

Part 3 Execution

3.1 CONDITION OF SURFACES

- .1 Examine the excavations and foundations for adequate working room and support for the work of this section.
- .2 Verify lines, levels and centre lines before proceeding with the work and ensure that dimensions agree with drawings.
- .3 Report to the Consultant discrepancies in other work which affect the work of this section.

3.2 PREPARATION

- .1 Coat the inside surfaces of forms with a form release agent, used in accordance with the manufacturer's instructions.
- .2 Apply the agent prior to placing reinforcing steel, anchoring devices and embedded parts.

3.3 ASSEMBLY AND ERECTION

- .1 Construct the formwork and shoring and bracing to meet the design and code requirements, accurately so that the resultant finished concrete shall conform to the shapes, lines and dimensions shown on the drawings, within the specified tolerances.
- .2 Formwork shall be so arranged and assembled as to permit easy dismantling and stripping so that the concrete will not be damaged during its removal.
- .3 Review locations of ties and form panels for exposed concrete work with the Consultant.
- .4 Check and correct formwork as required, both horizontally and vertically, during the placing of the concrete.
- .5 Construct formwork to maintain the following maximum tolerances:
 - .1 Deviation from horizontal and vertical lines:
6 mm in 3000 mm
20 mm in 12000 mm.
 - .2 Deviation of building dimensions indicated on Drawings and position of columns, walls and partitions:
6 mm.
 - .3 Deviation in cross sectional dimensions of columns or beams or in thickness of slabs and walls:
 ± 6 mm.
 - .4 Camber slabs and beams:
10 mm per 3000 mm of span unless indicated on drawings.
- .6 Obtain Departmental Representative's approval for use of earth forms.

3.4 JOINTS IN FORMS

- .1 Make form joints tight in order to prevent leakage of mortar.
- .2 Clean all edges and contact surfaces before erection.
- .3 Where required, install pvc waterstop to manufacturer's instructions and without displacing reinforcement. Do not distort or pierce waterstop.

3.5 SHORING AND BRACING

- .1 Provide bracing to ensure the stability of the formwork as a whole.
- .2 Prop or strengthen all previously constructed parts liable to be overstressed by construction loads.
- .3 Arrange forms to allow stripping without removal of the principal shores, where these are required to remain in place.

3.6 EMBEDDED PARTS AND OPENINGS

- .1 Provide formed openings where required for pipes, conduit, sleeves and other work to be embedded in and passing through concrete members. Accurately locate and set in place items which are to be cast directly into the concrete. Co-ordinate the work of other sections and co-operate with the trade involved in the forming and setting of openings, slots, recesses, chases, sleeves, bolts, anchors and other inserts. No such forming or setting of openings, slots, recesses, chases, sleeves, or parts shall be done unless specifically shown on the drawings or approved prior to installation.
- .2 Obtain Consultant's approval before framing openings in concrete beams or columns not specifically detailed on structural drawings.
- .3 Provide temporary ports or openings where required to facilitate cleaning and inspection. Openings at the bottom of forms shall be located so that flushing water will drain from the forms.
- .4 Close the temporary ports or openings with tight fitting panels, flush with the inside face of the forms, neatly fitted so that the joints will not be apparent in exposed concrete surfaces.
- .5 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval in writing or all modifications from the Consultant before placing concrete.
- .6 Install continuous vertical anchor slots where concrete walls or columns are masonry faced. Co-ordinate extent and locations of anchor slots with spacing of masonry ties as specified in Division 4.

3.7 FIELD QUALITY CONTROL

- .1 Inspect and check the completed formwork, shoring and bracing to ensure that the work is in accordance with the formwork design, and that the supports, fastenings, wedges, ties and parts are secure. The Engineer responsible for the design of the formwork shall assist in this inspection.
- .2 Inform the Consultant when the formwork is complete and has been cleaned. Obtain the approval of the engineer responsible for the design of the formwork and the general approval of the Consultant before placing concrete.

3.8 CLEANING

- .1 Clean the forms as erection proceeds to remove foreign matter.
- .2 Remove cuttings, shavings and debris from within the forms.
- .3 Flush the completed forms with water or air jet to remove remaining foreign matter. Ensure that water and debris drain to the exterior through the clean-out ports.

3.9 WINTER CONSTRUCTION

- .1 Remove ice and snow from within the forms.
- .2 The use of de-icing salts will not be permitted.
- .3 Unless formwork and concrete construction proceed within a heated enclosure, do not use water to clean out completed forms. Use compressed air or other means to remove foreign matter.

3.10 REMOVAL OF FORMWORK

- .1 Notify the Consultant before removing formwork.
- .2 Remove formwork progressively and in accordance with the reference code requirements, and so that no shock loads or imbalanced loads are imposed on the structure.
- .3 Do not remove forms and shoring before concrete has attained sufficient strength to ensure safety of structure. If evidence to verify concrete strength is not available, the forms and shores shall not be removed before the following minimum intervals after concrete is placed.
 - .1 Footings, walls and grade beams - 4 days.
 - .2 Columns - 7 days.
 - .3 Beams, soffits and slabs - 21 days.
- .4 Loosen forms carefully. Do not wedge pry bars, hammers or tools against concrete surfaces.
- .5 Leave forms loosely in place, against vertical surfaces, for protection until complete removal is approved by Consultant.

- .6 Store removed forms, for exposed architectural concrete, in a manner that surfaces to be in contact with fresh concrete will not be damaged. Marked or scored forms will be rejected.
- .7 Re-shore structural members where required due to design requirements or construction conditions and as required to permit progressive construction.
- .8 Remove forms not directly supporting weight of concrete as soon as stripping operations will not damage concrete.
- .9 Re-use of formwork and falsework is subject to the requirements of CAN/CSA A23.1-09.

END OF SECTION

Part 1 General

1.1 GENERAL CONDITIONS

- .1 The General Conditions of the Contract, Supplementary General Conditions and General Requirements are hereby made a part of this section.

1.2 WORK INCLUDED

- .1 Furnish and install all bonded reinforcement and associated items required and/or indicated on the Drawings for all cast-in-place concrete and reinforced masonry work.

1.3 INSPECTION AND TESTING

- .1 Upon request, provide certified copy of mill test report of steel supplied, showing physical and chemical analysis.

1.4 REFERENCE STANDARDS

- .1 Do reinforcing work in accordance with CAN/CSA A23.1-09 and welding of reinforcement with CSA W186-M1990 (R2007).

1.5 SUBMITTALS

- .1 Prepare, check and submit reinforcing steel and mesh placing drawings and bar bending and cutting schedules for all steel reinforcement shown or specified in accordance with General Conditions.
- .2 All drawings and schedules shall be prepared and checked under the direct supervision of a qualified professional engineer who is experienced in this work.
- .3 Clearly indicate bar sizes, spacing, location and quantities of reinforcement, mesh, chairs, spacers and hangers with identifying code marks to permit correct placement without reference to structural drawings; to ACI - 315 Manual of Standard Practice and Metric Supplement 1977 by Reinforcing Steel Institute of Ontario.
- .4 Design and detail lap lengths and bar development lengths to CAN3 A23.3-04, unless specified on drawings.
- .5 Review of shop drawings for size and arrangement of principal and auxiliary members only. Such review will not relieve the Contractor of responsibility for general and detail dimension and fit, or any errors or omissions.

1.6 DELIVERY AND STORAGE

- .1 Reinforcing steel, welded wire fabric and accessories shall be delivered, handled and stored in a manner which prevents contamination from bond reducing or foreign matter and damage to its fabricated form.

Part 2 **Products**

2.1 **MATERIALS**

- .1 *All reinforcing steel:* unless noted otherwise on the drawings or herein shall be deformed bars of new billet steel conforming to the current CAN/CSA G.30.18-09 Grade 400, plain finish for all bars. Minimum splice for 10 M bars to be 450 mm. Minimum lap splice for all other bars to be 36 bar diameters or 675 mm, whichever is greater.
- .2 *Weldable reinforcing bars:* high strength ductile, deformed bars to CSA G30.18-09, Grade 400.
- .3 *Column ties and beam stirrups:* shall conform to the current CAN/CSA G30.18-09, Grade 300.
- .4 *Welded wire fabric:* to CSA G30.5-M1983. Provide in the flat sheets only.
- .5 *Tie wires:* shall be 1.29 mm or heavier annealed wire or a patented system approved by the Consultant.
- .6 *Reinforcing steel supports:* shall conform to ACI Standard 315 unless otherwise approved by the Consultant.
- .7 *Mechanical splices:* subject to the approval of the Consultant.

2.2 **FABRICATION**

- .1 Fabricate bends, splices and ties and supply bar supports and accessories in accordance with the requirements of CAN-A23.3-04. Spacing and arrangements of supports in accordance with ACI 315.
- .2 All intermediate grade reinforcing bars shall be bent cold without hickeying. All high strength steel shall be preheated.
- .3 Reinforcing bars shall not be straightened or rebent.
- .4 Location of reinforcement splices not shown on the drawings subject to approval by the Consultant and shall, for beams and slabs be away from points of maximum stress in the steel.
- .5 *Welding of reinforcing bars:* use only weldable bars, preheat and weld to CSA W186-1990 (R2007).

Part 3 **Execution**

3.1 **EXAMINATION**

- .1 Examine the work upon which this section depends and report any discrepancies to the Consultant.

- .2 Commencement of the work shall imply acceptance of conditions.

3.2 PLACING

- .1 Reinforcement of the size and shapes shown on the drawings shall be accurately placed in accordance with the approved shop drawings, the structural drawings and the requirements of the current National Building Code.
- .2 Clear distances between parallel bars, except for columns, shall be not less than 1.4 times the diameter of the bar, or 30 mm or 1.4 times the maximum size of the coarse aggregate. Bars placed in two or more layers shall be placed directly above and below each other.
- .3 Clear distance between bars in columns shall be not less than 1½ the nominal diameter of the bar or 40 mm or 1½ times the maximum size of the coarse aggregate.
- .4 Reinforcing steel shall, where not otherwise shown on the structural drawings, be protected by the clear cover of concrete over the reinforcement as follows:
- .1 Where concrete is formed against earth, not less than 75 mm.
 - .2 Where concrete placed against forms is to be exposed to the weather or be in contact with the ground, not less than 50 mm for bars larger than 15 M, and not less than 40 mm for bars 15 M and smaller.
 - .3 In slabs and walls not exposed to the ground or weather, not less than 20 mm.
 - .4 In beams, girders and columns not exposed to the ground or weather, not less than 40 mm to principal reinforcement, ties and stirrups.

The foregoing clear covers shall be maintained within 5 mm.

- .5 Reinforcement shall be adequately supported by metal chairs, spacers or hangers and secured against displacement within the tolerance permitted and in accordance with the latest ACI Standard 315.
- .6 For slabs on grade, footings or similar construction, concrete blocks may be used in place of metal chairs.
- .7 Unless specifically detailed otherwise, supply and install additional 10 M bars by 2400 long at 300 mm centres above all steel floor beams supporting open web steel floor joists. Bars to be centred above beam and placed with 25 mm cover to top of slab. Provide 1 - 15 M carrier bar below for chairing.
- .8 Unless detailed otherwise, all exterior slabs, walks and pads abutting building foundations to be dowelled with 15 M at 400 on centre, extending minimum 750 into slab.
- .9 Review with the Consultant, placement of reinforcement prior to concreting.

- .10 Notify the Consultant twenty-four (24) hours prior to placing concrete.

3.3 CLEANING

- .1 All materials shall be clean and free of all form oil or deleterious materials.
- .2 All deleterious material shall be removed from the surface of the reinforcing steel in a manner acceptable to the Consultant.

3.4 WELDING

- .1 Do welding to meet requirements of CSA W186-M1990 (R2007). Have welding performed by workmen qualified under CSA W47.1-09. Welding only by written authority of the Departmental Representative.

END OF SECTION

Part 1 General

1.1 GENERAL CONDITIONS

- .1 The General Conditions of the Contract, Supplementary General Conditions and General Requirements are hereby made part of this section.

1.2 QUALITY ASSURANCE

- .1 Provide at least one person who shall be present at all times during execution of this portion of the Work and who shall be thoroughly trained and experienced in placing the types of concrete specified and who shall direct all work performed under this Section.
- .2 For finishing of exposed surfaces of the concrete, use only thoroughly trained and experienced journeyman concrete finishers.
- .3 Perform cast-in-place concrete work to requirements of CAN/CSA-A23.1-09 - "Concrete Materials and Methods of Concrete Construction".

1.3 PRODUCT HANDLING

- .1 Use all means necessary to protect cast-in-place concrete materials before, during and after installation and to protect the installed work and materials of all other trades.
- .2 In the event of damage, immediately make all repairs and replacements necessary to approval of the Consultant and at no additional cost to the Owner.

1.4 INSPECTION AND TESTING

- .1 Inspection and testing will be performed by a firm approved by the Departmental Representative and paid for by the Contractor. Unless approved otherwise, the testing agency must perform all aspects of testing including cylinder preparation.
- .2 Provide free access to all portions of work and co-operate with appointed firm.
- .3 Submit proposed mix design for each class of concrete to Departmental Representative for approval two (2) weeks prior to commencement of work.
- .4 Tests of cement and aggregates may be performed to ensure conformance with requirements stated herein.
- .5 One concrete test, consisting of three test cylinders, will be taken for every 50 cubic meters or less of each class of concrete placed. One cylinder to be tested at seven (7) days, the remaining two cylinders to be tested at twenty-eight (28) days.
- .6 One (1) additional test cylinder will be taken during cold weather concreting, and be cured on job site under same conditions of concrete it represents.
- .7 One (1) slump test and one (1) air content test will be taken for each set of test cylinders taken.

- .8 Testing of concrete will be performed in accordance with CAN/CSA-A23.2-09 "Method of Test for Concrete".
- .9 Test results will be issued to the Contractor, and Departmental Representative. Test reports are to be numbered consecutively beginning with number one.
- .10 Required retesting will be paid for by the Contractor.
- .11 The Departmental Representative may order additional testing any time even though the required tests indicate the strength requirements have been met. In this instance, the Owner will pay for those tests that meet the specified requirements and the Contractor will pay for those that do not.
- .12 Non-destructive methods for testing concrete shall be according to CAN/CSA A23.2-09.

1.5 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with General Conditions.
- .2 Prepare and submit to the Departmental Representative for review, shop drawings showing detailed layout of form dimensions, form joint fitting, form sealing and placement, location of openings and placement of form ties. Submit a detailed description of the exact construction method to be used, for all area designated as sand blasted finish, exposed aggregate finish and architectural exposed concrete

Part 2 Products

2.1 CONCRETE MATERIALS

- .1 *Cement:* Normal - N and Sulphate Resistant - HS Portland Type, to CSA A3000-08 - "Portland Cements".
- .2 *Fine and Coarse Aggregates:* conforming to CAN/CSA-A23.1-09 - "Concrete Material and Methods of Concrete Construction".
- .3 *Fine and Coarse Aggregates:* conforming to CAN/CSA-A23.1-09 - "Concrete Materials and Methods of Concrete Construction". The fine and coarse aggregate for concrete floor slabs and finish toppings shall contain a maximum of 0.4% low density particles as determined by CSA Test A23.2-09 "Low Density Material in Aggregate". Test results shall be submitted to Consultant for review.
- .4 *Water:* clean and free from injurious amounts of oil, alkali, organic matter, or other deleterious material.

2.2 ADMIXTURES

- .1 *Air Entrainment:* to ASTM C260-06 - "Air-Entraining Admixtures for Concrete".
- .2 *Chemical:* to ASTM C494-08a - "Chemical Admixtures for Concrete"; water reducing, strength increasing type WN - normal setting.

- .3 *Pozzolanic Mineral:* to CSA A3000-08 "Supplementary Cementing Materials and Their Use in Concrete Construction", fly ash permitted only as approved by Consultant.

2.3 ACCESSORIES

- .1 *Vapour Barrier:* 6 mil polyethylene film, to CGSB 70-GP-1a, Type 1 - low permeance heavy duty.
- .2 *Curing Compounds:* shall conform to the requirements of the latest issue of ASTM Standard C309.
- .3 *Non-shrink Grout:* premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 20 MPa at 3 days and 50 MPa at 28 days. CPD Non Shrink Grout by CPD Construction Products or approved equivalents.
- .4 *Void Form: to comply with either of the following:*
- .1 Biodegradable Void Form: biodegradable, 150 mm deep, structurally sufficient to support weight of wet concrete and other superimposed loads without collapsing until concrete has gained sufficient strength to support these loads after which time the form must promptly degrade. Do not wrap void form. Do not place void form on poly ground sheet. The onus is entirely on the Contractor and Supplier to ensure that the void form is installed to perform as intended.
- .2 Compressible Void Form: Compressible void form designed for 150 mm soil heave, installed to supplier's specifications.
- .5 *Joint Filler:* pre moulded bituminous impregnated cane fibre board.
- .6 *Vertical Joint Sealant:* non-sag polyurethane sealant designed for use on vertical surfaces. Install strictly in accordance with manufacturer's recommendations.
- .7 *Horizontal Joint Sealant:* three component chemically curing, self-levelling, polyurethane joint sealant. Colour selection by Departmental Representative. Install strictly in accordance with manufacturer's recommendations.
- .8 *Concrete Expansion Anchors:* Sized as per drawings. Minimum embedment length of all expansion anchors to be 150 mm unless noted otherwise.
- .9 *Concrete Inserts with Bolt Extension:* Concrete inserts to be sized as detailed on drawings. Bolt extensions to be mild steel threaded extensions sized as detailed on drawings.
- .10 *Concrete Patching Material:* pre-packaged, polymer modified, cementitious product containing graded natural aggregate,
- .11 *Bonding Agent:* Approved high polymer polyvinyl acetate emulsion applied in strict accordance with manufacturer's recommendations for proposed application. Mix bonding agent with Portland cement, sand and water to manufacturer's recommendation to achieve

a uniform slurry and scrubbed into the surface. Ensure surface is free from all laitance, dirt, dust, debris, grease or other substances. Clean surface with acid etching and hosing down. Neutralize acid if necessary.

- .12 *Epoxy Bonding Agent:* Approved mineral filled polymer/epoxy adhesive formulated to bond new concrete to cured concrete. Apply in strict conformance with manufacturer's written recommendations for proposed application.
- .13 *Cement Grout Capsules:* reinforcing steel detailed to be installed in pre-placed concrete to be anchored using Cement Grout Capsules.

2.4 CONCRETE MIXES

- .1 Mechanical mix concrete in accordance with the requirements of CAN/CSA A23.1-09.
- .2 All concrete shall have the following minimum properties.

Based on 2010 National Building Code

Location	Exposure Class	Comp. Strength (MPa) and Age	Aggregate	Air Entrainment	Slump
1. Footings/Pedestals	S-3	30 @ 56 d	20	4 – 7	80 ± 30
2. Interior Slab on Metal Deck	N	25 @ 28 d	20	0	80 ± 30
3. Exterior Grade Supported Sidewalks/Landing Pads, Slabs	C-2	32 @ 28 d	20	5 – 8	80 ± 30
4. Miscellaneous Concrete	N	25 @ 28 d	20	Specify	80 ± 30

Minimum cement content for Type 50 cement to be 280 kg/m³.
Maximum free water/cement ratio for Type 50 cement to be 0.5.

Semi-lightweight concrete to have unit weight of 2075 ± 75kg/m³.
Lightweight concrete to have unit weight of 1850 ± 75 kg/m³.

All slabs finished with dry shake hardener to contain no artificially entrained air.

- .3 Submit proposed mix design to Inspection and Testing Firm and to Consultant two (2) weeks prior to commencement of work. Provide certification that mix proportions selected will produce concrete of specified quality and that strength will comply with CAN/CSA A23.1-09.
- .4 Each load of ready-mixed or transit-mixed concrete delivered to the project site shall be accompanied by duplicate delivery slips providing the following information:
 - .1 Name of ready-mix batch plant
 - .2 Serial number of ticket
 - .3 Date and truck number
 - .4 Name of contractor

- .5 Specific designation of project
 - .6 Specific class of concrete
 - .7 Amount of concrete in cubic metres
 - .8 Time of loading or first mixing of aggregate, cement and water.
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- .5 Use accelerating admixtures in cold weather only when approved by Consultant. If approved, the use of admixture will not relax cold weather placement requirements. Use calcium chloride only as approved by the Consultant.
 - .6 Use set-retarding admixtures during hot weather only when approved by the Consultant.
 - .7 Use of plasticizers only when approved by Consultant.
 - .8 Concrete mix for exposed aggregate finish and sandblasted finish shall be designed as a low slump, gap-graded mix with a maximum amount of screened and washed crushed coarse aggregate.

Part 3 Execution

3.1 INSPECTION

- .1 Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- .2 Verify that all items to be embedded in concrete are in place.
- .3 Verify that concrete may be placed to the lines and elevations indicated on the Drawings, with all required clearance from reinforcement.

3.2 DISCREPANCIES

- .1 In the event of discrepancy, immediately notify the Departmental Representative.
- .2 Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.3 PREPARATION

- .1 Remove all wood scraps and debris from the formed areas in which concrete will be placed.
- .2 Thoroughly clean the forms to ensure proper placement and bonding of concrete.
- .3 Thoroughly wet the forms, except in freezing weather, or oil them; remove all standing water.
- .4 Thoroughly clean all transporting and handling equipment.

3.4 PLACING CONCRETE

- .1 Place concrete in accordance with requirements of CAN/CSA A23.1-09 and as indicated on Drawings.
- .2 Notify Departmental Representative and Inspection and Testing Firm a minimum of forty-eight (48) hours prior to commencement of concreting operations.
- .3 Ensure all anchors, seats, plates and other items to be cast into concrete are placed, held securely and will not cause undue hardship in placing concrete.
- .4 Maintain accurate records of poured concrete items. Record date, location of pour, quantity, air temperature and test samples taken.
- .5 Ensure reinforcement, inserts, embedded parts, formed joints and fitments are not disturbed during concrete placement.
- .6 Prepare previously placed concrete by cleaning with steel brush.
- .7 Pour concrete continuously between predetermined construction and control joints. All construction joints subject to approval of the Consultant.
- .8 Approval to place concrete shall be contingent on the formwork and reinforcing steel placement and evidence that the Contractor can place the planned casting without stopping.
- .9 Pour slabs on grade in checkerboard pattern or saw cut, as indicated on Drawings. Saw cut control joints within twenty-four (24) hours after finishing. Use 6 mm thick blades, cutting 20 mm into depth of slab thickness. Vacuum clean saw cut prior to installation of sealant.
- .10 Excessive honeycomb or embedded debris in concrete is not acceptable. Remove and replace defective concrete. Excessive honeycomb is when eraser end of a pencil fits into cavity.

3.5 COLD WEATHER REQUIREMENTS

- .1 When the air temperature is at or below 5⁰ C. or when there is a probability of it falling to this limit during the placing or curing period, cold weather requirements shall be applicable.
- .2 Provide heating equipment or heating plant on the job ready for use when concrete is being placed during cold weather. Such equipment shall be adequate for the purpose of maintaining the required temperature during the placing and curing of the concrete. The methods used for heating shall be approved by the Consultant. Equipment inducing carbon monoxide gas in the building shall not be accepted.
- .3 Concrete shall not be placed on or against reinforcement, formwork, ground or any surface that is at a temperature less than 5⁰ C.

- .4 The temperature of the concrete at all surfaces shall be maintained at not less than 15⁰ C for three (3) days, or at not less than 10⁰ C for five days after placing. Means shall be provided to humidify the air within enclosures and to keep the concrete and formwork continuously moist if dry heat is used. The concrete shall be kept above freezing temperature for a period of seven (7) days, and shall be kept from alternate freezing and thawing for at least fourteen (14) days after placement.
- .5 At the end of the specified protection period the temperature of the concrete shall be reduced gradually at a rate not exceeding that shown in CAN/CSA A23.1-09.
- .6 Accelerator or so-called anti-freeze compounds shall *not* be permitted unless otherwise approved in writing by the Consultant.
- .7 All protective coverings shall be kept clear of the concrete and form surfaces to permit free circulation of air and shall be maintained intact for at least twenty-four (24) hours after artificial heat is discontinued.

3.6 HOT WEATHER REQUIREMENTS

- .1 When the air temperature exceeds 27⁰, hot weather requirements shall be applicable.
- .2 Time of initial mixing to complete discharge shall not exceed 1 hour and 15 minutes and concrete placed shall not exceed 27⁰.
- .3 Concrete forming surfaces and reinforcing steel shall be sprinkled with cool water just prior to placing concrete. Standing water or puddles shall be removed prior to concrete placement.
- .4 Special wind protection will be required as directed by the Consultant.
- .5 Columns, walls, beams and slabs shall be kept continuously damp for twenty-four (24) hours by normal curing procedures as outlined by this Specification. Slabs cured by the applications of sealing, shall have curing compound applied immediately after finishing of the slab but before evaporation of surface moisture.
- .6 The use of water reducing agents shall be subject to the approval of the Consultant when hot weather conditions prevail.

3.7 CONSTRUCTION JOINTS AND WATERSTOPS

- .1 The location and detail of all construction joints not detailed on the structural drawings shall be approved by the Consultant.
- .2 Where fresh concrete is to be placed against concrete which has set or has partially set, the surface of the set or partially set concrete shall be roughened, cleaned of all laitance, and thoroughly soaked with water prior to the placement of fresh concrete.
- .3 In general the construction joints in floor and roof systems shall be located in the middle of the spans of slabs, beams and girders. Proper key and dowels or extensions of reinforcing shall be provided at all construction joints.

- .4 Concrete placed in wall and column forms shall be struck off flush with the underside of the floor and roof systems.
- .5 Vertical construction joints in foundation walls shall be properly keyed and dowelled and constructed with an approved water stop, properly anchored against displacement during the placement of the concrete and properly sealed at all of the intersections. Splices and intersections of water stop shall be jointed by heat fusion in accordance with approved manufacturer's instructions.
- .6 Where new below grade concrete foundation walls abut existing foundation walls, unless specifically detailed otherwise, install new pvc vertical waterstop at the joint by sawcutting and grouting the waterstop into the existing wall and casting into the new wall. Install full height vertical reglet each side of the joint and seal with approved vertical joint sealant over Ethafoam back up rod. Installation shall be in accordance with manufacturer's recommendations.

3.8 DEFECTIVE CONCRETE

- .1 Concrete not meeting the requirements of the Specifications and drawings shall be considered defective concrete.
- .2 Concrete not conforming to the lines, details and grade specified herein or as shown on the drawings shall be modified or replaced at the Contractor's expense and to the satisfaction of the Consultant. Finished lines, dimensions and surfaces shall be correct and true within tolerances specified in the Formwork Section of these Specifications.
- .3 Concrete not properly placed resulting in excessive honeycombing and all honeycombing and other defects in critical areas of stress, shall be repaired or replaced at the Contractor's expense and to the satisfaction of the Consultant.
- .4 Concrete of insufficient strength or improper consistency shall be, as required by the Consultant, subject to one or more of the following:
 - .1 Changes in mix proportions for the remainder of the work.
 - .2 Cores drilled and tested from the areas in question as directed by the Consultant and in accordance with CAN/CSA A23.2-09. The test results shall be indicative of the in-place concrete.
 - .3 Load testing of the structural elements in accordance with CAN3 A23.3-04.
 - .4 The changes in the mix proportions and the testing shall be at the Contractor's expense.
 - .5 Concrete failing to meet the strength requirements of this Specification shall be strengthened or replaced at the Contractor's expense and to the satisfaction of the Consultant.

3.9 PATCHING CONCRETE

- .1 After the removal of the forms concrete surfaces may be subject to inspection by the Consultant.
- .2 All exposed metal form ties, nails, wires, shall be removed, fins broken off and all loose concrete removed.
- .3 Form tie pockets shall be thoroughly wetted and patched with patching concrete followed by proper curing.
- .4 Honeycombed and other defective surfaces shall be chipped away to a depth of not less than 25 mm with the edges perpendicular to the surface, thoroughly wetted and patched with patching concrete followed by proper curing.
- .5 Patching concrete shall be thoroughly compacted into place and finished in such a manner as to match the adjoining concrete. The design mix of the patching concrete shall be approved by the Consultant.

3.10 FINISHING OF FORMED SURFACES

- .1 All formed surfaces noted in Architect's Room Finish Schedule as receiving a paint, vinyl or other applied finish shall be final finished to remove all protrusions, ridges and other irregularities. All voids and pinholes are to be filled. Finished surface is to be smooth, straight and true, ready to receive architectural finish as noted.
- .2 On all other exposed formed concrete surfaces, except at unfinished areas: remove blemishes, formwork joint marks by rubbing with carborundum block and water. Leave finished surfaces smooth, unmarred. Complete rubbing within twenty-four (24) hours for stripping formwork.

3.11 ANCHOR BOLTS AND WELDMENTS

- .1 Set anchor bolts and weldments to the following tolerances:
 - .1 Alignment: \pm 3mm of location, plumb and true.
 - .2 Projection: \pm 6mm of elevations called for.

3.12 BASE PLATES GROUTING

- .1 Mix and place as per Manufacturer's specifications. Pack grout tightly under plates and leave no voids. Neatly finish edges.

3.13 EQUIPMENT PADS

- .1 Provide concrete pads for equipment where and as indicated on Drawings.
- .2 Insert bolts and sleeves and pack solidly with non-shrink grout, in accordance with setting details and templates.
- .3 Steel trowel top surfaces smooth. Tool edges.

3.14 CONCRETE TOPPING

- .1 All concrete toppings indicated on drawings are to be bonded toppings.
- .2 Concrete toppings are to be bonded by either of the following methods unless specifically directed:
 - .1 Application of cement/bonding agent/sand grout to prepared base course in accordance with CAN/CSA A23.1-09, Clause 7.6.4.2.2 (b).
 - .2 Application of approved bonding agent to prepared base course.
- .3 The following toppings are to be bonded specifically by application of approved bonding agent:
 - .1 All toppings cast over existing slabs.
 - .2 All interior toppings.
- .4 New concrete slabs which are to receive toppings are to be prepared in accordance with CAN/CSA A23.1-09, Clause 23 and Section 03 35 00.
- .5 Existing concrete slabs which are to receive toppings are to be prepared in accordance with Specification Section 03 35 00 and as detailed on the Drawings.

3.15 FOOTINGS

- .1 All footings to be placed on undisturbed material. Any disturbed bearing material to be compacted to in situ density.
- .2 Adequate precautions shall be taken by the Contractor to prevent the soil at foundation level from drying to becoming wet from surface water prior to placement of concrete.
- .3 The Contractor shall ensure that the soil below the foundation is not allowed to freeze, either before or after construction. Under no circumstances should concrete be placed on frozen soil.

3.16 UNDERFLOOR DUCTS

- .1 Where underfloor ducts are indicated pour 10 MPa concrete around duct work being careful to avoid damaging or displacing ducts or allowing ducts to float. Concrete to be in two pours with ducts securely anchored into first pour.

3.17 DOVETAIL ANCHOR SLOTS

- .1 Cast in continuous dovetail anchor slots to receive dovetail anchors and masonry ties for lateral support of masonry.
- .2 Refer to Specifications Division 4 for extent and spacing of masonry ties. Anchor slots to be located to coincide with spacing of masonry ties as specified in Division 4.

3.18 SIDEWALKS

- .1 Unless specifically detailed otherwise on drawings or in specifications, sidewalks shall be constructed to the following details.
- .2 Use forms for edges of concrete walls to provide straight lines and smooth curves.
- .3 Locate asphalt impregnated fibreboard joint filler at 4.5 metre centres and where walks abut walls and other vertical surfaces. Joint filler to be full area of concrete section.
- .4 Slabs to be 125 thick cast over 6 mil poly and 200 compacted granular fill. Reinforce with 10 M at 300 mm on centre each way at mid-depth of slab.
- .5 Install tooled joints at 1.5 metres on centre.
- .6 Round all edges, including edges of control joints and tooled joints, with 12 mm radius edging tool.
- .7 Provide exposed surfaces of all sidewalks with medium broomed finish.
- .8 Slope walks and slabs as detailed on drawings.

END OF SECTION

Part 1 General

1.1 GENERAL CONDITIONS

- .1 The General Conditions of the Contract, Supplementary General Conditions and General Requirements are hereby made part of this section.

1.2 WORK INCLUDED

- .1 Finish separate floor toppings, slabs on fill and monolithic floor slabs.
- .2 Apply concrete hardener, sealer.
- .3 Cure finished surfaces.

Part 2 Products

2.1 COMPOUNDS/HARDENERS/SEALERS

- .1 *Curing Compound:* chlorinated liquid rubber to CGSB 90-GP-1a, Type 1.
- .2 *Non-metallic Surface Sealer:* premixed natural mineral type.
- .3 *Penetrating Epoxy Sealer:*
- .4 *Coloured Dry Shake Hardener and Sealer:* Hardener to be prepackaged, factory-mixed product containing crushed, washed and graded non-metallic aggregate, Portland cement, colouring pigments and other proprietary components. Sealer to be liquid curing and sealing compound recommended for use on color hardened floors. Sealer to be supplied in colour that is recommended for, and compatible with, colour or dry shake hardener.
- .5 *Horizontal Joint Sealer:* three component, chemically curing, self-levelling polyurethane joint sealant. Color selection by Departmental Representative. Install strictly in accordance with manufacturer's recommendations.
- .6 *Bonding Agent:* Approved high polymere polyvinyl acetate emulsion applied in strict accordance with manufacturer's recommendations for proposed application.
- .7 *Epoxy Bonding Agent:* Approved mineral filled polymer/epoxy adhesive formulated to bond new concrete to cured concrete. Apply in strict conformance with manufacturer's written recommendations for proposed application. Execution

2.2 FLOOR FINISHING

- .1 Finish concrete floor surfaces in accordance with CAN/CSA A23.1-09.
- .2 Uniformly spread, screed and float concrete. Do not use grate tampers or mesh rollers. Do not spread concrete by vibration. Bring surfaces to levels indicated on Drawings.

- .3 Apply Plain or Coloured Dry Shake Hardener and Sealer to concrete floors noted in Architect's Room Finish Schedule as receiving hardener. Colour selecting by Departmental Representative. Apply dry shake in two passes at the rate of 5.0 kg/m² (100 lb/100 Ft²) or as recommended by manufacturer for Normal Traffic Conditions. After application of shake hardener is complete, apply minimum one coat of sealer. Application of both the dry shake hardener and sealer is to be strictly in accordance with manufacturer's recommendations.
- .4 Unless otherwise noted, all concrete floors which are noted in Architect's Room Finish Schedule as exposed concrete, or as receiving carpeting, resilient flooring or hardener are to be final finished to a hard, smooth dense trowelled surface free from blemishes. Final finish to achieve a "flat" floor in accordance with CAN3 A23.1-09, Table 22 Class A straight edge method to produce floor surface of pleasing characteristics.
- .5 All concrete slabs noted in Architect's Room Finish Schedule as receiving thin-set quarry tile finish are to be final finished with a swirl trowel finish plus fine hair brooming to give a surface finish to achieve a "flat" floor in accordance with CAN/CSA A23.1-09, Clause 7.5.6.1 maintaining surface flatness with maximum variation of 5 mm in 3 M and absolute maximum of ± 6 mm.
- .6 All concrete slabs noted in Architect's Room Finish Schedule as receiving application of Penetrating Epoxy Sealer are to be final finished with a swirl trowel finish suitable for the application of penetrating type epoxy sealer. Slab is to be finished to a hard, smooth surface free from blemishes. Final finish to achieve a "flat" floor in accordance with CAN/CSA A23.1, Clause 7.5.6.1 to produce floor surface of pleasing appearance, easily cleaned and maintained with high wear-resistance qualities. Maintain surface flatness with maximum variation of 5 mm in 3 M and absolute maximum of ± 6 mm. Co-ordinate suitable curing method for slabs where penetrating type of sealer is used. Supplier's representative must be on site prior to application to advise on finishing procedures and application rate. Apply sealer at rate recommended for medium traffic in a minimum of two passes.
- .7 Apply concrete Surface Sealer on floor surfaces noted in Architect's Room Finish Schedule as exposed concrete. Apply strictly in accordance with manufacturer's recommendations.
- .8 In areas with floor drains, maintain floor level at walls and pitch surfaces uniformly to drain at 5 mm/M nominal unless indicated otherwise on Drawings.

2.3 TOPPINGS

- .1 All new concrete slabs which are to receive topping or thick set tile finish are to be screeded and mechanically floated to achieve surface flatness with maximum variation of 8 mm in 3 M. Depress slabs to accommodate finish where required. Provide a scratch finish in accordance with CAN/CSA A23.1-09, Clause 7.5.6.2 to all concrete slabs receiving topping or thickset tile finish.
- .2 All concrete slabs which are to receive a concrete topping shall be cleaned free of oil and loose material.

- .3 Place dividers, edge strips, reinforcing, expansion joint assemblies and other cast-in items shown.
- .4 Just prior to placing topping, apply cement bonding agent slurry coat in accordance with CAN/CSA A23.1-09, Clause 7.6.4.2.2 (b) or approved bonding agent to base slab.
- .5 Apply bonded concrete topping over prepared concrete base slab to CAN/CSA A23.1-09.
- .6 All concrete toppings to receive insulation or roofing system shall be final finished by hand or mechanical floating to within a tolerance of 8 mm in 3 M.
- .7 All concrete toppings to serve as floor surfaces are to be final finished in accordance with Item 3.1 Floor Finishing.

2.4 CURING AND PROTECTION

- .1 All equipment needed for the curing and protection of the concrete shall be on hand and ready for use before actual placing is started.
- .2 All exposed non-formed surfaces shall be kept continuously moist for a minimum of seven consecutive days after placement of the concrete. The water for curing shall be clean and free from any materials that will cause staining or discolouration of the concrete. A liquid, membrane forming, curing compound shall be used under circumstances where the application of moisture is impracticable and where such compounds will not jeopardize the appearance of the concrete nor the bonding of future floor finishes.
- .3 Special curing techniques shall be employed when the concrete is subject to drying conditions such as high temperatures, low relative humidity and high winds. Concrete wall and column forms shall be kept continuously moist.
- .4 Freshly placed concrete shall be protected from the effects of direct sunshine, drying winds, cold, excessive heat and running water by the use of adequate tarpaulins or other suitable material to cover completely or enclose all freshly finished surfaces until the end of the curing period specified.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 04 23 00 – Glass Unit Masonry
- .2 Section 05 50 00 - Metal Fabrications.
- .3 Section 07 92 00 - Joint Sealing.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International).
 - .1 CSA-A165 Series-94(R2000), Standards on Concrete Masonry Units.
 - .2 CSA A179-94(R1999), Mortar and Grout for Unit Masonry.
 - .3 CSA-A371-94 (R1999), Masonry Construction for Buildings.

1.3 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.
- .3 Storage and 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.

1.4 SITE CONDITIONS

- .1 Site Environmental Requirements.
 - .1 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.
 - .2 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.

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 PREPARATION

- .1 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

3.3 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.
- .3 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

3.4 CONSTRUCTION

- .1 Exposed masonry.
 - .1 Remove chipped, cracked, and otherwise damaged units, in accordance with CSA A-165, Clause 82.1 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.
 - .2 Allow joints to set just enough to remove excess water, then rake joints uniformly to 6 mm depth and compress with square tool to provide smooth, compressed, raked joints of uniform depth where raked joints are indicated.
 - .3 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.
 - .4 Provision for movement.
 - .1 Leave 5 mm space below shelf angles.
 - .2 Built masonry to tie in with stabilizers, with provision for vertical movement.

- .5 Lintels.
 - .1 Install lintels as shown on drawings.
- .6 Control joints.
 - .1 Construct continuous vertical control joints in locations indicated on drawings. Confirm locations with Consultant.

3.5 SITE TOLERANCES

- .1 Tolerances in notes to Clause 5.3 of CSA-A371 apply.

3.6 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.

3.7 PROTECTION

- .1 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 04 05 00 – Common Work Results for Masonry
- .2 Section 05 50 00 – Metal Fabrications

1.2 REFERENCES

- .1 CSA Group
 - .1 CAN/CSA-A179-04(R2009), Mortar and Grout for Unit Masonry.
 - .2 CAN/CSA-A371-04(R2009), Masonry Construction for Buildings.
 - .3 CAN/CSA-A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

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 glass unit masonry and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements 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 in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect glass unit masonry from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.5 SITE CONDITIONS

- .1 Ambient Conditions: assemble and erect components when temperature is above 4 degrees C.
- .2 Field Measurements:
 - .1 Make field measurements necessary to ensure proper fit of all members.

Part 2 Products

2.1 SYSTEM DESCRIPTION

- .1 Glass block panels not to be designed to support structural loads.
- .2 Provide for expansion and movement at jambs and heads of panels. Do not bridge expansion spaces with mortar.
- .3 Do not cut glass blocks.

2.2 MANUFACTURED UNITS

- .1 Solid glass block.
 - .1 Pattern and design: transparent.
 - .2 Surfaces: smooth.
 - .3 Colour: clear glass and sandblasted finish as noted in drawings.
 - .4 Nominal sizes:
 - .1 200 x 200 x 76 mm thick.
 - .5 Impact strength: 9-11 Nm, 6.8 kg mass per unit.
 - .6 Acceptable product: Pittsburgh Corning "Vistabrik".

2.3 ACCESSORIES

- .1 Mortar: white color, type M based on mortar proportion by volume.
- .2 Sealant: non-staining, waterproof mastic, silicone, urethane and Section 07 92 00 Joint Sealants. Apply sealant 24 hours after glass unit masonry installation.
- .3 Sealant primer: non-staining type recommended by sealant manufacturer.
- .4 Fasteners: steel, 6 mm minimum diameter, galvanized to ASTM A153/A153M, and as follows:
 - .1 To metal: self-drilling, self-tapping screws.
 - .2 To concrete and masonry: self-drilling, compression type insert, or self-tapping type screws for pre-drilled holes.
 - .3 To wood: wood screws.
- .5 Spacers: plastic, concealed type, allowing pointing mortar and placing reinforcing and panel anchors without obstruction, of size to provide horizontal and vertical joint width indicated, capable of supporting glass units until mortar set, incorporated into structural design of glass unit masonry.

2.4 SOURCE QUALITY CONTROL

- .1 Ensure glass block, components and materials are from single manufacturer.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for glass unit masonry installation in accordance with manufacturer's written instructions.
- .2 Beginning of installation means acceptance of conditions.

3.2 PREPARATION

- .1 Ensure structure or substrate is adequate to support glass block.
- .2 Surface Preparation: prepare surface in accordance with manufacturer's written recommendations and co-ordinate with Section 01 71 00 - Examination and Preparation.
- .3 Clean glass units of foreign substances.
- .4 Install sandblasted face of glass blocks in orientation noted in drawings.
- .5 Establish and protect lines, levels, and coursing.
- .6 Protect elements surrounding work of this Section from damage and disfiguration.

3.3 INSTALLATION

- .1 Erect glass units and accessories in accordance with manufacturer's instructions.
- .2 Set glass units with full bond mortar joints. Furrowing not permitted. Remove excess mortar.
- .3 Do not install glass unit when ambient temperature is below 4 degrees C. Maintain ambient temperature above 4 degrees C for 48 hours after installation.
- .4 Place units to maintain uniform joint width of 6 mm.
- .5 Install unit masonry to avoid contact of glass units with metal accessories or frames.
- .6 Shore assembly until mortar will maintain panel in position without movement.
- .7 Joint reinforcement:
 - .1 Install reinforcement in accordance with NBC and as follows.
 - .2 Place security bars between wythes prior to installation of glass blocks.

3.4 CONSTRUCTION

- .1 Mortar Placement:
 - .1 Place pointing mortar in accordance with manufacturer's written instructions and CSA A179.
 - .2 Set glass with full bond mortar joints. Furrowing not permitted. Remove excess mortar.
 - .3 Place units to maintain uniform joint width of 6 mm.
- .2 Jointing:
 - .1 Tool joints to concave profile, exposing shoulders of glass units.

- .2 Rake out mortar joints to depth equal to joint width and not less than 13 mm, to receive pointing mortar.
- .3 Rake out mortar joints to half of joint width but not less than 5 mm depth, to receive joint sealant.
- .3 Application of pointing mortar.
 - .1 Neatly tool surface to a concave profile. Expose shoulders of glass units.
 - .2 Remove excess mortar while it is still plastic using a clean, wet sponge or a scrub brush with stiff bristles.
 - .3 Vacuum clean mortar joints.

3.5 TOLERANCES

- .1 Tolerance for glass block unit construction in accordance with Section 04 05 00 - Common Work Results for Masonry, supplemented as follows.
 - .1 Variation from specified joint width: plus 2 mm and minimum 0 mm.
 - .2 Maximum variation from plane of unit to adjacent unit: 1 mm.
 - .3 Maximum variation from flat plane: 3 mm in 3 m, non-cumulative.

3.6 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.

3.7 PROTECTION

- .1 Brace and protect glass block unit construction in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .2 Make good damage to adjacent materials caused by glass block installation.

3.8 SCHEDULES

- .1 Hollow glass block: locate as indicated.

END OF SECTION

Part 1 General

1.1 GENERAL CONDITIONS

- .1 The General Conditions of the Contract, Supplementary General Conditions and General Requirements are hereby made part of this Section.

1.2 WORK INCLUDED

- .1 Structural steel framing members, structural steel support members, struts, complete with required bracing, welds, washers, nuts, shims, anchor plates and bolts.
- .2 Baseplates, connectors and bearing plates.
- .3 Field and shop welded composite beam studs shall be supplied and installed under this section.
- .4 Erection.

1.3 QUALITY ASSURANCE

- .1 Structural steel fabricator to be certified as minimum Division 2 Company under CSA W47.1-09 - "Certification of Companies for Fusion Welding of Steel Structures" or CSA Standard W55.3-08 "Resistance Welding Qualification Code for Fabricators of Structural Members" or both, as applicable.
- .2 Design to strictly adhere to all codes and standards as enumerated under Section 1.5 Reference Standards.
- .3 In the event of conflict between pertinent codes, standards and/or regulations, most stringent shall govern.
- .4 Composite steel studs attached to structural steel beams or girders and installed in either the fabricator's plant or in the field shall be supplied and installed by the Structural Steel Subcontractor who shall be a company certified as a Division 2 fabricator by the Canadian Welding Bureau under CSA Standard W47.1 "Certification of Companies for Fusion Welding of Steel Structures". This certification to be in effect prior to date of tender closing. This condition is a mandatory condition of the Contract Documents and shall not be waived regardless of Saskatchewan Bid Depository Rules or practices.

1.4 REFERENCE STANDARDS

- .1 CSA Standard CAN/CSA-S16-01 - "Limit States Design of Structural Steel Buildings".
- .2 CSA G40.21-04 (R2009) - "Structural Quality Steel".
- .3 ASTM Standard A325M - "High Strength Bolts for Structural Steel Joints including Suitable Nuts and Plane Hardened Washers".
- .4 CSA Standard W59-03 (R2008) - "Welded Steel Construction".

- .5 CSA Standard W47.1-09 - "Certification of Companies for Fusion Welding of Steel Structures".
- .6 ASTM Standard A53 - "Welded and Seamless Steel Pipe".

1.5 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with General Conditions.
- .2 Clearly indicate sizes, spacing and locations of structural members, connections, attachments, anchorages, framed openings and size and type of fasteners and welds.
- .3 Indicate all shop and erection details including cuts, copes, connections, holes, threaded fasteners and welds.
- .4 Show all welds, both shop and field, by the currently recommended symbols of the Canadian Welding Bureau.
- .5 Provide drawings stamped and signed by a Professional Engineer registered in the Province of Saskatchewan.
- .6 Review of shop drawings for size and arrangement of principal and auxiliary members only. Such review will not relieve the Contractor of responsibility for general and detail dimension and fit, or any errors or omissions.

1.6 INSPECTION AND TESTING

- .1 Materials and workmanship subject to inspection on behalf of Owner.
- .2 Report failure of material to fit together properly to Consultant. No corrective measures permitted unless approved by Consultant in writing.

Part 2 Products

2.1 MATERIALS/COMPONENTS

- .1 *Standard Rolled Sections:* new material conforming to CSA G40.21-04 (R2009), Grade 350W.
- .2 *Hollow Structural Sections:* new material conforming to CSA G40.21-04 (R2009), Grade 350W, Class C.
- .3 *Steel Pipe Sections:* new material conforming to ASTM Standard A53, Grade 241.
- .4 *Base and Cap Plates:* new material conforming to CSA G40.21-04 (R2009), Grade 300W.
- .5 *Beam End Plates, Ledger Angles and Miscellaneous Steel:* new material conforming to CSA G40.21-04 (R2009), Grade 300W.
- .6 *Anchor Bolts:* new material conforming to CSA G40.21-04 (R2009), Grade 260W.

- .7 *Bolts, Nuts and Washers:* high strength type recommended for structural steel joints, conforming to requirements of ASTM A325M-83c.
- .8 *Paint for Primer:* shall be grey (unless approved otherwise) and meet requirements of one of the following:
 - .1 CGSB 1-GP-40d, Primer, Structural Steel, oil alkyd type.
 - .2 CISC/CPMA Standard 1-73a, quick drying one-coat paint for use on structural steel.
- .9 *Shop and Field Studs:* shall be Nelson headed anchors to ASTM A108 - 58T or approved equivalent. Sizes as detailed on drawings.

2.2 FABRICATION

- .1 Fabricate structural steel members in accordance with building design drawings and all requirements of CAN/CSA S16-01. Welding to conform to CSA W59-03 (R2008) "Welded Steel Construction". Verify all dimensions prior to fabrication.
- .2 No cutting of openings in structural members except as shown on structural drawings. Reinforce openings to maintain required design strength.
- .3 Accurately cut and mill column ends to assure full contact of bearing surfaces.
- .4 Camber horizontal members as specified on drawings. Mill camber up where not specifically detailed.
- .5 All bolted connections to be "bearing" type connections except where subject to stress reversal which are to be "slip resistant" type connections.
- .6 All connections showing combined axial load (tension or compression) across the joint to be designed for loads shown. Such connection to be bolted through columns only.
- .7 All beams to be connected for the greater of the following conditions.
 - .1 Loads shown on drawings.
 - .2 50% of the total uniformly distributed load resistance of the member.
 - .3 Half depth of the connected member using M20 bolts (minimum two bolts) in double shear.
- .8 Shop installed shear studs to be installed in strict conformance with requirements of CSA Standard W59. Refer to Part 3 Execution for additional requirements.
- .9 Fabricate all glued-laminated timber brackets supported directly from structural steel. Coordinate design and details of connections with glulam supplier.
- .10 Masonry Ledgers
 - .1 All masonry ledgers supplied by structural steel shall be fabricated with connections to provide for full site adjustment.

.11 Tolerances

- .1 All masonry ledgers exposed to view are to be fabricated straight with no discernible kinks, bends or sweep. Maintain straightness to within tolerance of 1 in 500 with maximum deviation of ± 3 mm.
- .2 Tolerances of all other structural steel shall be maintained strictly in accordance with CAN/CSA S16-01.

- .12 All exposed steel and all related bridging and bracing shall be fabricated with clean, neat fitting welded connections.

2.3 PAINTING

- .1 All steel in contact with concrete and all faying surfaces of high strength bolted slip-resistant connections shall not be primed.

- .2 All exposed steel ledgers, lintels and glulam connections shall be prepared and painted as follows:

- (I) Blast clean steel to SSPC Standard SP6 "Commercial Blast Cleaning". Apply one coat of General Paint 06-134 Q.D. Shop Primer.
- (II) Apply one coat of General Paint 17-Line Q.D. Industrial Enamel. Color section by Consultant.

- .3 All other structural steel shall be prepared in accordance with SSPC Standard SP2 "Hand Tool Cleaning" and have one coat of specified shop applied primer.

- .4 Hot dipped galvanizing zinc coating. 600 grams/m² to CAN/CSA G164-M92.

Part 3 Execution

3.1 ERECTION

- .1 Erect structural steel in accordance with building design drawings and all requirements on CAN/CSA S16-01.

- .2 Make adequate provision for all erection loads and for sufficient temporary bracing to maintain structure safe, plumb and in true alignment until completion of erection. Leave such bracing in place as long as required for safety and integrity of the structure.

- .3 As erection progresses, securely bolt work to take care of full design loads and to provide structural integrity as required.

- .4 Use high tensile bolts for field connections unless otherwise noted on building design drawings.

- .5 Set all baseplates which are shop welded to columns to proper elevation on steel shims. Maximum tolerance from stated elevations to be ± 2 mm.

- .6 Masonry Ledgers
- .1 All masonry ledgers shall be erected with provision for full site adjustment. Position ledgers accurately to correct elevations and plan location and field weld in place prior to laying up masonry.
7. Tolerances
- .1 All masonry ledgers are to be erected straight, level and plumb with no discernible kinks, bends or sweep. All masonry support members are to be erected such that the masonry can be laid up in its correct location, fully supported, straight and plumb.
- .2 All masonry support members exposed to view are to be erected to comply with the following tolerances:
- .1 Straight to within tolerance of 1 in 500 with maximum deviation of ± 3 mm from established location.
- .2 Level to within tolerance of 1 in 1000 with maximum deviation of ± 3 mm from established location.
- .3 Plumb to within tolerance of 1 in 500 with maximum deviation of ± 3 mm .
- .4 Adjoining ends of these members shall be aligned vertically within 2 mm.
- .5 The location of these members vertically and horizontally shall be within 10 mm of the location established on the drawings.
- .6 Splices between ledgers shall have the toe of the exposed flanges flush. The ledgers are to be fully welded together at all splice locations and all exposed portions are to be continuous with all welds ground smooth and flush.
- .7 Exposed portions of all ledgers are to be finished smooth ready for finish painting. All irregularities and surface defects are to be removed.
- .3 Tolerance of all other structural steel shall be maintained strictly in accordance with CAN/CSA S16-01.
- .8 After erection, prime all welds, abrasions, bolted connections and all other surfaces not shop primed, except surfaces to be in contact with concrete.
- .9 Obtain written permission of Consultant prior to altering or field welding of structural members.

END OF SECTION

Part 1 General

1.1 GENERAL CONDITIONS

- .1 The General Conditions of the Contract, Supplementary General Conditions and General Requirements are hereby made part of this Section.

1.2 WORK INCLUDED

- .1 Steel roof and floor deck, complete with cover plates, cell closures and flashings.
- .2 All closure angles, channels, plates, as well as supplementary deck support or anchorage where required to provide continuous deck membrane.
- .3 Contractor to study Contract Drawings and Specifications with regard to the work shown and required under this Section to ensure its completeness. Supplementary items necessary to complete the work although not specifically shown or specified shall be supplied and installed.
- .4 Steel roof deck designed as a structural diaphragm. Contractor to ensure all side lap fastening and welding is as per the Drawings and Specifications.
- .5 Field and shop welded composite beam studs are to be supplied and installed by the structural steel subcontractor.

1.3 REFERENCE STANDARDS

- .1 Canadian Sheet Steel Building Institute (CSSBI) - "Standard Steel Roof Deck" and "Steel Roof Deck".
- .2 CAN/CSA S136-07 - "Cold Formed Steel Structural Members".
- .3 ASTM A446 - "Steel Sheet, Zinc Coated (Galvanized) by the Hot Dip Process, Physical (Structural Quality)".
- .4 Welding to CSA W59-03 (R2008) except where specified elsewhere.

1.4 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with General Conditions.
- .2 Clearly indicate decking plan, deck profile, dimensions, anchorage, supports, projects, openings and reinforcement, applicable details and accessories.
- .3 Clearly indicate position of temporary shoring of decking if required by design criteria.
- .4 Review of shop drawings will not relieve Contractor of responsibility for general and detail dimensions and fit, or any errors or omissions.
- .5 Prepare shop drawings under the direction of a professional engineer registered in the Province of Saskatchewan, Canada.

- .6 Submit shop drawings stamped and signed by qualified professional engineer registered in Province of Saskatchewan, Canada.

Part 2 Products

2.1 MATERIALS/COMPONENTS

- .1 *Sheet Steel:* Grade A or Grade B structural quality, conforming to ASTM A446.

2.2 DECKING/RELATED ACCESSORIES

- .1 *Floor Decking:* HB938 Hi-Bond Steel Floor Deck - 38 mm deep by 914 mm wide sheets by 0.76 mm core thickness. Galvanized to ZF075 (Wipe Coat) Standard.
- .2 Any substitution of specified material to be approved in writing by the Consultant.
- .3 *Closure Strips, Flashings, Cover Plates and Related Accessories:* minimum 1.6 mm (16 gauge) sheet steel.
- .4 *Acoustical Insulation:* fibrous glass 17.5 kg/M3 density; profiled to suit decking.
- .5 *Acoustical closures:* closed cell foam rubber profiled to deck corrugations, 25 mm thick.
- .6 *Primer:* Zinc rich, ready mix to CGSB-1-GP-181M.
- .7 *Closures to external walls:* neoprene as recommended by manufacturer.

2.3 FABRICATION

- .1 Fabricate metal decking in accordance with Drawings and as recommended by the Canadian Sheet Steel Building Institute (CSSBI) Standards. Fabricate to accommodate maximum deflections of 1/360 span.
- .2 Supply steel fillers between decking and supporting members where required.
- .3 Deck units to be 3 span continuous where possible; under no circumstances should deck be less than 2 span continuous except where detailed.

Part 3 Execution

3.1 INSTALLATION

- .1 Erect metal decking in accordance with drawings and as recommended by the CSSBI. Properly align and level on structural supports.
- .2 Allow minimum 40 mm bearing when supported by structural steel and minimum 100 mm bearing when supported by masonry or concrete.
- .3 Mechanical fasten male/female side laps at maximum 300 mm.

- .4 Fasten deck to ALL supporting steel with 20 mm fusion welds at maximum 300 mm on centre.
- .5 Reinforce openings 150 mm to 450 mm in size with L51 x 51 x 4.8 steel angles or as indicated on the Drawings. Place angles perpendicular to flutes, extended minimum two flutes each side of openings and weld to deck.
- .6 Reinforce openings over 450 mm in accordance with details indicated on Drawings.
- .7 Install minimum 150 mm cover plates where deck changes direction. Spot weld in place at maximum 300 mm on centre.
- .8 Install strip closures at slab edges to match thickness of slab, as required to contain poured concrete. Ensure closures are of sufficient strength to remain in place without distortion.
- .9 Install acoustical closures in locations above walls and partitions in areas where partitions butt to decking.
- .10 Immediately after installation, touch up welds, burned areas and damaged spots with prime paint. Use type of primer recommended for galvanized surfaces.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM A53/A53M-12, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A276-13a, Standard Specification for Stainless Steel Bars and Shapes.
 - .3 ASTM A307-12, Standard 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-1.181-99, Ready-Mixed, Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel.
 - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN/CSA-S16.1-01, Limit States Design of Steel Structures.
 - .4 CSA W48-06(R2011), Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - .5 CSA W59-13, Welded Steel Construction (Metal Arc Welding).

1.2 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 and locations, supports, reinforcement, details, and accessories.

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 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.

Part 2 Products

2.1 MATERIALS

- .1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 300W or 350W.
- .2 Steel pipe: to ASTM A53/A53M extra strong, galvanized finish.
- .3 Welding materials: to CSA W59.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Bolts and anchor bolts: to ASTM A307.
- .6 Stainless steel: to ASTM A276, Type 304.
- .7 Steel Mesh: rolled flattened steel mesh, galvanized finish.
- .8 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/m² to CAN/CSA-G164.
- .2 Chromium plating: chrome on steel with plating sequence of 0.009 mm thickness of copper, 0.010 mm thickness of nickel and 0.0025 mm thickness of chromium.
- .3 Shop coat primer: to CAN/CGSB-1.40.
- .4 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 STEEL ANGLE COLLARS AND BARS AT SECURE PENETRATIONS

- .1 Steel angles: Refer to drawings for sizes and locations.
- .2 Steel bars: Refer to drawings for sizes and locations.
- .3 Pre-drill anchor holes in angles.
- .4 Finish: hot dip galvanized.

2.7 FLOOR AND WALL JOINT COVER PLATE

- .1 Stainless steel checker plate: Length and width to suit joints indicated on drawings. 3mm thickness.
- .2 Finish: No. 4 brushed.
- .3 Locations: Floors: Refer to drawings. Walls: Rooms 107, 112, 118, 125, 128, 146.2, 151

2.8 CEILING JOINT COVER PLATE

- .1 Stainless steel checker plate: Length and width to suit joints indicated on drawings. 3mm thickness.

.2 Finish: No. 4 brushed.

.3 Locations: Room 118, 128, 146.2, 151.

2.9 CORNER GUARDS

.1 See Section 10 26 00 Wall & Ceiling Surface Protection.

2.10 VISION CONTROL GLAZING TRIM – ROOM 144

.1 See drawings for location and profile.

.2 Stainless steel plate: 3 mm thickness.

.3 Finish: No. 4 brushed.

2.11 DETENTION AREA DOOR FRAME TRIMS

.1 See drawing for locations and profiles.

.2 Stainless steel plate. 3mm thickness.

.3 Finish: No. 4 brushed.

2.12 SECURITY SCREENS

.1 Angles and flat bar: Refer to drawings, formed to shapes and sizes as indicated.

.2 Expanded Metal Mesh: Refer to drawings, formed to shapes and sizes as indicated.

.3 Galvanize finish.

2.13 OVERHEAD DOOR SILL – ROOM 151

.1 Stainless steel checker plate: Refer to drawings. 6 mm thickness.

.2 Finish: No. 4 brushed.

2.14 PIPE RAILINGS AND SLEEVES

.1 Steel pipe and sleeves: refer to drawings, formed to shapes and sizes as indicated.

.2 Hot dip galvanize after fabrication.

2.15 OVERHEAD DOOR OPERATOR PEDESTAL

.1 Hollow steel section: refer to drawings, formed to shapes and sizes as indicated.

.2 Steel sleeves and plates: refer to drawings, formed to shapes and sizes as indicated.

.3 Hot dip galvanize exterior after fabrication.

2.16 COUNTER SUPPORT ARM

- .1 Refer to drawings for location and details.
- .2 Steel plate, 6mm thick, shop primed (PT1).

2.17 BENCH SUPPORT ARMS (ROOM 101 AND 140)

- .1 Refer to drawings for location and details.
- .2 Steel plate, 6mm thick, shop primed (PT1).

2.18 STEEL MESH

- .1 Locations: Partitions, exterior walls, ceilings, floors and skirts. Refer to drawings.
- .2 Material: 19mm #9/10 rolled flattened steel mesh, hot dip galvanized.

2.19 SHEET STEEL

- .1 2mm (14ga) hot rolled sheet steel, hot dip galvanized.
- .2 Refer to drawings for locations and details.

2.20 CRAWLSPACE ACCESS LADDER

- .1 Refer to drawings. Shop primed. (PT1)

2.21 ROOF ACCESS LADDER

- .1 Refer to drawings. Shop primed. (PT1)

2.22 ROOF RESTRAINT

- .1 Refer to drawings and Section 07 72 69.

2.23 SECURE BAY TRENCH GRATES, ANGLES AND PAN

- .1 Refer to drawings.

2.24 VEHICULAR AND PEDESTRIAN RAMPS

- .1 Refer to drawings. Hot dip galvanized.

2.25 STAIR TREADS AND STRINGERS

- .1 Refer to drawings. Hot dip galvanized.

2.26 STEEL GRATING

- .1 Refer to drawings. Hot dip galvanized.

2.27 DETENTION WINDOW FRAME AND SECURITY BARS - INTERIOR

- .1 Interior Face Plate: Stainless steel plate. 3 mm thickness. Finish: No. 2B mill.
- .2 Internal Window Frame: Plate steel. 6mm thickness. Refer to drawings. Shop primed. (PT1).
- .3 Security Bars: Refer to drawings. Shop primed. (PT1).

2.28 DETENTION WINDOW FRAME - EXTERIOR

- .1 Stainless steel. 6mm thickness.
- .2 Finish: No. 2B mill.

2.29 SHOWER ENCLOSURE - ROOM 131

- .1 Stainless steel: 3mm thickness.
- .2 Fully welded water-tight enclosure at floor, walls and ceiling.
- .3 Security sealant at all joints to door frame.
- .4 Finish: No. 4 brushed. Slip resistant finish at floor pan.

2.26 BOLLARDS

- .1 Material: 150mm diameter x 8mm thick steel pipe. Base plates: Refer to drawings.
- .4 Refer to drawings for detailing.
- .5 Finish: Hot dip galvanize after fabrication.

2.27 RAIN WATER LEADER AND SUPPORT BRACKETS (RWL) – Police Building

- .1 Hollow structural steel: 152mm x 102mm x 4.8 mm thickness.
- .2 Support Brackets: Refer to drawings. 4.8 mm thickness. Prepare for 16 dia. stainless steel through bolts.
- .3 Finish: Hot dip galvanized finish. Touch up galvanized finish after site weld to bracket.

2.28 EXTERIOR DOOR SILLS

- .1 Stainless steel checker plate: Refer to drawings. 3 mm thickness x width to suit opening.
- .2 Finish: No. 4 brushed.

2.29 SIGN POSTS

- .1 Refer to drawings for size, locations and details.
- .2 Finish: Hot dip galvanized.

2.30 EXTERIOR SIGNS

- .1 Refer to drawings for size, locations and details.
- .2 Finish: Pre-finished. Refer to drawings.

Part 3 Execution

3.1 ERECTION

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage acceptable to Departmental Representative 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 and zinc finish coating where burned by field welding.

3.2 STEEL ANGLE COLLARS AND BARS AT SECURE PENETRATIONS

- .1 Install angles as indicated in drawings.

3.3 FLOOR AND WALL JOINT COVER PLATE

- .1 Install as indicated in drawings.
- .2 Secure to floor and wall structure with flush stainless steel screws at 300 o.c. Use security screws at wall locations.

3.4 CEILING JOINT COVER PLATE

- .1 Install as indicated in drawings.
- .2 Secure to ceiling structure with countersunk stainless steel security screws at 300 o.c.

3.5 CORNER GUARDS

- .1 See Section 10 26 00 Wall & Ceiling Surface Protection.

3.6 VISION CONTROL GLAZING TRIM – ROOM 144

- .1 Fasten to wood structure with flush stainless steel security screws.

3.7 DETENTION DOOR FRAME TRIM

- .1 Fasten to wood structure with flush stainless steel security screws. Refer to drawings.
- .2 Security sealant full perimeter.

3.8 SECURITY SCREENS

- .1 Install security screens as indicated in drawings.

3.9 OVERHEAD DOOR SILL – ROOM 151

- .1 Grout in place. Refer to drawings.

3.10 PIPE RAILINGS AND SLEEVES

- .1 Install pipe railings and sleeves as indicated in drawings.

3.11 OVERHEAD DOOR OPERATOR PEDESTAL

- .1 Install as indicated in drawings.

3.12 COUNTER SUPPORT ARM

- .1 Install counter support arm as indicated in drawings.
- .2 Continuously weld all connections, grind smooth.
- .3 Apply primer to exposed metal, finish paint support arm. (PT1)

3.13 BENCH SUPPORT ARM (ROOM 101 AND 140)

- .1 Fabricate and install support arm as indicated in drawings.
- .2 Continuously weld all connections, grind smooth.
- .3 Apply primer to exposed metal, finish paint support arm. (PT1)

3.14 STEEL MESH

- .1 Refer to Wall Types and details in drawings.

3.15 SHEET STEEL

- .1 Refer to drawings.

3.16 CRAWLSPACE ACCESS LADDER

.1 Refer to drawings.

3.17 ROOF ACCESS LADDER

.1 Refer to drawings.

3.18 ROOF RESTRAINT

.1 Refer to drawings and Section 07 72 69.

3.19 SECURE BAY TRENCH GRATES, ANGLES AND PAN

.1 Refer to drawings.

3.20 VEHICULAR AND PEDESTRIAN RAMPS

.1 Refer to drawings

3.21 STAIR TREADS AND STRINGERS

.1 Refer to drawings

3.22 STEEL GRATING

.1 Refer to drawings

3.23 EXTERIOR AND INTERIOR DETENTION WINDOW FRAME AND SECURITY BARS

.1 Refer to drawings.

3.24 ROOM 131 - SHOWER ENCLOSURE

.1 Refer to drawings.

3.25 BOLLARDS

.1 Refer to drawings.

3.26 RAIN WATER LEADER AND SUPPORT BRACKETS (RWL) – Police Building

.1 Refer to drawings.

3.27 EXTERIOR DOOR SILLS

.1 Refer to drawings.

3.28 SIGN POSTS

.1 Refer to drawings.

3.29 EXTERIOR SIGNS

- .1 Refer to drawings.

3.30 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 06 20 00 – Finish Carpentry
- .2 Section 06 40 00 – Architectural Woodwork
- .3 Section 06 17 23 – Laminated Veneer Lumber
- .4 Section 08 71 00 – Door Hardware
- .5 Section 09 21 16 – Gypsum Board Assemblies
- .6 Section 09 91 13 – Exterior Painting
- .7 Section 10 28 10 – Toilet and Bath Accessories

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C36/C36M-03e1, Standard Specification for Gypsum Wallboard.
 - .2 ASTM E-84/UL 723, Test for Surface Burning Characteristics of Building Materials and Flammability Ratings
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
 - .2 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .3 CAN/CGSB-71.26-M88, Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
 - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA O112 Series-M1977(R2006), CSA Standards for Wood Adhesives.
 - .4 CSA O141-05(R2009), Softwood Lumber.
 - .5 CSA O151-09, Canadian Softwood Plywood.
 - .6 CAN/CSA-O325.0-92(R2003), Construction Sheathing.
 - .7 CAN/CSA-S406-92(R2008), Construction of Preserved Wood Foundations.
 - .8 CSA O322-02(R2007), Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.
- .4 Underwriters Laboratories of Canada (ULC)
 - .9 CAN/ULC-S102.2-10 Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies

- .5 National Lumber Grades Authority (NLGA)
 - .10 Standard Grading Rules for Canadian Lumber 2010.

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 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 FRAMING AND STRUCTURAL MATERIALS

- .1 Lumber: unless specified otherwise, Douglas Fir or Spruce softwood, no. 2 or better, S4S, moisture content 19% (S-dry) or less in accordance with following standards:
 - .1 CSA O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
- .2 Structural Composite Lumber (SCL) in accordance with ASTM D5456.
- .3 Framing and board lumber: in accordance with NBC. Douglas Fir or Spruce, No. 2 or better.
- .4 Furring, blocking, nailing strips, grounds, rough bucks:
 - .1 Board sizes: "Standard" or better grade.
 - .2 Dimension sizes: "Standard" light framing or better grade.
 - .3 Post and timbers sizes: "Standard" or better grade.
- .5 Decks, stairs and miscellaneous exterior wood framing noted to be pressure treated: pressure (preservative) treated, exterior grade lumber material.
- .6 Skirting: Pressure (preservative) treated meeting CAN/CSA S406.

- .6 Fire retardant treated lumber. Refer to drawings. Acceptable product: D-Blaze Fire Retardant Treated Lumber, by Chemical Specialties Inc., One Woodlawn Green, Suite 350, 200 East Woodlawn Road, Charlotte, NC. 1-800-421-8661. www.treatedwood.com .

2.2 PANEL MATERIALS

- .1 Plywood, OSB and wood based composite panels: to CAN/CSA-O325.0.
- .2 Canadian softwood plywood (CSP): to CSA O151, standard construction.
- .3 Interior plywood sheathing: Good one side, fire retardant douglas fir plywood, flame spread of 25 or less in all locations. Refer to drawings. Acceptable product: D-Blaze Fire Retardant Treated Plywood, by Chemical Specialties Inc., One Woodlawn Green, Suite 350, 200 East Woodlawn Road, Charlotte, NC. 1-800-421-8661. www.treatedwood.com .
- .4 Skirting (interior and exterior faces): pressure (preservative) treated exterior grade plywood meeting CAN/CSA S406.

2.3 ACCESSORIES

- .1 Sealants: in accordance with Section 07 92 10 - Joint Sealing.
 - .1 Maximum allowable VOC limit 250 g/L.
- .2 Subflooring adhesive: to CGSB-71.26, cartridge loaded.
 - .1 Maximum allowable VOC limit 30 g/L.
- .3 General purpose adhesive: to CSA O112 Series.
 - .1 Maximum allowable VOC limit 140 g/L.
- .4 Nails, spikes and staples: to CSA B111.
- .5 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.
- .6 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer.
- .7 Skirting: Fasteners and connectors , moisture barrier, sealant and field applied preservative: to CAN/CSA-S406.

2.4 FASTENER FINISHES

- .1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for exterior work, interior highly humid areas, pressure-preservative, fire-retardant, and treated lumber.
- .2 Skirting: Fasteners and connectors to CAN/CSA-S406.

Part 3 Execution

3.1 PREPARATION

- .1 Store wood products in a dry location, off the ground.

3.2 INSTALLATION

- .1 Comply with requirements of NBC 2010 Part 3 and Part 9 supplemented by following paragraphs.
- .2 Construct and install preserved wood skirting in accordance with CAN/CSA-S406. Place cut ends up where studs cut to length.
- .3 Install members true to line, levels and elevations, square and plumb.
- .4 Construct continuous members from pieces of longest practical length.
- .5 Install spanning members with "crown-edge" up.
- .6 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.
- .7 Install wall sheathing in accordance with manufacturer's printed instructions.
- .8 Install interior fire retardant plywood with good side facing room. Prepare for final finish as per manufacturers written instructions. Coordinate with Room Finish Schedule.
- .9 Install furring and blocking as required to space-out and support architectural woodwork, residential casework, toilet partitions, toilet and bath accessories, detention furnishings, tack boards and whiteboards, storage assemblies, miscellaneous specialties, wall and ceiling finishes, facings, electrical equipment mounting boards, and other work as required. Refer to relevant Sections.
- .10 Install solid wood blocking 38mm x 152 mm in joist cavities at locations where wall mounted door stop is attached to stud wall assemblies.
- .11 Install solid wood blocking 38mm x 184 mm at 400 o.c. in floor at locations where interior partitions are required to be secured to floor between floor joists.
- .12 Install solid wood blocking 38mm x 184 mm between joists beneath fastening points for detention furniture. See Section 12 50 00 and drawings for locations.
- .13 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .14 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.

3.3 ERECTION

- .1 Erect preserved wood skirting in accordance with CAN/CSA-S406. Place cut ends up where studs cut to length.
- .2 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .3 Countersink bolts where necessary to provide clearance for other work.

- .4 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

3.4 SCHEDULES

- .1 Refer to drawings for various items requiring furring, blocking, nailing strips, grounds and rough bucks.
- .2 Refer to drawings for specialized fastening and joint layouts of panel materials.
- .3 Provide backing in walls for all millwork, shelving and wall mounted items requiring solid blocking.

END OF SECTION

Part 1 General

1.1 GENERAL REQUIREMENTS

- .1 The General Conditions of the Contract, Supplementary General Conditions and General Requirements are hereby made part of this Section.

1.2 WORK INCLUDED

- .1 This work includes the complete furnishings and installation of all laminated veneer lumber as shown on the drawings herein specified and necessary to complete the work.

1.3 RELATED WORK

- | | | |
|----|-------------------------|------------------|
| .1 | Structural Steel | Section 05 12 23 |
| .2 | Rough Carpentry | Section 06 10 00 |
| .3 | Wood Trusses | Section 06 17 53 |
| .4 | Laminated Veneer Lumber | Section 06 17 23 |

1.4 QUALITY ASSURANCE

- .1 Unless detailed otherwise, all beams to be designed to support all applicable dead loads, partition loads and all live loads for designated occupancies in accordance with current NBC.
- .2 All design in accordance with Part 4 of the National Building Code 1995 and CSA O86 "Engineering Design in Wood".
- .3 Complete design calculations showing layout, forces and stress control points to be provided to Consultant for review, if requested.
- .4 Design of beams to be under the direct supervision of a Professional Engineer registered in the Province of Saskatchewan.

Part 2 Products

2.1 MATERIALS

- .1 Materials shall comply with CCMC Report No. 08675-R.
- .2 Laminated veneer lumber shall be manufactured in a continuous process with all grain oriented parallel to the length of the member. All members are to be free of finger or scarf joints or mechanical connections in full length members.
- .3 Adhesives shall be of the waterproof type conforming to the requirements of CSA O112.6-M.

2.2 FABRICATION

- .1 Laminated veneer lumber shall be manufactured in a plant listed in the reports referred to above and under the supervision of an approved third-party inspection agency. It shall be manufactured in a continuous process with all grain parallel with the length of the members.

2.3 TOLERANCES

- .1 Manufacture all parallel strand lumber to the following tolerances:

Finished Length (as specified):	± 6.5 mm
Depth:	± 1.5 mm
Width:	± 1.5 mm

2.4 IDENTIFICATION

- .1 Each of the beams shall be identified by a stamp indicating the product type and grade, CCMC report number, manufacturer's name, plant number and the independent inspection agency's logo.

2.5 HARDWARE

- .1 All hardware is to be fabricated by others according to details contained in the contract drawings.

Part 3 Execution

3.1 ERECTION AND INSTALLATION

- .1 Beams shall be erected and installed in accordance with the plans, drawings and installations that may be provided.
- .2 Temporary construction loads that cause stresses beyond design limits are not permitted.
- .3 Holes, cuts or notches not previously approved shall not be permitted.
- .4 Connections: lateral nail holding and withdrawal are as provided in the Code for Douglas Fir sawn timber (SG=0.50). Nails installed parallel to the glue lines on the narrow face shall not be spaced closer than 100 mm for 76 mm (10d) common nails and 75 mm for 63.5 mm (8d) common nails. Nails installed perpendicular to the glue lines on the wide face shall be installed in accordance with the code. These nailing specifications are based on at least a 19 mm-thick and 89 mm-wide member. The resistance of bolts installed perpendicular to the glue lines in as provided in the Code for Douglas Fir.

3.2 INSTALLATION REVIEW

- .1 The Contractor shall give notification to the manufacturer, prior to enclosing the beams, to provide opportunity for review of the installation.

3.3 PERFORMANCE STANDARDS

- .1 Products shall be proven by testing and evaluation in accordance with the provisions of ASTM D-5456.

3.4 WARRANTY

- .1 The products delivered shall be free from manufacturing errors or defects in workmanship and material. The products, when correctly installed, shall perform to specifications for the normal and expected life of the building.

3.5 EXPOSED FINISH

- .1 Laminated veneer lumber: Sand to a smooth finish ensuring identifying labeling has been removed and apply two coats semi-transparent stain. Colour by Owner.

END OF SECTION

Part 1 General

1.1 GENERAL REQUIREMENTS

- .1 The General Conditions of the Contract, Supplementary General Conditions and General Requirements are hereby made part of this section.

1.2 WORK INCLUDED

- .1 Supply, fabricate and erect dimensional lumber trusses shown on drawings.
- .2 Examine the work upon which the work in this division depends and report any defects to the Consultant. The work of this division shall not commence until all defects have been corrected.
- .3 Commencement of the work shall imply acceptance of conditions.

1.3 QUALITY ASSURANCE

- .1 Unless detailed otherwise, all roof trusses to be designed to support all applicable dead loads and snow loads, including drift conditions, in accordance with current NBC.
- .2 Unless detailed otherwise, all floor joists to be designed to support all applicable dead loads, partition loads, and all live loads for designated occupancies in accordance with current NBC.
- .3 All design in accordance with Part 4 of the National Building Code 2010 and CAN3-086 "Engineering Design in Wood".
- .4 Complete design calculations showing layout, forces and stress control points to be provided to Consultant for review prior to fabrication.
- .5 Design of roof trusses to be under the direct supervision of a Registered Professional Engineer licensed for practice in Saskatchewan.
- .6 Unless noted otherwise, all trusses and joists to be designed for maximum live load deflection of $L/360$.

1.4 SHOP DRAWINGS

- .1 Prepare and check shop drawings including anchorage and erection drawings. Clearly indicate dimensioned profiles, member sizes, connection details, spacing, material grades and other information pertinent to design. Submit shop drawings in accordance with General Conditions.
- .2 Roof truss shop drawings must be reviewed by General Contractor and Mechanical Contractor to ensure that the size and locations of all duct penetrations are identified and co-ordinated. Final roof truss shop drawings must reflect framing to accommodate all such conditions.

- .3 Review of drawings to be for size and arrangement of principal and auxiliary members only. Review will not relieve Contractor of responsibility for general and detailed dimensions and fit or any errors or omissions.

Part 2 Products

2.1 MATERIALS

- .1 Structural wood members to CSA Standard 0141-05 "Softwood Lumber" graded in accordance with NLGA Grading Rules, or machine stress-rated material, kiln dried to maximum 19% moisture content. All joints to be full strength of section.
- .2 Connection may be proprietary systems of steel to minimum ASTM A307. Material and size to requirements of design. Submit data to satisfaction of the Consultant to substantiate connection design.
- .3 Pre-manufactured double-grip framing anchors, galvanized, shall be used to tie down trusses at all bearing locations.
- .4 Bridging to be horizontal wood members at top and bottom chord as required by design and indicated on shop drawings. Cross-brace as required.

Part 3 Execution

3.1 STORAGE

- .1 Store in vertical position and completely protected from weather. Handle in such a manner that no damage will be done to materials or structure.

3.2 FABRICATION

- .1 Wood trusses to be custom design Warren, Pratt or Howe Truss with tapered and pitched profiles as detailed.
- .2 Wood trusses to be manufactured in a plant subject to the approval of the Departmental Representative.
- .3 All connections as detailed on approved shop drawings.
- .4 Camber wood trusses for full dead load plus three-eighths ($\frac{3}{8}$) live load.
- .5 Supply for erection all pre-cut blocking, bridging and double-grip framing anchors.

3.3 ERECTION

- .1 Erect plumb and true; use temporary bracing where required to take care of all loads to which structure may be subjected, including erection equipment, and operation of same.

- .2 Wind forces on building permanently carried out by walls and decks. Provide temporary stability struts if required as work progresses and maintain in place until stability is provided by permanent structure.
- .3 As erection progresses, securely fasten work by means of double-grip framing anchors to take care of all dead, wind and erection stresses.
- .4 Make proper provision for safety carrying piles of material, erection equipment of other loads during erection.
- .5 Manufacturer to provide fully qualified representative to ensure conformance with design intent. Manufacturer's representative to inspect completed installation and certify acceptance of work. All shop drawings to be sealed by a professional engineer registered in the Province of Saskatchewan.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Describes architectural woodwork in police building only and hardwood casing at both police building and housing units. For residential casework see Section 12 35 00.

1.2 RELATED SECTIONS

- .1 Section 09 91 23 – Interior Painting

1.3 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI/HPVA HP-1-2009, Standard for Hardwood and Decorative Plywood.
 - .2 ANSI/NPA A208.1-2009, Particleboard.
- .2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
 - .1 Architectural Woodwork Quality Standards Illustrated, 2nd edition, 2014.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA B111-74(R2003), Wire Nails, Spikes and Staples.
 - .2 CSA O112.4 Series-M1977(R2006), Standards for Wood Adhesives.
 - .3 CSA O121-08(R2013), Douglas Fir Plywood.
 - .4 CSA O141-05(R2009), Softwood Lumber.
- .5 National Electrical Manufacturers Association (NEMA)
 - .1 ANSI/NEMA LD-3-2005, High-Pressure Decorative Laminates (HPDL).
- .6 National Hardwood Lumber Association (NHLA)
 - .1 Rules for the Measurement and Inspection of Hardwood and Cypress 2011.
- .7 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2010.

1.4 PERFORMANCE REQUIREMENTS

- .1 Perform architectural casework work in accordance with the recommendations of the "Architectural Woodwork Quality Standards Illustrated" of the Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada (AWMAC), 2014 Edition, together with authorized additions and amendments, Custom Grade.
- .2 Where modifications to the AWMAC Quality Standards are included in this project specification, then such modifications shall govern in case of conflict.

- .3 Materials and installation shall be in metric measurement as specified.

1.5 SUBMITTALS

- .1 Provide Submittal submissions: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Indicate details of construction, profiles, jointing, fastening and other related details.
 - .1 Scales: profiles full size, details half full size.
 - .2 Indicate materials, thicknesses, finishes and hardware.
 - .3 Indicate locations of service outlets in casework, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.
- .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Provide duplicate samples: sample size 300 x 300 mm or 600 mm long unless specified otherwise.
 - .2 Provide two (2) samples of each wood species for review.
 - .3 Provide duplicate colour samples of laminated plastic for colour selection.
 - .4 Provide duplicate samples of laminated plastic joints, edging, cutouts and postformed profiles.
- .4 Quality assurance submittals:
 - .1 Manufacturer's Instructions: manufacturer's installation instructions.

1.6 QUALITY ASSURANCE

- .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.
- .3 Delivery, Storage, and Handling:
 - .1 Deliver, handle, store and protect materials of this section in accordance with Section 01 61 00 - Common Product Requirements.
 - .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.
- .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 MATERIALS

- .1 Softwood lumber: unless specified otherwise, S4S, moisture content 19% or less in accordance with following standards:
 - .1 CSA O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
 - .3 AWMAC custom grade, moisture content as specified.
- .2 Hardwood lumber: moisture content 6% or less in accordance with following standards:
 - .1 National Hardwood Lumber Association (NHLA).
 - .2 AWMAC custom grade, moisture content as specified.
- .3 Douglas fir plywood (DFP): to CSA O121, standard construction.
 - .1 Urea-formaldehyde free.
- .4 Hardwood plywood: to ANSI/HPVA HP-1.
 - .1 Urea-formaldehyde free.
- .5 Engineered Combination core – 5 ply veneer: to ANSI A208-1
 - .1 Urea-formaldehyde free.
- .6 Laminated plastic for flatwork: to NEMA LD3, Grade VGL, Type HD, 1.6 mm thick; based on solid, woodgrain, printed pattern, and metallic, colour range with satin, matt, textured, and embossed finish.
- .7 Laminated plastic backing sheet: Grade BK, Type HD not less than 0.5 mm thick or same thickness and colour as face laminate.
- .8 Thermofused Melamine: to NEMA LD3 Grade VGL.
 - .1 High wear resistant thermofused melamine: equal or exceed 400 cycles (Minimum standard for HPL abrasion test).
- .9 Nails and staples: to CSA B111.
- .10 Wood screws: plain, type and size to suit application.
- .11 Splines: wood and metal.
- .12 Sealant: in accordance with Section 07 92 00 - Joint Sealants.
- .13 Laminated plastic adhesive:
 - .1 Adhesive: contact adhesive to CAN/CGSB-71.20.
 - .1 Maximum VOC limit 250 g/l.
 - .2 Adhesives urea-formaldehyde free.

2.2 HARDWOOD CASINGS, BASE AND TRIMS

- .1 H1: Hardwood: Solid maple, clear finish (S1). Refer to section 09 91 23 – Interior Painting
- .2 H2: Hardwood: Solid oak, stain to match residential casework (S2). Refer to section 09 91 23 – Interior Painting.

2.3 MANUFACTURED UNITS

- .1 Casework:
 - .1 Fabricate casework to AWMAC custom quality grade.
 - .2 Furring, blocking, nailing strips, grounds and rough bucks
 - .1 S2S is acceptable for concealed products.
 - .2 Board sizes: "standard" or better grade.
 - .3 Dimension sizes: "standard" light framing or better grade.
 - .4 Urea-formaldehyde free.
 - .3 Case bodies (ends, divisions and bottoms).
 - .1 Particleboard, grade, square edge, 19mm thick. Laminated with high pressure laminate on exposed ends and thermofused melamine on concealed interiors.
 - .4 Backs:
 - .1 Particleboard core, square edge, 12.7mm thick, laminated with thermofused melamine.
 - .5 Shelving:
 - .2 Particleboard, laminated with thermofused melamine, 19 mm thick.
 - .3 Edge banding: provide matching colour PVC, 3 mm thickness.
 - .6 Colors:
 - .1 PL-1: Wilsonart 4166-60 Pampas
 - .2 Thermofused Melamine: Panolam S463 Antique White
- .2 Drawers:
 - .1 Fabricate drawers to AWMAC custom grade supplemented as follows:
 - .2 Sides and Backs.
 - .1 Thermofused melamine: 15 mm thick.
 - .3 Bottoms:
 - .1 Thermofused melamine: 15 mm thick.
 - .4 Fronts:
 - .1 Particleboard, 19 mm thick, laminated with high-pressure plastic laminate.
 - .1 Exposed finish: high-pressure plastic laminate
 - .2 Semi-exposed surface: plastic laminate.

- .3 Edges: banded with 3 mm PVC edge, colour to match exposed faces.
- .5 Colors:
 - .1 PL-1: Wilsonart 4166-60 Pampas
 - .2 Thermofused Melamine: Panolam S463 Antique White
- .3 Casework Doors:
 - .1 Fabricate doors to AWMAC custom grade supplemented as follows:
 - .2 Particleboard, 19 mm thick, laminated with high-pressure plastic laminate.
 - .1 Exposed finish: high-pressure plastic laminate
 - .2 Semi-exposed surface: high-pressure plastic laminate.
 - .3 Edges: banded with 3 mm PVC edge, colour to match exposed faces.
 - .3 Colors:
 - .1 PL-1: Wilsonart 4166-60 Pampas
- .4 Countertops
 - .1 High-pressure plastic laminate: edged with 3 mm PVC edge unless indicated otherwise on details. Backsplash and sidesplash to match countertop unless indicated otherwise on drawings.
 - .2 Colors:
 - .1 PL-2: Wilsonart 4859-60 Spiced Zephyr
 - .3 Solid wood nosing: Maple, semi-transparent stain with water-borne varnish, Semi-gloss finish.
 - .1 Finish: MPI INT6.3W Premium Grade (stain with 3 coats of varnish)

2.4 FABRICATION

- .1 Assemble cabinets in flush overlay style.
- .2 Set nails and countersink screws apply plain wood filler to indentations, sand smooth and leave ready to receive finish.
- .3 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.
- .4 Shelving to cabinetwork to be adjustable unless otherwise noted.
- .5 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.
- .6 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.

- .7 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .8 Ensure adjacent parts of continuous laminate work match in colour and pattern.
- .9 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.
- .10 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
- .11 Apply laminate backing sheet to reverse side of core of plastic laminate work.

2.5 HARDWARE

- .1 Hinges: European concealed hinges, 110 degree opening. Only screw fastened hardware will be accepted, no friction fit hardware will be accepted. Use plastic insertion dowels to receive screws of hinge baseplates.
 - .1 Acceptable manufacturers: Hettich, Blum, Hafele or Richelieu.
- .2 Drawer slides: full extension, bearing type, secured to sides of drawers and to gable, 45kg static load capacity, integral stop, self-closing
 - .1 Acceptable product: Accuride 3832, or Knape & Vogt 8400.
- .3 Shelf standards: Safety shelf support pin for 5mm diameter holes, steel pin with mounded on clear plastic.
- .4 Pulls: Recessed metal pull.
 - .1 Acceptable product: Richelieu 616743128174, or Hettich Zinc Modern 043 981.
- .5 Cabinet locks: Cam type cylinder lock. Satin nickel finish. Install where shown on details. Key locks that are in the same room alike.
- .6 Clear plastic silencers to be installed on all cabinet doors.
- .7 Closet Rod and Shelf: See Section 10 90 00 Ventilated Metal Shelf Type 1.

Part 3 Execution

3.1 INSTALLATION

- .1 Do architectural woodwork to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.
- .2 Install prefinished millwork at locations shown on drawings. Position accurately, level, plumb straight.

- .3 Fasten and anchor millwork securely. Provide 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.
- .7 Apply water resistant building paper over wood framing members in contact with masonry or cementitious construction.
- .8 Fit hardware accurately and securely in accordance with manufacturer's written instructions.
- .9 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 indicated or approved. Slightly bevel arises.
- .10 For site application, offset joints in plastic laminate facing from joints in core.
- .11 Install wood window sills as noted in drawing.
- .12 Coordinate installation of continuous wood blocking behind adjustable shelving units. Attach standards to studs at a maximum spacing of 400mm on centre. Adjustable shelf shall extend a maximum of 100mm beyond the final standard, install standard as required.

3.2 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Clean millwork and cabinet work, inside cupboards and drawers and outside surfaces.
- .3 Remove excess glue from surfaces.

3.3 PROTECTION

- .1 Protect millwork and cabinet work from damage until final inspection.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 07 27 00 - Air and Vapour Barrier
- .3 Section 07 46 13 – Preformed Metal Siding
- .4 Section 07 54 23 – Thermoplastic Polyolefin Roofing

1.2 REFERENCES

- .1 Underwriters Laboratories of Canada (ULC)
 - .1 ASTM C612-[04], Standard Specification for Mineral Fibre Block and Board Thermal Insulation.
 - .2 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
 - .3 CAN/ULC-S702- 97, Thermal Insulation, Mineral Fibre, for Buildings.
 - .4 CAN/ULC-S704-03, Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.

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 01300 Submittals. Indicate VOC's insulation products and adhesives.
- .2 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.
- .3 Shop Drawings
 - .1 Provide layout for roof insulation.

1.4 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

- .1 Mineral fibre insulation must be formaldehyde free.

Part 2 Products

2.1 INSULATION

- .1 Skirt: Extruded polystyrene (XPS): to CAN/ULC-S701.
 - .1 Type: 4.
 - .2 Thickness: as indicated in drawings.
 - .3 Edges: shiplapped.
- .2 Roof: Rigid Cellular Polyisocyanurate:
 - .1 Refer to Section 07 54 23 – Thermoplastic Polyolefin Roofing
 - .2 Faced: to CAN/ULC C-S704-11.
 - .1 Closed cell polyisocyanurate foam core bonded to inorganic glass fibre reinforced faces, 2 sides per ASTM C1289 Type II, Class 1, Grade 2.
 - .2 Shape: flat.
 - .3 RSI (R-Value): as indicated on drawings.

2.2 ADHESIVE

- .1 Adhesive (for polystyrene): to CGSB 71-GP-24.
- .2 Compatible with roofing membrane and polystyrene insulation

2.3 ACCESSORIES

- .1 Insulation clips: impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self locking type.

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 WORKMANSHIP

- .1 Install insulation after building substrate materials are dry.
- .2 Install insulation to maintain continuity of thermal protection to building elements and spaces.
- .3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

- .4 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.
- .5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
- .6 Offset both vertical and horizontal joints in multiple layer applications.
- .7 Do not enclose insulation until it has been inspected and approved by Consultant.

3.3 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.

3.4 RIGID INSULATION INSTALLATION

- .1 Apply adhesive to insulation board in accordance with manufacturer's recommendations.
- .2 In addition to adhesive, install insulation boards with insulation clips and disk, 2 per 600 x 1200 mm board minimum, fit boards tight, cut of fastener spindle 3 mm beyond disk.

3.5 ROOF INSULATION INSTALLATION

- .1 Rigid Cellular Polyisocyanurate
 - .1 Refer to Section 07 54 23 – Thermoplastic Polyolefin Roofing.

3.6 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 06 10 00 – Rough Carpentry
- .2 Section 07 27 00 – Air and Vapour Barriers

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C553-02, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.
- .2 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S702-1997, Standard for Mineral Fibre Insulation.
 - .2 CAN/ULC S102 – Surface Burning Characteristics

Part 2 Products

2.1 INSULATION

- .1 Mineral Fibre Batt Insulation
 - .1 Mineral Fibre batt: to CAN/ULC S702.
 - .1 Type: 1
 - .2 Density 40kg/m3.
 - .3 Thickness: as indicated.

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 protection to building elements and spaces and to ASTM C1320.
- .2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .3 Do not compress insulation to fit into spaces.

- .4 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 vents.

3.3 CLEANING

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

END OF SECTION

PART 1 General

1.1 RELATED SECTIONS

- .1 Section 01 00 05 - General Requirements
- .2 Section 06 10 00 – Rough Carpentry

1.2 REFERENCES

- .1 American Society for Testing and Materials
 - .1 ASTM E 96/E 96 M, Water Vapor Transmission of Materials, desiccant method.
 - .2 Canadian Urethane Foam Contractors' Association Inc. (CUFCA)
 - .3 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S705.1-01, Standard for Thermal Insulation Spray Applied Rigid Foam, Medium Density, Material Specification.
 - .2 CAN/ULC-S705.2-02, Standard for Thermal Insulation Spray Applied Rigid Foam, Medium Density, Installer's Responsibilities-Specification.

1.1 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 including product characteristics, performance criteria and limitations.
 - .2 Submit proof of License of the Contractor by CUFCA (Canadian Urethane Foam Contractors Association Inc.) prior to commencing the work. Licensing is required by CAN/ULC S705.2-05 Installation Standard.
 - .3 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Maintenance Manuals:
 - .1 Conform to Section 01 78 00 – Closeout Submittals.

1.2 MOCK-UP

- .1 Construct on site a mock-up in accordance with Section 01 45 00.
- .2 The mock-up area shall be minimum 5 m² and include components of the work such as attachments, penetrations and corners.
- .3 The mock-up shall be reviewed by the Departmental Representative to verify conformance with the specification, workmanship and appearance. Recommended changes to installation methods and procedures may be agreed to at this time.
- .4 The mock-up may be part of the finished work.

- .5 This mock-up shall constitute a standard of acceptance for the remaining work.

1.3 QUALITY ASSURANCE

- .1 Applicators to conform to Canadian Urethane Foam Contractors Association Quality Assurance Program.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with with manufacturer's written instructions.
- .2 Materials are to be delivered in original containers and packaged with appropriate MSDS and labels.

1.5 SAFETY REQUIREMENTS

- .1 Protect workers as recommended by CAN/ULC-S705.2 and manufacturer's recommendations.

1.6 PROTECTION

- .1 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.
- .2 Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area.
- .3 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of insulation materials.

1.7 ENVIRONMENTAL CONDITIONS

- .1 Apply spray polyurethane foam when chemical, atmospheric and cavity/surface temperatures are within the limitations required by the CAN/ULC S705.2-05 Installation Standard and as recommended by the manufacturer.

PART 2 Products

2.1 MATERIALS

- .1 Insulation: 2 component spray polyurethane to CAN/ULC-S705.1.
- .2 Composition: Medium-density closed cell foam. Minimum in-place core density 32.0 kilograms per cubic meter (2 lb/ft³)
- .3 Primers: in accordance with manufacturer's recommendations for surface conditions.
- .4 Low expansion foam: closed cell, one-component moisture cure polyurethane. Must not contain urea formaldehyde or formaldehyde. Core density not less than 23kg/m³ (1.44 lbs/ft³)

PART 3 Execution

3.1 EXAMINATION

- .1 Verify that surfaces and conditions are suitable to accept work as outlined in this section.
- .2 Prior to commencement of work report in writing to the consultant any defects in surfaces or conditions that may adversely affect the performance of products installed under this section.

3.2 PREPARATION

- .1 Mask and cover adjacent areas to protect from over spray.
- .2 Ensure any required foam stop or back up material are in place to prevent over spray and achieve complete seal.
- .3 Seal off existing ventilation equipment. Install temporary ducting and fans to ensure exhaust fumes. Provide for make-up air.
- .4 Erect barriers, isolate area and post warning signs to advise non-protected personnel to avoid the spray area.

3.3 APPLICATION

- .1 Do not install product after expiry date on the container.
- .2 Manufacture of material on site by qualified installer trained to spray urethane foam insulation in accordance with CAN/ULC-S705.2
- .3 Apply insulation to clean surfaces in accordance with CAN/ULC-S705.2 and manufacturer's printed instructions. Use primer where recommended by manufacturer.
- .4 Apply spray foam in accordance with ASTM E 96/E 96 M if the spray foam is to act as a vapour barrier.
- .5 Apply sprayed foam insulation in thickness and in locations as indicated in drawings.
- .6 Apply in consecutive lifts as recommended by manufacturer to thickness indicated on drawings. Lifts shall be not less than 15mm and not greater than 50mm. Allow to cure between lifts.
- .7 Maintain minimum 75mm clearance from heat-emitting devices.
- .8 Finished surface of foam insulation to be free of voids and imbedded foreign objects.
- .9 Trim, as required, any excess thickness that would interfere with the application of cladding/covering system by other trades.

3.4 LOW EXPANSION FOAM

- .1 Install low expansion foam appropriate to the installation between door and window frames and the adjacent structure, to avoid causing pressure on the frame due to the expansion of the foam.

3.5 FIELD QUALITY CONTROL

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

3.6 TOLERANCES

- .1 Maximum variation from indicated thickness: minus (-) 6mm; plus (+) 12mm.

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove insulation material spilled during installation, clean affected surfaces.

3.8 SCHEDULE

- .1 Between window and door frames and adjacent structure.
- .2 Full perimeter of joints between modules.
- .3 Floor assembly of housing units.
- .4 Refer to drawings for other locations.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Vapour permeable air barrier (police building), vapour barrier (police building and housing units), home wrap air and moisture barrier (housing units), crawlspace vapour barriers (housing units and police building), self-adhering sheet waterproofing at skirting (police building). Air and vapour Barrier membrane for roofing is specified in Section 07 54 23 – Thermoplastic Polyolefin Roofing.

1.2 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 07 46 13 – Preformed Metal Siding
- .3 Section 07 46 46 – Cementitious Siding
- .4 Section 07 54 23 – Thermoplastic Polyolefin Roofing
- .5 Section 07 92 00 - Joint Sealants
- .6 Section 08 54 13 – Fiberglass Windows
- .7 Section 087 90 10 – Door, Frame & Hardware Schedule

1.3 REFERENCES-

- .1 ASTM International
 - .1 ASTM C920; Standard Specification for Elastomeric Joint Sealants
 - .2 ASTM C1193; Standard Guide for Use of Joint Sealants
 - .3 ASTM D882; Test Method for Tensile Properties of Thin Plastic Sheeting
 - .4 ASTM D1117; Standard Guide for Evaluating Non-woven Fabrics
 - .5 ASTM E84; Test Method for Surface Burning Characteristics of Building Materials
 - .6 ASTM E96; Test Method for Water Vapor Transmission of Materials
 - .7 ASTM E1677; Specification for Air Retarder Material or System for Framed Building Walls
 - .8 ASTM E2178; Test Method for Air Permeance of Building Materials
 - .9 ASTM E1677; Specification for Air Retarder Material or System for Framed Building Walls
 - .10 ASTM E154-99 (2005) Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls or as Ground Cover
 - .11 ASTM E96-05 Standard Test Methods for Water Vapor Transmission of Materials
 - .12 ASTM F1249-06 Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor

- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.33-M89, Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
 - .2 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.
- .3 AATCC – American Association of Textile Chemists and Colorists
 - .1 Test Method 127 Water Resistance: Hydrostatic Pressure Test
- .4 TAPPI
 - .2 Test Method T-410; Grams of Paper and Paperboard (Weight per Unit Area)
 - .3 Test Method T-460; Air Resistance (Gurley Hill Method)

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 datasheets.
 - .2 Submit summary of test results as per paragraph 8.3 of ASTM E 1745.

1.5 QUALITY ASSURANCE

- .1 Mock-Ups:
 - .1 Submit mock-ups in accordance with Section 01 45 00 - Quality Control.
 - .2 Convene pre-installation meeting prior to construction of mock-up, include major sub-trades..
 - .3 Install mock-up using approved air barrier assemblies including seaming, fasteners, flashing, tape and related accessories per manufacturer's current printed instructions and recommendations.
 - .1 Mock-up size: approximately 4 meters by 4 meters including wall opening.
 - .4 Mock-up will be used to judge workmanship, substrate preparation, and material application.
 - .5 Installation shall be in accordance with manufacturer's installation guidelines and recommendations.
 - .6 Source Limitations: Provide weather barrier and accessory materials produced by single manufacturer.
- .2 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 Allow 48 h for inspection of mock-up by Consultant before proceeding with air/vapour barrier Work.

1.6 SEQUENCING

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

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver weather barrier materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.
- .2 Store weather barrier materials as recommended by system manufacturer

Part 2 Products

2.1 Air and Vapour Barrier membrane for Roofing is specified in Section 07 54 23 – Thermoplastic Polyolefin Roofing.

2.2 POLYETHYLENE VAPOUR BARRIER

- .1 Polyethylene film: to CAN/CGSB-51.34, 0.15 mm thick.

2.3 HOME WRAP AIR AND MOISTURE BARRIER (HOUSING UNITS)

- .1 Spunbonded polyolefin, non-woven, non-perforated.
- .2 Performance Characteristics:
 1. Air Penetration: $<.004$ cfm/ft² at 1.57 psf, when tested in accordance with ASTM E2178. Type I per ASTM E1677.
 2. Water Vapor Transmission: 56 perms, when tested in accordance with ASTM E96-05, Method A.
 3. Water Penetration Resistance: 250 cm when tested in accordance with AATCC Test Method 127.
 4. Basis Weight: 1.8 oz/yd², when tested in accordance with TAPPI Test Method T-410.
 5. Air Resistance: 1200 seconds, when tested in accordance with TAPPI Test Method T-460.
 6. Tensile Strength: 30/30 lbs/in., when tested in accordance with ASTM D882.
 7. Tear Resistance: 8/6 lbs, when tested in accordance with ASTM D1117.
 8. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E84. Flame Spread: 15, Smoke Developed: 15
- .3 Acceptable products:
 - .1 Basis of Design: Dupont Tyvek HomeWrap, by Dupont, www.construction.tyvek.com
 - .2 Approved equivalent.

2.4 CRAWLSPACE VAPOUR BARRIER (HOUSING UNITS AND POLICE BUILDING)

- .1 Multi-layer plastic extrusion, continuously sealed, sheet-style vapour barrier for use as crawlspace ground cover.
- .2 Vapour barrier must have all of the following qualities:

- .1 Permeance of less than 0.01 Perms [grains/(s.f.*hr*inHg)] as tested in accordance with ASTM E 1745 Section 7.1.
 - .2 Strength: ASTM E 1745 Class A.
 - .3 Compatible and available tapes, sealants, vapour-proofing mastic, pipe boots for continuous seal.
- .3 Acceptable products:
- .1 Basis of Design: Stego Industries: Stego Wrap Vapour Barrier (15 mil) by Stego Industries LLC, www.stegoindustries.com
 - .2 Approved equivalent

2.5 VAPOUR PERMEABLE AIR BARRIER (POLICE BUILDING)

- .1 Self-adhered water resistive, vapour permeable, air barrier membrane to ASTM E 2178. Consisting of tri-laminate of modified polyolefin with two layers of non-woven polyethylene, suitable for full wall assemblies. Permeable self-adhesive layer with release film. Refer to details on drawings for locations and assembly.
 - .1 Henry Company: Bakor BlueskinVP 160
 - .2 Approved equivalent

2.6 SELF-ADHERING SHEET WATERPROOFING (POLICE BUILDING)

- .1 Self-adhered water proofing membrane consisting of SBS modified bitumen with a cross-laminated polyethylene film suitable for below grade waterproofing application on a preserved wood panel substrate. Refer to details on drawings for locations and assembly.
- .2 Waterproofing membrane must have all of the following properties:
 - .1 Thickness: 1.5 mm (60 mils) min.,
 - .2 Flexibility: Pass @ -40 degrees C to ASTM D1970,
 - .3 Vapour permeance: 2.8 ng/Pa.s.m² (0.05 perms) to ASTM E96,
 - .4 Tensile strength (membrane): 2.24 MPa to ASTM D412,
 - .5 Tensile strength (film): 34.5 MPa to ASTM D882,
 - .6 Elongation: 300% to ASTM D412,
 - .7 Puncture resistance: 222 N min. to ASTM E154.
- .3 Acceptable products:
 - .1 Basis of Design: Henry Company: Bakor Blueskin WP 200
 - .2 Approved equivalent

2.7 ACCESSORIES – POLYETHYLENE VAPOUR BARRIER

- .1 Joint sealing tape: air resistant pressure sensitive adhesive tape, type recommended by vapour barrier manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.
- .2 Sealant: compatible with vapour retarder materials, recommended by vapour retarder manufacturer. To Section 07 92 00 - Joint Sealing .
- .3 Staples: minimum 6 mm leg.

- .4 Moulded box vapour barrier: factory-moulded polyethylene box for use with recessed electric switch and outlet device boxes.

2.8 ACCESSORIES –HOME WRAP AIR AND MOISTURE BARRIER (HOUSING UNITS)

- .1 Seaming Tape: as recommended by manufacturer.
- .2 Fasteners: as recommended by manufacturer.
- .3 Sealants: Refer to Section 07 92 00 Joint Sealants. Sealants are to be compatible and as recommended by manufacturer.
- .4 Adhesives: as recommended by manufacturer.
- .5 Primers: as recommended by manufacturer.
- .6 Flashings: as recommended by manufacturer to suit type of opening and to ensure weather-tight seal.

2.9 ACCESSORIES- CRAWLSPACE VAPOUR BARRIER AND VAPOUR PERMEABLE AIR BARRIER

- .1 Sealant: compatible with air barrier materials, recommended by sheet barrier manufacturer. Refer to Section 07 92 00 - Joint Sealing.
- .2 Vapour-proof mastic: compatible with sheet barrier materials, recommended by sheet barrier manufacturer.
- .3 Seaming tape: compatible with sheet barrier materials, recommended by sheet barrier manufacturer.
- .4 Pipe boots: compatible with sheet barrier materials, recommended by sheet barrier manufacturer.
- .5 Foam Seal: Spray-applied medium density spray polyurethane foam insulation/air/vapour barrier compatible with sheet barrier manufacturer.
- .6 Sheet steel: Galvanized steel, Z275 zinc coating; 0.8 mm thick core steel.
- .7 Attachments: Galvanized steel bars and anchors.
- .7 Primer: Appropriate to application.

2.10 ACCESSORIES- SELF-ADHERING SHEET WATERPROOFING

- .1 Liquid Sealant and Termination Sealant: compatible with self-adhering waterproofing sheet and as recommended by sheet barrier manufacturer.
- .2 Prefabricated Drainage Board (vertical): prefabricated composite drain board, compatible with self-adhering waterproofing sheet complete with polypropylene core board with polypropylene fabric attached, having following physical properties:
 - .1 Flow rate: 223 L/min/m
 - .2 Compressive Strength: 11,000 psf

- .3 Thickness: 10mm
- .4 Accessories: Securement bars, moulding strip and drain board plugs and nails as per manufacturer's written recommendations.

- .3 Securement Bars and Fasteners: Galvanized steel bars and anchors as recommended by manufacturer, pre-drilled for non-corrosive screw attachment.
- .4 Primer: compatible with self-adhering waterproofing sheet and as recommended by sheet barrier manufacturer

Part 3 Execution

3.1 EXAMINATION

- .1 Verify substrate and surface conditions are in accordance with manufacturer recommended tolerances prior to installation of barrier and accessories.

3.2 INSTALLATION - POLY VAPOUR BARRIER

- .1 Refer to Wall Types and details on drawings for location and assembly.
- .2 Ensure services are installed and inspected prior to installation of retarder.
- .3 Install sheet vapour retarder on warm side of exterior wall and ceiling assemblies prior to installation of gypsum board to form continuous retarder.
- .4 Use sheets of largest practical size to minimize joints.
- .5 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.
- .6 Exterior Surface Openings
 - .1 Cut sheet vapour retarder to form openings and ensure material is lapped and sealed to frame using sealant recommended by manufacturer.
- .7 Perimeter Seals
 - .1 Seal perimeter of sheet vapour barrier as follows:
 - .1 Apply continuous bead of sealant, minimum 6mm wide and high, to substrate at perimeter of sheets.
 - .2 Lap sheet over sealant and press into sealant bead.
 - .3 Install staples through lapped sheets at sealant bead into wood substrate.
 - .4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.
- .8 Lap Joint Seals
 - .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 150 mm and press into sealant bead.
 - .4 Install staples through lapped sheets at sealant bead into wood substrate.
 - .5 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.
- .9 Electrical Boxes
- .1 Seal electrical switch and outlet device boxes that penetrate vapour barrier as follows:
 - .1 Install moulded box vapour barrier Wrap boxes with film sheet providing minimum 300 mm perimeter lap flange.
 - .2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

3.3 **INSTALLATION – HOME WRAP AIR AND MOISTURE BARRIER (HOUSING UNITS)**

- .1 Air and Moisture Barrier:
- .1 Install over exterior face of exterior wall substrate in accordance with manufacturer recommendations.
 - .2 Start installation at a building corner, leaving 6-12 inches of weather barrier extended beyond corner to overlap.
 - .3 Install weather barrier in a horizontal manner starting at the lower portion of the wall surface. Maintain weather barrier plumb and level.
 - .4 Extend bottom roll edge over sill plate interface 2” to 3” minimum. Seal weather barrier with sealant or tape. Shingle weather barrier over back edge of thru-wall flashings and seal weather barrier with sealant or tape. Ensure weeps are not blocked.
 - .5 Subsequent layers shall overlap lower layers a minimum of 6 inches horizontally in a shingling manner.
 - .6 Window and Door Openings: Extend weather barrier completely over openings.
 - .7 Weather Barrier Attachment:
 - .1 Attach weather barrier to studs through exterior sheathing. Secure using weather barrier manufacturer recommended fasteners, spaced 12 -18 inches vertically on center along stud line, and 24 inch on center, maximum horizontally.
 - .8 Apply manufacturer's recommended flashing membrane to weather barrier membrane prior to the installation cladding anchors.
- .2 Seaming
- .1 Seal seams of weather barrier with seam tape at all vertical and horizontal overlapping seams.
 - .2 Seal any tears or cuts as recommended by weather barrier manufacturer.
- .3 Opening Preparation
- .1 Cut weather barrier in an “Iut” pattern. A modified I-cut is also acceptable.
 - .1 Cut weather barrier horizontally along the bottom and top of the window opening.

- .2 From the top center of the window opening, cut weather barrier vertically down to the sill
- .3 Fold side and bottom weather barrier flaps into window opening and fasten.
- .2 Cut a head flap at 45-degree angle in the weather barrier membrane at window head to expose 8 inches of sheathing. Temporarily secure weather barrier membrane flap away from sheathing with tape.
- .4 Flashing
 - .1 Cut manufacturer's recommended flashing a minimum of 12 inches longer than width of sill rough opening. Apply primer as recommended by the manufacturer.
 - .2 Cover horizontal sill by aligning edge of manufacturer's recommended flashing with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6 inches. Secure flashing tightly into corners by working in along the sill before adhering up the jambs.
 - .3 Fan flashing at bottom corners onto face of wall. Firmly press in place. Follow manufacturer's recommended method of fastening fanned edges.
 - .4 On exterior, apply continuous bead of sealant to wall or backside of window mounting flange across jambs and head. Do not apply sealant across sill.
 - .5 Install window according to manufacturer's instructions.
 - .6 Apply 4-inch wide strips of manufacturer's recommended flashing at jambs overlapping entire mounting flange. Extend jamb flashing 1-inch above top of rough opening and below bottom edge of sill flashing.
 - .7 Apply 4-inch wide strip of manufacturer's recommended flashing as head flashing overlapping the mounting flange. Head flashing should extend beyond outside edges of both jamb flashings.
 - .8 Position weather barrier head flap across head flashing. Adhere using 4-inch wide manufacturer's recommended flashing over the 45-degree seams.
 - .9 Tape head flap in accordance with manufacturer recommendations.
 - .10 On interior, install backer rod in joint between frame of window and flashed rough framing. Apply sealant around entire window to create air seal. Apply sealant in accordance with sealant manufacturer's instructions and ASTM C1193.
- .5 Thru-wall Flashing Installation
 - .1 Apply primer per manufacturer's written instructions.
 - .2 Install preformed corners and end dams bedded in sealant in appropriate locations along wall.
 - .3 Starting at a corner, remove release sheet and apply membrane to primed surfaces in lengths of 8 to 10 feet.
 - .4 Extend membrane through wall and leave ¼ inch minimum exposed to form drip edge.
 - .5 Roll flashing into place. Ensure continuous and direct contact with substrate.
 - .6 Lap ends and overlap preformed corners 4 inches minimum. Seal all laps with sealant.

- .7 Trim exterior edge of membrane 1-inch and secure metal drip edge per manufacturer's written instructions.
 - .8 Terminate membrane on vertical wall. Terminate into reglet, counterflashing or with termination bar.
 - .9 Apply sealant bead at each termination.
- .6 Thru-Wall Flashing / Weather Barrier Interface At Base Of Wall
- .1 Overlap thru-wall flashing with weather barrier by 6-inches.
 - .2 Mechanically fasten bottom of weather barrier through top of thru-wall flashing.
 - .3 Seal vertical and horizontal seams with tape or sealing membrane.
- .7 Thru-Wall Flashing / Weather Barrier Interface At Window Head
- .1 Cut flap in weather barrier at window head.
 - .2 Prime exposed sheathing.
 - .3 Install lintel as required. Verify end dams extend 4 inches minimum beyond opening.
 - .4 Install end dams bedded in sealant.
 - .5 Adhere 2 inches minimum thru-wall flashing to wall sheathing. Overlap lintel with thru-wall flashing and extend ¼ inch minimum beyond outside edge of lintel to form drip edge.
 - .6 Apply sealant along thru-wall flashing edges.
 - .7 Fold weather barrier flap back into place and tape bottom edge to thru-wall flashing.
 - .8 Tape diagonal cuts of weather barrier.
 - .9 Secure weather barrier flap with fasteners.

3.4 INSTALLATION - VAPOUR PERMEABLE AIR BARRIER (POLICE BUILDING)

Refer to Wall Types and drawings for locations of vapour permeable air barrier.

- .1 Preparation
 - .1 Remove loose or foreign matter which might impair adhesion of materials.
 - .2 Ensure all substrates are clean of oil or excess dust; all masonry joints struck flush, and open joints filled; and all concrete surfaces free of large voids, spalled areas or sharp protrusions.
 - .3 Ensure all 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.
 - .5 Prime substrate surfaces to receive adhesive in accordance with manufacturer's instructions.
- .2 Installation
 - .1 Install materials in accordance with manufacturer's instructions to create a continuous seal between all material junctions within the building envelope.

- .2 Apply sealants and primers within recommended application temperature ranges. Consult manufacturer when products cannot be applied within these temperature ranges.
- .3 Install membrane using a consecutive weatherboard method starting at base of wall and working upward, provide minimum 50mm side laps and 80mm end laps.
- .4 Position membrane for alignment, remove protective film and firmly apply pressure to ensure adhesion. Eliminate all gaps and wrinkles.
- .5 Roll entire membrane surface, including seams, to ensure full contact and adhesion.
- .6 Seal membrane terminations, heads of mechanical fasteners, masonry tie fasteners, around penetrations, duct work, electrical and other apparatus extending through the water resistive air barrier membrane and around the perimeter edge of membrane terminations at window and door frames with manufacturer recommended sealant.

3.5 INSTALLATION - CRAWLSPACE VAPOUR BARRIER

- .1 Preparation
 - .1 Ensure that base material is approved by Departmental Representative.
 - .2 Level and compact base material
- .2 Installation
 - .1 Install vapour barrier in accordance with manufacturer's written instructions and ASTM E 1643.
 - .2 Unroll vapour barrier with the longest dimension parallel with the longest direction of the crawlspace.
 - .3 Lap vapour barrier over any footings and/or seal to foundations. See drawings.
 - .4 Overlap joints 150mm (6 inches) and seal with manufacturer's seaming tape.
 - .5 Seal all penetrations (including pipes) per manufacturer's written instructions.
 - .6 No penetration of the vapour barrier is allowed except for permanent utilities, piles and radon exhaust pipes.
 - .7 Repair damaged areas by cutting patches of vapour barrier, overlapping damaged area 150 mm (6 inches) and taping all sides with manufacturers' seaming tape.

3.6 INSTALLATION – SELF-ADHERING WATERPROOFING MEMBRANE (POLICE BUILDING)

Refer to drawings for locations of self-adhering waterproofing membrane.

- .1 Preparation
 - .1 Remove loose or foreign matter which might impair adhesion of materials.
 - .2 Fill spalled areas in substrate to provide an even plane.
 - .3 Ensure all substrates are clean of oil or excess dust; and substrate is cleared of sharp protrusions.

- .4 Ensure all substrates are free of surface moisture, frost and other contaminants prior to application of suitable waterproofing membrane primer as recommended by manufacturer based on air and surface temperature at time of application.
 - .5 Pre-treat cracks in substrate, horizontal to vertical inside corner transitions and outside corners in substrate as per manufacturer's written instruction.
 - .6 Where three or more planes come into contact, reinforce with cut sections of waterproofing membrane reinforcing sheet as per manufacturer's instructions.
 - .7 At projections, extend waterproofing membrane tight to projection and seal with liquid membrane as per manufacturer's written instructions.
 - .8 Prime substrate surfaces to receive adhesive in accordance with manufacturer's instructions.
- .2 Installation - Waterproofing Membrane – Vertical Application
- .1 Prime substrate surfaces to receive adhesive in accordance with manufacturer's instructions.
 - .2 Install materials in accordance with manufacturer's instructions to create a continuous waterproofing barrier.
 - .3 Apply sealants and primers within recommended application temperature ranges. Consult manufacturer when products cannot be applied within these temperature ranges.
 - .4 Apply waterproofing membrane to prepared substrate in lengths of 2400 mm or less.
 - .5 Provide 65 mm laps at both sides and ends. Position for alignment and remove protective film. Press firmly into place. Promptly roll entire membrane surface, all laps and seams, with a counter top roller to effect seal and to eliminate all gaps and wrinkles. If more than one length is required on a vertical surface, apply in a shingle fashion.
 - .6 Terminate membrane using termination mastic or termination bar, reglet or counter flashing as indicated. Refer to manufacturers standard details.
 - .7 All laps within 300 mm of a 90 degrees change in plane are to be sealed with termination sealant.
 - .8 Seal membrane terminations, heads of mechanical fasteners, masonry tie fasteners, around penetrations, duct work, electrical and other apparatus extending through the water resistive air barrier membrane and around the perimeter edge of membrane terminations at window and door frames with manufacturer recommended sealant.
- .3 Installation - Drainage Board – Vertical Application
- .1 Align and hang drainage up to foundation wall. Position bottom edge of drainage board to be at base of skirt.
 - .2 Mechanically fasten drainage board to foundation wall with non-corrosive fasteners with spacing as per manufacturer's written instructions.
 - .3 Align and install termination strip along top edge with non-corrosive mechanical fasteners spaced as per manufacturer's written instructions and seal with termination sealant.
 - .4 Align and install moulding strip over completed top edge detail.
 - .5 Overlap end laps, pull back loose fabric to expose drain core and position core of

- second panel over the overlap flange of first panel.
- .6 Bend drain board to create inside corners and cut board to create outside corners, provide 75 mm of extra fabric to wrap corner.
 - .7 Stagger or offset joints of drain board sheets as per manufacturer's written instructions.
 - .8 Place all subsequent sheets in an overlapping single fashion.
 - .9 Backfill bottom edge. Refer to drawings for details.

3.7 CLEANING

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Upon 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 installation for preformed metal siding at exterior walls.

1.2 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 07 27 00 – Air and Vapour Barriers
- .3 Section 07 62 00 – Sheet Metal Flashing and Trim.
- .4 Section 07 92 00 - Joint Sealing.

1.3 REFERENCES

- .1 American Society of Mechanical Engineers (ASME)
 - .1 ASME B18.6.3-2011, Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch Series).
- .2 ASTM International
 - .1 ASTM D2369-10e1, Test Method for Volatile Content of Coatings.
 - .2 ASTM D2832-92(2011), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
 - .3 ASTM D5116-10, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-93.3-M91, Prefinished Galvanized and Aluminum-Zinc Alloy Steel Sheet for Residential Use.
 - .2 CAN/CGSB-93.4-92, Galvanized and Aluminum-Zinc Alloy Coated Steel Siding Soffits and Fascia, Prefinished, Residential.
 - .3 CAN/CGSB-93.5-92, Installation of Metal Residential Siding, Soffits and Fascia.
- .4 CSA International
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

1.4 DESIGN AND PERFORMANCE REQUIREMENTS

- .1 Components: Design and size to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of panel as calculated in accordance with National Building Code of Canada.
- .2 Maximum Allowable Deflection of Panel: 1/180.
- .3 Movement: Accommodate movement within system without damage to system, components, or deterioration of seals; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; deflection of structural support framing.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for metal siding and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Indicate dimensions, profiles, attachment methods, schedule of wall elevations, trim and closure pieces, metal furring, and related work.
- .4 Samples:
 - .1 Submit duplicate 300 x 300 mm samples of siding material, of colour and profile specified.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements 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 and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect metal siding from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 STEEL CLADDING AND COMPONENTS

- .1 Panel siding: to CAN/CGSB-93.4; Class: plain.
 - .1 Thickness: 0.61 mm base metal thickness.
 - .2 Profile: 38 mm deep by 935 wide panels to match Vicwest CL 7040 profile or approved equivalent. Orientation as per drawings.
 - .3 Finish: factory prefinished 2 coat system.
 - .1 Base metal: ASTM A653 / ASTM A653M for Zinc coated steel (galvanized).
 - .2 Film thickness: To ASTM A755/A755M and AAMA 621-02. Minimum topcoat dry film thickness of 18microns (0.7 mils) and 5microns (0.2 mils) primer.
 - .3 Film hardness: to ASTM D3363.
 - .4 Gloss: to ASTM D523
 - .5 Humidity resistance: to ASTM D2247

- .6 Film integrity: no evidence of cracking, flacking, or checking that is apparent on ordinary outdoor observations for first 40 years.
- .7 Product Attributes: minimum of 70% Kynar 500 or Hylar 5000 PVDF resins, 10000 Series.
 - .1 Medium gloss.
 - .2 Colour 1- 16084 Navy Blue
 - .3 Colour 2 – 16080 Bright Red
 - .4 Colour 3 – 16070 Gold
- .2 Internal and External Corners: Same material, thickness, and finish, colour as adjacent sheets; profile to suit system; shop cut and factory mitered to required angles as recommended by manufacturer.

2.2 FASTENERS

- .1 Nails: CSA B111. Screws: ASME B18.6.3. Purpose made stainless steel

2.3 CAULKING

- .1 Sealants: as recommended by manufacturer and in accordance with Section 07 92 00 - Joint Sealants.

2.4 ACCESSORIES

- .1 Exposed trim: inside corners, outside corners, cap strip, drip cap, undersill trim, starter strip and window/door trim of same material, colour gloss as adjacent cladding, with fastener holes pre-punched.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable in accordance with manufacturer's written instructions.

3.2 MANUFACTURER'S INSTRUCTIONS

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

3.3 INSTALLATION

- .1 Install cladding in accordance with CGSB 93.5 and manufacturer's written instructions.
- .2 Install cladding in locations and orientations indicated in drawings.
- .3 Install continuous starter strips, inside and outside corners, edgings, soffit, drip, cap, sill and window/door opening flashings as indicated.
- .4 Install outside corners, fillers and closure strips with carefully formed and profiled work.

- .5 Maintain joints in exterior cladding, true to line, tight fitting, hairline joints.
- .6 Attach components in manner not restricting thermal movement.
- .7 Caulk junctions with adjoining work with sealant. Do work in accordance with Section 07 92 00 - Joint Sealants.

3.4 PROTECTION

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

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Cementitious lap siding, accent siding, trim boards and panels, as well as sealants associated with installation of panels and lap siding.

1.2 RELATED SECTIONS

- .1 Section 01 00 05 - General Requirements
- .2 Section 06 10 00 – Rough Carpentry
- .3 Section 07 27 00 – Air and Vapour Barriers (joint flashing behind lap siding)
- .4 Section 07 92 00 - Joint Sealants
- .5 Section 09 91 13 - Exterior Painting

1.3 REFERENCES

- .1 James Hardie Siding Products
 - .1 HZ5 Best Practices Canada – Installation Guide - Siding, Trim and Interior Products, Version 8.0
- .2 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C 1186-08 (2012) Standard Specification for Flat Fibre-Cement Sheets
 - .2 ASTM C 1325-14 Standard Specification for Non-Asbestos Fibre-Mat Reinforced Cementitious Backer Units
 - .3 ASTM D 226: Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
 - .4 ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .5 ASTM E119: Test Method for Fire Tests of Building Construction and Materials.
 - .6 ASTM C 954: Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 inch to 0.110 inch in Thickness.
 - .7 ASTM C 1002: Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - .8 ASTM C 1280: Standard Specification for Application of Gypsum Sheathing.

1.4 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 00 05 General Requirements.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature and specifications.

- .2 Submit manufacturer's printed Material Safety Data Sheet.
- .3 Shop Drawings:
 - .1 Provide detailed shop drawings of cementitious siding materials application including trim around openings, panel joints, butting to different material and flashing details.
- .4 Samples
 - .1 For each finish product specified, provide two samples, minimum size 100 by 150 mm, representing actual product, colour, and patterns.

1.5 QUALITY ASSURANCE

- .1 Installer Qualifications: Company experienced in installation of cementitious siding with minimum five years documented experience.
- .2 Mock-Ups:
 - .1 Submit mock-ups in accordance with Section 01 00 05 General Requirements
 - .2 Mock-up will be used to judge workmanship, substrate preparation, and material application and detailing.
 - .1 Mock-up size: 4 meters by 4 meters including window opening.
 - .2 Locate where directed by Departmental Representative.
- .3 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 Store products in manufacturer's unopened packaging until ready for installation.
- .2 Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

1.7 PROJECT CONDITIONS

- .1 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

- .1 Product Warranty: Standard manufacturer's product warranty against manufacturing defects.

Part 2 Products

2.1 MANUFACTURER

- .1 Lap Siding, Accent Siding, Trim Boards: James Hardie Building Products, Inc. or approved equivalent.

- .2 Cementitious Panels: USG, Durock, or approved equivalent.

2.2 PRODUCTS

- .1 Lap Siding
 - .1 Cementitious siding:
 - .1 James Hardie Building Products, Inc - "HardiePlank Select Cedarmill Color Plus", Climactic zone: HZ5
 - .2 Thickness: 7.9mm (5/16").
 - .3 Length: 3658 mm (12').
 - .4 Width: 184mm (7.25") with 152 mm (6") exposure.
 - .5 Finish:
 - .1 Factory applied finish; James Hardie "ColorPlus" Technology
 - .1 Colour 1 : to match JH70-30 "Evening Blue"
 - .2 Texture: Wood grain.

2.3 ACCESSORIES

- .1 Trim Boards
 - .1 James Hardie Building Products, Inc - "4/4 HardieTrim NT3 Boards" Climactic zone: HZ5
 - .2 Thickness: 25.0 mm (1").
 - .3 Length: 3658 mm (12').
 - .4 Finish: Factory applied finish; James Hardie "ColorPlus" Technology
 - .1 Colour 2: to match JH10-20 Arctic White.
 - .2 Texture: Smooth.
- .2 Accent Siding
 - .1 James Hardie Building Products, Inc - "HardieShingle Straight Edge Panel Siding" Climactic zone: HZ5
 - .2 Thickness: 6.3 mm (1/4").
 - .3 Sheet Size: 1219 mm (4') wide x 406 mm (16") high (178 mm/7" exposure).
 - .4 Finish: Factory applied finish; James Hardie "ColorPlus" Technology
 - .1 Colour 3: to match JH30-20 Sandstone Beige.
 - .2 Texture: Wood grain.
- .3 Cementitious Panels (Skirt Cladding)
 - .1 Non-combustible, glass-fibre reinforced, non-asbestos, cementitious board suitable for unfinished weather-exposed exterior applications. No labels showing on exterior exposed face.
 - .2 Type: Type A suitable for exterior application.
 - .3 Thickness: 13 mm (1/2") with reinforced edge.
 - .4 Sheet Size: 1219 mm (4') wide x 2440 mm (8'). Refer to drawings. Cut to suit.
 - .5 Finish: None.
 - .6 Joints: Butt joints. No flashing or caulking.

- .7 Color: selected by Departmental Representative from manufacturer's standard range.

2.4 FASTENERS

- .1 Lap and Accent Siding
 - .1 Corrosion resistant. Fasteners shall be blind nailed wherever possible. Where blind nailing is not possible fasteners shall be treated to accept touch-up paint adhesion. Fasteners shall be painted to match cementitious siding colour using manufacturer approved product.
 - .1 Fasteners as recommended by manufacturer.
 - .2 Trim Boards
 - .1 Corners, Band Boards, Windows and Doors: Concealed corrosion resistant tabs recommended by manufacturer.
 - .2 Fascia: Corrosion resistant exposed nail heads set flush. Nails shall be treated to accept touch-up paint adhesion. Fasteners shall be painted to match cementitious siding colour using manufacturer approved product.
 - .3 Skirt Cladding
 - .1 Exposed stainless steel screws complete with washers.

2.5 JOINT FLASHING

- .1 Lap and Accent Siding: Home wrap air and moisture barrier. Refer to Section 07 27 00 Air Barrier.

2.6 CAULKING

- .1 Refer to Section 07 92 10 – Joint Sealing.

2.7 FINISHING

- .1 Repair nicks, scrapes and nail holes with manufacturer approved matching paint colour products.
- .2 Paint or seal all field cut edges of lap and accent siding and trim boards during the installation process using an approved paint or sealer compatible with the final paint finish and colour.

Part 3 Execution

3.1 EXAMINATION

- .1 Do not begin installation until substrates have been properly prepared.
- .2 If framing preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.

3.2

INSTALLATION

- .1 Follow all safety procedures recommended by the manufacturer
- .2 Install materials in strict accordance with manufacturer's installation instructions.
- .3 Do not install cementitious panels or planks directly against concrete or brick. Isolate panels or planks with metal flashing as indicated on drawings.
- .4 Refer to manufacturer's written instructions for preparation of field cut edges..
- .5 Lap Siding
 - .1 Install siding utilizing blind nailing procedure. Place fasteners as per manufacturer's written instructions.
 - .2 Stagger butt joints. Joints to land on stud location. Butt joints are to be placed more than one vertical course away from any door or window head. Butt to trim boards and caulk.
 - .3 Joint treatment: Provide joint flashing at each butt joint between planks. Joint flashing shall be home wrap air and moisture barrier membrane.
 - .4 Leave gaps between plank ends and planks and trim pieces as recommended by the manufacturer.
 - .5 Apply colour matched edge coater to field end cuts.
 - .6 Remove laminate protective sheet immediately after installation of each course.
- .6 Accent Siding Panel
 - .1 Minimize joints. Layout from center of wall to outside corners. Install panels in largest size possible. Butt to trim boards and caulk.
 - .2 Joint treatment: Butt. Stagger vertical joints on wall.
 - .3 Remove laminate protective sheet immediately after installation of each course.
 - .4 Apply colour matched edge coater to end cuts.
 - .5 Place fasteners as per manufacturer's written instructions.
- .7 Trim Boards
 - .1 Install as per manufacturer's written instructions.
 - .2 Install boards in longest length possible. Lengths less than 300mm shall not be permitted.
 - .3 Butt lap siding and accent siding to trim board and caulk as per manufacturer's written instructions.
 - .4 Apply colour matched edge coater to end cuts.
- .8 Skirt Cladding
 - .1 Install 1200 mm wide panels. Length varies.
 - .2 Place fasteners no closer than 9.5 mm (3/4") from panel edges and 50 mm (2") from panel corners.
 - .3 Joint treatment: None. Butt joints. Refer to drawings for layout.

3.3 FIELD PAINTING

- .1 Utilize process and products as recommended by manufacturer.

3.4 JOINT SEALANT

- .1 Refer to Section 07 92 00 Joint Sealants.
- .2 Schedule of joint sealant locations:
 - .1 Lap siding, accent siding and trim boards: As recommended by siding manufacturer.
 - .2 Cementitious panels (skirt cladding): none.

3.5 CLEANING

- .1 Wash down surfaces to remove any surface dirt.

3.6 PROTECTION

- .1 Protect finished Work from damage.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Thermoplastic Polyolefin Membrane Roofing.
- .2 Membrane Flashings.

1.2 RELATED SECTIONS

- .1 Section 06 10 00 - Rough Carpentry.
- .2 Section 07 21 13 - Board Insulation.
- .3 Section 07 27 00 - Air and Vapour Barriers.
- .4 Section 07 62 00 - Sheet Metal Flashing and Trim.

1.3 REFERENCES

- .1 ASTM International Inc.
- .2 ASTM International (ASTM):
 - .1 ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
 - .2 ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
 - .3 ASTM D 6878 - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing.
 - .4 ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
- .3 Canadian Roofing Contractors' Association (CRCA)
 - .1 CRCA Roofing Specification Manual 1997.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA A123.21-04, Standard Test Method for the Dynamic Wind Uplift Resistance of Mechanically Attached Membrane-Roofing Systems
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .6 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - .2 CAN/ULC-S704-03, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.4 DESIGN CRITERIA

- .1 Wind Uplift Resistance testing will be in accordance with CSA123.21

- .2 Building parameters
 - .1 Geometry: Low rise, low slope roof.
 - .2 Exposure: Open.
 - .3 Openings: Category 2
 - .4 Importance: High
- .3 Roof assembly will be designed to be installed on a modular building that will be transported along roads to the final site. Roof assembly must be capable of withstanding wind loads occurring during transportation. The modular buildings will be assembled on site. The roof membrane will be seamed as necessary to provide a complete assembly and waterproof membrane in accordance with the stipulated warranty.
- .4 Submit a report, issued by a certified materials testing laboratory, showing the roofing system offered was tested in accordance with CSA A 123.21-10, Standard Test Method for the Dynamic Wind Uplift Resistance of Membrane Roofing Systems. Test results shall demonstrate the roofing system provides a Dynamic Uplift Resistance pressure for the field, edges and corners of the roof that satisfy the wind load requirements per the National Building Code of Canada.
- .5 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 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature, specifications and datasheets for boards, membranes, fasteners, adhesives and accessories to be incorporated into the Work. Include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements 01 35 43 - Environmental Procedures.
- .3 Provide shop drawings:
 - .1 Provide drawings stamped and signed by professional engineer registered or licensed in Province of Saskatchewan, Canada.
 - .2 Indicate membrane, vapour barrier, insulation, flashing, control joints, penetrations field fabricated seams details.
 - .3 Provide details indicating connections at parapets and scuppers.
- .4 Test and Evaluation Reports: submit laboratory test reports certifying compliance of roofing membrane with specification requirements.
 - .1 Compatibility of materials: submit written declaration to Departmental Representative and Consultant as described in PART 2, PERFORMANCE CRITERIA.
- .5 Manufacturer's Installation Instructions: indicate special precautions required for seaming the membrane.

- .6 Field Quality Control: at completion of Work provide a letter from membrane manufacturer stating membrane assembly including all material from roof membrane to vapour barrier inclusive have been installed according to manufacturer's written requirements and approved shop drawings.

1.6 QUALITY ASSURANCE

- .1 Installer qualifications: company or person specializing in application of Thermoplastic-polyolefin roofing systems with written approved by manufacturer.
- .2 Mock-ups:
 - .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
 - .2 Construct mock-up 10 m² minimum size showing typical lap joint, one inside corner and one outside corner.
 - .3 Construct mock-up where directed.
 - .4 Mock-up will be used:
 - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
 - .5 Allow 48 hours for inspection of mock-up by Departmental Representative and Consultant before proceeding with roofing work.
 - .6 When accepted, mock-up will demonstrate minimum standard of quality required for this work.
 - .7 Approved mock-up may remain as part of finished Work.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions and Section 01 61 00 - Common Product Requirements.
- .2 Storage and Handling Requirements:
 - .1 Provide and maintain dry, off-ground weatherproof storage.
 - .2 Store materials on supports to prevent deformation.
 - .3 Remove only in quantities required for same day use.
 - .4 Store uncured flashing and jointing materials to prevent premature curing and freezing.
 - .5 Store insulation protected from weather and deleterious materials.
 - .6 Store roofing materials in accordance with manufacturer's written instructions, to prevent damage or loss of performance.

1.8 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Apply thermoplastic polyolefin membrane only when surfaces and ambient temperatures are within manufacturers' prescribed limits.
 - .2 Install thermoplastic polyolefin membrane on dry substrate, free of snow and ice. Use only dry materials and apply only during weather that will not introduce moisture into system.

1.9 WARRANTY

- .1 For the Work of this Section 07 54 23 - thermoplastic polyolefin, 12 months warranty period is extended to 60 months.

Part 2 Products

2.1 DESCRIPTION - ROOFING SYSTEM

- .1 Roof System: Provide a waterproof roof system, capable of withstanding uplift forces as specified in the PART 1, DESIGN CRITERIA.
- .2 Base Flashing: Provide a waterproof, fully adhered base flashing system at all penetrations, plane transitions and terminations.

2.2 PERFORMANCE CRITERIA

- .1 Compatibility between components of system and adjacent materials is essential.
 - .1 Provide a written declaration to Departmental Representative and Consultant stating that all materials and components, as assembled in system, meet this requirement.
- .2 Roofing system: to CSA A123.21 for wind uplift resistance.

2.3 VAPOUR RETARDER

- .1 Self-adhering Modified Bitumen Membrane.
 - .1 Self adhesive styrene butadiene styrene (SBS) modified bituminous membrane, polyester reinforced, bottom surface with a release sheet, conforming to CGSB 37-GP-56M, Membrane Modified, Bituminous, Prefabricated and Reinforced for Roofing.
 - .2 Thickness: 1 mm (40 mil) minimum.

2.4 MEMBRANE

- .1 Roof System: Sloped wood deck on sleepers, vapour barrier, board insulation.
 - .1 Membrane Attachment: Fully Adhered.
- .2 Base Flashing: Provide a waterproof, fully adhered base flashing system at all penetrations, plane transitions and terminations.
- .3 Membrane Thickness: 60 mil nominal.
 - .1 Thickness over Scrim: 0.020 inches (0.508mm).
 - .2 Breaking Strength (ASTM D 751): 250 lbf/in (1.1 kN/m) minimum.
 - .3 Tear Resistance (ASTM D 751): 55 lbf/in (245 N/m) minimum.
 - .4 Elongation (ASTM D 751): 25 percent.
 - .5 Field Sheet Dimensions:
 - .1 Width: maximum width available to minimize seams.
 - .2 Length: maximum length available to minimize seams.
 - .6 Colour: white.

2.5 BOARD INSULATION

- .1 Refer to section 07 21 13 Board Insulation.
 - .1 Rigid Cellular Polyisocyanurate:
 - .1 Shape: flat as required to suit roof drainage slopes and plan.
 - .2 Average RSI (R-Value): as noted in drawings.
 - .2 Approved product:
 - .1 Compatible with roof membrane system and acceptable to membrane manufacturer as part of the specified extended warranty.
- .2 Adhere insulation to meet requirements of CSA 123.21 and in accordance with manufacturer's written instructions.

2.6 OVERLAY BOARD

- .1 11 mm Oriented strand board sheathing.
- .2 Mechanically fastened as recommended by manufacturer.

2.7 FLASHING ACCESSORIES

- .1 Inside Corners: Pre-molded corner flashing for inside corners. 60 mil thickness. Color to match membrane.
- .2 Outside Corners: Injection molded corner used for flashing outside corners. 60 mil thickness. Color to match membrane. Special colors require custom fabrication process.
- .3 TPO T-Joint Covers: Injection molded 60 mil thick TPO formed into a 114mm (4.5 inch) diameter circle used to seal step-offs at splice intersections. Color to match membrane. Special colors require custom fabrication process.
- .4 TPO Curb Wrap Corners: Pre-fabricated corner flashings made from 45 mil thick reinforced membrane.
- .5 Molded Pipe Seals: A pre-molded flashing and clamping ring used for pipe penetrations.. Color to match membrane.
- .6 TPO Square Tubing Wraps: Pre-fabricated flashings made of 45 mil thick reinforced Sure-Weld membrane for square tubing.
- .7 Pressure-Sensitive Cover Strip: A nominal 152mm (6 inch) wide by 40 mil thick non-reinforced TPO membrane laminated to nominal 35-mil thick cured synthetic rubber pressure-sensitive adhesive. Color to match membrane.
- .8 Heat Weldable Walkway Rolls: Minimum 850 mm wide, nominal 180 mils thick. Color : Gray.
- .9 Non-Reinforced Flashing: Non-reinforced TPO flashing, 60-mil thick non-reinforced TPO based membrane where the use of pre-molded or pre-fabricated accessories are not feasible. Color: to match field membrane.

2.8 ADHESIVE

- .1 As recommended by manufacturer to meet PART 1, DESIGN CRITERIA.

2.9 FASTENING COMPONENTS

- .1 As recommended by manufacturer to meet PART 1, DESIGN CRITERIA.
- .2 Insulation Fastening Plates: A nominal 76mm (3 inch) diameter metal plate used for insulation attachment in conjunction with the appropriate fastener.

2.10 EDGINGS AND TERMINATIONS

- .1 Coated metal sheets made from 24 gauge galvanized steel with a minimum 0.9mm (.035 inch) thick non-reinforced laminate. Color to match membrane.
- .2 Termination Bar: minimum 13 mm (1 inch) wide, 2.5mm (.098 inch) thick extruded aluminum bar with sealant ledge to support sealant.

2.11 SOURCE QUALITY CONTROL

- .1 Provide laboratory test reports certifying compliance of roofing materials with specification requirements as described in PART 1, ACTION AND INFORMATIONAL SUBMITTALS/QUALITY ASSURANCE.

Part 3 Execution

3.1 QUALITY OF WORK

- .1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- .2 Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual and CRCA Roofing Specification Manual .

3.2 SUBSTRATE EXAMINATION

- .1 Verification of Conditions: examine substrates and immediately inform Departmental Representative and Consultant in writing of defects.
- .2 Evaluation and Assessment: prior to beginning work ensure:
 - .1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris.
 - .2 Curbs have been built.
 - .3 Drains have been installed at proper elevations relative to finished surfaces.
 - .4 Plywood and lumber nailer plates have been installed to walls and parapets as indicated.

3.3 PROTECTION OF IN-PLACE CONDITIONS

- .1 Cover walls, walks , sloped roofs and adjacent work where materials hoisted or used.
- .2 Use warning signs and barriers:
 - .1 Maintain in good order until completion of Work.
- .3 Dispose of rain water away from face of building until drains or hoppers installed and connected.

- .4 Protect from traffic and damage:
 - .1 Comply with precautions deemed necessary by Departmental Representative and Consultant.
- .5 Place plywood runways over work to enable movement of material and other traffic.
- .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 Seal and ballast exposed edges.
- .8 If metal connectors used, treat connectors and decking with rust proofing or galvanization.

3.4 VAPOUR RETARDER (WOOD DECK)

- .1 Self-adhered as per manufacturer's written instructions.

3.5 INSULATION: MECHANICALLY FASTENED APPLICATION

- .1 Mechanically fasten insulation using screws and pressure distribution plates as recommended by manufacturer.
- .2 Number and pattern of screws per board to meet stipulated Performance Requirements.
- .3 Place boards in parallel rows with ends staggered, and in firm contact with one another.
- .4 Cut end boards to suit.

3.6 MEMBRANE PLACEMENT AND ATTACHMENT (FULLY ADHERED)

- .1 Position membrane over the acceptable substrate. Fold membrane sheet back lengthwise so half the underside of the membrane is exposed.
- .2 Apply adhesive in accordance with the manufacturer's published instructions, to the exposed underside of the membrane and the corresponding substrate area. Do not apply adhesive along the splice edge of the membrane to be hot air welded over the adjoining sheet. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.
 - .1 Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded section of the membrane sheet immediately after rolling the membrane into the adhesive with a soft bristle push broom to achieve maximum contact.
 - .2 Fold back the unbonded half of the sheet lengthwise and repeat the bonding procedures.
- .3 Position adjoining sheets to allow a minimum overlap of 2 inches.

3.7 SEAM WELDING

- .1 Hot-air weld membrane using an Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's current guidelines. At all splice intersections, roll the seam with a silicone roller to ensure a continuous hot air welded seam.
- .2 Overlay all splice intersections with Sure-Weld T-Joint Cover.

- .3 Probe all seams once the hot air welds have thoroughly cooled (approximately 30 minutes).
- .4 Repair all seam deficiencies the same day they are discovered.
- .5 Apply Cut Edge Sealant on all cut edges of reinforced membrane (where the scrim reinforcement is exposed) after seam probing is complete. Cut Edge Sealant is not required on vertical splices

3.8 FLASHING

- .1 Flashing of parapets, curbs, expansion joints and other parts of the roof must be performed using reinforced membrane or prefabricated accessories. Sure-Weld non-reinforced membrane may be used for flashing pipe penetrations, Sealant Pockets, and scuppers, as well as inside and outside corners, when the use of pre-molded or prefabricated accessories is not feasible.
- .2 Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

3.9 WALKWAYS

- .1 Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the Contract Drawings.
- .2 Hot-air weld walkway pads to the membrane in accordance with the manufacturer's current application guidelines.

3.10 FIELD QUALITY CONTROL

- .1 Inspection:
 - .1 Inspection and site testing of thermoplastic polyolefin membrane roofing membrane application will be carried out by roof membrane manufacturer.

3.11 CLEANING

- .1 Clean Work in accordance with Section 01 74 11 - Cleaning.
- .2 Check drains to ensure cleanliness and proper function, and remove debris, equipment and excess material from site.

3.12 PROTECTION

- .1 Protect installed products until completion of project.
- .2 Touch-up, repair or replace damaged products before Substantial Completion

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Materials and installation for sheet metal roofing and associated air barrier for conventional installation on sloped wood deck on housing units and building 157.

1.2 RELATED SECTIONS

- .1 Section 07 62 00 – Sheet Metal Flashing and Trim.
- .2 Section 07 72 53 – Snow Guards
- .3 Section 07 92 00 - Joint Sealants.

1.3 REFERENCES

- .1 ASTM International
 - .1 ASTM A653/A653M-10, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM A792/A792M-10, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process.
 - .3 ASTM D523-89(2008), Standard Test Method for Specular Gloss.
 - .4 ASTM C1177 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 - .5 ASTM D1970, Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
- .2 Canadian Sheet Steel Building Institute Standards
 - .1 CSSBI S8-2001, Quality & Performance Specification for Prefinished Sheet Steel Used for Building Products
 - .2 CSSBI 10M and 20M.

1.4 ROOF DESCRIPTION

- .1 Roof Type HR1 and R11 as noted on drawings.

1.5 DESIGN CRITERIA

- .1 Roofing Panels manufactured, fabricated and installed to withstand structural and thermal movement, wind load, snow build-up and weather exposure without defects, damage, and infiltration of water.
- .2 Design roof system in accordance with:
 - .1 CAN/CSA Standard S136 latest edition for the Design of Cold Formed Steel Structural Members.
 - .2 Canadian Sheet Steel Building Institute Standards 10M and 20M.
 - .3 National Building Code of Canada (latest edition).

- .3 Design fastener systems to withstand wind uplift on the roof and sliding forces induced by environmental loads.
- .4 Select ridge ventilation products in coordination with Section 07 62 00 to ensure soffit and roof ventilation products provide the required net free ventilated area to suit National Building Code requirements.
- .5 This section is responsible to provide a snow guard designed specifically for this roof by a professional engineer registered in the province of Saskatchewan.

1.6 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 sheet metal roofing and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Indicate arrangement of prefinished roof sheets including joints, types and locations of supports, fasteners, sealants and all metal components related to the roof installation.
 - .3 Submit 2 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 Saskatchewan, Canada.
- .4 Samples:
 - .1 Submit duplicate 300 x 300 mm samples of each sheet metal material.

1.7 QUALITY ASSURANCE

- .1 Manufacturer and installer of the metal roof system must have a minimum of 5 years' experience in fabrication and installation of architectural metal roofing projects similar in scope.

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements 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 in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect sheet metal roofing from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.9 ENVIRONMENTAL REQUIREMENTS

- .1 Do not install roofing materials or adhesives when temperature is below manufacturer's recommendations.
- .2 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.

1.10 QUALIFICATIONS

- .1 Applicator: Company specializing in performing work of this section with minimum 5 years documented experience in installation of roof systems. roofing contractor will supply and install materials to acceptance of manufacturer in order to qualify for manufacturer's warranty.

1.11 WARRANTY

- .1 Contractor shall warrant that the sheet metal roofing and companion flashing and snow guard will stay in place and remain leakproof in accordance with the General Conditions, but for two years.

Part 2 Products

2.1 COMPATIBILITY

- .1 Compatibility between components of system and adjacent materials is essential. Provide a written declaration to Consultant stating that materials and components, as assembled in system, meet this requirement and are eligible for system warranty.

2.2 SHEET METAL MATERIALS

- .1 Aluminum-zinc alloy coated steel sheet: to ASTM A792/A792M, Grade 230, with AZ150 coating (Galvalume), regular spangle surface, uncoiled, thermally cured clear organic resin passivation coating for unpainted finish.

2.3 PROFILE

- .1 Profile equivalent to Vicwest, "Prestige 16" or approved equivalent.
- .2 Single skin system on rigid decking.
 - .1 Snap-In/Interlocking Progressive System; thermal clip; standing seam-style seam, 38mm high, 400mm (15.75") wide panels.
 - .2 No exposed fasteners.
- .3 Finish: Weather X.
- .4 Colour: 16154 Metro Brown

2.4 UNDERLAYMENT MEMBRANE

- .1 Self-adhered water resistive, high heat resistant, air and moisture barrier membrane to ASTM E 2178. Consisting of butyl rubber based adhesive with protective plastic release liner backed with a layer of high density cross laminated polyethylene, suitable for roof

underlayment. Min. 0.76mm thickness (30 mils). Permeable self-adhesive layer with release film. Refer to details on drawings for locations and assembly.

- .1 Grace Company: Grace Ultra
- .2 Approved equivalent

2.5 ACCESSORIES

- .1 Roof Panel Support System: Hidden fastener, purpose-made, thermally responsive full height clip system, designed to accommodate full thermal expansion and contraction of the exterior roof sheet. Clips to be fabricated from a minimum of 0.61mm steel, with minimum Z275 galvanized coating.
- .2 Roof fasteners as specified by manufacturer to resist wind uplift and sliding snow forces.
- .3 Flashing: in accordance with Section 07 62 00 and manufacturer recommendations. Color: To match Metal Roofing Sheet. Formed from same materials (thickness and finish) as the Metal Roofing Sheet. Flashings to be custom fabricated to suit architectural details, as required.
- .4 Snow guard: Refer to Section 07 72 53 – Snow Guards.
- .5 Closures: Foam and metal closures to suit profiles selected, to manufacturer's recommendations.
- .6 Sealants: In accordance with manufacturer's recommendation and Section 07 92 00.
- .7 Isolation coating: alkali resistant bituminous paint.
- .8 Touch-up paint: as recommended by sheet metal roofing manufacturer.
- .9 Ridge vents: VicWest Field Notched Ridge Cap. Color to match roofing panels.

2.6 FABRICATION

- .1 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .2 Fabricate Metal Roofing System components to comply with dimensions, profiles, gauges and details as shown on the approved shop drawings, including all companion flashings.
- .3 Fabricate all components of the system in the factory, ready for field installation.
- .4 Provide roof sheet and all accessories in longest practicable length to minimize field lapping.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for sheet metal roofing installation in accordance with manufacturer's written instructions.
 - .1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

- .2 Proceed with installation only after unacceptable conditions have been remedied.

3.2 UNDERLAYMENT MEMBRANE

- .1 Install as per manufacturer's written instructions.

3.3 INSTALLATION – ROOF PANEL SYSTEM

- .1 Provide metal roofing sheets in longest standard length available from manufacturer.
- .2 Install exterior prefinished roof panels on panel support clips, using manufacturer's proper construction procedure. Ensure metal roofing sheet side-lap is positively retained by clips, and proper sheet coverage is maintained.
- .3 Install the seam-cap at all side laps as shown on the approved shop drawings. Add sealant as required. Mitre snap-cap as required to resist water entry.
- .4 Where indicated on approved shop drawings, secure the end-lap of metal roofing sheets in accordance with the manufacturers specifications and details to provide a weather-tight seal. Exposed fasteners to match colour of the roof sheet.
- .5 Provide notched and formed closures, sealed against weather penetration, at changes in pitch, at ridges and eaves and vertical walls where required.
- .6 Install all companion flashing as shown on the shop drawings. Use concealed fasteners when possible. Exposed fasteners to match colour of roof sheet.

3.4 SNOW GUARDS

- .1 Install snow guards in accordance with approved engineered shop drawings.

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.

3.6 PROTECTION

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 05 50 00 – Metal Fabrications
- .2 Section 07 46 13 – Preformed Metal Siding
- .3 Section 07 46 46 – Cementitious Siding
- .4 Section 07 54 23 – Thermoplastic Membrane Roofing
- .5 Section 07 61 00 – Sheet Metal Roofing.

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM International)
 - .1 ASTM A653/A653M-01a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian Roofing Contractors Association (CRCA)
 - .1 Roofing Specifications Manual 1997.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA B111-1974 (R1998), Wire, Nails, Spikes and Staples

1.3 SAMPLES

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate 100 x 100 mm samples of each type of sheet metal material, colour and finish.

1.4 DESIGN CRITERIA

- .1 Select soffit ventilation products in coordination with Section 07 61 00 to ensure soffit and roof ventilation products provide the required net free ventilated area to suit National Building Code requirements.

1.5 WARRANTY

- .1 Contractor shall warrant that sheet metal flashings will stay in place and remain leakproof in accordance with General Conditions (GC) - CCDC GC 12.3 , but for two years.

Part 2

Products

2.1 SHEET METAL MATERIALS

- .1 Zinc coated steel sheet: 0.8 mm thickness, commercial quality to ASTM A653/A653M, with Z275 designation coating.

2.2 PREFINISHED STEEL SHEET

- .1 Prefinished steel with factory applied silicone modified polyester finish.
 - .1 Stelco / Dofasco 8000 Series
 - .2 Colours : vary – see below.

2.3 ACCESSORIES

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement: to CAN/CGSB 37.5.
- .3 Sealants: two component polyurethane, colour to match adjacent materials.
- .4 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.
- .5 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.
- .6 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .7 Solder: to ASTM B32, alloy composition.
- .8 Touch-up paint: as recommended by prefinished material manufacturer.

2.4 METAL FLASHINGS, CAP FLASHINGS AND FASCIAS

- .1 Form flashings, copings and fascias to profiles indicated of 0.8mm thick prefinished steel.
- .2 Police Building: Perimeter Cap Flashing: Colour to match VicWest 16084 Navy Blue. Interior Cap Flashing: Selected by Consultant from manufacturer's standard range of colours.
- .3 Police Building: Colour of miscellaneous prefinished metal flashings: Match color of adjacent metal siding.
- .4 Housing Units: Colour of miscellaneous prefinished metal flashings at walls : White. Colour of miscellaneous prefinished metal flashings at roof: Selected by Consultant from manufacturers standard range of colours. Color of fascia: White.
- .5 Outbuilding 157: Colour of fascia: White.

2.5 EAVES TROUGHS AND DOWNPIPES – Housing Units and Building 157

- .1 Form eaves troughs and downpipes from prefinished steel, 28 gauge.
- .2 Clip hanger: galvanized metal hanger and stainless steel screws as recommended by eave trough manufacturer.
- .3 Sizes and profiles as indicated. Color: White.
- .4 Provide goosenecks, outlets, strainer baskets and necessary fastenings.

2.6 RAIN WATER LEADERS (RWL) AND SUPPORT BRACKETS – Police Building

- .1 See drawings and Section 05 50 00.

2.7 SCUPPERS – Police Building

- .1 Form scuppers from 1.2mm thick prefinished metal. Scuppers fully welded.
- .2 Sizes and profiles as indicated in drawings.
- .3 Provide necessary fastenings.
- .4 Colour to match adjacent metal siding.
- .5 Provide transition from scupper to HSS rainwater leader. Refer to Section 05 50 00 Metal Fabrications.

2.8 VENTILATED SOFFIT – Housing Units and Building 157

- .1 Colour: Bright White.
- .2 Size: 407 mm (16”) x 3700 mm (12’-1 5/16”)
- .3 Style: 2 Panel Heavy Gauge Aluminum.
- .1 Acceptable products: Gentek 1607 Vented or approved equal. Coordinate with Section 07 61 00 to ensure soffit and roof ventilation products provide the required net free ventilated area to suit National Building Code requirements.

Part 3 Execution

3.1 FABRICATION

- .1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA 'FL' series details 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.
- .6 Coordinate with Section 07 61 00 to ensure soffit and roof ventilation products provide the required net free ventilated area to suit National Building Code requirements.

3.2 INSTALLATION

- .1 Install sheet metal work in accordance with CRCA FL series details, FL Aluminum Sheet Metal Work in Building Construction and as detailed.
- .2 Use concealed fastenings except where approved before installation.
- .3 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.
- .4 "S-Lock" end joints and caulk with sealant.
- .5 Install metal flashing under cap flashing to form weather tight junction.

3.3 EAVES TROUGHS AND DOWNPIPES – Housing Units and Building 157

- .1 Install eaves troughs and secure to building at 750 mm on centre with strap anchors.
 - .1 Slope eaves troughs to downpipes as indicated.
 - .2 Match exposed screw heads to colour of eave trough.
 - .3 Seal joints watertight.
- .2 Install downpipes and provide goosenecks back to wall.
 - .1 Secure downpipes to wall with straps at 1800 mm on centre; minimum two straps per downpipe. Color: White.
- .3 Install splash pans as indicated.

3.4 RAIN WATER LEADERS (RWL) AND SUPPORT BRACKETS – Police Building

- .1 Refer to Section 05 50 00.
- .2 Fabricate down spouts as indicated on drawings.
- .3 Install down spouts as indicated on drawings.
- .4 Install splash pads as indicated.

3.5 SCUPPERS – Police Building

- .1 Form scuppers from 1.2 mm prefinished metal. Provide fasteners as required to secure scupper in wall. Scuppers shall be formed in a box shape and shall be continuous through entire depth of wall. Transition to hollow steel section rain water leaders. Refer to Section 05 50 00.

- .2 Install in locations indicated on drawings.

3.6 VENTILATED SOFFIT

- .1 Install as indicated on drawings as per manufacturer's written instructions.

END OF SECTION

PART 1 General

1.1 SECTION INCLUDES

- .1 Floor and roof access hatches.

1.2 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 07 21 13 – Board Insulation
- .3 Section 07 27 00 – Vapour Retarders
- .4 Section 07 54 23 – Thermoplastic Polyolefin Roofing
- .5 Section 07 62 00 – Sheet Metal Flashing and Trim

1.3 REFERENCES

- .1 ASTM International
 - .1 ASTM A506-12, Standard Specification for Alloy and Structural Alloy Steel, Sheet and Strip, Hot-Rolled and Cold-Rolled.
 - .2 ASTM B370-11e1, Standard Specification for Copper Sheet and Strip for Building Construction.
 - .3 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 CSA International
 - .1 CSA B111-1974(R2005), Wire Nails, Spikes and Staples.

1.4 DESIGN REQUIREMENTS

- .1 Cover shall be reinforced to support a minimum live load of 195 kg/m² (40 psf) with a maximum deflection of 1/150th of the span or 98 kg/m² (20 psf) wind uplift.
- .2 Operation of cover to be smooth and easy with controlled operation throughout entire arc of opening and closing.
- .3 Operation of cover to be unaffected by temperature.
- .4 Entire roof hatch shall be watertight with fully welded joints on cover and curb.

1.5 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00, Submittals.
- .2 Indicate size and description of components, location, materials, attachment devices, description of frame and finish, and construction interface details, dimensions.

1.6 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data for hardware complete with pertinent details, spare parts lists and warnings against harmful maintenance materials and practices for incorporation into manual specified in Section 01 33 00, Submittals.

PART 2 Products

2.1 ACCEPTABLE PRODUCTS / MAUFACTURERS

.1 ROOF ACCESS HATCH

- .1 Basis of Design: Bilco Canada Type S-50T Ladder Access Enhanced Performance Roof Hatch or approved equal.
- .2 Size: 762mm x 915mm (30" x 36"). Flange Depth: See drawings.
- .3 RSI Value: RSI 2.1 (R12) minimum
- .4 Hatch Cover:
 - .1 Metal Cover: Preformed, prefinished sheet aluminum, insulated sandwich construction.
 - .2 Lockable by means of owner's padlock from interior.
- .5 Curbed Frame:
 - .1 Preformed metal curb: insulated sandwich construction, with deck flange for attachment.
- .6 Accessories
 - .1 Safety post: manufacturer's standard.

.2 CRAWLSPACE ACCESS HATCH

- .1 Basis of Design: Bilco Canada Type T Floor Access Door or approved equal.
- .2 Size: Single leaf. 914mm x 914mm (36" x 36"). Flange Depth: See drawings.
- .3 Hatch Cover:
 - .1 Metal Cover: Shall be 6mm aluminum smooth pattern plate with extruded aluminum molding 3mm height fastened to the cover to receive floor covering.
 - .2 Shall be reinforced to support a minimum live load of 150 psf (732 kg/m²) with a maximum deflection of 1/150th of the span.
 - .3 Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing. Operation of the cover shall not be affected by temperature
- .4 Frame:
 - .1 Frame shall be extruded aluminum with strap anchors bolted to the exterior.
- .5 Hinges: Shall be specifically designed for horizontal and shall be bolted to the underside of cover.
- .6 Lifting mechanisms: Cam-action hinges shall pivot on torsion bars to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and to act as a check in retarding downward motion of the cover when closing.

- .7 A removable exterior turn/lift handle with a spring loaded ball detent shall be provided to open the cover.
- .8 Hardware:
 - .1 Hinges: Cast steel cam-action hinges which pivot on torsion bars shall be provided.
 - .2 Cover shall be equipped with a steel hold open arm that automatically locks the cover in the open position.
 - .3 Cover shall be fitted with the required number and size of torsion bars.
 - .4 A Type 316 stainless steel snap lock with fixed handle shall be mounted on the underside of the cover.
 - .5 Hardware: shall be zinc plated and chromate sealed. Type 316 stainless steel hardware is available for installation in corrosive environments.
- .9 Finishes: Factory finish shall be mill finish aluminum with bituminous coating applied to the exterior of the frame.

2.2 FABRICATION

- .1 Fabricate components free of twists, bends, or visual distortion and insulated. Weld corners and joints.
- .2 Assemble roof hatch components as indicated.
- .3 Ensure continuity of weather-tight seal.
- .4 Design flashings to collect and lead off accumulated condensation.
- .5 Zinc plate hardware and attachments and shop prime ready for field painting.

PART 3 Execution

3.1 INSTALLATION

- .1 Erect components plumb, level and in proper alignment.
- .2 Ensure continuity of building envelope air barrier and vapour retarder systems.
- .3 Adjust and seal assembly with provision for expansion and contraction of components.
- .4 Secure prefabricated curb assembly to structure.
- .5 Coat aluminum and copper in contact with dissimilar materials, with isolation coating.
- .6 Secure and seal frame to curb.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 07 61 00 - Sheet Metal Roofing

1.2 REFERENCES

- .1 Conform to the current edition of the following codes and standards:
 - .1 Aluminum Association (AA) - Aluminum Standards and Data, 2003 Edition.
 - .2 ASTM International (ASTM):
 - .1 B85-03 - Standard Specification for Aluminum-Alloy Die Castings.
 - .2 B221-04a - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.4 SYSTEM DESCRIPTION

- .1 Snow fence designed by a professional engineer registered in the province of Saskatchewan. Refer to Section 07 61 00 – Sheet Metal Roofing.
- .2 Loading: Supplier to Design the ‘Snow Guard System’ to meet all applicable codes and loading requirements.
- .3 Factor of safety: Utilize a factor of safety 2 to determine allowable loads from ultimate tested clamp tensile load values.
- .4 Attachment system to provide attachment to standing seam metal roof:
 - .1 With only minor dimpling of panel seams.
 - .2 Without penetrations through roof seams or panels.
 - .3 Without use of sealers or adhesives.
 - .4 Without voiding roof warranty.

1.5 SUBMITTALS

- .1 Submittals for Review:
 - .1 Shop Drawings: Show locations of snow guards on roof and attachment spacing.
 - .2 Product Data: Include product description and installation instructions.
 - .3 Samples:
 - .1 Clamp samples.
 - .2 24 inch long cross member samples including coupler and other hardware.
- .2 Quality Control Submittals:
 - .1 Test results: Results of product load testing, issued by a recognized independent testing laboratory, showing load-to-failure value of attachment.
- .3 Closeout Submittals:

- .1 Certification: Installer's certification that snow guard system was installed in accordance with manufacturer's instructions and approved Shop Drawings.

Part 2 Products

2.1 COMPONENTS

- .1 Clamps:
 - .1 Manufactured from 6061-T6 aluminum extrusions conforming to ASTM B221 or aluminum castings conforming to ASTM B85 and to AA Aluminum Standards and Data.
 - .2 Clamp model: clamp suitable for the standing seam metal roofing. Non-penetrating.
 - .3 Set screws: 300 Series stainless steel, 18-8 alloy, 3/8 inch diameter, with round nose point.
 - .4 Attachment bolts: 300 Series stainless steel, 18-8 alloy, 10 mm diameter, with flat washers.
- .2 Brackets:
 1. Manufactured from 6061-T6 alloy and temper aluminum extrusions conforming to ASTM B221 and AA Aluminum Standards and Data or cast aluminum.
 2. Screws for attachment of brackets to roof: Stainless steel of type best suited to application.
- .3 Cross Members:
 - .1 Manufactured from 6061-T6 alloy and temper aluminum extrusions conforming to ASTM B221 and AA Aluminum Standards and Data.
 - .2 Receptacle in face to receive color-matched metal strips.
 - .3 Provide splice connectors ensuring alignment and structural continuity at end joints.
- .4 Colour Strips: Same material and finish as roof panels; obtained from the roof panel manufacturer.
- .5 Snow and Ice Clips: Aluminum, with rubber foot, minimum 3 inches wide. The number of clips to be as per manufacturers recommendations.

2.2 ACCEPTABLE MANUFACTURERS

- .1 Metal Roof Innovations, Ltd.- S-5! ColorGard complete with S-5! Clamps compatible with roof panel system
- .2 Approved equivalent.

Part 3 Execution

3.1 EXAMINATION

- .1 Prior to beginning installation, verify that:
 - .1 Panel seaming is complete.

- .2 Panel attachment is sufficient to withstand loads applied by snow guard system.
3. Installation will not impede roof drainage.

3.2 PREPARATION

- .1 Clean areas to receive attachments; remove loose and foreign matter that could interfere with installation or performance

3.3 INSTALLATION

- .1 Install system in accordance with manufacturer's instructions and approved Shop Drawings.
- .2 Place clamps as required by design engineer.
- .3 Place clamps in straight, aligned rows.
- .4 Place both set screws on same side of clamp.
- .5 Tighten set screws to manufacturer's recommended torque. Randomly test set screw torque using calibrated torque wrench.
- .6 Insert color-matched metal strips into cross members, staggering strips to cover cross member joints.
- .7 Attach cross members to clamps; tighten bolts to manufacturer's recommended torque.
- .8 Install couplers at cross member end joints.
- .9 Do not cantilever cross members more than 4 inches beyond last clamp at ends.
- .11 Install SnoClips at spacings indicated on shop drawings.

END OF SECTION

Part 1

General

1.1 SECTION INCLUDES

- .1 Materials and installation for roof anchors and safety restraints at the Police Building.

1.2 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 05 50 00 – Metal Fabrications
- .3 Section 07 54 00 – Thermoplastic Membrane Roofing

1.3 REFERENCES

- .1 CSA International
 - .1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel.
 - .3 CSA W55.3-08, Certification of Companies for Resistance Welding of Steel and Aluminum.

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 roof anchors and safety restraints 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 Saskatchewan, Canada.
 - .1 Indicate component profiles, sizes, connection attachments, reinforcing, anchorage, flashing, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - .2 Indicate welded connections using standard welding symbols include net weld lengths.
 - .2 Submit design data and calculations.
 - .3 Submit load test results and certification.

1.5 QUALITY ASSURANCE

- .1 Design structural support framing components under direct supervision of Professional Structural Engineer experienced in design of this Work and licensed in the Province of Saskatchewan of Canada.
- .2 Qualifications:

- .1 Welder's qualifications: welders certification to CSA W55.3
 - .1 Employ qualified and licensed welders possessing certificates for each procedure to be performed.
- .3 Load testing
 - .2 Following installation of roof anchors perform load test on each roof anchor to verify anchor is capable of meeting specified load requirements.
 - .3 Load test to be performed by trained personnel certified to perform load testing.
 - .4 Submit report to Departmental Representative certifying test results and indicating pass or fail for each anchor.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements 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 in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect roof anchors and safety restraints from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 SYSTEM DESCRIPTION

- .1 Personal Restraint Assembly: Posts and attachments to resist lateral forces of 24.03 kN at any point and in all directions, without damage or permanent set.

2.2 MATERIALS

- .1 Steel Sections and Plates: CSA G40.20M/G40.21.
- .2 Steel Tubing: ASTM A500/A500M, Grade B, hot dipped galvanized.
- .3 Steel Rings: Type 304 stainless steel, forged, ring thickness determined by imposed loads.
- .4 Cap: Stainless steel, type 304.
- .5 Stack Flashing: aluminum flashing with TPO pressure seal grommet. Sealing of unit cannot rely on caulking.
- .6 Bolts, Nuts, and Washers for Stainless Steel: stainless steel, matte finish.
- .7 Gaskets Under Anchors: neoprene pads, compatible with roof membrane, cut to size.
- .8 Welding Materials: CSA W47.1 for materials being welded.
- .9 Shop Primer: Shop Primer: Epoxy, anti-corrosive type, two coats.

2.3 FABRICATION

- .1 Fit and shop assemble items in largest practical sections, for delivery to site.
- .2 Fabricate items with joints tightly fitted and secured.
- .3 Anchor types to suit roof assembly construction.
- .4 Continuously seal joined members by intermittent welds and plastic filler.
- .5 Grind exposed joints flush and smooth with adjacent finish surface.
 - .1 Make exposed joints butt tight, flush, and hairline.
 - .2 Ease exposed edges to small uniform radius.
- .6 Fill hollow steel support post with urethane insulation.
- .7 Exposed Mechanical Fastenings: screws or bolts; consistent with design of component.
- .8 Furnish and install components required for anchorage of fabrications.
- .9 Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.4 FABRICATION TOLERANCES

- .1 Squareness: 3 mm maximum difference in diagonal measurements.
- .2 Maximum Deviation from Plane: 1.5 mm from 1 m.

2.5 FINISHES

- .1 Concealed steel anchors, clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- .2 Do not prime surfaces in direct contact with concrete or where field welding is required.
- .3 Concealed Structural Components and Anchors: galvanize after fabrication to ASTM A123/A123M to minimum 600 g/sq m galvanized coating.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for roof anchors and safety restraint installation in accordance with manufacturer's written instructions.
- .2 Verify dimensions, tolerances, and method of attachment with other work.

3.2 PREPARATION

- .1 Supply and install steel items required to be attached to steel framing as clean uncoated metal, with setting templates to appropriate sections.

3.3 ERECTION TOLERANCES

- .1 Maximum Variation from Plumb: 6 mm.

3.4 INSTALLATION

- .1 Install items plumb and level, accurately fitted, free from distortion or defects.
- .2 Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- .3 Field weld components as indicated on shop drawings.
- .4 Obtain approval from Consultant prior to site cutting or making adjustments not scheduled.
- .5 After erection, apply primer in accordance with MPI Painting Manual to: welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.5 LOAD TESTING

- .1 Perform load test on each roof anchor.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.7 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by roof anchors and safety restraint installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 09 21 16 - Gypsum Board Assemblies

1.2 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-S115-2011, Fire Tests of Fire stop Systems.

1.3 DEFINITIONS

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

1.4 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 datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.
- .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 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.
 - .1 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.
 - .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 and cleaning procedures.

1.5 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer: company or person specializing in fire stopping installations with 5 documented years experience.
- .2 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 Upon completion of Work, after cleaning is carried out.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .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 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 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: as indicated in drawings.
- .2 Re-penetrable fire rated cable pathway system for power and communication cables.
 - .1 Square profile, heavy gauge galvanized steel with intumescent material for rapid expansion.
 - .2 Wall and floor applications.
 - .3 Accessories including manufactured multi-gang plates, brackets, extensions and multi-slot frames.
 - .4 Minimum fire rating of 4 hours.
 - .5 Approved systems:
 - .1 ETI EZ Path 44+ fire rated pathway system complete with all accessories.
- .3 Service penetration assemblies: systems tested to CAN-ULC-S115.
- .4 Service penetration fire stop components: certified by test laboratory to CAN-ULC-S115.
- .5 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.
- .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 seal system at module joints: engineered judgement by manufacturer.
- .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.
- .5 Remove excess compound promptly as work progresses and upon completion.

3.4 SPECIAL REQUIREMENTS

- .1 Location of special requirements for fire stopping and smoke seal materials at openings and penetrations in fire resistant rated assemblies are as follows:
 - .1 Design firestopping system to be re-penetrable at all data and communications cable penetrations.
- .2 Fire stopping system at building module joints to be engineered by firestop manufacturer.

3.5 SEQUENCES OF OPERATION

- .1 Proceed with installation only when submittals have been reviewed by Departmental Representative.
- .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.

3.6 FIELD QUALITY CONTROL

- .1 Inspections: notify Departmental Representative when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

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 Remove temporary dams after initial set of fire stopping and smoke seal materials.

3.8 SCHEDULE

- .1 Fire stop and smoke seal at:
 - .1 Penetrations through fire-resistance rated gypsum board partitions and walls.
 - .2 Top of fire-resistance rated gypsum board partitions.
 - .3 Intersection of fire-resistance rated gypsum board partitions.
 - .4 Control joints in fire-resistance rated gypsum board partitions and walls.
 - .5 Penetrations through fire-resistance rated floor assemblies.
 - .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 cm² : fire stopping to include bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation. Submit ULC listed assembly as per Section 01 33 00.
 - .9 Joints between modules at the floor, walls, ceiling, door openings, interior window openings and all other exposed joints between modules.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Materials, preparation and application for caulking and sealants.

1.2 RELATED SECTIONS

- .1 Section 06 40 00 - Architectural Woodwork.
- .2 Section 07 27 00 – Air and Vapour Barriers
- .3 Section 07 62 00 – Sheet Metal Flashing and Trim
- .4 Section 08 54 13 – Fiberglass Windows

1.3 REFERENCES

- .1 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.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.4 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data
 - .1 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.
 - .2 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Instructions to include installation instructions for each product used.
- .3 Samples:

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate samples of each type of material and colour.
- .3 Submit cured samples of exposed sealants for each color where required to match adjacent material.
- .4 Maintenance Manuals:
 - .1 Conform to Section 01 78 00 - Closeout Submittals.

1.5 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.

1.6 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 5 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.

1.7 ENVIRONMENTAL REQUIREMENTS

- .1 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

Part 2 Products

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 offgas 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.

2.2 SEALANT TYPES

- .1 Type 1 -Urethanes Three Part.
 - .1 Non-Sag to CAN/CGSB-19.24, Type 2, Class B, colour as selected by Consultant from standard range of manufacturer's colours.
 - .1 Acceptable material: Tremco "Dymeric 240",
 - .2 Or equivalent.
- .2 Type 2 -Urethanes One Part.
 - .1 Non-Sag to CAN/CGSB-19.13, Type 2, colour as selected by Consultant from standard range of manufacturer's colours.
 - .1 Acceptable material: BASF "Sonolastic NP 1".
 - .2 Or equivalent.
- .3 Type 3 -Silicones One Part.
 - .1 To CAN/CGSB-19.13. Colour as selected by Consultant from standard range of manufacturer's colours.
 - .1 Acceptable material: Dow Corning "Tub, Tile & Ceramic Silicone Sealant".
 - .2 Or equivalent.
- .4 Type 4 -Acrylic Latex One Part.
 - .1 To CAN/CGSB-19.17.
- .5 Type 5 -Acoustical Sealant.
 - .1 To ASTM C919.
- .6 Type 6 -Single Component Silicone Rubber sealant
 - .1 Self-leveling elastomeric polyurethane to ASTM C 920 Type S, Grade P. Colour as selected by Consultant from standard range of manufacturer's colours.
 - .1 Acceptable material: BASF "Silcoferm S".
 - .2 Or equivalent.

- .7 Type 7 –Epoxy Adhesive – Security Sealant
 - .1 Acceptable material: “Dynapoxy EP-430 Fast”
 - .2 No substitutions permitted.
 - .3 Refer to drawings and schedule at the end of this section for locations.

2.3 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/m³ 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.

2.4 SEALANT SELECTION

- .1 Exterior sealant: Sealant type: 1 or 2 (colour to be selected by consultant).
- .2 Perimeters of exterior openings where door and window frames meet exterior facade of building : Sealant type: 1 or 2.
- .3 Seal interior perimeters of exterior openings: Sealant type: 3.
- .4 Poly Vapour Barrier: Sealant type: 5.
- .5 Perimeters of interior window and door frames, base of interior door frames between frame and floor finish: Sealant type: 4.
- .6 Tops and bottoms of acoustic walls. Sealant type: 5.
- .7 Perimeters of countertop edges, Sealant type: 4.
- .8 Perimeter of fixtures (e.g. sinks, urinals, waterclosets, basins, vanities): Sealant type: 3.
- .9 In additional locations as noted on the drawings: confirm with Consultant.

2.5 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 that 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 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.

3.4 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.

3.5 MIXING

- .1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 APPLICATION

- .1 Refer to referenced Sections for specific installation instructions.
- .2 General Installation.
 - .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 sealant in continuous beads.
 - .4 Apply sealant using gun with proper size nozzle.
 - .5 Apply 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.
- .3 Curing.
 - .1 Cure sealants in accordance with sealant manufacturer's instructions.
 - .2 Do not cover up sealants until proper curing has taken place.
- .4 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.

3.7 SCHEDULE – SEALANT TYPE 7

- .1 Apply Type 7 sealant to all gaps within scheduled rooms including, but not limited to toilet/sink, light fixtures, door frames, air grilles, smoke detector covers, and security camera housings.
- .2 Room schedule:

128,128.1,128.2,128.3,128.4,129,130,131,132,133,134,136,137,138,139,140,141,

142,144,158,159,160,161.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Materials and installation for metal doors and frames in the police building and Building 157.

1.2 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 07 46 13 – Preformed Metal Siding
- .3 Section 08 14 16 – Flush Wood Doors
- .4 Section 08 34 74 – Acoustic Steel Door and Frame Assemblies
- .5 Section 08 71 00 - Door Hardware.
- .6 Section 08 90 10 - Door, Frame, and Hardware Schedule.

1.3 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A653/A653M-11, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM C591-13, Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation
 - .3 ASTM C1289-13e1, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-13, Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door Manufacturers' Association (CSDMA)
 - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2006.
 - .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 2009.
- .5 National Fire Protection Association (NFPA)
 - .1 NFPA 80-2013, Standard for Fire Doors and Fire Windows.
 - .2 NFPA 252-2013, Standard Methods of Fire Tests of Door Assemblies.

- .6 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC S104-10, Standard Method for Fire Tests of Door Assemblies.

1.4 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 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN/ULC S104 for ratings specified or indicated.
 - .3 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN/ULC S104, ASTM E152 or NFPA 252 and listed by nationally recognized agency having factory inspection services.

1.5 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 Saskatchewan, 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, and finishes.
 - .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

1.6 DELIVERY, STORAGE AND HANDLING

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

Part 2 Products

2.1 MATERIALS

- .1 Hot dipped galvanized steel sheet: to ASTM A653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.
- .2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF75.

2.2 DOOR CORE MATERIALS

- .1 Honeycomb construction:
 - .1 Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m³ minimum sanded to required thickness.
- .2 Insulated core:
 - .1 Polyisocyanurate: Rigid, modified polyisocyanurate, closed cell board. Density; 32 kg/m³ (2.0 pcf) minimum, thermal values; RSI 1.9 (R 11.0) minimum, in accordance with ASTM C591 (un-faced) or C 1289 (faced).
- .3 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door. Core to be tested as part of a complete door assembly, in accordance with CAN/ULC S104, ASTM E152 or NFPA 252, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.

2.3 ADHESIVES

- .1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.
 - .1 Adhesive: maximum VOC content 50 g/L.
- .2 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.

2.4 PRIMER

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

2.5 PAINT

- .1 Factory paint steel doors and frames in accordance with Sections 09 91 13 - Exterior Painting and 09 91 23 - Interior Painting. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.

2.6 ACCESSORIES

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Exterior and interior top and bottom caps: steel.
- .3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .4 Metallic paste filler: to manufacturer's standard.
- .5 Fire labels: metal riveted.
- .6 Sealant: in accordance with Section 07 92 00 – Joint Sealants.

- .1 Maximum VOC limit 250 g/L.
- .7 Glazing: in accordance with Section 08 80 50 - Glazing.
- .8 Make provisions for glazing as indicated and provide necessary glazing stops.
 - .1 Provide removable 0.9mm formed steel channels, 16mm high for use with glazing tapes and compounds and secured with countersunk stainless steel screw.
 - .2 Design exterior glazing stops to be tamperproof.

2.7 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, thermally broken type construction using rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19MA.
- .4 Interior frames: 1.6 mm welded type construction.
- .5 Strike bucket: accept a 25 mm throw dead bolt. Grout or wedge in the area of the strike bucket to prevent spreading.
- .6 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.
- .7 Protect mortised cutouts with steel guard boxes.
- .8 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .9 Manufacturer's nameplates on frames and screens are not permitted.
- .10 Conceal fastenings except where exposed fastenings are indicated.
- .11 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .12 Insulate exterior frame components with polyurethane insulation.
- .13 Prepare frames to receive electronic monitoring and security devices. Refer to Section 08 71 10 - Door Hardware and Section 08 90 10 - Door, Frame and Hardware Schedule. Coordinate frame preparation with Electrical Divisions 26 and 28.
- .14 Frames to be prepped to accommodate

2.8 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 jamb and intermediate at 660 mm on centre maximum.

2.9 FRAMES: WELDED TYPE

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

2.10 DOOR FABRICATION GENERAL

- .1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Fabricate doors with longitudinal edges welded. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
- .3 Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic hardware.
- .4 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .5 Reinforce doors where required, for surface mounted hardware. Provide flush steel top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
- .6 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .7 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in conformance with CAN/ULC S104, ASTM E152, or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.
- .8 Manufacturer's nameplates on doors are not permitted.

2.11 DOORS: CONSTRUCTION

- .1 Form face sheets for interior doors from 1.6 mm sheet steel with honeycomb core laminated under pressure to face sheets.
- .2 Form face sheets for exterior doors from 1.6mm sheet steel with insulated core laminated under pressure to face sheets.

2.12 THERMALLY BROKEN DOORS AND FRAMES

- .1 Fabricate exterior doors as thermally broken doors by using polyisocyanurate insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.
- .2 Thermal break: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.
- .3 Fabricate exterior frames as thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.
- .4 Apply insulation.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION GENERAL

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

3.3 FRAME INSTALLATION

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

- .6 Maintain continuity of air barrier and vapour retarder.

3.4 DOOR INSTALLATION

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.
- .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
 - .1 Hinge side: 1.0 mm.
 - .2 Latchside and head: 1.5 mm.
 - .3 Finished floor, top of carpet, and thresholds: 13 mm.
- .3 Adjust operable parts for correct function.
- .4 Install louvres.

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.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 06 10 11 – Rough Carpentry
- .2 Section 06 40 00 - Architectural Woodwork.
- .3 Section 07 92 00 – Joint Sealing
- .4 Section 08 80 50 – Glazing

1.2 REFERENCES

- .1 Aluminum Association (AA).
 - .1 DAF 45-03, Designation System for Aluminum Finishes.
- .2 American Architectural Manufacturers Association (AAMA).
 - .1 AAMA CW-10, Care And Handling of Architectural Aluminum from Shop to Site
 - .2 AAMA 611, Voluntary Specifications for Anodized finishes Architectural Aluminum
 - .3 AAMA 609-93, Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum.
- .3 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM B209M, Aluminum and Aluminum-Alloy sheet and Plate Metric
 - .2 ASTM E330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

1.3 SUBMITTALS

- .1 Product Data:
 - .1 Submit catalogue details for each type of frame illustrating profiles, dimensions and methods of assembly.
- .2 Shop Drawings
 - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Indicate materials and profiles and provide scaled details of components for each type of door and frame.
- .3 Closeout Submittals
 - .1 Conform to Section 01 78 00 - Closeout Submittals.

1.4 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.

Part 2 Products

2.1 MATERIALS

- .1 Aluminum extrusions: Aluminum Association alloy AA6063-T5 anodizing quality.
- .2 Fasteners: stainless steel where exposed
- .3 Isolation coating: bituminous paint.
- .4 Glass: refer to Section 08 80 50 – Glazing

2.2 ALUMINUM FRAMES

- .1 Interior aluminum frames:
 - .1 Extruded aluminum frames nominal size 100 x 45 mm, front glazed system.
 - .2 Thickness: 3 mm
 - .3 Kawneer: Trifab 450 series or approved alternate.

2.3 ALUMINUM WINDOW FRAME HARDWARE (ANTI-VAULT)

- .1 All components to be heavy duty.
- .2 Horizontal Sliding Panel: Suspended by two heavy duty roller brackets, each having self-lubricating nylon wheel and ball bearing assembly; running in an extruded aluminum track assembly. Provide continuous extruded aluminum door glides and retainer clips along bottom for positive guide no-sway operation.
- .3 Recessed pull handle (installed on office side).
- .4 Cylinder thumb turn (non key design) locking device with one hand operation. Interior side Locking device to be self-activating upon closing, slam latch operation.
 - .1 Device: Spring loaded Transcom latch Model #865 manufactured by Sbinco (as supplied by Anotec MFG Inc.)
 - .2 Locate lock so it cannot be reached through the adjacent opening. Confirm location with Consultant.
- .5 Pass through latch: Heavy duty, spring loaded mechanical latch.
- .6 Rubber faced door stop to restrict window movement at maximum window opening.

2.4 HARDWARE

- .1 Hardware to match colour of aluminum frames.

2.5 ALUMINUM FINISHES

- .1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
 - .1 Finish: Clear anodized AA-M12C22A31, 0.7 mil thickness, Class 1.

2.6 FABRICATION

- .1 Framing to be by same manufacturer.
- .2 Fabricate frames to profiles and maximum face sizes as shown. Provide minimum 22 mm bite for insulating glazed units.
- .3 Reinforce mechanically joined corners and components areas of aluminum framing with interior steel clips to provide strength, stiffness and rigidity in the completed installation.
- .4 Fit joints tightly and secure mechanically.
- .5 Conceal fastenings.
- .6 Mortise, reinforce, drill and tap frames and reinforcements to receive hardware.
- .7 Isolate aluminum from direct contact with dissimilar metals, concrete and masonry.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 WINDOW INSTALLATION

- .1 Install windows in accordance with manufacturer's instructions. Set frames plumb, square, level at correct elevation in alignment with adjacent work.
- .2 Anchor securely.
- .3 Adjust operable parts for correct function and smooth friction free operation.
- .4 Make allowances for deflection of structure to ensure that structural loads are not transmitted to frames.
- .5 Seal joints between window frame and other building components with clear silicone caulking.

3.3 GLAZING

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

3.4 CAULKING/SEALING

- .1 Apply sealant in accordance with Section 07 92 00 - Joint Sealing. Conceal sealant within the aluminum work except where exposed use is permitted by Consultant.

3.5 CLEANING

- .1 Perform cleaning of aluminum components in accordance with AAMA 609.1 - Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum.
- .2 Clean aluminum with damp rag and approved non-abrasive cleaner.
- .3 Remove traces of primer, caulking, epoxy and filler materials; clean doors and frames.
- .4 Clean glass and glazing materials with approved non-abrasive cleaner.
- .5 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 installation for flush wood doors at the police building. For interior doors and frames at the housing units see Section 08 14 18 Molded Panel Interior Doors.

1.2 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 08 34 74 – Acoustic Steel Door and Frame Assemblies
- .3 Section 08 71 00 - Door Hardware.
- .4 Section 08 80 50 – Glazing.
- .5 Section 08 90 10 – Door, Frame and Hardware Schedule.
- .6 Section 09 91 23 - Interior Painting.

1.3 REFERENCES

- .1 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
 - .1 Quality Standards for Architectural Woodwork, 1st edition, 2009.
- .2 Canadian Standards Association (CSA International).
 - .1 CAN/CSA O132.2 Series-90(R1998), Wood Flush Doors.
 - .2 CAN/CSA-O132.5-M1992(R1998), Stile and Rail Wood Doors.

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 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, sizes, core construction, transom panel construction and cutouts.

1.5 QUALITY ASSURANCE

- .1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical 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. Wrap doors.
 - .4 Store doors away from direct sunlight.

Part 2 Products

2.1 WOOD FLUSH DOORS

- .1 Solid core: to CAN/CSA-O132.2.1.
- .2 Grade: AWMAC “Custom” grade unless otherwise noted.
- .3 Performance Duty Level: AWMAC “Extra Heavy Duty” level unless otherwise noted
 - .1 Construction:
 - .1 Solid particleboard core: grade LD-1 or LD-2, stile and rail frame bonded to particleboard core with wood lock blocks and top blocks, 5-ply construction, 45 mm thickness. Door core and all materials shall contain no urea formaldehyde.
 - .2 Face Panels:
 - .1 Hardwood; veneer grades: Grade I (Premium), flat sliced Maple species.
 - .3 Adhesive: Type II (water resistant) for interior doors.
 - .4 Finish: Stain and clear varnish finish on site. Refer to Section 09 91 23 – Interior Painting.

2.2 ACCESSORIES

- .1 Door Seals: in accordance with Section 08 34 74 – Acoustic Steel Door and Frame Assembles and as required to meet specified STC rating.
- .2 Threshold: in accordance with Section 08 34 74 – Acoustic Steel Door and Frame Assemblies and as required to meet specified STC rating.

2.3 GLAZING

- .1 Glass: in accordance with Section 08 80 50 - Glazing.
- .2 Accessories: in accordance with Section 08 80 50 - Glazing.

2.4 FABRICATION

- .1 Vertical edge strips solid hardwood compatible with face veneer. AWMAC edge type 2.
- .2 Prepare doors for louvres and glazing. Provide hardwood species to match face veneer and 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.

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 doors and hardware in accordance with manufacturer's printed.
- .3 Adjust hardware for correct function.
- .4 Install glazing in accordance with Section 08 80 50 - Glazing.
- .5 Install louvres and stops.

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 Molded panel interior doors for the Housing Units. For interior doors and frames at the Police Building refer to Section 08 14 16.

1.2 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 08 71 00 - Door Hardware.
- .3 Section 08 90 10 – Door, Frame and Hardware Schedule.
- .4 Section 09 91 23 - Interior Painting.

1.3 REFERENCES

- .1 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
 - .1 Quality Standards for Architectural Woodwork, 2nd edition, 2014.
- .2 Canadian Standards Association (CSA International).
 - .1 CAN/CSA O132.2 Series-90(R1998), Wood Flush Doors.
 - .2 CAN/CSA-O132.5-M1992(R1998), Stile and Rail Wood Doors.

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 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 hardware, edge bevel locations and size, door sizes, core construction, swing.

1.5 QUALITY ASSURANCE

- .1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical 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. Wrap doors.
 - .4 Store doors away from direct sunlight.

Part 2 Products

2.1 MOLDED PANEL SIDE HINGED DOORS

- .1 Solid core: to CAN/CSA-O132.2.1. Particleboard to ANSI A208.1 or mineral core. See Room Finish Schedule for sizes and locations.
- .2 Hollow core: honeycomb grid. See Room Finish Schedule for sizes and locations.
- .3 Grade: AWMAC "Custom" grade unless otherwise noted.
- .4 Performance Duty Level: AWMAC "Standard Duty" level unless otherwise noted
 - .1 Construction:
 - .1 Solid particleboard or mineral core: grade LD-1 or LD-2, stile and rail frame bonded to core with wood lock blocks, 3-ply construction, 45 mm thickness. Door core and all materials shall contain no urea formaldehyde.
 - .2 Face Panels:
 - .1 Finish: Molded factory-finished hardboard. Sealed 6 sides. Textured wood grain finish.
 - .2 Style: 6-panel style to match exterior fibreglass doors and interior bifold doors.
 - .3 Color: Prefinished White.
 - .3 Adhesive: Type II (water resistant) for interior doors.
 - .4 Frame: Composite wood.
 - .5 Hardware: 3 butt hinges.
 - .1 Basis of Design: Stanley FBB179 114 x 101mm 26D
 - .2 Approved equivalent.
- .5 Acceptable pre-manufactured wood flush doors.
 - .1 Meet specified AWMAC Grade and Performance Level.
 - .2 Acceptable pre-manufactured door unit:
 - .1 Masonite
 - .2 Lynden
 - .3 Approved equivalent.

2.2 MOLDED PANEL BIFOLD DOORS

- .1 Hollow core: honeycomb grid. See Room Finish Schedule for sizes and locations.
- .2 Grade: AWMAC “Custom” grade unless otherwise noted.
- .3 Performance Duty Level: AWMAC “Standard Duty” level unless otherwise noted
 - .1 Construction:
 - .1 Honeycomb grid interior core: grade LD-1 or LD-2, stile and rail frame bonded to core with wood lock blocks, 3-ply construction, 45 mm thickness. Door core and all materials shall contain no urea formaldehyde.
 - .2 Face Panels:
 - .1 Finish: Molded factory-finished hardboard. Sealed 6 sides. Textured wood grain finish.
 - .2 Style: 3-panel style (per leaf) to match exterior fibreglass doors and interior side hinged doors.
 - .3 Color: Prefinished White.
 - .3 Adhesive: Type II (water resistant) for interior doors.
 - .4 Frame: hardware kit with track and hangers by door manufacturer.
 - .1 Basis of design: Single bifold: Pemko HF2/100 size to suit.
 - .2 Basis of design: Double bifold: Pemko HF4/100 size to suit.
 - .3 Approved equivalent.
- .4 Acceptable pre-manufactured wood flush doors.
 - .1 Meet specified AWMAC Grade and Performance Level.
 - .2 Acceptable pre-manufactured door unit:
 - .1 Masonite; Lynden Door.
 - .2 Approved equivalent.
- .5

2.3 ACCESSORIES

- .1 Bifold door track and hanger kit. Bifold door pulls: See Section 08 71 00.
- .2 Refer to Section 08 71 00 for additional side hinged door hardware.

2.4 FABRICATION

- .1 Loose layup assembly includes hardboard facing, composite stiles, composite rails and core. Composite bottom rail. Composite top rail with edge band. Vertical edge strips of composite wood with edge band lock stile.
- .2 Door facings to be bonded to stiles, rails and core forming 3-ply structural attachment.
- .3 Prepare doors for required hardware. See Section 08 71 00.

- .4 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.

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 and manufacturer's printed instructions.
- .2 Install doors and hardware in accordance with manufacturer's printed instructions.
- .3 Adjust hardware for correct function.

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

END OF SECTION

Part 1 – General

1.1 SECTION INCLUDES

- .1 Fiberglass doors and composite frames at the Housing Units.

1.2 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 08 71 00 – Door Hardware
- .3 Section 08 90 10 – Door, Frame and Hardware Schedule

1.4 REFERENCE STANDARDS

- .1 ASTM International (ASTM):
 1. ASTM D1666 - Test Methods for Conducting Machining Tests of Wood and Wood-Base Materials.
 2. ASTM D1761 - Test Methods for Mechanical Fasteners in Wood.
 3. ASTM E283 - Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 4. ASTM E330 - Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 5. ASTM E331 - Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
 6. ASTM E413 - Classification for Rating Sound Insulation.
 7. ASTM E547 - Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.
 8. ASTM E1332 - Standard Classification for Determination of Outdoor-Indoor Transmission Class.
 9. ASTM E1886 - Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
 10. ASTM E1996 - Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
 11. ASTM F1450 - Test Methods for Hollow Metal Swinging Door Assemblies for Detention Facilities.
- .2 National Fire Protection Association (NFPA):
 1. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
- .3 National Fenestration Rating Council (NFRC):
 - .1 NFRC 100 - Procedure for Determining Fenestration Product U-Factors.

- .2 NFRC 200 - Procedure for Determining Fenestration Product Solar Gain Heat Coefficient and Visible Transmittance at Normal Incidence.
- .3 NFRC 500 - Procedure for Determining Fenestration Product Condensation Resistance Values.
- .4 Underwriters Laboratories (UL):
 - .1 UL 10C - Positive Pressure Fire Tests of Door Assemblies.

1.5 SUBMITTALS

- .1 Submit under provisions of Section 01 33 00.
- .2 Shop Drawings: Submit for each type of door specified including details of core and edge construction and trim for openings.
 - .1 Include factory finishing information.
 - .2 Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in product data; and other pertinent data.
 - .3 Indicate compliance with referenced standards.
- .3 Operation and Maintenance Data as per Section 01 78 00 Closeout Submittals.

1.6 QUALITY ASSURANCE

- .1 Manufacturers: Firms regularly engaged in manufacture of fiberglass doors of the types and sizes required, whose products have been in satisfactory use in similar service for not less than 10 years.
- .2 Source Limitations: Obtain fiberglass doors through one (1) source from a single manufacturer.

1.7 DELIVERY, STORAGE AND HANDLING

- .1. Comply with requirements of manufacturer's written instructions.
- .2 Package doors on pallets and protect with cardboard top and bottom, corner protectors, banding, and shrink wrap.
- .3 Store and handle in strict compliance with manufacturer's written instructions and recommendations.
- .4 Protect from damage due to weather, excessive temperature, and construction operations.

1.8 WARRANTY

- .1. Warranty: Manufacturer's standard form, in which manufacturer warrants doors to be free of manufacturing defects in materials or workmanship.
 - 1 Warranty shall be in effect during the following period of time from date of Substantial Completion:
 - a. 25 year limited warranty on slab and frame.

- .2 Factory Stained Finish and Components: Five (5) year warranty.

Part 2 - Products

2.2 FIBERGLASS DOORS

- .1 Basis of design: Duxton (www.duxtonwindows.ca) or approved equivalent.
- .2 Construction:
 - .1 Door: Min. 4.4 mm (1.75") thick. Skins of high impact compression molded fiberglass reinforced material. Factory finished. Maintenance free. Color: Prefinished White. Style: 6 panel. Texture: Wood grain. Coordinate pre-drill for door hardware with Section 08 71 00.
 - .2 Stiles and rails: Composite material; full-length of door.
 - .3 Lockblock: Minimum length: 500 mm (20 inches)
 - .4 Core: 100 percent CFC-free polyurethane insulation. Min. RSI 2.4 (R14).
 - .5 Reinforcing: Steel.
 - .6 Water resistance: Construction protecting doors against water infiltration on all six (6) sides to prevent warping, delamination, corrosion, rotting, and build up of mold and mildew.
 - .7 Brickmould: 50mm (2") pultruded fiberglass.
 - .9 Frame: Pultruded fiberglass. Insulated. Maintenance free. Factory finished. Color: white. Width to suit construction see drawings.
 - .10 Threshold: Subsill of rot and insect-proof composite material. Pultruded fiberglass top sill.
 - .12 Accessories:
 - .1 Dust pad.
 - .2 Steel ball-bearing hinges and adjustable strike plate at latch and deadbolt.
 - .1 Basis of design: Stanley FBB179 114x101mm 26D or approved equivalent.
 - .3 Door viewer.
 - .1 Basis of design: Rockwood 622 26D or approved equivalent.
 - .4 White compression foam weatherstrip at jambs and head with second fin-type weatherstrip.
 - .5 Fixed vinyl Kerf-in sweep at bottom of door slab supplied by door manufacturer. Size to suit.
 - .1 Basis of design: Pemko 216APK or approved equivalent.

PART 3 - Execution

3.1 EXAMINATION

- .1 Examine frames and substrates, for suitable conditions where fiberglass doors [and composite frames will be installed.
- .2 Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
- .3 Reject doors and composite frames with defects.

- .4 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- .1 Install composite door frames level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
- .2 Hardware: Refer to Section 08 71 00 for installation.
- .3 Install fiberglass doors in compliance with manufacturer's written instructions.

3.3 ADJUSTING

- .1 Operation: Rehang or replace doors that do not swing or operate freely.
- .2 Factory Finished Doors: Replace doors that are damaged or do not comply with requirements. Repair or refinish doors if work complies with requirements and shows no evidence of repair or refinishing.

3.4 SCHEDULE

- .1 Refer to drawings and Section 08 90 10 Door, Frame & Hardware Schedule.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Mechanical Contractor to provide access doors for mechanical components for installation by contractor under section erecting associated walls or ceilings.

1.2 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit catalogue details for each type of door illustrating profiles, dimensions and methods of assembly.

1.3 CLOSEOUT SUBMITTALS

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

2 Products

2.1 ACCESS DOORS

- .1 Sizes: Except as indicated otherwise, to be minimum sizes as follows:
 - .1 For service entry: 600 x 600 mm.
 - .2 For visual inspection: 300 x 300 mm.
- .2 Construction: Rounded safety corners, concealed hinges, screwdriver latch, anchor straps, able to open 180 degrees.
- .3 Materials
 - .1 Tiled or marble surfaces and other special areas: Stainless steel with brushed satin or polished finish as directed by Departmental Representative.
 - .2 Other areas: Prime coated steel.
- .4 Access doors in ductwork, refer to 23 33 00 Ductwork Accessories.

3 Execution

3.1 LOCATION

- .1 Location: Ensure that equipment is within view and accessible for operating, inspecting, adjusting, servicing without using special tools.
- .2 Provide adequately sized access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, humidifiers, at fire dampers, and elsewhere as indicated. Review locations prior to fabrication.
- .3 Provide 100 x 100 mm (4"x 4") quick opening access doors for inspection of balancing dampers.

3.2 LOCATION

- .1 Location: Ensure that equipment is within view and accessible for operating, inspecting, adjusting, servicing without using special tools.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 08 90 10 – Door, Frame and Hardware Schedule
- .3 Section 09 96 53 – Elastomeric Coatings.
- .4 Hollow Metal Door & Pressed Steel Frame Shop Drawings, Sept. 26, 2007

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A568/A568M-13ae1, Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.
 - .2 ASTM A924/A924M-13, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
 - .3 ASTM A1008/A1008M-13, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
 - .4 ASTM F1450-12a, Standard Test Methods for Hollow Metal Swinging Door Assemblies for Detention Facilities.
 - .5 ASTM F1643 - 05 Standard Test Methods for Detention Sliding Door Locking Device Assembly
- .2 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20/G40.21M-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-13, Welded Steel Construction (Metal Arc Welding)
- .3 Canadian Steel Door Manufacturers Association (CSDMA),
 - .1 Selection and Usage Guide for Steel Doors and Frames, 2009.
- .4 National Association of Architectural Metal Manufacturers (NAAMM)
 - .1 NAAMM HMMA 840-07, Installation and Storage of Hollow Metal Doors and Frames.
 - .2 NAAMM HMMA 841-07, Tolerances and Clearance for Commercial Hollow Metal Doors and Frames.
 - .3 NAAMM HMMA 863-04, Guide Specification for Detention Security Hollow Metal Doors and Frames.
- .5 Owner's Door and Frame Shop Drawings
 - .1 'Hollow Metal Door & Pressed Steel Frame Shop Drawings' are appended to provide supplementary detailed requirements for sliding cell doors. In the event of conflict with these specifications the appended Shop Drawings will govern.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit proof of manufacturer's written certification in accordance with requirements of NAAMM HMMA 863 and ASTM F1450 for static load, rack, impact load and removable glazing stop tests.
- .2 Provide performance testing data prior to fabrication. Failure to provide required testing data or submission of misrepresented testing data would result in disqualification. In the event of disqualification substitute an acceptable alternate manufacturer or subcontractor, at no additional cost to the Departmental Representative.
- .3 Provide product data: in accordance with Section 01 33 00 - Submittal Procedures.
- .4 Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Indicate each type of door, material, internal reinforcement, mortise reinforcements, anchor types, closure methods, fastener locations, location of cut-outs for hardware, location of cut-outs for glazing, and finishes.
 - .2 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors, and finishes.
 - .3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
 - .4 Submit test and engineering data, and installation instructions.

1.4 MAINTENANCE DATA

- .1 Provide maintenance data for incorporation into manual in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide documentation including:
 - .1 Hardware identification including part numbers, manufacturer, and source of supply.
 - .2 Provide to the Departmental Representative a recommended spare parts list for maintenance purposes.
 - .3 Complete operation, adjustment, maintenance, and repair procedures.
 - .4 Name, address, and telephone numbers of product supplier and installing Subcontractor.
- .3 Provide two sets of Special Tools for installation and removal of each type of security screws in accordance with Section 01 78 00 - Closeout Submittals.
- .4 Sign off and verification of the detention door and hardware system is required during the Commissioning process.

1.5 QUALITY ASSURANCE

- .1 Perform Work to requirements of CSDMA (Canadian Steel Door Manufacturers Association) and HMMA (Hollow Metal Manufacturers Association) standards.
- .2 Manufacturer:
 - .1 Minimum 5 years documented experience designing and manufacturing detention hollow metal door assemblies.

1.6 MOCK-UP

- .1 Provide a full size mock-up in accordance with Section 01 45 00 – Quality Control for one sliding cell door.
- .2 Show complete installation including door, frame, glazing, hardware and operating system. Door and controls to be indicative of final installation in every aspect with all functions operable for inspection.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Comply with HMMA 840.
- .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.

1.8 WARRANTY

- .1 Provide Manufacturer's five (5) year warranty from date of substantial completion, covering material and workmanship.

Part 2 Products

2.1 MATERIALS

- .1 Face Sheet Steel:
 - .1 Commercial grade steel to ASTM A568/A568M, Class 1, hot dipped galvanized to ASTM A568/A568M, commercial quality coating designation to ASTM A924/A924M, ZF075.
- .2 Steel plate, shapes and bars:
 - .1 Structural quality to CAN/CSA-G40.20/G40.21, type 230G or 260W; free of scale, pitting and other surface blemishes.
- .3 Accessories:
 - .1 Floor anchors, channel spreaders, tee anchors, and wall stud anchors zinc coated to ASTM A1008M, coating designation ZF075, drill stud anchors to wire tie to studs, lag bolts, shields, and bushings for existing openings.
- .4 Guard boxes:
 - .1 ZF075 coating designation zinc finish, 1.6 mm core thickness steel unless noted otherwise.
- .5 Door insulation:
 - .1 Fibre board insulation for sound deadening, minimum 24 kg/m density.
- .6 Filler: Polyester type automotive body spot filler compound.
- .7 Isolation coating: Alkali resistant bituminous paint.

2.2 DETENTION DOORS

- .1 Conforming to Level 3 requirements of ANSI/NAAMM/HMMA 863 and ASTM F1450.
- .2 Galvanized Steel
 - .1 Steel sheet faces: 2.0 mm thick (14ga.), wipcoat, flush design.
 - .2 Core: 2.75mm (12ga.) stiffened core in conformance with HMMA 863 standards.
 - .3 Epoxy primed.
 - .4 Mortised to accept deadlatch hardware.
- .3 Fabrication Tolerances: To HMMA 841.
- .4 Lexan View Lite complete with Operable Viewport Shutter
 - .1 In accordance with appended Owner's Door and Frame Shop Drawings.
 - .2 Lexan View Lite:
 - .1 Size: 192 x 524mm,
 - .2 Material: one layer of 6.35mm mar-resistant Lexan flush with inmate side of door sandwiched to one layer of 19mm Lexan on corridor side, nylon gaskets behind, and set into steel frame
 - .3 Operable Viewport Shutter:
 - .1 Material: 2.78mm (12ga.) stainless steel plate complete with 25 x 51 x 12.7mm thick stainless steel plate handle, set in 2.54mm thick steel tracks with plastic U-channel, tamper resistant screws fastened to steel door.
 - .2 Locate as close to door hinge side as possible.
- .5 Food Pass Flap
 - .1 In accordance with appended Owner's Door and Frame Shop Drawings.
 - .2 Size: 309 x 120mm clear opening,
 - .3 Material: 1.99mm (14ga.) steel plate welded to 2.75mm (12ga.) steel plate reinforcement on guard side of door steel.
 - .4 Fabricate food pass assembly and latch, flush with inmate side of door.

2.3 DETENTION FRAMES

- .1 Galvanized Steel
 - .1 Steel sheet: 2.75mm thick (12ga.), wipcoat.
 - .2 Epoxy primed.
 - .3 Prepared to accept heavy- weight track and hardware as indicated in appended Owner's Door and Frame Shop Drawings.
 - .4 Frame must be prepared for correct anchoring system compatible with the wall type.
- .2 Fabrication Tolerances: To HMMA 841.

2.4 SLIDING DETENTION DOOR LOCKSET

- .1 Conforming to ASTM F1643.

- .2 Mechanical Detention Lockset:
 - .1 Five Tumbler Paracentric Mechanical Deadbolt, combination spring and deadlock, keyed one side.
 - .2 Heavy duty, maximum security, paracentric keyed, lever tumbler deadlock, locks and unlocks by key only.
 - .3 The lock must NOT automatically latch upon closing. Lock shall unlock with a half turn of the key and deadlock the latchbolt with a full turn of the key.
 - .4 The locks must come complete with mounting plate, strike and escutcheon.
 - .1 Sliding cell door: double wing escutcheon, 3 mm thick stainless steel
 - .5 All fasteners must be Torx Tamperproof, flat head machine screws.
 - .6 Sliding Door acceptable manufacturers and model numbers:
 - .1 Chubb 1030D-1
 - .2 Folger Adams 32D
 - .3 Southern Steel 1030D-1
 - .4 RR Brick 7030D.

2.5 ACCESSORIES

- .1 All screws must be flathead undercut Torx Tamperproof screws. Screws must be supplied compatible with the material they are fastening, as well as the material they are securing into.

2.6 DETENTION DOORS FABRICATION

- .1 Door Edge Construction: Longitudinal edges welded, filled and sanded with no visible edge seams.
- .2 Door Core Construction: Stiffened with continuous steel sections, spaced with interior webs not more than 152mm apart, which upon assembly span the full thickness of the interior of the door.
- .3 Top and Bottom Channels: Inverted, recessed, welded steel channels.
- .4 Reinforce doors where surface mounted hardware is required
- .5 Drill and tap for mortised, templated hardware.
- .6 Fabricate doors with hardware reinforcement plates welded in place.

2.7 DETENTION FRAMES FABRICATION

- .1 Welding in accordance with CSA W59.
- .2 Welded type construction, mitred corners, securely weld on inside of profile.
- .3 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to a uniform smooth finish.
- .4 Factory assemble and weld frames.
- .5 Fabricate frames with hardware reinforcement plates welded in place.

- .6 Reinforce frames wider than 1200 mm with roll formed steel channels fitted tightly into frame head, flush with top.

2.8 FINISHES

- .1 Galvanized Steel Finish: Factory applied epoxy primer to be applied to all exposed surfaces. Touch-up only, where product has been welded and ground smooth.

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 DOOR INSTALLATION

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 63 – Detention Door Hardware.
- .2 Provide even margins between doors and jambs and doors and finished floor
 - .1 Sliding detention doors:
 - .1 Hinge side, latch side, and head: 3.0 mm maximum.
 - .2 Finished floor: 19 mm maximum.
- .3 Adjust operable parts for correct function.

3.3 FRAME INSTALLATION

- .1 Set frames plumb, square, level and at correct elevation.
- .2 Secure anchorages and connections to adjacent construction.
- .3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
- .4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
- .5 Epoxy caulk perimeter of frames. Install caulking at a 45 degree angle with a consistent width and height.

3.4 ERECTION TOLERANCES

- .1 Installation tolerances of installed frame for squareness, alignment, twist and plumbness are to be no more than $\pm 1.5\text{mm}$ in compliance with HMMA 841.

3.5 FINISH REPAIRS

- .1 Touch up with primer finishes damaged during installation.

- .2 Fill exposed frame anchors surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.
- .3 Remove all burrs and sharp edges after installation.

END OF SECTION

Hollow Metal Door & Pressed Steel Frame Shop Drawings

Project: SLIDING AND SWINGING CELL DOORS

LEVEL 3 NAAMMM 863-98 ASTM F1450-97 PERFORMANCE CRITERIA

Prepared By: CATRIONA L JOHNSON

Date: SEPTEMBER 26, 2007

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GENERAL NOTES: PLEASE READ

- 1) FABRICATION OF HOLLOW METAL DOORS & FRAMES WILL NOT COMMENCE UNTIL THE FOLLOWING IS RECEIVED:
 - A) APPROVED HARDWARE SCHEDULE
 - C) ALL NECESSARY HARDWARE TEMPLATES
 NOTE: LEAD TIMES VARY SO THIS INFORMATION IS CRITICAL
- 2) THESE DRAWINGS ARE FOR THE RCMP USE ONLY. RCMP WILL NOT ACCEPT ANY RESPONSIBILITY DUE TO ERRORS CAUSED BY THE USE OF THESE DRAWINGS BY OTHER TRADES.
- 3) DOORS AND FRAMES TO BE REINFORCED FOR SURFACE MOUNTED HARDWARE AS REQUIRED. DRILLING AND TAPPING FOR ATTACHING OF SURFACE MOUNTED HARDWARE BY OTHERS. DOORS AND FRAMES WILL BE BLANKED, REINFORCED, DRILLED AND TAPPED FOR MORTISED TEMPLATED HARDWARE. TRIM MOUNTING HOLES AND ALL HOLES $\varnothing 1/2"$ [13 mm] & LESS, BY OTHERS.
- 4) MAXIMUM ALLOWABLE DISTANCE BETWEEN THE SLIDING DOOR AND THE FRAME MUST BE LIMITED TO 1/8" [3 mm]. FIELD SHIMMING MAY BE REQUIRED ON SITE BY THE INSTALLATION CONTRACTOR TO OBTAIN THE DESIRED CLEARANCES.
- 5) ALL DOORS AND FRAMES TO BE MARKED WITH THE DOOR MANUFACTURERS NAME AND PRODUCT NUMBER ON THE SECOND HINGE FROM THE TOP UNLESS SPECIFIED OTHERWISE.
- 6) ALL HOLLOW METAL FRAMES SHALL BE OF WELDED CONSTRUCTION UNLESS NOTED OTHERWISE.
- 7) ALL SWING TYPE FRAMES TO BE PREPARED FOR PUSH-IN TYPE SILENCERS, 3 PER STRIKE JAMB FOR SINGLE FRAMES OR 2 PER HEAD FOR DOUBLE FRAMES.
- 8) ALL HARDWARE LOCATIONS ON THE DOORS & FRAMES TO BE AS PER THE FOLLOWING DRAWINGS, UNLESS ADVISED OTHERWISE.
- 9) GENERAL CONTRACTOR IS RESPONSIBLE TO ENSURE THAT FRAMES AND DOORS ARE SET PLUMB, SQUARE, LEVEL AND THAT WALLS AND FRAME ARE FULLY GROUTED. THE MANUFACTURER OF HOLLOW METAL DOORS AND/OR PRESSED STEEL FRAMES CAN NOT CONTROL THE QUALITY OF EITHER THE HARDWARE, THE FIELD INSTALLATION OF HARDWARE, OR THE PROPER ERECTION OF FRAMES IN THE WALL.
- 10) ALL BURRS AND SHARP EDGES MUST BE REMOVED AFTER INSTALLATION.
- 11) THE FOLLOWING SHOP DRAWINGS REFLECT A STANDARD 195 mm BLOCK WALL CONSTRUCTION, SITE CONDITIONS MAY VARY.

REVISIONS:	NOTES:
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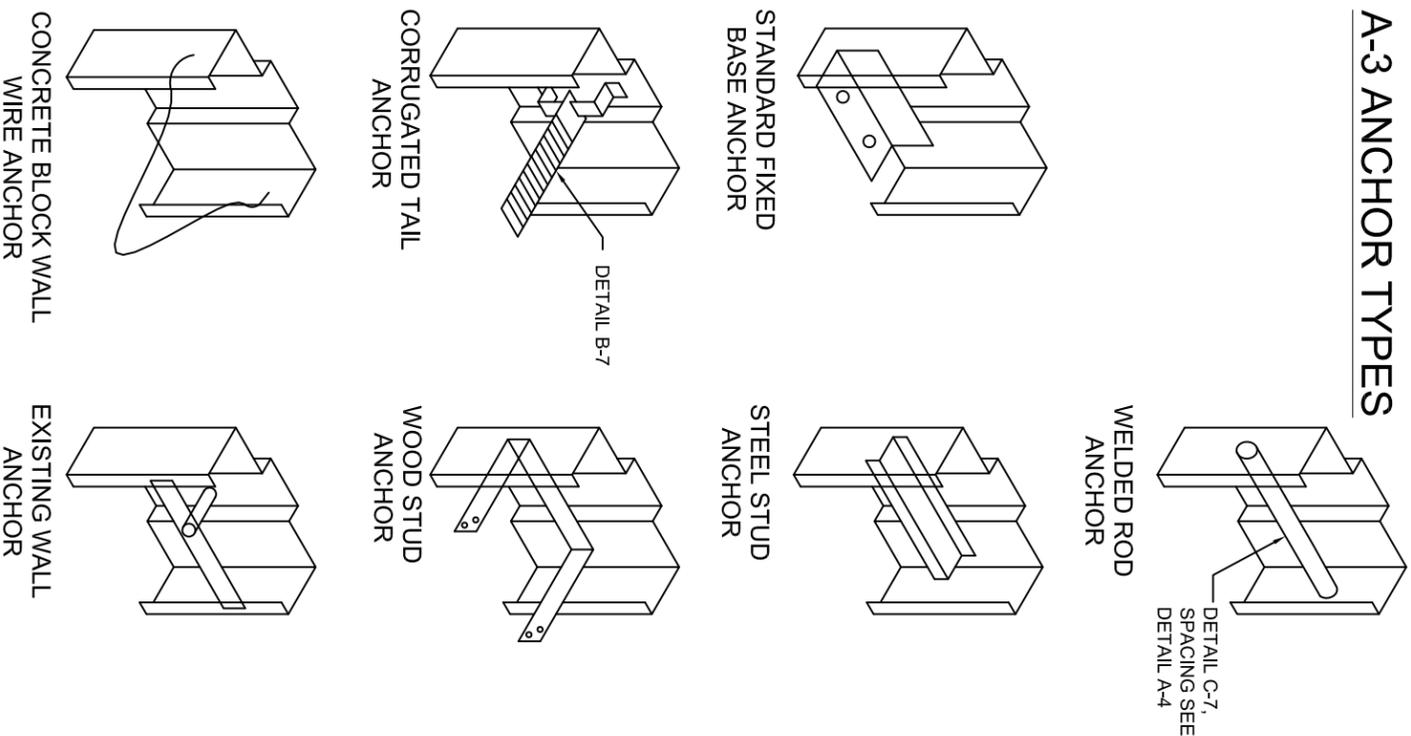
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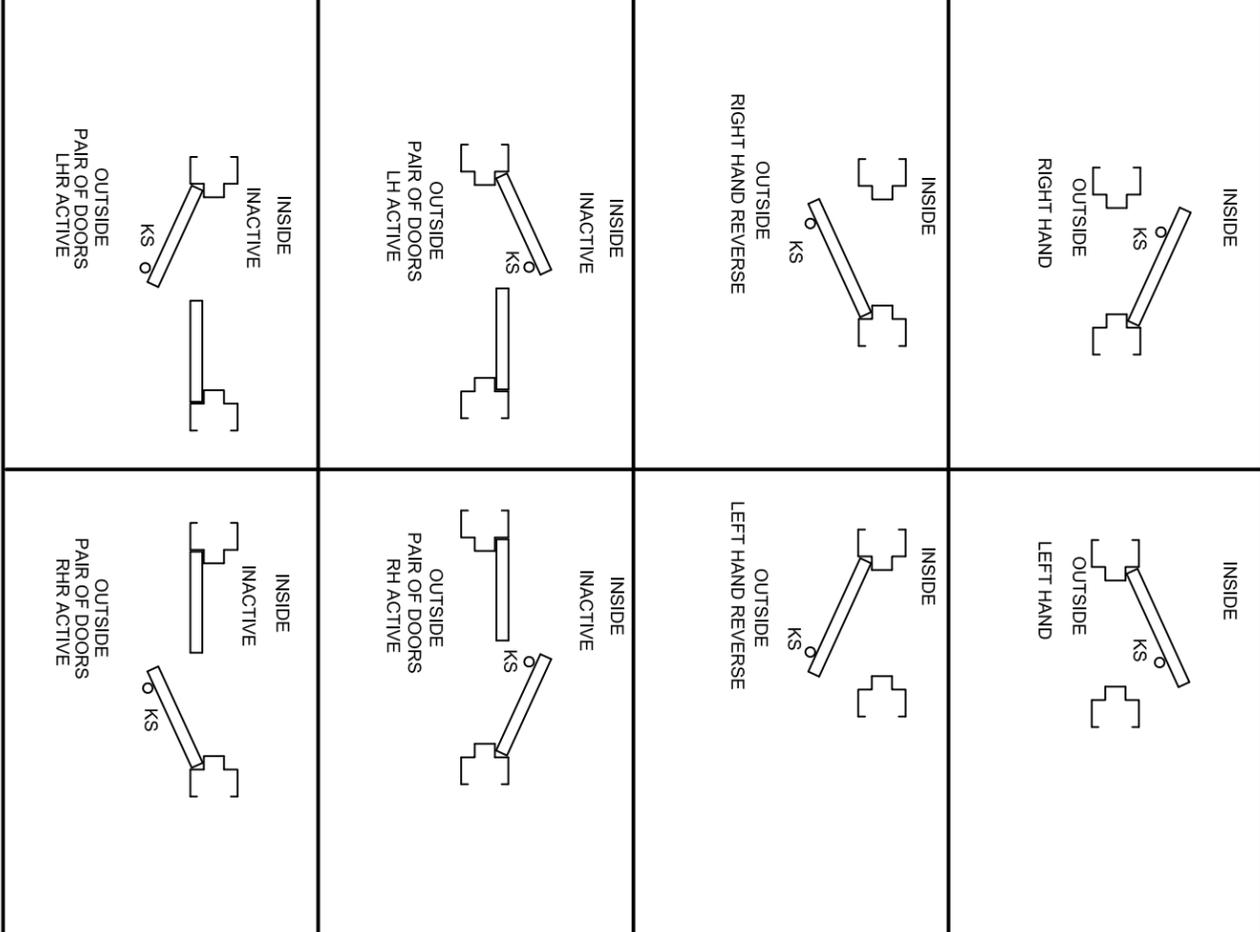
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A-3 ANCHOR TYPES



B-3 DOOR AND FRAME HANDING CHART TO DETERMINE HAND(SWING) OF DOOR AND FRAME STAND OUTSIDE - FACING DOOR



* KS IS THE KEY SIDE OF DOOR (PLEASE CHECK ALL SWINGS TO ENSURE KEY IS ON PROPER SIDE OF DOOR)

FIRE RATING LABELS

- A - 3 HOUR
 - B - 1 1/2 HOUR
 - C - 45 MINUTE
 - 20M - 20 MINUTE
- #### DOOR MATERIALS
- HM - HOLLOW METAL DOOR - HONEYCOMB
 - IHM - INSULATED HOLLOW METAL DOOR - POLYSTYRENE
 - SLH - STEEL STIFFENED (LAMINATED-HONEYCOMB)
 - SLP - STEEL STIFFENED (LAMINATED-POLYSTYRENE)
 - SWF - STEEL STIFFENED (WELDED-FIBREGLASS)
 - SCW - SOLID CORE WOOD DOOR
 - HCW - HOLLOW CORE WOOD DOOR
 - PLM - PLASTIC LAMINATED
- #### REMOVABLE STOPS
- PL - PULL SIDE OF DOOR
 - PS - PUSH SIDE OF DOOR
- #### ANCHOR TYPES
- SS - STEEL STUD ANCHOR
 - CT - CORRUGATED TAIL ANCHOR
 - WS - WOOD STUD ANCHOR
 - EWA - EXISTING WALL ANCHOR
 - CB - CONCRETE BLOCK WIRE ANCHOR
 - BA - BASE ANCHOR
 - WR - WELDED ROD ANCHOR
- #### HARDWARE
- PP - PUSH & PULL
 - RIM - RIM PANIC
 - VR - VERTICAL ROD
 - FB - FLUSH BOLT
 - R/F - REINFORCE
 - CVR - CONCEALED VERTICAL ROD
- #### DOOR SWINGS
- LH - LEFT HAND
 - LHR - LEFT HAND REVERSE
 - RH - RIGHT HAND
 - RHR - RIGHT HAND REVERSE

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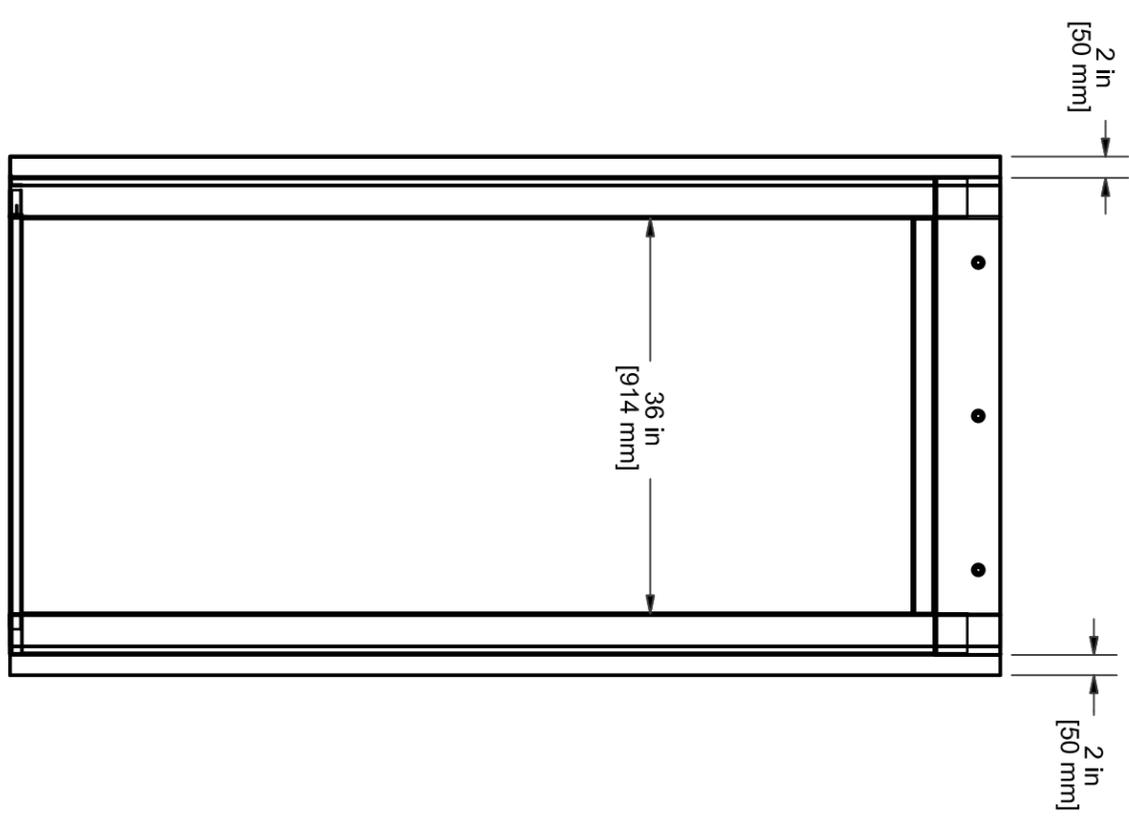
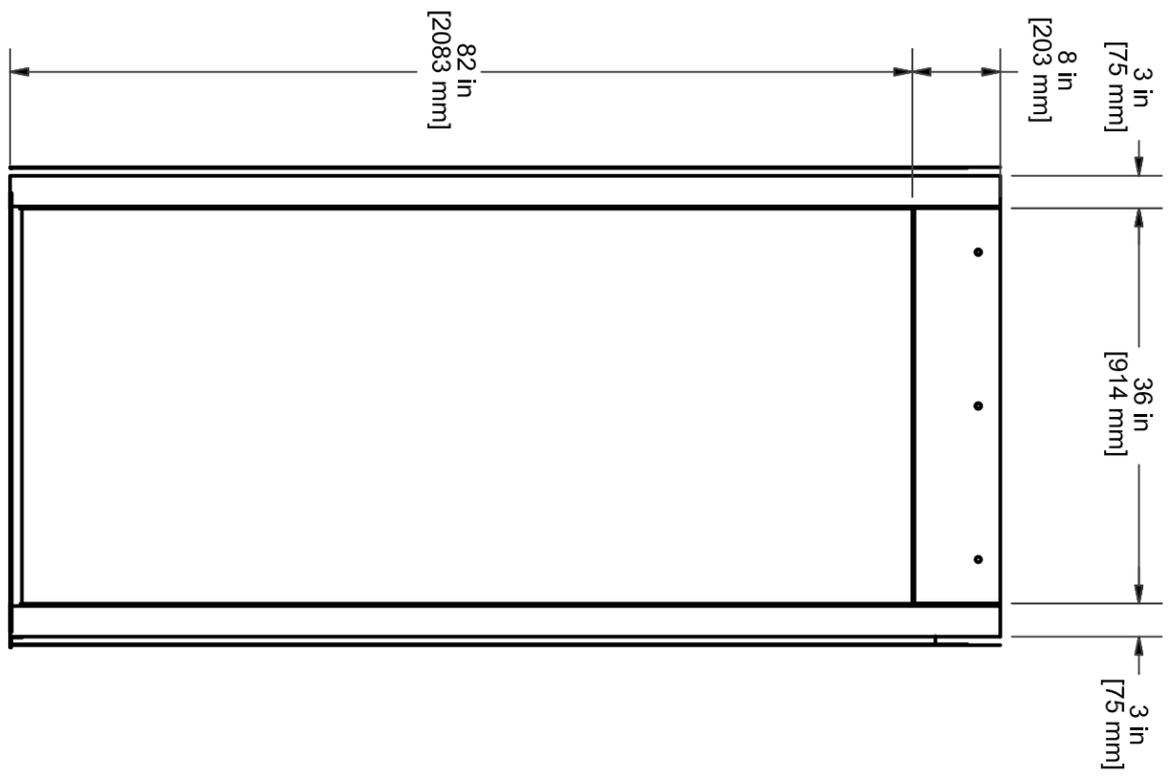
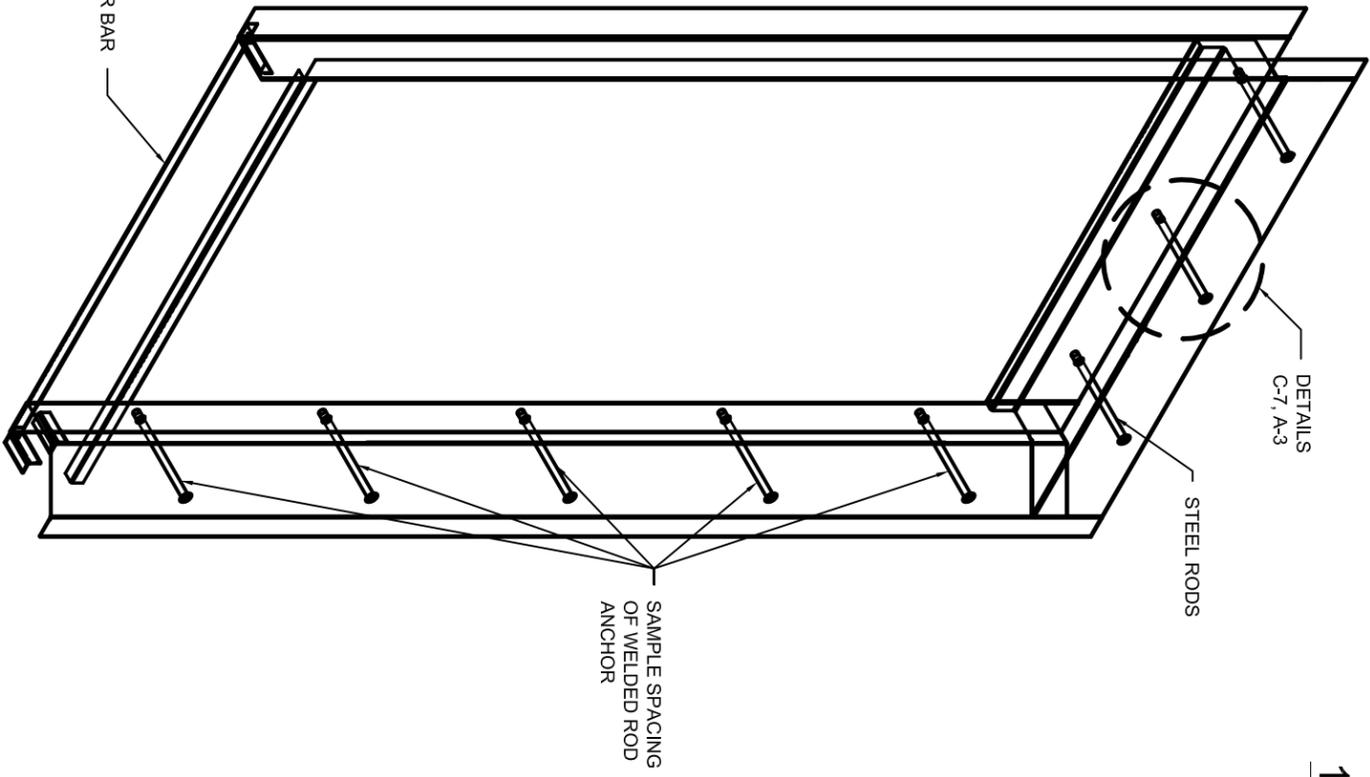
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12GA. FRAME FOR SLIDING DOOR



A-4 ISOMETRIC VIEW

B-4 CORRIDOR SIDE

C-4 DETAINEE SIDE

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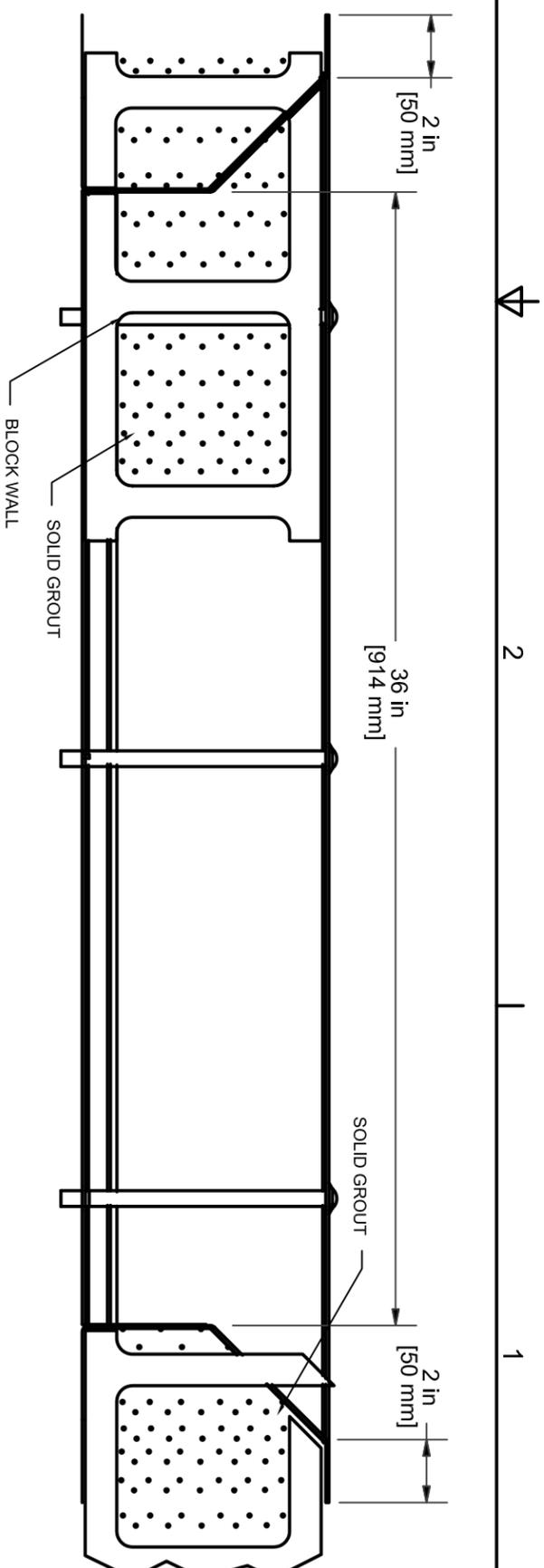
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A

B

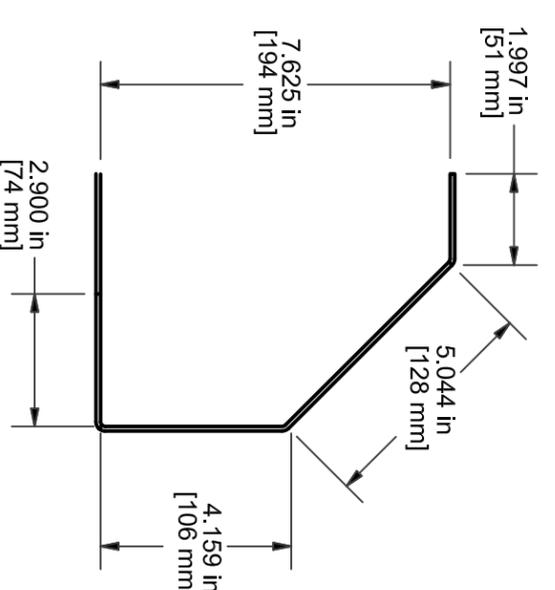
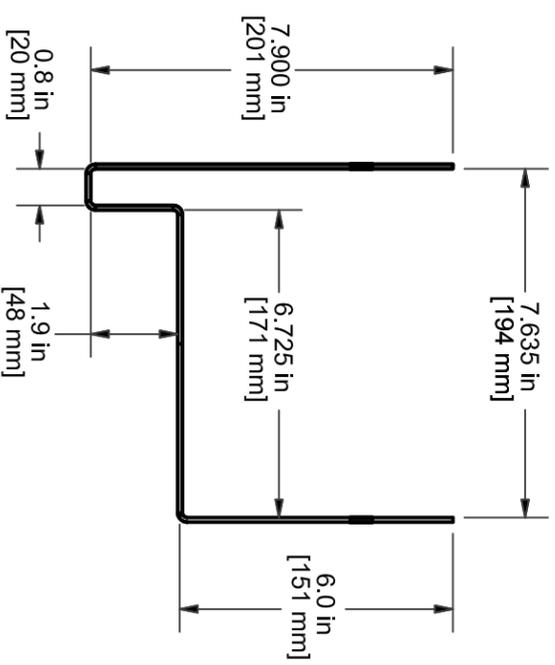
NOTE: FRAME MUST BE FULLY GROUTED FOR PROPER SLIDING ASSEMBLY INSTALLATION

NOTE: OPTIONAL 2" LENGTH X 3/16" [51 x 5 mm] FILLER PLATE CONTINUALLY WELDED TO HEADER AND SIDES OF FRAME.



A-5 SECTION THROUGH FRAME

C-5 JAMB PROFILES FOR BENDING



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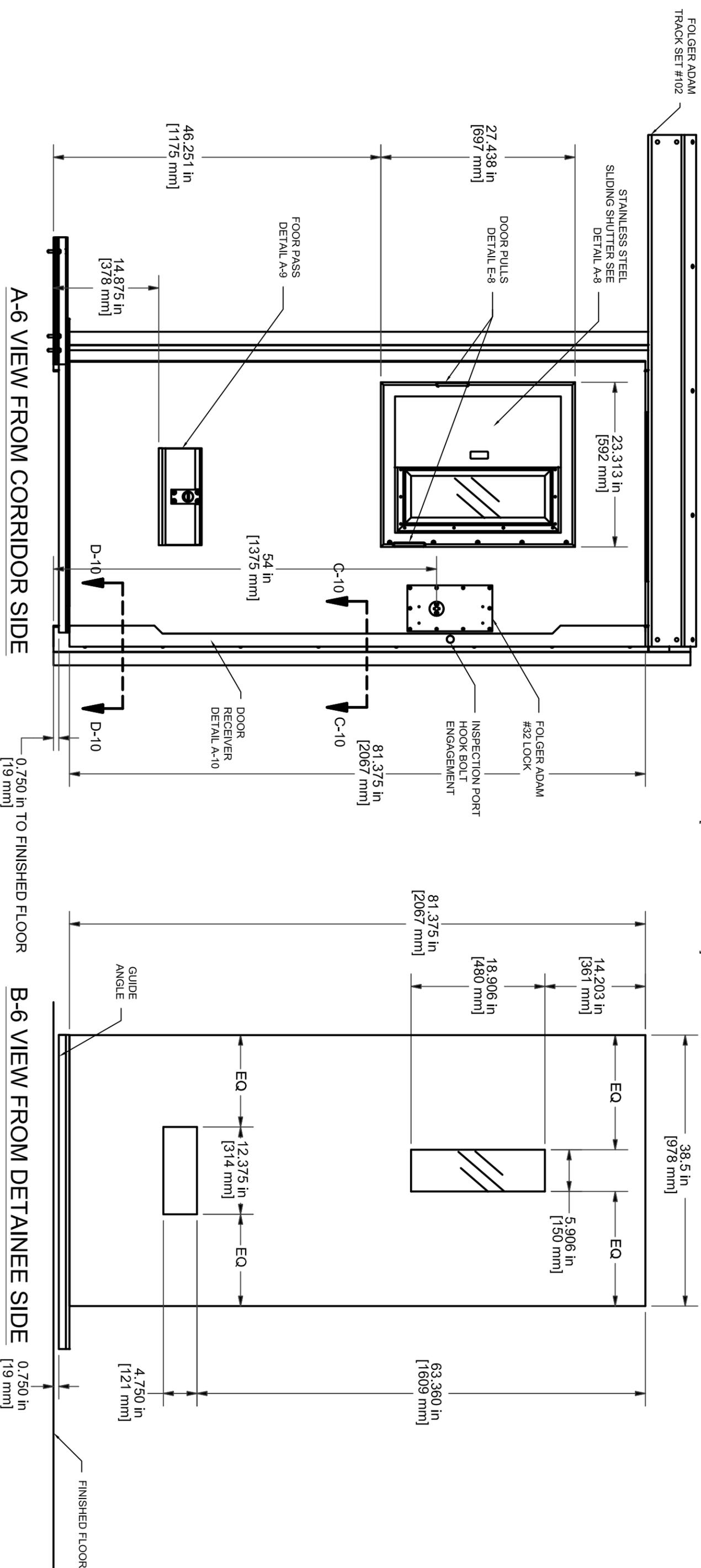
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TYPE A CELL DOOR (SLIDING)

12GA. FRAME & 14GA. STEEL STIFFENED DETENTION DOOR
 LEVEL 3 NAAMM 863-98 AND ASTM - F1450-97 PERFORMANCE CRITERIA
 FOR STATIC LOAD, RACK, IMPACT, & EDGE CRUSH TESTS
 3'-0" x 7'-0" x 2" [914 x 2134 x 52 mm]



A-6 VIEW FROM CORRIDOR SIDE

B-6 VIEW FROM DETAINEE SIDE

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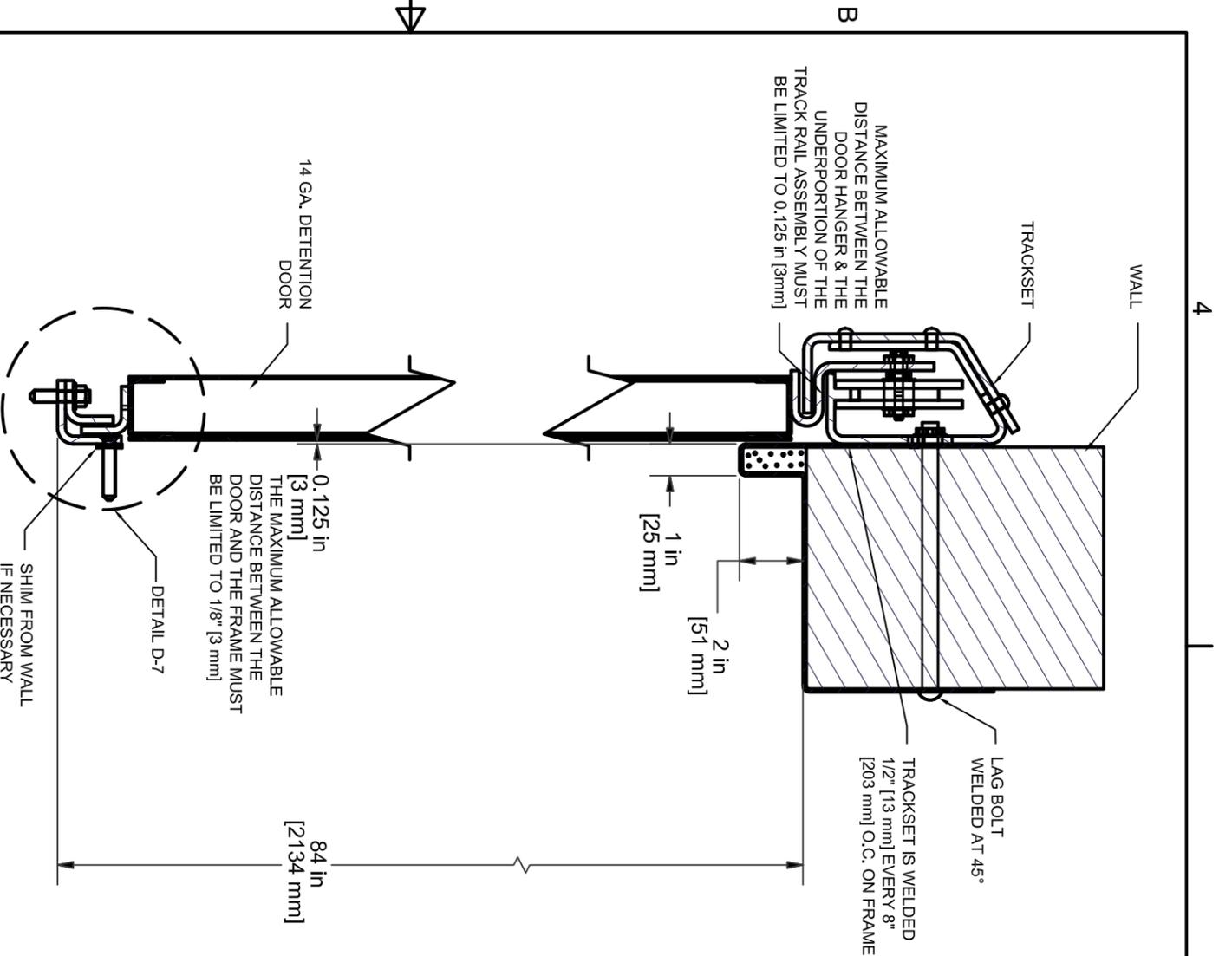
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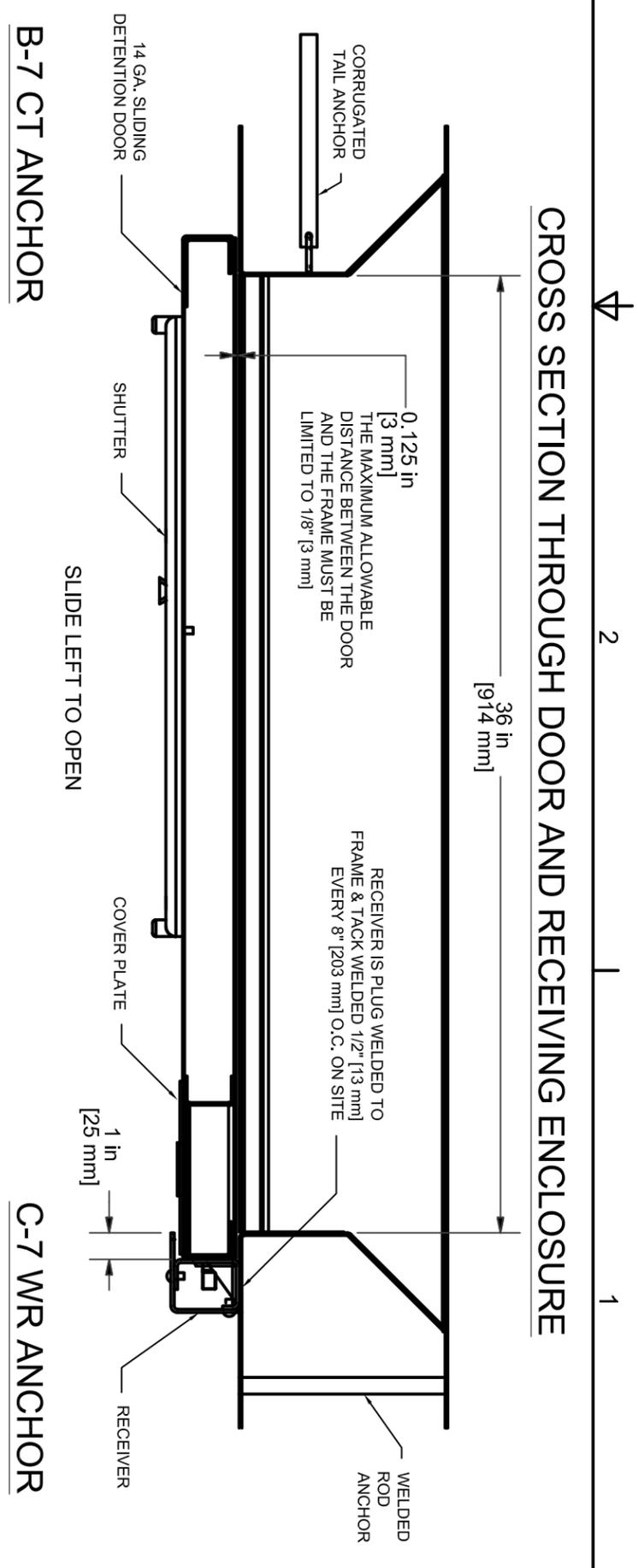
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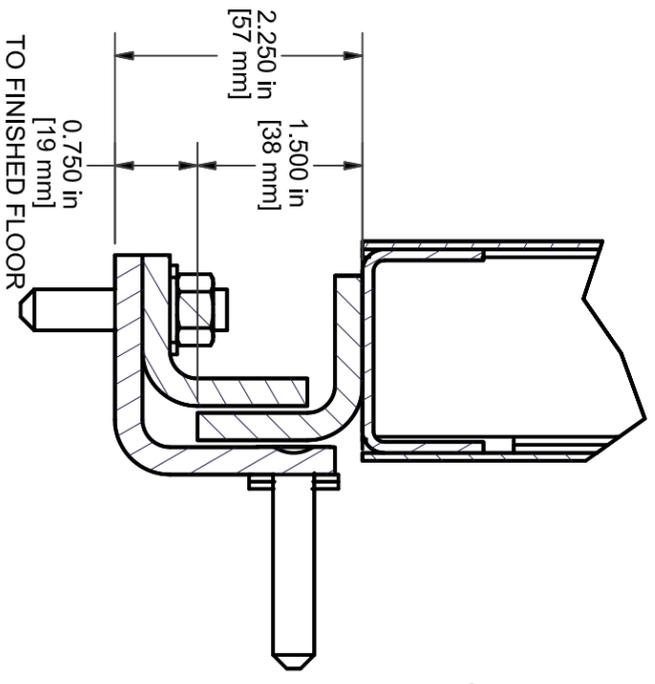
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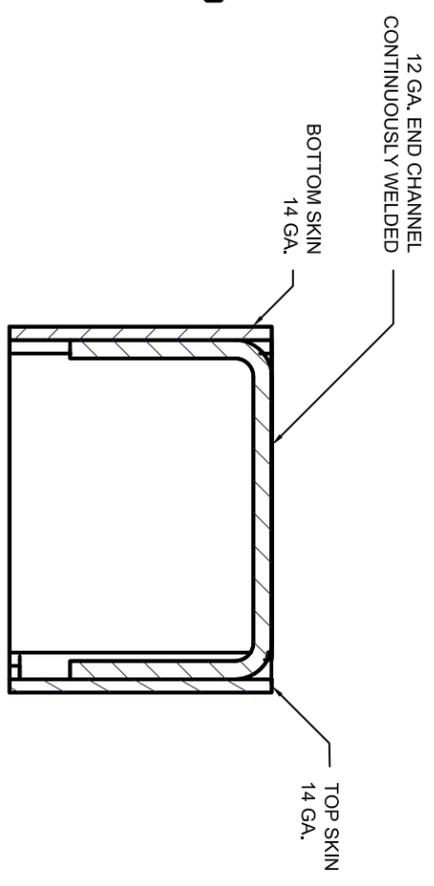
A-7 SECTION THROUGH TRACKSET AND DOOR



CROSS SECTION THROUGH DOOR AND RECEIVING ENCLOSURE



D-7 DETAIL



E-7 DETAIL TOP & BOTTOM END CHANNEL

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NOTES:
SEE A-3 FOR ADDITIONAL ANCHOR OPTIONS

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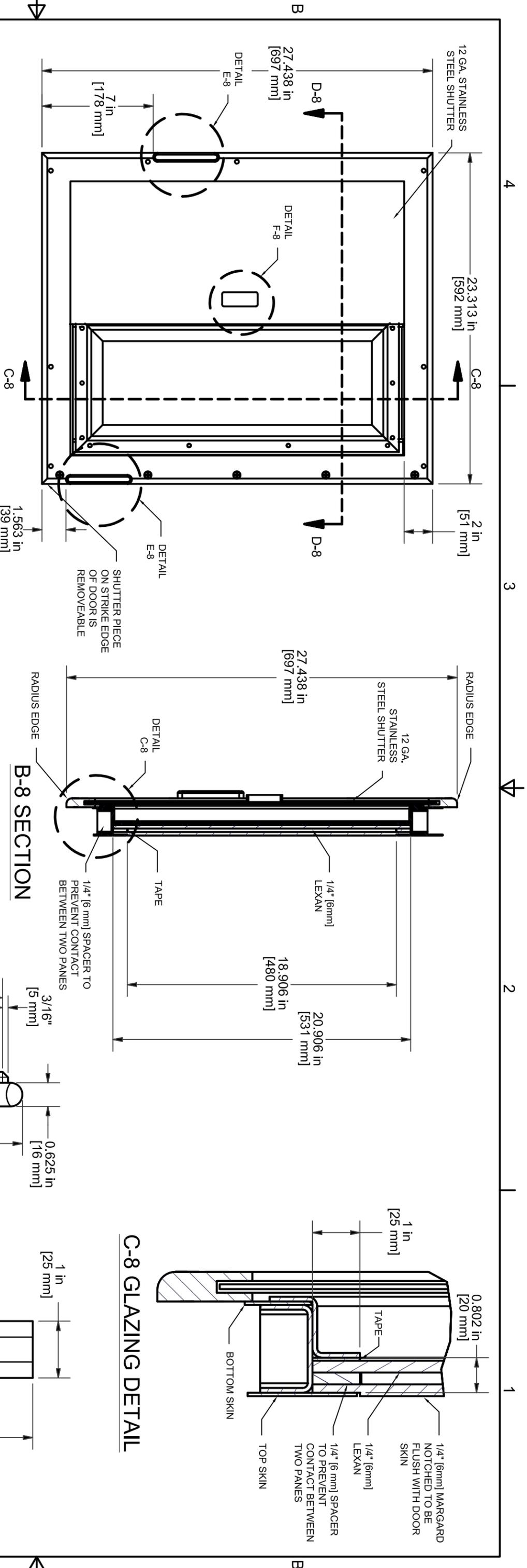
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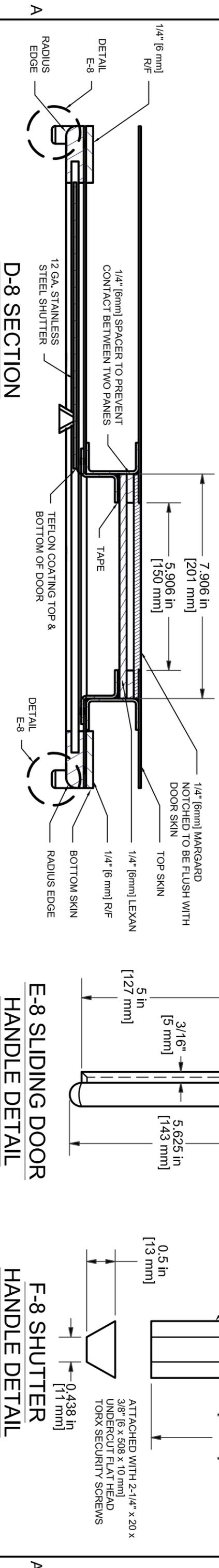
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A-8 SLIDING SHUTTER

B-8 SECTION

C-8 GLAZING DETAIL



D-8 SECTION

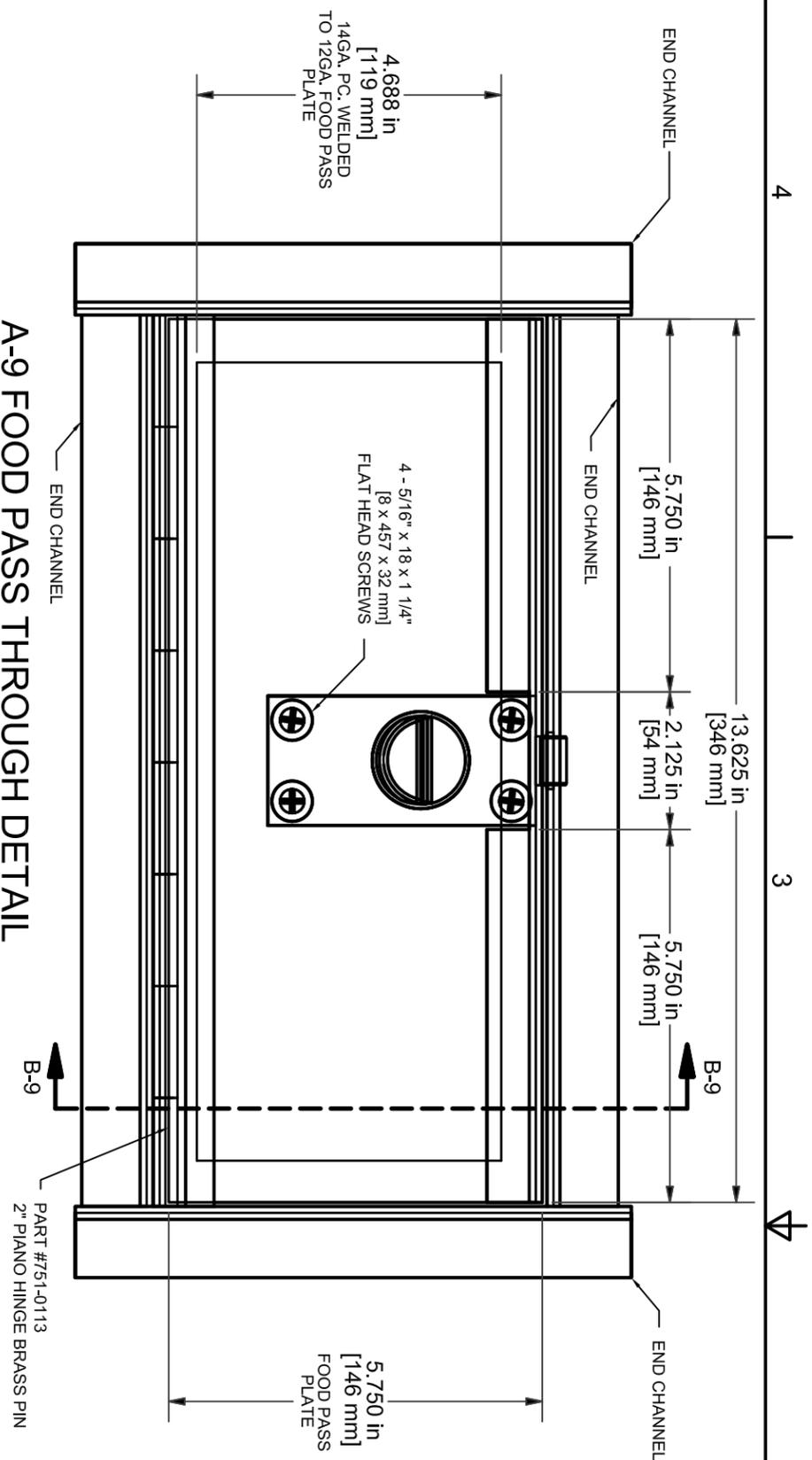
E-8 SLIDING DOOR HANDLE DETAIL

F-8 SHUTTER HANDLE DETAIL

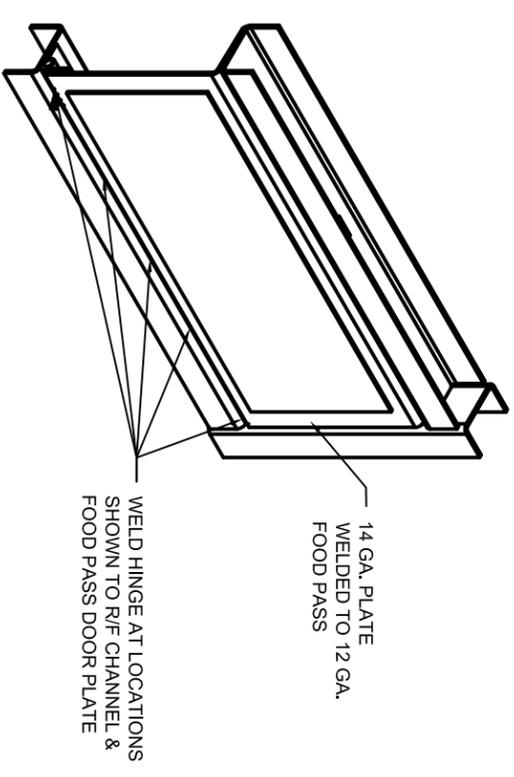
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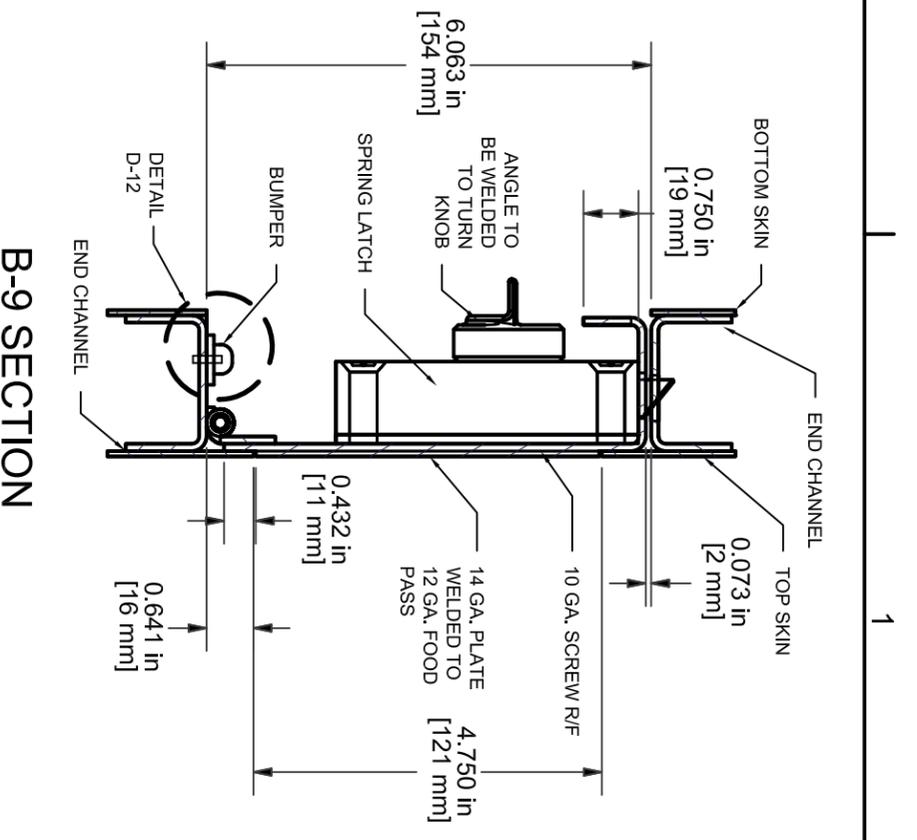
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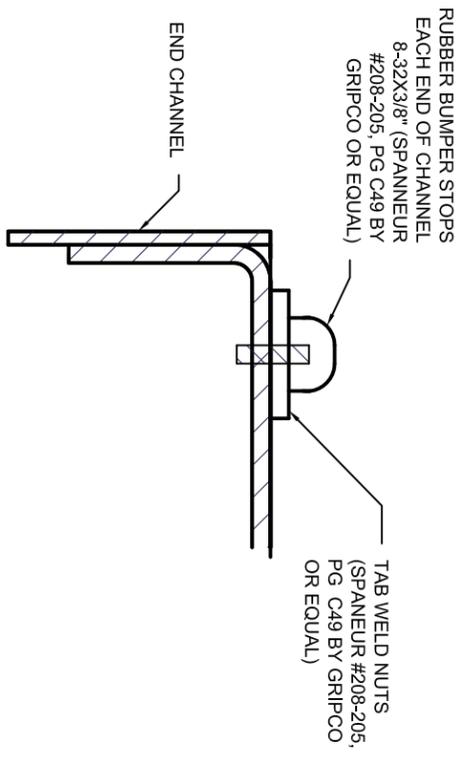
A-9 FOOD PASS THROUGH DETAIL



C-9 FOOD PASS THROUGH DETAIL



B-9 SECTION



D-12 BUMPER DETAIL

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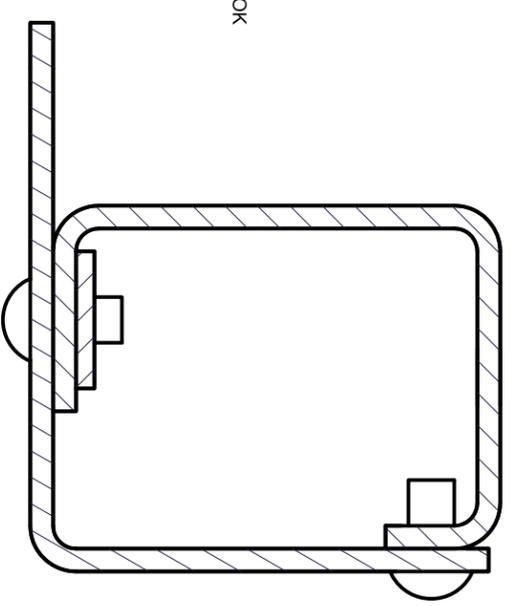
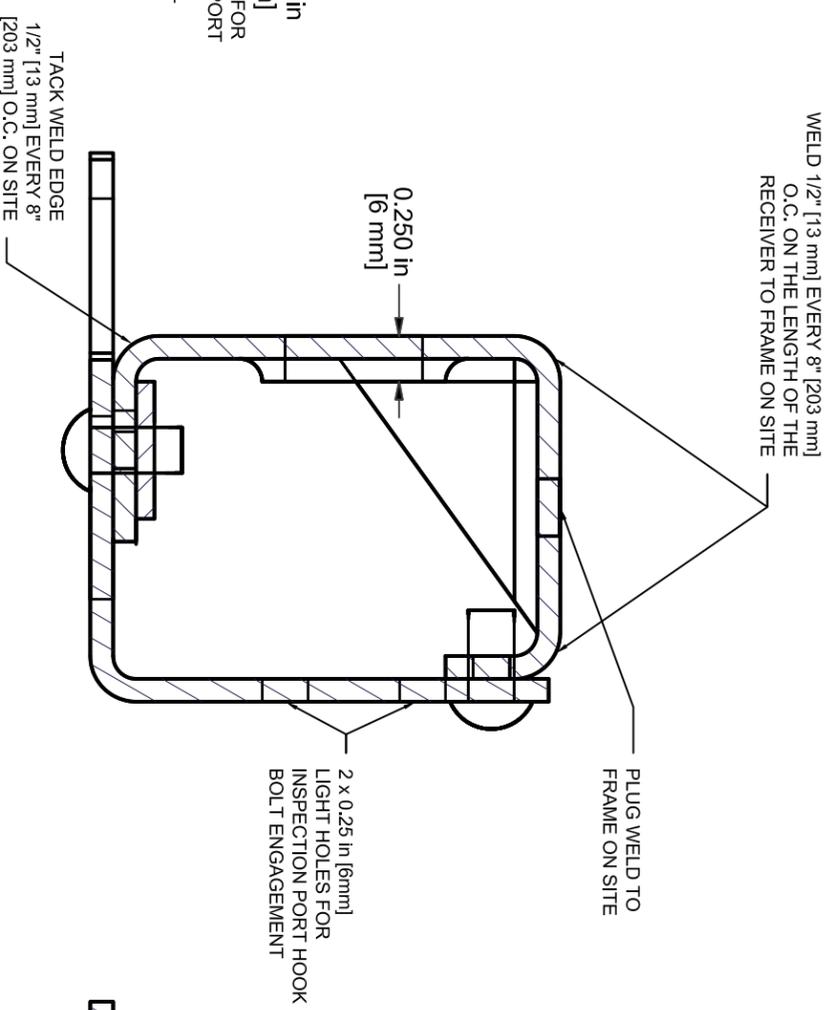
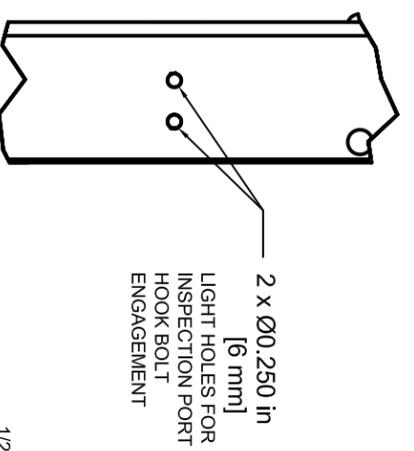
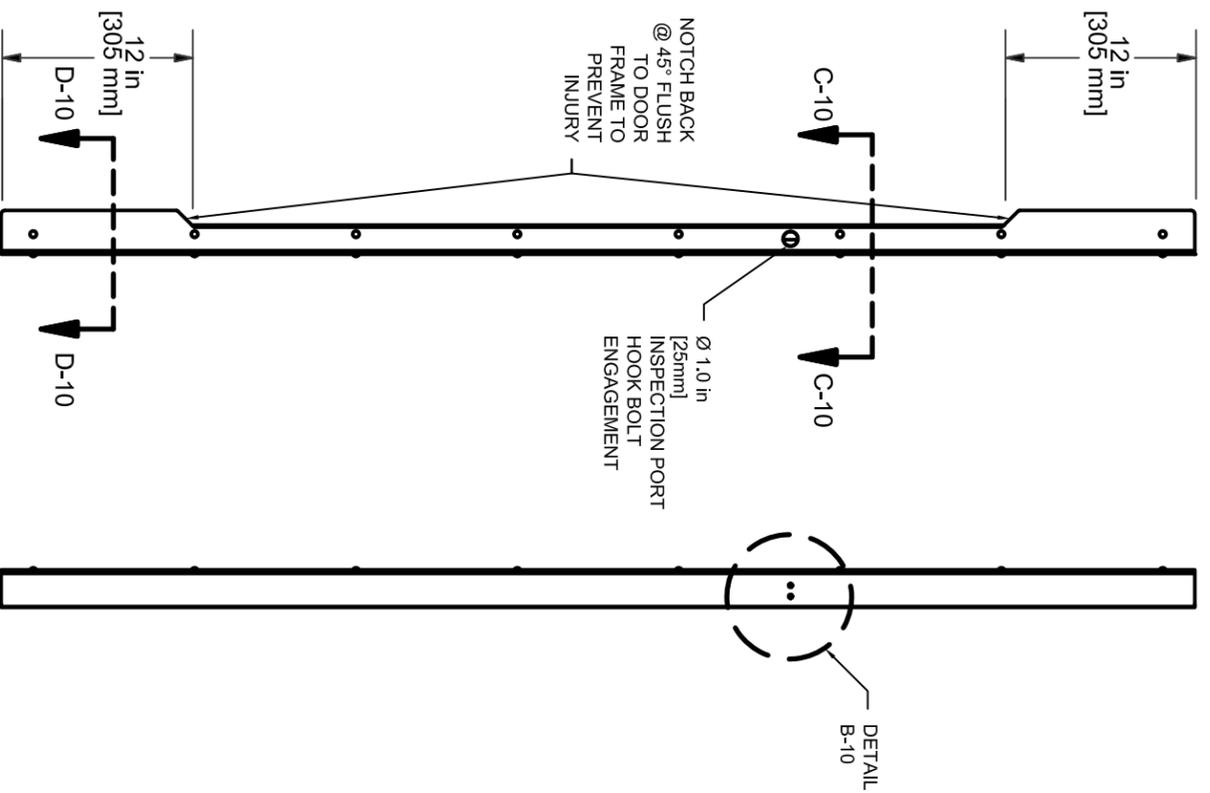
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A-10 DOOR RECEIVER

REVISIONS:

NOTES:
REMOVE ALL BURRS AND SHARP EDGES AFTER WELDING

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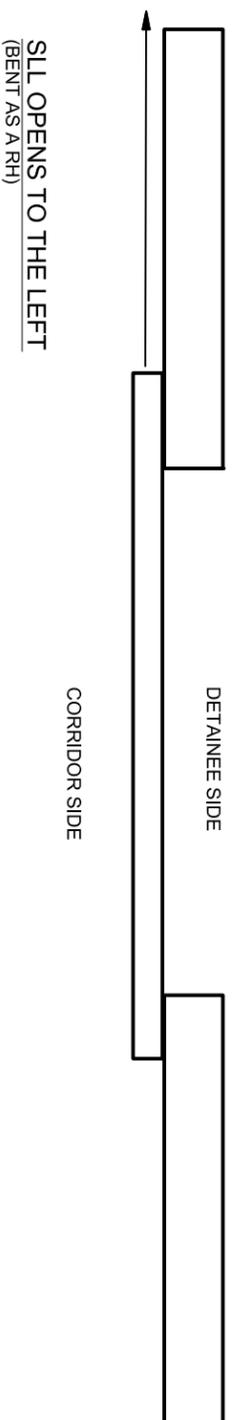
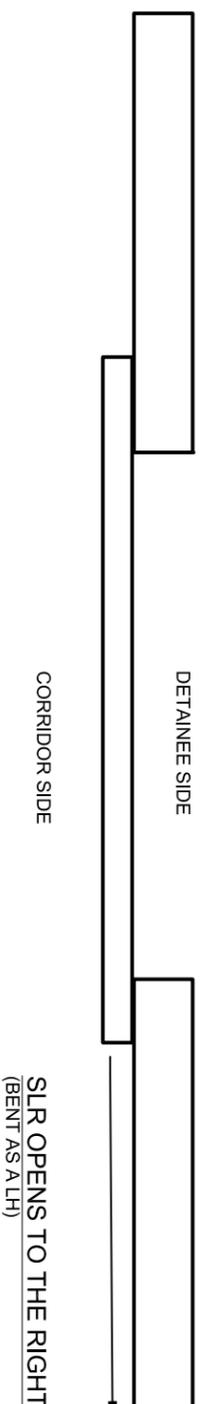
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A-11 SLIDING HANDING SHEET



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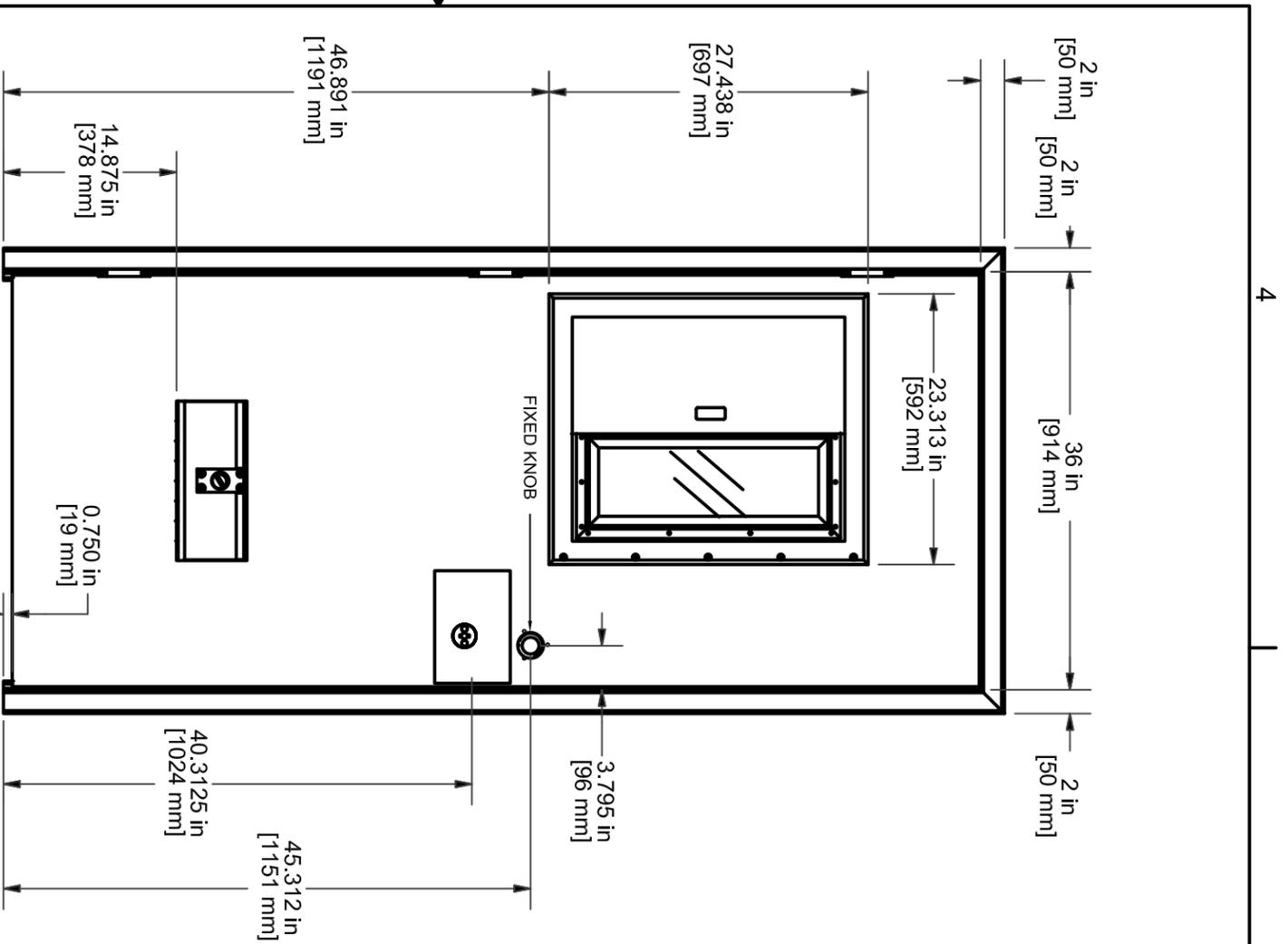
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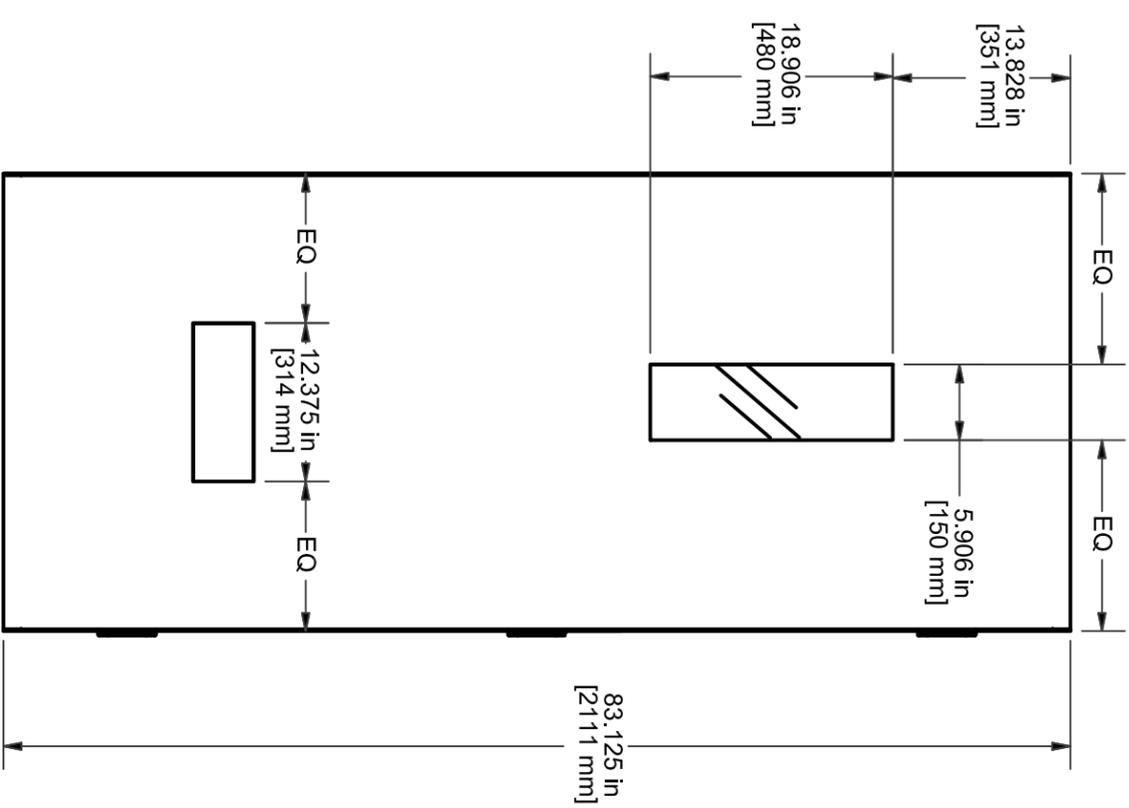
TYPE B CELL DOOR (SWINGING)

(MAY ALSO BE INSTALLED IN TYPE A CELLS)
 12GA. FRAME & 14GA. STEEL STIFFENED DETENTION DOOR
 LEVEL 3 NAAMM 863-98 AND ASTM - F1450-97 PERFORMANCE CRITERIA
 FOR STATIC LOAD, RACK, IMPACT, & EDGE CRUSH TESTS
 3'-0" x 7'-0" x 2" [914 x 2134 x 51 mm]

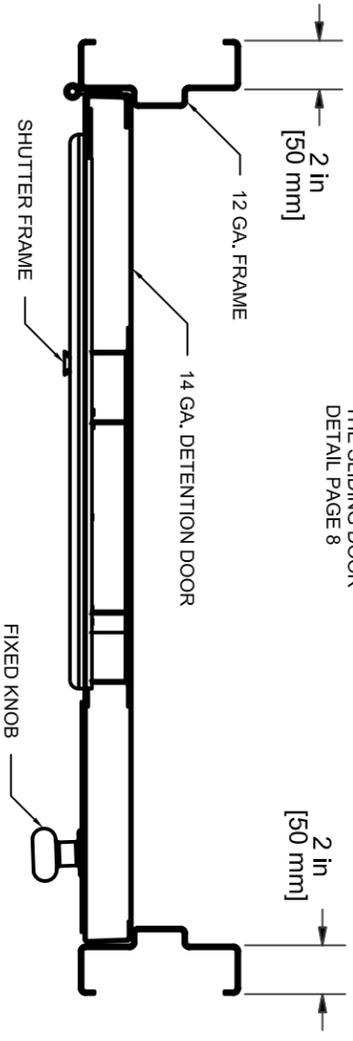
NOTE: LITE KIT IS THE SAME AS
 THE SLIDING DOOR
 DETAIL PAGE 8



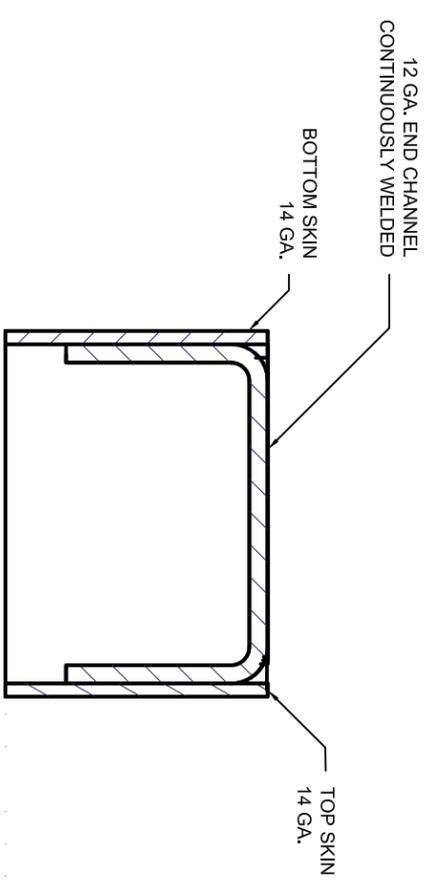
A-12 VIEW FROM CORRIDOR SIDE



B-12 VIEW FROM DETAINEE SIDE



C-12 CROSS SECTION THROUGH DOOR & FRAME



D-12 DETAIL TOP & BOTTOM END CHANNEL

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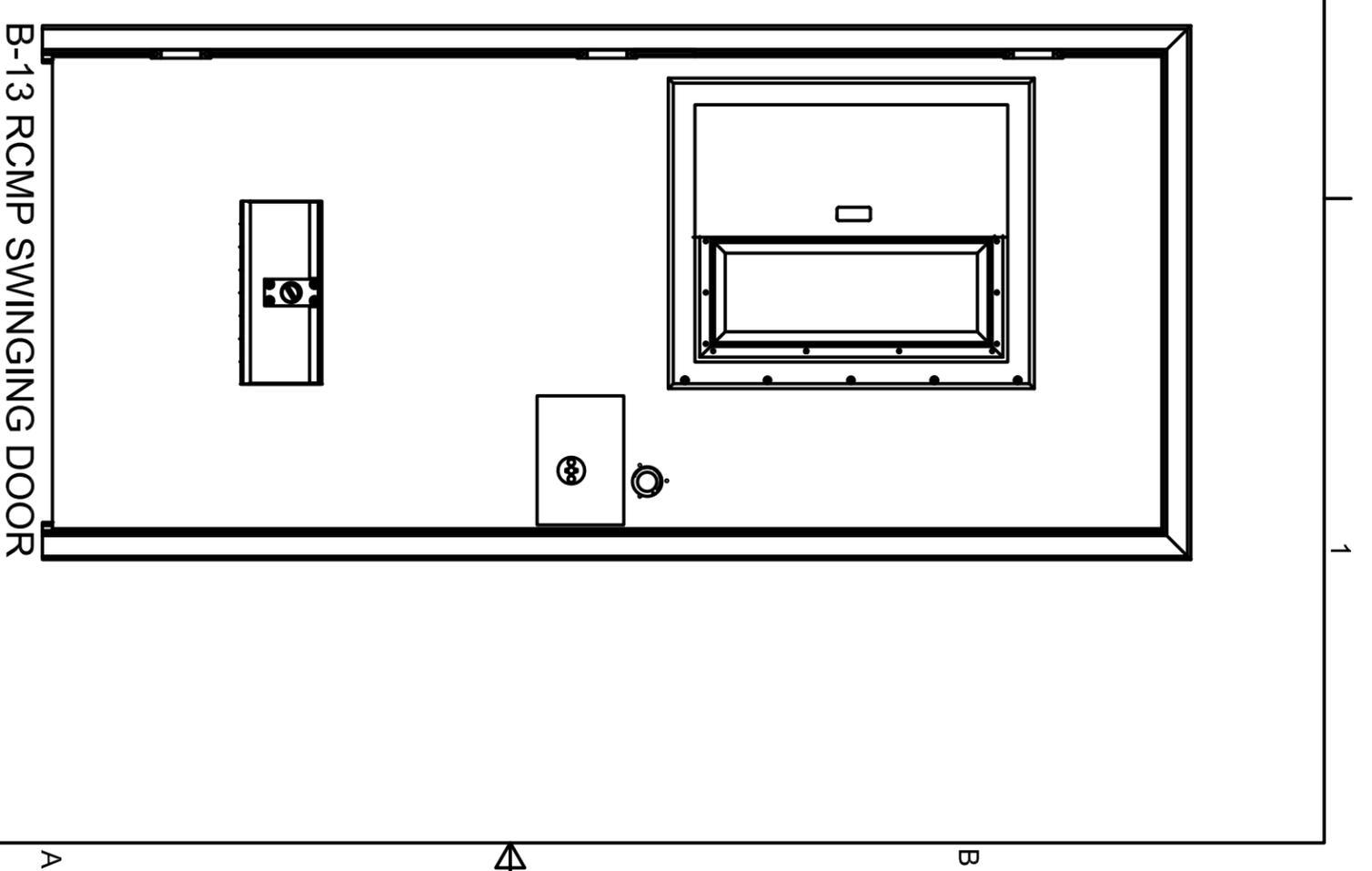
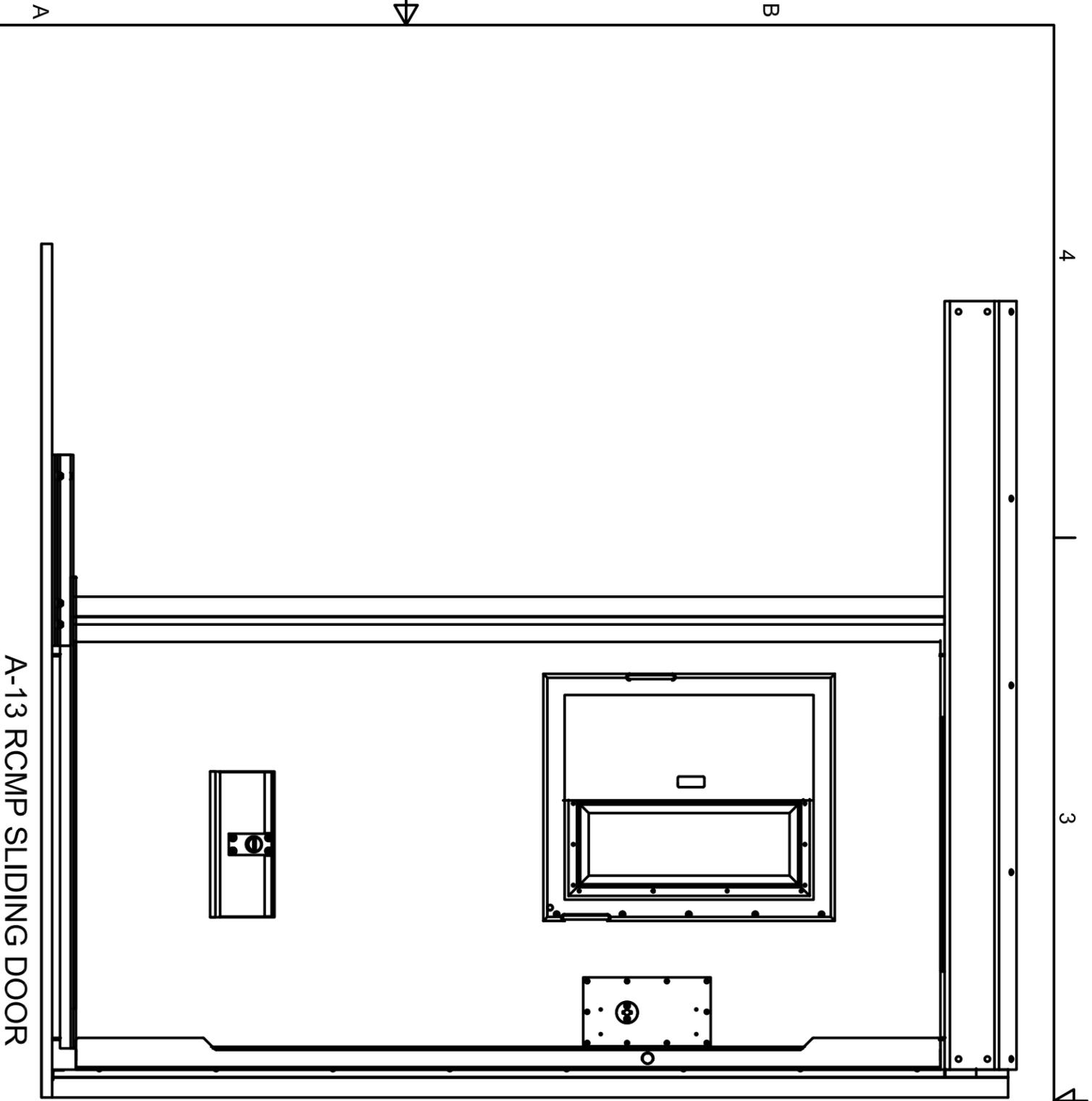
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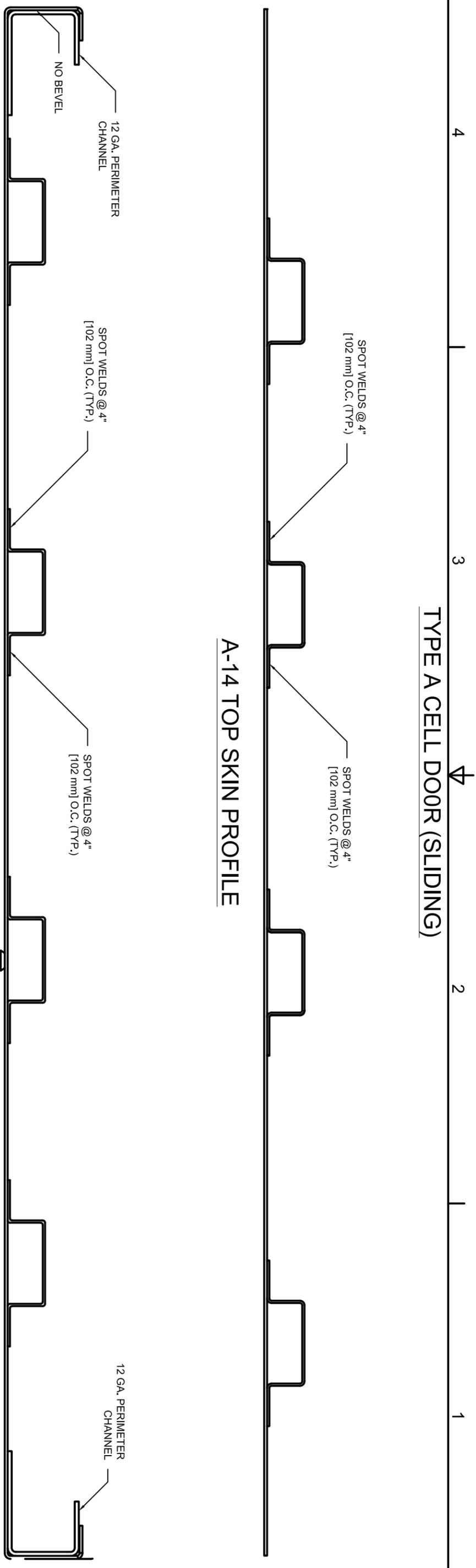
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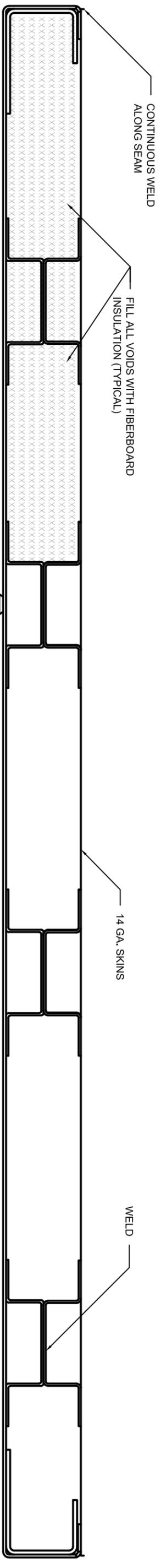
FINAL

TYPE A CELL DOOR (SLIDING)

A-14 TOP SKIN PROFILE



B-14 BOTTOM SKIN PROFILE



C-14 TOP & BOTTOM SKIN ASSEMBLY PROFILE

NOTES:

THIS DOOR IS A SQUARE EDGE AS IT IS SLIDING

REVISIONS:

REVISION AS PER THE MEETING ON JULY 20, 2006

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FINAL

JOB:

CONTRACTOR:

DRAWN BY: CL JOHNSON

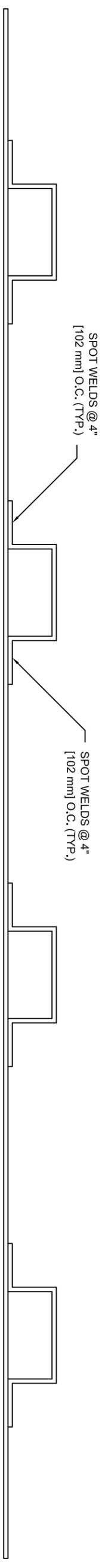
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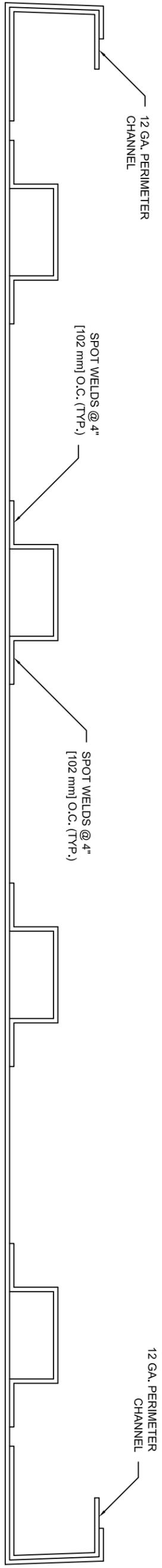
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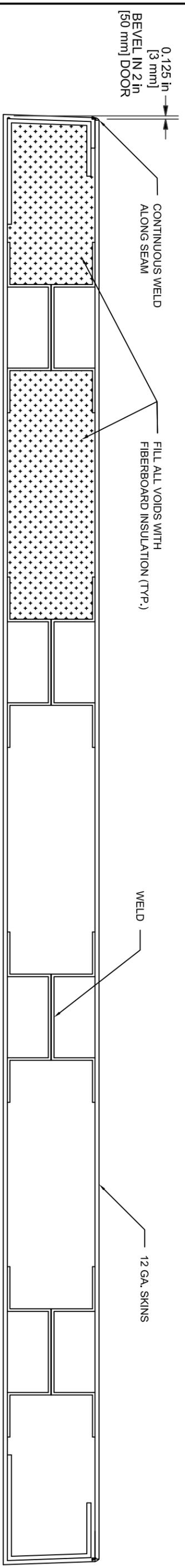
TYPE B CELL DOOR (SWINGING)



A-15 TOP SKIN PROFILE



B-15 BOTTOM SKIN PROFILE



C-15 TOP & BOTTOM SKIN ASSEMBLY PROFILE

REVISIONS:	NOTES:
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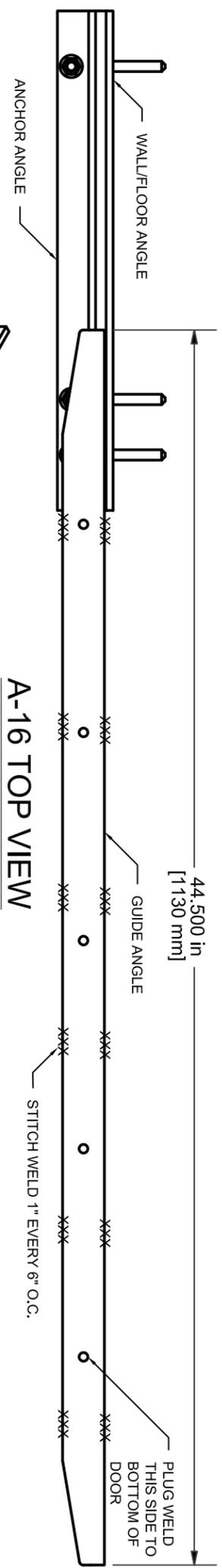
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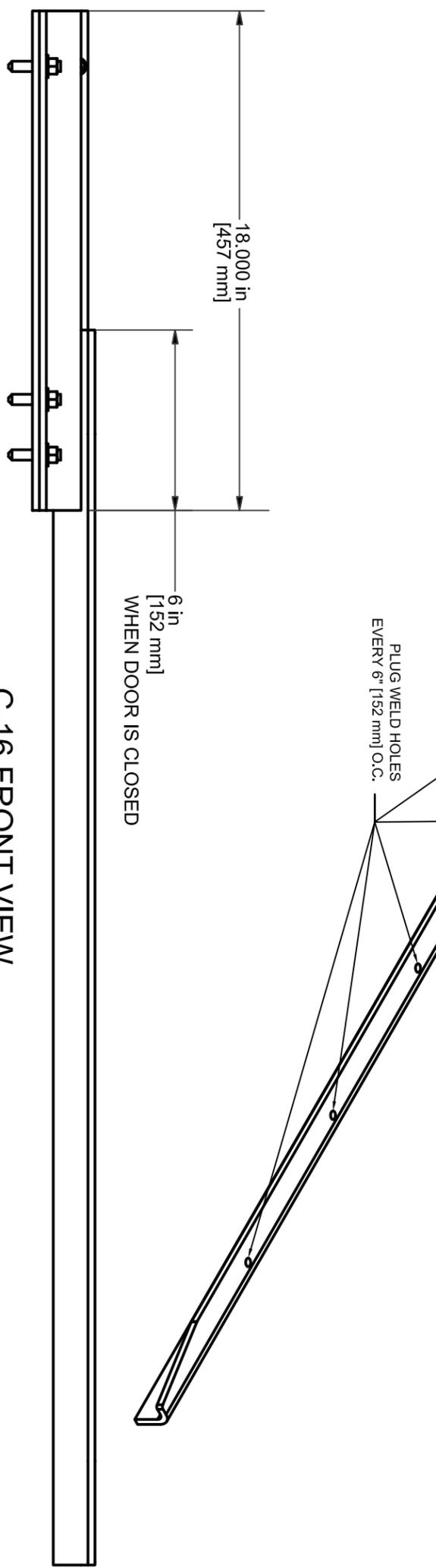
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CL JOHNSON	9/26/2007
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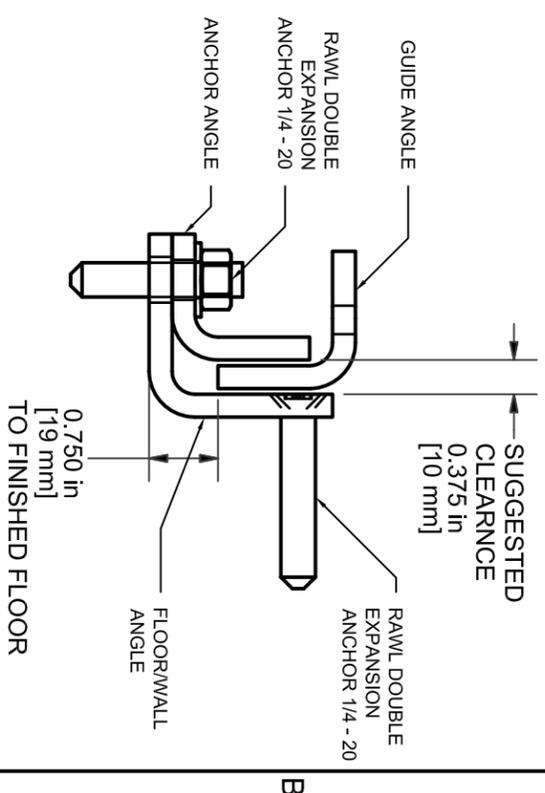
INSTALLATION OF WALL/FLOOR ANCHOR ANGLE & GUIDE ANGLE



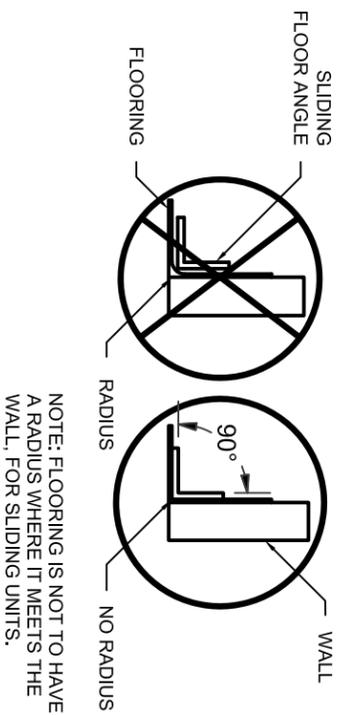
B-16 ISOMETRIC VIEW



C-16 FRONT VIEW



D-16 DETAIL



E-16 FLOORING DETAIL

REVISIONS:	
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NOTES:

REVISION AS PER THE MEETING ON JULY 20, 2006

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FINAL

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Part 1 General

1.1 SECTION INCLUDES

- .1 Materials and installation for acoustic steel door and frame assemblies at the Police Building.

1.2 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 08 14 16 – Flush Wood Doors
- .3 Section 08 71 00 - Door Hardware.
- .4 Section 08 80 50 – Glazing.
- .5 Section 08 90 10 – Door, Frame and Hardware Schedule.
- .6 Section 09 91 23 - Interior Painting.

1.3 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A653/A653M-11, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM E90-09 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - .3 ASTM E413-11 – Classification for Rating Sound Insulation
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-13, Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door Manufacturers' Association (CSDMA)
 - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2006.
 - .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 2009.
- .5 National Fire Protection Association (NFPA)
 - .1 NFPA 80-2013, Standard for Fire Doors and Fire Windows.
 - .2 NFPA 252-2013, Standard Methods of Fire Tests of Door Assemblies.

- .6 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC S104-10, Standard Method for Fire Tests of Door Assemblies.

1.4 SYSTEM DESCRIPTION

- .1 Design Requirements:
 - .1 Acoustic Performance: Minimum Sound Transmission Class (STC) 46 tested to ASTM E90. Label indicating sound transmission class shall be applied to the door and door frame.
 - .2 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN/ULC S104 for ratings specified or indicated.
 - .3 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN/ULC S104, ASTM E152 or NFPA 252 and listed by nationally recognized agency having factory inspection services.

1.5 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 Saskatchewan, 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, and finishes.
 - .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
 - .5 Test Data:
 - .1 Submit test data indicating compliance with the Sound Transmission Class (STC) requirements. Include laboratory name, test report number, and date of test.
 - .2 Submit certification from test laboratory qualified under the National Voluntary Accreditation Program (NVLAP) of the U.S. Bureau of Standards.

1.6 DELIVERY, STORAGE AND HANDLING

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

1.7 WARRANTY

- .1 Manufacturer's Limited Warranty: Five (5) years from date of supply, covering material and workmanship.

Part 2 Products

2.1 MATERIALS

- .1 Hot dipped galvanized steel sheet: to ASTM A653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.
- .2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF75.

2.2 ACCESSORIES

- .1 Hinges: Heavy weight butt type as recommended by the manufacturer.
- .2 Primer: Rust inhibitive zinc chromate.
- .3 Threshold: Smooth and flush, to provide a seal for door on closed position.
- .4 Perimeter acoustic seals: Primary and secondary perimeter acoustic seals to provide a seal for door in closed position to meet specified STC rating.
- .5 Head seal: Acoustic neoprene at header.
- .6 Bottom acoustic seals: Acoustic mortised drop door bottom to provide a seal for door in closed position to meet specified STC rating.

2.3 STEEL DOORS

- .1 Sheet steel faces, thickness, design, and core suitable to achieve specified STC performance.
- .2 Acoustic core construction, longitudinal edges, mechanically interlocked with visible edge seams.
- .3 Reinforce doors where hardware is required.
- .4 Drill and tap for mortised, templated hardware.
- .5 Top and Bottom Channels: Inverted, recessed, welded steel channels.

2.4 STEEL FRAMES

- .1 Sheet steel, metal thickness appropriate to maintain door STC ratings, mitred corners, fully welded seams.
- .2 Factory assemble and weld frames.

- .3 Affix permanent metal nameplates to frame indicating manufacture's name, door tag, and STC rating where is shall be clearly visible.

2.5 PRIMER

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

2.6 PAINT

- .1 Factory paint steel doors and frames in accordance with Sections 09 91 13 - Exterior Painting and 09 91 23 - Interior Painting. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.

2.7 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.

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 doors and frames to CSDMA Installation Guide.
- .2 Install components to manufacturer's written instructions.
- .3 Utilize welders certified by Canadian Welding Bureau (CWB).

3.3 FRAME INSTALLATION

- .1 Set frames plumb, square, level and at correct elevation.
- .2 Coordinate with masonry and gypsum board wall construction for anchor placement.
- .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 to allow easy operation and proper function of seals.
- .3 Adjust operable parts for correct function.

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 FIELD QUALITY CONTROL

- .1 Provide qualified manufacturer's representative to instruct installers on the proper installation and adjustment of door assemblies.
- .2 Provide manufacturer's representative to inspect door installation, and test minimum ten (10) cycles of operation. Correct any deficient doors.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry.
- .2 Section 05 50 00 - Metal Fabrications
- .3 Section 08 90 10 – Door, Frame and Hardware Schedule
- .4 Division 26 - Electrical

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM A1008/A1008M-[06a], Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - .2 ASTM A653/A653M-[06a], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian Standards Association (CSA International).
 - .1 CSA G164-M92 (R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 SYSTEM DESCRIPTION

- .1 Design Requirements.
 - .1 Design exterior door assembly to withstand windload of 1 kPa with a maximum horizontal deflection of 1/240 of opening width.
 - .2 Design door panel assemblies with minimum thermal insulation factor 3.0 RSI (R17).
 - .3 Design door assembly to withstand minimum 75,000 cycles.
 - .4 Design door lift in Room 151 and 157 to suit low headroom.

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 Shop Drawings
 - .1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
 - .1 Indicate sizes, service rating, types, materials, operating mechanisms, hardware and accessories and required clearances.
 - .2 Indicate electrical requirements including motor size, voltage, amperage. and electrical connections Include low voltage wiring diagram.

- .3 Provide written verification that door is designed to withstand designated minimum required cycles.

1.5 CLOSEOUT SUBMITTALS

- .1 Provide operation and maintenance data for overhead door hardware for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.6 WARRANTY

- .1 Provide five-year manufacturer's warranty for doors and all components and ten year for delamination.

Part 2 Products

2.1 MATERIALS

- .1 Galvanized steel sheet: commercial quality to ASTM A653/A653M with Z275 zinc coating.
- .2 Steel sheet: commercial quality to ASTM A1008/A1008M,.
 - .1 Exterior face sheet thickness 1.6 mm (16 gauge).
 - .2 Interior face sheet thickness 1.2 mm (18 gauge).
- .3 Prefinished steel with factory applied, two coat baked on polyester, primer and finish coat.
 - .1 Coating thickness: recommended by manufacturer.
 - .2 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D822 as follows:
 - .1 Outdoor exposure period 2500 hours.
 - .2 Humidity resistance exposure period 5000 hours.
- .4 Insulation: Non-CFC foamed in place, polyurethane to meet design requirements.

2.2 DOORS

- .1 Door Movement:
 - .1 Doors are low headroom lift.
- .2 Fabricate 50 mm thick insulated, textured panel doors of interlocking, roll formed steel sections, with thermal break between skins.
- .3 Extend doors 100 mm minimum past both sides of door opening.
- .4 Vertical steel stiffeners 305 mm on centre.
- .5 Assemble components by means of spot or arc welding or coated rivet system or adhesive and self tapping screws to manufacturer's recommendations.
- .6 Finish shall be factory applied, two-coat baked on polyester. Colour:

- .1 Interior: White.
- .2 Exterior at Detachment and Out Building 157: Red. Color selected by consultant to match red detachment siding.

2.3 HEAVY DUTY INDUSTRIAL HARDWARE

- .1 Track: standard hardware with 75 mm size 2.75 mm core thickness galvanized steel track. Track to suit specified door movements.
- .2 Track Supports: 3.1 mm core thickness continuous galvanized steel angle track supports.
- .3 Spring counter balance: heavy duty oil tempered torsion spring with manufacturers standard brackets.
- .4 Top roller carrier: galvanized Steel 3.04mm thick adjustable.
- .5 Rollers: full floating grease packed hardened steel, ball bearing 75mm diameter solid steel tire.
- .6 Roller brackets: adjustable, minimum 3.1mm galvanized steel.
- .7 Hinges: heavy duty, galvanized as recommended by manufacturer.
- .8 Cable: 6 mm diameter galvanized steel aircraft cable.

2.4 ACCESSORIES

- .1 Overhead horizontal track and operator supports: galvanized steel, type and size to suit installation.
- .2 Track guards: 5 mm thick formed sheet 1500 mm high track guards.
- .3 Pusher springs.
- .4 Door Handles.
 - .1 No exterior handles.
 - .2 Handle interior side only on Outbuilding 157. No interior handle on room 151.
 - .3 Interior handle: flat bar door latch with hole in flat bar at overhead door track for installation of padlock for manual locking of door.
- .5 Weather stripping.
 - .1 Sills: bulb type full width extruded neoprene weatherstrip.
 - .2 Jambs and head: extruded aluminum and arctic grade vinyl weatherstrip to manufacturer's standard.
 - .3 Two dual finned seals between sections.
- .6 Finish ferrous hardware items with minimum zinc coating of 300 g/m² to CSA G164.

2.5 ELECTRICAL OPERATOR

- .1 Electrical jack shaft operator to suit door size.

-
- .2 Electrical motors, controller units, remote pushbutton stations, relays and other electrical components: to CSA approval.
 - .3 Electric Motor: 120/208 V
 - .1 Size motor to suit type and weight of door. Electrical division will provide 120/208 wiring to motor locations.
 - .1 Electrical division to provide final connection to motor and local disconnect.
 - .2 Door provider to provide any additional wiring and connections required for operation of door. All wiring to be installed in suitable sized steel conduit.
 - .4 Controller units with integral motor reversing starter, solenoid operated brake, heater elements for overload protection, including pushbuttons and control relays as applicable.
 - .5 Operation:
 - .1 Door 151B:
 - .1 Refer to Section 28 22 00 Building Security Access Control
 - .2 "OPEN-STOP-CLOSE" designations on pushbuttons in English.
 - .3 Interior wall mounted station:
 - .4 Provide key operated lockout capability on interior wall mounted station.
 - .1 Key wall mounted station to match building cylinders and keying.
 - .5 Exterior door controller station (exterior pedestal):
 - .1 Provide 1 wired, card operated, exterior door operator, Overhead door operation is locked out until activated by electronic card reader unless otherwise noted.
 - .2 Door 157B:
 - .1 "OPEN-STOP-CLOSE" designations on pushbuttons in English.
 - .2 Interior wall mounted station:
 - .1 Provide key operated lockout capability on interior wall mounted station.
 - .2 Key wall mounted station to match building cylinders and keying.
 - .6 Location:
 - .1 Interior and exterior pushbutton stations to be located as noted in drawings. Refer to architectural and electrical drawings.
 - .7 Wiring and Conduit
 - .1 Section Metal Door section is responsible to provide all low voltage wiring and connections for operation of doors.
 - .2 Provide conduit and wiring for each door control location. All wiring will be installed in conduit.
 - .3 Door provider is responsible for connection of each wall station.
 - .4 Door provider is responsible for final connection of safety equipment to low voltage wiring.

- .5 Provide underground conduit for connection between overhead door operator pedestal and overhead door.
- .8 Safety switch: combination roll rubber with limit switches for full length of bottom rail of bottom section of door, to reverse door to open position when coming in contact with object on closing cycle.
 - .1 Sensing edge cord to be self retracting.
- .9 Emergency Release
 - .1 Attach operator to door with quick release device to disconnect door from operator in event of power failure. Provide chain for manual operation.
 - .2 Provide steel bracket on wall to allow chain to be bolted to the wall.
- .10 Mounting brackets: galvanized steel, size and gauge to suit conditions.

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 doors and hardware in accordance with manufacturer's instructions.
- .2 Rigidly support rail and operator and secure to supporting structure.
- .3 Touch-up steel doors with primer where galvanized finish damaged during fabrication.
- .4 Install operator including electrical motors, controller units, pushbutton stations, relays and other electrical equipment required for door operation.
- .5 Lubricate and adjust door operating components to ensure smooth opening and closing of doors.
- .6 Adjust weatherstripping to form a weather tight seal.
- .7 Adjust doors for smooth operation.
- .8 Install metal conduit as required for installation of low voltage wiring.
- .9 Coordinate installation of conduit to be buried and cast in concrete for exterior pedestal with General Contractor.
- .10 Install and make final connections of low voltage wiring.

3.3 CLEANING

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Underwriters Laboratories
 - .1 UL325 - Door, Drapery, Gate, Louver, and Window Operators and Systems
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.40-97, Anticorrosive Structural Steel Alkyd Primer.
 - .2 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.
 - .3 CAN/CGSB-79.1-M91, Insect Screens.
- .3 Canadian Standards Association (CSA) International
 - .1 CSA A440-11, NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights.
 - .2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN/CSA-C22.2 NO. 0-10 - General requirements - Canadian electrical code, part II.

1.2 PERFORMANCE REQUIREMENTS

- .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 windload per 30 year occurrence.
- .2 Limit mullion deflection to L/175; with full recovery of glazing materials.
- .3 Size glass units and glass dimensions to limits established in CAN/CGSB-12.20.
- .4 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.
- .5 Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.
- .6 Overall Thermal Resistance of:
 - .1 Total system maximum U-value: 1.60 W/m²K.

1.3 SUBMITTALS

- .1 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim junction between combination units elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finishes fasteners, and caulking. Indicate location of manufacturer's nameplates.

- .2 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit samples from manufacture's standard range of colours.
 - .3 Submit one representative cross-section of each type window frame (operable and fixed).
 - .4 Include frame, sash, sill, glazing and weatherproofing method, insect screens, surface finish and hardware. Show location of manufacturer's nameplates.

1.4 QUALITY ASSURANCE

- .1 Mock-ups:
 - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
 - .2 Construct mock-up to including window frame, glass glazing, and perimeter air barrier and vapour retarder.
 - .3 Mock-up will be used:
 - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
 - .2 For testing to determine compliance with performance requirements (testing will be at the discretion of the Departmental Representative).
 - .4 Locate where directed.
 - .5 Allow 48 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.
- .2 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 CLOSEOUT SUBMITTALS

- .1 Provide operation and maintenance data for windows for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.6 MANUFACTURER'S WARRANTY

- .1 Provide manufacturer's written warranty that frame will not warp, shrink, dent, twist, bow or rot under normal conditions and use for a period of 25 years and against aging and maintenance of window finish for a period of 10 years from date of acceptance of installation.
- .2 Sealed glazing units shall be warranted against failure of the air seal due to defects in material or workmanship for a period of 20 years from date of acceptance of installation.

Part 2 Products

2.1 MATERIALS

- .1 Materials: to CSA A440 supplemented as follows:

- .2 All windows by same manufacturer.
- .3 Fibreglass frame and sash shall be made from 60 to 85% glass fibres and 15 to 35% resin.
 - .1 Main frame: pultruded fiberglass thermally broken and insulated with expanded polystyrene (Type 1) insulation. To sizes indicated on drawings. Finish shall be non-chalking and non-yellowing, U/V resistant.
 - .1 Colour: Police Building: "Black". Provide samples for selection.
 - .2 Colour: Housing Units: "White". Provide samples for selection.
 - .2 Sash: pultruded fiberglass thermally broken and insulated with expanded polystyrene (Type 1) insulation. To sizes indicated on drawings. Finish shall be non-chalking and non-yellowing, U/V resistant. Colour to match window frame.
- .4 Glazing: Refer to Section 08 80 50 Glazing.
- .5 Screens: to CAN/CGSB-79.1.
 - .1 Insect screening mesh: count 18 x 16, glassfibre mesh. (black)
 - .2 Fasteners: tamper proof.
 - .3 Screen frames: aluminum colour to match window frames.
 - .4 Mount screen frames for interior replacement.
- .6 Interior jambs/sills: provide jamb/sill extension on interior as indicated and to suit conditions. Colour to match window frames.
- .7 Interior trim: Refer to Section 06 40 00 Architectural Woodwork for window sills.
- .8 Brickmould and brickmould extensions: by window manufacturer, profile and sizes as indicated. Minimum 50mm depth and minimum 1 mm wall thickness.
 - .1 Colour to match window frame.
- .9 Isolation coating: alkali resistant bituminous paint.
- .10 Fasteners: all fasteners are to be stainless steel and are to be concealed.

2.2 WINDOW TYPE AND CLASSIFICATION

- .1 Types:
 - .1 Type 1: Location: Police Building. See drawings for locations:
 - .1 Opening sash: bottom projected (awning) with triple glazing insulating glass.
 - .1 Manual crank operation.
 - .2 Integral limiter to prevent sash from opening beyond 100mm beyond sill.
 - .2 Fixed sash: with triple glazing insulating glass.
 - .3 Screens: on ventilating portion of windows.
 - .2 Type 2: Location: Housing Units. See drawings for locations.

- .1 Opening sash: bottom projected (awning) with triple glazing insulating glass.
 - .1 Manual crank operation.
 - .2 Fixed sash: with triple glazing insulating glass.
 - .3 Screens: on ventilating portion of windows.
- .3 Type 3: Location: Housing Units. See drawings for locations.
- .1 Opening sash: side projected (casement) with triple glazing insulating glass.
 - .1 Manual crank operation.
 - .2 Fixed sash: with triple glazing insulating glass.
 - .3 Screens: on ventilating portion of windows.
- .2 Classification rating: to CSA A440.
- .1 Air tightness: A3.
 - .2 Water tightness: B6.
 - .3 Wind load resistance: C3.
 - .4 Condensation resistance: Temperature Index, I 55.
 - .5 Forced Entry: F1
 - .6 Insect Screens: S1 (Heavy Duty)

2.3 FABRICATION

- .1 Fabricate in accordance with CSA A440 supplemented as follows:
- .2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.
- .3 Face dimensions detailed are maximum permissible sizes.
- .4 Brace frames to maintain squareness and rigidity during shipment and installation.
- .5 Finish steel clips and reinforcement with shop coat primer to CAN/CGSB-1.40; 380 g/m² zinc coating to CAN/CSA G164.

2.4 ISOLATION COATING

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

2.5 GLAZING

- .1 Refer to Section 08 80 50 - Glazing

2.6 HARDWARE

- .1 Hardware: stainless steel or bronze sash locks and aluminum handles to provide security and permit easy operation of units. Colour to match window frames.
- .2 Locks: provide operating sash with spring loading locking device, to provide automatic locking in closed position.
- .3 Provide special keyed opening device for windows normally locked.
- .4 Equip projected units with roto operators with locking handle.

2.7 AIR BARRIER AND VAPOUR RETARDER

- .1 Equip window frames with factory installed air barrier and vapour retarder material for sealing to building air barrier and vapour retarder as follows:
 - .1 Material width: adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder from interior.
 - .2 Ensure continuity of air barrier and vapour retarder with adjacent construction.
 - .3 Refer to drawings for arrangement of air barrier.

2.8 LOW EXPANSION FOAM

- .1 Low pressure polyurethane expanding foam, closed cell structure.
- .2 Foam remains flexible after curing.
- .3 Insulation value: R-5 per inch of cured foam.

Part 3 Execution

3.1 WINDOW INSTALLATION

- .1 Install in accordance with CSA A440.
- .2 Attach to structure to permit sufficient adjustment to accommodate existing building conditions and other irregularities.
- .3 Install products specified square, plumb and level. Center window unit in opening and secure window unit as indicated in manufacturer's written instructions. Provide alignment attachments and shims to permanently fasten system to building structure.
- .4 Arrange components to prevent abrupt variation in colour.
- .5 All fasteners are to be stainless steel and are to be concealed. Exposed heads will not be permitted.

- .6 Verify proper operation of all opening windows.
- .7 Allow for deflection of structure at head of window so structure will not impact window.

3.2 SILL INSTALLATION

- .1 Provide profile of sill as indicated on drawings for each condition.
- .2 Fabricate sills to suit opening sizes.
- .3 Secure sills in place with concealed anchoring clips located at ends and mid-point; space no more than 600 mm on centre in between.

3.3 CAULKING

- .1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Provide backer rod in gap and install sealant to thickness recommended by manufacturer for proper performing joint. Generally 1:3 thickness to width.
- .2 Seal perimeter joints of window to adjoining finish material.
- .3 Seal ends of sills at finish material.

3.4 LOW EXPANSION FOAM

- .1 Ensure compatibility between foam and adjacent materials.
- .2 Fill gap between window frame and adjacent rough opening with low expansion foam.
- .3 Do not overfill cavity.

3.5 ADJUSTING

- .1 Adjust units for smooth operation without binding or racking.
- .2 Adjust operating hardware and screens for correct operation.

3.6 CLEANING

- 1. Clean interior and exterior surfaces free of labels, mortar, plaster, paint, joint sealers and other foreign mater to prevent damage to weatherstripping and to prevent interference with operation or hardware.
- 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.

3.7 PROTECTION

- .1 Protect window unit from damage. Protect ventilators and operating parts from dirt and damage caused by subsequent construction activities. Repair or replace damaged units.
- .2 Protect finished Work from damage.

3.8 SCHEDULE

1. Refer to drawings for window locations and sizes.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).
 - .1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): standard hardware location dimensions.
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-69.18-M90/ANSI/BHMA A156.1-1981, Butts and Hinges.
 - .2 CAN/CGSB-69.19-93/ANSI/BHMA A156.3-1989, Exit Devices.
 - .3 CAN/CGSB-69.20-M90/ANSI/BHMA A156.4-1986, Door Controls (Closers).
 - .4 CAN/CGSB-69.21-M90/ANSI/BHMA A156.5-1984, Auxiliary Locks and Associated Products.
 - .5 CAN/CGSB-69.22-M90/ANSI/BHMA A156.6-1986, Architectural Door Trim.
 - .6 CAN/CGSB-69.24-M90/ANSI/BHMA A156.8-1982, Door Controls - Overhead Holders.
 - .7 CAN/CGSB-69.26-96/ANSI/BHMA A156.10-1991, Power-operated Pedestrian Doors.
 - .8 CAN/CGSB-69.28-M90/ANSI/BHMA A156.12-1986, Interconnected Locks and Latches.
 - .9 CAN/CGSB-69.29-93/ANSI/BHMA A156.13-1987, Mortise Locks and Latches.
 - .10 CAN/CGSB-69.32-M90/ANSI/BHMA A156.16-1981, Auxiliary Hardware.
 - .11 CAN/CGSB-69.35-M89/ANSI/BHMA A156.19-1984, Power Assist and Low Energy Power Operated Doors.

1.2 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 Hardware List:
 - .1 Submit contract hardware list in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
- .3 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.
- .4 Closeout Submittals
 - .1 Provide operation and maintenance data for door closers, locksets, door holders electrified hardware and fire exit hardware for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.3 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 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 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .2 Storage and Protection:
 - .1 Store finishing hardware in locked, clean and dry area.

1.5 WASTE DISPOSAL AND MANAGEMENT

- .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, and packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

1.6 MAINTENANCE

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

Part 2 Products

2.1 HARDWARE ITEMS

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

2.2 DOOR HARDWARE – Main Building

- .1 Locks and latches:

- .1 Interconnected locks and latches: to CAN/CGSB-69.28, series 5000 interconnected lock, grade 1, designed for function and keyed as stated in Hardware Schedule.
- .2 Mortise locks and latches: to CAN/CGSB-69.29, series 1000 mortise lock, grade 1, designed for function as stated in Hardware Schedule.
- .3 Knobs: Corbin Russwin "Global" design.
- .4 Lever handles: Corbin Russwin "Lustra" design.
- .5 Escutcheons: Solid stainless steel
- .6 Normal strikes: box type, lip projection not beyond jamb.
- .7 Cylinders: Corbin-Russwin, 0 bitted.
- .8 Finish: BHMA 626 Satin Chrome.
- .9 Acceptable manufacturer: Corbin Russwin.
- .2 Padlocks
 - .1 Provided by Departmental Representative.
- .3 Evidence, Storage and Gun Lockers
 - .1 Refer to Section 10 51 13 – Metal Lockers
- .4 Butts and hinges:
 - .1 Butts and hinges: to CAN/CGSB-69.18, listed in Hardware Schedule.
 - .2 Hinges on selected doors to be "NRP" Type (non-removable-pin) as scheduled.
 - .3 List of hinges:
 - a) FBB 168 114 x 114.
 - b) FBB 168 114 x 144 NRP.
 - .4 Acceptable manufacturers: Stanley, Hager, Monthard, McKimmey or approved alternate.
- .5 Door Closers and Accessories: (heavy duty a) and normal b))
 - .1 Door controls (closers): to CAN/CGSB-69.20, size in accordance with CAN/CGSB-69.20, table A1, finished to 630.
 - .1 Grade 1, heavy duty, adjustable hydraulic back check, separate regulation of closing speed and latching speed, rack and pinion action.
 - .2 List of closers:
 - .1 LCN 4040 with delayed action function.
 - .2 LCN 4040H with integral hold-open function
 - .3 Acceptable manufacturers: LCN, Sargent, Norton, Rixson or approved alternate.
- .6 Auxiliary locks and associated products: to CAN/CGSB-69.21, as listed in Hardware Schedule, finished to 26D.
- .7 Architectural door trim: to CAN/CGSB-69.22, as listed in Hardware Schedule, finish as noted
 - .1 Door protection plates: kick plate type, 1.27 mm thick stainless steel, bevelled edges, 300 mm high by 25 mm less than door width, 32D finish.

- .2 Push plates: 1.27 mm thick stainless steel, bevelled edges, 125 mm wide by 400 mm high, finished to 32D.
- .3 Pulls: 19 mm diameter "D" style, projecting 35 mm from door, height 300 mm, without rose.
- .8 Latch guard: Heavy gauge formed steel plate cover to protect lock strike area, 300 mm high, through bolt mounting formed to suit mortised locksets with standard strikes.
- .9 Auxiliary hardware: to CAN/CGSB-69.32, as listed in Hardware Schedule and as listed below.
 - .1 Door check chain: heavy duty compression springs, heavy duty welded steel chain, vinyl cover. 650 mm long, 26D finish.
 - .2 Wall stop: concave wall stop with concealed mounting, 62 mm diameter, 30 mm projection, cast brass with rubber bumper, 26D finish.
 - .1 Acceptable products: Hager 234 or Richelieu 2205.
 - .3 Floor stop: to ANSI A156.16, low dome stop, 45 mm diameter, 3.2 mm thick base, cast brass, 26D finish.
 - .1 Acceptable products: Hager 241, or Richelieu 218.
- .10 Thresholds:
 - .1 127 mm wide x full width of door opening, 12.7mm height, 3.8 mm wall. stainless steel mill finish, plain surface.
 - .2 127 mm wide x full width of door opening, extruded aluminum mill finish, serrated surface, with lip and vinyl door seal insert. Pemko 2005_T or approved alternate.
 - .3 127 mm wide x full width of door opening, 12.7 mm height, extruded stainless steel, mill finish, serrated surface, with thermal break of rigid PVC.
- .11 Weatherstripping:
 - .1 Head and jamb seal:
 - .1 Extruded aluminum frame and solid closed cell neoprene insert, clear anodized finish.
 - .2 Door bottom seal:
 - .1 Heavy duty, extruded aluminum frame and closed cell neoprene weather seal, surface mounted, closed ends, adjustable, clear anodized finish.
 - .3 Door 131 neoprene bottom seal:
 - .1 Heavy duty, extruded aluminum frame and neoprene weather seal, recess mounted to door bottom, closed ends, clear anodized finish.
 - .2 Acceptable manufacturer:
 - .1 CT-54N by KNC Crower Mfg. Inc.
 - .2 Approved equivalent.

- .12 Barrier Free Door Operator and Actuators:
 - .1 To ANSI/BHMA A165.19.
 - .2 Operator supplier shall include transformer for power for actuators. Include two push plate operators, mounted on push and pull side of doors. Tie operation of door operator to release electric strike where electric strike is provided with hardware on door. Operator shall be able to be adjusted to reduce force required to open manually from 66 N to 40 N.
 - .3 Control boxes: complete with electric strike relay and ability to be connected to the building security system.
 - .4 Power operator door switches with 150 x 150 mm #4 satin finish stainless steel face plate and push button with engraved "barrier free" symbol and mounted in tamper resistant assembly installed by Factory Certified Personnel.
 - .5 Wall mounted switches: recess mounted switch and box, hard wired to operator housing. Mount operators on push and pull sides of doors as indicated.
 - .6 Provide one push button on each side of each power operated door
 - .7 Operation: to
 - .1 In conjunction with ANSI F13 lockset.
 - .2 Public hours: Push button operates electric strike in door frame to release electric strike and activate power operator to open door.
 - .3 Secure hours: Push button is deactivated, electric strike is locked.
 - .4 Provide switch in operator housing to deactivate door operators when doors are locked by deadbolt.
 - .8 Provide switched line voltage to control box. Locate switch adjacent to box.
 - .9 Operator supplier shall be responsible for wiring of all low voltage wiring for controlling door. Electrical Division will provide 120V.
 - .10 Mount control box in location as directed by Departmental Representative.
 - .11 Acceptable manufacturers: Gyrotech 500, Horton, Stanley, or approved alternate.
- .13 Sound Seals:
 - .1 Head and jamb seal:
 - .1 Self-adhesive silicone perimeter gasketing.
 - .2 Acceptable Manufacturer: Pemko S773, DraftSeal DS340CS or approved alternate.
- .14 Electric strike: SDC Model 55 ABCDU electric strike complete with deadbolt keepers. No substitutions.
 - .1 Strike edge plate to match ANSI function of electric strike.
- .15 Card reader: provided by Owner.
- .16 Door Viewer
 - .1 Mount 1.57m above floor level.
 - .2 Pre-cut holes by door manufacturer to maintain listing of fire rated doors.
 - .3 Acceptable manufacturer:
 - .1 ASD Doorscope DS238.

2.3 DOOR HARDWARE – Housing Units

- .1 Exterior Lever Lockset:
 - .1 Style: Lever
 - .2 Finish: 26D
 - .3 Keying: master keyed.
 - .4 Basis of design:
 - .1 Taymor 32-C5553 C26D
 - .2 Approved equivalent.

- .2 Deadlocks:
 - .1 Finish: 26D
 - .3 Keying: master keyed.
 - .4 Basis of design:
 - .1 Taymor 30-D01SC602SC C26D
 - .2 Approved equivalent.

- .3 Wall Stops:
 - .1 Finish: 26D
 - .2 Basis of design:
 - .1 Gallery GSH-250 C26D
 - .2 Approved equivalent.

- .4 Floor Stops:
 - .1 Finish: 26D
 - .2 Basis of design:
 - .1 Gallery GSH-200 C26D
 - .2 Approved equivalent.

- .5 Weatherstripping:
 - .1 By frame manufacturer. See Section 08 16 13.

- .6 Threshold:
 - .1 By frame manufacturer. See Section 08 16 13.

- .7 Door sweep:
 - .1 By door manufacturer. See Section 08 16 13.

- .8 Door viewer:
 - .1 By door manufacturer. See Section 08 16 13.

- .9 Butt Hinges:

- .1 By door manufacturer. See Section 08 16 13.
- .10 Bifold Door Track Hardware:
 - .1 By door manufacturer. See Section 08 14 18.
- .11 Bifold Door Pull:
 - .1 Basis of design:
 - .1 Rockwood Manufacturing 841 C26D
 - .2 Approved equivalent.
- .12 Interior Lever Passage Set:
 - .1 Style: Lever
 - .2 Finish: 26D
 - .3 Keying: none.
 - .4 Basis of design:
 - .1 Taymor 32-C5510 C26D
 - .2 Approved equivalent.
- .13 Interior Lever Privacy Set:
 - .1 Style: Lever
 - .2 Finish: 26D
 - .3 Keying: privacy lock.
 - .4 Basis of design:
 - .1 Taymor 32-C5540 C26D
 - .2 Approved equivalent.
- .14 Robe Hook:
 - .1 Basis of design:
 - .1 Rockwood Manufacturing RM803 C26D
 - .2 Approved equivalent.
- .15 Hinge Pin Stop:
 - .1 Basis of design:
 - .1 Rockwood Manufacturing RM528 C26D
 - .2 Approved equivalent.

2.4 FASTENINGS

- .1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.

- .2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .3 Exposed fastening devices to match finish of hardware.
- .4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.
- .5 Use fasteners compatible with material through which they pass.

2.5 KEYING – MAIN BUILDING

- .1 Construction keying:
 - .1 Provide construction cores. Contractor to install construction cores and perform operation verification for all locks. Construction cylinders to be “0” bitted Corbin-Russwin L4 cylinders. Perimeter doors may have random bitting.
- .2 Permanent keying:
 - .1 Provide 000000 bitted for keying by Owner.
 - .2 Provide two blank keys, in duplicate, for every lock in this Contract.

2.6 KEYING – HOUSING UNITS

- .1 Construction keying:
 - .1 Provide construction cores. Contractor to install construction cores and perform operation verification for all locks.
- .2 Permanent keying:
 - .1 Keying by Owner.
 - .2 Provide two blank keys, in duplicate, for every lock in each unit.

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 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .3 Furnish manufacturers' 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 and as specified.
- .2 Where door stop contacts door pulls, mount stop to strike bottom of pull.
- .3 Use only manufacturer's supplied fasteners. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .4 Coordinate door and frame preparation with Section 08 11 00 Metal Doors and Frames to ensure the proper installation and operation of hardware.
- .5 Door manufacturer to precut holes for door viewers to maintain listing of fire rated doors.
- .6 Remove construction cores and locks when directed by Departmental Representative; install permanent cores and check operation of locks.

3.3 ADJUSTING

- .1 Adjust door hardware, operators, closures and controls 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 TESTING

- .1 All locks must be tested by the Contractor with the installed permanent cores for proper installation. All doors and locks not installed and operating correctly will be rejected.

3.5 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
- .3 Remove protective material from hardware items where present.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.6 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 door closers, locksets, and fire exit hardware.
- .2 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.7 SCHEDULE

<u>Door 001</u>	<u>Door 002</u>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2029-LWR-626 • “0” Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts (non-removable pins) 1 weatherstripping 1 closer 1 door viewer (interior to exterior)</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model:ML2029-LWR-626 • “0” Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts (non-removable pins) 1 closer</p>
<u>Door 003</u>	<u>Door 004</u>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model:ML2029-LWR-626 • “0” Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts (non-removable pins) 1 closer</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model:ML2029-LWR-626 • “0” Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts (non-removable pins) 1 closer</p>
	<u>Door 100A</u>
	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2065-LWR-626 • “0” Bitted L4 Cylinder • ANSI No.: F13 <p>3 butts (non-removable pins) 1 weatherstripping 1 door sweep 1 closer 1 auto operator 1 electric strike (w/ deadbolt retainer) 1 floor stop 1 door viewer (interior to exterior) 1 threshold <u>Comment:</u> Handicap Assist Door. See Note 2 below.</p>
<u>Door 100B</u>	<u>Door 102</u>

<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2065-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F13 <p>3 butts 1 closer 1 auto operator 1 electric strike (w/ deadbolt retainer) 1 wall stop <u>Comment:</u> Handicap Assist Door. See Note 2 below.</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2060-LWR-626 • ANSI No.: F22 <p>3 butts 1 closer 1 wall stop 1 kickplate</p>
<p><u>Door 103A</u></p>	<p><u>Door 103B</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2057-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F07 <p>3 butts 1 closer 1 electric strike 1 weatherstripping 1 drop seal (coordinate w/ Section 08 34 74) 1 wall stop 1 kickplate <u>Comment:</u> Electronic Accessed Controlled Door. See Note 1 below.</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2029-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts 1 closer 1 electric strike 1 weatherstripping 1 drop seal (coordinate w/ Section 08 34 74) 1 wall stop 1 kickplate <u>Comment:</u> Electronic Accessed Controlled Door. See Note 1 below.</p>
<p><u>Door 104</u></p>	<p><u>Door 105</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2051-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F04 <p>3 butts 1 closer 1 weatherstripping 1 drop seal (coordinate w/ Section 08 34 74) 1 floor stop 1 kickplate</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • ML2029-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts (non-removable pins) 1 closer 1 electric strike 1 kickplate 1 door viewer (view into reception area) <u>Comment:</u> Electronic Accessed Controlled Door. See Note 1 below.</p>
<p><u>Door 107.1</u></p>	<p><u>Door 107.2</u></p>
<p>1 lockset:</p>	<p>1 lockset:</p>

<ul style="list-style-type: none"> • Full Mortise • Model: ML2010-LWR-626 • ANSI No.: F01 <p>3 butts 1 closer 1 weatherstripping 1 drop seal (coordinate w/ Section 08 34 74) 1 kickplate</p>	<ul style="list-style-type: none"> • Full Mortise • Model: ML2051-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F04 <p>3 butts 1 closer 1 weatherstripping 1 door sweep 1 wall stop 1 kickplate</p>
<p><u>Door 108</u></p>	<p><u>Door 109A</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2029-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts (non-removable pins) 1 closer 1 wall stop 1 kickplate</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2029-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts (non-removable pins) 1 weatherstripping 1 door sweep 1 closer 1 electric strike 1 latch guard 1 door viewer (view to exterior) 1 threshold <u>Comment:</u> Electronic Accessed Controlled Door. See Note 1 below.</p>
<p><u>Door 109B</u></p>	<p><u>Door 110</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2010-LWR-626 • ANSI No.: F01 <p>3 butts (non-removable pins) 1 closer 1 wall stop 1 kickplate</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2060-LWR-626 • ANSI No.: F22 <p>3 butts 1 wall stop 1 kickplate</p>
<p><u>Door 111</u></p>	<p><u>Door 113</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise 	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise

<ul style="list-style-type: none"> • Model: ML2051-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F04 <p>3 butts 1 wall stop 1 weatherstripping 1 drop seal (coordinate w/ Section 08 34 74) 1 kickplate</p>	<ul style="list-style-type: none"> • Model: ML2057-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F07 <p>3 butts 1 closer 1 kickplate 1 wall stop</p>
<u>Door 114</u>	<u>Door 116</u>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2057-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F07 <p>3 butts 1 closer 1 floor stop 1 kickplate</p>	<p>1 push plate 1 pull plate 3 butts 1 closer 1 wall stop 1 kickplate</p>
<u>Door 116.1</u>	<u>Door 119.1</u>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2010-LWR-626 • ANSI No.: F01 <p>3 butts 1 closer 1 kickplate</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2010-LWR-626 • ANSI No.: F01 <p>3 butts 1 closer 1 wall stop 1 kickplate</p>
<u>Door 117</u>	<u>Door 118</u>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2060-LWR-626 • ANSI No.: F22 <p>3 butts 1 wall stop</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2029-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts 1 closer 1 floor stop 1 electric strike 1 kickplate <u>Comment:</u> Electronic Accessed Controlled Door. See Note 1 below.</p>
<u>Door 119</u>	<u>Door 120</u>
<p>1 push plate 1 pull plate 3 butts</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2060-LWR-626

<p>1 closer 1 wall stop 1 kickplate</p>	<ul style="list-style-type: none"> • ANSI No.: F22 <p>3 butts 1 wall stop</p>
<p><u>Door 122</u></p>	<p><u>Door 123</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2029-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts (non-removable pins) 1 closer 1 electric strike 1 kickplate <u>Comment:</u> Electronic Accessed Controlled Door. See Note 1 below.</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2065-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F13 <p>3 butts 1 closer 1 kickplate</p>
	<p><u>Door 126</u></p>
	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2010-LWR-626 • ANSI No.: F01 <p>3 butts 1 wall stop 1 kickplate</p>
<p><u>Door 127A</u></p>	<p><u>Door 127B</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2029-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts (non-removable pins) 1 weatherstripping 1 door sweep 1 closer 1 electric strike 1 kickplate 1 door viewer (view to exterior from interior) 1 threshold <u>Comment:</u> Electronic Accessed Controlled Door. See Note 1 below.</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2010-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F01 <p>3 butts 1 closer 1 wall stop 1 kickplate</p>
<p><u>Door 128A</u></p>	<p><u>Door 128B</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2022-GSR-626 	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2022-GSR-626

<ul style="list-style-type: none"> • "0" Bitted L4 Cylinders • ANSI No.: F14(K) <p>3 butts (non-removable pins) 1 closer 1 electric strike 1 weatherstripping 1 door sweep 1 latch guard 1 door viewer (view to exterior from interior) 1 threshold <u>Comment:</u> Knob trim. Electronic Accessed Controlled Door. See Note 1 below.</p>	<ul style="list-style-type: none"> • "0" Bitted L4 Cylinder • ANSI No.: F14(K) <p>3 butts (non-removable pins) 1 closer 1 wall stop 1 electric strike 1 kickplate 2 door viewers (to view both sides) 1 weatherstripping 1 door sweep <u>Comment:</u> Knob trim. Electronic Accessed Controlled Door. See Note 1 below.</p>
<p><u>Door 128.1</u></p>	
<p>1 lockset (no trim on the inside):</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2011-626 • "0" Bitted L4 Cylinders • ANSI No.: F18 <p>3 butts <u>Comment:</u> Provide cylinder pull.</p>	
<p><u>Door 128.2</u></p>	<p><u>Door 128.3</u></p>
<p>1 lockset (no trim on the inside):</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2011-626 • "0" Bitted L4 Cylinders • ANSI No.: F18 <p>3 butts <u>Comment:</u> Provide cylinder pull.</p>	<p>1 lockset (no trim on the inside):</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2011-626 • "0" Bitted L4 Cylinders • ANSI No.: F18 <p>3 butts <u>Comment:</u> Provide cylinder pull.</p>
<p><u>Door 128.4</u></p>	<p><u>Door 130</u></p>
<p>1 lockset (no trim on the inside):</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2011-626 • "0" Bitted L4 Cylinders • ANSI No.: F18 <p>3 butts <u>Comment:</u> Provide cylinder pull.</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2010-GSR-626 • ANSI No.: F01(K) <p>3 butts 1 closer 1 wall stop 1 kickplate <u>Comment:</u> Knob trim.</p>
<p><u>Door 131</u></p>	<p><u>Door 132</u></p>
<p>1 lockset (no trim on the inside):</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2011-626 • "0" Bitted L4 Cylinders 	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2057-GSR-626 • "0" Bitted L4 Cylinder

<ul style="list-style-type: none"> • ANSI No.: F18 <p>3 butts 1 kickplate 1 weatherstripping 1 neoprene bottom seal (see weatherstripping) <u>Comment:</u> Provide cylinder pull.</p>	<ul style="list-style-type: none"> • ANSI No.: F07(K) <p>3 butts 1 closer 1 kickplate <u>Comment:</u> Knob trim. Electronic Access Controlled Door. See Note 1 below.</p>
<p><u>Door 133</u></p>	<p><u>Door 134</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2057-GSR-626 • "0" Bitted L4 Cylinder • ANSI No.: F07(K) <p>3 butts 1 kickplate 1 closer <u>Comment:</u> Knob trim.</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2057-GSR-626 • "0" Bitted L4 Cylinders • ANSI No.: F07(K) <p>3 butts 1 kickplate 1 closer 1 weatherstripping 1 door sweep <u>Comment:</u> Knob trim</p>
<p><u>Door 135</u></p>	<p><u>Door 136</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2029-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts (non-removable pins) 1 weatherstripping 1 door sweep 1 closer 1 door viewer (interior to exterior) 1 threshold</p>	<p>SEE DETENTION DOOR AND FRAMES 08 34 63</p>
<p><u>Door 137</u></p>	<p><u>Door 138</u></p>
<p>SEE DETENTION DOOR AND FRAMES 08 34 63</p>	<p>SEE DETENTION DOOR AND FRAMES 08 34 63</p>
<p><u>Door 139</u></p>	<p><u>Door 140A</u></p>
<p>SEE DETENTION DOOR AND FRAMES 08 34 63</p>	<p>1 lockset :</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2057-GSR-626 • "0" Bitted L4 Cylinder

	<ul style="list-style-type: none"> ANSI No.: F07(K) <p>3 butts 1 closer 1 kickplate 1 electric strike <u>Comment:</u> Knob trim. Electronic Access Controlled Door. See Note 1 below.</p>
<u>Door 140B</u>	
<p>1 lockset:</p> <ul style="list-style-type: none"> Full Mortise Model: ML2022-GSR-626 "0" Bitted L4 Cylinder ANSI No.: F14(K) <p>3 butts (non-removable pins) 1 closer 1 floor stop 1 electric strike 1 kickplate 1 weatherstripping 1 door sweep <u>Comment:</u> Knob trim. Electronic Access Control Door. See Note 1 below.</p>	
<u>Door 141</u>	<u>Door 142</u>
SEE DETENTION DOOR AND FRAMES 08 34 63	SEE DETENTION DOOR AND FRAMES 08 34 63
<u>Door 143</u>	<u>Door 144</u>
<p>1 lockset:</p> <ul style="list-style-type: none"> Full Mortise Model: ML2029-LWR-626 "0" Bitted L4 Cylinder ANSI No.: F15 <p>3 butts 1 closer 1 floor stop 1 kickplate 1 electric strike 1 weatherstripping 1 door sweep <u>Comment:</u> Electronic Access Controlled Door. See Note 1 below.</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> Full Mortise Model: ML2022-GSR-626 "0" Bitted L4 Cylinder ANSI No.: F14(K) <p>3 butts 1 closer 1 weatherstripping 1 drop seal (coordinate w/ Section 08 34 74) 1 kickplate <u>Comment:</u> Knob trim.</p>
<u>Door 145A</u>	<u>Door 145B</u>
<p>1 lockset:</p> <ul style="list-style-type: none"> Full Mortise Model: ML2010-LWR-626 ANSI No.: F01 	<p>1 lockset:</p> <ul style="list-style-type: none"> Full Mortise Model: ML2029-LWR-626 "0" Bitted L4 Cylinders

<p>3 butts 1 closer 1 wall stop 1 kickplate</p>	<ul style="list-style-type: none"> • ANSI No.: F15 <p>3 butts (non-removable pins) 1 weatherstripping 1 door sweep 1 closer 1 latch guard 1 kickplate 1 electric strike 1 door viewer (view to exterior) 1 threshold <u>Comment:</u> Electronic Accessed Controlled Door. See Note 1 below.</p>
	<p><u>Door 146.1</u></p>
	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2057-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F07 <p>3 butts 1 closer 1 wall stop 1 electric strike 1 kickplate <u>Comment:</u> Electronic Accessed Controlled Door. See Note 1 below.</p>
<p><u>Door 146.2</u></p>	<p><u>Door 147</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model:ML2029-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts (non-removable pins) 1 closer 1 wall stop 1 kickplate</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2057-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F07 <p>3 butts (non-removable pins) 1 closer 1 wall stop 1 electric strike 1 kickplate <u>Comment:</u> Electronic Accessed Controlled Door. See Note 1 below.</p>
<p><u>Door 148</u></p>	<p><u>Door 149</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2029-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F15 	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2029-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F15

<p>3 butts (non-removable pins) 1 closer 1 kickplate</p>	<p>3 butts (non-removable pins) 1 closer 1 kickplate 1 weatherstripping 1 door sweep</p>
<p><u>Door 150</u></p>	<p><u>Door 151A</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2057-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F07 <p>3 butts (non-removable pins) 1 closer 1 kickplate 1 weatherstripping 1 door sweep</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2022-GSR-626 • "0" Bitted L4 Cylinders • ANSI No.: F14(K) <p>3 butts (non-removable pins) 1 weatherstripping 1 door sweep 1 closer 1 latch guard 1 kickplate 1 electric strike 1 door viewer (to view exterior from interior) 1 threshold</p> <p><u>Comment:</u> Knob trim. Electronic Access Controlled Door. See Note 1 below.</p>
<p><u>Door 151B</u></p>	<p><u>Door 151C</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Key Switch • Model: Camden CI-1KFS • "0" Bitted Cylinder <p><u>Comment:</u> SEE SECTIONAL METAL DOORS 08 36 13 – coordinate with electrical.</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2022-GSR-626 • "0" Bitted L4 Cylinder • ANSI No.: F14(K) <p>3 butts (non-removable pins) 1 closer 1 wall stop 1 electric strike 1 kickplate 2 door viewers (to view both sides) <u>Comment:</u> Knob trim. Electronic Access Controlled Door. See Note 1 below.</p>
<p><u>Door 152</u></p>	<p><u>Door 153</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2051-LWR-626 • "0" Bitted L4 Cylinder 	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2065-LWR-626 • "0" Bitted L4 Cylinder

<ul style="list-style-type: none"> • ANSI No.: F04 <p>3 butts 1 weather stripping 1 drop seal (coordinate with Section 08 34 74) 1 wall stop 1 kickplate</p>	<ul style="list-style-type: none"> • ANSI No.: F13 <p>3 butts 1 weather stripping 1 drop seal (coordinate w/ Section 08 34 74) 1 wall stop 1 kickplate</p>
<p><u>Door 155</u></p>	<p><u>Door 156A</u></p>
<p>1 passage set:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2050-LWR-626 • Half Dummy Trim <p>3 butts Spring-loaded roller latch closure 1 kickplate</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2029-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts 1 closer w/ integral hold open 1 weatherstripping 1 drop seal (coordinate w/ Section 08 34 74) 1 wall stop 1 kickplate</p>
<p><u>Door 156B</u></p>	<p><u>Door 157A</u></p>
<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2065-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F13 <p>3 butts 1 closer 1 weatherstripping 1 drop seal (coordinate w/ Section 08 34 74) 1 wall stop 1 kickplate</p>	<p>1 lockset:</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2029-LWR-626 • "0" Bitted L4 Cylinder • ANSI No.: F15 <p>3 butts (non-removable pins) 1 weatherstripping 1 door sweep 1 threshold 1 closer</p>
<p><u>Door 157B</u></p>	<p><u>Door 158</u></p>
<p>Two (2) sliding latch bolts from interior by overhead door manufacturer. SEE SECTIONAL METAL DOORS 08 36 13</p>	<p>1 lockset (no trim on the inside):</p> <ul style="list-style-type: none"> • Full Mortise • Model: ML2011-626 • "0" Bitted L4 Cylinders

	<ul style="list-style-type: none"> ANSI No.: F18 <p>3 butts 1 weatherstripping 1 drop seal (coordinate w/ Section 08 34 74) 1 kickplate <u>Comment:</u> Provide cylinder pull.</p>
<u>Door 159</u>	<u>Door 160</u>
SEE DETENTION DOOR AND FRAMES 08 34 63	SEE DETENTION DOOR AND FRAMES 08 34 63
<u>Door 161</u>	
<p>1 lockset:</p> <ul style="list-style-type: none"> Full Mortise Model: ML2057-GSR-626 "0" Bitted L4 Cylinders ANSI No.: F07(K) <p>3 butts 1 kickplate 1 closer <u>Comment:</u> Knob trim</p>	
Housing Unit Door Hardware	
<u>Door H100</u>	<u>Door H101</u>
<p>3 butt hinges – See Section 08 16 13 1 exterior lever lockset (master keyed) 1 deadlock 1 wall stop 1 threshold – See Section 08 16 13 1 set weatherstripping – See Section 08 16 13 1 sweep – See Section 08 16 13 1 door viewer – See Section 08 16 13</p>	<p>1 single bifold track and hanger kit – See Section 08 14 18 1 bifold door pull</p>
<u>Door H102</u>	<u>Door H103</u>
<p>1 double bifold track and hanger kit – See Section 08 14 18 2 bifold door pulls</p>	<p>3 butt hinges – See Section 08 16 13 1 lever privacy set 1 hinge pin stop</p>
<u>Door H104A</u>	<u>Door H104B</u>

1 single bifold track and hanger kit – See Section 08 14 18 1 bifold door pull	1 single bifold track and hanger kit – See Section 08 14 18 1 bifold door pull
<u>Door H105</u>	
3 butt hinges – See Section 08 16 13 1 lever privacy set 1 wall stop 1 robe hook	
<u>Door H106A</u>	<u>Door H106B</u>
3 butt hinges – See Section 08 16 13 1 lever passage set 1 hinge pin stop	3 butt hinges – See Section 08 16 13 1 exterior lever lockset (master keyed) 1 deadlock 1 hinge pin stop 1 threshold – See Section 08 16 13 1 set weatherstripping – See Section 08 16 13 1 sweep – See Section 08 16 13 1 door viewer – See Section 08 16 13
<u>Door H107</u>	<u>Door H110</u>
3 butt hinges – See Section 08 16 13 1 lever passage set 1 hinge pin stop	3 butt hinges – See Section 08 16 13 1 lever privacy set 1 wall stop 1 robe hook
<u>Door H111</u>	<u>Door H112</u>
3 butt hinges – See Section 08 16 13 1 lever privacy set 1 wall stop	1 single bifold track and hanger kit – See Section 08 14 18 1 bifold door pull
<u>Door H113</u>	<u>Door H001 Crawlspace Access Door</u>
1 double bifold track and hanger kit – See Section 08 14 18 2 bifold door pulls	1 lockset: <ul style="list-style-type: none"> • Full Mortise • Model: ML2029-LWR-626 • “0” Bitted L4 Cylinder • ANSI No.: F15 3 butts (non-removable pins) 1 weatherstripping 1 closer 2 door viewers (from both sides)

Note 1: Prepare frame for installation of SDC Model 55 ABCDU electric strike. Ensure Deadbolt keepers are installed and aligned in door frame where there are lock sets with deadbolts.

Note 2: Prep door with SDC 55 series electric strike specified for handicap assist door latch release.

END OF SECTION

PART 1 General

1.1 RELATED SECTIONS

- .1 Section 07 92 00 – Joint Sealing
- .2 Section 08 11 00 - Metal Doors and Frames.
- .3 Section 08 11 16 – Aluminum Frames.
- .4 Section 08 14 16 - Flush Wood Doors.
- .5 Section 08 54 13 – Fibreglass Windows.

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
 - .2 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
 - .3 CAN/CGSB-12.4-M91 Heat Absorbing Glass
 - .4 CAN/CGSB-12.11-M90, Wired Safety Glass.
- .2 Flat Glass Manufacturers Association (FGMA).
 - .1 FGMA Glazing Manual - 1997.
- .3 International Window Film Association (IWFA)
 - .1 IWFA Visual Quality Standard for Applied Window Film 1999.

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.

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 test data substantiating triple glazed sealed units meets specified maximum centre-of-glazing U-factor.
- .2 Shop Drawings:

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Sealed Units: Submit duplicate 300 x 300 mm size samples of sealed units.
- .4 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions in accordance with Section 01 33 00 - Submittal Procedures.
- .5 Closeout Submittals:
 - .1 Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 WARRANTY

- .1 Contractor's Warranty – Contractor shall warrant the work in accordance with the General Conditions.
- .2 Product Warranty – Provide a TEN (10) year manufacturer's warranty for sealed glazing units. Include coverage for sealed glass units from seal failure, interpane dusting or misting and replacement of same.

PART 2 Products

2.1 MATERIALS: FLAT GLASS

- .1 Float glass: to CAN/CGSB-12.3, Glazing quality.
- .2 Safety (tempered) glass: to CAN/CGSB-12.1, transparent.
 - .1 Type 2-tempered.
 - .2 Class B-float.
- .3 Heat absorbing glass: to CAN/CGSB-12.4.
 - .1 Type: Insulating glass unit.
 - .2 Class: Heat strengthened.
- .4 Silvered mirror glass: thickness to suit mirror dimensions.
 - .1 Type 3A-tempered.

2.2 MATERIALS: EXTERIOR SEALED INSULATING TRIPLE UNITS

- .1 Refer to Section 08 54 13 Fiberglass Windows and drawings.
- .2 Refer to Section 08 90 10 Door, Frame and Hardware Schedule and drawings.
- .3 Performance: Maximum centre-of-glazing U-factor:
 - .1 0.79 W/m²K (0.14 Btu/hour ft²F)

- .4 Insulating glass units: to CAN/CGSB 12.8, triple glazed unit; 44 mm overall thickness.
 - .1 Glass: to CAN/CGSB 12.1 and 12.3.
 - .2 Glass thickness: sized to in CAN/CGSB-12.20 and National Building Code to 1 in 50 hourly wind pressure level of 0.75 kPa – Open Terrain.
 - .1 Minimum lite thickness 6mm
 - .3 Exterior lite:
 - .1 Heat strengthened.
 - .2 Colour clear.
 - .4 Inter cavity space thickness: 12.5 mm
 - .5 Interior Lites:
 - .1 Heat strengthened.
 - .2 Low-E Glass coating: PPG “Solar Ban 60” soft coat low ‘e’
 - .3 Colour: clear.
 - .4 Coating surface #2 and surface #5.
 - .6 Inert gas fill: argon.
 - .7 Spacer: warm edge spacer PPG “Intercept” Black colour.
 - .8 U-value of sealed unit 0.18
 - .9 Solar Heat Gain Coefficient: 0.24
 - .10 Visible Transmittance: 0.41

2.3 LAMINATED GLASS UNIT

- .1 Laminated glass: to ASTM C-1172
 - .1 Type: Full surface layer of 0.762 mm polyvinyl butyral (PVB) interlayer compressed between two panes of 6 mm tempered glass unless noted otherwise.

2.4 SAFETY (TEMPERED) GLASS:

- .1 Safety glass: to CAN/CGSB-12.1, transparent, thickness as indicated.
 - .1 Type 2-tempered.
 - .2 Class B-float.
 - .3 Category 1 and 2 as applicable.
 - .4 Square edge.

2.5 SPEAKER PORT

- .1 Through glass mounted type, consisting of two circular 152 mm outside diameter perforated 14 gauge stainless steel discs, through bolted.
- .2 Perforations: 3 mm dia. holes spaced 10 mm apart each way. Holes in back plate offset 4.8 mm from front plate.
- .3 Fasteners: No 8 tamper resistant Torx flat head screws on secure side of room.
- .4 Finish: exposed surfaces to ANSI No. 4, satin finish.
- .5 Acceptable Product:
 - .1 Model 45-115-01-SD1 available from Securingcosmos.com.
 - .2 Metal Fab Services Ltd #820-SD.

2.6 WALL MIRROR

- .1 Frame: stainless steel.
- .2 Fasteners: vandal resistant clips, size and number to suit mirror dimensions.

2.7 ACCESSORIES

- .1 Sealant – refer to Section 07 92 00 – Joint Sealing
- .2 Setting blocks: Neoprene, 80-90 Shore durometer hardness to ASTM D2240, to suit glazing method, glass light, weight and area.
- .3 Spacer shims: Neoprene, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.
- .4 Glazing tape: Preformed butyl compound, 10-15 Shore durometer hardness to ASTM D2240; coiled on release paper; black colour.
- .5 Mirror attachment accessories:
 - .1 Vandal-resistant 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: INTERIOR - DRY METHOD (TAPE AND TAPE)

- .1 Perform work in accordance with FGMA Glazing 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.

3.5 INSTALLATION: EXTERIOR SEALED UNITS

- .1 Install to window and steel frame manufacturer's instructions.

3.6 INSTALLATION: LAMINATED/ TEMPERED GLAZED UNITS

- .1 Refer to drawings for glazing configuration and installation.
- .2 Install laminated glazing on exterior lite of sealed units.
- .3 Perform work in accordance with FGMA Glazing Manual for glazing installation methods.

3.7 INSTALLATION: SAFETY (TEMPERED) GLASS:

- .1 Refer to Section 08 90 10 Door Frame and Hardware Schedule and as noted in drawings.
- .2 Perform work in accordance with FGMA Glazing Manual for glazing installation methods.

3.8 INSTALLATION: MIRRORS

- .1 Set mirrors with clips. Anchor rigidly to wall construction.
- .2 Place plumb and level.
- .3 Refer to drawings for locations.

3.9 SPEAKER PORT

- .1 Cut opening in glass for speaker port.
- .2 Install speaker port according to manufacturer's written instructions.

3.10 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 using approved non-abrasive cleaner in accordance with manufacture's instructions.

3.11 PROTECTION OF FINISHED WORK

- .1 After installation, mark light with an "X" by using removable plastic tape or paste.

3.12 SCHEDULE

- .1 Refer to Specifications and Drawings.
- .2 Wall Mirrors
 - .1 Room 126

END OF SECTION

PART 1 General

1.1 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 07 92 00 – Joint Sealing.
- .3 Section 08 11 14 - Metal Doors and Frames.
- .4 Section 08 80 50 – Glazing

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
- .2 Flat Glass Manufacturers Association (FGMA).
 - .1 FGMA Glazing Manual - 1997.

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.

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- .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 test data substantiating triple glazed sealed units meets specified maximum centre-of-glazing U-factor.
- .2 Shop Drawings:
 - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Sealed Units: Submit duplicate 300 x 300 mm size samples of sealed units.
- .4 Manufacturer's Instructions:

- .1 Submit manufacturer's installation instructions in accordance with Section 01 33 00 - Submittal Procedures.
- .5 Closeout Submittals:
 - .1 Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 WARRANTY

- .1 Contractor's Warranty – Contractor shall warrant the work in accordance with the General Conditions.
- .2 Product Warranty – Provide a five (5) year manufacturer's warranty for sealed glazing units. Include coverage for sealed glass units from seal failure, interpane dusting or misting and replacement of same.

PART 2 Products

2.1 STANDARD OF ACCEPTANCE

- .1 Sound transmission class for complete unit: minimum STC 46.
- .2 Acceptable Product
 - .1 Vision Control by Unicl Architectural.
 - .2 Approved equivalent.

2.2 MATERIALS: LAMINATED GLASS UNIT

- .1 Laminated glass: to ASTM C-1172
 - .1 Type: Full surface layer of 0.762 mm polyvinyl butyral (PVB) interlayer compressed between two panes of 6 mm tempered glass for each pane of glazing.

2.3 MATERIALS: LOUVERS, FRAMES AND OPERATORS

- .1 Louvers: Hollow extruded aluminum, interlocking profile, 6mm thick x 35mm deep; Duracron K-1285 Gloss White finish.
- .2 Manual Operators: Thumb wheel type.
- .3 Glass Frame (Trim Kit): Welded metal frame sized to accept 63mm thick glass.

2.4 ACCESSORIES

- .1 Sealant – refer to Section 07 92 00 – Joint Sealing
- .2 Setting blocks: Neoprene, 80-90 Shore durometer hardness to ASTM D2240, to suit glazing method, glass light, weight and area.
- .3 Spacer shims: Neoprene, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.

- .4 Glazing tape: Preformed butyl compound, 10-15 Shore durometer hardness to ASTM D2240; coiled on release paper; black colour.

2.5 FABRICATION

- .1 Sealed Insulated Glass Units:
 - .1 Comply with ASTM E2190,
 - .2 Fabricate spacer bar frame of tubular aluminum filled with desiccant.
 - .3 Bond spacer bar frame to glass panes.
 - .4 Fill space outside frame to glass edge with elastomeric sealant.

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: INTERIOR - DRY METHOD (TAPE AND TAPE)

- .1 Perform work in accordance with FGMA Glazing 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.

3.5 CAULKING

- .1 Seal full perimeter of both sides of observation control window frame with approved caulking, prior to installation of polycarbonate glazing screen.

3.6 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 using approved non-abrasive cleaner in accordance with manufacture's instructions.

3.7 PROTECTION OF FINISHED WORK

- .1 After installation, mark light with an "X" by using removable plastic tape or paste.

3.8 SCHEDULE

- .1 Refer to Specifications and Drawings.

END OF SECTION

General notes:

- .1 This schedule is to be read in conjunction with the Drawings and applicable Specification Sections.
- .2 Refer to Section 08 71 10, Door Hardware for hardware groups.
- .3 Refer to Drawings for door and frame types
- .4 Refer to Electrical for Card reader rough-ins, door contacts, power operators and associated power. Hardware manufacturer/installer shall be responsible for making all low voltage connections.
- .5 Verify all door and frame sizes prior to ordering.

Door No.	Door				Frame			Rating (Min.)	Glass	Additional Requirements
	Size	Type	Mat'l	Fin.	Type	Mat'l	Fin.			
Main Building Crawlspace – Refer to Drawing A2.1										
001	900x900	H	IMD	PT4	F12	PS	PT4	-	-	Door viewer.
002	900x900	H	HM	PT4	F13	PS	PT4	45 MIN.	-	
003	900x900	H	HM	PT4	F13	PS	PT4	-	-	Non-rated fire separation.
004	900x900	H	HM	PT4	F13	PS	PT4	-	-	Non-rated fire separation.
Main Building and Outbuilding – Refer to Drawing A2.2										
100A	1000 X 2150	A	IMD	PT4 ¹	F4*	PS	PT4 ¹	-	-	Auto Operator. Electric strike. Door viewer. ¹ PT2 at interior face of door and frame.
100B	1000 X 2150	C	HM	PT2	F1*	PS	PT2	-	TG	Auto Operator. Electric strike.
102	900 X 2150	A	HM	PT2	F1	PS	PT2	-	-	
103A	900 X 2150	A	ASD	PT2	F2*	PS	PT2	-	-	Electronic access controlled door. Electric strike. Keyed on Room 101 side.
103B	900 X 2150	A	ASD	PT2	F2*	PS	PT2	-	-	Electronic access controlled door. Electric strike. Keyed on Room 103 side.
104	900 X 2150	A	ASD	PT2	F2	PS	PT2	-	-	
105	1000 X 2150	A	HM	PT2	F1*	PS	PT2	-	-	Electronic access controlled door. Electric strike. Door viewer.
107.1	900 X 2150	A	ASD	PT2	F2	PS	PT2	-	-	
107.2	900 X 2150	A	WFD	S/V	F1	PS	PT2	-	-	
108	900 X 2150	A	HM	PT2	F1	PS	PT2	-	-	Keyed on Corridor 108 side.
109A	1000 X 2150	A	IMD	PT4 ²	F4*	PS	PT4 ²	-	-	Electronic access controlled door. Electric Strike. Door viewer. ² PT2 interior face of door and frame.
109B	1000 X 2150	D	HM	PT2	F1	PS	PT2	-	TG	
110	900 X 2150	A	WFD	S/V	F1	PS	PT2	-	-	

Door No.	Door				Frame			Rating (Min.)	Glass	Additional Requirements
	Size	Type	Mat'l	Fin.	Type	Mat'l	Fin.			
111	900 X 2150	A	ASD	PT2	F2	PS	PT2	-	-	
113	900 X 2150	A	WFD	S/V	F1	PS	PT2	-	-	
114	1070 X 2150	A	HM	PT2	F1	PS	PT2	45 MIN.	-	
116	900 X 2150	A	WFD	S/V	F1	PS	PT2	-	-	
116.1	600 x 2150	A	HM	PT2	F1	PS	PT2	-	-	
117	900 X 1500	J	WFD	S/V	F1	PS	PT2	-	-	Door bottom is 300 AFF in regular frame for ventilation above and below.
118	900 X 2150	A	HM	PT2	F1*	PS	PT2	45 MIN.	-	Electronic access control door. Electric strike.
119	900 X 2150	A	WFD	S/V	F1	PS	PT2	-	-	
119.1	600 x 2150	A	HM	PT2	F1	PS	PT2	-	-	
120	900 X 1500	J	WFD	S/V	F1	PS	PT2	-	-	Door bottom is 300 AFF in regular frame for ventilation above and below.
122	900 X 2150	A	HM	PT2	F1*	PS	PT2	45 MIN.	-	Electronic access control door. Electric strike.
123	1070 X 2150	A	WFD	S/V	F1	PS	PT2	-	-	
126	900 X 2150	D	WFD	S/V	F1	PS	PT2	-	TG	Coordinate undercut with transition strip required between flooring of different heights between Rooms 112 and 126.
127A	1000 X 2150	A	IMD	PT4 ³	F4*	PS	PT4 ³	-	-	Electronic access door. Electric strike. Door viewer. ³ PT2 interior face of door and frame.
127B	1000 X 2150	D	HM	PT2	F1	PS	PT2	-	TG	
128A	900 X 2150	A	IMD	PT4/ EL ⁴	F4*	PS	PT4/ EL ⁴	-	-	Electronic access control door. Electric strike. Door viewer. ⁴ PT4 on exterior door and frame. EL interior door and frame.
128.1	600 X 2150	A	HM	EL	F1	PS	EL	-	-	
128.2	600 X 2150	A	HM	EL	F1	PS	EL	-	-	
128.3	600 X 2150	A	HM	EL	F1	PS	EL	-	-	
128.4	600 X 2150	A	HM	EL	F1	PS	EL	-	-	
128B	900 X 2150	A	HM	EL/ PT2 ⁵	F1*	PS	EL PT2 ⁵	45 MIN.	-	Electronic access control door. Electric strike. Door viewer both sides. ⁵ PT2 on door and frame in Room 112. EL in Room 128.
130	900 X 2150	A	HM	EL	F1	PS	EL	-	-	
131	900 X 2150	F	HM	EL	F1	PS	EL	-	LX	Coordinate final door size with shower base and water seal hardware.
132	900 X 2150	A	HM	EL	F1*	PS	EL	-	-	Non-rated fire separation. Electronic access control door. Electric strike.
133	900 X 2150	A	HM	EL	F1	PS	EL	-	-	Non-rated fire separation.
134	900 X 2150	A	HM	EL	F1	PS	EL	-	-	Non-rated fire separation.

Door No.	Door				Frame			Rating (Min.)	Glass	Additional Requirements
	Size	Type	Mat'l	Fin.	Type	Mat'l	Fin.			
135	1070 X 2150	A	IMD	PT4/ EL ⁶	F4	PS	PT4/ EL ⁶	-	-	⁶ PT4 on exterior door and frame. EL interior door and frame. Non-rated fire separation.
136	1000 X 2150	E	STL	EL	F9	-	EL	-	LX	Hardware as specified
137	1000 X 2150	E	STL	EL	F9	-	EL	-	LX	Hardware as specified
138	1000 X 2150	E	STL	EL	F9	-	EL	-	LX	Hardware as specified
139	1000 X 2150	E	STL	EL	F9	-	EL	-	LX	Hardware as specified
140A	900 X 2150	F	HM	EL	F1*	PS	EL	-	LX	Electronic access control door. Electric strike.
140B	900 X 2150	F	HM	EL/ PT2 ⁷	F1*	PS	EL PT2 ⁷	45 MIN.	-	Electronic access control door. Electric strike. ⁷ PT2 on door and frame in Room 112. EL in Room 140.
141	1000 X 2150	E	STL	EL	F9	-	EL	-	LX	Hardware as specified
142	1000 X 2150	E	STL	EL	F9	-	EL	-	LX	Hardware as specified
143	900 X 2150	A	HM	PT2	F2*	PS	PT2	45 MIN.	-	Electronic access controlled door. Electric strike.
144	900 X 2150	A	ASD	EL	F2	PS	EL	-	-	
145A	1000 X 2150	D	HM	PT2	F1	PS	PT2	-	TG	
145B	1000 X 2150	A	IMD	PT4 ⁸	F4*	PS	PT4 ⁸	-	-	Electronic access control door. Electric strike. Door viewer. ⁸ PT2 interior face of door and frame.
146.1	900 X 2150	A	HM	PT2	F1*	PS	PT2	45 MIN.	-	Electronic access control door. Electric strike.
146.2	900 X 2150	A	HM	PT2	F1	PS	PT2	45 MIN.	-	
147	900 X 2150	A	HM	PT2	F1*	PS	PT2	45 MIN.	-	Electronic access control door. Electric strike.
148	900 X 2150	A	HM	PT2	F1	PS	PT2	45 MIN.	-	
149	900 X 2150	A	HM	PT2	F1	PS	PT2	45 MIN.	-	
150	900 X 2150	A	HM	PT2	F1	PS	PT2	45 MIN.	-	
151A	1000 X 2150	A	IMD	PT4/ EL ⁹	F4*	PS	PT4/ EL ⁹	-	-	Electronic access control door. Electric strike. Door viewer. ⁹ PT4 on exterior door and frame. EL interior door and frame.
151B	3660W X 2440H	G	-	PRE	F11*	-	PT5/ EL ¹⁰	-	-	Sectional Metal Door. ¹⁰ PT5 on exterior frame. EL interior frame. Key switch. Coordinate with electrical.
151C	900 X 2150	A	HM	EL	F1*	PS	EL	45 MIN.	-	Electronic access control door. Electric strike. Door viewers both sides.
152	900 X 2150	A	WFD	S/V	F1	PS	PT2	-	-	
153	900 X 2150	A	ASD	PT2	F2	PS	PT2	-	-	
155	900 x 2150	A	WFD	S/V	F1	PS	PT2	-	-	
156A	900 X 2150	A	ASD	PT2	F2	PS	PT2	-	-	
156B	900 X 2150	A	ASD	PT2	F2	PS	PT2	-	-	Keyed on Room 156 side.
157A	900 X 2150	A	IMD	PT4	F1	PS	PT4	-	-	

Abbreviations:

EL – Elastomeric Coating (09 96 53)

HM – Hollow Metal Door (08 11 00)

ASD – Acoustic Steel Door (08 34 74)

IMD – Insulated Metal Door (08 11 00)

LX – Lexan (08 34 63)

PT# – Paint (# Denotes Colour) (09 91 13 & 09 91 23)

PS – Pressed Steel Frame (welded) (08 11 00 & 08 34 74)

LG – Laminated Glass (08 80 50)

WFD – Wood Flush Door (08 14 16)

TG – Tempered Glass (08 80 50)

STL – Steel (08 34 63)

S/V – Stain and Varnish (09 91 23)

FI –Fibreglass Insulated Door (08 16 13)

HCW –Hollow Core Molded Panel Interior Doors (08 14 18)

SCW –Solid Core Molded Panel Interior Doors (08 14 18)

PRE – Prefinished

WD - Wood

Notes:

F# * denotes a frame with special security requirements, refer to electrical drawings and specifications.

This schedule is to be read in conjunction with the Drawings and Specification Sections.

Room No.	Floor	Base	Walls				Ceiling	Notes:
			N	S	E	W		
100	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
101	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
102	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
103	RFF	RB	PT1	PT1	PT1	PT1	ATC	
104	RFF	RB	PT1	PT1	PT1	PT1	ATC	
105	RSSF	COV	PT1	PT1	PT1	PT1	ATC	
106	RSSF	COV	PT1	PT1	PT1	PT1	ATC	
107	RSSF	COV	PT1	PT1	PT1	PT1	ATC	
107.1	RFF	RB	PT1	PT1	PT1	PT1	ATC	
107.2	RFF	RB	PT1	PT1	PT1	PT1	ATC	
108	RSSF	COV	PT1	PT1	PT1	PT1	ATC	
109	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
110	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
111	RFF	RB	PT1	PT1	PT1	PT1	ATC	
112	RSSF	COV	PT1	PT1	PT1	PT1	ATC	
113	RSSF	COV	RWC	RWC	RWC	RWC	PT6	
114	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
115	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
116	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
116.1	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
117	RHF	COV	RWC	RWC	RWC	RWC	RWC	
118	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
119	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
119.1	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
120	RHF	COV	RWC	RWC	RWC	RWC	RWC	
121	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
122	RSSF	COV	PT1	PT1	PT1	PT1	ATC	
123	RSSF	COV	PT1	PT1	PT1	PT1	ATC	
125	RSSF	COV	PT1	PT1	PT1	PT1	ATC	

Room No.	Floor	Base	Walls				Ceiling	Notes:
			N	S	E	W		
126	RSF	RB	PT1	PT1	PT1	PT1	ATC	
127	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
128	RSSF	COV	EL	EL	EL	EL	EL	
128.1	RSSF	COV	EL	EL	EL	EL	EL	
128.2	RSSF	COV	EL	EL	EL	EL	EL	
128.3	RSSF	COV	EL	EL	EL	EL	EL	
128.4	RSSF	COV	EL	EL	EL	EL	EL	
129	RSSF	COV	EL	EL	EL	EL	EL	
130	RSSF	COV	EL	EL	EL	EL	EL	
131	SS	SS	SS	SS	SS	SS	SS	
132	RSSF	COV	EL	EL	EL	EL	EL	
133	RSSF	COV	EL	EL	EL	EL	EL	
134	RSSF	COV	EL	EL	EL	EL	EL	
135	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
136	RSSF	EL	EL	EL	EL	EL	EL	
137	RSSF	EL	EL	EL	EL	EL	EL	
138	RSSF	EL	EL	EL	EL	EL	EL	
139	RSSF	EL	EL	EL	EL	EL	EL	
140	RSSF	COV	EL	EL	EL	EL	EL	
141	RSSF	EL	EL	EL	EL	EL	EL	
142	RSSF	EL	EL	EL	EL	EL	EL	
143	RSSF	COV	PT1	PT1	PT1	PT1	ATC	
144	RSSF	COV	APT	APT	APT	APT	APT	Window frame PT2.
145	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
146.1	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
146.2	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
147	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
148	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
149	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
150	RSSF	COV	PT1	PT1	PT1	PT1	PT6	
151	CONC S&H	-	EL	EL	EL	EL	EL	Pigmented concrete with clean fines embedded within sealer.

List of Abbreviations:

APT	ACOUSTIC PANEL TYPE 1 (09 84 00)
ATC	ACOUSTIC TILE CEILING (09 51 13 & 09 53 01)
CONC S&H	CONCRETE WITH HARDENER AND SEALER (03 35 00/09 91 23)
COV	COVED FLOORING BASE (09 67 00)
RFF	RUBBER FLOCKED FLOORING (09 65 18)
EL	ELASTOMERIC COATING (09 96 53)
EXP	EXPOSED – No finish
GB	GYPSUM BOARD – PAINTED (09 91 23)
H1	HARDWOOD 1 (06 40 00)
H2	HARDWOOD 2 (06 40 00)
PT#	PAINT (# DENOTES COLOUR – SEE 09 91 23)
RB	RUBBER BASE (09 68 00)
RSSF	RESILIENT SHEET SAFETY FLOORING (09 65 16)
RHF	RESILIENT HYDRO FLOORING (09 65 16)
RWC	RESILIENT WALL CLADDING (10 26 00)
RSF	RUBBER SPORT FLOORING (09 65 20)
SS	STAINLESS STEEL (05 50 00)
SF	RESIDENTIAL RESILIENT SHEET FLOORING (09 65 16)
LF	LAMINATE FLOORING (09 62 19)
KD	KNOCK-DOWN TEXTURED CEILING FINISH – PAINTED (09 21 16)

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry.
- .2 Section 07 27 00 – Air and Vapour Barriers.
- .3 Section 09 06 01 – Room Finish Schedule.
- .4 Section 09 51 13 – Acoustical Panel Ceilings.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C36/C36M-03e1, Specification for Gypsum Wallboard.
 - .2 ASTM C475-12, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .3 ASTM C840-11, Specification for Application and Finishing of Gypsum Board.
 - .4 ASTM C841-03(2008), Standard Specification for Installation of Interior Lathing and Furring.
 - .5 ASTM C1002-07, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - .6 ASTM C1047-10a, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .7 ASTM C1178/C1178M-11, Specification for Glass Mat Water-Resistant Gypsum Backing Board.
 - .8 ASTM C1396/C1396M-11, Standard Specification for Gypsum Board.
 - .9 ASTM C1629/C1629M-06(2011), Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels
- .2 Association of the Wall and Ceilings Industries International (AWEI)
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .4 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-2007, Surface Burning Characteristics of Building Materials and Assemblies.

1.3 SUBMITTALS

- .1 Samples:
 - .1 Submit duplicate 300 x 300 mm samples of textured ceiling finishes for Housing Unit ceilings, in selected colour, to consultant for approval prior to installation.

1.4 MOCK-UP

- .1 Provide mock-up in accordance with Section 01 45 00 – Quality Control.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials in original packages, containers or bundles bearing manufacturers brand name and identification.
- .2 Store materials inside, level, under cover. Keep dry. Protect from weather, other elements and damage from construction operations and other causes.
- .3 Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal accessories and trim from being bent or damaged.
- .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.

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.

Part 2 Products

2.1 MATERIALS

- .1 Standard board: to ASTM C36/C36M, Type X, 16 mm thick, 1200 mm wide x maximum practical length, ends square cut, edges bevelled.
- .2 Mold and mildew resistant gypsum board: to ASTM C1396/C1396M, Type X, thickness as indicated in drawings, 1200 mm wide x maximum practical length.
- .3 Water-resistant gypsum board (Water-Resistant Fiber-Reinforced Gypsum Backing Panels): to ASTM 1278 regular thickness as indicated in drawings, 1200 mm wide x maximum practical length, Type X.

- .4 Metal Access doors: frameless, welded construction, push latching door, removable door, accepts 12.7 mm or 15.9 mm gypsum board, exposed frames paintable.
- .5 Metal furring runners, hangers, tie wires, inserts, and anchors required for installation to ASTM C841.
- .6 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .7 Resilient drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
- .8 Metal channel stiffener: 19 x 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.
- .9 Steel drill screws: to ASTM C1002.
- .10 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, metal, 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 Sealants.
- .12 Acoustic sealant: in accordance with Section 07 92 00 - Joint Sealants.
- .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 C475, asbestos-free.
- .16 Texturing plaster: mill mixed finishing plaster prepared for texture ceiling application. Colour: See Section 09 06 01.

Part 3 Execution

3.1 ERECTION

- .1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.
- .2 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.
- .3 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .4 Install work level to tolerance of 1:1200.
- .5 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, and grilles.

- .6 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .7 Install gypsum board fire and sound stops and to form plenum areas to underside of wood roof deck above suspended ceilings as indicated.
- .8 Install wall furring for gypsum board wall finishes in accordance with ASTM C840, except where specified otherwise.
- .9 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .10 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .11 Erect drywall resilient furring transversely across studs, 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.

3.2 APPLICATION

- .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 (as indicated on drawings) to metal furring or framing using screw. 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 C840.
 - .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 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.
- .4 Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.
- .5 Install gypsum board with face side out.
- .6 Do not install damaged or damp boards.

- .7 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.
- .8 Apply water resistant, fiber-reinforced gypsum board panels in Rooms 001, 002, 003, 004, H105, H106, H110, 116.1, 119.1, 117, 120, and 131. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Thickness and fire resistance rating to match gypsum board specified in Wall Type.
- .9 Apply mold and mildew resistant panels to interior side of walls in Rooms H108, 116, 119, and in locations where gypsum board is to be painted. Thickness and fire resistance rating to match gypsum board specified in Wall Type.
- .10 Textured Finishing Plaster:
 - .1 Mix, in proportion by dry weight, in accordance with applicable bag mixing instructions.
 - .2 Machine-Applied Spray Finishes:
 - .1 Apply plaster in uniform spray pattern to produce texture approved by Departmental Representative.

3.3 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.
- .4 Construct control joints of preformed units set in gypsum board facing and supported independently on both sides of joint.
- .5 Provide continuous polyethylene dust barrier behind and across control joints.
- .6 Apply 12 mm diameter bead of acoustic sealant continuously around perimeter of first layer of multiple layers of gypsum board to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, and penetrations, in partitions where perimeter sealed with acoustic sealant.
- .7 Install access doors to electrical and mechanical fixtures specified in respective sections.
 - .1 Rigidly secure frames to furring or framing systems.
- .8 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.
- .9 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 Levels of finish:

- .1 Level 0: No tapping, finishing or accessories required.
- .2 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.
- .3 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.
- .4 Level 3: Embed tape for joints and interior angles in joint compound and apply two separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
- .5 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.
- .6 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.
- .10 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.
- .11 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.
- .12 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .13 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .14 Mix joint compound slightly thinner than for joint taping.
- .15 Apply thin coat to entire surface using trowel or drywall broadknife to fill surface texture differences, variations or tool marks.
- .16 Allow skim coat to dry completely.
- .17 Remove ridges by light sanding or wiping with damp cloth.
- .18 Provide protection that ensures gypsum drywall work will remain without damage or deterioration at time of substantial completion.
- .19 Install textured knock-down finish to housing unit ceilings in locations indicated in Section 09 06 01 and as per manufacturer's written instructions. See Room Finish Schedule for locations and colors.

3.4 CONTROL JOINTS

- .1 Provide control joints at not greater than 9 m spacing on continuous gypsum board walls in a single plane and at not greater than 9 m spacing on ceilings and bulkheads except where indicated otherwise in the drawings.
 - .1 Confirm location of control joints with the Consultant prior to installation of gypsum board
- .2 Provide control joints of preformed units set in gypsum board facing and supported independently on both sides of joint. Interrupt top and bottom tracks at location of control joint.
- .3 Install control joints straight and true. Finish control joints as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.

3.5 ACCESS PANELS

- .1 Coordinate installation with Mechanical.
- .2 Secure frames rigidly in place, plumb and level in opening, with plane of door and panel face aligned with adjacent finished surfaces.
- .3 Set concealed frame type units flush with adjacent finished surfaces.
- .4 Position unit to provide convenient access to concealed work requiring access.

3.6 FINISH SCHEDULES

- .1 Levels of finish: Interior partitions;
 - .1 Level 1:
 - .1 Plenums above suspended ceilings, inside of duct shafts and other gypsum board wall areas not exposed to view.
 - .2 Level 4:
 - .1 Vertical surfaces (walls) exposed to view.
 - .2 Ceilings and underside of bulkheads exposed to view.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 09 06 01 – Room Finish Schedule.
- .2 Section 09 53 01 - Acoustical Suspension: Suspension system
- .3 Division 23 - Air diffusers within ceiling systems
- .4 Division 26 - Lighting fixtures within ceiling system

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C635-00 Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
 - .2 ASTM E 413-87(1999) Standard Classification for Rating Sound Insulation
 - .3 ASTM E1264-[98], Standard Classification for Acoustical Ceiling Products.
 - .4 ASTM E1477-[98a(2003)], Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
 - .5 ASTM E 1414-00a Standard test method for Airborne Sound Attenuation Between Rooms sharing a Common Ceiling Plenum

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate full size samples of each type of acoustical tile ceiling lay in panels required for the project

1.4 DELIVERY, STORAGE AND HANDLING

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

1.5 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 to 40% before and during installation.
- .3 Store materials in work area 48 hours prior to installation.

1.6 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 and obtain receipt, upon completion of the work of this section.

Part 2 Products

2.1 MATERIALS

- .1 To CAN/CGSB-92.1 ASTM E1264.
- .2 Flame spread rating in accordance with CAN/ULC-S102 and ASTM E 1264; Class A.
- .3 Smoke developed in accordance with CAN/ULC-S102.
- .4 Acoustic ceiling tiles for suspended ceiling.
 - .1 Textures: smooth.
 - .2 Noise Reduction Coefficient (NRC) designation of 0.70.
 - .3 Ceiling Attenuation Class (CAC) rating in accordance with ASTM C 1414
 - .4 Light Reflectance (LR) range of 0.90.
 - .5 Edge type: beveled tegular.
 - .6 Colour: White.
 - .7 Size: 610 x 610 x 19 mm thick.
 - .8 Shape: flat.
 - .9 Approved materials:
 - .1 Armstrong World Industries: Ultima
 - .2 CGC: Mars ClimaPlus
 - .3 Celotex: Symphony M
 - .4 Approved Alternate

Part 3 Execution

3.1 EXAMINATION

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

3.2 INSTALLATION

- .1 Co-ordinate with Section 09 53 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.

- .3 Install covers and escucheons to trim openings cut into ceiling tiles or panels.

3.3 ACOUSTIC CEILING TILES

- .1 Install acoustical tiles in accordance with the manufacturer's instruction, and in compliance with ASTM C 636 and with the authority having jurisdiction.
- .2 Install acoustic units to clean, dry and firm substrate.
- .3 Install acoustical units parallel to building lines with edge unit not less than 50% of unit width with directional pattern running in same direction. Refer to reflected ceiling plan.
- .4 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.

3.4 CLEANING

- .1 Proceed in accordance with Section 01 74 11 – Cleaning Procedures

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 09 06 01 – Room Finish Schedule.
- .2 Section 09 21 16 – Gypsum Board Assemblies.
- .3 Section 09 51 13 – Acoustical Panel Ceilings.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C635-04, Standard Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.

1.3 DESIGN REQUIREMENTS

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

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit a sample, one 1200mm length of T-bar for each type specified.

1.5 DELIVERY, STORAGE AND HANDLING

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

Part 2 Products

2.1 MATERIALS

- .1 Heavy duty system to ASTM C635.
- .2 Basic materials for suspension system: commercial quality cold rolled steel hot dipped galvanized steel.
- .3 Exposed tee bar grid components: Components die cut. Main tee with double web, steel construction. Main beams and cross tees shall have rotary stitching.
- .4 Suspension systems: non fire rated.
- .5 Hanger wire: galvanized soft annealed steel wire: To ASTM A641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least three times design load, but not less than:

- .1 3.6 mm diameter for access tile ceilings
- .2 2.6 mm diameter for other ceilings
- .6 Hanger inserts: purpose made.
- .7 Carrying channels: thickness to suit, galvanized steel.
- .8 Accessories: splices, clips, wire ties, retainers and wall moulding flush reveal, to complement suspension system components, as recommended by system manufacturer.

2.2 ACOUSTICAL SUSPENSION:

- .1 Coordinate suspension components with suspended tile and panel requirements.
- .2 Components: All main beams and cross tees shall be commercial quality hot-dipped galvanized (galvanized steel, aluminum, or stainless steel) as per ASTM A 653. Main beams and cross tees are double-web steel construction with 15/16 inch type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel (aluminum or stainless steel) in baked polyester paint. Main beams and cross tees shall have rotary stitching (exception: extruded aluminum or stainless steel).
 - .1 Structural Classification: ASTM C 635 HD.
 - .2 Colour: White and match the actual color of the selected ceiling tile, unless noted otherwise.
- .3 Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct hung unless otherwise indicated.
- .4 Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least three design load, but not less than 12 gauge.
- .5 Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same width as exposed runner.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

- .1 Installation: in accordance with ASTM C636 except where specified otherwise.
- .2 Do not erect ceiling suspension system until work above ceiling has been inspected by Consultant.
- .3 Secure hangers to overhead structure using industry approved attachment methods.

- .4 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.
- .5 Lay out centre line of ceiling both ways, to provide balanced borders at room perimeter unless otherwise indicated.
- .6 Ensure suspension system is co-ordinated with location of related components.
- .7 Install wall moulding to provide correct ceiling height.
- .8 Completed suspension system to support super-imposed loads, such as plywood panels and battens, lighting fixtures diffusers grilles and speakers.
- .9 Support at light fixtures, diffusers, plywood panels, with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .10 Interlock cross member to main runner to provide rigid assembly.
- .11 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.
- .12 Finished ceiling system to be square with adjoining walls and level within 1:1000.

3.3

CLEANING

- .1 Proceed in accordance with Section 01 74 11 – Cleaning Procedures
- .2 Touch up scratches, abrasions, voids and other defects in painted surfaces.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 06 40 00 – Architectural Woodwork
- .3 Section 12 35 00 – Residential Casework.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM E648-14c Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
 - .3 ASTM F141-12 Standard Terminology Relating to Resilient Floor Coverings
 - .4 ASTM F510/F510M-14 Standard Test Method for Resistance to Abrasion of Resilient Floor Coverings Using an Abrader with a Grit Feed Method
 - .5 ASTM F924-90 (2009) Standard Test Method for Resistance to Puncture of Cushioned Resilient Floor Coverings
 - .6 ASTM F373-13 Standard Test Method for Embossed Depth of Resilient Floor Coverings
 - .7 ASTM F1482-04(2009)e1 – Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
 - .8 ASTM D5751-99(2012) Standard Specification for Adhesives used for Laminate Joints in Nonstructural Lumber Products
 - .9 ASTM F 970 Standard Test Method for Static Load Limit
 - .10 ASTM D 2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring as Measured by the James Machine
 - .11 ASTM D 2571 Boiling Water Resistance
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .3 Canadian Standards Association (CSA International)
 - .1 CAN/CSA O80 Series-[08], Wood Preservation.
 - .2 CSA O151-[09], Canadian Softwood Plywood.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .5 North American Laminate Floor Association (NALFA)

- .1 NALFA LA-01-2008 3.1 Static Load Limit
 - .2 NALFA LA-01-2008 3.2 Thickness Swell
 - .3 NALFA LA-01-2008 3.3 Light Resistance
 - .4 NALFA LA-01-2008 3.4 Clean/Stain
 - .5 NALFA LA-01-2008 3.5 Ball Impact
 - .6 NALFA LA-01-2008 3.6 Dart Impact
 - .7 NALFA LA-01-2008 3.7 Wear
 - .8 NALFA LA-01-2008 3.8 Dimensional Tolerance
 - .9 NALFA LA-01-2008 3.9 Castor Chair
 - .10 NALFA LA-01-2008 3.10 Surface Bond
- .6 American National Standards Institute (ANSI)
- .11 ANSI Product Standards – Laminate Flooring Specifications and Test Methods
 - .12 ANSI Sustainability Standards – Laminate Flooring Sustainability Standard
 - .13 ANSI Underlayment Standards – Laminate Flooring Underlayment Pad Specifications and Test Methods
- .7 International Organization for Standardization (ISO)
- .2 ISO 24338 Laminate floor coverings – Determination of abrasion resistance.
 - .3 ISO 4918 Resilient textile, and laminate floor coverings – Castor Chair Test

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit duplicate, 200 mm long samples of finish flooring strips and duplicate full size cushions.
- .4 Closeout Submittals:
 - .1 Provide maintenance data for floor finish and care for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 QUALITY ASSURANCE

- .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
- .2 Construct mock-up 10m² minimum, of resilient wood flooring including one inside corner and one outside corner base.
- .3 Allow for inspection of mock-up by Departmental Representative before proceeding with Work.
- .4 When accepted, mock-up will demonstrate minimum standard for Work. Mock-up may remain as part of finished work.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Follow manufacturer's written instructions for delivery, storage and handling.
- .2 Check and record moisture content of both flooring and subflooring, and ensure levels are within manufacturer's acceptable range.
- .3 Waste Management and Disposal:
 - .1 As per Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.6 ENVIRONMENTAL REQUIREMENTS

- .1 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of materials.
- .2 Ventilation:
 - .1 Follow manufacturer's written recommendations.
- .3 Temperature:
 - .1 Follow manufacturer's written recommendations.
 - .2 Ensure substrate is within moisture limits prescribed by flooring manufacturer.
 - .3 Install flooring after drywall, work is completed and overhead mechanical and electrical work is finished in wood floor areas.

1.7 MAINTENANCE

- .1 Extra Materials:
 - .1 Provide extra materials in accordance with Section 01 78 00 - Closeout Submittals.
 - .2 Deliver 10 m² of each type and pattern of wood flooring required for this project for maintenance use. Include sufficient amount of adhesive and finishing materials and installation and application instructions. Store as directed.

Part 2 Products

2.1 MATERIALS

- .1 Urea-formaldehyde free.
- .2 Laminate strip flooring: pre-finished, drop lock installation, square or micro-bevel edge, MDF or HDF core, minimum 8 mm thick x minimum 100 mm wide random lengths, minimum length 1.2 m, tongue and groove edges and matched ends. Warranty: Min. 15 years
- .3 Resilient pad: anti-crush, compressible, mould resilient pad, standard with resilient wood flooring manufacturer. 2mm min. thickness.
- .4 Trims: T-molding, stair nosing, reducer and baby threshold as required by same manufacturer in finish to match laminate flooring.
- .5 Acceptable Products:

- .1 Mannington Value Lock
- .2 Cascade Lisbon
- .3 Approved equivalent
- .6 Colour: Mannington "Honeytone Washington Oak 65000L" or as selected by consultant from manufacturer's standard range.

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

- .1 Follow manufacturer's written recommendations.

3.3 CONSTRUCTION

- .1 Clean subfloor to be free of any dirt and debris.
- .2 Install resilient pad as per manufacturer's written instructions.
- .3 Layout to ensure no plank is less than 600 mm in length. Fit planks snugly and securely together.
- .3 Install finish flooring over resilient pad parallel to long dimension of room following manufacturer's written instructions.
- .4 Maintain 12 mm expansion space at perimeter of floor surface.
- .5 Vacuum clean and remove dust.
- .6 Install thresholds, reducers at openings and between flooring types. See drawings for locations.
- .7 Install 100% silicone sealant around pipe penetrations where condensation might be present.
- .8 Install wood perimeter base continuous at floor perimeter. See Section 06 40 00 Architectural Woodwork.

3.4 FIELD QUALITY CONTROL

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

3.5 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Clean flooring surfaces to flooring manufacturer's printed instructions.

3.6 PROTECTION

- .1 Protect new floors until final inspection.

3.7 SCHEDULES

- .1 See Room Finish Schedule for locations.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Sheet vinyl flooring and PVC safety flooring. See Section 09 65 18 for rubber base.

1.2 RELATED SECTIONS

- .1 Section 01 00 05 – General Requirements
- .2 Section 06 40 00 - Architectural Woodwork
- .3 Section 09 65 18 – Rubber Flocked Flooring
- .4 Section 09 65 20 – Rubber Sport Flooring

1.3 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM D2047-04 James Machine – Coefficient of Friction on Flooring Material
 - .2 ASTM E648 09a/NFPA 253 2000 – Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
 - .3 ASTM F1303-04 (2014) – Standard Specification for Sheet Vinyl Floor Covering with Backing
- .2 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102.2, Surface Burning Characteristics of Building Materials and Assemblies.

1.4 SUBMITTALS

- .1 Submit in accordance with 01 00 05 – General Requirements.
- .2 Shop Drawings
 - .1 Submit shop drawing/seaming diagram in accordance with Section 01 00 05 – General Requirements.
 - .2 Shop drawing/seaming diagrams shall clearly indicate the location of all seams and directions of sheet materials.

1.5 SAMPLES

- .1 Submit samples in accordance with 01 00 05 – General Requirements indicating the required colours for flooring, welding rods, and applicable accessories...
- .2 Submit 2 samples, 300 x 600 mm of each of the following required for the project:
 - .1 Resilient sheet flooring.
 - .2 Adhere samples to 10 mm thick plywood with joints and seams to represent project installation.

1.6 INSPECTION AND TESTING

- .1 Materials and workmanship subject to inspection on behalf of Owner.
- .2 Submit product data including certified copies of test reports verifying flooring materials comply with requirements specified herein, including requirements of standards specified.

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, Shipping, Handling and Unloading:
 - .1 Deliver, store, handle and protect materials in accordance with Section 01 00 05 – General Requirements
 - .2 Deliver and store materials in a dry, protected area in original, undamaged, unopened containers with manufacturer's labels indicating brand names, colours and patterns, and quality designations.
 - .3 Do not open containers or remove markings until materials are inspected and accepted.
 - .4 Store rolls on end and protect accepted materials in accordance with manufacturer's directions and recommendations.

1.8 QUALITY ASSURANCE

- .1 In the event of conflict between pertinent codes, standards and/or regulations, most stringent shall govern.

1.9 ENVIRONMENTAL REQUIREMENTS

- .1 Provide sufficient heating and ventilation in areas where work of this section is being performed. Take all precautionary measures necessary to ensure that excessive temperature changes do not occur.
- .2 Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond and moisture tests. The flooring contractor shall perform moisture content testing of structural substrates before placement of finish flooring. Moisture content testing shall be in accordance with ASTM F 1869 and ASTM D 4263. Installation of flooring materials shall not proceed until moisture transmission rate or vapour emission is at levels that comply with flooring manufacturer's written recommendation for flooring materials/systems.
- .3 For installation of resilient flooring, maintain 18° C minimum, 38° C maximum for 48 hours before, during and 7 days after installation.
- .4 Allow all resilient flooring materials and adhesives to condition to the room temperature a minimum of 48 hours before starting the installation.
- .5 Provide adequate ventilation to remove fumes and moisture.
- .6 Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring.

1.10 MAINTENANCE DATA

- .1 Provide copies of maintenance instructions for incorporation into Operating and Maintenance Manuals in accordance with Section 01 00 05 – General Requirements
- .2 Instructions are to include manufacturer's recommended materials and methods for cleaning, including precautions in the use of cleaning materials that may be detrimental to surface if improperly applied.

1.11 MAINTENANCE MATERIAL

- .1 Deliver maintenance material for maintenance use:
 - .1 Deliver 4 m² of each colour and pattern of linoleum sheet and safety flooring required for the project;
 - .2 Deliver 10 linear meters of each colour and pattern of rubber base required for the project;
- .2 All maintenance material shall be from same dye lot as used in the project.
- .3 Package neatly and mark plainly. Deliver to Owner and obtain a receipt.

Part 2 PRODUCTS

2.1 RESIDENTIAL RESILIENT VINYL SHEET FLOORING

- .1 Resilient (Vinyl) Sheet Flooring, denoted "SF" in Room Finish Schedule and drawings:
 - .1 Vinyl Sheet Flooring: Fibrous backing (non-asbestos formulated):
 - .1 Wear Layer Type: JT-88
 - .2 Wear Layer Thickness: 12
 - .3 Roll Width: 3.66m (12')
 - .4 Pattern: 305mm x 305mm (12" x 12") Tile
 - .5 Static Load Limit: 75 psi
 - .6 Recommended Spread: Full
 - .7 ASTM F-1303: Type 1, Grade 3, Class A
 - .8 ASTM #-648: Class 1
 - .9 Seams: Minimize. Pattern match.
 - .10 Care: No wax floor.
- .3 Acceptable manufacturer and products:
 - .1 Mannington Residential; Series: Aurora; Style: Canyon Ridge
 - .2 Approved equivalent.
- .4 Colour: Mannington "Aurora 41224" or one colour selected by consultant from manufacturer's standard range.

- .6 Warranty: Manufacturer's limited 12 year warranty against permanent indentation, rips, tears, gouges, yellowing, wear through, permanent discoloration from mold or mildew growth, discoloration from underlayment panels, permanent scuffing.

2.2 RESILIENT SHEET SAFETY FLOORING

- .1 Homogenous cross-linked polyvinyl chloride (PVC) sheet flooring denoted "RSSF" in Room Finish Schedule and drawings:
 - .1 Safety sheet flooring: to ASTM F 1303, Type 2, Grade 1, moisture resistant backing Class A; carborundum free; static coefficient of slip resistance in excess of 0.6 when tested to ASTM D2047; Surface roughness Rz > 20um, RRL Pendulum test >36 (wet test – 4S Rubber/Slider 96); Sustainable wet slip resistance AS/NZS 4586 R10; reaction to fire to ASTM E648, meeting Class 1 rating; classified antistatic to EN 1815.
 - .2 Must be compatible to heat weld with resilient wall panels. See Room Finish Schedule.
- .2 Thickness: Minimum 2.0 mm.
 - .1 Seams: Heat welded rod colour-matched to sheet flooring. Cut groove 3mm wide by 2/3 depth of the material, evenly along each joint.
- .3 Width of roll: 2 metres.
- .4 Seams: Heat welding rod as recommended by sheet flooring manufacturer, colour matched to sheet flooring.
- .5 Base: Form continuous coved base from sheet flooring.
- .3 Acceptable manufacturer and products:
 - .1 Polyflor Polysafe Verona
 - .2 Approved equivalent.
- .7 Colour: One colour selected by consultant from manufacturer's standard range.
- .4 Sealant: as recommended by flooring manufacturer. Colour to match flooring.
- .5 Cove former: as recommended by flooring manufacturer, 19mm radius.
- .6 Cove top edge (typical): water-tight cap strip suitable for installation at top edge of coved sheet material.
- .7 Cove top edge (at resilient wall panels): heat weld flooring cove base to wall panel to create waterproof joint. See Room Finish Schedule.

2.3 RESILIENT SHEET HYDRO FLOORING

- .1 Homogenous polyvinyl chloride (PVC) sheet flooring denoted "RHF" in Room Finish Schedule and drawings:
 - .1 Safety sheet flooring: to ASTM F 1303, Type 2, Grade 1, moisture resistant backing Class A; carborundum free; static coefficient of slip resistance in excess of 0.6 when tested to ASTM D2047; Surface roughness Rz > 20um, RRL Pendulum test >36 (wet test – 4S Rubber/Slider 96); Sustainable wet slip

resistance AS/NZS Part C Class B; reaction to fire to ASTM E648, meeting Class 1 rating; classified antistatic to EN 1815; water tightness to EN 13553 suitable for installation in wet areas.

- .2 Thickness: Minimum 2.0 mm with raised emboss.
 - .1 Seams: Heat welded rod colour-matched to sheet flooring. Cut groove 3mm wide by 2/3 depth of the material, evenly along each joint.
- .3 Width of roll: 2 metres.
- .4 Base: Form continuous coved base from sheet flooring.
- .5 Acceptable manufacturer and products:
 - .1 Polyflor Polysafe Hydro Evolve
 - .2 Approved equivalent.
- .6 Sealant: as recommended by flooring manufacturer. Colour to match flooring.
- .7 Cove former: as recommended by flooring manufacturer, 19mm radius.
- .8 Cove top edge: heat weld to resilient wall panels to ensure watertight joint.
- .9 Colour: One colour selected by consultant from manufacturer's standard range.

2.4 BASE MATERIALS

- .1 At RSSF and RHF: Cove resilient sheet flooring material unless indicated otherwise in drawings. Utilize manufacturer's recommended cove former. 100 ht.
- .2 At SF: Denoted as H2 in Room Finish Schedule. See Section 06 40 00 Architectural Woodwork.

2.5 ACCESSORIES/ADHESIVES/SEALERS

- .1 Sub-Floor Filler: Self levelling consistency:
 - .1 Ardex K-15.
 - .2 Mapei Ultraplan 1.
 - .3 Vetonite Plaano.
- .2 Subfloor Leveller: Series LS Leveller System as manufactured by Johnsonite, Division of Duramax.
- .3 Primers, Adhesives: Waterproof, of types recommended by resilient flooring manufacturer for specific material, application and climatic extremes and movement associated with transportation of building modules.
- .4 Provide metal edge strips of width shown on the drawings and of required thickness to protect exposed edges of the flooring. Provide units of maximum available length to minimize the number of joints. Use butt-type metal edge strips for concealed anchorage, or overlap-type metal edge strips for exposed anchorage. Unless otherwise shown, provide strips made of extruded aluminum with a mill finish.
- .5 Provide reducers/risers/transitions strips at all intersections with joint covers and dissimilar flooring materials.

- .6 Sealers, Cleaners and Wax: Type recommended by resilient flooring material manufacturer for material type and location.

Part 3 EXECUTION

3.1 ACCEPTABLE INSTALLERS

- .1 Installation of materials of this Section shall be by the manufacturer's approved installers, in strict accordance with manufacturer's installation instructions.
- .2 The Work of this Section shall be performed by skilled workers with at least three (3) years successful installation experience with the type of materials specified herein.
- .3 Submit evidence of experience and obtain Consultant's approval before proceeding with flooring installation.

3.2 EXAMINATION

- .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 flooring material.
- .2 Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mould, or mildew.

3.3 SITE AND SUBSTRATE CONDITIONS

- .1 Surfaces of substrate must not be coated with any type of membrane or curing compound.
- .2 Ensure concrete floors are dry maximum 7% moisture content and exhibit negative alkalinity, carbonization or dusting.
- .3 Store flooring materials in area of application. Allow 3 days for material to reach equal temperature as area.

3.4 PREPARATION

- .1 Ensure floors are level with maximum surface variation of 6 mm in 3 metres non-cumulative.
- .2 Ensure concrete floors are free from scaling and chatter marks.
- .3 Perform subfloor Calcium Chloride Tests (and Bond Tests) to determine if surfaces are dry; free of curing and hardening compounds, old adhesive and other coatings; and ready to receive flooring.
- .4 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.
- .5 Provide subfloor leveller at junction of resilient flooring with other flooring types to give a level transition. Bond to substrate with suitable substrate adhesive as recommended by leveller manufacturer.

- .6 Ensure walls are prepared according to floor manufacturer's instructions where safety flooring will form coved base.

3.5 LEVELLING

- .1 Smooth surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, control or construction joints, and other defects with specified sub-floor filler.
- .2 Clean floor and apply, trowel, and float filler to leave smooth, flat hard surface. Prohibit traffic until filler is cured.
- .3 Clean floor with an industrial vacuum cleaner. Remove any substance deleterious to adhesive bond.
- .4 Provide subfloor leveller at junction of resilient flooring with other flooring types to give a level transition. Bond to substrate with suitable substrate adhesive as recommended by leveller manufacturer.

3.6 INSTALLATION - FLOORING GENERAL

- .1 Lay flooring to provide a minimum number of seams. Locate seams at doorways and in areas of least amount of traffic. Avoid cross seams, filler pieces, and strips. "T" seams are not acceptable. Match edges for colour shading and pattern at the seams in compliance with the manufacturer's recommendations.
- .2 Locate seams 150 mm minimum from joints in sawcuts in concrete, subfloor or underlayment joints.
- .3 Install sheet flooring to a minimum of 1/3 full material width, except as detailed otherwise, and with sheet parallel to width of room.
- .4 Install sheet flooring using rolls in consecutive number to ensure match of colour and pattern.
- .5 Install with a minimum tile width 1/2 full size at room or area perimeter, to square grid pattern with all joints aligned and pattern grain parallel for all units and parallel to width of room.
- .6 Install flooring wall to wall after the installation of floor-set cabinets, and casework. Extend flooring into toe spaces, door recesses, closets, and similar openings. Cove base as scheduled up floor-set cabinets and casework.
- .7 Install flooring wall to wall before the installation of furniture, equipment, movable partitions, etc. Extend flooring into toe spaces, door recesses, closets, and similar openings.
- .8 Install flooring on pan-type floor access covers. Maintain continuity of colour and pattern within pieces of flooring installed on these covers. Adhere flooring to the subfloor around covers and to covers.
- .9 Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to provide tight joints.
- .10 Terminate resilient flooring at centre line of door openings where adjacent floor finish is dissimilar.

- .11 Adhere flooring to the subfloor without cracks, voids, raising and puckering at the seams. Spread cement evenly in quantity recommended by manufacturer to ensure adhesion over entire area of installation. Spread only enough adhesive to permit installation of flooring before initial set. Roll with a 45 kilogram roller in the field areas. Hand-roll flooring at the perimeter and the seams to assure adhesion. Refer to specific rolling instructions of the flooring manufacturer.
- .12 Install flooring with adhesives, tools, and procedures in strict accordance with the manufacturer's written instructions. Observe the recommended adhesive trowel notching, open times, and working times.
- .13 Install feature strips and floor markings where indicated. Fit joints tightly.
- .14 Install edge strips at unprotected or exposed edges where flooring terminates.
- .15 Install transition strips, risers, reducers at dissimilar flooring heights.
- .16 Carry flooring through beneath edges of metal thresholds.
- .17 Use methods and sequence of work in conformance with written instructions of the flooring manufacturer. Finish all seams flush and free from voids, recesses, and raised areas.
- .18 Apply sealer, polish or wax as recommended by manufacturer.

3.7 INSTALLATION – COVE

- .1 Turn flooring material up wall and securely bond to cove former and wall substrate. Install cove base to 100mm above finished floor.
- .2 Mitre cove at corners. Hot weld joints and mitred corners with matching welding rod.
- .3 Trim back cove formers in proximity to openings or door frames on wall and neatly terminate at opening or frame.
- .4 Install top cove edge strip.

3.8 MANUFACTURER'S FIELD SERVICES

- .1 Manufacturer's technical representative, acceptable to the Consultant, shall provide adequate initial on-site direction to Subcontractor and Contractor, to ensure acceptable application of all resilient flooring materials.
- .2 Provide additional periodic site representation to assist Subcontractor and Contractor in performance of the Work.

3.9 CLEANING

- .1 Promptly, as the work proceeds, clean up excess materials, rubbish and overspray or splash.
- .2 Remove excess adhesive from floor, base and wall surfaces without damage.
- .3 Clean floors by following manufacturer's written instruction.

3.10 PROTECTION

- .1 Prohibit traffic from floor finish for 48 hours after installation.
- .2 Protect resilient flooring until Substantial Performance of the Work.

- .3 Make good all damage to satisfaction of the Consultant, at no cost to the Owner.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Modular carpet and rubber base.

1.2 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry.
- .2 Section 09 06 01 – Room Finish Schedule.
- .3 Section 09 65 16 – Resilient Sheet Flooring.

1.3 REFERENCES

- .1 American Association of Textile Chemists and Colorists (AATCC)
 - .1 AATCC 16-1998, Color Fastness to Light.
 - .2 AATCC 134-2001, Electrostatic Propensity of Carpet.
- .2 American Society for Testing and Materials (ASTM International)
 - .1 ASTM E84-01, Test Method for Surface Burning Characteristics of Building Materials.
 - .2 ASTM F 1861-00, Standard Specification for Resilient Wall Base
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-4.129-93(R1997), Carpets for Commercial Use.
- .4 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-2007, Surface Burning Characteristics of Building Materials and Assemblies.
 - .2 CAN/ULC-S102.2-88(R2000), Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.

1.4 SUBMITTALS

- .1 Submit control submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit verification to demonstrate compliance with CAN/ULCS102 and CAN/ULCS102.2.
- .3 Submit carpet schedule using same room designations indicated on drawings.
- .4 Confirm carpet tile layout pattern to be used.
- .5 Submit carpet manufacturer's installation instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.5 PRODUCT DATA

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit product data sheet for each carpet, , adhesive, carpet protection and subfloor patching compound.
- .3 Submit data on specified products, describing physical and performance characteristics, sizes, patterns, colours, and methods of installation.

1.6 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate 610x610 mm pieces of each type carpet specified.

1.7 CLOSEOUT SUBMITTALS

- .1 Submit operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- .2 Submit maintenance data: Include maintenance procedures, recommendations for maintenance materials and equipment, and suggested schedule for cleaning.

1.8 QUALIFICATIONS

- .1 Installer Qualifications:
 - .1 Flooring contractor requirements.
 - .1 Specialty contractor normally engaged in this type of work, with prior experience in installation of these types of materials.
- .2 Be responsible for proper product installation, including floor testing and preparation as specified and in accordance with carpet manufacturers written instructions.

1.9 DELIVERY, STORAGE AND HANDLING

- .1 Label packaged materials. For carpet tile products indicate nominal dimensions of tile and indicate installation direction.
- .2 Store packaged materials in original containers or wrapping with manufacturer's seals and labels intact.
- .3 Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness.
- .4 Store materials in area of installation for minimum period of 48 hours prior to installation.
- .5 Modular carpet: store on pallet form as supplied by Manufacturer. Do not stack pallets.

1.10 ENVIRONMENTAL REQUIREMENTS

- .1 Moisture: Ensure substrate is within moisture limits and alkalinity limits prescribed by manufacturer.
- .2 Temperature: Maintain ambient temperature of not less than 18 °C from 48 hours before installation to at least 48 hours after completion of work.
- .3 Relative humidity: Maintain relative humidity between 10 and 65% RH for 48 hours before, during and 48 hours after installation.
- .4 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

1.11 EXTRA MATERIALS

- .1 Provide extra materials of carpet, carpet base, and adhesives in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide 10 complete modular carpet pieces of each colour and pattern.
- .3 Extra materials to be from same production run as installed materials.
- .4 Identify each package of carpet and each container of adhesive.
- .5 Store where directed by Consultant.

Part 2 Products

2.1 MODULAR CARPET

- .1 To ASTM E648/NFPA 253 – Class 1; ASTM E 662/NFPA 258 – 450 or less; ASTM D 2859 – pass.
- .2 Carpet: solid vinyl reinforced base, flocked nylon surface.
- .3 Gauge: 5.3 mm.
- .4 Backing: vinyl cushioned.
- .5 Wear layer composition: nylon type 6.6
- .6 Wear layer density: approx. 70,000,000 fibers/yd².
- .7 EN1307 (wear class): 4 (heavy duty).
- .8 Carpet Tile Dimensions: 500 x 500 mm.
- .9 Colourization: multiple colour tones.
- .10 Adhesive: as recommended by carpet manufacturer

- .11 Acceptable Manufacturer/Product:
 - .1 Forbo – series: Flotex “Penang”
 - .2 Approved equivalent.
- .12 Colour:
 - .1 “382015 Beige” or as selected from manufacturer’s standard range.

2.2 ACCESSORIES

- .1 Binder bars: Stainless steel.
- .2 Adhesive:
 - .1 Recommended by carpet manufacturer for direct glue down installation of modular carpet or speciality backed carpets.
- .3 Subfloor patching compound: Portland cement base filler, mix with latex and water to form a cementitious paste.

2.3 BASE MATERIALS

- .1 Resilient base: Conforming to ASTM F 1861, rubber, Type TS vulcanized rubber or Type TP thermoplastic rubber, coved, 102 mm high x 3mm thick, including premoulded end stops and external corners, of same material, size and colour as base.
- .2 Color: Selected from manufacturer’s standard range.
- .3 Acceptable Manufacturers:
 - .1 Johnsonite
 - .2 Approved alternate.

Part 3 Execution

3.1 SUB-FLOOR TREATMENT

- .1 Concrete substrates shall be free of paint, dirt, grease, oil, curing or parting agents, and other contaminates, including sealers, that may interfere with the bonding of the adhesive.
- .2 Wherever a powdery or porous concrete surface is encountered, a primer compatible with the adhesive shall be used to provide a suitable surface for glue-down installation.

3.2 PREPARATION

- .1 Prepare floor surfaces in accordance with CRI 104 Standard for Installation of Commercial Carpet.
- .2 Pre-condition carpeting following manufacturer's printed instructions.

3.3 INSTALLATION

- .1 Lay tile using a quarter turn pattern. Confirm with Department Representative prior to installation.
- .2 Install carpeting using minimum of pieces.
- .3 Apply acrylic adhesive and install modular carpet in accordance with manufacturer's written instructions.
- .4 Lay modular carpet with butt seams.
- .5 Finish installation to present smooth wearing surface free from conspicuous seams, burring and other faults.
- .6 Use material from same dye lot. Ensure colour, pattern and texture match within any one visual area. Maintain constant pile direction.
- .7 Fit neatly around architectural, mechanical, electrical and telephone outlets, and furniture fittings, around perimeter of rooms into recesses, and around projections.
- .8 Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- .9 Install carpet smooth and free of bubbles, puckers, and other defects.
- .10 Roll modular carpet with appropriate roller for complete contact of carpet with mill-applied adhesive to sub-floor.

3.4 SEAMS

- .1 Seal edges of cut-outs with latex.
- .2 Carpet visibility of seams and joints to acceptable industry standards.

3.5 CARPET TACKSTRIPS AND BINDER BARS

- .1 Install binder bars at exposed carpet edges and centre under doors in door openings.

3.6 INSTALLATION - BASE

- .1 Fit joints tight and vertical. Maintain minimum measurement of 450 mm between joints.
- .2 Mitre internal corners. Provide scribed external corners.
- .3 Install base on solid backing. Adhere tightly to wall and floor surfaces.
- .4 Scribe and fit to door frames and other obstructions.
- .5 Install straight and level to variation of plus or minus 3 mm over 3 m.
- .6 Provide base to all architectural woodwork and architectural casework counters and cabinets.

3.7 PROTECTION OF FINISHED WORK

- .1 Vacuum carpets clean immediately after completion of installation. Protect traffic areas.
- .2 Prohibit traffic on carpet for a period of 24 hours until adhesive is cured.
- .3 Install carpet protection to satisfaction of Consultant.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Rubber sport flooring in Room 126.
- .2 See Section 09 65 18 for rubber base.

1.2 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry.
- .2 Section 08 14 16 – Flush Wood Doors.
- .3 Section 09 06 01 – Room Finish Schedule.
- .4 Section 09 95 16 – Resilient Sheet Flooring
- .5 Section 09 65 18 – Rubber Flocked Flooring.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM International)
 - .1 ASTM F 710 Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.
 - .2 ASTM F1344-[00], Specification for Rubber Tile..
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-25.20-95, Surface Sealer for Floors.
 - .2 CAN/CGSB-25.21-95, Detergent-Resistant Floor Polish.

1.4 SUBMITTALS

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate tile in size and colours specified.
- .3 Submit technical data sheets of the flooring product and adhesive product.

1.5 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data for rubber sports flooring for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

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.

1.7 ENVIRONMENTAL REQUIREMENTS

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

1.8 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 m² of each colour, pattern and type flooring material required for this project for maintenance use.
- .3 Extra materials to be from same production run as installed materials.
- .4 Clearly identify each container of floor tile and each container of adhesive.
- .5 Deliver to Owner, upon completion of the work of this section.
- .6 Store where directed by Owner.

1.9 WARRANTY

- .1 Five year manufacturer warranty.

Part 2 Products

2.1 MATERIALS

- .1 Rubber floor tile: prefabricated rubber sports surfacing, dual durometer vulcanized and calandered with special embossing, including adhesive. Prefabricated rubber surface to be sheet goods, calandered and vulcanized with a base of natural and synthetic rubber, stabilizing agents and pigmentation. To be manufactured in two layers, vulcanized together.
 - .1 Thickness: 10mm total thickness, with wear layer thickness of 3mm
 - .2 Tile size: 610 x 610 mm or 915 x 915 mm.
 - .3 Pattern: smooth textured pattern from manufacture's standard range , solid color field with speckle throughout entire thickness of wear layer
 - .4 Colour: 2 colours to be selected from standard range.
 - .5 The shore hardness of the lower layer shall be less than the upper layer within the limits of following table. Field laminated material is not acceptable.

Physical Properties	Standard	Specification
Hardness Shore A	ASTM D-2240	75 (+-5) top layer 55(+/-) bottom layer
Tensile strength	ASTM D-412	565 psi (+-50)
Elongation at break	ASTM D-412	226 (+-50)

100% modulus	ASTM D-412	64 psi (+-25)
Taber abrasion H18 wheels 500gr/1000 cycles	STM C-501	0.0001gr
Critical radiant flux	ASTM E-648-94A	Class 1
Water absorption 24hr/23 degree C	ASTM D-570	0.49%
Coefficient of friction	ASTM D-2047	0.91 dry/ 0.94 wet
Static load limit	ASTM F-970	0.003 in
Flame spread	ASTM E-648-94A	0.46 watts/sq.cm, class 1

- .2 Rubber base: Refer to Section 09 65 18 Rubber Flocked Flooring.
- .3 Primers and adhesives: two part polyurethane adhesive suitable for adherence of flooring to concrete substrate. Adhesive to be supplied by or approved by the rubber flooring manufacturer.
- .4 Sub-floor filler and leveller: as recommended by flooring manufacturer for use with their product.
- .5 Edge transition strips and ramps between differing flooring heights: rubber; colour: black.

Part 3 Execution

3.1 INSPECTION

- .1 Ensure concrete floors are dry, by using test methods recommended by tile manufacturer. Concrete must have cured for a minimum of 30 days. Vapour emission from the substrate must be less than 1.35 kg per 93 Sq.m in 24 hours as per ASTM 1869-98.
- .2 Installer must have successfully completed installations of the same scale as this project, within the last three years and be recognized and approved by the sport surfacing manufacturer.

3.2 SUB-FLOOR TREATMENT

- .1 Prepare to ASTM F 710 and as recommended by rubber sport floor manufacturer.
- .2 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler. Floor must be level to not more than 3mm in 3 metre radius.
- .3 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.
- .4 General Contractor and installer shall thoroughly inspect subfloor surface prior to proceeding with installation. Report any deficiencies to Consultant.

3.3 FLOORING APPLICATION

- .1 Provide a high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. Vent directly to the outside. Do not let contaminated air re-circulate through a district or whole building air distribution system. Maintain extra ventilation for at least one month following installation.
- .2 To minimize emissions from adhesives, use lowest V.O.C. emitting material that will meet requirements of this specification.
- .3 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.
- .4 Install sport flooring in accordance with manufacturer's printed instructions.
- .5 Lay flooring with joints parallel to building lines to produce tile pattern required. Border tiles minimum half tile width. Cut and adjust flooring prior to adhesion.
- .6 As installation progresses, and after installation, ensure full adhesion of tiles in adhesive. Hold all seams in place in accordance with manufacturer's recommendations.
- .7 Cut tile and fit neatly around fixed objects.
- .8 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar. Coordinate door undercut with door supplier.
- .9 Install edge transition strips at unprotected or exposed edges where flooring terminates at openings or meets another type of flooring.
- .10 Provide matching flooring transition strip/ramp where flooring meets flooring of different thickness.

3.4 BASE APPLICATION

- .1 Refer to Section 09 65 18 – Rubber Flocked Flooring.

3.5 INITIAL CLEANING

- .1 Remove excess adhesive from floor, base and wall surfaces without damage.
- .2 Clean, floor and base surface to flooring manufacturer's instructions.

3.6 PROTECTION OF FINISHED WORK

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 09 06 01 – Room Finish Schedule
- .2 Section 09 21 16 – Gypsum Board Assemblies (coordinate installation of additional support in gypsum board walls as required for acoustic panels).

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM International)
 - .1 ASTM C423-01, Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - .2 ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- .2 Underwriter Laboratories of Canada (ULC)
 - .1 CAN/ULC-S702-97, Thermal Insulation, Mineral Fibre, for Buildings.
 - .2 CAN/ULC – S102 Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data
 - .1 Submit manufacturer's printed product literature, specifications and data sheets.
- .2 Shop Drawings
 - .1 Submit shop drawings indicating panel sizes and configuration.

1.4 DELIVERY, STORAGE AND HANDLING

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

Part 2 Products

2.1 MATERIALS

- .1 Acoustical construction products must:
 - .1 Not require being labelled as poisonous, corrosive, flammable or explosive under the Consumer Chemical and Container Regulations of the Hazardous Products Act.
 - .2 Be accompanied by detailed instructions for proper handling and installation so as to minimize health concerns.

2.2 ACOUSTIC PANELS (APT) TYPE 1

- .1 Acoustic core material: to CAN/CGSB-92.1.
 - .1 NRC designation of 0.50 or greater.
 - .2 Panel core: mineral fiber.
 - .3 Thickness: 16 mm.
 - .4 Edges: standard bevel edge with integral concealed edge reinforcing if required by panel sizes.
 - .5 Panels and visible edges to be wrapped with fire retardant material.
 - .1 Flame spread class of 25 or less to CAN/ULC S102.
 - .6 Fabric: Vinyl
 - .1 Colour selected from manufacturer's standard range of colours.
 - .7 Dimensions: refer to drawings for sizes and locations.
 - .8 Acceptable manufacturers:
 - .1 Armstrong "Soundsoak"
 - .2 Approved equivalent.

Part 3 Execution

3.1 INSTALLATION

- .1 Ensure substrate surface is straight to tolerance of plus or minus 3 mm over 3000 mm.
- .2 Install according to manufacturer's written instructions.
- .3 Install acoustic units to clean, dry and firm substrate using concealed clips.
- .4 Fully adhere acoustic units to wall and ceiling substrate.
- .5 Install acoustic units plumb and aligned. Arrange units as indicated.
- .6 Cut panels to suit electrical and mechanical items mounted to walls and ceilings.
- .7 Cut panels around openings in wall.
- .8 Wrap fabric back to panels wherever panels are cut, cover exposed panel edges.

3.2 CLEANING

- .1 Keep acoustic installation and all components clean. Remove blemishes immediately.

3.3 PROTECTION

- .1 Use polyethylene to protect finished acoustical treatment from damage.
- .2 Remove prior to substantial completion.

3.4 SCHEDULES

- .1 Indicated on drawings.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 05 50 00 - Metal Fabrications.
- .2 Section 06 10 00 – Rough Carpentry.
- .3 Section 07 46 46 – Cementitious Siding
- .4 Section 08 90 10 – Door, Frame and Hardware Schedule.

1.2 REFERENCES

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .2 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual – latest edition.

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 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 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 datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.

- .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 paint with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards.

1.5 MAINTENANCE

- .1 Extra Materials:
 - .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Submit one four litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements, 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 Remove paint materials from storage only in quantities required for same day use.
 - .10 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

- .11 Fire Safety Requirements:
 - .1 Provide one 9 kg Type ABC dry chemical 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 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
 - .2 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).
 - .3 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
 - .4 Close and seal tightly partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

1.7 AMBIENT CONDITIONS

- .1 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, perform no painting work when:
 - .1 Ambient air and substrate temperatures are below 10 degrees C.
 - .2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.
 - .3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.
 - .4 Relative humidity is above 85 % or when dew point is less than 3 degrees C variance between air/surface temperature.
 - .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.

- .2 Perform no painting work when maximum moisture content of substrate exceeds:
 - .1 12% for concrete and masonry (clay and concrete brick/block).
 - .2 15% for wood.
- .3 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.
- .2 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 Use only MPI listed L rated materials.
- .4 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).

- .5 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .6 Water-borne surface coatings and recycled water-borne surface coatings must have flash point of 61.0 degrees C or greater.

2.2 COLOURS

- .1 PT4: to match Preformed Metal Siding Color 1
- .2 PT5: to match Preformed Metal Siding Color 2
- .3 PT7: to match cementitious siding (Housing unit crawlspace access door)
- .4 S3: not used.
- .5 S4: Colour to be selected by consultant. (Housing unit deck stain.)
- .6 Selection of colours will be from manufacturer's full range of colours.
- .7 Where specific products are available in restricted range of colours, selection will be based on limited range.
- .8 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.
- .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 Structural Steel and Metal Fabrications: (only as noted)
 - .1 EXT 5.1M - Waterborne light industrial Gloss level 5 semi-gloss coating (over waterborne primer). Premium grade.
- .2 Galvanized Metal: not chromate passivated (Exterior doors)
 - .2 EXT 5.3L - Pigmented polyurethane over Epoxy Primer
 - .1 Grade: Premium; Gloss Level: G6
- .3 Pressure Treated Wood: (pressure treated housing unit decks) noted as S4.
 - .1 EXT 6.5D – Deck Stain (over wood preservative)
 - .1 Grade: Premium; Gloss Level: n/a
- .4 Cementitious Siding: as recommended by siding manufacturer. Refer to Section 07 46 46.

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 painted in accordance with MPI requirements.
- .4 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.
- .5 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.

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.
- .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 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas.

3.5 APPLICATION

- .1 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.
 - .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 properly 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 a uniform layer, with overlapping at edges of spray pattern.
 - .4 Brush out immediately runs and sags.
 - .5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access.
- .5 Apply coats of paint as 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 projecting ledges.
- .9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.6 MECHANICAL/ELECTRICAL EQUIPMENT

- .1 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, duct work, grilles and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.
- .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.

3.7 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.

3.8 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.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 05 50 00 - Metal Fabrications.
- .2 Section 06 10 00 – Rough Carpentry.
- .3 Section 06 40 00 – Architectural Woodwork.
- .4 Section 08 06 01 - Door, Frame and Hardware Schedule.
- .5 Section 08 14 16 - Flush Wood Doors
- .6 Section 09 06 01 – Room Finish Schedule.
- .7 Section 09 21 16 – Gypsum Board Assemblies.
- .8 Section 09 96 53 - Elastomeric Coatings.
- .9 Section 12 50 00 - Detention Furnishings.

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.

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.

1.4 ACTION AND INFORMATIONAL 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 three 200 x 300 mm sample panels of each paint, stain and clear coating with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards.
 - .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
 - .1 Submit manufacturer's installation application instructions.
 - .4 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.

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 and finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
 - .3 Delivery, storage and protection: comply with Owner 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 dry chemical 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 Handle and dispose of hazardous materials in accordance with Regional and Municipal, regulations.
 - .2 Ensure emptied containers are sealed and stored safely.
 - .3 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal. Dispose of according to Authorities with Jurisdiction.
 - .4 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
 - .5 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

1.7 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces.
 - .2 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.
 - .3 Provide continuous ventilation for seven days after completion of application of paint.
 - .4 Coordinate use of existing ventilation system with Consultant and ensure its operation during and after application of paint as required.

- .5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
- .6 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 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 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.

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 or 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" minimum E2 ratings based on VOC (EPA Method 24) content levels.
- .8 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .9 Flash point: 61.0 degrees C or greater for water-borne surface coatings and recycled water-borne surface coatings.
- .10 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.

2.2 COLOURS

- .1 PT1: to match General Paint CLW 1002W 'Ottertail'
- .2 PT2: to match General Paint CLC1257D 'Strata'
- .3 PT3: to match General Paint 8210W 'Whispering Birch'
- .4 PT6: to match General Paint CLW 1037W 'Stoney Plain'
- .5 Cell identification number: Refer to Section 09 96 53 Elastomeric Coatings.
- .6 S1: no stain. Clear varnish.
- .7 S2: stain to match Residential Casework Section 12 35 00.
- .8 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. Obtain written approval from Departmental Representative DCC Representative Consultant for tinting of painting materials.
- .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:

	Gloss @ 60 degrees	Sheen @ 85 degrees
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 as noted on Finish Schedule.

2.5 INTERIOR PAINTING SYSTEMS

- .1 Concrete horizontal surfaces: floors.
 - .1 INT 3.2F - Concrete floor sealer. Two coats. Broadcast clean non-skid aggregate into first coat of sealer while still wet.
- .2 Structural steel and metal fabrications: (columns, beams, joists, steel furniture and as indicated on drawings):
 - .1 INT 5.1Q – Latex, Gloss Level 5 – Semi-Gloss finish (over alkyd primer). Premium grade, 1 coat primer, two top coats.
- .3 Galvanized metal: (doors, frames, railings, misc. steel, pipes, overhead decking, ducts and as indicated on drawings).
 - .1 INT 5.3M - High performance architectural latex Gloss Level 5 – Semi-Gloss finish. Premium grade, 1 coat primer, two top coats.
- .4 Dressed lumber: (including doors, door and window frames, window sills, casings, joint covers, mouldings and as indicated as S1 on drawings):
 - .1 INT 6.3Q - Waterborne clear acrylic Gloss Level 5 – Semi-Gloss finish. Premium grade, two coats clear varnish.
- .5 Dressed lumber: (door and window frames, window sills, casings, base and mouldings and as indicated as S2 on drawings):
 - .1 INT 6.3W - Waterborne clear acrylic Gloss Level 5 – Semi-Gloss finish (over stain). Premium grade, 1 coat stain, two coats varnish.
- .6 Wood paneling and casework: partitions, panels, shelving, millwork:

- .1 INT 6.4S - High performance architectural latex Gloss Level 5 – Semi-Gloss finish. Premium grade, 1 coat primer, two top coats.
- .2 See Section 09 96 53 Elastomeric Coatings for elastomeric coating finish where indicated.
- .7 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:
 - .1 INT 9.2B - High performance architectural latex Gloss Level 3–egg shell finish. Premium grade, 1 coat primer, two top coats.
- .8 Cell Identification Number: Refer to Section 09 96 53 Elastomeric Coatings.

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. Correct damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Proceeding with work is acceptance of substrate.
- .3 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.
- .4 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.
- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products and equipment.
- .4 Protect passing pedestrians, building occupants and general public in and about the building.
- .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.
- .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.
 - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
 - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
 - .4 Allow surfaces to drain completely and allow 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.
- .8 Touch up of shop primers with primer as specified.

3.5 APPLICATION

- .1 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/ELECTRICAL 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: 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 fire protection piping red.
- .9 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .10 Paint natural gas piping yellow.
- .11 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.
- .12 Do not paint interior transformers and substation equipment.
- .13 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.7 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.

3.8 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 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition.
- .5 Touch up scratches, abrasions, voids and other defects in painted surfaces.

3.9 CLEANING

- .1 Proceed in accordance with Section 01 74 11 – Cleaning Procedures

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry.
- .2 Section 08 34 63 - Detention Doors and Frames.
- .3 Section 09 06 01 – Room Finish Schedule.
- .4 Section 09 91 23 – Interior Painting.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM E84-12, Standard Test Method for Surface Burning Characteristics of Building Materials.
- .2 Underwriters' Laboratories of Canada (ULC)

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 elastomeric coating application and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Samples:
 - .1 Submit duplicate 200 x 200 mm samples of each colour and texture of wall coating applied to gypsum board, plywood, and porous concrete block.
 - .2 Prior to commencing application, prepare wall and apply sample of wall coating of each texture to full wall panels, for Departmental Representative's approval.

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 elastomeric coatings for incorporation into manual.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:

- .1 Store materials indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect elastomeric coating materials.
- .3 Replace defective or damaged materials with new.
- .4 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .5 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.

1.6 SITE CONDITIONS

- .1 Environmental Requirements:
 - .1 Temperature: minimum temperature of substrate 10 degrees C. Minimum temperature of air during and for 48 hours before and after coating is applied 15 degrees C.
- .2 Ventilation:
 - .1 Ventilate enclosed spaces in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
 - .2 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.
 - .3 Provide continuous ventilation for seven days after completion of application of paint.
 - .4 Coordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
 - .5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.

Part 2 Products

2.1 MATERIALS

- .1 Coating: elastomeric, catalyst cured thermo-plastic without vinyl resins, semi-gloss surface finish, minimum dry film thickness 6 - 8 mils per coat, colour as selected by Departmental Representative from manufacture's standard range.
 - .1 Fire hazard classification: 25/35 to ASTM E84.
 - .2 Coatings: VOC limit 180 g/L maximum.
 - .3 Substrate filler: epoxy caulk.

- .4 Substrate filler: to CAN/CGSB-1.188.
- .5 Identify each coating material container with ULC listed markings stating fire hazard classification.
- .6 Provide factory-mixed coatings.
- .7 Do not thin, reduce, dilute, or add materials to coatings unless described in manufacturer's product literature.
- .8 Acceptable material: Amerlock 400.
- .2 Cell Number Identification Coating: engineered siloxane, high gloss epoxy coating, colour as selected by Departmental Representative from manufacture's standard range.
 - .1 Fire hazard classification: 25/35 to ASTM E84.
 - .2 Coatings: VOC limit 180 g/L maximum.
 - .3 Substrate filler: as per manufacturer's written recommendations.
 - .4 Substrate filler: to CAN/CGSB-1.188.
 - .5 Identify each coating material container with ULC listed markings stating fire hazard classification.
 - .6 Provide factory-mixed coatings.
 - .7 Do not thin, reduce, dilute, or add materials to coatings unless described in manufacturer's product literature.
 - .8 Acceptable material: PPG PSX 700.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for elastomeric coating and engineered siloxane application in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Ensure that items penetrating coating are placed before application of coating.
 - .3 Ensure maximum moisture content of substrate: 12%.
 - .4 Ensure negative alkalinity of substrate before application of coating.
 - .5 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .6 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 PREPARATION

- .1 Protect adjacent surfaces and equipment from damage by over spray, fall-out and dusting.
- .2 Clean substrate of matter which would affect bond of applied coating.

- .3 Plywood - remove dust, dirt, and other surface debris by vacuuming or wiping with dry or clean cloths.
- .4 Steel - Remove all dirt, grease or other contaminants using standard cleaning practices.
- .5 Gypsum board - tape and mud all joints, fill all screw holes and sand surface smooth. Remove all dust, and other surface debris by vacuuming or wiping with dry, clean cloths.
- .6 Epoxy caulk all joints in new and existing surfaces and prepare entire wall and ceiling surfaces as recommended by manufacturer.
- .7 Elastomeric Coating – prepare as per manufacturer’s written recommendations for application of engineered siloxane. Mask area for cell number identification.

3.3 APPLICATION

- .1 Manufacturer's Instructions: comply with manufacturer's written application recommendations.
- .2 Apply substrate filler coat 0.75 mm minimum thickness over completely dry concrete, concrete masonry, and other coarse surfaces as required to achieve a 100% filled, smooth surface with no pin holes and voids.
- .3 Apply substrate filler coat 0.5 mm minimum thickness over gypsum board and plywood surfaces as required to achieve a 100% filled, smooth surface.
- .4 Apply primer coat 0.5 mm minimum thickness over metal doors and metal frames as required to achieve a 100% filled, smooth surface.
- .5 Prime surfaces according to manufacturer's directions, allow to dry. Ensure primer is compatible with substrate and top coatings.
- .6 Apply coating employing trained applicators, using equipment specifically designed for this purpose by brush and roller.
- .7 Apply coating to a small test area and allow to set. Notify Departmental Representative to inspect mock-up.
- .8 Apply coating in two individual, uniform applications, permitting first to cure at least four hours before applying second coat.
- .9 Mask cell identification number, prepare substrate and apply cell number identification coating as per manufacturer’s written instructions. Apply coating in two individual, uniform applications, permitting first to cure as per manufacturer’s written instructions before applying second coat.
- .10 Finished work: to match approved samples, be uniform in thickness, sheen, colour and texture and to be free from marks, dirt particles, runs, crawls, drips, sags, brush marks, curling, holes, air pockets and other defects.

3.4 FIELD QUALITY CONTROL

- .1 Inspection of coating application will be carried out Departmental Representative.

3.5 MECHANICAL/ELECTRICAL EQUIPMENT

- .1 Finished areas: Unless noted otherwise, paint all exposed grilles, security cages, and other mechanical and electrical equipment with colour and finish as selected by Departmental Representative.
- .2 Do not paint over nameplates.
- .3 Keep sprinkler heads free of paint.
- .4 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.7 PROTECTION

- .1 Repair damage to adjacent materials caused by elastomeric coating application..

3.8 SCHEDULES

- .1 Plywood:
 - .1 One coat epoxy primer.
 - .2 Two coats (minimum) Amerlock 400.
- .2 Steel - not primed:
 - .1 One coat epoxy primer.
 - .2 Two coats (minimum) Amerlock 400.
- .3 Steel - primed:
 - .1 Touch-up with epoxy primer.
 - .2 Two coats (minimum) Amerlock 400.
- .4 Gypsum board:
 - .1 One coat epoxy primer.
 - .2 Two coats (minimum) Amerlock 400.
- .5 Cell Identification Number Coating:
 - .1 Surface preparation as per manufacturer's written instructions for Amerlock 400 substrate.
 - .2 Two coats (minimum).
 - .3 See drawings for locations.
- .6 All colours to be selected by Departmental Representative.

END OF SECTION

PART 1 General

1.1 RELATED SECTIONS

- .1 Section 01 00 05 – General Requirements.
- .2 Section 06 10 00 – Rough Carpentry.

1.2 REFERENCES

- .1 Aluminum Association (AA).
 - .1 DAF 45-03, Designation System for Aluminum Finishes.
- .2 Underwriters' Laboratories of Canada (ULC).
 - .1 CAN/ULC-S102-M88 (R2000), Surface Burning Characteristics of Building Materials and Assemblies.
 - .2 CAN/ULC-S706-02, Wood Fibre Thermal Insulation for Buildings.

1.3 SUBMITTALS

- .1 Submit in accordance with Section 01 00 05 – General Requirements, Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet.
- .3 Shop Drawings:
 - .1 Indicate location, type, size, panel arrangement, backing, hardware, anchor or mounting details, frame or trim and accessories.
- .4 Samples:
 - .1 Submit tackboard covering samples for colour selection.

1.4 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Surface burning characteristics of materials: listed and labelled 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.

PART 2 Products

2.1 ACCEPTABLE MANUFACTURERS

- .1 CP Distributors Ltd.
- .2 Shanahan's Building Specialties Limited
- .3 Approved equivalent.

2.2 MATERIALS / COMPONENTS

- .1 Whiteboards (noted as WB on drawings)
 - .1 12.7mm total thickness.
 - .2 Finish: Porcelain-ceramic semi-gloss finish.
 - .3 Base sheet: 28 ga. steel to ASTM A526, pre-cleaned and treated to ensure maximum adhesion of an acid resistant type porcelain enamel.
 - .4 Core panel: 11 mm high-density wood fibreboard to CAN/ULC-S706.
 - .5 Backer sheet: tempered aluminum foil for fixed wall mounted panels.
- .2 Tackboards (noted as TB on drawings)
 - .1 12.7mm total thickness.
 - .2 Facing: Fabric to CAN/ULC-S102-M88 manufacturer's standard tweed pattern or 15oz vinyl, exposed edges for trim installation, in colours as selected by Consultant.
 - .3 Fabric adhesive: manufacturer's standard type.
 - .4 Core panel: 11 mm high-density wood fibreboard to CAN/ULC-S706.
 - .5 Acceptable Products:
 - .1 CP Distributors Ltd.: Fabrictac 2EP, Versatrim 200 Series
 - .2 Shanahan's Building Specialties: Vin-tac Vinyl
 - .3 Approved equivalent.
- .3 Trim -Tackboards and whiteboards
 - .1 Perimeter trim or frame of manufacturer's standard sections appropriate for installation conditions.
 - .2 Extruded aluminum: Aluminum Association alloy AA6063-T5, minimum 1.5 mm wall thickness, clear anodized finish.
 - .3 Whiteboard trim to be supplied with bottom rail with integral chalk trough complete with end closures.
- .4 Maprails
 - .1 Maprail shall be supplied over tackboard and whiteboard panels as noted on drawings. Provide maprail complete with integral cork insert and nylon end stops. Provide 1 nylon maphook clip per 1 linear meter, minimum 2 hooks.
 - .1 Acceptable Products:
 - .1 CP Distributors Ltd.:
 - .1 JT204 2" Maprail or approved equivalent.

.2 #2HMC 2" Nylon Maphook/Clip or approved equivalent.

- .5 Joint reinforcement: concealed mechanical jointing system to provide straight, rigid, continuously supported, tight butt, flush joints at surface.
- .6 Anchor clips, brackets and fasteners: concealed type recommended by manufacturer for fixed mounting.

2.3 FABRICATION

- .1 Fabricate tackboard and whiteboard panels to sizes indicated. Dimensions on drawings are nominal. Panels may be up to 25 mm larger than sizes noted to suit standard trim.
- .2 Manufacture panels in largest sizes possible. Factory fit assemblies too large for shipment to site in one piece; disassemble for delivery and site assembly.

PART 3 Execution

3.1 INSTALLATION

- .1 Provide in-wall blocking behind each installation.
- .2 Install in accordance with manufacturer's instructions, parallel to floor with uniform vertical surface, plumb and level, to provide rigid, secure surface.
- .3 Install trim around panels. Make mitres and joints to hair-line fit, free of rough edges. Use concealed brackets to reinforce and hold joints tight and flush. No exposed fasteners permitted. Overlap trim 6 mm onto panels.
- .4 Mechanical attachment:
- .1 To concrete or solid masonry use lag screw and expansion bolts or screws and fibre plugs as appropriate for stresses involved.
 - .2 To hollow masonry use toggle bolts or equivalent.
 - .3 To wood or sheet metal use screws. Secure into blocking in stud walls.

3.2 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Clean surfaces after installation using manufacturer's recommended cleaning procedures.
- .3 Clean aluminum with damp rag and approved non-abrasive cleaner.

3.3 SCHEDULE

Room No.	Type	Size	Quantity	Notes
107	White Board	1220 ht x 610 w	1	Mount adjacent tack board.
107	Tack Board	1220 ht x 610w	1	Mount adjacent white board.
125	White Board	1220 ht x 610 w	1	
153	White Board	1220 ht x 610 w	1	
156	White Board	1220 ht x 1830 w	1	
156	Tack Board	50 ht x 1400 w	2	Mount flush with head of whiteboard on either side.

END OF SECTION

PART 1 General

1.1 REFERENCES

- .1 Aluminum Association, Inc. (AA)
 - .1 Designation System for Aluminum Finishes- 1997.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM A653/A653M-[01a], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual – March 1998.
- .4 Canadian Standards Association (CSA)
 - .1 CAN/CSA-B651-95 (R2001), Barrier-Free Design.

1.2 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures
- .2 Submit shop drawings, catalogue sheets and full size templates.
- .3 Indicate materials, thicknesses, sizes, finishes, colours, construction details, removable and interchangeable components, mounting methods and schedule of signs.
- .4 Submit drawn-to-scale details for individually fabricated lettering indicating word and letter spacing.

1.3 SAMPLES

- .1 Submit samples in accordance with Sections 01 33 00 – Submittal Procedures
- .2 Submit representative sample of each type sign, sign image and mounting method.

1.4 QUALITY ASSURANCE

- .1 Welding Certification in accordance with Section 01 33 00 – Submittal Procedures

1.5 WASTE MANAGEMENT AND DISPOSAL

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

PART 2 Products

2.1 MATERIAL

- .1 Multi-layered acrylic material with low-glare matte finish
- .2 Size: 100 x 100 x 1.6mm thick

- .3 Adhesives, paints, sealants and solvents: type recommended by material manufacturer for applicable condition.

2.2 SIGN GRAPHICS

- .1 Sign graphics to be well defined, arranged for balanced appearance, and properly word and letter spaced.
- .2 Apply by engraving at a depth of .30mm using a rotating carbide cutter.

2.3 DOOR SIGNS

- .1 Engrave 25mm high, single line three or four digit numerals incised to expose contrasting coloured core. Numbers shall correspond to room numbers on plans.
- .2 For interchangeable mounting: supply door signs with approved type, channel holders fabricated from 1.6mm aluminum, clear anodized finish.
- .3 For fixed mounting: use self-stick foam tape.

2.4 WASHROOM SIGNS

- .1 Each sign to be engraved with international symbol of man and/or woman.
- .2 Signs to be complete with drill holes and tamperproof screws for anchoring. Mount at 1500mm height on door.
- .3 Correspond signs according to plans.

2.5 HANDICAP SIGNS

- .1 Each sign is to be engraved with international symbol of accessibility for the handicapped.
- .2 Signs to be complete with drilled holes and tamperproof screws for anchoring. Mount at 1500mm height on door.
- .3 Correspond signs according to plans.

2.6 FABRICATION

- .1 Fabricate signs in accordance with details, specifications and shop drawings.
- .2 Build units square, true, accurate to size, free from visual or performance defects.
- .3 Accurately fit and securely join sections to obtain tight, closed joints.
- .4 Allow for thermal movement without distortion of components.
- .5 Exposed fasteners permitted only where indicated or approved by Engineer and to be inconspicuous and same finish and colour as base material, or as noted.
- .6 Polish exposed edges to smooth, slightly convex profile.

- .7 Manufacturer's nameplates on sign surface locations visible in completed work not acceptable.

2.7 FINISHES

- .1 Low-glare mate acrylic; colours to be selected.

PART 3 Execution

3.1 INSTALLATION

- .1 Erect and secure signs plumb and level at elevations indicated.
- .2 Comply with sign manufacturer's installation instructions and approved shops drawings.
- .3 Mechanical attachment:
 - .1 To steel use bolts with nut and lock washers, self-tapping screws.
 - .1 Do steel welding to CSA W59 and aluminum welding to CSA W59.2.
Finish exposed welds flush and smooth.
 - .2 To wood use screws.
 - .3 Secure into framing members behind stud walls or above ceilings.
 - .4 Fabricate special fasteners as required for installation conditions.
 - .5 Mechanical fasteners and methods of attachment subject to Engineer's approval.
Obtain Engineer's approval before fixing to structural steel.

3.2 CLEANING

- .1 Leave signs clean.
- .2 Touch up any damaged finishes.

END OF SECTION

PART 1 General

1.1 RELATED SECTIONS

- .1 Section 06 10 00 - Rough Carpentry.
- .2 Section 10 28 10 – Toilet and Bath Accessories.

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM A653/A653M-[02a], Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian Standards Association (CSA)
 - .1 CAN/CSA-B651-95 (R2001), Barrier-Free Design.

1.3 SUBMITTALS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures
- .2 Indicate fabrication details, plans, elevations, hardware, and installation details.
- .3 Submit 2 colour charts for selection of colours.

1.4 CLOSEOUT SUBMITTALS

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

1.5 STORAGE AND PROTECTION

- .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Protect finished surfaces during shipment and installation. Do not remove until immediately prior to final inspection.

PART 2 Products

2.1 MATERIAL

- .1 Toilet Partitions
 - .1 Doors and Panels
 - .1 Minimum base steel thickness: 0.8 mm.
 - .2 Constructed of 2 sheets Galvanneal steel, cemented to a honeycomb core. Honey comb to have a maximum 25mm cell size. Form and finish doors and panels with continuous self-locking edges with mitred, welded corners, and ground smooth. Height of doors and panels shall be 1460 mm.

- .3 Finish: All steel surfaces to be undercoated with an iron phosphate treatment suitable for final finish. Paint finish shall be a high solid polyester baking enamel to approximately 50% gloss. Colour shall be selected from manufacturer's standard range of colours.
- .2 Pilasters
 - .1 Minimum base steel thickness: 0.9 mm.
 - .2 Floor Braced.
 - .3 Manufactured from same material and fabrication methods as doors and panels. Pilaster height shall be 2083mm high. Provide stainless steel shoes.
- .3 Headrail: Clear anodized alloy and temper 6063T5 with anti-grip design. Outer flanges shall fit over the facing of the pilaster and be supported at the wall.
- .4 Components:
 - .1 Hinges, latch and connecting brackets: heavy-duty manufacturer's standard surface mount type, Type 304 stainless steel.
 - .2 Latches will have emergency access feature.
 - .3 Coat hook: combination hook and rubber door bumper, stainless steel.
 - .4 Door pull: Standard, stainless steel and barrier-free type suited for out-swing door.

PART 3 Execution

3.1 INSTALLATION

- .1 Ensure supplementary anchorage, if required, is in place.
- .2 Do work in accordance with CAN/CSA-B651.

3.2 ERECTION – TOILET PARTITIONS

- .1 Install partitions and pilasters secure, plumb and square.
- .2 Leave 12 mm space between wall and panel or end pilaster.
- .3 Anchor mounting brackets to wood framing using screws and shields: to hollow walls using bolts and toggle type anchors, to steel supports with bolts in threaded holes.
- .4 Attach panel and pilaster to brackets with through type sleeve bolt and nut.
- .5 Equip each door with coat hook mounted on door.
- .6 Attach pilasters to floor with pilaster supports and level, plumb, and tighten installation with levelling device. Secure pilaster shoes in position.

- .7 Secure headrail to pilaster face with not less than two fasteners per face.
- .8 Set tops of doors parallel with overhead brace when doors are in closed position.
- .9 Install hardware. Adjust and align hardware for proper function.

3.3 SCHEDULE

- .1 Provide toilet partitions in rooms:
 - .1 Women's Room 116
 - .2 Men's Room 119
 - .3 And as noted on drawings.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 07 92 00 - Joint Sealants.
- .2 Section 09 21 16 – Gypsum Board Assemblies.
- .3 Section 09 65 16 – Resilient Sheet Flooring.

1.2 SECTION INCLUDES

- .1 Vinyl wall and ceiling protection panels.
- .2 Stainless steel corner guards.

1.3 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM E84, 10b Standard Test Method for Surface Burning Characteristics of Building Materials
 - .2 ASTM D 256, 10 Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
 - .3 ASTM E648 Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
- .2 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102.2-10 Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.

1.4 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures
- .2 Product Data: Submit manufacturer's printed product literature and specifications.
- .3 Manufacturer's Instructions: Submit manufacturer's installation instructions.
- .4 Provide seaming layout for review by consultant.
- .5 Samples: For each finish product specified, including trim pieces, provide two samples, minimum size 300 by 300 mm, representing actual product, colour, and patterns.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver materials in original factory wrappings and containers, clearly labeled with manufacturer

1.6 PROJECT CONDITIONS

- .1 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.7 WARRANTY

- .1 Product Warranty: Standard manufacturer's product warranty against manufacturing defects.

Part 2 Products

2.1 RESILIENT WALL CLADDING

- .1 Type RWC as denoted in Room Finish Schedule. Flexible, homogenous PVC wall and ceiling covering with polyurethane surface treatment meeting ASTM E648 Class 1 for flame spread and smoke developed characteristics. Meeting CAN/ULC-S102.2-10 Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.
- .2 Thickness: 1.25 mm
- .3 Roll width: 2.0 m
- .4 Finish: smooth.
- .5 Colour: one color selected by consultant from manufacturer's standard range.
- .6 Pattern: marbelized.
- .7 Joints: Heat welded to provide waterproof barrier. Weld compatible to resilient sheet safety floor and resilient sheet hydro floor. Refer to Section 09 65 16. Weld color: to match protection panel.
- .8 Accessories
 - .1 Welds: As recommended by manufacturer.
 - .2 Corners: Cove former. 20mm radius.
 - .3 Adhesive and Primer: As recommended by manufacturer.
- .9 Acceptable Products:
 - .1 Polyflor Polyclad Pro PU
 - .2 Approved equivalent.

2.2 CORNER GUARDS:

- .1 Stainless Steel, type 304, 90 x 90 x 1220 mm high, 1.2mm thick (18 gauge). Finish: #4 satin. Corners shall be rounded with no sharp edges. Field applied adhesive mounting.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify substrates are properly prepared.
- .2 Wall surfaces to receive impact-resistant wall covering materials shall be dry and free from dirt, grease, loose paint, and scale.

3.2 INSTALLATION

- .1 Avoid materials with chips, cracks, voids, stains, or other defects that might be visible in the finished work.

3.3 RESILIENT WALL CLADDING

- .1 Adhesive trowel and application method to conform to manufacturer's recommendations.
- .2 Cut panels to fit around floor sinks and showers and door frames.
- .3 Seal panels to edges to shower inserts, floor sinks and door frames. Refer to Section 07 92 00 - Joint Sealants.
- .4 Utilize pre-fabricated cove formers from manufacturer at all wall-wall and wall-ceiling intersections.
- .5 Seaming layout to minimize joints. Heat weld all joints between sheets and between wall panels and resilient flooring.

3.4 CORNER GUARDS

- .1 Install aluminum retainers, mounting brackets, and other accessories in strict accordance with the manufacturer's instructions.
- .2 Install corner guards with construction adhesive as recommend by manufacturer.
- .3 Install corner guards as indicated in schedule.

3.5 CLEANING

- .1 Remove excess adhesive in manner recommended by manufacturer.
- .2 Clean plastic covers and accessories using a standard non-ammonia based household cleaning agent.

3.6

SCHEDULE

- .1 Wall and Ceiling Protection
 - .1 See Room Finish Schedule.
- .2 Corner Guards
 - .1 As indicated on drawings.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM A167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .2 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.81-M90, Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
 - .2 CAN/CGSB-1.88-92, Gloss Alkyd Enamel, Air Drying and Baking.
 - .3 CGSB 31-GP-107Ma-90, Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.
- .3 Canadian Standards Association (CSA)
 - .1 CAN/CSA-B651-07(2012), Barrier-Free Design.
 - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

1.2 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars.

1.3 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Samples to be returned for inclusion into work.

1.4 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 EXTRA MATERIALS

- .1 Provide special tools required for accessing, assembly/disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01 78 00 - Closeout Submittals.
- .2 Deliver special tools to Departmental Representative.