

Part 1 General

1.1 SECTION INCLUDES

- .1 Cold applied asphalt bitumen dampproofing.
- .2 Drainage panels.

1.2 RELATED SECTIONS

- .1 Structural Specifications
- .2 Section 07 21 13 – Board, Semi Rigid & Acoustic Insulation.

1.3 REFERENCES

- .1 ASTM D41-05 - Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
- .2 ASTM D449-03(2008) - Asphalt Used in Dampproofing and Waterproofing.
- .3 ASTM D1227-95(2007) - Emulsified Asphalt Used as a Protective Coating for Roofing.
- .4 ASTM D1187-97(2002)e1 - Test Method for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
- .5 ASTM D4479-07 - Asphalt Roof Coatings - Asbestos-Free
- .6 ASTM D4586-07 - Asphalt Roof Cement, Asbestos-Free
- .7 CGSB-37-GP-9Ma-83 - Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
- .8 CAN/CSA-A123.4-04 (R2008) - Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems
- .9 NRCA (National Roofing Contractors Association - USA) - Roofing and Waterproofing Manual.

1.4 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide properties of primer, bitumen, and mastics.

1.5 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements indicating special procedures and perimeter conditions requiring special attention.

1.6 QUALITY ASSURANCE

- .1 Perform Work in accordance with NRCA Waterproofing Manual.
- .2 Applicator Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.

1.7 ENVIRONMENTAL REQUIREMENTS

- .1 Do not proceed with work when wind chill or temperature would adversely effect the bitumen products before proper curing takes place.
- .2 Do not apply dampproofing in wet weather.

Part 2 Products

2.1 MANUFACTURERS

- .1 Bakor; Product: 710-11 Bituminous Dampproofing.
- .2 Other acceptable manufacturers offering functionally equivalent products.
 - .1 Elsro; Product: 505.
- .3 Substitutions: Refer to Section 01 62 00.

2.2 ASPHALTIC MATERIALS

- .1 Asphalt: CAN/CSA-A123.4 ASTM 449, Type I.
 - .1 Solvent-Based Asphalt Mastics: Cold-applied, asbestos-free, non-fibered asphalt compounds for exterior concrete surfaces below grade.
- .2 Asphalt Primer: CGSB-37-GP-9Ma, ASTM D41 Type 1, compatible with substrate.
- .3 Sealing Mastic: ASTM D4586, asbestos-free asphalt cement for trowel application.

2.3 ACCESSORIES

- .1 Protection Board: Rigid insulation specified in Section 07 21 13 - Board & Semi Rigid Insulation.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verification of existing conditions before starting work.
- .2 Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.
- .3 Verify items which penetrate surfaces to receive dampproofing are securely installed.

3.2 PREPARATION

- .1 Protect adjacent surfaces not designated to receive dampproofing.
- .2 Clean and prepare surfaces to receive dampproofing to manufacturer's written instructions.
- .3 Do not apply dampproofing to surfaces unacceptable to manufacturer or applicator.
- .4 Apply mastic to seal penetrations, small cracks, or minor honeycomb in substrate.

3.3 APPLICATION

- .1 Prime surfaces to manufacturer's instructions.
- .2 Apply bitumen dampproofing with mop, roller, or by spray application in accordance with manufacturer's instructions best suited for Site application.
- .3 Before applying dampproofing, seal cracks and holes around pipes and other services using sealing compound applied in accordance with manufacturer's instructions.
- .4 Apply bitumen continuous and uniform, at a rate of 1.5 L/sq m (3.6 gal/100 sq ft), to provide a minimum thickness of 3 mm (1/8 inch).
- .5 Apply from 50 mm (2 inches) below finish grade elevation to bottom of grade beams.
- .6 Apply two additional coats to all vertical corners and construction joints for a minimum width of 225mm (10 inches) of each side and all around and for 225mm (10 inches) along pipe passing through walls.
- .7 Seal items projecting through dampproofing surface with mastic. Seal watertight.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Board insulation at roof and exterior cavity wall construction, perimeter foundation wall, and exterior wall behind wall finish.
- .2 Board insulation where indicated on Drawings.

1.2 RELATED SECTIONS

- .1 Structural Specifications
- .2 Section 04 22 00 – Concrete Unit Masonry.
- .3 Section 07 26 00 - Vapour Retarders: Vapour retarder materials to adjacent insulation.
- .4 Section 07 52 00 - Modified Bituminous Membrane Roofing.

1.3 REFERENCES

- .1 ASTM C208-08a - Cellulosic Fibre, Insulating Board.
- .2 ASTM C552-07 - Cellular Glass Thermal Insulation.
- .3 ASTM C578-09e1 - Rigid, Cellular Polystyrene Thermal Insulation.
- .4 ASTM C591-09 - Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
- .5 ASTM C612-09 - Mineral Fibre Block and Board Thermal Insulation.
- .6 ASTM C1126-04 - Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation.
- .7 ASTM C1289-08e1 - Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- .8 ASTM E84-09c - Test Method for Surface Burning Characteristics of Building Materials.
- .9 ASTM E96/E96M-05 - Test Methods for Water Vapor Transmission of Materials.
- .10 ASTM D 1621 - Standard Test Method for Compressive Properties Of Rigid Cellular Plastics.
- .11 CAN/ULC-S102-07 - Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .12 CAN/ULC-S701-05 - Thermal Insulation, Polystyrene, Boards and Pipe Covering.
- .13 CAN/ULC-S702-09 - Thermal Insulation, Mineral Fibre, for Buildings.
- .14 CAN/ULC-S703-09 - Cellulose Fibre Insulation (CFI) for Buildings.

- .15 CAN/ULC-S704-03 - Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
- .16 CAN/ULC-S706-09 - Wood Fibre Thermal Insulation for Buildings.

1.4 SYSTEM DESCRIPTION

- .1 Materials of This Section: Provide continuity of thermal barrier at building enclosure elements in conjunction with thermal insulating materials in Section 07 21 19.
- .2 Materials of This Section: Provide thermal protection to vapour retarder in conjunction with vapour retarder materials in Section 07 26 00.
- .3 Materials of This Section: Provide thermal protection to air seal materials at building enclosure elements in conjunction with air barrier materials.

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 Coordinate the work with Section 07 26 00 for installation of vapour retarder.
 - .3 Coordinate the work with Section 07 52 00 for the installation of Modified Bitumen Membrane Roofing.

1.6 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data on product characteristics, performance criteria, and limitations.

1.7 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.

1.8 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Closeout Procedures.

1.9 ENVIRONMENTAL REQUIREMENTS

- .1 Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

Part 2 Products

2.1 INSULATION MATERIALS

- .1 Extruded Polystyrene Insulation (XPS) (**below grade**): CAN/ULC-S701, Type 4; cellular type, conforming to the following:

- .1 Thermal Resistance @ 24°C: RSI-0.87 (R-5.0).
- .2 Board Thickness: as indicated on Drawings.
- .3 Board Edges: Butt edges.
- .4 Flame/Smoke Properties: to CAN/ULC-S102.
- .5 Product: Styrofoam SM, manufactured by Dow.
- .2 Cavity Wall Insulation: Extruded polystyrene: to CAN/ULC-S701, Type 3, rigid, closed cell type, with integral high density skin. Thermal resistance aged RSI value of 0.97/25mm(1"). Compressive strength of minimum 170 kPa. Water absorption to ASTM D2842, 0.7% by volume maximum. Thickness and RSI (R) as indicated.
 - .1 Standard of Acceptance:
 - .1 DOW Cavitymate Ultra
 - .2 Celfort High-R CW Plus
- .3 Mineral Fibre Insulation: CAN/ULC-S702 Type 1 ASTM C665 Type 1, glass fibre, semi-rigid board, with the following characteristics:
 - .1 Board Density: 64 kg/cu m (4.0 lb/cu ft).
 - .2 Thermal Resistance: RSI-0.72 (R-4.1).
 - .3 Board Thickness: As shown on Drawings.
 - .4 Facing: Unfaced.
 - .5 Board Edges: Square.
 - .6 Flame/Smoke Properties: In accordance with CAN/ULC-S102, ASTM E84.
 - .7 Standard of Acceptance:
 - .1 AFB (Acoustical Fire Batt); manufactured by Roxul.
- .4 Roof Insulation.
 - .1 Refer to Section 07 52 00 - Modified Bituminous Membrane Roofing

2.2 ADHESIVE MATERIALS

- .1 Adhesive Type 1: Type recommended by insulation manufacturer for application.

2.3 ACCESSORIES

- .1 Sheet Vapour Retarder: Specified in Section 07 26 00.
- .2 Tape: Polyethylene self-adhering type, mesh reinforced, 50 mm (2 inch) wide.
- .3 Insulation Fasteners: Impaling clip of galvanized steel with washer retainer, to be mechanically fastened to surface to receive board insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verify existing conditions before starting work.

- .2 Verify that substrate, adjacent materials, and insulation boards are dry and ready to receive insulation and adhesive.
- .3 Verify substrate surface is flat, free of honeycomb, fins, irregularities and materials or substances that may impede adhesive bond.

3.2 INSTALLATION – ACOUSTIC INSULATION

- .1 Refer to Drawings.

3.3 INSTALLATION - FOUNDATION PERIMETER

- .1 Install rigid insulation on concrete foundation walls and concrete grade beams using H40 Hilti gun X-1E 6 –50min D152 washer/ fastener spaced 600mm (24”) vertically and horizontally or with purpose made multi-clinch metal strip c/w Gripcon® nail. Set metal strip flush into cut rigid insulation at 600mm (24”) spacing.
- .2 Install boards on foundation wall and grade beam perimeter, as best suited to maintain thermal continuity.
 - .1 Place boards in a method to maximize contact bedding.
 - .2 Stagger side/ end joints.
 - .3 Butt edges and ends tight to adjacent board and to protrusions.
- .3 Cut and fit insulation tight to protrusions or interruptions to the insulation plane.

3.4 INSTALLATION - EXTERIOR WALLS

- .1 Apply adhesive in three (3) continuous beads per board length.
- .2 Install boards on wall surface, vertically. Place membrane surface of insulation against adhesive.
- .3 Place boards in a method to maximize contact bedding. Stagger end joints. Butt edges and ends tight to adjacent board and to protrusions.
- .4 Cut and fit insulation tight to protrusions or interruptions to the insulation plane.
- .5 Tape insulation board joints.

3.5 PROTECTION OF FINISHED WORK

- .1 Section 01 78 40: MAINTENANCE REQUIREMENTS.
- .2 Do not permit work to be damaged prior to covering insulation.

END OF SECTION

1.1 SECTION INCLUDES

- .1 Foamed-in-place insulation in roof assembly and at exterior wall crevices requiring a thermal seal.
- .2 Foamed-in-place insulation at junctions of dissimilar wall and roof materials to achieve a thermal and air seal.

1.2 RELATED SECTIONS.

- .1 Section 07 21 13 - Board, Semi Rigid & Acoustic Insulation
- .2 Section 07 26 00 - Vapour Retarders
- .3 Section 07 52 00 - Modified Bituminous Membrane Roofing
- .4 Section 08 41 13 – Aluminum Framed Entrances and Store Fronts.
- .5 Section 08 44 13 – Glazed Aluminum Curtain Walls.
- .6 Structural Specifications

1.3 REFERENCES

- .1 ASTM C1029-09 - Spray-Applied Rigid Cellular Polyurethane Thermal Insulation.
- .2 ASTM E84-09c - Test Method for Surface Burning Characteristics of Building Materials.
- .3 CAN/ULC-S102-07 - Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .4 CAN/ULC-S705.1-01 - Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density - Material - Specification.
- .5 CAN/ULC-S705.2-05 - Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density, Installer's Responsibilities - Specification.
- .6 The Canadian Urethane Foam Contractors Association (CUFCA).

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 Coordinate work to ensure timely placement of insulation within construction spaces.

1.5 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.

- .2 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience, and licensed and certified by the SPF Quality Assurance Program used by CUFGA.

1.6 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for flame and smoke and concealment requirements.

1.7 ENVIRONMENTAL REQUIREMENTS

- .1 Do not install insulation when ambient temperature is lower than 21 degrees C (70 degrees F).

Part 2 Products

2.1 MANUFACTURERS

- .1 Acceptable manufacturers offering functionally and aesthetically equivalent products.
 - .1 CertainTeed Corp.; Product: CertaSpray Closed Cell Foam.
 - .2 BASF; Product: WALLTITE.

2.2 MATERIALS

- .1 Insulation: Spray-applied rigid cellular polyurethane:
 - .1 Thermal Resistance: R-5.8 aged.
 - .2 Compressive Strength (at yield or 10 % deformation): 25 psi.
 - .3 Water Vapor Permeability, max, 1.4 perm-inches.
 - .4 Water Absorption (maximum): 2%.
 - .5 Tensile Strength (minimum): 23 psi.
 - .6 Closed cell content (minimum): 88%.
 - .7 Flame Spread (maximum): 500.

2.3 ACCESSORIES

- .1 Primer: As required by insulation manufacturer.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify work within construction spaces or crevices is complete prior to insulation application.
- .3 Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

3.2 PREPARATION

- .1 Mask and protect adjacent surfaces from over spray or dusting.
- .2 Apply primer if required in accordance with manufacturer's written instructions.

3.3 INSTALLATION

- .1 Apply insulation to CAN/ULC-S705.2 and manufacturer's written instructions.
- .2 Apply insulation by spray method, to a uniform monolithic density without voids.
- .3 Apply to a minimum cured thickness as indicated on the Drawings.
- .4 Patch damaged areas.

3.4 FIELD QUALITY CONTROL

- .1 Section 01 45 00: Field inspection and testing.
- .2 Inspection will include verification of insulation thickness.

3.5 PROTECTION OF FINISHED WORK

- .1 Section 01 78 40: Protecting installed work.
- .2 Do not permit subsequent construction work to disturb applied insulation.

3.6 SCHEDULES

- .1 At locations and in thicknesses as indicated on Drawings.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Sheet and sealant materials for controlling vapour diffusion.

1.2 RELATED SECTIONS

- .1 Section 07 11 13 - Bituminous Dampproofing.
- .2 Section 07 21 13 – Board, Semi-Rigid & Acoustic Insulation.
- .3 Section 07 21 19 – Foamed-in-Place Insulation.
- .4 Section 07 52 00 – Modified Bituminous Membrane Roofing
- .5 Section 07 92 00 - Joint Sealants: Sealants.
- .6 Section 08 11 00 - Metal Doors and Frames.
- .7 Section 08 41 13 – Aluminum Framed Entrances and Storefronts.
- .8 Section 08 44 13 - Glazed Aluminum Curtain Walls

1.3 REFERENCES

- .1 ASTM C920-08 - Elastomeric Joint Sealants.
- .2 ASTM C1311-10 - Solvent Release Sealants.
- .3 ASTM E96/E96M-05 - Test Methods for Water Vapour Transmission of Materials.
- .4 CGSB-19-GP-14M-1984 - Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.
- .5 CAN/CGSB-19.13-M87 - Sealing Compound, One-component, Elastomeric, Chemical Curing.
- .6 CAN/CGSB-51.34-M86 - Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.
- .7 SWRI (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specification.

1.4 DEFINITION

- .1 Vapour Retarder: A material or assembly of materials that resists water vapour diffusion through it.

1.5 SYSTEM DESCRIPTION

- .1 Materials and installation methods to provide continuity of vapour retarder:
 - .1 In conjunction with materials described in Section 07 21 13 and 07 21 19.
 - .2 To seal gaps between enclosure components and opening frames.

1.6 PERFORMANCE REQUIREMENTS

- .1 Vapour Permeability (Perm): Maximum water vapour permeance of $57.4 \text{ ng}/(\text{Pa}\cdot\text{s}\cdot\text{m}^2)$ (1.0 perm) measured to CAN/CGSB-51.34, CAN/CGSB-51.33, ASTM E96/E96M.

1.7 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination: Coordinate with other work having a direct bearing on work of this section.
- .3 Sequencing:
 - .1 Sequence Work to permit installation of materials in conjunction with other retardant materials and seals , and air barrier assemblies.
 - .2 Do not install vapour retarder until items penetrating it are in place.

1.8 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.

1.9 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements, including preparation and installation requirements, techniques.

1.10 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Closeout Submittals.

1.11 QUALITY ASSURANCE

- .1 Section 01 4500: Quality Control.

Part 2 Products

2.1 MATERIALS

- .1 Sheet Seal Type 2: Self-adhesive rubberized asphalt bonded to sheet polyethylene, regular temperature, nominal total thickness of 1.5 mm.
 - .1 Product: BAKOR, manufactured by Blue Skin SA.
- .2 Foam-In-Place Seal expansion, spray-applied polyurethane foam insulation.

- .1 Refer to Section – 07 21 19.
- .3 Sheet Retarder: CAN/CGSB-51.34, Clear polyethylene film for under slab grade application and tie in of exiting wall assemblies, 6 mil thick.

2.2 SEALANTS

- .1 Acoustical Sealant: Single component, sound dampering, non-hardening, non-skinning; colour dark grey:
 - .1 Product: Acoustic Sealant, manufactured by Tremco.
 - .2 Cleaner: Non-corrosive type; recommended by sealant manufacturer; compatible with adjacent materials.

2.3 ADHESIVES

- .1 Mastic Adhesive: asphalt type, compatible with sheet barrier and substrate, thick mastic of uniform consistency.
- .2 Adhesive: Compatible with sheet barrier and substrate, permanently non-curing.

2.4 ACCESSORIES

- .1 Thinner and Cleaner for Butyl Sheet: As recommended by sheet material manufacturer.
- .2 Tape: Polyethylene self-adhering type, mesh reinforced, 50 mm (2 inch) wide, compatible with sheet material.
 - .1 Tuck Tape; manufactured by 3M.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify condition of substrate and adjacent materials.

3.2 PREPARATION

- .1 Remove loose or foreign matter which might impair adhesion.
- .2 Clean and prime substrate surfaces to receive adhesive/ sealants in accordance with manufacturers' written instructions.

3.3 INSTALLATION

- .1 Install materials to manufacturer's written instructions.
- .2 Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges or where compatibility with adjacent materials may be in doubt.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Sheathing over deck surface.
- .2 Insulation and overlay board.
- .3 Modified bituminous membrane roofing, and flashings.

1.2 RELATED SECTIONS

- .1 Section 06 10 13 - Wood Blocking and Curbing: Wood nailers.
- .2 Section 06 11 00 – Rough Carpentry.
- .3 Section 07 21 13 – Board, Semi-Rigid and Acoustic Insulation.
- .4 Section 07 62 00 - Sheet Metal Flashing and Trim.
- .5 Mechanical Divisions.
- .6 Electrical Specifications.

1.3 REFERENCES

- .1 ASTM C208-08a - Cellulosic Fibre, Insulating Board.
- .2 ASTM C552-07 - Cellular Glass Thermal Insulation.
- .3 ASTM C578-09e1 - Rigid, Cellular Polystyrene Thermal Insulation.
- .4 ASTM C612-09 - Mineral Fiber Block and Board Thermal Insulation.
- .5 ASTM C726-05e1 - Mineral Fiber Roof Insulation Board.
- .6 ASTM C728-05(2010) - Perlite Thermal Insulation Board.
- .7 ASTM C1002-07 - Steel Self-Piercing, Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- .8 ASTM C1177/C1177M-06 - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- .9 ASTM C1289-07 - Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
- .10 ASTM D41-05 - Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
- .11 ASTM D312-00(2006) - Asphalt Used in Roofing.
- .12 ASTM D2178-04 - Asphalt Glass Felt Used in Roofing and Waterproofing.

- .13 ASTM D2822-05 - Asphalt Roof Cement.
- .14 ASTM D6162-00a(2008) - Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
- .15 ASTM D6163-00(2008) - Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements
- .16 ASTM D6164-05e1 - Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements
- .17 ASTM D6222-08 - Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using Polyester Reinforcements
- .18 ASTM D6223/D6223M-02(2009)e1 - Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
- .19 ASTM D6298-05e1 - Fiberglass Reinforced Styrene-Butadiene-Styrene (SBS) Modified Bituminous Sheet with a Factory Applied Metal Surface.
- .20 CAN/CSA-A123.4-04 (R2008) - Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems.
- .21 CSA-O121-08 - Douglas Fir Plywood.
- .22 CSA-O151-09 - Canadian Softwood Plywood.
- .23 CGSB-37-GP-9Ma-83 - Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
- .24 CAN/CGSB-37-GP-56M-1985- Membrane Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
- .25 CAN/ULC-S107-03 - Methods of Fire Tests of Roof Coverings.
- .26 CAN/ULC-S701-05 - Thermal Insulation, Polystyrene, Boards and Pipe Covering.
- .27 CAN/ULC-S702-09 - Thermal Insulation, Mineral Fibre, Boards for Buildings.
- .28 CAN/ULC-S704-03 - Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Fixed.
- .29 CAN/ULC-S706-09 - Wood Fibre Thermal Insulation for Buildings.
- .30 FM (Factory Mutual) - Roof Assembly Classifications.
- .31 Province of Manitoba Roofing Contractors Association – Roofing Specifications Manual.
- .32 CRCA (Canadian Roofing Contractors' Association) – CRCA Roofing Specifications Manual.
- .33 ULC (Underwriters Laboratories of Canada) - List of Equipment and Materials for:

- .1 Building Materials.
- .2 Fire Resistance.

1.4 SYSTEM DESCRIPTION

- .1 Assembly of components include two (2) ply membrane system, heat-welded, with granulated surface, and insulation.

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 Coordinate the work with the installation of associated metal flashings, as the work of this section proceeds.
- .2 Pre-installation Meetings:
 - .1 Review preparation and installation procedures and coordinating and scheduling required with related work.
 - .2 The roofing material manufacturer to delegate a representative to visit the work Site at commencement of work.
 - .3 The Contractor shall permit and facilitate access to the work Site and roofs to said manufacturer's representative at all times.

1.6 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Shop Drawings: Indicate setting plan for tapered insulation, layout of seams, direction of laps, base flashing details.
- .3 Product Data: Provide product data for membrane, flashing materials, and insulation.

1.7 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements, including special precautions required for seaming the membrane.
- .3 Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.
- .4 Field Reports: Indicate procedures followed, ambient temperatures and wind velocity during application.

1.8 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Closeout Submittals.

1.9 QUALITY ASSURANCE

- .1 Perform Work to CRCA Roofing Specifications Manual and manufacturer's written instructions. Maintain one (1) copy of each document on Site.

- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum five (5) years documented experience and approved by the manufacturer.

1.10 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for roof assembly fire hazard requirements.
- .2 CAN/ULC-S107: Class A Fire Hazard Classification.

1.11 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver products in manufacturer's original containers, dry, undamaged, seals and labels intact.
- .2 Store products in weather protected environment, clear of ground and moisture.
- .3 Stand roll materials on end.

1.12 ENVIRONMENTAL REQUIREMENTS

- .1 Do not apply roofing membrane during inclement weather. Consult manufacture for temperatures requirements prior to membrane application.
- .2 Do not apply roofing membrane to damp or frozen deck surface.
- .3 Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.13 WARRANTY

- .1 Contractor's Warranty: Provide Roofing Contractor Association of Manitoba (RCAM) five (5) year warranty on roofing, dated from time of Substantial Performance.
- .2 Manufacturer's Warranty: Provide a ten (10) year manufacturer's warranty to include coverage for failure to meet specified requirements, including damage to building resulting from failure to prevent penetration of water.

Part 2 Products

2.1 PERFORMANCE CRITERIA

- .1 Compatibility between components of roofing system is essential. Provide written declaration to Contract Administrator stating that materials and components, as assembled in system, meet this requirement.
- .2 Roofing System: to CSA A123.21 for wind uplift resistance.

2.2 VAPOR BARRIER

- .1 Self-adhesive Air/Vapour Barrier: composed of bitumen modified with thermoplastic polymers and high-density polyethylene film. The self-adhesive underface is covered with a silicone release sheet. Water vapour permeability: 0.92 ng/Pa.s.m² (0.016 Perm)
 - .1 Acceptable material:
 - .1 Sopravap'r by Soprema
 - .2 Blueskin SA

2.3 POLYISOCYANURATE INSULATION

- .1 To CAN/ULC-S704, closed-cell polyisocyanurate foam core integrally laminated between two heavy coated-glass facers, thickness as indicated, RSI as indicated.
 - .1 Acceptable material:
 - .1 Top Layer 100mm (4") :
 - .1 Colgrip A by Soprema,
 - .2 Isotherm 3 by IKO
 - .3 approved equal.
 - .2 Bottom: 25mm (1")
 - .1 Colgrip B by Soprema
 - .2 Isotherm 3 by IKO
 - .3 approved equal.

2.4 SLOPED INSULTATION

- .1 Expanded polystyrene (EPS): to CAN/ULC-S701.
 - .1 Type: 2.
 - .2 Refer to drawings for location and required slope.

2.5 RECOVERY BOARD

- .1 Thickness is to be 1/4" and maximum sheet size is to be 4'x4'.
- .2 Two layers over sloped EPS
 - .1 Acceptable material:
 - .1 Soprema Sopraboard,
 - .2 IKO Protecto Board or
 - .3 approved equal.

2.6 MEMBRANE

- .1 Cap Sheet Colour to be BLACK.
- .2 Acceptable material:
 - .1 Soprema Sopralene Flam 180 base sheet with a Sopralene Flam 250 Gr. cap sheet;
 - .2 IKO Torchflex 180 FF with an IKO Torchflex 250 cap or approved equal.

2.7 MEMBRANE PRIMER

- .1 This is to be the primer recommended by the membrane manufacturer being used (for self adhering stripping)

2.8 PITCH BOX FILLER

- .1 Firestone FillGard Pourable Sealer, or approved equal.

2.9 PLUMBING VENT FLASHING

- .1 These shall be Insulated Stack Jack Flashings (with metal cap not neoprene seal) SJ-20 as manufactured by Thaler.

2.10 METAL FLASHING

- .1 Flashing shall be a minimum of 24 gauge in thickness. Metal is to be prefinished and is to be chosen from the standard in stock range of Stelco 8,000 series of colors or approved equal.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that surfaces and Site conditions are ready to receive work.
- .3 Verify deck is supported and secured.
- .4 Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains.
- .5 Verify deck surfaces are dry and free of snow or ice. Verify flutes of metal deck are clean and dry.
- .6 Verify roof openings, curbs, pipes, conduit, sleeves, ducts, and vents through roof are solidly set, and wood nailing strips are in place.

3.2 INSULATION APPLICATION

- .1 Install insulation to manufacturer's written instructions.
- .2 Place tapered thickness insulation to required slope pattern, to manufacturer's written instructions.
- .3 Mechanically fasten the recovery board system. This is to be a minimum of 5 screws and plates per 4' x 4' sheet of recovery board. Note that adhesive can be used in areas of excessive conduit. This must first be accepted by the Contract Administrator.
- .4 The perimeter edges are to have the number of fasteners increased by 50% and the outside corners are to be increased by 75%. The perimeter edge distance is defined as the lesser of:

- .1 10% of the building width or,
- .2 40% of the eave height, with a minimum of 4'.
- .5 Recovery board is to be offset 1" from underlying insulation.
- .6 Lay boards with edges in moderate contact without forcing.
- .7 Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
- .8 Apply no more insulation than can be covered with membrane in same day.

3.3 MEMBRANE APPLICATION

- .1 Apply membrane and primer to manufacturer's written instructions.
- .2 Apply membrane; lap and seal edges and ends permanently waterproof.
- .3 Apply membrane smooth, free from air pockets, wrinkles, or tears. Ensure full bond of membrane to substrate.
- .4 Extend membrane up parapets and onto vertical surfaces as shown on Drawings.
- .5 Seal membrane around roof protrusions and penetrations.
- .6 Provide waterproof cut-off to membrane at end of day's operation. Remove cut-off before resuming roofing.

3.4 FLASHINGS AND ACCESSORIES

- .1 Apply flexible sheet base flashings to seal membrane to vertical elements.
- .2 Secure to nailing strips at 100 mm (4 inches) on centre.
- .3 Coordinate installation of roof drains, curbs and related flashings.
- .4 Seal flashings and flanges of items penetrating or protruding through the membrane.

3.5 FIELD QUALITY CONTROL

- .1 Section 01 45 00: Field inspection testing.
- .2 Require Site attendance of roofing and insulation material manufacturers during installation of the Work.
- .3 Monitor and report installation procedures, unacceptable conditions to Contract Administrator.
- .4 Correct identified defects or irregularities.

3.6 CLEANING

- .1 Section 01 74 00: Cleaning installed work.

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

3.7 PROTECTION OF FINISHED WORK

- .1 Section 01 78 40: Protecting installed work.
- .2 Protect building surfaces against damage from roofing work.
- .3 Where traffic must continue over finished roof membrane, protect surfaces.
- .4 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.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Metal parapet, sill, lintel flashings, metal scuppers, and metal fascia panels.

1.2 RELATED SECTIONS

- .1 Section 07 12 13 - Bituminous Waterproofing.
- .2 Section 07 52 00 - Modified Bituminous Membrane Roofing
- .3 Section 07 92 00 - Joint Sealants.
- .4 Section 09 91 99 - Painting for Minor Works.
- .5 Mechanical Divisions – Heating, Ventilating, and Air-Conditioning (HVAC).
- .6 Electrical Specifications: Flashing sleeves and collars for electrical items protruding through roofing membrane.

1.3 REFERENCES

- .1 ASTM A167-99(2009) - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .2 ASTM A653/A653M-09 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3 ASTM B32-08 - Solder Metal.
- .4 ASTM B101- 07 - Lead-Coated Copper Sheet and Strip for Building Construction.
- .5 ASTM B209M-07 - Aluminum and Aluminum-Alloy Sheet and Plate.
- .6 ASTM D2178-04 - Asphalt Glass Felt Used in Roofing and Waterproofing.
- .7 ASTM D4586-07 - Asphalt Roof Cement, Asbestos-Free.
- .8 ASTM D226-06 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- .9 CAN/CGSB-51.34-M86 - Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .10 CCBDA (Canadian Copper & Brass Development Association) - Copper in Architecture Handbook.
- .11 Province of Manitoba Roofing Contractors Association – Roofing Specifications Manual.
- .12 NRCA (National Roofing Contractors Association - USA) - Roofing and Waterproofing Manual.

- .13 SMACNA (Sheet Metal and Air Conditioning Contractors' National Association) - Architectural Sheet Metal Manual.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.

1.5 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submittal Procedures.
- .2 Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.6 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submittal Procedures.
- .2 Installation Data: Manufacturer's special installation requirements.

1.7 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Closeout Submittals.

1.8 QUALITY ASSURANCE

- .1 Perform Work to NRCA standard details and requirements. Maintain one (1) copy of each document on site.
- .2 Fabricator Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.

1.9 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Common Product Requirements.
- .2 Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- .3 Prevent contact with materials which may cause discolouration or staining.

Part 2 Products

2.1 SHEET MATERIALS

- .1 Pre-Coated Galvanized Steel: ASTM A653/A653M, Z275 (275 g/m²), (G90 (0.90 oz/ft²) zinc coating designation; 0.6 mm (24 gauge) unless indicated otherwise on Drawings.

- .2 Galvanized Steel: ASTM A653/A653M, Z275 (G90) zinc coating designation; 0.6 mm (24 gauge) unless otherwise indicated on Drawings.
- .3 Zinc: ASTM B69-11-Architectural Rolled Zinc - Type 2 Architectural Rolled Zinc. Type graphite-grey zinc. 0.7mm (22gauge).
 - .1 Standard of Acceptance: Rheinzink – Protect Line Graphite Grey
 - .2 Refer to Alternative No. 4 in Section 01 23 10.

2.2 ACCESSORIES

- .1 Fasteners: Same material and finish as flashing metal.
- .2 Primer: Zinc chromate type.
- .3 Protective Backing Paint: Bituminous.
- .4 Sealant: Type specified in Section 07 92 00.
- .5 Bedding Compound: Rubber-asphalt type.

2.3 FABRICATION

- .1 Form sections true to shape, accurate in size, square, and free from distortion or defects.
- .2 Fabricate cleats of same material as sheet, minimum 100 mm (4 inches) wide, interlockable with sheet.
- .1 Shop fabricate metal flashing and trim components to the maximum length possible, forming metal work with clear, sharp, straight and uniform bends and rises. Hem exposed edges of flashings 12mm (1/2") to the underside.
- .2 Form flashing components from single full width sheet. Provide shop fabricated mitred corners, joined using closed end pop rivets and joint sealant.
- .3 Fabricate related sheet metal work in accordance with approved shop drawings and applicable standards.
- .4 Provide linear sheet metal items in minimum 3000mm (10') sections except as otherwise noted on Drawings. Form flashing using single pieces for the full width. Provide shop fabricated, mitred and joined corners.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verify existing conditions before starting work.
- .2 Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, reglets in place, and nailing strips located.

- .3 Verify roofing termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

- .1 Install starter and edge strips, and cleats before starting installation.
- .2 Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.

3.3 INSTALLATION

- .1 Install all prefinished metal flashing and trim such that liner face is not exposed to view. Where liner face is exposed, prepaint to match prefinished exposed face, or fabricate 2-ply installation.
- .2 Oil-canning or crimping at fasteners securing metal flashing or trim, will not be acceptable. Contract Administrator to review upon completion.
- .3 Install butt joints and lapped joints at locations acceptable to the Contract Administrator.
- .4 Separate dissimilar metals by painting each metal surface in area of contact with a bituminous coating, by applying rubberized asphalt underlayment to each metal surface, or by other permanent separation as recommended by manufacturers of dissimilar metals.
- .5 Install plumb, straight, and true to adjacent work in continuous lengths without flashings, closures or horizontal laps.
- .6 Install parapet flashing, miscellaneous flashing, and closure caps as per drawings to provide a water tight roof system.
- .7 Seal all metal joints weathertight.

3.4 FIELD QUALITY CONTROL

- .1 Section 01 45 00: Field inspection.
- .2 Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.5 SCHEDULES

- .1 Refer to drawings.
- .2 Colour of all pre-finished metal (interior and exterior) to be selected by Contract Administrator from Standard Architectural Stock Colours.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Fireproof firestopping and fire-safing materials and accessories.

1.2 RELATED SECTIONS

- .1 Section 06 10 13 - Wood Blocking and Curbing.
- .2 Section 07 26 00 - Vapour Retarders: Vapour retarder materials to adjacent insulation.
- .3 Section 09 21 16 - Gypsum Board Assemblies.
- .4 Section 09 22 16 - Non-Structural Metal Stud Framing
- .5 Structural Specifications.
- .6 Mechanical Divisions – Heating, Ventilating, and Air-Conditioning (HVAC):
Mechanical work requiring firestopping.
- .7 Electrical Divisions: Electrical work requiring firestopping.

1.3 REFERENCES

- .1 ASTM E84-09c - Test Method for Surface Burning Characteristics of Building Materials.
- .2 ASTM E119-09c - Method for Fire Tests of Building Construction and Materials.
- .3 ASTM E814-09 - Test Method of Fire Tests of Through-Penetration Fire Stops.
- .4 ASTM E1966-07 - Test Method for Fire-Resistive Joint Systems.
- .5 CAN/ULC-S101-07 - Fire Endurance Tests of Building Construction and Materials.
- .6 CAN/ULC-S102-07 - Method of Test for Surface Burning Characteristics of Building
Materials and Assemblies.
- .7 CAN/ULC-S115-05 - Fire Tests of Firestop Systems.
- .8 FM (Factory Mutual) - FM 4991, Approval of Firestop Contractors.
- .9 FCIA (Firestop Contractors International Association) - Manual of Practice.
- .10 NFPA 251 - Fire Tests of Building Construction and Materials.
- .11 OPL (Omega Point Laboratories).
- .12 UL 263 - Fire Tests of Building Construction and Materials (ASTM E119, NFPA 251).
- .13 UL 1479 - Fire Tests of Through-Penetration Firestops. (ASTM E814).

- .14 UL 1709 - Rapid Rise Fire Tests of Protection Materials for Structural Steel.
- .15 UL 2079 - Tests for Fire Resistance of Building Joint Systems.
- .16 ULC (Underwriters Laboratories of Canada) - List of Equipment and Materials for:
 - .1 Building Materials.
 - .2 Fire Resistance.
 - .3 Firestop Systems and Components.
- .17 WHI (Intertek/Warnock Hershey).
- .18 Standard Method of Fire Tests Through Penetration Fire Stops, ULC-S115-M.2005/
CAN4- S115-M.2005 or ASTM E814 Test Requirements.
- .19 Underwriters Laboratories of Canada (ULC) CAN4-S115-M.2005 under their
designation of ULC-S115-M.2005 and publishes the results in FIRE RESISTANCE
RATINGS DIRECTORY.

1.4 DEFINITIONS

- .1 Firestopping (Fire-safing): A sealing or stuffing material or assembly placed in spaces between building materials to arrest the movement of smoke, heat, gases, or fire through wall or floor openings.

1.5 SYSTEM DESCRIPTION

- .1 Firestopping systems installed to resist spread of fire and passage of smoke and other gases at penetrations through fire resistance rated wall, and floor assemblies, materials and components.

1.6 PERFORMANCE REQUIREMENTS

- .1 Materials, accessories and application procedures listed by ULC, cUL, or tested to CAN/ULC-S115 to comply with building code requirements.
- .2 Firestopping Materials: CAN/ULC-S101, ASTM E119, ASTM E814 to achieve a fire rating as noted on Drawings.

1.7 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate with other work having a direct bearing on work of this section.

1.8 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submittal Procedures.
- .2 Product Data: Provide data on product characteristics, performance and limitation criteria.
- .3 System Design Listings: Submit system design listings, including illustrations from a qualified testing and inspection agency that is applicable for each firestop configuration.

1.9 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submittal procedures.
- .2 Installation Data: Manufacturer's special preparation and installation requirements.
- .3 Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.10 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Closeout Submittal.

1.11 QUALITY ASSURANCE

- .1 Contractor Qualifications: Company specializing in performing the work of this section and as follows:
 - .1 FM approved in accordance with FM standard 4991 - Approval of Firestop Contractors.
 - .2 FCIA Member in good standing.
 - .3 Licensed by the province or local authority where applicable.
 - .4 Successfully completed not less than five (5) comparable scale projects.
- .2 Single Source Responsibility: Obtain firestop systems for each type of penetration and construction situation from a single primary firestop systems manufacturer.

1.12 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for fire resistance ratings and surface burning characteristics.
- .2 Provide certificate of compliance from authority having jurisdiction indicating approval of materials used.

1.13 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Deliver firestopping products in original, unopened containers with labels intact and legible, identifying product and manufacturer.
- .3 Store and handle firestopping materials to manufacturer's instructions.

1.14 ENVIRONMENTAL REQUIREMENTS

- .1 Sequence work to permit installation of firestopping and smoke seal materials to be installed after adjacent work is complete and before closure of spaces.
- .2 Do not install firestopping when ambient or substrate temperatures are outside limits permitted by manufacturers or when substrates are wet, due to rain, frost, condensation, or other causes.
- .3 Maintain this minimum temperature before, during and for three (3) days after installation of materials.

- .4 Ventilate firestopping per manufacturers' instructions by natural means or, where this is inadequate, forced air circulation.
- .5 During installation, provide masking and drop sheets to prevent firestopping materials from contaminating any adjacent surfaces.
- .6 Do not use materials that contain flammable solvents.
- .7 Water based products are unacceptable in wet areas or areas that may be subject to occasional flooding.

1.15 WARRANTY

- .1 Manufacturers shall warrant work of this Section against defects and deficiencies in the product material for a period of two (2) years from date of Substantial Performance, in accordance with General Conditions of Contract. Promptly correct any defects or deficiencies, which become apparent within warranty period at no expense to City of Winnipeg.
- .2 Fire and smoke stop system Contractor hereby warrants workmanship on material installation for period of two (2) years from date of Substantial Performance, in accordance with General Conditions of Contract. Promptly correct any defects or deficiencies, which become apparent within warranty period at no expense to City of Winnipeg.

Part 2 Products

2.1 MATERIALS

- .1 System 1:
 - .1 Firestopping at joints of floor to wall construction, filling gaps and holes in fire rated assemblies, and filling voids around service penetrations through fire rated assemblies. Install damming material where support for sealant is required.
 - .2 Materials:
 - .1 Mineral wool backing insulation: ULC labelled, preformed non combustible or intumescent composite sheet.
 - .1 Standard of Acceptance:
 - .1 3M Brand Fire Barrier CS 195 Composite Sheet.
 - .2 A/D Fire Barrier mineral wool by A/D Fire Protection.
 - .2 Fire stopping sealant: ULC labelled, single component silicone based or intumescent sealant.
 - .1 Standard of Acceptance:
 - .1 3M Brand Fire Barrier Mouldable putty or CP25WB, CP 25N/S or CP 25 S/L caulk
 - .2 A/D Silicone Firebarrier by A/D Fire Protection.
 - .3 Fire Stop Sealant by Dow Corning Canada Inc.
 - .4 Tremco FYRE SIL

- .5 Firetemp by Johns Mansville.
- .2 System 2:
 - .1 Firestopping for filling voids around multiple service penetrations through fire rated assemblies. Install damming material to temporarily contain firestopping foam.
 - .2 Materials:
 - .1 Firestopping foam: ULC labelled two component silicone foam, foam mortar or intumescent firestopping.
 - .1 Standard of Acceptance:
 - .1 3M Brand Fire Barrier FS 195 Wrap/Strip, 7904 Series system or CS 195 Composite sheet with CP 25 S/L elastomer or mouldable putty.
 - .2 A/D firebarrier mortar or A/D Silicone over A/D firebarrier Mineral Wool Firestopping.
 - .3 Dow Corning 3 6548 Silicone RTV Foam or Dow Corning Fire Stop Intumescent Wrap Strip over damming material.
- .3 System 3:
 - .1 Firestopping PVC, CPVC and ABS plastic pipe penetration through fire rated assemblies.
 - .2 Materials:
 - .1 Intumescent UL classified as a through penetration firestop device when tested in accordance with ASTM E814 (UL 1479). Complete with retainer clip.
 - .1 Standard of Acceptance:
 - .1 3M Firebarrier Plastic Pipe Device utilizing FS 195 Wrap/Strip and RC 1 Restricting collar.
 - .4 Damming material: Provide permanent or removable mineral wool, mineral fibreboard, sheet metal, plywood, particleboard, or calcium silicate board to temporarily support firestopping in accordance with tested assembly being installed and as acceptable to authority having jurisdiction.
 - .5 Retainers: 24mm (15/16") wide x 24 ga. steel Z formed configuration with bottom dimensions conforming to opening size listed in manufacturer's sizing chart.
 - .6 Acceptable Manufacturers:
 - .1 AD Fire Protection Systems Inc.
 - .2 Hilti Fire Stop Systems.
 - .3 3M Fire Protection Products.
 - .4 Tremco, Tremstop, Firestop Systems.
 - .5 Rectorseal, Bio Fireshield.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping are ready to receive the work of this section.
- .2 Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- .1 Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.
- .2 Remove incompatible materials which may affect bond.
- .3 Install backing or damming materials to arrest liquid material leakage.

3.3 APPLICATION

- .1 Apply primer and materials to manufacturer's written instructions.
- .2 Install material at walls or partition openings which contain penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.
- .3 Apply firestopping material in sufficient thickness to achieve rating as listed in manufacturer's technical literature and to uniform density and texture. Fire resistance rating of fire stopping material assembly must meet or exceed the fire resistance rating of the floor or wall assembly being penetrated.
- .4 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.
- .5 Tool or trowel exposed surfaces to a neat finish where required.
- .6 Remove excess compound promptly as work progresses and upon completion.

3.4 CLEANING

- .1 Clean adjacent surfaces of firestopping materials.
- .2 Remove equipment, excess materials and debris and clean adjacent surfaces immediately after application. Use methods and cleaning materials approved by manufacturer.
- .3 Protect firestopping during and after curing period from contact with contaminating substances. If damage caused by others, the Contractor shall instruct the Firestop Sub-Trade to make appropriate repairs and charge to appropriate trades.
- .4 Remove temporary dams after initial set of fire stop and smoke seal materials.

3.5 SCHEDULES

- .1 Jan Closet / Storage Room RM103: 1 hour.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Preparing substrate surfaces.
- .2 Sealant and joint backing.
- .3 Structural sealant for glazing assemblies.

1.2 RELATED SECTIONS

- .1 Section 04 04 25 – Masonry Units.
- .2 Section 07 11 13 - Bituminous Dampproofing: Sealants required in conjunction with dampproofing.
- .3 Section 07 26 00 - Vapour Retarders: Sealants required in conjunction with vapour retarder.
- .4 Section 07 84 00 - Firestopping: Sealants required in conjunction with firestopping.
- .5 Section 07 52 00 - Modified Bituminous Membrane Roofing
- .6 Section 07 62 00 - Sheet Metal Flashing And Trim.
- .7 Section 08 11 00 –Metal Doors and Frames.
- .8 Section 08 41 13 - Aluminum Framed Entrances and Storefronts.
- .9 Section 08 44 13 - Glazed Aluminum Curtain Walls.
- .10 Section 08 80 50 – Glass and Glazing: Sealants required in conjunction with glazing methods.
- .11 Section 32 12 16 - Asphalt Paving.

1.3 REFERENCES

- .1 ASTM C509-06 - Elastomeric Cellular Preformed Gasket and Sealing Material.
- .2 ASTM C834-10 - Latex Sealants.
- .3 ASTM C919-08 - Use of Sealants in Acoustical Applications.
- .4 ASTM C920-08 - Elastomeric Joint Sealants.
- .5 ASTM C1184-05 - Structural Silicone Sealants.
- .6 ASTM C1193-09 - Guide for Use of Joint Sealants.

- .7 ASTM C1311-10 - Solvent Release Sealants.
- .8 ASTM C1330-02(2007) - Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
- .9 ASTM C1401-09a - Guide for Structural Sealant Glazing.
- .10 ASTM E330-02 - Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
- .11 CGSB-19-GP-5M-1984 - Sealing Compound, One Component, Acrylic Base, Solvent Curing.
- .12 CGSB-19-GP-14M-1984 - Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.
- .13 CAN/CGSB-19.13-M87 - Sealing Compound, One-component, Elastomeric, Chemical Curing.
- .14 CAN/CGSB-19.17-M90 - One-Component Acrylic Emulsion Base Sealing Compound.
- .15 CAN/CGSB-19.22-M89 - Mildew-Resistant Sealing Compound for Ceramic Tiles.
- .16 CAN/CGSB-19.24-M90 - Multi-component, Chemical Curing Sealing Compound.
- .17 SWRI (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specification.

1.4 SCOPE OF WORK

- .1 Caulking shall be provided where required to prevent entry of water into the structure.
- .2 Caulking shall be provided between masonry, siding, or other cladding materials and the adjacent door and window frames or trim, including sills unless, such locations are completely protected from the entry of water. Caulking shall also be provided at vertical joints between different cladding materials unless the joint is suitably lapped or flashed to prevent the entry of water.
- .3 Caulking shall be provided at all masonry control joints.
- .4 Caulk perimeter of all interior pressed steel door and window frames, fire hose cabinets, access door flanges, etc.

1.5 PERFORMANCE REQUIREMENTS

- .1 Sealant Design: Design structural sealant to withstand specified loads without breakage, loss, failure of seals, product deterioration, and other defects.
- .2 Design installed sealant to withstand:
 - .1 Dead loads and live loads caused by positive and negative wind loads acting normal to plane of wall as calculated in accordance with the National Building Code.

- .2 Movement from ambient temperature range of 49 degrees C (120 degrees F).
- .3 Movement and deflection of structural support framing.
- .4 Water and air penetration.

1.6 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 Coordinate the work with all sections referencing this section.

1.7 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submittal Procedures
- .2 Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, colour availability.
- .3 Samples: Submit two (2) samples, 300 mm (12 inch) in size illustrating sealant colours for selection.

1.8 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submittal Procedures.
- .2 Installation Data: Manufacturer's special installation requirements.
 - .1 Indicate special procedures, surface preparation, perimeter conditions requiring special attention, field quality control testing.

1.9 QUALITY ASSURANCE

- .1 Perform work to sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- .2 Perform structural sealant application work to ASTM C1401.
- .3 Perform acoustical sealant application work to ASTM C919.
- .4 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .5 Applicator Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.

1.10 ENVIRONMENTAL REQUIREMENTS

- .1 Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.11 WARRANTY

- .1 Section 01 78 00: Closeout Submittals.

- .2 Warranty: Include coverage for installed sealants and accessories which fail to achieve air tight seal and water tight seal, exhibit loss of adhesion or cohesion, or do not cure.
- .3 Provide manufacturer's twenty (20) year material warranty for installed silicone sealant.
- .4 Defective work shall include, but not be restricted to joint leakage, cracking, crumbling, melting, running, loss of adhesion, loss of cohesion, or staining of adjoining or adjacent work or surfaces.

Part 2 Products

2.1 MATERIALS

- .1 Sealant Colour: to be selected by the Contract Administrator from full range.
- .2 Primers: To be type recommended by sealant manufacturer.
- .3 Joint backing material: shall be extruded polyolefin foam.
 - .1 Standard of Acceptance:
 - .1 Tremco Sof Rod.
- .4 Bond Breaker: Where joint configuration does not allow for proper depth/width ration (See Section 3.2.5) - a pressure sensitive plastic tape, such as 3M #266 or #481 shall be placed on the back of the joint which will not bond to the sealant.
- .5 Joint Cleaner: Xyol, methylethylketone, or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

2.2 SEALANTS

- .1 Type 1: Sealant for all locations except where another type is specified in this section. Multi-component, polyepoxide urethane sealant. To meet specified requirements of CGSB Specification CAN2.19-24-M80.
 - .1 Standard of Acceptance:
 - .1 Tremco Dymeric 511
 - .2 Sonolastic NP-2
 - .3 Permapol RC-2.
 - .4 Morton Thiokol
 - .5 Sikaflex 2CNS/SL
 - .6 Bostik Chem-Calk 500
- .2 Type 2: Sealant for construction joints in lieu of Type 1 where pre-approved by Contract Administrator. One part elastomeric sealants: to meet specified requirements of NSC/CGSB 25-B-N moisture curing hybrid polyurethane.
 - .1 Standard of Acceptance:
 - .1 Tremco Dymonic.
 - .2 Sonolastic 150.
 - .3 Permapol RC-1.

- .4 Morton Thiokol.
- .5 Sikaflex 1A.
- .6 Bostik Chem-Calk900.
- .2 Type 3: Sealant for glass to glass, sloped glazing systems, glass to metal, and metal to metal joints. One part low modulus silicone elastomeric sealant to meet specified requirements of NSC/CGSB Specification CAN2-19.13-M82.
 - .1 Standard of Acceptance:
 - .1 Dow Corning 795
 - .2 Tremco Spectrum 2.
 - .3 GE Silglaze 2800.
 - .4 GE Silpruf 2000.
- .3 Type 4: Polyurethane sealant for exterior and interior horizontal traffic joints.
 - .1 Standard of Acceptance:
 - .1 Tremco THC-900.
 - .2 Permapol RC-2Sl.
 - .3 Sonolastic SL2.
 - .4 Sikaflex 2CSL.
 - .5 Bostik Chem-Calk 550
- .4 Type 6: Use at all perimeter joints and openings in sound rated drywall systems and sealing polyethylene air/vapour barriers. One part acoustical sealant to meet specified requirements of CGSB Specification 19-GP-21M.
 - .1 Standard of Acceptance:
 - .1 Tremco Acoustical sealant.
 - .2 Gibson Homans 2210.
- .5 Type 7: Sealant for finishing interior construction joints subject to minimal movement and not otherwise specified in this section. One part paintable latex.
 - .1 Standard of Acceptance:
 - .1 Tremco Latex 100.
 - .2 Bulldog Acrylic Latex
- .6 Type 8: Sealant for sealing gutters and rainware. One part high quality synthetic rubber blended with a synthetic resin for metal to metal and metal to plastic joints.
 - .1 Standard of Acceptance:
 - .1 Tremco Gutter Seal.
- .2 Type 9: Sealant for masonry joints including control joints, reglets, etc.: Ultra-low modulus, one part silicone joint sealant. 790 or moisture curing hybrid polyurethane 150.
 - .1 Standard of Acceptance:
 - .1 Sonolastic 150.

2.3 STRUCTURAL SEALANT

- .1 Structural Silicone Sealant: ASTM C1184, ASTM C920, Grade NS, Class A, Use NT; single component, neutral curing, non-sagging, non-staining, fungus resistant non-bleeding;
 - .1 Colour: To be selected by Contract Administrator from Standard Colour Range.
 - .2 Elongation Capability 25%.
 - .3 Service Temperature Range -54 to 82 degrees C (-65 to 180 degrees F).
 - .4 Shore A Hardness Range 40.

2.4 ACCESSORIES

- .1 Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- .2 Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- .3 Joint Backing: ASTM C1330; round, closed cell polyethylene foam rod; oversized 30% to 50% larger than joint width.
- .4 Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- .5 Masking tape: Non-staining, non-absorbent type compatible with sealant and adjacent surfaces.
- .6 Setting Blocks and Spacers: Compatible with silicone sealant and recommended by sealant manufacturer.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verify existing conditions before starting work.
- .2 Verify that substrate surfaces and joint openings are clean, dry, and free of frost and ready to receive work.
- .3 Verify that joint backing and release tapes are compatible with sealant.
- .4 Verify at the Site that joints and surfaces have been provided and that joint conditions will not adversely affect execution, performance, or quality of the completed work; and that they can be put into acceptable condition by means of preparation specified in this section.
- .5 Ascertain that sealers and coatings applied to sealant substrates are compatible with sealant used and that full bond between sealant and substrate is attained. Request samples of the sealed or coated substrate from their fabricators for testing of compatibility and bond, if necessary.
- .6 Verify that specified environmental conditions are ensured before commencing work.

- .7 Ensure that releasing agents, coatings or other treatments have either not been applied to joint surfaces or that they are entirely removed.
- .8 Defective work resulting from application to unsatisfactory joint conditions will be considered the responsibility of those performing the Work of this Section.

3.2 PREPARATION

- .1 Remove loose materials and foreign matter which might impair adhesion of sealant.
- .2 Clean and where required prime joints to sealant manufacturer's written instructions.
- .3 Perform preparation to sealant manufacturer's written instructions.
- .4 Protect elements surrounding the work of this section from damage or disfiguration.
- .5 Remove dust, paint, loose mortar, and other foreign matter and dry joint surfaces.
- .6 Remove dust silt, scale, and coatings from ferrous metals by wire brush, grinding, or sandblasting.
- .7 Remove oil, grease and other coatings from non-ferrous metals with joint cleaner.
- .8 Joints to be caulked are to be a minimum of 6mm (1/4 inch) to a maximum of 40mm (1 1/2 inch). Examine joint sizes to achieve proper width/depth ratio per manufacturer's recommendations for specified sealant.
- .9 Install joint filler or apply bond breaker tape to achieve correct joint depth.
- .10 Where necessary to prevent staining, mask adjacent surfaces with tape prior to priming and/or caulking.
- .11 Prime sides of joints to sealant manufacturer's instructions immediately prior to caulking.
- .12 Before any caulking or sealing is commenced, a test of the material shall be made for indications of staining or poor adhesion.

3.3 INSTALLATION

- .1 Install sealant to sealant manufacturer's written instructions.
- .2 Measure joint dimensions and size materials to achieve required width/depth ratios.
- .3 Install joint backing to achieve a neck dimension no greater than 1/3 of the joint width.
- .4 Install bond breaker where joint backing is not used.
- .5 Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- .6 Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- .7 Tool joints concave unless detailed otherwise.

3.4 STRUCTURAL SEALANT INSTALLATION

- .1 Site install glass panels specified in Section 08 80 50 to aluminum curtain wall framing specified in Section 08 44 13.
- .2 Joint Design: Install sealant as follows:
 - .1 Glueline Thickness: 6 mm (1/4 inch) minimum.
 - .2 Structural Bite: 6 mm (1/4 inch) minimum and equal to or greater than glueline thickness.
 - .3 Fill joint with standard sealant application procedures, install backer rod or bond breaker tape to avoid three-sided sealant adhesion.
- .3 Prepare substrates and apply silicone sealant to manufacturer's written instructions and reviewed Shop Drawings.
- .4 Bond glass to metal support members with structural silicone sealant using 2-sided method as detailed on Drawings.
- .5 Install sealant without gaps, twisting, stretching, or puncturing backing material. Ensure uniform depth to achieve correct profile, coverage, and performance.
- .6 Use temporary glass supports to retain glass panels while sealant is applied and allowed to cure.
- .7 Provide concave, smooth, uniform, sealant finish. Eliminate air pockets and ensure complete contact on both sides of joint opening.

3.5 CLEANING

- .1 Clean adjacent soiled surfaces.

3.6 PROTECTION OF FINISHED WORK

- .1 Remove masking tape and excess sealant.
- .2 Protect sealants until cured , remove temporary glass supports.

END OF SECTION