

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- .1 All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.

1.2 SUMMARY

- .1 The work of this section includes, but is not limited to, the following:
 - .1 Rubberized asphalt sheet membrane waterproofing system
 - .2 Prefabricated drainage composite protection board
- .2 Related Sections: Other specification sections which directly relate to the work of this section include, but are not limited to, the following:
 - .1 Section 02223 – Excavating, trenching and backfill (interior)
 - .2 Section 03300 – Cast-In-Place Concrete

1.3 REFERENCE STANDARDS

- .1 The following standards and publications are applicable to the extent referenced in the text.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM D 41-[94(2002)e1], Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
 - .2 ASTM D 6164-[00], Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

1.4 SUBMITTALS

- .1 Product Data: Submit manufacturer's product data, installation instructions, use limitations and recommendations. Include certification of data indicating VOC (Volatile Organic Compound) content of all components of waterproofing system.
- .2 Samples: Submit representative samples of the following for approval:
 - .1 Sheet membrane
 - .2 Prefabricated drainage composite protection board

1.5 QUALITY ASSURANCE

- .1 **Manufacturer:** Sheet membrane waterproofing system shall be manufactured and marketed by a firm with a minimum of 20 years experience in the production and sales of torch applied sheet membrane waterproofing. Manufacturers proposed for use but not named in these specifications shall submit evidence of ability to meet all requirements specified, and include a list of projects of similar design and complexity completed within the past 5 years.
- .2 **Installer:** A firm which has at least 3 years experience in work of the type required by this section.
- .3 **Materials:** For each type of material required for the work of this section, provide primary materials which are the products of one manufacturer.
- .4 **Pre-Installation Conference:** A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Agenda for meeting shall include review of special details and flashing.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials and products in labeled packages. Store and handle in strict compliance with manufacturer's instructions, recommendations and material safety data sheets. Protect from damage from sunlight, weather, excessive temperatures and construction operations. Remove damaged material from the site and dispose of in accordance with applicable regulations.
 - .1 Do not double-stack pallets of membrane on the job site. Provide cover on top and all sides, allowing for adequate ventilation.
 - .2 Protect mastic and adhesive from moisture and potential sources of ignition.
 - .3 Store drainage composite or protection board flat and off the ground. Provide cover on top and all sides.
 - .4 Protect surface conditioner from freezing.
- .2 Sequence deliveries to avoid delays, but minimize on-site storage.

1.7 PROJECT CONDITIONS

- .1 Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials and products used.
- .2 Proceed with installation only when substrate construction and preparation work is complete and in condition to receive sheet membrane waterproofing.

1.8 WARRANTY

- .1 **Sheet Membrane Waterproofing:** Provide written 5 year material warranty issued by the membrane manufacturer upon completion of the work.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Membrane Waterproofing System: SBS-modified bitumen sheet, supplied in rolls 1 m wide, for torch installation, minimum 3.8 mm thick, minimum 250 g/m² non-woven polyester reinforcement, meeting CGSB 37-GP-56-M Classification Type 1, Class A, Grade 2.

.1 Acceptable Product:

- Sopralene FLAM 180
- Bituthene System 4000 Membrane

.2 Sheet Membrane Waterproofing to;

.2 Physical Properties:

Property	Test Method	Typical Value
Color		Dark gray-black
Thickness	ASTM D 3767 Method A	1.5 mm (0.060 in.) nominal
Flexibility, 180° bend over 25 mm (1 in.) mandrel at -43°C (-45°F)	ASTM D 1970	Unaffected
Tensile Strength, Membrane Die C	ASTM D 412 Modified ¹	2240 kPa (325 lbs/in. ²) minimum
Tensile Strength, Film	ASTM D 882 Modified ¹	34.5 MPa (5,000 lbs/in. ²) minimum
Elongation, Ultimate Failure of Rubberized Asphalt	ASTM D 412 Modified ¹	300% minimum
Crack Cycling at -32°C (-25°F), 100 Cycles	ASTM C 836	Unaffected
Lap Adhesion at Minimum Application Temperature	ASTM D 1876 Modified ²	880 N/m (5 lbs/in.)
Peel Strength	ASTM D 903 Modified ³	1576 N/m (9 lbs/in.)
Puncture Resistance, Membrane	ASTM E 154	222 N (50 lbs) minimum
Resistance to Hydrostatic Head	ASTM D 5385	70 m (231 ft) of water
Permeance	ASTM E 96, Section 12 – Water Method	2.9 ng/m ² sPa (0.05 perms) maximum
Water Absorption	ASTM D 570	0.1% maximum

Footnotes:

1. The test is run at a rate of 50 mm (2 in.) per minute.
2. The test is conducted 15 minutes after the lap is formed and run at a rate of 50 mm (2 in.) per minute at -4°C (25°F).
3. The 180° peel strength is run at a rate of 300 mm (12 in.) per minute.

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- .3 Asphalt Primer: Acceptable Product - Elastocol 500 by Soprema
 - .4 Prefabricated drainage composite protection board:
 - .1 Prefabricated Drainage Composite Hydroduct 220 by Grace Construction Products. Drainage Composite shall be designed to promote positive drainage while serving as a protection course.
 - .5 Miscellaneous Materials: Surface conditioner, mastic, liquid membrane, tape and accessories specified or acceptable to manufacturer of sheet membrane waterproofing.

PART 3 EXECUTION

3.1 LOCATION

- .1 Foundation wall in areas where new floor slab is below finish grade elevations and as indicated on drawings.

3.2 EXAMINATION

- .1 The installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify the contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.

3.3 PREPARATION OF SUBSTRATES

- .1 Refer to manufacturer's literature for requirements for preparation of substrates. Surfaces shall be structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods which are acceptable to manufacturer of sheet membrane waterproofing.
- .2 Cast-In-Place Concrete Substrates:
 - .1 Do not proceed with installation until concrete has properly cured and dried
 - .2 Fill form tie rod holes with concrete and finish flush with surrounding surface.
 - .3 Repair bugholes over 13 mm (0.5 in.) in length and 6 mm (0.25 in.) deep and finish flush with surrounding surface.
 - .4 Grind irregular construction joints to suitable flush surface.
- .3 Related Materials: Treat joints and install flashing as recommended by waterproofing manufacturer.

3.4 INSTALLATION

- .1 Refer to manufacturer's literature for recommendations on installation, including but not limited to, the following:
 - .1 Apply surface conditioner at rate recommended by manufacturer. Recoat areas not waterproofed if contaminated by dust. Mask and protect adjoining exposed finish surfaces to protect those surfaces from excessive application of surface conditioner.
 - .2 Delay application of membrane until surface conditioner is completely dry. Dry time will vary with weather conditions.
 - .3 Seal daily terminations with troweled bead of mastic.
 - .4 Apply Hydroduct Composite protection board and related materials in accordance with manufacturer's recommendations.

3.5 CLEANING AND PROTECTION

- .1 Remove any masking materials after installation. Clean any stains on materials which would be exposed in the completed work.
- .2 Protect completed membrane waterproofing from subsequent construction activities as recommended by manufacturer.

END OF SECTION

PART 1 GENERAL

1.1 RELATED WORK

- .1 Underslab Dampproofing (Cast-in-Place Concrete) Section 03300
- .2 Board Insulation Section 07212
- .3 Fire Stopping and Smoke Seals Section 07270
- .4 Modified Bituminous Roofing (Conventional) Section 07525
- .5 Sealants Section 07900
- .6 Aluminum Doors and Door Frames Section 08120
- .7 Aluminum Curtainwall Systems Section 08520
- .8 Vapour Barrier at Exterior Gypsum Sheathing Board Applications Section 09250

1.2 REFERENCES

- .1 CAN/CGSB-51.33-latest edition, Vapour Barrier Sheet, excluding polyethylene, for Use in Building Construction.
- .2 CAN/CGSB-51.34-latest edition, Vapour Barrier, polyethylene sheet, for Use in Building Construction.

1.3 QUALITY ASSURANCE

- .1 Perform work in accordance with the printed requirements of the air/vapour barrier manufacturer and this specification.
- .2 At the beginning of the work and at all times during the execution of the work, allow access to work site by the air/vapour barrier membrane manufacturer's representative.
- .3 Components used in this section shall be sourced from one manufacturer, including sheet membrane, air/vapour barrier sealants, primers, mastics and adhesives.

1.4 MOCK-UP

- .1 Provide mock-up of air barrier materials under provisions of Section 01340.
- .2 Construct typical exterior steel stud and drywall sheathing board wall panels 2 m long by 2 m wide, incorporating window frame and sill, insulation, junction with roof vapour retarder; illustrating materials interface and seals.
- .3 Locate where directed by the Architect.

- .4 Mock-up may remain as part of the work.
- .5 Allow 24 h for inspection of mock-up by Architect before proceeding with air barrier work.

1.5 COORDINATION

- .1 Coordinate work of this section with all sections referencing this section on Page 1, paragraph 1.2.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.
- .2 Store roll materials on end in original packaging.
- .3 Store adhesives and primers at temperatures of 5⁰C and above to facilitate handling.
- .4 Keep solvent away from open flame or excessive heat.
- .5 Protect rolls from direct sunlight until ready for use.

PART 2 PRODUCTS

2.1 SHEET VAPOUR BARRIER

- .1 Polyethylene Film: to CAN/CGSB-51.34-latest edition, Type 1, 0.15 mm thick.
- .2 Air/vapour barrier membrane (self-adhering): SBS modified bitumen, self-adhering sheet membrane complete with cross-laminated polyethylene film and having the following physical properties:
 - .1 Thickness: 1.0 mm.
 - .2 Low temperature flexibility: -30⁰C to CGSB 37-GP-56M.
 - .3 Elongation: 200% to ASTM D412 – modified.
 - .1 Acceptable Material: Blueskin SA as manufactured by Bakor.
- .3 Through-wall flashing membrane (self-adhering): SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film, having the following physical properties:
 - .1 Thickness: 1.0 mm (minimum).
 - .2 Film thickness: 0.225 mm.
 - .3 Tensile strength (film): 34500 kPa (5000 PSI) ASTM D882.
 - .4 Elongation: 200% to ASTM D412.
 - .1 Acceptable Material: Blueskin TWF as manufactured by Bakor.

- .4 Through-wall flashing and dampproof coursing mastic: synthetic rubber base compound having the following characteristics:
 - .1 Compatible with air/vapour barrier membrane, substrate and insulation materials.
 - .2 Long-term flexibility: PASS CGSB 71-GP-24M.
 - .3 Chemical resistance: alkalis, mild acid and salt solutions.
 - .1 Acceptable Material: Air-Bloc 21 or 230-21 adhesive as manufactured by Bakor.
- .5 Primer for self-adhering membranes: polymer emulsion based adhesive type, quick-setting, having the following physical properties:
 - .1 Colour: Aqua
 - .2 Weight: 1.0 kg/L
 - .3 Solids by weight: 53%
 - .4 Water based
 - .5 Drying time (initial set): 30 minutes
 - .1 Acceptable Material: Aquatac Primer (high surface tack, ideal for vertical surfaces) as manufactured by Bakor.
- .6 Substrate Cleaner: non-corrosive type as recommended by manufacturer of air barrier.

2.2 ACCESSORIES

- .1 Joint Sealing Tape: air resistant pressure sensitive adhesive tape, type recommended by vapour barrier manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.
- .2 Sealants: In accordance with Section 07900 - Sealants. Colour selected by the Architect.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Verify that surfaces and conditions are ready to accept the work of this section. Notify Architect in writing of any discrepancies. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrate.

3.2 SURFACE PREPARATION

- .1 All surfaces shall be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas in substrate to provide an even plane. Strike masonry joints flush.
- .2 New concrete shall be cured for a minimum of two (2) weeks and must be dry before air/vapour barrier membranes are applied.
- .3 Concrete surfaces shall be free of large voids.

- .4 Where curing compounds are used, they must be clear resin based without oil, wax or pigments.

3.3 PRIMER

- .1 Apply primer for self-adhering membrane at the rate recommended by manufacturer.
- .2 Apply primer by roller and allow minimum 30 minute open time. Primed surfaces not covered by sheet membrane during the same working day must be reprimed.

3.4 PRIMER FOR THROUGH-WALL FLASHING MEMBRANE

- .1 Apply primer for self-adhered membranes at rate recommended by manufacturer.
- .2 Apply primer to all areas for through-wall flashing membrane as indicated on drawings by roller and allow minimum 30 minute open time. Primed surfaces not covered by through-wall flashing membrane during the same working day must be reprimed.

3.5 UNDER SLAB VAPOUR BARRIER

- .1 Install polyethylene film under Ground Floor slabs and other surfaces as noted on drawings, using one layer (or more). Arrange for installation to be followed as soon as possible with covering material, use in roll form with largest width possible, and follow manufacturer's instructions.
- .2 Seal perimeter of under slab 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 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.
- .3 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.

3.6 AIR/VAPOUR BARRIER MEMBRANE

- .1 Apply membrane complete and continuous to primed substrate in an overlapping shingle fashion and in accordance with manufacturer's recommendations and written instructions. Stagger all vertical joints.
- .2 Align and position sheet membrane, remove protective film and press firmly into place. Ensure minimum 50 mm overlap at all end and side laps. Promptly roll all laps and membrane with a countertop roller to effect the seal.
- .3 At the end of each day's work, seal the top edge of the membrane where it meets the substrate using Air-Bloc 21. Trowel apply a feathered edge to seal termination and shed water.
- .4 Tie-in to window frames, aluminum screens, hollow metal door frames, spandrel panels, roofing system and at the interface or dissimilar materials as indicated on drawings.
- .5 Ensure all projections, including anchors are properly sealed with a caulk application of Air-Bloc 21.
- .6 Mechanically fasten membrane through securement bars to all windows, doors louver and curtain wall sections, where proper adhesion and bonding cannot be maintained.
- .7 Membrane applied to the underside of substrate shall receive special attention on application to ensure maximum surface area adhesion is obtained.
- .8 Install sheet vapour barrier on warm side of exterior wall assemblies to form continuous barrier.
- .9 Use sheets of largest practical size to minimize joints.
- .10 Inspect sheets for continuity. Repair punctures and tears with sealing tape before work is concealed.
- .11 Install vapour barrier tie-in at roof curbs to join wall and roof vapour barriers. Product shall be compatible with both wall and roof vapour barrier membranes.

3.7 INSPECTIONS

- .1 Notify Architect when sections of work are complete so as to allow for review prior to installing insulation.

3.8 PROTECTION OF FINISHED WORK

- .1 SBS membranes are not designed for permanent exposure. Cover membrane work as soon as possible.

3.9 CLEANING

- .1 Use mineral spirits.

Caution:

Mineral Spirits are flammable. Take suitable fire precautions. Do not allow smoking or welding in working area. Keep away from heat and open flame. Use in well ventilated areas. Keep containers covered when not in use

END OF SECTION

PART 1 GENERAL

1.1 RELATED WORK

- | | | |
|----|--------------------------------|------------------------------|
| .1 | Cast-in-place Concrete | Section 03300 |
| .2 | Sheet Vapour Barriers | Section 07190 |
| .3 | Batt and Blanket Insulation | Section 07213 |
| .4 | Foamed-in-Place Insulation | Section 07616 |
| .5 | Insulation for Mechanical Work | Refer to Mechanical Drawings |

PART 2 PRODUCTS

2.1 INSULATION

- .1 Perimeter foundation insulation.
- .1 Below grade perimeter foundation insulation shall be extruded polystyrene board conforming to CAN/ULC-S701, Type 4, rigid, closed cell, with integral high density skin. Compressive strength: minimum 210 kPa. Thickness shall be 75 mm, 600 mm x 1200 mm with shiplapped edges.
- .2 Standard of Acceptance: Styrofoam SM Extruded Polystyrene Insulation as manufactured by Dow Chemical Canada Inc. or Owens Corning Formula 300.

2.2 ACCESSORIES

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

OR

Purpose-made plastic ribbed mechanical fasteners with head size of 40 mm dia., length to suit for fastening to concrete or concrete block.

- .2 Adhesive as recommended by manufacturer, to CGSB 71-GP-24M, Type 1, compatible with insulation types, air/vapour barrier system and bituminous dampproofing

PART 3 EXECUTION

3.1 WORKMANSHIP

- .1 Install insulation after building substrate materials are dry.
- .2 Install insulation to maintain continuity of thermal protection to building elements and spaces.
- .3 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.
- .4 Offset both vertical and horizontal joints in multiple layer applications.
- .5 Do not enclose insulation until it has been inspected and approved by the Architect.
- .6 At concrete block or poured concrete wall surfaces, in addition to adhesive, install mineral fibre insulation boards with insulation clips and disk, 6 per 600 x 1200 mm board minimum, fit boards tight, cut off fastener spindle 3 mm beyond disk.

3.2 PERIMETER FOUNDATION INSULATION

- .1 Exterior Application:
 - .1 75 mm polystyrene insulation board, installed vertically to the outer face of foundation wall extending 150 mm below exterior grade down to base of foundation wall, and inner face of foundation wall extending 900 mm below underside of slab on grade, and horizontally 900 mm wide under slab on grade. Place insulation onto compacted layer of Granular A fill material.

END OF SECTION

PART 1 GENERAL

1.1 RELATED WORK

- .1 Board Insulation Section 07212
- .2 Insulation for modified Bituminous Membranes Section 07525
- .3 Aluminum Curtainwall System Section 08520
- .4 Gypsum Board Section 09250
- .5 Insulation for Mechanical Work Refer to Mechanical Drawings

1.2 REFERENCES

- .1 CAN/ULC S702-latest edition, Mineral Fibre Thermal Insulation for Buildings.
- .2 CAN/ULC S-102-latest edition, Test for Surface Burning Characteristics for Building Materials and Assemblies
- .3 CAN4-S114-latest edition, Test for Determination of Non-Combustibility in Building Materials
- .4 ASTM 553-latest edition Mineral Fibre Insulation for buildings
- .5 CSA B111-latest edition, Wire Nails, Spikes and Staples.

PART 2 PRODUCTS

2.1 INSULATION

- .1 Semi-rigid batt insulation to CAN/ULC S702-latest edition, Type 1 (without membrane), thickness as indicated.
 - .1 Acceptable Materials:
 - .1 "Roxul Comfortbatt" by Batt Insulation as manufactured by Roxul Inc.
- .2 Semi-rigid insulation mineral fibre: to ASTM C612 flame spread Classification: 15, Fuel Contribution: 0, Smoke Developed: 0, butt edges.
 - .1 Acceptable Materials:
 - .1 "Roxul Cavity Rock insulation as manufactured by Roxul Inc.
Thickness: as required to fill wall cavity and other thickness where indicated on drawings.

.3 Sound attenuation batt insulation: to CAN/ULC S702-latest edition, Type 1 (without membrane). Thickness to match depth of wall cavity.

.1 Acceptable Materials:

- .1 "Safe 'N' Sound" batt insulation and/or "Acoustical Fire Batts - AFB" as manufactured by Roxul Inc.
- .2 "Quiet Zone" noise stop blanket - 700 Series as manufactured by Owens Corning Canada Inc.
- .3 Eco Touch Pink Quite Zone Pink Fiberglas Acoustic Insulation.
- .4 "Noise Reducer" Sound Attenuation Batt by Certain Teed Insulation.

2.2 ACCESSORIES

.1 Insulation clips:

- .1 For concrete block and concrete back-up walls and gypsum sheathing boards - Impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self locking type.
- .2 For Steel Stud back-up walls - Insulations screws complete with 50mm diameter white polypropylene washer. Screws to be of length to suit installation, corrosion resistance to DIN 50018.2.01 and ASTM B117, self-tapping, Phillips head screws. Retaining washer to be made of polypropylene and is to be a minimum of 50mm diameter.
 - .1 Standard of Acceptance: Grid-Mate by, ITW Buildex
- .3 Nails: galvanized steel, length to suit insulation plus 25 mm, to CSA B111.
- .4 Staples: 12 mm minimum leg.

PART 3 EXECUTION

3.1 INSULATION INSTALLATION

- .1 Install insulation to maintain continuity of thermal protection to building elements and spaces as indicated.
- .2 Install insulation where indicated. Lap ends and side flanges of membrane over framing members. Retain in position with nails, staples, insulation clips or wire ties installed as recommended by manufacturer. Tape seal butt ends and lapped side flanges. Do not tear or cut vapour barrier.
- .3 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .4 Fit insulation between window frame, door frame, and surrounding masonry opening, or other surfaces.

- .5 Do not compress insulation to fit into spaces.
- .6 Do not enclose insulation until it has been inspected and approved by the Architect.
- .7 At exterior walls, provide continuous horizontal steel wire support at 600 o.c. to retain insulation.

3.2 INSULATION OF SEMI-RIGID WALL INSULATION

- .1 Apply the specified semi-rigid insulation to fill wall cavity.
- .2 Provide minimum eight (8) mechanical fasteners at edges and field of insulation boards.
- .3 Do not enclose insulation until it has been reviewed by the Architect.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1	Masonry	Division 4
.2	Metal Decking	Section 05311
.3	Structural Steel	Section 05120
.4	Rough Carpentry	Section 06100
.5	Air/Vapour-Barrier	Section 07190
.6	Roofing	Section 07525
.7	Metal Flashing, Trim, and Metal Fire Stops	Section 07620
.8	Gypsum Board	Section 09250

1.2 SUBMITTALS AND SAMPLES

- .1 Before commencing work, submit in accordance with Section 01340 the following:
 - .1 Result of independent laboratory test reports, data sheets, physical properties, meeting or exceed requirements of the standard and specification.
 - .2 Submit a laboratory report of the adhesion compatibility with: flashing, membranes, coatings and substrates.
 - .3 License under CUFCA and certification applicators under CUFCA/NECA (National Energy Conservation Association) to be submitted to the consultant upon request, prior to the commencement of work.
 - .4 Submit by the manufacturer a conformity certification to NBC of the polyurethane foam system.
 - .5 Submit independent laboratory results on a vapour permeance properties (ASTM E96 system) for three samples in each composition wall.

1.3 QUALITY ASSURANCES

- .1 Contractor performing work under this Section must be licensed under CUFCA (Canadian Urethane Foam Contractors Association) Quality Assurance Program.
- .2 Applicators performing work under this section must be trained and certified by CUFCA/NECA (National Energy Conservation Association).
- .3 Upon request of consultant, submit a copy of the contractors quality control report as requested in CAN/ULC-S705.2 – Latest Edition.

- .4 Conduct site tests of sprayed work as required by CUFCA Quality Assurance Program.
- .5 Upon request of consultant, spray an area 1 m² (10 ft²) in accordance with Section 01340.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Materials shall be delivered in manufacturers original sealed containers clearly labelled with manufacturer's name, product identification, safety, information, net weight of contents, and expiration date.
- .2 Material is to be stored in a safe manner and where the temperatures are in the limits specified by the material manufacturer.
- .3 Empty containers have to be removed from site on a daily basis in accordance with CAN/ULC-S705.2-latest edition.

1.5 APPLICATION CONDITIONS

- .1 At the beginning and during the work, the product manufacturer representative shall provide technical support, assistance, and provide periodic review of the installation on the job site.
- .2 Execute the work of this section when the temperature of the air and substrate are within the limits of the data sheet supplied by the manufacturer.
- .3 Apply the spray-foam only when the relative humidity is lower than 80%.
- .4 Prepare all oily surfaces with primer, follow manufacturer's recommendations and CAN/ULC S705.2 Standard.
- .5 Prime all metal surfaces when the application temperature is lower than 5°C.

1.6 PROTECTION

- .1 Ventilate area to receive insulation by introducing fresh air and exhausting air continuously during and 24 hours after application to maintain non-toxic, unpolluted, safe working conditions.
- .2 Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area.
- .3 Protect workers as recommended by insulation manufacturer.
- .4 Protect all adjacent surfaces and equipment from overspray, fall-out, and dusting of insulation materials.
- .5 Dispose of waste foam daily in location designated by the Architect and decontaminate empty drums in accordance with foam manufacturer's instructions.

1.7 WARRANTY

- .1 Warrant work of this section against defects and deficiencies for a period of two years from date of work completion.
- .2 Provide a CWC Warranty Certificate in conformity to CUFCA Quality Assurance Program.
- .3 Provide manufacturer's warranty for the field-applied product.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Spray Applied Polyurethane Foam Insulation system in accordance with CAN/ULC-S705.1-latest edition Standard for Thermal Insulation Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification.
- .2 Acceptable Product: **HEATLOK SOYA**

2.2

PHYSICAL PROPERTIES	TEST	OBJECTIVE	RESULT	UNIT
.1 Density	ASTM D1622	Min.	33	Kg/m ³
.2 Thermal Resistance	ASTM C518 180 days/23 ^o c	Min.	1.17/25mm 6.6 / 1"	RSI R
.3 Long Term Thermal Resistance	CAN/ULC S 770	Min.	1,04/25mm 6/ 1"	RSI R
.4 Dimensional stability	ASTM D-2126 (% of change in volume at 28 days)			
	-20°C	Min.	-0.03	%
	70°C R.H.>97 +/-3%	Max.	+9.58	%
	80°C	Max.	+2.9	%
.5 Flames spread Index	CAN/ULC S 102-03	Max.	200	FSI
.6 Smoke Develop Index	CAN/ULC S 102-03	Max.	396	SDI
.7 Compressive strength	ASTM D1621	Min.	195	KPa
.8 Tensile strength	ASTM D1623	Min.	335	KPa
.9 Open cells	ASTM D2856	Min.	8.0	%
.10 Water absorption	ASTM D2842 (96 hrs)	Max.	0.8	%
.11 Air barrier Material at 75 Pa	CCMC 07273 (25 mm core only)	Max.	0.00004	L/s/m ² at 75 Pa
.12 Fungi Resistance	ASTM C 1338	Min.	No Fungal Growth	
.13 V.O.C.	CAN/ULC S 774	Max.	1	Day
.14 Water vapour permeance	ASTM E96 (25mm core only)	Max.	69	ng/Pa s m ²
.15 Water vapour permeance for spray foam polyurethane applied on <u>concrete blocks</u> (75mm on substrate)	ASTM E96 (system)	Max.	22.0	ng/Pa s m ²
.16 Water vapour permeance for spray foam polyurethane applied on exterior <u>gypsum board</u> (75mm on substrate)	ASTM E96 (system)	Max.	44	ng/Pa s m ²

2.3 PRIMERS

- .1 As per manufacturer's recommendations for surfaces conditions and CAN/ULC S 705.2. For oily steel surfaces use Adbond 8388-1 adhesive primer, colour red.

2.4 EQUIPMENT

- .1 Equipment shall be as recommended in CAN/ULC-S705.2-latest edition, and approved by foam manufacturer for type of application.

2.5 ACCESSORIES

- .1 Adhesive for membrane flashing as recommended by the insulation manufacturer.
- .2 Mechanical fasteners for membrane flashings: 13 mm x 25 mm x 0.42 mm thickness, galvanized continuous steel angle.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 The contractor and the manufacturer's representatives shall verify that surfaces and conditions are suitable to accept work as outlined in this section.
- .2 According to the prescriptions of the standard CAN/ULC S705.2-latest edition, verify the conditions of surfaces.
 - .1 Surfaces to be covered with spray foam, shall be free of an excess of moisture, frost, oil, rust and any other foreign material able to have a negative effect on the adhesion of the product.
 - .2 Make sure of the complete cure of the substrates: concrete, mortar, fillers, membranes, primers, coatings or other surfaces, before pulverizing, taking into account climatic conditions.
 - .3 Where the thickness of application of the HEATLOK SOYA is greater than 50 mm and if the temperature is lower than 0°C, use mechanical fastener for self-adhesive membranes continuous galvanized steel angle: 13 mm x 25 mm x 0.42 mm in thickness. Fixed at 400 mm C/C.
 - .4 Respect the moisture content of the different materials.
 - .5 Follow the recommendations of the manufacturer.
- .3 Report in writing, any defects in surfaces or conditions which may adversely affect the performance of products installed under this section to the consultant prior to commencement of work.
- .4 Commencement of work outlined in this section shall be deemed as acceptance of existing work and conditions.

3.2 APPLICATION

- .1 Spray application of polyurethane foam shall be performed in accordance with CAN/ULC-S705.2-latest edition. Standard for Thermal Insulation Spray Applied Rigid Polyurethane Foam, Medium Density, **Installer's Responsibilities.**
- .2 Apply only when surfaces and environmental conditions are within limits prescribed by the material manufacturer.
- .3 Apply in consecutive passes (min. 15 mm, max. 50 mm each) to obtain the thickness as indicated.
- .4 Do not spray closer than 75 mm of chimneys, recess spot light or other source of heat.
- .5 The applied product shall provide an average of the RSI and minimum average thickness requirements in 1 M². Maximum variation from specified thickness in applied thickness shall not exceed ± 6 mm.
- .6 Apply the insulation in a uniform manner in accordance to Article 9.25.2.3.1.
- .7 Apply insulation at all exterior cavity walls and elsewhere indicated on drawings and in addition to the exterior portion of all structural steel members that penetrate, bear on, or extend over the exterior building walls.
- .8 At the exterior portion of structural steel members and metal deck penetrating or bearing on the exterior building wall, apply insulation over a minimum depth of 600 mm of the member measured from the face of the wall insulation.
- .9 Except where indicated otherwise, apply sprayed foam insulation in thickness as follows:

Walls	85 mm Minimum Insulation Thickness, Minimum R20
Soffits	150 mm Minimum Insulation Thickness
	Refer to drawings for location and insulation thickness

END OF SECTION

PART 1 GENERAL

1.1 RELATED WORK

- | | | |
|----|--------------------------------------|---------------|
| .1 | Air/Vapour Barriers - Membrane | Section 07190 |
| .2 | Sprayed-in-place Urethane Insulation | Section 07216 |
| .3 | Metal Stud System | Section 09111 |
| .4 | Gypsum Board | Section 09250 |

1.2 SCOPE OF WORK

- .1 Provide labour, materials and equipment necessary to fabricate on site the complete textured soffit finish system.

1.3 REFERENCE STANDARDS

- .1 Do work in accordance with ASTM C 1063- latest edition, except where specified otherwise.
- .2 'Non-combustible' Finish System to CAN/ULC – s134.

1.4 SAMPLES

- .1 Submit duplicate 300 mm x 300 mm samples of the exterior soffit finish system in accordance with Section 01340.

1.5 SHOP DRAWINGS AND ENGINEERING SUBMITTALS

- .1 Provide shop drawings for exterior soffits in accordance with Section 01340, showing control joint lay-out and reveal edge details.
- .2 For design criteria and engineering submittals, refer to Section 09111 and Section 09250.

PART 2 PRODUCTS

2.1 APPROVED FINISH SYSTEM

- .1 Approved System Manufacturers:
 - .1 STO Industries Canada Inc.
 - .2 Dryvit System Inc.
 - .3 Adex Systems Inc.
- .2 Substitution of similar products from similar manufacturers meeting these specifications will be considered provided that the fabricator obtains acceptance from the Architect prior to tender closing, refer to Section 00200 – Instructions to Bidders.
- .3 All materials shall meet requirements of and shall be approved by the systems manufacturer.

2.2 MATERIALS

- .1 Water: clean, potable.
- .2 Exterior sheathing: a glass-fibre mat surfaced gypsum board with a silicone treated water and mould resistant gypsum core. Equal to Dens-Glass Gold, Type X, 16 mm thick x 1200 mm wide by longest practical lengths as manufactured by Georgia Pacific.
- .3 Joint tape for Dens-Glass Gold: 50 mm wide, 10 x 10 woven glass mesh tape.
- .4 Joint finishing sealant for Dens-Glass Gold sheathing: Dow Corning 795 Building Sealant.
- .5 Conditioner: water based sheathing conditioner.
- .6 Leveller:
 - .1 For levelling up to 3 mm, a polymer based, trowel applied parge coating.
 - .2 For levelling up to 13 mm, a polymer modified, Portland cement based trowel applied parge coating.
- .7 Exterior base coat: a 100% acrylic polymer based, non-combustible, asbestos-free.
- .8 Standard reinforcing fabric: 6 oz. interlaced, open weave glass fibre mesh with trimmed roll edges to minimize overlapped seams.
- .9 Primer: a water based silicone emulsion primer.
- .10 Exterior finish coat: a water based factory mixed 100% pure acrylic/silicone emulsion textured finish coating containing integral colour and texture. Colour selection from standard range.

- .11 Preformed joint flashing: a purposed shaped joint finishing.
- .12 Casing beads: purpose made shapes and profiles specifically designed as an integral component of the system.
- .13 Perforated vent strip: a purpose made and shaped perforated vent track especially designed as an integral component of the soffit system.
- .14 Sealant: a low-modulus, one part silicone sealant equal to Dow Corning 795 silicone building sealant, colour to match finish coat. Use close cell backer rods where applicable.

2.3 METAL FURRING AND SUSPENSION SYSTEMS

- .1 Metal Furring Runners 0.87 mm (20 gauge), Hangers, Tie Wires, Inserts, Anchors: to ASTM C 645, hot dipped, galvanized.
- .2 Drywall Furring Channels: 0.87 mm (20 gauge) core thickness galvanized steel channels for screw attachment of all kinds of gypsum boards specified herein.

2.4 FASTENINGS AND ADHESIVES

- .1 Nails and Screws: to CSA B111-latest edition. Galvanized for exterior application. Type S screws for resilient channel application.
- .2 Laminating Compound: as recommended by manufacturer.

2.5 ACCESSORIES

- .1 Sealant: to CAN/CGSB-19.24-latest edition.
 - .1 Sealants acceptable for use on this project must be listed on CGSB Qualified Product List issued by CGSB Qualification Panel for Joint Sealants.
- .2 Polyethylene: to CAN/CGSB-51.34-latest edition, Type 2.
- .3 Insulating Strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one (1) face; lengths as required.
- .4 Soffit vent track, trims, reveals and control joints for exterior soffit application shall be rigid vinyl by Vinyltech, distributed by Morin Bros. Building Supplies Ltd.
- .5 Adhesive for Trim Accessories: "premium grade" contact cement.

PART 3 EXECUTION

3.1 LOCATION

- .1 Provide exterior soffit finish system at the following locations and as indicated on drawings.

3.2 DELIVERY AND STORAGE

- .1 Deliver materials when and as required in their original packages and store in a dry location. Do not unpack materials until they are ready to be used.

3.3 PROTECTION

- .1 Before commencing work protect all adjacent finished surfaces to save them from damage.
- .2 Work is not to commence or continue unless a temperature of 13 degrees C minimum is maintained within the building.

3.4 SUSPENDED AND FURRED SOFFITS

- .1 Erect hangers and runner channels for suspended gypsum board soffits in accordance with ASTM C 754 except where specified otherwise.
- .2 Install work level to tolerance of 1:1200.
- .3 4 mm (9 gauge) hangers shall be spaced not over 900 mm for exterior applications, in the direction of the 33 mm main runner channels and not over 900 mm for exterior applications in the direction at right angles to the main runners, and within 150 mm of the ends of main runner runs and of boundary walls or similar interruptions of ceiling continuity.
- .4 Main runners shall be placed maximum 900 mm o.c. for exterior applications, properly positioned, levelled, and hangers shall be saddle tied along runner.
- .5 Main runners shall not be let into nor come in contact with abutting walls. Runner channels shall be located within 150 mm, 6" of the walls to support the ends of the furring channels.
- .6 Except where shown otherwise, metal furring channels shall be spaced 300 mm o.c. for exterior application. Metal furring channels shall be securely clipped with furring channel clips or saddle tied with two (2) strands of 16 gauge tie wire to main runners or main support members and shall not be let into or come in contact with abutting walls.
- .7 End splices shall be provided by nesting channels or studs no less than 200 mm and securely attached with wire.

- .8 Metal furring channel clips shall be installed on alternate sides of the main runner channel. Wire tie metal furring channel to 38 mm channel and to main support members when clips cannot be alternated.
- .9 At light fixtures or any openings that interrupt the main runner or channels, reinforce grillage with 19 mm cold rolled channels, wire tied atop and parallel to the main runner channels.
- .10 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .11 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.

3.5 RESILIENT FURRING

- .1 Erect drywall resilient furring transversely spaced maximum 400 mm o.c. and not more than 150 mm from ceiling/wall juncture. Secure to each support.

3.6 CONTROL JOINTS AND PERIMETER REVEAL

- .1 Install purpose made control joints at 3.0m max. on centre (in any direction) and as indicated on drawings.
- .2 Install purpose made vented perimeter reveal at all intersections of soffit and vertical surfaces and as indicated on drawings.

3.7 DENS-GLASS GOLD BOARD APPLICATION - EXTERIOR SOFFITS

- .1 Install Dens-Glass Gold board sheathing in accordance with manufacturer's instructions, Document GA-253. Install sheathing, gold side out, perpendicular to metal framing. Stagger joints over studs and framing. Butt joints together. Use maximum board lengths to minimize joints. Apply water resistant sealant to edges, ends, cut-outs with exposed gypsum core and to fastener heads.
- .2 Install control joints, soffit vent track and related trims to manufacturer's printed recommendations.
- .3 Attach Dens-Glass Gold sheathing to metal framing with specified screws spaced 200 mm o.c. at perimeter to framing supports, and 200 mm o.c. along intermediate framing in field. Drive fasteners to bear tight against and flush with surface of sheathing. Do not countersink. Locate fasteners minimum 10 mm from edges and ends of sheathing panels.

- .4 Tape and caulk all joints with 10 x 10 woven glass mesh tape. Apply fibreglass joint tape to all joints overlapping at intersections. Apply approximately a 10 mm bead of the specified caulk into the entire surface of the tape with a trowel. Apply enough caulk to every fastener to completely cover when trowelled smooth.

3.8 EXTERIOR FINISH SYSTEM APPLICATION

- .1 Apply levelling parge coating as required to ensure a level, uniform surface. Fill all voids and depressions. Treat trims, control joints and vent track to be level with adjacent board surfaces.
- .2 Apply base coat over the entire surface of sheathing, with a stainless steel trowel to a uniform minimum thickness of 1.5 mm. Apply base in strips of 1 m and immediately embed standard reinforcing mesh into the wet base coat. Avoid wrinkles in the mesh. Base coat shall be levelled and smoothed immediately.
- .3 The finish thickness of the base coat shall be such that the mesh is fully embedded and the mesh pattern and colour is not visible. Feather out base coat on either side of the mesh overlap and at moulding edges.
- .4 Allow base coat to thoroughly dry before applying primer.
- .5 Apply primer with roller over clean dry base coat and joint surfaces to receive sealant.
- .6 Apply exterior textured finish coat directly over primed base coat using a stainless steel trowel. The finish coat shall be applied continuously, to a thickness not greater than the largest aggregates. A wet edge shall be maintained. Levelling and texturing shall take place in one operation.
- .7 Provide equipment, materials and work crew of sufficient size to ensure a continuous operation without cold joints, scaffolding lines, etc. Avoid installing separate batches of finish side by side.

3.9 PATCHING AND MAKING GOOD

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

3.10 CLEANING

- .1 The applicator shall promptly remove all temporary coverings and clean work area and remove debris from the site upon completion. Clean adjacent surfaces of any excess materials, resulting from their work.

3.11 PROTECTION

- .1 Protect completed system from damage and weather.

END OF SECTION

PART 1 GENERAL

1.1 RELATED WORK

- | | | |
|----|-------------------------------|------------------------------|
| .1 | Masonry Procedures | Section 04050 |
| .2 | Metal Flashings and Trim | Section 07620. |
| .3 | Sealants | Section 07900 |
| .4 | Aluminum Curtain Wall Systems | Section 08520 |
| .5 | Metal Stud Systems | Section 09111 |
| .6 | Mechanical | Refer to Mechanical Drawings |
| .7 | Electrical | Refer to Electrical Drawings |

1.2 REFERENCES

- .1 CAN4-S115-latest edition, Standard Method of Fire Tests of Fire Stop Systems.

1.3 SAMPLES

- .1 Submit samples in accordance with Section 01340 Shop Drawings, Product Data, Samples and Mock-ups.

1.4 SUBMITTALS

- .1 The firestopping system manufacturer shall provide ULC or cUL test design for all conditions applicable to this project.
- .2 Where cUL or ULC tests are not available for certain conditions, the system manufacturer shall provide "Engineered" firestopping details that are satisfactory to authorities having jurisdiction. These engineered details shall bear the professional stamp of a registered Fire Protection Systems Engineer who is licensed to practice in Canada. Costs for the provision of these engineering services shall be the responsibility of the System Manufacturer.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Fire stopping and smoke seal systems: in accordance with ULC-s115.
 - .1 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of ULC-s115 and not to exceed opening sizes for which they are intended.
 - .2 Fire stop system rating: Generally one and two hours.
- .2 Service penetration assemblies: certified by ULC in accordance with ULC-s115 and listed in ULC Guide No. 40 U19.
- .3 Service penetration fire stop components: certified by ULC in accordance with ULC-s115 and listed in ULC Guide No. 40 U19.13 and ULC Guide No. 40 U19.15 under the Label Service of ULC. (Prefix SP).
- .4 Fire-resistance rating of installed fire stopping assembly not less than the fire-resistance rating of surrounding floor and wall assembly.
- .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 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.
- .9 Sealants for vertical joints: non-sagging.
- .10 Approved Manufacturer: AD Firestop Systems, as listed in the ULC rated systems for each specified application.
- .11 Material colour shall be: red where not exposed to view; grey where exposed to view.

PART 3 EXECUTION

3.1 PREPARATION

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

3.2 INSTALLATION

- .1 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.
- .2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
- .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
- .4 Tool or trowel exposed surfaces to a neat finish.
- .5 Remove excess compound promptly as work progresses and upon completion.

3.3 INSPECTION

- .1 Notify the Architect when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

3.4 SCHEDULE

- .1 Fire stop and smoke seal at:
- .1 All openings and penetrations through masonry, concrete, and gypsum board partitions and walls that provide a fire resistance rating or a non-rated fire separation.
 - .2 All wall penetrations located above suspended ceilings.
 - .3 Top of masonry and gypsum board partitions.
 - .4 At perimeter of masonry and gypsum board partitions.
 - .5 Perimeter of all gypsum board partitions and masonry walls located within the ceiling spaces.
 - .6 At perimeter of all door frames and glazed frames in walls that provide a rated or unrated fire separation or smoke separation.
 - .7 Intersection of masonry and gypsum board partitions where one or both provides a fire resistance rating or a non-rated fire separation or smoke separation.
 - .8 Control and sway joints in masonry and gypsum board partitions and walls that provide a fire resistance rating, non-rated fire separation and, smoke separation.
 - .9 All expansion joints.
 - .10 Slab edge / curtain wall conditions.
 - .11 Openings and sleeves installed for future use.
 - .12 Around mechanical and electrical assemblies, at penetrations of new and existing surfaces and construction.
 - .13 Rigid ducts: greater than 129 cm²: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.
 - .14 Where affected by new work inside the existing building at all perforations of existing surfaces and construction.
 - .15 Other areas as shown on drawings.

3.5 CLEAN UP

- .1 Remove excess materials and debris and clean adjacent surfaces immediately after application.
- .2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE OF WORK

- .1 This Section of work covers existing building window infill

1.2 RELATED WORK

- | | | |
|----|--|---------------|
| .1 | Structural Steel | Section 05121 |
| .2 | Rough Carpentry | Section 06100 |
| .3 | Air/Vapour Barrier Membranes | Section 07190 |
| .4 | Batt and Blanket Insulation | Section 07213 |
| .5 | Metal Flashing and Trim | Section 07620 |
| .6 | Sealants | Section 07900 |
| .7 | Metal Stud Systems | Section 09111 |
| .8 | Structural Drawings and Specifications | |

1.3 DESIGN AND PERFORMANCE REQUIREMENTS

- .1 Design metal siding panels to provide for thermal movement of component materials caused by ambient temperature range of 60°C buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.
- .2 Include expansion joints to accommodate movement in wall system and between wall system and building structure, caused by structural movements, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration.
- .3 Design sub-members shall withstand dead load and wind loads calculated in accordance with NBC and applicable local regulations, to maximum allowable deflection of 1/180 of span.
- .4 Provide for positive drainage of condensation occurring within wall construction and water entering at joints, to exterior face of wall in accordance with NRC "Rain Screen Principles."
- .5 Design wall system to accommodate specified erection tolerances of structure.
- .6 Maintain the following installation tolerances:
- | | |
|----|---|
| .1 | Maximum variation from plane or location shown on approved shop drawings:
10 mm in 10 m of length and up to 20 mm in 100 mm of length. |
| .2 | Maximum offset from true alignment between two adjacent members abutting, end to end, in line: 0.75 mm. |

- .7 Wind load: design soffit and cladding system to resist wind loads, positive and negative, expected in this geographical region (OBC climatic data, 30 year probability) with maximum deflection of 1/180 of span and without causing rattling, vibration, overstressing of fasteners, clips and other detrimental effects on soffit and wall system.
- .8 Structural and thermal movement: accommodate movement of supporting structural framing and movement caused by thermal expansion and contraction of system component parts without causing bowing, buckling, delamination, oil canning, failure of joint seals, excessive stress on fasteners or any other detrimental effects.

1.4 REFERENCES

- .1 CSA B35.3-1962 Tapping and Drive Screws (Slotted and Recessed Head, Thread Forming and Thread Cutting Screws, and Metallic Drive Screws).
- .2 CGSB 93-GP-4M-78 Siding, Soffits and Fascia, Steel, Galvanized, Prefinished.

1.5 SAMPLES

- .1 Submit 300 x 300 mm sample of metal panel and 200 mm long sample of each trim, colour and finish as specified.

1.6 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01340.
- .2 Indicate dimensions, wall openings, head, jamb, sill, trim and molding detail, materials and finish, anchor details, compliance with requirements of related work.
- .3 Each shop drawing submitted shall bear the stamp and signature of a qualified Professional Engineer who is registered and licensed to practice in the Province of Ontario. The metal stud systems contractor shall retain the services of a Professional Structural Engineer for the Project and pay for engineering services in connection with shop drawings and review during construction of the metal stud systems.
- .4 Include all necessary shop details and erection diagrams. Indicate member sizes, locations, thicknesses exclusive of coating, coatings and materials. Include connection details for attaching framing to itself and for attachment to the structure. Show splice details where permitted. Indicate dimension, openings, requirement of related work and critical installation procedures. Show temporary bracing required for erection purposes.
- .5 Indicate design loads.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Approved Product

Exterior Cladding Sheet: Factory preformed sheet steel shall be "VEE-RIB" and similar to existing building profile, similar to corrugated siding, profile as manufactured by Ideal Roofing. Base steel thickness minimum 24 gauge, commercial grade, to ASTM A653 SS Grade and A446 with a galvanized Z275 zinc coating. Factory precoated. Colour to match existing bronze colour.

.2 Exterior Corners: of same profile, material and finish as adjacent cladding material, factory built and brake formed to required angle, concealed corner brace with hairline exposed joint. Dimensions similar to existing building.

.3 Accessories: inside corners, drip flashings, jamb trims, conversion moldings, flashings, copings of same material, thickness and finish as exterior siding, factory built and brake formed to details as indicated. Dimensions similar to existing building.

.4 Exposed joint (perpendicular to profile): ends of cladding sheet shop cut clean and square. Backed with tight fitting filler lapping back of joint, exposed components colour matched to cladding.

.5 Gaskets: closed cell polyurethane foam, adhesive on two (2) sides, release paper protected.

.6 Touch-up paint: as recommended by siding manufacturer.

.7 Isolation Coating: Bituminous paint.

.8 Sealants: in accordance with Section 07900, colour to match siding panels as selected by Architect.

.9 Fasteners: purpose made, self-tapping and self-drilling, screws of hardened carbon steel shank with heavy cadmium plating and a chromate finish, length to suit. Provide matching existing fasteners.

.10 Steel Stud Framing: 16 gauge base thickness steel, commercial grade, to ASTM-A653 / A653M zinc coated (galvanized). Dimensions, profile and spacing as indicated and in maximum lengths.

PART 3 EXECUTION

3.1 PREPARATION

- .1 Protect metal surfaces in contact with concrete, masonry mortar, plaster or other cementitious surface with isolation coating.

3.2 INSTALLATION (FIELD ASSEMBLED)

- .1 Installation to be in strict accordance with manufacturer's written recommendations and reviewed shop drawings.
- .2 Provide supplemental steel support members for work of this section to suit design requirements.
- .3 Provide supplemental work to resist wind uplift and to provide necessary strength and rigidity to all preformed sheet steel profiles and accents by incorporating braces, anchors, frames, bent supports and tie-ins.
- .4 Provide steel stud framing to substrate to Manufacturer's spacing and reviewed engineered shop drawings and corresponding to joint spacing of preformed sheet steel panels and accents/dividers. Secure at 400 mm min. and to suit loading requirements.
- .5 Ensure full contact of the air-barrier adhesive to and around the sub-girts to provide and maintain the continuity of the barrier.
- .6 Ensure all flashings and trims are installed before or immediately after erecting panels and sealed to stop direct weather penetration.
- .7 Provide exterior finish siding and dividers to internal sub-girts with matching colour fasteners.
- .8 Ensure continuity of "pressure equalization" of rain screen principle.
- .9 Provide cladding panels in longest practical length. Intermediate joints are not permitted.
- .10 Provide intermediate structural supports, alignment bars, brackets, clips, inserts, shims as required to securely and permanently fasten wall system to building structure.
- .11 Provide preformed trim pieces. Provide flashings, trim and sealants as indicated and as required to render work complete and weathertight.
- .12 Provide water-tight sealant joint at perimeter of new infill panel.

3.3 CLEANING AND TOUCH-UP

- .1 Repair and touch-up with colour matching high grade synthetic enamel minor surface damage, only where appearance after touch-up is acceptable to the Architect.
- .2 Replace damaged components which in the opinion of the Architect cannot be satisfactorily repaired.
- .3 Upon completion of work clean exposed surfaces. Remove dirt, grease, oil, caulking material and other foreign matter. Leave surfaces clean and neat, and uniform in colour.

3.4 STRUCTURAL CERTIFICATION

- .1 Upon completion of work, identified in Item 1.4, provide a certificate that shall state that the work has been performed in accordance with requirements of the Ontario Building Code and Regulations of Authorities in Jurisdiction. The certificate shall bear the seal of a qualified Structural Engineer who is licensed in the Province of Ontario.

END OF SECTION

PART 1 GENERAL

1.1 RELATED WORK

- | | | |
|----|---|------------------------------|
| .1 | Rough Carpentry | Section 06100 |
| .2 | Sheet Membrane Waterproofing | Section 07135 |
| .3 | Metal Flashing and Trims | Section 07620 |
| .4 | Sealants | Section 07900 |
| .5 | Plumbing Specialties and Accessories | Refer to Mechanical Drawings |
| .6 | All Notes on drawings related to roofing. | |

1.2 REFERENCE

- .1 ASTM C1396 latest edition, Gypsum Board Products.
- .2 ASTM C726-05 (CAN/CSA-A247-latest edition) Mineral Fiber Roof Insulation Board.
- .3 CSA B35.3-latest edition, Tapping and Drive Screws (Slotted and Recessed Head, Thread).
- .4 CGSB 37-GP-56M-latest edition, Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
- .5 CAN/CGSB-51.26-latest edition, Thermal Insulation, Polyisocyanurate Foam Core, Faced.
- .6 CAN/CGSB-51.33-latest edition, Vapour Barrier Sheet excluding Polyethylene for use in Building Construction.
- .7 CSA A123.4-latest edition, Bitumen for Use in Construction of Built-Up Roof Coverings.
- .8 CAN/CGSB 37.5-latest edition, Modified Bitumen Plastic Cement, Roofing Cement and Adhesives.
- .9 CAN/CGSB-37-GP9-Ma-latest edition, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
- .10 CSA 0121-latest edition, Douglas Fir Plywood.
- .11 CSA 0151-latest edition, Canadian Softwood Plywood.
- .12 Carry out roofing work in accordance with good roof practices of (CRCA) Canadian Roofing Contractors' Association, Roofing Specifications Manual.

- .13 The Canadian Roofing Contractors' Association (CRCA) Roofing Specifications Manual is a consensus of the CRCA Membership of what constitutes good roofing practice. In the context of the specifications for roofing, flashing and general construction upon which roofing and flashing must depend for proper performance, the recommendations contained in the CRCA "Roofing Specifications Manual" shall be read as specification requirements.
- .14 Notwithstanding the foregoing, where there are differences between the specifications and CRCA recommendations, consult the Architect before proceeding; otherwise, it will be assumed that the Contractor is in agreement with procedures specified.

1.3 QUALIFICATIONS

- .1 The Roofing Contractor shall be during the bidding period and during installation officially recognized as an approved Contractor by the Roofing Material Manufacturer.
- .2 Provide a competent Foreman to supervise all work and act as the Contractor's representative unless instructed otherwise.
- .3 Use only skilled roofers experienced in this type and class of work. Work shall be in accordance with best standard practice of the industry.

1.4 WORKMANSHIP

- .1 Installation shall be in strict accordance with the manufacturer's published instructions.
- .2 In instances where the manufacturer's published instructions are at variance with the requirements of the contract documents, notify the Architect.
- .3 Include all associates costs of modifications to the contract documents necessary to suit the requirements of the proposed membrane manufacturer.

1.5 SUBMITTALS

- .1 Prior to ordering or installing any materials submit the following for review:
- .1 Complete technical data describing proposed membrane system (data shall be sufficiently detailed to permit confirmation of requirements of contract documents).
 - .2 Manufacturer's complete published installation instructions.
 - .3 Manufacturer's approved Platinum Warranty Request Form.

1.6 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups.

1.7 COMPATIBILITY

- .1 Ensure and be responsible for compatibility of all components.
- .2 Confirm with roofing membrane manufacturer that all components are compatible with his products.

1.8 STORAGE AND HANDLING

- .1 Deliver and store materials in original containers with manufacturers labels and seals intact.
- .2 Store materials elevated from contact with ground and moisture and protected from weather.
- .3 Store membrane rolls on end, one pallet high, selvage edge up; do not store in a leaning position.
- .4 Store combustible materials away from heat and open flame.
- .5 For installation in cold weather, rolls shall be stored in a heated area prior to application.

1.9 PRECAUTIONS

- .1 Roofing shall not be carried out when materials are damp, or when ambient temperature is less than minus eighteen (18^oC) degrees Celsius. (Postpone roofing work when inclement weather appears imminent.)
- .2 Apply each part of roofing system only when surfaces are clean and dry. Notify the Architect in writing of unsuitable surfaces and conditions. Commencement of work shall imply acceptance of surfaces and conditions.
- .3 All adjacent parts of the building shall be protected from damage caused by roofing operations. Any damage caused by this contract shall be rectified to the satisfaction of the Architect.
- .4 Locate kettles, equipment and materials well away from the building in areas designated by the Architect so smoke shall not enter the building or discolour surface.
- .5 Conduct operations so as to leave deck exposed for minimum period of time. Protect as required to prevent water infiltration or environmental damage to building interior.

- .6 Insulation shall not be left exposed to the elements nor shall more be laid than can be completely covered in the same day.
- .7 Where work must continue over finished roofing membrane, protect surface with minimum 13 mm thick plywood sheets extending 900 mm beyond area.
- .8 All roof openings, except roof drains, shall be curbed. Curbs shall be mounted on and directly attached to the structural deck.
- .9 Roof drains shall be installed at the proper elevation relative to the finished roof surface.
- .10 Clean up daily and dispose of all materials off site.
- .11 Asphalt application temperature shall be the manufacturer's equiviscous temperature +/- 15 degrees C.

1.10 SITE PROTECTION

- .1 During roofing work, exposed surfaces of finished walls shall be protected with tarps in order to prevent damage. Contractor shall assume full responsibility for any damage.

1.11 ENVIRONMENTAL REQUIREMENTS

- .1 Do not install roofing when temperature remains below -18 deg C for torch application.
- .2 Minimum temperature for solvent-based adhesive is -5 deg 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.

1.12 PROTECTION

- .1 Fire Extinguishers: maintain one stored pressure rechargeable type with hose and shut-off nozzle, ULC labelled for A, B and C class protection. Size 9 kg on roof per torch applicator, within 10 m of torch applicator.
- .2 Maintain fire watch for 1 hour after each days roofing operations cease.
- .3 Install water cut-offs at the end of each day's work; remove completely prior to continuing further roofing applications.
- .4 Inspect all laps of the membrane application to ensure they are properly bonded. Repair any deficiencies prior to leaving the site for the day.
- .5 Base sheet applications should not be left exposed overnight unless all seams are torch welded prior to leaving the work site.

1.13 EXAMINATION

- .1 Examine all surfaces to receive new roof assembly, and if corrective measures are necessary, report items to Consultant in writing. Substrate shall be smooth, clean, dry and free from depressions or sharp edges.
- .2 All required drains, wood blocking and curbs shall be securely in place prior to start of roofing work.
- .3 Inspect the substrate and all roof mounted mechanical equipment being affected by the work to ensure they are in good repair and working order. Notify the Consultant, in writing, prior to commencing contracted work, should corrective measures be required.
- .4 Examine drawings and existing conditions, provide for all vents, curbs, stacks roof mounted equipment curbs, new roof anchors and other openings through membrane roofing.

1.14 WARRANTY

- .1 Provide a written warranty in the name of the Owner, countersigned by the Roofing Contractor and the Roofing Manufacturer stating that the Contractor will replace any portion of the roof assembly or sheet metal flashing exhibiting defects due to faulty workmanship or materials, and pay for all damage to other work which results from the aforementioned defects which appear during a period of two (2) years following the date of the certificate of substantial performance.
- .2 The product manufacturer will issue a written and signed document in the Owner's name, certifying all product performance properties for a period of ten (10) years, starting from the date of acceptance. This warranty will cover the removal and replacement of defective roof membrane products, resulting from manufacturing defects and/or installation workmanship, including labour. The warranty must remain a full warranty for the duration of the period specified. The scope of this warranty must not be limited by other system components manufactured or distributed by the membrane manufacturer. No letter amending the manufacturer's standard warranty will be accepted and the warranty certificate must reflect these requirements.

- .1 Standard of Acceptance: Platinum Warranty by Soprema

1.15 MANUFACTURER'S REPRESENTATIVE

- .1 The roofing materials manufacturer will delegate a representative to visit the work site at commencement of work at completion of work and at appropriate intervals during execution of the roofing work.
- .2 At all times, the contractor shall permit and facilitate access to the work site and roofs to

said manufacturer's representative.

1.16 LABORATORY TESTING

- .1 Upon request from the Owner, the elastomeric manufacturer's shall supply the results of mechanical and chemical testing performed on the elastomeric asphalt materials in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups.
- .2 The tests shall be performed to certify compliance with CGSB 37-GP-56M standard, latest Edition.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Gypsum Board Sheathing (over steel deck) as indicated: exterior gypsum sheathing board shall be core treated and formulated to be water resistant, 12.7 mm thick. To ASTM C1396M-latest edition, as manufactured by Canada Gypsum Company Ltd., Domtar Construction Materials and Westrock Industries Ltd.
- .2 **Gypsum Board Fasteners:**
 - .1 Corrosion resistant screws and hexagon steel plates to meet factory mutual approval to CSA B35.3-latest edition.
- .3 **Gypsum Board Adhesive**
 - .1 Description: Solvent-based polyurethane adhesive that can be applied by ribbons or spots.
 - .2 Properties:

.1	Solids by weight (%):	86
.2	Flash Point (ASTM D-93):	22°C (72°F)
.3	Cure Time (25°C):	2 hours
.4	Complete Cure (25°C):	7 days

Specified Product: Coltack by Soprema or equal by Tremco.

.4 Primer

- .1 Primer for heat welded membranes:
 - .1 Description: A blend of elastomeric bitumen, volatile solvents and adhesive enhancing additives used to prime concrete or metal substrates to enhance the adhesion of torch-applied waterproofing membranes. Specified product: Elastocol 500 By Soprema or equal by Tremco.

.5 Vapour Barrier

.1 Oxidized Bitumen Vapour Barrier:

.1 Description: Oxidized bitumen and glass fleece reinforced membrane. Nominal thickness 1.2 mm. Both surfaces are sanded.

.2 Specified product: SOPRAGLASS 40 by SOPREMA.

.6 Bitumens (Asphalt)

.1 Bitumen shall conform to CSA Standard A123.4M-04, Asphalt Type III for all roof areas and surfaces, including sloped insulation, fibreboard and flashings.

.7 Insulation Adhesive:

.1 Description: Solvent-based polyurethane bitumen adhesive that can be applied by ribbons or spots.

.2 Properties:

Solids by weight (%):	86
Flash Point (ASTM D-93):	22°C (72° F)
Cure Time (25°C):	2 hours
Complete Cure (25° C):	7 days

.3 Specified product: COLTACK by SOPREMA.

.8 Bituminous panels:

.1 Description: Multi-ply, semi-rigid asphaltic roofing substrate board composed of a mineral fortified asphaltic core formed between two asphaltic saturated fibreglass liners. Length 1.2 m x width 1.5 m x thickness 12 mm.
Specified product: Sopraboard by Soprema or equal by Tremco.

.9 Roof Insulation

.1 Rigid, closed cell, polyisocyanurate foam, integrally bonded on upper and lower surfaces to inorganic/organic felt facers. Insulation to ASTM C1289-02, Type II, Class 1, Grade 2 and CAN/ULC S704. Board size not to exceed 1200 mm x 1200 mm. Panels to be pre-wrapped to prevent moisture infiltration. Standard of Acceptance: COLGRIP B by SOPREMA

.2 Fibrous glass batts, friction fit to CSA A-101 M1983, Latest Edition.

.10 Sloped Insulation

.1 Sloped/tapered insulation to be rigid, closed cell, polyisocyanurate foam, integrally

bonded on upper and lower surfaces to inorganic/organic felt facers. Sloped insulation to CAN/CGSB 51.26-M86 and CAN/ULC S126-M86. Board size not to exceed 1200 mm x 1200 mm. Panels to be pre-wrapped to prevent moisture infiltration. Standard of Acceptance: Tapered insulation as manufactured by Posi-Slope or Accuplane.

- .2 Insulation slopes and thickness shall be as indicated on detailed drawings and roof plan and shall be, in multiple layer conditions, a distinct separate layer with joints staggered over the underlying layer.
- .3 All valley corners and crickets shall be factory mitred.
- .4 Panels shall be factory cut to correct slopes and clearly marked to match provided shop drawings.
- .5 Tapered panels shall not be less than 13 mm at any point of the roof.

.11 Self-Adhering Waterproof Vapour Retarder Membrane

- .1 Self-adhering waterproof membrane to be comprised of modified asphalt with a consistent layer of adhesive applied to one side. Standard of Acceptance: Colphene 1500 as manufactured by Soprema.

.12 Membrane:

- .1 **Membrane base sheet** - Elastophene 180 P.S. by Soprema or equal by Tremco.

- .1 Description: Roofing membrane shall have a non-woven polyester reinforcement and SBS modified bitumen. Top surface is composed of a thermofusible plastic film and the bottom side is sanded to be adhered in hot asphalt.

- .2 Thermofusible elastomeric asphalt: mix of selected bitumen and SBS thermoplastic polymer. Sopraguard tape: a self-adhesive fire stop membrane composed of a glass fleece reinforcement and SBS modified bitumen by Soprema Inc.

- .3 **Base sheet flashing (ON NON CUMBUSTABLE SURFACES) - SOPRALENE FLAM 180** or equal by Tremco.

- .1 Description: Roofing membrane shall have a non-woven polyester reinforcement and thermofusible elastomeric asphalt. Both sides shall be protected by a thermofusible plastic film. This membrane is to be applied by torching only.

- .2 Components

- .1 Reinforcement: non-woven polyester, 180 g/m².

- .2 Thermofusible elastomeric asphalt: mix of selected bitumen and SBS thermoplastic polymer.

- .4 **Base sheet flashing (ON CUMBUSTABLE SURFACES) SOPRAFLASH FLAM**

STICK or equal by Tremco.

Description: A self-adhesive SBS modified bitumen roofing membrane. A silicone release plastic film protects the self-adhesive under face. The top face is covered with a thermo fusible plastic film to allow the installation of a cap sheet with a torch.

.5 Membrane cap sheet and cap sheet (flashing) - SOPRALENE FLAM 250 GR
or equal by Tremco

.1 Description: Roofing membrane shall have a non-woven polyester reinforcement and thermofusible elastomeric asphalt. The top side shall be self-protected with coloured granules. The colour of granules will be selected from the manufacturer's full range of colours. The underside shall be protected by a thermofusible film. This membrane is to be applied by torching only.

.2 Components

.1 Reinforcement: 250 g/m² of non-woven polyester.

.2 Elastomeric asphalt: mix of selected bitumen and SBS thermoplastic polymer.

.13 Primer for self-adhesive membranes

.1 Description: A blend of elastomeric bitumen, volatile solvents, adhesive enhancing resins used to prime porous substrates and non-porous substrates such as wood, concrete or metal to enhance the adhesion of self-adhesive membranes at temperatures above - 10°C.
Specified product: ELASTOCOL STICK by Soprema or equal by Tremco.

.14 Vapour Barrier Under Roof Curbs and Parapets:

.1 Shall be comprised of Sopraseal stick 1100 vapour barrier as manufactured by Soprema. Use appropriate primer recommended by the vapour barrier manufacturer. Select vapour barrier material that is compatible with roofing membrane.

.15 Mechanical Fasteners

.1 Round top cap nails: 38 mm (1" or 1 ½")

.2 In compliance with CSA B-111-1974 standard, table 12, nails shall be made of galvanized steel, long enough to penetrate the deck by at least 20 mm on flashings and parapet walls.

.16 Walkway Protection

.1 At perimeter of all mechanical units, at roof hatch and elsewhere shown on drawings.

- .2 Acceptable Material: "Sopramat" as manufactured by Soprema or equal by Tremco.
- .17 Accessories:**
- .1 Vent Stack Flashings: to be a spun aluminum sleeve to fit over the vent stack with sufficient space to insulate. A spun aluminum cap to fit outside the sleeve and inside the vent stack. The cap is not to restrict the vent stack inside diameter.
- .2 One (1) granulated cap sheet layer, 1.0 m wide minimum. (around units or walkway)
- .3 Gypsum sheathing joint tape: to be making tape 50 mm in width.
- .4 Sopraguard tape: a self-adhesive fire stop membrane composed of a glass fleece reinforcement and SBS modified bitumen by Soprema Inc.
- .5 Colply Trowel grade adhesive: to glue the Sopramat on granulated cap sheet.
- .6 Alsan Flashing: waterproofing coating for flashing and roof details.
- .7 Sopramastic Alu: joint filling and waterproofing solution to repair and seal joints, holes and cracks in elastomeric membranes.

PART 3 EXECUTION

3.1 WORKMANSHIP

- .1 Do roofing work in accordance with manufacturer's details and specifications.

3.2 PROTECTION

- .1 Cover walls and adjacent work where materials hoisted or used.
- .2 Use warning signs and barriers. Maintain in good order until completion of work.
- .3 Clean off drips and smears of bituminous material immediately.
- .4 Dispose of rain water off roof and away from face of building until roof drains or hoppers installed and connected.
- .5 Protect roof from traffic and damage. Comply with precautions deemed necessary by the Architect.
- .6 At end of each day's work or when stoppage occurs due to inclement weather, provide protection from completed work and materials out of storage.

3.3 SURFACE INSPECTION AND PREPARATION

- .1 Before commencing work, the Roofing Inspector, together with the roofing contractor shall

inspect and approve the deck condition (slopes and nailing supports) as well as plywood on parapet walls, stack vents, vent outlets and others, and expansion or control joints. If applicable, a non-compliance notice shall be submitted to the contractor so that adjustments can be made. Commencement of work shall imply acceptance of surfaces and conditions.

- .2 Before commencing work, all surfaces must be smooth, dry, clean and free of ice and debris. No salt or calcium shall be used to remove ice or snow.
- .3 Check if the work of other trades has been properly completed.
- .4 Do not install materials in conditions of rain, snow or fog.

3.4

EQUIPMENT

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

3.5

DECK COVERING – MECHANICALLY FASTENED

- .1 Mechanically fasten each gypsum board sheathing to the steel deck with a minimum of one (1) fastener per 4 ft². Minimum of two (2) fasteners required for pieces of sheathing 4 ft² or smaller. All fasteners shall penetrate through top of flute a minimum of 13 mm and a maximum of 19 mm. Increase by 50% at all perimeters and corners.
- .2 Place gypsum sheathing board with long axis of each sheet transverse to steel deck ribs, with end joints staggered and fully supported on ribs.
- .3 Terminate ends of boards over the flutes.
- .4 Install joint tape over all joints between boards.
- .5 Where gypsum board seams coincide with a steel deck flute, add galvanized sheets to ensure a continuous support

3.6

PRIMING OF DECK

- .1 Apply primer on substrate at the rate recommended by manufacturer: 0.25 L/m².

3.7

VAPOUR RETARDER (GYPSUM BOARD DECKS)

- .1 Unroll vapour retarder membrane dry onto substrate for alignment purposes. Overlap side laps by 75 mm. and end laps by 150 mm. Laps shall be staggered a minimum of 300 mm. Begin work at bottom of slopes.
- .2 Unroll vapour retarder onto hot asphalt layer and spread at rate of 1 kg/m² to 1.5 kg/m².

- .3 Apply Type III bitumen on roofing at a temperature of about 230°C and heat in kettle at about 250°C (never exceed asphalt's flash point temperature). Follow supplier's recommendations. In cold weather (below 10°C), warm membrane's underface by sweeping torch over roll's entire width.
- .4 The roof vapour retarder must meet and overlap the air/vapour barrier on adjoining walls to ensure total continuity. Adhesive bitumen and membrane must not exceed base sheet by more than 25 mm.
- .5 Install vapour retarder membrane at insulation perimeters and around each element piercing the insulation to ensure sealed connections with base sheet at upstands. Adhesive asphalt and membrane must not exceed base sheet by more than 25 mm.]

3.8 INSULATION APPLICATION

- .1 Insulation shall consist of multiple layers of equal thickness installed in a staggered fashion. The total overall insulation minimum thickness shall be 150 mm.
- .2 Embed insulation using the specified bitumen with minimum EVT of 218 C and at the rate of 2 kg/m².
- .3 Butt insulation boards firmly together without gaps. Ensure long dimension of board runs parallel and rests firmly on flutes. Fit accurately to abutting surfaces. Install only as much insulation as can be covered with the roof membrane in each working day. This requirement shall be strictly enforced. Secure all remaining layers of insulation by setting boards into a full mop coat of asphalt.
- .4 At drain install 1:50 sloped insulation sump in a single layer, finish insulation flush with surrounding insulation.
- .5 Cut end pieces to suit.
- .6 Install sloped insulation in areas indicated on the drawings, set into a full mop coating of bitumen. Ensure modules are placed in parallel rows, in a predesigned order and as indicated on the shop drawings.

3.9 PROTECTION/BOARD OVERLAY

- .1 Apply the specified protection board fully covering insulation. The protection board shall be firmly embedded in a solid uniform mopping of Type III bitumen. Joints between layers must be staggered and boards walked-in. Install long side running perpendicular to the slope.

3.10 BASE SHEET APPLICATION

- .1 Ensure base sheet is unrolled to enable membrane to fully relax prior to installation. Relaxation time will vary with weather conditions, consult manufacture's installation guidelines.

- .2 Ensure base sheet membrane is installed parallel to the long side of the underlying insulation cap sheet.
- .3 Commencing at the lowest point of the roof, embed the base sheet in a full mop coat of approximately 1.2 kg/m² of bitumen. Apply base sheet with 75mm side laps and 150mm end laps. Extend the base sheet up verticals 50mm above the top of the cant in a full mop coat of bitumen and nail above the top of the cant at 225mm on centres.
- .4 Torch weld all lap joints by heat softening the membrane and pressing the edge of the membrane firmly with a roofing trowel.
- .5 Apply bitumen not more than 1.5m ahead of membrane as it is being applied, while ensuring complete bonding."

3.11 INSTALLATION OF FLAME-STOP MEMBRANES

- .1 Adhere the membrane directly onto an approved substrate by peeling back the silicone release film. SOPRAGUARD TAPE is designed to prevent flames from penetrating into empty spaces and openings while installing heat-welded membranes.
- .2 Unroll the flame-stop membrane onto the insulation without adhering, being careful to overlap adjacent strips to ensure that the flame will not come in contact with the insulation.

3.12 BASE SHEET STRIPPING (FLASHING) APPLICATION

- .1 Base-Sheet Flashing Installation (Self Adhered)
 - .1 Apply base sheet flashing only once primer coat is dry.
 - .2 Before applying membranes, always remove the plastic film on the section to be covered if there is an overlap (inside and outside corners and field surface). For sanded base sheet membranes, apply ELASTOCOL STICK to the area to be covered at the foot of the parapets.
 - .3 Position the pre-cut membrane piece. Peel back 4 to 6 inches (100 to 150 mm) of the silicone release paper to hold the membrane in place at the top of the parapet.
 - .4 Then, gradually peel back the remaining silicone release paper, pressing down on the membrane with an aluminium applicator to ensure good adhesion. Use the aluminium applicator to ensure a perfect transition between the upstand and the field surface. Smooth the entire membrane surface with a roller for full adhesion.
 - .5 Cut off corners at end laps to be covered by the next roll.
 - .6 Install a reinforcing gusset in all inside and outside corners.

Always seal overlaps at the end of the workday.

3.13 CAP SHEET INSTALLATION

- .1 Once the base sheet and stripping has been applied and does not show any defects, the cap sheet can then be laid.
- .2 Cap sheet shall be unrolled starting from the low point of the roof. Cap sheet shall be rerolled from both ends prior to torching. Care must be taken to ensure alignment of the first roll (parallel with the edge of the roof).
- .3 Cap sheet shall be torch welded on to the base sheet membrane. During this application, both surfaces shall be simultaneously melted, forming an asphalt bead that shall be pushed out in front of the cap sheet.
- .4 Base sheet and cap sheet seams shall be staggered a minimum of 300 mm.
- .5 Cap sheet shall have side laps of 75 mm and end laps 150 mm. Surface granules on end laps must be embedded prior to installation of following sheet.
- .6 After installation of the cap sheet, check all lap seams on the cap sheet.
- .7 Avoid excessive asphalt seepage.
- .8 Bleed-out of damaged surface areas shall be corrected with matching colour granules.

3.14 CAP SHEET STRIPPING (FLASHING) INSTALLATION

- .1 Cap sheet stripping shall be laid in strips one metre wide. Side laps shall be 75 mm and shall be staggered a minimum of 100 mm from cap sheet laps in order to avoid excessive thickness.
- .2 Using a chalk line, lay-out a straight line on the cap sheet surface, parallel to roof edge, 150 mm inside the roof from the base of the cant strip.
- .3 Using a torch and round nosed roofing trowel, embed the surface granules into the heated and soft bitumen, from the chalk line to the edge of the cap sheet.
- .4 Cap sheet stripping shall be torch welded directly on its base sheet, proceeding from bottom to top. Torching shall soften the two membranes and ensure a uniform weld.
- .5 Cap sheet stripping shall be applied to extend down outside face of exterior edge, across top of parapet, down interior vertical surface and on to flat roof a distance of 150 mm, to the extent of area of embedded granules. Cut roll into required lengths and use width of roll (1 metre) down length of roof, maintaining specified 75 mm side laps.

3.15 WALKWAY INSTALLATION

- .1 At walkway locations, prime existing cap sheet and torch apply an additional ply of cap sheet at all locations where the sopramat walkway is to be installed.

- .2 Adhere sopramat walkway pads using Colply adhesive as recommended by the manufacturer. Install with 25 mm spacing to allow for expansion.

3.16 VENT FLASHINGS

- .1 Install spun aluminum vent stack covers at all vent pipes. Extend vent pipes as required to a minimum height of 400 mm above the completed membrane surface. Provide sufficient allowance for pipe expansion or contraction.
- .2 Prime aluminum flange, centre over existing vent stack and set into a coat of hot asphalt on top of base sheet. Flash with one (1) ply of base sheet membrane for reinforcement, to extend a minimum of 200 mm beyond flange. Complete installation with the application of the cap sheet membrane.
- .3 Install batt insulation between vent stack and aluminum stack flashing, and seal top of insulation.
- .4 Caulk as detailed.
- .5 Secure caps with self-tapping screws.

3.17 ROOF DRAINS

- .1 Co-ordinate the roof drain installation with Section 15400 - Plumbing.
- .2 Ensure the integrity of the vapour barrier is maintained, where applicable.
- .3 Install base sheet, a reinforcing ply of base sheet flashing material (180 gram/m², torch applied) 1.0 m x 1.0 m centred over the drain and then complete the cap sheet application over the first two plies. Extend the cap sheet under the clamping ring. De-granulate membrane prior to installation.
- .4 Trim roofing membrane and set clamping ring.

3.18 ROOF PENETRATIONS

- .1 Install vent stack covers and other roof penetration flashings and seal to membrane in accordance with the manufacturer's recommendations and details.

3.19 COMPLETION OF DAY'S WORK

- .1 Install water cut-offs at the end of each day's work; remove completely prior to continuing further roofing applications.
- .2 Inspect all laps of the membrane application to ensure they are properly bonded. Repair

any deficiencies prior to leaving the site for the day.

- .3 Base sheet applications should not be left exposed over night unless all seams are torch welded and all fasteners are covered prior to leaving the work site.
- .4 Provide a two (2) hour fire watch at the end of each day when torching membrane. Walk the entire production area to check for smoke and hot spots.

3.20 EXISTING ROOFING

- .1 Where indicated on drawings, overlap new modified bituminous roofing system with existing roofing system. Repair and make good in all areas affected by new construction.
- .2 Provide new insulation, vapour barrier, sheathing board, bituminous panels where required and indicated on drawings.

3.21 GENERAL

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

3.22 FIELD QUALITY CONTROL

- .1 Inspection and testing of roofing application will be carried out by testing laboratory designated by Owner.
- .2 Owner will pay for tests as specified in Section 01410 - Testing and Field Reviews.

END OF SECTION

PART 1 GENERAL

1.1 RELATED WORK

- | | | |
|----|---|-------------------|
| .1 | Safety Requirements | Section 01545 |
| .2 | Installation of metal through-wall flashings and fire stops | Section 04150 |
| .3 | Plywood parapet strips, blocking, curbs and nailing strips | Section 06100 |
| .4 | Spray-in-place Urethane Insulation | Section 07216 |
| .5 | Fire Stopping and Smoke Seals | Section 07270 |
| .6 | Modified Bituminous Roofing (Conventional) | Section 07525 |
| .7 | Sealants | Section 07900 |
| .8 | Mechanical and Electrical | Refer to Drawings |

1.2 DISPOSAL

- .1 Be responsible for the safe disposal of all debris from the job site.

1.3 GENERAL

- .1 Install all sheet metal caps, counter flashings, and all other metal flashings required to complete roofing installation.
- .2 Form to profiles as detailed upon the drawings, or as required to suit site conditions.
- .3 Supply pre-formed metal fire stops for exterior wall cavities for installation by other trades. Refer to drawing for details.

1.4 SAMPLES

- .1 Submit samples of sheet metal flashing specified before samples proceeding with the work, showing proposed method of shaping, forming, jointing and fastening.
- .2 Submit samples if approval of substitutions is requested.

1.5 WORKMANSHIP

- .1 Sheet metal flashing work shall be carried out in accordance with the best standard practices; with joints locked, cleated, caulked as required and exposed edges hemmed. Ample allowance shall be made in all work for expansion and contraction.
- .2 Mitred corners shall be straight and true to profiles shown on drawings, with flat surfaces free of distortion and free of face nailing.

1.6 REFERENCES

- .1 Standard practices, unless otherwise noted herein, shall be deemed to constitute recommended procedures published in S.M.A.C.C.N.A. Architectural Manual.

1.7 WARRANTY

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

PART 2 PRODUCTS

2.1 SHEET METAL MATERIALS

- .1 Sheet steel shall be 0.61 mm (24 gauge) minimum thickness, commercial quality to ASTM A526M, galvanized with G90 zinc coating conforming to ASTM A653M.
- .2 Where a metal flashing is in contact with dissimilar metal, use separation sheet or back paint to suitable thickness to prevent electrolytic action.
- .3 Roof scuppers shall be 3 mm thick pre-finished aluminum to AA 1100 H14 or AA 003 H14 alloy. Finish: Duranar XL-2 exotic coating as manufactured by PPG. Colour to later selection from manufacturer's standard range of colours.
- .4 Cavity Wall Fire Stopping: 18 gauge minimum thickness, commercial quality to ASTM A526M, galvanized with G90 zinc coating conforming to ASTM A653M.

2.2 PREFINISHED STEEL SHEET

- .1 Finish: factory applied coating to from P.D. 8000+ Series to ASTM D1005 and CGSB-93-GP-3M.
- .2 Colour to match existing.

2.3 SEALANTS

- .1 In accordance with Section 07900, colour shall match colour of flashing, one component polyurethane.

2.4 STARTER STRIP

- .1 Starter strips to be manufactured from the same type of material used for cap and counter flashings, and shall be a minimum thickness of .71mm.

2.5 FASTENING CLEATS

- .1 Fastening cleats to be manufactured from the same type of material used for cap and counter flashings and a minimum of 0.71mm.

2.6 UNDERLAY/SEPARATION SHEET

- .1 No. 15 perforated asphalt felt.

2.7 FASTENERS

- .1 Of same material as sheet metal, galvanized flat head roofing nails to CSA B111-latest edition, of length and thickness suitable for metal flashing application.
- .2 Cadmium plated screws, colored head.

2.8 ACCESSORIES

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement: to CAN/CGSB-37.5-latest edition.
- .3 Underlay for metal flashing: No. 15 perforated asphalt felt to CSA A123.3-latest edition.
- .4 Sealants: in accordance with Section 07900, colour shall match colour of flashing. Only sealants listed on CGSB Qualified Products List are acceptable for use on this project.

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

2.9 FABRICATION

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

2.10 METAL FLASHINGS

- .1 Form flashings, copings and fascias to profiles indicated.

2.11 REGLETS AND CAP FLASHINGS

- .1 Form and cut recessed reglets and metal cap flashing of 0.6 mm thick prefinished sheet metal to be built into masonry work as detailed and in accordance with CRCA FL series details. Provide slotted fixing holes and steel/plastic washer fasteners.

2.12 ROOF SCUPPERS

- .1 Fabricate from 3 mm thick pre-finished aluminium to details and dimensions shown on drawings.

PART 3 EXECUTION

3.1 INSTALLATION

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

3.2 ANCHORS

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

3.3 COUNTER FLASHING

- .1 Install metal counter flashes as soon as possible after membrane flashes are in place and accepted by Consultant.
- .2 Counter flashing shall have crimped bottom edge, stiffening break and shall extend at least 450 mm up verticals and extend down verticals as detailed.
- .3 Where detailed, turn top edge of flashing into walls, secure with lead wedge or friction fit pins into reglet and caulk joint at wall.
- .4 Secure sections of metal in S-lock joints and allow for sufficient expansion and contraction between each piece.
- .5 Secure metal counter flashing a minimum of 300 mm above roof membrane. Use fasteners of sufficient length to penetrate at least 25 mm into substrate.

3.4 CAP FLASHING

- .1 Supply and install continuous metal starter strips, secure at 600 mm o.c. maximum of 50 mm above drip edge, with fastener of sufficient length to penetrate a minimum of 25 mm into substrate.
- .2 Supply and install metal cleats at 600 mm o.c. and as detailed. Use fastener of sufficient length to penetrate a minimum of 25 mm into substrate.
- .3 Use concealed fastenings except where approved by consultant.
- .4 Secure sections of metal in S-lock joints, and allow for sufficient expansion and contraction between each piece.
- .5 Form cap flashes to profiles as shown on the detail drawings. Ensure positive drainage to the interior (roof surface) areas.
- .6 At junction between new and existing building, replace nearest existing metal cap flashing with new material. Fabricate to suit new condition.

3.5 REGLETS

- .1 Reglets that are not of sufficient height, are not to be reused. New reglets are to be cut at suitable height and are to be a minimum of 19 mm wide and 25 mm deep.

3.6 SEALANTS

- .1 Install caulking in accordance with manufacturer's latest recommendations and Section 07900.
- .2 Provide foam backer rod for joints greater than 19mm wide and 25mm deep, prior to installing caulking compound.
- .3 Tool finish to satisfaction of Consultant.

3.7 CLEAN UP

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

END OF SECTION

PART 1 GENERAL

1.1 RELATED WORK

- .1 Masonry Procedures Section 04050
- .2 Architectural Woodwork Section 06400
- .3 Firestopping and Smoke Seals Section 07270
- .4 Caulking in connection with roof flashing Section 07525
Section 07620
- .5 Caulking between members of aluminum frames and screens Section 08120
- .6 Caulking between members of aluminum windows Section 08520
- .7 Acoustical caulking Section 09250

1.2 SAMPLES

- .1 Submit duplicate samples of each type of material and colour to be used in accordance with Section 01340.
- .2 Cure samples under conditions anticipated at job site during application.

1.3 ENVIRONMENTAL AND SAFETY REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets 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.

1.4 WARRANTY

- .1 Repair or replace any caulking that runs, cracks or otherwise shows sign of failure within five (5) years from the date of the Certificate of Substantial Performance.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Primers: type recommended by sealant manufacturer.
- .2 Joint Fillers:
 - .1 General: compatible with primers and sealants, oversized 30 to 50%.
 - .2 Joint backing rod: round, non-gassing, polyurethane foam, closed-cell polyethylene, non-bleeding neoprene or butyl rod. Installed under the manufacturer's recommended compression. Note: joint backing and adjoining substrates must be thoroughly dry.
 - .3 Polyurethane and/or polyethylene: to shore A hardness 20, tensile strength 140 to 200 kPa.
 - .4 Neoprene or butyl rubber: to shore A hardness 70.
 - .5 Caution: do not install more joint backing than can be sealed the same day.
- .3 Bond breakers:
 - .1 Adhesive backed, pressure sensitive, polyethylene or PVC bond breaker tape to prevent three-sided adhesion and which will not bond to sealants.
 - .2 Acceptable Products: 470 tape or 481 tape by 3M.
- .4 Sealants:
 - .1 For exterior applications:
 - .1 Use three component, chemically curing, epoxidized polyurethane terpolymer sealant to CAN/CGSB 19.24-M-latest edition, Type II, Class B.
 - .2 Acceptable Material: Dymeric 240 epoxidized polyurethane sealant as manufactured by Tremco Incorporated.
 - .2 For interior application:
 - .1 One part acrylic to CGSB 19-GP-17M Tremco Acrylic 834.
- .5 Colour of sealants:
 - .1 To be selected from Tremco Standard "Colour-Paks".
 - .2 Aluminum windows/doors (exterior) - to be selected later by the Architect. Allow for six (6) different colours.
 - .3 Aluminum windows/doors (interior) - to match aluminum colour.
 - .4 Steel doors (interior and exterior) - to match colour of door frame.
 - .5 Brick control joints - to match colour of adjacent brick.
- .6 Compressible seal: permanently elastic, precompressed, latex modified asphalt-impregnated, high density open celled polyurethane foam strip. Size as recommended by manufacturer for joint to be sealed. Degree of compression: 25%.
 - .1 Acceptable material: Emseal expanding foam sealant as manufactured by Emseal Corporation, depth to suit joint dimension and as recommended by manufacturer.

- .7 Joint cleaner: xylol, methylethyleketon or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

PART 3 EXECUTION

3.1 PREPARATION

- .1 Remove dust, paint, loose mortar and other foreign matter. Dry joint surfaces.
- .2 Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.
- .3 Remove oil, grease and other coatings from non-ferrous metals with joint cleaner.
- .4 Prepare metal, concrete, masonry, gypsum board, glazed and vitreous surfaces to sealant manufacturer's instructions.
- .5 Examine joint sizes and correct to achieve depth ratio 1/2 of joint width with minimum width and depth of 6 mm, maximum width 25 mm.
- .6 Install joint filler to achieve correct joint depth.
- .7 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .8 Apply bond breaker tape where required to manufacturer's instructions.
- .9 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.2 APPLICATION

- .1 Apply sealants, primers, joint fillers, compressible seal, and bond breakers as indicated to manufacturer's instructions. Apply sealant using gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.
- .2 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities. Neatly tool surface to a slight concave joint.
- .3 Apply sealant to joints between window or door frames to adjacent building components, around perimeter of every external opening, to control joints in masonry walls, concrete slabs and in addition where indicated.
- .4 Clean adjacent surfaces immediately and leave work neat and clean. Remove excess sealant and droppings using recommended cleaners as work progresses. Remove masking after tooling of joints.

3.3 EXTENT OF CAULKING

- .1 Provide caulking in all locations indicated in various specification sections as shown on drawings and in addition where noted below.
- .2 Provide caulking at the perimeter of all door and window frames, glazed metal screens, and at window flashings where they butt adjacent materials.
- .3 At exterior door thresholds spread a bead of caulking compound over entire length at least 3.2 mm thick before installing threshold.
- .4 Provide caulking where countertops and countertop splashbacks and sides butt against vertical surfaces.
- .5 Caulk at perimeter of all drinking fountains, tops and sides of urinals, bases of water closets, around mechanical access panels, and top of ceramic tile bases.
- .6 Caulk at all interior and exterior masonry control and expansion joints.
- .7 Except where noted otherwise, caulk at junctions between gypsum board and all dissimilar surfaces.

END OF SECTION