

CARTER AI
DAVID CARTER ARCHITECTS INC.

Specifications
for

CAMPBELLFORD MEMORIAL HOSPITAL

NEW ELECTRICAL ROOM

146 OLIVER ROAD, CAMPBELLFORD, ON K0L 1L0

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David Carter Architects Inc.
Job # 23-166
688 Richmond St. W. Unit 303
Toronto ON, M6J 1C5
T. 416.977.6300
www.carterai.ca

PART 1 - GENERAL

Comply with CAN/CSA-Z317.13 Infection Control During Construction, Renovation, and Maintenance of Health Care Facilities.

1.1 INSTALLATION
AND REMOVAL

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

1.2 DUST TIGHT
SCREENS

- .1 Provide dust tight screens or insulated partitions to localize dust generating activities, and for protection of workers, finished areas of work and the public.
- .2 Maintain and relocate protection until such work is complete.
- .3 Comply with all owner requirements and owner accepted procedure for execution of work and necessary protection to allow continuous, uninterrupted operations in areas adjacent to work.

1.3 ACCESS TO SITE

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

1.4 PUBLIC TRAFFIC
FLOW

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

1.5 FIRE ROUTES

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

1.6 PROTECTION FOR
PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.
- .3 Provide security measures including locks, lights, cameras, alarms, dust tight screens, hoarding and fencing to comply with owner's security requirements for all temporary enclosures.

1.7 PROTECTION OF
BUILDING FINISHES

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

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

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| <u>1.1 REFERENCES</u> | .1 | Canadian Standards Association (CSA International)
.1 CSA S350, Code of Practice for Safety in Demolition of Structures. |
| <u>1.2 SUBMITTALS</u> | .1 | Submit shop drawings in accordance with Division 1. |
| | .2 | Before proceeding with temporary removal or demolition of exterior, fire rated or load bearing walls and where required by authority having jurisdiction, submit for review by Consultant shoring and underpinning drawings prepared by qualified professional engineer registered or licensed in the Province of Ontario, showing proposed method. |
| <u>1.3 SITE CONDITIONS</u> | .2 | Prior to demolition work refer to Specification Division 02 as well as related Hazardous Building Materials Assessment Report prepared by Owner's environmental consultant for all materials containing hazardous substances and abatement procedures at all areas of work. |
| | .3 | Notify Consultant before disrupting building access or services. |

PART 2 – PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

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| <u>3.1 PREPARATION</u> | .1 | Inspect building and site with Consultant and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain. |
| | .2 | Locate and protect utilities. Preserve active utilities traversing site in operating condition. |
| | .3 | Notify and obtain approval of utility companies before starting demolition. |
| | .4 | Disconnect, cap, plug or divert, as required, existing public utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.
.1 Immediately notify Consultant and utility company concerned in case of damage to any utility or service, designated to remain in place.
.2 Immediately notify the Consultant should uncharted utility or service be encountered, and await instruction in writing regarding remedial action. |
| <u>3.2 PROTECTION</u> | .1 | Prevent movement, settlement, or damage to adjacent structures, utilities, and landscaping features and parts of building to remain in |

place. Provide bracing and shoring required.

- .2 Keep noise, dust, and inconvenience to occupants to minimum.
- .3 Protect building systems, services and equipment.
- .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .5 Do Work in accordance with Owner's health and safety requirements.

3.3 SALVAGE

- .1 Refer to demolition drawings and specifications for items to be salvaged for reuse. Consult and coordinate with Owner regarding existing equipment to be removed and for items to be removed and returned to Owner.
- .2 Remove items to be reused, store as directed by Consultant and re-install under appropriate section of specification.
- .3 Comply with Owner's disposal and recycling requirements.

3.4 DEMOLITION

- .1 Remove and protect parts of existing building to permit new construction and/or reinstallation and reinstatement. Sort materials for reuse and recycling.

END OF SECTION

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 53/A 53M, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A 653/A 653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .3 ASTM A 269, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - .4 ASTM A 307, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.40, Anti-corrosive Structural Steel Alkyd Primer.
 - .2 CAN/CGSB-1.181, Ready-Mixed, Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel.
 - .2 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN/CSA-S16, Design of Steel Structures.
 - .4 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding.
 - .5 CSA W59, 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 Division 1.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Division 1. Indicate VOC's for finishes, coatings, primers and paints.
- .2 Shop Drawings
 - .1 Submit shop drawings in accordance with Division 1.
 - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
 - .3 A structural engineer licensed to practice in the Province of Ontario shall seal shop drawings.

1.3 QUALITY ASSURANCE

- .1 Design and supervise work of this Section by a qualified Professional Engineer registered or licensed in the Province of Ontario.
- .2 Weld structural components: in steel, to conform to requirements of CSA W59, and by fabricator fully certified by the Canadian Welding Bureau to conditions of CSA W47.1-92 if applicable.
- .3 Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.
- .4 Design steel connections and members that are not fully detailed

on Drawings. For fully detailed connections, verify structural adequacy and accept responsibility for the successful fabrication and erection. Design and detail connections so as to not encroach upon architectural clearance lines and finishes.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, handle and protect materials in accordance with Division 1 requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Include all supplementary parts as required to complete fabrication and installation of work of this Section.
- .2 Metals and sheet metal products and composite metal products shall be free from defects which impair strength or durability, or which are visible. Metals shall be new, of best quality, and free from rust or waves and buckles, clean, straight and with sharply defined profiles.
- .3 Galvanized Steel Sheet: Galvanized coating G90, in accordance with ASTM A 653/A 653M.
- .4 Structural Steel Shapes: Hot-rolled, to meet specified requirements of CAN/CSA-G40.20/G40.21, Grade 300W or 350W.
- .5 Steel Plates, Sections, Grating and Bars: CAN/CSA-G40.20/G40.21, Grade 300 or 350W.
- .6 Welding materials: to CSA W59.
- .7 Welding electrodes: to CSA W48 Series.
- .8 Bolts and anchor bolts: to ASTM A 307.
- .9 Stainless steel tubing: to ASTM A 269, Type 302 Commercial grade Seamless welded with AISI No. 4.
- .10 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 round headed screws on items requiring assembly by screws or as indicated on Drawings.
- .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 Shop coat primer: to CAN/CGSB-1.40.
- .3 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

<u>2.4 ISOLATION COATING</u>	.1	Isolate aluminum from following components, by means of bituminous paint and nylon washers: .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area. .2 Concrete, mortar and masonry. .3 Wood.
<u>2.5 SHOP PAINTING</u>	.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.
<u>2.6 ANGLE LINTELS</u>	.1	Locate over all openings in masonry walls and where indicated on Drawings. All steel in exterior walls shall be galvanized.
<u>2.7 GUARDS</u>	.1	Steel angles and pipe: formed to shapes and sizes as indicated on drawings. Weld to form continuous frame as indicated.
	.2	Shop coat prime interior guard frame and mesh after fabrication.
<u>2.8 SILLS AND HEADS</u>	.1	Folded steel formed to shapes and sizes as indicated on Drawings.
	.2	Finish: Unpainted galvanized.
<u>2.9 BOLLARDS</u>	.1	Steel pipe as indicated on Drawings. Hot-dip galvanize after fabrication.
<u>PART 3 – EXECUTION</u>		
<u>3.1 ERECTION</u>	.1	Do welding work in accordance with CSA W59 unless specified otherwise.
	.2	Erect metal work square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
	.3	Provide suitable means of anchorage acceptable to Consultant, such as dowels, anchor clips, bar anchors, expansion bolts and shields, toggles and rivets.
	.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.
	.7	Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

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| | .8 | Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer. |
| | .9 | Touch-up galvanized surfaces with zinc rich primer where burned by field welding. |
| <u>3.2 CLEANING</u> | .1 | Perform cleaning after installation to remove construction and accumulated environmental dirt and finger prints. |
| | .2 | Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers. |

END OF SECTION

PART 1 - GENERAL

1.1 NOT USED

1.2 REFERENCES

- .1 American National Standards Institute/National Association of Architectural Metal Manufacturers (ANSI/NAAMM)
 - .1 ANSI/NAAMM MBG531, Metal Bar Grating Manual.
- .2 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM A 53/A 53M, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A 307, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .3 ASTM F 3125, Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.40, Anti-corrosive Structural Steel Alkyd Primer.
 - .2 CAN/CGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating.
 - .3 CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA G40.20, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA W59, Welded Steel Construction (Metal Arc Welding/Imperial Version).
- .5 National Association of Architectural Metal Manufacturers (NAAMM)
 - .1 AMP 510, Metal Stair Manual.
- .6 Steel Structures Painting Council (SSPC), Systems and Specifications Manual, Volume 2.

1.3 SYSTEM DESCRIPTION

- .1 Design Requirements:
- .2 Design metal stair, handrails and landing construction and connections to Ontario Building Code. Design to Live load of 4.8 kN/m² (100lbs/sq.ft.) plus dead load.
- .3 Detail and fabricate stairs to NAAMM Metal Stairs Manual.
- .4 Refer to Structural Drawings.

1.4 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Division 1.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Division 1.

	.2	Shop Drawings
	.1	Submit shop drawings in accordance with Division 1.
	.2	Indicate construction details, sizes of steel sections and thickness of steel sheet.
	.3	Submit shop drawing bearing stamp of a qualified professional structural engineer registered in Canada, Province of Ontario.
<u>1.5 QUALITY ASSURANCE</u>	.1	Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
	.2	Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.
<u>1.6 NOT USED</u>		
<u>PART 2 - PRODUCTS</u>		
<u>2.1 MATERIALS</u>	.1	Steel Stringer sections: to CSA-G40.20/G40.21 Grade 300W or 350W.
	.2	Stair pan and risers: to CSA-G40.20/G40.21, Grade 260 W.
	.3	Steel Angle: as indicated on Drawings.
	.4	Welding materials: to CSA W59.
	.5	Bolts: to ASTM A 307.
	.6	High strength bolts: to ASTM F 3125.
	.7	Tread surface: as indicated on Drawings.
<u>2.2 FABRICATION</u>	.1	Fabricate to NAAMM, Metal Stair Manual.
	.2	Weld connections where possible, otherwise bolt connections. Countersink exposed fastenings, cut off bolts flush with nuts. Make exposed connections of same material, colour and finish as base material on which they occur.
	.3	Accurately form connections with exposed faces flush; mitres and joints tight. Make risers of equal height.
	.4	Grind or file exposed welds and steel sections smooth.
	.5	Shop fabricate stairs in sections as large and complete as practicable.
<u>2.3 PLATE/GRATING STAIRS</u>	.1	Form steel grating treads and landings from metal bar grating to profile indicated and secure to stringers and supports as indicated. Form landings of steel grating and reinforce as required.
	.2	Refer to Architectural and Structural Drawings.

2.4 PIPE/TUBING
BALUSTRADES

- .1 Construct balusters and handrails from steel pipe / tubing indicated on Drawings.
- .2 Cap and weld exposed ends of balusters and handrails.
- .3 Terminate at abutting wall with end flange.

2.5 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164.
- .2 Shop coat primer: to CAN/CGSB-1.40.
- .3 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

2.6 SHOP PAINTING

- .1 Clean surfaces in accordance with Steel Structures Painting Council Manual Volume 2.
- .2 Apply one coat of shop primer except interior surfaces of pans.
- .3 Apply two coats of primer of different colours to parts inaccessible after final assembly.
- .4 Use primer as prepared by manufacturer without thinning or adding admixtures. Paint on dry surfaces, free from rust, scale, grease, do not paint when temperature is below 7 degrees C.
- .5 Do not paint surfaces to be field welded.

PART 3 - EXECUTION

3.1 INSTALLATION OF
STAIRS

- .1 Install in accordance with NAAMM, Metal Stair Manual.
- .2 Install plumb and true in exact locations, using welded connections wherever possible to provide rigid structure. Provide anchor bolts, bolts and plates for connecting stairs to structure.
- .3 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.
- .4 Do welding work in accordance with CSA W59 unless specified otherwise.
- .5 Touch up shop primer to bolts, welds, and burned or scratched surfaces at completion of erection.

3.2 CLEANING

- .1 Perform cleaning as soon as possible 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 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 653, Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process.
 - .2 ASTM A 792, Specification for Steel Sheet, 55% Aluminum-Zinc Allow-Coated by the Hot-Dip Process.
 - .3 ASTM C 208, Specification for Cellulosic Fiber Insulating Board.
 - .4 ASTM C 578, Specification for Rigid, Cellular Polystyrene Thermal Insulation.
 - .5 ASTM C 591, Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
 - .6 ASTM C 612, Specification for Mineral Fibre Block and Board Thermal Insulation.
 - .7 ASTM C 726, Specification for Mineral Fiber Roof Insulation Board.
 - .8 ASTM C 728, Specification for Perlite Thermal Insulation Board.
 - .9 ASTM C 1126, Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation.
 - .10 ASTM C 1289, Specification for Faced Rigid Cellular
 - .11 ASTM C 1303, Standard Test Method for Predicting Long-Term Thermal Resistance of Closed-Cell Foam Insulation.
 - .12 ASTM C 1621, Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
 - .13 ASTM C 2842, Standard Test Method for Water Absorption of Rigid Cellular Plastics.
 - .14 ASTM E 96, Standard Test Method for Water Vapour Transmission of Materials.
 - .15 ASTM E 96/E 96M, Standard Test Methods for Water Vapour Transmission of Materials.
- .1 Canadian Gas Association (CGA)
 - .1 CAN/CGA-B149.1, Natural Gas and Propane Installation Code Handbook.
 - .2 CAN/CGA-B149.3, Code for the Field Approval of Fuel-Burning Appliances and Equipment
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 71-GP-24M, Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.
- .3 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
 - .2 CAN/ULC-S114, Standard Method of Test for Determination of Non-Combustibility in Building Materials.
 - .3 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
 - .2 CAN/ULC-S702, Standard for Mineral Fibre Insulation for Buildings.
 - .3 CAN/ULC-S704, Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.
 - .4 CAN/ULC-S770, Standard Test Method for Determination of Long-Term Thermal Resistance of Closed-Cell Thermal Insulating Foams.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

<u>1.2 SUBMITTALS</u>	.1	Product Data: .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Division 1. .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Division 1. Indicate VOC's insulation products and adhesives.
<u>1.3 QUALITY ASSURANCE</u>	.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.
<u>1.4 WASTE MANAGEMENT AND DISPOSAL</u>	.1	Separate waste materials for reuse and recycling in accordance with Division 1.
	.2	Remove from site and dispose of packaging materials at appropriate recycling facilities.
<u>1.5 DELIVERY, STORAGE, AND HANDLING</u>	.1	Store insulation materials in dry areas, protect from wetting and traffic. Store insulation board flat, on a flat surface to prevent edge damage and placing of materials on top of stored boards.
	.2	Ensure that insulation board and adhesives are stored at minimum temperature of 4°C for 12 hours before installation, and that freezable adhesives are stored above 0° at all times.
	.3	Store and install insulation materials with adequate protection against adverse environmental conditions such as water, freezing, sunlight and similar conditions that would subject the materials to damage.
<u>PART 2 - PRODUCTS</u>		Acceptable Manufacturers: Soprema, Atlas Roofing Corporation, Owens Corning.
<u>2.1 NOT USED</u>		
<u>2.2 INSULATION</u>	.1	Exterior Rigid Wall Insulation - Product: Sopra-ISO V Plus Polyiso Wall Insulation, by Soprema: .1 Thermal: min R6 per inch / 3.5" = R 21.7 .2 Tensile Strength: >35 kPa (5.08 psi) to ASTM D1623. .3 Flexural Strength: >275 kPa (40 psi) to ASTM C203. .4 Compressive Strength: >140 kPa (20 psi) to ASTM D1621. .5 Water Vapour Permeance: 58 ng/Pa*s*m² at 25.4mm (1.01 perm) to ASTM E96 (Method A). .6 Water Absorption: 1.1% by volume to ASTM D2842. .7 Thickness: as indicated in drawings. .8 Edges: butt edges. .9 Facing: Laminated non-reflective glass-mat facer on front and back.
	.2	Roof Insulation - Product: Sopra-ISO SL Polyiso Roof Insulation, by Soprema: .1 Thermal: min R5.9 per inch / 6.0" = R 35.7 .2 Tensile Strength: >35 kPa (5.08 psi) to ASTM D1623. .3 Compressive Strength: >138 kPa (20 psi) to ASTM D1621. .4 Water Absorption: < 1.0% to ASTM C209; < 3.5% to ASTM D2842.

	.5	Flame Spread: 40 – 60 to ASTM E84.
	.6	Thickness: 6.0".
	.7	Edges: shiplapped (all 4 edges).
	.8	Facing: organic facers reinforced with glass fibres on front and back.
	.3	Tapered Roof Insulation - Product: Sopra-ISO Transition and Tapered Roof Insulation panels, by Soprema:
	.1	Thermal: varies. Min. 5.7 per inch.
	.2	Tensile Strength: >35 kPa (5.08 psi) to ASTM D1623.
	.3	Compressive Strength: >138 kPa (20 psi) to ASTM D1621.
	.4	Water Absorption: < 1.0% to ASTM C209; < 3.5% to ASTM D2842.
	.5	Flame Spread: 40 – 60 to ASTM E84.
	.6	Thickness: varies. Contractor achieve layout and sloping requirements indicated on Drawings.
	.7	Edges: butt edges and tapered edges.
	.8	Facing: organic facers reinforced with glass fibres on front and back.
<u>2.3 ADHESIVE</u>	.1	Adhesive: to CGSB 71-GP-24.
	.1	Only as approved by insulation board manufacturer. Provide Primer as required.
<u>2.4 ACCESSORIES</u>	.1	Insulation clips: impale type, perforated 2 x 2 inches (50 x 50 mm) cold rolled carbon steel 0.031 inch (0.8 mm) thick, adhesive back, spindle of 0.098 inch (2.5 mm) diameter annealed steel, length to suit insulation, 0.98inch (25 mm) diameter washers of self locking type.
	.2	Joint Tape: as recommended at joints and penetrations though cavity insulation by manufacturer to provide drainage plane.
<u>PART 3 - EXECUTION</u>		
<u>3.1 MANUFACTURER'S INSTRUCTIONS</u>	.1	Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
<u>3.2 WORKMANSHIP</u>	.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 3" from heat emitting devices.
	.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.
<u>3.3 EXAMINATION</u>	.1	Examine substrates and immediately inform Consultant in writing of defects.

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| | .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. |
| <u>3.4 RIGID INSULATION INSTALLATION</u> | .1 | Install polystyrene board insulation by adhesive method in accordance with manufacturer's specifications. Prime surfaces as required by adhesive manufacturer. |
| | .2 | Imbed insulation boards into vapour barrier type adhesive, applied as specified, prior to skinning of adhesive. Position and press boards into full contact with adhesive. |
| | .3 | Install insulation retainers and brick ties with appropriate reinforcing at each location. |
| | .4 | Leave insulation board joints unbonded over line of expansion and control joints. Bond a continuous 6 inch (150mm) wide 0.006 inch modified bituminous membrane over expansion and control joints using compatible adhesive and primer before application of insulation. |
| <u>3.5 PERIMETER FOUNDATION INSULATION</u> | .1 | Under slab application: extend boards as indicated. Lay boards on level compacted fill. |
| <u>3.6 ROOF INSTALLATION</u> | .1 | In accordance with Section 07 52 00 – Modified Bituminous Membrane Roofing. |
| <u>3.7 CLEANING</u> | .1 | Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers. |

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C 167, Standard Test Methods for Thickness and Density of Blanket or Batt Thermal Insulations.
 - .2 ASTM C 208, Specification for Cellulosic Fiber Insulating Board.
 - .3 ASTM C 423, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - .4 ASTM C 553, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.
 - .5 ASTM C 591, Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
 - .6 ASTM C 612, Standard Specification for Mineral Fibre Block and Board Thermal Insulation.
 - .7 ASTM C 665, Specification for Mineral-Fibre Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - .8 ASTM C 726, Standard Specification for Mineral Fiber Roof Insulation Board.
 - .9 ASTM C 728, Standard Specification for Perlite Thermal Insulation Board.
 - .10 ASTM C 1126, Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation.
 - .11 ASTM C 1289, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
 - .12 ASTM C 1320, Standard Practice for Installation of Mineral Fibre Batt and Blanket Thermal Insulation for Light Frame Construction.
 - .13 ASTM E 90, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - .14 ASTM E 96, Standard Test Methods for Water Vapour Transmission of Materials.
 - .15 ASTM E 413, Classification for Rating Sound Insulation.
 - .16 ASTM F 1667, Specification for Driven Fasteners: Nails, Sikes, and Staples.
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 71-GP-24M, Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.
- .3 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
 - .2 CAN/ULC-S702, Standard for Mineral Fibre Insulation.
 - .3 CAN/ULC-S704, Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.

1.2 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.

PART 2 - PRODUCTS

2.1 INSULATION

- .1 Batt and blanket mineral fibre: Non-combustible, stone wool batt insulation to ASTM C 553 and CAN/ULC S702.

- .1 Type: 1.
- .2 Fire Performance: Non-combustible to CAN/ULC S114.
 - .1 Flame Spread: 0.
 - .2 Smoke Developed: 5.
- .3 Surface Burning Characteristics: to CAN/ULC S102.
 - .1 Flame Spread: 0.
 - .2 Smoke Developed: 0.
- .4 Thickness: as indicated on Drawings.

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.
- .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 3 inches (75 mm) from heat emitting devices such as recessed light fixtures, and minimum 2 inches (50 mm) from CAN/CGA-B149.1 and CAN/CGA-B149.2 Type B and L vents.
- .5 Do not enclose insulation until it has been inspected and approved by Consultant.

3.3 CLEANING

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

END OF SECTION

PART 1 - GENERAL

1.1 NOT USED

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .1 ASTM E 96, Standard Test Method for Water Vapor Transmission of Materials.
 - .1 ASTM E 154, Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.
 - .1 ASTM E 1643, Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
 - .1 ASTM E 1745, Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
 - .1 ASTM E 1993, Standard Specification for Bituminous Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.33, Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
 - .2 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Division 1.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet and include:
 - .1 Product characteristics.
 - .2 Performance criteria.
 - .3 Limitations.
- .3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS).

1.4 QUALITY ASSURANCE

- .1 Health and Safety Requirements: do construction in accordance with Division 1.
- .2 The contractor shall inspect air/vapour barrier for continuity prior to installation of insulation. Repair punctures, rips or tears with pieces of the membrane completely adhered to the damaged membrane. Where punctures and tears are extensive, replace entire damaged section.
- .3 Do not cover or permit to be covered any portion of the membranes until they have been inspected.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver flexible sheet air-vapour barrier materials in factory wrapped rolls with labels indicating manufacturer and trade name, material type, thickness, roll width and area.
- .2 Protect material from physical damage and direct exposure to sunlight.

PART 2 - PRODUCTS

- | | | |
|---|----|---|
| <u>2.1 SELF ADHERING AIR/VAPOUR BARRIER</u> | .1 | Single-ply, self-adhesive, self-sealing, modified bituminous membrane, minimum 1.0 mm thick, as recommended by manufacturer. |
| | .2 | Refer to Section 07 52 00 Modified Bituminous Membrane Roofing for self-adhered air/vapour barrier required at roof assembly. |
| <u>2.2 SELF ADHERING AIR BARRIER</u> | .1 | Self-adhesive, self-sealing, vapour-permeable air barrier membrane, minimum 0.6 mm thick, as recommended by manufacturer. Vapour permeance: 972 ng/Pa*s*m ² (17 perm). |
| <u>2.3 SHEET VAPOUR BARRIER</u> | .1 | Polyethylene film: to CAN/CGSB-51.34, 0.15 mm thick. |
| | .2 | Foil: to CAN/CGSB-51.33, Type 1. |
| <u>2.4 ACCESSORIES</u> | .1 | Primer: standard asphaltic material as recommended by the membrane manufacturer. |
| | .2 | 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. |
| | .3 | Sealant: compatible with vapour retarder materials, recommended by vapour retarder manufacturer. Refer to Section 07 92 00 - Joint Sealants. |

PART 3 - EXECUTION

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|-------------------------|---|--|----|---|----|---|----|---|----|---|----|--|----|--|
| <u>3.1 INSTALLATION</u> | .1 | Coordinate installation of air and vapour barriers with work of other Sections to achieve an air and vapour tight building envelope. Ensure services are installed and inspected prior to installation of retarder. | | | | | | | | | | | | |
| | .2 | Self Adhering Air/Vapour Barrier <table border="0" style="margin-left: 20px;"> <tr><td>.1</td><td>Prime substrate with appropriate primer and allow to cure and dry.</td></tr> <tr><td>.2</td><td>Ensure complete coverage of, and adhesion to, all substrates to receive the self adhering air/vapour, including wall protrusions.</td></tr> <tr><td>.3</td><td>Apply membrane such that horizontal joints overlap with the upper sheet over the lower sheet, shingle style. Lap all joints 50mm minimum and adhere completely.</td></tr> <tr><td>.4</td><td>Seal penetrations in membrane with liquid membrane minimum 50mm around the penetration.</td></tr> <tr><td>.5</td><td>Provide mastic at membrane terminations and at locations where membrane meets other constructions.</td></tr> <tr><td>.6</td><td>Apply air/vapour barrier so that the exterior wall is air tight, with air junctions at all door frames, louvers and all other openings, penetrations and edges, and where indicated on drawings.</td></tr> </table> | .1 | Prime substrate with appropriate primer and allow to cure and dry. | .2 | Ensure complete coverage of, and adhesion to, all substrates to receive the self adhering air/vapour, including wall protrusions. | .3 | Apply membrane such that horizontal joints overlap with the upper sheet over the lower sheet, shingle style. Lap all joints 50mm minimum and adhere completely. | .4 | Seal penetrations in membrane with liquid membrane minimum 50mm around the penetration. | .5 | Provide mastic at membrane terminations and at locations where membrane meets other constructions. | .6 | Apply air/vapour barrier so that the exterior wall is air tight, with air junctions at all door frames, louvers and all other openings, penetrations and edges, and where indicated on drawings. |
| .1 | Prime substrate with appropriate primer and allow to cure and dry. | | | | | | | | | | | | | |
| .2 | Ensure complete coverage of, and adhesion to, all substrates to receive the self adhering air/vapour, including wall protrusions. | | | | | | | | | | | | | |
| .3 | Apply membrane such that horizontal joints overlap with the upper sheet over the lower sheet, shingle style. Lap all joints 50mm minimum and adhere completely. | | | | | | | | | | | | | |
| .4 | Seal penetrations in membrane with liquid membrane minimum 50mm around the penetration. | | | | | | | | | | | | | |
| .5 | Provide mastic at membrane terminations and at locations where membrane meets other constructions. | | | | | | | | | | | | | |
| .6 | Apply air/vapour barrier so that the exterior wall is air tight, with air junctions at all door frames, louvers and all other openings, penetrations and edges, and where indicated on drawings. | | | | | | | | | | | | | |
| | .3 | Sheet Vapour Barriers <table border="0" style="margin-left: 20px;"> <tr><td>.1</td><td>Install sheet vapour retarder on warm side of exterior wall and floor assemblies prior to installation of insulation board at walls and prior to poured slab on floor, to form continuous retarder.</td></tr> <tr><td>.2</td><td>Ensure membrane is tight to insulating element and secure in place to framing members, where possible.</td></tr> <tr><td>.3</td><td>Seal joints in vapour barrier and where building elements penetrate it, with sheathing tape or a bead of acoustic sealant.</td></tr> <tr><td>.4</td><td>Use sheets of largest practical size to minimize joints.</td></tr> </table> | .1 | Install sheet vapour retarder on warm side of exterior wall and floor assemblies prior to installation of insulation board at walls and prior to poured slab on floor, to form continuous retarder. | .2 | Ensure membrane is tight to insulating element and secure in place to framing members, where possible. | .3 | Seal joints in vapour barrier and where building elements penetrate it, with sheathing tape or a bead of acoustic sealant. | .4 | Use sheets of largest practical size to minimize joints. | | | | |
| .1 | Install sheet vapour retarder on warm side of exterior wall and floor assemblies prior to installation of insulation board at walls and prior to poured slab on floor, to form continuous retarder. | | | | | | | | | | | | | |
| .2 | Ensure membrane is tight to insulating element and secure in place to framing members, where possible. | | | | | | | | | | | | | |
| .3 | Seal joints in vapour barrier and where building elements penetrate it, with sheathing tape or a bead of acoustic sealant. | | | | | | | | | | | | | |
| .4 | Use sheets of largest practical size to minimize joints. | | | | | | | | | | | | | |

3.2 EXTERIOR
SURFACE OPENINGS

- .1 Cut sheet vapour retarder to form openings and ensure material is lapped and sealed to frame.

3.3 PERIMETER SEALS

- .1 Seal perimeter of sheet vapour barrier as follows:
 - .1 Apply continuous bead of sealant 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.
- .2 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.4 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 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.5 ELECTRICAL
BOXES

- .1 Seal electrical switch and outlet device boxes that penetrate vapour barrier as follows:
 - .1 Install moulded box vapour barrier.
 - .2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

3.6 CLEANING

- .1 Proceed in accordance with Division 1.
- .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 Requirements for the installation of preformed metal cladding/siding.

1.2 NOT USED

1.3 REFERENCES

- .1 American National Standards Institute (ANSI).
.1 ANSI B18.6.4, Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws.
- .2 American Society for Testing and Materials International, (ASTM).
.1 ASTM A 653, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
.2 ASTM B 209, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
.3 ASTM D 2369, Test Method for Volatile Content of Coatings.
.4 ASTM D 2832, Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
.5 ASTM D 5116, Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
- .3 Canadian General Standards Board (CGSB).
.1 CAN/CGSB-51.32, Sheathing, Membrane, Breather Type.
.2 CAN/CGSB-93.2, Prefinished Aluminum Siding, Soffits and Fascia, for Residential Use.
.3 CAN/CGSB-93.3, Prefinished Galvanized and Aluminum-Zinc Alloy Steel Sheet for Residential Use.
.4 CAN/CGSB-93.4, Galvanized and Aluminum-Zinc Alloy Coated Steel Siding Soffits and Fascia, Prefinished, Residential.
.5 CGSB 93.5, Installation of Metal Residential Siding, Soffits and Fascia.
- .4 Canadian Standards Association (CSA International).
.1 CSA B111, Wire Nails, Spikes and Staples.
.2 CSA-S136 for the design of Cold Formed Steel Structural Members
- .5 Underwriters' Laboratories of Canada (ULC).
.1 CAN/ULC-S706, Wood Fibre Thermal Insulation for Buildings.
.2 CAN/ULC-S741, Standard for Air Barrier Materials – Specification.
- .6 Canadian Sheet Steel Building Institute Standards 20M.

1.4 SUBMITTALS

- .1 Product data: submit manufacturer's printed product literature, specifications and data sheet in accordance with Division 1.
.1 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Division 1. Indicate VOC's for caulking materials during application and curing.
- .2 Shop Drawings:
.1 Submit shop drawings in accordance with Division 1.
.2 Indicate arrangement, sizes, joints, fasteners, thicknesses,

materials of cladding system, including dimensions, location of joints, sizes, types and locations of supports, fasteners and attachment methods, flashing, trim, closures and all metal components related to the cladding installation.

.3 Drawings shall be signed and sealed by a Professional Engineer, attesting to the ability of the metal panels assembly to withstand required loads.

.3 Samples:

.1 Submit samples in accordance with Division 1.

.2 Submit duplicate samples of siding material, of colours and profile specified prior to fabrication.

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.5 QUALITY ASSURANCE

.1 Cladding installer shall demonstrate at least five years experience in projects similar in scope.

.2 This section establishes the standard of quality required for the complete metal wall system. Proposed substitutions must meet this standard, and will be considered as follows:

.1 A written request for approval of a substitution is received at least ten (10) days prior to tender closing.

.2 The request includes a complete item-by-item description comparing the proposed substitution to the specified system, together with manufacturer's literature, samples, test data, engineering standards and performance evaluation indicating comparable standards to those specified.

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

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

.5 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Division 1.

1.6 DESIGN REQUIREMENTS

.1 Design wall system to resist:

.1 Wind loads, positive and negative, expected in this geographical region NBCC climatic data, 50 year probability.

.2 Deflection of the wall system is not to exceed 1/180th of the span for the wind load based on serviceability limit states.

.3 Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, overstressing of components, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.

.4 Design expansion joints to accommodate movement in cladding and between cladding and structure to prevent permanent distortion or damage to the cladding.

	.5	Design wall system to maintain the following erection tolerances:
	.1	Maximum variation from plane or location shown on shop drawings: 20 mm/10 m (3/4 inch/30 feet).
	.2	Maximum offset from true alignment between two adjacent members abutting end to end in line: 1 mm (0.04 inches).
<u>1.7 PRODUCT DELIVERY HANDLING AND STORAGE</u>	.1	Store components and materials in accordance with panel manufacturer's recommendations and protect from elements.
	.2	Protect prefinished steel during fabrication, transportation, site storage and erection, in accordance with CSSBI Standards.
<u>1.8 GUARANTEE</u>	.1	For work in this section, warranty by installer against defects or deficiencies in materials or workmanship shall be for a period of one year from date of substantial completion.
<u>1.9 WARRANTY</u>	.1	Provide a manufacturer's written warranty: Furnish manufacturer's written warranty covering failure of factory-applied exterior finish within the warranty period. Warranty period for finish: 40 years after the date of Substantial Completion. The values below are based on normal environments and exclude any aggressive atmospheric conditions.
	.1	WeatherX™ (Siliconized Polyester - SMP) will not crack, chip, or peel (lose adhesion) for forty (40) years from date of installation (40.5 yrs from application). This does not include minute fracturing that may occur during the normal fabrication process. WeatherX™ (Siliconized Polyester - SMP) will not chalk in excess of a number six (6) rating, in accordance with ASTM D-4214-98 method D659 at any time for thirty (30) years from date of installation (30.5 yrs from application); will not change colour more than eight (8.0) Hunter ΔE units as determined by ASTM method D-2244-02.
<u>1.10 WASTE MANAGEMENT AND DISPOSAL</u>	.1	Separate waste materials for reuse and recycling in accordance with Division 1
	.2	Divert unused caulking, sealants, and adhesive materials from landfill through disposal at hazardous material depot.
<u>PART 2 - PRODUCTS</u>		Acceptable Manufacturers: VicWest, Agway Metals Inc., Westman Steel.
<u>2.1 MATERIALS</u>	.1	Cladding system and all related components by single manufacturer.
<u>2.2 STEEL CLADDING AND COMPONENTS</u>	.1	Metal Siding and Components – at new Exterior Wall:
	.1	Sub Girts: Sub-girts: Minimum 1.21 mm (0.048") thick formed galvanized steel, ASTM A653M Grade 230 with Z275 zinc coating. Full depth of wall system (4"), factory notched and formed to match liner.
	.2	Insulation: as specified in Section 07 21 13.
	.3	Air Barrier: as specified in Section 07 26 00.
	.4	Metal Siding:
	.1	Profile: CL3035 by VicWest.
	.2	Fabricated from Z275 galvanized sheet steel conforming to ASTM A653M Grade 230 having a nominal core thickness gauge 26 (0.45mm).
	.3	Fasteners: Galvanized, with exposed fasteners colour matched to cladding.

		.4	Panel Dimensions: covered width 40" nominal; Profile depth 1.35" nominal.
		.5	Colour: VicWest 'Deep Grey' 55174.
	.2		Perforated Metal Siding – at new Exterior Stair:
	.1		Sub Girts: Refer to Structural Drawings.
	.2		Perforated Metal Siding:
		.1	Profile: CL508 by VicWest.
		.2	Fabricated from Z275 galvanized sheet steel conforming to ASTM A653M Grade 230 having a nominal core thickness gauge 26 (0.45mm).
		.3	Fasteners: Galvanized, with exposed fasteners colour matched to cladding.
		.4	Panel Dimensions: covered width 32" nominal; Profile depth 0.4" nominal.
		.5	Perforation: 40.3 %.
		.6	Colour: VicWest 'Regent Grey' 56082.
<u>2.3 PANEL FINISHES</u>	.1		Cladding coating: Prepainted with WeatherX™ on interior and exterior face.
<u>2.4 COLOUR</u>	.1		Prefinished cladding colour to be:
	.1		Refer to Section 2.2.
<u>2.3 ACCESSORIES</u>	.1		Flashing / Exposed trim:
	.1		In accordance with section 07 62 00 to match material, colour and gloss of cladding in exposed locations, with fastener holes pre-punched., galvanized material in concealed locations. Custom fabricated to suit architectural details, as required. Use preformed corner pieces only. Double back exposed edges
	.2		Closures: Metal closures to suit profiles selected, to manufacturer's recommendations.
<u>2.4 FASTENERS</u>	.1		Fasteners: Galvanized, with exposed fasteners colour matched to cladding.
<u>2.5 CAULKING</u>	.1		Sealants:
	.1		Test for acceptable VOC emissions in accordance with ASTM D 2369 and ASTM D 2832.
	.2		Concealed: Tape or compound, non-skinning, non-drying, butyl rubber.
	.3		Exposed: One part silicone to CGSB CAN2-19.13
<u>2.6 FABRICATION</u>	.1		Fabricate roof components to comply with dimensions, profiles, gauges and details as shown on the shop drawings, including fascia and soffit panels and all companion flashing.
	.2		Fabricate all components of the system in the factory, ready for field installation.
	.3		Provide cladding and all accessories in longest practicable length to minimize field lapping of joints.
<u>PART 3 - EXECUTION</u>			
3.1 MANUFACTURER'S	.1		Compliance: comply with manufacturer's written data, including

INSTRUCTIONS

product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 EXAMINATION

- .1 Examine work of other Sections upon which work of this Section depends.
- .2 Report all discrepancies to consultant before beginning work on the roof system.

3.2 INSTALLATION

- .1 Install cladding in accordance with CGSB 93.5, and manufacturer's written instructions
- .2 Sub-girt framing system: Install notched sub-girts directly concrete masonry. Frame all openings in the cladding.
- .3 Flashing: Install starter flashing, drip and other flashing, and corners, edgings, window and door flashing as shown on the drawings.
- .4 Insulation: Install insulation in accordance with manufacturer's recommendations. Ensure insulation is positively fixed to concrete masonry to prevent sagging.
- .5 Exterior Cladding:
 - .1 Install exterior cladding in accordance with manufacturer's standard installation procedures, providing proper laps and detailing to ensure a weathertight face.
 - .2 Install finishing flashing and cap flashing.
 - .3 Maintain joints in exterior cladding, true to line, tight fitting, hairline joints.
- .6 Sealants: Install sealants at junctions with adjoining work, and where shown on the drawings, in accordance with Section 07 92 00.

3.3 CLEANING

- 1. Clean exposed panel surfaces in accordance with manufacturer's instructions.
- .2 Repair and touch up with colour matching high grade enamel minor surface damage, only where permitted by the Consultant and only where appearance after touch-up is acceptable to Consultant.
- .3 Replace damaged panels and components that, in opinion of the Consultant, cannot be satisfactorily repaired.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .5 Provide maintenance data for cleaning and maintenance of panel finishes for incorporation into product manual.

END OF SECTION

PART 1 - GENERAL

1.1 NOT USED

1.2 REFERENCES

- .1 Perform roofing and sheet metal work in conformance with roofing manufacturer's written recommendations as well as requirements of ULC laboratories Class C, and Canadian Roofing Contractor's Association (CRCA).
- .2 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM D 41, Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
 - .2 ASTM D 312, Asphalt Used in Roofing.
 - .3 ASTM D 2178, Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
 - .4 ASTM D 6162, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fibre Reinforcements.
 - .5 ASTM D 6162, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fibre Reinforcements.
 - .6 ASTM D 6163, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fibre Reinforcements.
 - .7 ASTM D 6164, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
- .3 Canadian General Standards Board (CGSB).
 - .1 CGSB 37-GP-9Ma, Primer, Asphalt, Used, for Asphalt Roofing, Dampproofing and Waterproofing.
 - .2 CGSB 37-GP-56M, Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
 - .3 CAN/CGSB-51-26, Thermal Insulation, and Isocyanurate, Board, Faced.
 - .4 CAN/CGSB-51-33, Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
- .4 Canadian Roofing Contractors Association (CRCA).
 - .1 CRCA Roofing Specifications Manual.
- .5 Canadian Standards Association (CSA International).
 - .1 CAN/CSA A123.3, Asphalt Saturated Organic Roofing Felt.
 - .2 CAN/CSA A123.4, Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems.
 - .3 CAN/CSA A123.16, Asphalt-Coated Glass-Base Sheet.
 - .4 CAN/CSA A123.21, Standard Test Method for the Dynamic Wind Uplift Resistance of Mechanically Attached Membrane-Roofing Systems.
- .6 Factory Mutual (FM Global).
 - .1 FM Approval Standard #4470, Class 1 Roof Covers.
 - .2 FM Roof Assembly Classifications.
- .7 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).

- .8 Underwriters Laboratories' of Canada (ULC).
 - .1 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
 - .2 CAN/ULC-S107, Methods of Fire Tests of Roof Coverings.
 - .3 CAN/ULC-S701.1, Standard for Thermal Insulation, Polystyrene, Boards.
 - .4 CAN/ULC-S701.2, Mineral Fibre Thermal Insulation for Buildings.
 - .5 CAN/ULC-S704, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
 - .6 CAN/ULC-S770, Standard Test Method for Determination of Long-Term Thermal Resistance of Closed-Cell Thermal Insulating Foams.

1.3 SUBMITTALS

- .1 Submittals in accordance with Division 1.
- .2 Submit two copies of most recent technical roofing components data sheets describing physical properties of the following materials: membrane, bitumen, base flashing, insulation, roof barriers and drainage layers.
- .3 Shop Drawings: indicate setting plan for insulation, tapered insulation to suit slope requirements indicated on Drawings, layout of seams, direction of laps and base flashing details, roof equipment curb details, and roof penetration details.
- .4 Manufacturer's Installation Instructions: indicate special precautions required for seaming the membrane.
- .5 Manufacturer's field reports in accordance with Division 1.
- .6 Manufacturer's Field Reports: indicate procedures followed, ambient temperatures and wind velocity during application.
- .7 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.
- .8 Independent Inspections and Testing Reports: submit 3rd Party Inspection Agency's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

1.4 QUALITY ASSURANCE

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

1.5 QUALIFICATIONS

- .1 Applicator: company specializing in performing the work of this section with 5 years' documented experience and approved by membrane manufacturer.

<u>1.6 REGULATORY REQUIREMENTS</u>	.1	Conform to applicable code for roof assembly fire hazard requirements.
<u>1.7 DELIVERY, STORAGE, AND HANDLING</u>	.1	Deliver, store, protect, and handle products to site in accordance with Division 1.
	.2	Deliver products in manufacturer's original containers, dry, undamaged, seals and labels intact.
	.3	Store products in weather protected environment, clear of ground and moisture.
	.4	Store rolls of felt and membrane in upright position. Store membrane rolls with selva edge up.
	.5	Remove only in quantities required for same day use.
	.6	Place plywood runways over work to enable movement of material and other traffic.
	.7	Store sealants at +5 degrees C minimum.
	.8	Store insulation protected from daylight and weather and deleterious materials.
	.9	Handle roofing materials in accordance with manufacturer's written directives, to prevent damage or loss of performance.
<u>1.8 NOT USED</u>		
<u>1.9 WASTE MANAGEMENT AND DISPOSAL</u>	.1	Separate waste materials for reuse and recycling in accordance with Division 1.
<u>1.10 ENVIRONMENTAL REQUIREMENTS</u>	.1	Do not install roofing during inclement weather when temperature remains below -18 degrees C for torch application, or to manufacturers' recommendations for mop application.
	.2	Minimum temperature for solvent-based adhesive is -5 degrees C.
	.3	Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.
	.4	Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
<u>1.11 CO-ORDINATION</u>	.1	Coordinate Work with installing associated metal flashings as Work of this section proceeds.
<u>1.12 WARRANTY</u>	.1	Modified bituminous roofing and membrane flashings shall stay in place and remain leakproof, Manufacturer will provide ten (10) year manufacturer's labour and material replacement warranty.
	.2	The contractor will provide a warranty for this project, valid for a period of two (2) years covering labour, materials and workmanship for entire area of roofing project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS - MEMBRANE MATERIALS

- .1 Acceptable manufacturers include: Soprema, Henry Bakor and IKO.
- .1 All components of roofing system to be from same manufacturer.
- .2 Product Substitutions: refer to Section 01 23 00 1.1.4 and provide Letter of Equivalence.

2.2 ROOFING MATERIALS

- .1 **Deck:**
Steel.
- .2 **Deck Sheathing:**
5/8" (16mm) glass-fibre reinforced gypsum panel, mechanically fastened.
- .3 **Fasteners:**
 - .1 Description: #14 Phillips [pre-assembled] mechanical fasteners made of case-hardened carbon steel with a rust preventive coating that comply with FMR approval standards. 50 mm diameter, barbed stress plates that comply with the CSA B35.3 and FM 4470 approval standard.

Specified products: SOPRAPHIX FASTENERS/PLATES by SOPREMA as approved by FM the specified system, or approved equivalent.

 - .2 Roofing nails: spiral nails with steel round-top cap 25 mm in diameter and 3 mm diameter shank; long enough to penetrate solid wood supports by at least 38 mm and plywood substrates by at least 20 mm.
- .3 **Vapour Barrier:**
 - .1 In accordance with Section 07 26 00 – Air and Vapour Retarders.
Product: SOPRAVAP'R by Soprema.
- .4 **Insulation:**
 - .1 In accordance with Section 07 21 13 – Board Insulation.
Provide tapered insulation as indicated on drawings.
- .5 **Asphaltic Overlay Board with Laminated Base Sheet Membrane:**
 - .1 SBS modified base sheet membrane and polyester reinforcement, factory-laminated on a semi-rigid asphaltic board. Board measures 0.91 m x 2.44 m (3 ft x 8 ft). Top surface sanded. Membrane side lap is 60% self-adhesive. Total thickness 7mm. (Asphaltic board, 4.8 mm + membrane 2.2 mm).

Specified product: SOPRABOARD by Soprema, or approved equivalent.
- .6 **Primer:** Stabilized bituminous emulsion primer used to enhance adhesion of membranes.

Specified product: ELASTOCOL STICK by Soprema (for self-adhesive membranes), or approved equivalent.
- .7 **Adhesive:** low-rise, two-part urethane adhesive with no solvents, to allow a complete cure in few minutes, with no temperature restrictions.
Specified product: DUOTACK INSULATION ADHESIVE by SOPREMA or approved equivalent.
- .8 **Roof Membrane base sheet flashing:** to CGSB 37-GP-56M.

.1 Roofing membrane with glass and polyester reinforcement and SBS modified bitumen to ASTM D6162. Top face sanded, under side self-adhesive. Top face marked with three (3) distinctive blue chalk lines to ensure proper roll alignment.

Specified product: ELASTOPHERE 180 PS by Soprema or approved equivalent.

.9 **Roof Membrane Cap sheet and Cap Sheet Flashing:** to CGSB 37-GP-56M.

.1 Roofing membrane with fiberglass and polyester reinforcement and elastomeric bitumen to ASTM D6162. Top face covered by white coloured granules, under face self-adhesive.

Specified product: SOPRASTAR HD GR by Soprema or approved equivalent.

.10 **Waterproofing Mastics:**

.1 Product recommended by manufacturer, mastic made of synthetic rubbers, plasticized with bitumen and solvents.

2.3 ACCESSORIES

.1 Fibre Cant and Tapered Edge Strips: Rigid mineral wool fibre cant for 45°, to measure 5-1/2 inches on slope for transitions at parapet walls, roof curbs, mechanical units, roof to wall junctions, and other protrusions requiring a curb.

.2 Specified product: Refer to Board Insulation Specification 07 21 13. Install as per manufacturer requirements.

.3 Roof Flashing: Soprema Alsan Flashing, one-component polyurethane / bitumen resin. Substrate to be prepared and primed per manufacturer's recommendations. Cover flashed area finished top coat with roofing granules to match appearance of adjacent roofing surface.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual and CRCA Roofing Specification Manual, Roofing Association Manual, particularly for fire safety.

.2 Inspect deck conditions including parapets, construction joints, roof drains, plumbing vents and ventilation outlets to determine readiness to proceed. Immediately inform Consultant in writing of any defects.

.1 Verify that surfaces and site conditions are ready to receive work.

.2 Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains.

.3 Verify deck surfaces are dry and free of snow or ice; do not use calcium or salt for ice or snow removal.

.4 Verify roof openings, curbs, pipes, conduit, sleeves, ducts, and vents through roof are solidly set, and cant strips and reglets are in place.

.5 Do not install roofing materials during rain or snowfall.

.6 Correct deficiencies before starting roofing application Work.

- | | |
|---|---|
| <u>3.2 PROTECTION</u> | <ul style="list-style-type: none">.1 Cover walls, walks, sloped roofs and adjacent work where materials hoisted or used..2 Use warning signs and barriers; maintain in good order until Work completed..3 Clean off drips and smears of bituminous material immediately..4 Protect roof from traffic and damage during roof installation and material handling..5 At end of each day's work and when stoppage occurs due to inclement weather, provide protection for completed Work and materials out of storage. |
| <u>3.3 APPLICATION GENERAL</u> | <ul style="list-style-type: none">.1 Execute roofing work in accordance with manufacturer's instructions and applicable standards in Canadian Roofing Contractors Association (CRCA) Roofing Specifications Manual..2 Install roofing elements on clean and dry surfaces, in conformance with manufacturer's instructions and recommendations..3 Complete roofing work in a continuous fashion as surfaces are prepared and weather conditions permit..4 Ensure watertight conditions for roofs at all times, including protection during installation work by other trades and progressive protection as work is completed (e.g. vents, drains, etc.)..5 Comply with manufacturer's requirements for sealing and flashing all penetrations and standard details. |
| <u>3.4 DECK SHEATHING</u> | <ul style="list-style-type: none">.1 Lay sheathing board with tightly butted joints. Longitudinal joints must be at right angles to flute direction. Joints occurring along widths of board to be continuously supported on top flute of metal deck..2 Mechanically fasten sheathing to deck with self-tapping, non-corroding screws, spaced evenly to each board and to only top flutes. Use 8 fasteners per 4' x 8' panels and 12 fasteners per corner panels.3 Ensure sheathing is immediately protected with membrane. |
| <u>3.5 ASPHALT PRIMER APPLICATION</u> | <ul style="list-style-type: none">.1 Roofing substrates of wood, metal, concrete, masonry or gypsum board surfaces will receive a coat of asphalt primer at a rate of 0.2 to 0.3 l/m² (none required for factory-painted metals). Surfaces to be primed must be free of any residue that may hinder adherence. Cover primed surfaces with roofing membrane as soon as possible. Application temperature limit -10°C. |
| <u>3.6 VAPOUR BARRIER</u> | <ul style="list-style-type: none">.1 Install fabricated sheet vapour barrier membrane over deck sheathing on metal decks and over concrete decks in accordance with manufacturer's recommendations. |
| <u>3.7 INSTALLATION OF VAPOUR BARRIER</u> | <ul style="list-style-type: none">.1 Beginning at the bottom of the slope, without adhering the membrane, unroll onto the substrate for alignment. Do not immediately remove the silicone release sheet..2 Align the roll parallel to the corrugations of the steel deck. Make sure the membrane overlaps are supported along their entire length. |

- .3 Peel back one end of the silicone release sheet and adhere this part of the membrane to the substrate. Peel back the remaining release sheet at a 45° angle to avoid wrinkles in the membrane.
 - .4 If the membrane is not properly aligned, do not try to adjust it. Instead, cut the roll and start again, making sure that it is properly aligned and that it overlaps the end of the misaligned piece by 150 mm.
 - .5 Overlap adjacent membranes by 75 mm. Overlap end laps by 150 mm. Stagger end laps by at least 300 mm.
- 3.8 INSTALLATION OF INSULATION**
- .1 Insulation installation:
 - .1 Apply insulation to vapour retarder with adhesive in conformance with manufacturer's written recommendations.
 - .2 Install only as much insulation as can be covered in the same day.
 - .3 Around the drains lower insulation by 1" to create a sump 4' X 4' in area. Bevel the edge of the 3" insulation on a 45° angle.
 - .4 Install tapered insulation in adhesive where indicated on drawings.
- 3.9 INSTALLATION OF OVERLAY BOARD AND BASE SHEET COMPOSITE PANEL**
- .1 Install composite board with adhesive in continuous strips spaced 30 cm (12 in) on the field. Decrease the spacing between ribbons to a minimum of 15 cm (6") at the perimeter and 10 cm (4") at the corners.
 - .2 Adhere the first 60 mm (2.5 in) of the self-adhesive side and end laps using a membrane roller, then heat-weld the last 40 mm (1.5 in) (self-adhesive, heat-welded side laps).
 - .3 Avoid forming wrinkles, swelling or fishmouths.
- 3.10 BASESHEET FLASHING INSTALLATION**
- .1 Apply primer to the substrate at a rate of .25 L/m². Allow primer to dry before installation of Base Sheet
 - .2 Install reinforcing gussets at all inside and outside corners.
 - .3 Install base sheet flashing in one- (1) metre widths to cover roofing substrate over 100 mm. Overlap side laps by 75 mm. Stagger side laps by at least 100 mm from base sheet overlaps on roof to avoid excessive layering.
 - .4 Apply base sheet flashing directly onto substrate by removing siliconed paper cover sheet. Proceed from top to bottom. Once in place, apply pressure manually in a uniform fashion to obtain homogenous adherence over entire surface. Deal seams with rubber roller. Nail outside edge at 300 mm o/c.
- 3.11 CAP SHEET INSTALLATION**
- .1 Beginning at the drains and perpendicular to the slope, install the cap sheet by peeling back the silicone release paper to adhere the membrane to the (primed) base sheet membrane.
 - .2 Install the cap sheet in parallel strips, staggering the end laps by at least 300 mm.
 - .3 Overlap the longitudinal joints by 75 mm and the end laps by 150 mm. The longitudinal joints must be primed immediately before overlapping with the next strip of cap sheet membrane.

- .4 Adhere the first 50 mm (2.0 in) of the self-adhesive side laps using a membrane roller, then heat-weld the last 50 mm (2.0 in) (self-adhesive, heat-welded side laps).
 - .5 Apply adhesive for the first 125 mm (5 in) of the end laps using a steel trowel with 5 mm (3/16 in) notches.
 - .6 Complete the application by welding the last 25 mm (1 in) of the overlap to the field surface, using an electric hot-air welder and a membrane roller.
 - .7 Once in place, apply pressure manually in a uniform fashion to obtain homogenous adherence over entire surface. Preferably seal seams with rubber roller.
 - .8 Once cap sheet is installed, carefully check all overlapped joints.
- 3.12 CAP SHEET FLASHING
 INSTALLATION**
- .1 Install this cap sheet in one-metre-wide strips (3.25 ft).
 - .2 Each seldge will overlap the previous one laterally along lines provided for this purpose, and will overlap by 150 mm (6 in) the field surface. Membranes for flashings must be spaced at least 100 mm (4 in) with respect to the cap sheet membranes on the field surface, to avoid areas of excessive membrane thickness.
 - .3 Cut off corners at end laps of areas to be covered by the next roll.
 - .4 Use a chalk line to draw a straight line on the field surface 150 mm. from the upstands and parapets.
 - .5 Prime the surface of the upstand and allow to dry.
 - .6 Position the pre-cut membrane piece. Peel back 100 to 150 mm. (4 to 6 in.) of the silicone release paper to hold the membrane in place at the top of the upstand. As you progressively remove the paper, use the aluminum applicator to ensure good adherence and a perfect transition between the upstand and the field surface.
 - .7 Apply primer before installing the next strip.
 - .8 Smooth the entire membrane surface with a roller for full adhesion.
 - .9 Adhere the first 50 mm (2.0 in) of the self-adhesive side laps using a membrane roller, then heat-weld the last 50 mm (2.0 in) (self-adhesive, heat-welded side laps).
 - .10 Apply adhesive for the first 125 mm (5 in) of the end lap using a steel trowel with 5 mm (3/16 in) notches.
 - .11 Finish by heat-welding the last 25 mm. (1 in.) to the existing surface with an electric hot-air welder and roller. Provide a smooth application, free of wrinkles, fishmouths or air pockets.
- 3.13 FIELD QUALITY
 CONTROL**
- .1 Require site attendance of roofing materials manufacturer's representative during installation of Work, prior to commencement of Work, once during Work on each roof, and at completion of Work. Manufacturer's representative to provide field review reports within 3 days of each visit. Provide reports to Consultant for review.

- .2 Field quality control is under control of Contractor.
- .3 Inspection and Site Tests:
 - .1 Contractor to carry for Inspection of roofing installation to be carried out by Independent Inspections Agency accepted by Consultant.
 - .2 Independent Inspections Agency shall perform inspections of the work in successive stages, at 25%, 50% and final completion. Contractor to coordinate and allow for field reviews. Do not proceed with application of roofing when inspection indicates non-compliance with roofing design or manufacturer's instructions.
 - .3 Roofing will be considered defective if it does not pass inspections.
 - .1 Remove and replace roofing and related components that do not pass inspections at no expense to Owner, and call for further inspection.
 - .2 Correct identified defects or irregularities.
 - .3 Costs of any subsequent required inspections as a result of deficient work will be paid for by Contractor.
 - .4 Prepare Inspection reports sealed by an engineer licensed in the Province of Ontario and submit to Consultant within 3 days of inspection.
 - .5 Should potential infiltration sources be observed during independent inspections, or should infiltration be detected inside the building, the independent inspection agency will determine the scope and type of deficiencies involved. If required, the inspection agency will carry out a thermographic inspection of the roofing system or use a hygrometer to locate zones that may have been damaged by moisture ingress. The cost for such detailed inspections, if required, will be borne by the Contractor.

3.14 CLEANING

- .1 Remove bituminous markings from finished surfaces.
- .2 In areas where finished surfaces are soiled caused by work of this section, consult manufacturer of surfaces for cleaning advice and complying with their documented instructions.
- .3 Repair or replace defaced or disfigured finishes caused by work of this section.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 The Aluminum Association Inc. (AAI)
 - .1 AAI-Aluminum Sheet Metal Work in Building Construction-2002.
 - .2 AAI DAF45, Designation System for Aluminum Finishes.
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 606, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
 - .2 ASTM A 653/A 653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .3 ASTM A 792/A 792M, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - .4 ASTM B 32, Standard Specification for Solder Metal.
 - .5 ASTM B 370, Standard Specification for Copper Sheet and Strip for Building Construction.
 - .6 ASTM D 523, Standard Test Method for Specular Gloss.
 - .7 ASTM D 822, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
- .3 Canadian Roofing Contractors Association (CRCA)
 - .1 Roofing Specifications Manual.
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.32, Sheathing, Membrane, Breather Type.
 - .2 CAN/CGSB-93.1, Sheet Aluminum Alloy, Prefinished, Residential.
- .5 Canadian Standards Association (CSA International)
 - .1 CSA A123.3, Asphalt Saturated Organic Roofing Felt.
 - .2 AAMA/WDMA/CSA 101/I.S.2/A440, Standard/Specification for Windows, Doors, and Unit Skylights.
 - .3 CSA B111, Wire Nails, Spikes and Staples.

1.2 SUBMITTALS

- .1 Provide submittals in accordance with Division 1.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Shop drawings: submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
- .4 Quality assurance submittals: submit in accordance with Division 1.
 - .1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.

1.3 QUALITY ASSURANCE

- .1 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with Project Manager to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.

		.4	Review manufacturer's installation instructions and warranty requirements.
1.4 DELIVERY, STORAGE AND HANDLING	.1		Deliver, store and handle materials in accordance with Division 1.
	.2		Waste Management and Disposal:
		.1	Separate waste materials for reuse and recycling in accordance with Division 1.
PART 2 - PRODUCTS			
2.1 PREFINISHED METAL FLASHING	.1		Provide prefinished galvanized or aluminum sheet flashing where indicated on Drawings:
		.1	Finish: provide colour selection from manufacturer's standard range for selection by consultant. Colour to match preformed metal siding colour.
		.2	Base metal thickness: 0.511 mm (24 ga.)
		.3	Coating thickness: not less than 0.025mm.
2.2 ACCESSORIES	.1		Isolation coating: alkali resistant bituminous paint.
	.2		Plastic cement: to CAN/CGSB 37.5.
	.3		Underlay for metal flashing: asphalt laminated 3.6 to 4.5 kg kraft paper or No. 15 perforated asphalt felt to CSA A123.3.
	.4		Sealants: in accordance with Section 07 92 00 – Joint Sealants.
	.5		Cleats: of same material and temper as sheet metal, minimum 2 inches (50 mm) wide. Thickness same as sheet metal being secured.
	.6		Fasteners: of same material and matching colour as sheet metal, to CSA B111, flat head roofing nails of length and thickness suitable for metal flashing application.
	.7		Washers: of same material as sheet metal, 0.039 inches (1 mm) thick with rubber packings.
	.8		Touch-up paint: as recommended by prefinished material manufacturer.
2.3 FABRICATION	.1		Fabricate metal flashings and other sheet metal work as indicated on drawings.
	.2		Fabricate aluminum flashings and other sheet aluminum work in accordance with AAI-Aluminum Sheet Metal Work in Building Construction.
	.3		Hem exposed edges on underside 1/2 inch (12 mm.)
		.1	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 or installed on concrete, mortar or cement board.

2.4 METAL FLASHINGS .1 Form flashings, copings and fascias to profiles indicated of minimum 24 ga. prefinished galvanized sheet steel.

2.5 SCUPPERS .1 Form from galvanized metal 18 ga., paint to match prefinished metal cap flashing.

.2 Sizes and profiles as indicated on drawings.

.3 Provide goosenecks, outlets, strainer baskets and necessary fastenings.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS .1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION .1 Install sheet metal work in accordance with CRCA FL series details, and as indicated on drawings.

.2 Use concealed fastenings except where approved before installation.

.3 Provide underlay under sheet metal.

.1 Secure in place and lap joints 4 inches (100 mm.)

.4 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs.

.1 Flash joints using S-lock forming tight fit over hook strips, or as detailed on drawings.

.5 Lock end joints and caulk with sealant.

.6 Install surface mounted reglets true and level, and caulk top of reglet with sealant.

.7 Insert metal flashing into reglets to form weather tight junction.

.8 Install pans, where shown around items projecting through roof membrane.

.9 Install flashing joints in line with joints in adjacent materials wherever practical.

3.4 CLEANING .1 Proceed in accordance with Division 1.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.3 Leave work areas clean, free from grease, sealants, finger marks and stains.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- .1 Provide factory-fabricated roof hatch for ladder access.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM A 506, Specification for Alloy and Structural Alloy Steel, Sheet and Strip, Hot-Rolled and Cold-Rolled.
 - .2 ASTM B 370, Specification for Copper Sheet and Strip for Building Construction.
 - .3 ASTM A 653/A 653M, 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-1.105, Quick-Drying Primer.
- .3 Canadian Standards Association (CSA International).
 - .1 CSA B111, Wire Nails, Spikes and Staples.

1.3 SUBMITTALS

- .1 Product data: Provide manufacturer's product data for all materials in this specification.
- .2 Samples: Manufacturer to provide upon request; sized to represent material adequately.
- .3 Shop Drawings: Submit shop drawings including profiles, accessories, location, adjacent construction interface, and dimensions.
- .4 Contract Closeout: Roof hatch manufacturer shall provide the manufacturer's Warranty prior to the contract closeout.

1.4 PRODUCT HANDLING

- .1 All materials shall be delivered in manufacturer's original packaging.
- .2 Store materials in a dry, protected, well-vented area. The contractor shall thoroughly inspect products upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.
- .3 Remove protective wrapping immediately after installation.

1.5 SUBSTITUTIONS

- .1 Proposed substitutions shall meet the performance and quality standards of this specification.

1.6 CONDITIONS

- .1 Verify that other trades with related work are complete before installing roof hatch.
- .2 Mounting surfaces shall be straight and secure; substrates shall be proper width.
- .3 Refer to construction documents, and manufacturer's installation instructions.
- .4 Coordinate installation with roof membrane and roof insulation manufacturer's installation instructions.

- .5 Observe all occupational health and safety guidelines for this work.

1.7 WARRANTY

Manufacturer's Warranty: provide manufacturer's standard warranty. Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

PART 2 – PRODUCTS

Acceptable Manufacturer's: Bilco, Acudor, Nystrom.

2.1 ROOF HATCH

- .1 Furnish and install where indicated on Drawings, Double-Leaf Roof Scuttle Type D, by Acudor Access Doors. The roof hatch shall be pre-assembled from the manufacturer.
- .1 Size: as indicated on Drawings.
- .2 Performance characteristics:
- .1 Cover shall be reinforced to support maximum load of 40 psf (195 kg/m²) with a maximum deflection of 1/150th of the span or 20 psf (97 kg/m²) wind uplift.
- .2 Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
- .3 Operation of the cover shall not be affected by temperature.
- .4 Entire hatch shall be weather tight with fully welded corner joints on cover and curb.
- .3 Lifting mechanism: Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe.
- .4 Safety Rail: Model SLE-Y Safety Ladder Extension by Acudor.

2.2 HATCH COVER

- .1 Metal Cover: Shall be 14 gauge (1.9mm) paint bond G-90 galvanized steel with a 3" (76mm) beaded flange with formed reinforcing members. Covers shall have a heavy extruded EPDM rubber gasket gasket that is bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.
- .2 Cover insulation: shall be fiberglass of 1" (25mm) thickness, fully covered and protected by a 22 gauge (.8mm) paint bond G-90 galvanized steel metal liner.
- .3 Lifting mechanisms: Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation though out the entire arc of the opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe that is through bolted to the curb assembly.

2.3 CURBED FRAME

- .1 Curb height shall be as per drawings and of 14 gauge (1.9mm) paint bond galvanized steel. The curb shall be formed with a 3.5" (89mm) flange with 7/16" (11mm) holes provided for securing to the roof deck. The curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners, that features the Bil-Clip® flashing system, including stamped tabs, 6" (153mm) on centre, to be bent inward to hold single ply roofing membrane securely in place.
- .2 Curb insulation shall be rigid high-density fiberboard of 1" (25mm) thickness on outside of curb.

2.4 HARDWARE

- .1 Hinges: shall be heavy pintle hinges.
- .2 Cover shall be equipped with a spring latch with interior and exterior handles.
- .3 Roof hatch shall be equipped with interior and exterior padlock hasps.
- .4 The latch strike shall be a stamped component bolted to the curb assembly.
- .5 Cover shall automatically lock in the open position with a grid hold open arm equipped with a 1" (25mm) diameter red vinyl grip handle to permit easy release for closing.
- .6 Compression spring tubes shall be anti-corrosive composite material and all other hardware shall be zinc plated and chromate sealed.
- .7 Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.
- .8 Resilient gasket/seal to inner face of lid in contact with hatch lid support frame around all sides of cover.

2.5 FINISHES

- .1 Factory finish: shall be grey (Telegrey 2, RAL 7046) baked enamel polyester.

2.6 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.

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 Examine substrates and openings for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.
- .2 Install products in strict accordance with manufacturer's instructions and approved submittals. Locate units level, plumb, and in proper alignment with adjacent work.
- .3 Test units for proper function and adjust until proper operation is achieved.
- .4 Repair finishes damaged during installation.
- .5 Restore finishes so no evidence remains of corrective work.

3.3 CLEANING

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

END OF SECTION

1.1 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, Fire Tests of Fire stop Systems.

1.2 DEFINITIONS

- .1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.
- .2 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.

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Division 1.
- .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 Division 1.
 - .3 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.
- .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.
 - .3 Indicate ULC Listing number and the required temperature and flame rating thickness for all proposed assemblies.
- .4 Quality assurance submittals: submit following in accordance with Division 1.
 - .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.

1.4 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer: specializing in fire stopping installations with 5 years documented experience.
- .2 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with contractor's representative and Consultant to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.
- .3 Site Meetings: as part of Manufacturer's Services described in PART 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.
 - .1 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.
 - .2 Once during progress of Work at 25% complete.
 - .3 Upon completion of Work, after cleaning is carried out.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Division 1.
- .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 and ULC markings.

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 and listed in ULC listings for Firestop and Components.
 - .2 Fire stop system rating:
 - .1 F Rating for walls, including top of walls and partitions designated as a fire separation.
 - .2 FT Rating for floors.
 - .3 F Rating for Control joints occurring in walls and partitions including wall intersections designated as a fire separation.
- .2 Service penetration assemblies: systems tested to CAN-ULC-S115.
- .3 Service penetration fire stop components: certified by test

laboratory to CAN-ULC-S115.

- .4 Fire-resistance rating of installed fire stopping assembly in accordance with the Ontario Building Code.
- .5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.
- .6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- .10 Sealants for vertical joints: non-sagging.

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 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 un-penetrated 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.
<u>3.4 SEQUENCES OF OPERATION</u>	.1	Proceed with installation only when submittals have been reviewed by Consultant.
	.2	Install floor fire stopping before interior partition erections.
	.3	Metal deck bonding: fire stopping to precede spray applied fireproofing to ensure required bonding.
	.4	Mechanical pipe insulation: certified fire stop system component.
	.1	Ensure pipe insulation installation precedes fire stopping.
<u>3.5 FIELD QUALITY CONTROL</u>	.1	Inspections: notify Consultant when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.
	.2	Manufacturer's Field Services:
	.1	Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as per Division 1.
	.2	Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
	.3	Schedule site visits, to review Work, as directed in Division 1.
<u>3.6 CLEANING</u>	.1	Proceed in accordance with Division 1.
	.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.
<u>3.7 SCHEDULE</u>	.1	Fire stop and smoke seal at:
	.1	Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
	.2	Edge of floor slabs at curtain wall and precast concrete panels.
	.3	Top of fire-resistance rated partitions.
	.4	Control and sway joints in fire-resistance rated masonry and gypsum board walls.
	.5	Penetrations through fire-resistance rated floor slabs.
	.6	Around mechanical and electrical assemblies penetrating fire separations.
	.7	Rigid ducts: greater than 129 cm ² : fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of

fire separation.

.8 Gaps located within expansion joints.

.9 Intersection of fire-resistance rated masonry and gypsum board partitions.

.10 Provide adequate fire stopping system behind existing structural steel and block walls where gypsum board cannot be provided.

.11 Openings at each floor level in fire rated shafts.

.12 Around mechanical and electrical assemblies penetrating fire separations.

.13 Other locations as may be required to meet code requirements and where specified elsewhere in project specification.

END OF SECTION

<u>PART 1 - GENERAL</u>	.1	Contractor shall warrant caulking against leaks, cracks, crumbling, melting, shrinking, loss of adhesion or stain of adjacent surfaces for 2 years after installation.
<u>1.1 SECTION INCLUDES</u>	.1	Materials, preparation and application for caulking and sealants.
<u>1.2 REFERENCES</u>	.1	American Society for Testing and Materials International, (ASTM) .1 ASTM C 919, Standard Practice for Use of Sealants in Acoustical Applications.
	.2	Canadian General Standards Board (CGSB) .1 CGSB 19-GP-5M, Sealing Compound, One Component, Acrylic Base, Solvent Curing. .2 CGSB 19-GP-14M, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing. .3 CAN/CGSB-19.17, One-Component Acrylic Emulsion Base Sealing Compound. .4 CAN/CGSB-19.24, Multi-component, Chemical Curing Sealing Compound.
	.3	Health Canada/Workplace Hazardous Materials Information System (WHMIS) .1 Material Safety Data Sheets (MSDS).
<u>1.3 SUBMITTALS</u>	.1	Submit product data in accordance with Division 1.
	.2	Manufacturer's product to describe. .1 Caulking compound. .2 Primers. .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
	.3	Submit samples in accordance with Division 1.
	.4	Submit duplicate samples of each type of material and colour.
	.5	Cured samples of exposed sealants for each color where required to match adjacent material.
	.6	Submit manufacturer's instructions in accordance with Division 1. .1 Instructions to include installation instructions for each product used.
<u>1.4 QUALITY ASSURANCE/ MOCK-UP</u>	.1	Construct mock-up in accordance with Division 1.
	.2	Construct mock-up to show location, size, shape and depth of joints complete with back-up material, primer, caulking and sealant.
	.3	Mock-up will be used: .1 To judge workmanship, substrate preparation, operation of equipment and material application.
	.4	Locate where directed.
	.5	Allow for inspection of mock-up by Consultant before proceeding

with sealant work.

- .6 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-up may remain as part of finished Work.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, handle, store and protect materials in accordance with Division 1.
- .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 4.4 degrees C.
 - .2 When joint substrates are wet.
- .2 Joint-Width Conditions:
 - .1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:
 - .1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.7 ENVIRONMENTAL REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labeling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.
- .2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

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.
- .4 Colour of caulking to match colour of surface to which it is applied.

**2.2 SEALANT MATERIAL
DESIGNATIONS**

- .1 **Sealant Type 1:** Exterior Sealant.
Use Multi-Component Polyepoxide Urethane Sealant to meet requirements of CAN/CGSB-19.24-M90 Type 2, Class B.
Acceptable Products:
Dymeric by The Tremco Manufacturing Company (Canada) or equivalent.
- .2 **Sealant Type 2:** Concealed Bedding Joint and Acoustical Sealant.
Single Component, non-skinning, non-hardening synthetic rubber sealant meeting the specified requirements of specification CAN/CGSB-19.21-M87 and ASTM C 919.
Acceptable Products:
Tremco Acoustical Sealant by The Tremco Manufacturing Company (Canada) or equivalent.
- .3 **Sealant Type 3:** Interior Sanitary Sealant.
Single Component Acrylic Latex Sealant, mildew resistant, meeting the specified requirements of specification CGSB-19GP22M.
Colour: white.
Acceptable Manufacturers:
The Tremco Manufacturing Company (Canada)
Dow Corning Corporation
GE
- .4 **Sealant Type 4:** PVC Roofing Sealant.
Single-Component, non-sag, elastomeric sealant compatible with PVC roofing components, as recommended by roofing manufacturer.
Colour: to match roofing components.

2.3 SEALANT SELECTION

- .1 Exterior Sealant Joint: Sealant Type 1.
Applications:
 - .1 Control and expansion joints in cast-in-place concrete.
 - .2 Control and expansion joints in unit masonry.
 - .3 Joints between different materials listed above.
 - .4 Perimeter joints between materials listed above and frames of doors, windows, louvers, vents and similar openings.
 - .5 Control and expansion joints in soffits and overhead surfaces.
 - .6 Other exterior joints in vertical surfaces and non-traffic horizontal surfaces for which no other sealant is specified.
- .2 Concealed Bedding Sealant Joint: Sealant Type 2.
Applications:
 - .1 Bedding joints under metal thresholds.
 - .2 Bedding joints under sheet metal flashings and metal panels.
 - .3 Concealed lap and hook joints in sheet metal flashing and trim.
 - .4 Perimeter bedding seal and joint seal for polyethylene vapour barrier.
 - .5 Perimeter joints around top and bottom stud tracks with substrate.
- .3 Interior Sanitary Sealant Joint :Sealant Type 3:

		Applications: .1 General use. .2 Painted areas.
<u>2.4 SEALANT BACKING</u>	.1	Extruded closed cell foam rod compatible with sealant; oversized 25% larger than joint width; recommended by sealant manufacturer to suit application.
<u>2.5 JOINT CLEANER</u>	.1	Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.
	.2	Primer: as recommended by manufacturer.
<u>2.6 BOND BREAKER</u>	.1	Pressure sensitive plastic tape, which will not bond to sealant.
<u>PART 3 - EXECUTION</u>		
<u>3.1 PROTECTION</u>	.1	Protect installed Work of other trades from staining or contamination.
<u>3.2 SURFACE PREPARATION</u>	.1	Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
	.2	Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.
	.3	Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
	.4	Ensure joint surfaces are dry and frost free.
	.5	Prepare surfaces in accordance with manufacturer's directions.
<u>3.3 PRIMING</u>	.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.
<u>3.4 BACKUP MATERIAL</u>	.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.
<u>3.5 MIXING</u>	.1	Mix materials in strict accordance with sealant manufacturer's instructions.
<u>3.6 APPLICATION</u>	.1	Sealant: .1 Apply sealant in accordance with manufacturer's written instructions. .2 Mask edges of joint where irregular surface or sensitive

joint border exists to provide neat joint.

- .3 Apply sealant in continuous beads.
- .4 Apply sealant using gun with proper size nozzle.
- .5 Use sufficient pressure to fill voids and joints solid.
- .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
- .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
- .8 Remove excess compound promptly as work progresses and upon completion.

.2 Curing:

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

3.7 CLEANING

- .1 Clean adjacent surfaces immediately and leave Work neat and clean.
- .2 Remove excess and droppings, using recommended cleaners as work progresses.
- .3 Remove masking tape after initial set of sealant.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 653/A 653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM B 29, Standard Specification for Refined Lead.
 - .3 ASTM B 749, Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59, Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door Manufacturers' Association (CSDMA)
 - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames.
 - .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors.
- .5 National Fire Protection Association (NFPA)
 - .1 NFPA 80 Standard for Fire Doors and Other Opening Protections.
 - .2 NFPA 252, Standard Methods of Fire Tests of Door Assemblies.
- .6 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - .2 CAN/ULC-S702, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
 - .3 CAN/ULC-S704, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
 - .4 CAN4-S104-M80, Standard Method for Fire Tests of Door Assemblies.
 - .5 CAN4-S105-M85, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.2 SYSTEM DESCRIPTION

- .1 Design Requirements:
 - .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35 degrees C to 35 degrees C.
 - .2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.
 - .3 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104, NFPA 252 for ratings specified or indicated.
 - .4 Provide fire labelled frames for openings requiring fire

protection ratings. Test products in conformance with CAN4-S104 or NFPA 252 and listed by nationally recognized agency having factory inspection services.

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Division 1.
- .2 Provide product data: in accordance with Division 1.
- .3 Provide shop drawings: in accordance with Division 1.
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the province of Ontario, Canada.
 - .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, arrangement of hardware, fire rating and finishes.
 - .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors, exposed fastenings and fire rating finishes.
 - .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Division 1.

PART 2 – PRODUCTS

2.1 MATERIALS

- .1 Hot dipped galvanized steel sheet: to ASTM A 653M, Commercial Quality, coating designation ZF75 (A25). Tension leveled with minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.
- .2 Reinforcement channel: to CAN/CSA-G40.20/G40.21, Type 44W, coating designation to ASTM A 653/A 653M, ZF75.
- .3 Cleanroom Flush Doors and Frames: Refer to Drawings for requirements. Basis of design is ACH Engineering cleanroom doors. Acceptable Manufacturers as follows:
 - .1 ACH Engineering Inc.: 647 406 5721
 - .2 Labworks International: 416 977-5477
 - .3 Mecart Inc.: 418 880-7000

2.2 DOOR CORE MATERIALS

- .1 Stiffened: face sheets welded, insulated core as indicated.
- .2 Fibreglass: to CAN/ULC-S702, semi-rigid, Type 2, density 24 kg/m³.
- .3 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250 degrees C at 30 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, or NFPA 252, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.

<u>2.3 ADHESIVES</u>	.1	Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.
	.2	Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.
<u>2.4 PRIMER</u>	.1	Touch-up prime CAN/CGSB-1.181.
<u>2.5 PAINT</u>	.1	Field paint steel doors and frames in accordance with Division 1. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.
<u>2.6 ACCESSORIES</u>	.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, factory attached.
	.6	Sealant: In accordance with Section 07 92 00.
	.7	Glazing: In accordance with Section 08 80 50.
	.8	Make provisions for glazing where indicated and provide necessary glazing stops. .1 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws.
<u>2.7 FRAMES FABRICATION GENERAL</u>	.1	Fabricate frames in accordance with CSDMA specifications.
	.2	Fabricate frames to profiles and maximum face sizes as indicated.
	.3	Exterior frames: 1.2 mm welded construction.
	.4	Interior frames: .1 1.2 mm welded construction. .2 1.6 mm welded construction for lead-lined frames.
	.5	Blank, reinforce, drill and tap frames for mortised, templated hardware, using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
	.6	Protect mortised cutouts with steel guard boxes.
	.7	Prepare frame for door silencers, 3 for single door, 2 at head for double door.
	.8	Manufacturer's nameplates on frames and screens are not permitted.

	.9	Conceal fastenings except where exposed fastenings are indicated.
	.10	Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
	.11	Insulate exterior frame components with polyurethane insulation.
<u>2.8 FRAME ANCHORAGE</u>	.1	Shim and anchor new doors in accordance with CAN/CSA A440.4.
	.2	Provide appropriate anchorage to floor and wall construction.
	.3	Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
	.4	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.
	.5	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.
<u>2.9 FRAMES: WELDED TYPE</u>	.1	Welding in accordance with CSA W59.
	.2	Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
	.3	Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.
	.4	Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
	.5	Securely attach floor anchors to inside of each jamb profile.
	.6	Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.
	.7	For lead-lined doors: securely attach lead to inside of frame profile from return to jamb soffit (inclusive) on door side of frame only.
<u>2.10 DOOR FABRICATION GENERAL</u>	.1	Doors: swing type, flush, with provision for glass and/or louvre openings where indicated.
	.2	Exterior doors: hollow steel construction. Interior doors: hollow steel construction. Interior lead-lined doors: honeycomb construction.
	.3	Fabricate doors with longitudinal edges welded or with lock-seam. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish. For lead-lined doors: fabricate with longitudinal edges mechanically interlocked, and seams visible.

- .4 Blank, reinforce, drill doors and tap for mortised, templated hardware.
- .5 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .6 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.
- .7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .8 Provide fire labeled doors for those openings requiring fire protection ratings, as scheduled. Test such products in conformance with CAN4-S104 and 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.
- .9 Locate manufacturer's nameplates on hinge side doors concealed from view.

2.11 HOLLOW STEEL CONSTRUCTION

- .1 Form face sheets for exterior doors from 1.6 mm sheet steel.
- .2 Form face sheets for interior doors from 1.2 sheet steel.
- .3 Reinforce doors with vertical stiffeners, securely welded to face sheets at 150 mm on centre maximum.
- .4 Fill voids between stiffeners of exterior doors with polystyrene core.
- .5 Fill voids between stiffeners of interior doors with fibreglass core.

2.12 THERMALLY BROKEN DOORS AND FRAMES

- .1 Fabricate thermally broken doors by using 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 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.

- | | | | | | | | | |
|---------------------------------|--|--|----|---------------------|----|-----------------------------|----|--|
| <u>3.2 INSTALLATION GENERAL</u> | .1 | Install labeled steel fire rated doors and frames to NFPA 80 except where specified otherwise. | | | | | | |
| | .2 | Install doors and frames to CSDMA Installation Guide. | | | | | | |
| <u>3.3 FRAME INSTALLATION</u> | .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 and vapour barriers. | | | | | | |
| <u>3.4 DOOR INSTALLATION</u> | .1 | Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00. | | | | | | |
| | .2 | Provide even margins between doors and jambs and doors and finished floor and thresholds as follows. <table border="0" style="margin-left: 20px;"><tr><td style="vertical-align: top;">.1</td><td>Hinge side: 1.0 mm.</td></tr><tr><td style="vertical-align: top;">.2</td><td>Latchside and head: 1.5 mm.</td></tr><tr><td style="vertical-align: top;">.3</td><td>Finished floor, top of finished floor and thresholds: 13 mm.</td></tr></table> | .1 | Hinge side: 1.0 mm. | .2 | Latchside and head: 1.5 mm. | .3 | Finished floor, top of finished floor and thresholds: 13 mm. |
| .1 | Hinge side: 1.0 mm. | | | | | | | |
| .2 | Latchside and head: 1.5 mm. | | | | | | | |
| .3 | Finished floor, top of finished floor and thresholds: 13 mm. | | | | | | | |
| | .3 | Adjust operable parts for correct function. | | | | | | |
| <u>3.5 FINISH REPAIRS</u> | .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. | | | | | | |

END OF SECTION

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-69.17, Bored and Preamsembled Locks and Latches.
 - .2 CAN/CGSB-69.18 /ANSI/BHMA A156.1, Butts and Hinges.
 - .3 CAN/CGSB-69.19/ANSI/BHMA A156.3, Exit Devices.
 - .4 CAN/CGSB-69.20/ANSI/BHMA A156.4, Door Controls (Closers).
 - .5 CAN/CGSB-69.21 /ANSI/BHMA A156.5, Auxiliary Locks and Associated Products.
 - .6 CAN/CGSB-69.22/ANSI/BHMA A156.6, Architectural Door Trim.
 - .7 CAN/CGSB-69.26/ANSI/BHMA A156.10, Power-operated Pedestrian Doors.
 - .8 CAN/CGSB-69.28 /ANSI/BHMA A156.12, Interconnected Locks and Latches.
 - .9 CAN/CGSB-69.29/ANSI/BHMA A156.13, Mortise Locks and Latches.
 - .10 CAN/CGSB-69.31/ANSI/BHMA A156.15, Closer/Holder Release Device.
 - .11 CAN/CGSB-69.32/ANSI/BHMA A156.16, Auxiliary Hardware.
 - .12 CAN/CGSB-69.34/ANSI/BHMA A156.18, Materials and Finishes.

1.2 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Division 1.
- .2 Samples:
 - .1 Submit samples in accordance with Division 1.
 - .2 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
 - .3 After approval samples will be returned for incorporation in the Work.
- .3 Hardware List:
 - .1 Submit contract hardware list in accordance with Division 1.
 - .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
- .4 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.
- .5 Closeout Submittals
 - .1 Provide operation and maintenance data for door closers,

locksets, door holders and fire exit hardware for incorporation into manual specified in Division 1.

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.
 - .4 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 Division 1.
 - .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 MAINTENANCE

- .1 Extra Materials:
 - .1 Provide maintenance materials in accordance with Division 1.
 - .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 Hardware as listed in Hardware Schedule.

2.2 DOOR HARDWARE

- .1 Locks and latches:
 - .1 Bored and preassembled locks and latches: to CAN/CGSB-69.17, grade 1, designed for function as stated in Hardware Schedule.
 - .2 Interconnected locks and latches: to CAN/CGSB-69.28. Refer to Hardware Schedule.
 - .3 Mortise locks and latches: to CAN/CGSB-69.29, series 1000 mortise lock, grade 1, designed for function and keyed as stated in Hardware Schedule.
 - .4 Knobs and Lever handles: refer to Hardware Schedule.
 - .5 Roses and Escutcheons: refer to Hardware Schedule.
 - .6 Normal strikes: box type, lip projection not beyond jamb.
 - .7 Cylinders: key into keying system as directed.
 - .8 Finish: refer to Hardware Schedule.

- .2 Butts and hinges:
 - .1 Butts and hinges: to CAN/CGSB-69.18, listed in Hardware Schedule.
- .3 Exit devices: to CAN/CGSB-69.19, grade 1, non-handed, single point rim latching device, ULC Fire and Panic listed. Stainless steel latch bolt.
 - .1 Auxiliary item: door co-coordinator, type 21, for pairs of doors with overlapping astragals.
- .4 Door Closers and Accessories:
 - .1 Door controls (closers): to CAN/CGSB-69.20, as indicated in Hardware Schedule, size in accordance with CAN/CGSB-69.20, table A1.
 - .2 Door co-ordinator: surface for pairs of doors with overlapping astragal.
- .5 Door Operators:
 - .1 Power-operated pedestrian doors: to CAN/CGSB-69.26.
 - .2 Power assist and low energy power operated doors: to CAN/CGSB-69.35.
- .6 Auxiliary locks and associated products: to CAN/CGSB-69.21, listed in Hardware Schedule.
 - .1 Cylinders: for installation in locking hardware listed in Hardware Schedule. Finish to match hardware. Key into keying system as directed.
- .7 Architectural door trim: to CAN/CGSB-69.22, listed in Hardware Schedule.
 - .1 Door protection plates: kick plate type, 1.27 mm thick stainless steel, size as indicated in Hardware Schedule.
 - .2 Push plates: 1.27 mm thick stainless steel size as indicated in Hardware Schedule.
 - .3 Push/Pull units: refer to Hardware Schedule.
- .8 Auxiliary hardware: to CAN/CGSB-69.32, listed in Hardware Schedule.
 - .1 Door stops, floor mounted.
 - .2 Flush bolts, surface mounted.
 - .3 Door silencer.
- .9 Door bottom seal: heavy duty, door seal of extruded aluminum frame and solid closed cell neoprene weather seal, recessed in door bottom, closed ends, clear anodized finish.
- .10 Weatherstripping:
 - .1 Head and jamb seal:
 - .1 Extruded aluminum frame and solid closed cell neoprene insert, clear anodized finish.
 - .2 Adhesive backed neoprene material.
 - .2 Door bottom seal:
 - .1 Extruded aluminum frame and closed cell neoprene sweep, clear anodized finish.
- .11 Astragal/Latch Guard: overlapping, extruded aluminum frame with vinyl insert, finished to match doors.

2.3 FASTENINGS

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

2.4 KEYING

- .1 Provide interchangeable construction cores for locking hardware. Contractor to provide and install permanent cores and coordinate keying to suit Owner's requirements.

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.
- .2 Where door stop contacts door pulls, mount stop to strike bottom of pull.
- .3 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .4 Remove construction cores when directed by Consultant. 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 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.

3.5 SCHEDULE

- .1 Refer to architectural drawings.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 Aluminum Association:
 - .1 Designation for Aluminum Finishes.
- .2 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C 36/C 36M, Specification for Gypsum Wallboard.
 - .2 ASTM C 79/C 79M, Standard Specification for Treated Core and Non-treated Core Gypsum Sheathing Board.
 - .3 ASTM C 442/C 442M, Specification for Gypsum Backing Board, Gypsum Coreboard, and Gypsum Shaftliner Board.
 - .4 ASTM C 475 Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .5 ASTM C 630/C 630M, Specification for Water-Resistant Gypsum Backing Board.
 - .6 ASTM C 840, Specification for Application and Finishing of Gypsum Board.
 - .7 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 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
 - .8 ASTM C 1002, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - .9 ASTM C 1047, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .10 ASTM C 1280, Specification for Application of Gypsum Sheathing Board.
 - .11 ASTM C 645-06a, Specification for Nonstructural Steel Framing Members.
 - .12 ASTM C 754-09a, Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .3 Association of the Wall and Ceilings Industries International (AWEI)
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .2 CAN/CGSB-71.25, Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.
 - .3 CAN/CGSB-1.40-97, Primer, Structural Steel, Oil Alkyd Type.
- .5 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102, Surface Burning Characteristics of Building Materials and Assemblies.

1.2 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.

<u>1.3 SITE ENVIRONMENTAL REQUIREMENTS</u>	.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.
<u>1.4 SUBMITTALS</u>	.1	Submit shop drawings in accordance with Division 1.
	.1	Show design, construction and relevant details of furring, enclosures and partitions which require fire ratings.
	.2	Provide engineered design of ULC systems for fire-resistance rated ceilings.
<u>PART 2 - PRODUCTS</u>		
<u>2.1 MATERIALS</u>	.1	Materials Required For Fire Rated Construction: Listed and labelled by ULC or other testing authority acceptable to authorities.
	.2	Volatile Organic Compound (VOC): Maximum VOC as tested to US EPA Method 24.
	.1	Sealants: 250 g/L.
	.2	Adhesives: 50 g/L.
	.3	Recycle Content: Minimum combined post-consumer and pre-consumer recycle content.
	.1	Gypsum Boards: 25%
	.2	Metal Members: 65%.
<u>2.2 METAL STUDS</u>	.1	Stud Framing For Full Height, Non-Load Bearing Interior Partitions: ASTM C645, roll formed from minimum 0.0179" (0.45 mm) thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 450 mm (18") centres.
	.2	Stud Framing For Non-Load Bearing Interior Partitions Unsupported At Top And For Partitions Where Abuse Resistant Gypsum Board Is Used: ASTM C645, roll formed from minimum 0.0179" (0.45 mm) thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 450 mm (18") centres.
	.3	Floor and ceiling tracks: to ASTM C645, in widths and flange depths to suit stud sizes.
	.4	Metal channel stiffener: 19 x 10 mm, 14 mm thick cold rolled steel, coated with rust inhibitive coating.
	.5	Shaftwall framing: 2-1/2" and 4" CH steel studs by Canadian Gypsum Company or USG Corporation.

<u>2.3 METAL FURRING</u>	.1	Furring Channels: galvanized sheet steel, minimum 0.63 mm (25 gauge, 0.020") thick screw channels, 41 mm x 22 mm (1-1/4" wide x 7/8" deep).
	.2	Main runner channels for horizontal application: 1.0 mm (20 gauge 0.034 inch) galvanized steel, 60 mm x 19 mm (2-3/8" wide x 3/4" deep.
	.3	Resilient furring channels: RC-1 manufactured by Canadian Gypsum Company or approved equal.
	.4	Tie wire: 1.6 mm (1/16") extra pliable, soft, annealed, galvanized wire of high strength.
<u>2.4 GYPSUM BOARD</u>	.1	Gypsum Board: ASTM C1396/C1396M, paper faced, regular and fire rated Type X core, 1200 mm (4'0") wide x maximum practical length, ends square cut, square edged base layer and taper edged face layer, thickness as indicated.
	.2	Shaft Wall Liner: ASTM C1396/C1396M, Dens-Glass Ultra Shaftliner by GP Gypsum Corporation.
<u>2.5 WATER</u>	.1	Fresh, clean, potable water, free from deleterious matter, acids or alkalis.
<u>2.6 CORNER BEADS AND TRIM</u>	.1	Corner beads: to ASTM C 1047, 0.63 mm (25 gauge) galvanized steel with perforated flanges; one piece length per location.
	.2	Casing beads: 200 Series by Canadian Gypsum Company for filling with compound.
<u>2.7 JOINT TREATMENT</u>	.1	Joint tape: 50 mm (2 inch) wide 10 x 10 glass mesh.
	.2	Joint compound: ASTM C475 asbestos-free. Where moisture resistant gypsum board or tile backing board is used: use suitable Tough Rock Joint Compounds by G-P Gypsum Corporation.
	.3	Joint compound and tape shall be by the same manufacturer as gypsum board.
<u>2.8 DRYWALL FASTENERS</u>	.1	Screws: 32 mm (1 1/4 inch) type W, bugle head to ASTM C1002.
	.2	Stud adhesive: to CAN/CGSB/-71.25-M88.
	.3	Laminating compound: to CAN/CSA A82.31-M91, asbestos-free.
<u>2.9 ACOUSTIC INSULATION</u>	.1	Acoustic Insulation: Roxul AFB mineral fibre batt insulation or Thermafire Sound Attenuation Fire Blankets by Canadian Gypsum Company, thickness as shown on drawings required to obtain required S.T.C. rating.
<u>2.10 ACOUSTICAL SEALANT</u>	.1	Purpose made, non skinning, non-hardening type.
<u>2.11 ISOLATION STRIP</u>	.1	Isolation strip: moisture resistant, 3 mm (1/8 inch) thick closed cell neoprene sponge strip, self adhesive sticking permanent adhesive on one face, lengths as required.

2.12 FIRE STOPPING .1 Fire Stop Sealant: refer to Section 07 84 00 Fire Stopping.

PART 3 - EXECUTION

3.1 EXAMINATION .1 Examine the Work of other Sections that is to receive the Work of this Section and report defects. Proceed only when conditions are satisfactory.

.2 Do not install gypsum board systems over mechanical or electrical Work that requires inspection and approval until such inspection has been made and the Work approved by the Consultant. Ensure that insulation, if required, has been completed to pipes and other items.

3.2 INSTALLATION - GENERAL .1 Do application and finishing of gypsum board in accordance with ASTM C 840 and manufacturer's recommendations except where specified otherwise.

.2 Do application of gypsum sheathing in accordance with ASTM C 1280.

.3 Install access doors supplied by respective Sections.

.4 Coordinate Work of this Section with the trades installing equipment above or in the suspended ceiling areas so as to produce a layout of hangers, carrying channels and furring channels suitable to accommodate fittings and units of equipment in a proper manner. This shall apply especially to flush mounted lighting fixtures, diffusers and similar items.

.5 Install work level to tolerance of 1:1200.

3.3 STEEL STUD PARTITIONS .1 Provide partition tracks at floor and underside of deck, align accurately; lay out according to partition layout. Secure floor tracks at 600 mm o.c. maximum with hardened masonry nails or non-ferrous, metallic expansion sleeves and screws at concrete and masonry.

.2 Unless otherwise indicated, place studs vertically at 400 mm o.c. and 300 mm for cement backer board, not more than 50 mm from abutting walls, openings and each side of corners. Install studs in tracks at floor and ceiling. Provide freedom for deflection under beams and structural slabs to avoid transmission of structural loads to studs or install 50 mm leg ceiling tracks.

.3 Where horizontal runs of service lines are scheduled to be installed, arrange with applicable trades and install studs simultaneously. Ensure web openings are aligned.

.4 Permanently attach studs for cornice height partitions to top and bottom track. Make moment resisting connections and reinforce to resist lateral thrusts.

.5 At openings in stud walls, erect track at head and sills to accommodate intermediate studs. At each end of track, cut out flanges, turn web and screw to studs. Install intermediate studs above and below openings in same manner and spacing as wall studs.

.6 Provide two studs extending from floor to ceiling at each side of

- openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
- .7 Erect track at head of door/screen openings and sills of screen openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.
 - .8 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
 - .9 Provide necessary blocking and additional framing components between studs at area of partitions requiring additional reinforcement in order that objects and brackets exerting up to 23 kg. per stud may be supported. Follow manufacturer's instructions and details for such reinforcing.
 - .10 Install steel studs or furring channel between studs for attaching electrical and other boxes.
 - .11 Extend partitions full height to underside of structure except where noted otherwise on drawings. Extend fire rated partitions to underside of fire rated assembly above.
 - .12 Stiffen all partitions and walls with one (1) 19 mm bracing channel extending horizontally across length of each partition or wall, located at 1200 mm o.c. of studs up to 2400 mm in height, two (2) rows equally spaced for studs over 2400 mm in height. Provide solid backing at all horizontal wallboard joints.
 - .13 Where gypsum board forms part of the air barrier system - extend gypsum board to underside of structure.
 - .14 Extend sound control partitions to the structure above.
 - .15 Install two continuous beads of acoustical sealant under studs and tracks around perimeter of sound control partitions.
 - .16 At duct openings and structural member locations in non-fire rated separations, pack space between framing members and ducts or structural members with wool packing insulation and seal with sealant. Install firestop and smoke seals in fire rated separations.
 - .17 Install dampproof course under stud shoe tracks of partitions on slabs on grade.
 - .18 Install continuous insulating strips to isolate studs from uninsulated surfaces.
 - .19 Where partitions extend above ceilings, provide lateral bracing in both directions to structure above.
 - .20 Provide framing for air plenums and fire rated duct enclosures shown on mechanical drawings.

<u>3.4 BLOCKING</u>	.1	Install blocking for cabinet, handrail, and shelving attachment. Centre blocking on mounting height of anchors.
	.2	Install double stud framing where blocking to be installed. Studs to be full height, back to back. Attach studs with sheet metal screws at 400 mm o.c.
	.3	Secure blocking with galvanized sheet screws, minimum 2 screws to each stud.
<u>3.5 RESILIENT CHANNEL INSTALLATION</u>	.1	Erect resilient furring transversely across studs, spaced maximum 400 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.
<u>3.6 BULKHEADS</u>	.1	Construct suspended bulkhead framing of studs, hanger wires, braces and other components required to support all loads the building will be exposed to. Locate hanger wires to minimize the effect of deflection of the structural components.
<u>3.7 CHASE WALLS</u>	.1	Construct chase walls where indicated consisting of two parallel steel stud partitions of 64 mm size. Comply with requirements specified for steel stud partitions.
	.2	Provide cross bracing consisting of 13 mm gypsum board, 300 mm deep, at quarter points, on each pair of studs. Attach cross bracing to studs with 3 drywall screws. Coordinate construction of partitions to suit installation of services.
	.3	Bracing with 64 mm metal studs may be used in place of gypsum panels. Anchor web at each end of metal brace to stud web with two 9.5 mm pan head screws. When chase wall studs are not opposite, install metal stud cross braces 400 mm o.c. horizontally and securely anchor each end to a continuous horizontal 64 mm runner screw-attached to chase wall studs with the cavity.
	.4	Adapt cross bracing as necessary to avoid interference with services.
<u>3.8 WALL FURRING</u>	.1	Install wall furring for gypsum board wall finishes in accordance with CAN/CSA A82.31-M91, except where specified otherwise.
	.2	Frame openings around built-in equipment, cabinets, and access panels. Extend furring into reveals. Check clearances with equipment suppliers.
	.3	Furr duct shafts, beams, columns, pipes and exposed services where indicated and in finished rooms.
<u>3.9 FURRING FOR GYPSUM BOARD CEILINGS</u>	.1	For concealed grid supporting gypsum board ceilings, main runners shall be suspended as specified in CAN/CSA-A82-.31-M91. Cross furring shall consist of approved sections of U-channels, spaces at 300 mm centres and clipped to the main runners in an approved manner.
	.2	Arrange hangers for suspended wallboard ceilings to support grillage independently of walls, columns, pipes, ducts.

- .3 Space hangers at 1200 mm maximum along runner channels and not more than 150 mm from ends.
- .4 Hangers shall be straight, of length required to assure secure anchorage and correct finished ceiling heights. Hangers shall have a 90 degree bend at the lower end to engage the runner channels.
- .5 Secure hangers to structure. Hangers shall not be secured to pipes, ducts or any electrical or mechanical items.
- .6 Space runner channels at 1200 mm maximum and not more than 150 mm from boundary walls, interruptions of continuity and changes in direction. Run channels transversely to structural framing members.
- .7 Runner channel splices shall have 300 mm lap and shall be wire tied at each end with a double strand of tie wire. Do not cluster or line up splices.
- .8 Frame around fixtures, grilles and other openings. Where ducts, or where a combination of ducts and other items interfere so that hanger spacing exceeds 1200 mm increase the size of the main runners and hanger wire accordingly, to sustain increased loading and span. Provide additional hangers as required to support the weight of lighting fixtures, diffusers, grilles and other built-in items occurring in ceilings.
- .9 Attach runner channels to rod hangers by bending hanger sharply under bottom flange of runner and securely wiring in place with saddle tie.
- .10 Provide 25 mm clearance between channels and abutting walls and partitions.
- .11 Erect furring channels transversely across runner channels at 600 mm o.c. maximum, 300 mm o.c. at fire rated assemblies and at soffits carrying insulation, at not more than 150 mm from boundary walls, openings interruptions in ceiling continuity and changes in direction.
- .12 Secure furring channels to each support with purpose made clips or wire tie. Splice joints by lapping channels 200 mm and tying together.
- .13 Level cross furring.

3.10 INSTALLATION OF METAL DOOR FRAMES

- .1 Provide door buck stud at all door jambs and at each side of openings in steel stud partitions where openings exceed 450 mm.
- .2 Erect a second standard stud at each jamb on side of opening 50 mm from buck studs.
- .3 Secure buck stud and second stud.
- .4 Extend studs full height.
- .5 Receive metal door frames from work of Section 08 11 00 and set plumb, true and square, maintaining uniform door rebate, widths and heights. Use standard hanger clipped or attached to steel studs at 3 per jamb to 2235 mm in height.

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|--|---|--|----|--|----|---|
| | .6 | Screw door frame anchor clips to door buck studs, header and/or all members to prevent movement of stud or frame relative to each other. | | | | |
| | .7 | Fasten frames to floor with at least two (2) screws and expansion shields spaced at least 75 mm apart, through each floor anchor clip provided on the frame. | | | | |
| | .8 | Set frames plumb and square to a tolerance of 1.6 mm out of plumb measured on face of frame and 3.2 mm twist corner to corner measured diagonally. | | | | |
| 3.11 CONSTRUCTION OF
SOUND ATTENUATED
PARTITIONS | .1 | Install acoustic insulation batts in partitions full height, secure to one side with staples 450 mm o.c. along edges and at quarter points along centre line. | | | | |
| | .2 | In fire rated separations, attach to gypsum board with self-stick pin to support batt and prevent sagging, as required in the tested assembly. | | | | |
| | .3 | Apply 12 mm continuous bead of acoustical sealant around perimeter of wall at web of top and bottom tracks and end studs. Lay gypsum board into position forcing caulking bead to fill space between gypsum board and structure. | | | | |
| | .4 | Install 150 mm continuous strip of 12.7 mm gypsum board along base of partition where resilient furring installed. | | | | |
| | .5 | Seal full perimeter for cut-outs around electrical boxes, pipes and ducts and perimeter convactor pipes with acoustical sealant. | | | | |
| | .6 | Apply Durabond 90 around electrical boxes in acoustically rated partitions. | | | | |
| | .7 | Adhere sound absorbing panels to substrate with adhesive as recommended by manufacturer. | | | | |
| 3.12 SHAFT WALL | .1 | Install J-floor track and ceiling runners. | | | | |
| | .2 | Install liner panels between C-H studs at 600 mm o.c. | | | | |
| | .3 | Install double layer of gypsum wallboard on outside face of studs. | | | | |
| | .4 | Construct shaft wall in accordance with ULC requirements for ratings shown on Drawings and Schedules. | | | | |
| | .5 | Allow for movement of structure, so that the partition will not have load imposed. | | | | |
| 3.13 GYPSUM BOARD
APPLICATION | .1 | Take all measurements accurately. Cut boards by scoring the face paper, snapping the core of the board and then cutting the back paper. Smooth the cut edges. | | | | |
| | .2 | Single-layer application: <table border="0"> <tr> <td>.1</td> <td>Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C840.</td> </tr> <tr> <td>.2</td> <td>Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.</td> </tr> </table> | .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. |
| .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. | | | | | |

- .3 Stagger vertical joints over different studs on opposite sides of wall.
- .3 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.
- .4 Apply gypsum board to concrete and concrete block surfaces, where indicated, using laminating adhesive.
 - .1 Comply with gypsum board manufacturer's recommendations.
 - .2 Brace or fasten gypsum board until fastening adhesive has set.
 - .3 Mechanically fasten gypsum board at top and bottom of each sheet.
- .5 Minimize end joints. Joints shall not align with edge of wall openings.
- .6 Where cutting and patching is being done to accommodate modifications, fill openings in partitions as required. Restore fire resistance rating of existing assemblies.
- .7 Patch and fill to ensure smooth, undetectable transition between new and existing Work. Fill openings including above ceilings, around frames, openings created by removal of doors, frames, fixtures, equipment, openings created to accommodate partitions, openings used for access and other such areas.
- .8 Apply gypsum board to metal or furring framing using screw fasteners.
- .9 Apply fire stop sealant at the junction of all fire rated gypsum board partitions and all non-rated fire separations with the underside of the structure.
- .10 All services passing through fire separations to be tightly fitted and firestopped with Type F fire rated system as per test method CAN 4-S115M.
- .11 Clad framing for air plenums to prevent air leakage to adjoining spaces.
- .12 Apply moisture resistant gypsum board where indicated and at locations which may experience water damage such as adjacent to plumbing fixtures. Apply water-resistant sealant to edges, ends, cut-outs and penetrations that expose gypsum core and to fastener heads. Apply joint treatment.
- .13 Provide tile backing board in accordance with manufacturer's specifications as substrate for all ceramic wall tile.

-
- | | | |
|---|-----|--|
| | .14 | Provide cement board in accordance with manufacturer's specifications as substrate at all tub and shower surrounds. |
| | .15 | Construct duct enclosure as shown on mechanical drawings and/or as requested by jurisdictional authorities. |
| | .16 | Apply membranes and sealants to assure that where the gypsum board cladding is used as an air barrier, it will be properly joined to and sealed at the adjoining building components and designed and/or suitable to perform as air barriers. |
| 3.14 CORNER BEADS AND TRIM 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 o.c. in each flange. Stagger fasteners in each flange. |
| | .2 | Apply corner beads to all external vertical and horizontal corners and edges. |
| | .3 | Install casing bead where gypsum board butts against surfaces having no trim concealing junction and where indicated. |
| | .4 | Install isolation strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break. |
| 3.15 ACCESS DOOR AND PANEL INSTALLATION | .1 | Install access doors to electrical and mechanical fixtures as indicated in Mechanical and Electrical Documents. Supply of access panels for mechanical and electrical shall be by respective trades. |
| | .2 | Install units plumb square, straight and level, provide rigid and secure installation in accordance with manufacturer's instructions. Provide anchorage to adjacent construction and concealed fasteners. |
| | .3 | Each access panel shall be installed to provide complete access to equipment for maintenance and servicing. |
| | .4 | Rigidly secure frames to furring or framing systems. |
| 3.16 CONTROL JOINTS INSTALLATION | .1 | Construct control joints of two back-to-back casing beads set in gypsum board facing and supported independently and continuously on both sides of joint. |
| | .2 | Where application is on studs, provide double studs at control and expansion joints, place one stud on each side of joint. Terminate runners at each side of joint. |
| | .3 | Provide continuous polyethylene dust barrier behind and across control joints. |
| | .4 | Install control joints straight and true. |
| | .5 | Locate control joints where indicated, at changes in substrate construction, at approximate 10 m spacing in wall runs, at approximate 15 m spacing on interior ceilings, and in accordance with CSA A82.31, |

Appendix B.

3.17 TAPING AND FILLING

- .1 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. Levels of finish:
- .1 Level 0: No taping, finishing or accessories required. Applies to temporary construction.
- .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. Applies to dust proof hoardings, plenum areas above ceiling, concealed pipe chases.
- .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 gypsum board to receive tile finish.
- .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. Applies to unfinished areas.
- .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. Applies to mechanical rooms.
- .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. Applies to all areas not identified above.
- .2 Finish corner beads and trim as required with two coats of joint compound and one coat of finishing compound, feathered out onto panel faces.
- .3 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.
- .4 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .5 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

3.18 CLEANING

- .1 Repair defective work.
- .2 Protect and clean glass and aluminum during progress of work.
- .3 Clean and remove excess material from other finished surfaces.

END OF SECTION

PART 1 - GENERAL

1.1 NOT USED

1.2 REFERENCES

- .1 Architectural Painting Specification Manual, Canadian Paint and Contractors Association (CPCA).
- .2 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 Master Painters Institute (MPI)
 - .1 MPI Architectural Painting Specifications Manual.
- .4 CAN/CGSB-85.100 Painting.

1.3 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Contractor: minimum of five years proven satisfactory experience. Provide qualified crew of painters and full time review of work by qualified supervisor for the duration of the work.
 - .2 Conform to the latest OPCA requirements for interior painting work including surface preparation, priming and finishing.
- .2 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Division 1.

1.4 SCHEDULING

- .1 Submit work schedule for various stages of painting to Consultant for review. Submit schedule minimum of 48 hours in advance of proposed operations.
- .2 Obtain written authorization from Consultant for changes in work schedule.
- .3 Schedule painting operations to prevent disruption of occupants and operation of machinery.

1.5 SUBMITTALS

- .1 Submittals in accordance with Division 1.
- .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 Division 1. Indicate VOCs during application and curing.
- .3 Samples:
 - .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 submitted on the following substrate materials:
 - .1 3 mm plate steel for finishes over metal surfaces.
 - .2 50 mm concrete block for finishes over concrete

or concrete masonry surfaces.

.3 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.

.2 When approved, samples shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.

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

.5 Closeout Submittals: submit maintenance data for incorporation into manual specified in Division 1 include following:

.1 Product name, type and use.

.2 Manufacturer's product number.

.3 Colour numbers.

.4 MPI Environmentally Friendly classification system rating.

1.6 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 Division 1.

.2 Quantity: provide one sealed, 4 litre can of each type and colour of primer 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's requirements for delivery and storage of extra materials.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials as follows:

.1 Deliver and store materials in original containers, sealed, with labels intact.

.2 Labels: to indicate:

.1 Manufacturer's name and address.

.2 Type of paint or coating.

.3 Compliance with applicable standard.

.4 Colour number in accordance with established colour schedule.

.3 Remove damaged, opened and rejected materials from site.

.4 Provide and maintain dry, temperature controlled, secure storage.

.5 Observe manufacturer's recommendations for storage and handling.

.6 Store materials and supplies away from heat generating devices.

.7 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.

.8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.9 Keep areas used for storage, cleaning and preparation, clean and orderly. After completion of operations, return areas to clean condition.

.10 Remove paint materials from storage only in quantities required for same day use.

.11 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling

storage, and disposal of hazardous materials.

.12 Fire Safety Requirements:

- .1 Provide one 9 kg Type ABC fire extinguisher adjacent to storage area.
- .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
- .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.8 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 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 Unless pre-approved written approval by Paint Inspection Agency Authority and product manufacturer, perform no painting when:
 - .1 Ambient air and substrate temperatures are below 10 degrees C.
 - .2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
 - .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
 - .4 The relative humidity exceeds 85% or when the dew point is more than 3 degrees C variance between the air/surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
 - .5 Rain or snow are forecast to occur before exterior paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
 - .6 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.
- .2 Perform painting work when maximum moisture content of the substrate is below:
 - .1 Allow new concrete and masonry to cure minimum of 28 days.
 - .2 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.

- .3 Surface and Environmental Conditions:
 - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
 - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
 - .3 Apply paint when previous coat of paint is dry or adequately cured.
- .4 Additional interior application requirements:
 - .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Provide paint materials for paint systems from single manufacturer.
- .3 Conform to latest MPI requirements for interior painting work including preparation and priming.

2.2 COLOURS

- .1 Colours as indicated on finish schedule.
- .2 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from Consultant for on-site 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.
- .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 Level Category/	Units @ 60 Degrees/	Units @ 85 Degrees/
(1) Flat 'Matte'	0 - 5	Max. 10
(2) Flat 'Velvet'	5 - 10	10 - 35
(3) Eggshell	10 - 25	10 - 35
(4) Satin	20 - 35	Min. 35
(5) Semi-gloss	35 to 70	
(6) Gloss	70 to 85	
(7) High Glass	More than 85	

- .2 Gloss level ratings of painted surfaces as indicated and as noted on Finish Schedule.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 GENERAL

- .1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.3 EXAMINATION

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Consultant damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
.1 Stucco, plaster and gypsum board: 12%.
.2 Concrete and Concrete Block: 12%.
- .4 Inspect gypsum board to ensure joints are completely filled and sanded smooth. Inspect surfaces for "nail popping," screw heads not recessed and taped, breaks in surface or other imperfections and have repaired as required.

3.4 PREPARATION

- .1 Protection:
.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Consultant.
.2 Protect items that are permanently attached such as Fire Labels on doors and frames.
.3 Protect factory finished products and equipment.
.4 Protect 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. Signs to approval of Consultant.
- .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
 - .1 Remove dust, dirt, and other surface debris by vacuuming or wiping with dry, clean cloths.
 - .2 Wash surfaces with a 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.
- .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 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.
- .6 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes or vacuum cleaning.
- .7 Touch up of shop primers with primer as specified.
- .8 Do not apply paint until prepared surfaces have been accepted by Consultant.

3.5 APPLICATION

- .1 Method of application to be as approved by Consultant. Apply paint by brush, roller or air sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
 - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not

accessible to roller using brush, daubers or sheepskins.

.4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.

.5 Remove runs, sags and brush marks from finished work and repaint.

.3 Spray application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

.2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.

.3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.

.4 Brush out immediately all runs and sags.

.5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.

.4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.

.5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.7 Sand and dust between coats to remove visible defects.

.8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.

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 Do not paint over nameplates.

.3 Keep sprinkler heads free of paint.

.4 Paint fire protection piping red.

.5 Paint disconnect switches for fire alarm system and exit light systems in red enamel.

.6 Paint natural gas piping yellow.

3.7 SITE TOLERANCES AND QUALITY CONTROL

.1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.

.2 Ceilings and 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.

3.8 RESTORATION

- .1 Clean and re-install hardware items removed before undertaking painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of Consultant.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

END OF SECTION

PART 1 - GENERAL

- | | | |
|---------------------------------------|----|--|
| <u>1.1 PRODUCT DATA SHEETS</u> | .1 | Submit product data sheets in accordance with Division 1. |
| <u>1.2 WHMIS</u> | .1 | Submit two copies of MSDS - Material Safety Data Sheets to Departmental Representative. |
| | .2 | Indicate VOC's during application and curing. Refer to Floor Coating VOC limits indicated below. |
| | .3 | Enforce use of personal protective equipment required by MSDS. |
| <u>1.3 SAMPLES</u> | .1 | Submit samples in accordance with Division 1. |
| | .2 | Submit duplicate 400 x 200 mm (8 inch x 12 inch) samples of each colour and finish coating applied to concrete board. |
| <u>1.4 QUALIFICATIONS</u> | .1 | Applied by applicator trained and licensed by epoxy material manufacturer for application of its products. |
| | .2 | Manufacturer's representative:
.1 Inspect substrate prior to commencement of work, during application of materials and upon completion of work.
.2 Provide technical assistance to the applicator and assist where required in correct installation of crack isolation membrane, expansion joint filler, grout, floor base coat mortar and floor top coat sealer. |
| <u>1.4 MOCK-UP</u> | .1 | Apply materials of each finish to approximately 10 m ² (100 sq ft) area of surface to be treated. |
| | .2 | Allow 24 h for review of mock-up by Consultant before proceeding with coating work. |
| | .3 | Do not proceed until mock-up has been inspected and accepted by Consultant. |
| | .4 | Reviewed and accepted mock-up shall become part of installed work. |
| <u>1.5 ENVIRONMENTAL REQUIREMENTS</u> | .1 | Do not apply epoxy systems unless uniform minimum 16°C air temperature at installation area for 24 hours prior to and after application. |
| | .2 | Provide adequate ventilation or isolation measures to protect against toxic fumes.
.1 Ventilate area 24 hours per day, during installation and for 7 days after installation is completed with minimum 30% outside air.
.2 Ventilate at a rate sufficient to produce a negative pressure in the work area and exhaust direct to the outside of the building. Do not reticulate contaminants within the building. |
| | .3 | Comply with owner requirements for ventilation to ensure |

continuous safe operation with adjacent areas.

1.6 MAINTENANCE
DATA

- .1 Provide maintenance data for coatings for incorporation into manual specified in Division 1.

PART 2 - PRODUCTS

Acceptable Manufacturers: Sika Canada, PPG Industries Inc., Stonhard.

2.1 MATERIALS

- .1 Ensure compatibility for all epoxy materials including primers, resins, hardening agents, finish coats and sealer coats.
- .2 All epoxy materials from same manufacturer.

2.2 FLOOR SYSTEM
STANDARD EPOXY

- .1 **Finish Type EP-1 Product:** Chemical Resistant Epoxy Coating Floor System:
 1. Sikafloor FastflorCR, low odour, low VOC, neat/broadcast floor coating system. Slip resistant finish. Installed system thickness: minimum 3mm (1/8"). Extend floor coating up walls to 4" height. Building up corner to provide cove and orange peel finish. Provide samples for colour and slip resistance selections.
 .2 Sikafloor 265 Waterproof Epoxy Membrane with primer as recommended by manufacturer. Sikafloor 265 has been designed for slab-on-grade and suspended concrete substrates.

PART 3 – EXECUTION

3.1 PREPARATION OF
SURFACES

- .1 Prepare surfaces in accordance with manufacturer's instructions.
- .2 Remove all dust, laitance, oil, dirt, grease, curing compounds, bond inhibiting impregnations, waxes and other contaminants as recommended by epoxy manufacturer's representative. All projections, rough spots etc. to be ground off to achieve a level surface prior to applying the epoxy system. Repair surface defects with compatible repair material before beginning installation.
- .3 Mask surrounding surfaces to provide neat, clean juncture lines.
- .4 Protect adjacent surfaces and equipment from damage by overspray.
- .5 Complete work penetrating substrate before installing coating.

3.2 PREPARATION OF
FLOORS

- .1 Prepare existing floor surfaces as recommended by manufacturer.

3.3 FLOOR SYSTEM
APPLICATION

- .1 Mix in accordance with material manufacturer's instructions.
- .2 Apply primer to in accordance with manufacturer's written instructions.
- .3 Pre-mix each component as per manufacturer's instructions.
- .4 Apply materials in accordance with the manufacturers' instructions for a three-coat application, consisting of a prime coat of Sikafloor® Fastflor CR^{CA} at (8 mils), a neat resin coat at 45 mils / broadcast to rejection with selected sand and a topcoat of Sikafloor® Fastflor

CR^{CA} at (10-20 mils). With slip resistant texture to be selected by the project consultant. Minimum thickness 3mm (1/8").

- .5 During application check the wet film thickness of the materials in compliance with ASTM D 4414-84 test method "Measurement of Wet Film Thickness by Notch Gages".
- .6 Finished work shall match approved samples, be uniform in thickness, sheen, colour, and texture. The finished surface must be free from defects detrimental to appearance or performance of the product.
- .7 Provide adequate temporary protection until flooring is fully cured.
- .8 Co-ordinate with room finish schedule.

3.4 CLEANING

- .1 Remove masking and covering used to protect adjacent surfaces.
- .2 Remove remaining materials and debris from job site and dispose of them in accordance with local rules and regulations. Leave area in clean condition.

3.5 PROTECTION

- .1 Protect completed floor from damage by trade traffic by suitable means as required.
- .2 Protect completed work from contact with water until cured, approximately twenty-four hours at 20°C (68°F).
- .3 Protect completed flooring from chemical exposure until fully cured, approximately seven days at 20°C (68°F).

3.6 TESTING

- .1 Perform two pull-off strength adhesion tests per floor area.
- .2 Do pull-off strength adhesion tests in accordance with ASTM D 4541.
- .3 Patch floors where pull-off strength adhesion tests are performed. Patch shall not be visible when viewed 600 mm (2 ft) above finished floor.

END OF SECTION