Part 1 General

1.1 RELATED SECTIONS

.1 Section 01330 - Submittal Procedures.

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB).

.1 CGSB 71-GP-24M-[77(R1983)], Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.

.2 Underwriters Laboratories of Canada (ULC).

.1 CAN/ULC-S701-[01], Thermal Insulation, Polystrene, Boards and Pipe Coverings.

.3 Environmental Choice Program (EPC).

.1 CCD-016-[97], Thermal Insulation.

1.3 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01330 - Submittal Procedures.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01330 - Submittal ProceduresIndicate VOC's insulation products and adhesives.

.2 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.4 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.

.3 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

Part 2 Products

2.1 INSULATION

.1 Rigid cellular polystyrene: to CAN/ULC-S701.

.1 Type: 4.

.2 Compressive strength: 170

.3 Thickness: as indicated.

.4 Size: 600 x 1200.

.5 Edges: ship lapped.

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.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 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 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures.

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

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

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

3.3 EXAMINATION

.1 Examine substrates and immediately inform Contract Administrator in writing of defects.

.2 Prior to commencement of work ensure:

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

3.4 RIGID INSULATION INSTALLATION

.1 Employ thermal studs in accordance with manufacturer's recommendations.

3.5 PERIMETER FOUNDATION INSULATION

.1 Exterior application: extend boards as indicated. Install on exterior face of perimeter foundation wall with thermal studs.

3.6 CAVITY WALL INSTALLATION

.1 Install polystyrene insulation boards on outer surface of inner wythe of wall cavity utilizing thermal studs

3.7 CLEANING

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

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation methods providing airvapour barrier materials and assemblies.

.2 Air/vapour barrier materials to provide continuous seal between components of building envelope and building penetrations.

1.2 REFERENCES

.1 Canadian Construction Documents Committee

.1 CCDC 2 - Stipulated Price Contract.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.13M-[M87], Sealing Compound, One Component, Elastomeric Chemical Curing.

.2 CAN/CGSB-19.18M-[M87], Sealing Compound, One Component, Silicone Base Solvent Curing.

.3 CAN/CGSB-19.24M-[M90], Multi-Component, Chemical Curing Sealing Compound.

.4 CGSB 19-GP-14M-[76], Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.

.3 NBCC 1995; Part 5 - Environmental Separation

.4 Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification.

1.3 SUBMITTALS

.1 Submit shop drawings in accordance with Section 01330 - Submittal Procedures.

.2 Submit manufacturer’s product data sheets in accordance with Section 01330 - Submittal Procedures

.3 Submit manufacturer’s installation instructions in accordance with Section 01330 - Submittal Procedures.

1.4 QUALITY ASSURANCE

.1 Perform Work in accordance with Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification requirements for materials and installation.

1.5 QUALIFICATIONS

.1 Applicator: Company specializing in performing work of this section [with minimum 5 years documented experience with installation of air/vapour barrier systems. Completed installation must be approved by the material manufacturer. .

.2 Applicator: Company who is currently licensed by certifying organization must maintain their license throughout the duration of the project.

1.6 MOCK-UP

.1 Construct typical exterior wall panel 5m long by 0.800 m high.

.2 Locate where directed.

.3 Mock-up may remain as part of the Work.

.4 Allow 24 h for inspection of mock-up by Contract Administrator before proceeding with air/vapour barrier Work.

1.7 PRE- INSTALLATION MEETINGS

.1 Convene prior to commencing Work of this section.

1.8 DELIVERY, STORAGE AND HANDLING

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

.2 Avoid spillage. Immediately notify Contract Administrator if spillage occurs and start clean up procedures.

.3 Clean spills and leave area as it was prior to spill.

1.9 PROJECT ENVIRONMENTAL REQUIREMENTS

.1 Do not install solvent curing sealants or vapour release adhesive materials in enclosed spaces without ventilation.

.2 Ventilate enclosed spaces.

.3 Maintain temperature and humidity recommended by materials manufactures before, during and after installation.

1.10 WARRANTY

.1 For sealant and sheet materials the 12 months warranty period prescribed in subsection GC 32.1 of General Conditions "C" is extended to 24 months.

Part 2 Products

2.1 SHEET MATERIALS

.1 Sheet Seal Type 1: Self-Adhesive bitumin laminated to high-density polyethylene film,

.1 Acceptable material: Grace ‘Perma-Barrier’.

.2 Sheet Seal Type 2: Thermofusable elastomeric bitumin membrane reinforced with a glass mat.

.1 Acceptable material: Soprema ‘Sopra-flam’

.3 Foam Seal [Type [4]]: Spray-applied medium density spray polyurethane foam insulation/air/vapour barrier.

2.2 SEALANTS

.1 Sealants in accordance with Section 079210 - Joint Sealers.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that surfaces and conditions are ready to accept the Work of this section.

.2 Ensure all surfaces are clean, dry, sound, smooth, continuous and comply with air barrier manufacturer=s requirements.

.3 Report any unsatisfactory conditions to the Contract Administrator in writing.

.4 Do not start work until deficiencies have been corrected. Commencement of Work implies acceptance of conditions.

3.2 PREPARATION

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

.2 Ensure all substrates are clean of oil or excess dust; all masonry joints struck flush, and open joints filled; and all concrete surfaces free of large voids, spalled areas or sharp protrusions.

.3 Ensure all substrates are free of surface moisture prior to application of [self-adhesive] membrane and primer.

.4 Ensure metal closures are free of sharp edges and burrs.

.5 Prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.

3.3 INSTALLATION

.1 Install materials in accordance with manufacturer's instructions.

.2 Install sheet seal between window and door frames and adjacent wall seal materials with sealant and mechanically fastened galvanized metal cleats

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

3.4 PROTECTION OF WORK

.1 Do not permit adjacent work to damage work of this section.

.2 Ensure finished Work is protected from climatic conditions.

END OF SECTION

Part 1 General

1.1 RELATED WORK

.1 Metal Flashing and Trim: Section 076200.

.2 Joint Sealers: Section 079210.

1.2 References

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C 36-95b, Specification for Gypsum Wallboard.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.

.2 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.

.3 CGSB 37-GP-15M-76, Application of Asphalt Primer for Asphalt Roofing, Dampproofing and Waterproofing.

.4 CGSB 37-GP-19M-76, Cement, Plastic, Cutback Tar.

.5 CAN/CGSB-37.29-M89, Rubber-Asphalt Sealing Compound.

.6 CGSB 37-GP-56M-80, Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.

.7 CAN/CGSB-51.20-M87 Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.3 Canadian Standards Association (CSA)

.1 CSA A123.4-M1992, Bitumen for Use in Construction of Built-Up Roof Coverings and Dampproofing and Waterproofing Systems.

.2 CSA A231.1-1972, Precast Concrete Paving Slabs.

.3 CAN/CSA-A247-M86, Insulating Fibreboard.

.4 CSA A284-1976, Mineral Aggregate Thermal Roof Insulation.

.5 CSA O121-M1978, Douglas Fir Plywood.

.6 CSA O151-M1978, Canadian Softwood Plywood.

1.3 Shop Drawings

.1 Submit shop drawings in accordance with Section 013300 - Submittal Procedures.

.2 Indicate flashing, control joints, tapered insulation details.

.3 Provide layout for tapered insulation.

1.4 Storage and Handling

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

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

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

.4 Place plywood runways over work to enable movement of material and other traffic.

.5 Store sealants at +5EC minimum.

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

1.5 Environmental Requirements

.1 Do not install roofing when temperature remains below -18EC for torch application, or -10EC to manufacturers' recommendations for mop application.

.2 Minimum temperature for solvent-based adhesive is -5EC.

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

1.6 Protection

.1 Fire Extinguishers: maintain one stored pressure rechargeable type with hose and shut-off nozzle, ULC labeled for A, B and C class protection.

.2 Maintain fire watch for 1 hour after each day’s roofing operations cease.

1.7 Warranty

.1 For the Work of this Section 075200 - Modified Bituminous Roofing, the 12 months warranty period prescribed in General Conditions "C" is extended to 24 months.

.2 Contractor hereby warrants that modified bituminous roofing and membrane flashings will stay in place and remain leakproof in accordance with General Conditions, but for two years.

1.8 Compatibility

.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.

1.9 Quality Assurance

.1 Submit laboratory test reports.

Part 2 Products

2.1 Deck Covering

.1 Gypsum board sheathing: to ASTM C 36 Standard 12.7 mm thick.

.2 Sand: natural silica sand passing 1-18 mm sieve.

2.2 Deck Primer

.1 Asphalt primer: to CGSB 37-GP-9Ma.

2.3 Vapour Retarder

.1 Base sheet vapour retarder: to CGSB 37-GP-56M, Styrene-Butadiene-Styrene (SBS) elastomeric polymer glass reinforcement, weighing 100 g/m ^{2} .

2.4 Membrane

.1 Base sheet: to CGSB 37-GP-56M, Styrene-Butadiene-Styrene (SBS) elastomeric polymer glass reinforcement, weighing 180 g/m^2.

.1 Type 1, fully adhered.

.2 Cap sheet: to CGSB 37-GP-56M, Styrene-Butadiene-Styrene (SBS) elastomeric polymer glass reinforcement, weighing 250 g/m^2.

.1 Type 1, fully adhered.

2.5 Bitumen

.1 Asphalt: to CSA A123.4, Type 2.

2.6 Polystyrene Insulation

.1 To CAN/CGSB-51.20, Type 4, thickness as indicated, square edges. Only polystyrene insulations listed on CGSB Qualified Products List (51 GP Series) are acceptable for use on this project.

2.7 Sealers

.1 Plastic cement: asphalt, to CAN/CGSB-37.5 coal tar, to CGSB 37-GP-19M.

.2 Sealing compound: to CAN/CGSB-37.29, rubber asphalt type.

2.8 Fasteners

.1 Covering to steel deck: No. 10 flat head, self tapping, Type A or AB, cadmium plated screws to CSA B35.3.

.2 Insulation to deck: fasteners and plates must meet Factory Mutual 4470 Standard for wind uplift and corrosion resistance.

.3 -slip finish with 51 mm plain margin around perimeter.

2.9 Paver Pedestals

.1 Pedestals and levelling plates made of high density polyethylene with integral spacer ribs on upper surface.

Part 3 Execution

3.1 Workmanship

.1 Do roofing work in accordance with applicable, standard in Canadian Roofing Contractors Association (CRCA) Roofing Specifications Manual .Do priming for asphalt roofing in accordance with CGSB 37-GP-15M.

3.2 Protection

.1 Cover walls and adjacent work where materials hoisted or used.

.2 Use warning signs and barriers. Maintain in good order until completion of work.

.3 Clean off drips and smears of bituminous material immediately.

.4 Dispose of rain water off roof and away from face of building until roof drains or hoppers installed and connected.

.5 Protect roof from traffic and damage. Comply with precautions deemed necessary by Contract Administrator.

.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.

3.3 Examination of Roof Decks

.1 Examine roof decks and immediately inform Contract Administrator.

.2 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 Curbs have been built.
- .3 Roof drains have been installed at proper elevations relative to finished roof surface.
- .4 Plywood and lumber nailer plates have been installed to deck, walls and parapets as indicated.

3.4 Deck Covering

.1 Mechanically fasten to steel deck with screws spaced 400 mm o/c each way.

.2 Place with long axis of each sheet transverse to steel deck ribs, with end joints staggered and fully supported on ribs.

3.5 Vapour Retarder (Concrete/Gypsum Board/Plywood Deck)

.1 Embed vapour retarder in hot bitumen spread at rate of 1.2 kg/m^2.

3.6 Exposed Membrane Roofing Application

.1 Insulation: fully adhered, adhesive application.

.1 Adhere insulation to laminated vapour barrier using solvent-based adhesive.

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

.3 Cut end pieces to suit.

.2 Insulation: fully adhered, bitumen application.

.1 Embed insulation in 1 to 1.5 kg/m^2 mopping of bitumen.

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

.3 Cut end pieces to suit.

.3 Tapered insulation application.

.1 Mop insulation to vapour retarder and top layer of insulation to bottom layer with hot asphalt at rate of 1 kg/m^2.

.2 Install tapered insulation as second insulation layer, in accordance with shop drawings. Stagger joints between layers 150 mm minimum.

.4 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 uniform coating of asphalt applied at rate of 1.2 kg/m^2, at 230EC.

.3 Unroll and torch base sheet onto substrate taking care not to burn membrane or its reinforcement or substrate.

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

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

.5 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 uniform coating of asphalt applied at rate of 1.2 kg/m^2, EVT at point of contact.

.3 Unroll and torch cap sheet onto base sheet taking care not to burn membrane or its reinforcement.

.4 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.

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

.6 Do membrane application in accordance with manufacturer's recommendations.

.6 Flashings.

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

.2 Torch base and cap sheet onto substrate in 1 metre wide strips.

.3 Lap flashing base sheet to membrane base sheet minimum 150 mm and seal by mopping or torch welding.

.4 Lap flashing cap sheet to membrane cap sheet 250 mm minimum and torch weld.

.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 recommendations.

.7 Roof penetrations.

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

3.7 Walkways

.1 Install walkway concrete paving slabs as indicated.

3.8 Field Quality Control

.1 Inspection and testing of roofing application will be carried out by testing laboratory designated by Contract Administrator.

.2 Contract Administrator will pay for tests.

.3 Inspection and testing of roofing application will be carried out by testing laboratory designated by City.

.4 Costs of tests will be paid by City.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 The Aluminum Association Inc. (AA)

- .1 Aluminum Sheet Metal Work in Building Construction-2000.
- .2 AA DAF45-97, Designation System for Aluminum Finishes.

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

- .1 ASTM A167-99, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .2 ASTM A240/A240M-02, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
- .3 ASTM A591/A591M-98, Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications.
- .4 ASTM A606-01, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
- .5 ASTM A653/A653M-01a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .6 ASTM A792/A792M-02, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- .7 ASTM B32-00, Standard Specification for Solder Metal.
- .8 ASTM B370-98, Standard Specification for Copper Sheet and Strip for Building Construction.
- .9 ASTM D523-89(1999), Standard Test Method for Specular Gloss.
- .10 ASTM D822-01, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

.3 Canadian Roofing Contractors Association (CRCA)

- .1 Roofing Specifications Manual 1997.

.4 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.
- .2 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
- .3 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.

.5 Canadian Standards Association (CSA International)

- .1 CSA A123.3-98, Asphalt Saturated Organic Roofing Felt.
- .2 CSA-A440-00/A440.1-00 - A440-00, Windows / Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows.
- .3 CSA B111-1974(R1998), Wire Nails, Spikes and Staples.

Part 2 Products

2.1 SHEET METAL MATERIALS

.1 Zinc coated steel sheet: 0.5mm thickness, commercial quality to ASTM A653/A653M, with Z275 designation zinc coating.

.2 Stainless steel sheet: to ASTM A167 and ASTM A240/A240M, Type 304 with mill finish.

2.2 ACCESSORIES

.1 Isolation coating: alkali resistant bituminous paint.

.2 Plastic cement: to CAN/CGSB 37.5.

.3 Underlay for metal flashing: dry sheathing to CAN/CGSB-51.32, asphalt laminated 3.6 to 4.5 kg kraft paper, No. 15 perforated asphalt felt to CSA A123.3.

.4 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.

.5 Fasteners: of same material as sheet metal, to CSA B111, ring thread flat head roofing nails of length and thickness suitable for metal flashing application.

.6 Washers: of same material as sheet metal, 1 mm thick with rubber packings.

.7 Solder: to ASTM B32, alloy composition Sn 50.

.8 Flux: rosin, cut hydrochloric acid, or commercial preparation suitable for materials to be soldered.

.9 Touch-up paint: as recommended by prefinished material manufacturer.

2.3 FABRICATION

.1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA 'FL' series details.

.2 Fabricate aluminum flashings and other sheet aluminum work in accordance with AA-Aluminum Sheet Metal Work in Building Construction.

.3 Form pieces in 2400 mm maximum lengths. Make allowance for expansion at joints.

.4 Hem exposed edges on underside 12 mm. Mitre and seal corners with sealant.

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

.6 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

2.4 METAL FLASHINGS

.1 Form flashings, copings and fascias to profiles indicated of minimum 0.5 mm thick galvanized, prefinished steel.

2.5 SCUPPERS

.1 Form scuppers from 0.5 mm thick galvanized sheet metal.

.2 Sizes and profiles as indicated.

.3 Provide necessary fastenings.

Part 3 Execution

3.1 INSTALLATION

.1 Install sheet metal work in accordance with CRCA FL series details.

.2 Use concealed fastenings except where approved before installation.

.3 Provide underlay under sheet metal. Secure in place and lap joints 100 mm.

.4 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock forming tight fit over hook strips.

.5 Lock end joints and caulk with sealant.

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

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

.8 Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm. Lead wedge flashing securely into joint.

.9 Caulk flashing at reglet, cap flashing with sealant.

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

3.2 SCUPPERS

.1 Install scuppers as indicated.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Underwriter=s Laboratories of Canada (ULC)

.1 ULC-S115-1995, Fire Tests of Firestop Systems.

1.2 QUALITY ASSURANCE

.1 Firestopping and smoke sealing shall be by competent installers having minimum five (5) years experience in application of materials and systems being used, approved and trained by material or system manufacturer.

.2 Asbestos free firestopping and smoke seal materials and/or systems to provide closures to fire and smoke at openings around penetrations, and at openings and joints within fire separations and assemblies having a fire-resistance rating, including openings and spaces at perimeter edge conditions. System shall provide draft tight barriers to retard passage of flame and smoke, and firefighter's hose stream and passage of liquids. System shall provide and maintain fire resistance rating of adjacent floor, wall or other fire separation assembly acceptable to authorities having jurisdiction. Provide firestopping and smoke seals within mechanical (i.e. inside ducts, dampers) and electrical assemblies (i.e. inside bus ducts) respectively and around outside of such mechanical and electrical assemblies where they penetrate rated fire separations.

.3 Firestopping and smoke seal materials shall conform to both the temperature and flame ratings of ULC-S115 and, where applicable, to ASTM E814, and other requirements of authorities having jurisdiction.

1.3 SUBMITTALS

.1 Submit shop drawings indicating ULC assembly number for each condition, required temperature rise and flame rating, hose stream rating, thickness, installation methods and materials of firestopping and smoke seals, damming materials, reinforcements, anchorages and fastenings, size of opening, adjacent materials and number of penetrations. Submit copies of current ULC listings for each system and certified copies of test reports verifying that firestopping and smoke seals meet or exceed specified requirements.

1.4 ENVIRONMENTAL REQUIREMENTS

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

Part 2 Products

2.1 MATERIALS

.1 Certified and listed by ULC or WH in accordance with CAN4-S115 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 OBC for openings in respective fire resistance rated floor, wall or other assembly.

.2 Firestop Systems: Certified by ULC, WH and listed in ULC Guide No. 40 U19.

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

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

.5 Firestopping 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 Firestopping 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 Firestopping 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.

.3 Primers: To manufacturer's recommendation for specific material, substrate, and end use.

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

.5 Damming and Backup Materials, Supports and Anchoring Devices: To manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

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

.7 Intumescent Pads: Permanently pliable type.

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

.9 Sealants and Putty For Vertical And Overhead Joints: Non-sagging.

.10 Sealants and fluid seals at floors: Self-levelling.

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

Part 3 Execution

3.1 INSTALLATION

.1 Ensure materials and products are compatible with abutting materials, coatings and finishes. Remove applied coatings and finishes as required to permit proper installation and adhesion.

.2 Ensure that pipe and duct insulation and wrappings occurring within openings to receive firestopping and smoke seal are installed prior to work of this Section and that insulation and wrapping within fire seals is a ULC listed component of the system to be installed, unless ULC certified assembly permits such other insulation and wrapping to remain within the assembly. Otherwise, precede installation of mechanical insulations or remove insulation from area of insulated pipe or duct where such pipes or ducts penetrate a fire separation. Coordinate work of this Section with the work of Division 15, Mechanical. Ensure the continuity and integrity of thermal and vapour barriers where such are removed, altered, or replaced, acceptable to Division 15 and the City.

.3 Apply firestopping and smoke seals in accordance with manufacturer's instructions and tested designs acceptable to authorities having jurisdiction to provide required temperature and flame rated seal, and to prevent passage of smoke and liquids.

.4 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing. Completely fill and seal voids with firestopping and smoke seal materials. Do not cover up materials until full curing has taken place. Notify when completed installations are ready for inspection and prior to concealing or enclosing firestopping and smoke seals.

3.2 CLEANING

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

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials, preparation and application for caulking and sealants.

.2 Text to complete other various Sections containing sealant or caulking specifications.

1.2 REFERENCES

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

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

.2 Canadian General Standards Board (CGSB)

.1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).

.2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.

.3 CGSB 19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).

.4 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.

.5 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.

.3 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act, 1999 (CEPA).

.4 General Services Administration (GSA) - Federal Specifications (FS)

.1 FS-SS-S-200-E(2)1993, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.

.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.6 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.3 SUBMITTALS

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

.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 manufacturer's instructions in accordance with City of Winnipeg CW 1110 – General Instructions.

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

1.4 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.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling.

.3 Place materials defined as hazardous or toxic in designated containers.

.4 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.5 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.6 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Contract Administrator.

.7 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.

.8 Fold up metal banding, flatten, and place in designated area for recycling.

1.6 PROJECT CONDITIONS

.1 Environmental Limitations:

.1 Do not proceed with installation of joint sealants under following conditions:

.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.

.2 When joint substrates are wet.

.2 Joint-Width Conditions:

.1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.

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

.3 Ventilate area of work as directed by Contract Administrator by use of approved portable supply and exhaust fans.

Part 2 Products

2.1 SEALANT MATERIALS

.1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks are not possible, confine usage to areas which offgas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize offgas time.

.3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Urethanes One Part.

.1 Non-Sag to CAN/CGSB-19.13, Type 2, MCG-2-25, MCG-2-40.

.2 Silicones One Part.

.1 To CAN/CGSB-19.13.

2.3 SEALANT SELECTION

.1 Sealant as per manufacturer’s recommended product for specified use. Acceptable product Dow, Tremco, or equivalent.

2.4 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.2 Primer: as recommended by manufacturer.

Part 3 Execution

3.1 PROTECTION

.1 Protect installed Work of other trades from staining or contamination.

3.2 SURFACE PREPARATION

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

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

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

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

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

3.5 MIXING

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 APPLICATION

.1 Sealant.

- .1 Apply sealant in accordance with manufacturer's written instructions.
- .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
- .3 Apply sealant in continuous beads.
- .4 Apply sealant using gun with proper size nozzle.
- .5 Use sufficient pressure to fill voids and joints solid.

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

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

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

.2 Curing.

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

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

.3 Cleanup.

.1 Clean adjacent surfaces immediately and leave Work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

END OF SECTION