture and water. |
| <u>Delivery</u> | | |
| <u>Storage &</u> | | |
| <u>Handling</u> | | |
| | | |
| <u>1.4</u> | .1 | Comply with requirements of Workplace Hazardous Materials information System (WHMIS) regarding use, Handling, storage, and disposal of hazardous materials; And regarding labelling and provision of material safety Data sheets acceptable to Labour Canada. |
| <u>Environmental</u> | | |
| <u>& Safety</u> | | |
| <u>Requirements</u> | | |
| | .2 | Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use. |

PART 2 – PRODUCTS

- | | | |
|-------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>2.1</u> | .1 | Sealant acceptable must be listed on CGSB Qualified Products List issued by CSGB Qualification Board for Joint Sealants. Where Sealants are qualified with primers use only these primers. |
| <u>Sealant</u> | | |
| <u>Materials</u> | | |
| | .2 | At reglets, metal flashings, mechanical penetrations and other locations: to CAN/CGSB-19.13-M87, single component, urethane based. Standard of Acceptance: Sonneborn NP-1, Tremco Dymonic, or approved equivalent. |

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- 2.2**
Back-Up
Materials
- .1 Polyethylene, Urethane, Neoprene or Vinyl Foam
 - .2 Extruded closed cell foam backer rod.
 - .3 Size: oversize 3- to 50%
 - .4 Bond breaker tape
 - .5 Polyethylene bond breaker tape which will not bond to sealant.

- 2.3**
Joint
Cleaner
- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.
 - .2 Primer: as recommended by manufacturer.

PART 3 – EXECUTION

- 3.1**
Preparation
of Joint
Surfaces
- .1 Remove all existing sealant from reglets to be re-used.
 - .2 Examine joint sized and conditions to establish correct depth to width relationship for installation of backup materials.
 - .3 Clean bonding joint surfaces of harmful matter substances including dust, rust oil grease, and other matter which may impair work.
 - .4 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
 - .5 Ensure joint surfaces are dry and frost free.
 - .6 Prepare surfaces in accordance with manufacturer's directions.

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3.2
Application

.1 Sealant.

- .1 Apply sealant in accordance with manufacturer's instructions.
- .2 Apply sealant in continuous beads.
- .3 Apply sealant using gun with proper size nozzle.
- .4 Use sufficient pressure to fill voids and joints solid.
- .5 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
- .6 Tool exposed surfaces to give slightly concave shape.

.2 Curing.

- .1 Cure sealants in accordance with sealant manufacturer's instructions.
- .2 Do not cover up sealants until proper curing has taken place.

.3 Clean up.

- .1 Clean adjacent surfaces immediately and leave work neat and clean.
- .2 Remove excess and droppings, using recommended cleaners as work progresses.

-END OF SECTION-

PART 1- GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 653/A 653M-06a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM B 29-03, Standard Specification for Refined Lead.
 - .3 ASTM B 749-03, Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20-04/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-03, Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door Manufacturers' Association (CSDMA)
 - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2000.
 - .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 1990.
- .5 National Fire Protection Association (NFPA)
 - .1 NFPA 80-99, Standard for Fire Doors and Fire Windows.
 - .2 NFPA 252-03, Standard Methods of Fire Tests of Door Assemblies.
- .6 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1113-04, Architectural Coatings.
 - .2 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
- .7 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S701-01, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - .2 CAN/ULC-S702-97, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
 - .3 CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
 - .4 CAN4-S104-M80, Standard Method for Fire Tests of Door Assemblies.
 - .5 CAN4-S105-M85, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.2 SYSTEM DESCRIPTION

- .1 Design Requirements:
 - .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35 degrees C to 35 degrees C.
 - .2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.
 - .3 Frames and screens required to provide fire-resistance ratings or a non-rated fire separation shall be designed to meet requirement of The Building Code and NFPA 80

METAL DOORS AND FRAMES

- .4 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with, CAN4-S104 and NFPA 252 for ratings specified or indicated.
- .5 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104, NFPA 252 and listed by nationally recognized agency having factory inspection services.
- .6 Design shall be based on limited states design principles using factored loads and resistances.
- .7 In addition to information identified in the Door Schedule, refer also to Drawings for required fire separation and provide rating of frames accordingly. In the event of discrepancies, the more stringent requirement will govern

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit drawings stamped and signed by professional engineer licensed in Province of Ontario.
 - .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, louvred, arrangement of hardware and fire rating and finishes.
 - .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing, fire rating, finishes.
 - .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
 - .5 Submit test and engineering data, and installation instructions.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

1.5 WARRANTY

- .1 Doors and frames shall be warranted against manufacturing defects for a period of **three (3) years** from the date of Substantial Performance. Where defects occur, the contractor shall be responsible for all costs, including painting, hanging and installing hardware, associated with replacing the defective doors.

1.6 REQUIREMENTS OF REGULATORY AGENCIES

- .1 Steel fire rated doors and frames, labelled and listed by an organization accredited by standards Council of Canada in conformance with CAN4-S104M NFPA 252 for ratings specified or indicated.
- .2 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4-S104, ASTM E 152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

METAL DOORS AND FRAMES

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Fire Rated Doors, Frames and Screens:
 - .1 Door and frame assembly: material and construction approved by ULC. Door: sheet steel, 1.3 mm (18 gauge) minimum base thickness. Frame: sheet steel, 1.6 mm (16 gauge) minimum base thickness.
 - .2 Frames for glazed screens: shall be constructed to Ontario Building Code Section 3.1.8.14.2 Door cores: vertically stiffened with steel ribs and all voids filled with semi-rigid fibrous insulation minimum density 24 kg/m³, unless indicated otherwise on Door Schedule.
 - .3 Temperature rise limits for doors: for all doors listed within Door Schedule with temperature rise restrictions, the maximum temperature rise on the opaque portion of a door shall not exceed 250⁰ C after one hour when tested in accordance with CAN4-S104M "Standard Method for Fire Tests of Door Assemblies".
 - .4 Glazing stops: commercial grade sheet steel of thickness and design approved by ULC.
 - .5 Anchors for installation in concrete walls: tube and anchor (recessed head). All components and design approved by ULC.
 - .6 Anchors for installation in metal stud walls: "Z" steel anchors, thickness and design approved by ULC.
- .2 Hollow Metal Doors:
 - .1 Sheet steel: 1.2 mm base thickness, commercial grade, zinc coated steel to ASTM A653:
 - .1 Provide a Z275 zinc coating to ASTM A446 for exterior doors.
 - .2 Provide a W25 (wiped) zinc finish to ASTM A653 for interior doors.
 - .2 Glazing stops: minimum 1.2 mm base thickness sheet steel, tamperproof, screw fixed:
 - .1 Provide a Z275 zinc coating to ASTM A446 for exterior doors.
 - .2 Provide a W25 (wiped) zinc finish to ASTM A653 for interior doors
 - .3 Door Core: unless indicated on Door Schedule, all doors be steel stiffened with 5 ribs, welded to both faces and insulated with semi-rigid fibrous insulation with a minimum density of 24 kg/m³
- .3 Hollow Metal Frames and Screens:
 - .1 Sheet steel: commercial grade, zinc coated steel to ASTM A653
 - .1 Frames: 1.6 mm (16 gauge) base thickness, steel
 - .2 Provide a Z275 zinc coating to ASTM A446 for exterior frames
 - .3 Provide a W25 (wiped) zinc finish to ASTM A653 for interior frames
 - .2 Glazing stops: minimum 1.2 mm base thickness sheet steel, tamperproof, screw fixed:
 - .1 Provide a Z275 zinc coating to ASTM A446 for exterior frames
 - .2 Provide a W25 (wiped) zinc finish to ASTM A653 for interior frames
 - .3 Reinforcing channel: to CAN/CSA G40-21-M1978, Type 300W
 - .4 Door bumpers: black neoprene double stud
- .4 General:
 - .1 Frame floor anchors and channel spreaders: minimum 1.6 mm thick base steel
 - .2 Guard boxes: minimum 0.8 mm thick base steel
 - .3 Hardware, strike, etc., reinforcing: minimum 3.5 mm thick base steel unless indicated otherwise. Hinge reinforcing: minimum 6.4 mm thick base steel.
 - .4 Primer: to CGSB 1-GP-181M.
 - .5 Insulate exterior doors and frames components with polyurethane insulation.

2.2 FABRICATION

- .1 Fabricate doors and frames as detailed, to Canadian Steel Door and Frame Manufacturers' Association, (CSDFMA) Canadian Manufacturing Specifications for Steel Doors and Frames, latest edition; except where specified otherwise. Reinforce door and frames to suit hardware requirements specified in Section 08 71 00 - Door Hardware.
- .2 Fit and assemble work in shop where possible. Execute according to details and reviewed shop drawings. Where shop fabrication is not possible make trial assembly in shop.
- .3 Welding shall conform to requirements of CSA W-59-R2001, and shall be performed by a fabricator fully approved by the Canadian Welding Bureau. Fill or grind exposed welds to a smooth and flush finish. Exposed welds shall be continuous.
- .4 Joints and intersecting members shall be accurately fitted, made in true planes with adequate fastenings.
- .5 Insulate to prevent contact between different metals and metal-to-masonry or concrete to obviate chemical or electrolytic corrosion.
- .6 Fabricate work square, plumb, straight, true and accurately fitted. Provide adequate reinforcing and anchorage.
- .7 Bond treat and shop prime with a rust inhibitive zinc chromate primer on all parts not specified to have zinc coating.
- .8 Exterior doors and frames shall be thermally broken.

2.3 HOLLOW STEEL FRAMES AND SCREENS

- .1 Provide hollow steel frames and screens for openings as indicated.
- .2 Form frames and screens to profiles indicated of minimum 1.6 mm (16 gauge) hot rolled steel. Minimum zinc coating shall be in accordance with CSA G 164-M1981 (See Table 1 for minimum mass of zinc coating), and applied to frames and screens. Where indicated, frames for glazed screens shall be fabricated in compliance with Building Code Section 3.1.8.14.2. Refer to Door Schedule.
- .3 Accurately cut mitres, weld corners continuously along inside frame profile. Grind welded corners to a smooth and flush finish. Fill corners of steel frames with metallic paste filler and sand to a smooth and uniform finish.
- .4 Prepare frames for hardware as called for on the hardware schedule. Blank, reinforce for butts with minimum 6.4 mm steel plate. Drill and tap as required. Reinforce both sides of door frames for door closers and for hardware attachment in accordance with the approved hardware schedule.
- .5 Cut mitres and joints accurately and weld continuously on inside of frame profile.
- .6 Grind welded corners and joints to flat plane, fill with metallic paste filler and sand to uniform smooth finish.
- .7 Provide two (2) readily removable or concealed in floor type channel or angle spreaders. Finish shall be as in frames.

METAL DOORS AND FRAMES

- .8 Provide three (3) rubber bumpers in each jamb on strike side.
- .9 Frames and screens shall be provided with engineered mullion extensions. Such mullion extensions shall be fully concealed in drywall partitions, and shall extend to the underside of the structure above. Provide bracing above the ceiling as required.
- .10 Screens shall be anchored to the floor at 600 mm on centre. Anchor screen reinforcing firmly to structure.
- .11 Provide removable glazing stops of formed steel complete with countersunk Phillips head screws.
- .12 Frame extrusions and hollow steel sections shown on Door Schedule shall meet ULC, and/or Building Code requirements. Certification of test performance in accordance with ASTM E90-617 or E90-66T shall be provided.
- .13 For locations of frames installed in drywall refer to drawings and Door Schedule.

2.4 HOLLOW STEEL DOORS

- .1 Provide hollow metal doors of types and sizes noted on Door Schedule and shown on drawings.
- .2 Doors shall be flush, 44 mm thick, of 1.3 mm Steel (18-gauge) cold rolled, stretcher levelled, sheet steel.
- .3 Unless noted otherwise, interior doors shall have 1.6 mm (16 gauge) stiffeners at maximum 150 mm o.c., with all voids filled with the specified insulation. Where required, prepare doors to accept weatherstripping, gaskets and such accessories.
- .4 Doors shall be mortised, reinforced, drilled, and tapped to receive template hardware. Reinforce for surface mounted hardware.
- .5 Weld door components together by means of arc welding in accordance with CSA W-59-MR2001 to provide integrated units, square, true, and free from distortion or waves.
- .6 Clean, sand, flood coat with air drying paste filler, and again clean, and sand flush to eliminate all unevenness or irregularities.
- .7 Glazed doors shall be provided with glazing stops of formed steel complete with countersunk Phillips head screws.
- .8 Door style edges at openings shall be closed and reinforced. Caps with exposed laps onto door faces are not permitted.
- .9 The maximum free clearance below doors in the closed position shall be 6 mm.
- .10 At double doors the clearance between leaves shall be a maximum of 2 mm when they are in the fully closed position.
- .11 All exterior doors and also interior doors with electronic contacts shall have a top flush steel closure with edges welded and seam filled.

2.5 FIRE RATED STEEL DOORS AND FRAMES

- .1 In all instances fire rated steel doors and frames shall bear an appropriate Underwriters' Laboratories of Canada label for the rating required.

2.6 FRAME ANCHORAGE

- .1 Provide appropriate anchorage to floor and wall construction.
- .2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.
- .4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm on centre maximum.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION GENERAL

- .1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
- .2 Install doors and frames to CSDMA Installation Guide.

3.3 FRAME INSTALLATION

- .1 Set frames plumb, square, level and at correct elevation.
- .2 Secure anchorages and connections to adjacent construction.
- .3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
- .4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
- .5 Caulk perimeter of frames between frame and adjacent material.
- .6 Maintain continuity of air barrier and vapour retarder.

3.4 DOOR INSTALLATION

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's

METAL DOORS AND FRAMES

instructions and Section 08 71 00 - Door Hardware.

- .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
 - .1 Hinge side: 1.0 mm.
 - .2 Latchside and head: 1.5 mm.
 - .3 Finished floor, top of carpet, noncombustible sill, and thresholds: 13 mm.
- .3 Adjust operable parts for correct function.
- .4 Install louvers as shown on mechanical drawings.

3.5 FINISH REPAIRS

- .1 Touch up with primer finishes damaged during installation.
- .2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.6 GLAZING

- .1 Install glazing for doors and frames in accordance with Section 08 80 50 - Glazing.
- .2 Install Fire-rated glass in all fire rated frames and screens.

END OF SECTION

PART 1- GENERAL

1.1 RELATED SECTIONS

- .1 Section 07 92 00 – Joint Sealing.

1.2 REFERENCES

- .1 ASHRAE/IES 90.1-1989
- .2 ANSI/ASHRAE/USGBC/IES 189.1-2009
- .3 American Architectural Manufacturers Association (AAMA): AAMA 609/610-09, Cleaning and Maintenance Guide for Architecturally Finished Aluminum.
- .4 ASTM International : ASTM E 330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .5 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.40-97, Anticorrosive Structural Steel Alkyd Primer.
 - .2 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
 - .3 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.
- .6 CSA International
 - .1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .7 Ontario Building Code, SB-10
- .8 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards: SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

1.3 SYSTEM DESCRIPTION

- .1 Design Criteria
 - .1 Design frames and doors in exterior walls to:
 - .1 Accommodate expansion and contraction within service temperature range of -35 to 35 degrees C.
 - .2 Limit deflection of mullions to maximum 1/175th of clear span when tested to ASTM E 330 under wind load of 1.2 kpa submit certificate of tests performed.
 - .3 Movement within system.
 - .4 Movement between system and perimeter framing components or substrate.

1.4 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate materials and profiles and provide full-size, scaled details of components for door and frame. Indicate:
 - .1 Interior trim and exterior junctions with adjacent construction.
 - .2 Junctions between combination units.
 - .3 Elevations of units.

- .4 Core thicknesses of components.
- .5 Type and location of exposed finishes, method of anchorage, number of anchors, supports, reinforcement, and accessories.
- .6 Location of caulking.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .1 Apply temporary protective coating to finished surfaces. Remove coating after erection. Use coatings that are easy to remove and residue free.
 - .2 Leave protective covering in place until final cleaning of building.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location, and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect aluminum doors and frames from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Protection:
 - .1 During construction protect aluminum members and glass against damage from plaster, mortar, and any other cause.
 - .2 Protect prefinished aluminum surfaces with protective coatings or wrappings, until the installation of glazing commences. Ensure that method of protection does not damage finish.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in MANAGEMENT AND accordance with Section 01 74 19 -DISPOSAL Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Dispose of corrugated cardboard polystyrene plastic packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Aluminum extrusions: to Aluminum Association alloy AA 6063-T5 anodizing quality.
- .2 Sheet aluminum: Aluminum Association alloy AA 1100-H14 anodizing quality.
- .3 Fasteners: finished to match adjacent material.
- .4 Door bumpers: black neoprene.

- .5 Isolation coating: bituminous paint.
- .6 Glazing materials: Section 08 80 50
- .7 Sealants: Section 07 92 10

2.2 ALUMINUM DOORS

- .1 Acceptable Products
 - .1 Prevost, Series 2250 with optional 166 mm (6 1/2") bottom rail and 102 mm (4") midrail.
 - .2 Alumicor, Canadiana Insuldoor 400A with optional 104.8 mm (4 1/8") midrail and a 143mm (5 5/8") top rail.
 - .3 Kawneer, Insulclad 360 with a 100mm (4") midrail and a 127mm (5") top rail.
- .2 Glazing stops: interlocking snap-in type for dry glazing. Exterior stops: tamperproof type.
- .3 Provide thermally broken doors for exterior.
- .4 Hardware:
 - .1 Threshold: 178 mm wide (exterior door). Ensure threshold heights meet accessibility of no more than 12mm from surfaces.
 - .2 Hinges: roton 780-224 HD.
 - .3 Plated steel butt back-up plates 4.7 mm thick x 254 mm long, heavy duty.
 - .4 Exit device: Sargent 16-8504-98-K-PTB with keyed cylinder for DOG down.
 - .5 Closer: LCN 4041 PA-CUSH.
 - .6 Stabilizing security blocks from door to frame.
 - .7 Pull Handle: GSH 1180-2.
 - .8 Door sweep and weather stripping as recommended by the manufacturer.
 - .9 Best cylinder for panic hardware & exterior to accommodate 7 pin cores. Owner to supply cores.
- .5 Insulated Panels: Solid lower panel consisting of .80 aluminum sheet each side or 3/4" plywood core. Finish to match door and frame.

2.3 ALUMINUM FRAMES

- .1 Exterior entrance, 115mm clear anodized thermally broken.

2.4 ALUMINUM FINISHES

- .1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
 - .1 Clear anodic finish: designation AA-M10C22A31.
- .2 Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, and Protective and Decorative.

2.5 STEEL FINISHES

- .1 Finish steel clips and reinforcing steel with steel primer to CGSB 1.40 zinc coating to CSA G164.

2.6 FABRICATION

- .1 Doors and framing to be by same manufacturer.
- .2 Fabricate doors and frames to profiles and maximum face sizes as indicated. Provide minimum 22 mm bite for insulating glazed units.
- .3 Provide structural steel reinforcement as required.
- .4 Fit joints tightly and secure mechanically.
- .5 Conceal fastenings.
- .6 Mortise, reinforce, drill and tap doors, frames and reinforcements to receive hardware using templates provided under Section 08 71 00 - Door Hardware.
- .7 Isolate aluminum from direct contact with dissimilar metals, concrete and masonry.

PART 3- EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets

3.2 INSTALLATION

- .1 Set frames plumb, square, level at correct elevation in alignment with adjacent work.
- .2 Anchor securely.
- .3 Install doors and hardware in accordance with hardware templates and manufacturer's instructions.
- .4 Adjust door components to ensure smooth operation.
- .5 Make allowances for deflection of structure to ensure that structural loads are not transmitted to frames.

3.3 GLAZING

- .1 Glaze aluminum doors and frames in accordance with Section 08 80 50 – Glazing.

3.4 CAULKING

- .1 Apply sealant in accordance with Section 07 92 10 – Joint Sealing.

3.5 CLEANING

- .1 Perform cleaning of aluminum components in accordance with AAMA 609.1 - Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum.
- .2 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .3 Clean aluminum with damp rag and approved non-abrasive cleaner.
- .4 Remove traces of primer, caulking, epoxy and filler materials; clean doors and frames.
- .5 Clean glass and glazing materials with approved non-abrasive cleaner.
- .6 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers

END OF SECTION

PART 1- GENERAL

1.1 RELATED REQUIREMENTS

- .1 Work included: Furnishing and installing factory fabricated and finished electro- mechanical swinging operator.
- .2 Provide all associated electrical and hardware requirements to this section.

1.2 REFERENCES

- .1 Aluminum Association (AA): AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
- .2 American Architectural Manufacturers Association (AAMA): AAMA 701/702-04, Voluntary Specifications for Pile Weather Stripping and Replaceable Fenestration Weatherseals.
- .3 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association:
 - .1 ANSI/BHMA A156.1-2006, American National Standard for Butts and Hinges.
 - .2 ANSI/BHMA A156.3-2001, Exit Devices.
 - .3 ANSI/BHMA A156.4-2008, Door Controls - Closers.
 - .4 ANSI/BHMA A156.5-2001, Auxiliary Locks and Associated Products.
 - .5 ANSI/BHMA A156.10-2005, Power Operated Pedestrian Doors.
 - .6 ANSI/BHMA A156.19-2007, Power Assist and Low Energy Power Operated Doors.
- .4 ASTM International
 - .1 ASTM A 167-99(R2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
 - .2 ASTM B 209M-07, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).
 - .3 ASTM B 221M-07, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).
 - .4 ASTM D 2000-08, Classification System for Rubber Products in Automotive Applications.
 - .5 ASTM D 2287-96(R2010), Standard Specification for Non Rigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds.
 - .6 ASTM E 283-04, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - .7 ASTM E 330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 - .8 ASTM E 331-00(2009), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
 - .9 ASTM E 547-00(2009), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.
- .5 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.132M-90, Zinc Chromate Primer, Low Moisture Sensitivity.
 - .2 CAN/CGSB 1.181-99, Ready-Mixed, Organic Zinc-Rich Coatings.
- .6 CSA International
 - .1 CAN/CSA-A440-00, Windows /Special Publication A440.1-00(R2005), User Selection Guide to CSA Standard CAN/CSA-A440-00, Windows.
 - .2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .7 National Research Council of Canada (NRC)
 - .1 MNECB-97, Model National Energy Code of Canada for Buildings.

- .8 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-A2007, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
- .9 Underwriters' Laboratories of Canada (ULC)
 - .1 ULC/ORD C305-72, Panic Hardware.
 - .2 CAN/ULC-S524-06, Standard for the Installation of Fire Alarm Systems.
 - .3 CAN/ULC-S533-08, Egress Door Securing and Releasing Devices.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for doors, hardware, and accessories and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Indicate layout, dimensions, elevations, detail sections of members and sill conditions, materials, finishes, recesses, hardware including mounting heights, anchors and reinforcements, provisions for expansion and contraction, methods of joining sheet metal and joint locations, glass types and glass thicknesses, glazing details, types of sealants, details of other pertinent components of the work, and adjacent construction to which work of this section is attached.
 - .2 Identify installation tolerances required, assembly conditions, routing of service lines, locations of operating components, controls and boxes.
 - .3 Indicate door signs.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Maintenance Contract: Supply complete service and maintenance of operating equipment for 1 (one) year from date of substantial performance of the work.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Supply wrenches and tools required for maintenance of equipment.

1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Conform to applicable code for automatic release of control drive unit to permit manual operation of emergency exit doors.
 - .2 Conform to applicable code for release of automatic locks to permit manual operation of emergency exit doors and to CAN/ULC-S524 where required to be integrated with building's fire alarm system.
- .2 Certifications: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.7 CERTIFICATION REQUIREMENTS

- .1 Swinging door operator shall be CERTIFIED by the manufacturer to meet performance design criteria according to the following test standards:
 - .1 Underwriter's Laboratories (UL) listed to UL325.
 - .2 UL Listed Fire Door Operator
 - .3 cUL Listed – CSA22.2 No. 247 (equivalent to CSA certified).
- .2 Automatic Swinging Door Operator: Shall be manufactured in an ISO 9001 registered manufacturing facility.

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location, and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect automatic entrance doors and frames from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Cover exposed metal surfaces with pressure sensitive heavy protection paper or strippable plastic coating.
 - .1 Use materials of type which will not leave residue or become bonded when exposed to sun.
 - .2 Use padded blankets or approved protective wrapping for decorative metal work and similarly finished exposed elements.

1.9 SITE CONDITIONS

- .1 Verify that other trades are complete before installing the automatic swinging door operator.
- .2 Mounting surfaces shall be plumb, straight and secure; substrates shall be of proper dimension and material.
- .3 Refer to the construction documents, shop drawings and manufacturer's installation instructions.
- .4 Coordinate installation with the glass, glazing and hardware installation.
- .5 Observe all appropriate OSHA safety guidelines for this work.

1.10 WARRANTY

- .1 Contractor hereby warrants that automatic doors will function as specified for period of 5 (five) years from date of substantial performance.
- .2 Warranty: include coverage of repair or replacement of components or entire units which fail in materials workmanship. Failures include but are not necessarily limited to, structural failures including excessive deflection, excessive leakage or air infiltration, faulty operation of operators speed control and hardware, deterioration of metals, metal finishes, and other materials beyond

normal weathering.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- .1 Stanley Access Technologies.

2.2 AUTOMATIC DOOR SYSTEM

- .1 Swinging Door Operator: Shall be Stanley Magic-Force Swinging Door Operator-Visible application-Low Energy. The system shall consist of electro-mechanical swinging door operator and electrical controls, aluminum header, connecting hardware, actuating controls, guide rails (optional), and on/off/hold open switch. All components shall be factory assembled, adjusted and tested. NO ALTERNATES.
- .2 Power Open Operation: The operator shall open the door with a 3/16 HP, DC motor through a high torque reduction gear system, cut spiral beveled gear set welded to a toothed drive shaft, and linkage. The drive system shall have positive, constant engagement. A cam and roller mechanism shall provide for a non-back-lash positive open and close positioning. The operator shall stop the door in the open position by electrically reducing the motor voltage and stalling against a field adjustable 80 to 135 degree position stop.
- .3 Full Energy / Low Energy Selectable: The microprocessor control shall be easily field adjustable to comply with ANSI A156 – Full Energy or ANSI A156.19 – Low Energy Code requirements. Field adjustments for door-opening speed, door-opening force, door-closing speed, door-closing force shall be provided without the requirement for additional components. The system shall have the ability to be converted from Low Energy to Full Energy with simple field modifications and addition of Safety Sensors as outlined in ANSI A156.10.
- .4 Non-Handed Operation: The operator shall have the ability to be converted from right hand to left hand operation with simple field modifications.
- .5 Serviceability: To reduce on site spare parts requirements, the operator shall be designed to accommodate right hand, left hand, in-swing, out-swing, visible, concealed, low energy, and full energy applications with minimal field modifications/parts.
- .6 Field Adjustable Compression Spring Closing Operation: The operator shall close the door by spring energy. Employing the motor, as a dynamic brake shall aide-closing speed. The closing spring shall be a helical compression spring, adjustable for positive closing action at a low material stress level for long spring life. The helical compression spring shall be easily adjustable to accommodate a wide range of field conditions.
- .7 Independent Adjustable Closing and Latching Speed Control: The operator shall employ a rheostat module to allow for easy, independent field adjustment of closing and latching speeds using the motor as a dynamic brake.
- .8 Field Adjustable Open Stop: The operator shall provide a non-handed, easily field adjustable open stop to accommodate opening angles from 80 to 135 degrees without the need for additional components.
- .9 Consistent Cycle: Utilizing a cam and roller mechanical design profile, the operator shall deliver an even, consistent open force across the entire transition from door fully closed to door fully open. Additionally, the range of the force shall be easily field adjustable to accommodate a wide range of on-site conditions.

AUTOMATIC DOOR OPERATORS

- .10 Controlled Motion: The operator shall be designed to provide a positive position for full open and a positive position for full closed.
- .11 Split Force Path: The operator shall be designed such that abusive forces deployed to the door shall directly bypass the motor and gear train assembly and be delivered directly to the compression spring via actuator rods and a profile cam, thereby extending the life of the system.
- .12 Quiet Performance: The operator shall be designed to output audible noise ratios less than or equal to 50dba.
- .13 Field Removable Motor: The operator shall be designed to allow for motor removal and replacement in the field with simple tools and without the need for operator removal from the header assembly.
- .14 Auxiliary Switch: The operator shall incorporate an auxiliary switch allowing for monitoring of door position.
- .15 Manual Use: The operator shall function as a manual door closer in the direction of swing with or without electrical power. A cam and roller mechanism shall allow the operator to deliver an even, consistent open force across the entire transition from door fully closed to door fully open.
- .16 Emergency Release: For center pivot door(s)-normal in swing, the operator shall have a built-in emergency release with controlled spring return to the closed position without manual resetting. While the door is in the emergency release mode, a disconnect switch shall prevent powered operation. No header or jamb mounted stops or cams shall be required for emergency function. Not more than 50 pounds at the lock stile shall be required for emergency use per ANSI A157.10.
- .17 Aluminum Header Extrusions: Shall be minimum 0.156" wall thickness.
- .18 Aluminum Extrusion Finish: Standard anodized finish shall be AA-M12-C22-A31 Clear.
- .19 Header Case: Shall be 5-1/2" wide by 6" high (124mm wide by 152 mm high) aluminum extrusion with structurally integrated end caps. The operator shall be sealed against dust, dirt, and corrosion within the header case. Access to the operator and electronic control box shall be provided by a full-length removable cover, edge rabbetted to the header to ensure a flush fit.
- .20 Linkage Assembly: Shall provide positive control of door through entire swing; shall permit use of butt hung, center pivot, and offset pivot-hung doors.
- .21 Door Arm Assembly: Shall be a door arm assembly consisting of a forged steel arm which fastens into web of top rail. The door arm shall fasten to the factory installed reinforcing plate. All parts shall be concealed in the top web of the door. The door arm shall be splined to the operator drive spindle for maximum holding and strength. The door arm assembly shall have no moving parts.
- .22 Controls: push plates, with moulding. Controls shall be mounted at 36,5" (930mm) above finished floor.
- .23 Entrapment Protection: The door forces and speeds generated during power opening and manual opening in both directions of swing, and spring closing in both directions of swing shall conform to the requirements of ANSI A156.
- .24 Automatic Operators shall:
 - .1 Be capable of functioning on doors weighing up to 158Kg.
 - .2 Be non-handed
 - .3 Incorporate the following adjustment capabilities: opening force, closing force, open

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- speed, close speed and open check speed.
- .4 Incorporate a non-ferrous cover not exceeding 150mm square in section.
- .5 Incorporate a separate On-Off-Hold Open switch. Switch to be installed inside the unit.
- .6 Be microprocessor controlled and incorporate a position encoder.
- .7 Readily function with standard activation and safety sensors. Provide activation devices as required.
- .8 Function as a manual door closer without power applied, and shall power open/spring close with power applied.
- .9 Function with 115V AC electrical service for operator and standard low voltage connections for activation.

2.3 OPERATING CONDITIONS

- .1 Climatic Conditions: The operator shall be fully lubricated to minimize wear and friction of moving parts, and shall operate between -30 degrees F and +130 degrees F in all climatic conditions.

2.4 ELECTRICAL CONTROLS

- .1 Electrical control shall incorporate the following: An encoder on the motor shaft shall monitor revolutions and send signals to a microprocessor in the controller. Signals from the encoder define door position without using an external magnet and magnetic switch. The door position data is used for: carpet applications, electronic sensor (Sentrex) applications, open check calculation, MAGIC-TOUCH, and reverse-on-obstruction.
- .2 Full Energy / Low Energy Selectable: The microprocessor control shall be easily field adjustable to comply with ANSI A156.10 – Full Energy or ANSI A156.19 – Low Energy Code requirements. Field adjustments for door-opening speed, door-opening force, door-closing speed, door-closing force shall be provided without the requirement for additional components. Additionally the system shall have the ability to be converted from Full Energy to Low Energy with simple field modifications.
- .3 Life Cycle Data Counter (LCD): The microprocessor control shall incorporate an output to drive a non-re-settable counter used to aide in customer tailored maintenance programs.
- .4 Controller Protection: The microprocessor controller shall incorporate the following features to ensure trouble free operation. Automatic Reset Upon Power Up, Fuse Protection, Electronic Surge Protection, internal Power Supply Protection.
- .5 Learn speed. When power is first applied and an open signal is received, the controller shall open the door at a speed slightly faster than check speed which allows the controller to “learn” safely yet expediently.
- .6 A “watchdog” LED shall indicate that the controller is functioning properly by remaining lit (when power is on). Additional LED’s shall indicate proper operation of the motor encoder when the door moves.
- .7 The controller shall have program dip switched to allow selection or change at the following parameters: carpet or timer logic, single or dual door, normal operation or 2S logic, bifold sensor logic, normal back check or large back check, “MAGIC-TOUCH” on/off.
- .8 The MAGIC-TOUCH features shall allow door activation by manual action without the need for an approach sensor.
- .9 A “soft-start” “soft-stop” motor driving circuit shall be provided for smooth normal opening and recycling, thus minimizing loosening of doors, pivots, and frames.

- .10 A one second reverse-on-obstruction feature shall be provided to reverse door motion if an obstruction is met during door opening or closing.
- .11 A cam actuated emergency breakout switch shall be provided to disconnect power to the motor when an in-swinging door is manually pushed in the emergency out direction. The operator will then automatically reset and power will be resumed.
- .12 Fully adjustable opening speed and opening check speed. Control circuitry shall include a 0-30 second adjustable time delay.
- .13 Provide an internal transformer/power supply for approach sensor and Sentrex safety sensors.
- .14 Provide a "safety plus" – 1.5 seconds extension of both operate and safety signals after pressure has been removed from the control mats.
- .15 A safety carpet check feature shall monitor the safety carpet activation on every open cycle. If a safety carpet shall fail "open", the door shall be held open for 12 seconds as a signal to the owner that there is a problem.
- .16 Provide optional power-close accessory, provide optional closing speed control.

PART 3- EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for automatic entrances installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.
- .2 The door installer shall verify that the installation area is dry, clean and free of foreign matter. Check as-built conditions and verify the manufacturer's details for accuracy to fit the wall assembly prior to fabrication. Report in writing to the Contractor any detrimental conditions to the proper functioning of the swinging door operator and correct prior to any installation in accordance to manufacturer's recommendations

3.2 INSTALLATION

- .1 Provide 120 VAC, 10 amps minimum to electrical door operator. Electrical contractor shall provide service to each operator from junction box for multiple operators.
- .2 Installation shall be by an installer approved and trained by the manufacture in strict accordance with the manufacturer's instructions and fire marshal's listing requirements.
- .3 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .4 Install doors, frames, and screens in accordance with shop drawings and manufacturer's instructions.
- .5 Co-ordinate installation of components with related and adjacent work. Attach and seal air vapour barrier materials to perimeter framing. Attach and seal dampproofing flashings to perimeter framing.

- .6 Set work plumb, square, level, free from warp, twist and superimposed loads.
- .7 Securely anchor work in required position. Do not restrict thermal movement.
- .8 Brace frames rigidly for building-in. Supply temporary horizontal spreaders at third points of door openings to maintain frame width. Vertically support at centre, heads of openings over 1.2 m wide. Remove temporary bracing after framing is set.
- .9 Apply isolation coating to separate aluminum and primed or galvanized steel surfaces at points of contact with cementitious materials.
- .10 Pack fibrous insulation in shim spaces at perimeter of assembly [and void spaces between members to maintain continuity of thermal barrier.
- .11 Maintain clearances between head members and structure to ensure that structural loads are not transmitted to frames.
- .12 Install hardware using templates provided. Refer to Section 08 71 00 - Door Hardware for installation requirements.
- .13 Install door operator system in accordance with manufacturer's instructions, including piping controls, control wiring. Install remote power units.
- .14 Set tracks, header assemblies, operating brackets, rails and guides level and true to location, with adequate anchorage for permanent support.

3.3 FIELD QUALITY CONTROL

- .1 Have manufacturer of products supplied under this Section review Work involved in handling, installation/application, protection and cleaning of its products, and submit written reports in acceptable format to verify compliance of Work with Contract within 3 days of review.
- .2 Manufacturer's Field Services: submit manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.4 ADJUSTING

- .1 After repeated operation of completed installation equivalent to three days of use by normal traffic (100 to 300 cycles), readjust door operators and controls for optimum, smooth operating condition and safety and for weather tight closure. Lubricate hardware, operating equipment and other moving parts.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

3.6 DEMONSTRATION

- .1 Demonstrate operation, operating components, adjustment features, and lubrication requirements to Owner.

3.7 PROTECTION

- .1 Protect installed products and components from damage during construction.

- .2 Repair damage to adjacent materials caused by aluminum door and frame installation.

END OF SECTION

PART 1- GENERAL

1.1 GENERAL

- .1 Glazed Aluminum Curtain Wall and Window System (including glazing) is to meet or exceed requirements of SB-10 of the Ontario Building Code.
- .2 Contractor to submit in writing, certification and test results that the proposed systems (including glazing), meets or exceeds requirements of SB-10 of the Ontario Building Code.

1.2 REFERENCES

- .1 ASHRAE/IES 90.1-1989
- .2 ANSI/ASHRAE/USGBC/IES 189.1-2009
- .3 Aluminum Association (AA): AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
- .4 American Architectural Manufacturers Association (AAMA)
 - .1 AAMA CW-10-04, Care and Handling of Architectural Aluminum From Shop to Site.
 - .2 AAMA CW-11-85, Design Wind Loads and Boundary Layer Wind Tunnel Testing.
 - .3 AAMA T1R-A1-04, Sound Control for Fenestration Products.
 - .4 AAMA 501-05, Methods of Test for Exterior Walls.
 - .5 AAMA 611-98, Voluntary Specifications for Anodized Finishes Architectural Aluminum.
 - .6 AAMA 612-02, Voluntary Specifications, Performance Requirements, and Test Procedures for Combined Coatings of Anode Oxide and Transparent Organic Coatings on Architectural Aluminum.
 - .7 AAMA 2603-02, Voluntary Specification Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
 - .8 AAMA 2604-05, Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- .5 ASTM International
 - .1 ASTM A 36/A 36M-08, Specification for Carbon Structural Steel.
 - .2 ASTM A 123/A 123M-09, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM A 167-99(2009), Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .4 ASTM A 653/A 653M-09a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .5 ASTM B 209-07, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - .6 ASTM B 221-08, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - .7 ASTM E 283-04, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - .8 ASTM E 330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference.
 - .9 ASTM E 331-00(2009), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.
 - .10 ASTM E 413-04, Classification for Rating Sound Insulation.
 - .11 ASTM E 1105-00(2008), Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.

- .6 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 1.108-M89, Bituminous Solvent Type Paint.
 - .2 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.
- .7 CSA International
 - .1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA S136-07, North American Specification for the Design of Cold Formed Steel Structural Members.
 - .3 CAN/CSA-S157/S157.1-05, Strength Design in Aluminum/Commentary on CAN/CSA-S157, Strength Design in Aluminum.
 - .4 CSA W59.2-M1991(R2008), Welded Aluminum Construction.
- .8 Society for Protective Coatings (SSPC)
 - .1 SSPC - Paint 20-02(R2004), Zinc Rich Coating, Type I - Inorganic and Type II - Organic.
 - .2 SSPC - Paint 25 - 97(R2004) BCS, Zinc Oxide, Alkyd, Linseed Oil and Primer for Use Over Hand Cleaned Steel Type 1 and Type 2.
- .9 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-A2007, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Co-ordination: co-ordinate work of this Section with installation of fire stopping, air barrier placement, vapour retarder placement, flashing placement, installing ductwork to rear of louvres, perimeter heating, rough carpentry and components or materials.

1.4 EXAMINATION

- .1 Examine the structure to which work is to be fixed and report any deficiency which is detrimental to the proper installation of the work.
- .2 Verify all dimensions on site, and site dimension to ensure that adjustments in fabrication and installation are provided for and clearances to other construction have been maintained.
- .3 Report any defects discovered to the Architect and do not commence work before these have been remedied. Commencement of work shall be construed as acceptance of underlying conditions.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for curtain wall components, anchorage and fasteners, glass and infill, and internal drainage details and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario.

- .2 Indicate system dimensions, framed opening requirements and tolerances, adjacent construction, anchor details anticipated deflection under load, affected related Work, weep drainage network, expansion and contraction joint location and details, and field welding required.
- .4 Samples: Provide Mock-Up on Site as directed by Architect.
- .5 Test Reports:
 - .1 Submit substantiating engineering data, test results of previous tests by independent laboratory which purport to meet performance criteria, and supportive data:
 - .1 Window classifications A3, B7, C5 for opening windows, and A2, B2, C2 for fixed sash.
 - .2 Enamelled finish.
 - .3 Air tightness fixed rating.
 - .4 Water tightness B-7 rating.
 - .5 Wind load resistance C-5 rating.
 - .6 Condensation resistance I @58.1.
 - .7 Sash strength and stiffness – projecting.
 - .8 Ease of operation - windows with operable lights.
 - .9 Forced entry resistance.
 - .10 Mullion deflection - combination and composite windows.

1.6 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for glazed aluminum curtain wall and operating sashes for incorporation into manual.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Handle work of this Section in accordance with AAMA CW-10.
 - .2 Store materials off ground, indoors, in dry location, and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .3 Store and protect aluminum glazed curtain wall components from nicks, scratches, and blemishes.
 - .4 Protect prefinished aluminum surfaces with wrapping or strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
 - .5 Replace defective or damaged materials with new.

1.8 AMBIENT CONDITIONS

- .1 Install sealants when ambient and surface temperature is above 5 degrees C minimum.
- .2 Maintain this minimum temperature during and for 48 hours minimum after installation of sealants.

1.9 WARRANTY

- .1 From the date of Certificate of Substantial Performance, the hermetically sealed glazing units

shall be warranted for a period of **five (5) years** against vision obstruction due to the formation of dust or film on the internal surfaces, caused by the failure of the hermetic seal other than through glass breakage.

- .2 All other parts of the work shall be warranted against defects due to faulty materials and/or workmanship for a period of **three (3) years** from the date of the Certificate of Substantial Performance.
- .3 Repair and/or replace when so directed by the Architect, within the said periods, any and all portions of work which fail to perform according to the requirements of these Specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Extruded aluminum: to ASTM B 221.
- .2 All aluminum extrusions shall be 6063 TS aluminum alloy with a T5 temper. Sash members shall be tubular, with a nominal wall thickness of 1.5 mm generally and 2.3 mm at areas which receive operating hardware.
- .3 All visible interior portions of aluminum surfaces for frames and sashes shall be given anodic oxide treatment in accordance with Aluminum Association Specification AA-M12C22A31 #17 Clear.
- .4 All visible exterior portions of aluminum surfaces of frames and sashes shall be given a thermo setting acrylic enamel coating in accordance with CAN/CGSB 63-GP2M.
- .5 Exterior aluminum sills shall be break formed aluminum sheet metal of type and size as detailed and/or to suit job conditions, minimum 2mm thick, complete with joint covers, end caps and drip deflectors, drains, anchoring devices and end pieces. Sills shall be #17 clear anodized.
- .6 Insect screen framing shall be of same colour as curtain wall frames. Insect screen shall be black fiberglass mesh.
- .7 Weatherstripping: shall be flexible vinyl spline with durometer rating 60.
- .8 Sheet aluminum: to ASTM B 209. Shall be 3mm thick.
- .9 Sheet steel: to CSA S136 and ASTM A 653/A 653M; galvanized.
- .10 Steel sections: to CSA G40.20/G40.21, ASTM A 36/A 36M and ASTM A 167 Type 304 stainless; shaped to suit mullion sections.
- .11 Anchors: 3-way adjustable hot-dip galvanized cast iron.
- .12 Fasteners: stainless steel, finish to match curtain wall.
- .13 Bituminous paint: CAN/CGSB 1.108, without thinner.
- .14 Fire Safety Materials: see Section 07 84 00 - Fire Stopping.
- .15 Sealant: To CAN/CGSB-19.13, Class 40, one component cold-applied, non-sagging silicone. Acceptable material: Dow Corning 795.

2.2 HARDWARE

- .1 Provide two (2) locking claw handles.
- .2 Provide roto operators, under screen push bars if they are not acceptable.
- .3 For operating sashes, provide 100 mm limiters to restrict the extension of the sashes when in the open position.

2.3 FABRICATION

- .1 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- .2 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- .3 Prepare components to receive anchor devices. Install anchors.
- .4 Arrange fasteners and attachments to ensure concealment from view.
- .5 Prepare system components to receive exterior doors, and hardware.
- .6 Reinforce framing members for external imposed loads.
- .7 Visible manufacturer's identification labels not permitted.
- .8 Infill Panels:
 - .1 Fabricate infill panels with metal covered edge seals around perimeter of panel assembly, enabling installation and minor movement of perimeter seal.
 - .2 Reinforce interior surface of exterior panel sheet from deflection caused by wind and suction loads.
 - .3 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
 - .4 Place insulation within panel, adhered to exterior face of interior panel sheet over entire area of sheet with impale fasteners.
 - .5 Ventilate and pressure equalize the air space outside the exterior surface of the insulation, to the exterior.
 - .6 Arrange fasteners and attachments to ensure concealment from view.
- .9 Finishes:
 - .1 Exterior exposed aluminum surfaces: to AAMA A41 or A42 or A43, anodized, 0.7 mils thick or greater (Architectural Class I).
 - .2 Exterior exposed infill panel surfaces: to AAMA A43, Duranar Finish, Aluminum Colour.

2.4 ISOLATING COATING

- .1 Isolate aluminum from following components, by means of isolation coating:
 - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
 - .2 Concrete, mortar and masonry.

2.5 SOURCE QUALITY CONTROL

- .1 Perform work in accordance with AAMA GSM-1 and AAMA CW-I-9. Maintain 1 copy on site.
- .2 Manufacturer qualifications: company specializing in manufacturing the products specified in this section with minimum 3 years documented experience.

- .3 of a Professional Structural Engineer experienced in design of this Work and licensed at the place where the Project is located.
- .4 Perform welding Work in accordance with CSA W59.2.

2.6 FABRICATION

- .1 Fabricate in accordance with CAN/CSA-A440-00 supplemented as follows:
 - .1 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.
 - .2 Face dimensions detailed are maximum permissible sizes.
 - .3 Brace frames to maintain squareness and rigidity during shipment and installation.
 - .4 Finish steel clips and reinforcement for fire rated windows with 380 g/m² zinc coating to CSA G164.
- .2 Provide 2 mm thick, aluminum drip flashing at the head of ALL curtain walls.

2.7 INSULATED SANDWICH PANELS

- .1 At exposed exterior face of panel, provide 6 mm thick opaque spandrel glass. Opaque glass coating shall be DTG Coating System for Architectural Glass by PPG. Colour to be selected from manufacturer's full range of colours. Glass shall be **tempered** glass.
- .2 Insulate sandwich panels with minimum 100 mm thick semi-rigid insulation. Curtainrock semi-rigid insulation as manufactured by Roxul Inc.
- .3 Where back-up spandrel panels are exposed to view in the building interior, 3 mm (0.12") thick aluminum sheets shall be used. Finish shall match curtain wall frame.
- .4 Where back-up spandrel panel is not exposed to view use minimum 0.9 mm thick (20 gauge) galvanized sheet steel at interior face of panel.

2.8 VENTILATING SASH FABRICATION

- .1 Projected Ventilator Units: medium duty units with thermal break: to CAN/CSA-A440.3-98, Class A3, B7, C5, and D2, hopper vent, projecting in units.
 - .1 Acceptable Product: Alumicor UniVent 1375AW Insert Vent or Equivalent by Prevost or Kawneer.
 - .2 Colour to match curtain wall frame colour.
- .2 Sash members shall be factory assembled and shall have corners machine cut at 45 degrees with concealed structural corner fastening.
- .3 Entire perimeter of sash shall close on double flexible vinyl weatherstripping which is inserted into integral grooves in extruded aluminum sash and weathering sections to give two (2) point weathering contact.
- .4 One (1) piece sill adaptor shall be sloped to exterior for weathering.
- .5 Positive aligning corner clips shall be inserted into integral grooves to exterior face of sash.
- .6 Glazing stops shall be snap-in type, installed from the interior, and held in place by means of integral groove in sash surround.

- .7 As required, reinforce sashes to size of unit.
- .8 Provide two (2) vertical security cam handles per window vent. Cam handles shall be in a finish to match window colour. Supply and install gaskets with claws
- .9 For operating sashes, provide 100 mm limiters to restrict the extension of the sashes when in the open position.

2.9 CURTAIN WALL SYSTEM

- .1 Acceptable Product: Alumicor 2600 or equivalent by Prevost or Kawneer.
- .2 Provide reinforcing of mullions as required. Frame Depth: 168 mm (6.63")
- .3 Caps shall be 19 mm, unless noted otherwise.
- .4 Structural silicone joints where indicated.
- .5 The system shall be designed to meet wind load requirements, maximum stress of 0.96 KPA (20 PSI) and have a maximum deflection of L/200 of the span.
- .6 The entire curtain wall system shall be designed according to the "Open Rain Screen" principle and shall provide:
 - .1 Gaskets, sleeved spigotted joints, and seals necessary to ensure rain water does not enter the cavities of the system.
- .7 Mullion sections shall be tubular extruded sections when the system is designed for spigot joinery, and split mullion extruded sections when screw spline joinery is to be used. Incorporate split mullions as required to allow for thermal expansion.
- .8 All horizontal sections shall form equalized pressure and sealed gutter members.
- .9 Vertical expansion and construction joints shall be sleeved spigotted joints between mullion ends in combination with an applied sealant.
- .10 Provide structural steel supports, brackets and all anchoring to building structure, anchors shall have three-way adjustment. Welding shall be completed after curtain wall is aligned. Touch up painting of welded areas shall be done on site.

2.10 GLAZING OF CURTAIN WALL SYSTEM

- .1 Glaze curtain walls in accordance with CAN/CSA- A440. Refer to Section 08 80 50 for glass and glazing materials.

2.11 PUNCH WINDOW

- .1 Fixed Units: medium duty units with thermal break to CAN/CSA-A440.3-98, Classifications: fixed for air leakage, B3 (water leakage), C3 (wind load resistance), and D2 (condensation resistance):
 - .1 Acceptable Product: Kawneer 518 Isoport Window or Alumicor 970E series with a 189mm (6 1/4") frame or Prevost 1300 series.
 - .2 All frames shall be complete with factory installed rigid insulation in jamb, head, and sill sections.
- .2 Window frames shall be factory fabricated in accordance with reviewed shop drawings. They shall be cut, drilled and assembled using jigs to ensure proper hairline fit.

- .3 Overall depth of frame shall be 108 mm minimum. The maximum allowed sight lines shall be as follows. Except where noted otherwise, jamb, sill and head members only shall be open sections with an exterior face of 41 mm and an interior face of 25 mm. All intermediate members shall be tubular sections with an exterior face of 64 mm and an interior face of 25 mm approximately. Open sections for intermediate members shall not be acceptable.
- .4 Provide 2 mm thick, aluminum drip flashing at the head of the window.
- .5 Frame sections shall incorporate integral screw ports for mechanical fastening of all corners and intermediate joints. 38 mm, 1-1/2" #8 self-tapping screws or spigots shall be used.
- .6 All assembly screws, fixing screws, and fastenings of any nature shall be concealed. No exposed fastening devices shall be permitted.
- .7 Main framing member shall incorporate integral groove to receive snap-in glazing bead where applicable.
- .8 Provide 3 mm thick break formed aluminum sills to shapes and sizes shown on the drawings. Sills shall be complete with matching end pieces and anchors or brackets. Apply the specified finish after fabrication. Provide exterior and interior sills as indicated on drawings

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for aluminum curtain wall installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Verify dimensions, tolerances, and method of attachment with other work.
 - .3 Verify wall openings and adjoining air barrier and vapour retarder materials are ready to receive work of this Section.
 - .4 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .5 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION (GENERAL)

- .1 Install curtain wall and sloped glazing system in accordance with manufacturer's instructions.
- .2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- .3 Use alignment attachments and shims to permanently fasten system to building structure. Clean weld surfaces; apply protective primer to field welds and adjacent surfaces.
- .4 Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.
- .5 Use thermal isolation where components penetrate or disrupt building insulation.
- .6 Install sill flashings.
- .7 Install eave edge flashings at sloped glazing system.

- .8 Co-ordinate installation of fire stop insulation, specified in Section 07 84 00 - Fire Stopping, at each floor slab edge and intersection with vertical construction where indicated.
- .9 Co-ordinate attachment and seal of perimeter air barrier and vapour retarder materials.
- .10 Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- .11 Install fire-safing in areas as indicated.
- .12 Install operating sash in accordance with Section 08 80 50 - Glazing.
- .13 Install louvres, associated flashings, blank-off plates and screening. Fit blank-off plates tight to ductwork.
- .14 Install glass and infill panels in accordance with Section 08 80 50 – Glazing. Place sealant on the up-slope side of the pressure plate cover caps; finish the surface with a slope to encourage drainage over the cap. Cover caps to conceal screws and ensure continuous sightline.
- .15 Install perimeter sealant to method required to achieve performance criteria. Backing materials, and installation criteria in accordance with Section 07 92 00 - Joint Sealants.

3.3 INSTALLATION OF CURTAIN WALL SYSTEMS

- .1 Install curtain wall system in accordance with reviewed shop drawings. CAN/CGSB-A440.3-98 and to CAN/CGSB-63.14-M89.
- .2 Provide all steel angles, brackets, supports and anchors required for the complete installation.
- .3 Install curtain wall system plumb, level, square, free from warp, twist or other defect, and anchor securely to provide complete adequate resistance to stresses expected in service.
- .4 Make adequate provision for thermal expansion of the curtain wall system.
- .5 Secure and shim curtain wall system with non-corrosive and inorganic materials. Anchors, clips, blocking, shims, and all other attachments shall be concealed. Provide all fastenings and clips required for positive fastening of frames to concrete block wall and/or steel stud wall.
- .6 Fasteners at heads shall allow for minimum 12 mm deflection of the building structure.

3.4 SILL INSTALLATION

- .1 Aluminum sills shall be 2 mm thick break formed aluminum sheet metal of type and size as detailed and/or to suit job conditions, minimum 2 mm thick, complete with joint covers, jamb drip deflectors, anchoring devices and end pieces. Colour of sills to match curtain wall system colour.
- .2 Install sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use one piece at each location.
- .3 Secure sills in place with anchoring devices located at ends and evenly spaced 600 mm oc in between.
- .4 Fasten drip deflectors with self tapping Installation stainless steel screws.
- .5 Provide interior sills where shown on drawings. Fabricate from 2 mm thick formed aluminum to

shape and dimension indicated.

3.5 CAULKING (JOINT SEALANTS)

- .1 Seal joints between curtain wall frame and sill with sealant. Bed drip deflectors in bedding compound. Caulk between sill upstand and curtain wall frame. Caulk butt joints in continuous sills.
- .2 Apply sealants in accordance with Section 07 92 00 – Joint Sealants. Conceal sealant within curtain wall units except where exposed use is permitted by the Architect.

3.6 SITE TOLERANCES

- .1 Maximum variation from plumb: 1.5 mm/m non-cumulative or 12 mm/30 m, whichever is less.
- .2 Maximum misalignment of two adjoining members abutting in plane: 0.8 mm.
- .3 Maximum sealant space between curtain wall and adjacent construction: 13 mm.

3.7 FIELD QUALITY CONTROL

- .1 Inspection by independent testing agency will monitor quality of installation and glazing. Test system to: ASTM E 1105, and AAMA 501.
- .2 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer of curtain wall and glass verifying compliance of Work, in handling, installing, applying, protecting and cleaning of products, and submit written reports in acceptable format to verify compliance of Work with Contract within 3 days of review.
 - .2 Submit manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
 - .3 Ensure manufacturer's representative of curtain wall and glass is present before and during critical periods of installation.

3.8 ADJUSTING

- .1 Adjust operating sash for smooth operation.

3.9 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .2 Leave Work area clean at end of each day.
- .3 Remove protective material from prefinished aluminum surfaces.
- .4 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- .5 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.
- .6 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.10 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by glazed aluminum curtain wall installation.

END OF SECTION

PART 1- GENERAL

1.1 RELATED REQUIREMENTS

- .1 Architectural Millwork.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
 - .1 ANSI/BHMA A156.9-2003, Cabinet Hardware.
 - .2 ANSI/BHMA A156.11-2004, Cabinet Locks.
 - .3 ANSI/BHMA A156.16-2008, Auxiliary Hardware.
 - .4 ANSI/BHMA A156.18-2006, Materials and Finishes.
 - .5 ANSI/BHMA A156.20-2006, Strap and Tee Hinges and Hasps.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data: Submit manufacturer's instructions, printed product literature and data sheets for cabinet hardware and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Submit contract hardware list. Indicate specified hardware, including make, model, material, function, finish and other pertinent information.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for cabinet hardware for incorporation into manual.

1.5 QUALITY ASSURANCE

- .1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .2 The supplier shall satisfy himself as to the suitability of all hardware and advise the Architect of any discrepancies. All hardware installation shall be according to manufacturer's requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .4 Storage and Handling Requirements:

CABINET AND MISCELLANEOUS HARDWARE

- .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect cabinet hardware from nicks, scratches, and blemishes.
- .3 Protect prefinished surfaces with wrapping.
- .4 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 HARDWARE ITEMS

- .1 Use one manufacturer's product for all similar items.

2.2 FINISHES

- .1 Finish of all plated hardware shall be C32D, brushed stainless steel except where indicated otherwise.

2.3 QUANTITIES

- .1 Quantity and sizes shall be determined from drawings

2.4 CABINET HARDWARE

- .1 UPPER AND LOWER CABINETS WITH 19 MM (3/4") DOORS (PAIRS)
 - 2 pr. Hinges: Fully Concealed, 110 deg Modular opening, self-closing, Hettich Model #742-T-42. Use #8 screws for fastening.
 - 2 Pulls: C.B.H. Model 240 - 100mm C32D
 - Pilasters: No. 255ZC by K.V., length to suit (recessed)
 - Shelf Clips: No. 256 by K.V. (4 per shelf)
 - Door Dumpers: "Bump On" by 3M - clear rubber
- .2 ADJUSTABLE SHELVING STANDARDS
 - Pilasters: No. 255 ZC by K.V., length to suit (recessed)
 - Shelf Clips: No. 256 by K.V.
- .3 HOOKS FOR CUBBIES

Resettable "Henkel HDB003R" Hook. Colour to be selected by Owner
- .4 COAT RAILS

Chrome or nickel plated oval tube, 30 mm high x 15 mm wide, cut to required length. Provide matching end supports and intermediate hangers where required. Provide rails as indicated on drawings. Standard of acceptance: Richelieu #170-140 or 170-3-140, c/w #7837-180 end supports.
- .5 MISCELLANEOUS HARDWARE ITEMS

To be determined from drawings and millwork details. To suit conditions as required and to the satisfaction of the Architect

2.5 FASTENINGS

- .1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .2 Exposed fastening devices to match finish of hardware (use exposed fasteners only when approved in writing by Architect).
- .3 Use fasteners compatible with material through which they pass.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Install hardware to standard hardware location dimensions in accordance with manufacturer's recommendations and to project design requirements.

3.2 ADJUSTING

- .1 Adjust cabinet hardware for optimum, smooth operating condition.
- .2 Lubricate hardware and other moving parts.
- .3 Adjust cabinet door hardware to ensure tight fit at contact points with frames.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
 - .3 Remove protective material from hardware items where present.
 - .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.4 DEMONSTRATION

- .1 Brief maintenance staff regarding:
 - .1 Proper care, cleaning, and general maintenance of projects complete hardware.
 - .2 Description, use, handling, and storage of keys.
- .2 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by cabinet and miscellaneous hardware installation.

END OF SECTION

PART 1- GENERAL

1.1 RELATED SECTIONS

- .1 Section 08 11 00 - Metal Doors And Frames.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
 - .1 ANSI/BHMA A156.1-2000, American National Standard for Butts and Hinges.
 - .2 ANSI/BHMA A156.2-2003, Bored and Preassembled Locks and Latches.
 - .3 ANSI/BHMA A156.3-2001, Exit Devices.
 - .4 ANSI/BHMA A156.4-2000, Door Controls - Closers.
 - .5 ANSI/BHMA A156.5-2001, Auxiliary Locks and Associated Products.
 - .6 ANSI/BHMA A156.6-2005, Architectural Door Trim.
 - .7 ANSI/BHMA A156.8-2005, Door Controls - Overhead Stops and Holders.
 - .8 ANSI/BHMA A156.10-1999, Power Operated Pedestrian Doors.
 - .9 ANSI/BHMA A156.12-2005, Interconnected Locks and Latches.
 - .10 ANSI/BHMA A156.13-2002, Mortise Locks and Latches Series 1000.
 - .11 ANSI/BHMA A156.14-2002, Sliding and Folding Door Hardware.
 - .12 ANSI/BHMA A156.15-2006, Release Devices - Closer Holder, Electromagnetic and Electromechanical.
 - .13 ANSI/BHMA A156.16-2002, Auxiliary Hardware.
 - .14 ANSI/BHMA A156.18-2006, Materials and Finishes.
- .2 Canadian Steel Door and Frame Manufacturers' Association (CSDMA): CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames - 2009.
- .3 All hardware for fire rated openings shall meet ULC or Warnock-Hersey testing as required.
- .4 All fire and life safety codes shall be met as required by the authority having jurisdiction.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit manufacturer's instructions, printed product literature and data sheets for door hardware and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Hardware Schedule:
 - .1 Submit contract hardware list. Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
- .4 Manufacturer's Instructions: submit manufacturer's installation instructions.
- .5 Furnish other sections with two (2) complete sets of hardware templates for related fabricating and installation.
- .6 Submit for owner review and comments two (2) key schedules listing the door number, hardware heading or item, lock function and the key group.
- .7 Closeout Submittals

- .1 Provide operation and maintenance data for door closers, locksets, door holders electrified hardware and fire exit hardware for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.

1.4 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.
 - .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .4 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location, and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect door hardware from nicks, scratches, and blemishes.
 - .3 Protect prefinished surfaces with wrapping.
 - .4 Replace defective or damaged materials with new.

1.6 WASTE DISPOSAL AND MANAGEMENT

- .1 Separate and recycle waste materials in AND MANAGEMENT accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Dispose of corrugated cardboard polystyrene plastic packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

1.7 MAINTENANCE

- .1 Extra Materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00 – Closeout Submittals.
 - .2 Supply two sets of wrenches for door closers locksets and fire exit hardware.

PART 2 – PRODUCTS

2.1 HARDWARE ITEMS

- .1 Use one manufacturer's products only for similar items.

2.2 DOOR HARDWARE

- .1 Locks and latches:
 - .1 Locks and latches: to ANSI/BHMA A156.13, mortise lock sets, designed for function as stated in Hardware Schedule.
 - .2 Latch bolts to be anti friction with separate latch guard.
 - .3 ULC labels and 19mm throw for all fire rated doors.
 - .4 Auxiliary dead bolts to have hardened steel pin inserts.
 - .5 Lever trim is required, trim to have concealed through bolt mounting and the lever is to be solid cast or forged material with a return to the door face.
 - .6 Finished as stated in Hardware Schedule.
 - .7 Acceptable Manufacturers:
 - .1 Sargent.
- .2 Ball Bearing Hinges:
 - .1 Acceptable Manufacturers:
 - .1 Hager Companies
- .3 Continuous Hinges:
 - .1 Acceptable Manufacturers:
 - .1 Continuous Roton Hinges
- .4 Exit devices: to ANSI/BHMA A156.3 and ULC S132-93 (R2001).
 - .1 Low profile push pad style. Outside trim to have the same trim design as the locksets.
 - .2 Furnish all devices in dull chrome plated finish.
 - .3 Exit hardware must have the correct life safety or fire rated labels attached to the active case.
 - .4 Ensure that the actuating push pad covers 1/2 of the door opening.
 - .5 Exit devices installed on exterior doors to have dead latching bolts which ensure tamper proof security.
 - .6 Where pairs of doors are indicated, have two (2) vertical rod exit devices. Ensure that no overlapping astragal is used by the door manufacturer.
 - .7 Acceptable Manufacturers:
 - .1 Sargent
- .5 Door Closers and Accessories:
 - .1 Door controls (closers): to ANSI/BHMA A156.4.
 - .2 To have full adjustment features including back check, general speed, and latch speed control.
 - .3 All interior door closers to have reduced opening force spring power of 22N as required by the barrier free codes.
 - .4 Surface mounted door closers are to be located on the room side of the door whenever possible.
 - .5 Provide all mounting plates for door closers required to mount on special door and frame conditions. Check all door and frame details from related trades to ensure dimensions have not changed and hardware will not conflict with window lite kits.
 - .6 Where listed, door closers are to have full body covers to match the project finishes.
 - .7 Acceptable Manufacturers:
 - .1 LCN 4041.
- .6 Architectural door trim: to ANSI/BHMA A156.6, as listed in Hardware Schedule.
 - .1 All kick plates, push plates, and bumper plates must have all sides bevelled and corners rounded to ensure there are no sharp edges. Supply plates with tape mounting or if screws are listed, with counter sunk screw holes. The plates will be .050 thick unless

- listed otherwise. Size to suit door width. Kickplate will be door width less 35 mm for single door and less 25 mm for pairs of doors.
- .2 When push plates are listed with door pulls, install the push plate to conceal the through bolt.
- .3 Pulls to be supplied with back to back (BTB) or through bolt mounting.
- .4 All escutcheon plates to have a three digit room number engraved. Numbers to be 19mm high, Helvetica Medium, filled black.
- .5 Acceptable Manufacturers:
 - .1 Hager
- .7 Door stops and holders:
 - .1 Wall stops are only to be used on proper wall conditions such as block or masonry. Supply floor stops with sufficient height to suite the floor condition or undercut of doors.
 - .2 Overhead stops and holders to be surface mounted unless there is a conflict with door closers or other hardware. Provide door stays with friction action in locations that do not have door closers. Install overhead stops and holders for 90 DEG stop unless otherwise specified.
 - .3 Electronic door holder to be supplied to suit the specified voltage and be connected to the fire alarm system to release the door when signalled.
 - .4 Acceptable Manufacturers:
 - .1 Sargent
 - .2 Hager.
- .8 Door seals:
 - .1 Perimeter seals to be supplied to fully cover all gaps between the door, frame, and floor condition to seal against weather, sound, or smoke.
 - .2 Frame gasketing to be closed cell neoprene. The extruded housing to have a rib to prevent distortion during installation. Aluminum frames to be equipped with felt inserts by the frame supplier.
 - .3 Door bottoms will be heavy duty and have an adjustment screw to ensure proper contact with the floor. Supply the correct drop insert for carpet where required.
 - .4 Supply thermally broken thresholds for all exterior door openings.
 - .5 Acceptable Manufacturers:
 - .1 KN Crowder.

2.3 FASTENINGS

- .1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.
- .2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .3 Exposed fastening devices to match finish of hardware.
- .4 Use fasteners compatible with material through which they pass.

PART 3- EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Supply metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .3 Supply manufacturers' instructions for proper installation of each hardware component.

3.2 INSTALLATION

- .1 Install hardware to standard hardware location dimensions in accordance with CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction).
- .2 Use only manufacturer's supplied fasteners. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

3.3 ADJUSTING

- .1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure. If a manufacturer's representative has done this work, forward written confirmation of same.
- .2 Lubricate hardware, operating equipment and other moving parts.
- .3 Adjust door hardware to ensure tight fit at contact points with frames.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
 - .3 Remove protective material from hardware items where present.
 - .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

HARDWARE GROUPS ON FOLLOWING PAGES.

END OF SECTION

PART 1- GENERAL

1.1 RELATED REQUIREMENTS

- .1 Architectural Woodwork.
- .2 Metal Doors and Frames
- .3 Aluminum Doors and Frames
- .4 Glazed Aluminum Curtain Walls

1.2 GENERAL

- .1 Glazing System (including/tested with Aluminum Doors and Frames System, and Aluminum Doors and Frames) is to meet or exceed requirements of SB-10 of the Ontario Building Code.
- .2 Contractor to submit in writing, certification and test results that the proposed systems, meet or exceed requirements of SB-10 of the Ontario Building Code.

1.3 REFERENCES

- .1 ASHRAE/IES 90.1-1989
- .2 ANSI/ASHRAE/USGBC/IES 189.1-2009
- .3 ASTM International
 - .1 ASTM C 542-05, Standard Specification for Lock-Strip Gaskets.
 - .2 ASTM D 790-07e1, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 - .3 ASTM D 1003-07e1, Standard Test Method for Haze and Luminous Transmittance of Plastics.
 - .4 ASTM D 1929-96(R2001)e1, Standard Test Method for Determining Ignition Temperature of Plastics.
 - .5 ASTM D 2240-05, Standard Test Method for Rubber Property - Durometer Hardness.
 - .6 ASTM E 84-10, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .7 ASTM E 330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 - .8 ASTM F 1233-08, Standard Test Method for Security Glazing Materials and Systems.
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
 - .2 CAN/CGSB-12.2-M91, Flat, Clear Sheet Glass.
 - .3 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
 - .4 CAN/CGSB-12.4-M91, Heat Absorbing Glass.
 - .5 CAN/CGSB-12.6-M91, Transparent (One-Way) Mirrors.
 - .6 CAN/CGSB-12.8-97, Insulating Glass Units.
 - .7 CAN/CGSB-12.8-97 (Amendment), Insulating Glass Units.
 - .8 CAN/CGSB-12.9-M91, Spandrel Glass.
 - .9 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting.
 - .10 CAN/CGSB-12.11-M90, Wired Safety Glass.
 - .11 CAN/CGSB-12.12-M90, Plastic Safety Glazing Sheets.
 - .12 CAN/CGSB-12.13-M91, Patterned Glass.
- .5 Glass Association of North American (GANA)

- .1 GANA Glazing Manual - 2008.
- .2 GANA Laminated Glazing Reference Manual - 2009.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit manufacturer's instructions, printed product literature and data sheets for glass, sealants, and glazing accessories and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Submit samples for review and acceptance of each unit.
- .4 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for glazing for incorporation into manual.

1.6 QUALITY ASSURANCE

- .1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .2 Mock-ups: Construct mock-ups in accordance with Section 01 45 00 - Quality Control.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect glazing and frames from nicks, scratches, and blemishes.
 - .3 Protect prefinished aluminum surfaces with wrapping.
 - .4 Replace defective or damaged materials with new.

1.8 AMBIENT CONDITIONS

- .1 Ambient Requirements:
 - .1 Install glazing when ambient temperature is 10 degrees C minimum. Maintain ventilated environment for 24 hours after application.
 - .2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.9 WARRANTY

- .1 From the date of Certificate of Substantial Performance, the insulating glass units shall be warranted for a period of five (5) years against vision obstruction due to the formation of dust or film on the internal surfaces, caused by the failure of the hermetic seal other than through glass breakage.
- .2 Replace when so directed by the Architect, within the said periods, any and all portions of work which fail to perform according to the requirements of these specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Design Criteria:
 - .1 Ensure continuity of building enclosure vapour and air barrier using glass and glazing materials. Utilize inner light of multiple light sealed units for continuity of air and vapour seal.
 - .2 Size glass to withstand wind loads, dead loads and positive and negative live loads acting normal to plane of glass to design pressure designated for the geographical location of the project to ASTM E330.
 - .3 Limit glass deflection to 1/200 with full recovery of glazing materials.
- .2 Tempered glass: to CAN/CGSB-12.1-M90 Type 2, Class B, Category 11, 6 mm and 10 mm thickness.
 - .1 Thickness for display cases:
 - .1 Display case shelving shall be minimum 6 mm thick
 - .2 Display case glazing shall be laminated safety glass.
sliding glass: 6 mm thick
fixed glass: 10mm thick
 - .2 Acceptable Material: AFG Glass Inc., Concord, Ont., for items .1 and .2 above.
- .3 Clear sheet glass: to CAN/CGSB-12.2,A quality.
- .4 Polished plate or Float glass: to CAN/CGSB-12.3, glazing quality, 6 mm thick. For locations and sizes, see also millwork drawings and Door Schedule.
- .5 Fire-rated Glass:
 - .1 Install in 45 minute fire rated pressed metal frame and door. Fill frame with grout.
 - .2 Acceptable material: 45 min rated FireLite Plus, laminated, thickness 8mm, as manufactured by Technical Glass Products, Milton, Ontario or approved equivalent.
- .6 Insulating glass units:
 - .1 For windows and curtain wall system:
 - .1 Typical sealed glazed unit (total thickness 25mm):

Outer pane: 6 mm thick clear tempered glass to CAN/CGSB-12.4-M91
Cavity: 13mm, Air 5%/ Argon 95%/ Warm edge spacers
Inner pane: 6 mm thick tempered glass to CAN/CGSB-12.4-M91
-Low E coating on to located on third surface SolarBan 60

- .2 Opaque spandrel glass: Opaque spandrel glazing to CAN2-12.9, Duranar DTG coating by the Coating and Resins Group - PPG Industries, applied to 6 mm thick, heat strengthened, float glass. Coating colour to be selected from manufacturer's full range of colours.

2.2 GLAZING AND SEALING COMPOUND MATERIALS

- .1 Only compounds listed on the CGSB Qualified Sealing Compound Products List are acceptable for use on this project.
- .1 Glazing sealant: one part polysulphide to CAN/CGSB-19.13-M87 or one part silicone to CAN/CGSB-19.18-M87.
- .2 Glazing tape: preshimmed polyisobutylene: Polyshim by Tremco. 10-15 durometer hardness, paper release, black.
- .3 Glazing gasket: Tremco Vision Strip; colour selected by Architect.

2.3 ACCESSORIES

- .1 Setting blocks: neoprene, 80-90 Shore A durometer hardness to ASTM D 2240, minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height 6mm.
- .2 Spacer shims: neoprene, 80 Shore A durometer hardness to ASTM D 2240, 75 mm long x 2.4mm thick x 9mm high. Self adhesive on one face.
- .3 Glazing points and wire spring clips: corrosion resistant, manufacturer's standard.
- .4 Primer-sealers and cleaners: to glass manufacturer's standard.

2.4 FIRE RATED ASSEMBLIES

- .1 Provide and install Fire-rated glass in all doors and frames located in a fire separation. Lines of fire separations are shown on drawings.

PART 3 - EXECUTION

3.1 WORKMANSHIP

- .1 Remove protective coatings and clean contact surfaces with solvent and wipe dry
- .2 Apply primer-sealer to contact surfaces.
- .3 Place setting blocks as per manufacturer's instructions.
- .4 Install glass, rest on setting blocks, ensure full contact and adhesion at perimeter.
- .5 Install removable stops, without displacing tape or sealant.

- .6 Provide edge clearance of 3 mm minimum.
- .7 Insert spacer shims to centre glass in space. Place shims at 600 mm oc and keep 6 mm below sight line.
- .8 Apply cap bead of the specified TREMCO sealant at exterior void.
- .9 Apply sealant to uniform and level line, flush with sightline and tooled or wiped with solvent to smooth appearance.
- .10 Do not cut or abrade tempered, heat treated or coated glass.

3.2 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for glazing installation in accordance with manufacturer's written instructions.
 - .1 Verify that openings for glazing are correctly sized and within tolerance.
 - .2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.
 - .3 Visually inspect substrate in presence of Consultant.
 - .4 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .5 Proceed with installation only after unacceptable conditions have been remedied.

3.3 PREPARATION

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.

3.4 INSTALLATION: EXTERIOR - DRY METHOD (TAPE/TAPE AND SEALANT)

- .1 Manufacturer's Instructions: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.
- .3 Cut glazing tape to proper length and set against permanent stops 5 mm below sight line. Install horizontal strips first, extend over entire width of opening before applying vertical strips. Weld corners together by butting tape and dabbing with sealant.
- .4 Place glazing tape on glass in manner described above.
- .5 Drain infiltrated moisture to exterior through drain holes in sill.
- .6 Install locking strip and gasket assembly to manufacturer's instructions.
- .7 Trim protruding tape edge.

3.5 INSTALLATION: INTERIOR - DRY METHOD (TAPE AND TAPE)

- .1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.
- .2 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.
- .3 Place setting blocks at 1/3 points, with edge block maximum 150 mm from corners.
- .4 Rest glazing on setting blocks and push against tape for full contact at perimeter of light or unit.
- .5 Place glazing tape on free perimeter of glazing in same manner described.
- .6 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .7 Knife trim protruding tape.

3.6 FINISHING

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

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .1 Remove traces of primer, caulking.
 - .2 Remove glazing materials from finish surfaces.
 - .3 Remove labels.
 - .4 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.
- .2 Clean glass just prior to and immediately after installation. Remove glazers' dirt and stains, then wash and polish all surfaces and leave thoroughly clean
- .3 Install insect screens after final cleaning by General Contractor.
- .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.8 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 After installation, mark each light with an "X" by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units.
- .3 Repair damage to adjacent materials caused by glazing installation.

END OF SECTION

PART 1- GENERAL

1.1 RELATED REQUIREMENTS

- .1 Do work in accordance with CSA A82.31-M1980 and the C.G.C. Gypsum Construction Handbook Latest Edition, except where specified otherwise.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM C 475-02(2007), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .2 ASTM C 514-04(2009e1), Standard Specification for Nails for the Application of Gypsum Board.
 - .3 ASTM C 557-03(2009)e1, Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
 - .4 ASTM C 840-08, Standard Specification for Application and Finishing of Gypsum Board.
 - .5 ASTM C 954-07, 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.
 - .6 ASTM C 1002-07, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - .7 ASTM C 1047-09, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .8 ASTM C 1280-99, Standard Specification for Application of Gypsum Sheathing.
 - .9 ASTM C 1177/C 1177M-08, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 - .10 ASTM C 1178/C 1178M-08, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.
 - .11 ASTM C 1396/C 1396M-09a, Standard Specification for Gypsum Wallboard.
- .2 Association of the Wall and Ceilings Industries International (AWCI): AWCI Levels of Gypsum Board Finish-97.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .2 CAN/CGSB-71.25-M88, Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.
- .4 Underwriters' Laboratories of Canada (ULC): CAN/ULC-S102-07, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Provide shop drawings for the metal framing for suspended ceilings and bulkheads.
 - .2 Clearly indicate layout and dimensions, member sizes, profiles and thicknesses, connection details, fastening methods, and other pertinent information.
 - .3 The ceiling and bulkhead framing, including all related connections and fastenings, shall

be designed by a structural engineer permanently licensed to practice in the Province of Ontario. Each shop drawing shall bear the stamp and signature of the aforesaid structural engineer.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store gypsum board assemblies materials level, off ground, indoors, in dry location, and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect gypsum board assemblies from nicks, scratches, and blemishes.
 - .3 Protect from weather, elements and damage from construction operations.
 - .4 Handle gypsum boards to prevent damage to edges, ends or surfaces.
 - .5 Protect prefinished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
 - .6 Replace defective or damaged materials with new.

1.5 AMBIENT CONDITIONS

- .1 Maintain temperature 10 degrees C minimum, 21 degrees C maximum for 48 hours prior to and during application of gypsum boards and joint treatment, and for 48 hours minimum after completion of joint treatment.
- .2 Apply board and joint treatment to dry, frost free surfaces.
- .3 Ventilation: ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

1.6 FIRE RATED CONSTRUCTION

- .1 Provide wall and ceiling assemblies for fire rated partitions, and floor or roof assemblies to ULC test designs and National Building Code Fire performance Requirements indicated on drawings.

1.7 DESIGN CRITERIA

- .1 Design the suspended ceiling and bulkhead framing to be attached to and supported by the structure above.
- .2 The suspension system shall be capable of safely supporting the weight of all items which are designed to be supported by it, including, but not limited to:
 - .1 Light fixtures
 - .2 Diffusers
 - .3 Other items supported by the ceiling system.
- .3 Be advised that light fixtures will not be provided with separate support.
- .4 Design the suspension system to withstand normal and seismic loads.

- .5 Maximum deflection: 1/360 of span to ASTM C635 deflection test.

PART 2 - PRODUCTS

2.1 GENERAL ACCEPTANCE

- .1 For materials manufactured by CGC and listed in this specification section, equivalents can be proposed as manufactured by CertainTeed and Georgia-Pacific.

2.2 GYPSUM BOARD PANELS

- .1 Interior: abuse resistant paper faced gypsum core panel to CSA A82.27-M91, Type X, 16 mm thick as indicated on drawings, 1200 mm wide by maximum practical lengths, ends square cut, edges tapered with round edges.
- .2 Cement board for application at roof curbs: Duracrete exterior cement board: 12.7 mm thick, 1200 mm x 2400 mm as manufactured by C.G.C.
- .3 For canopies and Exterior Wall Assemblies (outer layer): Dens Glass Gold, 16mm thick, 1200mm x 2400mm.

2.3 METAL FURRING AND SUSPENSION SYSTEMS

- .1 Metal Furring Runners 0.87 mm (20 gauge), Hangers, Tie Wires, Inserts, Anchors: to CSA A82.30-M1980, hot dipped, galvanized.
- .2 Resilient Channels and Furring Channels: 0.87 mm (20 gauge) core thickness galvanized steel channels for screw attachment of all kinds of gypsum boards specified herein.

2.4 FASTENINGS AND ADHESIVES

- .1 Nails and Screws: to CSA A82.31-M1980, Type S, bugle head, fine thread, rust-resistant, sharp point drywall screw for light gauge metal framing or furring. Type S-12, bugle head, fine thread, rust-resistant, drill point drywall screw for heavy gauge (12-22 gauge) steel framing. Screws for exterior application shall be zinc coated or stainless steel.
- .2 Stud adhesive: to CAN/CGSB-71.25-M88.
- .3 Laminating compound as recommended by manufacturer.
- .4 Contact cement: premium grade.

2.5 JOINT TREATMENT MATERIAL

- .1 For Interior Use:
 - .1 Joint tape: 50 mm wide, high strength cross fibre paper tape for reinforcing joints, as manufactured by C.G.C. Inc.
 - .2 Joint compound: ready-mixed all-purpose drywall compound as manufactured by C.G.C. Inc.
- .2 For Exterior Use (Soffits):
 - .1 Joint tape for Dens-Glass Gold: 50 mm wide, 10 x 10 wove glass mesh joint tape.

- .2 Joint compound for Dens-Glass Gold: horizontal surfaces, G.P. gypsum "Speed Set 90" as manufactured by Georgia Pacific.
- .3 For Exterior Use (Vertical Surfaces):
 - .1 Joint tape: 50 mm wide, 10 x 10 woven glass mesh joint tape
 - .2 Joint finishing sealant: Dow Corning T95 building sealant, Tremco Dymonic.

2.6 ACCESSORIES

- .1 Casing Beads, Corner Beads, Control Joints: 26 gauge galvanized steel, as manufactured by The Canadian Gypsum Company:
 - .1 Casing Beads: C.G.C.-200B, the use of "J" trims is not permitted
 - .2 Corner Beads: No. 114, C.G.C Dur-A-BEAD.
 - .3 Control Joints: C.G.C. Control Joint # 093.
 - .4 Column Rings: At all round concrete columns (refer to drawings for quantities) intersecting with gypsum board bulkheads, provide shadow mould column rings. Rings equal to model CRR 144 as manufactured by C.G.C. Inc. All exposed surfaces of rings to be prefinished to match acoustical ceiling suspension system components.
 - .5 Edge mouldings and trims: Metal or extruded aluminum of types and profiles indicated. Provide flexible and fixed reveal shadow mouldings at all locations indicated. Reveal trim equal to model D-300 as manufactured by Bailey Metal Products Ltd.
- .2 Acoustic Sealant: to CAN/CGSB-19.21-M87. Sealants acceptable for use on this project must be listed on CGSB Qualified Product List issued by CGSB Qualification Panel for Joint Sealants.
- .3 Polyethylene: to CAN/CGSB-51GP-51M, Type 2.
- .4 Insulating Strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one (1) face; lengths as required.
- .5 Sound Attenuation Batts: 76 mm, friction fit, semi-rigid, mineral wool insulation with fire hazard classification of: flame spread 15, fuel contributed 0, and smoke developed 0. Acceptable material: Acoustical Fire Batt as manufactured by Roxul.
- .6 Fire Stopping Material: "Fire-Stop" as manufactured by AA/D Distributors.
- .7 Adhesive for Trim Accessories: "premium grade" contact cement.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for gypsum board assemblies installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 SUSPENDED AND FURRED CEILINGS AND BULKHEADS

- .1 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with CSA A82.31-M1980 except where specified otherwise.

- .2 Install work level to tolerance of 1:1200.
- .3 4 mm (9 gauge) hangers shall be spaced not over 1200 mm for interior applications, and not over 900 mm for exterior applications, in the direction of the 33 mm main runner channels and not over 1200 mm for interior applications, and not over 900 mm for exterior applications in the direction at right angles to the main runners, and within 150 mm of the ends of main runner runs and of boundary walls or similar interruptions of ceiling continuity. Secure hangers to u/s of over head steel structure. It is NOT PERMISSIBLE to attach hangers or channels from the steel deck. Where it is not possible to attach to steel structure, provide additional supports hung from steel structure.
- .4 Main runners shall be placed not over 1200 mm oc for internal applications, and maximum 900 mm oc for exterior applications, properly positioned, levelled, and hangers shall be saddle tied along runner.
- .5 Main runners shall not be let into nor come in contact with abutting walls. Runner channels shall be located within 150 mm, 6" of the walls to support the ends of the furring channels.
- .6 Except where shown otherwise, metal furring channels shall be spaced 450 mm oc for internal application and 300 mm oc for exterior application. Metal furring channels shall be securely clipped with furring channel clips or saddle tied with two (2) strands of 16 gauge tie wire to main runners or main support members and shall not be let into or come in contact with abutting masonry walls.
- .7 End splices shall be provided by nesting channels or studs no less than 200 mm and securely attached with wire.
- .8 Metal furring channel clips shall be installed on alternate sides of the main runner channel. Wire tie metal furring channel to 38 mm channel and to main support members when clips cannot be alternated.
- .9 At light fixtures or any openings that interrupt the main runner or channels, reinforce grillage with 19 mm cold rolled channels, wire tied atop and parallel to the main runner channels. Provide gypsum board boxing over fixtures or other devices to maintain fire resistance rating of one (1) hour. Size boxing of recessed light fixtures to meet fixture manufacturer's requirements for dissipation of heat.
- .10 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .11 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.
- .12 Install 22 x 68 mm C.G.C. furring channels parallel to, and at exact locations of steel stud partition header track.
- .13 Furr for gypsum board faced vertical bulkheads within or at termination of ceilings. Vertical furring shall be braced type wherever possible. Where bracing is impractical, furring shall be sized to suit the condition prevailing.
- .14 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

3.3 INSTALLATION OF SOUND ATTENUATION BATTS

- .1 Provide sound attenuation batts in **all interior walls**.

3.4 GYPSON BOARD APPLICATION (INTERIOR)

- .1 Do not apply gypsum board until bucks, anchors, blocking, electrical and mechanical work are reviewed by the Architect.
- .2 The use of crimpers shall be not permitted on this project.
- .3 Apply 12 mm diameter bead of acoustic sealant continuously around perimeter of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, etc., in partitions where perimeter is sealed with acoustical sealant.
- .4 Install acoustic fibrous material in all metal stud partitions both above and below the ceiling to achieve minimum STC 45 rating for partition.
- .5 Install specified layers of the specified wallboard to steel studs as indicated.
- .6 Apply the specified number of layers of gypsum wallboard over steel studs:
 - .1 one (1) layer: vertically
 - .2 two (2) layers: first layer horizontally, second layer vertically
- .7 Gypsum wallboard shall be screwed at 300 mm on centres at a maximum in the field of the board and 200 mm, 8" on centres along the vertical abutting edges.
- .8 Use 31.7 mm (1-1/4") screws for one (1) layer of wallboard; 63.4 mm (2-1/2") screws for two (2) layers of wallboard:
 - .1 first layer: apply with screws as specified in para .7 above
 - .2 second layer: laminate over first layer using the specified compound
- .9 Install sound attenuation batts as specified herein at all interior partitions, and elsewhere Specified herein or shown on the drawings. Press in tightly and staple to the back side of one (1) face of the partition.
- .10 Joints on opposite sides of the partition shall occur on different studs. Cut wallboard neatly to fit around all interruptions.
- .11 Install sealant at the perimeter and on both sides of all walls and at all interruptions.
- .12 All visible internal and external angles formed by the intersection of either wallboard surfaces or other surfaces shall be treated with vinyl trims, as specified herein and as indicated.
- .13 Carry all partitions to underside of concrete structure. Pack all gaps between deck and top of partitions with the specified sound attenuation batts. Use ULC approved fire stopping material for walls which are required to provide a smoke barrier or fire rating.
- .14 All abutting end or edge joints shall occur over the web surface of the furring channel and shall be fitted neatly and accurately with end joints staggered.
- .15 Gypsum wallboard shall be properly supported around all cutouts and openings in the ceiling.
- .16 Install casing beads around perimeter of suspended ceilings.
- .17 For diffusers and access panels see mechanical specifications and mechanical drawings for details to be complied with.

- .18 Install wire mesh in walls between Library and Teacher=s Lounge as per O.B.C. 4.1.10.3.

3.5 ACCESSORIES

- .1 Erect accessories straight, level, rigid, and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned, and rigidly secured. Mitre and fit corners accurately, and free of rough edges.
- .2 Install metal corner beads on external angles.
- .3 Install metal casing beads around perimeter of suspended ceilings.
- .4 Install metal casing beads where gypsum board butts against surfaces which have no trim to conceal the junction, and where indicated. Seal joints with sealant.
- .5 Install insulating strips continuously at edges of gypsum board or casing beads abutting metal window or exterior door frames, to provide thermal break.
- .6 Install metal casing beads where gypsum board butts dissimilar material.

3.6 ACCESS DOORS

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

3.7 TRIM

- .1 Minimize joints; use corner pieces as specified herein.

3.8 INSTALLATION OF GYPSUM WALLBOARD TREATMENT JOINT TREATMENT

- .1 All junctions of wallboard panels shall be taped and filled in accordance with the following:
 - .1 Joint compounds shall be mixed in accordance with manufacturer's instructions and CSA A82.31-M1980.
 - .2 Prefill abutting rounded edges of eased edge gypsum wallboard with pre-fill compound. Leave a depression for tape.
 - .3 Apply the specified reinforced tape; embed it in joint compound and fold it and embed it in all angles to provide a true angle.
 - .4 A filling coat shall be applied over the embedding coat to fill board tapers flush with the wallboard surface. On joints with no taper the fill coat shall cover the tape and feather out at least 100 mm on either side of the tape.
 - .5 A finishing coat shall be applied to the fill coat and feathered to a smooth uniform finish.
 - .6 To provide a smooth surface, sanding shall occur between coats and following the final application of compound.

3.9 CONTROL JOINTS

- .1 Construct control joints of preformed units set in gypsum board facing and supported independently on both sides of joint.
- .2 Provide continuous polyethylene dust barrier behind and across control joints.

- .3 For interior work, locate control joints at changes in substrate construction at approximate 10m spacing on walls, at approximate 15 m spacing on ceilings.
- .4 For exterior work, locate control joints as per manufacturer's recommendations.
- .5 Install control joints straight and true.

3.10 PATCHING AND MAKING GOOD

- .1 Patch and make good new surfaces cut, damaged or disturbed, to Architect's approval.
- .2 Making good shall extend beyond the immediate limits of the disturbed surfaces to ensure the imperceptible continuity of existing décor.

END OF SECTION

PART 1- GENERAL

1.1 RELATED REQUIREMENTS

- .1 Ontario Building Code (latest edition).
- .2 National Building Code of Canada (latest edition)
- .3 CAN3-S136, Cold Formed Steel Structural Members.
- .4 CSA-W47.1, Certification of Companies for Fusion Welding of Steel Structures
- .5 CSA-W59, Welded Steel Construction (Metal Arc Welding)
- .6 CAN-CGSB, 1-GP-181M Standard for: Coating, Zinc Rich, Organic Ready Mix

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM C 645-00, Specification for Nonstructural Steel Framing Members.
 - .2 ASTM C 754-00, Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .2 Canadian General Standards Board (CGSB): CAN/CGSB-1.40-97, Primer, Structural Steel, Oil Alkyd Type.

1.3 FIRE RATED CONSTRUCTION

- .1 Provide wall assemblies for fire rated partitions to ULC test designs.

1.4 DESIGN CRITERIA FOR EXTERIOR WALL STEEL CHANNEL STUD FRAMING AND AT EXTERIOR CANOPIES

- .1 The Design for the entire wall system and anchoring to the building structure shall be based principles using factored loads and resistances.
- .2 Loads and load factors shall be in accordance with the National Building Code of Canada.
- .3 Resistances and resistance factors shall be determined in accordance with the National Building Code and CAN3-S136.
- .4 Conform to the requirements of specified fire rated assemblies.
- .5 Design 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. Sheathing shall not be used to help restrain member rotation and translation perpendicular to the minor axis for: wind bearing studs.
- .6 Maximum deflections under specified loads shall be L/600.
- .7 Design components or assemblies to accommodate specified erection tolerances of the structure.
- .8 The spacing of member shall not exceed 400mm o.c.
- .9 Allow for movement of the building structure. Design wind bearing stud end connections to accommodate roof deflections such that the studs are not loaded axially.
- .10 Connections between stud framing members shall be by bolts, welding or sheet metal screws.

- .11 Resistances for sheet metal screw shall be based on the manufacturer's lower bound test values multiplied by the appropriate resistance factor, given in CAN3-S136.
- .12 Allow for appropriate end eccentricities in the design of axial load bearing members.

1.5 SUBMITTALS

- .1 Submit 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.
- .2 Submit 3 copies of engineering calculations or data verifying the capacity of the members and the ability of the assemblies to meet the design requirements.
- .3 Submit shop drawings in accordance with Section 01 33 00:
 - .1 Each shop drawing submitted shall bear the stamp and signature of a qualified Professional Engineer and registered in the Province of Ontario. The metal stud systems contractor shall retain the services of a Professional Structural Engineer for the Project and pay for engineering services in connection with shop drawings and review during construction of the metal stud systems.
 - .2 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 dimension, openings, requirement of related work and critical installation procedures. Show temporary bracing required for erection purposes.
 - .3 Indicate design loads.
- .4 Do not fabricate until all submittals are reviewed by Consultant. Submit 3 copies of field review reports from the Systems Contractors Structural Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 EXTERIOR WALL CHANNEL STUD FRAMING: to ASTM C645-81; stud side 152 mm deep; roll formed from minimum 18 gauge thickness electro-galvanized sheet steel; for screw attachment of cementitious sheathing board and gypsum board and steel girth. Knock out service holes at 460 mm centres.
- .2 EXTERIOR STUD WALL FLOOR TRACKS: to ASTM C645-81, in widths to suit stud sizes. 50 mm + flange height, to suit individual conditions. Gauge and finish to match exterior wall channel stud framing.
- .3 EXTERIOR STUD WALL TOP TRACKS: to ASTM C645-8, in width to suit stud sizes complete with long legged inner and outer top track to accommodate deflection of the building structure. Screwed top track deflection as per Baley Construction Detail No. 1. Gauge and finish to match wall stud framing.
- .4 NON-LOADBEARING CHANNEL STUD FRAMING FOR INTERIOR USE: to ASTM C645-81; 92 mm and 152 mm deep x 0.53 mm thick; roll formed from electrogalvanized steel sheet, for screw attachment of gypsum board. Knock out service holes at 460 mm centres.
- .5 NON-LOADBEARING CHANNEL STUD FRAMING FOR INTERIOR USE WITH ABUSE RESISTANT GYPSUM BOARD: to ASTM C645-81; 92 mm and 152 mm deep x 0.9 mm thick;

- roll formed from electrogalvanized steel sheet, for screw attachment of gypsum board. Knock out service holes at 460 mm centres
- .6 FLOOR AND TOP TRACKS FOR INTERIOR STUD WALLS: to ASTM C645-81; in widths to suit stud sizes, minimum 40 mm flange height. Top tracks for partitions located below steel roof or floor structures shall be deflection tracks which allow maximum 25 mm deflection of building structure.
 - .7 METAL CHANNEL STIFFENER FOR STUD WALLS: 2 mm thick by minimum 38 mm wide cold rolled steel, coated with rust inhibitive coating.
 - .8 SHAFT WALL CONSTRUCTION: C-H metal studs and Type S drywall screws. Refer to shaft wall construction in Section 09250.
 - .9 ACOUSTICAL SEALANT: to CGSB 19-GP-21M.
 - .10 INSULATING STRIP: rubberized, moisture resistant 3 mm thick neoprene strip, 12 mm wide, with self-sticking adhesive on one (1) face, lengths as required.
 - .11 SCREWS AND FASTENINGS FOR STUD WALL SYSTEM: purpose-made to suit application, to CSA-A82.31-M1980, Type S, shall be zinc coated, stainless steel for exterior stud wall system.

PART 3 - EXECUTION

3.1 ERECTION OF NON LOAD BEARING CHANNEL STUD FRAMING FOR INTERIOR USE

- .1 Align partition tracks at floor and underside of metal deck and concrete structure and secure at 400 mm o.c. maximum.
- .2 Place studs vertically at 400 mm o.c. and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.
- .3 Erect metal studding to tolerance of 1:1000.
- .4 Attach studs to bottom and top track or as detailed on drawings, using screws or crimp pop rivets.
- .5 Coordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.
- .6 Coordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.
- .7 Provide two (2) or more studs extending from floor to ceiling at each side of openings wider than stud centres specified or as shown on drawings. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
- .8 Provide one row of continuous horizontal of stiffener for all interior stud walls. At partitions over 3500 mm (12'-0") high provide two (2) rows. There upon provide one additional row of horizontal stiffener for every 1500 mm (5'0") height of partition.
- .9 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's printed instructions. Install intermediate studs above and below openings in same

manner and spacing as wall studs.

- .10 Provide 40 mm stud or furring channel and wood blocking as required secured between studs for attachment of millwork, fixtures, etc., and other items including wall stops for doors, towel rails, etc., attached to steel stud partitions.
- .11 Install steel studs or furring channel between studs for attaching electrical and other boxes.
- .12 Extend partitions to underside metal deck and/or concrete except where noted otherwise.
- .13 Maintain clearance under steel structure to avoid transmission of structural loads to studs. Use 50 mm leg top tracks with stud connections at these locations to allow for movement. Refer to drawings for additional details.
- .14 Install continuous insulating strips to isolate studs from uninsulated surfaces.
- .15 Install two (2) continuous beads of sealant behind studs and tracks around perimeter of all partitions.
- .16 Extend studs vertically and tie to structure to provide lateral stability.
- .17 Provide diagonal bracing above ceilings as required to meet design criteria.

Frame all openings in fire rated partitions, inclusive of mechanical and electrical Channel openings, to ULC-G21, Figures 4, 5, 6, 7, 8 for and 15, ULC CR 1255, Figures 1 and 2, and ULC Certification Bulletin #80-5.

3.2 ERECTION OF EXTERIOR WALL STEEL CHANNEL STUD FRAMING

- .1 Erection Tolerances:
 - .1 For the purposes of this section, camber is defined as the deviation from straightness of a member or any portion of a member with respect to its major axis, and sweep is defined as the deviation from straightness of a member or any portion of a member with respect to its minor axis.
 - .2 Straightness shall not exceed 1/1000 th of the member length.
 - .3 For exterior steel studs, out of plumbness shall not exceed 1/500 th of the member length. Out of straightness (camber and sweep) shall not exceed 1/100 th of the member length.
 - .4 For track, camber shall not exceed 1/1000 th 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 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.
- .2 Make all field measurement necessary to insure the proper fit of all members.
- .3 Cutting of members may be by saw or shear. Exterior wall steel torch cutting is not permitted.
- .4 Insulation equal to that specified shall be placed in all jamb and header assemblies that will be inaccessible after their installation into the wall. Insure that insulation is kept dry and not compressed.

3.3 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1- GENERAL

1.1 RELATED WORK

- .1 Section 09 53 00 Acoustic Suspension.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C 423-02a, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
 - .2 ASTM E 1264-98, Standard Classification for Acoustical Ceiling Products.
 - .3 ASTM E 1477-98a(2003), Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction and Amendment No. 1 1988.
 - .2 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.
- .3 Canadian Standards Association (CSA International): CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS): Material Safety Data Sheets (MSDS).
- .5 Underwriter's Laboratories of Canada (ULC): CAN/ULC-S102-2003, Surface Burning Characteristics of Building Materials and Assemblies.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate samples of each type acoustical units.

1.4 QUALITY ASSURANCE

- .1 Regulatory Requirements: Fire-resistance rated floor/ceiling and roof/ceiling assembly: certified by Canadian Certification Organization accredited by Standards Council of Canada.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Protect on site stored or installed absorptive material from moisture damage.
- .2 Store extra materials required for maintenance, where directed by Owner.

1.6 ENVIRONMENTAL REQUIREMENTS

- .1 Permit wet work to dry before beginning to install.
- .2 Maintain uniform minimum temperature of 15 degrees C and humidity of 20-40% before and during installation.

- .3 Store materials in work area 48 hours prior to installation.

1.7 EXTRA MATERIALS

- .1 Provide extra materials of acoustic units in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide acoustical units amounting to 2% of gross ceiling area for each pattern and type required for project.
- .3 Ensure extra materials are from same production run as installed materials.
- .4 Clearly identify each type of acoustic unit, including colour and texture.
- .5 Deliver to Owner, upon completion of the work of this section.

1.8 EXAMINATION

- .1 Examine all items on which the installation depends and ensure that there are no defects. Ensure that all mechanical, electrical, or other equipment that has to be installed before commencing of work is in place.

1.9 CERTIFICATION OF SUSPENSION SYSTEM

- .1 Provide and pay for structural engineering and design for the suspension system.
- .2 Maximum deflection: 1 / 360th of span to ASTM C3635 deflection test.
- .3 The design of the suspension system and anchoring to the building structure shall be based on the principles using factored loads and seismic restraints in accordance w/ the 2006 OBC and the user's guide NBC 2005 structural commentary. Submit shop drawings stamped by Engineer licensed in the Province of Ontario.
- .4 Resistances and resistance factors shall be determined in accordance with the 2006 OBC and CAN/CSA S136.
- .5 Contractor to submit a letter stamped by Engineer licensed in the Province of Ontario, inspecting and certifying the Suspension System.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Lay-in Acoustic Tile:
 - .1 Acoustic tile Type 1 shall be moulded mineral fibre tile, fire rated, 16 mm thick and 610 mm x 1220 mm. Acceptable Material: Baroque Mineral Fiber Ceiling – PBT-197, as manufactured by CertainTeed.

PART 3- EXECUTION

3.1 EXAMINATION

- .1 Do not install acoustical panels and tiles until work above ceiling has been inspected by Consultant.

3.2 INSTALLATION

- .1 Install acoustical panels and tiles in ceiling suspension system.
- .2 Ensure substrate surface is level to 1:1000
- .3 In fire rated ceiling systems, secure lay-in panels with hold-down clips and protect over light fixtures, diffusers, air return grilles and other appurtenances according to Certification Organizations design requirements.

3.3 APPLICATION

- .1 Install acoustical units parallel to building lines with edge unit not less than 50% of unit width. Refer to reflected ceiling plan.
- .2 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.

3.4 INTERFACE WITH OTHER WORK

- .1 Co-ordinate with Section 09 53 00 - Acoustical Suspension.
- .2 Co-ordinate ceiling work to accommodate components of other sections, such as light fixtures, diffusers, speakers, sprinkler heads, to be built into acoustical ceiling components.

END OF SECTION

PART 1- GENERAL

1.1 EXAMINATION

- .1 Examine all drawings, notes on drawings and items on which the installation depends. Ensure that all mechanical, electrical, or other equipment that has to be installed before commencement of the work is in place.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM C 635/C 635M-07, Standard Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - .2 ASTM C 636/C 636M-08, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for acoustical suspension for incorporation into manual.

1.5 QUALITY ASSURANCE

- .1 Fire-resistance rated suspension system: certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 DELIVERY, STORAGE AND HANDLING

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

1.7 CERTIFICATION OF SUSPENSION SYSTEM

- .1 Provide and pay for structural engineering and design for the suspension system.
- .2 Maximum deflection: 1 / 360th of span to ASTM C3635 deflection test.
- .3 The design of the suspension system and anchoring to the building structure shall be based on the principles using factored loads and seismic restraints in accordance w/ the 2024 OBC and the user's guide NBC 2005 structural commentary. Submit shop drawings stamped by Engineer licensed in the Province of Ontario.

- .4 Resistances and resistance factors shall be determined in accordance with the 2024 OBC and CAN/CSA S136.
- .5 Contractor to submit a letter stamped by Engineer licensed in the Province of Ontario, inspecting and certifying the Suspension System.

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

- .1 Design Requirements: maximum deflection: 1/360th of span to ASTM C 635/ASTM C635M deflection test.

2.2 MATERIALS

- .1 Components: all main beams and cross tees shall be commercial quality hot dipped galvanized steel as per ASTM A 653. main beams and cross tees are double-web steel construction with 15/16 type exposed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.
 - .1 Structural Classification: ASTM C 635 Intermediate Duty.
 - .2 Colour: White and to match the actual colour of the selected ceiling tile, unless noted otherwise.
 - .3 Acceptable Products:
 - .1 Fire Rated, two directional 25 mm (15/16") exposed tee-bar grid system for acoustic tiles:
 - .1 Acceptable Manufacturers:
 - .1 Certain Teed Ceilings, 15/16" Classic, Fire Rated, or equivalent.
- .2 Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- .3 Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, prestretched, with a yield stress load of at least time three design load, but not less than 12 gauge.
- .4 Edge Mouldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard Mouldings for edges and penetrations, including light fixtures that fit type of edge detail and suspension system indicated. Provide flexible and fixed reveal shadow moulding with exposed flange of the same width as exposed runner.
- .5 Accessories: splices, hold down clips, wire ties, retainers and wall moulding reveal, to complement suspension system components, as recommended by system manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for acoustical ceiling tile and track installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Installation: to ASTM C 636/C 636M except where specified otherwise.
- .3 Install suspension system to manufacturer's instructions and Certification Organizations tested design requirements.
- .4 Do not erect ceiling suspension system until work above ceiling has been inspected and approved by Consultant.
- .5 Secure hangers to overhead structure using attachment methods acceptable to Consultant. It is **NOT PERMITTED** to attach hangers or similar fasteners to the steel deck or concrete beams. X-ray hollow core roof prior to installation of hangers.
- .6 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.
- .7 Lay out system according to reflected ceiling plan.
- .8 Ensure suspension system is co-ordinated with location of related components.
- .9 Support at light fixtures diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .10 Interlock cross member to main runner to provide rigid assembly.
- .11 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.
- .12 Install access splines to provide 50% ceiling access.
- .13 Finished ceiling system to be square with adjoining walls and level within 1:1000.
- .14 Where it is not possible by direct suspension to support the ceiling grid or other components in the ceiling assembly as specified, provide a secondary suspension system to support the required ceiling hangers
- .15 Expansion joints:
 - .1 Erect two main runners parallel, 50 mm apart, on building expansion joint line. Lay in strip of acoustic tile/board, 25% narrower than space between 2 'T' bars.
 - .2 Supply and install "Z" shaped metal trim pieces at each side of expansion joint. Design to accommodate plus or minus 25 mm movement and maintain visual closure. Finish metal components to match adjacent exposed metal trim. Provide backing plates behind butt joints.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning. Leave Work area clean at end of each day.
- .2 Touch up scratches, abrasions, voids and other defects in painted surfaces.
- .3 Clean exposed trim, edge moulding, shadow moulding and suspension members.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by acoustical suspension installation.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM D 2047, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
 - .2 ASTM E 648, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
 - .3 ASTM F 137, Standard Test Method of Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus.
 - .4 ASTM F 1514, Standard Test Method of Measuring Heat Stability of Resilient Flooring by Color Change.
 - .5 ASTM F 1515-21, Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change.
 - .6 ASTM F 1913-19, Standard Specification for Vinyl Sheet Floor Covering without Backing.
 - .7 ASTM F 925, Standard Test Method of Resistance to Chemicals of Resilient Flooring.
 - .8 ASTM F 970, Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading.
- .2 Standards Council of Canada (CAN/ULC)
 - .1 CAN/ULC S102.2-07, Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide product data in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit duplicate 300 x 300 mm sample pieces of sheet material, 300 mm long base and edge strips.
- .4 Closeout Submittals:
 - .1 Provide maintenance data for resilient flooring for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.3 QUALITY ASSURANCE

- .1 Installer Qualifications: Trained journeymen with a minimum of five years successful experience in the installation of welded vinyl sheet flooring.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

1.5 AMBIENT CONDITIONS

- .1 Maintain air temperature and structural base temperature at flooring installation area above 20 degrees for 48 hours before, during and 48 hours after installation.

1.6 MAINTENANCE

- .1 Extra Materials:
 - .1 Provide extra materials of resilient sheet flooring and adhesives in accordance with Section 01 78 00 - Closeout Submittals.
 - .2 Provide 5 m² of each colour, pattern and type flooring material required for project for maintenance use.
 - .3 Extra materials: one piece and from same production run as installed materials.
 - .4 Identify each roll of sheet flooring and each container of adhesive.
 - .5 Deliver to Owner upon completion of the work of this section.
 - .6 Store where directed by Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Resilient Sheet Flooring Materials:
 - .1 Provide Homogeneous non-directional patterned sheet flooring, Aria, as produced by Tarkett. Color to be determined from the range currently available from Tarkett. 2 m wide, having a nominal total thickness of 2.00 mm. UV-cured factory applied polyurethane finish on homogeneous vinyl construction.
 - .2 Provide Solid Colour Vinyl Weld Rod as produced by Tarkett., and intended for heat welding of seams. Colour shall be compatible with field colour of flooring or as selected by architect to contrast with field colour of flooring. Colour selected from the range currently available from Tarkett.
- .2 Wall Base Material:
 - .1 Johnsonite Dura Cove, 100mm high x 3mm thick rubber base. Base shall be coved. Colour to be determined from the range currently available from Tarkett.
- .3 Adhesives:
 - .1 Provide Tarkett RollSmart Flooring Adhesive Flooring.
- .4 Accessories:
 - .1 For Patching, smoothing, and leveling monolithic subfloors, Provide Mapei PlaniPatch or Ardex Feather Finish.
 - .2 For Sealing Joints between the top of wall base or integral cove cap and irregular wall surfaces such as masonry, provide plastic filler applied according to the manufacturer's recommendations.
 - .3 Provide transition/reducing strips tapered to meet abutting materials, if required.
 - .4 Provide threshold of thickness and width as shown on the drawings.
 - .5 Provide resilient edge strips, of equal gauge to the flooring, homogeneous vinyl or rubber composition, tapered or bullnose edge, with colour to match or contrast with the flooring, or as selected by the architect from standard colors available.

- .6 Provide metal edge strips of required thickness to protect exposed edges of the flooring . Provide units of maximum available length to minimize the number of joints. Use butt-type metal edge strips for concealed anchorage, or overlap - type metal edge strips for exposed anchorage. Unless otherwise shown, provide strips made of extruded aluminum with a mill finish.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 SITE VERIFICATION OF CONDITIONS

- .1 Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.
- .2 Examine Subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.
- .3 Examine. Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold or mildew.
- .4 Report Conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.
- .5 Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates regarding conditions existing at the time of installation.

3.3 PREPARATION

- .1 Remove existing resilient flooring.
- .2 Remove or treat old adhesives to prevent residual, old flooring adhesives from bleeding through to new flooring and/or interfering with the bonding of new adhesives.
- .3 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.
- .4 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with sub-floor filler.
- .5 Seal concrete slab to resilient flooring manufacturer's printed instructions.

3.4 APPLICATION: FLOORING

- .1 Provide high ventilation rate, with maximum outside air, during installation, and for 48 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.
- .2 Apply adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.
- .3 Lay flooring with seams parallel to building lines to produce a minimum number of seams. Border widths minimum 1/3 width of full material.
- .4 Heat weld seams of sheet flooring in accordance with manufacturer's printed instructions.
- .5 As installation progresses, and after installation roll flooring with 45 kg minimum roller to ensure full adhesion.
- .6 Cut flooring around fixed objects.
- .7 Install feature strips and floor markings where indicated. Fit joints tightly.
- .8 Install flooring in pan type floor access covers. Maintain floor pattern.
- .9 Continue flooring over areas which will be under built-in furniture.
- .10 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.
- .11 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- .12 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.5 APPLICATION: BASE

- .1 Lay out base to keep number of joints at minimum.
- .2 Clean substrate and prime with one coat of adhesive.
- .3 Apply adhesive to back of base.
- .4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.
- .5 Install straight and level to variation of 1:1000.
- .6 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.
- .7 Cope internal corners. Use premoulded corner units for right angle external corners. Use formed straight base material for external corners of other angles.

3.6 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:

- .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.7 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Remove excess adhesive from floor, base and wall surfaces without damage.
- .3 Clean floor and base surface to flooring manufacturer's printed instructions.
- .4 Seal and wax to be applied by Owner.

3.8 PROTECTION

- .1 Protect new floors from time of final set of adhesive until final inspection.
- .2 Prohibit traffic on floor for 48 hours after installation.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM F 1066-04, Standard Specification for Vinyl Composition Floor Tile.
 - .2 ASTM F 1344-04, Standard Specification for Rubber Floor 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.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS): Material Safety Data Sheets (MSDS).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide product data in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

1.4 ENVIRONMENTAL REQUIREMENTS

- .1 Maintain air temperature and structural base temperature at flooring installation area above 20 degrees C for 48 hours before, during and for 48 hours after installation.

1.5 MAINTENANCE

- .1 Provide maintenance materials of resilient tile flooring, base and adhesive in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide 5% of each colour (or one full box, whichever is greater), pattern and type flooring material required for this project for maintenance use.
- .3 Extra materials from same production run as installed materials.
- .4 Identify each container of floor tile and each container of adhesive.
- .5 Deliver to Owner, upon completion of the work of this section.
- .6 Store where directed by Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Filler, Primer, and Adhesives: Type and brand recommended by the flooring materials manufacturer for applicable conditions. Adhesives shall be waterproof.
- .2 Vinyl Tile: In accordance with CSA Specification A-126-1-1984, Type A, plain and mottled. accepted manufacturer: Armstrong, product: Armstrong Excelon or equivalent product by Flextile. Tile shall be 3 mm thick, 300 x 300 mm size. Floor tile colours are as follows:
RFT-1 – 5934 Silk
RFT-2 – 57551 Perfect Storm
RFT-3 – 51929 Sandy Beach
- .3 Rubber Base: Johnsonite Dura Cove, 100 mm high x 3 mm thick rubber base. Base shall be coved. Colour: Silver Grey WG.
- .4 Transition strips, expansion/control joint trims/covers as per manufacturer's recommendations at all transitions of dissimilar material and control joints, or as indicated
- .5 Feature strips: of same material and thickness as adjacent work.
- .6 Sub-floor filler and leveller: as recommended by flooring manufacturer for use with their product.
- .7 Metal edge strips: aluminum extruded, smooth, mill finish with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.
- .8 Sealer: to CAN/CGSB-25.20, Type 2-water based, recommended by flooring manufacturer.

PART 3- EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSPECTION

- .1 Ensure concrete floors are dry, by using test methods recommended by tile manufacturer.

3.3 SUBSTRATE TREATMENT

- .1 Remove existing resilient flooring.
- .2 Remove old adhesives to prevent residual, old flooring adhesives from bleeding through to new flooring and/or interfering with the bonding of new adhesives (to Manufacturer's Recommendations).
- .3 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

- .4 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
- .5 Prime and Seal substrate to flooring manufacturer's printed instructions.

3.4 TILE APPLICATION

- .1 Provide high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.
- .2 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place. Ensure compatibility of adhesives with floor and wall surfaces.
- .3 Lay flooring with joints parallel to building lines to produce symmetrical tile pattern. Border tiles minimum half tile width.
- .4 Install flooring to square grid pattern with joints aligned.
- .5 As installation progresses, and after installation, roll flooring in 2 directions with 45 kg minimum roller to ensure full adhesion or as per Manufacturer's written Recommendations.
- .6 Cut tile and fit neatly around fixed objects.
- .7 Install feature strips and floor markings where indicated. Fit joints tightly.
- .8 Install flooring in pan type floor access covers. Maintain floor pattern.
- .9 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.
- .10 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.
- .11 Install rubber base at all vertical surfaces in rooms called up to have rubber base by the Room Finish Schedule.
- .12 Joints in the rubber base shall be tight and no part of the joint shall exceed 1 mm in width. Joints shall occur no more frequently than every 1200 mm except where the vertical surface changes plane.
- .13 Provide rubber transition edging at junctions between resilient flooring and exposed or painted concrete floors.
- .14 At junctions with ceramic tile flooring and resilient sports flooring, use cementitious product feather subfloor to provide a flash finish between top of vinyl tile and top of ceramic tile floor finish. Apply feathered transition over a distance of 1200 mm minimum
- .15 Install metal edge strips at unprotected or exposed edges where flooring terminates.
- .16 Concrete shall be at least twenty-eight (28) days old before tile is applied.

3.5 APPLICATION: BASE

- .1 Lay out base to keep number of joints at minimum.
- .2 Clean substrate and prime with one coat of adhesive.
- .3 Apply adhesive to back of base.
- .4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.
- .5 Install straight and level to variation of 1:1000.
- .6 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.
- .7 Cope internal corners. Use premoulded corner units for right angle external corners. Use formed straight base material for external corners of other angles.

3.6 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services: Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.7 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Remove excess adhesive from floor, base and wall surfaces without damage.
- .3 Clean, seal and wax floor and base surface to flooring manufacturer's instructions.

3.8 PROTECTION

- .1 Protect new floors from time of final set of adhesive until final inspection.
- .2 Prohibit traffic on floor for 48 hours after installation.

END OF SECTION

PART 1 – GENERAL

.1 RELATED REQUIREMENTS

- .1 Section 03 30 00 - Cast-in-place Concrete.

.2 REFERENCE STANDARDS

- .1 ASTM International
 - 1. ASTM C 241/C 241M-13, Standard Test Method for Abrasion Resistance of Stone Subject to Foot Traffic.
 - 2. ASTM D 2370-98(r20100), Standard Test Method for Tensile Properties of Organic Coatings.
- .2 Canadian General Standards Board (CGSB)
 - 1. CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - 2. CAN/CGSB-25.20-95, Surface Sealer for Floors.
- .3 CSA Group (CSA)
 - 1. CSA A23.1/A23.2-09(R2014), Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - 2. CSA A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - 1. Safety Data Sheets (SDS)
- .5 Terrazzo, Tile and Marble Association of Canada (TTMAC)
 - 1. Maintenance Guide.
 - 2. TTMAC/CSCTEK-AID 09 40 00, Portland Cement Terrazzo Digest.
 - 3. TTMAC 2012/2014 Specification Guide 09 30 00 Tile Installation Manual.
 - 4. TTMAC 09 66 00 Terrazzo Installation Manual.

.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data:
 - 1. Submit manufacturer's instructions, printed product literature and data sheets for aggregate terrazzo flooring and include product characteristics, performance criteria, physical size, finish and limitations.
 - 2. Submit 2 copies of TTMAC Maintenance Guide for inclusion in operations and maintenance manual prepared and submitted in Section 01 78 00. Provide specific warning of maintenance practices of materials that may damage or disfigure finished work.
 - 3. Submit WHMIS SDS sheets for floor sealer products.
- .3 Samples:
 - 1. Submit 300 x 300 x 20mm thick samples of each colour terrazzo.

.4 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data as set out in TTMAC publication for terrazzo work for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.

.5 QUALITY ASSURANCE

- .1 Qualifications:
 1. Installer: trained and experienced in tile work. Company must be registered as members in good standing with Terrazzo, Tile and Marble Association of Canada. If requested by Consultant submit listing of at least three previously completed projects of similar size and scope.
 2. Supplier: a member in good standing with Terrazzo, Tile and Marble Association of Canada, providing materials meeting the minimum standards of TTMAC.

.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 1. Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 2. Store and protect specified materials from nicks, scratches, and blemishes.
 3. Replace defective or damaged materials with new.

.7 SITE CONDITIONS

- .1 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of materials.
- .2 Ventilation:
 1. Provide continuously during and after installation. Run system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of installation.
 2. Ventilate enclosed spaces in accordance with Section 01 51 00 – Temporary Utilities.
- .3 Ambient Conditions:
 1. Maintain air temperature and structural base temperature at terrazzo installation area above 12 degrees C for 24 hours prior to, during, and for 24 hours following installation.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Colour of cement, aggregates, chips and other components to match existing adjacent terrazzo as closely as possible.
- .2 Cement:
 2. To CSA A3000.
 3. Type 10, grey for underbed.
 4. White for topping.
 5. 6% air-entrainment.
- .3 Sand, fine and coarse aggregates:
 6. To CSA A23.1/A23.2
 7. Clean, washed, locally available.
 8. Oval aggregate.
- .4 Water: potable.
- .5 Marble chips:
 9. Graded in accordance with TTMAC standard.
 10. Abrasion resistance to ASTM C 241/C 241M.
 11. No deleterious or foreign matter.
- .6 Pigments:
 12. Compatible with Portland cement.
 13. Alkali-resistant, colour-stable.
 14. Lime-proof mineral.
- .7 Epoxy bonding agent: two components, epoxy resin and epoxy hardener conforming to following performance properties after cure schedule of 28 days at 25 degrees C.
 15. Viscosity: mixed viscosity not less than 0.04 Pa.s or more than 0.5 Pa.s.
 16. Gel time: not less than half hour at 20 degrees C
 17. Flexibility: Gardiner flexibility test, passes bending over 12 mm mandrel, without cracking.
 18. Elongation: ASTM D 2370, minimum 10%.
 19. Bond strength: 2 MPa, with 100% concrete failure at minimum coverage, test concrete specimen minimum compressive strength 20 MPa.
 20. Coverage: 0.3 L/m² minimum, dry film thickness not less than 0.2 mm.
- .8 Divider strips: brass, thickness to match existing adjacent.
- .9 Accessories: base caps and base divider strips, separator strips, purpose made and of same material to match divider strips.
- .10 Reinforcing steel: billet steel, grade 300 plain bars.
- .11 Welded steel wire fabric: to 50 x 50 x 1.6 x 1.6 mm wire, galvanized, in flat sheets only.
- .12 Slip sheet: polyethylene sheet to CAN/CGSB-51.34, Type 2, 0.05 mm thick.
- .13 Non-slip aggregate: aluminum oxide of size and colour to match marble chips.

- .14 Non-slip inserts: brass 10 x 10 x 0.8 mm thick, dove-tail shaped channels, with anchors.
- .15 Non-slip material for inserts: fine aluminum oxide and cement or epoxy mixture in selected colours.
- .16 Curing compound: to manufacturer's standard.
- .17 Cleaning compound: to TTMAC standard.
- .18 Sealants:
 - 21. To CAN/CGSB-25.20.
 - 22. Sealants.
- .19 Finishing compound: to TTMAC standard 3001.
 - 23. Sealant.

2.2 MIXES

- .20 Slurry coat: cement and water mixed to creamy paste.
- .21 Underbed: 1 part cement to 4 parts sand by volume.
- .22 Terrazzo topping: To match existing adjacent as selected by Consultant.

PART 3 – EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for Portland cement terrazzo flooring installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Consultant.
 - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 INSPECTION

- .1 Examine area to receive terrazzo for defects in existing work which will affect proper execution of terrazzo work.
- .2 Ensure tolerances of concrete slab work do not deviate from tolerance set for finished terrazzo floor.
- .3 Terrazzo contractor to start work only when all defects are corrected.

3.3 INSTALLATION

- .1 Do terrazzo work in accordance with TTMAC 09 66 00 Terrazzo Installation Manual.

- .2 Install terrazzo after concrete slabs have cured 28 days.
- .3 Install divider strips true and level to pattern in adjacent flooring.
- .4 Install non-slip inserts and construction joints where indicated.
- .5 Install covers at building expansion joints.
- .6 Install control joints above control joints in subfloor.
- .7 Produce terrazzo finished surfaces to match adjacent existing.
- .8 Floors::
 - .1 Monolithic terrazzo: provide 16 mm minimum terrazzo topping bonded to concrete base slab.
 - .2 Bonded terrazzo: to TTMAC detail No. 1.
 - .3 Floating standard terrazzo: to TTMAC detail No. 2.
- .9 Bases::
 - .1 Terrazzo bases: To match existing adjacent bases.

3.4 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
 - .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning:
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 – Cleaning.
 - .1 Clean flooring and base surfaces to flooring manufacturer's printed instructions.
- .3 Remove excess adhesive from floor, base and wall surfaces without damage.
- .4 Clean, seal and wax floor and base surface to flooring manufacturer's instructions. In carpeted areas clean, seal and wax base surface before carpet installation.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- .2 Referred in Tender Documents also as Tectum Panels.

1.2 SUMMARY OF WORK

- .1 Work Included: The work of this Section includes all labour, materials, equipment and services required to fabricate and install a complete acoustical cementitious wood fibre wall panel system, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Work:
 - .1 Section 06 20 00 - Finish Carpentry.
 - .2 Section 09 91 00 - Painting.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM C612-14, Standard Specification for Mineral Fiber Block and Board Insulation.
- .2 Architectural Woodwork Manufacturers' Association of Canada (AWMAC):
 - .1 Architectural Woodwork Standards, 1st. Edition, 2009 (referred to hereinafter as "AWS").

1.4 SHOP DRAWINGS

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Shop Drawings:
 - .1 Indicate layout of panels, joint locations, panel profile, furring, anchorage methods and installation procedures.
- .3 Product Data: Manufacturer's specifications and technical data edited specifically for proposed system, including the following information:
 - .1 Detailed description of product.
 - .2 Manufacturer's installation instructions.
- .4 Maintenance Data:
 - .1 Provide maintenance data for wall panels for incorporation into the operation and maintenance manual specified in Section 01 78 00 Closeout Submittals.

1.5 QUALIFICATIONS

- .1 The work of this Section shall be fabricated by a manufacturer with minimum five years experience in the actual production of the specified products.
- .2 Installation shall be executed by skilled tradesmen experienced in work of this nature.

1.6 ENVIRONMENTAL CONDITIONS

- .1 Permit wet work to dry before commencement of installation.
- .2 Maintain uniform minimum temperature of 15°C and humidity of 20 - 40% RH before and during installation.
- .3 Store materials in work area 48 hours prior to installation.

1.7 DELIVERY, STORAGE & HANDLING

- .1 Deliver products in original unopened packaging with legible manufacturer's identification.
- .2 Store materials in a dry place. Do not place in contact with floors or walls. Do not subject to water.
- .3 Protect wall panel packages against marring, soil or damage during storage and installation.
- .4 Cover the bottom of panels with moisture proof materials and allow for circulation under cover to prevent condensation.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 "Waste Management and Disposal".

Part 2 Products

2.1 MANUFACTURER

- .1 This specification is based on Tectum Interior Wall Panels as manufactured by Tectum Inc.
- .2 Requests for substitutions will be considered in accordance with provisions of Section 01 25 00 Substitution Procedures. Acceptance of alternative products is subject to the approval of the Consultant.

2.2 PANELS

- .1 Basic Material: A combination of aspen wood fibres, bonded with a proprietary inorganic hydraulic cement binder and formed in a continuous process under heat and pressure.
- .2 Panel description: Standard panels, 1194 mm wide x length as indicated x 38 mm thick, unfaced with acoustical backing, t & g edges for interlocking continuous panelling; square cut ends. Colour - natural for paint finish by Section 09 91 00 Painting.
- .3 Acoustic backer: Semi-rigid mineral fibre board made from basalt rock and steel slag, unfaced, to ASTM C612, Type 4B; thickness 25 mm.
- .4 Perimeter trim: Solid clear birch, profile to suit. Clear coat varnish: INT 6.3Q, W.B.Acrylic, Clear, G4 finish. Premium grade. Refer to 09 91 00 Painting.
- .5 Attachment hardware:
 - .1 Galvanized U-channels, nominal 0.8 mm base metal thickness, 50 mm x 50 mm x 6 mm gap between each U plate. Provide plates for mounting on wall and on backside of panel
 - .2 Fasteners: galvanized screw fasteners, length and type to suit

Part 3 Execution

3.1 Examination

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

3.2 INSTALLATION

- .1 Install in accordance with the manufacturer's instructions.
- .2 Lay out the work in accordance with the drawings.
- .3 Fasten wall clips into studs, block anchors or solid blocking to ensure secure installation.
- .4 Locate fasteners in accordance with manufacturer's instructions. Install wall clips with open edge facing up, level and true to line to permit uniform installation of all wall panels.
- .5 Provide minimum 4 wall clips per panel, located to align with panel clip locations.
- .6 Fasten hanging clips to backside of tectum panels, 75 mm from each panel corner. Install panel clips with open side facing down

- .7 Slide panels onto wall clips
- .8 Interlock panels and t & g edges to form continuous panelling.
- .9 Cut panels neatly and precisely as required to accommodate electrical boxes and other penetrations.
- .10 Adjust panels to provide a uniform installation, level and true-to-line.
- .11 Install wood trim to AWS Custom Grade and as specified for standing and running trim in Section 06 20 00 Finish Carpentry.

3.3 CLEANING

- .1 Upon completion of the installation remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean and ready for use.
- .2 Make good any damage caused by the work of this Section.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES

- .1 Environmental Protection Agency (EPA): Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
- .2 Do painting to CAN/CGSB-85-100-M81.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS): Material Safety Data Sheets (MSDS).
- .4 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - February 2004.
 - .2 Standard GPS-1-05, MPI Green Performance Standard for Painting and Coatings.
- .5 National Fire Code of Canada and Ontario Fire Code.
- .6 Society for Protective Coatings (SSPC): Systems and Specifications, SSPC Painting Manual 2005.

1.2 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Contractor: to have a minimum of five years proven satisfactory experience. When requested, provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
 - .2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work
 - .3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.
 - .4 Conform to latest MPI requirements for exterior painting work including preparation and priming.
 - .5 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
 - .6 paint materials such as linseed oil, shellac, and turpentine to be highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and to be compatible with other coating materials as required.
 - .7 Standard of Acceptance:
 - .1 Walls: No defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Soffits: No defects visible from floor at 45 degrees to surface when viewed using final lighting source.
 - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 On request of the Architect submit sample "draw downs" sets of materials and colours proposed for use in the work. One set of each sample will be retained by the Architect for future comparison. Finished work shall be equal to samples.
- .3 When required, samples shall be made on the actual work in the building.

1.4 QUALITY CONTROL

- .1 Provide mock-up in accordance with Section 01 45 00 - Quality Control.
- .2 When requested by Consultant, prepare and paint designated surface, area, room or item to requirements specified herein, with specified paint or coating showing selected colours, number of coats, gloss/sheen, textures and workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site work.

1.5 MAINTENANCE

- .1 Extra Materials:
 - .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
 - .2 Submit one, four litre can of each type and colour of primer, stain, finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

1.7 AMBIENT CONDITIONS

- .1 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces.
 - .2 Do not perform painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
 - .3 Where required, provide continuous ventilation for seven days after completion of application of paint.
 - .4 Co-ordinate use of existing ventilation system with Owner and ensure its operation during and after application of paint as required.
 - .5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
 - .6 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities to be provided by General Contractor.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, perform no painting work when:
 - .1 Ambient air and substrate temperatures are below 10 degrees C.
 - .2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.
 - .3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.
 - .4 Relative humidity is above 85 % or when dew point is less than 3 degrees C variance between air/surface temperature.
 - .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
 - .2 Perform no painting work when maximum moisture content of substrate exceeds:
 - .1 12% for concrete and masonry (clay and concrete brick/block).

- .2 15% for wood.
- .3 12% for plaster and gypsum board.
- .3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".
- .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:
 - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
 - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.
 - .3 Apply paint when previous coat of paint is dry or adequately cured.
 - .4 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.
 - .5 Do not apply paint when:
 - .1 Temperature is expected to drop below 10 degrees C before paint has thoroughly cured.
 - .2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.
 - .3 Surface to be painted is wet, damp or frosted.
 - .6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.
 - .7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.
 - .8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
 - .9 Paint occupied facilities in accordance with approved schedule only. Schedule operations to approval of Owner such that painted surfaces will have dried and cured sufficiently before occupants are affected.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Paint materials listed in latest edition of MPI Approved Products List (APL) are acceptable for use on this project.
- .2 The Products of generally only one (1) manufacturer shall be used on the project and the Architect shall be notified of the proposed products to be used prior to delivery of the materials to the site.
- .3 Acceptable Materials shall be
 - .1 Over new surfaces:
 - .1 Benjamin Moore Advance Waterborne Interior Alkyd Paint 792, Pearl finish.
 - .2 Benjamin Moore Advance Waterborne Interior Alkyd Paint 793, Semi-gloss finish.
 - .3 DuluxXpert Interior Waterborne Alkyd Paint, 22010, Melamine finish.
 - .4 DuluxXpert Interior Waterborne Alkyd Paint, 21010, Semi-gloss finish.
 - .5 Para: premium Hybrid waterborne alkyd.
 - .6 Sherwin-Williams: Promar 200 waterborne alkyd.
 - .2 Latex primer over new gypsum board surfaces:

- .1 Dulux Ultrahide 36600 or equivalent Benjamin Moore, Para and Sherwin Williams primer sealer.
- .3 Oil to Latex conversion primer, over existing surfaces:
 - .1 B-I-N Shellac-Base Primer Sealer by Zinsser – assume all existing paint is oil base.
- .4 Over new concrete block surfaces: Block filler to CAN/CGSB-1.188-M90.
- .4 Provide paint products meeting MPI “Environmentally Friendly” E1, E2, E3 ratings based on VOC (EPA Method 24) content levels.
- .5 Paint colours

PT-1 – Typical Wall Paint & Wood Door Frames – Benjamin Moore Cotton Balls 2145-70

PT-2 – Accent Wall Paint – Benjamin Moore Blue Hydrangea 2062-60

PT-3 – Hollow Metal Door and Frames – Benjamin Moore Smoke Gray 2120-40

All metal door and frames to be semi-gloss finish

2.2 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials is allowed only with Consultant's written permission.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Add thinner to paint manufacturer's recommendations. Do not use kerosene or organic solvents to thin water-based paints.
- .4 Thin paint for spraying according in accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Consultant.
- .5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.3 GLOSS/SHEEN RATINGS

- .1 Paint gloss: defined as sheen rating of applied paint, in accordance with following values:

Gloss Level Category	Units @ 60 Degrees	Units @ 85 Degrees
G1 - matte finish	0 to 5	max. 10
G2 - velvet finish	0 to 10	10 to 35
G3 – eggshell finish	10 to 25	10 to 35
G4 – satin finish	20 to 35	min. 35
G5 – semi-gloss finish	35 to 70	
G6 – gloss finish	70 to 85	
G7 – high gloss finish	> 85	

- .2 Gloss level ratings of painted surfaces as noted on Finish Schedule.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 EXAMINATION

- .1 Exterior repainting work: inspected by Contractor. Painting contractor to notify Consultant minimum of one week prior to commencement of work and provide copy of project repainting specification and Finish Schedule.
- .2 Exterior surfaces requiring repainting: inspected by Contractor who will notify Consultant in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.
- .3 Where assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before repainting is started.
- .4 Where "special" repainting or recoating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer to provide as part of work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Owner.

3.3 STORAGE

- .1 Store paint materials in areas assigned for the purpose. Ventilate well and take all fire safety precautions. Keep containers closed.
- .2 Keep all paint materials in unopened, original containers which are sealed and labelled.
- .3 Packaged items which require inside protection shall be stored in a warm, dry area within the building.
- .4 All soiled or used rags and waste shall be removed from the building every night.

3.4 PREPARATION

- .1 Perform preparation and operations for exterior painting in accordance with MPI Maintenance Repainting Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.
- .3 Clean and prepare exterior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:
 - .1 Remove dust, dirt, and surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
 - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
 - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
 - .4 Allow surfaces to drain completely and allow it to dry thoroughly. Allow sufficient drying time and test surfaces using electronic moisture meter before commencing work.
 - .5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.

- .6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.
- .4 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminants from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .6 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

3.5 EXISTING CONDITIONS

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Consultant damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Consultant. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
 - .1 Stucco: 12%.
 - .2 Concrete: 12%.
 - .3 Clay and Concrete Block/Brick: 12%.
 - .4 Wood: 15%.

3.6 PROTECTION

- .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Consultant.
- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products and equipment.
- .4 Protect passing pedestrians, building occupants, and general public in and about building.
- .5 Remove light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Store items and re-install after painting is completed.
- .6 Move and cover exterior furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
- .7 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas to approval of Consultant.

3.7 MECHANICAL/ELECTRICAL EQUIPMENT

- .1 Unless otherwise specified, paint ALL exterior exposed conduits, piping, hangers, duct work and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise. Do not paint inside mechanical cabinets.
- .2 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .3 Do not paint over nameplates.
- .4 Fire protection piping shall be red 509-102 in accordance with CAN/CGSB 60.1-M89.
- .5 Natural gas piping shall be yellow 505-101 in accordance with CAN/CGSB 60.1-M89.
- .6 Keep sprinkler heads free of paint.
- .7 Paint inside of ductwork where visible with primer and one coat of matt black paint.
- .8 Paint both sides and edges of plywood backboards for equipment before installation. Leave equipment in original finish except for touch-ups as required. Do not paint over name plates.
- .9 Paint steel electrical light standards. Do not paint outdoor transformers and substation equipment.

3.8 EXTENT OF EXTERIOR PAINTING

- .1 All items which are not prefinished and which are installed at the exterior of the building shall be painted.
- .2 All exterior mechanical and electrical equipment, inclusive of exposed pipes, conduits, and duct work, shall be painted.
- .3 All miscellaneous metal items shall be painted.

3.9 EXTENT OF INTERIOR PAINTING

- .1 As indicated in Room Finish Schedule, drawings and specifications.
- .2 All interior mechanical and electrical equipment, inclusive of exposed pipes and ducts, shall be painted.

3.10 SURFACE PREPARATION

- .1 General:
 - .1 Surfaces shall be carefully cleaned. Remove all oil, ridges and unevenness
 - .2 Surfaces shall be dry.
- .2 Plaster and Drywall:
 - .1 Plaster shall be thoroughly cured. Prepare to CAN/CGSB-85.100-93. Fill minor cracks with plaster patching compound.
 - .2 Gypsum wall board shall be properly finished, patched, taped and sanded smooth, by the drywall contractor, prior to painting. All surface dust shall be removed to enhance

adhesion.

- .3 Wood:
 - .1 Prepare to CAN/CGSB-85.100-93. Putty all holes, cracks, joints and other defects and sand smooth. Sand lightly between all coats. Knots, sap and pitch in wood shall be stopped with two (2) coats of shellac before priming.
- .4 Concrete Block and Concrete Surfaces:
 - .1 Prepare to CAN/CGSB-85.100-93. Wire brush off loose particles and dust.
- .5 Ferrous Surfaces:
 - .1 Remove dirt and grease with benzine. Remove runs and defective prime paint down to bare metal and touch up with CGSB 1-GP-40M to CGSB 85-GP-14M.
- .6 Galvanized Steel (including but not limited to exposed roof deck and exposed ductwork):
 - .1 Prepare galvanized and zinc coated surfaces to CGSB 85-GP-16M. Prime with metal conditioner which conforms to CGSB 1-GP-121M. After ten (10) minutes wash with clean water. Mild steel shall be primed with red lead primer.
- .7 Concrete Floors:
 - .1 Prepare to CGSB 85-GP-32M.
- .8 Plastic/Vinyl/PVC:
 - .1 After removing all surface contaminants, the surface shall be scuff sanded or scrubbed with an abrasive cleaner to dull the surface for best adhesion. Prime with PrepRite Bonding Primer B51W50 as manufactured by Sherwin Williams.

3.11 APPLICATION

- .1 Paint colours shall be in accordance with the colour schedule prepared by the Architect at a later date.
- .2 The different surfaces in any one (1) room will not necessarily be one (1) colour. Millwork, doors, walls, and other elements within rooms shall be painted with different strong accent colours. The total number of strong accent colours in the project shall be limited to three (3). A total of three (3) basic wall colours shall be used. Doors shall be painted a different colour from door frame. Doors shall be a different colour from walls. Radiator covers shall be painted in strong accent colours.
- .3 In the Room Finish Schedule, where surfaces in rooms are specified to be painted, all elements fixed to those surfaces including frames of openings, doors, radiators, exposed new metal surfaces, shall be painted unless otherwise specified. Paint behind radiator covers.
- .4 In the Room Finish Schedule, where surfaces in rooms are specified to be painted, all elements fixed to those surfaces including frames of openings, doors, radiators, exposed new metal surfaces, shall be painted unless otherwise specified. Paint behind radiator covers.
- .5 Apply each coat at the proper consistency in accordance with the manufacturer's directions.
- .6 Sand lightly between coats when enamel or varnish is applied to wood or metal.
- .7 Regardless of the number of coats specified for any surface, apply sufficient number of extra coats of paint to produce a solid, uniform appearance and coverage in the opinion of the Architect.
- .8 Paint shall be applied by brush and roller. Reduce paint materials in strict accordance with the

manufacturer's directions.

- .9 Top and bottom edges of doors shall receive the same finish as the face of the door.
- .10 New Gypsum Board:
 - .1 One (1) coat of primer-sealer to CAN/CGSB-1-119-2000
 - .2 Two (2) coats of Acrylic egg shell finish.
- .11 Concrete Block and Poured Concrete Walls:
 - .1 Two (2) coats of block filler to CAN/CGSB-1.188-96
 - .2 Three (3) coats of Waterborne Alkyd semi-gloss finish.
- .12 Galvanized and Zinc Coated Metal, doors, frames, railings, misc. steel, pipes, overhead decking and ducts:
 - .1 Two (2) coats of Waterborne Alkyd satin finish.
- .13 Interior Woodwork:
 - .1 On surfaces designated for painting, wood doors, trim, etc.:
 - .1 One (1) coat of undercoat to CAN/CGSB-1.38-2000
 - .2 Two (2) coats of semi-gloss Waterborne Alkyd to CAN/CGSB-1.57-96
- .14 Interior of Ductwork:
 - .1 On interior of ductwork visible through grilles or diffusers:
 - .1 One (1) coat matt black conforming to CAN/CGSB-1.114-M91
 - .2 May be spray applied.

3.12 FIELD QUALITY CONTROL

- .1 Inspection: Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.13 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .1 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.

3.14 RESTORATION

- .1 Clean and re-install hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM A 167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .2 ASTM B 456-03, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
 - .3 ASTM A 653/A 653M-09, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .4 ASTM A 924/A 924M-09, 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 CGSB 31-GP-107MA-90, Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.
- .3 CSA International
 - .1 CAN/CSA-B651-04, Accessible Design for the Built Environment.
 - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings: Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars

1.3 MAINTENANCE MATERIAL SUBMITTALS

- .1 Tools: Provide special tools required for assembly, disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01 78 00 - Closeout Submittals. Deliver special tools to Owner.

PART 2- PRODUCTS

2.1 MATERIALS

- .1 Sheet steel: to ASTM A 653/A 653M with ZF001 designation zinc coating.
- .2 Stainless steel sheet metal: to ASTM A 167, Type 304, with No.4 satin luster finish.
- .3 Stainless steel tubing: A1S1 Type 304, commercial grade, seamless welded, 1.2 mm wall thickness.
- .4 Fasteners: concealed screws and bolts hot dip galvanized, exposed fasteners to match face of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use. Exposed fasteners shall be same finish as surrounding material.

2.2 FABRICATION

- .1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.
- .2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.
- .3 Brake form sheet metal work with 1.5 mm radius bends.
- .4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
- .5 Back paint components where contact is made with building finishes to prevent electrolysis.
- .6 Hot dip galvanize concealed ferrous metal anchors and fastening devices to CAN/CSA-G164.
- .7 Shop assemble components and package complete with anchors and fittings.
- .8 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.
- .9 Provide "in wall" carriers, steel anchor plates and components for installation on studding and building framing

2.3 FINISHES

- .1 Chrome and nickel plating: to ASTM B 456, satin finish.
- .2 Baked enamel: condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by Consultant.
- .3 Manufacturer's or brand names on face of units not acceptable.

2.4 WASHROOM ACCESSORIES

- .1 Supply and install the following:
 - .1 Coat Hook
 - .1 Henkel HDB003R, colour selected by owner
 - .2 760 x 760 mm 90 degree L-shaped Grab Bar: 36 mm o.d., stainless steel, Concealed fasteners, peened grip surface. By Frost, Code 1001 Series. (Or equivalent) in Washrooms:
 - .3 600mm horizontal Grab Bar: 36 mm o.d., stainless steel, 600mm long, Concealed fasteners, peened grip surface. By Frost, Code 1001 Series. (Or equivalent) in Washrooms:
 - .4 Shelf Manufactured by Frost, Model No. 950-4x18 – Heavy duty shelf, max 100 mm depth, one in each barrier free washroom.
 - .5 Mirror: 915mm x 610mm
 - .1 Acceptable Material: Bobrick B165 2436, or approved equivalent.
 - .6 Hand Dryer – refer to electrical drawings
 - .7 Paper Towel Dispenser
 - .1 Acceptable Material: Tork Mechanical Hand Towel Roll Dispenser
 - .2 Colour: black
 - .8 Soap Dispenser
 - .1 Acceptable Material: GOJO ADX-12 Dispenser 1250-ML
 - .2 Colour: Gray/white
 - .9 Sanitary Napkin Disposal
 - .1 Acceptable Material: Bobrick B-270
 - .2 Surface Mount

- .10 Toilet Paper Holder
 - .1 Acceptable Material:
 - Tork Twin Jumbo Bath Tissue Roll Dispenser
 - .1 Colour: Smoke Grey

PART 3- EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrates and surfaces to receive toilet and bathroom accessories previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's instructions prior to toilet and bathroom accessories installation.
- .2 Inform Consultant of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

- .1 Install and secure accessories rigidly in place as follows:
 - .1 Stud walls: Install wood blocking into cavity. Install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.
 - .2 Hollow masonry units, existing plaster or drywall: use toggle bolts drilled into cell or wall cavity.
 - .3 Solid masonry, marble, stone or concrete: use bolt with lead expansion sleeve set into drilled hole.
 - .4 Toilet and shower compartments: use male to female through bolts.
- .2 Install grab bars on built-in anchors provided by bar manufacturer. Supply templates, details and instructions for building in anchors in toilet compartments.
- .3 Use tamper proof screws/bolts for fasteners.
- .4 Fill units with necessary supplies shortly before final acceptance of building.
- .5 Install mirrors in accordance with manufacturer's instructions.

3.3 ADJUSTING

- .1 Adjust toilet and bathroom accessories components and systems for correct function and operation in accordance with manufacturer's written instructions.
- .2 Lubricate moving parts to operate smoothly and fit accurately.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by toilet and bathroom accessories installation.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 08 44 13 – Aluminum Curtain Walls, Windows and Doors.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM D 1784-11, Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Indicate on drawings dimensions in relation to window jambs, operator details, head and sill anchorage details, hardware and accessories details.
- .3 Samples:
 - .1 Submit one representative working sample of each type roller shade.
 - .2 Submit duplicate samples of manufacturer's standard colours for selection by Consultant.
 - .3 After approval samples will be returned for incorporation into Work.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirement and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect horizontal louvre blinds from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer pallets, crates, padding and packaging materials.

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

- .1 Design roller shades to following requirements:
 - .1 Be designed in a manner that allows wear susceptible parts to be replaceable by either user or manufacturer.
 - .2 Be accompanied by instructions for replacing or repairing worn parts, including inventory numbers for parts and procedures for ordering replacement parts.
 - .3 Be designed in a manner that permits effective disassembly of components in order to permit recycling of materials for which recycling markets exist.
 - .4 Include stamps on major plastic components indicating composition code to facilitate recycling efforts.

2.2 MATERIALS AND FABRICATION

- .1 Roller shade: Chain Roller Shade with Optispace ALS complete with cassette headrail (aluminum finish) by Altex or equivalent product by Shade O Matic.
 - .1 Stainless steel or plastic chain with heavy duty clutch and spring assisted system where recommended by manufacturer.
 - .2 Fabric: Woven PVC/Polyester, Sheerweave with 1% openness factor. Meets NFPA 701 for flame retardance. Colour to be Alabaster.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Install roller shades at all new windows as indicated on drawings.
- .2 Site measure all openings and ensure fit with minimum gaps around shade.
- .3 Include centre brackets where necessary to prevent deflection of headrail.
- .4 Adjust to provide for operation without binding.
- .5 Use non corrosive metal fasteners for installation, concealed in final assembly.
- .6 Do not install window coverings to window frames.

3.2 ADJUSTING

- .1 Adjust roller shades components for correct function and operation in accordance with manufacturer's written instructions.
- .2 Lubricate moving parts to operate smoothly and fit accurately.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by roller shades installation.

END OF SECTION

PART 1- GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C 117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C 136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D 422-63 2002, Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D 698-00a1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft²) (600 kN-m/m²).
 - .5 ASTM D 1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft²) (2,700 kN-m/m²).
 - .6 ASTM D 4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .2 CSA-A3001-03, Cementitious Materials for Use in Concrete.
 - .3 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .4 U.S. Environmental Protection Agency (EPA)/Office of Water: EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.2 DEFINITIONS

- .1 Excavated materials will be measured in cubic metres in their original location.
- .2 Rock excavation: excavation of material from solid masses of igneous, sedimentary or metamorphic rock which, prior to its removal, was integral with its parent mass, and boulders or rock fragments having individual volume in excess of 2 m³. Frozen material not classified as rock.
- .3 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation including dense tills, hardpan, frozen materials, unsuitable materials and partially cemented materials which can be ripped and excavated with heavy construction equipment.
- .4 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding. Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.
- .5 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

1.3 EXAMINATION

- .1 Examine the site thoroughly and investigate all conditions likely to affect site work. Submission of tender will be deemed to indicate compliance with above-noted conditions.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedure.

1.5 EXISTING CONDITIONS

- .1 Buried services:
 - .1 Before commencing work, verify and establish location of buried services on and adjacent to site.
 - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
 - .3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.
 - .4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .5 Prior to beginning excavation Work, notify applicable authorities having jurisdiction, establish location and state of use of buried utilities and structures. Authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.
 - .6 Confirm locations of buried utilities by careful test excavations.
 - .7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
 - .8 Where utility lines or structures exist in area of excavation, obtain direction of Consultant before removing or re-routing.
 - .9 Record location of maintained, re-routed and abandoned underground lines.
 - .10 Confirm locations of recent excavations adjacent to area of excavation.
- .2 Existing buildings and surface features:
 - .1 Conduct, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
 - .2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Consultant
 - .3 Where required for excavation, cut roots or branches as directed by Consultant.

1.6 INSPECTION AND TESTING

- .1 Testing of materials and compaction will be carried out by testing laboratory designated by the Owner.
- .2 Obtain review of the work of this section as follows:
 - .1 Upon completion of sub-grade excavation.
 - .2 Before pouring footings or concrete fill materials.
 - .3 Before backfilling footing trenches.
 - .4 Before backfilling outside the foundations.
 - .5 Before filling inside of the foundations.
 - .6 Before backfilling service trenches.
- .3 Following approval of the subgrade and as soon as the first 300 mm of fill has been placed and

compacted the Contractor shall notify the Architect who may then arrange the testing to determine the density of the layer by means of field density equipment. Field density testing will be conducted by an independent testing agency appointed by the Owner. Advance notification of twenty-four (24) hours is to be given prior to the required testing. Each 300 mm of placed and compacted granular fill shall be tested.

- .4 If compaction tests disclose inadequate compaction, additional tests required to ascertain that re-compaction is sufficient shall be paid for by the Contractor.

1.7 SHORING, BRACING AND UNDERPINNING

- .1 Engage services of qualified professional engineer who is registered in the Province of Ontario to design and inspect shoring, bracing and underpinning required for work.
- .2 At least two (2) weeks prior to commencing work, submit design and supporting data.
- .3 Design and supporting data submitted to bear the stamp and signature of a qualified professional engineer registered in the Province of Ontario.
- .4 Professional Engineer is responsible for design of temporary structures to submit proof of insurance coverage for professional liability except where engineer is an employee of the contractor, in which case the contractor shall submit proof that the work by the professional engineer is included in contractor's insurance coverage.

1.8 SAMPLES

- .1 Submit 20 kg samples to the Geotechnical Engineer of fill materials, where such are required, for testing and review, at least one (1) week prior to commencement of backfill operations.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Earth: Material with which the entire site is covered such as backfill, top soil, peat, clay, weathered shale, rubble and products of demolition.
- .2 Earth Fill:
 - .1 For use as follows:
 - .1 Alternate fill material to raise subgrade under paved areas.
 - .2 Fill material to build up under the running track and sports field.
 - .2 Material approved by the Geotechnical Engineer that comprises sand, gravel, silt, and/or clay, and is free of contaminants and organics. This material shall be at or below the optimum moisture content to allow for compaction.
 - .3 Suitability of this material with respect to the frost line (1.2 metres below finished grade) will depend on its percent, by weight, of particles within the 5 mm to 75 mm size range (i.e. its silt content). In the case of bouldery fill materials, this requirement will refer to the matrix of the fill, with the boulders and cobbles excluded:
 - .1 Material with 0 to 40% within the 5 mm to 75 mm size range will be suitable for use above and below the frost line.
 - .2 Material with greater than 40% within the 5 mm to 75 mm size range will only be suitable for use below the frost line.

- .3 Miscellaneous Fill:
- .1 For use under landscaped areas other than those identified in Section 2.1.2
 - .2 Any earth fill material approved by the Geotechnical Engineer that is free of contaminants and is less than 20% organic material by volume.

- .4 Granular Fill:
- .1 Granular "A" Fill:
 - .1 Clean, hard, durable crushed gravel or stone free from shale, clay, friable material, cementation, organic material, frozen material and other deleterious materials.
 - .2 Gradations to be within limits specified in OPSS-1010 for Granular "A" when tested in accordance with OPSS-1001 and to ASTM C136-84a and ASTM C117-87. Sieve sizes to CAN/CGSB-8.1-88 rather than ASTM E11-87.

<u>Sieve Designation</u>		<u>%Passing</u>
26.5	mm	100
19	mm	85-100
13.2	mm	65-90
9.5	mm	50-73
4.75	mm	35-55
1.18	mm	15-40
0.3	mm	5-22
0.075	mm	2-8

- .2 Granular "B" Fill:
 - .1 Clean, hard, durable crushed stone, free from shale, clay, friable material, cementation, organic material, frozen material and other deleterious materials.
 - .2 Gradations to be within limits specified in OPSS-1010 for Granular "B", Type II, when tested in accordance with OPSS-1001, ASTM C136-84a and ASTM C117-87. Sieve sizes to CAN/CGSB-8.1-88 rather than ASTM E11-87.

<u>Sieve Designation</u>		<u>% Passing</u>
150	mm	100
26.5	mm	50-100
4.75	mm	20-55
1.18	mm	10-40
0.3	mm	5-22
0.075	mm	0-10

PART 3- EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during

removal.

3.2 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Remove all buried stumps and tree roots entirely below footings, slabs and paving, and to 600 mm below finished grade elsewhere.
- .3 Dispose of material off site daily to disposal areas acceptable to the authority having jurisdiction.
- .4 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.3 PREPARATION/PROTECTION

- .1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Consultant approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .5 Protect buried services that are required to remain undisturbed.

3.4 STOCKPILING

- .1 Due to the sensitivity of existing soils conditions, stockpile fill materials away from building and existing paved areas as indicated or as designated by the Soils Engineer.
- .2 Stockpile in locations as directed by Consultant. Stockpile height not to exceed 2 m and should be protected from erosion.
- .3 Protect fill materials from contamination.
- .4 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.5 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

- .1 Brace and/or shore the banks of all excavations. Ensure strength and rigidity sufficient to prevent collapse and to support existing building and/or services
- .2 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Provincial Regulation.
- .3 Erect and maintain adequate hoardings to protect all banks against accidents to the public and to workers employed on the work.
- .4 During backfill operation:
 - .1 Unless otherwise indicated, remove sheeting and shoring from excavations.

- .2 Do not remove bracing until backfilling has reached respective levels of such bracing.
- .3 Pull sheeting in increments that will ensure compacted backfill is maintained at elevation at least 500 mm above toe of sheeting.
- .5 When sheeting is required to remain in place, cut off tops at elevations as indicated.
- .6 Upon completion of substructure construction:
 - .1 Remove cofferdams, shoring and bracing.
 - .2 Remove excess materials from site and restore watercourses.

3.6 DEWATERING AND HEAVE PREVENTION

- .1 Keep excavations free of water while Work is in progress.
- .2 Provide for details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur. Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.
- .4 Protect open excavations against flooding and damage due to surface run-off.
- .5 Dispose of water in to approved runoff areas and in manner not detrimental to public and private property, or portion of Work completed or under construction. Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.
- .6 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas.

3.7 EXCAVATION

- .1 Excavate to lines, grades, elevations and dimensions as indicated.
- .2 Remove concrete, masonry, paving, walks, demolished foundations and rubble and other obstructions encountered during excavation.
- .3 Excavation must not interfere with bearing capacity of adjacent foundations.
- .4 Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .5 For trench excavation, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.
- .6 Keep excavated and stockpiled materials safe distance away from edge of trench.
- .7 Restrict vehicle operations directly adjacent to open trenches.
- .8 Dispose of surplus and unsuitable excavated material off site.
- .9 Do not obstruct flow of surface drainage or natural watercourses.
- .10 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

- .11 Notify Consultant when bottom of excavation is reached.
- .12 Notify the Consultant when soil at bottom of excavation appears unsuitable and proceed as directed by the Consultant.
- .13 Remove unsuitable material from trench bottom including those that extend below required elevations.
- .14 Excavate for mechanical, electrical trades and all other items requiring excavation.
- .15 The following shall set the protocol to be used when soil or rock conditions, other than the conditions described in the geotechnical report are discovered:
 - .1 Contractor shall immediately notify the geotechnical consultant and the architect who will in turn notify the Owner.
 - .2 Geotechnical consultant in consultation with the Architect shall determine the necessary action. The extent of remedial action shall be estimated in order to determine the most cost effective resolution.
 - .3 The change in scope of work shall be quantified by both the contractor and the geotechnical consultant and duly recorded.
 - .4 Failure to follow the above process may result in rejection of the contractor's claim.
- .16 Correct unauthorized over-excavation as follows:
 - .1 Notify Geotechnical Engineer immediately.
 - .2 Fill under bearing surfaces and footings with concrete specified for footings or as directed by Geotechnical Engineer.
 - .3 Fill under other areas with Granular A fill compacted to minimum of 98% Standard Proctor Maximum Dry Density.
- .17 Where soil supported floor slabs and paving are to be placed, excavate and remove all the existing layers of fill and topsoil in accordance with the Geotechnical Report.
- .18 Ensure that the surface on which the footings are to be laid is clean, undisturbed native material and engineered fill where indicated, level, and free from loose material. Form steps as indicated.
- .19 Protect bottom and sides of the excavation from exposure to sun and wet weather to prevent cave-ins and softening of the bed upon which the concrete or drains rest.
- .20 Keep surfaces against which concrete, or fill, will be placed, free of frost. Where such surfaces become frozen, thaw and remove material to a firm base to the satisfaction of the Architect.

3.8 FILL TYPES AND COMPACTION

- .1 Use types of fill as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D 698.
 - .1 Exterior side of perimeter walls: Use Granular "B", Type II maximum size 75 mm fill or better to subgrade level. Compact to a minimum of 98% Standard Proctor Maximum Dry Density.
 - .2 Within building area below slabs on grade: use Granular "B", Type II to underside of base course for floor slabs. Use minimum 150 mm Granular "A" base course to underside floor slabs. Compact to a minimum of 98% Standard Proctor Maximum Dry Density.

3.9 PLACING OF FILL AND COMPACTION WITHIN BUILDING PERIMETER

- .1 Immediately after the foundation walls are brought up to the floor level and the services installed in trenches, provide, deposit, and consolidate Granular "B" Type II fill as required to bring the level up to the elevation of the underside of the base course layer. Place and consolidate minimum 150 mm Granular "A" fill up to the elevation of the underside of the floor slabs.
- .2 Lay Granular "B" Type II fill in maximum 200 mm (8") layers. Thoroughly consolidate each layer before depositing the next. Thoroughly compact the whole underslab area by rolling a vibrator type roller to the satisfaction of the Architect.
- .3 For areas adjoining walls, piers, and grade beams, etc., obtain equivalent compaction by the use of mechanical tampers and thinner lifts, as appropriate.
- .4 For the final 150 mm, 6" fill under all concrete slabs on grade lay Granular "A". Compact using vibratory compaction equipment to 98% Standard Proctor Maximum Dry Density.
- .5 Ensure that foundation walls have adequate lateral support before placing fill against them.

3.10 BEDDING AND SURROUND OF UNDERGROUND SERVICES

- .1 Place bedding and surround material in unfrozen condition.
- .2 Examine drawings and site in order to locate services. Report any difficulties or discrepancies to the Architect.
- .3 Excavate for new buried services in order to provide Class "B" bedding. Backfill each section before the next section is excavated.
- .4 Class "B" bedding shall be as follows;
 - .1 Excavate trenches to provide a uniform continuous bearing and support for 150 mm thickness of pipe bedding material on solid and undisturbed ground. Trench widths below a point 300 mm above the pipe shall not exceed the diameter of the pipe plus 800 mm; above this height, sides of trenches may be sloped back at the natural angle of repose of the material.
 - .2 Level bottom of trench. Bottom of trenches shall be undisturbed soil, bedrock, approved existing fill or Granular "B" Type II over one of the above.
 - .3 Place 150 mm thick layer of Granular A for pipe bed. Compact granular to provide positive support for pipe.
 - .4 Bring stone up sides of pipe to spring line of pipe and compact granular to provide positive support for pipe.
 - .5 Do hand backfilling over pipe to a depth of 300 mm to provide adequate protection against mechanically placed backfill.
 - .6 Place backfill in maximum 300 mm thick layers.
 - .7 Compact all backfill to a minimum of 98% Standard Proctor Density.

3.11 EXCAVATION AND BACKFILL UNDER EXTERIOR CONCRETE, AND ASPHALT PAVING

- .1 Where required, raise the subgrade to achieve elevations shown on drawings, and to accommodate the specified granular basecourses, place and compact Granular B Type II or better fill material in maximum 300 mm layers. Thoroughly consolidate each layer before depositing next layer of gravel. Obtain a minimum density of 98% Standard Proctor, maximum dry density.

- .2 Do all required backfilling service trenches. Use native backfill above cover material or Granular B Type II fill material. Fill over trenches to match adjacent subgrade materials or fill. Proceed as per Items .5, .6, and .7 of Item 3.9 above.
- .3 Where necessary to provide specified basecourses for exterior paving, excavate and remove existing soils.
- .4 Raise sub-grades with Granular "B" Type II or better material as required at paved areas to the elevation that allows for granular basecourses
- .5 Place minimum 400 mm O.P.S.S. Granular "B" Type II material topped with minimum 150 mm Granular "A" material immediately under all exterior concrete paving, unit paving, curbs, asphalt paving.
- .6 Prepare subgrade to lines and levels required to carry finish and base course materials to meet grades shown on the drawings. Correct any irregularities or depressions by cutting out and filling with compacted Granular "B", Type II granular material. From all areas below paving, provide smooth, positive slopes at catch basin locations.
- .7 Replace with acceptable compacted granular material, any loose or soft zones exposed during excavation.
- .8 Proceed in accordance with Section 02512 - Hot Mix Asphalt Concrete Paving, Item 3.2 - Installation of Granular Basecourses.

3.12 EXCAVATION AND BACKFILL UNDER SODDED AND SEEDED AREAS

- .1 Excavate and/or place approved miscellaneous fill material to the required suitable depth which will allow incorporation of new grading shown on drawings.
- .2 Existing topsoil can be blended with miscellaneous earth material for fill in these areas by placing alternating layers of maximum 150 mm existing topsoil minimum 400 mm miscellaneous fill material. The top layer of fill material shall consist of minimum 400 mm miscellaneous fill material.
- .3 Where required to achieve elevations shown on drawings, except where noted otherwise, place approved fill material in 300 mm maximum loose - thickness layers and compact by means of passing motorized earth moving equipment over each layer (except close to structures in which case light hand tampers shall be used).
Under planting areas at the bottom of the 450 mm planting soil mixture, place minimum
- .4 150 mm deep layer of permeable 10 mm clear crushed stone to facilitate drainage.

3.13 BACKFILLING AROUND INSTALLATIONS

- .1 Place bedding and surround material as specified elsewhere.
- .2 Do not backfill around or over cast-in-place concrete within 24 h after placing.
- .3 Place layers simultaneously on both sides of installed work to equalize loading. Difference not to exceed 0.15 m.
- .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
 - .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to

withstand earth and compaction pressure and approval obtained from the Architect, OR:
.1 If approved by the Architect, erect bracing or shoring to counteract unbalance,
and leave in place until removal is approved by the Architect

3.14 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by Consultant.
- .2 Replace topsoil as indicated or directed by Consultant.
- .3 Reinstall lawns to elevation which existed before excavation.
- .4 Reinstall pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinstall areas affected by Work.
- .6 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.
- .7 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

PART 1- GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 23 33 – Excavating, Trenching, and Backfilling

1.2 REFERENCES

- .1 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS MUNI 1010 – Material Specifications for Aggregates – Base, Subbase, Select Subgrade, and Backfill Material

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 OPSS 1010
- .2 The use of recycled materials will not be permitted.

2.2 COMPACTION

- .1 Granular 'A' shall be compacted in maximum 150mm lifts to 100% SPMDD.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verify conditions of subgrade are acceptable for granular base installation.
- .2 Inform Contract Administrator of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Contract Administrator.

3.2 PLACING

- .1 Place granular base after subgrade is inspected and approved by Contract Administrator.
- .2 Construct granular base to depth and grade in areas indicated.
- .3 Ensure no frozen material is placed.
- .4 Place material only on clean unfrozen surface, free from snow or ice.
- .5 Place granular base materials using methods which do not lead to segregation or

degradation.

- .6 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Contract Administrator may authorize thicker lifts (layers) if specified compaction can be achieved.
- .7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .8 Remove and replace portion of layer in which material has become segregated during spreading.
- .9 Place material to minimum compacted thickness as shown on drawings, or thicker as required to achieve design base elevation.

3.3 COMPACTION

- .1 Compaction equipment to be capable of obtaining required material densities.
- .2 Compact to density of not less than 100% of Standard Proctor Maximum Dry Density (SPMDD) to ASTM D698.
- .3 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
- .4 Apply water as necessary during compaction to obtain specified density.
- .5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Contract Administrator.
- .6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

END OF SECTION