Part 1 General

1.1 GENERAL SUMMARY

.1 Composite wall cladding of rigid insulation and applied coating.

1.2 RELATED SECTIONS

.1 Section 07 92 00 - Joint Sealants.

1.3 REFERENCES

.1 Canadian Construction Materials Centre (CCMC).

.2 EIFS Council of Canada.

.3 ASTM E283-04, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.4 ASTM E2098-00(2006), Standard Test Method for Determining Tensile Breaking Strength of Glass Fiber Reinforcing Mesh for Use in Class PB Exterior Insulation and Finish Systems (EIFS), after Exposure to a Sodium Hydroxide Solution.

.5 CAN/ULC S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.6 CAN/ULC S710.1-05, Standard for Thermal Insulation - Bead - Applied One Component Polyurethane Air Sealant Foam, Part 1: Material Specification.

.7 CAN/ULC S710.2-05, Standard for Thermal Insulation - Bead-Applied One Component Polyurethane Air Sealant Foam - Part 2: Installation.

1.4 PERFORMANCE REQUIREMENTS

.1 Materials of this section shall provide:

- .1 continuity of thermal barrier at building enclosure elements in conjunction with associated materials,
- .2 continue air barrier continuity,
- .3 continue vapour retarder continuity.

.2 Assembly of materials to resist without failure, wind/suction loads imposed at the place of building, consistent with code requirements.

.3 Maintain moisture migration from within assembly to the exterior via an internal network of drainage channels and weep openings.

.4 Conform to material and assembly requirements and tested assembly requirements of CCMC #12969-R.

1.5 SUBMITTALS

.1 Submit shop drawings to requirements of Section 01 33 00.

.2 Indicate on shop drawings, wall and parapet joint pattern and joint details.

.3 Samples:

.1 Submit two (2) samples, 150 mm x 150 mm in size, illustrating coating colour and texture range for approval.

.2 Submit sample of reinforcing mesh.

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Do not install products when ambient temperature is below 40ºF.

.2 Maintain this temperature during and twenty four (24) hours after installation of finish.

Part 2 Products

2.1 ACCEPTABLE MANUFACTURERS

.1 Durock InsulROCK.

.2 Dryvit Outsulation Plus.

.3 StoTherm Classic NExT.

2.2 COMPONENTS

.1 Water Resistive Air Barrier System: ready-mixed, flexible coating.

.1 Air Leakage: less than or equal to 0.004 cfm/ft² at 1.5 lb/ft² when tested to ASTM E283.

.2 All components of the air barrier system, including sealants, primers, mastics, reinforcement tape and adhesives to be supplied by single manufacturer.

.3 Reinforcement tape: Open-weave mesh.

.2 Stucco Base Coat: fibre-reinforced Portland cement based stucco for trowel or pump application, field mixed with graded sand and water.

.3 Reinforcing Mesh: to ASTM E2098, Heavy duty strength glass fibre mesh, UV resistant, alkali-resistant; supplied by stucco system manufacturer.

.4 Finish Primer: 100% acrylic-based primer for stucco, for increased fade resistance and durability of finish coat, colour-tinted to match finish coat colour.

.5 Elastomeric Finish: Factory-mixed 100% acrylic polymer and aggregate, integrally pigmented and formulated for fine textured finish, dirt resistant. Colours as selected by Departmental Representative to match existing.

2.3 INSULATION

.1 Rigid Foam Insulation: Type 3 extruded expanded polystyrene (XPS) insulation conforming to CAN/ULC-S701, supplied by a manufacturer acceptable to the EIFS manufacturer.

.1 Channelled design having vertical drainage grooves on reverse.

.2 Nominal density of 1 pcf.

.3 XPS used in shapes and mouldings for decoration on EIFS shall comply with the above requirements less channelled design.

2.4 ACCESSORIES

.1 Insulation Fastening: Steel screw fastener, corrosion resistant, of type and size to suit substrate, complete with plastic washers at least 50 mm in diameter.

.2 Insulation Adhesive: Recommended by manufacturer.

.3 Perimeter Trim, Control Joints and Drainage Track: Extruded plastic with attachment flanges.

.4 Metal Flashing and Copings: Supplied and installed by Section 07 62 00.

.5 Sealant Materials: Silicone type, specified in Section 07 92 00; custom colour to match acrylic finish.

.6 Sprayed-in-Place Polyurethane Foam Insulation: One-Component, low expansion, moisture-cured polyurethane foam conforming to ULC S710.1.

.7 Transition Membrane: Self-adhesive modified bituminous membrane supplied by EIFS manufacturer, field-cut to suit.

Part 3 Execution

3.1 PREPARATION

.1 Protect adjacent surfaces from damage resulting from Work of this section.

.2 Protect finished Work from water penetration at end of each day or on completion of each section of Work.

.3 Protect installation from moisture for 48 hours minimum after completion of each portion of Work.

.4 Prepare surfaces and reinforce joints in accordance with stucco system manufacturer's written instructions.

3.2 INSTALLATION

.1 Install water resistive air barrier in accordance with manufacturer's written instructions. Apply continuously to all surfaces of the substrate where stucco system to be installed, at the minimum required thickness specified by manufacturer.

.2 Allow water resistive air barrier to cure until fully dry throughout material thickness before installation of the insulation.

.3 Apply insulation in accordance with manufacturer's written instructions.

.4 Mechanically fasten decorative profiles with a depth-to-height ratio greater than 1:6.

.5 Stagger vertical insulation board joints and interlock insulation at interior and exterior corners.

.6 Gaps in insulation boards greater than 1.5 mm to be filled with sprayed-in-place-foam. Do not fill gaps with base coat.

.7 Install stucco coating in accordance with manufacturer's instructions. Moist cure for minimum 48 hours.

.8 Install perimeter trim, accessories and control joints.

3.3 FINISHING

.1 Apply primer evenly with brush, roller or spray equipment over clean, dry stucco and insulation build-outs. Allow to dry before applying finish.

.2 Apply finish to manufacturer's written instructions for specified finish.

.3 Wet application and subsequent floating of finish to be continuous between vertical and horizontal terminations, aesthetic reveals, and decorative shapes.

.4 Float finish coat in a consistently random pattern, ensuring that thickness and floating of texture are even throughout wall area.

.5 Do not apply finish coat into expansion joints where sealants are to be installed.

.6 Apply sealant at finish perimeter and control joints in accordance with Section 07 92 00.

END OF SECTION

Part 1 General

1.1 GENERAL SUMMARY

.1 Polyethylene sheet vapour barrier for application to warm side of exterior framed wall assemblies.

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet and include:

.1 Product characteristics.

.2 Performance criteria.

.3 Limitations.

.3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS).

.4 Quality assurance submittals:

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

.2 Instructions: submit manufacturer's installation instructions and comply with written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

1.4 QUALITY ASSURANCE

.1 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 34.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Waste Management and Disposal:

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

Part 2 Products

2.1 SHEET VAPOUR BARRIER

.1 Polyethylene film: to CAN/CGSB-51.34, 0.10 mm thick.

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 Sealant: compatible with vapour retarder materials, recommended by vapour retarder manufacturer. To Section 07 92 00 - Joint Sealants.

.3 Staples: minimum 6 mm leg.

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

Part 3 Execution

3.1 INSTALLATION

.1 Ensure services are installed and inspected prior to installation of retarder. Install sheet vapour retarder on warm side of exterior wall and ceiling assemblies prior to installation of gypsum board to form continuous retarder.

.2 Use sheets of largest practical size to minimize joints.

.3 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.

3.2 EXTERIOR SURFACE OPENINGS

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

3.3 PERIMETER SEALS

.1 Seal perimeter of sheet vapour barrier as follows:

.1 Apply continuous bead of sealant to substrate at perimeter of sheets.

.2 Lap sheet over sealant and press into sealant bead.

.3 Install staples through lapped sheets at sealant bead into wood substrate.

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

3.4 LAP JOINT SEALS

.1 Seal lap joints of sheet vapour barrier as follows:

.1 Attach first sheet to substrate.

.2 Apply continuous bead of sealant over solid backing at joint.

.3 Lap adjoining sheet minimum 150 mm and press into sealant bead.

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

3.5 ELECTRICAL BOXES

.1 Seal electrical switch and outlet device boxes that penetrate vapour barrier as follows:

.1 Install moulded box vapour barrier.

.2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

3.6 CLEANING

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

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

END OF SECTION

Part 1 General

1.1 GENERAL SUMMARY

.1 Materials and installation of cold-applied modified bituminous roofing and flashing required to suit new roof-mounted equipment curbing.

1.2 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 07 62 00 - Sheet Metal Flashing and Trim.

1.3 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

- .1 ASTM C 1177/C 1177M-06, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- .2 ASTM D41-05, Standard Specification for Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing.
- .3 ASTM D312-00 (2006), Standard Specification for Asphalt Used in Roofing.

.2 Canadian Standards Association (CSA International)

- .1 CAN/CSA-O141-91 (R1999), Softwood Lumber.
- .2 CSA O151-M1978 (R1998), Canadian Softwood Plywood.

.3 Canadian General Standards Board (CGSB)

- .1 CGSB 37-GP-9Ma-83 Primer, Asphalt, Unfilled, for Asphalt Roofing, Damp proofing and Waterproofing.
- .2 CGSB 37-GP-56M-80b (A1985) Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.

.4 Master Roofers Guarantee of New Brunswick (MRGNB).

- .1 MRGNB Roofing Specifications 2010.

.5 Canadian Roofing Contractors Association (CRCA).

- .1 CRCA Roofing Specifications Manual.

.6 Underwriter's Laboratories of Canada (CAN/ULC)

- .1 CAN/ULC-S704-01, Polyurethane/Polyisocyanurate, faced.
- .2 CAN/ULC-S706-02, Standard for Wood Fibre Thermal Insulation for Buildings
- .3 CAN-ULC-S710.1-05, Standard for Thermal Insulation - Bead - Applied One Component Polyurethane Air Sealant Foam, Part 1.
- .4 CAN-ULC-S710.2-05, Standard for Thermal Insulation - Bead-Applied One Component Polyurethane Air Sealant Foam, Part 2.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Convene pre-installation meeting no later than one week prior to beginning waterproofing Work, with Roofing Contractor's Representative and Departmental Representative.

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other building subtrades if required.

.4 Review manufacturer's installation instructions and requirements.

1.5 QUALITY ASSURANCE

.1 Roofing Work to be done in accordance with applicable standard in Master Roofers Guarantee of New Brunswick (MRGNB) 5 Year Guarantee Roofing Specifications Manual.

1.6 SCHEDULING OF WORK

.1 Work scheduled during normal hours of operations must be approved by building and Departmental Representative representatives. Provide information to the Departmental Representative indicating how the Contractor will keep emissions to a minimum. Use of site and type of work performed may be limited.

.2 Demolition work is not to commence until all material has been ordered and date of arrival of products has been verified. Contractor to provide copy of order to Departmental Representative.

1.7 SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Product Data:

.1 Provide copies of most recent technical roofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit product data for roof membranes, adhesives, sealants and accessories.

1.8 FIRE PROTECTION

.1 Fire Extinguishers: maintain one cartridge operated type or stored pressure rechargeable type with hose and shut-off nozzle, ULC labeled for A, B and C class protection. Size 9 kg on roof per torch applicator, within 10 m of torch applicator.

.2 Maintain a minimum fire watch for 1 hour after each days roofing operations cease and as according to Hot Works requirement of the Canadian Fire Code (latest edition).

1.9 DELIVERY STORAGE AND HANDLING

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

.2 Storage and Handling Requirements:

.1 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.

.2 Provide and maintain dry, off-ground weatherproof storage.

.3 Store rolls of felt and membrane in upright position. Store membrane rolls with selvage edge up.

.4 Remove only in quantities required for same day use.

.5 Place plywood runways over completed work and existing roofs not under construction to enable movement of material and other traffic.

.6 Store caulking at +5°C minimum.

.7 Store insulation protected from daylight and weather and deleterious materials.

.8 Handle roofing materials in accordance with manufacturer's written directives, to prevent damage or loss of performance.

1.10 ENVIRONMENTAL REQUIREMENTS

.1 Do not install roofing when temperature remains below -18°C for torch application, or -5°C and to manufacturers' recommendations for mop application.

.2 Minimum temperature for solvent-based adhesive is -5°C.

.3 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.

.4 Disposal of demolished materials are to be removed from site and disposed of in an approved disposal site as authorized by authority having jurisdiction. Contractors may be requested to provide certified weigh bills or receipts from authorized disposal sites.

Part 2 Products

2.1 CARPENTRY

.1 Lumber: To Section 06 10 00.

.2 Canadian softwood plywood (CSP): to Section 06 10 00 and to CSA O151, standard construction.

.3 Batt Insulation: To Section 06 10 00.

.4 Fasteners for wood:

.1 Nails, spikes and staples: to CSA B111.

.2 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.

.3 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer.

2.2 VAPOUR BARRIER

.1 Vapour Barrier: Same as Base Sheet; cold-applied with adhesive.

2.3 MEMBRANE

.1 Base Sheet: to CGSB 37-GP-56M, Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, polyester reinforcement, weighing 180 g/m², minimum thickness of 2.0 mm ± 0.2 mm.

.1 Type 1, fully adhered.

.2 Grade heavy duty service.

.3 Top and bottom surfaces: Polyethylene/sanded.

.4 Acceptable Products:

.1 IKO Modiflex MP-180-FS.

.2 Soprema Elastophene 180 P.S.

.3 or approved equivalent.

.2 Fire Seal Membrane: SBS modified bitumen membrane, reinforced, thermofusible plastic film top surface, self-adhering bottom surface with release paper. Provide VOC compliant primer as recommended by manufacturer.

.1 Acceptable Products:

.1 IKO Armourbond 180

.2 Soprema Sopralene Flam Stick.

.3 or approved equivalent.

.3 Base Flashing: to CGSB 37-GP-56M Styrene-Butadiene-Styrene (SBS) Elastomeric Polymer, prefabricated sheet, polyester reinforcement, weight 180 g/m², minimum thickness of 3.0 mm ± 0.2 mm.

.1 Type 1, fully adhered.

.2 Class C - Plain surface.

.3 Grade: heavy duty service.

.4 Top and bottom surfaces: Sanded/sanded.

.5 Acceptable Material.

.1 IKO Modiflex MP-180-FS.

.2 Soprema Elastophene 180 P.S.

.3 or approved equivalent.

.4 Cap Sheet: to CGSB 37-GP-56M, Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, polyester reinforcement, weighing 250 g/m², minimum thickness of 4 mm ± 0.2 mm at selvage edge.

.1 Type 1, fully adhered.

.2 Class A-granule surfaced.

.3 Grade heavy duty service.

.4 Bottom surface: Sanded.

.5 Acceptable material:

.1 IKO Torchflex TP-250.
.2 Soprema Sopralene Mammouth 250.
.3 or approved equivalent.

.5 Cap Flashing: same as Cap Sheet, 1000 mm wide, unless noted otherwise.

2.4 COLD APPLIED ADHESIVE

.1 General: all adhesives shall be fully compatible with materials being bonded or Factory Mutual 1-90 wind uplift requirements. Provide primers as recommended by the adhesive manufacturer.

.2 Adhesive (for adhering rigid and fibreboard insulation): two component, 100% solids, solvent free, asphalt extended, flexible vulcanizing adhesive. Primer as recommended by membrane manufacturer.

.1 Acceptable Material:

.1 Soprema Duotack Adhesive.
.2 IKO Roofcraft RoofMix adhesive.
.3 or approved equal.

.3 Adhesive (for adhering vapour barrier, and base sheet membrane to insulation): one component fibrated rubberized adhesive, 60% (±) solids:

.1 Acceptable Material:

.1 Soprema Cold Adhesive Trowel Grade
.2 IKO Cold Gold Adhesive.
.3 or approved equal.

.4 Adhesive (for adhering base sheet flashings to substrates): non-flammable, solvent type, rubberized asphalt adhesive.

.1 Acceptable Material:

.1 Soprema Cold Adhesive Trowel Grade
.2 IKO Cold Gold 2-part Flashing Cement.
.3 or approved equal.

2.5 INSULATION

.1 Polyisocyanurate Insulation: To CAN/ULC-S704-01, Facing to be factory applied fiberboard and kraft paper, CFC free.

.1 Thickness: As required to suit existing assembly.
.2 Density: 40 kg/mn.
.3 Shape: flat and tapered as indicated on drawings, minimum thickness as indicated on Drawings. Minimum slope 1:100. Boards are to be a maximum of 1220 mm width x 1220 mm length.
.4 Acceptable Products: Isox IFB, ModulR TS ProtecF Composite or approved equivalent.

2.6 SEALERS

.1 Plastic cement: asphalt.

.2 Sealing compound: rubber asphalt type.

.3 Sealants: to CAN/CGSB-19.24-M80.

2.7 METAL FLASHING

.1 Prefinished Steel: Supplied by Section 07 62 00; installed by this Section.

2.8 ACCESSORIES

.1 Polyethylene back-up rope: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa, compatible with primers and sealants, oversized 30 to 50%.

.2 Torchable Cants: Provide pre-manufactured polyisocyanurate foam cant strips to locations indicated.

.1 Acceptable Products: Isox T.R. Cant Strip, ModulRTS CantR Composite or approved equivalent.

Part 3 Execution

3.1 WORKMANSHIP

.1 Do examination, preparation and roofing work in accordance with applicable standard in MRGNB 5 Year Guarantee Roofing Specifications Manual, except where specified otherwise.

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 adhesive 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 all roof areas from traffic and damage. Comply with precautions deemed necessary by Departmental Representative.

.6 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed work and materials out of storage.

.7 Metal connectors and decking will be treated with rust proofing or galvanization.

3.3 DEMOLITION

.1 Remove existing roofing assembly to accommodate the Work of this Section.

.2 Dispose of materials off site.

3.4 EXAMINATION

.1 Prior to commencement of work ensure:

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

.2 Provide cants, curbs, dividers and blocking as required and secure using galvanized fasteners.

.3 Plywood and lumber nailer plates have been installed to deck, walls and parapets as indicated.

.4 Install members true to line, levels and elevations, square and plumb.

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

.6 Countersink bolts where necessary to provide clearance for other work.

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

3.5 VAPOUR BARRIER

.1 Install using cold-applied adhesive.

.2 Vapour retarder shall be continuous and complete in all locations. Seal at penetrations.

.3 Extend vapour retarder up vertical surfaces and fold 100mm over insulating material.

3.6 FIRE SEAL BASE FLASHING

.1 A self-adhering base sheet is to be installed at all exposed wood and combustibles starting at the vapour barrier and covering the entire curb. Ensure wood is not exposed to flame. Prime wood surface with primer as recommended by manufacturer, fasteners maybe used to ensure a good adherence. This self-adhered base sheet is an underlay for the standard torch applied base sheet flashing and is to provide a continuous fire seal at wall/curb and roof junctions.

3.7 EXPOSED MEMBRANE ROOFING APPLICATION

.1 Insulation: fully adhered, cold applied adhesive application.

.1 Embed insulation in full spread of adhesive.

.2 Place boards in parallel rows with ends staggered, and in firm contact with one another.

.3 Cut end pieces to suit.

.2 Base sheet application.

.1 Starting at low point of roof, perpendicular to slope, unroll base sheet, align and reroll from both ends.

.2 Unroll and embed base sheet in full spread of adhesive.

.3 Lap sheets 75 mm minimum for side and 150 mm minimum for end laps.

.4 Application to be free of blisters, wrinkles and fishmouths.

.3 Cap sheet application.

.1 Starting at low point on roof, perpendicular to slope, unroll cap sheet, align and reroll from both ends.

.2 Unroll and embed cap sheet in full spread of adhesive. Use of torch applied cap sheet is at the discretion of the Departmental Representative.

.3 Lap sheets 75 mm minimum for side laps and 150 mm minimum for end laps. Offset joints in cap sheet 300 mm minimum from those in base sheet.

.4 Application to be free of blisters, fishmouths and wrinkles.

.5 Do membrane application in accordance with manufacturer's written recommendations.

.4 Flashings.

.1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.

.2 Nail and embed flashing base sheet and flashing cap sheet onto substrate in 1 metre wide strips using full spread of adhesive.

.3 Lap flashing base sheet to membrane base sheet minimum 200 mm.

.4 Lap flashing cap sheet to membrane cap sheet 150 mm minimum.

.5 Provide 75 mm minimum side lap and seal.

.6 Properly secure flashings to their support, without sags, blisters, fishmouths or wrinkles.

.7 Do work in accordance with manufacturer's written recommendations.

3.8 CANTS

.1 Install prefabricated cants over fiberboard overlay and fasten to vertical with 50 mm plate and fasteners spaced a minimum of 400 mm oc.

.2 Angle cut cants to fit tightly on back and bottom where roof to wall angle varies from 90 degrees.

3.9 METAL FLASHING

.1 Install metal flashings as detailed and in minimum 2440 mm or longest practical lengths.

.2 Fasten face of flashing to wood fascia with nylon headed hex screws, for widths over 150 mm stagger fasteners in a "W" pattern and fasten top and bottom a minimum of 50 mm from edge.

.3 Lock end joints and caulk with sealant.

3.10 CLEANING

.1 Remove bituminous markings from finished surfaces.

.2 In areas where finished surfaces are soiled caused by work of this section, consult manufacturer of surfaces for cleaning advice and complying with their documented instructions.

.3 Repair or replace defaced or disfigured finishes caused by work of this section.

END OF SECTION

Part 1 General

1.1 GENERAL SUMMARY

.1 Coping, parapet, cap, sill, and other flashings.

1.2 RELATED SECTIONS

.1 Section 07 52 16 - Modified Bituminous Membrane Roofing.

.2 Section 07 92 00 - Joint Sealants.

1.3 REFERENCES

.1 ASTM A653/A653M-01a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

1.4 SUBMITTALS

.1 Section 01 33 00: Submission procedures.

.2 Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

.3 Submit two samples 50 x 50 mm in size illustrating metal finish colour.

1.5 QUALIFICATIONS

.1 Fabricator and Installer: Company specializing in sheet metal flashing work with 5 years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Stack preformed and prefinished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

.2 Prevent contact with materials which may cause discolouration or staining.

Part 2 Products

2.1 SHEET MATERIALS

.1 Pre-painted Steel Sheet: Prefinished steel with silicone modified polyester finish; form to profiles indicated of 20 gauge steel.

.1 Class F2S.

.2 Colour and sheen selected by Departmental Representative to match existing.

2.2 ACCESSORIES

.1 Fasteners: Provide plastic covered hex head screw complete with rubber gasket, colour match to sheet metal.

.2 Exposed Sealant: Silicone, as specified in Section 07 92 00; colour to match sheet metal finish.

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 50 mm wide, interlockable with sheet.

.3 Form pieces in longest possible lengths.

.4 Hem exposed edges on underside 13 mm; mitre and seam corners.

.5 Form material with flat lock seams.

.6 Fabricate vertical faces with bottom edge formed outward 6 mm and hemmed to form drip.

.7 Fabricate flashings for curtain wall, windows, louvres and other openings to profiles indicated. Coordinate installation with work of other sections.

Part 3 Execution

3.1 PREPARATION

.1 Install starter and edge strips, and cleats before starting installation.

3.2 INSTALLATION

.1 Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

.2 Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

.3 Seal metal joints watertight.

END OF SECTION

Part 1 General

1.1 GENERAL SUMMARY

.1 Firestopping and smoke seals within mechanical assemblies (i.e. inside ducts, dampers) and electrical assemblies (i.e. inside cable trays) are specified in Sections 21, 22, 23, 25 and 26.

1.2 SUMMARY

.1 Only tested fire stop systems shall be used in specific locations as follows:

.1 Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical bus ways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.

.2 Openings in fire rated walls, floors and roofs both empty and those containing penetrations such as cables, conduits, cable trays, pipes, ducts and similar penetrating items.

.3 Penetrations through smoke barriers and construction enclosing compartmentalized areas involving openings containing penetrating items.

1.3 DEFINITIONS

.1 Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, water and hot gases through penetrations in fire rated wall and floor assemblies.

1.4 REFERENCES

.1 Underwriters' Laboratories of Canada (ULC).

.1 Guide BXUVC, Fire Resistance Ratings.

.2 Guide XHEZC, Firestop Systems.

.3 CAN/ULC-S101, Standard Methods of Fire Endurance Tests of Building Construction and Materials.

.4 CAN/ULC-S102, Standard Test Method for Surface Burning Characteristics of Building Materials.

.5 CAN/ULC-S115, Standard Method of Fire Tests of Firestop Systems.

.6 CAN/ULC-S702, Thermal Insulation, Mineral Fibre, for Buildings.

.2 Underwriters Laboratories Inc. (UL).

.1 Guide BXUV7, Fire Resistance Ratings Certified for Canada.

.2 Guide XHEZ7, Through-penetration Firestop Systems Certified for Canada.

.3 UL 2079, Tests for Resistance of Building Joint Systems.

.3 American Society for Testing and Materials (ASTM).

.1 ASTM E 2174-01, Standard Practice for On-site Inspection of Installed Fire Stops.

.2 ASTM E 2307, Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus.

.4 International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments.

1.5 QUALITY ASSURANCE

.1 Firestop installation must meet requirements of CAN/ULC S115 tested assemblies that provide a fire rating as indicated.

.2 Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.

.3 For firestop applications for which no ULC or UL tested system is available through a manufacturer, a manufacturer's Engineering Judgment derived from similar ULC or UL fire resistance designs to be submitted to local Authorities Having Jurisdiction for their review and approval prior to installation. Engineer Judgment drawings must follow requirements set forth by the International Firestop Council.

.4 Installer Qualifications: Certified, licensed, or otherwise qualified by the fire stopping manufacturer as having necessary experience and training to install fire stopping per specified requirements.

1.6 SUBMITTALS

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

.2 Shop Drawings: Submit shop drawings indicating ULC or UL design, showing typical installation details including reinforcement, anchorage, fastenings and method of installation for each type of fire stopping condition.

.3 Schedule: Provide schedule indicating material to be used, building elements to be protected, hourly rating and appropriate references.

.4 Submit manufacturer's specifications and technical data for each material including the composition and limitations, and manufacturer's installation instructions.

.5 Submit material safety data sheets (MSDS) provided with products delivered to job site.

.6 Manufacturer's Engineering Judgment identification number and drawing details when no ULC or UL fire resistance design is available for an application.

1.7 SYSTEM PERFORMANCE

.1 Firestopping Materials: Provide fire stopping systems of sufficient thickness, width and density to provide and maintain fire resistance rating as indicated and in accordance with ULC and UL design numbers.

.2 Provide a seal completely filling all annular spaces to prevent the passage of flame, smoke and gases through the opening in the fire separation in which it is installed.

.3 Material Compatibility: Provide materials which are compatible with all materials used in the system including materials used in or on penetrating items as well as all construction materials used in conjunction or contiguous with the system.

.4 Provide components for each fire stopping system that are needed to install fill materials. Use only components specified by the fire stopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire resistance rated systems.

1.8 ENVIRONMENTAL REQUIREMENTS

.1 Comply with manufacturer's recommended requirements for temperature, relative humidity and substrate moisture content during application and curing of materials.

.2 Do not proceed with installation of fire stopping materials when temperatures or weather conditions exceed manufacturer's recommendations.

.3 Ventilate solvent based and moisture-cure fire stopping per manufacturer's instructions by natural means or, where inadequate, by forced air circulation.

1.9 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to Site in Manufacturer's sealed and labeled containers intact. Handle and store materials in accordance with manufacturer's instructions.

Part 2 Products

2.1 ACCEPTABLE MANUFACTURERS

.1 Provide fire stopping and smoke seal systems that are ULC Listed or UL Certified for use in Canada when tested in accordance with CAN/ULC-S115 from the following manufacturers: A/D Fire Protection Systems, 3M Fire Protection Products, Hilti Canada Ltd. and Tremco Sealants and Coatings.

2.2 MATERIALS

.1 Silicone Sealants: For use in openings with penetrating items subject to high movement, multiple penetration systems, combustible pipes up to 50 mm diameter and as a sealant for smoke barrier construction.

.2 Intumescent Caulk: For general use as a firestop sealant with insulated and un-insulated pipes, electrical cables and conduit, and ducts.

.3 Spray: For use with multiple penetration systems, plumbing, mechanical, electrical, and where sprayed sealant application is required or desired.

.4 Mortar: For use in large openings, static non-moving penetrations such as cable trays, multiple penetration systems, electrical and communication bundles, conduits, non-combustible sleeves, and insulated pipes.

.5 Collars: For use in openings with single combustible pipe penetrations greater than 50 mm diameter.

.6 Pillows: For use in openings with cable tray, multiple cable penetrations where retrofitting of penetrating items is anticipated, and as a temporary firestop system.

2.3 ACCESSORIES

.1 Back-up and Forming Materials: Batt insulation to CAN/ULC-S702-1997, mineral wool fibre.

.1 Acceptable products: Roxul SAFE, Fibrex Safing Insulation.

.2 Anchoring Devices: Non-combustible, to manufacturer's recommendations and in accordance with the tested system being installed.

.3 Primers: As required by firestopping manufacturer and compatible with selected system.

.4 Water: Potable.

.5 Tape: Pressure sensitive masking tape as recommended by the firestopping manufacturer.

2.4 SCHEDULE OF FIRESTOP RATINGS

.1 Firestop system installation must meet requirements of CAN/ULC-S115 tested assemblies that provide a fire rating as follows:

.1 For non-combustible penetrations through a fire separation provide a firestop system with an F-Rating as indicated below:

Fire resistance rating of separation	Required F-Rating of firestopping assembly
30 minutes	20 minutes
45 minutes	45 minutes
1.0 hour	45 minutes
1.5 hours	1.0 hour
2.0 hours	1.5 hours
3.0 hours	2.0 hours
4.0 hours	3.0 hours

.2 For combustible pipe penetrations through a fire separation, provide a firestop system with an F-Rating which is equal to the fire resistance rating of the construction being penetrated.

.3 For penetrations through a firewall or horizontal fire separation provide a firestop system with an FT-Rating equal to the fire resistance rating of the construction being penetrated.

.4 For joints provide a firestop system with an Assembly Rating as determined by CAN/ULC-S115 equal to the fire resistance rating of the construction being penetrated.

Part 3 Execution

3.1 PREPARATION

.1 Do not install fire stopping until Work within opening has been completed. Coordinate with other applicable Sections.

.2 Schedule work of other trades so that fire stopping can be inspected prior to being covered by subsequent construction.

.3 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

.4 Clean surfaces to receive fire stopping free of dirt, dust, grease, oil, rust, loose materials, form release agents, frost, moisture or any other matter which would impair the bond of fire stopping material to the substrate and penetrating items.

.5 Prime substrates in accordance with manufacturer's instructions.

.6 Do not apply fire stopping and smoke seals to surfaces previously painted or treated with sealers, curing compounds, water repellent or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.7 Ensure that anchoring devices, back-up materials, clips, sleeves, supports and other related materials used in the actual fire tests are provided.

.8 Mask where necessary to prevent fire stopping materials from contacting adjoining surfaces that will remain exposed upon completion of Work.

.9 Maintain insulation around pipes and ducts penetrating fire separation.

.10 Coordinate location and proper selection of cast-in-place firestop devices with trade responsible for the work. Ensure device is installed before placement of concrete.

.11 Installation is not to proceed until submittals have been completed.

3.2 INSTALLATION

.1 Install fire stopping material and components in accordance with ULC/UL fire resistance design and manufacturer's instructions.

.2 Seal holes or voids made by through penetrations, poke-through termination devices, and un-penetrated openings 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 Provide leak-proof dams as required to seal openings and contain liquid sealants, putty or mortar until cured. Install damming in accordance with manufacturer's instructions.

.5 Tool or trowel exposed surfaces to a neat finish.

.6 Remove excess compound promptly as work progresses and upon completion.

3.3 FIELD QUALITY CONTROL

.1 Notify GOCB Site Construction Manager when completed installations are ready for inspection prior to concealing or enclosing area containing fire stopping materials.

.2 Following field inspections, provide all repair as required to ensure compliance with the Contract Documents.

.3 Install permanent warning labels provided by fire stopping material manufacturer adjacent to openings that may be re-penetrated or disturbed. This card should contain the following information:

.1 Warning that the opening has been firestop protected.

.2 Indicate the firestop system used (ULC/UL Design No.).

.3 F-rating or FT rating.

.4 Fire stop product(s) used.

.5 Person to contact and phone number in case of modification or new penetration of firestop system.

3.4 CLEANING AND PROTECTION

.1 Upon completion of this work, remove all materials, equipment and debris from the site.

.2 Leave work area and adjacent surfaces in a condition acceptable to the Departmental Representative.

.3 Protect work until Interim Inspection.

END OF SECTION

Part 1 General

1.1 GENERAL SUMMARY

.1 Preparing substrate surfaces.

.2 Sealant and joint backing.

1.2 RELATED SECTIONS

.1 Section 08 51 13 - Aluminum Windows.

1.3 REFERENCES

.1 American Society for Testing of Materials (ASTM).

.1 ASTM C834-00e1, Standard Specification for Latex Sealants.

.2 ASTM C919-02, Standard Practice for Use of Sealants in Acoustical Applications.

.3 ASTM C920-02, Standard Specification for Elastomeric Joint Sealants.

1.4 SUBMITTALS FOR REVIEW

.1 Submit in accordance with Section 01 33 00.

.2 Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and colour availability.

.3 Samples: Submit two sample ribbons of sealant, illustrating sealant colours for selection.

.4 Submit laboratory tests or data validating product compliance with performance criteria specified. Include SWRI validation certificate where required.

1.5 QUALITY ASSURANCE

.1 Installer Qualifications: Qualified to perform work specified by reason of experience or training provided by product manufacturer. Submit reference list including minimum three projects of similar size and scope.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

.2 Store products in a location protected from freezing, damage, construction activity, precipitation, and direct sunlight in strict accordance with manufacturer's recommendations.

.3 Condition products to approximately 16 to 21°C for use in accordance with manufacturer's recommendations.

1.7 WARRANTY

.1 Silicone Sealants: Provide manufacturer's 20-year material warranty for properly installed silicone sealant. Include results from site testing.

1.8 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.

Part 2 Products

2.1 SEALANT MATERIALS

.1 Acrylic latex: to ASTM C 834, single component general purpose siliconized acrylic latex sealant, paintable; white colour.

.2 Silicone: to ASTM C 920, Type S, Grade NS, Class 50, single component neutral cure RTV silicone sealant, plus minus 50% joint movement capability.

.1 Colour: Custom unless noted otherwise.

.2 Warranty Requirements: 20 year.

.3 Acoustical sealant: to ASTM C919, single component, non-hardening, non-skinning, synthetic rubber.

2.2 ACCESSORIES

.1 Primer: Type recommended by the sealant manufacturer and compatible with joint forming materials.

.2 Joint Cleaner: Non-corrosive and non-staining type recommended by sealant manufacturer and compatible with joint forming materials.

.3 Soft Backer Rod: to ASTM C 1330, non-gassing, reticulated closed-cell polyethylene rod designed for use with cold-applied joint sealants. Size required for joint design.

.4 Closed-Cell Backer Rod: to ASTM C 1330, closed-cell polyethylene rod designed for use with cold-applied joint sealants for on-grade or below-grade applications. Size required for joint design.

.5 Joint Filler: closed-cell polyethylene joint filler designed for use in cold joints, construction joints, or isolation joints wider than 6 mm. Size required for joint design.

.6 Bond Breaker: Pressure-sensitive tape recommended by sealant manufacturer to suit application.

2.3 COLOURS

.1 Unless indicated otherwise in respective technical specification sections, colour selection is at the option of the Departmental Representative.

2.4 SEALANT SCHEDULE

.1 Perimeters of exterior openings where frames meet exterior facade of building. All other exterior applications.

.1 Sealant type: Silicone.

.2 Perimeters of interior door/window frames and surfaces, where required.

.1 Sealant type: Acrylic latex.

.3 Building envelope applications (vapour barrier/vapour barrier, vapour barrier/wall opening, etc.):

.1 Sealant type: Acoustical sealant.

.4 For locations not included in this schedule, consult with Departmental Representative for proper selection of sealants.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that substrate surfaces and joint openings are clean, dry, and free of frost and ready to receive work.

.2 Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

.1 Remove loose materials and foreign matter which might impair adhesion of sealant.

.2 Clean and prime joints in accordance with sealant manufacturer's written instructions.

.3 Perform preparation in accordance with sealant manufacturer's written instructions.

.4 Protect elements surrounding the work of this section from damage or disfiguration.

3.3 INSTALLATION

.1 Install sealant in accordance with sealant manufacturer's written instructions.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Measure joint dimensions and size materials to achieve required 2:1 width/depth ratios.

.4 Install joint backing to achieve a neck dimension no greater than 1/3 of the joint width.

.5 Install bond breaker where joint backing is not used.

.6 Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

.7 Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

.8 Tool joints concave.

3.4 CLEANING

.1 Clean adjacent soiled surfaces.

3.5 PROTECTION OF FINISHED WORK

.1 Remove masking tape and excess sealant.

.2 Protect sealants until cured.

END OF SECTION