1. GENERAL

1.1 References

.1 Canadian General Standards Board (CGSB)

.1 CGSB 37-GP-9Ma, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.

.2 Canadian Standards Association (CSA)

.1 CSA A123.4, Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems.

1.2 Product Data

.1 Submit product data in accordance with Section E4 –Shop Drawings.

.2 Submit WHMIS MSDS - Material Safety Data Sheets.

.3 Submit product data sheets for bituminous dampproofing products. Including:

.1 Product characteristics.

.2 Performance criteria.

.3 Application methods.

.4 Limitations.

1.3 Environment

.1 Temperature, relative humidity, moisture content.

.1 Apply dampproofing materials only when surfaces and ambient temperatures are within Manufacturers' prescribed limits.

.2 Do not proceed with Work when windchill effect would tend to set bitumen before proper curing takes place.

.3 Maintain air temperature and substrate temperature at dampproofing installation area above 5°C for twenty-four (24) hours before, during and twenty-four (24) hours after installation.

.4 Do not apply dampproofing in wet weather.

2. PRODUCTS

2.1 Materials

.1 Accepted Systems:

.1 Hydrotech Monolithic Membrane 6125 (MM6125) system as manufactured by American Hydrotech Inc.:

.1 Primer: as required by dampproofing manufacturer.

.2 Membrane: one (1) 4.8 mm WFT layer.

.2 Bakor 790-11 system as manufactured by Henry Company:

.1 Primer: as required by dampproofing manufacturer.

.2 Membrane: one (1) 2.3 mm WFT layer of membrane. Apply reinforcing sheet and embed into first layer of membrane. Apply one (1) additional 3.2 mm WFT layer of membrane over reinforcing sheet.

3. EXECUTION

3.1 Workmanship

.1 Keep hot asphalt:

.1 Below its flash point.

.2 At or below its final blowing temperature.

.3 Within its equiviscous temperature range at place of application.

3.2 Preparation

.1 As an initial step, clean all surfaces to be dampproofed of any and all deleterious material.

.2 Inspect all subject surfaces to identify imperfections including, but not limited to, uneven surfaces, joints, cracks, honeycombing, spalls, delaminated areas, exposed reinforcing steel, or any other existing conditions that may affect the performance of the new dampproofing system.

.3 Repair cracks in concrete using polyurethane or epoxy injection. After injection, remove any related coatings or injection nipples and prepare the surfaces affected.

.4 Repair other surface imperfections and surface of cracks by chipping out and filling with repair mortar to the satisfaction of the Contract Administrator and the dampproofing materials manufacturer prior to beginning final surface preparation steps.

.5 Blast clean all surfaces to a dry, roughened texture using approved equipment, materials and methods; while adhering to the dampproofing Manufacturer’s requirement and environmental considerations.

.6 Dampproofing Manufacturer’s authorized agent to inspect surfaces to be dampproofed with the Contract Administrator and dampproofing Subcontractor. Provide to the Contract Administrator a written certification from the dampproofing Manufacturer that the surfaces area acceptable for the application of the dampproofing system, and that the proposed dampproofing system is appropriate for the location and required service. Do not apply any dampproofing until the Contract Administrator receives the written certification from the Manufacturer.

3.3 Application

.1 Apply dampproofing only when atmospheric conditions are suitable. Do not apply during rain or when temperatures are below 10°C. Maintain material and substrate temperatures within limits recommended by product Manufacturer. Provide suitable enclosures of areas to be dampproofed if necessary to satisfy the work condition requirements.

3.4 Schedule

.1 Apply dampproofing to protect dry and wet areas below grade, including:

.1 All around the exterior concrete walls, exterior tops of slabs that are covered by topping and exterior edges of slabs.

.2 Where dampproofing is discontinued, extend dampproofing 1 m beyond the required location.

.3 Confirm locations and details with the Contract Administrator prior to proceeding with dampproofing.

END OF SECTION

1. GENERAL

1.1 References

.1 ASTM International (ASTM)

.1 ASTM D2842, Standard Test Method for Water Absorption of Rigid Cellular Plastics

.2 Canadian General Standards Board (CGSB)

.1 CGSB 71-GP-24M, Adhesive, Flexible, for Bonding Cellular Polystyrene Insulation.

.3 Underwriters Laboratories of Canada (ULC)

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

1.2 Action and Informational Submittals

.1 Product Data:

.1 Submit Manufacturer's printed product literature, specifications and data sheet in accordance with Section E4 –Shop Drawings.

.2 Submit two (2) copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section E4 –Shop Drawings. Indicate VOC's insulation products and adhesives.

.2 Manufacturer's Instructions:

.1 Submit Manufacturer's installation instructions.

1.3 Quality Assurance

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

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

2. PRODUCTS

2.1 Rigid Insulation

.1 Masonry Wall Insulation: 100 mm thick rigid insulation CAN/ULC-S701, Type 4 rigid, closed cell type, with integral high density skin, extruded polystyrene insulation, 610 mm wide x 2440 mm long, edge treatment: butt edge and ship lapped.

.2 Below Topping Insulation: 100 mm thick rigid insulation CAN/ULC-S701, Type 4 rigid, closed cell type, with integral high density skin, extruded polystyrene insulation, 610 mm wide x 2440 mm long, edge treatment: butt edge and ship lapped.

.3 Below Main Floor Elevation unexposed foundation well insulation: 100 mm thick rigid insulation CAN/ULC-S701, Type 4 rigid, closed cell type, with integral high density skin,

extruded polystyrene insulation, 610 mm wide x 2440 mm long, edge treatment: butt edge and ship lapped.

2.2 Exposed Foundation Wall Insulation

.1 CFI Panel: 100 mm thick rigid insulation complete with factory applied concrete facing, CAN/ULC-S701, Type 4 rigid closed cell type, extruded polystyrene insulation, 610 mm wide x 1220 mm long; Concrete Faced Insulation (CFI) Wall Panels. These panels are to extend at least 500 mm below finished grade.

.2 Anchorage: Purpose made galvanized steel securement clips.

2.3 Below Main Floor Elevation Rigid Insulation Anchorage

.1 Below grade rigid insulation anchorage: Retainer Tee Stud complete with Screws.

2.4 Spray Foam Insulation

.1 Spray Foam Insulation: closed-cell foam with water-resistant outer skin when cured. Low expansion for windows and doors.

3. EXECUTION

3.1 Workmanship

.1 Install insulation after building substrate materials are dry.

.2 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

.4 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.

.5 Offset both vertical and horizontal joints in multiple layer applications.

.6 Do not enclose insulation until it has been inspected and approved by Contract Administrator.

3.2 Rigid Insulation

.1 Apply adhesive to secure above grade rigid insulation to substrate.

.2 Apply adhesive to secure below grade insulation to substrate and provide mechanical anchorage to substrate utilizing Retainer Tee Stud and related anchors.

.3 Butt edges and ends tight to adjacent board and protrusions.

.4 Spray foam voids between rigid insulation sheet joints.

3.3 Foundation Insulation

.1 Install CFI Wall Panels with 1220 mm edge vertical.

.2 Install purpose made anchors and side flashings.

END OF SECTION

1. GENERAL

1.1 References

.1 ASTM International (ASTM)

.1 ASTM C553, Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.

.2 ASTM C665, Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

.3 ASTM C1320, Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.

.2 Canadian Standards Association (CSA)

.1 CSA B111, Wire Nails, Spikes and Staples.

.3 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC S702, Standard for Mineral Fiber Thermal Insulation for Buildings.

1.2 Action and Informational Submittals

.1 Product Data:

.1 Submit Manufacturer's printed product literature, specifications and data sheet in accordance with Section E4 –Shop Drawings.

.2 Manufacturer's Instructions:

.1 Submit Manufacturer's installation instructions.

1.3 Quality Assurance

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

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

2. PRODUCTS

2.1 Insulation

.1 Batt and blanket mineral fibre: to ASTM C665.

.1 Type: 1.

.2 Thickness: as indicated.

2.2 Accessories

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

.2 Nails: galvanized steel, length to suit insulation plus 25 mm, to CSA B111.

.3 Staples: 12 mm minimum leg.

.4 Tape: as recommended by Manufacturer.

3. EXECUTION

3.1 Insulation Installation

.1 Install insulation after building substrate materials are dry.

.2 Install insulation to maintain continuity of thermal protection to building elements and spaces and to ASTM C1320.

.3 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.

.4 Do not compress insulation to fit into spaces.

.5 Do not enclose insulation until it has been inspected and approved by Contract Administrator.

3.2 Workmanship

.1 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.2 Fit insulation tight to electrical boxes, plumbing and heating pipes and ducts, around external doors and protrusions.

END OF SECTION

1. GENERAL

1.1 References

.1 American Society for Testing and Materials

.1 ASTM D412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension.

.2 ASTM D882, Standard Test Method for Tensile Properties of Thin Plastic Sheeting.

.3 ASTM E154/E154M, Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.

.4 ASTM D903, Standard Test Method for Peel or Stripping Strength of Adhesive Bonds.

.5 ASTM D570, Standard Test Method for Water Absorption of Plastics.

.6 ASTM E283-91, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.7 ASTM E330-90, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

.2 Canadian General Standards Board (CGSB)

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

.2 CAN/CGSB 37-GP-56M, Water Vapour Transmission, Membrane, Modified, Bituminous, Prefabricated, and Reinfroced for Roofing.

1.2 Action and Informational Submittals

.1 Provide submittals in accordance with Section E4 –Shop Drawings.

.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 (2) 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.

2. PRODUCTS

2.1 Sheet Vapour Barrier

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

.2 Air/Vapour Membrane: to CAN/CGSB 37-GP-56M) SBS modified bitumen, self-adhering sheet membrane 1.0 mm thick.

.3 Through-wall Flashing Membrane: to CAN/CGSB 37-GP-56M SBS modified bitumen, self-adhering sheet membrane 1.0 mm thick.

.4 Roof Underlay Self-Adhesive membrane complete with silicone treated release sheet, 1.0 mm thick, non-slip surface

.5 Below Slab Vapour Barrier 0.38 mm thick (15 mil) by Stego Industries.

.1 Seam Tape for Slab on grade: Stego Tape by Stego Industries

.2 Mastic for all types: Stego Mastic by Stego Industries.

.3 Termination Bar: Stego ‘Term’ Bar by Stego Indusries.

2.2 Accessories

.1 Joint sealing tape: air resistant pressure sensitive adhesive tape, type recommended by air/vapour barrier manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.

.2 Sealant: compatible with air/vapour barrier materials, recommended by air/vapour barrier manufacturer.

.3 Staples: minimum 6 mm leg.

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

2.3 Adhesives

.1 Adhesive: type recommended by air/vapour barrier manufacturer.

3. EXECUTION

3.1 Installation – Air/Vapour Barrier

.1 Ensure services are installed and inspected prior to installation of air/vapour barrier.

.2 Install sheet air/vapour barrier on warm side of exterior assemblies to form continuous air/vapour barrier.

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

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

.5 Install air/vapour barrier prior to installation of doors, windows, and mechanical louvers.

.6 Start air/vapour barrier installation at a building corner, leaving 150 mm to 300 mm or air/vapour barrier extended beyond corner to overlap.

.7 Install air/vapour barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in shingling manner to overlap lower layers. Maintain air/vapour barrier plumb and level.

.8 Door openings and wall penetrations: Extend air/vapour barrier completely over openings.

.9 Extend and lap to air/vapour barrier at ceiling to maintain building envelope.

.10 Extend and lap to dampproofing to maintain building envelope.

3.2 Installation – Through Wall Flashing

.1 Install Through Wall Flashing to lap air/vapour barrier and metal flashing material.

.2 Install continuous sealant at discontinuous edges of Through Wall Flashing.

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

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

3.5 Electrical Boxes

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

.1 Install moulded box vapour retarder or wrap boxes with film sheet providing minimum 300 mm perimeter lap flange.

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

END OF SECTION

1. GENERAL

1.1 Reference Standards

.1 American National Standards Institute (ANSI)/ American Society of Mechanical Engineers (ASME).

.1 ANSI/ASME B18.6.3, Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch Series).

.2 ASTM International (ASTM).

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

.2 ASTM D2369, Standard Test Method for Volatile Content of Coatings.

.3 ASTM D2832, Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.

.4 ASTM D5116, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.

.3 Canadian General Standards Board (CGSB).

.1 CAN/CGSB 51.32, Sheathing, Membrane, Breather Type.

.4 Canadian Sheet Steel Building Institute (CSSBI)

.1 CSSBI 20M, Standard for Sheet Steel Cladding for Architectural, Industrial and Commercial Building Applications.

.2 CSSBI S8, Quality and Performance Specification for Prefinished Sheet Steel Used for Building Products.

.5 Canadian Standards Association (CSA).

.1 CSA B111, Wire Nails, Spikes and Staples.

1.2 Action and Informational Submittals

.1 Product data: submit Manufacturer's printed product literature, specifications and data sheet in accordance with Section E4 –Shop Drawings.

.2 Submit two (2) copies of WHMIS MSDS - Material Safety Data Sheets. Indicate VOC's for caulking materials during application and curing.

.3 Shop Drawings:

.1 Submit Shop Drawings in accordance with Section E4 –Shop Drawings.

.2 Indicate dimensions, profiles, attachment methods, schedule of wall elevations, trim and closure pieces, soffits, fascia, metal furring, and related work.

.4 Samples:

.1 Submit samples in accordance with Section E4 –Shop Drawings.

.2 Submit 100 mm x 100 mm colour samples for pre-finished sheet metal liner panel. Colours to be custom colours and be coordinated with Contract Administrator prior to submitting Shop Drawings.

.3 Submit five (5) screws for each colour of pre-finished sheet metal cladding and sheet metal liner panel.

.5 Manufacturer's Instructions:

.1 Submit Manufacturer's installation instructions.

2. PRODUCTS

2.1 Steel Cladding and Components

.1 Metal Liner Panel: factory pre-finished Diamond Rib DR762 0.50mm thick, finish Silicone Modified Polyester (SMP), colour chosen from manufacturer standard colour chart. Front and back sides factory pre-finished in (SMP) coating.

.2 Metal Fascia Cladding: factory pre-finished CL 308, 0.8 mm thick, finish Silicone Modified Polyester (SMP), colour chosen from manufacturer standard colour chart. Front and back sides factory pre-finished in (SMP) coating.

.3 Fabricate all components of the system in the factory, ready for field installation.

.4 Provide liner and cladding and all accessories in longest practicable length to minimize field lapping of joints.

.5 Form sections square, true and accurate to size, free from distortion, and other defects detrimental to appearance or performance.

.6 Backpaint flashing with bituminous paint where expected to be in contact with cementitious materials or dissimilar metals.

2.2 Accessories

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

.2 Rubber-asphalt sealing compound.

.3 Bituminous paint: acid and alkali resistant type; black colour.

2.3 Fasteners

.1 Nails: CSA B111.

.2 Screws: ANSI B18.6.3. Purpose made, factory pre-finished, galvanized fastener complete with nylon washer. Fastener colour to match cladding and liner panel to which it is attached.

3. EXECUTION

3.1 Installation

.1 Install cladding in accordance with CGSB 93.5, and Manufacturer's written instructions.

.2 Install one (1) layer exterior wall sheathing paper horizontally by stapling lapping edges 150 mm.

.3 Install continuous starter strips, inside and outside corners, edgings, soffit, drip, cap, sill and window/door opening flashings as indicated.

.4 Install outside corners, fillers and closure strips with carefully formed and profiled work.

.5 Install soffit and fascia cladding as indicated.

.6 Maintain joints in exterior cladding, true to line, tight fitting, hairline joints.

.7 Attach components in manner not restricting thermal movement.

.8 Caulk junctions with adjoining work with sealant. Do Work in accordance with Section 07 92 00 - Joint Sealants.

.9 Interlock liner side joints and seal with butyl caulking.

3.2 Field Touch-up and Cleaning

.1 Touch-up minor paint abrasions with touch-up paint.

.2 Clean cladding by dry wiping.

END OF SECTION

1. GENERAL

1.1 Reference Standards

.1 ASTM International (ASTM)

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

.2 ASTM D4586/D456M, Standard Specification for Asphalt Roof Cement, Asbestos free.

.2 Canadian Roofing Contractors' Association (CRCA)

.1 CRCA Roofing Specifications.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.32, Sheathing, Membrane, Breather Type.

.4 Canadian Sheet Steel Building Institute (CSSBI)

.1 CSSBI 20M, Standard for Sheet Steel Cladding for Architectural, Industrial and Commercial Building Applications.

.2 CSSBI S8, Quality and Performance Specification for Prefinished Sheet Steel Used for Building Products.

.5 Canadian Standards Association (CSA)

.1 CSA A123.3, Asphalt Saturated Organic Roofing Felt.

.6 Aluminum Association

.1 AA ASM-35, Specifications for Aluminum Sheet Metal Work in Building Construction.

1.2 Action and Informational Submittals

.1 Submit in accordance with Section E4 –Shop Drawings.

.2 Product Data:

.1 Submit Manufacturer's instructions, printed product literature and data sheets for sheet metal roofing and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Proof of Manufacturer's CCMC listing and listing number.

.3 Submit two (2) copies of WHMIS MSDS.

.3 Shop Drawings:

.1 Submit Drawings stamped and signed by Professional Engineer registered or licensed in Province of Manitoba.

.2 Clearly indicate profiles, sizes, connections, attachments, reinforcing, anchorage, size, snow fence and type of fasteners and accessories.

.3 Indicate arrangements of sheets and joints, types and locations of fasteners and special shapes and relationship of panels to structural truss layout, location, design and installation details for snow and ice retention system, and any requirements for additional support of roof panels where snow and ice retention system will be installed.

.4 Clearly indicate design brief on Shop Drawings.

.4 Samples:

.1 Submit duplicate 300 x 300 mm samples of each sheet metal material.

.2 Submit colour samples of the snow and ice fence.

.3 Submit samples of fasteners.

.5 Maintenance Data:

.1 Provide operation and maintenance data for Sheet Metal Roofing for incorporation into maintenance manual specified in Section 01 78 00 – Closeout Submittals.

1.3 Warranty

.1 For sheet metal roofing and the snow and ice retention system the twelve (12) months warranty period is extended as follows:

.1 Twenty-four (24) month warranty for the sheet metal roofing in accordance with Canadian Roofing Contractors Association (CRCA) recommendations covering material, roof leaks, and installation workmanship.

.2 Sixty (60) month warranty for the snow and ice retention system with liability insurance against system failure.

2. PRODUCTS

2.1 Sheet Metal Roofing

.1 Design Standard standing seam roof: with snap-on cap and ribs at 400 mm centre to centre. Minimum 0.61 mm thick (24 gauge) pre-finished steel panels, top coat colour to be Silicone Modified Polyester (SMP). Front and back sides factory pre-finished in SMP system coating.

.2 Snow fence: pre-finished galvanized to match pre-finished galvanized roof metal.

.3 Pre-finished galvanized metal fascia, gutters and downspouts: minimum 0.46 mm thick (26 gauge) with Z275 zinc coating; pre-finished topcoat a. Colour selected by Contract Administrator from Manufacturer's standard range.

.4 Pre-finished aluminum vented soffit: SP-600 Vented, 410 mm (16 inch). Colour to be White Semi Gloss.

.5 Pre-finished aluminum solid soffit: SP-600 Solid, 410 mm (16 inch). Colour to be White Semi Gloss.

2.2 Snow and Ice Fence System

.1 Snow and ice fence system required. Colour selected by Contract Administrator from Manufacturer's standard range.

.2 All snow and ice fence system components are required to be design calculated and components must carry a specified engineered load rating as determined by the Contractor's Engineer.

.3 The snow and ice fence system secured with self-tapping 304 stainless steel screws and washers, quantity to be determined by loading.

.4 The system shall have a listed snow load rating, based over two lineal feet (610 mm), with a safety factor of at least 2.

.5 Each roof section must have appropriate snow load calculations. The Contractor shall provide the Manufacturer with the necessary roof dimensions, the city the project is located in, and any drifting conditions.

.6 The Contractor must provide the Manufacturer with the roof type and seam configuration. The Contractor must also provide the Manufacturer with the substructure and the roof system that the snow and ice retention system will be fastened to.

2.3 Accessory Materials and Components

.1 Rubber-asphalt sealing compound.

.2 Bituminous paint: acid and alkali resistant type; black colour.

2.4 Ridge Vent

.1 Pre-finished galvanized vented ridge cap: 0.61 mm thick (24 gauge) with Z275 zinc coating; pre-finished topcoat. Colour to match roof sheet metal. Provide minimum 0.65m^2 of Free Area of Venting at ridge in accordance with NBC 2010.

2.5 Fabrication

.1 Fabricate metal cap in accordance with recommendations of CRCA.

.2 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.3 Make allowances for expansion at joints.

.4 No joints are allowed in panel length. Overlap sheet metal in order to shed water.

.5 Backpaint flashing with bituminous paint where expected to be in contact with pressure treated wood or dissimilar metals.

.6 Gutter depth to be 175 mm. Gutter width by Contractor to suit total gutter cross sectional area of 12,410 mm^2. Gutter slope to be 1:100. Downspout to be 100 mm x 100 mm, enclosed for top 50% of its length. For remainder of length provide one open face.

.7 Fabricate aluminum sheet metal in accordance with AA ASM-35.

.8 Form individual pieces in 2,400 mm maximum lengths. Make allowances for expansion at joints.

.9 Hem exposed edges on underside 12 mm, mitre and seal.

.10 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.11 Apply minimum 0.2 mm dry film thickness coat of plastic cement to both faces of dissimilar metals in contact.

.12 Protect panel metals against oxidization by backpainting with isolation coating where indicated.

.13 Tin edges of copper sheets to be soldered for width of 40 mm both sides with solder.

3. EXECUTION

3.1 Installation of Roofing

.1 Install Underlay over entire roof surface.

.2 Install sheet metal roofing and appurtenances in accordance with CRCA recommendations and as indicated on Drawings.

.3 Lock seams and end joints. Fit flashing tight in place. Make corners square, surfaces true and straight in all planes and all lines accurate to profiles.

.4 Reinforce roof as required to properly install the perimeter snow fence.

.5 Counter-flash all mechanical and electrical items projecting through.

.6 Seal metal joints watertight.

END OF SECTION

1. GENERAL

1.1 References

.1 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S115, Fire Tests of Fire stop Systems.

1.2 Definitions

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

.2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.

.3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.

.4 Tightly Fitted; (ref: NBC Part 3.1.9.1.1 and 9.10.9.6.1): penetrating items that are cast in place in buildings of non-combustible construction or have "0" annular space in buildings of combustible construction.

.1 Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation.

1.3 Action and Informational Submittals

.1 Provide submittals in accordance with Section E4 – Shop Drawings.

.2 Product Data:

.1 Submit Manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two (2) copies of WHMIS MSDS - Material Safety Data Sheets.

.3 Shop Drawings:

.1 Submit Shop Drawings to show location, ULC assembly number for each condition, required temperature rise and flame rating, hose stream rating, thickness, installation methods and materials of fire stop material and smoke seals, damming materials, reinforcements, anchorages and fastenings, size of opening, adjacent materials and number of penetrations..

.2 Construction details should accurately reflect actual job conditions.

.4 Samples:

.1 Submit duplicate 300 x 300 mm samples showing actual fire stop material proposed for project.

.5 Quality assurance submittals: submit the following.

.1 Test reports: in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.

.1 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.

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

.3 Manufacturer's Instructions: submit Manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.

2. PRODUCTS

2.1 Materials

.1 Fire stop and smoke seal systems: in accordance with CAN/ULC-S115.

.2 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CAN/ULC S115 and not to exceed opening sizes for which they are intended.

.3 Certified and listed by ULC or WH and bearing ULC or WH label, products shall be heat resistant, flexible, durable and compatible with adjacent materials and finishes. System shall be self-supporting at penetration capable to adhere and yet maintain its integrity while providing effective barrier against passage of flame, smoke and gases. Product shall provide flame and temperature rating in accordance with requirements of NBC for openings in respective fire resistance rated floor, wall or other assembly.

.4 Fire Stop Systems: Certified by ULC, WH and listed in ULC Guide No. 40 U19.

.5 Fire Stop System Components: Certified by ULC, WH and listed in ULC Guide No. 40 U19.13 under the Label Service of ULC.

.6 Cementitious Matrices: Minimum 2758 kPa (400 psi) compressive strength when cured, to retard cable tray warping within the firestop seal.

.7 Fire Stop and Smoke Seals at Openings Where Reinstallation Occurs: An elastomeric or re-useable cementitious matrix or putty seal; do not use a permanent cementitious seal at such locations.

.1 Fire stop and smoke seals at openings around penetrations for electrical bus ducts, pipes, ductwork and other electrical and mechanical items requiring sound and vibration control or allowance for expansion, contraction and other movement: An elastomeric seal; do not use a cementitious or rigid seal at such locations.

.2 Fire stop and smoke seals at joints and spaces designed and required to allow movement such as building movement joints, deflection spaces, control joints, expansion joints, and similar locations shall be flexible, elastomeric seal suitable to

withstand the required movement and capable of returning to original configuration without damage to seal and without adhesive or cohesive failure; do not use a cementitious or rigid seal at such locations.

.8 Primers: To Manufacturer's recommendation for specific material, substrate, and end use.

.9 Water (if applicable): Potable, clean and free from injurious amounts of deleterious substances.

.10 Damming and Back-up Materials, Supports and Anchoring Devices: To Manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to Authorities Having Jurisdiction.

.11 Pipe and Duct Insulation and Wrappings: Compatible with firestopping systems.

.12 Intumescent Pads: Permanently pliable type.

.13 Intumescent Composite Sheet: Composite sheet, strip or precut shapes.

.14 Sealants and Putty for Vertical and Overhead Joints: Non-sagging.

.15 Materials and products shall not cause stress, chemical or physical reaction, or other damage to penetrating items or adjacent materials.

3. EXECUTION

3.1 Preparation

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.

.2 Ensure that substrates and surfaces are clean, dry and frost free.

.3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.

.4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.2 Installation

.1 Install fire stopping and smoke seal material and components in accordance with Manufacturer's certified tested system listing.

.2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

.3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

.4 Tool or trowel exposed surfaces to neat finish.

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

3.3 Sequences

.1 Install floor fire stopping before interior partition erections.

.2 Metal deck bonding: fire stopping to precede spray applied fireproofing to ensure required bonding.

.3 Mechanical pipe insulation: fire stop system component.

.1 Ensure pipe insulation installation precedes fire stopping.

3.4 Schedule

.1 Fire stop and smoke seal at:

.1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.

.2 Edge of floor slabs at curtain wall and precast concrete panels.

.3 Top of fire-resistance rated masonry and gypsum board partitions.

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

.5 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.

.6 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.

.7 Openings and sleeves installed for future use through fire separations.

.8 Around mechanical and electrical assemblies penetrating fire separations.

.9 Rigid ducts: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

END OF SECTION

1. GENERAL

1.1 References

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.13, Sealing Compound, One-component, Elastomeric, Chemical Curing.

.2 CAN/CGSB-19.17, One-Component Acrylic Emulsion Base Sealing Compound.

.3 CAN/CGSB-19.24, Multi-component, Chemical Curing Sealing Compound.

1.2 Action and Informational Submittals

.1 Submit in accordance with Section E4 - Shop Drawings.

.2 Product Data:

.1 Submit Manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Manufacturer's product to describe:

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.3 Submit two (2) copies of WHMIS MSDS.

.3 Samples:

.1 Submit two (2) samples of each type of material and colour.

.2 Cured samples of exposed sealants for each colour where required to match adjacent material.

.4 Manufacturer's Instructions:

.1 Submit instructions to include installation instructions for each product used.

1.3 Closeout Submittals

.1 Submit in accordance with Section 01 78 00 – Closeout Submittals.

.1 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

1.4 Site Conditions

.1 Ambient Conditions:

.1 Proceed with installation of joint sealants only when:

.1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 5°C.

.2 Joint substrates are dry.

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

.2 Joint-Width Conditions:

.1 Proceed with installation of joint sealants only where joint widths are within limits allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

2. PRODUCTS

2.1 Materials

.1 Primers: type recommended by sealant manufacturer.

.2 Joint Fillers:

.1 General: compatible with primers and sealants, outsized 30 to 50%.

.2 Polyethylene, urethane, neoprene or vinyl: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa.

.3 Bond Beaker: pressure sensitive plastic tape, which will not bond to sealants.

.4 Joint Sealant: non-staining, non-sagging, grey two-part polysulphide liquid polymer base or a two-part polyurethane base such as Sikaflex 2c NS/SL or Vulkem 245 for horizontal and vertical joints with compatible primer as per sealant Manufacturer’s requirements

.5 Interior Control Joint Sealant: catalyst cured epoxy rubber, Sika Loadflex, Sealtight Bondflex, Concrete Chemicals 903B Flexible Sealant, Allied Coatings AC-1210 Flexible Epoxy Sealant

.6 Sealants:

.1 Colour of sealants: to match adjacent surface. Colours to be selected by the Contract Administrator from standard and custom colour ranges.

.7 Joint Cleaner: non-corrosive type recommended by sealant manufacturer and compatible with sealant

.8 Sealants – Exterior Type 1:

.1 Silicone Building Sealant, colours to be selected.

.9 Sealants – Interior Wet and Damp Areas above Main Floor Elevation Type 2:

.1 Premium Kitchen & Bath Adhesive Caulk.

.10 Sealants – Interior Dry Areas above Main Floor Elevation Type 3:

.1 Acrylic Latex Caulk Plus Silicone (paintable).

3. EXECUTION

3.1 Surface Preparation

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of back-up materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

3.2 Backup Material

.1 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.3 Application

.1 Sealant:

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

.2 Apply sealant in continuous beads.

.3 Apply sealant using gun with proper size nozzle.

.4 Use sufficient pressure to fill voids and joints solid.

.5 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.6 Tool exposed surfaces before skinning begins to give slightly concave shape.

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

.2 Curing:

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.3 Do not cover up sealants until proper curing has taken place.

END OF SECTION