

Turnbull Learning Centre  
Music Room Addition

Specifications  
Issued for  
Pricing

July 2018



**HOBIN**  
ARCHITECTURE

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**END OF SECTION**

**re: Geotechnical Desktop Review**  
**Proposed Building Addition - Turnbull Learning Centre**  
**1132 Fisher Avenue - Ottawa**

**to:** Cunliffe & Associates - **Mr. Rick Cunliffe** - rcunliffe@cunliffe.ca

**date:** June 22, 2018

**file:** PG4528-MEMO.01

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Further to your request and authorization, Paterson Group (Paterson) completed a desktop review of the proposed building addition at the aforementioned site. The following report summarizes our findings and provides our recommendations from a geotechnical perspective.

## **1.0 Background**

The field investigation for the geotechnical report for the existing building was carried out on March 1, 1995 by John D. Paterson and Associates Ltd. (JDPA) and consisted of five (5) test pits advanced to a maximum depth of 3.0 m below existing grade. The test pits were dug with a rubber tire backhoe. All field work was carried out under the full-time supervision of JDPA personnel under the direction of a senior engineer. The locations of the test holes, sampling details, survey information and test hole logs are attached to this report. It should be noted that the subsurface profile at the test pit locations was representative of the soil profile before construction of the existing building and current site features.

It is understood that the proposed building addition will consist of a slab on grade construction with associated landscaping and hardscaping areas, including a new fire route.

## **2.0 Geotechnical Discussion**

From a geotechnical perspective, the subject site is suitable for the proposed building addition. It is expected that the proposed building will be founded on conventional shallow footings placed on an undisturbed, compact glacial till bearing surface.

### **Site Grading and Preparation**

Topsoil and deleterious fill, such as those containing organic materials, should be stripped from under any buildings and other settlement sensitive structures.

It is anticipated that the existing fill, free of deleterious material and significant amounts of organic material, can be left in place below the proposed slab on grade. However, it is recommended that the existing fill be proof-rolled using heavy vibratory equipment and approved by the geotechnical consultant at the time of construction. Any poor performing areas noted during the proof-rolling operation should be removed and replaced with an approved fill material.

Non-specified existing fill along with site-excavated soil can be used as general landscaping fill where settlement of the ground surface is of minor concern. These materials should be spread in thin lifts and at least compacted by the tracks of the spreading equipment to minimize voids. If these materials are to be used to build up areas to be paved, they should be compacted in thin lifts to a minimum density of 95% of their respective standard Proctor maximum dry density (SPMDD). Non-specified existing fill and site-excavated soils are not suitable for use as backfill against foundation walls or below settlement sensitive structures, such as concrete sidewalks and exterior concrete entrance areas, unless approved by the geotechnical consultant.

## **Foundation Design**

Footings placed on an undisturbed, compact glacial till bearing surface can be designed using a bearing resistance value at serviceability limit states (SLS) of **125 kPa** and a factored bearing resistance value at ultimate limit states (ULS) of **175 kPa**. A geotechnical resistance factor of 0.5 was applied to the reported bearing resistance value at ULS. Footings placed over an engineered fill pad can be designed using the abovenoted bearing resistance values.

Footings designed using the abovenoted bearing resistance value at SLS will be subjected to potential post-construction total and differential settlements of 25 and 20 mm, respectively.

An undisturbed soil bearing surface consists of a surface from which all topsoil and deleterious fill, such as loose, frozen or disturbed soil, whether in situ or not, have been removed, in the dry, prior to the placement of concrete for footings.

The bearing medium under footing-supported structures is required to be provided with adequate lateral support with respect to excavations and different foundation levels. Adequate lateral support is provided to a compact glacial till and engineered fill above the groundwater table when a plane extending down and out from the bottom edge of the footing at a minimum of 1.5H:1V passes only through in situ soil of the same or higher capacity as the bearing medium soil.

As a general procedure, it is recommended that footings for the proposed structure that are located adjacent to the existing structure be founded at the same level as the existing footings. This accomplishes three objectives. First, the behaviour of the two structures at their connection will be similar due to the similar bearing medium. Second, there will be minimal stress added to the existing structure from the new structure. Third, the bearing of the new structure will likely not be influenced by any backfill material associated with the existing structure. If lower footings are proposed for the subject building addition, it is recommended that an underpinning system or shoring system be designed by an engineer specializing in these works to provide sufficient support along the existing building foundation walls during construction.

### **Design for Earthquakes**

The site class for seismic site response can be taken as **Class C**. Soils underlying the subject site are not susceptible to liquefaction. Reference should be made to the latest revision of the Ontario Building Code (OBC) 2012 for a full discussion of the earthquake design requirements.

### **Slab on Grade Construction**

With the removal of all topsoil and fill, containing deleterious or organic materials, the native soil or existing granular fill approved by the geotechnical consultant at the time of excavation will be considered to be an acceptable subgrade surface on which to commence backfilling for slab on grade construction. Any soft areas should be removed and backfilled with appropriate backfill material. OPSS Granular A or Granular B Type II, with a maximum particle size of 50 mm, are recommended for backfilling below the floor slab.

It is recommended that the upper 200 mm of sub-floor fill consist of OPSS Granular A crushed stone. All backfill materials within the footprint of the proposed building addition should be placed in maximum 300 mm thick loose lifts and compacted to at least 98% of its SPMDD.

### **Pavement Design**

For design purposes, the pavement structure presented in the following tables could be used for the design of car parking areas and the proposed fire route.

<b>Table 1 - Recommended Pavement Structure - Car Only Parking Areas</b>	
<b>Thickness (mm)</b>	<b>Material Description</b>
50	<b>Wear Course</b> - HL 3 or Superpave 12.5 Asphaltic Concrete
150	<b>BASE</b> - OPSS Granular A Crushed Stone
300	<b>SUBBASE</b> - OPSS Granular B Type II
<b>SUBGRADE</b> - Either fill, in situ soil or OPSS Granular B Type I or II material placed over in situ soil or fill	

<b>Table 2 - Recommended Pavement Structure - Proposed Fire Route</b>	
<b>Thickness (mm)</b>	<b>Material Description</b>
40	<b>Wear Course</b> - HL3 or Superpave 12.5 Asphaltic Concrete
50	<b>Binder Course</b> - HL8 or Superpave 19.0 Asphaltic Concrete
150	<b>BASE</b> - OPSS Granular A Crushed Stone
400	<b>SUBBASE</b> - OPSS Granular B Type II
<b>SUBGRADE</b> - Either fill, in situ soil or OPSS Granular B Type I or II material placed over in situ soil or fill	

Minimum Performance Graded (PG) 58-34 asphalt cement should be used for this project.

If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be excavated to a competent layer and replaced with OPSS Granular B Type II material. The pavement granular base should be placed in maximum 300 mm thick loose lifts and compacted to a minimum of 100% of the material's SPMDD using suitable vibratory equipment.

### 3.0 Design and Construction Precautions

#### Foundation Drainage and Backfill

A perimeter foundation drainage system is recommended for the proposed building. The system should be connected to the existing system and should consist of a 150 mm diameter perforated corrugated plastic pipe, surrounded on all sides by 150 mm of 19 mm clear crushed stone, placed at the underside of footing level around the exterior perimeter of the structure. The pipe should have a positive outlet, such as a gravity connection to the storm sewer.

Backfill against the exterior sides of the foundation walls should consist of free-draining **patersongroup**



non frost susceptible granular materials, such as clean sand or OPSS Granular B Type I granular material. The greater part of the site excavated materials will be frost susceptible and, as such, are not recommended for re-use as backfill against the foundation walls.

Backfill material below sidewalk subgrade areas or other settlement sensitive structures should consist of free-draining, non-frost susceptible material placed in maximum 300 mm thick loose lifts and compacted to at least 95% of its SPMDD under dry and above freezing conditions. Frost heave and settlement of the structures should be minimized in this regard.

### **Protection of Footings Against Frost Action**

Perimeter footings of heated structures are required to be insulated against the deleterious effect of frost action. A minimum of 1.5 m thick soil cover, or an equivalent combination of soil cover and foundation insulation, should be provided in this regard.

Exterior unheated footings, such as those for isolated exterior piers, are more prone to deleterious movement associated with frost action than the exterior walls of the structure proper and require additional protection, such as 2.1 m of soil cover or an equivalent combination of soil cover and foundation insulation.

### **Excavation Side Slopes**

The side slopes of excavations in the soil and fill overburden materials should either be cut back at acceptable slopes or should be retained by shoring systems from the start of the excavation until the structure is backfilled. It is assumed that sufficient room will be available for the greater part of the excavation to be undertaken by open-cut methods (i.e. unsupported excavations).

The excavation side slopes above the groundwater level extending to a maximum depth of 3 m should be cut back at 1H:1V or flatter. The flatter slope is required for excavation below groundwater level. The subsoil at this site is considered to be mainly a Type 2 and 3 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects.

Excavated soil should not be stockpiled directly at the top of excavations and heavy equipment should be kept away from the excavation sides.

Slopes in excess of 3 m in height should be periodically inspected by the geotechnical consultant in order to detect if the slopes are exhibiting signs of distress.

It is recommended that a trench box be used at all times to protect personnel working in trenches with steep or vertical sides. It is expected that services will be installed by “cut and cover” methods and excavations will not be left open for extended periods of time.

### Groundwater Control

The contractor should be prepared to direct water away from all bearing surfaces and subgrades, regardless of the source, to prevent disturbance to the founding medium.

The flow of groundwater into the excavation through the overburden materials is expected to be low based on the local groundwater table. It is anticipated that pumping from open sumps will be sufficient to control the groundwater influx through the sides of the excavations.

A temporary Ministry of the Environment and Climate Change (MOECC) permit to take water (PTTW) may be required for this project if more than 400,000 L/day of ground and/or surface water is to be pumped during the construction phase. A minimum of 4 to 5 months should be allowed for completion of the PTTW application package and issuance of the permit by the MOECC.

For typical ground or surface water volumes being pumped during the construction phase (typically between 50,000 and 400,000 L/day), it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of two to four weeks should be allotted for completion of the EASR registration and the Water Taking and Discharge Plan to be prepared by a Qualified Person as stipulated under O.Reg. 63/16. If a project qualifies for a PTTW based upon anticipated conditions, an EASR will not be allowed as a temporary dewatering measure while awaiting the MOECC review of the PTTW application.

We trust that this information satisfies your immediate requirements.

### Paterson Group Inc.

Nathan F. S. Christie, P.Eng.



David J. Gilbert, P.Eng.

### Paterson Group Inc.

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**JOHN D. PATERSON & ASSOCIATES LTD.**

Consulting Geotechnical and Environmental Engineers  
28 Concourse Gate, Unit 1, Nepean, Ont. K2E 7T7

**SOIL PROFILE & TEST DATA**

Environmental Site Assessment  
Prop. New Turnbull Learning Centre, Fisher Ave.  
Ottawa, Ontario

**DATUM** Elevations interpolated from survey plan provided by Webster & Simmonds Surveying Ltd. and are therefore approximate.

**FILE NO.**  
**E1190**

**REMARKS**

**HOLE NO.**  
**TP 1**

**BORINGS BY** Backhoe

**DATE** 2 March 1995

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				PIEZOMETER CONSTRUCTION
		TYPE	NUMBER	% RECOVERY	N VALUE OF ROD			○ Lower Explosive Limit %				
GROUND SURFACE							20	40	60	80		
Dark brown, silty TOPSOIL					0	81.30						
Reddish brown SILTY SAND, some organics		G	5									
GLACIAL TILL: Very dense to dense, silty sand-gravel with cobbles and boulders		G	6		1	80.30						
End of Test Pit					2	79.30						
Shovel refusal on boulders @ 2.6m depth. (TP dry upon completion)												

100 200 300 400 500  
**Gastech 1314 Rdg. (ppm)**  
▲ Full Gas Resp. Δ Methane Elm.





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Environmental Site Assessment  
Prop. New Turnbull Learning Centre, Fisher Ave.  
Ottawa, Ontario

**DATUM** Elevations interpolated from survey plan provided by Webster & Simmonds Surveying Ltd. and are therefore approximate.

**FILE NO.**  
**E1190**

**REMARKS**

**HOLE NO.**  
**TP 3**

**BORINGS BY** Backhoe

**DATE** 1 March 1995

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				PIEZOMETER CONSTRUCTION	
		TYPE	NUMBER	% RECOVERY	N VALUE or ROD			○ Lower Explosive Limit %					
GROUND SURFACE								20	40	60	80		
Dark brown, silty TOPSOIL		G	7			0	81.10						
Yellowish brown SAND		G	8										
GLACIAL TILL: Dense, grey silty sand-gravel with many boulders		G	9			1	80.10						
End of Test Pit						2	79.10						
Shovel refusal on large boulder @ 2.6m depth. (TP dry upon completion)													

100 200 300 400 500  
**Gastech 1314 Rdg. (ppm)**  
▲ Full Gas Resp. Δ Methane Elim.



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Consulting Geotechnical and Environmental Engineers  
28 Concourse Gate, Unit 1, Nepean, Ont. K2E 7T7

**SOIL PROFILE & TEST DATA**

Environmental Site Assessment  
Prop. New Turnbull Learning Centre, Fisher Ave.  
Ottawa, Ontario

**DATUM** Elevations interpolated from survey plan provided by Webster & Simmonds Surveying Ltd. and are therefore approximate.

**FILE NO.**  
**E1190**

**REMARKS**

**HOLE NO.**  
**TP 4**

**BORINGS BY** Backhoe

**DATE** 1 March 1995

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				PIEZOMETER CONSTRUCTION	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Lower Explosive Limit %					
GROUND SURFACE								20	40	60	80		
Dark brown, silty TOPSOIL						0	79.70						
Greyish brown CLAYEY SANDY SILT		G	3										
GLACIAL TILL: Dense to very dense, greyish brown to grey, bouldery silty sand-gravel		G	4			1	78.70						
End of Test Pit (TP dry upon completion)						3	76.70						

100 200 300 400 500  
**Gastech 1314 Rdg. (ppm)**  
▲ Full Gas Resp. △ Methane Elim.



**JOHN D. PATERSON & ASSOCIATES LTD.**

Consulting Geotechnical and Environmental Engineers  
28 Concourse Gate, Unit 1, Nepean, Ont. K2E 7T7

**SOIL PROFILE & TEST DATA**

**Environmental Site Assessment**  
Prop. New Turnbull Learning Centre, Fisher Ave.  
Ottawa, Ontario

**DATUM** Elevations interpolated from survey plan provided by Webster & Simmonds Surveying Ltd. and are therefore approximate.

**FILE NO.**  
**E1190**

**REMARKS**

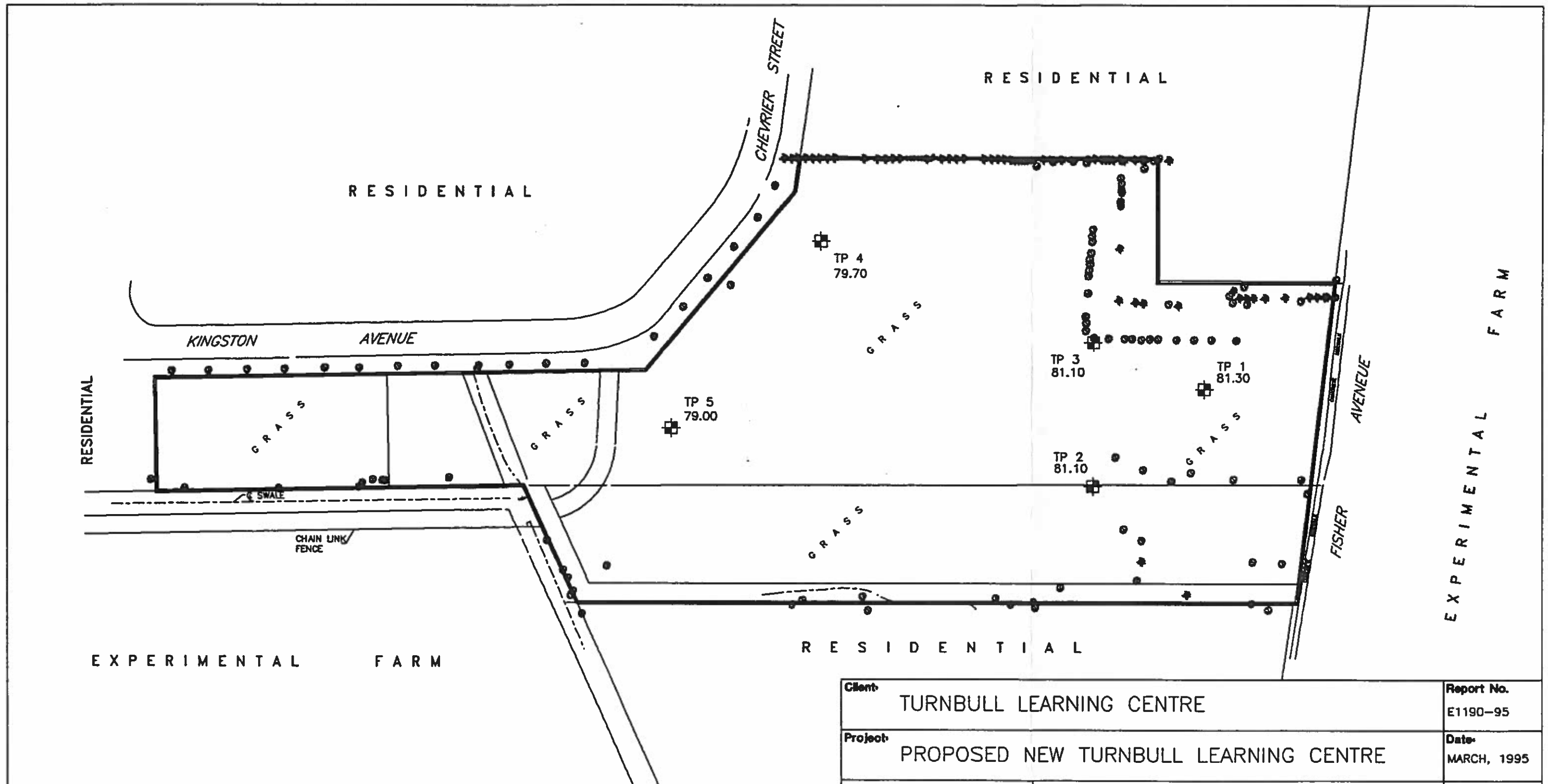
**HOLE NO.**  
**TP 5**

**BORINGS BY** Backhoe


**DATE** 1 March 1995

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				PIEZOMETER CONSTRUCTION
		TYPE	NUMBER	% RECOVERY	N VALUE or ROD			○ Lower Explosive Limit %				
GROUND SURFACE								20	40	60	80	
Dark brown, silty TOPSOIL	[Solid Black]					0	79.00					
	0.25											
Very stiff, olive grey, fissured SILTY CLAY	[Hatched]	G	1			1	78.00	△				
	1.90											
GLACIAL TILL: Dense, olive grey to grey silty sand-gravel with cobbles and boulders	[Dotted]	G	2			2	77.00	△				
	2.80											
End of Test Pit												
Shovel refusal on boulder @ 2.8m depth.												



100 200 300 400 500  
**Gastech 1314 Rdg. (ppm)**  
▲ Full Gas Resp. △ Methane Elm.



**LEGEND:**

-  TEST PIT LOCATION
- 81.30 GROUND SURFACE ELEVATION (m)

ELEVATIONS INTERPOLATED FROM SURVEY PLAN PROVIDED BY WEBSTER & SIMMONDS SURVEYING LTD. AND ARE THEREFORE APPROXIMATE.

Client: TURNBULL LEARNING CENTRE		Report No. E1190-95
Project: PROPOSED NEW TURNBULL LEARNING CENTRE		Date: MARCH, 1995
	Title: TEST HOLE LOCATION PLAN FISHER AVENUE OTTAWA, ONTARIO	Dwg. No. E1190-1
	 <b>JOHN D. PATERSON AND ASSOC. LTD.</b> Consulting Geotechnical and Environmental Engineers 28 Concourse Gate, Unit 1, Nepean, Ontario K2E 7T7	Scale: 1:1000
		Des.:
		Dwn: MPG
		Chkd: AJT



## **PART 1 – GENERAL**

### **1.1 WORK COVERED BY CONTRACT DOCUMENTS**

- .1 Work of this Contract comprises of general construction of a Music Room Addition to Turnbull School located at 1132 Fisher Avenue in Ottawa. The renovation work includes but is not limited to the following:
  - .1 126m<sup>2</sup> single storey Music Room Addition.
  - .2 Relocation of existing catchbasin.
  - .3 Relocation of existing exit door.
  - .4 New ramp, concrete retaining wall and galvanized steel guard.
  - .5 Modifications to existing 2<sup>nd</sup> floor projected bay curtainwall windows to allow for membrane tie-ins to new addition.
  - .6 Interior floor, wall and ceiling finishing work in existing Corridor to accommodate new addition.

### **1.2 CONTRACT METHOD**

- .1 Construct Work under stipulated price unit price contract.
- .2 Relations and responsibilities between suppliers and subcontractors assigned by Owner are as defined in Conditions of Contract.

### **1.3 WORK BY OTHERS**

- .1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Consultant.
- .2 Co-ordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Consultant, in writing, any defects which may interfere with proper execution of Work.

### **1.5 WORK SEQUENCE**

- .1 Construct Work in stages to accommodate Owner's continued use of premises during construction. Refer to drawings and specifications for school dates and proposed availability of spaces.
- .2 Co-ordinate Progress Schedule and co-ordinate with Owners ongoing Occupancy during construction.
- .3 Maintain fire access/control at all times.

1.6 CONTRACTOR USE  
OF PREMISES

- .1 Unrestricted use of the crawl space until Substantial Performance.
- .2 Limit use of premises for Work, for storage, and for access, to allow:
  - .1 Owner occupancy.
  - .2 Work by other contractors.
- .3 Co-ordinate use of premises under direction of Owner.
- .4 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .5 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .6 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed.
- .7 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.7 OWNER OCCUPANCY

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .3 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.11 OWNER  
FURNISHED ITEMS

- .1 Owner Responsibilities:
  - .1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor .
  - .2 Deliver supplier's bill of materials to Contractor.
  - .3 Arrange and pay for delivery to site in accordance with Progress Schedule.
  - .4 Inspect deliveries jointly with Contractor.
  - .5 Submit claims for transportation damage.
  - .6 Arrange for replacement of damaged, defective or missing items.
  - .7 Arrange for manufacturer's field services; arrange for and deliver manufacturer's warranties and bonds to Contractor.
- .2 Contractor Builder Responsibilities:
  - .1 Designate submittals and delivery date for each product in progress schedule.
  - .2 Review shop drawings, product data, samples, and other

submittals. Submit to Consultant notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.

- .3 Receive and unload products at site.
- .4 Inspect deliveries jointly with Owner; record shortages, and damaged or defective items.
- .5 Handle products at site, including uncrating and storage.
- .6 Protect products from damage, and from exposure to elements.
- .7 Assemble, install, connect, adjust, and finish products.
- .8 Provide installation inspections required by public authorities.
- .9 Repair or replace items damaged by Contractor or subcontractor on site.

1.13 EXISTING SERVICES

- .1 Notify consultants and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Consultant and Owner a minimum of 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian or vehicular traffic.
- .3 Provide alternative routes for personnel pedestrian and vehicular traffic.
- .4 Establish location and extent of service lines in area of work before starting Work. Notify Consultant of findings.
- .5 Submit schedule to and obtain approval from Consultant and Owner for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .6 Provide temporary services as required to maintain critical building and tenant systems.
- .7 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
- .8 Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.
- .9 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

- .10 Record locations of maintained, re-routed and abandoned service lines.
- .11 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures .

1.14 DOCUMENTS  
REQUIRED

- .1 Maintain at job site, one copy each document as follows:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Reviewed Shop Drawings.
  - .5 List of Outstanding Shop Drawings.
  - .6 Change Orders.
  - .7 Other Modifications to Contract.
  - .8 Field Test Reports.
  - .9 Copy of Approved Work Schedule.
  - .10 Health and Safety Plan and Other Safety Related Documents.
  - .11 Other documents as specified.

**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 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.

### **1.2 USE OF SITE AND FACILITIES**

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Owner to facilitate work as stated. Provide daily or as required updates with the school representative to advise of proposed activities that may generate objectionable or worrisome noises.
- .2 Maintain existing services to building and provide for personnel and vehicle access. During school's operations during summer months, the Contractors use of the site shall be limited to a 9.7m x 12m area; this area must be fenced in. Access to and from this compound must be outside of bus drop off and pick up hours. Refer to Site Plan, section 01 11 00.01 for location of GC's parking and GC's compound. The final location of this compound shall be reviewed with the Owner's Representative.
- .3 Where security is reduced by work provide temporary means to maintain security.
- .4 Closures: protect work temporarily until permanent enclosures are completed.

### **1.4 EXISTING SERVICES**

- .1 Notify Owner' Representative and Consultant of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Owner 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 and pedestrian and vehicular traffic.
- .4 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

### **1.5 SPECIAL REQUIREMENTS**

- .1 Submit schedule in accordance with 01 32 16.07 - Construction Progress Schedule - Bar (GANNT) Chart.

- .2 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations. All access to occupied areas is limited to pre approved or escorted visitation
  - .3 Keep within limits of work and avenues of ingress and egress.
  - .4 Deliver materials during the school year to be limited to the following times unless otherwise approved.
    - .1 Before School: between 6:30am to 8:00am
    - .2 After School: after 3:30pm
- 1.6 SECURITY
- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.
- 1.7 BUILDING SMOKING ENVIRONMENT
- .1 Comply with smoking restrictions. Smoking is not permitted on Turnbull School property.
- 1.8 CRIMINAL BACKGROUND CHECKS
- .1 The successful Proponent acknowledges Turnbull School is required by Provincial Regulation 521/01 (Collection of Personal Information) to the Education Act (Ontario) with respect to criminal background checks and offence declarations. The successful Proponent covenants and agrees to assist the School in complying with same by providing the School or such other entity as the School may designate with a criminal background check covering offences which would be revealed by a search of Criminal Records together with an Offence Declaration in a School approved form for every individual or employee of the successful Proponent, who may come into direct contact with pupils on a regular basis at a school site of the School. Criminal background checks are required prior to the occurrence of such possible direct contact on or before September 1st each year thereafter with respect to Offence Declarations. For the purposes of this submission, the School shall determine in its sole discretion whether an individual or employee of the successful Proponent may come into direct contact with pupils on a regular basis.
- 1.9 ACCESS TO THE BUILDING
- .1 The successful Proponent shall be responsible for managing all Site Personnel arriving to the school during the School Year and during the summer months.
  - .2 The successful Proponent shall be responsible for ensuring that any site personnel who require access to the areas still in use by staff and students during the school year that they follow all

protocols for Visitors set out by the School.

**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 Owner/Contractor Agreement.
  - .2 Canadian Construction Documents Committee (CCDC)
    - .1 CCDC 2-2008, Stipulated Price Contract.
- 1.2 APPLICATIONS FOR PROGRESS PAYMENT**
- .1 Refer to CCDC 2.
  - .2 Make applications for payment on account as provided in Agreement 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.
  - .2 Provide detailed 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.
- .2 Consultant will issue to Owner, no later than 10 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.
- .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 No later than 10 days after receipt of list and application, Consultant will review Work to verify validity of application, and no later than 7 days after completing review, will notify Contractor if Work or designated portion of Work is substantially performed.
- .4 Consultant: state date of Substantial Performance of Work or designated portion of Work in certificate.
- .5 Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Consultant, establish reasonable date for finishing Work.
- 1.7 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF WORK
- .1 Refer to CCDC 2.
- .2 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.

- .3 After receipt of application for payment and sworn statement, Consultant will issue certificate for payment of holdback amount.
- .4 Amount authorized by certificate for payment of holdback amount is due and payable on day following expiration of holdback period stipulated in lien legislation applicable to Place of Work. Where lien legislation does not exist or apply, holdback amount is due and payable in accordance with other legislation, industry practice, or provisions which may be agreed to between parties. Owner may retain out of holdback amount sums required by law to satisfy liens against Work or, if permitted by lien legislation applicable to Place of Work, other third party monetary claims against Contractor Design-Builder which are enforceable against Owner.

1.8 FINAL PAYMENT .1 Refer to CCDC 2, GC 5.7.

**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 ADMINISTRATIVE**

- .1 Schedule and administer project meetings throughout the progress of the work on a bi-weekly basis or at the call of Owner or Consultant.
- .2 Prepare agenda for meetings.
- .3 Distribute written notice of each meeting four days in advance of meeting date to Consultant.
- .4 Provide physical space and make arrangements for meetings.
- .5 Preside at meetings.
- .6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and, affected parties not in attendance and Consultant.
- .8 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 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Senior representatives of Owner, Consultant Team, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3 Establish time and location of 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 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.

- .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.

1.3 PROGRESS MEETINGS

- .1 During course of Work and 4 weeks prior to project completion, schedule progress meetings twice per month or as requested.
- .2 Contractor, major Subcontractors involved in Work and Owner Representative and Consultant and Owner 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 2 days after meeting.
- .5 Agenda to include the following:
  - .1 Review, approval of minutes of previous meeting.
  - .2 Review of Work progress since previous meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems which impede construction schedule.
  - .5 Review of off-site fabrication delivery schedules.
  - .6 Corrective measures and procedures to regain projected schedule.
  - .7 Revision to construction schedule.
  - .8 Progress schedule, during succeeding work period.
  - .9 Review submittal schedules: expedite as required.
  - .10 Maintenance of quality standards.
  - .11 Review proposed changes for affect on construction

schedule and on completion date.  
.12 Other business.

**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 DEFINITIONS**

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
- .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Saturday, inclusive, will provide six (6) day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
- .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7 Milestone: significant event in project, usually completion of major deliverable.
- .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .9 Project Planning, Monitoring and Control System: overall system operated by to enable monitoring of project work in relation to established milestones.

### **1.2 REQUIREMENTS**

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.
- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, and Final Certificate as defined times of completion are of essence of this contract.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Consultant within 10 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Consultant within 5 working days of receipt of acceptance of Master Plan.

1.4 MASTER PLAN

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 Owner and Consultant will review and return revised schedules within 5 working days.
- .3 Revise impractical schedule and resubmit within 5 working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.5 PROJECT SCHEDULE

- .1 Develop Project Schedule that is broken down by those areas for which work can begin during the school year and those tasks being performed during the summer months.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
  - .1 Award.
  - .2 Shop Drawings, Samples.
  - .3 Permits.
  - .4 Mobilization.
  - .5 Abatement
  - .6 Demolition
  - .7 Slab removals for underground plumbing.
  - .8 Backfill.
  - .9 Slab on grade infills.
  - .10 Interior Architecture (Walls, Floors and Ceiling).

- .11 Plumbing Rough In and Finishing
- .12 Lighting Removals and Installation
- .13 Electrical Removals, Rough In and Finishing.
- .14 Heating, Ventilating, and Air Conditioning.
- .15 Millwork.
- .16 Exterior Siteworks - rough grading, sidewalks, asphalt and fencing.
- .17 Testing and Commissioning.
- .18 Supplied equipment long delivery items.
- .19 Note activities planned on school closure days.
- .20 Occupancy Dates
- .21 Total Completion

1.6 PROJECT SCHEDULE REPORTING

- .1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.7 PROJECT MEETINGS

- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Weather related delays with their remedial measures will be discussed and negotiated.

**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 RELATED REQUIREMENTS**

.1 Section - All Sections.

**1.2 ADMINISTRATIVE**

- .1 Submit to Consultant submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. 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 Do not proceed with Work affected by submittal 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 GC to 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 co-ordinated 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 co-ordinated.
- .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 Refer to CCDC 2 GC 3.10.

- .2 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.
- .3 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario.
- .4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .5 Allow 10 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 and submission number
  - .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 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 After Consultant's review, distribute copies.
  - .11 Submit an electronic copy of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.
  - .12 Submit an electronic copy 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. Provide all documents in PDF format (.pdf)
  - .13 Submit an electronic copy 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.
    - .3 Provide all documents in PDF format (.pdf)
  - .14 Submit an electronic copy 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.
    - .3 Provide all documents in PDF format (.pdf)
  - .15 Submit an electronic copy of manufacturer's 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.

- .2 Provide all documents in PDF format (.pdf)
- .16 Submit an electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Consultant. Provide all documents in PDF format (.pdf)
- .17 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .18 Submit an electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Consultant.
- .19 Delete information not applicable to project.
- .20 Submit three physical samples of all colours of material, printed material and electronic material is not acceptable.
- .21 Supplement standard information to provide details applicable to project.
- .22 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, 1 electronic copy 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.
- .23 The review of shop drawings by the Consultants is for sole purpose of ascertaining conformance with general concept.  
.1 This review shall not mean that the Consultants approve 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 in duplicate as requested in respective specification Sections. Label samples with origin and intended use.

ISSUED FOR PERMIT

- .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.

1.6 PHOTOGRAPHIC DOCUMENTATION

- .1 Submit electronic copy of colour digital photography in jpg & tif format, fine resolution monthly with progress statement and as directed by Consultant.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints: 4 locations.
  - .1 Viewpoints and their location as determined by Consultant.
- .4 Frequency of photographic documentation: twice weekly and as directed by Consultant.
  - .1 Upon completion of: excavation, foundation, framing and services before concealment, of Work, and as directed by Consultant.

1.7 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.

**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 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
  - .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
    - .1 Material Safety Data Sheets (MSDS).
  - .3 Province of Ontario
    - .1 Occupational Health and Safety Act, R.S.O. 1990 Updated 2011.
- 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 found in work plan.
  - .3 Submit 1 copy of Contractor's authorized representative's work site health and safety inspection reports to Consultant bi-weekly (2 times per month).
  - .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 Consultant will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 6 days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within 10 days after receipt of comments from Consultant.
  - .8 Consultant's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
  - .9 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during

emergency situations.

.1 Fire Alarm Testing and Evacuation Program implemented by the RCCDSB.

1.3 FILING OF NOTICE

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

1.4 SAFETY ASSESSMENT

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

1.5 REGULATORY REQUIREMENTS

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

1.6 PROJECT/SITE CONDITIONS

.1 Work at site will involve contact with:  
.1 Materials referenced in the attached Designated Substance Survey.

1.7 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.  
.2 Consultant may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.8 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.

1.9 COMPLIANCE REQUIREMENTS

.1 Comply with Ontario Health and Safety Act, R.S.O.

1.10 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



Consultant verbally and in writing.

1.11 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 demolition and asbestos.
  - .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.

1.12 POSTING OF  
DOCUMENTS

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

1.13 CORRECTION OF  
NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Consultant.
- .2 Provide Consultant with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Consultant may stop Work if non-compliance of health and safety regulations is not corrected.

1.14 BLASTING

- .1 Blasting or other use of explosives is not permitted.

1.15 POWDER  
ACTUATED DEVICES

- .1 Use powder actuated devices only after receipt of written permission from Owner.

1.16 WORK STOPPAGE

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

**PART 2 - PRODUCTS**

2.1 NOT USED

- .1 Not used.

**PART 3 - EXECUTION**

3.1 NOT USED .1 Not used.

**END OF SECTION**

## **PART 1 - GENERAL**

- 1.1 RELATED REQUIREMENTS** .1 All Sections
- 1.2 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 humankind; or degrade environment aesthetically, culturally and/or historically.  
.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.
- .2 Reference Standards:  
.1 Canadian Construction Documents Committee (CCDC)  
.1 CCDC 2-2008 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.
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS** .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prior to commencing construction activities or delivery of materials to site, provide Environmental Protection Plan for review by Consultant.
- .3 Ensure Environmental Protection Plan includes 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.
- .5 Include in Environmental Protection Plan:  
.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.  
.2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.

- .3 Names and qualifications of persons responsible for training site personnel.
- .4 Descriptions of environmental protection personnel training program.
- .5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including 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, EPA 832/R-92-005, Chapter 3 requirements.
- .6 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Ensure plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.
- .7 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Ensure plan includes measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
- .8 Spill Control Plan including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .9 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .10 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
- .11 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .12 Waste Water Management Plan identifying methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- .13 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.
- .14 Pesticide treatment plan to be included and updated, as required.

- 1.4 FIRES .1 Fires and burning of rubbish on site not permitted.
- 1.5 DRAINAGE .1 Provide Erosion and Sediment Control Plan identifying type and location of erosion and sediment controls provided. Ensure plan includes 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, EPA 832/R-92-005, Chapter 3 requirements.
- .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.
- 1.6 POLLUTION CONTROL .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment and plant to local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area.  
.1 Provide temporary enclosures where directed.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- PART 2 – PRODUCTS**
- 2.1 NOT USED .1 Not Used.
- PART 3 - EXECUTION**
- 3.1 CLEANING .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials for reuse and

recycling in accordance with Section 01 74 21 -  
Construction/Demolition Waste Management and Disposal.

- .3 Ensure storm and sanitary sewers remain free of waste and volatile materials disposal.

**END OF SECTION**

**PART 1 - GENERAL**

**1.1 REFERENCES AND CODES**

- .1 Perform Work in accordance with Ontario Building Code (OBC) 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 that is not identified in Contract Documents. Notify Consultant.

**1.3 BUILDING SMOKING ENVIRONMENT**

- .1 Comply with smoking restrictions and municipal by-laws.
- .2 Smoking is not permitted on site.

**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 RELATED REQUIREMENTS** .1 Section - All Divisions, all Sections
- 1.2 REFERENCES** .1 Canadian Construction Documents Committee (CCDC)  
.1 CCDC 2- 2008, Stipulated Price Contract.
- 1.3 INSPECTION** .1 Refer to CCDC 2, GC 2.3.
- 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 Owner.
- .2 The Contractor is responsible for coordinating and scheduling the work with the assigned Inspection and Testing Agency.
- .3 Provide equipment required for executing inspection and testing by appointed agencies.
- .4 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .5 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 Consultant. Pay costs for retesting 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 Refer to CCDC, GC 2.4.
- .2 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.
- 1.8 REPORTS
- .1 Submit 1 electronic copy of inspection and test reports in PDF format to Consultant.
- .2 Provide copies to subcontractor of work being inspected or tested manufacturer or fabricator of material being inspected or tested.
- 1.9 TESTS AND MIX DESIGNS
- .1 Furnish test results and mix designs as requested.
- 1.11 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 and as specified in specific Section.
- .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 Mock-ups may remain as part of Work if approved by Consultant.
- 1.12 MILL TESTS
- .1 Submit mill test certificates as requested or as required of specification Sections.

1.13 EQUIPMENT AND  
SYSTEMS

- .1 Submit adjustment and balancing reports for mechanical and electrical systems.
- .2 Refer to Mechanical and Electrical Divisions for specific sections and for definitive requirements.

**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 RELATED REQUIREMENTS** .1 Division 26
- 1.2 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.
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS** .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.  
.2 Submit erosion and sedimentation control plan as required.
- 1.4 INSTALLATION AND REMOVAL** .1 Provide temporary utilities controls in order to execute work expeditiously.  
.2 Remove from site all such work after use.
- 1.5 WATER SUPPLY** .1 Provide continuous supply of potable water for construction use.  
.2 The Contractor may use the School for water supply. The Contractor shall coordinate with the owner for suitable source and maintain over construction period.  
.3 The Contractor shall coordinate with owner any disruptions of water supply in non construction zones. Any disruptions shall be scheduled in non school hours.
- 1.6 TEMPORARY HEATING AND VENTILATION** .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.  
.2 Construction heaters used inside building must be flameless type. Solid fuel salamanders are not permitted.  
.3 Provide temporary heat and ventilation in enclosed areas as required to:  
.1 Facilitate progress of Work.  
.2 Protect Work and products against dampness and cold.  
.3 Prevent moisture condensation on surfaces.  
.4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.

- .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.
- .5 Ventilating:
  - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
  - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
  - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
  - .4 Ventilate storage spaces containing hazardous or volatile materials.
  - .5 Ventilate temporary sanitary facilities.
  - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .6 On completion of Work for which permanent heating system is used, replace filters, clean ductwork and all diffusers.
- .7 Ensure Date of Substantial Performance and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Consultant.
- .8 Pay costs for maintaining temporary heat, when using permanent heating system if available.
- .9 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
  - .1 Conform with applicable codes and standards.
  - .2 Enforce safe practices.
  - .3 Prevent abuse of services.
  - .4 Prevent damage to finishes.
  - .5 Vent direct-fired combustion units to outside.
- .10 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.8 TEMPORARY POWER  
AND LIGHT

- .1 Provide for temporary lighting and operating of power tools.
- .2 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.
- .3 Temporary power may be taken from panels within the wing

being renovated.

1.9 TEMPORARY  
COMMUNICATION  
FACILITIES

- .1 Provide and pay for temporary telephone, fax, and data hook up lines equipment necessary for own use and use of Turnbull School Representative and Consultant.

1.10 FIRE  
PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of Work as required by governing codes, insurances, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted on site.
- .3 The Contractor shall follow direction from the Owner for participation in any planned fire alarm drills.

**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**

### **1.2 REFERENCES**

- .1 Canadian Construction Documents Committee (CCDC)
  - .1 CCDC 2-2008, Stipulated Price Contract.
- .2 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.
- .3 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.

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit erosion and sedimentation control plan.

### **1.4 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 gravelled 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.

### **1.5 SCAFFOLDING**

- .1 Scaffolding in accordance with CAN/CSA-S269.2.
- .2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms and temporary stairs.

- 1.6 HOISTING
- .1 Provide, operate and maintain hoists, 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.
- 1.7 SITE STORAGE/LOADING
- .1 Refer to CCDC 2, GC 3.11.
- 1.8 CONSTRUCTION PARKING
- .1 During the school's operations Contractors use of the site shall be limited to a 9.7m x 12m compound located in the area south of the school where the proposed bus lane will be located. The final location of this compound shall be reviewed with the Owner's Representative.
  - .2 During the summer months the Contractors use of the site can be increased; the Contractor shall submit a sketch locating proposed placement of storage containers and parking for review by Turnbull School.
- 1.9 SECURITY
- .1 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays if required.
- 1.10 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.
  - .4 Equip office with 1 x 3 m table, 10 chairs, 6 m of shelving 300 mm wide, one 3 drawer filing cabinet, one plan rack and one coat rack and shelf.
  - .5 Maintain in clean condition.
- 1.11 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.
- 1.12 SANITARY/WASHROOM FACILITIES
- .1 The Contractor shall provide workers with portable washroom facilities. Placement of these units shall be within the Contractors fenced compound.
- .2 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.
- 1.13 CONSTRUCTION SIGNAGE
- .1 Provide and erect project sign, within three weeks of signing Contract, in a location designated by Consultant.
- .2 Construction sign 2.4 m x 2.4 m, of wood frame and plywood construction painted with exhibit lettering produced by a professional sign painter.
- .3 Indicate on sign, name of Owner and Contractor.
- .4 No other signs or advertisements, other than warning signs, are permitted on site.
- .5 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.
- .6 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project.
- 1.14 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. Keep all local roads used by construction traffic clean and clear of mud, gravel, etc.
- .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 Construct access and haul roads necessary.
- .8 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .9 Dust control: adequate to ensure safe operation at all times.

1.17 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.

**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 INSTALLATION  
AND REMOVAL**

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

**1.2 HOARDING**

- .1 Supply and erect hoarding around perimeter of work area for each phase of work as approved by Owner and Authority Having Jurisdiction.
- .2 Contractor to present layout of hoarding and obtain approval from Owner prior to construction. Any changes to hoarding layouts to be presented prior to making adjustments.
- .3 Contractor will erect hoarding site enclosures of 1.8m high chain link fence or Modu-loc fencing. Hoarding shall be designed by a Professional Engineer in the Province of Ontario. The hoarding design Engineer shall review the installation of the hoarding as the nature of the site changes during the construction process.

Contractor to provide lockable truck entrance(s) with lockable gates and at least one pedestrian door conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys. Provide Owner with key.

- .4 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
- .5 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

**1.3 CONSTRUCTION  
BARRIERS WITHIN BUILDINGS**

- .1 Supply and erect construction barriers as approved by Owner and Authority Having Jurisdiction.
- .2 Contractor to present layout of hoarding and obtain approval from Project Manager prior to construction. Any changes to hoarding layouts to be presented prior to making adjustments. A minimum of 72 hours shall be provided to the Owner's Project Manager prior to relocating construction barriers.
- .3 Provide construction barriers to separate occupied areas of the building from the construction zones.

- .4 Provide a lockable door complete with frame and required hardware including weatherstripping within construction barriers to provide access to the construction areas. Doors shall be kept locked at all times. Contractor shall provide copy of key to Owner.
- .5 Existing walls and doors can be used for construction barriers.
- 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.
- .2 Provide as required by governing authorities.
- 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 and snow loading.
- 1.6 DUST TIGHT SCREENS AND PARTITIONS
- .1 Provide dust tight screens / insulated partitions to localize dust generating activities, and for protection of workers, finished areas of Work occupied and public areas. Screens must be structurally sound and impact resistant.
- .2 Maintain and relocate protection until such work is complete.
- .3 Screens will be required at all work abutting occupied spaces.
- 1.6 ACCESS TO SITE
- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.
- 1.7 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.
- 1.8 FIRE ROUTES
- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.

- .2 Provide temporary fire routes and signage as required to suit project. Work with Turnbull School Representative and local fire authority to develop temporary fire exit routes.
- 1.9 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY
- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Document adjacent properties with digital photography and advise residents of any works likely to disturb adjacent properties.
- .3 Be responsible for damage incurred.
- 1.10 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.
- 1.11 WASTE MANAGEMENT AND DISPOSAL
- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

**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 RELATED  
REQUIREMENTS**

.1 Section - All Sections.

**1.2 REFERENCES**

.1 Canadian Construction Documents Committee (CCDC)  
.1 CCDC 2-2008, Stipulated Price Contract.

.2 Within text of each specifications section, reference may be made to reference standards.

.3 Conform to the latest issue of reference standards, in whole or in part as specifically requested in specifications.

.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 borne by Owner in event of conformance with Contract Documents or by Contractor in event of non-conformance.

**1.3 QUALITY**

.1 Products, materials, equipment and articles 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.

.2 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.

.3 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.

.4 Should disputes arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.

- .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .6 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.

1.4 AVAILABILITY

- .1 Immediately upon signing Contract, 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.

1.5 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 and masonry 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 of 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.

1.6 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Transportation cost of products supplied by Owner will be paid for by Owner. Unload, handle and store such products.

1.7 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.

1.8 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.

1.9 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.
- .3 Provide interference drawings developed by the Contractor and

major sub-trades for all levels of the building indicating mechanical plumbing, HVAC, fire protection, lighting, and electrical services routing, elevations, and sizes fully co-ordinated with architectural elements of the building.

These interference drawings shall include services running through walls, ceilings and millwork.

Identify area of conflict and request clarification from Consultant. Allow sufficient time for Consultant to review interference drawings prior to scheduled work commencing. Contractor shall be responsible for proceeding with work without reviewed interference drawings and all costs associated with re-routing services as required by Consultant to maintain original design intent.

- .4 Contractor is responsible for co-ordination between mechanical and electrical trades with existing steel joist structure. Co-ordinate fully the proposed routing and hanging of mechanical and electrical services from the steel structure. Submit drawings noting the location of joist, weight of equipment that is being suspended from existing structure along with connection locations and point loads.
- .5 Mechanical and electrical contractors shall note onto millwork shop drawings of Classrooms, Kindergarten & Daycare and Staff Areas indicating all routing of services that will run within the cabinet including necessary clearances for material and physical constraints to allow for its installation. These drawings shall be submitted to Consultants as part of the Shop Drawing review process.

#### 1.10 CONCEALMENT

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

#### 1.11 REMEDIAL WORK

- .1 Refer to CCDC 2and Section 01 73 00 - Execution Requirements.
- .2 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.
- .3 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.



1.12 LOCATION OF  
FIXTURES

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.  
  
Refer to Architectural Interior elevations where devices may be shown as they relate to concrete blocks or with dimensions. This is intended to located electrical devices where their location is critical and is not intended to be representative of all devices being installed.
- .2 Inform Consultant of conflicting installation. Install as directed.

1.13 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.

1.14 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.

1.15 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.

1.16 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 and pedestrian and vehicular traffic.
- .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.

**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 Canadian Construction Documents Committee (CCDC)
  - .1 CCDC 2-2008 Stipulated Price Contract.
- .2 Owner's identification of existing survey control points and property limits.
- .3 Section 01 14 00 Work Restrictions

### **1.2 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 and to suit Municipal standards.

### **1.3 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 when required by Consultant.

### **1.4 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

### **1.5 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.

**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 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 including excavation and fill, 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 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .7 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- .8 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .9 Restore work with new products in accordance with requirements of Contract Documents.
- .10 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .11 At perimeter of and 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.
- .12 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.
- .13 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.5 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

**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 Canadian Construction Documents Committee (CCDC)
  - .1 CCDC 2-2008, Stipulated Price Contract.
  - .2 CCDC/OAA Document 100/Latest Edition.

### 1.2 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 off peak from school activities.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Provide on-site roll off containers for collection of waste materials and debris.
- .5 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .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.

### 1.3 FINAL CLEANING

- .1 Refer to CCDC 2, GC 3.13.
- .2 When Work is Substantially Performed remove surplus



- products, tools, construction machinery and equipment not required for performance of remaining Work.
- .3 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
  - .4 Prior to final review remove surplus products, tools, construction machinery and equipment.
  - .5 Remove waste products and debris including that caused by Owner or other Contractors.
  - .6 Remove waste materials from site at regularly scheduled times off peak from school activities.
  - .7 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
  - .8 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 associated with renovation.
  - .9 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.
  - .10 Clean lighting reflectors, lenses, and other lighting surfaces.
  - .11 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
  - .12 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
  - .13 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
  - .14 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds associated with renovations and site works.
  - .15 Remove dirt and other disfiguration from exterior surfaces associated with renovation and site works.
  - .16 Clean and sweep roofs, gutters, areaways, and sunken wells associated with renovation and site works.
  - .17 Sweep and wash clean paved areas.

- .18 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment associated with renovation.
- .19 Clean roofs, downspouts, and drainage systems of material associated with renovation.
- .20 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .21 Remove snow and ice from access to building.

1.4 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

**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 WASTE MANAGEMENT GOALS**

- .1 The minimum Waste Management Goal for the Project shall be compliance with all required Local, Provincial, and Federal waste by-laws, and waste management regulations.
- .2 An optimum Waste Management Goal for the Project shall be 75 percent of total Project Waste to be diverted from landfill sites.
  - .1 Provide Consultant documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.
  - .2 Accomplish maximum control of solid construction waste.
  - .3 Preserve environment and prevent pollution and environment damage.

### **1.2 DEFINITIONS**

- .1 Class III: non-hazardous waste - construction renovation and demolition waste.
- .2 Cost/Revenue Analysis Workplan (CRAW): based on information from WRW, and intended as financial tracking tool for determining economic status of waste management practices.
- .3 Demolition Waste Audit (DWA): relates to actual waste generated from project.(Schedule C)
- .4 Inert Fill: inert waste - exclusively asphalt and concrete.
- .5 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation. (Schedule C)
- .6 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .7 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .8 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include

burning, incinerating, or thermally destroying waste.

- .9 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
  - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
  - .2 Returning reusable items including pallets or unused products to vendors.
- .10 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .11 Separate Condition: refers to waste sorted into individual types.
- .12 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.
- .13 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill. Refer to Schedule A.
- .14 Waste Management Co-ordinator (WMC) : contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
- .15 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. Refer to Schedule B. WRW is based on information acquired from WA (Schedule B).

### 1.3 DOCUMENTS

- .1 Maintain at job site, one copy of following documents:
  - .1 Waste Audit.
  - .2 Waste Reduction Workplan.
  - .3 Material Source Separation Plan.
  - .4 Schedules A B C D completed for project.

### 1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare and submit following prior to project start-up:

- .1 Submit 2 copies of completed Waste Audit (WA): Schedule A.
- .2 Submit 2 copies of completed Waste Reduction Workplan (WRW): Schedule B.
- .3 Submit 2 copies of completed Demolition Waste Audit (DWA): Schedule C.
- .4 Submit 2 copies of Materials Source Separation Program (MSSP) description. (Schedule D)

- .3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project using deconstruction/disassembly material audit form.
  - .1 Failure to submit could result in hold back of final payment.
  - .2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled, co-mingled and separated off-site or disposed of.
  - .3 For each material reused, sold or recycled from project, include amount in tonnes and the destination.
  - .4 For each material land filled or incinerated from project, include amount in tonnes of material and identity of landfill, incinerator or transfer station.

1.5 WASTE AUDIT (WA)

- .1 Conduct WA prior to project start-up.
- .2 Prepare WA: Schedule A.
- .3 Record, on WA - Schedule A, extent to which materials or products used consist of recycled or reused materials or products.

1.6 WASTE REDUCTION WORKPLAN (WRW)

- .1 Prepare WRW prior to project start-up.
- .2 WRW should include but not limited to:
  - .1 Destination of materials listed.
  - .2 Deconstruction/disassembly techniques and sequencing.
  - .3 Schedule for deconstruction/disassembly.
  - .4 Location.
  - .5 Security.
  - .6 Protection.
  - .7 Clear labelling of storage areas.
  - .8 Details on materials handling and removal procedures.
  - .9 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill.

- .3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.
- .4 Describe management of waste.
- .5 Identify opportunities for reduction, reuse, and recycling of materials. Based on information acquired from WA.
- .6 Post WRW or summary where workers at site are able to review content.
- .7 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.
- .8 Monitor and report on waste reduction by documenting total volume and cost of actual waste removed from project.

1.7 DEMOLITION  
WASTE AUDIT (DWA)

- .1 Prepare DWA prior to project start-up.
- .2 Complete DWA: Schedule C.
- .3 Provide inventory of quantities of materials to be salvaged for reuse, recycling, or disposal.

1.8 COST/REVENUE  
ANALYSIS WORKPLAN  
(CRAW)

- .1 Prepare CRAW: Schedule D.

1.9 MATERIALS  
SOURCE SEPARATION  
PROGRAM (MSSP)

- .1 Prepare MSSP and have ready for use prior to project start-up.
- .2 Implement MSSP for waste generated on project in compliance with approved methods and Provincial Standards.
- .3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
- .4 Provide containers to deposit reusable and recyclable materials.
- .5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.
- .6 Locate separated materials in areas which minimize material

damage.

- .7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.
  - .1 Transport to approved and authorized recycling facility or to users of material for recycling.

1.10 STORAGE,  
HANDLING AND  
PROTECTION

- .1 Store, materials to be reused, recycled and salvaged.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Protect structural components not removed for demolition from movement or damage.
- .6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Consultant.
- .7 Protect surface drainage, mechanical and electrical from damage and blockage.
- .8 Separate and store materials produced during dismantling of structures in designated areas.
- .9 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
  - .1 On-site source separation is recommended.
  - .2 Remove co-mingled materials to off-site processing facility for separation.
  - .3 Provide waybills for separated materials.

1.11 DISPOSAL OF  
WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste volatile materials mineral spirits oil paint thinner into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
  - .1 Number and size of bins.

	.2	Waste type of each bin.
	.3	Total tonnage generated.
	.4	Tonnage reused or recycled.
	.5	Reused or recycled waste destination.
	.4	Remove materials from deconstruction as deconstruction/disassembly Work progresses.
	.5	Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.
<u>1.12 USE OF SITE AND FACILITIES</u>	.1	Execute work with least possible interference or disturbance to normal use of premises.
<u>1.13 SCHEDULING</u>	.1	Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.
<b><u>PART 2 - PRODUCTS</u></b>		
<u>2.1 NOT USED</u>	.1	Not Used.
<b><u>PART 3 - EXECUTION</u></b>		
<u>3.1 APPLICATION</u>	.1	Do Work in compliance with WRW.
	.2	Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.
<u>3.2 CLEANING</u>	.1	Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.
	.2	Clean-up work area as work progresses.
	.3	Source separate materials to be reused/recycled into specified sort areas.
<u>3.3 DIVERSION OF</u>	.1	From following list, separate materials from general waste



MATERIALS

stream and stockpile in separate piles or containers, and consistent with applicable fire regulations.

- .1 Mark containers or stockpile areas.
- .2 Provide instruction on disposal practices.

OR

Send waste materials to off-site sorting agency for separation and diversion / recycling of waste materials

- .2 On-site sale of salvaged recovered materials is not permitted.

- .3 Demolition Waste:

Material Type	Recommended Diversion %	Actual Diversion %
Acoustic Tile	50	
<u>Acoustical Insulation</u>	100	80
	100	
Partitions		
Doors and Frames	100	80
Electrical Equipment	80	
Furnishings		
Marble Base	100	100
Mechanical Equipment	100	
Metals		
Rubble	100	
Wood (uncontaminated)	100	
Other		

- .4 Construction Waste:

Material Type	Recommended Diversion %	Actual Diversion %
Cardboard	100	100
Plastic Packaging	100	
Rubble		
Steel	100	
Wood (uncontaminated)	100	
Other		

3.5 WASTE AUDIT (WA) .1 Schedule A - Waste Audit (WA):

(1) Material Category	(2) Material Quantity Unit	(3) Estimated Waste	(4) Total Quantity of Waste (unit)	(5) Generation Point	(6) % Recycled	(7) % Reused
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.1 Wood  
and  
Plastics

Material  
Description

Off-cuts

Warped  
Pallet  
Forms

Plastic  
Packaging

Cardboard  
Packaging

Other

.2 Doors  
and  
Windows

Material  
Description

Painted  
Frames

Glass

Wood

Metal

Other

3.6 WASTE REDUCTION WORKPLAN (WRW) .1 Schedule B:

(1) Material Category	(2) Person(s) Responsible	(3) Total Quantity of Waste (unit)	(4) Actual Reused Amount (units)	(5)Actual Recycled Amount (unit)	(6) Material (s) Destination
. 1 Wood and Plastics					
Material Description					
Chutes					
Warped Pallet					
Forms					
Plastic Packaging					
Cardboard Packaging					
Other					
.2 Doors and Windows					
Material Description					
Painted Frames					
Glass					
Wood					
Metal					

Other

3.7 DEMOLITION  
WASTE AUDIT (DWA)

.1 Schedule C - Demolition Waste Audit (DWA):

(1) Material Description	(2) Quantity Total Volume	Weight	Remarks and Assumption
Wood			
Wood Stud			
Plywood			
Baseboard-Wood			
Door Trim - Wood			
Cabinet			
Doors and Windows			
Panel Regular			
Slab Regular			
Wood Laminate			
Bi-fold - Closet			
Glazing			

3.8 CANADIAN  
GOVERNMENTAL  
DEPARTMENTS CHIEF  
RESPONSIBILITY FOR  
THE ENVIRONMENT

- .1 Schedule E - Government Chief Responsibility for the Environment:

Ontario Ministry of Environment and Energy  
135 St. Clair Avenue West  
Toronto ON M4V 1P5  
General Inquiries  
416 323-4321 - phone  
800-565-4923  
416-323-4682 - fax

Environment Canada  
Toronto ON  
General Inquiries  
416-734-4494

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 REFERENCES**

- .1 Canadian Construction Documents Committee (CCDC)
  - .1 CCDC 2-2008, Stipulated Price Contract.
  - .2 OGCA/OAA Document 100 latest edition.
  - .3 Section 01 74 11 – Cleaning.

### **1.2 ADMINISTRATIVE REQUIREMENTS**

- .1 Acceptance of Work Procedures:
  - .1 Contractor's Inspection: Contractor: 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 Boiler Inspection Branch Fire Commissioner Utility companies: submitted.
    - .5 Operation of systems: demonstrated to Owner's personnel.
    - .6 Commissioning of mechanical systems: completed in accordance with Commissioning Requirements and 2 copies of final Commissioning Report submitted to Consultant.
- .4 Final Inspection:
  - .1 When completion tasks are done, request final inspection of Work by Consultant, and Contractor.
  - .2 When Work incomplete according to Owner and 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.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**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 ADMINISTRATIVE REQUIREMENTS**

- .1 Pre-warranty Meeting:
  - .1 Convene meeting one week prior to contract completion with contractor's representative and Consultant, in accordance with Section 01 31 19 - Project Meetings to:
    - .1 Verify Project requirements.
    - .2 Review manufacturer's installation instructions and warranty requirements.
  - .2 Consultant to establish communication procedures for:
    - .1 Notifying construction warranty defects.
    - .2 Determine priorities for type of defects.
    - .3 Determine reasonable response time.
  - .3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
  - .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

### **1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two weeks prior to Substantial Performance of the Work, submit to the Consultant, four final copies of operating and maintenance manuals in English.
- .3 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .4 Provide evidence, if requested, for type, source and quality of products supplied.

### **1.3 FORMAT**

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings.
  - .1 Identify contents of each binder on spine.



- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab.
  - .1 Bind in with text; fold larger drawings to size of text pages.
- .9 Provide scanned drawing files in dxf format on CD.

1.4 CONTENTS -  
PROJECT RECORD  
DOCUMENTS

- .1 Table of Contents for Each Volume: provide title of project;
  - .1 Date of submission; names.
  - .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
  - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
  - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
  - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.
- .6 Training: refer to Section 01 79 00 - Demonstration and Training.

ISSUED FOR PERMIT

1.5 AS -BUILT  
DOCUMENTS AND  
SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for Consultant and Owner one record copy of:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other modifications to Contract.
  - .5 Reviewed shop drawings, product data, and samples.
  - .6 Field test records.
  - .7 Inspection certificates.
  - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.
  - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
  - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
  - .1 Do not use record documents for construction purposes.

1.6 RECORDING  
INFORMATION ON  
PROJECT RECORD  
DOCUMENTS

- .1 Record information on set of black line opaque drawings.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
  - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
  - .1 Measured depths of elements of foundation in relation to finish first floor datum.
  - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
  - .4 Field changes of dimension and detail.
  - .5 Changes made by change orders.
  - .6 Details not on original Contract Drawings.
  - .7 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction,

including:

- .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
- .2 Changes made by Addenda and change orders.

- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- .7 Provide digital photos, as requested, for site records. CD/DVD format.

1.7 EQUIPMENT AND SYSTEMS

- .1 For each item of equipment and each system include description of unit or system, and component parts.
  - .1 Give function, normal operation characteristics and limiting conditions.
  - .2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.
  - .1 Include regulation, control, stopping, shut-down, and emergency instructions.
  - .2 Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide Contractor's Design-Builder's co-ordination drawings, with installed colour coded piping diagrams.
- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control and to suit commissioning requirements.
- .15 Additional requirements: as specified in individual specification sections.

1.8 MATERIALS AND FINISHES

- .1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
  - .1 Provide information for re-ordering custom manufactured products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional requirements: as specified in individual specifications sections.

1.09 MAINTENANCE MATERIALS

- .1 Spare Parts:
  - .1 Provide spare parts, in quantities specified in individual specification sections.
  - .2 Provide items of same manufacture and quality as items in Work.
  - .3 Deliver to site location as directed; place and store.
  - .4 Receive and catalogue items.
    - .1 Submit inventory listing to Consultant.
    - .2 Include approved listings in Maintenance Manual.
  - .5 Obtain receipt for delivered products and submit prior to final payment.

- .2 Extra Stock Materials:
    - .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
    - .2 Provide items of same manufacture and quality as items in Work.
    - .3 Deliver to site location as directed; place and store.
    - .4 Receive and catalogue items.
      - .1 Submit inventory listing to Consultant.
      - .2 Include approved listings in Maintenance Manual.
    - .5 Obtain receipt for delivered products and submit prior to final payment.
  - .3 Special Tools:
    - .1 Provide special tools, in quantities specified in individual specification section.
    - .2 Provide items with tags identifying their associated function and equipment.
    - .3 Deliver to site location as directed; place and store.
    - .4 Receive and catalogue items.
      - .1 Submit inventory listing to Consultant.
      - .2 Include approved listings in Maintenance Manual.
- 1.10 DELIVERY, STORAGE AND HANDLING
- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
  - .2 Store in original and undamaged condition with manufacturer's seal 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 own expense and for review by Consultant.
- 1.11 WARRANTIES AND BONDS
- .1 Develop warranty management plan to contain information relevant to Warranties.
  - .2 Warranty management plan to include required actions and documents to assure that Owner receives warranties to which it is entitled.
  - .3 Assemble approved information in binder, submit upon

acceptance of work and organize binder as follows:

- .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
  - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
  - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
  - .4 Verify that documents are in proper form, contain full information, and are notarized.
  - .5 Co-execute submittals when required.
  - .6 Retain warranties and bonds until time specified for submittal.
- 
- .4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
  - .5 Conduct joint 12 month warranty inspection, measured from time of acceptance, by Consultant.
  - .6 Include information contained in warranty management plan as follows:
    - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
    - .2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and commissioned systems such as fire protection, alarm systems, sprinkler systems.
    - .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
      - .1 Name of item.
      - .2 Model and serial numbers.
      - .3 Location where installed.
      - .4 Name and phone numbers of manufacturers or suppliers.
      - .5 Names, addresses and telephone numbers of sources of spare parts.
      - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
      - .7 Cross-reference to warranty certificates as applicable.
      - .8 Starting point and duration of warranty period.
      - .9 Summary of maintenance procedures required to continue warranty in force.
      - .10 Cross-Reference to specific pertinent Operation

and Maintenance manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for various warranted equipment.

.4 Contractor's plans for attendance at 4 month post-construction warranty inspections.

.5 Procedure and status of tagging of equipment covered by extended warranties.

.6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

.7 Respond in timely manner to oral or written notification of required construction warranty repair work.

.8 Written verification to follow oral instructions.

.1 Failure to respond will be cause for the Consultant to proceed with action against Contractor.

### 1.13 WARRANTY TAGS

.1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag.

.2 Attach tags with copper wire and spray with waterproof silicone coating.

.3 Leave date of acceptance until project is accepted for occupancy.

.4 Indicate following information on tag:

.1 Type of product/material.

.2 Model number.

.3 Serial number.

.4 Contract number.

.5 Warranty period.

.6 Inspector's signature.

.7 Construction Contractor.

## **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 RELATED REQUIREMENTS**
- .1 Section 01 35 30 Health and Safety Requirements  
Section 01 47 18 Indoor Air Quality, Construction  
Section 01 56 00 Temporary Barriers and Enclosures  
Section 01 74 21 Construction Waste Management and Disposal  
Section 02 82 00 Asbestos Abatement Precautions
- 1.2 REFERENCES**
- .1 Canadian Standards Association (CSA International)  
.1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS**
- .1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Shop Drawings:  
.1 Provide shop drawings and product data in accordance with Section 01 33 00 – Submittal Procedures.  
.2 Provide drawings stamped and signed by professional engineer registered or licensed in Province Ontario, Canada.
- .3 Before proceeding with demolition of load bearing walls or of other walls and where required by authority having jurisdiction submit for review by Consultant shoring and underpinning drawings prepared by qualified professional engineer registered or licensed in the Province of Ontario, Canada showing proposed method.
- .4 Prior to beginning of Work on site submit detailed Waste Reduction Workplan in accordance with Section 01 74 21 – Construction Waste Management and Disposal and indicate:  
.1 Descriptions of and anticipated quantities in percentages of materials to be salvaged reused, recycled and landfilled.  
.2 Schedule of selective demolition.  
.3 Number and location of dumpsters.  
.4 Anticipated frequency of tipping.  
.5 Name and address of haulers, waste facilities and waste receiving organizations.
- 1.4 DELIVERY, STORAGE AND HANDLING**
- .1 Waste Management and Disposal:  
.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction Waste Management and Disposal.

1.5 SITE CONDITIONS

- .1 Review Asbestos Abatement Precautions to protect environment.
- .2 Should material resembling spray or trowel-applied asbestos or other designated substance listed as hazardous be encountered, stop work, take preventative measures, and notify Project Manager immediately.
  - .1 Do not proceed until written instructions have been received from Project Manager
- .3 Notify Owner's Representative before disrupting building access or services.

**PART 2 - PRODUCTS**

2.1 EQUIPMENT

- .1 Leave equipment and machinery running only while in use, except where extreme temperatures prohibit shutting down.
- .2 Demonstrate that tools and machinery are being used in manner which allows for salvage of materials in best condition possible.

**PART 3 - EXECUTION**

3.1 PREPARATION

- .1 Do Work in accordance with Section 01 35 30 - Safety Requirements.
- .2 Protection:
  - .1 Prevent movement, settlement, or damage to adjacent structures, utilities, and parts of building to remain in place. 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.
- .3 Disconnect and re-route electrical service lines. Post warning signs on electrical lines and equipment which must remain energized to serve other products during period of demolition.
- .4 Owner to disconnect and re-route telephone and communication service lines. Owner to post warning signs on lines and equipment which must remain energized to serve other products during period of demolition.
- .5 Locate and protect utility lines. Do not disrupt active or energized utilities traversing premises or designated to remain

undisturbed.

- .6 Disconnect and cap designated mechanical services where noted.
  - .1 Gas supply lines: remove in accordance with utility company requirements and as directed Consultant.
  - .2 Sewer and water lines: remove in accordance with requirements of authority having jurisdiction and as directed by Consultant.

3.2 DEMOLITION  
SALVAGE AND  
DISPOSAL

- .1 Remove parts of existing building to permit new construction. Sort materials into appropriate piles for reuse and recycling.
- .2 Refer to demolition drawings and specifications for items to be salvaged for reuse.
- .3 Remove items to be reused or salvaged, store as directed by Owner and re-install where indicated.
- .4 Dispose of removed materials, to appropriate recycling facilities / reuse facilities except where specified otherwise, in accordance with authority having jurisdiction.

3.3 PARTIAL  
DEMOLITION OF  
STRUCTURES

- .1 Refer to Demolition drawings and Scope of Work Form in Section 00 50 00 for extent of removals.

3.4 STOCKPILING

- .1 Label stockpiles, indicating material type and quantity.
- .2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.
- .3 Locate stockpiled materials convenient for use in new construction. Eliminate double handling wherever possible.
- .4 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

3.5 REMOVAL FROM  
SITE

- .1 Transport material designated for alternate disposal to approved facilities listed in waste reduction workplan and in accordance with applicable regulations. Do not deviate from facilities listed in waste reduction workplan without prior written authorization.
- .2 Dispose of materials not designated for alternate disposal in accordance with applicable regulations. Disposal facilities must be approved of and listed in waste reduction workplan.

Do not deviate from disposal facilities listed in waste reduction workplan without prior written authorization.

3.6 CLEANING AND RESTORATION

- .1 Keep site clean and organized throughout demolition procedure.
- .2 Upon completion of project, reinstate areas affected by Work to condition which existed prior to beginning of Work. Match condition of adjacent, undisturbed areas.

**END OF SECTION**

PART 1 – GENERAL

1.1 RELATED WORK

- .1 Section 03 20 00 Concrete Reinforcement
- .2 Section 03 30 00 Cast-in-Place Concrete
- .3 Section 03 35 00 Concrete Floor Finishes

1.2 REFERENCE STANDARDS

- .1 Do concrete formwork in accordance with CAN/CSA-A23.1-14 and CSA Standard S269.3(R2013), except where specified otherwise.

PART 2 – PRODUCTS

2.1 MATERIALS

- .1 Formwork materials:
  - .1 For concrete not exposed to view use wood and wood product formwork materials to CSA-O121, CAN/CSA-O86-09, CSA O437 Series and CSA-O153-09.
  - .2 For concrete exposed to view, use formwork materials to CAN/CSA-A23.1-14.
- .2 Form ties:
  - .1 For concrete not exposed to view, use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm dia. in concrete surface.
  - .2 For concrete exposed to view, use snap ties complete with plastic cones and light gray concrete plugs.
- .3 Form liner:
  - .1 Plywood: medium density overlay Canadian Softwood Plywood to CSA O121 –M1978
- .4 Form release agent: chemically active release agents containing compounds that react with free lime present in concrete to provide water insoluble soaps, preventing concrete from sticking to forms.

PART 3 – EXECUTION

3.1 ERECTION

- .1 Verify lines, levels and column centres before proceeding with formwork and ensure dimensions agree with drawings.
- .2 Construct forms to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1-14.
- .3 Obtain Engineer's permission before framing openings not indicated in concrete slabs, walls, piers and footings.
- .4 Align form joints and make watertight. Keep form joints to minimum. Locate horizontal form joints for exposed walls to approval of Architect.
- .5 Form chases, slots, openings, drips, recesses expansion and control joints as indicated.
- .6 Clean formwork in accordance with CAN/CSA-A23.1-14, before placing concrete.

.7 Leave formwork in place for following minimum periods of time after placing concrete.

.1 24 hours for footings.

.2 48 hours for foundation walls and elements exposed to view.

After form removal cover and protect concrete for the remainder of the initial curing period. Use insulated tarps for cold weather operation.

.8 Re-use of formwork subject to requirements of CAN/CSA-A23.1-14.

**END OF SECTION**

PART 1 GENERAL

1.1 RELATED WORK

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

1.2 REFERENCES

- .1 ANSI/ACI 315-80, Details of Concrete Reinforcement.
- .2 ACI 315R-80, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.
- .3 Reinforcing steel manual of standard practice - Reinforcing Steel Institute of Ontario.
- .4 CAN/CSA-A23.1-14, Concrete Materials and Methods of Concrete Construction.
- .5 CSA-A23.3-09, Design of Concrete Structures for Buildings.
- .6 CSA G30.12-M1977, Billet-Steel Bars for Concrete Reinforcement.

1.3 SOURCE QUALITY CONTROL

- .1 Upon request inform Engineer of proposed source of material to be supplied.

1.4 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 30 00.
- .2 Shop drawings consist of bar bending details, lists and placing drawings.
- .3 On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and mechanical splices, with identifying code marks to permit correct placement without reference to structural drawings. Indicate sizes, spacing and location of chairs, spacers and hangers. Do drawings in accordance with Reinforcing Steel Manual of Standard Practice - by Reinforcing Steel Institute of Ontario.
- .4 Design and detail lap lengths and bar development lengths to CSA-A23.3-14, unless otherwise indicated.
- .5 Approval applies to general arrangement and does not relieve responsibility for making this work complete, accurate and conforming to drawings and specifications.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Reinforcing steel: billet steel, grade 400, deformed bars to CSA G30.12-M1977.
- .2 Chairs, bolsters, bar supports, spacers: to CSA A23.1-09.

2.2 FABRICATION

- .1 Fabricate reinforcing in accordance with CSA-A23.1-14 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Ontario.
- .2 Obtain Engineer's approval for locations of reinforcement splices other than shown on placing drawings.

- .3 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

PART 3 EXECUTION

3.1 FIELD BENDING

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

3.2 PLACING  
REINFORCEMENT

- .1 Place reinforcing steel as indicated on approved placing drawings and in accordance with CSA-A23.1-14.
- .2 Prior to placing concrete, obtain Engineer's approval of reinforcing steel and position.

END OF SECTION



PART 1 GENERAL

1.1 RELATED WORK

- .1 Concrete Reinforcement Section 03 20 00
- .2 Concrete Floor Finishes Section 03 35 00
- .3 Vapour Barriers Section 07 26 00

1.2 REFERENCE STANDARDS

- .1 Do cast-in-place concrete work in accordance with CSA A23.1-14, and testing in accordance with CSA-A23.2-14 except where specified otherwise.
- .2 CAN-A266.4-M78, Guidelines for use of admixtures in concrete.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Portland cement: to CAN/CSA-A3000-13
- .2 Water: to CSA-A23.1-14.
- .3 Aggregates: to CAN/CSA-A23.1-14. Coarse aggregates to be normal density.
- .4 Air entraining admixture: to CAN3-A266.1-M78.
- .5 Chemical admixtures: to CAN3-A266.2-M78. Engineer to approve accelerating or set retarding admixtures during cold weather placing.
- .6 Non premixed dry pack grout: composition on non metallic aggregate Portland cement with sufficient water for mixture to retain its shape when made into a ball by hand and capable of development compression strength of 50 MPa at 28 days.
- .7 Curing Compound: To CSA-A23.1-14.
- .8 Pre-moulded joint fillers:
  - .1 Bituminous impregnated fibreboard: to ASTM D1751-91.

2.2 CONCRETE MIXES

- .1 Proportion normal density concrete in accordance with CSA-A23.1-14, to give the following properties for exterior concrete including sidewalks and curbs.
  - .1 Cement: use Type GU or GUb Portland cement.
  - .2 Minimum compressive strength at 28 days: 32 MPa.
  - .3 Class: C-2
  - .4 Nominal size of coarse aggregate: 20 mm.
  - .5 Air Entrainment: 5 to 8%.
  - .6 Slump at time and point of discharge: 80 mm.
- .2 Proportion normal density concrete in accordance with CSA-A23.1-14, to give the following properties for exterior foundation walls and piers.
  - .1 Cement: use Type GU or GUb Portland cement.
  - .2 Minimum compressive strength at 28 days: 25 MPa.

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- .3 Class: F-2
- .4 Nominal size of coarse aggregate: 20 mm.
- .5 Air Entrainment: 4 to 7%.
- .6 Slump at time and point of discharge: 80 mm.
- .3 Proportion normal density concrete in accordance with CSA-A23.1-14, to give the following properties for all other concrete.
  - .1 Cement: use Type GU or GUb Portland cement.
  - .2 Minimum compressive strength at 28 days: 25 MPa.
  - .3 Class: N
  - .4 Nominal size of coarse aggregate: 20 mm.
  - .5 Slump at time and point of discharge: 75 mm.
- .4 Proportion normal density concrete in accordance with CSA-A23.1-14, to give the following properties for exterior retaining walls.
  - .1 Cement: use Type GU or GUb Portland cement.
  - .2 Minimum compressive strength at 28 days: 35 MPa.
  - .3 Class: C-1
  - .4 Nominal size of coarse aggregate: 20 mm.
  - .5 Air Entrainment: 5 to 8%.
  - .6 Slump at time and point of discharge: 80 mm.
- .5 Use of calcium chloride or admixtures containing calcium chloride, not permitted.

PART 3 EXECUTION

3.1 WORKMANSHIP

- .1 Obtain Engineer's approval before placing concrete. Provide 24 h notice prior to placing of concrete.
- .2 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .3 Prior to placing of concrete obtain Engineer's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .4 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .5 Do not place load upon new concrete until authorized by Engineer.

3.2 INSERTS

- .1 Set sleeves, ties, and other inserts and openings as indicated or specified elsewhere. Sleeves and openings greater than 100 mm X 100 mm not indicated on structural drawings must be approved by Engineer.
- .2 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of modifications from Engineer before placing of concrete.
- .3 Check locations and sizes of sleeves and openings shown on structural

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drawings with architectural, mechanical and electrical drawings.

- .4 Anchor bolts:
  - .1 Place anchor bolts to templates under supervision of trade supplying anchors prior to placing concrete.
  
- 3.3 PLACING GROUT .1 Grout under base plates and machinery using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.
  
- 3.4 FINISHING .1 Finish concrete in accordance with CAN/CSA-A23.1-14.
  - .2 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radius edges unless otherwise indicated.
  - .3 Concrete exposed to public view to have a smooth-form finish unless specified otherwise.
  
- 3.5 JOINT FILLERS .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Engineer. When more than one piece is required for a joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
  - .2 Locate and form isolation joints as indicated. Install joint filler.
  - .3 Use 12 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12 mm of finished slab surface unless indicated otherwise.
  
- 3.6 FIELD QUALITY CONTROL .1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by Owner in accordance with CSA-A23.1-14.
  - .2 Costs of tests will be paid for as specified in Sections 01 40 00.
  - .3 Engineer will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
  - .4 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.
  
- 3.7 SAWCUTTING OF CONTROL JOINTS .1 In slab-on-grade construction, perform and complete saw cutting of all control joints within 12 hours after concrete placement. Saw cutting shall begin as soon as concrete can support the workers and equipment.
  - .2 Configuration and extent of sawcut control joints shall be as shown on the drawings.
  - .3 Saw cutting to be performed using power driven abrasive or diamond blades. Depth of sawcuts shall be as indicated on drawings.

3.8 DEFECTIVE

.1

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Remove and replace excessive honeycomb or embedded Concrete Finish debris in concrete as directed by Consultant.

END OF SECTION

PART 1 GENERAL

1.1 RELATED WORK

- .1 Concrete Reinforcement Section 03 20 00
- .2 Cast-in-Place Concrete Section 03 30 00

1.2 REFERENCE STANDARDS

- .1 Do concrete floor finishing work in accordance with CAN/CSA-A23.1-14 except where specified otherwise.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Concrete materials to Section 03 30 00 - Cast-in-Place Concrete and reinforcement to Section 03 20 00 - Concrete Reinforcement.
- .2 Curing and sealing compound: to ASTM C309 Type 1 Class B, clear.

PART 3 EXECUTION

3.1 FLOOR FINISHES

- .1 Floor slab surfaces shall be finished to Class A classification as defined in CAN/CSA-A23.1-14, Table 22.
- .2 Saw cut crack-control joints to CSA-A23.1-14.
- .3 Apply floor curing and sealing compounds to manufacturer's instructions. Cure to manufacturer's recommendations.
- .4 Cure concrete in accordance with CAN/CSA-A23.1-14 except where specified otherwise.
- .6 Provide any housekeeping pads for electrical and mechanical equipment.
- .5 Slope floor to drain at 5mm/m. except as indicated otherwise. Floors to be level around walls.
- .6 Provide non-slip light broom finish to exposed interior steps and landings. Provide non-slip medium broom finish to exposed exterior steps, ramps and landings.

3.2 PROTECTION

- .1 Protect concrete to be left exposed throughout the course of construction. Make good damaged areas to the approval of the Engineer.

END OF SECTION

## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 04 03 31 – Replacing Brick
- .2 Section 04 05 00 – Common Work Results for Masonry
- .3 Section 04 05 12 – Mortar & Masonry Grout
- .4 Section 04 05 19 – Masonry Anchorage and Reinforcing
- .5 Section 04 05 23 – Masonry Accessories
- .6 Section 04 21 13 – Brick Masonry
- .7 Section 04 22 00 – Concrete Unit Masonry

### **1.2 SCOPE OF WORK PAYMENT PROCEDURES**

- .1 The work of this Section shall include all material, labour, equipment, and tools required to complete the work described herein and reflected in the Contract Documents.
- .2 Existing brick veneer cladding to remain directly adjacent to the work of this Contract shall have all mortar joints repointed to properly blend new work into existing where existing joints are damaged as a result of the work of this Contract.

### **1.3 REFERENCES**

- .1 Definitions:
  - .1 Raking: removal of loose/deteriorated mortar to a depth suitable for repointing until sound mortar, and/or 4x joint thickness and/or a specified mm depth mm is reached.
  - .2 Repointing: filling and finishing of masonry joints from which mortar is missing has been raked out or has been omitted.
  - .3 Tooling: finishing of masonry joints using tool to provide final contour.
  - .4 Low-pressure water cleaning: water soaking of masonry using less than 350 kPa (50 psi) water pressure, measured at nozzle tip of hose.
- .2 Reference Standards:
  - .1 CAN/CSA A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
  - .2 CAN/CSA A179-04(R2009), Mortar and Grout for Unit Masonry.

### **1.4 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 and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.

1.5 QUALITY  
ASSURANCE

- .3 Samples:
  - .1 Provide labelled samples of materials used on project for approval before work commences.
- .4 Test and Evaluation Reports:
  - .1 Provide certified test reports showing compliance with specified performance characteristics and physical properties.
  - .2 Provide laboratory test reports certifying compliance of mortar ingredients with specifications requirements.

- .1 Masonry Contractor:
  - .1 Use single Masonry Contractor for masonry work.
  - .2 Masonry contractor to have 10 years experience minimum in historic stone and brick masonry work on projects of similar size and complexity to Work of this Contract.
  - .3 Masonry contractor to have good level of understanding of structural behaviour of masonry walls when masonry work involves replacing brick.
- .2 Masons:
  - .1 Mason to have 10 years minimum experience.
- .3 Cement grouting: grouting activities should be undertaken by experienced workers in manipulation and cement grouting methods.
- .4 Obtain approval from Consultant for changes to qualified personnel.
- .5 Mock-ups:
  - .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
  - .2 Construct mock-up to demonstrate raking and repointing procedures.
  - .3 Notify Consultant minimum of 72 hours prior to construction of the mock-up.
  - .4 Perform mock-up of masonry cleaning with low pressure 15 to 45 psi clean water and soft natural bristle brush.
  - .5 Construct mock-up where directed by Consultant.
  - .6 Work not to proceed prior to approval of mock-up. Allow 72 hours for inspection of mock-up by Consultant before proceeding with masonry repointing work.
  - .7 Accepted mock-up will demonstrate minimum standard for this work. Mock-up will remain as part of finished work.

1.6 DELIVERY,  
STORAGE AND

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

HANDLING

manufacturer's written instructions.

- .2 Delivery and Acceptance Requirements:
  - .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
  - .2 Store cementitious materials and aggregates in accordance with CAN/CSA A23.1.
  - .3 Store lime putty in plastic lined sealed drums.
  - .4 Keep material dry. Protect from weather, freezing and contamination.
  - .5 Ensure that manufacturer's labels and seals are intact upon delivery.
  - .6 Remove rejected or contaminated material from site.
- .3 Packaging Waste Management: remove pallets, crates, padding, and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.7 AMBIENT  
CONDITIONS

- .1 Maintain masonry temperature between 10 degrees C and 25 degrees C for duration of work.
- .2 When ambient temperature is below 10 degrees C:
  - .1 Store mortar materials for immediate use within heated enclosure. Allow mortar materials to reach minimum temperature of 10 degrees C before use.
  - .2 Ensure only sand aggregate and water are heated before use:
    - .1 Heat and maintain sand aggregate temperature to minimum 10 degrees C and maximum 30 degrees C.
    - .2 Heat and maintain water temperature to minimum of 20 degrees C and maximum of 30 degrees C:
- .3 Maintain sand aggregate temperature between 10 degrees C and 30 degrees.
- .4 Do not mix cement with water or with aggregate or with water-aggregate mixtures having higher temperature than 30 degrees C.
- .5 Maintain mortar mix temperature between 10 degrees C and 30 degrees C.



## **PART 2 - PRODUCTS**

- 2.1 MORTAR
- .1 Mortar: in accordance with CAN/CSA A179 and Section 04 05 12 – Mortar and Masonry Grout
  - .2 Proportion Specification:
    - .1 In accordance with CAN/CSA A179 and Section 04 05 12 – Mortar and Masonry Grout .

## **PART 3 - EXECUTION**

- 3.1 SITE VERIFICATION OF CONDITIONS
- .1 Report in writing to Consultant areas of deteriorated masonry not previously identified.
- 3.2 PROTECTION OF IN-PLACE CONDITIONS
- .1 Protection requirements are specified in Section 04 05 00 - Common Work Results for Masonry.
- 3.3 RAKING JOINTS
- .1 Preferred Method #1: Removal of mortar by hand with a hand chisel and mash hammer. Use manual raking tools to obtain clean masonry surfaces.
  - .2 Alternative Method #2: Removal with power tools such as pneumatic chisels and grinders. Power saws are not to be used without prior approval from Consultant.
  - .3 Alternative Method #3: Combined use of power tools and hand chiseling method.
  - .4 Remove deteriorated and adhered mortar from masonry surfaces to sound mortar but in no case less than 20 mm leaving square corners and flat surface at back of cut. Clean out voids and cavities encountered. Loose or disintegrated mortar beyond the minimum depth shall be removed.
  - .5 Remove mortar without chipping, altering or damaging masonry units. Chisels and power tools are to be the appropriate size to fit cleanly into mortar joints without damage to surrounding surfaces.
  - .3 Clean surfaces of joints by compressed air and with non-ferrous brush without damaging texture of exposed joints or masonry units.

- .4 Flush open joints and voids; clean open joints and voids with with compressed air.
- .5 If work is found unacceptable by the Consultant, all raking shall cease without additional cost to the project until deficiencies in tools, workmanship, or methodology have been corrected to the Consultant's satisfaction.

### 3.4 REPOINTING:

- .1 Dampen joints.
- .2 Keep masonry damp while pointing is being performed.
- .3 Completely fill joint with mortar.
  - .1 If surface of masonry units has worn rounded edges keep pointing back from surface to keep same width of joint
  - .2 Avoid feather edges.
  - .3 Pack mortar solidly into voids and joints.
- .4 Build-up pointing in layers not exceeding 12 mm in depth.
  - .1 Allow each layer to set before applying subsequent layers.
  - .2 Maintain joint width.
- .5 Tool joints to match existing profile, concave joint.
  - .1 Tool, compact and finish using jointing tools to force mortar into joint.
- .6 Remove excess mortar from masonry face before it sets.

### 3.5 PROTECTION DURING CURING PROCESS

- .1 Cover completed and partially completed work not enclosed or sheltered at end of each work day.
  - .1 Membranes should extend to 0.5 m over surface area of work and be tightly installed to prevent finished work from drying out too rapidly.
- .2 Cover with waterproof tarps to prevent weather from eroding recently repointed material. Ensure that bottoms of tarps permit airflow to reach mortar in joints.
- .3 Anchor coverings securely in position.
- .4 Damp cure:
  - .1 Provide damp cure for pointing mortars.
  - .2 Install and maintain wetted burlap protection during the curing process:
    - .1 Minimum 3 days.
  - .3 Wet mist burlap only - ensure no direct spray reaches

surface of curing mortar.

.4 Shade areas of work from direct sunlight and maintain constant dampness of burlap.

.5 Protect from drying winds. Pay particular attention at corners of structure.

.6 Maintain ambient temperature of minimum 10 degrees C after repointing masonry for:

.1 Minimum 7 days in summer.

.2 Minimum 30 days in cold weather conditions using dry heated enclosures.

### 3.6 CLEANING

.1 Clean surfaces of mortar droppings, stains and other blemishes resulting from work of this contract as work progresses.

.2 Remove droppings and splashings using clean sponge and water.

.3 Do further cleaning using stiff natural bristle brushes after mortar has attained its initial set and has not fully cured.

.4 Clean masonry with stiff natural bristle brushes and plain water only if mortar has fully cured.

.5 Clean masonry with low pressure 15 to 45 psi clean water and soft natural bristle brush.

### 3.7 PROTECTION OF COMPLETED WORK

.1 Protect adjacent finished work against damage which may be caused by on-going work.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 04 03 07 – Masonry Repointing
- .2 Section 04 05 00 – Common Work Results for Masonry
- .3 Section 04 05 12 – Mortar & Masonry Grout
- .4 Section 04 05 19 – Masonry Anchorage and Reinforcing
- .5 Section 04 05 23 – Masonry Accessories
- .6 Section 04 21 12 – Brick Masonry
- .7 Section 04 22 00 – Concrete Unit Masonry

### **1.2 SCOPE OF WORK**

- .1 The work of this Section shall include all material, labour, equipment, and tools required to complete the work described herein and reflected in the Contract Documents.
- .2 The work includes removing and salvaging existing brick veneer cladding to the extent indicated on architectural and structural drawings.. Carefully remove existing brick and salvage for re-use where required to allow for proper membrane tie-ins between existing school and Music Room addition..

### **1.3 REFERENCES**

- .1 Reference Standards:
  - .1 CAN/CSA-A179-04, Mortar and Grout for Unit Masonry.
  - .2 CSA-S304.1-04, Design for Masonry Structures.
  - .3 CAN/CSA A-370-04(R2009), Connectors for Masonry.
  - .4 CAN/CSA A-371-04(R2009), Masonry Construction for Buildings.

### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Pre-installation Meeting:
  - .1 Conduct pre-installation meeting to verify project requirements and procedures, manufacturer's installation instructions and schedule of work.

### **1.5 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 and data sheets for materials 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 method of brick removal.
- 1.6 QUALITY ASSURANCE
- .1 Mock-ups:
- .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
- .2 Construct mock-up panel of masonry wall construction showing brick removal, infill with salvaged brick masonry use of reinforcement, ties, through-wall flashing, weep holes, jointing, coursing, mortar, joint finishing, cleaning and workmanship.
- .3 Construct mock-up where directed by Consultant.
- .4 Notify Consultant minimum of 72 hours prior to construction of the mock-up.
- .5 Work not to proceed prior to approval of mock-up. Allow 72 hours for inspection of mock-up by Consultant. Accepted mock-up becomes standard for this Work.
- .7 When mock-up accepted, proceed with pointing and repair work. Mock-up will remain as part of finished Work.
- 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:
- .1 Provide weather protection and construction protection in accordance with CSA-S304.1.
- .2 Provide weather protection to newly opened sections in assembly.
- .3 Protect bricks and store bricks to facilitate their resetting. Store dismantled masonry units on wood pallets or platforms, protected from exposure to water, elements, and potential mechanical damage.
- .4 Place detached bricks on wood surfaces during handling. Prevent contact with metal.
- .5 When bricks are lowered to ground, place directly on wooden platform that will be used for transport or storage.
- .6 Ensure that sharp edges of bricks do not come into contact with hard objects.
- .7 At request of Consultant, turn over any remaining salvaged bricks to Owner at completion of contract.
- .3 Packaging Waste Management: dispose of pallets, crates, padding, and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- 1.8 AMBIENT CONDITIONS
- .1 Maintain materials and surrounding air to minimum 10 degrees C prior to and for minimum 72 hours after completion of brick repairs.

- .2 Maintain temperature of mortar materials in accordance with Section 04 03 07 - Masonry Repointing.
- .3 Maintain masonry temperature between 10 degrees C and 25 degrees C for duration of the Work in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .4 Cold weather requirements: meet recommended practices for cold weather masonry construction.

## **PART 2 - PRODUCTS**

### **2.1 EXISTING BRICK**

- .1 Use undamaged, hard, sound, and clean old bricks salvaged on site. Use only bricks without evidence of soluble salts.

## **PART 3 - EXECUTION**

### **3.1 SITE VERIFICATION OF CONDITIONS**

- .1 Check for evidence of repairs, cracks, moisture, soluble salts contamination and other defects not noted on Contract Drawings, and report to Consultant before starting Work.

### **3.2 PREPARATION**

- .1 Place safety devices and signs near work area as directed in accordance with Section 01 56 00 - Temporary Barriers and Enclosures .
- .2 Install and remove self-supporting scaffolding in accordance with Section 01 52 00 - Construction Facilities.

### **3.3 BRICK REMOVAL**

- .1 Verify locations and dimensions of areas of Work with Consultant.
- .2 Remove identified areas of salvageable brickwork as follows:
  - .1 Cut through unsupported load bearing brickwork in accordance with approved shop drawings.
  - .2 Cut out non-loadbearing brickwork in accordance with approved shop drawings.
  - .3 During removal, protect sound areas to remain. Use mechanical hand methods of removal. Obtain Consultant's approval for use of power tools before commencing work.
  - .4 Remove adhered mortar from surface of adjacent bricks that remain in place.

- 3.4 BRICK SALVAGE .1 Carefully clean, and store bricks for re-use. Store and protect bricks in accordance with article 1.7, DELIVERY, STORAGE AND HANDLING.
- 3.5 RAKING JOINTS .1 Refer to Specification Section 04 03 07 – Masonry Repointing
- 3.6 BRICK REPLACEMENT .1 Build in flashings in masonry in accordance with CSA A371.
- .2 Install masonry ties and connectors in accordance with Specification Section 04 05 19 Masonry Anchorage and Reinforcing
- .3 Co-ordinate bond pattern, coursing height and joint width with existing brickwork.
- .4 Mix and blend brick units within each pallet and with other pallets to ensure uniform blend of colour and texture.
- .5 Except in cold weather, pre-wet bricks having an initial rate of absorption exceeding 30 g/minute-194 cm<sup>2</sup> to uniform degree of saturation, 3 to 4 hours before laying. Do not lay until surface is dry or damp only, with no standing water.
- .6 Clean dust and brick fragments from slot. Before proceeding with Work, inspect cleaned surface.
- .7 Dampen slot's surfaces before applying mortar.
- .8 Apply mortar and lay bricks.
- .1 Lay bricks on full beds of mortar.
- .2 Fill vertical joints buttered and placed full in face
- .3 Lay bricks and tool joints in one operation, tooling with a round jointer to provide smooth joints compressed uniformly concave.
- .4 Rake bedding mortar back to a minimum depth of 25 mm and make ready for pointing with pointing mortar in separate operation.
- .9 Apply pointing mortar:
- .1 Fill raked joints with pointing mortar.
- .10 Clean finished brickwork as work progresses.
- .1 Remove mortar splashings on exposed brickwork.
- .2 Leave no mortar on face of bricks.
- .3 Remove mortar staining before it sets.
- .4 Clean masonry with clean water and soft bristle brush only.

- .11 Inspect finished brickwork with Consultant.
- 3.7 REPOINTING:
- .1 Do pointing work in accordance with Section 04 03 07 - Masonry Repointing.
- 3.8 CLEANING
- .1 Clean brick work surfaces after repairs have been completed and mortar has set.
- .2 Clean brick surfaces of adhesive or mortar residue resulting from work performed without damaging bricks or joints.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal 01 35 21
- 3.9 PROTECTION OF WORK
- .1 Cover completed and partially completed work not enclosed or sheltered at end of each work day.  
.1 Membranes should extend to 0.5 m over surface area of work and be tightly installed to prevent finished work from drying out too rapidly.
- .2 Cover with waterproof tarps to prevent weather from eroding recently repointed material. Ensure that bottoms of tarps permit airflow to reach mortar in joints.
- .3 Anchor coverings securely in position.
- .4 Protect from drying winds. Pay particular attention at corners of structure.
- .5 Maintain ambient temperature of minimum 10 degrees C after repointing masonry for:  
.1 Minimum 7 days in summer.  
.2 Minimum 30 days in cold weather conditions using dry heated enclosures.
- .6 Protect adjacent finished work against damage which may be caused by on-going work.

**END OF SECTION**



## **PART 1 - GENERAL**

<b><u>1.1 RELATED SECTIONS</u></b>	.1	Section 04 03 07 – Masonry Repointing
	.2	Section 04 03 31 – Replacing Brick Masonry
	.3	Section 04 05 12 – Mortar and Masonry Grout
	.4	Section 04 05 19 – Masonry Anchorage and Reinforcing
	.5	Section 04 05 23 – Masonry Accessories
	.6	Section 04 21 13 – Brick Masonry
	.7	Section 04 22 00 – Concrete Unit Masonry
	.8	Section 05 50 00 – Metal Fabrications
	.9	Section 07 21 13 – Board Insulation
	.10	Section 07 27 00 – Air Barriers
	.11	Section 07 92 00 – Joint Sealing
<b><u>1.2 REFERENCES</u></b>	.1	Canadian Standards Association (CSA International).
	.1	CSA-A165 Series-04, Standards on Concrete Masonry Units.
	.2	CSA A179-04, Mortar and Grout for Unit Masonry.
	.3	CSA-A371-04, Masonry Construction for Buildings.
<b><u>1.3 ADMINISTRATIVE REQUIREMENTS</u></b>	.1	Pre-installation meetings: comply with Section 01 31 19 - Project Meetings. Conduct pre-installation meeting two weeks prior to commencing work of this Section and on-site installations to:
	.1	Verify project requirements, including mock-up requirements.
	.2	Verify substrate conditions.
	.3	Co-ordinate products, installation methods and techniques.
	.4	Sequence work of related sections.
	.5	Co-ordinate with other building substrades.
	.6	Review manufacturer's installation instructions.
	.7	Review masonry cutting operations, methods and tools and determine worker safety and protection from dust during cutting operations.
	.8	Review warranty requirements.
	.2	Sequencing: sequence with other work in accordance with Section 01 32 16.06 - Construction Progress Schedule. Comply with manufacturer's written recommendations for sequencing construction operations.
	.3	Scheduling: schedule with other work in accordance with Section 01 32 16.06 - Construction Progress Schedule.
<b><u>1.4 ACTION SUBMITTALS</u></b>	.1	Product Data.
	.1	Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section

01 33 00 - Submittal Procedures.

- .2 Samples.
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit samples.
    - .1 Two of each type of masonry unit specified.
    - .2 Two of each type of masonry accessory specified.
    - .3 Two of each type of masonry reinforcement, tie and connector proposed for use.
- .3 Manufacturer's Instructions.
  - .1 Submit manufacturer's installation instructions.
  - .2 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, limitations and colours.
  - .3 Provide two copies of Workplace Hazardous Materials Information System (WHMIS) - Material Safety Data Sheets (MSDS) in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .4 Shop Drawings:
  - .1 Provide drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
  - .2 Provide shop drawings detailing masonry anchoring and tie layout, and temporary bracing required, designed to resist wind pressure and lateral forces during installation.
- .5 Manufacturer's Reports: provide written reports prepared by Masonry veneer manufacturer's personnel to include:
  - .1 Verification of compliance of work with Contract.
  - .2 Site visit reports providing detailed review of installation of work, and installed work.

1.5 QUALITY  
ASSURANCE

- .1 Test Reports.
  - .1 Certified test reports showing compliance with specified performance characteristics and physical properties.
  - .2 Submit laboratory test reports in accordance Section 01 29 83 - Payment Procedures: Testing Laboratory Services.
  - .3 Submit laboratory test reports certifying compliance of masonry units and mortar ingredients with specification requirements.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Qualifications:
  - .1 Manufacturer: capable of providing field service

representation during construction and approving application method.

.2 Installer: experienced in performing work of this section who has specialized in installation of work similar to that required for this project.

.3 Masons: company or person specializing in masonry installations with 5 years documented experience with masonry work similar to this project.

.1 Masons employed on this project must demonstrate ability to reproduce mock-up standards.

.4 Mock-ups:

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

.2 Construct mock-up panel of exterior masonry wall construction showing masonry colours and textures, use of reinforcement, ties, through-wall flashing, weep holes, jointing, coursing, mortar and workmanship.

.3 Mock-up used:

.1 To judge workmanship, substrate preparation, operation of equipment and material application.

.4 Construct mock-up where directed by Consultant.

.5 Allow 72 hours for inspection of mock-up by Consultant before proceeding with work.

.6 When accepted by Consultant, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

.7 Start work only upon receipt of written acceptance of mock-up by Consultant.

1.6 DELIVERY,  
STORAGE, AND  
HANDLING

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

.2 Deliver materials to job site in dry condition, store and handle material in accordance with manufacturer's instructions.

.3 Storage and Handling Protection.

.1 Keep materials dry until use except where wetting of bricks is specified.

.2 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

1.7 WASTE  
MANAGEMENT AND  
DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, pallets, packaging material for recycling in accordance with Waste Management Plan.

- .3 Unused metal materials are to be diverted from landfill to a metal recycling facility as approved by Consultant.
- .4 Unused or damaged masonry materials must be diverted from landfill to a local facility as approved by Consultant.

## 1.8 SITE CONDITIONS

- .1 Ambient Conditions: assemble and erect components when temperatures are above 4 degrees C.
- .2 Weather Requirements: to CSA-A371.
- .3 Cold weather requirements.
  - .1 Supplement Clause 5.15.2 of CSA-A371 with following requirements.
    - .1 Maintain temperature of mortar between 5 degrees C and 50 degrees C until batch is used or becomes stable.
    - .2 Maintain ambient temperature between 5 degrees C and 50 degrees C and protect site from windchill.
  - .4 Hot weather requirements.
    - .1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.
    - .2 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.
- .5 Spray mortar surface at intervals and keep moist for maximum of three days after installations.

## 1.9 CLOSEOUT SUBMITTALS

- .1 Provide manufacturer's instructions for care, cleaning and maintenance of prefaced masonry units for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Masonry materials are specified in Related Sections.

### **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 EXAMINATION**
- .1 Examine conditions, substrates and work to receive work of this Section.
- .1 Co-ordinate with Section 01 71 00 - Examination and Preparation.
- .2 Examine openings to receive masonry units. Verify opening size, location, and that opening is square and plumb, and ready to receive work of this Section.
- .1 Inform Consultant of unacceptable conditions immediately upon discovery.
- .2 Proceed with installation after unacceptable conditions have been remedied.
- .3 Verification of Conditions:
- .1 Verify that:
- .1 Existing construction and substrate conditions which have been previously installed under other sections or contracts, are acceptable for product installation in accordance with manufacturer's instructions prior to installation of brick and concrete block
- .2 Field conditions are acceptable and are ready to receive work.
- .3 Built-in items are in proper location, and ready for roughing into masonry work.
- .2 Commencing installation means acceptance of existing substrates.
- 3.3 PREPARATION**
- .1 Surface Preparation: prepare surface in accordance with manufacturer's written recommendations and co-ordinate with Section 01 71 00 - Examination and Preparation.
- .2 Establish and protect lines, levels, and coursing.
- .3 Protect adjacent materials from damage and disfiguration.
- .4 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.
- 3.4 INSTALLATION**
- .1 Do masonry work in accordance with CSA-A371 except where

specified otherwise.

- .2 Build masonry plumb, level, and true to line, with vertical joints in alignment, respecting construction tolerances permitted by CSA-A371.
- .3 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting. Coursing shall match existing brick and block coursing.
- .4 Assume complete responsibility for dimensions, plumbs and levels of this work and constantly check same with graduated rod.
- .5 Carry up walls in uniform manner. Raise no one portion more than 1.2m or less to avoid excessive loads on un-set joints. Ensure no impact to plumbness and alignment of wall as work progresses. Review permitted height with masonry veneer manufacturer and adjust as necessary to suit cure rate for each type of masonry unit.

### 3.5 CONSTRUCTION

- .1 Exposed masonry.
  - .1 Remove chipped, cracked, and otherwise damaged units, in accordance with CSA A-165, in exposed masonry and replace with undamaged units.
- .2 Jointing.
  - .1 Allow joints to set just enough to remove excess water, then tool with round jointer to provide smooth, joints true to line, compressed, uniformly concave joints where concave joints are indicated. Typical for all exposed locations.
  - .2 Strike flush 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 Cutting.
  - .1 Cut out for electrical switches, outlet boxes, and other recessed or built-in objects.
  - .2 Make cuts straight, clean, and free from uneven edges.
- .4 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.
- .5 Support of loads.

- .1 Use 25 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 where grout is used in lieu of solid units.
- .3 Install building paper below voids to be filled with concrete grout; keep paper 25 mm back from faces of units.
- .6 Provision for movement.
  - .1 Leave 20 mm space below shelf angles.
  - .2 Leave 15 mm space between top of non-load bearing walls and partitions and structural elements. Do not use wedges.
  - .3 Built masonry to tie in with stabilizers, with provision for vertical movement.
- .7 Loose steel lintels.
  - .1 Install loose steel lintels. Centre over opening width.
- .8 Control joints.
  - .1 Construct continuous control joints as required for site condition, as indicated, and at maximum spacing of 9M.
- .9 Expansion joints.
  - .1 Build-in continuous expansion joints as indicated
- 3.6 SITE TOLERANCES .1 Tolerances in notes to CSA-A371 apply.
- 3.7 FIELD QUALITY CONTROL .1 Inspection and testing will be carried out by Testing Laboratory designated by Consultant.
- .2 Manufacturer's Services:
  - .1 Have manufacturer of masonry veneer products supplied under this Section review work involved in handling, installation/application, and protection of its products, and submit written reports in acceptable format to verify compliance of work with Contract.
  - .2 Manufacturer's field services: provide manufacturer's field services, consisting of product use recommendations and periodic site visits for inspection of product installation, in accordance with manufacturer's instructions.
  - .3 Schedule site visits to review work at stages listed:
    - .1 After delivery and storage of products, and when preparatory work on which work of this Section depends is complete, but before installation begins.
    - .2 Twice during progress of work at 25% and 60% complete.
    - .3 Upon completion of work, after cleaning is carried out.
  - .4 Obtain reports within three days of review and submit

immediately to Consultant.

3.8 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Progress cleaning in accordance with related masonry sections.
- .3 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.9 PROTECTION

- .1 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.
- .2 Keep masonry dry using waterproof non-staining coverings. Drape over walls and extend down sufficient to protect walls from wind driven rain until masonry wall is complete and protected by flashings or other permanent construction.

**END OF SECTION**



## **PART 1 - GENERAL**

- |                              |   |
|------------------------------|---|
| <u>1.1 RELATED SECTIONS</u>  | <ul style="list-style-type: none"><li>.1 Section 04 03 07 – Masonry Repointing</li><li>.2 Section 04 03 31 – Replacing Brick Masonry</li><li>.3 Section 04 05 00 – Common Work Results for Masonry</li><li>.4 Section 04 05 19 – Masonry Anchorage and Reinforcing</li><li>.5 Section 04 05 23 – Masonry Accessories</li><li>.6 Section 04 21 13 – Brick Masonry</li><li>.7 Section 04 22 00 – Concrete Unit Masonry</li></ul>  |
| <u>1.2 REFERENCES</u>        | <ul style="list-style-type: none"><li>.1 Canadian Standards Association (CSA International)<ul style="list-style-type: none"><li>.1 CAN/CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.</li><li>.2 CAN/CSA A179-04, Mortar and Grout for Unit Masonry.</li><li>.3 CAN/CSA A371-04, Masonry Construction for Buildings.</li><li>.4 CAN/CSA-A3000-03, Cementitious Materials Compendium; CAN/CSA-A3002-03, Masonry and Mortar Cement.</li></ul></li><li>.3 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)<ul style="list-style-type: none"><li>.1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.</li></ul></li></ul>   |
| <u>1.3 ACTION SUBMITTALS</u> | <ul style="list-style-type: none"><li>.1 Product Data.<ul style="list-style-type: none"><li>.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.</li><li>.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures and in Section 01 35 29.06 - Health and Safety Requirements. Indicate VOC's mortar, grout, parging, colour additives and admixtures. Expressed as grams per litre (g/L).</li></ul></li><li>.2 Samples.<ul style="list-style-type: none"><li>.1 Sample to be part of mock-up review.</li></ul></li><li>.3 Manufacturer's Instructions.<ul style="list-style-type: none"><li>.1 Submit manufacturer's installation instructions.</li></ul></li></ul> |
| <u>1.4 QUALITY ASSURANCE</u> | <ul style="list-style-type: none"><li>.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties and in accordance with Section 04 05 00 - Common Work Results for Masonry supplemented as follows:<ul style="list-style-type: none"><li>.1 Submit laboratory test reports in accordance Section</li></ul></li></ul>   |

01 29 83 - Payment Procedures: Testing Laboratory Services.

- .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:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control and requirements of Section 04 05 00 - Common Work Results for Masonry.

1.5 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.

1.6 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

1.7 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material for recycling in accordance with Waste Management Plan.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Use same brands of materials and source of aggregate for entire project.
- .2 Mortar and grout: CSA A179.
- .3 Aggregate: supplied by one supplier.
  - .1 to CAN/CSA A179,
  - .2 Use aggregate passing 1.18 mm sieve where 6 mm thick joints are indicated.
- .4 Cement:
  - .1 Portland Cement: to CAN/CSA-A3000, HS – High sulphate-resistant hydraulic cement (Type 50), gray colour.
  - .2 Masonry Cement: to CAN/CSA-A3002 and CAN/CSA A179, Type N and S.
  - .3 Mortar Cement: to CAN/CSA-A3002 and CAN/CSA A179, Type N and S.
  - .4 Packaged Dry Combined Materials for mortar: to CAN/CSA A179, Type N and S, using gray colour cement.
- .5 Water: clean and potable.
- .6 Lime:
  - .1 Quick Lime: to CAN/CSA A179, Type N.
  - .2 Hydrated Lime: to CAN/CSA A179, Type S.
- .7 Bonding Agent: epoxy type.
- .8 Polymer Latex: organic polymer latex admixture of butadiene-styrene type non-emulsifiable bonding admixture.
- .9 Non-Staining mortar: use non-staining masonry cement for cementitious portion of specified mortar type.
- .10 Grout: to CSA A179, Table 3.

### **2.2 MORTAR MIXES**

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

- .3 Mortar for foundation walls, manholes, sewers, pavements, walks, patios and other exterior masonry at or below grade: type M based on proportion specifications.
- .4 Following applies regardless of mortar types and uses specified above:
  - .1 Mortar for grouted reinforced masonry: type S based on proportion specifications.

### 2.3 MORTAR MIXING

- .1 Mix mortar ingredients in accordance with CAN/CSA A179 in quantities needed for immediate use.
- .2 Maintain sand uniformly damp immediately before mixing process.
- .3 Add admixtures in accordance with manufacturer's instructions. Provide uniformity of mix and colouration.
- .4 Do not use anti-freeze compounds including calcium chloride or chloride based compounds.
- .5 Do not add air entraining admixture to mortar mix.
- .6 Use a batch type mixer in accordance with CAN/CSA A179.
- .7 Re-temper mortar only within two hours of mixing, when water is lost by evaporation.
- .8 Use mortar within 2 hours after mixing at temperatures of 32 degrees C, or 2-1/2 hours at temperatures under 10 degrees C.

### 2.4 GROUT MIXES

- .1 Grout: Minimum compressive strength of 12.5 MPa at 28 days. Maximum aggregate size and grout slump: CAN/CSA A179. High slump (200-250mm).

### 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.
- .3 Inspection and testing will be carried out by Testing Laboratory designated by Consultant.

## **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 CSA A179 except where specified otherwise.

3.5 MIXING

- .1 Clean all mixing boards and mechanical mixing machine between batches.
- .3 Mortar must be weaker than the units it is binding.
- .4 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 requirements of CAN/CSA A179.
- .2 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 400mm, without consolidating grout by rodding.
- .5 Do not displace reinforcement while placing grout.

3.8 FIELD QUALITY  
CONTROL

- .1 Site Tests, Inspection: in accordance with Section 04 05 00 - Common Work Results for Masonry supplemented as follows:
  - .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.
- .2 Manufacturer's Field Services: in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .3 Inspection and testing will be carried out by Testing Laboratory designated by Consultant.

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.

- .4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

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 SECTIONS**
- .1 Section 04 03 07 – Masonry Repointing
  - .2 Section 04 03 31 – Replacing Brick Masonry
  - .3 Section 04 05 12 – Mortar and Masonry Grout
  - .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 21 13 – Board Insulation
  - .9 Section 07 27 00 – Air Barriers.
- 1.2 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 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 Submit manufacturer's printed product literature, specifications and datasheets illustrating products to be incorporated into project for specified products.
    - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's for epoxy coatings and galvanized protective coatings and touch-up products.
  - .2 Shop Drawings :
    - .1 Provide drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
    - .2 Shop drawings consist of bar bending details, lists and placing drawings.
    - .3 On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and connectors.
  - .3 Manufacturer's Instructions:
    - .1 Submit manufacturer's installation instructions.



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- .4 Samples:  
.1 Samples to be part of mock-up sample for review.
- 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. Comply with Section 04 05 00 - Common Work Results for Masonry.
- .4 Mock-ups:  
.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control and requirements of Section 04 05 00 - Common Work Results for Masonry supplemented as follows:  
.1 Construct mock-ups panel of anchorage installation and reinforcement installation.  
.2 Sample panel: using proposed procedures, anchorage material, connectors, reinforcement material, and workmanship.
- 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, supplemented as follows:  
.1 Deliver reinforcement and connectors, identified in shop and placement drawings.
- 1.7 WASTE MANAGEMENT AND DISPOSAL
- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material for recycling in accordance with Waste Management Plan.
- .3 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Bar reinforcement: to CSA-A371 and CAN/CSA G30.18, Grade 400.
- .2 Wire reinforcement: to CSA-A371 and CSA G30.14, truss type, tri-rod for cavity walls, with min. 3.8 mm deformed side rods but heavier rods where required, galvanized without a drip, 50 mm narrower than wall.
- .3 Connectors: to CSA-A370 and CSA-S304.
- .4 Corrosion protection: to CSA-S304.1, galvanized to CSA-S304.1 and CSA-A370. Hot dip galvanized with min. 0.46 kg. zinc /m<sup>2</sup>.
- .5 At back up metal studs, use Bailey brick tie/connector or Fero Slotted Stud Tie with brick connector connected by sheet metal screws to web of stud; all material to be hot dipped galvanized complete with insulation support clip.
- .6 Fasteners to steel studs: sheet metal screws with self-drilling tip round of pan head, min. 10mm longer than material to be fastened min. 4.8mm diameter (#12). Construction Fasteners Inc.'s "Sentri-Coating, Buildex" Climaseal Coating", or 300 Series Stainless Steel. Engineer for large format masonry units.
- .7 Back up concrete block walls: use Helifix stainless steel masonry ties (6mm) by Blok-Lok Ltd. Anchors to be drilled into place and not set into mortar joints. Ties to be drilled through cavity wall insulation and air/vapour barrier.

### **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 Ontario.
- .2 Fabricate connectors in accordance with CSA-A370.
- .3 Obtain Consultant's approval for locations of reinforcement splices other than shown on placing drawings.
- .4 Upon approval of Consultant, weld reinforcement in accordance with CSA W186.
- .5 Ship reinforcement and connectors, clearly identified in accordance with drawings.

2.3 SOURCE QUALITY CONTROL

- .1 Upon request, provide Consultant with certified copy of mill test report of reinforcement steel and connectors, showing physical and chemical analysis, minimum 5 weeks prior to commencing reinforcement work.
- .2 Upon request, inform Consultant of proposed source of material to be supplied.

**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 INSTALLATIONS

- .1 Supply and install masonry connectors and reinforcement in accordance with CSA-A370, CSA-A371, CAN/CSA-A23.1 and CSA-S304.1 unless indicated otherwise.
- .2 As part of mock-up assembly obtain Consultant's review of placement of reinforcement and connectors.
- .3 Supply and install additional reinforcement to masonry as indicated.

3.3 HORIZONTAL REINFORCING

- .1 Provide horizontal reinforcing in all masonry work in accordance with drawings. Refer to structural drawings.
- .2 Install continuous horizontal reinforcing in each wythe of every concrete block wall at vertical spacing intervals 400mm maximum or 200mm where called for. Lap 150mm at each splice.
- .3 Utilize "L" and "T" shaped horizontal reinforcement at corners and abutting partitions.
- .4 Additionally place reinforcement in the first and second bed joints above and below openings extending 600mm beyond each side of opening.
- .5 Place joint reinforcement continuous in first [and second] joint below top of walls.
- .6 Lap joint reinforcement ends minimum 150 mm.

### 3.4 BONDING AND TYING

- .7 Reinforce masonry where thickness is reduced by a column or chase with a length of horizontal reinforcing in the joint of every block course and extending 1.2m beyond each end of the column or chase.
- .1 Bond walls of two or more wythes using metal connectors in accordance with CSA-S304, CSA-A371 and as indicated and specified.
- .2 Tie masonry veneer to backing in accordance with NBC, CSA-S304.1, CAN/CSA A371 and as indicated.
- .3 Install unit, adjustable, single wythe and multiple wythe joint reinforcement where indicated and in accordance with CAN/CSA A370 and CAN/CSA A371 and manufacturer's instructions.
- 1 Locate box anchors in cavity walls at max. 400mm o.c. vertically and maximum 600mm o.c. horizontally.
- .2 Secure special ties to framing: locate at maximum 400mm o.c. horizontally and max. 600mm o.c. vertically to metal studs.
- .3 Additionally reinforce brick to steel stud framing:
- .1 At max. 3 brick courses below top of any wall or wall opening.
- .2 At max. 5 brick courses above steel lintels and shelf angles.
- .4 Connect [stack bonded unit] joint corners and intersections with strap anchors [400] mm on centre

### 3.5 GROUTING

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

### 3.6 ANCHORS

- .1 Supply and install metal anchors as indicated.
- .2 Embed metal anchors solidly in mortar or grout to develop maximum resistance to design forces.
- .3 Anchor masonry to structural beams, columns, and walls max. 400mm o.c. vertically and max. 1.2m o.c. horizontally.
- .1 Anchor concrete block to steel columns and beams with 250mm long x 38mm wide x 3mm thick "L" shaped straps at 400mm o.c. with 200mm leg in block and 50mm leg welded to column or beam.
- .2 Anchor new concrete block to existing concrete block with corrugated ties at 400mm o.c.

3.7 LATERAL SUPPORT  
AND ANCHORAGE

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

3.8 CLEANING

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

**END OF SECTION**

## **PART 1 - GENERAL**

- 1.1 RELATED SECTIONS**
- .1 Section 04 03 07 – Masonry Repointing
  - .2 Section 04 03 31 - Replacing Brick Masonry
  - .3 Section 04 05 00 – Common Work Results for Masonry
  - .4 Section 04 05 12 – Mortar and Masonry Grout
  - .5 Section 04 05 19 – Masonry Anchorage and Reinforcing
  - .6 Section 04 21 13 – Brick Masonry
  - .7 Section 04 22 00 – Concrete Unit Masonry
- 1.2 REFERENCES**
- .1 American Society for Testing and Materials International, (ASTM).
    - .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 ACTIVE AND INFORMATIONAL SUBMITTALS**
- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Product Data:
    - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
    - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's for joint fillers and lap adhesives.
  - .3 Manufacturer's Instructions:
    - .1 Submit manufacturer's installation instructions.
  - .4 Shop Drawings:
    - .1 Provide shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
      - .1 Provide drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
    - .2 Provide shop drawings consist of flashing and installation details. Indicate sizes, spacing, location and

quantities of fasteners.

- .5 Samples:
  - .1 Provide samples in accordance with Section 01 33 00 - Submittal Procedures, supplemented as follows:
    - .1 Materials: two, cured, and coloured samples, illustrating colour and colour range. Include:
      - .1 Movement joint filler.
      - .2 Lap adhesive.
      - .3 Mechanical fasteners.
      - .4 Reglets.
      - .5 Brick vents.
    - .2 Two moisture control material samples, illustrating colour and colour range, size, and shape. Include:
      - .1 Weep hole vents.
      - .2 Mortar diverters.
      - .3 Grout screens.
    - .3 Two flashing material samples, illustrating colour and colour range, size, shape, and profile. Include as specified:
      - .1 Sheet metal flashings.
      - .2 Composite flashings.
- .6 Quality Assurance Submittals:
  - .1 Test reports: submit certified test reports in accordance with Section 04 05 00 - Common Work Results for Masonry.
  - .2 Certificates: submit in accordance with Section 04 05 00 - Common Work Results for Masonry.
  - .3 Manufacturer's Instructions: submit in accordance with Section 04 05 00 - Common Work Results for Masonry, supplemented as follows:
    - .1 Submit installation instructions for fillers, adhesives, reglets, brick vents, weeps, vents, diverters, screens, and flashings.
- .7 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .8 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .9 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Section 04 05 00 - Common Work Results for Masonry.

- 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 anchorage and reinforcing materials in accordance with Section 01 61 00 - Common Product Requirements, supplemented as follows:  
.1 Deliver reinforcement and connectors, identified in shop and placement drawings.
- 1.6 WASTE MANAGEMENT AND DISPOSAL
- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.

## PART 2 - PRODUCTS

- 2.1 MATERIALS
- .1 Control joint filler: purpose-made elastomer 654-4 (85+ or - 5) durometer hardness to ASTM D 2240.
- .2 Lap adhesive: recommended by masonry flashing manufacturer. Use low VOC products in compliance with the SCAQMD Rule 1168
- .3 Nailing inserts: 0.6mm thick purpose made galvanized steel inserts for setting in mortar joints.
- .4 Mechanical fasteners: recommended by flashing manufacturer to suit project requirements
- 2.2 MOISTURE CONTROL
- .1 Weep Hole Vents: Purpose made PVC.
- .2 Cell vents: polypropylene plastic, honeycomb design.  
.1 Size: 9.5 mm x 63.5 mm x 85.7 mm
- .3 Colour: grey.
- .4 Mortar diverters: shaped and sized to suit cavity spaces. "Mortarstop" cavity drainage board manufactured by Polytitle Manufacturing Corporation.



- .5 Grout Screens: 6 mm square monofilament screen is fabricated from high-strength, non-corrosive polypropylene polymers to isolate flow of grout in designated areas.

### 2.3 FLASHINGS

- .1 Through-wall Flashings: Perm-a-Barrier wall flashing membrane by W.R.Grace, Blueksin AG by Bakor or Sopraseal Stick 1100T by Soprema. Complete with adhesive and primer recommended by Manufacturer of flashing. Provide metal support over cavities larger than 50mm of 26GA (0.55 mm) zinc coated steel commercial quality to ASTM A526M with Z275 designated zinc coating.

## **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 MANUFACTURER'S INSTRUCTIONS

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

### 3.3 INSTALLATION: MATERIALS

- .1 Install continuous control joint fillers in control joints at locations indicated on drawings. Provide control joints at 9m maximum spacing. .
- .2 Install inserts in mortar joints at 400mm centres each way, for attachment of wall strapping. install fasteners to suit application and in accordance with manufacturer's written installation instructions.
- .3 Reglets: install reglets at locations indicated on drawings.
- .4 Lap adhesive: apply adhesive to flashing lap joints.

### 3.4 INSTALLATION: MOISTURE CONTROL

- .1 Install weep hole vents in vertical joints immediately over flashings, in exterior wythes of cavity wall and masonry veneer wall construction, at maximum horizontal spacing of 600 mm on centre.
- .2 Install cavity drainage board within cavity wall directly behind

weep holes, immediately over flashings.

- .3 Grout screens: install purpose made diverters in cavities of new brick veneer installations above through wall flashings and weep holes, as directed, size and shape to suit purpose and function.

### 3.5 INSTALLATION: FLASHINGS

- .1 Build in flashings in masonry in accordance with CSA-A371.
  - .1 Install flashings under exterior masonry bearing on foundation walls, slabs, and steel angles over openings. and at base of cavity wall and where cavity is interrupted by horizontal members or supports and as shown on drawings. Install flashings under weep hole courses and as indicated.
  - .2 In double wythe masonry walls, veneered walls, and siding clad walls carry flashings from front edge of masonry or siding under outer wythe, then up backing not less than 200mm, bond to backing using manufacturer's recommended adhesive.
  - .3 Where required and detailed provide metal flashing support to adhere through wall flashing to and span over suspended steel angle vertical framing.
  - .4 Lap joints 150mm and seal full overlap with adhesive.
  - .5 Turn up ends of flashings at ends to form end dams at lintels, sills and wall ends to prevent water from travelling horizontally past flashing ends.(i.e. at sills of openings/windows).

### 3.6 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 04 03 07 - Masonry Repointing
- .2 Section 04 03 31 - Replacing Brick Masonry
- .3 Section 04 05 00 – Common Work Results for Masonry
- .4 Section 04 05 12 – Mortar and Masonry Grout
- .5 Section 04 05 19 – Masonry Anchorage and Reinforcing
- .6 Section 04 05 23 – Masonry Accessories
- .7 Section 04 22 00 – Concrete Unit Masonry

### **1.2 SCOPE OF WORK**

- .1 The work of this Section shall include all material, labour, equipment, and tools required to complete the work described herein and reflected in the Contract Documents.
- .2 The work includes supply of new brick to match existing should the Contractor not salvage sufficient quantities of existing brick to complete the work of this Contract. Note that it is anticipated that there is sufficient quantities of existing brick being removed to facilitate the work of this Contract if the Contractor follows the requirements of Section 04 03 31 – Replacing Brick Masonry.
- .3 Should the Contractor request to provide new brick in-lieu of salvaging existing brick, he shall submit samples of proposed replacement brick for Consultant's review and written approval.

### **1.3 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM).
  - .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).
  - .1 Technical Note No. 20-2006, Cleaning Brick Masonry.
- .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.

### **1.4 ACTION AND INFORMATIONAL SUBMITTALS**

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

- .2 Product Data.
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Manufacturer's Instructions.
  - .1 Submit manufacturer's installation instructions in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .4 Samples:
  - .1 Provide unit samples in accordance with Section 01 33 00 - Submittal Procedures.

1.5 QUALITY ASSURANCE

- .1 Provide Certificates: in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .2 Test and Evaluation Reports: submit certified test reports in accordance with Section 04 05 00 - Common Work Results for Masonry, supplemented as follows:
- .3 Pre-Installation Meetings: conduct pre-installation meeting in accordance with Section 04 05 00 - Common Work Results for Masonry to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.
- .4 Mock-ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control and requirements of Section 04 05 00 - Common Work Results for Masonry.
- .5 Delivery, Storage, and Handling:
  - .1 Deliver, store and handle brick unit masonry in accordance with Section 01 61 00 - Common Product Requirements.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.

1.7 SITE CONDITIONS

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

**PART 2 - PRODUCTS**

2.1 MANUFACTURED UNITS

- .1 Face brick.  
.1 Brick to match existing brick units in size, colour, and texture to the satisfaction and approval of the Consultant. Existing brick previously specified as 'Sandalwood Sandstone' by Canada Brick, CSR size, 90mm x 70mm x 230mm.
- .2 Reinforcement:  
.1 Reinforcement in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.
- .3 Connectors:  
.1 Connectors in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.
- .4 Flashings:  
.1 Flashing: in accordance with Section 04 05 23 - Masonry Accessories.
- .5 Mortar Mixes:  
.1 Mortar and mortar mixes in accordance with Section 04 05 12 - Masonry Mortar and Grout.
- .6 Grout Mixes:  
.1 Grout and grout mixes in accordance with Section 04 05 12 - Masonry Mortar and Grout.
- .7 Cleaning Compounds:  
.1 Use low VOC products in compliance with SCAQMD Rule 1168.  
.2 Compatible with substrate and acceptable to masonry manufacturer for use on products.  
.3 Cleaning compounds compatible with brick masonry units and in accordance with manufacturer's written recommendations and instructions.

**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 substrates.

3.2 PREPARATION

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

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 INSTALLATION

.1 Construction to conform to CAN/CSA A371.

.2 Bond: Typical bond is stretcher. Brick vertical piers combination of stretcher bond with center recessed stack bond.

.3 Coursing height: 200 mm for three/two bricks and three/two joints and as indicated.

.4 Jointing: concave

.5 Mixing and blending: mix units within each pallet and with other pallets to ensure uniform blend of colour and texture.

.6 Clean unglazed clay masonry as work progresses.

.7 Reinforcement:

.1 Install reinforcing in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.

.8 Connectors:

.1 Install connectors in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.

.9 Flashings:

.1 Install flashings in accordance with Section 04 05 23 - Masonry Accessories.

.10 Mortar Placement:

.1 Place mortar in accordance with Section 04 05 12 - Masonry Mortar and Grout.

.11 Grout Placement:

.1 Place grout in accordance with Section 04 05 12 - Masonry Mortar and Grout.

- .12 Repair/Restoration:
  - .1 Upon completion of masonry, fill holes and cracks, remove loose mortar and repair defective work.
- .13 Field Quality Control:
  - .1 Site Tests, Inspection: in accordance with Section 04 05 00 - Common Work Results for Masonry
  - .2 Manufacturer's Field Services: in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .14 Tolerances:
  - .1 To CAN/CSA A371 unless noted below which shall govern.
  - .2 Cull out masonry units which do not meet the range of acceptance from the reviewed mockup. Remove units which are chipped cracked, have broken corners, excessive colour and texture variation, and size/deformation variations which are visible when viewed 3 meters from wall face.

### 3.5 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 Clean unglazed clay masonry: 10 m<sup>2</sup> area of wall designated by Consultant as directed below and leave for one week. If no harmful effects appear and after mortar has set and cured, protect windows, sills, doors, trim and other work, and clean brick masonry as follows.
  - .1 Remove large particles with wood paddles without damaging surface. Saturate masonry with clean water and flush off loose mortar and dirt.
  - .2 Scrub with solution of 25 mL trisodium phosphate and 25 mL household detergent dissolved in 1 L of clean water using stiff fibre brushes, then clean off immediately with clean water using hose. Alternatively, use proprietary compound recommended by brick masonry manufacturer in accordance with manufacturer's directions.
  - .3 Repeat cleaning process as often as necessary to remove mortar and other stains.
  - .4 Use acid solution treatment for difficult to clean masonry as described in Technical Note No.20 by the Brick Industry Association. Test selected area prior to proceeding to determine effectiveness.
- .4 Upon completion of installation, remove surplus materials,

rubbish, tools and equipment barriers.

- .5 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

3.6 PROTECTION

- .1 Brace and protect brick masonry in accordance with Section 04 05 00 - Common Work Results for Masonry.

**END OF SECTION**



## **PART 1 - GENERAL**

- 1.1 RELATED SECTIONS**
- .1 Section 04 03 07 – Masonry Repointing
  - .2 Section 04 05 00 – Common Work Results for Masonry
  - .3 Section 04 05 12 – Mortar and Masonry Grout
  - .4 Section 04 05 19 – Masonry Anchorage and Reinforcing
  - .5 Section 04 05 23 – Masonry Accessories
  - .6 Section 04 21 13 – Brick Masonry
  - .7 Section 07 84 00 – Fire Stopping
  - .8 Section 08 11 00 – Metal Doors and Frames
- 1.2 REFERENCES**
- .1 Canadian Standards Association (CSA International)
    - .1 CAN3 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.
  - .4 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
    - .1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
  - .5 Underwriters' Laboratories of Canada (ULC)
    - .1 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:
    - .1 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 Samples:
    - .1 Provide unit samples in accordance with Section 04 05 00 - Common Work Results for Masonry. Sample to be part of Project mockup.
  - .4 Manufacturer's Written Instructions: provide in accordance with Section 04 05 00 - Common Work Results for Masonry.
- 1.4 QUALITY ASSURANCE SUBMITTALS**
- .1 Certificates: provide in accordance with Section 04 05 00 - Common Work Results for Masonry.

- .2 Test and Evaluation Reports: provide certified test reports in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .3 Pre-Installation Meetings: conduct pre-installation meeting in accordance with Section 04 05 00 - Common Work Results for Masonry to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.
- .4 Mock-ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control and requirements of Section 04 05 00 - Common Work Results for Masonry.

1.5 DELIVERY,  
STORAGE, AND  
HANDLING

- .1 Deliver, store and handle concrete unit masonry in accordance with Section 04 05 00 - Common Work Results for Masonry.

1.6 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate and recycle waste materials in 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 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material for recycling in accordance with Waste Management Plan.
- .4 Divert damaged or unused concrete materials from landfill to local facility approved by Consultant.

**PART 2 - PRODUCTS**

2.1 MATERIALS

- .1 Standard concrete block units: to CAN3-A165 Series (CAN3-A165.1).
  - .1 Classification: H / 15 / A / M.
  - .2 Size: To match existing block size and coursing. Refer to drawings for required thicknesses
  - .3 Special shapes: where shown on drawings provide bull-nosed units for wall exposed corners and at exposed corners at door frames. Provide purpose-made shapes for lintels and bond beams. Provide additional special shapes as indicated.
  - .4 Size and coursing of blocks to match existing.
- .2 Special fire resistant concrete block units: to CAN3-A165

Series (CAN3-A165.1) as modified below.

.1 Classification: H/15/B/M except as modified by fire resistance requirements specified below.

.2 Fire resistant characteristics: aggregate used in units and equivalent thickness of units to the Supplement to the National Building Code of Canada 1990, Chapter 2 for fire-resistance ratings indicated.

.3 Size: True Imperial sizes to match existing block size and coursing. Refer to drawings for required thicknesses

.4 Special shapes: where shown on drawings provide bull-nosed units for wall exposed corners and at door frames. Provide purpose-made shapes for lintels and bond beams and provide additional shapes as indicated.

## 2.2 REINFORCEMENT

.1 Reinforcement in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing .

## 2.3 CONNECTORS

.1 Connectors in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.

## 2.4 FLASHING

.1 Flashing: in accordance with Section 04 05 23 - Masonry Accessories.

## 2.5 MORTAR MIXES

.1 Mortar and mortar mixes in accordance with Section 04 05 12 - Masonry Mortar and Grout.

## 2.6 GROUT MIXES

.1 Grout and grout mixes in accordance with Section 04 05 12 - Masonry Mortar and Grout.

## 2.7 CLEANING COMPOUNDS

.1 Use low VOC products [in compliance with SCAQMD Rule 1168.

.2 Compatible with substrate and acceptable to masonry manufacturer for use on products.

.3 Cleaning compounds compatible with concrete unit masonry and in accordance with manufacturer's written recommendations and instructions.

## 2.8 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 [2]mm.

### **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 Concrete block units.

.1 Bond: running.

.2 Coursing height: 213 mm for one block and one joint.

.3 Jointing: concave where exposed or where paint or other finish coating is specified. Flush joints where PVC Hygenic wall panel finishes.

.2 Install blocks with bullnose corners at all exterior corners of walls except where walls are completely finished with covering material of gypsum board, wood paneling, ceramic tile, or other finished material (excluding paint and coatings).

.3 Concrete block lintels.

.1 Install special units to form corners, returns, offsets, reveals and indents without cut ends being exposed and without losing bond or module.

.2 Install reinforced concrete block lintels over openings in masonry where steel or reinforced concrete lintels are not indicated.

.3 End bearing: not less than 200 mm and as indicated on drawings.

.4 Refer to structural drawings for general requirements

3.4 REINFORCEMENT

.1 Install reinforcing in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.

3.5 CONNECTORS

.1 Install connectors in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.

3.6 FLASHING

.1 Install flashings: in accordance with Section 04 05 23 - Masonry Accessories.

3.7 MORTAR PLACEMENT

.1 Place mortar in accordance with Section 04 05 12 - Masonry Mortar and Grout.

3.8 GROUT PLACEMENT

.1 Place grout in accordance with Section 04 05 12 - Masonry Mortar and Grout.

3.9 CONSTRUCTION

.1 Cull out masonry units, in accordance with CAN/CSA A165 and reviewed 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 [weathered/raked for interior work]; strike concealed joints flush.
- .13 After mortar has achieved initial set up, tool joints.
- .14 Do not interrupt bond below or above openings.

3.10 FIELD QUALITY CONTROL

- .1 Site Tests, Inspection: in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .2 Manufacturer's Field Services: in accordance with Section 04 05 00 - Common Work Results for Masonry.

3.11 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning, supplemented as follows.
- .2 Allow mortar droppings on masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of block and finally by brushing.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

3.12 PROTECTION

- .1 Brace and protect concrete unit masonry in accordance with Section 04 05 00 - Common Work Results for Masonry.

**END OF SECTION**

PART 1 GENERAL

1.1 RELATED WORK

- .1 Cast-in-Place Concrete Section 03 30 00
- .2 Painting Section 09 91 00

1.2 REFERENCE STANDARDS

- .1 Do structural steel work in accordance with CAN/CSA -S16-09 and CAN3-S136-07 except where specified otherwise.
- .2 Do welding in accordance with CSA W59-13, by companies certified by and welders qualified in accordance with CSA W47.1-09, except where specified otherwise.

1.3 SOURCE QUALITY CONTROL

- .1 Prior to commencing of work, if required by Engineer, submit 3 certified copies of mill reports covering chemical and physical properties of steel used in this work.

1.4 DESIGN OF DETAILS

- .1 Design details and connections in accordance with requirements of and Connections CAN/CSA-S16-09 and CAN3-S136-07.
- .2 For all connections, submit sketches and design calculations stamped and signed by qualified professional engineer licensed in the Province of Ontario or submit shop drawings stamped and signed by a qualified professional engineer licensed in the Province of Ontario with the proviso "for connections only".

1.5 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 30 00.
- .2 Indicate shop and erection details including cuts, copes, connections, holes, bolts and welds. Indicate welds by welding symbols defined in CSA-W59-13.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Structural steel: to CAN3-G40.21-13 Grade as indicated on structural drawings.
- .2 Anchor bolts: to CAN3-G40.21-13, Grade A307.
- .3 Bolts, nuts and washers: to ASTM A325M.
- .4 Welding materials: to CSA-W59-13.
- .5 Shop paint primer: to CISC/CPMA standard 1-73a.

PART 3 EXECUTION

3.1 FABRICATION

- .1 Fabricate structural steel, as indicated, in accordance with CAN/CSA-S16-09 and in accordance with approved shop drawings.

3.2 SHOP PAINTING

- .1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16-09 except where members are to be encased in concrete.
- .2 Apply primer paint to exposed surfaces without sags or runs. Sand down and repaint areas not acceptable to the Architect.

3.3 MARKING

- .1 Mark materials in accordance with CAN3-G40.20-13 and CAN/CSA-G40.21-13. Do not use die stamping. If steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.
- .2 Match marking: shop mark for fit and match.

3.4 ERECTION

- .1 Erect structural steel, as indicated and in accordance with CAN 3-S16-09 and in accordance with shop drawings.
- .2 Obtain written permission of Engineer prior to field cutting or altering of structural members not shown on shop drawings.
- .3 Clean mechanical brush and touch up primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.

3.5 FIELD QUALITY CONTROL

- .1 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Owner.
- .2 Costs of tests will be paid for as specified in Section 01 45 00 Quality Control.

END OF SECTION



PART 1 GENERAL

1.1 RELATED WORK

.1 Structural Steel Section 05 12 00

1.2 REFERENCE STANDARDS

- .1 American Society for Testing and Materials International, (ASTM)
- .1 ASTM A653/A653M-08, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .2 ASTM A792/A792M-08, Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International)
- .1 CSA C22.2 No.79-1978(R1999), Cellular Metal and Cellular Concrete Floor Raceways and Fittings.
  - .2 CAN/CSA-S16-09 Design of Steel Structures.
  - .3 CSA-S136-07, Cold Formed Steel Structural Members.
- .4 Canadian Sheet Steel Building Institute (CSSBI)
- .1 CSSBI 10M-96, Standard for Steel Roof Deck.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Zinc (Z) coated steel sheet: to ASTM A653/A653M structural quality Grade A with Z275, coating, 0.61 to 1.21 mm base steel thickness.
- .2 Cover plates, cell closures and flashings: steel sheet with minimum base steel thickness varies. Refer to plans. Metallic coating same as deck material.
- .3 Primer: zinc rich, ready mix to CAN/CGSB-1.181.

2.2 TYPES OF DECKING

- .1 Deck is used as shear wall reinforcement. Refer to drawings for configuration.

PART 3 EXECUTION

3.1 GENERAL

- .1 Structural steel work: in accordance with CAN/CSA-S136-07 and CSSBI 10M and CSSBI 12M.

3.2 ERECTION

- .1 Erect metal decking as indicated to manufacturer's instructions
- .2 Immediately after decking is permanently secured in place touch-up galvanized surface with zinc rich primer where burned by welding.

- .3 Fastening requirements shall be as noted on structural drawings.
- .4 The decking shall be continuous over at least 3 spans with ends lapped 50mm minimum over supports.
- 3.3 STORAGE .1 Decking shall be stored on wood supports above the grade and sloped so as to allow runoff along down flutes.
- 3.4 ACCESSORIES .1 Provide all required closures, reinforcing sheet steel and flashing.
- 3.5 FIELD QUALITY CONTROL .1 Inspection and testing of material and workmanship will be carried out by testing laboratory.
- .2 Quality assurance shall be in conformance with Section 01 45 00.
- .3 Damaged decking shall be replaced at Consultants discretion.
- 3.6 REVIEW OF CONSTRUCTION .1 Review of construction by the Consultant and inspection and testing by an independent inspection is to ascertain general conformity with design documents. The review does not relieve contractor from carrying out his own quality control and making the work accurate and in conformity with the drawings and specification.

END OF SECTION

## **9PART 1 - GENERAL**

- 1.1 SUMMARY** .1 Section Includes:
- .1 Materials and application of Wind-Load bearing steel stud systems.
  - .2 Sustainable requirements for construction.
    - .1 Recycled Content.
    - .2 Construction Waste Management
    - .3 Local/regional materials.
  - .3 The work of this section includes the engineering and design of structural metal stud framing. Engineer and design framing to support all dead and live loads applied to exterior walls including loads from cladding and windows.
- 1.2 RELATED REQUIREMENTS** .1 Section 05 31 00 – Steel deck
- .2 Section 06 10 00 – Rough Carpentry
  - .3 Section 08 10 00 – Metal Doors and Frames
  - .4 Section 09 21 16 – Gypsum Board Assemblies
  - .5 Section 09 22 16 – Non-structural Metal Framing
- 1.3 REFERENCES** .1 American Society for Testing and Materials International (ASTM)
- .1 ASTM A 123/A 123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .2 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.
  - .3 ASTM A 792/A 792M-09a, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International)
- .1 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel Structures.
  - .2 CSA W55.3-08, Certification of Companies for Resistance Welding of Steel and Aluminum.
  - .3 CSA W59-M03(R2008), Welded Steel Construction (Metal Arc Welding) Metric.
  - .4 CAN/CSA S136-07, North American Specification for the Design of Cold Formed Steel Structural Members.
- .4 Canadian Sheet Steel Building Institute (CSSBI)
- .1 CSSBI 50M-06, Lightweight Steel Framing Manual.
  - .2 CSSBI Fact Sheet #3 June 1994, Care and

Maintenance of Prefinished Sheet Steel Building Products.  
.3 CSSBI Technical Bulletin Vol. 7, No. 2 February 2004,  
Changing Standard Thicknesses for Canadian Lightweight  
Steel Framing Applications.  
.4 CSSBI S5-04, Guide Specification for Wind Bearing  
Steel Studs.

#### 1.4 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 -  
Submittal Procedures.
- .2 Shop Drawings:
  - .1 Indicate design loads, member sizes, materials, design  
thickness exclusive of coatings, coating specifications,  
connection and bracing details, screw sizes and spacing, and  
anchors.
  - .2 Indicate locations, dimensions, openings and  
requirements of related work.
  - .3 Indicate welds by welding symbols as defined in CSA  
W59.
  - .4 Shop drawings shall be stamped and signed by a  
qualified professional Engineer registered in the Province of  
Ontario.
  - .5 Design structural steel stud framing to carry dead and  
live loads from cladding and windows.
- .3 Submit samples of framing components and fasteners to  
Consultant.
- .4 Prior to beginning Work, submit: two certified copies of mill  
reports covering material properties.
- .5 Submit Contractor's Engineer certificate/ written report, within 3  
days of review, verifying compliance of Work, as described in  
PART 3 - FIELD QUALITY CONTROL. Certificate/report shall  
be stamped and signed by qualified professional engineer  
registered in the province of Ontario.

#### 1.5 QUALITY ASSURANCE

- .1 Site Meetings: as part of Contractor's Services as described in  
PART 3 - FIELD QUALITY CONTROL, schedule site visits, to  
review Work, at stages listed:
  - .1 After delivery and storage of products, and when  
preparatory Work is complete but before installation begins.
  - .2 Upon completion of Work, after cleaning is carried out.
- .2 Sustainable Requirements:
  - .1 Structural metal stud framing contain 25% post  
consumer recycled content and 50% pre-consumer recycled  
content.

.2 Structural metal studs to be manufactured regionally.

1.6 DELIVERY,  
STORAGE AND  
HANDLING

- .1 Protect steel studs during transportation, site storage and installation in accordance with CSSBI Sheet Steel Facts #3.
- .2 Handle and protect galvanized materials from damage to zinc coating.
- .3 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 219 - Construction/Demolition Waste Management and Disposal.
  - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
  - .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
  - .4 Ensure emptied containers are sealed and stored safely.
  - .5 Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.
  - .6 Fold up metal and plastic banding, flatten and place in designated area for recycling.

**PART 2 - PRODUCTS**

2.1 SUSTAINABLE  
REQUIREMENTS

- .1 Materials and products in accordance with Section 01 47 15 - Sustainable Requirements: Construction.

2.2 MATERIALS

- .1 Steel: to CSA S136, fabricated from ASTM A 653/A 653M, Grade 230 340 steel.
- .2 Zinc coated steel sheet: quality to ASTM A 653/A 653M, with Z275 designation coating. Sustainable recycled content as specified.
- .3 Welding materials: to CSA W59 and certified by Canadian Welding Bureau.
- .4 Screws: pan head, self-drilling, self-tapping sheet metal screws, corrosion protected with minimum zinc coating thickness of 0.008 mm, length 8 mm ( shall be 5mm longer than twice thickness of steel)
- .5 Anchors: concrete expansion anchors or other suitable drilled type fasteners.

- .6 Bolts, nuts, washers: hot dipped galvanized to CAN/CSA-G164, 380 600 g/m<sup>2</sup> zinc coating.
- .7 Touch up primer: zinc rich, to CAN/CGSB 1-GP-181 MPI #18.

### 2.3 STEEL STUD DESIGNATIONS

- .1 Colour code: to CSSBI Technical Bulletin Vol.7, No. 2.

### 2.4 METAL FRAMING

- .1 Steel studs: to CSA S136, fabricated from metallic coated steel, depth as indicated.
  - .1 Minimum steel thickness 1.37. Designation thickness of 43 , Designation colour yellow,(18 gauge)
- .2 Stud tracks: fabricated from same material and finish as steel studs, depth to suit.
  - .1 Bottom track: single piece.
  - .2 Top track: single piece.
- .3 Bridging: fabricated from same material and finish as studs, 38 x 12 x 1.09 mm minimum thickness.
- .4 Angle clips: fabricated from same material and finish as studs, 38 x 38 mm x depth of steel stud, 1.37 mm minimum thickness.
- .5 Tension straps and accessories: as recommended by manufacturer.
- .6 Deflection Clips: fabricated from same material and finish as studs, 65mm x 90mm full depth of steel stud, 1.52mm thickness, with screw slots to accommodate specified deflection. Deflection clips must fit snug inside between flanges of the stud, full width of the stud drawing.
- .7 Thickness and gauges indicated in 2.4, are minimum guidelines only. Tender price to include for required gauge to meet engineer's requirements for application of specified stud width.

### 2.5 SOURCE QUALITY CONTROL

- .1 Ensure mill reports covering material properties are reviewed by Consultant.

## PART 3 - EXECUTION

### 3.1 GENERAL

- .1 Do welding in accordance with CSA W59.
- .2 Certification of companies: CSA W47.1 for fusion welding and CSA W55.3 for resistance welding of structural components.

.3 Do work to CSSBI S5.

### 3.2 ERECTION

- .1 Erect components to requirements of reviewed shop drawings.
- .2 Prior to install tracks, scrape and clean off slab to take continuous beads of caulking.
- .3 Install continuous insulating strip or beads of caulking two rows, under sill tracks and above head tracks at connection to concrete structure for all acoustic rated wall assemblies.
- .4 Install continuous insulating strip or beads of caulking, two rows at all vertical studs abutting concrete structure for all acoustic rated wall assemblies.
- .5 Anchor tracks securely to structure at 800 mm on centre maximum, unless lesser spacing prescribed on shop drawings.
- .6 Erect studs plumb, aligned and securely attached with two screws minimum, or welded in accordance with manufacturer's recommendations.
- .7 Seat studs into bottom tracks and single piece top track.
- .8 Install deflection clips at top track as per shop drawings to allow deflection of structure. Clip to be full width of stud framing.
- .9 Install studs at not more than 50.0 mm from abutting walls, openings, and each side of corners and terminations with dissimilar materials.
- .10 Brace steel studs with horizontal internal bridging at 200 mm maximum.
  - .1 Fasten bridging to steel clips fastened to steel studs with screws or by welding.
- .11 Frame openings in stud walls to adequately carry loads by use of additional framing members and bracing as detailed on shop drawings. Review with window supplier and co-ordinate with window shop drawings locations of window anchors and provide solid blocking as detailed for window anchor attachment to wall framing.
- .12 Touch up welds with coat of zinc rich primer.
- .13 Refer to structural drawings for erection requirements for steel stud shear walls and installation of metal decking specified in Section 05 31 00.

3.3 ERECTION  
TOLERANCES

- .1 Plumb: not to exceed 1/500th of member length.
- .2 Camber: not to exceed 1/1000th of member length.
- .3 Spacing: not more than +/- 3.0 mm from design spacing.
- .4 Gap between end of stud and track web: not more than 4.0 mm.

3.4 CUTOUTS

- .1 Maximum size of cutouts for services as follows:

Member Depth	Across Member Depth	Along Member Length (mm)	Centre to Centre Spacing
92	40 max.	105 max.	600 min.
102	40 max.	105 max.	600 min.
152	65 max.	115 max.	600 min.

- .2 Limit distance from centerline of last unreinforced cutout to end of member to less than 300 mm.

3.5 ELECTRICAL BOXES &  
RECESSED ELEMENTS

- .1 Provide additional stud framing from floor to top of outlet/element. Provide cross members from the additional stud to bearing stud to provide solid backing for installation of electrical box or other recessed element.

3.6 FIELD QUALITY  
CONTROL

- .1 Manufacturer's Field Services:
  - .1 Obtain written report from Contractor's Engineer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
  - .2 Provide Contractor's Engineer field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
  - .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

**END OF SECTION**



## **PART 1 - GENERAL**

- 1.1 RELATED SECTIONS**
- .1 Section 03 30 00 – Cast-in-Place Concrete
  - .2 Section 04 05 00 - Common Work Results for Masonry.
  - .3 Section 04 05 19 - Masonry Anchorage and Reinforcing.
  - .4 Section 05 12 00 - Structural Steel.
  - .5 Section 05 31 00 - Steel Deck.
  - .6 Section 09 91 13 - Exterior Painting
  - .7 Section 09 91 23 - Interior Painting.
- 1.2 REFERENCES**
- .1 American Society for Testing and Materials International, (ASTM)
    - .1 ASTM A 53/A 53M-07, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
    - .2 ASTM A 307-07b, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .2 Canadian General Standards Board (CGSB)
    - .1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.
    - .2 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating.
  - .3 Canadian Standards Association (CSA International)
    - .1 CAN/CSA-G40.20/G40.21-04-(R2009), General Requirements for Rolled or Welded Structural Quality Steel.
    - .2 CAN/CSA-G164-M92(R12003), Hot Dip Galvanizing of Irregularly Shaped Articles.
    - .3 CAN/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)989(R2001),Welded Steel Construction (Metal Arc Welding) (Imperial Version).
  - .4 The Environmental Choice Program
    - .1 CCD-047-98 (R2005) Architectural Surface Coatings.
    - .2 CCD-048-98 (R2006), Surface Coatings - Recycled Water-borne.
- 1.3 SUBMITTALS**
- .1 Product Data:
    - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
    - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
      - .1 For finishes, coatings, primers and paints.

- .2 Shop Drawings
    - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
    - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
    - .3 Each shop drawing submitted shall bear the stamp and signature of a qualified Professional Engineer registered in the Province of Ontario.
  - .3 Submit Contractor's Engineer certificate/ written report, within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL. Certificate/report shall be stamped and signed by qualified professional engineer registered in the province of Ontario.
- 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.
  - .4 Site Meetings: as part of Contractor's Services as described in PART 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed:
    - .1 After delivery and storage of products, and when preparatory Work is complete but before installation begins.
    - .2 Twice during progress of Work at 25% and 60% complete.
    - .3 Upon completion of Work, after cleaning is carried out.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- .1 Packing, Shipping, Handling and Unloading:
    - .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Storage and Protection:
    - .1 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.
    - .2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

1.6 WASTE MANAGEMENT  
AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

**PART 2 - PRODUCTS**

2.1 MATERIALS

- .1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 300W.
- .2 Steel pipe: to ASTM A 53/A 53M standard weight , galvanized finish.
- .3 Welding materials: to CSA W59.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Bolts and anchor bolts: to ASTM A 307.
- .6 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

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 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m<sup>2</sup> to CAN/CSA-G164.
- .2 Shop coat primer: to CAN/CGSB-1.40.

.3 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

2.4 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.

2.5 SHOP PAINTING

- .1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.
- .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.

2.6 ANGLE LINTELS

- .1 Steel angles: galvanized, sizes indicated for openings. Provide 150 mm minimum bearing at ends.
- .2 Weld or bolt back-to-back angles to profiles as indicated.
- .3 Finish: galvanized.
- .4 Refer to structural drawings for size and details of angle lintels, hangers and corner lintels and suspended lintels.

**PART 3 - EXECUTION**

3.1 ERECTION

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metal work 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 Provide components for building by other sections in accordance with shop drawings and schedule.

- .6 Make field connections with bolts to CAN/CSA-S16.1, or weld.
- .7 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.
- .8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.
- .9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

### 3.2 INSTALLATION

- .1 Install all items listed under Part 2 of this Section and as indicated on drawings as per the reviewed shop drawings.

### 3.3 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
  - .1 Obtain written report from Contractor's Engineer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
  - .2 Provide Contractor's Engineer field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
  - .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

### 3.4 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 05 41 00 – Structural Metal Stud Framing
- .2 Section 06 40 00 – Architectural Woodwork
- .3 Section 06 61 16 – Solid Surfacing Fabrications
- .4 Section 07 52 00 – Modified Bituminous Roof
- .5 Section 08 11 00 – Metal Frames
- .6 Section 08 71 00 – Door Hardware
- .7 Section 09 21 16 – Gypsum Board Assemblies
- .8 Section 09 22 16 – Non-Structural Metal Framing
- .9 Section 10 28 10 – Toilet and Bath Accessories

### **1.2 REFERENCES**

- .1 American National Standards Institute (ANSI)
  - .1 ANSI/NPA A208.1-2009, Particleboard.
- .2 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A 653/A 653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
  - .2 ASTM D 1761-06, Standard Test Methods for Mechanical Fasteners in Wood.
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-11.3-M87, Hardboard.
- .4 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-A247-M86 (R1996), Insulating Fiberboard
  - .2 CSA B111-1974(R2003), Wire Nails, Spikes and Staples
  - .3 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles
  - .4 CSA O112 Series-M1977(R2006), CSA Standards for Wood Adhesives
  - .5 CSA O121-08, Douglas Fir Plywood
  - .6 CSA O141-05 (R2009), Softwood Lumber
  - .7 CSA O151-09, Canadian Softwood Plywood
  - .8 CSA O153-M1980(R2008), Poplar Plywood
  - .9 CSA O437 Series-93(R2011), Standards on OSB and Waferboard
- .5 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber 2010.
- .5 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
  - .1 SCAQMD Rule 1113-A2011, Architectural Coatings.
  - .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

- 1.3 SUBMITTALS .1 Submit Submittal submissions: in accordance with Section 01 33 00 – Submittal Procedures.
- 1.4 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 in accordance with CSA and ANSI standards.
- 1.5 DELIVERY, STORAGE, AND HANDLING .1 Waste Management and Disposal:
- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction Waste Management and Disposal

## **PART 2 - PRODUCTS**

### **2.1 FRAMING AND STRUCTURAL MATERIALS**

- .1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% (S-dry) or less in accordance with the following standards:
- .1 CSA 0141,  
.2 NLGA Standard Grading Rules for Canadian Lumber.
- .2 Glued end-jointed (finger-jointed), are not acceptable for use on this project without written approval from the consultant.
- .3 Composite wood products and laminate adhesive to contain no added ureaformadelhyde.
- .4 Furring, blocking, nailing strips, grounds, rough bucks cants, curbs, fascia backing and sleepers:
- .1 S2S is acceptable.  
.2 Board size: "Standard" or better grade.  
.3 Dimension sizes: "Standard" light framing or better grade.  
.4 Post and timbers sizes: "Standard" or better grade.

### **2.2 PANEL MATERIALS**

- .1 Composite wood products and laminate adhesive to contain no added ureaformadelhyde.
- .2 Plywood, OSB and wood based composite panels: to CAN/CSA-O325.0.
- .3 Douglas fir plywood (DFP): to CSA O121, standard construction
- .4 Canadian softwood plywood (CSP): to CSA O151, standard construction.

	.5	Poplar plywood (PP): to CSA O153, standard construction.
	.6	Interior mat-formed wood particleboard: to ANSI 208.1.
	.7	Mat-formed structural panelboards (OSB wafer): to CAN3-O437.0.
<u>2.3 ACCESSORIES</u>	.1	Nails, spikes and staples: to CSA B111.
	.2	Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.
	.3	Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.
	.4	Sealants: in accordance with Section 07 92 00 – Joint Sealants .1 Maximum allowable VOC limit 250 g/L. All sealants shall comply with SCAQMD 1168 requirements.
	.5	General Purpose Adhesive: to CSA 0112 Series. Maximum allowable VOC limit 70 g/L. All adhesives shall comply with SCAQMD 1168 requirements. All aerosol adhesives to comply with Green Seal Standard for commercial adhesives.
<u>2.4 FASTENER FINISHES</u>	.1	Galvanizing: to CAN/CSA-G164 ASTM A 653, use galvanized fasteners for exterior work pressure-preservative treated lumber.
	.2	Stainless steel: use stainless steel where indicated.
<u>2.5 WOOD PRESERVATIVE</u>	.1	SCAQMD Rule #1113 - Architectural Coatings.
	.2	Maximum allowable VOC limit 350 g/L.
<u>2.6 FIRE RETARDANT TREATMENT</u>	.1	Pressure impregnation fire retardant material (FRT): Wood and plywood where specified or indicated and where required by authorities having jurisdiction.
	.2	Vacuum pressure impregnate wood with fire retardant treatment in accordance with CAN/CSA-080, C20 for lumber and C27 for plywood. Acceptable products: "Dricon" fire retardant chemicals for wood which is concealed in final work.
	.3	Provide flame spread rating of 25 or less. Provide ULC or WHI label for treated lumber and plywood as received from the



pressure treatment plant. Including identification colour dye in the fire retardant chemicals for wood which is concealed in the final work.

- .4 Pressure treat materials before final milling and kiln dry after treatment to the specified moisture content.
- .5 Do not expose pressure treated materials to dampness between times of treatment and time that finish is applied. Remove surface salt deposits before finishing.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- .1 Store wood products.

#### **3.2 INSTALLATION**

- .1 Comply with requirements of OBC 2006, Part 3
- .2 Install wood/plywood backing sheets to provide solid backing for grab bars, washroom accessories, cabinets and exterior exhaust vents.
- .3 Install members true to line, levels and elevations, square and plumb.
- .4 Install spanning members with "crown-edge" up.
- .5 Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.
- .6 Install furring to support elements applied vertically where there is not blocking and where sheathing is not suitable for direct nailing.
  - .1 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .7 Install rough bucks, nailers, and linings to rough openings as required to provide backing for frames and other work. Refer to drawing details for requirements.
- .8 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.

#### **3.3 ERECTION**

- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

- .2 Countersink bolts where necessary to provide clearance for other work.
- .3 Use nailing disks for sheathing as recommended by sheathing manufacturer.

### 3.4 SCHEDULES

- .1 Provide wood blocking and backing to areas to receive wall mounted grab bars, wall mounted appliances and fixtures, washroom accessories, recessed cabinets, surface mounted cabinets, hardware wall stops, and as indicated on drawings.
- .2 Electrical equipment mounting boards:
  - .1 Plywood, DFP or CSP grade, square edge 19mm thick, fire treated pressure impregnated fire retardant material for all electrical and security equipment mounting boards.
- .3 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, and sleepers at rooftop equipment and services:
  - .1 S2S is acceptable.
  - .2 Board sizes: "Standard" or better grade.
  - .3 Dimension sizes: "Standard" light framing or better grade.
  - .4 Post and timbers sizes: "Standard" or better grade.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 SECTION INCLUDES**

- .1 The work of this section includes the provision of all labour, material, equipment and services required to fabricate and install all shop fabricated finished cabinetwork and millwork items, as indicated on the drawings and specified herein and as required for a complete project.
- .2 The work includes, but is not necessarily limited to the following:
  - .1 Laminated plastic faced cabinetwork and millwork.
  - .2 Hardwood veneer faced cabinetwork and millwork.
  - .3 Solid surface countertops.
  - .4 Plastic Laminates as specified in Section 06 47 00

### **1.2 RELATED REQUIREMENTS**

- .1 Section 05 41 00 – Structural Metal Stud Framing
- .2 Section 06 10 00 – Rough Carpentry
- .3 Section 06 61 16 – Solid Surfacing Fabrications
- .4 Section 09 00 00 – Room Finish Schedule
- .5 Section 09 91 23 – Interior Painting

### **1.3 REFERENCES**

- .1 American National Standards Institute (ANSI)
  - .1 ANSI A208.1-09, Particleboard.
  - .2 ANSI A208.2-09, Medium Density Fiberboard (MDF) for Interior Applications.
  - .3 ANSI/HPVA HP-1-10, Standard for Hardwood and Decorative Plywood.
  - .4 ANSI Z124-6-5.2 1997 Stain Resistance
- .2 ASTM International
  - .1 ASTM E 1333-10, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.
  - .2 ASTM D 2832-92(R2011), Standard Guide for Determining Volatile and Nonvolatile Content of Paint And Related Coatings.
  - .3 ASTM D 5116-10, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
- .3 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
  - .1 Architectural Woodwork Quality Standards Illustrated, 8<sup>th</sup> edition, Version 1.0 (2009).
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-11.3-M87, Hardboard
  - .2 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.

- .5 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 O121-08, Douglas Fir Plywood.
    - .4 CSA O141-05(R2009), Softwood Lumber.
    - .5 CSA O151-09, Canadian Softwood Plywood.
    - .6 CSA O153-M1980(R2008), Poplar Plywood.
  - .6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
    - .1 Material Safety Data Sheets (MSDS).
  - .7 National Electrical Manufacturers Association (NEMA)
    - .1 ANSI/NEMA LD-3-[05], High-Pressure Decorative Laminates (HPDL).
  - .8 National Hardwood Lumber Association (NHLA)
    - .1 Rules for the Measurement and Inspection of Hardwood and Cypress [2011].
  - .9 National Lumber Grades Authority (NLGA)
    - .1 Standard Grading Rules for Canadian Lumber [2010].
  - .10 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
    - .1 SCAQMD Rule 1113-[A2011], Architectural Coatings.
    - .2 SCAQMD Rule 1168-[A2005], Adhesives and Sealants Applications.
- 1.4 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 architectural woodwork and include product characteristics, performance criteria, physical size, finish and limitations.
    - .2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
  - .3 Shop Drawings:
    - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
    - .2 Indicate details of construction, profiles, jointing, Fastening and other related details.
      - .1 Scales: profiles full size, details half full size.

1.5 QUALITY  
ASSURANCE

- .3 Indicate materials, thicknesses, finishes and hardware.
- .4 Indicate locations of service outlets in casework, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.
- .5 Indicate steel structure and space for electrical conduit and devices.
  
- .4 Samples:
  - .1 Submit for review and acceptance one complete typical cabinet unit cw drawers and doors.
  - .2 Samples will be returned for inclusion into work.
  - .3 Submit duplicate samples of solid surfacing and Laminated plastic for colour selection.
  - .4 Submit duplicate samples of solid surfacing and Laminated plastic joints, edging, cutouts and postformed profiles.
  - .5 Submit duplicate samples of solid wood and wood Veneer stained for colour selection.
  
- .5 Certifications: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  
- .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.
  
- .3 Mock-ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 – Quality Control.
    - .1 Shop prepare one base cabinet unit c/w counter top, complete with hardware and shop applied finishes, and install where directed by Consultant.
    - .2 Allow 24 hours for inspection of mock-up by Consultant before proceeding with Work.
    - .3 When accepted, mock-up will demonstrate minimum standard for Work.
    - .4 Do not proceed with work prior to receipt of written acceptance of mock-up by Consultant.
    - .5 Mock-up may remain as part of finished work.

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.
  - .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 with manufacturer's recommendations 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.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.7 WARRANTY

- .1 Warrant the work of this Section in accordance with GC12.3 but for the time periods specified following.
- .2 Contractor's Warranty: Warrant that the work of this section will not warp or delaminate for a period of two (2) years from the date of Substantial Completion of the contract. Make all necessary repairs and replacements at no cost to the owner.
- .3 Provide solid surfacing material manufacturer's 10 year limited warranty for replacement of defective material. Provide Contractor's warranty for material and labour for a period of five (5) years from the date of Substantial Completion of the Contract. Warrant that solid surfaces will not crack, delaminate, or discolour.

**PART 2 - PRODUCTS**

2.1 MATERIALS

- .1 Softwood Lumber: To CAN/CSA 0141 and National Lumber Grades Authority requirements, with maximum moisture content on 7% for interior work, 12% for exterior work, yard lumber

- selected for paint finish, pine species, to AWMAC custom grade, "C" select or better (Paragraph 112C). Finger-jointed material unacceptable.
- .2 Machine stress-rated lumber is acceptable for all purposes.
  - .3 Hardwood: To National Hardwood Lumber Association (NHLA) requirements, moisture content of maximum 7% for interior.
    - .1 Maple: To AWMAC custom grade.
  - .4 Hardwood plywood: To CSA 0115-1982 Maple, rotary cut, Type II bond, formaldehyde free. Good two sides where exposed to view both sides. 19mm unless otherwise called for. Plywood resin to contain no added urea-formaldehyde.
  - .5 Douglas Fir or Poplar Plywood: To CSA 0121, good two sides, select sheathing, formaldehyde free, 19mm thick unless otherwise called for. Plywood resin to contain no added urea-formaldehyde.
  - .6 Laminated Plastic for Flatwork: To CAN3-A172-M79 Grade GP Type HD 1.5mm thick; suede finish colours; pattern as indicated. Backing sheet; min. 0.5mm thick, sanded surface, of same manufacturer as facing sheets.
  - .7 Laminated Plastic for Post Formed Work: To CAN3-A172-M79. Grade PF, Type S, 1.25mm thick, otherwise as for flatwork.
  - .8 Laminated Plastic Adhesive: As recommended by plastic laminate manufacturer, water based.
  - .9 Hardboard: To CAN/CGSB – 11.3-M87, tempered, 6mm, perforated.
  - .10 Core Hardwood Plywood: Provide PureBond® process domestic veneer core hardwood plywood as manufactured by Columbia Forest Products (<http://www.columbiaforestproducts.com/Products.aspx/VeneerCore>).
  - .11 Particleboard Core Hardwood Plywood: Provide phenolic particleboard core hardwood plywood assembled with PureBond® formaldehyde-free technology by Columbia Forest Products (<http://www.columbiaforestproducts.com/Products.aspx/VeneerCore>) or Vesta by Flakeboard, [www.flakeboard.com](http://www.flakeboard.com)
  - .12 Medium Density Fiberboard (MDF) Core Hardwood Plywood: Provide phenolic or MDI bonded MDF-core hardwood plywood assembled with PureBond® formaldehyde-free technology by

Columbia Forest Products

(<http://www.columbiaforestproducts.com/Products.aspx/VeneerCore>) or Superior MDF by Flakeboard, [www.flakeboard.com](http://www.flakeboard.com)

- .13 Multi-Layered Core Hardwood Plywood: Provide specialty all hardwood European style (Europly PLUS™) high-ply-count birch veneer core blank with a phenolic-bonded platform to assure a no-added urea-formaldehyde panel, with face and back veneers laminated with PureBond® formaldehyde-free technology, as manufactured by Columbia Forest Products (<http://www.columbiaforestproducts.com/Products.aspx/VeneerCore>).
- .14 Combi-Core Hardwood Plywood: Provide panels constructed of veneer core inner plies with phenolic-bonded MDF crossbands; panel shall offer similar strength and stability to veneer core but shall have the void-free surface quality of PBC or MDF; panel shall provide excellent substrate for thin-sliced woods and rotary woods with face and back veneers laminated with PureBond® formaldehyde-free technology; Classic Core™ as manufactured by Columbia Forest Products (<http://www.columbiaforestproducts.com/Products.aspx/VeneerCore>).
- .15 Thermofused Melamine: to NEMA LD3 Grade VGL.
  - .1 High wear resistant thermofused melamine: equal or exceed 400 cycles (Minimum standard for HPL abrasion test).
- .16 Nails and staples: to CSA B111.
- .17 Wood screws: stainless steel and steel, type and size to suit application.
- .18 Splines: wood or metal.
- .19 Sealant: in accordance with Section 07 92 00 - Joint Sealants.
  - .1 Sealants: VOC limit 250 g/L maximum to SCAQMD Rule 1168.

## 2.2 MANUFACTURED UNITS

- .1 Casework.
  - .1 Fabricate caseworks to AWMAC custom quality grade.
  - .2 Furring, blocking, nailing strips, grounds, and rough bucks and sleepers.
    - .1 S2S is acceptable.
    - .2 Board sizes: Standard or better grade.
    - .3 Dimension sizes: Standard light framing or better grade.
  - .3 Framing maple species, NHLA select grade.



- .4 Case Bodies: (ends, gables, divisions and bottoms).
  - .1 Hardwood plywood:
    - .1 Thickness: 19 mm.
    - .2 Number of plies: 7.
    - .3 Face veneer: as per Finish Schedule.
    - .4 Back veneer to match face veneer where it is exposed. Back veneer to be white plastic laminate where finish would be exposed. Bottom of cabinet to be white plastic laminate where there is a sink.
    - .5 Core: veneer.
    - .6 Bond: Type II.
    - .7 Sanding: touch sanding.
    - .8 Grain direction longitudinal.
  - .2 Solid wood edges: maple species, select grade, 19 mm thick x 10mm.
- .5 Backs:
  - .1 Hardwood plywood:
    - .1 Thickness: 6 mm.
    - .2 Number of plies: 4.
    - .3 Face veneer: Plastic Laminate.
    - .4 Back veneer: to match face veneer where exposed.
    - .5 Core: veneer.
    - .6 Bond: Type II.
    - .7 Sanding: touch sanding.
    - .8 Grain direction vertical.
    - .9 Hanging Strips - Provide cabinet backs with suitable hanging strips.
  - .6 Doors:
    - .1 Fabricate doors to AWMAC premium grade supplemented as follows:
    - .2 MDF core with finish veneer of maple veneer as noted in the Finish Schedule:
      - .1 Thickness: 19mm.
      - .2 Face veneer: maple veneer as per Finish Schedule.
      - .3 Back veneer: maple veneer to match outside of cabinet.
      - .4 Bond: Type II.
      - .5 Sanding: touch sanding.
      - .6 Grain direction vertical.
  - .7 Shelves:
    - .1 Hardwood plywood:
      - .1 Thickness: 19 mm.

- .2 Number of plies: 7.
  - .3 Face veneer: maple species, select grade, rotary cut, bookmatch in locations where cabinets shelving is open and where cabinets are noted as maple veneer finish on finish schedule. Plastic laminate finish for insides of cabinets and for open shelving where cabinets are noted as plastic laminate finish on finish schedule.
  - .4 Back veneer: maple species, select grade, rotary cut, matching requirement.
  - .5 Core: veneer.
  - .6 Bond: Type II.
  - .7 Sanding: touch sanding.
  - .8 Grain direction longitudinal.
- .2 Edge banding:
- .1 provide 10 mm thick solid matching wood strip on plywood edges 12 mm or thicker, exposed in final assembly for fixed shelves and front and rear on adjustable shelves. Strips same width as plywood.
  - .2 Provide self edge plastic laminate on front face of fixed shelves and on all four edges on adjustable shelves with plastic laminate finishes.
  - .3 In locations where adjustable shelves are greater than 750mm wide, construct shelving in "z" shape with 50mm vertical at rear and front face to minimize deflection. Finish all faces and edges.
- .8 Countertops.
- .1 Marine Okoume plywood (Contact: Robert Bury Ltd. 613-747-2879):
    - .1 Thickness: 19 mm.
  - .2 All exposed surface underneath countertop must be sealed
  - .3 All exposed surfaces and edges: plastic laminate where noted as plastic laminate on Room Finish Schedule Legend.
  - .4 Phenolic based glue

2.3 SOLID SURFACING  
MATERIALS

- 1 For use in handsink unit countertop and all window sills.

- .1 Solid surfacing materials:
  - .1 13mm thick, Cast, non-porous, filled polymer, not coated, laminated of composite construction with through body colours meeting ANSI Z124.3 or ANSI Z124.6. Superficial damage to a depth of .25mm shall be repairable by sanding and/or polishing.
  - .2 Eased edge treatments.
  - .3 Colour: See Acceptable Products.
- .3 Adhesives: for seams and drop edges, standard one or two part adhesive kit to create inconspicuous non-porous joints as recommended by Manufacturer.
- .4 Panel Adhesive: Manufacturer's standard neoprene-based panel adhesive complying with ANSI A136.1-1967, UL Listed.
- .5 Sealant: Manufacturer's standard mildew-resistant UL-listed silicone sealant in colours matching components..
- .6 Acceptable products:.
  - .1 Formica Solid Surface 'Bianco Minera' #758
  - .2 Corian 'Arrowroot'
  - .4 Corian 'Silver Birch'

## 2.3 ACCESSORIES

- .1 Nails and staples: to CSA B111; galvanized to ASTM A 123/A 123M for exterior work, interior humid areas and for treated lumber; plain finish elsewhere.
- .2 Wood screws: electroplated steel, type and size to suit application.
- .3 Splines: wood.
- .4 Adhesive and Sealants: in accordance with Section 07 92 00 - Joint Sealants.
  - .1 Provide adhesives, sealants, and sealant primers with VOC quantities lower than stated in SCAQMD Rule #1168, current edition.
  - .2 Provide primers, paints, sealers, coatings and wood finishes with VOC quantities lower than limits stated in Green Seal's Standards GS-3 and GS-11 and SCAQMD Rule #1113, current editions.

## 2.4 CABINET HARDWARE

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

- .2 Supply all necessary screws, bolts, expansion shields, and other fastening devices required for satisfactory installation and operation of hardware.
- .3 Exposed fastenings devices to match finish of hardware.
- .4 Use fasteners compatible with material through which they pass.
- .5 Hinges: Concealed self-closing type B01601 finish to 626.
- .6 Pulls: Back mounted for drawers and upper cabinets and lower cabinets.
  - .1 Richelieu brushed nickel catalogue No. 39965 – 128mm c.c.
- .7 Pulls: Back mounted for full height doors at pantries, etc.
  - .1 Richelieu brushed nickel catalogue No. 3986\* - 192mm c.c.
- .8 Elbow latch: Type B03023 similar to type 2 in zinc 604.
- .9 Roller catches type B03091 finish to 626.
- .10 Shelf rests at adjustable shelving unless noted, Richelieu CP2289180. Shelf rest installed in predrilled holes at 30mm spacing.
- .11 Door bumpers: Richelieu #MP30311 9.5mm dia. Stick on bumpers.

## 2.5 FINISHING

- .1 Factory finish all cabinetwork prior to delivery to site.
- .2 Appearance of finish of stained finish to be visibly free of flow lines, streaks, sags, blisters and other surface imperfections.
- .3 Provide temporary protection to factory finished cabinetwork during shipment. Ensure that method of protection does not damage finish.
- .4 Touch up marked or abraded finish to Consultants approval. Units which are damaged beyond acceptance standard shall be replaced at no extra cost to the owner.

## 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. . Proceed with installation only after unacceptable conditions have been remedied.

### 3.2 INSTALLATION

- .1 Do architectural woodwork to Quality Standards of AWMAC.
- .2 Install prefinished millwork at locations shown on drawings.
  - .1 Position accurately, level, plumb straight.
- .3 Fasten and anchor millwork securely.
  - .1 Supply and install heavy duty fixture attachments for wall mounted cabinets.
- .4 Use draw bolts in countertop joints.
- .5 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.
- .6 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.
- .7 Fit hardware accurately and securely in accordance with manufacturer's written instructions.

### 3.2 CONSTRUCTION

- .1 Fastening:
  - .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
  - .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
  - .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.
  - .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.
- .2 Hardware:
  - .1 Install hardware at locations indicated including but not limited to:
    - .1 Millwork and cabinet hardware.
    - .2 Furnish manufacturer's instructions for proper installation of each hardware component.
    - .3 It is the responsibility of the millwork contractor to determine quantities from the contract documents.

### 3.4 CLEANING

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

11-Cleaning.

- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11-Cleaning
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/ Demolition Waste Management and Disposal.

3.5 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 RELATED REQUIREMENTS**

- .1 Section 01 33 00 Submittal Procedures
- .2 Section 01 45 00 Quality Control
- .3 Section 01 74 21 Construction / Demolition Waste Management and Disposal
- .4 Section 01 61 00 Common Product Requirements
- .5 Section 06 10 00 Rough Carpentry
- .6 Section 06 40 00 Architectural Woodwork
- .7 Section 07 92 00 Joint Sealing

### **1.2 REFERENCES**

- .1 American National Standards Institute (ANSI)
  - .1 ANSI A208.2-02, Medium Density Fibreboard (MDF) for Interior Applications.
- .2 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM D 2832-92(R1999), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
  - .2 ASTM D 5116-97, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
- .4 Canadian Standards Association (CSA International)
  - .1 CSA O112-M1977(R2001), Standards for Wood Adhesives.
  - .2 CSA O112.5-1.1-Series-M-1977(R2001), Urea Resin Adhesives for Wood (Room- and High-Temperature Curing).
  - .3 CSA O112.7-1.1-Series M-1977(R2001), Resorcinol and Phenol-Resorcinol Resin Adhesives for Wood (Room- and Intermediate-Temperature Curing).
  - .4 CSA O121-M1978(R1998), Douglas Fir Plywood.
  - .5 CAN/CSA O141-91(R1999), Softwood Lumber.
  - .6 CSA O151-M1978(R1998), Canadian Softwood Plywood.
  - .7 CSA O153-M1980(R1998), Poplar Plywood.
- .5 Environmental Choice Program (EPC)

- .1 CCD-044-95, Adhesives.
- .2 CCD-045-95, Sealants and Caulking Compounds.
- .3 CCD-048-95, Surface Coatings Recycled Water-borne.
- .4 CCD-047a-98, Paints - Surface Coatings.
- .5 CCD-048b-98, Stains - Surface Coatings.
- .6 CCD-048c-98, Varnishes - Surface Coatings.

- .6 National Electrical Manufacturers Association (NEMA)
  - .1 NEMA LD3-2000, High Pressure Decorative Laminates

### 1.3 SUBMITTALS

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheets in accordance with Section 01 33 00 – Submittal Procedures.
  - .2 Submit two copies of WHMIS MSDS – Material Safety Data Sheets in accordance with Section 01 33 00 – Submittal Procedures, Indicate VOC limits for adhesives, solvents and cleaners.
- .2 Samples:
  - .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
  - .2 Submit duplicate samples of joints, edging, cutouts and postformed profiles.
- .3 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.

### 1.4 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data for laminate work for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.

### 1.5 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.

### 1.6 STORAGE AND PROTECTION

- .1 Deliver, handle, store and protect material of this Section in accordance with Section 01 61 00 – Common Product Requirements.
- .2 Maintain relative humidity between 25% and 60% at 22°C during storage and installation.

### 1.7 WASTE MANAGEMENT

- .1 Divert wood cut-offs from landfill by disposal into on-site wood



AND DISPOSAL

recycling bin

- .2 Divert reusable materials for reuse at nearest used building materials facility or similar type facility.
- .3 Divert unused caulking, sealants, surface coatings and adhesive materials from landfill through disposal at a special wastes depot

1.8 WARRANTY

- 1 Warrant the work of this Section in accordance with GC12.3 but for the time periods specified following.
- .2 Contractor's Warranty: Warrant that the work of this section will not warp or delaminate for a period of two (2) years from the date of Substantial Completion of the contract. Make all necessary repairs and replacements at no cost to the owner.

**PART 2 - PRODUCTS**

2.1 MATERIALS

- .1 Laminated plastic for flatwork: to NEMA LD 3.
  - .1 Type: General purpose.
  - .2 Grade: HGS.
  - .3 Size: 1.27 mm thick.
  - .4 Colour: multilayered, allow for 5 separate colours/patterns.
  - .5 Pattern: solid or printed pattern.
  - .6 Finish: furniture.
- .2 Laminated plastic for postforming work: to NEMA LD 3.
  - .1 Type: Postforming.
  - .2 Grade: HGP.
  - .3 Size: 1.016 mm thick.
  - .4 Colour: multilayered, allow for 5 separate colours/patterns.
  - .5 Pattern: solid or printed pattern.
  - .6 Finish: furniture.
- .3 Laminated plastic for backing sheet: to NEMA LD 3.
  - .1 Type: Backer.
  - .2 Grade: BKH.
  - .3 Size: not less than 0.5 mm thick or same thickness as face laminate.
  - .4 Colour: same colour as face laminate.
- .4 Plywood core: Douglas Fir Plywood to CSA O151 Softwood Plywoods solid two sides, only where indicated.
  - .1 Douglas Fir plywood for countertops with sinks and at window sills.

- .5 Core: meeting CAN3.0.188.1-M78 Grade R DH, sanded faces, of thickness indicated.
  - .1 Particleboard Type DH for countertops without sinks.
- .6 Laminated plastic adhesive: urea resin adhesive to CSA O112.5, contact adhesive to CAN/CGSB-71.20, resorcinol resin adhesive to CSA O112.7 or polyvinyl adhesive to CSA O112.4
- .7 Sealer: water resistant sealer or glue acceptable to laminate manufacturer.
- .8 Sealants: Section 07900/ Sealants.
- .9 Draw bolts and splines: as recommended by fabricator.
- .10 Solid Surfaces:
  - .1 Formica solid Surfacing or Quartz Ceasarstone as noted in Section 09 00 00 Interior Finish/Material Colour Schedule and as per drawings. All substitutions must be approved by Architect prior to tender close.

## 2.2 FABRICATION

- .1 Comply with NEMA LD 3, 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 2400 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 plastic laminate to cover underside of countertop edge to match countertop.

### **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 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 oc, 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.
- .6 Site apply laminated plastic to units as indicated. Adhere laminated plastic over entire surface. Make corners with hairline joints. Use full sized laminate sheets. Make joints only where approved.
- .7 For site application, offset joints in plastic laminate facing from joints in core.

#### **3.3 PROTECTION**

- .1 Cover finished laminated plastic veneered 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.

#### **3.4 CLEANING**

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Perform care and cleaning with NEMA LD 3, Annex B.
- .3 Remove traces of primer, caulking, epoxy and filler materials; clean doors and frames.

**END OF SECTION**

## **PART 1 - GENERAL**

<b><u>1.1 SECTION INCLUDES</u></b>	.1	Materials and requirements for wall board insulation. .1 Semi-rigid insulation for use in exterior steel stud wall assemblies and parapet framing.
<b><u>1.2 RELATED SECTIONS</u></b>	.1	Section 05 41 00 – Structural Metal Stud Framing
	.2	Section 07 27 00 – Air Barriers
	.3	Section 07 52 00 – Modified Bituminous Membrane Roofing
	.4	Section 07 62 00 – Sheet metal Flashing and Trim
<b><u>1.3 REFERENCES</u></b>	.1	American Society for Testing and Materials International (ASTM) .1 ASTM E 96/E 96M-05, Standard Test Methods for Water Vapour Transmission of Materials. .2 ASTM C 612-04 Standard Specification for Mineral Fibre Block and Board Thermal Insulation
	.2	Canadian General Standards Board (CGSB) .1 CGSB 71-GP-24M-77(R1983), Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.
	.3	Underwriters Laboratories of Canada (ULC) .1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings. .2 CAN/ULC-S702-97, Standard for Thermal Insulation, Mineral Fibre for Buildings.
	.4	Health Canada/Workplace Hazardous Materials Information System (WHMIS) .1 Material Safety Data Sheets (MSDS).
<b><u>1.4 SUBMITTALS</u></b>	.1	Product Data: .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures. .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00.
	.2	Manufacturer's Instructions: .1 Submit manufacturer's installation instructions.
	.3	.1 Indicate VOC's for adhesives .2 VOC limits for adhesives must comply with SCAQMD 1168 and Green Seal Standard for Commercial adhesives. .3 Submit information on recycled content of materials .4 Submit information on locations of manufacture and

extraction.

1.5 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 Convene pre-installation meeting one week prior to beginning on-site installations.
  - .1 Verify project requirements.
  - .2 Review installation and substrate conditions.
  - .3 Co-ordinate with other building subtrades.
  - .4 Review manufacturer's installation instructions and warranty requirements.

1.6 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

**PART 2 - PRODUCTS**

2.1 INSULATION

- .1 Cavity Wall Insulation:
  - .1 Mineral fibreboard thermal insulation to CAN/ULC-S702, ASTM C612
  - .2 Type: 2.
  - .3 Density 70kg.m<sup>3</sup>.
  - .4 Thickness: 89mm or as noted
  - .5 Size: 610 x 1219mm.
  - .6 Edges: square.
  - .7 Thermal Resistance: 4.2 R Value/inch
  - .8 Acceptable Product: Roxul CavityRock DD
- .2 Extruded polystyrene (XPS), Expanded Polystyrene (EPS): To CAN/ULC-S701 wall and foundation insulation.
  - .1 Type 2 and Type 4.
  - .2 Compressive strength: 70-210kPa.
  - .3 Thickness: 50mm or as indicated.
  - .4 Size: 610 x 2438mm.

.5 Edges: shiplapped.

.3 Roof Insulation:

.1 Refer to Section 07 52 00 for roofing and waterproofing assemblies and insulation requirements.

### 2.3 ADHESIVES

.1 Adhesive (for polystyrene): to CGSB 71-GP-24

.1 Type 1.

.2 VOC emission: per Section 01 35 21.

### 2.4 ACCESSORIES

.1 Insulation clips: impale type, preformed 50 x 50 mm Cold Rolled Carbon Steel 0.8mm thick, adhesive back, spindle of 2.5 mm dia. annealed steel, length to suit insulation, 25mm dia. washers of self locking type.

.2 Refer to Section 07 21 19 Foamed-In-Place Insulation for infilling spaces between butt joints of rigid insulation boards.

## **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 EXAMINATION

.1 Examine substrates and immediately inform Consultant in writing of defects.

.2 Prior to commencement of work ensure:

.1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

### 3.3 WORKMANSHIP

.1 Install insulation after building substrate materials are dry and after installation of air vapour barrier.

.2 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.3 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN4-S604 type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 type B and L vents.

.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 Do not enclose insulation until it has been inspected and approved by Consultant.

3.4 CLEANING

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

**END OF SECTION**

## **PART 1 - GENERAL**

- 1.1 RELATED SECTIONS**
- .1 Section 01 33 00 – Submittal Procedures
  - .2 Section 07 27 00 – Air Barriers
  - .3 Section 07 84 00 - Fire Stopping
  - .4 Section 09 21 16 - Gypsum Board Assemblies
  - .5 Section 09 22 16 - Non-structural Metal Framing
- 1.2 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 Canadian Standards Association (CSA International)
    - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
  - .3 Underwriters Laboratories of Canada (ULC)
    - .1 CAN/ULC-S604-M1991, Type A Chimneys.
    - .2 CAN/ULC-S702-1997, Standard for Mineral Fibre Insulation.
- 1.3 SUBMITTALS**
- .1 Product Data:
    - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 – Submittal Procedures.
  - .2 Manufacturer's Instructions:
    - .1 Submit 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 Convene pre-installation meeting one week prior to beginning on-site installations.
    - .1 Verify project requirements.
    - .2 Review installation and substrate conditions.
    - .3 Co-ordinate with other building subtrades.
    - .4 Review manufacturer's installation instructions and warranty requirements.
- 1.5 WASTE**
- .1 Separate waste materials for reuse and recycling in



MANAGEMENT AND  
DISPOSAL

accordance with Section 01 74 21 – Construction Waste Management & Disposal.

- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

**PART 2 - PRODUCTS**

2.1 INSULATION

- .1 Acoustic Insulation
  - .1 Batt and blanket mineral fibre ASTM C665 CAN/ULCS702-09, ASTM C553.
  - .2 Type: 1.
  - .3 Thickness: as indicated
  - .4 Non Combustible in accordance with CAN/ULC S114 and ASTM E136
  - .5 Flame spread 0, smoke development 0.
  - .6 Width purpose made for fitting between studs, depth to suit stud thickness.
  - .7 Acceptable Products:
    - .1 Ottawa Fibre Industries - Golden Glow Acoustic Insulation
    - .2 CGC Thermafibre SAFB
    - .3 Certainteed Certasound
    - .4 Roxul AFB
    - .5 Owens Corning Quietzone

**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 INSULATION  
INSTALLATION

- .1 Install insulation to maintain continuity of thermal and acoustic protection to building elements and spaces and to ASTM C 1320.
- .2 Install insulation within framing members tightly fit but not compressed. Retain in position with nails, staples and insulation clips installed as required and recommended by manufacturer.

- .3 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .4 Do not compress insulation to fit into spaces.
- .5 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.
- .6 Do not enclose insulation until it has been inspected and approved by Consultant.

### 3.3 CLEANING

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

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Materials and requirements for application of spray foam insulation:
  - .1 Applied within exterior steel stud wall assemblies adjacent to foundation upstand and within parapet framing.
  - .2 At perimeter of new window and door openings.

### **1.2 RELATED SECTIONS**

- .1 Section 07 21 13 – Board Insulation
- .2 Section 07 27 00 – Air Barriers
- .3 Section 08 11 00 – Metal Doors and Frames
- .4 Section 08 11 16 – Aluminum Doors and Frames
- .5 Section 08 44 13 – Glazed Aluminum Curtainwalls
- .6 Section 08 50 00- Windows

### **1.3 REFERENCES**

- .1 Canadian Urethane Foam Contractors' Association Inc. (CUFCA)
- .2 Green Seal Environmental Standards
  - .1 Standard GC-03-93, Anti-Corrosive Paints.
  - .2 Standard GS-11-97, Architectural Paints.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .4 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S101-04, Fire Endurance Tests of Building Construction and Materials.
  - .2 CAN/ULC-S102-03, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
  - .3 CAN/ULC-S705.1-01, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification.
  - .4 CAN/ULC-S705.2-05, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Application.

### **1.4 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

- .2 Submit two copies WHMIS MSDS - Material Safety Data Sheets.
  - .3 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
    - .1 Test reports: submit certified test reports for insulation from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
    - .2 Submit test reports in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.
    - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.
    - .4 Manufacturer's Field Reports: submit to manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.
  - .4 Provide information on recycled contents of materials as per Section 01 61 00 – Product Requirements
- 1.5 QUALITY ASSURANCE
- .1 Applicators to conform to CUFCA Quality Assurance Program or BASF Canada Quality Assurance Training Program (QATP).
  - .2 Qualifications:
    - .1 Installer: person specializing in sprayed insulation installations with 5 years documented experience approved by manufacturer.
    - .2 Manufacturer: company with minimum 5 years experience in producing of material used for work required for this project, with sufficient production capacity to produce and deliver required units without causing delay in work.
  - .3 Convene pre-installation meeting one week prior to beginning on-site installations.
    - .1 Verify project requirements.
    - .2 Review installation and substrate conditions.
    - .3 Co-ordinate with other building subtrades.
    - .4 Review manufacturer's installation instructions and warranty requirements.
  - .4 Health and Safety Requirements: worker protection:
    - .1 Protect workers as recommended by CAN/ULC-S705.2 and manufacturer's recommendations:
    - .2 Workers must wear protective clothing when applying foam insulation.
    - .3 Workers must not eat, drink or smoke while applying foam insulation.

1.6 DELIVERY,  
STORAGE AND  
HANDLING

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle materials in accordance w.th Section 01 61 00 - Common Product Requirements
  - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.7 SITE CONDITIONS

- .1 Ventilate area in accordance with Section 01 51 00 - Temporary Utilities.
- .2 Ventilate area to receive insulation by introducing fresh air and exhausting air continuously during and 24 hour after application to maintain non-toxic, unpolluted, safe working conditions.
- .3 Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area.
- .4 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of insulation materials.
- .5 Apply insulation only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

**PART 2 - PRODUCTS**

2.1 MATERIALS

- .1 Insulation: spray polyurethane to CAN/ULC-S705.1.
  - .1 Two component closed cell spray-applied rigid polyurethane foam system.
  - .2 Thermal resistance: Min. 1.15 RS1/25mm (R6.1/in)
  - .3 Class: 1 flame spread rating 25
  - .4 Perm rating: to ASTM E-96 0.9 - 1.0 perm/ 25mm
  - .5 Acceptable products:
    - .1 BASF Walltite
    - .2 Polarfoam PF-7300-0 Soya
    - .3 TigerFoam by Commercial Thermal Solutions, Inc.
- .2 Primers: in accordance with manufacturer's recommendations for surface conditions. Maximum VOC limit as per Section 01 61 00 Product Requirements

### **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 APPLICATION**

- .1 Apply insulation to clean surfaces in accordance with CAN/ULC-S705.2 compliance with the spray polyurethane Foam Alliance and manufacturer's printed instructions.
- .2 Use primer where recommended by manufacturer.
- .3 Apply after installation of metal studs, anchorage ties, and supports, and galvanized "Z" girt framing for anchorage of cladding systems.
- .4 Apply in maximum 50mm thickness per pass. On initial application thickness of first pass shall be no more than 25mm. Allow application of spray foam to cure and cool prior to application of additional layers of insulation as per manufacturer's recommendations to achieve total thickness to meet thermal values specified.
- .5 Apply sprayed foam insulation in total thickness indicated.

#### **3.3 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 at stages listed.
    - .1 After delivery and storage of products and when preparatory work and mock-up is completed but before general installation begins.
    - .2 Upon completion of work, after cleaning is carried out.
    - .3 Provide written report for each site review.

#### **3.4 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

**END OF SECTION**

## **PART 1 - GENERAL**

- 1.1 SECTION INCLUDES**
- .1 Materials and requirements for wall vapour retarder systems.
    - .1 Applied to interior face of existing stud insulated stud walls being affected by new work.
    - .2 Refer to Section 07 52 00 – Modified Bituminous Roofing and Waterproofing for vapour barrier specifications for roof assembly.
- 1.2 RELATED SECTIONS**
- .1 Section 07 21 16 – Blanket Insulation
  - .2 Section 07 92 00 – Joint Sealants
  - .3 Section 09 21 16 – Gypsum Board Assemblies
- 1.3 REFERENCES**
- .1 Canadian General Standards Board (CGSB)
    - .1 CAN/CGSB-51.34-M86, Polyethylene Sheet, for Use in Building Construction.
- 1.4 SUBMITTALS**
- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Product Data:
    - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
    - .2 Submit WHMIS MSDS - Material Safety Data Sheets. List VOC limits on MSDS.
- 1.5 QUALITY ASSURANCE**
- .1 Qualifications:
    - .1 Applicator: company specializing in performing work of this section with minimum five years documented experience with installation of vapour retarder systems.
      - .1 Completed installation must be approved by the material manufacturer.
    - .2 Applicator: company:
      - .1 Currently licensed by National Air Barrier Association.
      - .2 Must maintain their license throughout the duration of the project.
  - .2 Mock-Up:
    - .1 Construct mock-up in accordance with Section 01 45 00

- Quality Control.

.2 Construct one bay section of exterior wall (between existing column to column and floor slab to concrete beam), incorporating insulation, steel studs, exterior sheathing, mechanical louver penetration; illustrating materials interface and seals.

.3 Mock-up may remain as part of finished work.

.4 Coordinate inspection of mock-up with Consultant before proceeding with vapour retarder work.

.3 Site Meetings: as part of Manufacturer's Services described in PART 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.

.1 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.

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

.3 Upon completion of Work, after cleaning is carried out.

1.6 DELIVERY,  
STORAGE AND  
HANDLING

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

.2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

1.7 WASTE  
MANAGEMENT AND  
DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away from children.

1.8 AMBIENT  
CONDITIONS

.1 Install solvent curing sealants and vapour release adhesive materials in open spaces with ventilation.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.3 Maintain temperature and humidity recommended by materials manufactures before, during and after installation.



- 1.9 SEQUENCING .1 Sequence work to permit installation of materials in conjunction with related materials and seals.
- 1.10 WARRANTY .1 Provide three year warranty under provisions of Section 01 78 00 - Closeout Submittals and in accordance with General Conditions (GC) CCDC 17 GC 12.3.
- .2 Warranty: include coverage of installed sealant and sheet materials which:
- .1 Fail to achieve vapour tight seal.
  - .2 Exhibit loss of adhesion or cohesion.
  - .3 Do not cure.

## **PART 2 - PRODUCTS**

- 2.1 SHEET MATERIALS .1 Polyethylene film:
- .1 To meet CAN/CGSB-51.34, 0.15mm (96 mil) thick for use in back-up wall assembly around insulated blank-off panels for louvred openings. See architectural details.
- 2.2 ACCESSORIES .1 Joint sealing tape: air resistant pressure sensitive adhesive tape, type recommended by vapour barrier manufacturer, 50mm wide for lap joints and perimeter seals, 25mm elsewhere.
- .1 Sealants: Non-hardening Acoustic Sealant to CGSB 19-GP-21M.
  - .2 Moulded box vapour barrier: factory-moulded polyethylene box for use with recessed electric switch and outlet device boxes.

## **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 Remove loose or foreign matter within wall cavity.
- .2 Ensure metal closures are free of sharp edges and burrs.
- 3.3 INSTALLATION .1 Exterior Walls:

- .1 Ensure services are installed and inspected prior to installation of retarder.
- .2 Install sheet vapour retarder on warm side of exterior assemblies prior to installation of gypsum board to form continuous retarder.
- .3 Use sheets or largest practical size to minimize joints.
- .4 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.

### 3.4 LAP JOINT SEALS AT EXTERIOR WALLS

- .1 Seal lap joints of sheet vapour barrier as follows:
  - .1 Attach first sheet to substrate;
  - .2 Apply continuous bead of sealant over solid backing at joint;
  - .3 Lap adjoining sheet minimum 150mm and press into sealant bed.
  - .4 Ensure that no gaps exist in sealant bed. Smooth out folds and ripples occurring in sheet over sealant;
  - .5 Seal electrical switch and outlet device boxes that penetrate vapour barrier as follows:
    - .1 Install moulded box vapour barrier;
    - .2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

### 3.5 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

### 3.7 PROTECTION OF WORK

- .1 Protect finished work in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Do not permit adjacent work to damage work of this section.
- .3 Ensure finished work is protected from climatic conditions.
- .4 Consultant to review installation of vapour barrier prior to installation of gypsum board.

**END OF SECTION**

## **PART 1 - GENERAL**

- 1.1 SECTION INCLUDES**
- .1 Materials and requirements for wall air/vapour barrier systems.
    - .1 Applied to exterior face of exterior wall sheathing and to provide a continuous air barrier membrane at exterior walls, windows and doors.
    - .2 Applied to parapets to transition between wall and roof membranes.
    - .3 Applied to existing curtainwall framing at 2<sup>nd</sup> level projected bay windows to provide a continuous air barrier membrane between the existing building and the new addition.
    - .4 Applied to existing concrete block and wood stud walls where existing masonry veneer is being removed. It is expected the existing air barrier membrane will require repair or complete replacement following removal of masonry veneer and associated masonry anchoring system to existing wall.
    - .5 Thru-wall flashings at base of new and existing walls.
    - .6 Underlayment for sheet metal flashing work, and aluminum window sills.
- 1.2 RELATED SECTIONS**
- .1 Section 06 10 00 – Rough Carpentry
  - .2 Section 07 21 16 – Blanket Insulation
  - .3 Section 07 21 29 – Spray In Place Foam Insulation
  - .4 Section 07 46 13 – Preformed Metal Siding
  - .5 Section 07 62 00 – Sheet Metal Flashing and Trim
  - .6 Section 07 92 00 – Joint Sealants
  - .7 Section 09 21 16 - Gypsum Board Assemblies
- 1.3 REFERENCES**
- .1 Canadian Construction Documents Committee
    - .1 CCDC 17- 2010, Stipulated Price Contract.
  - .2 Canadian General Standards Board (CGSB)
    - .1 CAN/CGSB-19.13M-M87, Sealing Compound, One Component, Elastomeric Chemical Curing.
    - .2 CAN/CGSB-19.24M-M90, Multi-Component, Chemical Curing Sealing Compound.
    - .3 CGSB 19-GP-14M-84, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.
  - .3 Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification.
- 1.4 SUBMITTALS**
- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Product Data:
    - .1 Submit manufacturer's printed product literature,

specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit WHMIS MSDS - Material Safety Data Sheets. List VOC limits on MSDS.

- .3 Quality Assurance Submittals: submit following in accordance with Section 01 45 00 - Quality Control.
- .1 Existing Substrate Condition: report deviations, as described in PART 3 -EXAMINATION in writing to Consultant.
  - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.
  - .4 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

## 1.5 QUALITY ASSURANCE

- .1 Qualifications:
- .1 Applicator: company specializing in performing work of this section with minimum five years documented experience with installation of air/vapour barrier systems.
    - .1 Completed installation must be approved by the material manufacturer.
  - .2 Applicator: company:
    - .1 Currently licensed by National Air Barrier Association.
    - .2 Must maintain their license throughout the duration of the project.
- .2 Mock-Up:
- .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
  - .2 Mock-up to consist of one new window opening in existing wall illustrating material interface and seals.
  - .3 Mock-up may remain as part of finished work.
  - .4 Coordinate inspection of mock-up with Consultant before proceeding with air barrier work.
- .3 Site Meetings: as part of Manufacturer's Services described in PART 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.
- .1 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.
  - .2 Twice during progress of Work at 25% and 60% complete.
  - .3 Upon completion of Work, after cleaning is carried out.

1.6 DELIVERY,  
STORAGE AND  
HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .3 Avoid spillage: immediately notify Consultant if spillage occurs and start clean up procedures.
- .4 Clean spills and leave area as it was prior to spill.

1.7 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.

1.8 AMBIENT  
CONDITIONS

- .1 Install solvent curing sealants and vapour release adhesive materials in open spaces with ventilation.
- .2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.
- .3 Maintain temperature and humidity recommended by materials manufactures before, during and after installation.

1.9 SEQUENCING

- .1 Sequence work to permit installation of materials in conjunction with related materials and seals.

1.10 WARRANTY

- .1 Provide three year warranty under provisions of Section 01 78 00 - Closeout Submittals and in accordance with General Conditions (GC) CCDC 17 GC 12.3 .
- .2 Warranty: include coverage of installed sealant and sheet materials which:
  - .1 Fail to achieve air tight and watertight seal.
  - .2 Exhibit loss of adhesion or cohesion.
  - .3 Do not cure.

## **PART 2 - PRODUCTS**

### **2.1 SHEET MATERIALS**

- .1 Air Barrier Membrane: Reinforced SBS Modified Bitumen self-adhesive composite membrane, nom. 1.5mm thick or rubberized asphalt self-adhesive composite membrane nom. 1 mm thick.
  - .1 Acceptable products:
    - .1 Blueskin SA by Bakor
    - .2 IKO AquaBarrier AVB
    - .3 Perm-A-Barrier by W.R. Grace
    - .4 Sopraseal Stick 1100 by Soprema
    - .5 ExoAir 110 by Tremco
    - .6 Air Shield by W.R. Meadows.
  - .2 Vapour-Permeable Air Barrier Membrane: Self-adhering membrane consisting of microporous film laminate, backed with a specially applied adhesive to allow water vapour to permeate through while acting as a barrier to air and bulk water.
    - .1 Acceptable products:
      - .1 Blueskin Breather by Bakor
      - .2 IKO AquaBarrier VP
      - .3 Sopraseal VP by Soprema
  - .3 Thru-Wall Flashing Membrane: Reinforced SBS modified bitumen self-adhesive composite membrane, laminated to a cross-laminate, high-density polyethylene film with a siliconized release liner, nominal 1.0mm thick.
    - .1 Acceptable products:
      - .1 Blueskin TWF
      - .2 IKO AquaBarrier TWF
      - .3 Sopraseal WFM by Soprema
  - .4 Primer: synthetic rubber primer and one-part thermoplastic rubber based sealant for Self-Adhesive membrane as recommended by manufacturer of membrane. VOC limits as per Section 01 61 00 Product Requirements
  - .5 Adhesive: compatible with sheet seal membrane and substrate, permanently non-curing. VOC limits as per Section 01 61 00 Product Requirements
  - .6 Sealant around Penetrations: Butyl Sealant or trowel applied liquid air/vapour barrier membrane synthetic, rubber based adhesive compatible with sheet seal membrane and substrate, permanently non-curing.
    - .1 Sealants as per 07 92 00 Joint Sealants.
  - .7 Metal flashing supports: 26 GA (0.55mm) zinc coated steel commercial quality to ASTM A526M with Z275 designated zinc coating.

- .8 Provide the above materials in either summer grade (above 5 degrees C) or winter grade (between -5 to 5 degrees C) applications to suit installation temperatures.

### **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 GENERAL**

- .1 Perform Work in accordance with National Air Barrier Association - Professional Contractor Quality Assurance Program and requirements for materials and installation.

#### **3.3 EXAMINATION**

- .1 Verify that surfaces and conditions are ready to accept work of this section.
- .2 Ensure surfaces are clean, dry, sound, smooth, continuous and comply with air barrier manufacturer's requirements.
- .3 Report unsatisfactory conditions to Consultant in writing.
- .4 Do not start work until deficiencies have been corrected.  
.1 Beginning of Work implies acceptance of conditions.

#### **3.4 PREPARATION**

- .1 Remove loose or foreign matter, which might impair adhesion of materials.
- .2 Ensure substrates are clean of oil or excess dust; masonry joints struck flush, and open joints filled; and concrete surfaces free of large voids, spalled areas or sharp protrusions.
- .3 Ensure substrates are free of surface moisture prior to application of self-adhesive membrane and primer.
- .4 Ensure metal closures are free of sharp edges and burrs.

#### **3.5 INSTALLATION**

- .1 Install materials in accordance with manufacturer's instructions.
- .2 Maintain environmental conditions recommended by manufacturer.

- .3 Extend membrane into openings as indicated. Lap joints to shed water to the exterior starting at the sill flashing.
- 3.6 FIELD QUALITY CONTROL .1 Consultant to review installation prior to material being concealed.
- 3.7 CLEANING .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- 3.8 PROTECTION OF WORK .1 Protect finished work in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Do not permit adjacent work to damage work of this section.
- .3 Ensure finished work is protected from climatic conditions.

**END OF SECTION**



## 1 GENERAL

### 1.1 GENERAL REQUIREMENTS

- .1 All requirements of the contract documents form an integral part of the work specified herein; In particular refer to the general conditions and Division 1 of the specifications.
  
- .2 Composite Metal Panel System to be:
  - .1 Alucobond as manufactured by Alcan Composites USA Inc. and fabricated/distributed by:  
Sobotec Ltd.  
67 Burford Rd.  
Hamilton ON L8E 3C6  
Telephone: (905) 578-1278  
  
Thermal Systems KWC Ltd.  
2780 - 24 Avenue N.E.  
Telephone: (403) 250-5507
  
  - .2 Alpolic as manufactured by Mitsubishi Chemical FP America, Inc and fabricated/distributed by:  
Flynn Canada Ltd.  
6300 Northam Drive  
Mississauga, ON L4V 1H7  
Telephone: (905) 671 3971
  
  - .3 Alucobond as manufactured by Alcan Composites USA Inc. and fabricated/distributed by:  
Firestone Building Products  
2835 Argentia Road, Unit#2  
Mississauga, ON L5N 8G6  
Telephone: (888) 292 6265
  
  - .4 Alpolic as manufactured by Mitsubishi Chemical FP America Inc. and fabricated/distributed by :  
Horizon Building Envelope Solutions Inc.  
15 Lake Street Unit B  
Grimsby Ontario L3M 2G4  
office 905 945 9599

### 1.2 QUALITY ASSURANCE

- .1 Composite panel system shall be fabricated by the above listed manufacturers and installed by an approved installer as per the installer list below or by the General Contractor.
  - .1 Installers for Thermal Systems KWC Ltd
    - .1 Ontario & Quebec

J.P. Entreprises  
559 Marcellus Avenue  
Milton, ON L9T 4E7  
Phone: (416) 819-3872  
Fax: (905) 693-1828  
Contact: Jim Pettie  
Email: [jpettie@sympatico.ca](mailto:jpettie@sympatico.ca)

Laurin & Company – Groupe Laurin  
#11 – 52 Antares Drive  
Nepean, ON K2E 7Z1  
Phone: (613) 723-3093  
Fax: (613) 723-7496  
Contact: Dennis Laurin  
Email: [dennis.laurin@laurin.ca](mailto:dennis.laurin@laurin.ca)

2. Installers for Firestone Metal Products:

3. Semple-Gooder Roofing Ltd  
1365 Martingrove Rd  
Toronto, ON M9W 4X7  
Telephone: (416) 743 5370  
Fax : (416) 743 4257  
Project Manager: Sven Lavado  
E-Mail: [slavado@semple-gooder.com](mailto:slavado@semple-gooder.com)

.2 Field measurements should be taken prior to shop fabrication

.3 Panel lines, breaks and angles shall be sharp, true and surfaces free from warp or buckle.

.4 Tolerances

.1 Panel Bow: Maximum 0.8% of panel dimension in width and length of any 1828mm (72") panel dimension.

.2 Panel fabrication tolerances for length or width to be a maximum of  $\pm 1$ mm (3/64") and the variation from theoretical diagonal dimensions of the finished panel cannot exceed 3mm (1/8").

.3 Joints shall not vary more than 5% of their dimensioned width at any location along the full joint length and shall not be wavy, out of line or of different width from panel to panel.

.4 Maximum deviation from vertical and horizontal alignment of erected panels: 6mm (1/4") in 6m (20') non-accumulative.

.5 Panel dimensions: Allowance for field adjustments as recommended by distributor/fabricator where final dimensions cannot be established by field measurement before completion of panel manufacturing.

### 1.3 SUBMITALS

- .1 Submittals shall be in conformance with Section 01340
- .2 Shop Drawings: Indicate thickness and dimensions of parts; fastening and anchoring methods; detail type and location of joints and gaskets including joints necessary to accommodate thermal movement
- .3 Affidavit certifying material meets requirements specified.
- .4 Two copies of manufacturer's literature for panel material.

### 1.4 DELIVERY, STORAGE AND HANDLING

- .1 Protect finish and edges in accordance with panel manufacturer's recommendations.
- .2 Store material in accordance with panel manufacturer's recommendations.

## 2. PRODUCTS

### .1 Materials

- .1 3 mm or 4 mm Alucobond as manufactured by Alcan Composites USA.  
Colour: Clear Anodized or match QC-2624 'Bright Silver'
- . 3 mm or 4 mm Alpolic as manufactured by Mitsubishi Chemical FP America, Inc. Colour: Clear Anodized or match QC-2624 'Bright Silver'.

### 2. SYSTEM TYPES

- .1 Approved panel systems shall be:
  - .1 Thermal Systems AP100/200/250/300
  - .2 Flynn Canada Acumet 2000
- .2 Fasteners (non-corrosive/concealed) as recommended by panel distributor/fabricator.
- .3 Dry Joint system, erected without the use of any sealants in the joints.

### 3. SYSTEM PERFORMANCE

- .1 Panel Joints – standard for vertical and horizontal joints is 3/8" (10mm) or as detailed on drawings.
- .2 Substrate to be minimum ½" plywood. Gypsum board or OSB, etc is not acceptable.

### 4. SYSTEM ACCESSORIES

- .1 Panel Clips as recommended by distributor/fabricator and per system design
  - .2 Subgirts: Minimum 1.22mm (18ga.) Z275 galvanized steel as per system design requirements for panel attachment when required
  - .3 Gaskets within the panel system shall be as per distributor/fabricator standards if required
  - .4 Exposed aluminum extrusion to be finished to match composite aluminum panel colour

### **3. EXECUTION**

#### **.1 INSPECTION**

- .1 Surfaces to receive panels shall be even, smooth, sound, clean, dry and free from defects detrimental to work. Notify contractor in writing of conditions detrimental to proper and timely completion of the work. Do not proceed with erection until unsatisfactory conditions have been corrected.

#### **.2 INSTALLATION**

- .1 Fabricator/installer to have a minimum ten years experience with installation of similar size and complexity.
- .2 Fabricator/Installer to be approved by the manufacturer to comply with warranty requirements
- .3 Erect panels plumb, level and true in accordance with specified tolerances.
- .4 Erect panels with skilled workers in the permanent employ of the fabricator/installer
- .5 Anchor panels securely in place in accordance with distributor/fabricator's approved shop drawings and system design.
- .6 Conform to distributor/fabricator's instructions for installation of concealed fasteners.
- .7 Attachment system shall allow for the free noiseless vertical and horizontal thermal movement due to expansion and contraction for a material temperature of -28°C [-20°F] to +82°C [180°F]. Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement will not be permitted. Fabrication, assembly and erection procedure shall account for the ambient temperature at the time of the respective operation.
- .8 Separate dissimilar metals and use gasketed fasteners where needed to eliminate the possibility of corrosive or electrolytic action between dissimilar metals.

#### **.3 ADJUSTING AND CLEANING**

- .1 Remove and replace panels damaged beyond repair or panels not meeting specified tolerances
- .2 Repair panels with minor damage.
- .3 Remove protective film from panels as soon as possible after installation. Final cleaning to be discussed with General Contractor.

**END OF SECTION**

## PART 1 - GENERAL

<u>1.1 SECTION INCLUDES</u>	.1	Materials and installation for wall systems comprising fibre reinforced cementitious facing panels and perimeter frieze board identified as ' <b>FCP</b> ' on architectural drawings
<u>1.2 RELATED SECTIONS</u>	.1	Section 01 33 00 - Submittal Procedures.
	.2	Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
	.3	Section 07 21 13 -Board Insulation
	.4	Section 07 92 00 – Joint Sealants
	.5	Section 08 11 16 – Aluminum Doors & Frames
	.6	Section 09 91 13 – Exterior Painting
<u>1.3 REFERENCES</u>	.1	Aluminum Association (AA). .1 AA-DAF-45-R03, Designation System for Aluminum Finishes.
	.2	Canadian General Standards Board (CGSB). .1 CAN/CGSB-1.40-97, Anticorrosive Structural Steel Alkyd Primer. .2 CAN/CGSB 1-GP-71 Amendment 13-1995, Methods of Testing Paints and Pigments (including Amendments 1 to 12 and Supplement No. 1). .3 CAN/CGSB-34.16-M89, Sheets, Asbestos-Cement, Flat, Fully Compressed. .4 CAN/CGSB-34.17-M89, Sheets, Asbestos-Cement, Flat, Semi-compressed. .5 CGSB 41-GP-6M-83, Sheets, Thermosetting Polyester Plastics, Glass Fibre Reinforced.
	.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 - March 1998 (R2002).
	.5	National Research Council (NRC).
<u>1.4 DESIGN REQUIREMENTS</u>	.1	Design composite building panel wall to provide for thermal movement of component materials caused by ambient temperature range of -30 to +40 degrees C without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.

- .2 Include expansion joints to accommodate movement in wall system and between wall system and building structure, caused by structural movements, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration.
- .3 Design members to withstand dead load and wind loads as calculated in accordance with OBC and applicable Municipal/Territorial regulations, to maximum allowable deflection of 1/180 of span.
- .4 Provide for positive drainage of condensation occurring within wall construction and water entering at joints, to exterior face of wall in accordance with NRC "Rain Screen Principles".
- .5 Design wall system to accommodate specified erection tolerances of structure.
- .6 Maintain following installation tolerances:
  - .1 Maximum variation from plane or location shown on approved shop drawings: 5 mm/m of length and up to 20 mm/100 m maximum.
  - .2 Maximum offset from true alignment between two adjacent members abutting end to end, in line: 0.75 mm.
- .7 Panels shall be installed by contractors trained by the panel manufacturer and have experience in the installation of the specified projects of similar size and complexity.

#### 1.5 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate dimensions, wall openings, head, jamb, sill and mullion detail, materials and finish, anchor details, compliance with design criteria and requirements of related work.

#### 1.6 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate 600 x 600 mm samples of wall system, representative of materials, finishes, colours and fasteners.

1.7 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Separate for reuse and recycling and place in designated containers Steel Metal Plastic waste in accordance with Waste Management Plan.
- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Ensure emptied containers are sealed and stored safely.
- .7 Dispose of unused sealant material at official hazardous material collections site approved by Consultant.
- .8 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .9 Fold up metal banding, flatten and place in designated area for recycling.

1.8 ENVIRONMENTAL  
REQUIREMENTS

- .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 (MSDS) acceptable to Labour Canada.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Panel Siding: HardiePanel by James Hardie or Weatherboard by Certainteed. Noted as '**FCP**' on architectural drawings
  - .1 Thickness: 11mm
  - .2 Panel. Size: As indicated on drawings,
  - .3 Colour To be selected from manufacturer's standard colour range.
  - .4 Fire .Rating: NFPA Class A according to ASTM E 136, CAN/ULC-S114, non-combustible.
  - .5 Fasteners: No 8-18 x 8.2mm HD x 25mm (1") long,

self-drilling ,corrosion resistant S-12 ribbed buglehead screws as per manufacturer's standard.

.6 J-Channel Trim: Pre-painted aluminum Fry Reglet  
#FCP-Z Flashing to match panel colour

### **PART 3 - EXECUTION**

#### **3.1 FCP INSTALLATION**

- .1 Hardiepanel, HardieSoffit and HardieTrim products shall be installed by trained contractors. Install panels and sub-framing as per reviewed shop drawings and in accordance with Manufacturer's guidelines and requirements.
- .2 Design and install sub-framing as per panel manufacturer's engineered shop drawings. Fully support panel edges and provide intermediate sub-framing as required.
- .3 Erect panels as per layouts indicated on drawings. Support panels directly over pressure-treated wood blocking or galvanized vertical sub-framing. Edges shall be installed with continuous Fry Reglet reveal trim as per manufacturer's typical detail.
- .4 System shall be constructed as a "rain-screen" wall. Provide drainage at the base of the wall and vent openings at the top of walls.
- .5 Mechanically fasten panels to metal sub-framing with self-drilling screws as recommended by panel manufacturer. Space fasteners equally per panel to comply with the requirements of tables 2 and 3 in the National Evaluation Service Report No. NER-405, as per panel manufacturer's requirements.
- .6 Install all panels oriented alike.

#### **3.3 CLEANING**

- .1 Wash down exposed exterior surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths.
- .2 Perform cleaning operations as per manufacturer's recommendations.

**END OF SECTION**



PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 The work of this Section includes all material, equipment and tools, and labour for the supply and installation of wood siding as indicated on the drawings as **“WS”**
- 1.2 RELATED SECTIONS
- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 19 - Construction/Demolition Waste Management and Disposal.
- .3 Section 07 44 56 – Mineral Fibre Reinforced Cementitious Panels.
- .4 Section 07 62 00 - Sheet Metal Flashing and Trim.
- .5 Section 07 92 00 - Joint Sealing.
- 1.3 REFERENCES
- .1 Canadian General Standards Board (CGSB).
- .1 CAN/CGSB-11.3-M87, Hardboard.
- .2 CAN/CGSB-11.5-M87, Hardboard, Precoated, Factory Finished, for Exterior Cladding.
- .3 CAN/CGSB-11.6-M87, Installation of Exterior Hardboard Cladding.
- .4 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
- .3 Canadian Standards Association (CSA International).
- .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .2 CSA O121-M1978(R1998), Douglas Fir Plywood.
- .3 CSA O151-M1978(R1998), Canadian Softwood Plywood.
- .4 CAN/CSA-Z808-96, A Sustainable Forest Management System: Guidance Document.
- .4 Environmental Choice Program (ECP).
- .1 CCD-045-95, Sealants and Caulking Compounds.
- .5 National Lumber Grades Authority (NLGA).
- .1 NLGA Standard Grading Rules for Canadian Lumber 2003.

1.4 SUBMITTALS

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's for caulking materials during application and curing.
- .2 Samples:
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit duplicate 600mm long samples of each profile specified.
- .3 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.

1.5 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.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in 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 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility.
- .5 Divert unused wood materials from landfill to recycling, reuse, composting facility.

- .6 Divert unused caulking material from landfill to official hazardous material collections site.
- .7 Do not dispose of unused caulking materials into the sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Lumber siding: to NLGA Standard Grading Rules for Canadian Lumber.
  - .1 Bevel siding: Western Canadian Lodgepole pine, No. 1 grade, factory pre-finished with 2 coats 100% acrylic system. Standard of acceptance: Cape Cod Wood Siding or Maibec Siding
  - .2 WS: 1"x 6" (Cape Cod CC 6) channel siding installed horizontally, colour to match existing school.
- .2 Accessories: exposed trim, closures, cap pieces of manufacturer's standard, finish to match siding.
- .6 Exterior wall membrane (air/vapour Barrier): as per Section 07 27 00.
- .7 Fasteners: nails to CSA B111, hot galvanized steel, sized as required, spiral or ring thread type with flat finishing head to manufacturer's standard.
- .8 Sealants: As per Section 07 92 00

## 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 Install hardboard to CGSB 11-GP-6M and manufacturers' instructions.
- .2 Install one layer sheathing paper horizontally under rigid

insulation boards directly to sheathing by stapling, lapping edges 100 mm.

- .3 Install sill flashings, wood starter strips, inside corner flashings, edgings and flashings over openings.
- .4 Fasten wood siding in straight, aligned lengths to framing and furring at 600mm mm on centre maximum using two nails at each fixing location. Intermediate butt joints are not permitted Stagger butt joints not less than 800 mm and distribute evenly over wall faces. Cut butt joints at 45 degrees and for vertical siding slope to outside. Seal cut surfaces.

### 3.3 CLEANING

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

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 SECTION INCLUDES**

- .1 The work of this Section includes all, materials, tools and equipment, and labour required to supply and install complete roofing systems for the project as indicated on the drawings and noted below.
- .2 All products are to be single source for the roof system and compatible with the selected insulation to provide a complete "system" with a manufacturer warrantee.
- .3 Conventional Roofing System over steel deck:
  - .1 Cap Sheet: Modified Bituminous Cap Sheet Membrane
  - .2 Base Sheet: Modified Bituminous Base Sheet Membrane.
  - .3 Roof protection board
  - .4 Rigid Insulation: Polyisocyanurate board insulation
  - .5 Sloped Insulation: Polyisocyanurate board insulation sloped to drains.
  - .6 Vapour Barrier: SBS sheet membrane
  - .7 Primer: V.B. Manufacturer's primer
  - .8 Roof Deck Sheathing
  - .8 Steel Roof Deck over Structural Steel Framing

### **1.2 RELATED SECTIONS**

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 07 62 00 – Sheet Metal Flashing and Trim.
- .3 Section 07 92 00 – Joint Sealants.
- .4 Division 22 - Plumbing Specialties and Accessories: drains

### **1.3 REFERENCES**

- .1 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM C 1177/C 1177M-17, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
  - .2 ASTM D 41 /D41M-11(2016), Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
  - .3 ASTM D 312 /D312M-16a, Standard Specification for Asphalt Used in Roofing. .
  - .4 ASTM D 2178 /D2178M-15a, Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
  - .5 ASTM D 6162 /D6162M-16, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fibre Reinforcements.
  - .6 ASTM D 6163 /D6163M-16, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous

- .7 Sheet Materials Using Glass Fibre Reinforcements.  
ASTM D 6164 /D6164M-16, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
- .2 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.
  - .2 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
  - .3 CGSB 37-GP-15M-84, Application of Asphalt Primer for Asphalt Roofing, Dampproofing and Waterproofing.
  - .4 CGSB 37-GP-19M-85, Cement, Plastic, Cutback Tar.
  - .5 CAN/CGSB-37.29-M89, Rubber-Asphalt Sealing Compound.
  - .6 CGSB 37-GP-56M-80b(A1985), Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
  - .7 CAN/CGSB-51.33-M89, Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
- .3 Canadian Roofing Contractors Association (CRCA).
  - .1 CRCA Roofing Specifications Manual-Latest version
- .4 Canadian Standards Association (CSA International).
  - .1 CAN/CSA-A123.3-05, Asphalt Saturated Organic Roofing Felt.
  - .2 CAN/CSA-A123.4-04, Asphalt for Use in Construction of Built-Up Roof Coverings and Waterproofing Systems. .
  - .3 CSA O121-08, Douglas Fir Plywood.
  - .4 CSA O151-04, Canadian Softwood Plywood.
- .5 Department of Justice Canada (Jus).
  - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .6 Factory Mutual (FM Global).
  - .1 FM Approvals - Roofing Products.
- .7 Health Canada / Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).
- .8 Transport Canada (TC).
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .9 Underwriters Laboratories' of Canada (ULC).
  - .1 CAN/ULC-S701-05, Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  - .2 CAN/ULC-S704-03, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
  - .3 CAN/ULC-S706-02, Standard for Wood Fibre Thermal

Insulation for Buildings.

1.4 PERFORMANCE  
REQUIREMENTS

- .1 Compatibility between components of roofing system is essential. Provide written declaration to Consultant stating that materials and components, as assembled in system, meet this requirement.

1.5 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit two copies of most recent technical roofing components data sheets describing materials' physical properties.
- .3 Submit WHMIS MSDS - Material Safety Data Sheets.
- .4 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .5 Indicate flashing, control joints, tapered insulation details.
- .6 Provide layout for tapered insulation.
- .7 Manufacturer's Installation Instructions: indicate special precautions required for seaming the membrane.
- .8 Manufacturer's Certificate: certify that products meet or exceed specified requirements.
- .9 Manufacturer's field report: in accordance with Section 01 45 00 - Quality Control.
- .10 Reports: indicate procedures followed, ambient temperatures and wind velocity during application.

1.6 QUALITY  
ASSURANCE

- .1 Submit laboratory test reports in accordance with Section 01 45 00 - Quality Control.
- .2 Submit laboratory test reports certifying compliance of bitumens and membrane with specification requirements.
- .3 Convene pre-installation meeting one week prior to beginning waterproofing work, with roofing contractor's representative and Consultant to:
  - .1 Verify project requirements.
  - .2 Review installation and substrate conditions.
  - .3 Co-ordination with other building subtrades.

- .4 Review manufacturer's installation instructions and warranty requirements.
- .4 Contractors must be members in good standing of the Ontario or Canadian Roofing Contractor's Association (ORCA or CRCA) and/or have been established as a roofing contractor for a minimum of 5 years, and shall be recognized as a qualified SBS Modified Bitumen Membrane installer.
- .5 Roofing work shall be performed only by experienced and qualified applicators in accordance with Manufacturer's recommendations and best trade practices. Replace all work that results from inferior products or workmanship as directed by the Consultant.
- .6 Installer qualifications: Engage an experienced installer to perform work of this section who is specialized in installing roofing similar to that required for this project, who is approved, authorized or licensed by the roofing system manufacturer to install the manufacturer's product and who is eligible to receive the standard roofing manufacturer's warranty.
- .7 The roofing contractor and his subcontractors, throughout the bid and installation periods, must own a business license and must be officially recognized as an approved contractor by the roofing product manufacturer. Only skilled tradespersons, officially employed by a roofing contractor operating adequate and necessary equipment, will be authorized to perform all roofing work.
- .8 Employ only skilled tradesmen who have successfully completed a course of instruction provided by the material manufacturer and are experienced in this work.
- .9 Upon request by the Consultant, submit evidence of previously completed projects of a similar nature.

1.7 FIELD QUALITY CONTROL

- .1 The Owner may appoint an independent Waterproofing/Roofing inspector to conduct inspections and tests to ensure compliance with specification requirements. The cost of the inspection and testing shall be paid by the Owner.
- .2 Provide a minimum two working days notice to the Consultant and Roofing Inspector of commencement of each phase of the work and provide them with manufacturer's literature on materials and installation upon request.
- .3 On completion of the roofing, conduct in the presence of and



under the direction of the Roofing Inspector, a flood test of that portion of the work.

- .4 After installation, provide certification, signed by the roofing material manufacturer, that all items have been installed in accordance with the shop drawings and the manufacturer's specifications and details.
- .5 Cooperate with the Roofing Inspector and Consultant and afford all facilities necessary to permit full inspection of the work and testing of materials prior to and during their use and during the warranty period.

#### 1.8 HEALTH AND SAFETY

- .1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

#### 1.9 STORAGE AND HANDLING

- .1 Provide and maintain dry, off-ground weatherproof storage.
- .2 Store rolls of felt and membrane in upright position. Store membrane rolls with selvage edge up.
- .3 Remove only in quantities required for same day use.
- .4 Place plywood runways over completed Work to enable movement of material and other traffic.
- .5 Store sealants at +5 degrees C minimum.
- .6 Store insulation protected from daylight and weather and deleterious materials.
- .7 Handle roofing materials in accordance with manufacturer's written directives, to prevent damage or loss of performance.
- .8 All materials will be delivered and stored in conformance with the requirements described in the manufacturer's product manual; they must remain in their original packaging with manufacturer's name and product standards.

#### 1.10 PROTECTION

- .1 Fire Extinguishers: maintain one cartridge operated type or stored pressure rechargeable type with hose and shut-off nozzle, ULC labeled for A, B and C class protection. Size 9 kg on roof per torch applicator, within 6 m of torch applicator.
- .2 Maintain fire watch for 1 hour after each day's roofing operations cease.

1.11 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Separate for reuse and recycling and place in designated containers Steel Metal Plastic waste in accordance with Waste Management Plan.
- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Handle and dispose of hazardous materials in accordance with CEPA , TDGA , Regional and Municipal regulations.
- .7 Clearly label location of salvaged material's storage areas and provide barriers and security devices.
- .8 Ensure emptied containers are sealed and stored safely.
- .9 Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.
- .10 Unused adhesive, sealant and asphalt materials must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .11 Dispose of unused adhesive material at official hazardous material collections site approved by Consultant.
- .12 Dispose of unused sealant material at official hazardous material collections site approved by Consultant.
- .13 Dispose of unused asphalt material at official hazardous material collections site approved by Consultant.
- .14 Divert unused gypsum materials from landfill to recycling facility as reviewed by Consultant.
- .15 Fold up metal banding, flatten and place in designated area for

recycling.

1.12 ENVIRONMENTAL  
REQUIREMENTS

- .1 Do not install roofing when temperature remains below -18 degrees C for torch application, or -5 degrees C to manufacturers' recommendations for mop application.
- .2 Minimum temperature for solvent-based adhesive is -5 degrees C.
- .3 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.
- .4 Conduct moisture tests of concrete slabs prior to application to confirm subsurface is acceptable to membrane manufacturer.

1.13 WARRANTY

- .1 Provide manufacturer's warranty stating that the membrane and membrane flashing will remain in a watertight condition and will not leak as a result of faulty materials for a period of 10 years from the date of substantial performance of the contract. The scope of the warranty shall include all material and labour to return the membrane to a weathertight condition.
- .2 Contractor hereby warrants that modified bituminous roofing and membrane flashings will stay in place and remain leakproof in accordance with General Conditions (GC) - CCDC GC 12.3, but for two years from the date of substantial performance of the contract. Make all necessary repairs and replacements within 48 hours of receipt of written notification.

**PART 2 – PRODUCTS**

2.1 ROOF SHEATHING

- .1 Exterior Roof Sheathing:
  - .1 To steel decks: Glass Mat, Gypsum Board: to ASTM C 1177 standard, water resistant silicone treated core, and embedded glass mat facing, 1220mm x 2440mm x 13mm thick.
  - .2 Plywood:
    - .1 As specified in Section 06 10 00.01 - Rough Carpentry Short Form.

2.2 DECK PRIMER

- .1 Asphalt primer: to CGSB 37-GP-9Ma ASTM D 41.
  - .1 Apply to all plywood, glass mat gypsum board and

concrete surfaces to receive vapour barrier at a rate of approximately 0.16L/sq.m.

.2 Acceptable Products:

- .1 Elastacol Stick by Soprema or 910-01 by Bakor.
- .2 IKO S.A.M. LVC Adhesive.

### 2.3 VAPOUR BARRIER

- 1 Vapour Barrier: Self adhesive air/vapour barrier modified bitumen membrane composed of SBS modified bitumen. The top surface is a tri-laminated woven polyethylene or sanded surface as noted below. A silicone release film covers the self adhesive underface. Width of membrane 1140mm, water vapour permeability 0.016 perm.
  - .1 Acceptable Products:
    - .1 Sopravap'R by Soprema.
    - .2 IKO MVP
    - .3 Perma-Seal FG by Bakor.

### 2.4 MEMBRANE

- .1 Base sheet: to CGSB 37-GP-56M polyester fibres to ASTM D 6164 glass fibres to ASTM D 6163 combination of polyester and glass fibres to ASTM D 6162.
  - .1 Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, glass or polyester reinforcement, having nominal weight of 180 g/m<sup>2</sup>.
  - .2 Type 2, fully adhered.
  - .3 Class C - plain surfaced.
  - .4 Grade heavy duty service.
  - .5 Top and bottom surfaces:
    - .1 Sanded/sanded sanded/polyethylene.
  - .6 Base sheet membrane properties: to CGSB 37-GP-56M.
    - .1 Strain energy (longitudinal/transversal): 11/10.6 kN/m.
    - .2 Breaking strength (longitudinal/transversal): 17.0/18.0 N/5 cm.
    - .3 Ultimate elongation (longitudinal/transversal): 60/60 %.
    - .4 Tear resistance: 85 N.
    - .5 Cold bending at -30 degrees C : no cracking.
    - .6 Softening point:  $\leq$  110 degrees C.
    - .7 Static puncture resistance: >380.
    - .8 Dimensional Stability: -0.3 / 0.3 %.
    - .7 ULC certification: Class A.
    - .8 Acceptable Products:
      - .1 SOPRALENE FLAM 180 by SOPREMA
      - .2 TORCHFLEX TO 180-FF-BASE by IKO
- .2 Cap sheet membrane: to CGSB 37-GP-56M polyester fibres to ASTM D 6164 glass fibres to ASTM D 6163 combination of

polyester and glass fibres to ASTM 6162.

- .1 Styrene-Butadiene-Styrene(SBS) elastomeric polymer, prefabricated sheet, glass or polyester reinforcement, having nominal weight of 250 g/m<sup>2</sup>.
- .2 Type 1, fully adhered.
- .3 Class A-granule surfaced.
  - .1 Colour : Grey
- .4 Grade heavy duty service.
- .5 Bottom surface polyethylene.
- .6 Cap sheet membrane properties: to CGSB 37-GP-56M.
  - .1 Strain energy (longitudinal/transversal): 18.4/18.1 kN/m.
  - .2 Breaking strength (longitudinal/transversal): 31/31 kN/m.
  - .3 Ultimate elongation (longitudinal/transversal): 60/60 %.
  - .4 Tear resistance: 205 N.
  - .5 Cold bending at -30 degrees C: No cracking.
  - .6 Softening point:  $\leq$  110 degrees C.
  - .7 Static puncture resistance: >540.
  - .8 Dimensional Stability: -0.2 / 0.2 %.
- .7 ULC certification: Class A.
- .8 Acceptable Products:
  - .1 SOPRALENE FLAM 250gr by SOPREMA
  - .2 TORCHFLEX TP-250-CAP by IKO

## 2.5 BITUMEN

- .1 Asphalt: to CAN/CSA A123.4 ASTM D 312, Type 2

## 2.6 INSULATION

- .1 Roof Insulation:: Polyisocyanurate Insulation Boards: to ASTM C 1289-02 Type II, Class I, Grade 2 and CAN/ULC S 704, Type 3, Class 2 (See CCMC Evaluation Report 13058-L). Board Size: 1220mm x 2440mm, R value of 7.3 per 38mm. Thickness as indicated on drawings.
  - .1 Composed of a closed cell polyisocyanurate foam core bonded in the foaming process to 1/2" (13 mm) high density wood fiberboard on one side and a fiber reinforced facer on the other.
  - .2 Insulation manufacturing shall utilize an environmentally compliant blowing agent containing pentane hydrocarbon to enhance the thermal performance of the foam insulation. This hydrocarbon shall have zero ozone depletion potential and conform to the Montreal Protocol established in 1987.
  - .3 Acceptable Product:
    - .1 ENRGY 3 Plus by Johns Manville
    - .2 SOPRA-ISO B by Soprema
    - .3 IKOTherm by IKO

- .2 Parapet Insulation:
  - .1 Polyisocyanurate Insulation Boards as per Roof Insulation Boards. Board Size: 1220mm x 2440mm, 50mm thickness, R value of 11.06  
or
  - .2 Extruded polystyrene(XPS) to CAN/ULC-S701, ASTM C578. Type: 4, Compressive strength: 30 psi for vertical applications, Thickness: 50 mm, Size: 600 x 2400mm, Edges: shiplapped, Thermal Resistance: 5.0 Value/inch, Acceptable Product: Dow, Styrofoam SM
- .3 Protection Board: 3mm th. Semi-rigid asphaltic roofing substrate board. Mineral fortified asphaltic core formed between two fiberglass reinforcing plies. Acceptable Product: Sopraboard by Soprema.
- .4 Tapered Insulation: Insulation Boards as per Roof Insulation types, tapered to provide drainage slopes around roof elements to drains. Structural decks are installed flat, use sloped insulation to achieve slopes to drains.

## 2.7 SEALERS

- .1 Plastic cement: asphalt, to CAN/CGSB-37.5.
- .2 Sealing compound: to CAN/CGSB-37.29, rubber asphalt type.
- .3 Sealants:. Caulking - see Section 07 92 00 - Joint Sealants.

## 2.8 CARPENTRY

- .1 Refer to Section 06 10 00 - Rough Carpentry.

## 2.9 FASTENERS

- .1 Covering to steel deck: No. 10 flat head, self tapping, Type A or AB, cadmium plated screws.
- .2 Insulation to deck: coated insulation fasteners and galvanized plates must meet FM Approval for wind uplift and corrosion resistance, as recommended by insulation manufacturer.

## 2.10 ACCESSORIES

- .1 Vent stack flashings: purpose made spun aluminium, 1.6mm thick, 300mm high c/w integral deck flange and removable cap.
- .2 Sealing compound: Conform to CGSB 37-GP-29M.
- .3 "B" vent flashings: Thaler MEF-4A "B" vent flashings sized to suit vent diameter complete with integral deck flange and two piece collar.

- .4 Hot pipe flashings: Thaler MEF-3A hot pipe flashing sized to suit pipe diameter complete with integral deck flange and two piece friction fit collar.

**2.11 WATERPROOFING  
MASTICS**

- .1 Waterproofing products: Mastic made of synthetic rubbers, plasticized with bitumen and solvents. Aluminium pigments are added to Mastic to provide greater resistance to U.-V. Specified product: SOPRAMASTIC ALU by SOPREMA or IKO equal .
- .2 Waterproofing products in conformance with CAN/CGSB-19.13-M87 – Sealing compound, one-component, elastomeric, chemical curing.
- .3 An aluminium coloured solvent-based mastic containing superior grade bitumen modified with SBS synthetic rubber and fibres. Designed for pitch box filling. Specified product: MAMMOUTH PITCH POCKET FILLER by SOPREMA or IKO MS Detail..

**2.12 METAL FLASHINGS**

- .1 As per Section 07 62 00

**PART 3 - EXECUTION**

**3.1 WORKMANSHIP**

- .1 Do roofing work in accordance with applicable, standard in Canadian Roofing Contractors Association (CRCA) Roofing Specifications Manual and to FM ULC Design Standards, except where specified otherwise.
- .2 Do priming for asphalt roofing in accordance with CGSB 37-GP-15M.
- .3 The interface of the walls and roof steel deck assemblies shall be fitted with durable rigid material plywood providing connection point for continuity of air barrier.
- .4 Assembly, component and material connections will be made in consideration of appropriate design loads.
- .5 Prepare surfaces and complete Roofing work in conformance with Roofing Membrane Manufacturer's requirements, and the "Roofers' Guide".
- .6 Install roofing elements on clean and dry surfaces, in conformance with manufacturer's instructions and recommendations.

- .7 Roofing work must be completed in a continuous fashion as surfaces are readied and weather conditions permit.
- .8 Preferably seal all seams that are not covered by a cap sheet membrane in the same day. The cap sheet cannot be installed if any moisture is present at/in the base sheet seams.
- .9 Whenever membranes are torch applied, a continuous and even bead of molten bitumen must be visible as the membrane is unrolled and torched.
- .10 Roofing contractor responsible for installing parapet roof membranes over top of parapet curbs and down roof side of parapet.

### 3.2 EXAMINATION OF ROOF DECKS

- .1 Inspect with Consultant deck conditions including parapets, construction joints, roof drains, plumbing vents and ventilation outlets to determine readiness to proceed.
- .2 Prior to beginning of work ensure:
  - .1 Decks are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris. Do not use calcium or salt for ice or snow removal.
  - .2 Curbs have been built.
  - .3 Roof drains have been installed at proper elevations relative to finished roof surface.
  - .4 Plywood and lumber nailer plates have been installed to deck, walls and parapets as indicated.
- .3 Do not install roofing materials during rain or snowfall.
- .4 Before roofing work begins, the owner's representative and roofing foreman will inspect and approve deck conditions (including slopes and wood blocking) as well as upstands, parapets, and construction joints. If necessary, a non-conformity notice will be issued to the contractor so that required corrections can be made. The start of roofing work will mean roofing conditions are acceptable for work completion.

### 3.3 PROTECTION

- .1 Cover walls, walks and adjacent work where materials 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 immediately.
- .4 Dispose of rain water off roof and away from face of building until



roof drains or hoppers installed and connected.

- .5 Protect roof from traffic and damage. Comply with precautions deemed necessary by Consultant.
- .6 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed Work and materials out of storage.
- .7 Metal connectors and decking will be treated with rust proofing or galvanization.

### 3.4 DECK COVERING

- .1 Mechanically fasten to steel deck Glass Mat Gypsum Board and Plywood with screws to steel deck's upper rib surfaces, spaced 400 mm on centre each way.
- .2 Place with long axis of each sheet transverse to steel deck ribs, with end joints staggered and fully supported on ribs.

### 3.5 PRIMING

- 1 Apply deck primer to wood and concrete roofing substrate at the rate recommended by manufacturer.

### 3.6 EXPOSED MEMBRANE ROOFING APPLICATION

- .1 Apply self adhering vapour barrier membrane to primed wood, and concrete surfaces as per manufacturer's instructions.
- .2 Tapered insulation application:
  - .1 Mop insulation to vapour retarder and top layer of insulation to bottom layer with hot asphalt at rate of 1 kg/m<sup>2</sup>.
  - .2 Install tapered insulation as top insulation layer, in accordance with shop drawings. Stagger joints between layers 150 mm minimum.
- .3 Install roof cover board over roof insulation where re-cover board is not provided as part of insulation assembly to allow application of roof membrane base sheet.
- .4 Base sheet application:
  - .1 Starting at low point of roof, perpendicular to slope, unroll base sheet, align and reroll from both ends.
  - .2 Unroll and embed base sheet in uniform coating of asphalt applied at rate of 1.2 kg/m<sup>2</sup>, at 230 degrees C.
  - .3 Lap sheets 75 mm minimum for side and 150 mm minimum for end laps.
  - .4 Application to be free of blisters, wrinkles and fishmouths.
- .5 Cap sheet application:

- .1 Starting at low point on roof, perpendicular to slope, unroll cap sheet, align and reroll from both ends.
  - .2 Unroll and torch cap sheet onto base sheet taking care not to burn membrane or its reinforcement.
  - .3 Lap sheets 75 mm minimum for side laps and 150 mm minimum for end laps. Offset joints in cap sheet 300 mm minimum from those in base sheet.
  - .4 Application to be free of blisters, fishmouths and wrinkles.
  - .5 Do membrane application in accordance with manufacturer's recommendations.
  - .6 Apply reflective coating to roof surface area in accordance with manufacturers recommendations.
- .6 Flashings:
- .1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.
  - .2 mop base and torch cap sheet onto substrate in 1 metre wide strips.
  - .3 Lap flashing base sheet to membrane base sheet minimum 150 mm and seal by mopping or torch welding.
  - .4 Lap flashing cap sheet to membrane cap sheet 250 mm minimum and torch weld.
  - .5 Provide 75 mm minimum side lap and seal.
  - .6 Properly secure flashings to their support, without sags, blisters, fishmouths or wrinkles.
  - .7 Do work in accordance with manufacturer's recommendations Section 07 62 00 - Sheet Metal Flashing and Trim.
- .7 Roof penetrations:
- .1 Install roof drain pans, vent stack covers and other roof penetration flashings and seal to membrane in accordance with manufacturer's recommendations and details.

3.7 FIELD QUALITY CONTROL

- .1 Inspection and testing of membrane application will be carried out by testing laboratory designated by Owner.
- .2 Costs of tests will be paid under cash allowance by Owner.
- .3 Do not conceal waterproofing until inspection and testing are completed and approved by Roofing Inspection Company
- .4 The Owner's independent roofing inspector may conduct electric leak detection (ELD) tests on the roof assemblies at different stages of the works completion as defined and recommended by the roofing inspection company. The work of this Section shall be to co-ordinate and co-operate with the inspection company to facilitate these tests and make all necessary repairs as directed

by the inspection company resulting from these ELD tests.

3.8 CLEANING

- .1 Clean Work in accordance with Section 01 74 11 - Cleaning.
- .2 Clean to Consultant's approval, soiled surfaces, spatters, and damage caused by Work of this Section.
- .3 Check area drains to ensure cleanliness and proper function, and remove debris, equipment and excess material from site.
- .4 Remove bituminous markings from finished surfaces.
- .5 In areas where finished surfaces are soiled caused by work of this section, consult manufacturer of surfaces for cleaning advice and complying with their documented instructions.
- .6 Repair or replace defaced or disfigured finishes caused by work of this section.

**END OF SECTION**

## **PART 1 - GENERAL**

- |   |   |
|---|---|
| <b><u>1.1 RELATED SECTIONS</u></b>              | .1 Section 06 10 00 - Rough Carpentry<br>.2 Section 07 27 00 – Air Barriers<br>.3 Section 07 52 00 – Modified Bituminous Roofing and Waterproofing.   |
| <b><u>1.2 REFERENCES</u></b>                    | .1 American Society for Testing and Materials (ASTM International)<br><br>.3 Canadian Roofing Contractors Association (CRCA)<br>.1 Roofing Specifications Manual 1997.<br><br>.4 Canadian General Standards Board (CGSB)<br>.1 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.<br>.2 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.<br>.3 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.<br><br>.5 Canadian Standards Association (CSA International)<br>.1 CSA A123.3-05, Asphalt Saturated Organic Roofing Felt.<br>.2 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.                    |
| <b><u>1.3 SAMPLES</u></b>                       | .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.<br><br>.2 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, colour and finish.  |
| <b><u>1.4 WASTE MANAGEMENT AND DISPOSAL</u></b> | .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.<br><br>.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.<br><br>.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.<br><br>.4 Place materials defined as hazardous or toxic in designated containers.<br><br>.5 Ensure emptied containers are sealed and stored safely for disposal away from children. |

- .6 Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.
- .7 Unused paint and sealant material must be disposed of at an official hazardous material collections site as approved by Consultant.
- .8 Unused paint and sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .9 Fold up metal banding, flatten and place in designated area for recycling.

## **PART 2 - PRODUCTS**

### **2.1 SHEET METAL MATERIALS**

- .1 Zinc coated steel sheet: 26 GA, 0.457mm thickness, commercial quality to ASTM A 653/A 653M, with Z275 designation zinc coating.

### **2.2 METAL FINISHES**

- .1 Prefinished steel with factory applied silicone modified polyester.
  - .1 Class F1S.
  - .2 Colour: Based on Manufacturer's standard colour range.
  - .3 Specular gloss: 30 units +/- 5 in accordance with ASTM D 523.
  - .4 Coating thickness: not less than 20 micrometres.
  - .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D 822 as follows:
    - .1 Outdoor exposure period 1000 hours.
    - .2 Humidity resistance exposure period 1000 hours.

### **2.3 ACCESSORIES**

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement: to CAN/CGSB 37.5.
- .3 Underlay for metal flashing: self adhesive membrane composed of SBS modified bitumen and a polyethylene woven complex c/w primer.
  - .1 Acceptable products: Refer to Section 07 27 00 – Air Barriers
- .4 Sealants: as per Section 07 92 00.
- .5 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.

- .6 Fasteners: of same material as sheet metal, to CSA B111, ring thread flat head roofing nails of length and thickness suitable for metal flashing application.
- .7 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .8 Touch-up paint: as recommended by prefinished material manufacturer.

## 2.4 FABRICATION

- .1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA 'FL' series details and as indicated.
- .2 Form pieces in 2400 mm maximum lengths. Make allowance for expansion at joints.
- .3 Hem exposed edges on underside 12 mm. Mitre and seal corners with sealant.
- .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .5 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

## 2.5 METAL FLASHINGS

- .1 Form metal flashing trims to metal siding with 26 ga. Prefinished sheet metal, finish to match siding.

## **PART 3 - EXECUTION**

### 3.1 INSTALLATION

- .1 Install sheet metal work in accordance with CRCA FL series details, and as detailed.
- .2 Use concealed fastenings except where approved before installation.
- .3 Provide underlay under sheet metal. Secure in place and lap joints 100 mm.
- .4 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock forming tight fit over hook strips, as detailed.
- .5 Lock end joints and caulk with sealant.

- .6 Install surface mounted reglets true and level, and caulk top of reglet with sealant.
- .7 Insert metal flashing into reglets and under cap flashing to form weather tight junction.
- .8 Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm. Lead wedge flashing securely into joint.
- .9 Caulk flashing at reglet and cap flashing with sealant.

### 3.2 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Leave work areas clean, free from grease, finger marks and stains.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 SECTION INCLUDES**

- .1 The work of this Section includes all material, equipment, tools, and labour required to supply and install fire stopping materials to maintain noted fire separations.
- .2 Fire stopping of mechanical and electrical service penetrations are the responsibility of the mechanical and electrical trades. Mechanical, plumbing, fire protection, and electrical shall each be responsible for fire stopping their service penetrations. Refer to mechanical and electrical specifications.

### **1.2 RELATED SECTIONS**

- .1 Section 05 41 00 - Structural Metal Stud Framing
- .2 Section 07 21 13 - Board Insulation
- .3 Section 07 21 16 - Blanket Insulation
- .4 Section 07 92 00 - Joint Sealants
- .5 Section 09 21 16 - Gypsum Board Assemblies
- .6 Section 09 22 16 - Non-structural Metal Framing

### **1.3 REFERENCES**

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

### **1.4 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. Fire stop material also refers to assemblies intended to close off openings and gaps in the floor slabs and between wall assemblies and the edges of floor slabs to maintain fire separations between floor levels.
- .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.

.1 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.

### 1.5 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets.
- .3 Shop Drawings:
  - .1 Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation.
  - .2 Construction details should accurately reflect actual job conditions.
- .4 Samples:
  - .1 Submit duplicate 300 x 300 mm samples showing actual fire stop material proposed for project.
- .5 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
  - .1 Test reports: in accordance with CAN-ULC-S101 for fire endurance and CAN-ULC-S102 for surface burning characteristics.
  - .2 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.
  - .3 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .4 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.
  - .5 Manufacturer's Field Reports: submit to manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

### 1.6 QUALITY ASSURANCE

- .1 Qualifications:
  - .1 Installer: company specializing in fire stopping

installations with 5 years documented experience approved by manufacturer.

- .2 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with contractor's representative and Consultant to:
  - .1 Verify project requirements.
  - .2 Review installation and substrate conditions.
  - .3 Co-ordination with other building subtrades.
  - .4 Review manufacturer's installation instructions and warranty requirements.

- .3 Site Meetings: as part of Manufacturer's Services described in PART 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.
  - .1 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.
  - .2 Twice during progress of Work at 25% and 60% complete.
  - .3 Upon completion of Work, after cleaning is carried out.

#### 1.7 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle materials in accordance w.th Section 01 61 00 - Common Product Requirements
  - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
  - .3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer, ULC markings.
- .2 Storage and Protection:
  - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.
- .3 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

### **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: to match rating of assembly at location of use.
- .2 Service penetration assemblies: systems tested to CAN-ULC-S115.
- .3 Service penetration fire stop components: certified by test laboratory to CAN-ULC-S115.
- .4 Fire-resistance rating of installed fire stopping assembly in accordance with NBC and OBC.
- .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 Fire stopping and smoke seals at perimeter of rated walls and floors: Elastomeric Seal.
- .8 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .9 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .10 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.
- .11 Sealants for vertical joints: non-sagging.

### **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.
    - .1 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. Where firestopping at the top of walls will remain visible in the finished work the joint must be tooled to the acceptable of the Consultant or covered over with a painted bent metal continuous closure plate (100mm x 100mm x 2mm th. x max length ) to hide the joint. (Science, Biology, Chemistry Rooms, and associated Prep Rooms).
  - .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 Mechanical pipe insulation: certified fire stop system component.
    - .1 Ensure pipe insulation installation precedes fire stopping.
- 3.5 FIELD QUALITY
- .1 Inspections: notify Authority Having Jurisdiction and Consultant

CONTROL

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 as described in PART 1 - SUBMITTALS.
  - .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 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.6 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

3.7 SCHEDULE

- .1 Fire stop and smoke seal at:
  - .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
  - .2 Top of fire-resistance rated masonry and gypsum board partitions.
  - .3 Intersection of fire-resistance rated masonry and gypsum board partitions.
  - .4 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
  - .5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
  - .6 Openings and sleeves installed for future use through fire separations.
  - .7 Around mechanical and electrical assemblies penetrating fire separations.
  - .8 Rigid ducts: greater than 129 cm<sup>2</sup>: 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 fire separation.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 SECTION INCLUDES**

- .1 The work of this Section includes all, materials, tools and equipment, and labour required to supply and install joint sealants for the project as indicated on the drawings and noted below.
- .2 Requirements for Joint Sealants to complete other various Sections containing sealant or caulking specifications.

### **1.2 RELATED SECTIONS**

- .1 Section 04 05 00 - Common Work Results for Masonry
- .2 Section 07 27 00 - Air Barriers
- .3 Section 07 62 00 - Sheet Metal Flashing and Trim
- .4 Section 08 11 00 - Metal Doors and Frames
- .5 Section 08 11 16 - Aluminum Doors and Frames
- .6 Section 08 44 13 - Glazed Aluminum Curtain Walls
- .7 Section 08 80 50 - Glazing
- .8 Section 09 21 16 - Gypsum Board Assemblies
- .9 Section 09 22 16 - Non-structural Metal Framing

### **1.3 REFERENCES**

- .1 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM C 919-02, Standard Practice for Use of Sealants in Acoustical Applications.
- .2 Canadian General Standards Board (CGSB)
  - .1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
  - .2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
  - .3 CGSB 19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
  - .4 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
  - .5 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.
- .3 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .4 General Services Administration (GSA) - Federal Specifications (FS)
  - .1 FS-SS-S-200-E(2)1993, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.

- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .6 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

#### 1.4 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Manufacturer's product to describe.
  - .1 Caulking compound.
  - .2 Primers.
  - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
- .3 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .4 Submit duplicate samples of each type of material and colour.
- .5 Cured samples of exposed sealants for each color where required to match adjacent material.
- .6 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Instructions to include installation instructions for each product used.
- .7 Submit MSDS with VOC contents as per 01 61 00 for approval

#### 1.5 QUALITY ASSURANCE/MOCK-UP

- .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
- .2 Construct mock-up to show location, size, shape and depth of joint s complete with back-up material, primer, caulking and sealant.
- .3 Mock-up will be used:
  - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
- .4 Locate where directed.
- .5 Allow 24 hours for inspection of mock-up by Consultant before proceeding with sealant work.
- .6 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-up may remain as

part of finished Work.

1.6 DELIVERY,  
STORAGE, AND  
HANDLING

- .1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.7 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .6 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .7 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Consultant.
- .8 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.
- .9 Fold up metal banding, flatten, and place in designated area for recycling.

1.8 PROJECT  
CONDITIONS

- .1 Environmental Limitations:
  - .1 Do not proceed with installation of joint sealants under following conditions:
    - .1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.
    - .2 When joint substrates are wet.



- .2 Joint-Width Conditions:
    - .1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
  - .3 Joint-Substrate Conditions:
    - .1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.
- 1.9 ENVIRONMENTAL REQUIREMENTS**
- .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 (MSDS) acceptable to Labour Canada.
  - .2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
  - .3 Ventilate area of work by use of approved portable supply and exhaust fans.
- 1.10 WARRANTY**
- .1 Contractor hereby warrants that joint sealants will stay in place and remain leakproof in accordance with General Conditions (GC), but for five years from the date of substantial performance of the contract. Make all necessary repairs and replacements within 48 hours of receipt of written notification.
- PART 2 – PRODUCTS**
- 2.1 SEALANT MATERIALS**
- .1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.
  - .2 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize offgas time.
  - .3 Where sealants are qualified with primers use only these primers.
  - .4 VOC limit for joint sealants as per 01 61 00.
    - .1 Substrate metal to metal sealant 30g/l
    - .2 Substrate plastic foam sealant 50g/l
    - .3 Substrate porous material sealant 50g/l

- .4 Substrate wood sealant 30g/l
- .5 Substrate fibreglass sealant 80g/l
- .6 Architectural sealant 250g/l
- .7 other 420g/l
  
- .5 VOC limit for sealant primers as per 01 61 00.
  - .1 Architectural nonporous 250g/l
  - .2 Architectural porous 775g/l
  - .3 other 750g/l
  
- .6 All sealants and primers shall comply with SCAQMD 1168, aerosol adhesives to comply with Green Seal Standard for Commercial adhesives.

2.2 SEALANT  
MATERIAL  
DESIGNATIONS

- .1 Type 1: Urethanes Two Part.
  - .1 Non-Sag to CAN/CGSB-19.24, Type 2, Class B, colour selected by consultant from full product range.
  - .2 Acceptable material:Tremco Dymeric 240
  
- .2 Type 2: Urethanes One Part.
  - .1 Self-Leveling to CAN/CGSB-19.13, MG-2-25-B-N, colour selected by consultant from full product range
  - .2 Acceptable material : Tremco Dymonic or Pourthane NS by W.R.Meadows.
  
- .3 Type 3: Silicones One Part.
  - .1 To CAN/CGSB-19.13, Type MCG-2-25-A-L.
  - .2 Acceptable material: Spectrum 2 by Tremco
  
- .4 Type 4: Silicone Resistant One Part Mildew resistant:
  - .1 Acceptable material:Tremsil 200 by Tremco
  
- .5 Type 5: Acrylic Latex One Part.
  - .1 To CAN/CGSB-19.17.
  - .2 Acceptable material:Tremflex 834 by Tremco
  
- .6 Type 6: Acoustical Sealant.
  - .1 To ASTM C 919.
  - .2 Acceptable material: Acoustical Sealant by Tremco
  
- .7 Type 7: Urethanes One or Two Part
  - .1 Multi or single component, self levelling or slope grade polyurethane sealant to ASTM C 920, Type M, Grade P, Class 25, Use T,M,A and O
  - .2 Acceptable material: THC 900 or THC901 hybrid or Vulkem 45 by Tremco
  
- .8 Preformed Compressible and Non-Compressible back-up materials.
  - .1 Polyethylene, Urethane, Neoprene or Vinyl Foam.

- .1 Extruded open closed cell foam backer rod.
- .2 Size: oversize 30 to 50 %.
- .2 Neoprene or Butyl Rubber.
  - .1 Round solid rod, Shore A hardness 70.
- .3 High Density Foam.
  - .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m<sup>3</sup> density, or neoprene foam backer, size as recommended by manufacturer.
- .4 Bond Breaker Tape.
  - .1 Polyethylene bond breaker tape which will not bond to sealant.

### 2.3 SEALANT SELECTION

- .1 Use Sealant Type 1 or Type 3 at all locations except where another type is specified including: exterior joint work, bedding for windows, perimeter of all aluminum and steel entrance frames and windows including around base of all frames, below perimeter edge of door thresholds, perimeter of all louvers and exhaust caps, balcony floor slabs and poured concrete curbs.
- .2 Use Sealant Type 1 or Type 3 at Expansion and control joints in exterior surfaces of poured-in-place concrete walls, and at exterior side of cold joint at balcony concrete curbs.
- .3 Use Sealant Type 1 or Type 3 at Expansion and control joints in exterior surfaces of precast panels.
- .4 Use Sealant Type 1 or Type 3 at Control and expansion joints in exterior surfaces of unit masonry walls.
- .5 Use Sealant Type 3 at glass to glass, glass to metal and metal to metal joints, including coping joints and coping-to facade joints:
- .6 Use Sealant Type 7 at exterior joints in horizontal wearing surfaces, and penetrations through floors.
- .7 Use Sealant type 2 or Type 3 at all interior perimeters of exterior openings as detailed on drawings. Use at interior joints between windows, door frames and screen frames and adjacent wall assemblies.
- .8 Use Sealant Type 2 or Type 3 at all control and expansion joints on the interior of exterior poured-in place concrete walls.
- .9 Use Sealant Type 2 or Type 3 at control and expansion joints on the interior of exterior surfaces of unit masonry walls.
- .10 Use Sealant Type 7 at Interior control and expansion joints in floor surfaces, sawcuts and perimeter joints in floor slabs..

- .11 Use Sealant Type 2 or Type 3 at perimeters of interior frames and penetrations through interior walls.
- .12 Use Sealant Type 2 or Type 3 at interior masonry vertical control joints (block-to-block, block-to-concrete, and intersecting masonry walls).
- .13 Use Sealant Type 6 at joints at tops of non-load bearing, non-rated masonry walls at the underside of poured concrete.
- .14 Use Sealant type 4 at perimeter of bath fixtures (e.g. sinks, tubs, urinals, stools, water closets, basins, access doors, vanities, and countertops).
- .15 Use Sealant Type 5 at exposed interior control joints in drywall.
- .16 Use Sealant Type 6 at Perimeter of all acoustically rated partitions and around penetrations through acoustically rated partitions.

#### 2.4 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 PROTECTION

- .1 Protect installed Work of other trades from staining or contamination.

#### 3.2 SURFACE PREPARATION

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.
- .3 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.
- .4 Ensure joint surfaces are dry and frost free.

- .5 Prepare surfaces in accordance with manufacturer's directions.
- 3.3 TESTING .1 Perform an adhesive test of proposed joint sealant for all exterior applications to confirm surface prep, priming and sealant performance to manufacturer's specifications. Submit written test results to Consultant prior to proceeding with project work.
- 3.4 PRIMING .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.
- 3.5 BACKUP MATERIAL .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.
- 3.6 MIXING .1 Mix materials in strict accordance with sealant manufacturer's instructions.
- 3.7 APPLICATION .1 Sealant.
- .1 Apply sealant in accordance with manufacturer's written instructions.
- .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
- .3 Apply primer to joints prior to caulking application.
- .3 Apply sealant in continuous beads.
- .4 Apply sealant using gun with proper size nozzle.
- .5 Use sufficient pressure to fill voids and joints solid.
- .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
- .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
- .8 Remove excess compound promptly as work progresses and upon completion.
- .9 Install backing rods to support sealants where joint gaps exceed 3mm.
- .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 Cleanup.
  - .1 Clean adjacent surfaces immediately and leave Work neat and clean.
  - .2 Remove excess and droppings, using recommended cleaners as work progresses.
  - .3 Remove masking tape after initial set of sealant.

**END OF SECTION**

## 1.0 DOOR SCHEDULE INDEX

Door Schedule Legend Section 08 00 00	2 pages
Door Schedule, Section 08 00 01	1 page
Door Schedule Drawings:	2 pages
08 00 00.02 Door and Frame Types	
08 00 00.03 Frame Details	

## 2.0 GENERAL NOTES

- .1 All metal doors and frames for painting
- .2 Door sizes shown are frame rebate sizes
- .3 Glass for hollow metal screens shall be the same as doors within the screen and as noted.
- .4 All hollow metal frames in masonry or concrete walls shall be filled with grout.
- .5 Where doors are fire-rated or ULC labelled, door frames and hardware shall match.
- .6 Provide sealant around all hollow metal frames, both sides.
- .7 Provide door caps across head of exterior, stair and security doors.
- .8 Undercut doors to janitor closets and electrical rooms.
- .9 Indicated size of glass units in doors shall be exposed glass area, inside glazing stop to inside glazing stop.
- .10 All exterior hollow metal doors shall be insulated units. Refer to specification section 08 11 00.
- .11 Throat dimensions noted in schedule are equal to the overall wall thickness for-wrap around frames.
- .12 Confirm sizes of all existing frames to remain prior to ordering new doors to fit within.
- .13 Refer to Finish Schedule for finishing of new and existing frames. Existing frames to remain to be sanded smooth and primed for new paint finish.
- .14 Where indicated on door schedule new door to be installed in existing frame with different door swing, into the classroom. Prep and repair existing door frame for new door and new door swing. Refer to hardware schedule.

### 3.0 DOOR SCHEDULE LEGEND

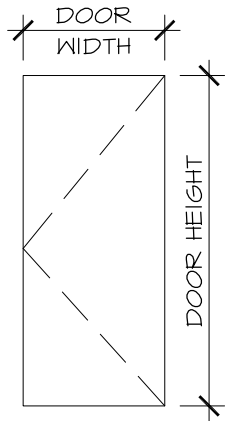
PSF-__	Pressed Steel Frame
SCWD-__	Solid Core Wood Door type
PT	Paint Finish
PF	Prefinished material
ST	Stain Finish
GL-__	Glass type (refer to Section 08 80 50)
GL-1	Insulated Tempered Glass

**END**

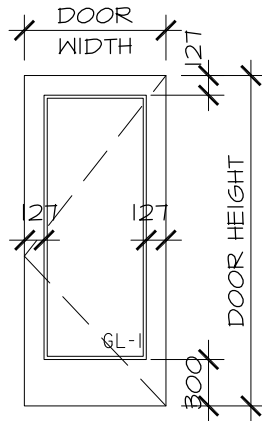


Door No	Room Name	Frame Type	Throat Dim	Finish	Details	Door Type	Width	Height	Finish	Glass	Label Min.	Hardware Heading	Remarks
EX.1	Corridor B	EXF-1	N/A	PT		ALD-B	1200	2150	C/A				EXISTING DOOR TO BE REMOVED & INFILLED AS PER DETAIL 12/A6.01
000.1	Ex. Corridor	ALF-1	+/-190 (SITE DIM.)	PT	JD-1	ALD-B	1200	2150	Red	GL-1			Site Confirm Opening size. Duramar Finish to match existing doors/ PROVIDE BF OPERATOR & CARD READER
101.1	MUSIC ROOM	PSF-1	+/-190 (SITE DIM.)	PT	JD-1	WD-C	1200	2150	PT	GL-2	N/A		NEW DOOR IN EX. WINDOW OPENING/ PROVIDE SOUND GASKETING
102.1	STORAGE	PSF-1	184	PT	JD-3	WD-C	965	2150	PT	GL-2	N/A		
103.1	OFFICE	PSF-1	124	PT	JD-5	WD-A	965	2150	PT	N/A	N/A		PROVIDE SOUND GASKETING
104.1	PRACTICE ROOM 1	PSF-1	216	PT	JD-4	WD-C	965	2150	PT	GL-2	N/A		PROVIDE SOUND GASKETING
105.1	PRACTICE ROOM 2	PSF-1	216	PT	JD-4	WD-C	965	2150	PT	GL-2	N/A		PROVIDE SOUND GASKETING

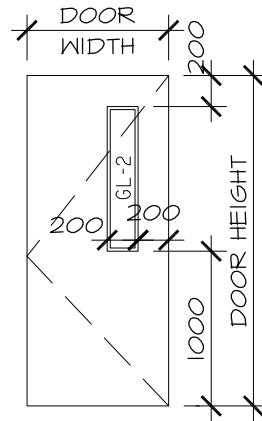
# ALUMINUM AND WOOD DOOR TYPES



TYPE A

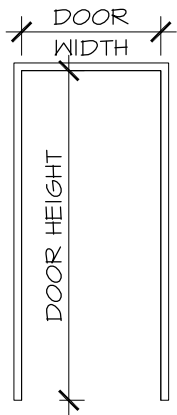


TYPE B



TYPE C

# FRAME TYPES



PSF-1 / ALF-1



project  
**TURNBULL SCHOOL  
 MUSIC ROOM ADDITION**  
 1132 FISHER AVE.  
 OTTAWA, ON

drawing title  
**DOOR & FRAME  
 TYPES**

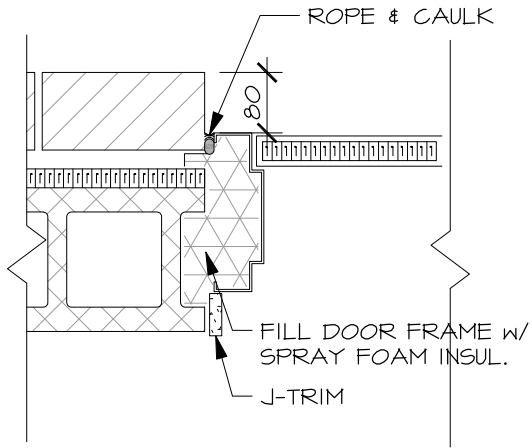
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 JUNE 2018

scale  
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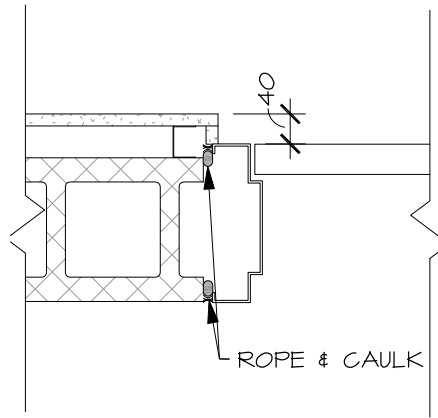
project  
 1705

dwg. no.  
 08 00 00.02

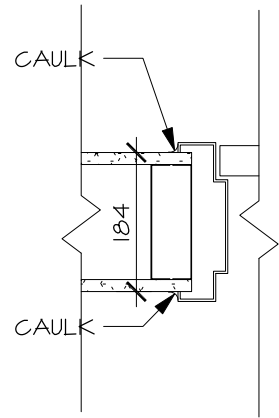
# DOOR FRAME DETAILS



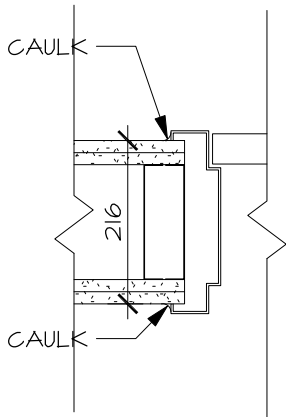
JAMB DETAIL 1



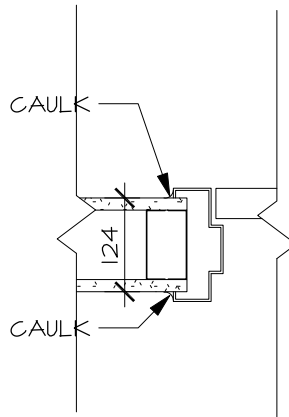
JAMB DETAIL 2



JAMB DETAIL 3



JAMB DETAIL 4



JAMB DETAIL 5



project  
**TURNBULL SCHOOL  
 MUSIC ROOM ADDITION**  
 1132 FISHER AVE.  
 OTTAWA, ON

drawing title  
**FRAME DETAILS**

date  
 JUNE 2018

scale  
 N/A

project  
 1705

dwg. no.  
 08 00 00.03

## **PART 1 - GENERAL**

- |                             |  |   |
|-----------------------------|--|---|
| <u>1.1 RELATED SECTIONS</u> | .1<br>.2<br>.3<br>.3<br>.4<br>.5<br>.6<br>.7<br>.8   | Section 04 05 00 - Common Work Results for Masonry<br>Section 06 10 00 – Rough Carpentry<br>Section 07 92 00 - Joint Sealants<br>Section 08 14 16 - Flush Wood Doors<br>Section 08 71 00 - Door Hardware<br>Section 08 80 50 - Glazing<br>Section 09 22 16 - Non-structural Metal Framing<br>Section 09 91 13 - Exterior Painting<br>Section 09 91 23 - Interior Painting   |
| <u>1.2 REFERENCES</u>       | .1<br>.1<br>.2<br>.1<br>.2<br>.3<br>.1<br>.2<br>.4<br>.1<br>.2<br>.5<br>.1<br>.2<br>.3<br>.4 | American Society for Testing and Materials International (ASTM)<br>ASTM A 653/A 653M-06a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.<br>Canadian General Standards Board (CGSB)<br>CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.<br>CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.<br>Canadian Standards Association (CSA International)<br>CSA-G40.20-04/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.<br>CSA W59-03, Welded Steel Construction (Metal Arc Welding).<br>Canadian Steel Door Manufacturers' Association (CSDMA)<br>CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2000.<br>CSDMA, Selection and Usage Guide for Commercial Steel Doors, 1990.<br>National Fire Protection Association (NFPA)<br>NFPA 80-99, Standard for Fire Doors and Fire Windows.<br>NFPA 252-03, Standard Methods of Fire Tests of Door Assemblies.<br>Underwriters' Laboratories of Canada (ULC)<br>CAN/ULC-S701-01, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.<br>CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.<br>CAN4-S104-M80, Standard Method for Fire Tests of Door Assemblies.<br>CAN4-S105-M85, Standard Specification for Fire Door |

Frames Meeting the Performance Required by CAN4-S104.

1.3 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 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 NFPA 252 for ratings specified or indicated.
  - .4 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104, ASTM E 152 or NFPA 252 and listed by nationally recognized agency having factory inspection services.

1.4 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 shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.
- .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
  - .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.

1.5 DELIVERY,  
STORAGE AND  
HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Waste Management and Disposal:
- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Hot dipped galvanized steel sheet: to ASTM A 653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.
  - .1 Recycled Content: 30 % post-consumer content, 0 % pre-consumer content.
- .2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A 653M, ZF75.
  - .1 Recycled Content: 30 % post-consumer content, 0 % pre-consumer content.

### **2.2 PRIMER**

- .1 Touch-up prime CAN/CGSB-1.181.
  - .1 Maximum VOC limit 50 g/L to GC-03.

### **2.3 PAINT**

- .1 Field paint steel doors and frames in accordance with Sections 09 91 23 - Interior Painting, 09 91 13 - Exterior Painting. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.
  - .1 Maximum VOC emission level 50 g/L to GS-11.

### **2.4 FRAMES FABRICATION GENERAL**

- .1 Fabricate frames in accordance with CSDMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Exterior frames: 1.6 mm welded type construction.
- .4 Interior frames: 1.6 mm welded type construction.
- .5 Blank, reinforce, drill and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .6 Protect mortised cutouts with steel guard boxes.
- .7 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .8 Manufacturer's nameplates on frames and screens are not permitted.
- .9 Conceal fastenings except where exposed fastenings are indicated.

- .10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .11 Insulate exterior frame components with polyurethane insulation.

#### 2.5 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.

#### 2.6 FRAMES: WELDED TYPE

- .1 Welding in accordance with CSA W59.
- .2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
- .3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.
- .4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
- .5 Securely attach floor anchors to inside of each jamb profile.
- .6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

#### 2.7 HOLLOW STEEL CONSTRUCTION

- .1 Form face sheets for exterior doors from 1.6 mm (16ga) sheet steel.
- .2 Form face sheets for interior doors from 1.6 mm (16ga) sheet steel.
- .3 Reinforce exterior doors with vertical stiffeners, securely welded to face sheets at 150 mm on centre maximum.
- .4 Fill voids between stiffeners of exterior doors with polyurethane core.

- .5 Fill voids between stiffeners of interior doors with fibreglass core.

### **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. Frame installation tolerances to comply with Canadian Steel Door manufacturer's Association Standard as indicated on Drawings 08 11 00-1, 2, 3 & 4 included as part of this section.
- .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 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: 3.3 mm.
  - .2 Latchside and head: 3.3 mm.
  - .3 Finished floor, and thresholds: 19 mm.Door clearance tolerances to comply with Canadian Steel Door



manufacturer's Association Standard as indicated on Drawings 08 11 00-1, 2, 3 & 4 included as part of this section.

- .3 Adjust operable parts for correct function.
- .4 Install louvers where indicated.

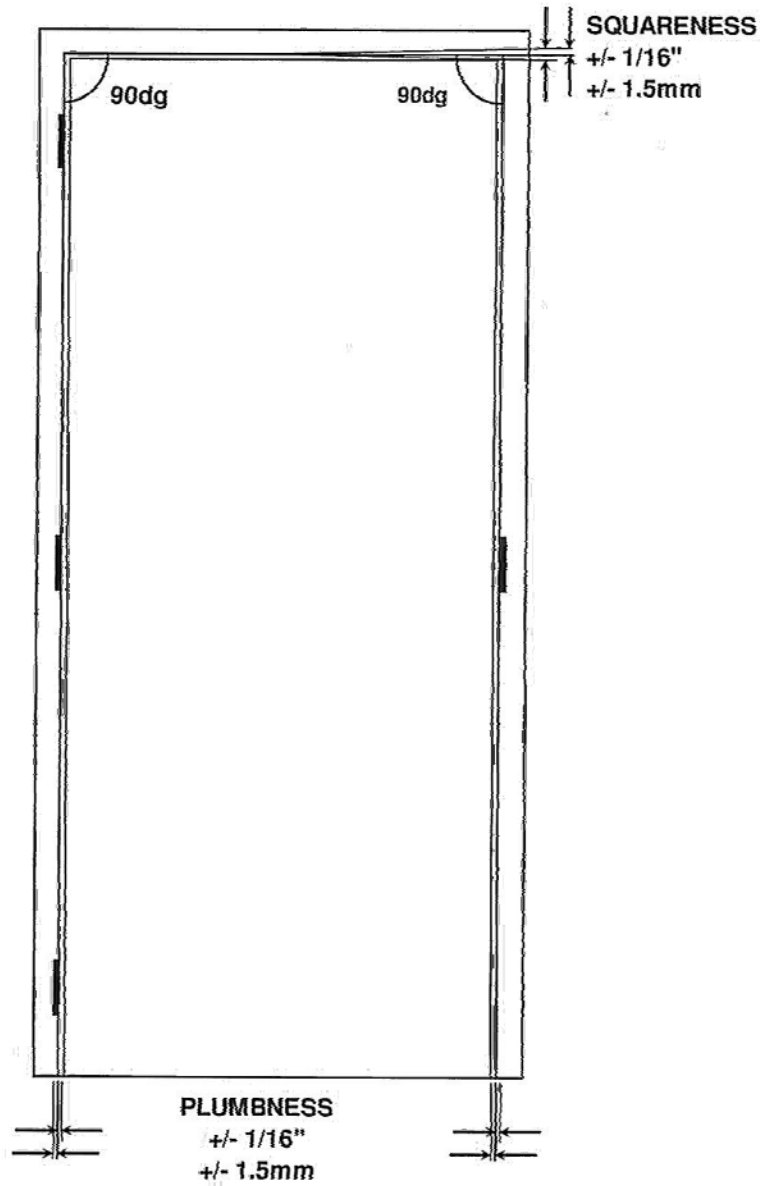
### 3.5 FINISH REPAIRS

- .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 and Door Schedule.

**END OF SECTION**



**NOTE:** The accumulative effect of installations with tolerances at their maximum will result in sufficient misalignment to prevent the door and/or hardware from functioning properly. Installers are cautioned not to create tolerance build up. Reference: NFPA 80-Standard for Fire Doors and Windows



project  
**TURNBULL SCHOOL  
 MUSIC ROOM ADDITION**  
 1132 FISHER AVE.  
 OTTAWA, ON

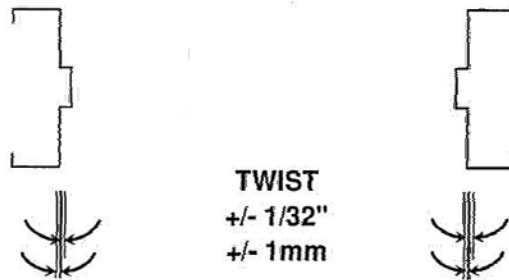
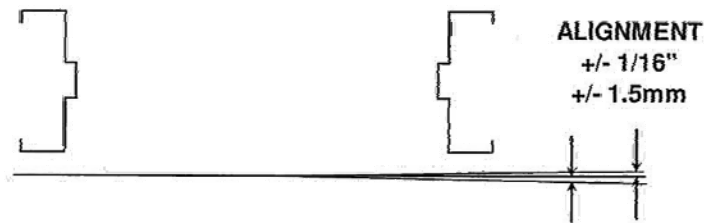
drawing title  
 FRAME  
 INSTALLATION  
 TOLERANCES

date  
 JUNE 2018

scale  
 N/A

project  
 1705

dwg. no.  
 08 11 00.01



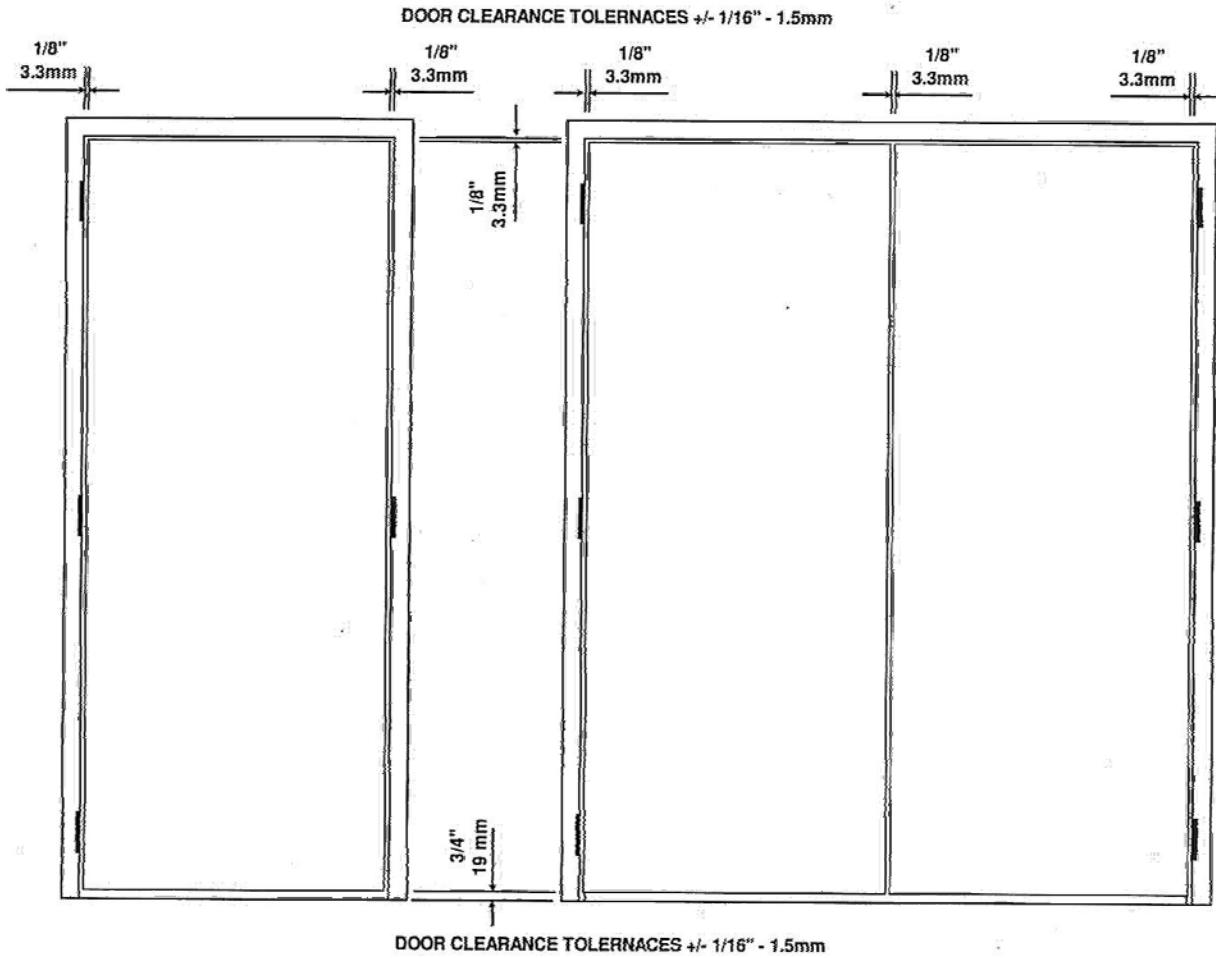
**NOTE:** The accumulative effect of installations with tolerances at their maximum will result in sufficient misalignment to prevent the door and/or hardware from functioning properly. Installers are cautioned not to create tolerance build up. Reference: NFPA 80-Standard for Fire Doors and Windows




project  
**TURNBULL SCHOOL  
 MUSIC ROOM ADDITION**  
 1132 FISHER AVE.  
 OTTAWA, ON

drawing title  
 FRAME  
 INSTALLATION  
 TOLERANCES

date JUNE 2018	scale
project 1705	dwg. no. 08 11 00.02



**NOTE: The accumulative effect of installations with tolerances at their maximum will result in sufficient misalignment to prevent the door and/or hardware from functioning properly. Installers are cautioned not to create tolerance build up. Reference: NFPA 80-Standard for Fire Doors and Windows**

	project <b>TURNBULL SCHOOL MUSIC ROOM ADDITION</b> 1132 FISHER AVE. OTTAWA, ON	drawing title DOOR CLEARANCES TOLERANCES	date JUNE 2018	scale N/A
			project 1705	dwg. no. 08 11 00.03

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 06 10 00 - Rough Carpentry
- .2 Section 07 27 00 - Air Barriers
- .3 Section 07 92 00 - Joint Sealants
- .4 Section 08 44 13 - Glazed Aluminum Curtain Wall
- .5 Section 08 71 00 - Door Hardware - General
- .6 Section 08 80 50 - Glazing
- .7 Division 26 - Electrical – connections for security systems and sensors, outlet boxes, conduit boxes and fittings
- .8 Section 09 00 00 – Interior Finishes Material / Colour Legend
- .9 Section 09 00 01 – Interior Room Finish Schedule

### **1.2 REFERENCES**

- .1 Aluminum Association (AA).
  - .1 DAF 45-03, Designation System for Aluminum Finishes.
- .2 American Architectural Manufacturers Association (AAMA).
  - .1 AAMA 609/610-09, Cleaning and Maintenance of Architectural Anodized Aluminum.
- .3 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM E 330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .4 Canadian General Standards Board (CGSB).
  - .1 CGSB 1.40-97, Primer, Structural Steel, Oil Alkyd Type.
  - .2 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
  - .3 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.
- .5 Canadian Standards Association (CSA International).
  - .1 CAN/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.

### **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 75 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.

- .2 Size glass thickness and glass unit dimensions to limits in accordance with CAN/CGSB-12.20.
- .3 Design door system to provide average thermal resistance of:
  - .1 Door system (excluding vision glass areas): RSI of 3.8.
- .4 Provide continuous air barrier and vapour retarder through door system. Primarily in line with inside pane of glass and heel bead of glazing compound.

1.4 SUBMITTALS

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheets in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's for caulking materials during application and curing.

1.5 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 each type of 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.
  - .7 Each type of door system including location.
  - .8 Arrangement of hardware and required clearances.
- .3 Submit catalogue details for each type of door and frame illustrating profiles, dimensions and methods of assembly.

1.6 CLOSEOUT  
SUBMITTALS

- .1 Provide maintenance data for cleaning and maintenance of aluminum finishes for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.7 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.

1.8 DELIVERY,  
STORAGE, AND  
HANDLING

- .1 Storage and Protection:
  - .1 Apply temporary protective coating to finished surfaces. Remove coating after erection. Do not use coatings that will become hard to remove or leave residue.
  - .2 Leave protective covering in place until final cleaning of building.

1.9 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - 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.
- .4 Divert used metal cut-offs from landfill by disposal into the on-site metals recycling bin.

1.10 WARRANTY

- .1 The warranty period stated in General Conditions and relevant supplementary conditions is with respect to this section of work extended from one year to three. Provide a written guarantee.
- .2 Warrant that aluminium finishes will not develop excessive fading, non-uniformity of colour and will not crack, peel, delaminate or otherwise corrode and that hardware fastening points will not wear excessively allowing hardware to work loose.
- .3 Warrant that stainless steel cladding will not crack, peel, delaminate from aluminium frames and doors.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Aluminum extrusions: Aluminum Association alloy AA 6063-T5 or T6 anodizing quality.
- .2 Sheet aluminum: Aluminum Association alloy AA 1100 - H14 or AA 5005 - H32 or H34 anodizing quality.
- .3 Steel reinforcement: to CAN/CSA-G40.20/G40.21, grade 300 W.
- .4 Fasteners: stainless steel, finished to match adjacent material.
- .5 Weatherstrip: replaceable mohair backed wool pile.
- .6 Door bumpers: black neoprene.
- .7 Door bottom seal: adjustable door seal of anodized extruded aluminum frame and vinyl weather seal, surface mounted with drip cap, closed ends.
- .8 Isolation coating: alkali resistant bituminous paint.
- .9 Glazing materials: as per Section 08 80 50.
- .10 Sealants: as per Section 07 92 00 colour selected by Consultant.
- .11 Plastic shims: Glazelock Shims, High impact polystyrene horseshoe shaped purpose made glazing shims. (wood shims are NOT PERMITTED on this project.)
- .12 Aluminum cladding: Provide sample of corner closure pieces, caps, transom panels, louvers etc. for review and approval.

### **2.2 ALUMINUM SWING DOORS**

- .1 Construct doors of porthole extrusions with minimum wall thickness of 2.4 mm.
- .2 Door stiles nominal 127 mm wide plus or minus 6 mm.
- .3 Top rail nominal 127 mm wide plus or minus 6 mm.
- .4 Bottom rail nominal 165 mm wide plus or minus 6 mm.
- .5 Mid rail nominal 152mm wide plus or minus 6mm.
- .6 Reinforce mechanically-joined corners of doors to produce sturdy door unit.
- .7 Glazing stops: interlocking snap-in type for dry glazing. Exterior



stops: tamperproof type.

- .8 Provide thermally broken doors for exterior.
- .9 Hardware as per Hardware Schedule.
- .10 Door swing: See Drawings.
- .11 Acceptable Products:
  - .1 Kawneer 560 Insulclad.
  - .2 Alumico 5020.
  - .3 Prevost 2750.
  - .4 Alumicor 600A.
  - .5 Windspec 500 Series

### 2.3 ALUMINUM FRAMES

- .1 Mullion profile:
  - .1 Vertical members: 63 x 76 mm nominal dimension back section tubes.
  - .2 Horizontal members: 63 x 76 mm nominal dimension back section tubes.
  - .3 Thermally broken with interior tubular section insulated from exterior pressure plate.
  - .4 Matching stops and pressure plate of sufficient size and strength to provide adequate bite on glass and infill panels. 19mm deep cap sections.
  - .5 Drainage holes, deflector plates and internal flashings to accommodate internal weep drainage system.
  - .6 Acceptable manufacturers
    - .1 Alumico 6800;
    - .2 Prevost 3400HP;
    - .3 Alumicor 2600 Series.
    - .4 Windspec 5500 HTC Series.
- .2 Reinforced mullion: internal reinforcement of shaped steel structural section as required to meet load requirements.
- .3 Flashings: 2 mm thick aluminum, finish to match curtain wall mullion sections where exposed, secured with concealed fastening method.
- .4 Air barrier: specified in Section 07 27 00 - Air Barriers.

### 2.4 ALUMINUM FINISHES

- .1 Finish coatings: conform to AA designations.
- .2 Exposed aluminum surfaces to be :
  - .1 Coloured Duranar XL Exotic Coating U40597 XL Banner Red to match existing.

- .3 Exterior of exposed infill panel and trim surfaces: to match window frame finish.
- .4 Shop and touch-up primer for steel components: SSPC 25 Paint red oxide.
- .5 Touch-up primer for galvanized steel surfaces: SSPC 20 Paint zinc rich.
- .6 Concealed steel items: galvanized in accordance with CAN/CSA-G164M ASTM A 123 to 600 gm/m<sup>2</sup>.
- .7 Apply two coats of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

2.6 STEEL FINISHES

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

2.7 FABRICATION

- .1 Doors and framing to be by same manufacturer.
- .2 Fabricate doors and frames to profiles and maximum face sizes as shown. 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 - General.
- .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 operable parts for correct function.
- .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 Seal joints to provide weather tight seal at outside and air, vapour seal at inside.
- .2 Apply sealant in accordance with Section 07 92 00 - Joint Sealants. Conceal sealant within the aluminum work except where exposed use is permitted by Consultant.

3.5 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.
- .2 Manufacturer's field services: provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .3 Schedule site visits to review Work at stages listed:
  - .1 After delivery and storage of products, and when preparatory Work on which Work of this Section depends is complete, but before installation begins.
  - .2 Twice during progress of Work at 25% and 60% complete.
  - .3 Upon completion of Work, after cleaning is carried out.
- .4 Obtain reports within three days of review and submit.

3.6 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.

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 RELATED REQUIREMENTS**

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 06 20 00 – Finished Carpentry
- .3 Section 08 11 00 – Metal Doors and Frames
- .4 Section 08 71 00 – Door Hardware
- .5 Section 08 80 50 – Glazing
- .6 Section 09 00 00 – Finish Colour Schedule
- .6 Section 09 91 23 – Interior Painting

### **1.2 REFERENCES**

- .1 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
  - .1 Quality Standards for Architectural Woodwork 1998.
- .2 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-71.19-M88, Adhesive, Contact, Sprayable.
  - .2 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
- .3 Canadian Standards Association (CSA International).
  - .1 CSA O115-M1982(R2001), Hardwood and Decorative Plywood.
  - .3 CAN/CSA O132.2 Series-90(R1998), Wood Flush Doors.
  - .4 CAN/CSA-O132.5-M1992(R1998), Stile and Rail Wood Doors.
  - .5 CSA Certification Program for Windows and Doors 00.
- .4 Environmental Choice Program (ECP).
  - .1 CCD-045-92, Sealants and Caulking Compounds.
  - .2 CCD-046-92, Adhesives.
- .5 National Fire Protection Association (NFPA).
  - .1 NFPA 80-1999, Standard for Fire Doors and Fire Windows.
  - .2 NFPA 252-1999, Standard Method of Fire Tests of Door Assemblies.
- .6 Underwriters' Laboratories of Canada (ULC).
  - .1 CAN-4S104M-80(R1985), Fire Tests of Door Assemblies.
  - .2 CAN4-S105M-85 (R1992), Fire Door Frames Meeting the Performance Required by CAN4-S104.

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

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

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:

- .1 For caulking materials during application and curing.
- .2 For door materials and adhesives.

.2 Shop Drawings:

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate door types and cutouts for lights and louvres

#### 1.4 SAMPLES

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

.2 Submit one 300 x 300 mm corner sample of each type wood door.

.3 Show door construction, core, glazing detail and faces.

.4 Manufacturer's Instructions:

- .1 Submit manufacturer's installation instructions.

#### 1.5 QUALITY ASSURANCE

.1 Regulatory Requirements:

- .1 Wood fire rated doors: labelled and listed by an organization accredited by Standards Council of Canada.

.2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.4 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

.1 Storage and Protection:

.1 Protect doors from dampness. Arrange for delivery after work causing abnormal humidity has been completed.

.2 Store doors in well ventilated room, off floor, in accordance with manufacturer's recommendations.

.3 Protect doors from scratches, handling marks and other damage.

.4 Store doors away from direct sunlight.

1.7 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Dispose of corrugated cardboard, polystyrene, plastic packaging material in appropriate on-site bin for recycling in accordance with site waste management program.
- .3 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.
- .4 Divert unused adhesive material from landfill to official hazardous material collections site.
- .5 Do not dispose of unused paint materials into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

1.8 WARRANTY

- .1 The warranty period stated in GC 12.3 Warranty and Relevant Supplementary Conditions, is, with respect to this section of work, extended from one year to three. Provide a written guarantee in the form specified in Section 01.
- .2 Warranty shall specifically guarantee the wood doors against warpage, twist, showing core lines, splitting, delaminating and sag.

**PART 2 - PRODUCTS**

2.1 WOOD FLUSH  
DOORS

- .1 Solid core: to CAN/CSA-O132.2.1.
  - .1 Solid particleboard core: stile and rail frame bonded to particleboard core with wood lock blocks and special describe wood blocking, 5-ply construction.
  - .2 Solid wood core:
    - .1 Glued block core with wood edge band.
    - .2 528 kg/m<sup>3</sup> minimum, sanded faces, of thickness to fill void. Extruded particle board cores with voids are not permitted.
  - .3 Rails:
    - .1 Top 38mm minimum
    - .2 Bottom: 38mm minimum
  - .4 Stiles
    - .1 Hinge: 38mm minimum.
    - .2 Lock: 38mm minimum.
    - .3 Edge detail: AWMAC No. 2.
  - .5 5-ply construction.
  - .6 Crossbanding: 1.5mm thick HDF composite
  - .7 AF45-MO/VE agrifibre core for 45min fire resistant

doors.

- .3 Face Panels:
  - .1 Hardwood; veneer grades: Grade I (Premium) flat cut, Maple species.
  - .2 3mm plywood or composite crossband, with veneer to be stained finish for a total thickness of 44mm.
  - .4 Edges: 6mm hardwood edging matching face veneer.
  - .5 Adhesive: Type II (water resistant)] for interior doors.
  - .6 Acceptable Manufacturers:
    - .1 Cambridge Door Ltd
    - .2 Baillargeon Doors Inc.
    - .3 Lambton Doors,
    - .4 Madawaska Doors Inc.

## 2.2 GLAZING

- .1 Glass: As per Section 08 80 50 Glazing

## 2.3 FABRICATION

- .1 Vertical edge strips to match face veneer.
- .2 Prepare doors for glazing where indicated. Provide hardwood glazing stops with mitred corners.
- .3 Bevel vertical edges of single acting doors 3 mm in 50 mm on lock side and 1.5 mm in 50 mm on hinge side.
- .4 Radius vertical edges of double acting doors to 60 mm radius.
- .5 Undercut doors where indicated.
- .6 Factory seal top and bottom of doors. Site apply sealer to edge of all cut-outs.
- .7 Finish wood veneer smooth and flush with stile edges of door and bevel at approximately 20 degrees.
- .8 Provide solid wood finish to match door face at all visible cut outs.
- .9 All doors to be factory premachined for specified finishing hardware.
- .10 Rabetted door head and transom required to maintain fire rating. Provide manufacturer's tested assembly for door with transom above located in fire separations.

## 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 Unwrap and protect doors in accordance with CAN/CSA-O132.2 Series, Appendix A.
- .2 Install labelled fire rated doors to NFPA 80.
- .3 Install doors and hardware in accordance with manufacturer's printed instructions and CAN/CSA-O132.2 Series, Appendix A.
- .4 Adjust hardware for correct function.
- .5 Install glazing in accordance with Section 08 80 50 - Glazing.

3.3 ADJUSTMENT

- .1 Re-adjust doors and hardware just prior to completion of building to function freely and properly.

3.4 CLEANING

- .1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .2 Remove traces of primer, caulking; clean doors and frames.
- .3 Clean glass and glazing materials with approved non-abrasive cleaner.
- .4 On completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

- .1 The work of this Section includes but is not limited to all materials, labour, equipment and tools required to supply and install complete glazed aluminum curtain wall systems as indicated and detailed on the Contract documents.
- .2 Curtain wall assembly of aluminum extrusions, glass and glazing, glass spandrel panels, aluminum spandrel panels within curtain wall framing, associated wall aluminum trims, air vapour barrier seals to building membrane, and attachments to building structure.
- .3 Weather sealing of glazing systems specified under this Section. Work includes air vapour barrier membrane supply and installation at perimeter of curtain wall, spray foam insulation at perimeter of curtain wall assemblies, perimeter caulking at the interior face of all curtain wall assemblies.
- .4 Curtain wall assemblies supply and installation includes galvanized steel air-vapour barrier pans, insulation, spandrel glass and spandrel aluminum panels, and sealants.
- .5 Exterior and interior aluminum sills, trims and panels c/w end dam flashings and underlayment membrane.
- .6 Window operators complete with all hardware (including integral restrictors) and insect screens.
- .7 Work to be performed by this Contract specified in other Sections includes all labour, materials, equipment and tools required to provide a complete project for the following scope of work as indicated on the Contract Documents.
  - .1 Aluminum doors.
  - .2 Glazing.

### 1.2 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 07 27 00 – Air Barriers.
- .3 Section 07 92 00 – Joint Sealants
- .4 Section 08 11 16 – Aluminum Doors and Frames
- .5 Section 08 50 00 – Aluminum Windows
- .6 Section 08 80 50 – Glazing.
- .7 Section 09 91 23 – Interior Painting: Field painting of interior surface of infill panel and surfaces.

### 1.3 REFERENCES

- .1 Aluminum Association Designation System For Aluminum Finishes (AA)-1997.

- .1 DAF 45 2003(R2009), Designation System For Aluminum Finishes.
- .2 American Architectural Manufacturers Association (AAMA).
  - .1 AAMA CW-DG-1-96, Aluminum Curtain Wall Design Guide Manual.
  - .2 AAMA CW-10-04, Care and Handling of Architectural Aluminum From Shop to Site.
  - .3 AAMA CW-11-85, Design Wind Loads for Buildings and Boundary Layer Wind Tunnel Testing.
  - .4 AAMA T1R-A1-04, Sound Control for Fenestration Products.
  - .5 AAMA 501-05, Methods of Test for Exterior Walls.
  - .6 AAMA 611-98, Voluntary Specifications for Anodized Finishes Architectural Aluminum.
  - .7 AAMA 612-02, Voluntary Specifications, Performance Requirements, and Test Procedures for Combined Coatings of Anode Oxide and Transparent Organic Coatings on Architectural Aluminum.
  - .8 AAMA 2603-02, Voluntary Specification Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
  - .9 AAMA 2604-05, Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- .3 American Society for Testing and Materials International, (ASTM).
  - .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 283-91-04, 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(R2009), 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.
	.4	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.
	.5	Canadian Standards Association (CSA International).
	.1	CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.
	.2	CSA-S136-07, North American Specification for the Design of Cold-Formed Steel Structural Members.
	.3	CAN3-S157/S157.1-05, Strength Design in Aluminum.
	.4	CSA W59.2-M1991(R2008), Welded Aluminum Construction.
	.5	CSA-A440-00/A440.1-00(R2005), A440-00, Windows / Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows.
	.6	Environmental Choice Program (ECP).
	.1	CCD-45-95(R2005), Sealants and Caulking Compounds.
	.2	CCD-47-98(R2005), Surface Coatings.
	.3	CCD-48-98(R2006), Recycled Water-Borne Surface Coatings.
	.7	Society for Protective Coatings (SSPC).
	.1	SSPC - Paint 20 Zinc Rich Coating.
	.2	SSPC - Paint 25 Alkyd, Zinc Oxide Linseed Oil and Primer for Use Over Hand Cleaned Steel Type 1 and Type 2.
<u>1.4 SYSTEM DESCRIPTION</u>	.1	Aluminum curtain wall system includes thermally broken tubular aluminum sections with self supporting framing, shop fabricated, factory prefinished horizontal and vertical pressure plates and caps, vision glass, insulated glass spandrel infill, related flashings, trims and anchorage and attachment devices.
	.2	Assembled system to permit re-glazing of individual glass (and infill panel) units from exterior without requiring removal of structural mullion sections.
<u>1.5 PERFORMANCE REQUIREMENTS</u>	.1	Design and size components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of system as calculated in accordance with NBC to a design

- pressure of 1.0 kPa as measured in accordance with AAMA CW 11 and ASTM E 330.
- .2 Design and size components to withstand seismic loads and sway displacement as calculated in accordance with OBC.
  - .3 Limit mullion deflection to L/175; with full recovery of glazing materials.
  - .4 Size glass units and glass dimensions to limits established in CAN/CGSB-12.20.
  - .5 Provide system to accommodate, without damage to components or deterioration of seals:
    - .1 Movement within system.
    - .2 Movement between system and perimeter framing components.
    - .3 Dynamic loading and release of loads.
    - .4 Deflection of structural support framing.
    - .5 Shortening of building concrete structural columns.
    - .6 Creep of concrete structural members.
    - .7 A mid-span slab edge deflection of 15mm.
  - .6 Thermal performance of Glazed Aluminum Curtain Wall USI value of 2.38 W/(sq.m K). The manufacturers shall submit WINDOW and THERM analysis for the actual curtain wall system proposed (i.e. not just standard ASTM test sizes).
  - .7 Limit air infiltration through assembly to 0.0003 m<sup>3</sup> /s/m<sup>2</sup> of wall area, measured at a reference differential pressure across assembly of 75 Pa as measured in accordance with AAMA 501 and ASTM E 283.
  - .8 Vapour seal with interior atmospheric pressure of 25 mm sp, 22 degrees C, 40% RH: No failure.
  - .9 Water leakage: none, when measured in accordance with AAMA 501 and ASTM E 331.
  - .10 System to provide for expansion and contraction within system components caused by a cycling temperature range of 95 degrees C over a 12 hour period without causing detrimental affect to system components.
  - .11 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network. "Rain Screen" curtain wall design.
  - .12 Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel

bead of glazing compound. Position thermal insulation on exterior surface of air barrier and vapour retarder.

- .13 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.
- .14 Design all fixed curtain wall framing within dwelling units that extend to less than 1m from the floor to withstand the lateral design loads for balcony guards in Part 4 of the Ontario Building Code. Curtain wall shall be designed to comply with Article 4.1.5.14 of the O.B.C.

#### 1.6 PRODUCT DATA

- .1 Submit WHMIS MSDS - Material Safety Data Sheets for all sealants and primers/paints applied on site indicating VOC limits.
- .2 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details and water flow diagrams.

#### 1.7 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .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.
- .3 Clearly indicate materials and large scale details for head, jamb and sill, profiles of components, elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finished and fasteners.
- .4 Indicate connections of curtainwall to structural components of building. Connections to be designed and shop drawings to be stamped by a professional engineer in the Province of Ontario.
- .5 Prior to substantial completion, the engineer who stamped the shop drawings shall submit a stamped letter confirming that the curtainwall has been installed as per the approved shop drawings.

- 1.8 SAMPLES
- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit two samples 300 x 300 mm in size illustrating prefinished aluminum surface, finish, colour, texture, specified glass units, insulated infill panels, glazing materials illustrating edge and corner.
- 1.9 DESIGN DATA
- .1 Submit design data in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Provide framing member structural and physical characteristics, calculations, dimensional limitations, special installation requirements.
- 1.10 TEST REPORTS
- .1 Submit test reports in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit substantiating engineering data, test results of previous tests by independent laboratory which purport to meet performance criteria, and supportive data.
  - .3 Submit test reports from approved independent testing agency certifying compliance with specification requirements for CSA A440.
    - .1 Air tightness
    - .2 Water tightness
    - .3 Wind load resistance
    - .4 Condensation resistance
    - .5 Forced entry
    - .6 Insect screens
    - .7 Glazing
- 1.11 MOCK-UP
- .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
  - .2 Provide one typical curtain wall unit mock-up including all framing vision glass light, and insulated infill panel. Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.
  - .3 Locate where directed.
  - .4 Allow 24 hours for inspection of mock-up by Consultant before

proceeding with work.

- .5 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

1.12  
PRE-INSTALLATION  
MEETING

- .1 Convene two weeks before starting work of this section.

1.13 DELIVERY,  
STORAGE, AND  
HANDLING

- .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Handle work of this section in accordance with AAMA CW-10.
- .3 Protect prefinished aluminum surfaces with wrapping . Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.14 ENVIRONMENTAL  
REQUIREMENTS

- .1 Do not install sealants when ambient and surface temperature is less than 5 degrees C.
- .2 Maintain this minimum temperature during and after installation of sealants.

1.15 SEQUENCING

- .1 Coordinate work of this section with installation of fire stopping, air barrier placement and flashing placement.

1.16 WARRANTY

- .1 Provide warranty in accordance with General Conditions (GC) GC12.3 but for a period of five (5) years.
- .2 Warranty shall specifically guarantee against leakage, defects and malfunction under normal usage. Warrant against defects in material and labour of the work of this Section. Warrant that the glazed aluminum curtain wall system will remain structurally sound, free from distortion and deformation under load and and that glazing splines and sealants will be free from deterioration from sunlight, weather and oxidation.
- .3 Warrant structural Sealant Glazing system will stay in place and remain leakproof including coverage for complete system failure in accordance with GC 12.3 but for a period of five (5) years.



1.17 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Dispose of corrugated cardboard polystyrene plastic packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

1.18 POST INSTALLATION  
CERTIFICATION

- .1 After installation, submit written certification, signed by the structural engineer responsible for the design indicated on the shop drawings, that all items have been installed in accordance with the stamped shop drawings.

**PART 2 - PRODUCTS**

2.1 MATERIALS

- .1 Materials and resources in accordance with CSA A440.
- .2 Extruded aluminum: ASTM B 221 Aluminum Association Alloy AA6063-T5
- .3 Sheet aluminum: ASTM B 209 break formed aluminum sheet interior 2mm thick and exterior 3mm thick.
- .4 Sheet steel: CSA-S136M ASTM A 653/A 653M; galvanized in accordance with CAN/CSA G164.
- .5 Steel sections: CSA-G40.20/G40.21M Grade 300W; shaped to suit mullion sections.
- .6 Anchors: 3-way adjustable hot-dip galvanized cast iron.
- .7 Fasteners: stainless steel or cadmium plated, corrosion resistant steel of adequate strength for the purpose.
- .8 Bituminous paint: CAN/CGSB 1.108, Type 1, without thinner.
- .9 Glazing:
  - .1 Refer to Section 08 80 50.
- .10 Fire Safety Materials - See Section 07 84 00 - Firestopping.
- .11 Sealant: as per Section 07 92 00
- .12 Backpans: 24GA, galvanized steel.

- .13 Insulation: Mineral fiber block and board insulation to ASTM C612, Type IVB, thickness minimum 75mm thick, RSI 0.74/25.4 mm c/w insulation clips and self locking washers.
- .14 Air Vapour Barrier Perimeter Seal: in accordance with Section 07 27 00.
- .15 Structural sealant: silicone to ASTM C920, Type S, Grade NS, Class 509, Tremco Spectrem 2.
- .16 Secondard sealant:two part, high modules elastomeric silicone to ASTM, C920, Type M, Grade NS, Class 25, Tremco Proglaze II.
- .17 Spray Foam Insulation: CF 812 by Hilti

## 2.2 COMPONENTS

- .1 Mullion profile:
  - .1 Vertical members: 63 x 76 mm nominal dimension back section tubes.
  - .2 Horizontal members: 63 x 76 mm nominal dimension back section tubes.
  - .3 Thermally broken with interior tubular section insulated from exterior pressure plate.
  - .4 Matching stops and pressure plate of sufficient size and strength to provide adequate bite on glass and infill panels. 19mm on horizontal and vertical mullions..
  - .5 Drainage holes, deflector plates and internal flashings to accommodate internal weep drainage system.
  - .6 Internal mullion baffles to eliminate "stack effect" air movement within internal spaces. Spray foam where indicated.
  - .8 Acceptable manufacturers
    - .1 Quest
    - .2 Kawneer
    - .3 Alumico
    - .4 Prevost
    - .5 Alumicor
    - .6 Oldcastle
    - .7 Lessard
    - .8 Allan
    - .9 Windspec 5500 HTC)
    - .10 Alternative Products not listed above which have been approved prior to tender closing.All manufacturers must confirm proposed systems comply with project specifications and System Classification performance requirements listed under 2.7 of this section.
- .2 Reinforced mullion: internal reinforcement of shaped steel

structural section as required to meet load requirements.

- .3 Infill panel: internally reinforced, glazing edge sealed unsealed permitting internal air movement to glazing space, outside air barrier line , structurally sufficient to support wall fin radiation saddles:
  - .1 Outer face: GL3.
  - .2 Core: Mineral wool fibre insulation, RSI of
  - .3 /25.4mm, total RSI value of 2.22
  - .4 Inner face: galvanized steel formed pan.
- .4 Flashings: 2 mm thick aluminum, finish to match curtain wall mullion sections where exposed, secured with concealed fastening method.
- .5 Operable Sash: awning operable windows, complete with
  - .1 Limiters on all operators to restrict the vent from opening more than 100mm and heavy duty screens to comply with OBC 3.7.2.2(3)(b).
- .6 Air barrier: specified in Section 07 27 00 - Air Barriers.

### 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, specified in Section 08 11 16 and hardware specified in Section 08 71 00.
- .6 Reinforce framing members for external imposed loads to suit spans and window layout as indicated.
- .7 Visible manufacturer's identification labels not permitted.

### 2.4 FABRICATION: 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.

## 2.5 FINISHES

- .1 Finish coatings: conform to AA designations.
- .2 Exterior exposed aluminum surfaces for all curtain wall framing to be :
  - .1 Exterior Surfaces: to be clear anodic finish: AA-M12C22A41.
  - .2 Interior Surfaces: to be clear anodic finish: AA-M12C22A41.
- .3 Exterior of exposed infill panel and trim surfaces: to match window frame finish.
- .4 Shop and touch-up primer for steel components: SSPC 25 Paint red oxide.
- .5 Touch-up primer for galvanized steel surfaces: SSPC 20 Paint zinc rich.
- .6 Concealed steel items: galvanized in accordance with CAN/CSA-G164M ASTM A 123 to 600 gm/m<sup>2</sup>.
- .7 Apply two coats of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

## 2.6 SOURCE QUALITY CONTROL

- .1 Perform work in accordance with AAMA GSM-1 AAMA CW-I-9. Maintain one copy on site.
- .2 Manufacturer qualifications: company specializing in manufacturing the products specified in this section with minimum 5 years documented experience.
- .3 Installer qualifications: company specializing in performing the work of this section with minimum 5 years documented experience approved by manufacturer.

- .4 Design structural support framing components to CAN3 S157 under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the Province of Ontario.
- .5 Perform welding Work in accordance with CSA W59.2.

**2.7 SYSTEM CLASSIFICATION**

- .1 To CSA A440 classifications as follows:
  - .1 Air tightness: A3
  - .2 Water tightness: B7
  - .3 Wind load resistance: C5
  - .4 Condensation Resistance Temperature Index: 168.
  - .5 Forced Entry: F2
  - .6 Insect Screens: S2
  - .7 Thermal performance of Glazed Aluminum Curtain Wall USI value of 2.38 W/(sq.m. K). The manufacturers shall submit WINDOW and THERM analysis for the actual curtain wall system proposed (ie. Not just standard ASTM test sizes).

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

- .1 Verify dimensions, tolerances, and method of attachment with other work.
- .2 Verify wall openings and adjoining air barrier and air vapour materials are ready to receive work of this section.

**3.2 INSTALLATION**

- .1 Install curtain wall system in accordance with manufacturer's instructions.
- .2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- .3 Provide 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 Provide thermal isolation where components penetrate or disrupt building insulation.
- .6 Install sill flashings complete with under sill membrane specified in Section 07 27 00 and end dams to sills.

- .7 Coordinate installation of fire stop insulation, specified in Section 08 84 00, at each floor slab edge.
- .8 Install operating sash in accordance with manufacturer's instructions.
- .9 Install glass and infill panels in accordance with Section 08 80 50 - Glazing, to glazing method required to achieve performance criteria exterior method of 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 provide continuous sightline.
- .10 Install perimeter sealant to method required to achieve performance criteria. Sealant, backing materials, and installation criteria in accordance with Section 07 92 00 - Joint Sealant.

### 3.3 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.

### 3.4 PERIMETER SEALING

- .1 Provide and install continuous strip of air barrier membrane as per Section 07 27 00 to all perimeter frames. Provide sufficient material to allow minimum 150mm lap onto wall membrane.
- .2 Air barrier membrane to be sealed into glazing spline of perimeter frames and securely adhered.
- .3 All perimeter frames shall have shim space sealed with spray applied polyurethane insulation. Install in multiple passes to ensure application full depth of shim space.

### 3.5 MANUFACTURER'S FIELD SERVICES

- .1 Curtain wall product manufacturers to provide field surveillance of installation of their Products.
- .2 Monitor and report installation procedures, unacceptable conditions and submit reports at inspections performed at 25%, 60% and 100% stages of installation.

3.6 ADJUSTING

- .1 Adjust operating sash for smooth operation.

3.7 CLEANING

- .1 Remove protective material from prefinished aluminum surfaces.
- .2 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.
- .3 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

3.8 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by installations of this Section.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 08 11 00 - Metal Doors and Frames
- .2 Section 08 11 16 - Aluminum Doors and Frames
- .3 Section 08 14 16 - Flush Wood Doors
- .4 Section 26 00 00 - Electrical

### **1.2 REFERENCES**

- .1 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).
- .2 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction) : standard hardware location dimensions, or as indicated for special conditions.
- .3 CAN CSA B-651-12 Accessible Design for the Built Environment.
- .4 American National Standards Institute / Builders Hardware Manufacturers Association.

### **1.3 SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheets indicating hardware proposed, including ANSI function where ANSI used in this specification, grade, type, series, BHMA finish, fire label listing, in accordance with Section 01 - General Instructions.
- .2 Samples:
  - .1 When requested, submit samples of each type of hardware specified in accordance with Section 01 - General Instructions.
  - .2 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
  - .3 After approval samples will be returned for incorporation in the Work.
- .3 Hardware List:
  - .1 Submit a typewritten Finishing Hardware schedule in accordance with Section 01 - General Instructions.
  - .2 Indicate specified hardware, including make, model, base material, function, size, finish and other pertinent information.
  - .3 When preparing the Finish Hardware schedule to submit for approval review specifications and drawings, confirming quantities and detailing, reporting any errors and/or omissions to the Architect. "Extras" will not be considered nor accepted for necessary changes as a result of the Contractor's neglect.



1.3 SUBMITTALS  
(Cont'd)

.4 "Extras" will be invoiced at no more than 30% off Manufacturer's current list price. "Credits" will be issued at no less than 70% off Manufacturer's current list price.

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

.5 Closeout Submittals:

.1 Provide operation, maintenance data, parts list and manufacturer's instructions for each type of locksets, fire exit hardware, door closers, door operators and door holders for incorporation into manual specified in Section 01 - General Instructions.

1.4 QUALITY ASSURANCE

.1 Regulatory Requirements:

.1 Use hardware for doors in fire separations and exit doors certified by a Canadian Certification organization accredited by Standards Council of Canada.

.2 All fire and life safety codes shall be met as required by the authority having jurisdiction.

.3 Use lock and latchsets with lever handles meeting requirements of CAN/CSA-B651, Barrier Free Design, unless specified otherwise.

.2 Pre-installation Meetings:

.1 Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

.3 Qualifications :

.1 It shall be clearly understood that within the terms of this Subcontract, the Door Hardware Supplier is bound not just as a supplier, but as a Subcontractor and is responsible for the supply of Project services relative to project co-ordination, supervision and inspection.

.2 No claims for extra money will be entertained if such claims are from lack of co- ordination between the Hardware Subcontractor and any other Subcontractor. Ensure that Work of other Subcontractors, as it proceeds, will accommodate the installation of hardware.

.3 Attend site meetings as requested by the Contractor.

1.5 DELIVERY, STORAGE  
AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Deliver, store, handle and protect materials in accordance with Section 01 00 10 - General Instructions.

.2 Store finishing hardware in locked, clean and dry area.

.3 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

1.6 WASTE DISPOSAL  
AND MANAGEMENT

- .1 Environmental:
  - .1 Separate and recycle waste materials in accordance with Section 01 - General Instructions.
  - .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
  - .3 Dispose of all 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 - General Instructions.
  - .2 Supply two sets of wrenches for locksets, door closers and door openers.

## **PART 2 - PRODUCTS**

### **2.1 HARDWARE ITEMS**

- .1 Door hardware, as specified, to be certified to ANSI/BHMA standards.
- .2 Use one manufacturer's products only for all similar items.

### **2.2 HINGES**

- .1 Supply 1-1/2 pair per door leaf for doors up to 2285mm in height. Supply one additional hinge for each additional 762mm of height or fraction thereof. Doors, 45mm thickness, up to 914mm in width, supply 114mm high hinges; over 914mm to 1220mm, supply 127mm high hinges.

- .2 NRP - non removable pin.

- .3 Hinges listed are by Hager.  
Stanley equivalents are acceptable.

Hager	Stanley
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BB1168	FBB168
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BB1279	FBB179
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### **2.3 CONTINUOUS HINGES**

- .1 Continuous hinges for aluminum doors shall be aluminum material, gear type, edge mount, heavy duty, minimum thirty-two thrust bearings, staggered screw holes.
- .2 Hager Roton continuous hinges 780-112HD series listed .  
Equivalent continuous hinges SL11 HD by Select are acceptable alternates.
- .3 Factory cut, maintaining three rows of two screws (six total) at both top and bottom, to length required for door height. Length to match door height. 12.7mm of door heel exposure is acceptable. For exterior door application the length should be reduced to allow installation of the door sweep across the full width of the exterior door face without interfering with the hinge knuckle.

### **2.4 LOCKS AND LATCHES**

- .1 Cylindrical type. Schlage 'AL' series.  
Saturn (SAT) lever design. Functions as specified.  
Provide dust boxes behind all strikes.

### **2.6 EXIT DEVICES**

- .1 Von Duprin "98" series flat bar type as specified to match standards of acceptance. No substitution.

<u>2.7 ELECTRIC STRIKES</u>	.1	Von Duprin heavy duty 6000 series, all stainless steel construction where specified. No substitution. Power supplies as required.
<u>2.8 DOOR PULLS</u>	.1	25.4mm round diameter, 'D' shape, 90 degree offset, 304.8mm centres. Type 316 stainless steel material.  Standard Metal C.B.H.  3012-2                      7009-1"
<u>2.9 DOOR CLOSERS</u>	.1	LCN as specified to match standards of acceptance. No substitution.
	.2	Heavy Duty. Full rack and pinion hydraulic action. Cast iron cylinder body. Adjustable back check. Full plastic moulded cover.
	.3	Provide adapter plates as required for proper installation of door closers.
<u>2.10 DOOR OPENERS</u>	.1	Automatic swing door operator c/w electronic control with adjustable opening, full cast aluminum gear body, back check, closing speed and time delay, interface relay for electrified hardware e.g. electric latch retraction, electric strikes where required, on/off and hold open switch, built-in adjustable stop. Opener to function as a manual door closer in the direction of swing with or without electrical power. Opener has a one-way clutch in the gear train to facilitate easy manual operation of door and to prolong gear and motor life. Recessed circular 152.4mm diameter wall actuators engraved with HDCP logo, weather and vandal resistant at exterior. Opener to be installed in an aluminum extruded header (114mm wide x 165mm high) with structurally integrated end caps. Low profile (LP) where listed. Full length (flush with outside of jambs) at header where noted. Full length removable cover.
	.2	Door openers listed are by Hunter Automatics Inc.. No substitution.
<u>2.11 KICK PLATES</u>	.1	1.27mm material type 304 stainless steel. Bevelled edges. Height as specified x length to suit  Standard Metal                      Gallery                      C.B.H.                      Hager  K10A                                      80A                                      903                                      190S

2.12 OVERHEAD STOPS  
AND HOLDERS

- .1 Glynn-Johnson heavy duty overhead concealed "100" series and surface "90" series. No substitution.
- .2 All listed degrees of opening should be reviewed and confirmed before preparation and/or installation.

2.13 FLOOR AND  
WALL STOPS

- .1 Cast brass/bronze material except where specified zinc die cast.
- .2 Rear portion of one piece cast base shall have a stud to prevent rotation. Rise to suit door undercut.
- .3 Wall stops shall have a metal backplate secured to wall with (2) screws and shields. Housing and rubber insert fits over backplate and is secured with inconspicuous set screw. No screws or holes shall be visible on face of bumper.

Standard Metal

C.B.H.

S120

120

S122

130

2.14 SOUND GASKETING

- .1 Extruded aluminum c/w synprene bulb insert. Predrilled with oblong screw holes for adjustment. 25.4mm wide x 6.4mm thick aluminum extrusion. Synprene bulb insert integrated into and around centre support leg of extrusion ensuring seal against face of frame stop.
- .2 Sound gasket listed is by A.K.Draftseal Ltd.

2.15 DOOR SWEEP

- .1 K.N. Crowder as specified to match standards of acceptance. No substitution.
- .2 Product # W-24S, aluminum extrusion c/w black nylon bristles.

2.16 SYSTEM INTEGRATION  
PANEL (SIP)

- 1. System integration panel (SIP) c/w 24 port terminal strip. 254.0mm high x 254.0mm wide x 101mm deep, gray metal box with door to be held closed using (4) security type 'torx' screws.

2.17 FASTENINGS

- .1 All hardware is to be installed using manufactures' supplied fasteners. Failure to comply may void warranties and applicable licensed labels.
- .2 Self tapping/tek screws used for installation of butt hinges, locksets, exit devices, door closers and kick plates **will not be acceptable** on this project.
- .3 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .4 Exposed fastening devices to match finish hardware.
- .5 Kick plates shall be supplied with self adhesive tape, except where noted, then supply countersunk, oval head, flush mounting socket screws to suit door material.

2.18 KEYING

- .1 The Door Hardware Supplier shall prepare a detailed keying schedule to approval of the Client.
- .2 All locks shall be keyed into an existing Schlage keying system as follows:
  - master keyed
  - keyed alike or different as required.
- .3 Supply (2) change keys per cylinder, except where noted otherwise.
- .4 All permanent keys are to be delivered directly to the Owner.
- .5 The Door Hardware Supplier is to ensure all cylinders are supplied with cams / tailpieces suitable for specified lock functions. Supply all compression rings, trim collars and blocking rings to suit.
- .6 The Contractor is responsible for providing cylinders as required for his own use during the period of construction.

2.19 FINISHES

.1 Recommended Practices for Materials and Finishes:

Hinges	628	clear anodized aluminum
	652	satin chromium plating on steel
Locksets	626	satin chromium plated
Exit Devices	626	chromium, dull
Door Closers	689	powder coat aluminum
Door Openers	CLR	anodized clear aluminum
Kick plates	630	stainless steel, satin
Overhead stops	630	stainless steel, satin
Wall Stops	626	satin chromium
Sound Gasket	AL	clear anodized aluminum
Door Sweep	AL	clear anodized aluminum

2.20 ABBREVIATIONS

ALD	aluminum door
T.B. ALF	thermally broken aluminum frame
HMD	hollow metal door
PSF	pressed steel frame
SCWD	solid core wood door
LH	left hand
RH	right hand
LHR	left hand reverse
RHR	right hand reverse
MS	machine screw
WS	wood screw
T.B.	thermally broken
TB	through bolt
HR/FR	hour fire rated
MIN/FR	minute fire rated
EX	existing

### **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.
- .2 When requested, furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .3 Furnish manufacturer's instructions for proper installation of each hardware component.

#### **3.2 INSTALLATION**

- .1 Install hardware to standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association, or as indicated for special conditions.
- .2 Only tradesmen competent in the installation of Finishing Hardware shall be used for this purpose. Qualification would require a minimum (5) years experience in commercial application. The installer shall adjust, clean and make good all installation of Finishing Hardware to the satisfaction of the Architect and Consultants.
- .3 Section 26 (Electrical) to provide backboxes, conduits c/w pull wires and power supply for all access control systems and related hardware.
- .4 Section 26 (Electrical) to provide backboxes, conduits c/w pull wires and power supply (115V @ headers) for door opener systems. Install all door hardware for operation of door operators at not less than 900mm and not more than 1100mm above the finished floor as per O.B.C..
- .5 The Door Hardware Supplier is responsible for the electrical connections for all door hardware to the system integration panels (SIP).
- .6 The Door Hardware Supplier is responsible for the installation of the Hunter Automatics door openers and all related hardware. An AAADM certified technician to be approved by the Manufacturer as having the qualifications to ensure the proper operation of all components related to the opener systems. An acceptable Subcontractor is Canadian Facility Security 613-224-3939



3.2 INSTALLATION  
(Cont'd)

- .7 Wiring schematics (portals) detailing all electrical components for each opening to be supplied by the Door Hardware Supplier. The Door Hardware Supplier is to prepare the schematics with the support of both the facility security Subcontractor and the Manufacturer. Drawings to indicate all components of systems listed under this section. Power supplies are listed sized and with optional distribution boards as required. Confirm power supply requirements prior to ordering. The Door Hardware Supplier is responsible for co-ordinating with Electrical exact locations of power supplies.
- .8 The Door Hardware Supplier to supply As Built wiring schematics c/w power supply locations and conductor identification as required to allow trouble-shooting and servicing. Each power supply and conductor should be labeled to identify the door it services and the hardware it operates, with conductors labeled both at the power supply and the load. A file number should also be noted on the power supply to allow service providers easy access to As Built records.
- .9 Kick plates are to be installed .79mm maximum up from the bottom edge of door push side. On single doors install in the centre of the door equally spaced to clear between the frame jamb stops. On pairs of doors install 6.35mm maximum from meeting edge of doors and the correct distance away from hinge edge of door to clear frame jamb stop.
- .10 Contractor to ensure walls are properly blocked to prevent future damage wherever surface mounted hardware i.e. wall stops are to be used.
- .11 Surface seals are not to be installed until final coat of paint has been applied to the door and frame and is completely dry.
- .12 All existing door hardware & fasteners not being reused is to be returned to Owner and reused where noted.

3.3 ADJUSTING

- .1 Adjust door hardware for optimum, smooth operating condition, safety and for weather tight closure.
- .2 Lubricate hardware, operating equipment and other moving parts.
- .3 Adjust door hardware to provide tight fit at contact points with frames.

3.4 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Clean hardware with damp cloth and approved non-abrasive cleaner. Polish hardware in accordance with manufacturer's instructions.
- .3 Remove protective material from hardware items where present.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.5 DEMONSTRATION

- .1 Maintenance Staff Briefing:
  - .1 Brief maintenance staff regarding:
    - .1 Proper care, cleaning and general maintenance of projects complete hardware.
    - .2 Description, use, handling, and storage of keys.
    - .3 Use, application and storage of wrenches for latchsets.
  - .2 Demonstrate operation, operating components, adjustment features and lubrication requirements.

3.6 INSPECTIONS

- .1 The Door Hardware Supplier shall make periodic site inspections during installation of hardware to ensure that all hardware supplied is being applied in accordance with specifications, details and Architect's directions. Inform the Contractor and the Architect in writing of such inspections, pointing out errors, omissions, etc.; so that same may be corrected.
- .2 The Door Hardware Supplier will contact product representatives (locksets, exit devices and door closers/auto door openers) who will also make inspections during construction to ensure the proper installation and adjustment of their products. Final inspection to be carried out by the Door Hardware Supplier and Product Representative. Representative to provide written certification that hardware has been installed and adjusted as intended.
- .3 The first inspection listed above by the Door Hardware Supplier and product representative shall occur and be submitted within 5 working days of the hardware installation reaching 25% completion. The Consultant will review the submitted inspection report and perform a sampling review of the completed installations to assess if the work to date is in compliance with the Contract requirements. The Contractor shall make all required adjustments to the installed hardware as per the findings of the Consultant and ensure all future installations and reports comply with these findings.

3.6 INSPECTIONS  
(Cont'd)

- .4 Subsequent inspections and reports shall be completed and submitted by the Contractor at the 50%, 75% and 100% stages of the door hardware installations.
- .5 NO PAYMENTS SHALL BE CERTIFIED FOR DOOR HARDWARE INSTALLATIONS UNTIL THE FINAL INSPECTION REPORT HAS BEEN SUBMITTED BY THE CONTRACTOR AT THE END OF THE PROJECT AND ACCEPTED BY THE CONSULTANT.

3.7 HARDWARE  
SCHEDULE

- .1 The following is a list of hardware to be used to meet the Client's standards on this project. Any deviation from the hardware scheduled shall be replaced with the proper hardware at the Door Hardware Supplier's expense. Acceptable alternates as listed. Substitutions without prior approval will not be accepted in the shop drawing submission.
- .2 Hardware schedule as follows:

<u>ITEM #1</u>			
	1 SGLE DOOR 001.1	EXTERIOR FROM CORRIDOR	LHR
	1200 x 2150 x CONFIRM	T.B. ALD/T.B. ALF	
	TYPE ALD-B/ALF-1	WIDE STILE DOOR	
	1 EA CONT. HINGE	780-112 HD	628
		c/w CURRENT TRANSFER PREP	
	1 EA CURRENT TRANSFER EPT-10		SP28
	1 EA EXIT DEVICE CDLX98NL-OP x 110NL-MD x 4FT x LESS STRIKE		626
	1 EA ELECT. STRIKE	6111 FSE CONFIRM VOLTAGE	630
		c/w FRAME STOP SHIM AS REQUIRED	
		POWER SUPPLY THROUGH DOOR OPENER SYSTEM	
	1 EA SYSTEM INTEGRATION PANEL (SIP)		
	1 EA MORTISE CYLINDER 20-001 (31.75mm)		626
		c/w XQ11-949 INVERTED CAM & BLOCKING RING TO SUIT	
	1 EA RIM CYLINDER	20-021	626
	1 EA DOOR PULL	3012-2 x #4B MTG.	316 S.S.
	1 EA DOOR OPENER	HA-8 c/w E/S RELAY x TB ARM SHOE	CLR ANO
		c/w FULL HOUSING	
		CONFIRM REVEAL & LONG ARM REQUIREMENT	
	2 EA WALL ACTUATOR	CM-60/2	630
	2 EA ESCUTCHEON	CM-69	
	1 EA WEATHER GASKET	CM-69G	
	1 EA O/H STOP	GJ 106S x 95 DEGREE	630
		T.B. THRESHOLD BY DOOR AND FRAME MANUFACTURER	
		DOOR SWEEP BY DOOR AND FRAME MANUFACTURER	
		W/STRIPPING BY DOOR AND FRAME MANUFACTURER	
	1 EA DOOR SWEEP	W-24S x 1200mm (EXTERIOR SIDE)	AL

LX FEATURE TO ACTIVATE EXTERIOR SIDE WALL ACTUATOR WHEN EXIT DEVICE IS MANUALLY DOGGED.  
 CORRIDOR SIDE WALL ACTUATOR TO BE ACTIVE AT ALL TIMES.  
 LOCATION OF ACTUATORS TO BE CONFIRMED.

SECURITY SYSTEM SUPPLIED BY SECURITY CONSULTANT  
 INCLUDES : CARD READER, DOOR CONTACT & ALL RELATED HARDWARE.

<u>ITEM #2</u>			
	1 SGLE DOOR 101.1	CORRIDOR TO MUSIC ROOM 101	LH
	1200 x 2150 x 45	SCWD/PSF	
	TYPE WD-C/PSF-1		
	1 EA CONT. HINGE	780-224 HD	628
	1 EA LOCKSET	AL70PD x SAT	626
	1 EA DOOR CLOSER	4011 DEL	689
	1 EA KICK PLATE	K10A 203.2 x 1148mm x TAPE	630
	1 EA O/H STOP	GJ 106S x 90 DEGREE	630
	1 SET SOUND GASKET	DS143C 1/1200mm + 2/2150mm	AL

<u>ITEM #3</u>	1 SGLE DOOR 102.1 965 x 2150 x 45 TYPE WD-C/PSF-1	MUSIC ROOM 101 FROM STORAGE 102 SCWD/PSF	LHR
	3 EA HINGE	BB1279 127 x 101mm NRP	652
	1 EA LOCKSET	AL70PD x SAT	626
	1 EA KICK PLATE	K10A 203.2 x 927mm x TAPE	630
	1 EA O/H STOP/HOLD	GJ 904F x 90 DEGREE	630
<u>ITEM #4</u>	1 SGLE DOOR 103.1 965 x 2150 x 45 TYPE WD-A/PSF-1	MUSIC ROOM 101 TO OFFICE 103 SCWD/PSF	RH
	3 EA HINGE	BB1279 127 x 101mm	652
	1 EA LOCKSET	AL70PD x SAT	626
	1 EA KICK PLATE	K10A 203.2 x 914mm x TAPE	630
	1 EA WALL STOP	S120	626
	1 SET SOUND GASKET	DS143C 1/965mm + 2/2150mm	AL
<u>ITEM #5</u> <u>ITEM #6</u>	1 SGLE DOOR 104.1 1 SGLE DOOR 105.1 965 x 2150 x 45 TYPE WD-C/PSF-1	MUSIC ROOM 101 FROM PRACTICE ROOM 104 MUSIC ROOM 101 FROM PRACTICE ROOM 105 SCWD/PSF	RHR RHR
	6 EA HINGE	BB1279 127 x 101mm NRP	652
	2 EA LOCKSET	AL70PD x SAT	626
	2 EA KICK PLATE	K10A 203.2 x 914mm x TAPE	630
	2 SET SOUND GASKET	DS143C 1/965mm + 2/2150mm	AL

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 07 92 00 - Joint Sealers.
- .2 Section 08 00 01 – Door Schedule
- .3 Section 08 11 00 - Metal Doors and Frames.
- .4 Section 08 11 16 - Aluminum Doors and Frames.
- .5 Section 08 14 16 - Flush Wood Doors.
- .6 Section 08 44 33 – Glazed Aluminum Curtainwalls

### **1.2 REFERENCES**

- .1 American National Standards Institute (ANSI).
  - .1 ANSI/ASTM E330-02, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .2 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM C 542-05, Specification for Lock-Strip Gaskets.
  - .2 ASTM D 2240-05, Test Method for Rubber Property - Durometer Hardness.
  - .3 ASTM E 84-10, Test Method for Surface Burning Characteristics of Building Materials.
  - .4 ASTM E 330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .3 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, (Amendment) Insulating Glass Units.
  - .7 CAN/CGSB-12.9-M91, Spandrel Glass.
  - .8 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting.
  - .9 CAN/CGSB-12.11-M90, Wired Safety Glass.
  - .10 CAN/CGSB-12.12-M90, Plastic Safety Glazing Sheets.
- .4 Canadian Standards Association (CSA International).
  - .1 CSA A440.2-98, Energy Performance Evaluation of Windows and Sliding Glass Doors.
  - .2 CSA Certification Program for Windows and Doors 2000.
- .5 Environmental Choice Program (ECP).
  - .1 CCD-045-95(R2005), Sealants and Caulking.
- .6 Glass Association of North American (GANA)

- .1 GANA Glazing Manual - 2008.
- .2 GANA Laminated Glazing Reference Manual - 2009.
- .7 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
- 1.3 SYSTEM DESCRIPTION
  - .1 Performance Requirements:
    - .1 Provide continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:
      - .1 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 meet requirements of Ontario Building Code and as measured in accordance with ANSI/ASTM E330.
      - .3 Limit glass deflection to 1/200 flexural limit of glass with full recovery of glazing materials.
    - .2 Conform to applicable criteria in Sections 08 44 13 Glazed Aluminum Curtain wall.
    - .3 Use only galvanized materials whose compatibility with insulating units has been confirmed in writing by insulating unit management.
- 1.4 SUBMITTALS
  - .1 Product Data:
    - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
    - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
      - .1 For glazing materials during application and curing.
    - .3 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.
  - .2 Shop Drawings:
    - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
    - .2 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
  - .3 Samples:
    - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

- .2 Submit duplicate 300 mm x 300 mm size samples of each type of glass.
  - .4 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
  - .5 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
  - .6 Manufacturer's Instructions:
    - .1 Submit manufacturer's installation instructions.
  - .7 Closeout Submittals:
    - .1 Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- 1.5 QUALITY ASSURANCE
- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
    - .1 Provide testing of glass under provisions of Section 01 45 00 - Quality Control.
    - .2 Provide shop inspection and testing for glass.
  - .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
  - .3 Mock-ups:
    - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
    - .2 Construct mock-up to including glass glazing, and perimeter air barrier and vapour retarder seal.
    - .3 Mock-up will be used:
      - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
      - .4 Locate where directed where indicated.
      - .5 Allow 24 hours for inspection of mock-up before proceeding with work.
      - .6 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.
- 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 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 strippable coating.
    - .4 Replace defective or damaged materials with new.
- 1.7 SITE CONDITIONS
- .1 Environmental 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.
- 1.8 WASTE MANAGEMENT AND DISPOSAL
- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
  - .2 Divert metal cut-offs from landfill by disposal into on-site Metal recycling bin.
  - .3 Divert uninstalled materials for reuse at nearest used building materials facility or similar type facility.
  - .4 Divert unused caulking and sealant materials from landfill through disposal at special wastes depot.
  - .5 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.
  - .6 Remove from site and dispose of packaging materials at appropriate recycling facilities.
  - .7 Dispose of corrugated cardboard, polystyrene, plastic, packaging material in appropriate on-site bin for recycling in accordance with site waste management program.
- 1.9 WARRANTY
- .1 Provide manufacturer's warranty for sealed glazed units in accordance with General Conditions (GC) GC12.3 but for five (5) years.

- .2 Warrant sealed units against failure of perimeter seals of enclosed spaces and deposits on inner face of glass.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Float glass: to CAN/CGSB-12.3, Glazing quality, of thickness indicated.
- .2 Insulating glass units (tempered/tempered) to CAN/CGSB-12.8, double unit, 25 mm overall thickness (**Glass Type GL-1**).
  - .1 Glass: to CAN/CGSB-12.3 outer glass, Cardinal 272 Low-E(2) or PPG Solarban 60 Low E on Pos. #2, inner glass 6mm clear.
  - .2 Glass thickness: 6 mm each light.
  - .3 Glass: tempered each light
  - .4 Inter-cavity space thickness: 12.5 mm with low conductivity spacers thermal edge space black.
  - .5 Glass coating: surface number 2, low "E".
  - .6 Inert gas fill: argon.
  - .7 Performance:
    - .1 Visible transmittance: 70%
    - .2 Winter U Value: 0.29
    - .3 Shading coefficient: 0.44
    - .4 Solar heat gain coefficient: 0.38
    - .5 Relative Heat Gain: 94 BTU/hr/sq.ft.
- .3 Safety Glass: to CAN/CGSB-12.1, transparent, 6mm thick, for use in interior doors.
  - .1 **Type GL-2 – Tempered**
  - .2 Class B-Float
  - .3 Category 1
  - .4 Edge treatment: flat ground

### **2.2 MATERIALS**

- .1 Sealant: multi-component, chemical curing to CAN 2-19.24, Type 2 Class A, compatible with sealed units.

### **2.3 ACCESSORIES**

- .1 Setting blocks: Neoprene, EPDM, Silicone, 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 to suit glazing method, glass light weight and area.
- .2 Spacer shims: Neoprene Silicone, 50-60 Shore A durometer hardness to ASTM D 2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.
- .3 Glazing tape:
  - .1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to

ASTM D 2240; coiled on release paper , black colour.

- .4 ,Glazing splines: resilient polyvinyl chloride or silicone, extruded shape to suit glazing channel retaining slot, colour as selected by Consultant.
- .5 Glazing clips: manufacturer's standard type.
- .6 Lock-strip gaskets: to ASTM C 542.
- .7 Mirror attachment accessories:
  - .1 Stainless steel clips.

### **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 EXAMINATION**

- .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.

#### **3.3 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 WET/DRY METHOD (PREFORMED TAPE AND SEALANT)**

- .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, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.
- .3 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.
- .4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners. Ensure support of both planes of glass. Do not block drainage cavities.

- .5 Rest glazing on setting blocks and push against tape and heel head of sealant with sufficient pressure to attain full contact at perimeter of light or glass unit.
- .6 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line. Place glazing tape on glazing light or unit with tape flush with 16 mm below sight line.
- .7 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.
- .8 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.
- .9 Install pressure plates with gaskets or glazing tape as required. Ensure proper alignment of weep holes for drainage at base of glass unit. Ensure proper compression of gaskets or glazing tape. Seal ends of abutting pressure plates.
- .10 Install snap caps. Ensure proper alignment of weep holes for drainage from underside of cap.

3.5 INSTALLATION:  
EXTERIOR - WET  
METHOD (SEALANT AND  
SEALANT)

- .1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.
- .2 Place setting blocks at 1/4 points and with edge block maximum 150 mm from corners. Ensure support of both planes of glass. Do not block drainage cavities.
- .3 Install removable stops with glazing centred in space by inserting spacer shims both sides at 600 mm intervals, 6 mm below sight line.
- .4 Fill gaps between glazing and stops with sealant to depth of bite on glazing, maximum 9 mm below sight line to ensure full contact with glazing and continue air and vapour seal.
- .5 Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.6 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 1/4 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.

3.7 INSTALLATION:  
INTERIOR WET/DRY  
METHOD (TAPE AND  
SEALANT)

- .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 install against permanent stops, projecting 1.6 mm above sight line.
- .3 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .4 Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of light or unit.
- .5 Install removable stops, with spacer shims inserted between glazing and applied stops at 600 mm intervals, 6 mm below sight line.
- .6 Fill gaps between light and applied stop with sealant to depth equal to bite on glazing, to uniform and level line.
- .7 Trim protruding tape edge.

3.8 INSTALLATION:  
INTERIOR - WET  
METHOD COMPOUND AND  
COMPOUND

- .1 Install glazing resting on setting blocks. Install applied stop and centre light by use of spacer shims at 600 mm centres, 6 mm below sight line.
- .2 Locate and secure glazing light using spring wire clips glazers' clips.
- .3 Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

3.9 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Remove traces of primer, caulking.
- .3 Remove glazing materials from finish surfaces.
- .4 Remove labels after work is complete.
- .5 Clean glass and mirrors using approved non-abrasive cleaner in accordance with manufacturer's instructions.
- .6 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.10 PROTECTION OF  
FINISHED WORK

- .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.
  - .1 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 SECTION INCLUDES**

- .1 The work of this Section includes all labour, materials, equipment, and tools required to complete the following list of work as identified on the Contract Documents.
  - .1 Exterior gypsum board wall assemblies.
  - .2 Interior gypsum board wall assemblies.
  - .3 Interior gypsum board ceiling assemblies.
  - .4 Acoustic caulking to gypsum board assemblies.
  - .5 Exterior sheathing to exterior metal stud walls.
  - .6 Installation of access panels and doors supplied by Division 21, 22, 23, 25, and 26.
- .2 Work by the same contractor specified in other sections includes all labour, materials, equipment, and tools required to complete the following list of work as identified on the Contract Documents.
  - .1 Sheet metal blocking within metal stud wall framing for anchoring of millwork, cabinets, grab bars, handrails, etc.
  - .2 Wood blocking at all exterior window and door frames.
  - .3 Wind and load bearing steel stud wall assemblies. (Exterior walls)
  - .4 Non-load bearing steel stud wall framing. (Interior walls)
  - .5 Suspended steel stud framing for suspended interior ceilings and bulkheads.
  - .6 Steel stud furring channel assemblies.
  - .7 Acoustic batt insulation within wall and ceiling assemblies.

### **1.2 RELATED SECTIONS**

- .1 Section 06 10 00 - Rough Carpentry
- .2 Section 07 21 13 – Board Insulation
- .3 Section 07 21 16 - Blanket Insulation
- .4 Section 07 27 00 – Air Barriers
- .5 Section 07 21 29 – Spray In Place Foam Insulation
- .6 Section 07 84 00 – Firestopping
- .7 Section 07 92 00 – Air Barriers
- .8 Section 08 11 00 – Metal Doors and Frames
- .9 Section 08 11 16 – Aluminum Doors and Frames
- .10 Section 08 44 13 - Glazed Aluminum Curtainwalls
- .11 Section 08 50 00 - Windows
- .12 Section 09 00 00 – Interior Finish, Material/Colour Legend
- .13 Section 09 00 01 – Room Finish Schedule
- .14 Section 09 22 16 - Non-structural Metal Framing

### **1.3 REFERENCES**

- .1 Aluminum Association
  - .1 AA DAF 45-03(R2009), Designation System for

Aluminum Finishes.

- .2 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM C 475-03(R2009), Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
  - .2 ASTM C 840-08, Standard Specification for Application and Finishing of Gypsum Board.
  - .3 ASTM C 954-07, 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.
  - .4 ASTM C 1002-07, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
  - .5 ASTM C 1047-09, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
  - .6 ASTM C 1280-99, Specification for Application of Gypsum Sheathing Board.
  - .7 ASTM C 1177 / C 1177M-08, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
  - .8 ASTM C 1178/C 1178M-08, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.
  - .9 ASTM C 1396/C 1396M-09a, Standard Specification for Gypsum Wallboard.
- .3 Association of the Wall and Ceilings Industries International (AWCI)
  - .1 AWCI Levels of Gypsum Board Finish-[97].
- .4 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.
- .5 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S102-07, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.
- .6 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.

1.4 ACTION AND

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



INFORMATIONAL  
SUBMITTALS

Procedures.

- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum board assemblies and include product characteristics, performance criteria, physical size, finish and limitations.

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 Deliver materials in original packages, containers or bundles bearing manufacturers brand name and identification.
- .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 of strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
  - .6 Replace defective or damaged materials with new

1.6 SITE  
ENVIRONMENTAL  
REQUIREMENTS

- .1 Maintain temperature minimum 10 degrees C, maximum 21 degrees C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours 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.

1.7 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at

appropriate recycling facilities.

- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.
- .4 Divert unused gypsum from landfill to gypsum recycling facility for disposal approved by Consultant.
- .5 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.
- .6 Divert unused wood materials from landfill to recycling composting facility approved by Consultant.
- .7 Divert unused paint and caulking material from landfill to official hazardous material collections site approved by Consultant.
- .8 Do not dispose of unused paint and caulking materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Gypsum board materials must comply with Canadian Recognized tested assemblies for fire resistance and acoustic performance noted. Supplier of materials must provide confirmation that products and total assemblies meet performance requirements.
- .2 Standard board: to ASTM C 36/C 36M regular, 12.7mm and 15.9 mm thick, and Type X 1200 mm wide x maximum practical length, ends square cut, edges bevelled, 4% post consumer recycled content, 94% post industrial recycled content, and 100% recycled face paper.
  - .1 CGC Sheetrock TGD
  - .2 Certainteed Proroc
- .3 Exterior glass mat gypsum substrate sheathing: to ASTM C 1177/C 1177M, 12.7 & 15.9mm thick, 1200 mm wide x maximum practical length. Type X where indicated.
  - .1 Acceptable Materials:
    - .1 CGC Fibrerock Aqua-Tough sheathing
    - .2 Certainteed Glasroc
    - .3 Georgia Pacific Dens Glass Gold

- .4 Metal furring runners, hangers, tie wires, inserts, anchors: to CSA A82.30, galvanized.
- .5 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .6 Resilient drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
- .7 Nails: to ASTM C 514.
- .8 Steel drill screws: to ASTM C 1002.
- .9 Laminating compound: as recommended by manufacturer, asbestos-free.
- .10 Casing beads, corner beads, control joints and edge trim: to ASTM C 1047, zinc-coated by electrolytic process, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .11 Sealants: in accordance with Section 07 92 00 - Joint Sealing.
- .12 Acoustic sealant: Tremco Acoustic Sealant or equal, Refer to Section 07 92 00
- .13 Polyethylene: to CAN/CGSB-51.34, Type 2.
- .14 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one face, lengths as required.
- .15 Joint compound: to ASTM C 475, asbestos-free.
- .16 Gypsum board J-trim with neoprene gaskets at junctions where new installation abut:
  - .1 with existing gypsum board assemblies to remain
  - .2 exterior window frames
  - .3 Mechanical cabinets within finished rooms.
  - .4 where indicated on drawings:
  - .5 Acceptable Product: Nova Trim, Adjustable and removable "J" protection, Model 8131.

## **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 Contractor of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied.

### 3.2 ERECTION

- .1 Do application and finishing of gypsum board in accordance with ASTM C 840 except where specified otherwise.
- .2 Do application of gypsum sheathing in accordance with ASTM C 1280.
- .3 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C 840 except where specified otherwise.
- .4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .5 Install work level to tolerance of 1:1200.
- .6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles, and other access locations including valves, access doors and fire dampers.
- .7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .10 Install wall furring for gypsum board wall finishes in accordance with ASTM C 840, except where specified otherwise.
- .11 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .13 Erect drywall resilient furring transversely across studs and joists, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.

### 3.3 APPLICATION

- .14 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.
  
- .1 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical and mechanical work are approved.
  
- .2 Apply single and double layer gypsum board to wood and metal furring or framing using screw fasteners for first layer, screw fasteners for second layer. Maximum spacing of screws 300 mm on centre.
  - .1 Single-Layer Application:
    - .1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C 840.
    - .2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.
  - .2 Double-Layer Application:
    - .1 Install gypsum board for base layer and exposed gypsum board for face layer.
    - .2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.
    - .3 Apply base layers at right angles to supports unless otherwise indicated.
    - .4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.
  
- .3 Apply single and double layer gypsum board to concrete concrete block surfaces, where indicated.
  - .1 Comply with gypsum board manufacturer's recommendations.
  
- .4 Ceilings: Install exterior gypsum board perpendicular to supports; stagger end joints over supports. Install with 6 mm gap where boards abut other work.
  
- .5 Apply 12 mm diameter bead of acoustic sealant continuously around periphery 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,, in partitions where perimeter sealed with acoustic sealant. Refer to acoustic notes on drawings related to additional requirements.
  
- .6 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.

- .7 Install gypsum board on walls vertically to avoid end-butt joints. At high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.
- .8 Install gypsum board with face side out.
- .9 Do not install damaged or damp boards.
- .10 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.
- .11 Install tile backer board to all walls specified to receive ceramic tile finish.
- .12 At all exterior window frame jambs and heads, return gypsum board into window frame. Apply specified Nova trim to act as separator between gypsum board and window frame. Finish gypsum board to trim edge. Construct mock-up for review and approval prior to proceeding with general work.

### 3.4 INSTALLATION

- .1 Erect accessories straight, plumb or 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, free from rough edges. Secure at 150 mm on centre.
- .2 Install casing beads around perimeter of suspended ceilings.
- .3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .4 Install insulating strips continuously at edges of gypsum board and casing beads abutting window and exterior door frames, to provide thermal break. Use 2mm thick black foam tape, leaving tape edge exposed as a break between window and door frames and gypsum board casing bead.
- .5 Construct control joints of preformed units set in gypsum board facing and supported independently on both sides of joint.
- .6 Provide continuous polyethylene dust barrier behind and across control joints.
- .7 Locate control joints where indicated at changes in substrate construction at approximate 10 m spacing on long corridor runs at approximate 15 m spacing on ceilings.

- .8 Install control joints straight and true.
- .9 Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.
- .10 Install expansion joint straight and true.
- .11 Splice corners and intersections together and secure to each member with 3 screws.
- .12 Install access doors to electrical and mechanical fixtures specified in respective sections.
  - .1 Rigidly secure frames to furring or framing systems.
- .13 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.
- .14 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with Association of the Wall and Ceiling Industries (AWCI) International Recommended Specification on Levels of Gypsum Board Finish:
  - .1 Level 1: Embed tape for joints and interior angles in joint compound. Surfaces to be free of excess joint compound; tool marks and ridges are acceptable. Locations: plenum areas above ceilings.
  - .2 Level 2: Embed tape for joints and interior angles in joint compound and apply one separate coat of joint compound over joints, angles, fastener heads and accessories; surfaces free of excess joint compound; tool marks and ridges are acceptable. Locations: panels to be covered with ceramic tile and Whiterock finish.
  - .3 Level 3: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges. Locations which are to receive coving plaster finish.
  - .4 Level 4: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges. Locations: standard for all locations not exposed to severe natural lighting conditions (natural light washing across wall face).
  - .5 Level 5: embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges. Locations: standard

for all locations exposed to severe natural lighting conditions.  
(natural light washing across wall face)

- .15 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .16 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.
- .17 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .18 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .19 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.
- .20 Mix joint compound slightly thinner than for joint taping.
- .21 Apply thin coat to entire surface using trowel or drywall broadknife to fill surface texture differences, variations or tool marks.
- .22 Allow skim coat to dry completely.
- .23 Remove ridges by light sanding or wiping with damp cloth.
- .24 Provide protection that ensures gypsum drywall work will remain without damage or deterioration at time of substantial completion.

### 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.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.



3.6 PROTECTION

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

**END OF SECTION**

## **PART 1 - GENERAL**

- 1.1 RELATED SECTIONS**
- .1 Section 05 41 00 – Structural Metal Stud Framing
  - .2 Section 07 92 00 - Joint Sealants.
  - .3 Section 09 21 16 - Gypsum Board Assemblies.
- 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).
    - .1 CAN/CGSB-1.40-97, Primer, Structural Steel, Oil Alkyd Type.
  - .3 Environmental Choice Program (ECP).
    - .1 CCD-047a -98, Paints - Surface Coatings.
    - .2 CCD-048-98, Surface Coatings - Recycled Water-borne.
- 1.3 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.
- 1.4 WASTE MANAGEMENT AND DISPOSAL**
- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
  - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
  - .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

- .4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.
- .5 Divert unused gypsum materials from landfill to recycling facility approved by Consultant.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Non-load bearing channel stud framing: to ASTM C 645, stud size as indicated on drawings, roll formed from 0.53 mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres.
- .2 Floor and ceiling tracks: to ASTM C 645, in widths to suit stud sizes, 32 mm flange height.
- .3 Use 0.91mm thick steel sheet for studs at walls which are to have grab bars installed.
- .4 Metal channel stiffener: size to suit wall stud, framing, 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.
- .5 Acoustical sealant: to ASTM C919.
- .6 Insulating strip: rubberized, moisture resistant 6 mm thick foam strip, full width of track, with self sticking adhesive on one face, lengths as required.
- .7 Steel Backing Sheets: 1.083mm (18 GA) galvanized sheet steel.

## **PART 3 - EXECUTION**

### **3.1 ERECTION**

- .1 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.
- .2 Install damp proof course under stud shoe tracks of partitions on slabs on grade.
- .3 Place studs vertically at 600 mm on centre 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.

- .4 Erect metal studding to tolerance of 1:1000.
- .5 Attach studs to bottom ceiling track using screws.
- .6 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.
- .7 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.
- .8 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
- .9 Install heavy gauge single jamb studs at openings.
- .10 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 instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.
- .11 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
- .12 Provide 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars, attached to steel stud partitions. Refer also to other clauses of this Section for backing and blocking requirements.
- .13 Install steel studs or furring channel between studs for attaching electrical and other boxes.
- .14 Extend partitions to underside of structure except where noted otherwise on drawings.
- .15 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50 mm leg ceiling tracks.
- .16 Install two continuous beads of acoustical sealant or insulating

strip under studs and tracks around perimeter of sound control partitions. Refer to acoustic notes on drawings for acoustic requirements.

- .17 Install continuous 200mm wide horizontal strips of galvanized sheet steel screw fastened to studs at locations required to provide anchorage backing for cabinets and wall mounted elements. Screw heads to be flush with backing strips as not to effect finish drywall surface plumpness. Items for which metal backing is to be installed included but not limited to millwork, cabinets, wall mounted door hardware (wall stops), washroom accessories, and grab bars.
- .18 At all accessible washrooms provide and install 18GA galv. metal panels 1220 high for backing of grab bars sandwiched between layers of drywall in double drywall applications.
  - .1 At water closets provide to accommodate grab bars installed as per O.B.C. 3.8.3.8.(3) and (4).
- .19 Install heavy gauge studs (1.146mm th.) with wide flange (41mm) at all locations where cement board or specialty board is to be installed which require increased sub-framing support / anchorage. This applies to locations with ceramic wall tile and hygienic pvc wallcovering as the wall finish.
- .20 Refer to structural drawings for metal stud "shear wall" construction. Metal deck to be installed to face of metal stud walls.

### 3.2 CLEANING

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

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 SUMMARY**

- .1 Section Includes:
  - .1 Materials and application of acoustical units for direct application or for application and installation within a suspended ceiling.
  - .2 Engineering of Acoustical Panel Ceilings to meet the prescriptive requirements of ASTM E580 for Seismic Design and CAN/CSA S832, or OBC Article 4.1.8.17. Seismic Design of ceiling systems shall consider the following factors:
    - .1 Soil site classification D.
    - .2 The design spectral response acceleration found in SB-1.
    - .3 The intended use of the completed Project as noted in OBC Article 4.1.8.5.
- .2 Related Requirements
  - .1 Section 09 00 00 – Interior Finish Material / Colour Legend
  - .2 Section 09 00 50 – Room Finish Schedule
  - .3 Section 09 53 00 – Acoustical Suspension Grid
  - .4 Division 21, 22, 23 - Mechanical
  - .5 Division 25 - Electrical

### **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 E580 / E580M-14, Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
  - .3 ASTM E 1264-98, Standard Classification for Acoustical Ceiling Products.
  - .4 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-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.
  - .2 CAN/CSA-S832-06 (R2011) – Seismic Risk Reduction of Operational and Functional Components (OFCs) of Buildings
- .3 Canadian Standards Association (CSA International)
  - .1 CSA B111-1974(R2003), Wire Nails, Spikes and

Staples.

- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .5 Underwriter's Laboratories of Canada (ULC)
  - .1 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 Product Data: submit WHMIS MSDS in accordance with Section 01 47 15 - Sustainable Requirements: Construction and Section 02 81 01 - Hazardous Materials.
- .3 Co-ordinate submittal requirements and provide submittals required by Section 01 47 15 - Sustainable Requirements: Construction.
- .4 Submit duplicate 150 x 150 samples of each type acoustical units.

### 1.4 QUALITY ASSURANCE

- .1 Regulatory Requirements:
  - .1 Fire-resistance rated floor/ceiling and roof/ceiling assembly: certified by Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Mock-up:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
  - .2 Construct mock-up of each type acoustical tile ceiling including one inside corner and one outside corner.
  - .3 Construct mock-up where directed.
  - .4 Allow 24 hours for inspection of mock-up by Consultant before proceeding with ceiling work.
  - .5 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of the finished work.
- .3 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

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 Departmental Representative DCC Representative Consultant.
- .3 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling .
  - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
  - .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling.
  - .4 Separate for reuse and recycling and place in designated containers Steel Metal Plastic waste in accordance with Waste Management Plan.
  - .5 Fold up metal and plastic banding, flatten and place in designated area for recycling.

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.

**PART 2 - PRODUCTS**

2.1 MATERIALS

- .1 Acoustic units for suspended ceiling system: to CAN/CGSB-92.1 and ASTM E 1264.



- .1 Acceptable products:
  - .1 Armstrong SchooZone Fine Fissured #1714 Square Edge, 610mm x 1219mm x 25mm.
  - .2 CGC Radar ClimaPlus High NRC #22441 Square Edge, 610mm x 1219mm x 25mm.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

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

#### **3.2 INSTALLATION**

- .1 Install acoustical panels and tiles in ceiling suspension system.

#### **3.3 APPLICATION**

- .1 Install acoustical units as noted on 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 00.01 - 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 SUMMARY**

- .1 Section Includes:
  - .1 Materials and application of acoustical suspended ceiling for acoustic panel ceilings.
  - .2 Engineering of Acoustical Panel Ceilings to meet the prescriptive requirements of ASTM E580 for Seismic Design and CAN/CSA S832, or OBC Article 4.1.8.17. Seismic Design of ceiling systems shall consider the following factors:
    - .1 Soil site classification D.
    - .2 The design spectral response acceleration found in SB-1.
    - .3 The intended use of the completed Project (OBC Article 4.1.8.5).
  - .3 Related Requirements:
    - .1 Section 09 00 00 – Interior Finish Material / Colour Legend
    - .2 Section 09 00 50 – Room Finish Schedule
    - .3 Section 09 51 13 – Acoustical Ceiling Panel
    - .4 Divisions 21, 22, and 23: Mechanical
    - .5 Division 26: Electrical

### **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.
  - .3 ASTM E580 / E580M-14, Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CSA-S832-06 (R2011) – Seismic Risk Reduction of Operational and Functional Components (OFCs) of Buildings
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).

### **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 acoustical suspension 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 Canada. Shop drawings shall demonstrate compliance with seismic design requirements of ASTM E580 / E580M and CAN/CSA-S832
    - .2 Submit reflected ceiling plans for special grid patterns as indicated.
    - .3 Indicate lay-out, insert and hanger spacing and fastening details, splicing method for main and cross runners, location of access splines change in level details, access door dimensions, and locations and acoustical unit support at ceiling fixture lateral bracing and accessories.
  - .4 Samples:
    - .1 Submit for review and acceptance of each unit.
    - .2 Samples will be returned for inclusion into work.
    - .3 Submit one representative model of each type ceiling suspension system.
    - .4 Ceiling system to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.
- 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 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria, seismic design, 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.
  - .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 acoustical ceiling tiles and tracks from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section .
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **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 Heavy duty system to ASTM C 635/ASTM C635M.
- .2 Basic materials for suspension system: commercial quality cold rolled steel .
- .3 Suspension system: non fire rated, made up as follows:
  - .1 2 directional exposed tee bar grid.
  - .2 Acceptable products:
    - .1 Armstrong Prelude ML
    - .2 CGC DX
- .4 Exposed tee bar grid components: shop painted satin sheen white . Components die cut. Main tee with double web, rectangular bulb and 25 mm rolled cap on exposed face. Cross tee with rectangular bulb; web extended to form positive interlock with main tee webs; lower flange extended and offset to provide flush intersection.
- .5 Hanger wire: galvanized soft annealed steel wire:
  - .1 3.6 mm diameter for access tile ceilings.
  - .2 To ULC design requirements for fire rated assemblies.
- .6 Hanger inserts: purpose made.
- .7 Carrying channels: 38 x 19mm channel, of 1.2 mm thick

galvanized steel.

- .8 Accessories: splices, clips, wire ties, retainers and wall moulding flush reveal, to complement suspension system components, as recommended by system manufacturer.
- .9 The Contractor shall ensure compatibility between ceiling tiles and specified suspension grid during tender period.

### **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 manufacturer.
- .6 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees and as per manufacturer's written instructions, to meet seismic design requirements and as per approved shop drawings.
- .7 Install seismic bracing as per manufacturer's written instruction to meet seismic design requirements and as per approved shop drawings.
- .8 Lay out centre line of ceiling both ways, to provide balanced borders at room perimeter with border units not less than 50% of

standard unit width system according to reflected ceiling plan.

- .9 Ensure suspension system is co-ordinated with location of related components.
- .10 Install wall moulding to provide correct ceiling height.
- .11 Completed suspension system to support super-imposed loads, such as lighting fixtures diffusers grilles and speakers .
- .12 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.
- .13 Interlock cross member to main runner to provide rigid assembly.
- .14 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.
- .15 Finished ceiling system to be square with adjoining walls and level within 1:1000.

### 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.
  - .1 Touch up scratches, abrasions, voids and other defects in painted surfaces.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal .
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### 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 GENERAL**

- .1 The work of this Section includes the supply and installation of Vinyl Composite Tile (VCT).

### **1.2 RELATED SECTIONS**

- .1 Submittal Procedures Section 01 33 00
- .2 Indoor Air Quality Requirements Section 01 81 19
- .3 Concrete Flooring Finishing Section 03 35 00
- .4 Architectural Woodwork Section 06 40 00

### **1.3 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM C1028-96, Standard Test for Floor Slip Resistance.
  - .2 ASTM E648, Standard Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
  - .3 ASTM E662, Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
  - .4 ASTM F970, Standard Test for Static Load Limit.
  - .5 ASTM F1514, Standard Test Method for Measuring Heat Stability of Resilient Flooring by Color Change..
  - .6 ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
  - .7 ASTM F1869, Standard Test Method for Measuring Vapour Emission Rate of Concrete Sub Floor Using Anhydrous Calcium Chloride.
  - .8 ASTM F2170, Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
- .2 Resilient Floor Covering Institute
  - .1 RFCI Standard Slab Moisture Test Method
- .3 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.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.5 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

.6 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S102.2, Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.

#### 1.4 SUBMITTALS

- .1 Samples: Submit for approval the complete range of colours, finishes and material for the various items of work specified herein. Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Shop Drawings: Submit shop drawings for review in accordance with Section 01 33 00 – Submittal Procedures.
- .3 Maintenance Data and Operating Instructions: Provide copies of maintenance and operating instructions in accordance with Section 01 77 00 – Closeout Submittals.

#### 1.5 HANDLING & STORAGE

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .1 Store the flooring inside, sheltered from extreme hot or cold temperatures. Place the material on a smooth level floor or where there is a uniform solid support in a clean, dry well-ventilated area. The storage temperature must be maintained between 18dC and 24dC. Protect adhesive from freezing and extreme heat.
- .2 Waste Management and Disposal:  
.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
- .3 Protect all material during transit and on the site from damage and from the elements.
- .4 Do not remove units from crates and protective packing until ready for installation.
- .5 Handle the units with care to prevent damage and use



protective pads and covering to prevent soiling and marring of the finish. .

1.6 ENVIRONMENTAL REQTS

- .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.

1.7 MAINTENANCE

- .1 Extra Materials:
- .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, 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 Consultant, upon completion of the work of this section.
  - .6 Store where directed by Consultant.

1.8 QUALITY ASSURANCE

- .1 Installer Qualifications: Experienced in performing the work of this section and who is specialized in the installation of work similar to that required for this project.
- .1 Training: Installer who has attended a Manufacturer's flooring installation training clinic.
- .2 Mock-ups: Install at project site a job mock-up using acceptable products and manufacturer approved installation methods, including concrete substrate testing. Obtain Owner's and Consultant's acceptance of finish colour texture and pattern and workmanship standards.
- .1 Mock-up Size: 3m x 3m
  - .2 Maintenance: Maintain mock-up during construction for workmanship comparison.
  - .3 Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.

1.9 WARRANTY

- .1 Project Warranty: Refer to CCDC 2 for project warranty provisions.
- .2 Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official in accordance with Section 01 78 00 Closeout Submittals. Manufacturer's warranty is in addition to and not a limitation of other rights that the Owner may have under the Contract Conditions.

- .3 Warranty period on material shall be extended from one year to five years.
- .4 Warranty shall specifically guarantee against defects and wear, of pattern, colour and delamination.
- .5 Warranty period on labour shall be extended from one year to two years.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Vinyl composition tile: to CSA A126.1 Type A mottled, 3.17 mm thick, 305 x 305mm size, slip resistance ADA compliant, Standard Test Method for Static Load Limit - 300 psi.
  - .1 Acceptable product:
    - .1 Johnsonite Azrock VCT Collection 'Pinch of Salt' V-234.
  - .2 Resilient base: RB-1 traditional cove rubber base with standard toe profile. Meets ASTM F-137, Dimensional Stability no more than +/-0.25% ASTM F-1861. PVC free, 100% Type TS Pinnacle Rubber. Lengths to be in minimum 1200 mm length and 100 mm including premoulded end stops and external corners for coved base only. Height 100mm, Standard toe profile.
    - .1 Acceptable product:
      - .1 Johnsonite 'Burnt Umber B' #63.
  - .3 Adhesives:
    - .1 For adhering flooring and rubber base to substrate as per Manufacturer's Written Instructions.
  - .4 Primer and Patch: 2 part latex-type filler requiring no water as recommended by flooring manufacturer for use with their product. Feather floor areas as required to ensure minimum transition height between floor finishes as noted on drawings. Allow for two coats. Standard of Acceptance: HB Fuller TA 320 Perfect Finish
  - .5 Floor patch and leveller TEC Primer TA560 and TEC Levelling TA323 "No substitute" where vinyl flooring is being applied where substrate requires a self levelling material.
  - .6 Metal edge strips: Schluter aluminum extruded, smooth, mill finish with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

- .7 Transition strips: Schluter stainless steel or aluminum profiles as noted to provide smooth transition between different finish heights.
- .8 Sealer: to CAN/CGSB-25.20, Type 2-water based or type recommended by flooring manufacturer.
  - .1 Sealant: Sealant: maximum VOC limit 50 g/L to SCAQMD Rule 1168.
- .9 Wax: to CAN/CGSB-25.21 or type recommended by flooring manufacturer.

### **PART 3 – EXECUTION**

#### **3.1 WORKMANSHIP**

- .1 Install flooring, base and transitions in accordance with manufacturer's instructions.
- .2 Finished installation shall present a uniform appearance , free from conspicuous joints, unevenness, colour contrast and other faults. Joints shall be firm and even. Entire surface of tile shall be fully adhered to substrate.

#### **3.2 SURFACE CONDITIONS**

- .1 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 finished flooring material.
- .2 Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, and hardening compounds; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold or mildew.
- .3 Do not remove residual or other adhesive with chemical adhesive removal products.
- .4 Report conditions contrary to contract requirements which 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 with regard to conditions existing at the time of installation.

- .6 Vinyl flooring shall be installed over subfloors conforming to ASTM F710 for concrete and other monolithic floors.
- .7 Moisture Testing: Perform calcium chloride moisture test every 800 square feet of area. Advise Flooring Material's Technical Representative, Consultant and Project Manager of results.
- If Calcium Chloride test results are found to be above Manufacturer's Written Recommendations perform Rapide R.H. Moisture Test by Wagner Electronics. The Contractor shall be paid \$200 per Rapide R.H. Moisture Test performed.
- .7 The pH level of the subfloor surface shall not be higher than the Manufacturer's recommendations. If higher, subfloor must be neutralized.
- .8 Underlayment and Patching Compounds: Use only gray colored Portland cement based underlayments; patching compounds are used for filling cracks, holes and leveling. White gypsum materials are not acceptable.
- .9 Perform a bond test for each type of material. Mockup shall incorporate underlayment, adhesive and tile on the concrete slab to determine compatibility of the system. This shall be performed in advance of the flooring being installed. Photographs of each step taken shall be forwarded to the Manufacturer's representative for review and issuance of a report prior to proceeding with the full installation.

### 3.3 PREPARATION OF FLOORS

- .1 Substrate to be free from oil, grease, dust, loose, concrete sealer, floor finishes or curing compound. Surface protrusions shall be removed by sanding, scraping or chipping. After sanding, remove all dust by vacuuming.
- .2 Apply TEC TA320 Perfect Finish Floor Patch and Leveller smooth finish as per manufacturer's written recommendations.

### 3.4 PREPARATION OF ALL SUBSTRATES PRIOR TO INSTALLATION OF FINISH FLOORING

- .1 Vacuum or broom-clean surfaces to be covered immediately before the application of flooring. Make subfloor free from dust, dirt, grease and all foreign materials.
- .2 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

### 3.5 TILE APPLICATION

- .1 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.
- .2 Lay flooring with joints parallel to building lines to produce symmetrical tile pattern. Border tiles minimum half tile width.
- .3 See Floor Finish Plans for joint pattern.
- .4 As installation progresses and after installation, roll flooring in 2 directions with 45 kg minimum roller to ensure full adhesion, all in accordance with manufacturer's written instructions.
- .5 Cut tile to fit neatly around fixed objects.
- .6 Install feature strips and floor markings where indicated. Fit joints tightly.
- .8 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.
- .9 Refer to Section 09 30 13 for trim where flooring abuts ceramic tile.

### 3.6 CLEANING

- .1 Remove excess adhesive from floor without damage.
- .2 After adhesive has set, clean floor and base surface to flooring manufacturer's instructions. Wash with neutral cleaner, rinse and dry.
- .3 Wax: material and application by Owner.

### 3.7 PROTECTION OF FINISHED WORK

- .1 Protect new floors from time of final set of vinyl until just prior to final inspection with brown Kraft paper and then a layer of plywood sheets.
- .2 Prohibit traffic on floor for 48 hours after installation.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 35 43 – Environmental Procedures
- .3 Section 01 45 00 – Quality Control
- .4 Section 01 74 21 – Construction/Demolition Waste Management and Disposal
- .5 Section 05 50 00 – Metal Fabrications
- .6 Section 07 46 23 – Wood Siding
- .7 Section 07 92 00 – Joint Sealants
- .8 Section 09 01 23 – Interior Painting

### **1.2 REFERENCES**

- .1 Environmental Protection Agency (EPA)
  - .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .3 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.
- .4 National Fire Code of Canada.
- .5 Society for Protective Coatings (SSPC)
  - .1 Systems and Specifications, SSPC Painting Manual 2005.
- .6 South Coast Air Quality Management District (SCAQMO) Rule 1113 – Paint Coatings
- .7 Green Seal Program
  - .1 GS-11 – Paints (1993)
  - .2 GC-03-Anti Corrosive Paints (1997)

### **1.3 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Conform to latest MPI requirements for exterior painting work including preparation and priming.
  - .2 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
  - .3 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.
- .4 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Consultant.
  - .5 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.

1.4 PERFORMANCE REQUIREMENTS

- .1 Environmental Performance Requirements:
  - .1 Provide paint products meeting MPI "Environmentally Friendly" E1 E2 E3 ratings based on VOC (EPA Method 24) content levels.
  - .2 Green Performance in accordance with MPI Standard GPS-1.

1.5 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit WHMIS MSDS - Material Safety Data Sheets.
- .3 Upon completion, submit records of products used. List products in relation to finish system and include the following:
  - .1 Product name, type and use.
  - .2 Manufacturer's product number.
  - .3 Colour numbers.
  - .4 MPI Environmentally Friendly classification system rating.
  - .5 Manufacturer's Material Safety Data Sheets (MSDS).
- .4 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Submit duplicate 200 x 300 mm sample panels of each specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards submitted on the following substrate materials:
    - .1 3 mm plate steel for finishes over metal surfaces.
    - .2 13 mm birch plywood for finishes over wood surfaces.

.3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.

.4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.

.5 38 mm cedar for clear coating over wood surfaces.

.2 When approved, samples shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.

.3 Submit full range of available colours where colour availability is restricted.

#### 1.6 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.

#### 1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements, supplemented as follows:
- .1 Deliver and store materials in original containers, sealed, with labels intact.
- .2 Labels: to indicate:
- .1 Manufacturer's name and address.
- .2 Type of paint or coating.
- .3 Compliance with applicable standard.
- .4 Colour number in accordance with established colour schedule.
- .3 Remove damaged, opened and rejected materials from site.
- .4 Provide and maintain dry, temperature controlled, secure storage.
- .5 Observe manufacturer's recommendations for storage and handling.
- .6 Store materials and supplies away from heat generating devices.
- .7 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
- .8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Consultant. After completion of operations, return areas to clean condition to approval of Consultant.
- .10 Remove paint materials from storage only in quantities required for same day use.



- .11 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
- .12 Fire Safety Requirements:
  - .1 Provide one 9 kg Type ABC fire extinguisher adjacent to storage area.
  - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
  - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .2 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
  - .3 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
  - .4 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
  - .5 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into the ground the following procedures shall be strictly adhered to:
    - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
    - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
    - .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
    - .4 Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.
    - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
  - .6 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
  - .7 Set aside and protect surplus and uncontaminated finish materials. Deliver to or arrange collection by organizations for verifiable re-use or re-manufacturing.
  - .8 Close and seal tightly partly used sealant and adhesive

containers and store protected in well ventilated fire-safe area at moderate temperature.

1.8 AMBIENT  
CONDITIONS

- .1 Heating, Ventilation and Lighting:
- .1 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.
  - .2 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.
  - .3 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 15 % for wood.
    - .2 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.

## **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 Paint materials for paint systems: to be products of single manufacturer.
- .3 Only qualified products with E2 E3 "Environmentally Friendly" ratings are acceptable for use on this project.

### **2.2 COLOURS**

- .1 Colours: Wood Siding: To match existing wood siding colour on existing school..
- .2 Selection of colours will be from manufacturers full range of colours.
- .3 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site.
- .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.

2.4 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 specified and as noted on Finish Schedule.

2.5 EXTERIOR PAINTING SYSTEMS

- .1 Asphalt Surfaces: zone/traffic marking for drive and parking areas, etc.
  - .1 EXT 2.1A - Latex zone/traffic marking finish.

- .2 Structural Steel and Metal Fabrications:
  - .1 EXT 5.1G - Pigmented polyurethane finish (over epoxy zinc rich primer and high build epoxy).
- .3 Galvanized Metal: not chromate passivated
  - .1 EXT 5.3D - Pigmented polyurethane 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 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 wiping with dry, clean cloths.
  - .2 Wash surfaces with a biodegradable detergent 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 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 Do not apply paint until prepared surfaces have been accepted by Paint Manufacturer's Representative.
- .7 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.

### 3.3 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 Wood: 15 %.

### 3.4 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, 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.

### 3.5 APPLICATION

- .1 Method of application to be as approved by Consultant. Apply paint by brush and roller . Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
  - .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple unless approved by Consultant.
  - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Consultant.
- .4 Apply coats of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .6 Sand and dust between coats to remove visible defects.
- .7 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.

### 3.6 MECHANICAL/ELECTRICAL EQUIPMENT

- .1 Unless otherwise specified, paint 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. Confirm items with Consultant.
- .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 Paint steel electrical light standards. Do not paint outdoor transformers and substation equipment.

### 3.7 FIELD QUALITY CONTROL

.1 Inspection:

.1 Advise Consultant when each surface and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.

.2 Co-operate with Consultant and provide access to areas of work.

.2 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.

### 3.8 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.

### 3.9 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.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

**END OF SECTION**



## **PART 1 - GENERAL**

### **1.1 SUMMARY**

- .1 Section Includes:
  - .1 Material and installation of site applied paint finishes to new interior surfaces, including site painting of shop primed surfaces.
- .2 Related Sections:
  - .1 Section 01 33 00 – Submittal Procedures
  - .2 Section 01 35 30 – Health and Safety Requirements
  - .3 Section 01 45 00 – Quality Control
  - .4 Section 01 60 00 – Common Product Requirements
  - .5 Section 01 74 19 – Waste Management and Disposal
  - .6 Section 01 78 00 – Closeout Submittals
  - .7 Section 05 12 00 – Structural Steel
  - .8 Section 05 31 00 – Steel Deck
  - .9 Section 06 40 00 – Architectural Woodwork
  - .10 Section 08 11 00 – Hollow Metal Doors and Frames
  - .11 Section 08 14 16 – Flush Wood Doors
  - .12 Section 09 21 16 – Gypsum Board Assemblies

### **1.2 REFERENCES**

- .1 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33
- .2 Environmental Protection Agency (EPA)
  - .1 EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 - 1995, (for Surface Coatings).
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .4 Master Painters Institute (MPI)
  - .1 MPI Architectural Painting Specifications Manual, 2004.
- .5 National Fire Code of Canada - 1995
- .6 Society for Protective Coatings (SSPC)
  - .1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.
- .7 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34 .

1.3 QUALITY  
ASSURANCE

- .1 Qualifications:
  - .1 Contractor: minimum of five years proven satisfactory experience. Provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
  - .2 Journeymen: qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" engaged in painting work.
  - .3 Apprentices: working under direct supervision of qualified trades person in accordance with trade regulations.
  
- .2 Mock-Ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
    - .1 Provide 3 sq.m. mock-up. Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen, textures.
    - .2 Mock-up will be used:
      - .1 To judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
      - .3 Locate where directed
      - .4 Allow 72 hours for inspection of mock-up before proceeding with work.
      - .5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.
  
- .3 Pre-Installation Meeting:
  - .1 Convene pre-installation meeting two weeks prior to beginning work of this Section and on-site installations
    - .1 Verify project requirements.
    - .2 Review installation and substrate conditions.
    - .3 Coordination with other building subtrades.
    - .4 Review manufacturer's installation instructions and warranty requirements.
  
- .4 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

1.4 SUBMITTALS

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

- .2 Product Data:
  - .1 Submit product data and instructions for each paint and coating product to be used.
  - .2 Submit product data for the use and application of paint thinner.
  - .3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOCs during application and curing.
  
- .3 Samples:
  - .1 Submit full range colour sample chips to indicate where colour availability is restricted.
  - .2 Submit duplicate 200 x 300 mm sample panels of each paint stain clear coating special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
    - .1 3 mm plate steel for finishes over metal surfaces.
    - .2 13 mm maple plywood for finishes over wood surfaces.
    - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
    - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
  - .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
  - .4 Test reports: submit certified test reports for paint from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
    - .1 Lead, cadmium and chromium: presence of and amounts.
    - .2 Mercury: presence of and amounts.
    - .3 Organochlorines and PCBs: presence of and amounts.
  - .5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .6 Manufacturer's Instructions:
    - .1 Submit manufacturer's installation and application instructions.
  - .7 Closeout Submittals: submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals include following:
    - .1 Product name, type and use.
    - .2 Manufacturer's product number.
    - .3 Colour numbers.
    - .4 MPI Environmentally Friendly classification

system rating.

1.5 MAINTENANCE

- .1 Extra Materials:
- .1 Deliver to extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 - Closeout Submittals.
  - .2 Quantity: provide 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.
  - .3 Delivery, storage and protection: comply with Consultant requirements for delivery and storage of extra materials.

1.6 DELIVERY,  
STORAGE AND  
HANDLING

- .1 Packing, Shipping, Handling and Unloading:
- .1 Pack, ship, handle and unload materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's written instructions.
- .2 Acceptance at Site:
- .1 Identify products and materials with labels indicating:
    - .1 Manufacturer's name and address.
    - .2 Type of paint or coating.
    - .3 Compliance with applicable standard.
    - .4 Colour number in accordance with established colour schedule.
- .3 Remove damaged, opened and rejected materials from site.
- .4 Storage and Protection:
- .1 Provide and maintain dry, temperature controlled, secure storage.
  - .2 Store materials and supplies away from heat generating devices.
  - .3 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
- .5 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .6 Keep areas used for storage, cleaning and preparation clean and orderly. After completion of operations, return areas to clean condition.
- .7 Remove paint materials from storage only in quantities required for same day use.

- .8 Fire Safety Requirements:
  - .1 Provide one 9 kg Type ABC fire extinguisher adjacent to storage area.
  - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
  - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.
  
- .9 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
  - .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan (WMP).
  - .4 Separate for reuse and recycling and place in designated containers Steel Metal Plastic waste in accordance with Waste Management Plan (WMP).
  - .5 Place materials defined as hazardous or toxic in designated containers.
  - .6 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal, regulations.
  - .7 Ensure emptied containers are sealed and stored safely.
  - .8 Unused paint coating materials must be disposed of at official hazardous material collections site as approved by Consultant.
  - .9 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
  - .10 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
  - .11 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
  - .12 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:
    - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
    - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure

proper disposal.

.3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.

.4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.

.5 Empty paint cans are to be dry prior to disposal or recycling (where available).

.13 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.

.14 Set aside and protect surplus and uncontaminated finish materials. Deliver to or arrange collection by, or organizations for verifiable re-use or re-manufacturing.

## 1.7 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
- .1 Provide heating facilities 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.
- .2 Provide continuous ventilation for seven days after completion of application of paint.
- .3 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.
- .4 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
- .1 Unless pre-approved written approval by product manufacturer, perform no painting when:
- .1 Ambient air and substrate temperatures are below 10 degrees C.
- .2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
- .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
- .4 The relative humidity is under 85 % or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.

- .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
- .6 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.
- .2 Perform painting work when maximum moisture content of the substrate is below:
  - .1 Allow new concrete and masonry to cure minimum of 28 days.
  - .2 15 % for wood.
  - .3 12 % for plaster and gypsum board.
- .3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "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.
  - .3 Apply paint when previous coat of paint is dry or adequately cured.
- .4 Additional interior application requirements:
  - .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Provide paint materials for paint systems from single manufacturer.
- .3 Only qualified products with E2 E3 "Environmentally Friendly" rating are acceptable for use on this project.
- .4 Conform to latest MPI requirements for interior painting work

including preparation and priming.

- .5 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.
- .6 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.
- .7 Provide paint products meeting MPI "Environmentally Friendly", E2& E3 ratings based on VOC (EPA Method 24) content levels.

## 2.2 COLOURS

- .1 Selection of colours from manufacturer's full range of colours. Allow for 5 colours.
- .2 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

## 2.3 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.
- .4 Thin paint for spraying in accordance with paint manufacturer's instructions.
- .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.

## 2.4 GLOSS/SHEEN RATINGS

- .1 Paint gloss is defined as sheen rating of applied paint, in accordance with following values:

	<u>Gloss @ 60 degrees</u>	<u>Sheen @ 85 degrees</u>
Gloss Level 1 - Matte Finish (flat)	Max. 5	Max. 10



Gloss Level 2 - Velvet-Like Finish	Max.10	10 to 35
Gloss Level 3 - Eggshell Finish	10 to 25	10 to 35
Gloss Level 4 - Satin-Like Finish	20 to 35	min. 35
Gloss Level 5 - Traditional Semi-Gloss Finish	35 to 70	
Gloss Level 6 - Traditional Gloss	70 to 85	
Gloss Level 7 - High Gloss Finish	More than 85	

.2 Gloss level ratings of painted surfaces as indicated.

2.5 INTERIOR  
 PAINTING SYSTEMS

- .1 Exposed ceiling structure, metal deck, mechanical and electrical systems: All portions of structural, mechanical & electrical systems shall be painted as indicated. Paint over applied fireproofing where exposed.
  - .1 INT 510.2A – Latex G1, flat premium grade finish. Colour to be selected from manufacturer’s standard colour range.
- .2 Galvanized metal: doors, frames, railings, misc. steel, pipes, overhead decking, and ducts.
  - .1 INT 5.3B - Waterborne light industrial G5 premium coating.
- .3 Dressed lumber: including doors, door and window frames, casings, mouldings:
  - .1 INT 6.3A - High performance architectural latex G5 premium grade finish for painted wood.
  - .2 INT 6.3S - Clear fire retardant finish (ULC rated), for fire treated wood.
  - .3 INT 6.3Z - Clear (2 component) polyurethane finish. Premium grade.
- .4 Wood paneling and casework: partitions, panels, shelving, millwork:
  - .1 INT 6.4J - Polyurethane varnish G4 premium finish.
  - .2 INT 6.4Y - Clear lacquer G4 premium grade finish.

- .5 Spray textured surfaces: ceilings:  
.1 INT 9.1B - Latex G2 premium grade finish (over alkyd sealer).
- .6 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:  
.1 INT 9.2B - High performance architectural latex G2 - all ceilings/bulkheads, G3 within suites, G4 in "public" areas, walls premium grade finish.
- 2.6 SOURCE QUALITY CONTROL
- .1 Perform following tests on each batch of consolidated post-consumer material before surface coating is reformulated and canned. Testing by laboratory or facility which has been accredited by Standards Council of Canada.  
.1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.  
.2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.  
.3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

### 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 data sheet.
- 3.2 GENERAL
- .1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.
- 3.3 EXAMINATION
- .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 properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do

not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

- .3 Maximum moisture content as follows:
  - .1 Stucco, plaster and gypsum board: 12 %.
  - .2 Concrete: 12 %.
  - .3 Clay and Concrete Block/Brick: 12 %.
  - .4 Wood: 15 %.

### 3.4 PREPARATION

- .1 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 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.
- .2 Surface Preparation:
  - .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
  - .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
  - .3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Consultant.
- .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and other surface debris by wiping with dry, clean cloths.
  - .2 Wash surfaces with a biodegradable detergent 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 to dry thoroughly.
  - .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
  - .6 Use trigger operated spray nozzles for water hoses.
  - .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.

- .4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .5 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
  - .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
  - .2 Apply wood filler to nail holes and cracks.
  - .3 Tint filler to match stains for stained woodwork.
- .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.
- .7 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes blowing with clean dry compressed air or vacuum cleaning.
- .8 Touch up of shop primers with primer as specified.
- .9 Do not apply paint until prepared surfaces have been accepted by Paint Manufacturer's Representative

### 3.5 APPLICATION

- .1 Method of application to be as approved by Consultant. Apply paint by brush, roller and airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
  - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
  - .5 Remove runs, sags and brush marks from finished work and repaint.

- .3 Spray application:
    - .1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
    - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
    - .3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
    - .4 Brush out immediately all runs and sags.
    - .5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.
  - .4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
  - .5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
  - .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
  - .7 Sand and dust between coats to remove visible defects.
  - .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
  - .9 Finish inside of cupboards and cabinets as specified for outside surfaces.
  - .10 Finish closets and alcoves as specified for adjoining rooms.
  - .11 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.
- 3.6  
MECHANICAL/ELECTRIC  
AL EQUIPMENT
- .1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as indicated.
  - .2 Boiler room, mechanical and electrical rooms: do not paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.
  - .3 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical

equipment in original finish and touch up scratches and marks.

- .4 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .5 Do not paint over nameplates.
- .6 Keep sprinkler heads free of paint.
- .7 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .8 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .9 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.
- .10 Do not paint interior transformers and substation equipment.

### 3.7 SITE TOLERANCES

- .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
- .2 Ceilings: 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.

### 3.8 PAINT COLOURS

Paint Colours and Locations:

- .1 The work of this section includes painting all exposed wall and ceiling surfaces in all areas of the building unless specifically noted otherwise.  
Colours: To be selected from Manufacturer's standard colour range. Allow for 5 (five) colours.

### 3.8 FIELD QUALITY CONTROL

- .1 Standard of Acceptance:
  - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
  - .2 Ceilings: 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.

- .2 Advise Consultant when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .3 Cooperate with inspection firm and provide access to areas of work.
- .4 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Consultant.

### 3.9 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.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 GENERAL**

- .1 The work of this Section includes the supply and installation of miscellaneous specialty items required for a complete Project.
- .2 Allow for the following items to be supplied and installed as noted on the drawings.  
TB1 - 1220mm x 1220mm - 4 units.  
WB1 - 2440mm X 1220mm with chalkrail - 2 units.

### **1.2 SUBMITTALS**

- .1 Samples: Submit for approval the complete range of colours, finishes and material for the various items of work specified herein. Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Shop Drawings: Submit shop drawings for review in accordance with Section 01 33 00 – Submittal Procedures.
- .3 Maintenance Data and Operating Instructions: Provide copies of maintenance and operating instructions in accordance with Section 01 77 00 – Closeout Submittals.

### **1.3 RELATED SECTIONS**

- |    |                                 |                  |
|----|---------------------------------|------------------|
| .1 | Submittal Procedures            | Section 01 33 00 |
| .2 | Indoor Air Quality Requirements | Section 01 81 19 |
| .3 | Rough Carpentry                 | Section 06 10 00 |
| .4 | Non-Structural Metal Framing    | Section 09 22 16 |

### **1.4 HANDLING & STORAGE**

- .1 Protect all material during transit and on the site from damage and from the elements.
- .2 Do not remove units from crates and protective packing until ready for installation.
- .3 Handle the units with care to prevent damage and use protective pads and covering to prevent soiling and marring of the finish.

### **1.5 WARRANTY**

- .1 Project Warranty: Refer to CCDC 2 for project warranty provisions.
- .2 Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official in accordance with Section 01 78 00 Closeout Submittals. Manufacturer's warranty is in addition



to and not a limitation of other rights that the Owner may have under the Contract Conditions.

- .3 Warranty period shall be extended from one year to 10 years.

## **PART 2 - PRODUCTS**

### **2.1 PRODUCT REQUIREMENT**

- .1 Acceptable Manufacturer: Architectural School Products Lts, Mississauga, Ontario. or Global School Products.

### **2.2 WHITEBOARDS**

- .1 WB1 - 2440mm X 1220mm with chalkrail.
- .2 All markerboards shall consist of a sandwich type construction composed of face panel, core and rear balancing steel.
- .3 Writing face to be white porcelain enamel coating fused to steel backing.
- .4 Core 11.1mm (7/16") impregnated fibreboard laminated under heat and pressure to face panel and back sheet using adhesives that ensure no joint failure of the contact surfaces.
- .5 Backing (balancing) sheet to be 28 gauge zinc coated stretcher steel leveled in one unjointed section. Overall thickness of whiteboard to be 12.7mm (1/2").
- .6 Aluminum trims as noted in 2.5 below.

### **2.3 NATURAL TACKBOARDS**

- .1 TB1 - 1220mm x 1220mm.
- .2 All tackboards shall be 12.7mm (1/2") factory prelaminated units consisting of 6mm (1/4") thick ASP Natural cork laminated to 6mm (1/4") particle board or masonite substrate.
- .2 Units to be fabricated under mechanical pressure available in sizes up to 1219mm x 1219mm (4' -0" x 4' -0"). Unit dimensions as per Architect's drawings.
- .3 Natural cork colour throughout. Bonding of materials by waterproof adhesive that will not delaminate or rupture at the contact surfaces. Finished unit to be trimmed all around with clear aluminum perimeter trim as note in 2.5 below.
- .4 All tackboards shall meet the minimum requirements of the

applicable building code and/or Ontario Fire Marshal's office.

### 2.5 ALUMINUM TRIMS

- .1 Except where noted otherwise, aluminum trim to be Series 200 by Architectural School Products, or Global School Products. Aluminum to be 6063T5 alloy with clear etched and anodized 0.051mm (.002') satin finish free from extruding draw marks and surface scratches. All whiteboards to be supplied with full perimeter trims, as specified below.
- .2 Perimeter Trim: No. 205 by Architectural School Products, or Global School Products
- .3 Divider Bar: No. 207 by Architectural School Products, or Global School Products.
- .4 Map Rail: No. 206 complete with 2 combination roller map hooks per 1.829mm (6 lineal feet) by Architectural School Products, or Global School Products. Provide 1 map rail at full top perimeter of each chalkboard.
- .5 Chalktray: No. 212 complete with contour fitting end caps and castings by Architectural School Products, or Global School Products. Provide 1 chalktray at full bottom perimeter of each whiteboard.

### 2.6 FABRICATION

- .1 Fabricate tackboard panels to sizes as indicated on Architectural drawings and details and in strict accordance to manufacturer's specifications.

## **PART 3 – EXECUTION**

### 3.1 SURFACE CONDITIONS

- .1 Before commencing work examine the work already executed by other trades for any conditions preventing the proper and satisfactory execution of the work of this Specification. Do not proceed until unsatisfactory conditions have been rectified.
- .2 Ensure proper blocking provided on walls and recesses to receive locker anchorage and trim.

### 3.2 FIELD MEASUREMENTS

- .1 Verify all measurements and dimensions affecting this section.

### 3.3 INSTALLATION

- .1 Install boards plumb and level in accordance with manufacturer's instructions and specifications, to provide rigid,

secure surface.

- .2 Install trim and framing around all tackboard panels. Make intersecting joints to hairline fit, free of rough edges. Use concealed brackets throughout, and to reinforce and hold joints tight and flush. No exposed fasteners permitted. Overlap trim 6mm onto panels.
- .3 Use surface fasteners of following types, except where specified type is indicated.
  - (a) To hollow masonry, plaster and panel surfaces use toggle bolt.
  - (b) To solid masonry and concrete use expansions shield with lag screw, jut fibre or lead plug with wood screw.

### 3.4 CLEANING

- .1 Remove all protective masking and leave surfaces free of oil and imperfections.
- .2 Clean all surfaces after installation using manufacturer's recommended cleaning procedures.
- .3 At completion of work, remove from the site all tools, debris and equipment.

**END OF SECTION**