Part 1 General

1.1 RELATED WORK

.1 Fire stopping and smoke seals within Mechanical assemblies (i.e inside ducts, dampers) and Electrical assemblies (i.e. inside cable trays) are specified in Mechanical and Electrical portions of the Specifications respectively.

1.2 REFERENCES

.1 Underwriter's Laboratories of Canada (ULC).

.1 CAN/ULC-S115-11-EN. Standard Method of Fire-Tests of Firestop Systems.

.2 Provide Submittals in accordance with Section 01 33 00 - Submittal Procedures.

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

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

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

1.3 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 CAN/ULC-S115.

.1 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of CAN/ULC-S115 and not to exceed opening sizes for which they are intended and conforming to special requirements specified in 3.5.

.2 Firestop system rating: to match fire resistance rating of wall and floor assembly as indicated in the drawings.

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

.3 Service penetration firestop components: certified by ULC in accordance with CAN/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 National Building Code (NBC) 2010.

.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.

.11 Firestop sealants: non-sagging, primerless, single component, self-leveling silicone sealant.

.12 Firestop insulation: pre-formed, semi-rigid, non-combustible mineral wool, precut into 1220 mm lengths to required depth and width.

.13 Junction box/outlet sealing putty: intumescent putty, preformed in pads.

.14 Gypsum Board: as specified in Section 09 21 16 - Gypsum Board Assemblies.

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 Prepare all existing openings in walls of existing electrical and mechanical rooms to receive firestopping. For large openings and penetrations, install steel stud framing, batt insulation and 15.9 mm Type X GWB to both sides of walls, prior to firestopping remainder of opening.

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

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

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

3.2 INSTALLATION

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

.2 Install around pipe, ductwork, cables, and other objects penetrating fire separations to provide fire resistance not less than the fire resistance rating of surrounding floor, ceiling and wall assembly.

.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.

.7 Install firestop insulation as required and where indicated to form complete firestop and smoke seal. Install as backup material where required to areas receiving firestop sealant.

.8 Install firestop sealant to areas indicated, ensure full depth of joint filled with material, remove excess immediately.

.9 Seal around electrical boxes and outlets with sealing putty in accordance with manufacturer's instructions.

3.3 INSPECTION

.1 Notify Departmental Representative 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 gypsum board partitions and walls.
- .2 Top of fire-resistance rated gypsum board partitions.
- .3 Intersection of fire-resistance rated gypsum board partitions.
- .4 Control and sway joints in fire-resistance rated 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.

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 C919-12. Standard Practice for Use of Sealants in Acoustical Applications.

.2 ASTM C920-11. Standard Specification for Elastomeric Joint Sealants.

.2 Canadian General Standards Board (CGSB)

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

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit product data, samples and Installation Instructions in accordance with Section 01 33 00 - Submittal Procedures.

.2 Manufacturer's Product Data to describe.

.1 Each type of sealing compound specified.

.2 Primers.

.3 Compatibility when different sealants are in contact with each other.

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

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

.5 Submit complete installation instructions for each product specified. Indicate special handling criteria, surface preparation procedures, application sequence and cleaning procedures.

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 in accordance with Waste Management Plan.

.4 Place materials defined as hazardous or toxic in designated containers. Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.

.5 Handle and dispose of hazardous materials in accordance with appropriate Federal, Provincial and Municipal regulations.

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

1.5 PROJECT CONDITIONS

.1 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use. 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 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 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 Departmental Representative will arrange for ventilation system to be operated on maximum outdoor air and exhaust during installation of caulking and sealants. Ventilate area of work as approved 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 Sealant TYPE A: one-component, medium-modulus, neutral cure silicone. To ASTM C920, Type S, Grade NS, Class 50. Use NT, M, G, A and O.

.2 Sealant TYPE C: multi-component or single component, self-levelling or slope grade polyurethane. To ASTM C920, Type M, Grade P, Class 100/50. Use T, M, A and O.

.3 Sealant TYPE D: multi-component, chemical curing, polyurethane. To ASTM C920, Type M, Grade P, Class 25. Use T, M, A and O.

.4 Sealant TYPE E: one-component, solvent release, acrylic latex. To CAN/CGSB-19.17.

.5 Sealant TYPE H: to ASTM C919. One-component, non-skinning, non-hardening, butyl rubber acoustic.

.6 Backer Rods: oversized 30 - 50 %. Shore A hardness of 20. Tensile strength of 830 - 900 KPa.

.1 Vertical Surfaces: extruded polyolefin rod.

.2 Horizontal Surfaces: extruded closed cell polyurethane foam. Standard Backer Rod.

.3 High Density Foam: 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/m^3 density, or neoprene foam backer, size as recommended by manufacturer.

.7 Bond Breaker: pressure sensitive polyethylene plastic tape. Formulated so that sealant will not bond. For installation where minimum joint depth cannot be obtained.

2.3 SEALANT SELECTION

.1 Perimeters of exterior openings where frames meet exterior facade of building (i.e. brick, block): Sealant TYPE A.

.2 Expansion and control joints in exterior surfaces of poured-in-place concrete walls: Sealant TYPE A.

.3 Control and expansion joints in exterior surfaces of unit masonry walls: Sealant TYPE A.

.4 Coping joints and coping-to facade joints: Sealant TYPE G.

.5 Exterior joints in horizontal wearing surfaces (as itemized): Sealant TYPE C or D.

.6 Seal interior perimeters of exterior openings as detailed on drawings: Sealant TYPE A.

.7 Control and expansion joints on the interior of exterior poured-in place concrete walls: Sealant TYPE A.

.8 Control and expansion joints on the interior of exterior surfaces of unit masonry walls: Sealant TYPE A.

.9 Interior control and expansion joints in floor surfaces: Sealant TYPE C.

.10 Perimeters of interior frames, as detailed and itemized: Sealant TYPE D.

.11 Interior masonry vertical control joints (block-to-block, block-to-concrete, and intersecting masonry walls): Sealant TYPE D.

.12 Exposed interior control joints in drywall: Sealant TYPE E.

.13 In acoustic separations and where acoustic properties are required TYPE H.

2.4 CLEANERS AND PRIMERS

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

.2 Primer: as recommended by manufacturer for specific sealant specified.

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