

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 03 45 00 – Precast architectural concrete.

1.2 REFERENCES

- .1 Green Seal Environmental Standards (GS)
 - .1 GS-11-11, Standard for Paints and Coatings.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for water repellents and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements. Indicate VOC's for water repellent.
- .3 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
 - .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .3 Storage and Handling Requirements:
 - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect water repellents from nicks, scratches, and blemishes.
 - .4 Packaging Waste Management: remove for reuse and return of packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Renovation/Demolition (CRD).
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1.6 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Maintain substrate temperature at water repellent installation area in accordance with water repellent manufacturer's printed instructions.
 - .2 Apply coating during dry weather. Allow surfaces to dry minimum of 3 days after rainfall or cleaning before applying further coats.
 - .3 Protect plants and vegetation which might be damaged by water repellents.
 - .4 Protect surfaces not intended to have application of water repellents.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Coating to be applied on precast concrete elements, new and existing, planting box walls and paving:
 - .1 Coating to be: alkyltrialkoxysilane, a color free liquid water repellent with no solvent.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 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.

3.3 PREPARATION

- .1 Prepare and clean substrate surfaces in accordance with water repellent manufacturer's printed instructions.

3.4 APPLICATION

- .1 Apply at least two coats of water repellents using low pressure spraying apparatus, in accordance with manufacturer's printed instructions.

3.5 FIELD QUALITY CONTROL

- .1 After water repellent has dried, spray coated surfaces with water to verify coating coverage. Allow Departmental Representative to witness tests.
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3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Renovation/Demolition (CRD) Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by water repellent application.

END OF SECTION

PART 1 – GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 02 41 99 – Demolition for minor works.
- .2 Section 07 62 00 – Sheet metal flashing and trim.
- .3 Section 03 45 25 – Adjustable pedestal for prefabricated concrete elements.
- .4 Roof drains - refer to Mechanical.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM C 578-11be1, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
 - .2 ASTM D 41/D 41M-11, Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
 - .3 ASTM D 312-00(2006), Asphalt Used in Roofing.
 - .4 ASTM D 6162-00a(2008), Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fibre Reinforcements.
 - .5 ASTM D 6163-00(2008), Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fibre Reinforcements.
 - .6 ASTM D 6164/6 164M-11, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
 - .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
 - .2 CGSB 37-GP-56M-80b(A1985), Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
 - .3 CAN/CGSB-51.33-M89, Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
 - .3 Canadian Roofing Contractors Association (CRCA)
 - .1 CRCA Roofing Specifications Manual, 2011.
 - .4 CSA International
 - .1 CAN/CSA-A123.4-04(R2008), Asphalt for Construction of Built-Up Roof Coverings and Waterproofing Systems.
 - .5 Factory Mutual (FM Global)
 - .1 FM Approval Standard #4470-2010, Standard for Single-Ply, Polymer-Modified Bitumen, Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for Use in Class 1 and Noncombustible Roof Deck Construction.
 - .2 FM Roof Assembly Classifications.
 - .6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
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- .7 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - .2 ULC - List of Equipment and Materials for:
 - .1 Building Materials.
 - .2 Fire Resistance.
 - .3 Fire Stop Systems and Components.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for roofing materials and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 1 electronic copy of most recent technical roofing components data sheets describing materials' physical properties of the following materials: primer, insulation, drainage panel and other materials indicated in part 2 of current section.
 - .3 Submit 1 electronic copy of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
 - .1 Indicate VOC content for:
 - .1 Primers.
 - .2 Asphalt.
 - .3 Sealers.
 - .4 Filter fabric.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Quebec, Canada.
 - .1 Indicate setting plan for insulation, layout of seams, direction of drainage channels.
- .4 Samples:
 - .1 Submit 1 sample 304.8 mm long pieces of each type of insulation.
- .5 Source Quality Control Submittals:
 - .1 Submit manufacturer's certificate certifying that products meet or exceed specified requirements.
- .6 Manufacturers Reports:
 - .1 Indicate procedures followed, ambient temperatures, and wind velocity during application.

1.4 QUALITY ASSURANCE

- .1 The contractor shall, at the time of tenders and during the work, be officially recognized as an approved Contractor by the Manufacturer sealants roofer and be a member of the Association of Master Roofers in Quebec (AMCQ).
 - .2 Work must be performed in accordance with Roofing Specification, from CRCA and manufacturer's instructions.
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- .3 Inspection of the work described in this section and relevant tests will be carried out by an independent inspection firm (control firm), specialized in roofing, accredited by the Association of Master Roofers of Quebec, mandated and paid by the Departmental Representative.
- .4 The supervising office will conduct a preliminary inspection to verify the carrier to receive the roofing materials, slopes, durability cleanliness, preparation and approval of related structures such as walls, parapets, downspouts plumbing vent, and other required work.
- .5 In addition, the supervising office shall, before beginning of work, check the conformity between the specification and minimum requirements of the Master Roofers Association of Quebec, in order to ensure the insurance of its guaranteed.
- .6 During installation of roofing materials, the presence of the control inspector will be continuous and no interruption will be permitted.
- .7 The inspector's presence, however, is not required with performing cleaning work supports, whether rid of surplus materials, accumulation of snow and/or ice on the surface. If the roofing contractor summoned the inspector by mistake for periods where his presence is not required, the contractor must bear the cost of such a presence.
- .8 The Contractor shall ensure perfect continuity in the execution of the Work to assure that the incorporated materials are not damaged by any cause.
- .9 Work inspection ensure compliance with plans and specifications and will include following verifications:
 - .1 Nature, thickness, weight and number of waterproofing membranes.
 - .2 Overlap and sealing joints of membranes.
 - .3 The construction of membranes and metal flashing or control or expansion joints.
 - .4 Sealing the base of mechanical, electrical or other equipment on the rooftop.
 - .5 Storm water runoff to the various drains.
- .10 After Work acceptance by the inspector, he will provide a certificate of quality and compliance of the required installations to the Contractor.
- .11 Maintain 1 copy of each reference document on site.
- .12 Qualifications:
 - .1 Manufacturer: company specializing in manufacturing products specified in this section with 5 years documented experience.
 - .2 Applicator: company specializing in performing work of this section with 10 years documented experience.

1.5 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for roof assembly fire hazard requirements.
 - .2 ULC: class A Fire Hazard Classification.
 - .3 FM: Roof Assembly Classification, of class 1 Construction.
 - .4 Conform to Quebec Master Roofers Association (AMCQ)'s documentation.
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1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground and in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store rolls of felt and membrane in upright position. Store membrane rolls with selvage edge up.
 - .3 Remove from storage area only in quantities required for same day use.
 - .4 Place plywood runways over work to enable movement of material and other traffic.
 - .5 Store sealants at +5 degrees C minimum.
 - .6 Store and protect roofing materials from nicks, scratches, and blemishes.
 - .7 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse by manufacturer of packaging materials as specified in Construction Waste Management in accordance with Section 01 74 21 - Construction/Renovation/Demolition (CRD) Waste Management and Disposal.

1.7 FIRE PROTECTION

- .1 Fire Extinguishers: maintain 1 cartridge operated type or stored pressure rechargeable type with hose and shut-off nozzle, ULC labelled for A, B and C class protection. Extinguisher to be placed within 6 m of torch applicator.
- .2 Maintain fire watch for 1 hour after each days roofing operations cease.

1.8 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Do not install roofing [during inclement weather] when temperature remains below -18 degrees C for torch application, or to manufacturers' recommendations for mop application.
 - .2 Minimum temperature for solvent-based adhesive is -5 degrees C.
 - .3 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.
 - .4 Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.9 WARRANTY

- .1 For Work in this Section 07 55 63 - Vegetated Protected Membrane Roofing, 12 months warranty period is extended as follows:
 - .1 Provide a signed and written document, in the name of Canada, certifying that the waterproofing work (labour and material) are jointly warrantied by the roofing contractor and the elastomeric membrane Manufacturer against any defect for a period of five (5) years starting from the issue date of the substantial completion certificate of the work.

- .2 Provide a signed and written document, in the name of Canada, certifying that the membrane work is warranted by the elastomeric membrane Manufacturer against any defect for a period of ten (10) years starting from the issue date of the substantial completion certificate of the work.
- .2 Contractor warrants that modified bituminous roofing and membrane flashings will stay in place and remain leak proof, but for 24 months.

PART 2 – PRODUCTS

2.1 PRIMER

- .1 Primer for base coat: Primer made from bitumen, fast evaporating solvents and enhancing additives. Used to prime to improve the adhesion of torch-applied waterproofing membranes.
 - .1 Conform to CGSB 37 GP 9Ma.

2.2 MEMBRANE

- .1 Underlayment membranes:
 - .1 Field surface, vertical surfaces and parapets: to CGSB 37-GP-56M. (9th Draft)
 - .1 Membrane composed of SBS modified bitumen and composite reinforcement. Both sides are covered with a thermofusible plastic film. The surface must be marked with three (3) chalk lines to ensure proper roll alignment.
 - .2 Minimum requirements

	Longitudinal	Transversal
.1 Strain energy (kN/m)	7,8	7,2
.2 Breaking strength (kN/m)	15	13,5
.3 Ultimate elongation (%)	60	65
.4 Tear resistance (N)	125	
.5 Static puncture resistance (N)	560	
.6 Dimensional stability %	0,2	0
.7 Plastic flow (°C)	≥ 110	
.8 Cold bending at -30°C	No cracking	
.9 Lap joint strength Pass (kN/m)	Pass > 4	
.10 Thickness:	2,5 mm	
 - .2 Finish Membrane (same as underlayment membrane):
 - .1 Field surface, vertical surfaces and parapets: to CGSB 37-GP-56M. (9th Draft)
 - .1 Membrane composed of SBS modified bitumen and composite reinforcement. Both sides are covered with a thermofusible plastic film. The surface must be marked with three (3) chalk lines to ensure proper roll alignment.
 - .2 Minimum requirements

	Longitudinal	Transversal
.1 Strain energy (kN/m)	7,8	7,2
.2 Breaking strength (kN/m)	15	13,5
.3 Ultimate elongation (%)	60	65
.4 Tear resistance (N)	125	
.5 Static puncture resistance (N)	560	
.6 Dimensional stability %	0,2	0
.7 Plastic flow (°C)	≥ 110	
.8 Cold bending at -30°C	No cracking	

.9	Lap joint strength Pass (kN/m)	Pass> 4
.10	Thickness:	2,5 mm

2.3 POLYSTYRENE INSULATION

- .1 Insulation to: extruded polystyrene board CAN/ULC-S701, Type IV, with the following characteristics:
 - .1 Panel dimensions: 610mm x 1220mm.
 - .2 Thickness : 63mm
 - .3 Edges of panels: shiplapped edges with channel vents underneath panel.
 - .4 Compressive Strength: minimum 240 kPa or 35 psi.
 - .5 Thermal Resistance per 25 mm thickness 0.88 m² c/w.
 - .6 Water Capillarity: none
 - .7 Flexural Strength: 552 kPa or 80 psi.
 - .8 Dimensional stability: 1.5 (% linear change)
- .2 As a base layer under prefabricated concrete low walls locations. Insulation to be extruded polystyrene board CAN/ULC-S701, Type IV, with the following characteristics:
 - .1 Panel dimensions: 610mm x 2438mm.
 - .2 Thickness : 38mm
 - .3 Edges of panels: butt edges with channel vents underneath panel.
 - .4 Compressive Strength: minimum 415 kPa or 60 psi.
 - .5 Thermal Resistance per 25 mm thickness 0.88 m² c/w.
 - .6 Water Capillarity: none
 - .7 Flexural Strength: 965 kPa or 140 psi.
 - .8 Dimensional stability: 1.5 (% linear change)
- .3 As a top layer under prefabricated concrete low walls locations. (Total thickness both layers 63mm) Insulation to be extruded polystyrene board CAN/ULC-S701, Type IV, with the following characteristics:
 - .1 Panel dimensions: 610mm x 2438mm.
 - .2 Thickness : 25mm
 - .3 Edges of panels: butt edges.
 - .4 Compressive Strength: minimum 415 kPa or 60 psi.
 - .5 Thermal Resistance per 25 mm thickness 0.88 m² c/w.
 - .6 Water Capillarity: none
 - .7 Flexural Strength: 965 kPa or 140 psi.
 - .8 Dimensional stability: 1.5 (% linear change)

2.4 DRAINAGE PANEL

- .1 High density drainage panel composed of a polyethylene core onto which a geotextile is factory-laminated.
 - .1 Must satisfy the following properties:
 - .1 Thickness : 10mm
 - .2 Core:
 - .1 Compressive strength (kPa) : (ASTM D 1621) 550
 - .2 Maximum flow rate (l/min * m) : (ASTM D 4716) 223
 - .3 Geotextile :
 - .1 Apparent opening size (ASTM D 4751) 0.21
 - .2 Water in-place flow rate (l/min * m²) : (ASTM D 4491) 5690
 - .3 Puncture resistance (N) : 300

2.5 ACCESSORIES

- .1 Waterproofing coating: waterproofing one-component polyurethane / bitumen resin dedicated to roof flashings and details where it is difficult to apply waterproofing membranes. Used together with a polyester armature reinforcement mesh (100 g/m²) at transitions, changes in plan and junctions between two supports.
 - .1 Conform to ASTM D412 ET ASTM D5147.

2.6 ROOF DRAINS

- .1 Refer to mechanical.

PART 3 – EXECUTION

3.1 REMOVAL OF EXISTING LIQUID MEMBRANE

- .1 Proceed with the removal of the existing liquid membrane, taking all the precautions not to damage the existing concrete support. Work by zones in order to never leave any unprotected surfaces. Remove the existing membrane only in the sectors where the new membrane can be applied within the same day.
- .2 Clean surfaces, ready for primer application. Once the cleaning has been completed, the primer and membrane work must be started within the next two (2) hours.

3.2 EXAMINATION

- .1 Do examination, preparation and roofing Work in accordance with CRCA Roofing Specification Manual particularly for fire safety precautions.
- .2 Inspect with Departmental Representative deck conditions including parapets, construction joints, roof drains, to determine readiness to proceed.
 - .1 Verify that surfaces and site conditions are ready to receive work.
 - .2 Verify that existing surface (concrete topping) on top is clean and smooth, free of depressions, waves, or projections, properly sloped to drains.
 - .3 Verify deck surfaces are dry and free of snow or ice; do not use calcium or salt for ice or snow removal.
 - .4 Confirm dry deck by moisture meter with 12% moisture maximum.
 - .5 Verify roof openings, curbs, pipes, conduit, sleeves, ducts, and vents through roof are solidly set.
 - .6 Verify that roof drain (refer to mechanical) is set to achieve weep drainage at membrane level and top grating of drain at finish deck level.
 - .7 Do not install roofing materials during rain or snowfall.
 - .8 Correct deficiencies before starting roofing application Work.

3.3 PRE-INSTALLATION PROTECTION

- .1 Cover wall, adjacent work where materials hoisted or used.
 - .2 Use warning signs and barriers; maintain in good order until completion of Work.
 - .3 Clean off drips and smears of bituminous material or other immediately.
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- .4 Protect roof from traffic and damage during roof installation and material handling.
 - .1 Install protective boardwalks over installed roofing materials to enable passage of people and products.
- .5 At end of each day's work and when stoppage occurs due to inclement weather, provide protection for completed Work and materials out of storage.

3.4 QUALITY OF WORK

- .1 Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual and CRCA Roofing Specification Manual, particularly for fire safety precautions.
- .2 Do priming in accordance with manufacturers written recommendations.
- .3 Make the connection of the assembly of components and materials taking into account the loads of the considered elements.
- .4 Realize entirely all the Work of a basin prior to starting a new basin. Follow established phasing.
- .5 Roofing must run on a continuous basis as when the surfaces are ready and weather the conditions permit. Do not undertake demolition if the weather forecast during working hours or other conditions prevent from completing Work.
- .6 Seal all joints of the sub-layers that are not covered with a coat membrane the same day. In no event shall there be any moisture trapped in the joints before laying a second membrane.

3.5 CONDITIONS OF IMPLEMENTATION

- .1 Do not install roofing materials when the temperature is below -5°C considering the wind factor.

3.6 EXAMINATION OF ROOF SURFACES

- .1 The examination and preparation of surfaces must be made according to the instructions included in the technical documentation of the roof membrane manufacturer.
- .2 Prior to the beginning of the work, the owner's representative and the roofing superintendant will be responsible to inspect and approve the condition of support (slopes and wood blocking, where applicable) as well as vertical surfaces at parapets, roof drains, plumbing vents and others, and others and construction joints. When applicable, a non-conformity notice will be given to the contractor in order for him to proceed to the corrections. The beginning of the work will be considered as an acceptance of the conditions related to the achievement of the work.
- .3 Do not start any of the work until surfaces are clean, smooth, dry and free of ice, snow and waste materials. The use of calcium salts and is forbidden to remove ice or snow.
- .4 Ensure that plumbing, carpentry and others have been duly completed.
- .5 Do not install roofing materials during rain or snowfall.

3.7 PREPARATION - CONCRETE SUPPORT

- .1 Fill surface honeycomb and variations with latex filler. Refer to structural for more important repairs.
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- .2 Apply primer at rate recommended by manufacturer.
- .3 Temperature at Point of Application: in accordance with manufacturer's instructions.

3.8 PRIMER APPLICATION

- 1. Existing concrete surfaces will receive a primer. All application surfaces must be free of rust, dust and residues that could prevent adhesion. Surface covered with primer must be covered with membrane as soon as possible.

3.9 MEMBRANE APPLICATION

- .1 Base Sheet Application:
 - .1 Starting at low point of roof, perpendicular to slope, unroll base sheet, align and reroll from both ends.
 - .2 Unroll and torch base sheet onto substrate taking care not to burn membrane or its reinforcement [or substrate].
 - .3 Lap sheets 75 mm for side and 150 mm for end laps.
 - .4 Application to be free of blisters, wrinkles and fishmouths.
- .2 Cap Sheet Application:
 - .1 Starting at low point on roof, perpendicular to slope, unroll cap sheet, align and reroll from both ends.
 - .2 Unroll and torch cap sheet onto base sheet taking care not to burn membrane or its reinforcement.
 - .3 Lap sheets 75 mm minimum for side laps and 150 mm minimum for end laps. Offset joints in cap sheet 300 mm from those in base sheet.
 - .4 Application to be free of blisters, fishmouths and wrinkles.
- .3 Extend membrane over vapour barrier of wall construction and seal.
- .4 Install waterproof cut-off to membrane at end of day's operation. Remove cut-off before resuming roofing.
- .5 With waterproofing coating, seal membrane around roof penetrations and protrusions, apply with trowel, roll or brush, in two coats minimum. Use with polyester armature reinforcement mesh where required by manufacturer, with a third coat of coating.

3.10 INSTALLATION OF INSULATION AND DRAINAGE PANEL

- .1 Place insulation, channel vents face down, where applicable, loose laid in parallel rows with ends staggered.
 - .2 Place insulation boards to an irregular pattern to encourage close contact and fit.
 - .3 Ensure that each portion of insulation panel (under drainage panel) is maintained in place by a minimum of adjustable pedestals, in order to avoid any movement.
 - .3 Place drainage panel directly over insulation boards, in accordance with manufacturer's instructions.
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3.11 WATERPROOFING COATING INSTALLATION

- .1 Waterproofing coating: waterproofing one-component polyurethane / bitumen resin dedicated to roof flashings and details where it is difficult to apply waterproofing membranes (specifically along the Habitation du Centre-Ville).
 - .1 Product to be applied with a trowel, a brush or a roller.
 - .2 Applicable in two (2) layers (minimum) or in three (3) layers when reinforcement is required.
 - .3 Apply in accordance with manufacturer's recommendations.

3.12 FIELD QUALITY CONTROL

- .1 Refer to section 01 45 00 – Quality control.

3.13 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Remove bituminous markings from finished surfaces.
- .4 Repair or replace finished surfaces that have been altered or damaged in any way, following the done under the current section.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.14 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 In areas where finished surfaces are soiled caused by work of this Section, consult manufacturer of surfaces for cleaning advice and complying with written recommendations.
- .3 Repair damage to adjacent materials caused by membrane roofing installation.

END OF SECTION

PART 1 – GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 03 45 00 – Precast architectural concrete.
- .2 Section 07 84 00 – Fire stopping.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM C 919-08, 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 General Services Administration (GSA) - Federal Specifications (FS)
 - .1 FS-SS-S-200-E(2)1993, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for [joint sealants] and include product characteristics, performance criteria, physical size, finish and limitations.
 - .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 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
 - .3 Samples:
 - .1 Submit 2 samples of each type of material and color.
 - .2 Cured samples of exposed sealants for each color where required to match adjacent material.
 - .4 Manufacturer's Instructions:
 - .1 Submit instructions to include installation instructions for each product used.
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1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect joint sealants from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.6 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Proceed with installation of joint sealants only when:
 - .1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.
 - .2 Joint substrates are dry.
 - .3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
- .2 Joint-Width Conditions:
 - .1 Proceed with installation of joint sealants only where joint widths are more than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:
 - .1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

1.7 ENVIRONMENTAL REQUIREMENTS

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

PART 2– PRODUCTS

2.1 SEALANT MATERIALS

- .1 Do not use caulking that emits strong odors, contains toxic chemicals or is not certified as mould resistant in air handling units.
- .2 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.
- .3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

- .1 High performance, UV stable, non-sag polyurethane polymer sealant.
 - .1 Must have the following properties:
 - .1 To ASTM C920.
 - .2 To CAN/CGSB 19.13-M87.
 - .3 Have a tensile strength of 350 to 450 psi.
 - .4 Movement capability to ASTM C719.
 - .5 Tear strength: 65 to 75 psi, to ASTM D624
 - .6 Will not crack, craze or yellow
 - .2 Applicable at the following locations:
 - .1 Joints between prefabricated concrete works.
 - .2 Exterior joints required on plans but not covered under other sections.
 - .3 Expansion joints.
- .2 Fire stopping sealant, refer to Section 07 84 00 - Fire stopping.

2.3 BACK-UP MATERIAL

- .1 Ensure that back-up materials must be from 30% to 50% oversized and are compatible with selected sealant and of type recommended by manufacturer.
- .2 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/m³ density, or neoprene foam backer, size as recommended by manufacturer.
- .3 Bond breaker tape:
 - .1 Polyethylene bond breaker tape which will not bond to sealant.

2.4 SEALANT COLOR

- .1 Color of each sealant to be selected by the Architect, to match color of adjacent surfaces (submit color chart).
-

2.5 JOINT CLEANER

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

PART 3 – EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

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.

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Clean adjacent surfaces immediately.
 - .3 Remove excess and droppings, using recommended cleaners as work progresses.
 - .4 Remove masking tape after initial set of sealant.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Renovation/Demolition (CRD) Waste Management.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.8 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by joint sealants installation.

END OF SECTION

PART 1 – GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 07 55 63 – Vegetated protected membrane roofing.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 606-04, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
 - .2 ASTM A 653/A 653M-07, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .3 ASTM A 792/A 792M-[06a], Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - .4 ASTM B 32-04, Standard Specification for Solder Metal.
- .2 Canadian Roofing Contractors Association (CRCA)
 - .1 Roofing Specifications Manual 1997.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.32[M77, Sheathing, Membrane, Breather Type.
 - .2 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA A123.3-05, Asphalt Saturated Organic Roofing Felt.
 - .2 AAMA/WDMA/CSA 101/I.S.2/A440-2008, Standard/Specification for Windows, Doors, and Unit Skylights.
 - .3 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Product Data:
 - .1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 29.06 - Health and Safety Requirements.
 - .3 Shop Drawings:
 - .1 Shop drawings: submit drawings stamped and signed by professional engineer registered or licensed in the Province of Québec, Canada.
 - .4 Samples:
 - .1 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, finishes and colors.
-

- .5 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
 - .1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.
 - .2 Manufacturer's Field Reports: submit to manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3, FIELD QUALITY CONTROL.

1.4 QUALITY ASSURANCE

- .1 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section and on-site installation, with Departmental Representative in accordance with Section 01 32 16.07 - Construction Progress Schedule - Bar (GANTT) Chart to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Renovation/Demolition Waste Management and Disposal.

1.6 WARRANTY

- .1 Provide a written warranty, issued and signed on behalf of the owner, by the installer and the manufacturer certifying that the work specified in this section shall be free from defects in materials and workmanship including against cracking, flaking, discoloration and crumbling for a period of five (5) years from the final acceptance date.
- .2 The warranty shall cover the cost of all the cost of any expense incurred by the repair of such defects or any other damage to the building resulting from defect of Work.
- .3 The form of the warranty shall be approved by the architect and the owner.

PART 2 – PRODUCTS

2.1 PREFINISHED STEEL SHEET

- .1 Prefinished steel with factory applied polyvinylidene fluoride.
 - .1 Class F1S.
 - .2 Color to match existing.
 - .3 Specular gloss: 30 units +/- in accordance with ASTM D 523.
 - .4 Coating thickness: not less than 22 micrometres.
 - .5 Resistance to accelerated weathering for chalk rating of, colour fade 5 units or less and erosion rate less than 20 % to ASTM D 822 as follows:
 - .1 Outdoor exposure period 2500 hours.
 - .2 Humidity resistance exposure period 5000 hours.

2.2 ACCESSORIES

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement: to CAN/CGSB 37.5.
 - .1 Maximum VOC limit 50 g/L to SCAQMD Rule 1168.
- .3 Underlay for metal flashing: dry sheathing to CAN/CGSB-51.32.
- .4 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.
- .5 Fasteners: of same material as sheet metal, to CSA B111, ring thread flat head roofing nails of length and thickness suitable for metal flashing application.
- .6 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .7 Flux: rosin, cut hydrochloric acid, or commercial preparation suitable for materials to be soldered.
- .8 Touch-up paint: as recommended by prefinished material manufacturer.

2.3 FABRICATION

- .1 Fabricate metal flashings and other sheet metal as indicated.
- .2 Form pieces in 2400 mm maximum lengths.
 - .1 Make allowance for expansion at joints.
- .3 Hem exposed edges on underside 12 mm.
 - .1 Mitre and seal corners with sealant.
- .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .5 Metal surfaces to be embedded in the concrete or the grout must be covered with a protective coating.

2.4 METAL FLASHINGS

- .1 Form flashings, copings and fascias to profiles indicated with prefinishes steel to match existing.

2.5 REGLETS AND CAP FLASHINGS

- .1 Form metal cap flashing of 0.48 mm thick and to be built-in masonry work in accordance with drawings.
 - .1 Provide slotted fixing holes and steel/plastic washer fasteners.
 - .2 Cover face and ends with plastic tape.

PART 3 – EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

- .1 Install sheet metal work in accordance with details.
- .2 Use concealed fastenings except where approved before installation.
- .3 Provide underlay under sheet metal.
 - .1 Secure in place and lap joints 100 mm.
- .4 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs.
 - .1 Flash joints using standing seams forming tight fit over hook strips, as detailed.
- .5 Lock end joints and caulk with sealant.
- .6 Install surface mounted reglets true and level, and caulk top of reglet with sealant.
- .7 Insert metal flashing under cap flashing to form weather tight junction.
- .8 Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm. Lead wedge flashing securely into joint.
- .9 Caulk flashing at reglet and cap flashing with sealant.
- .10 Install pans, where shown around items projecting through roof membrane.

3.3 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
 - .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.4 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Leave work areas clean, free from grease, finger marks and stains.

END OF SECTION

PART 1 – GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 03 45 00 – Precast architectural concrete.
- .2 Section 07 92 00 – Joint sealants.

1.2 REFERENCES

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .2 Underwriter's Laboratories of Canada (ULC)
 - .1 ULC-S115-1995, Fire Tests of Fire stop Systems.

1.3 DEFINITIONS

- .1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.
- .2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.
- .3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.
- .4 Tightly Fitted; (ref: NBC Part 3.1.9.1.1 and 9.10.9.6.1): penetrating items that are cast in place in buildings of noncombustible construction or have "0" annular space in buildings of combustible construction.
 - .1 Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets.
 - .3 Shop Drawings:
 - .1 Submit shop drawings to show proposed material, reinforcement, anchorage, fastenings and method of installation.
 - .2 Construction details should accurately reflect actual job conditions.
 - .4 Samples:
 - .1 Submit duplicate 300 x 300 mm samples showing actual fire stop material proposed for project.
-

- .5 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
 - .1 Test reports: in accordance with CAN-ULC-S101 for fire endurance and CAN-ULC-S102 for surface burning characteristics.
 - .1 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.
 - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.
 - .4 Manufacturer's Field Reports: submit to manufacturer's written reports within [3] days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

1.5 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer: company specializing in fire stopping installations with 5 years documented experience approved by manufacturer.
- .2 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with[contractor's representative and Departmental Representative in accordance with Section 01 32 16.06 - Construction Progress Schedule - Critical Path Method (CPM) to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.
- .3 Site Meetings: as part of Manufacturer's Services described in PART 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.
 - .1 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.
 - .2 Twice during progress of Work at 25% and 60% complete.
 - .3 Upon completion of Work, after cleaning is carried out.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
 - .3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer, ULC markings.
- .2 Storage and Protection:
 - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .3 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.

PART 2 – PRODUCTS

2.1 MATERIALS

- .1 Self-levelling neutral elastic silicone based fire stopping sealant to:
 - .1 UL 1479
 - .2 ASTM E 1966
 - .3 UL 2079
 - .4 ASTM E 814
 - .5 ASTM E 2307
 - .6 ASTM E 84
 - .7 ASTM G21
 - .8 CAN/ULC-S115
 - .9 Color: grey
 - .10 Cure time: 2mm / 3 days
- .2 Fire stopping and smoke seal systems: in accordance with CAN-ULC-S115.
 - .1 Asbestos-free materials and systems capable of maintaining 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 specified special requirements described in PART 3.
 - .2 Fire stop system rating: 1 hour.
- .3 Service penetration assemblies: systems tested to CAN-ULC-S115.
- .4 Service penetration fire stop components: certified by test laboratory to CAN-ULC-S115.
- .5 Fire-resistance rating of installed fire stopping assembly in accordance with NBC, for a minimum of 2 hours.
- .6 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.
- .7 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .8 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .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 MANUFACTURER'S INSTRUCTIONS

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

3.2 PREPARATION

- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.
 - .1 Ensure that substrates and surfaces are clean, dry and frost free.
- .2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.
- .3 Maintain insulation around pipes and ducts penetrating fire separation.
- .4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.3 INSTALLATION

- .1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing.
- .2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
- .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
- .4 Tool or trowel exposed surfaces to neat finish.
- .5 Remove excess compound promptly as work progresses and upon completion.

3.4 SEQUENCES OF OPERATION

- .1 Proceed with installation only when submittals have been reviewed by Departmental Representative.
- .2 Metal deck bonding: fire stopping to precede spray applied fireproofing to ensure required bonding.
- .3 Mechanical pipe insulation: certified fire stop system component.
 - .1 Ensure pipe insulation installation precedes fire stopping.

3.5 FIELD QUALITY CONTROL

- .1 Inspections: notify Departmental Representative when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.
 - .2 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
 - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
 - .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.
-

3.6 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

3.7 SCHEDULE

- .1 Fire stop and smoke seal at:
 - .1 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.

END OF SECTION
