

PART 1 - GENERAL

- |                             |    |                                                     |
|-----------------------------|----|-----------------------------------------------------|
| <u>1.1 RELATED SECTIONS</u> | .1 | Section 04 05 00 - Common Work Results for Masonry. |
|                             | .2 | Section 04 05 23 - Masonry Accessories.             |
|                             | .3 | Section 07 27 10 - Air Barriers.                    |
- 
- |                       |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1.2 REFERENCES</u> | .1 | Canadian Standards Association (CSA)<br>.1 CSA A101- ,Thermal Insulation, Mineral Fibre, for Buildings.                                                                                                                                                                                                                                                                                                                                                                                                 |
|                       | .2 | Canadian General Standards Board (CGSB)<br>.1 CAN/CGSB-51.20- ,Thermal Insulation, Polystyrene, Boards and Pipe Covering.<br>.2 CGSB 51-GP-21M Thermal Insulation, Urethane and Isocyanurate, Unfaced.<br>.3 CAN/CGSB-51.25- ,Thermal Insulation, Phenolic, Faced.<br>.4 CAN/CGSB-51.26- ,Thermal Insulation, Urethane and Isocyanurate, Boards, Faced.<br>.5 CAN/CGSB-51.38- ,Cellular Glass Thermal Insulation.<br>.6 CGSB 71-GP-24M Adhesive, Flexible, for Bonding Cellular polystyrene Insulation. |
|                       | .3 | Canadian Gas Association (CGA)<br>.1 CAN/CGA-B149.1- Natural Gas Installation Code.<br>.2 CAN/CGA-B149.2- Propane Installation Code.                                                                                                                                                                                                                                                                                                                                                                    |
|                       | .4 | Underwriters Laboratories of Canada (ULC)<br>.1 CAN4-S604- Factory-Built, Type A Chimneys.                                                                                                                                                                                                                                                                                                                                                                                                              |
|                       | .5 | American Society for Testing and Materials (ASTM)<br>.1 ASTM E 96- Test Methods for Water Vapor Transmission of Materials.                                                                                                                                                                                                                                                                                                                                                                              |
-

1.3 STORAGE AND  
HANDLING

- .1 Provide and maintain dry, off-ground storage.
- .2 Store isocyanurate insulation protected from daylight and weather and deleterious materials. Provide additional tarpaulins, and cover insulation beyond the manufacturer's shipping packaging.

PART 2 - PRODUCTS

2.1 INSULATION

- .1 Mineral fibre (cavity wall insulation): mineral wool fibre to ASTM C 612, type IA, unfaced, thickness 100 mm or as indicated, with the following properties:
  - .1 Density - 48 kg/m<sup>3</sup>.
  - .2 RSI value @ 25.4 mm = 0.75 m<sup>2</sup> K/W
  - .3 EcoLogo certified.

PART 3 - EXECUTION

3.1 WORKMANSHIP

- .1 Install insulation after building substrate materials are dry.
  - .2 Install insulation to maintain continuity of thermal protection to building elements and spaces.
  - .3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.
  - .4 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.
-

- |                                               |    |                                                                                                                                                                                                                                                          |
|-----------------------------------------------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>3.1 WORKMANSHIP</u><br>(Cont'd)            | .7 | Do not enclose insulation until it has been inspected and approved by Departmental Representative.                                                                                                                                                       |
| <u>3.2 EXAMINATION</u>                        | .1 | Examine substrates and immediately inform Departmental Representative in writing of defects.                                                                                                                                                             |
|                                               | .2 | Prior to commencement of work ensure:<br>.1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.<br>.2 Departmental Representative has inspected, and signed off on installation of air/vapour barrier. |
| <u>3.3 SEMI RIGID INSULATION INSTALLATION</u> | .1 | Install mineral fibre insulation boards with insulation wedge anchors as per manufacturer's recommendations.                                                                                                                                             |
|                                               | .2 | Install mineral fibre insulation boards with friction fit in all cladding wall cavities.                                                                                                                                                                 |

## PART 1 - GENERAL

- |                         |    |                                                                                                                                          |
|-------------------------|----|------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1.1 RELATED WORK</u> | .1 | Section 09 21 16 - Gypsum Board Assemblies.                                                                                              |
| <u>1.2 REFERENCES</u>   | .1 | ASTM C 612-04 Standard Specification for Mineral Fiber Block and Board Thermal Insulation.                                               |
|                         | .2 | ASTM C 665-06 Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing. |
|                         | .3 | ASTM C1302-04 Standard Guide for Selection and Use of Keywords for Thermal Insulation Test Methods and Standards.                        |
| <u>1.3 PRODUCT DATA</u> | .1 | Submit product data in accordance with Section 01 33 00 - Submittal Procedures.                                                          |

## PART 2 - PRODUCTS

- |                       |    |                                                                                                                                                                           |
|-----------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>2.1 INSULATION</u> | .1 | Batt and blanket glass fibre: to ASTM C1302, 32kg/m <sup>3</sup> , friction fit fibrous glass batt insulation, to thicknesses and/or RSI values as indicated on drawings. |
|                       | .2 | Sound and Fire Stopping Insulation: to ASTM C 665, 40kg/m <sup>3</sup> , friction fit mineral wool insulation, to thicknesses and indicated on drawings.                  |

## PART 3 - EXECUTION

- |                                        |    |                                                                                                                          |
|----------------------------------------|----|--------------------------------------------------------------------------------------------------------------------------|
| <u>3.1 INSULATION<br/>INSTALLATION</u> | .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. |
-

3.1 INSULATION  
INSTALLATION  
(Cont'd)

---

- .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.

PART 1 - GENERAL

- |                         |    |                                                                                                                                                                                                                             |
|-------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1.1 REFERENCES</u>   | .1 | Canadian General Standards Board (CGSB)<br>.1 CAN/ULC-S705.1-01(R2005), Spray-Applied Rigid Polyurethane Cellular Plastic Thermal Insulation.                                                                               |
|                         | .2 | Underwriters Laboratories of Canada, (ULC)<br>.1 CAN/ULC-S101-07, Fire Endurance Tests of Building Construction and Materials.<br>.2 CAN/ULC-S102-07, Surface Burning Characteristics of Building Materials and Assemblies. |
| <u>1.2 TEST REPORTS</u> | .1 | Submit test reports, verifying qualities of insulation meet or exceed requirements of this specification, in accordance with Section 01 10 10 - General Instructions.                                                       |
|                         | .2 | Submit test reports in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.                                                                                                |
| <u>1.3 MOCK-UP</u>      | .1 | Construct mock-up in accordance with Section 01 10 10 - General Instructions.                                                                                                                                               |
|                         | .2 | Allow 24 hours for inspection of mock-up by Owner Representative before proceeding with work.                                                                                                                               |
| <u>1.4 PROTECTION</u>   | .1 | Ventilate area to receive insulation by introducing fresh air and exhausting air continuously during and 24 hour after application to maintain non-toxic, unpolluted, safe working conditions.                              |
|                         | .2 | Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area.                                                                                                           |
|                         | .3 | Protect workers as recommended by insulation manufacturer.                                                                                                                                                                  |
-

1.4 PROTECTION (Cont'd) .4 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of insulation materials.

.5 Dispose of waste foam daily in location designated by Owner Representative and decontaminate empty drums in accordance with foam manufacturer's instructions.

1.5 ENVIRONMENTAL REQUIREMENTS .1 Apply insulation only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

## PART 2 - PRODUCTS

2.1 MATERIALS .1 Insulation: spray polyurethane to CAN/ULC-S705.1.

.1 Physical Properties:

- .1 Density - 28kg/m<sup>3</sup>
- .2 Thermal Resistance - 1.22/25mm RSI
- .3 Flame spread - 335 Max.
- .4 Compressive strength- 174 KPa
- .5 Tensile strength - 121 KPa
- .6 Open cells - 6.0 %
- .7 Water absorption - 0.62% Max.
- .8 Air barrier(@ 75 Pa)- 0.000 L/s/m<sup>2</sup>.
- .9 Water vapour perms - 86 ng/Pa s m<sup>2</sup>

.2 Primers: in accordance with manufacturer's recommendations for surface conditions.

.3 Equipment shall be as recommended in CAN/ULC-S705.1 and approved by the foam manufacturer for type of application.

## PART 3 - EXECUTION

3.1 APPLICATION .1 Apply insulation to clean surfaces in accordance with CAN/ULC-S705.1 and manufacturer's printed instructions. Use primer where recommended by manufacturer.

---

Building Modernization	FOAMED-IN-PLACE	Section 07 21 19
Phase II	INSULATION	Page 3
10 Weldon St. Shediac, NB		
Project No. R.039554.001		2013-07-17

3.1 APPLICATION (Cont'd)	.2	Apply sprayed foam insulation around exterior door frames and window frames and in areas as indicated on contract documents.
-----------------------------	----	------------------------------------------------------------------------------------------------------------------------------



PART 1 - GENERAL

1.1 RELATED  
SECTIONS

- .1 Section 04 05 00 - Common Work Results for Masonry.
- .2 Section 04 05 23 : Masonry Accessories.
- .3 Section 07 21 12 : Board Insulation.
- .4 Section 07 90 00 : Joint Sealant.
- .5 Section 08 11 14 : Metal Doors and Frames.
- .6 Section 08 71 10 : Door Hardware.

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-19.13 , Sealing Compound, One Component, Elastomeric Chemical Curing.
  - .2 CAN/CGSB-19.24- , Multi-Component, Chemical Curing Sealing Compound.
  - .3 CGSB 19-GP-14M- , Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.
- .2 NBCC 2010; Part 5 - Environmental Separation
- .3 Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification.
- .4 ASTM E1677- , Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Framed Building Walls.

1.3 SUBMITTALS

- .1 Submit shop drawings and product data to requirements of Section 01 33 00 - Submittal Procedures.
  - .2 Manufacturer's Installation Instructions: Indicate preparation, installation requirements and techniques, product storage and handling criteria.
-

<u>1.4 QUALITY ASSURANCE</u>	.1	Perform Work in accordance with Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification requirements for installation.
------------------------------	----	------------------------------------------------------------------------------------------------------------------------------------------------

	.2	Maintain one copy of documents on site.
--	----	-----------------------------------------

<u>1.5 QUALIFICATIONS</u>	.1	Applicator: Company specializing in performing work of this section with minimum 5 years documented experience approved by materials' manufacturers.
---------------------------	----	------------------------------------------------------------------------------------------------------------------------------------------------------

<u>1.6 ENVIRONMENTAL REQUIREMENTS</u>	.1	Do not install solvent curing sealants or vapour release adhesive materials in enclosed spaces without ventilation.
---------------------------------------	----	---------------------------------------------------------------------------------------------------------------------

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

<u>1.7 SEQUENCING</u>	.1	Sequence work to permit installation of materials in conjunction with related materials and seals.
-----------------------	----	----------------------------------------------------------------------------------------------------

## PART 2 - PRODUCTS

<u>2.1 SHEET MATERIALS</u>	.1	Air/vapour barrier at concrete block walls: minimum 2.5 mm SBS modified bitumen membrane reinforced with non-woven fiberglass, supplied in 457 mm wide rolls, Thermofusible grade air & vapour barrier membrane system.
----------------------------	----	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	.2	Mastic and primer: As per manufacturer's recommendations.
--	----	-----------------------------------------------------------

	.3	Thru-wall flashing: minimum 1.0mm SBS rubberized asphalt laminated to cross-laminated polyethylene film. Membrane to be specifically designed for thru-wall flashing.
--	----	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------

---

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 Departmental Representative 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 in accordance with manufacturer's instructions. Prime only the area to be covered in a working day.

3.3 INSTALLATION OF  
MEMBRANE

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

3.3 INSTALLATION OF MEMBRANE  
(Cont'd)

- .2 Install membrane to substrates horizontally. All horizontal side laps of rolls to be 64 mm minimum. All end laps to be 150 mm minimum. At each cross member of the masonry wall reinforcing, slit the edge of the membrane just far enough to allow the membrane to pass each side of the cross member and overlap the edge of the next strip of membrane.
- .3 Roll the membrane firmly and completely after each sheet is applied. Take special care to be sure that all joints in membrane are completely sealed.
- .4 Inspect membrane thoroughly before covering and make any required repairs immediately. Repair misaligned or inadequately lapped seams, punctures or other damage with a patch of membrane extending 150 mm in all directions from the edge of the damaged area.
- .5 At all inside and outside corners, apply a continuous 300 mm wide reinforcing strip of membrane prior to installation of the air/vapour barrier.
- .6 At all window frames, door frames, etc., leave enough membrane extending into the opening, around the entire perimeter of the opening, so that the frame installer can carry the membrane behind the frame as detailed on drawings and seal the membrane to the frame. At all vertical sides of window frames, door frames, etc., this membrane is to be a vertical strip of membrane, adhered to the horizontal membrane and extending into the opening.

3.4 WALL FLASHING

- .1 Carry out all wall flashing at windows, doors, base of walls, etc., as detailed on drawings, using air/vapour barrier materials as specified above. Carry flashing materials up the face of the air/vapour barrier on the wall a minimum of 200 mm and seal to the wall material.

## PART 1 - GENERAL

### 1.1 Section Includes

- .1 Aluminum composite material (ACM) cladding, with related flashings and accessory components.
- .2 Supporting structure.

### 1.2 Related Sections

- .1 Section 07 90 00 - Joint Sealing.

### 1.3 References

- .1 American Society for Testing and Materials (ASTM).
  - .1ASTM A653/A653M-05 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .2ASTM B209-06, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
  - .3ASTM B221-06, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - .4ASTM C297, Standard Test Method for Tensile Strength on Flat Sandwich Constructions in Flatwise Plane.
  - .5ASTM D1781, Standard Test Method for Climbing Drum Peel for Adhesives.

### 1.4 DESIGN AND PERFORMANCE REQUIREMENTS

- .1 Components: Design and size to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of panel as calculated in accordance with applicable code.

- .2 Maximum Allowable Deflection of Panel: 1/180.
- .3 Movement: Accommodate movement within system without damage to system, components, or deterioration of seals; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; deflection of structural support framing.
- .4 Tolerances: Accommodate tolerances of building structural framing.

#### 1.5 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00.
- .2 Product Data: Provide data on assembled panel structural capabilities.
- .3 Shop Drawings: Indicate dimensions, panel profile and layout, spans, joints, construction details, methods of anchorage, and method and sequence of installation.
- .4 Colour Samples: Panel material manufacturer's colour charts or chips illustrating full range of colours, finishes and patterns available for factory applied finishes.
- .5 Samples: Submit two samples of each panel finish, in size illustrating finish colour, sheen, and texture.
- .6 Manufacturer's Installation Instructions: Indicate special handling criteria, installation sequence, and cleaning procedures.

1.6 Quality Assurance

- .1 Manufacturer: Company specializing in manufacturing the Products specified in this Section with minimum five years experience.
- .2 Installer: Company specializing in performing the work of this Section with minimum five years documented experience.

1.7 Pre-Installation Meeting

- .1 Convene one week before starting work of this section.

1.8 Delivery, Storage, And Protection

- .1 Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- .2 Store pre-finished material off ground with weather protection to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- .3 Prevent contact with materials which may cause discoloration or staining.

1.9 Coordination

- .1 Coordinate the work for installation of vapour retarder and air barrier seals.
- .2 Coordinate the work for installation of windows, louvres, and curtain wall components or materials.

1.10 Warranty

- .1 Comply with Section 01 78 00 for warranties and bonds.
- .2 Corrective defective work within a five year period after Substantial Completion for degradation of panel finish including colour fading caused by exposure to weather.

## PART 2 - PRODUCTS

### 2.1 Wall Panels

of

- .1 ACM Panel System: Aluminum face sheets thermally bonded to thermoplastic core, 4.0 mm minimum total thickness.
  - .1 System Design: Rain screen principle, dry joint installation; consisting composite aluminum panels, framing track and retainers, fasteners, and accessories.
  - .2 Exposed Finish: Locations indicated on drawings and as follows:
    - .1 Silver: Metallic finish to match clean anodized aluminum as selected by Departmental Representative.
    - .3 Acceptable Manufacturers: Alpollic, Alucobond, Reynobond or approved alternate.

### 2.2 Components

- .1 Supports: to ASTM A653M sheet steel; 1.2mm galvanized steel, sizes and profiles indicated.
- .2 Flashing: Prefinished steel sheet; 0.457 mm zinc coated galvanized steel sheet to ASTM A653M. Colour to match adjacent ACM panels.

### 2.3 Accessories

- .1 Provide panel system manufacturer's standard accessories, including fasteners, clips, anchorage devices and attachments.
- .2 Joint Sealer: Two part polyurethane. Colour selected by Departmental Representative to match finish.

### 2.4 Fabrication

- .1 Shop fabricated panels to sizes and configurations indicated on the drawings, following panel material manufacturer's instructions and recommendations.



- .2 Fabrication of component profiles on site is not permitted.
- .3 Form sections true to shape, accurate in size, square, and free from distortion or defects.
- .4 Fabricate with sharply cut edges, with no displacement of aluminum sheet or protrusion of core.
- .5 Fabricate panels for installation using concealed fasteners.
- .6 Where final dimensions cannot be established by field measurements, provide allowance for field adjustment as recommended by the fabricator.

#### 2.5 Metalwork

- .1 Metal Flashing and Trim: Form sills, drip flashing, roof edge flashings, and closures as indicated and required by manufacturer's installation instructions.

### PART - 3 EXECUTION

#### 3.1 Examination

- .1 Do not begin installation until substrates are complete and have been properly prepared.

#### 3.2 Preparation

- .1 Protect adjacent work areas and finish surfaces from damage during product installation.
- .2 Install structural supports as indicated.
- .3 Provide metal flashing as indicated and integrate into panel system.
- .4 Install composite panel system on walls and soffits in accordance with manufacturer's written instructions.
- .5 Permanently fasten panel system to structural supports; aligned, level, and plumb, within specified tolerances.

.6 Locate panel joints over supports.

.7 Use concealed fasteners.

### 3.3 Tolerances

.1 Maximum Offset from True alignment between adjacent members butting or in line: 1.6 mm.

.2 Maximum variation from plane or location indicated on drawings: 3mm.

### 3.4 Cleaning

.1 Remove site cuttings from finish surfaces.

.2 Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

### 3.5 Protection

.1 Protect finish of installed panels from damage during construction.

END OF SECTION

PART 1 - GENERAL

- |                          |    |                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1.1 RELATED WORK</u>  | .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 divisions 21 and 28 respectively.                                                                                                                                                                                                 |
| <u>1.2 DESCRIPTION</u>   | .1 | Work under this section, includes furnishing and installation only those through penetration fire and smoke seals for openings in floors, walls, and other elements of construction that are in accordance with ULC-S115-05. <b>All penetrations made by Divisions 2 to 44 are to be completed under this section. All openings in firewalls/smoke stops are to be completed under this section by same contractor.</b> |
| <u>1.3 REFERENCES</u>    | .1 | Underwriter's Laboratories of Canada (ULC)<br>.1 ULC-S115-05, Fire Tests of Firestop Systems.                                                                                                                                                                                                                                                                                                                           |
| <u>1.4 SAMPLES</u>       | .1 | Submit samples in accordance with Section 01 33 00 - Submittal Procedures.                                                                                                                                                                                                                                                                                                                                              |
| <u>1.5 SHOP DRAWINGS</u> | .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.                                                                                                                                                                                                                                  |
| <u>1.6 PRODUCT DATA</u>  | .1 | Submit product data in accordance with Section 01 33 00 - Submittal Procedures.                                                                                                                                                                                                                                                                                                                                         |
-

- |                                                  |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1.6 PRODUCT DATA<br/>(Cont'd)</u>             | .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.                                                                                                                                                                                                                                                                                         |
| <u>1.7 WASTE<br/>MANAGEMENT AND<br/>DISPOSAL</u> | .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.                                                                                                                                                                                                                                                                                                                                                                                        |
| <u>1.8 QUALITY<br/>ASSURANCE</u>                 | .1 | Performance: .1 Materials shall have been tested to provide a fire resistance rating equal to or surpassing that required by the design document.                                                                                                                                                                                                                                                                                                                                                       |
|                                                  | .2 | A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.                                                                                                                                                              |
|                                                  | .3 | 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 judgement drawings must follow requirements set forth by the Interntional Firestop Council (September 7, 1994, as may be amended from time to time). |
|                                                  | .4 | Applicator Qualifications:<br>.1 Two years experience installing UL or ULC classified fire stop systems or industry equivalent.                                                                                                                                                                                                                                                                                                                                                                         |
-

- 1.9 WARRANTY .1 For the Work of this Section 07 84 00 - Fire Stopping, the 12 months warranty period prescribed is extended to 24 months.

PART 2 - PRODUCTS

- 2.1 GENERAL .1 Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.
- .2 Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
- .3 Acceptable Material:
- .1 Hilti (Canada) Limited (Indicated Below).
  - .2 A/D Fire Protection Systems Inc.
  - .3 Johns Manville
  - .4 3M Canada
  - .5 Alternative Materials: Approved by addendum in accordance with Instructions to Bidders.
  - .6 Manufacturer used shall provide a written schedule indicating specific areas products will be used, as indicated below.

- 2.2 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.
-

2.2 MATERIALS  
(Cont'd)

---

- .1 (Cont'd)
    - .2 Provide materials classified by a qualified third party test facility tested in a system to provide fire resistance equal to at least the rating of construction assembly being penetrated, or as dictated by the local code authority.
  - .2 Cast-in-place firestop devices for use with non-combustible and combustible plastic pipe (closed and open piping systems) penetrating concrete floors, the following products are acceptable:
    - .1 "CP 680" Cast-In Place Firestop Device.
  - .3 Sealants or caulking materials for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:
    - .1 2. "FS 604" Self Leveling Firestop Sealant.
  - .4 Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:
    - .1 1. "CP 601s" Elastomeric Firestop Sealant.
  - .5 Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:
    - .1 "CP 601s" Elastomeric Firestop Sealant
  - .6 Intumescent sealants or caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:
    - .1 "FS-ONE" Intumescent Firestop Sealant
  - .7 Intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:
    - .1 "FS-ONE" Intumescent Firestop Sealant
  - .8 Non curing, re-penetrable intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:
-

2.2 MATERIALS  
(Cont'd)

- .8 (Cont'd)
  - .1 "CP 618" Firestop Putty Stick.
- .9 Wall opening protective materials for use with U.L.C. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:
  - .1 "CP 617" Firestop Putty Pad.
- .10 Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:
  - .1 "CP 642" Firestop Collar.
- .11 Materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
  - .1 Hilti FS 635 Trowelable Firestop Compound.
- .12 Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
  - .1 "FS 657" FIRE BLOCK.
- .13 Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable: .1 "CP 601s" Elastomeric Firestop Sealant.
- .14 For non-combustible pipes, tubing, ducts, optical fibre cables, electrical wires and cables, totally enclosed non-combustible raceways, electrical outlet boxes and similar building services that penetrate through a Fire Separation provide a firestop system with a "F" Rating as determined by ULC or cUL.
- .15 For penetrations through a Fire Wall or through a horizontal Fire Separation between a major occupancy area, provide a firestop system with a "FT" Rating as determined by ULC or cUL which is equal to the fire resistance rating of the construction being penetrated.

2.2 MATERIALS  
(Cont'd)

- .16 For joints provide a firestop system with an Assembly Rating as determined by ULC-S115, ULC-S115 or UL 2079 which is equal to the fire resistance rating of the construction being penetrated.
- .17 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.
- .18 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .19 Water (if applicable): potable, clean and free from unjurious amounts of deleterious substances.
- .20 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.
- .21 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 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.
-



### 3.2 INSTALLATION

- .1 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.
- .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 a neat finish.
- .5 Remove excess compound promptly as work progresses and upon completion.

### 3.3 INSPECTION

- .1 Notify Departmental Representative when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.
- .2 Install a warning card that is clearly visible adjacent to all large and medium openings that may be re-penetrated. This card should contain the following information:
  - .1 Warning that the opening has been fire stop protected.
  - .2 Indicate the fire stop system used (ULC or cUL).
  - .3 F rating or FT rating.
  - .4 Fire stop product(s) used.
  - .5 Person to contact and phone number in case of modification or new penetration of fire stop system.

### 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.
-

3.4 SCHEDULE  
(Cont'd)

- .1 (Cont'd)
  - .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<sup>2</sup>: 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.

PART 1 - GENERAL

- |                                            |    |                                                                                                                                                                                         |
|--------------------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>1.1 RELATED WORK</u>                    | .1 | Section 04 05 00 - Common Work Results for Masonry.                                                                                                                                     |
|                                            | .2 | Section 04 05 23 - Masonry Accessories.                                                                                                                                                 |
|                                            | .3 | Section 06 10 00 - Rough Carpentry.                                                                                                                                                     |
|                                            | .4 | Section 06 40 00 - Architectural Woodwork.                                                                                                                                              |
|                                            | .5 | Section 06 47 00 - Plastic Laminates.                                                                                                                                                   |
|                                            | .6 | Section 07 27 10 - Air Barriers.                                                                                                                                                        |
|                                            | .7 | Section 08 11 14 - Metal Doors and Frames.                                                                                                                                              |
|                                            | .8 | Section 08 11 16 - Aluminum Doors and Frames.                                                                                                                                           |
|                                            | .9 | Section 08 80 50 - Glazing.                                                                                                                                                             |
| <u>1.2 REFERENCES</u>                      | .1 | CAN/CGSB-19.13-M87 Sealing Compound, One-component, Elastomeric, Chemical Curing.                                                                                                       |
|                                            | .2 | CAN/CGSB-19.24-M90 Sealing Compound, Two-component, Elastomeric, Chemical Curing.                                                                                                       |
|                                            | .3 | ASTM C 920-05, Specification For Elastomeric Joint Sealants.                                                                                                                            |
| <u>1.3 SAMPLES</u>                         | .1 | Submit product data in accordance with Section 01 33 00 - Submittal Procedures.                                                                                                         |
| <u>1.4 DELIVERY, STORAGE, AND HANDLING</u> | .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 ENVIRONMENTAL  
AND SAFETY  
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 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. Sealant and substrate materials to be minimum 5°C.
- .3 Should it become necessary to apply sealants below 5°C, consult sealant manufacturer and follow their recommendations.

1.6 WARRANTY

- .1 For the Work of this Section 07 90 00 - Joint Sealing, the 12 months warranty period prescribed in subsection GC 32.1 of General Conditions "C" is extended to 36 months.

PART 2 - PRODUCTS

2.1 SEALANT  
MATERIALS

- .1 Sealant for interior joints unless noted otherwise: To ASTM C 920, high performance, low modulus, one-component, moisture curing, polyurethane joint sealant.
  - .1 Acceptable materials:
    - .1 "Dymonic" as manufactured by Tremco.
    - .2 "Sonclac" as manufactured by Sonneborn.
    - .3 "Sikaflex 1C SL" as manufactured by Sika Construction, or an approved alternate.
  - .2 Sealants for exterior joints: Epoxidized Polyurethane joint sealant conforming to CAN/CGSB-19.24.
    - .1 Acceptable materials:
      - .1 "Dymeric" as manufactured by Tremco (Canada) Ltd.
      - .2 "Sikaflex 2C NS/SL" as manufactured by Sika Construction.

- |                                   |             |                                                                                                                                                                                                                                                           |
|-----------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.1 SEALANT MATERIALS<br>(Cont'd) | .2 (Cont'd) |                                                                                                                                                                                                                                                           |
|                                   | .1 (Cont'd) |                                                                                                                                                                                                                                                           |
|                                   | .3          | "NP 2" as manufactured by Sonneborn, or an approved alternate.                                                                                                                                                                                            |
|                                   | .3          | Colour of sealant: selected by the Departmental Representative.                                                                                                                                                                                           |
| 2.2 BACK-UP MATERIALS             | .1          | Preformed Compressible and Non-Compressible back-up materials.                                                                                                                                                                                            |
|                                   | .1          | Polyethylene, Urethane, Neoprene or Vinyl Foam.                                                                                                                                                                                                           |
|                                   | .1          | Extruded closed cell foam backer rod, compatible with primers and sealants.                                                                                                                                                                               |
|                                   | .2          | 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/m <sup>3</sup> density, or neoprene backer, size as recommended by manufacturer. |
|                                   | .4          | Bond Breaker Tape.                                                                                                                                                                                                                                        |
|                                   | .1          | Polyethylene bond breaker tape which will not bond to sealant.                                                                                                                                                                                            |
|                                   | .5          | Vent tubing:                                                                                                                                                                                                                                              |
|                                   | .1          | 6 mm inside diameter extruded polyvinyl chloride tubing.                                                                                                                                                                                                  |
| 2.3 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 sealant manufacturer.                                                                                                                                                                                                           |

### PART 3 - EXECUTION

- |                |    |                                                                        |
|----------------|----|------------------------------------------------------------------------|
| 3.1 PROTECTION | .1 | Protect installed work of other trades from staining or contamination. |
|----------------|----|------------------------------------------------------------------------|
-

3.2 PREPARATION OF  
JOINT SURFACES

- .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 substances including dust, rust, oil, grease, and other matter which will impair work.
- .3 Remove dust, paint, loose mortar and other foreign matter. Dry joint surfaces.
- .4 Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.
- .5 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.
- .6 Ensure joint surfaces are dry and frost free.
- .7 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.

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. Superficial pointing with skin bead is not acceptable.
  - .7 Tool exposed surfaces to give slightly concave shape.
  - .8 Remove excess compound promptly as work progresses and upon completion.
- .2 Apply sealant to joints between window and door frames to adjacent building components, around perimeter of every external opening, to control joints in concrete slabs and where indicated.
- .3 All joints at fixtures, mechanical fixtures, electrical fixtures, window frames, and door frames to be caulked with sealant.
- .4 Apply sealant to joints around plumbing fixtures, and adjacent material.
- .5 Curing.
  - .1 Cure sealants in accordance with sealant manufacturer's instructions.
  - .2 Do not cover up sealants until proper curing has taken place.
- .6 Cleanup.
  - .1 Clean adjacent surfaces immediately and leave work neat and clean.
  - .2 Remove excess sealant and droppings, using recommended cleaners as work progresses.
  - .3 Remove masking tape after initial set of sealant.