1 GENERAL

1.01 REFERENCE STANDARDS

.1 Underwriters Laboratories of Canada (ULC)
- .1 ULC 102 – Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
- .2 ULC 114 – Standard Method of Test for Determination of Non-Combustibility in Building Materials
- .3 ULC 702 – Standard for Mineral Fibre Insulation for Buildings

1.02 DELIVERY, STORAGE AND HANDLING

.1 Protect insulation materials from physical damage and from deterioration due to moisture, soiling and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing and protecting during installation.

2 PRODUCTS

2.01 INSULATION

.1 Semi-rigid and rigid mineral fibre thermal:
- .1 to ULC 702, Type I.
- .2 Fire performance:
  - .1 Non-combustible (to ULC S114)
  - .2 Flame spread = 0, smoke developed = 0 (to ULC 102)
- .3 Thickness: as noted on drawings.
- .4 Standard of acceptance:
  - .1 ComfortBatt, as manufactured by Rockwool.

.2 Foam insulation: two-component polyurethane insulation.
- .1 Standard of acceptance:
  - .1 Foamsulate Eco Closed Cell Foam, as manufactured by Accella Polyurethane Systems LLC
  - .2 or approved equal

.3 Roofing insulation: refer to Section 07 52 00, Modified Bituminous Membrane Roofing.

2.02 ACCESSORIES

.1 Mechanical fasteners: in accordance with manufacturer's written instructions.

3 EXECUTION

3.01 EXAMINATION

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

.2 Before start of work, ensure substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

3.02 INSTALLATION – MINERAL FIBRE THERMAL

.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 Do not compress insulation to fit into spaces.

.5 Maintain 75mm clearance of insulation from heat emitting devices such as recessed light fixtures not rated for or protected from contact with insulation.

.6 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.

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

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

3.03 INSTALLATION – FOAM INSULATION

.1 Apply foamed-in-place insulation/sealant in strict accordance with manufacturer's recommendations.

.2 Apply to fill gaps in insulation and to prevent infiltration at exterior insulation envelope to maintain air/vapour barrier and insulation envelope.

.3 Apply foam at:
- .1 Plumbing pipe, electrical and duct penetrations.
- .2 Materials protruding through the insulation envelope.
- .3 Where noted on drawings.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM)
- .1 ASTM C726 – Standard Specification for Mineral Fiber Roof Insulation Board
- .2 ASTM C1177/C1177M – Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
- .3 ASTM C1289 – Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
- .4 ASTM D6162 – Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements

.2 Canadian General Standards Board (CGSB)
- .1 CGSB 37-GP-56M – Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing
- .2 CAN/CGSB-37.29 – Rubber-Asphalt Sealing Compound

.3 Canadian Roofing Contractors Association (CRCA)
- .1 CRCA Roofing Specifications Manual

1.02 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide product data and shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

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

.3 Shop drawings:
- .1 Indicate flashing, control joints, and tapered insulation details.
- .2 Provide layout for tapered insulation.

1.03 QUALITY ASSURANCE

.1 Installer qualifications:
- .1 Company or person specializing in application of modified bituminous roofing systems with five (5) years documented experience.

1.04 FIRE PROTECTION

.1 Fire extinguishers: maintain one (1) ULC labelled for A, B and C class protection on roof per torch applicator, within 6m (20ft) of torch applicator.

.2 Maintain fire watch for two (2) hours after each day's roofing operations cease.

.3 Never apply torch directly to flammable materials.

.4 Respect all safety measures described in technical data sheets of sealants. Welding torches must never be placed near combustible or flammable products, nor be used where the flame is not visible or cannot be easily controlled.

1.05 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions and Section 01 61 00 - Common Product Requirements.

.2 Storage and handling requirements:
- .1 Provide and maintain dry, off-ground weatherproof storage.
- .2 Store rolls of felt and membrane in upright position. Store membrane rolls with salvage edge up.
- .3 Remove only in quantities required for same day use.
- .4 Place plywood runways over completed Work to enable movement of material and other traffic.
- .5 Store sealants at +5 degrees C minimum.
- .6 Store insulation protected from daylight, weather and deleterious materials.

1.06 SITE CONDITIONS

.1 Ambient conditions:
- .1 Install roofing within temperature range according to manufacturer’s recommendations.
- .2 Provide heating and hoarding as required for roof work when conditions require.

.2 Install roofing on dry deck, free of snow and ice.

.3 Use only dry materials and apply only during weather that will not introduce moisture into roofing system.

1.07 WARRANTY

.1 Provide manufacturer’s warranty for 15 years from date of Substantial Completion of Work.

1. The membrane manufacturer will issue written document in The City’s name, valid for 15 year period, saying it will repair any leaks in roofing membrane to restore roofing system to dry and watertight condition, to the extent that membrane manufacturing or installation defects caused water infiltration. Warranty must cover for entire cost of repair(s) during entire warranty period. Warranty must be transferable, at no extra cost, to subsequent building owners. Contractor will issue written and signed document in The City’s name, certifying that work executed will remain in place and free of any workmanship defect for period of 15 years starting from the date of acceptance. Warranty certificate

must reflect these requirements.

2 PRODUCTS

2.01 PERFORMANCE CRITERIA

.1 Perform roofing Work in accordance with applicable standard in Canadian Roofing Contractors Association (CRCA) Roofing Specifications Manual, and to manufacturer's instructions, except as specified otherwise.

.2 Compatibility between components of roofing system is essential. Provide written declaration to Contract Administrator stating that materials and components, as assembled in system, meet this requirement.

2.02 VAPOUR RETARDER

.1 Roofing membrane composed of SBS modified bitumen and a non-woven polyester reinforcement. The upper surface is sanded, the underface is covered with a thermofusible plastic film.
- .1 Standard of acceptance: Soprema Sopralene 180 SP 3.5 or approved equal.

.2 Vapour retarder primer: Primer made of bitumen, volatile solvents and adhesive resins. Used as primer to improve the adhesion of thermofusible waterproofing membranes.
- .1 Standard of acceptance: Soprema Elastocol 500 Primer or approved equal.

2.03 INSULATION

.1 Polyisocyanurate insulation: glass fiber reinforced polyisocyanurate insulation to ASTM C1289, Type 2, Class 1, Grade 2, thickness as noted on drawings, closed cell, polyisocyanurate foam core bonded on each side to reinforced glass fiber facers.
- .1 Standard of acceptance (Flat Insulation): Soprema Sopra-Iso Plus, or approved equal.
- .2 Standard of acceptance (Tapered Insulation): Soprema Sopra-Iso Plus, or approved equal.

.2 Insulation adhesive: compatible with insulation, vapour retarder and acceptable to roofing system manufacturer.
- .1 Standard of acceptance: Soprema Duotack, or approved equal.

2.04 BASE PANEL

.1 Insulating high performance base sheet panel composed of SBS modified bitumen membrane with a non-woven polyester reinforcement, factory-laminated on a high density polyisocyanurate insulation support panel
- .1 Standard of acceptance: Soprema 2-1 Soprasmart Board ISO HD, or approved equal.

.2 Base panel adhesive: compatible with base panel and acceptable to roofing system manufacturer.
- .1 Standard of acceptance: Soprema Duotack, or approved equal.

2.05 MEMBRANE

.1 Cap sheet membrane (torch-on): to CGSB 37-GP-56M, Type 1, Class A, Grade 2, heavy-duty modified bitumen roofing membrane, composite reinforcement, coated both sides with SBS modified asphalt, thermofusible plastic film, top face with coloured granules.
- .1 Standard of acceptance: Soprema Sopraply Traffic Cap, or approved equal.
- .2 Colour: to be selected by Contract Administrator from manufacturer's standard range.
  - .1 Provide contrasting colour cap sheet at perimeter of roof where indicated.

.2 Cap sheet membrane fire-rated (torch-on): to CGSB 37-GP-56M, Type 1, Class A, Grade 2, heavy-duty modified bitumen roofing membrane, composite reinforcement, coated both sides with SBS modified asphalt and a flame retardant agent, thermofusible plastic film, top face with coloured granules.
- .1 Standard of acceptance: Soprema Sopraply Traffic Cap FR, or approved equal.

.3 Membrane flashing:
- .1 Base strip: self-adhesive membrane with compatible substrate primer.
  - .1 Standard of acceptance: Soprema Sopraply Flam Stick, or approved equal.
- .2 Cap strip: same as cap sheet membrane.
- .3 Flashing base sheet membrane primer: rubber, adhesive enhancing resins, and volatile solvent used to prime substances to enhance adhesion of membranes at temperatures above -10 deg C.
  1. Standard of acceptance: Soprema Elastocol Stick or approved equal.

.4 Accessory membrane/cover strip:
- .1 Membrane strip: to ASTM D6162, SBS modified bitumen and composite reinforcement, both faces covered with plastic thermofusible film to ensure water-tightness in the end laps, width 330mm (13").
  - .1 Standard of acceptance: Soprema Sopralap, or approved equal.

2.06 FLAME-STOP MEMBRANE

.1 Self-adhesive membrane comprised of SBS modified bitumen and glass mat reinforcement, designed to prevent flames from penetrating into voids, cavities and openings before installing heat-welded membranes.
- .1 Standard of acceptance: Soprema Soprguard tape, or approved equal.

2.07 MISCELLANEOUS

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

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

.3 Accessories:
- .1 Roof expansion joint membrane: torchable waterproof expansion joint.
  - .1 Standard of acceptance: Soprema Soprajoint Plus 20, or approved equal.
- .2 Angle flashing: 0.76mm (22 gauge) bent angle flashing where noted on drawings.
- .3 Waterproofing Mastic: Multi-purpose solvent-based mastic containing SBS modified bitumen fibres and mineral fillers.
  - .1 Standard of acceptance: Soprema Sopramastic, or approved equal.
- .4 Sealing product: Bitumen / polyurethane waterproofing mono-component resin and polyester reinforcements.
  - .1 Standard of acceptance: Soprema Alsan Flashing and Flashing Reinforcement.
- .5 Stack jack flashing:
  - .1 Standard of acceptance: Thaler SJ-38 Insulated Flashing (13” high), or approved equal.

3 EXECUTION

3.01 QUALITY OF WORK

.1 Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual, and CRCA Roofing Specification Manual.

3.02 EXAMINATION OF ROOF DECKS

.1 Prior to beginning of Work ensure:
- .1 Decks are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris. Do not use calcium or salt for ice or snow removal.
- .2 Concrete deck has been cleaned of all previous existing membranes and roofing materials.
- .3 Curbs have been built.
- .4 Roof drains have been installed at proper elevations relative to finished roof

surface.

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

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

3.03 PROTECTION OF IN-PLACE CONDITIONS

.1 Cover walls, walks 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.

3.04 METHOD OF EXECUTION

.1 Roofing Work must be completed in continuous fashion as surfaces are readied and as weather conditions allow it.

.2 Seal all joints that are not covered by a cap sheet membrane the same day. A second cap sheet cannot be installed if any moisture is present in joints.

.3 Ensure waterproofing of roofs at all times, including protection during installation Work by other trades and protection as Work is completed (ie. vents, drains, etc.).

3.05 DECK PREPARATION

.1 Apply roof expansion joint membrane, where noted on drawings, in accordance with manufacturer’s written instructions.

.2 Prime deck in accordance with vapour retarder manufacturer’s recommendations, in preparation for application of vapour retarder.

3.07 VAPOUR RETARDER

.1 Apply vapour retarder in accordance with manufacturer’s written instructions.

.2 Unroll and align vapour retarder centered at low point of roof or drain.

.3 Overlap adjacent rolls 75mm (3”) on sides and 150mm (6”) on ends. Stagger end laps by

300mm (12”).

.4 Lap vapour retarder with wall air/vapour barrier membrane at roof/wall junction.

.5 Ensure continuity of vapour retarder at roof penetrations. Seal vapour retarder to penetrating element with continuous bead of sealaning compound around perimeter of vertical member penetrating vapour retarder.

3.08 INSULATION

.1 Install polyisocyanurate insulation in continuous strips using adhesive as recommended by manufacturer applied in continuous strips as follows:
- .1 300mm (12”) on center on the field surface.
- .2 150mm (6”) on center around the perimeter.
- .4 100mm (4”) on centre on corners.

.2 Install tapered insulation in single layer to provide slopes as shown on drawings.
- .1 Slope to drawings: positive slope of finished roof system.
- .2 Adhere using compatible adhesive as recommended by manufacturer.

.3 Stagger joints from previous insulation layer, set boards in moderate contact with each other, without gaps.

.4 Install only as much insulation as can be covered in the same day.

3.09 BASE PANEL

.1 Install base panel over insulation with staggered joints using adhesive as recommended by manufacturer applied in continuous strips as follows:
- .1 300mm (12”) on center on the field surface.
- .2 150mm (6”) on center around the perimeter.
- .4 100mm (4”) on centre on corners.

.2 Seal end laps by welding 330mm (13”) protection strip centered over joint. Properly secure to their support, without sags, blisters, fishmouths or wrinkles.

3.10 FLAME-STOP MEMBRANE

.1 Adhere membrane directly onto base panel joints to prevent fire from torching process igniting the insulation. Install in accordance with manufacturer’s recommendations.

.2 Adhere the membrane directly onto an approved substrate by peeling back the silicone release film. Flame-stop membrane is designed to prevent flames from penetrating into empty spaces and openings while installing heat-welded membranes.

.3 Unroll the flame-stop membrane onto the insulation without adhering, being careful to overlap adjacent strips to ensure that the flame will not come in contact with the insulation.

3.11 MEMBRANE APPLICATION

.1 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 torch cap sheet onto base sheet taking care not to burn membrane or its reinforcement.
- .3 Lap sheets 75mm (3”) minimum for side laps and 150mm (6”) minimum for end laps. Offset joints in cap sheet 300mm (12”) from those in base sheet.
- .4 Heat-weld cap sheet membrane to create a bleed out of 3mm to 6mm (1/8” to 1/4").
- .5 Application to be free of blisters, fishmouths and wrinkles.
- .6 Do membrane application in accordance with manufacturer's recommendations.

.2 Flashings:
- .1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.
- .2 Torch base and cap sheet onto substrate in 1m (39”) wide strips.
- .3 Lap flashing base sheet to membrane base sheet minimum 100mm (4”) and seal by torch welding.
- .4 Lap flashing cap sheet to membrane cap sheet 150mm (6”) minimum and torch weld.
- .5 Provide 75mm (3”) 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.

.3 Roof penetration:
- .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.

.4 Termination bar:
- .1 Install termination bar at the top of the cap sheet membrane around all perimeters and upstand conditions. Seal with mastic to ensure proper waterproofing.

3.12 FIELD QUALITY CONTROL

.1 Inspection and testing of the roofing application will be carried out by inspection agency engaged and paid for by The City.

.2 Notify inspection agency minimum 48 hours prior to commencement of roofing operations to arrange inspection. Permit agency full access to all portions of roofing Work.

.3 Submit copy of each inspection report, complete with photographs, to Contract Administrator.

3.13 PROTECTION

.1 Where Work must continue over finished roofing membrane, protect surface with minimum 13mm (1/2”) thick plywood sheets.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 American Society for Testing and Materials (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 B32 – Standard Specification for Solder Metal

.2 Canadian Roofing Contractors Association (CRCA)
- .1 Roofing Specifications Manual

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB 37.5 – Cutback Asphalt Plastic Cement

.4 Canadian Standards Association (CSA)
- .1 CSA A123.3 – Asphalt Saturated Organic Roofing Felt
- .2 CSA B111 – Wire Nails, Spikes and Staples

1.02 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product data: submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

2 PRODUCTS

2.01 SHEET METAL MATERIALS

.1 Zinc coated steel sheet: minimum 0.61mm (24 gauge) base steel thickness unless noted otherwise on drawings, commercial quality, to ASTM A653/A653M, with Z275 designation zinc coating.

2.02 PREFINISHED STEEL SHEET

.1 Prefinished steel sheet: minimum 0.61mm (24 gauge) base steel thickness, Grade A steel, with Z275 designation zinc coating with baked enamel finish. Finish shall be factory finished high molecular polyester (HMP), 8000+ series, one (1) side, to be selected by Contract Administrator from manufacturer’s standard and extended colour range.

2.03 ACCESSORIES

.1 Isolation coating: alkali resistant bituminous paint.

.2 Plastic cement: to CAN/CGSB 37.5.

.3 Underlay for metal flashing: No. 15 perforated asphalt felt to CSA A123.3.

.4 Sealants: to Section 07 92 00 - Joint Sealants.

.5 Cleats: of same material, and temper as sheet metal, minimum 50mm (2”) wide. Thickness same as sheet metal being secured.

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

.7 Washers: of same material as sheet metal, 1mm (0.04”) thick with rubber packings.

.8 Solder: to ASTM B32.

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

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

2.04 FABRICATION

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

.2 Form pieces in 2400mm (8ft) maximum lengths.
.1 Make allowance for expansion at joints.

.3 Hem exposed edges on underside 13mm (1/2”).
.1 Mitre and seal corners with sealant.

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

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

2.05 METAL FLASHINGS

.1 Form flashings, copings and fascias to profiles indicated of galvanized steel, except as noted.

.2 Form flashings, copings and fascias exposed to view from prefinished sheet steel, unless noted otherwise.

2.06 SCUPPERS

.1 Form scuppers from prefinished steel sheet as indicated on drawings, complete with necessary fasteners.

3 EXECUTION

3.01 INSTALLATION

.1 Install sheet metal work in accordance with CRCA FL series details, and as detailed.

.2 Use concealed fastenings except where approved before installation.

.3 Provide underlay under sheet metal.
.1 Secure in place and lap joints 100mm (4”).

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

.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 Caulk flashing at reglet and cap flashing with sealant.

.9 Set parapet flashing into mortar joint minimum 25mm as shown on drawings.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 Underwriter's Laboratories of Canada (ULC)
  .1 ULC 115 – Standard Method of Fire Tests of Firestop Systems

1.02 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: penetrating items that are cast in place in buildings of noncombustible 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.

1.03 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 product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:
  .1 Submit system design listings, including illustrations from qualified testing and inspection agency applicable to each firestop configuration. Indicate proposed material, reinforcement, anchorage, fastenings, and method of installation.
  .2 Construction details should accurately reflect actual job conditions.

.4 Samples: submit duplicate 300mm x 300mm (12” x 12”) samples showing actual fire stop material proposed for project.

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

1.04 QUALITY ASSURANCE

.1 Installer: company/installer specializing in firestopping installations with minimum five (5) years documented experience, and approved by manufacturer.

.2 A manufacturer's direct representative (not distributor or agent) shall be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This shall be done per manufacturer's written recommendations published in their literature and drawing details.

.3 Firestop system installation shall meet requirements of ULC 115 tested assemblies that provide a fire rating as required.

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

.5 Firestop Systems do not re-establish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

.6 For those firestop applications that exist for which no ULC or cUL tested system is available through a manufacturer, a manufacturer's engineering judgment derived from similar ULC or cUL system designs or other tests will 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.

1.05 DELIVERY, STORAGE AND HANDLING

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

.2 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer and ULC markings.

.3 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

2 PRODUCTS

2.01 MANUFACTURER

.1 Standard of acceptance: products by Hilti (Canada) Ltd., or approved equal.

2.02 MATERIALS

.1 Fire stopping and smoke seal systems: in accordance with ULC 115.
- .1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of ULC 115 and not to exceed opening sizes for which they are intended.
- .2 Fire stop system rating: refer to drawings.

.2 Service penetration assemblies: systems tested to ULC 115.

.3 Service penetration fire stop components: certified by test laboratory to ULC 115.

.4 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.

.5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal. Do not use cementitious or rigid seal materials at these locations.

.6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal. Do not use cementitious or rigid seal materials at these locations.

.7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

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

.9 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.

.10 Sealants for vertical joints: non-sagging.

3 EXECUTION

3.01 ACCEPTABLE INSTALLERS

.1 National Firestop Ltd., 405 Gunn Road, PO Box 16 Grp 514 RR5, Winnipeg, Manitoba, R2C 2Z2, Phone: 204.777.0100.

.2 Secure Firestop, B-580 Dobbie Street, Winnipeg, Manitoba, Phone: 204.667.8859.

.3 Total Fire Stop Systems Limited, Box 464, Stony Mountain, Manitoba, R0C 3A0, Phone: 204.344.5696.

.4 Western Construction Services Ltd., 300 Dawson Road N., Winnipeg, Manitoba, R2J 0S7.

3.02 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.03 PREPARATION

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

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

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

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

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

3.04 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.

3.05 SEQUENCES OF OPERATION

.1 Proceed with installation only when submittals have been reviewed by Contract Administrator.

.2 Install floor fire stopping before interior partition erections.

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

.4 Mechanical pipe insulation: certified fire stop system component.

.1 Ensure pipe insulation installation precedes fire stopping.

3.06 FIELD QUALITY CONTROL

.1 Inspections: notify Contract Administrator when ready for review and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

.2 Manufacturer's field services:
- .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product.
- .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .3 Schedule site visits, to review Work.

3.07 CLEANING

.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

3.08 SCHEDULE

.1 Fire stop and smoke seal at:
- .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
- .2 Top of fire-resistance rated masonry and gypsum board partitions.
- .3 Intersection of fire-resistance rated masonry and gypsum board partitions.
- .4 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
- .5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
- .6 Openings and sleeves installed for future use through fire separations.
- .7 Around mechanical and electrical assemblies penetrating fire separations.
- .8 Rigid ducts: greater than 129 cm^2: 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

1.01 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM)
- .1 ASTM C834 – Standard Specification for Latex Sealants
- .2 ASTM C920 – Standard Specification for Elastomeric Joint Sealants

.2 Canadian General Standards Board (CGSB)
- .1 CGSB 19-GP-5M – Sealing Compound, One Component, Acrylic Base, Solvent Curing
- .2 CAN/CGSB-19.13 – Sealing Compound, One-component, Elastomeric, Chemical Curing
- .3 CGSB 19-GP-14M – Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing
- .4 CAN/CGSB-19.17 – One-Component Acrylic Emulsion Base Sealing Compound
- .5 CAN/CGSB-19.24 – Multi-component, Chemical Curing Sealing Compound

.3 South Coast Air Quality Management District (SCAQMD)
- .1 SCAQMD Rule 1168 – Adhesives and Sealants Applications

1.02 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product data: for products indicated.
- .1 Statement of compatibility: compatibility between sealants and substrates is essential. Provide written declaration to The City stating that materials meet this requirement.

.3 Samples:
- .1 Submit duplicate samples of each type of material and colour.
- .2 Cured samples of exposed sealants for each colour where required to match adjacent material.

1.03 QUALITY ASSURANCE

.1 Installer: installation of joint sealants and caulking shall be carried out by applicator thoroughly trained, experienced and competent in all phases of the Work, with a minimum of five (5) years' experience.

1.04 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

1.05 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 degrees 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 more than those 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.

.4 Ventilate area of Work by use of approved portable supply and exhaust fans.
  .1 For Work within existing buildings, arrange with The City for ventilation system to be operated on maximum outdoor air and exhaust during installation of caulking and sealants.

1.06 WARRANTY

.1 Contractor hereby warrants that joint sealant Work will not leak, crack, crumble, melt, shrink, run, lose adhesion or stain adjacent surfaces for three (3) years.

2 PRODUCTS

2.01 GENERAL

.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 off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.

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

.4 All sealant and caulking applied on site shall be low VOC in accordance with SCAQMD Rule 1168.

2.02 MATERIALS

.1 Acceptable manufacturers:
- .1 Dow Corning
- .2 Tremco
- .3 Sika Canada

.2 Sealant types:
- .1 Neutral cure, one part, low modulus silicone, movement range to ±50%, for exterior and interior use on concrete, masonry, stone, metals, glass, porcelain, control joints, expansion joints; to ASTM C920, Type S, Grade NS, Class 50, colour selected by The City.
  - .1 Acceptable products: Dow Corning “790”, Tremco “Spectrum 2”, or approved equal.
- .2 One component, polyurethane, for interior, window frame joints, heel beads, toe beads, and air seals; to ASTM C920, Type S, Grade NS, Class 25, colour selected by The City.
  - .1 Acceptable products: Tremco “Vulkem 116”, Sika Canada “Sikaflex 1-a”, Tremco “Dymonic”, or approved equal.
- .3 Acrylics one part: general purpose, one part, paintable translucent acrylic, movement range ±10%, for interior use in dry areas around windows, door frames, interior caulking to gypsum board, masonry, and metals; to ASTM C834.
  - .1 Acceptable products: Tremco “Mono 555”, or approved equal.

.3 Preformed compressible and non-compressible back-up materials:
- .1 Polyethylene, urethane, neoprene or vinyl foam:
  - .1 Extruded closed cell foam backer rod.
  - .2 Size: oversize 30 to 50 %.
- .2 Neoprene or butyl rubber:
  - .1 Round solid rod, Shore A hardness 70.
- .3 High density foam:
  - .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m³ density, or neoprene foam backer, size as recommended by manufacturer.
- .4 Bond breaker tape:
  - .1 Polyethylene bond breaker tape which will not bond to sealant.

2.03 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.

.2 Primer: in accordance with sealant manufacturer's written recommendations.

3 EXECUTION

3.01 EXAMINATION

.1 Examine joints indicated to receive joint sealants, with installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

.2 Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 SURFACE PREPARATION

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

.2 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.

.3 Ensure joint surfaces are dry and frost free.

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

3.03 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.

3.04 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.

3.05 MIXING

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

3.06 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.

3.07 CLEANING

.1 Clean adjacent surfaces immediately.

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

.3 Remove masking tape after initial set of sealant.

END OF SECTION