Part 1 General

1.1 REFERENCES

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

.1 ASTM C 553-02, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.

.2 ASTM C 1320-05, Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.

.2 Canadian Standards Association (CSA International).

.1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.3 Underwriters Laboratories of Canada (ULC).

.1 CAN/ULC-S702-1997, Standard for Mineral Fibre Insulation.

1.2 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.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.

1.4 WASTE MANAGEMENT AND DISPOSAL

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

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

.3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.

Part 2 Products

2.1 INSULATION

.1 Acoustical Insulation **(BI-01):** Mineral fibre to CAN/ULC-S702-97, Type 1.

.1 Size: To suit stud spacing.

.2 Thickness: As indicated on drawings.

.3 Combustibility to CAN4-S114: Non-combustible.

.4 Surface Burning Characteristics to CAN/ULC-S102:

.1 Flame Spread: 0

.2 Smoke Developed: 0

.5 Smoulder Resistance to CAN/ULC S129: 0.09%

.6 Density: 45 kg/m³.

.7 Acoustical Performance to ASTM C423:

Thickness	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC
25.4 mm	0.14	0.25	0.65	0.90	1.01	1.01	0.70

38.1 mm	0.18	0.44	0.94	1.04	1.02	1.03	0.85
50.8 mm	0.28	0.60	1.09	1.09	1.05	1.07	0.95
76.2 mm	0.52	0.96	1.18	1.07	1.05	1.05	1.05
101.6 mm	0.86	1.11	1.20	1.07	1.08	1.07	1.10

2.2 ACCESSORIES

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

.2 Staples: 12 mm minimum leg.

.3 Tape: as recommended by manufacturer.

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 INSULATION INSTALLATION

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

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

.3 Do not compress insulation to fit into spaces.

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

.5 Do not enclose insulation until it has been inspected and approved by Departmental Representative.

3.3 CLEANING

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

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 REGULATORY REQUIREMENTS:

.1 The work of this Section shall conform to the requirements of the National Building Code of Canada 2010, to ULC design requirements for each assembly and to all other applicable codes and regulations, to the satisfaction of the authorities having jurisdiction.

1.3 SAMPLES

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

.2 Submit duplicate 300 x 300 mm samples showing actual firestop material proposed for project.

1.4 SHOP DRAWINGS

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

.2 Submit shop drawings to show proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect actual job conditions.

1.5 PRODUCT DATA

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

.2 Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site. Include manufacturer's printed instructions for installation.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

.2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

Part 2 Products

2.1 MATERIALS

.1 Fire stopping and smoke seal systems: in accordance with ULC-S115.

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

.2 Firestop system rating: as indicated; Fire-resistance rating of installed fire stopping assembly shall not be less than the fire-resistance rating of the surrounding floor and wall assembly.

.2 Service penetration assemblies: certified by ULC in accordance with ULC-S115 and listed in ULC Guide No.40 U19.

.3 Service penetration firestop components: certified by ULC in accordance with ULC-S115 and listed in ULC Guide No.40 U19.13 and ULC Guide No.40 U19.15 under the Label Service of ULC.

.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.

.6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.

.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.

Part 3 Execution

3.1 PREPARATION

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

.2 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.

.3 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

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

.5 Maintain insulation around pipes and ducts penetrating fire separation without interuption to vapour barrier.

.6 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 seals at service penetrations through fire resistive construction and at all locations where the continuity of fire resistive construction is interrupted, as indicated on the drawings, as specified herein and as required for a complete project

.2 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.

.3 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.

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

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

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

3.3 INSPECTION

.1 Notify Consultant when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.

3.4 SCHEDULE

.1 Firestop 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: greater than 129 cm^2 and as indicated: 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.

3.5 CLEAN UP

.1 Remove excess materials and debris and clean adjacent surfaces immediately after application.

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

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)
- .1 ASTM C 919-02, 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 Transport Canada (TC)
- .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.2 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 samples in accordance with Section 01 33 00 - Submittal Procedures.

.4 Submit duplicate samples of each type of material and colour.

.5 Cured samples of exposed sealants for each color where required to match adjacent material.

.6 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.
- .1 Instructions to include installation instructions for each product used.

1.3 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 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.

1.4 WASTE MANAGEMENT AND DISPOSAL

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

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

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

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

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

.6 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.

.7 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Departmental Representative.

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

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

1.5 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.

1.6 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 Departmental Representative 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 Polyurethane Hybrid sealant to CAN/CGSB-19.13: **Type A**, Fast Curing, Low-Modulus, Silane End-Capped.
- .1 Rheological Properties to ASTM C 639: Non-sag (NS), 0”of sag in channel.
- .2 Extrusion Rate to ASTM C 1183, minimum: 93.1 ml.
- .3 Hardness Properties to ASTM C 661: 25.
- .4 Weight Loss to ASTM C 1246: Pass.
- .5 Skin Time: 1 hour.
- .6 Tack Free Time to ASTM C 679: 3-4 hours.
- .7 Stain & Color Change to ASTM C 510: No visible color change/No stain.
- .8 Adhesion-in-Peel to ASTM C 794: Aluminum 20-25 pli, Concrete 18-22 pli. No Adhesion Loss.

.9 Effects of Accelerated Aging to ASTM C 793: Pass.
.10 Movement Capability: ±35%.
.11 Colour: To match adjacent surfaces.

.2 Silicones One Part to CAN/CGSB-19.13: **Type B**, General Construction Grade Silicone Sealant.
.1 One-part, acetoxy silicone sealant.
.2 Mildew resistant.
.3 Colour: Clear.

.3 Silicones One Part to CAN/CGSB-19.13: **Type C**, Moisture curing, acetoxy, silicone sealant.
.1 Tack Free Time to ASTM C 679: 10 to 20 minutes.
.2 Flow, sag or slump to ASTM D 2202: 0.4 mm.
.3 Working Time, Skin Formation: 7 to 15 minutes.
.4 As Cured: After 14 days at 25 degrees C and 50% R.H.
.1 Hardness (Shore A) to ASTM C 661: 26 to 30.
.2 Tensile Strength at Max Elongation to ASTM D 412: 2.06-2.75 MPa.
.3 Maximum Elongation to ASTM D 412: 450-550%.
.4 Tensile Strength at 100% Max Elongation to ASTM C 1184: 0.345-0.552 MPa.
.5 Tear Strength to ASTM D 624: 7.0-7.5 kN/m.
.6 Peel Strength to ASTM C 794: Aluminum and Glass 2.28-2.63 kN/m.
.7 Dynamic Movement to ASTM C 719: ±25%.
.5 Colour: To match adjacent surfaces.

.4 Acoustical Sealant to CAN/CGSB 19.21: **Type D**, One-Part, Non-Skinning, Sound Dampering Sealant.
.1 Resistance to Sag to CGSB 7.1: Passes.
.2 Extrusion Rate to CGSB 3.1: Passes
.3 Viscosity Brookfield: 1,000,000 cps
.4 Shear Modulus using GR component: 45,000 N/m².
.5 Density: 1720 Kg/m³.
.6 Colour: Dark grey.

2.3 SEALANT SELECTION

.1 Sealant **Type A**:
.1 Joints between different materials listed above.
.2 Perimeter joints between materials listed above and frames of doors, windows, storefronts, louvers and similar openings.
.3 Control and expansion joints in soffits and overhead surfaces.
.4 Other exterior joints in vertical surfaces and non-traffic horizontal surfaces for which no other sealant is specified.
.5 Control and expansion joints on exposed interior surfaces of exterior walls.
.6 Perimeter joints on exposed interior surfaces of exterior openings.
.7 Perimeter joints between interior wall surfaces and frames of interior doors, windows, storefronts, louvers, elevator entrances and similar openings.
.8 Other interior joints in vertical surfaces and non-traffic horizontal surfaces subject to movement for which no other sealant is specified.

.2 **Sealant Type B:**
.1 Joints in kitchen counter tops and work surfaces.
.2 Joints between food service equipment and surrounding construction.
.3 Other interior joints, where incidental food contact may occur.
.4 Joints in toilet room and bathroom counter tops.
.5 Joints between plumbing fixtures and adjacent materials.
.6 Joints between locker room lockers and adjacent materials.
.7 Joints between food service equipment and surrounding construction.
.8 Other interior joints in wet areas where needed to limit mold and mildew growth.

.3 Sealant **Type C**:
.1 Perimeters joints of glazing on interior and exterior within frames; toe, heel, and cap beads, weather seal, and bedding.

.2 Glass applications.

.4 Sealant **Type D**:
- .1 Acoustical sealing of drywall partitions, corridors and party walls.
- .2 Lap joint and perimeter sealant for polyethylene vapour barriers over fibre glass batt or other insulations.

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