Part 1 General

1.1 RELATED SECTIONS

.1 Section 04 04 99 - Masonry for Minor Works, for ties with insulation retainers

.2 Section 07 27 10 - Air/Vapour Barriers

1.2 REFERENCES

.1 Canadian Gas Association (CGA)

.1 CAN/CGA-B149.1, Natural Gas and Propane Installation Code Handbook

.2 CAN/CGA-B149.2, Propane Storage and Handling Code

.2 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S604, Standard for Type A Chimneys

.2 CAN/ULC-S702, Standard for Thermal Insulation Mineral Fibre for Buildings

1.3 SUBMITTALS

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

1.4 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

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

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Provide construction waste management in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 INSULATION

.1 Insulation Type A - Mineral fibre insulation: non-combustible, semi-rigid mineral wool fibre insulation board to CAN/ULC-S702, thickness and number of layers indicated.

.1 Type 1.

.2 Density:

.1 Outer layer: 100 kg/m3.

.2 Inner layer: 55 kg/m3.

.3 Thermal resistance per 25 mm thickness: 0.76 m2 K/W (R-4.2 per inch).

.4 Moisture resistance: 0.07% to ASTM C1104.

.5 Fire performance:

.1 Non-combustible to CAN4-S114.

.2 Smoke developed: 0 to CAN/ULC S102.

.3 Flame spread: 0 to CAN/ULC S102.

.6 Acceptable products: Roxul CavityRock DD.

2.2 ACCESSORIES

.1 Insulation Fasteners: Mechanically-attached, spindle-type anchors, plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.

.1 Plate: Perforated, galvanized carbon-steel sheet, 0.762 mm thick by 50 mm square.

.2 Spindle: Copper-coated, low-carbon steel; fully annealed; 2.67 mm in diameter; length to suit depth of insulation indicated.

.2 Adhesive for Bonding Insulation and Fastners: Product with demonstrated capability to bond insulation and fasteners securely to substrates without damaging insulation and substrates, approved by air vapour barrier manufacturer.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 EXAMINATION

.1 Examine substrates and immediately inform Departmental Representative in writing of defects.

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

3.3 INSTALLATION GENERAL

.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 combustible insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN4-S604 type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 type B and L vents.

.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 Fasten insulation in place using type of fastener applicable to substrate. Follow manufacturers written installation instructions for minimum fasteners per insulation board.

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

.8 Apply continuous 6mm beads of adhesive at 150 on centre in a horizontal serpentine pattern full width of board, and at top and bottom edges. Apply adhesive fully around protrusions.

.9 Butt insulation tightly together at side and end laps to provide complete thermal barrier.

.10 Do not enclose insulation until it has been observed by Departmental Representative.

3.4 CAVITY WALL INSULATION

.1 Install insulation boards on top of air/vapour barrier over exterior face of substrate.

.1 Following air/vapour barrier installation, adhere insulation fasteners to air/vapour barrier using manufacturer’s approved adhesive. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.

.2 Install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.

3.5 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 07 21 13 - Board Insulation

.2 Section 07 27 10 - Air/Vapour Barrier

.3 Section 08 11 00 - Steel Doors and Frames

1.2 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials

.2 Canadian Construction Materials Centre (CCMC)

.1 Evaluation Report

.3 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings

.2 CAN/ULC-S705.1, Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Material – Specifications, Includes Amendments 1, 2

.3 CAN/ULC-S705.2, Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Application

1.3 SUBMITTALS

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

.2 Action Submittals:

.1 Product Data: For each insulation or foam sealant product indicated.

.3 Informational Submittals:

.1 Submit test reports in accordance with Section 01 45 00 - Quality Control, verifying properties of foamed-in-place insulation meet or exceed the requirements of this specification.

.2 Submit current CCMC evaluation report certifying products meet or exceed specification requirements.

.3 Qualification data.

1.4 QUALITY ASSURANCE

.1 Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Store products in strict accordance to manufacturer's instructions in temperature controlled, dry and ventilated area.

.2 Minimize construction waste sent to the landfill, separate and recycle materials as specified in Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Apply foamed-in-place insulation and sealants only when substrate and ambient temperatures are within prescribed limits.

.2 Ensure temperature is maintained throughout curing period.

Part 2 Products

2.1 MATERIALS

.1 Use of insulation products manufactured with CFCs as blowing agents is prohibited.

.2 Spray Foam Insulation: to CAN/ULC S705.1, closed cell, spray applied rigid cellular polyurethane foam air barrier and thermal insulation, medium 29 kg/cu m density.

.1 Performance criteria:

.1 Fire Performance: less than 500 flame spread, less than 500 smoke developed to CAN/ULC S102.

.2 Water vapour permeance: 42ng/Pa-s-sq m to ASTM E96.

.3 Long term thermal resistance: RSI 1.95 at 50 mm thickness.

.2 Locations: Around protrusions and penetrations through air seal, and other locations indicated.

.3 Thickness: Minimum indicated.

.3 Spray Foam Sealant – General Purpose: one-component, semi-rigid polyurethane sealant, to CAN/ULC-S701, 16 to 24 kg/m3, minimum RSI 0.67 per 25 mm thickness:

.1 Locations: gaps and cracks up to 75 mm in size.

.4 Spray Foam Sealant – Low Pressure: one-component, semi-flexible polyurethane sealant, to CAN/ULC-S701, 27 kg/m3:

.1 Locations: gaps and cracks adjacent to door, window and curtain wall framing.

Part 3 Execution

3.1 PREPARATION

.1 Clean surfaces which are to receive insulation, of dirt, dust, grease, loose material or other foreign matter which may inhibit adhesion.

.2 Provide sufficient ventilation during and until insulation has cured, to ensure safe working conditions. Introduce fresh air and exhaust air continuously during the 24 hour period after application to maintain non-toxic, unpolluted, safe working conditions.

.3 Temporarily brace door frames as may be required to prevent possible bowing of frames due to over expansion of the foamed-in-place insulation.

3.2 PROTECTION

.1 Provide temporary enclosures to prevent spray and noxious vapour from contaminating air beyond application area.

.2 Protect workers as recommended by insulation manufacturer.

.3 Protect adjacent surfaces and equipment from damage by over spray, fall-out, and dusting of insulation materials.

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

3.3 INSTALLATION, GENERAL

.1 Where spray-foam insulation or sealant is used to maintain continuity of thermal barrier, and is installed in conjunction with membrane air seal/vapour barrier around frames including metal and aluminum frames or protrusions, ensure that foamed-in-place insulation is installed on exterior side of membrane air seal/vapour barrier.

.2 Apply materials in accordance with manufacturer’s written instructions.

.3 Ensure finished surface is free of voids and imbedded objects.

.4 Apply primer when required to properly prepared substrates for special conditions required by foam insulation manufacturer’s requirements.

3.4 INSTALLATION AROUND PROTRUSIONS THROUGH AIR SEAL

.1 Apply by spray method to uniform monolithic density without voids.

.2 Install spray-foam insulation around protrusions including mechanical and electrical protrusions, electrical chases, exhaust systems, heating and cooling ducts, sole plates, top plates, wall sections, and elsewhere as required to achieve and maintain continuity of thermal barrier around such protrusions.

.3 Conduct daily visual inspection, adhesion testing and density measurements as required by CAN/ULC S705.2 and manufacturer's application guidelines.

3.5 INSTALLATION AROUND ENTRANCE FRAMING

.1 Install spray foam sealant around entrance frames to maintain continuity of thermal barrier, after air/vapour barrier has been installed and sealed to framing as specified in Sections 07 27 10.

.2 Install spray foam sealant around window openings to completely and continuously connect window frame to adjacent air/vapour barrier, to maintain continuity of air/vapour seal.

.3 Ensure that spray foam sealant completely fills spaces, without voids, and that foam is continuous at corners.

3.6 CLEAN-UP

.1 Remove masking materials and overspray from adjacent areas immediately after foam surface has hardened.

.2 Repair damaged areas in accordance with manufacturer's instructions.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 30 00 - Cast-in-Place Concrete

.2 Section 09 21 16 - Gypsum Board Assemblies

1.2 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM D4541, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers

.2 ASTM E1186, Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Retarder Systems

.2 National Building Code of Canada (NBCC)

.1 NBCC, Part 5 - Environmental Separation

1.3 SUBMITTALS

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

.2 Action Submittals:

.1 Product Data: Manufacturer’s technical data sheet demonstrating compliance with specified performance criteria.

.2 Samples:

.1 Submit duplicate 300 mm x 300 mm samples of membrane.

.3 Informational Submittals:

.1 Submit manufacturer's installation instructions.

.2 Compatibility: Provide letter(s), provided and signed by manufacturer of membrane air/vapour barrier material(s), that products used on the project are compatible with adjacent materials, and materials with which the membrane will be in contact or sealed.

.3 Qualification Data: For Installer.

.4 Field quality control reports.

1.4 QUALITY ASSURANCE

.1 Provide quality control in accordance with Section 01 45 00 – Quality Control.

.2 Protect building materials from damage by:

.1 fully covering stored materials.

.2 elevating stored materials off ground.

.3 disposing of materials with evidence of moisture damage.

1.5 DELIVERY, STORAGE AND HANDLING

.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 Provide construction waste management in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Provide forced air circulation during installation and curing periods for enclosed applications.

.2 Exercise caution for proper adhesion, curing when temperature below 4 deg C.

.3 Do not install solvent curing sealants or vapour release adhesive materials in enclosed spaces without ventilation.

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

Part 2 Products

2.1 PERFORMANCE CRITERIA

.1 Construct air/vapour barrier system of building to provide a continuous, structurally supported plane of materials to contain indoor air (exfiltration) and to prevent outdoor air from entering the building (infiltration) in accordance with the following requirements:

.1 Incorporate a continuous air/vapour barrier system, meeting or exceeding the requirements of the NBCC, Part 5.

.2 Maximum air leakage through the air/vapour barrier system within the areas of the exterior walls from the roof to grade is not to exceed 0.02 L/(s·m2) at 75 Pa pressure differential.

.3 Maximum water vapour permeance, 2.9 ng/Pa· m2 ·s (0.05 perms).

.4 Maximum air leakage through joints between air/vapour barrier components of various assemblies (window frames, curtain wall, door frames, roof junction to walls, each other) is not to exceed 0.02 L/s·m at 75 Pa pressure differential.

.5 Membrane-Substrate Tensile Adhesion: minimum 103 kPa (15 psi) when tested to ASTM D 4541.

2.2 MATERIALS

.1 Membrane air seal/vapour barrier (AVB): SBS modified bitumen membrane or rubberized asphalt coated polyethylene or cross-laminated polyethylene bonded to modified asphalt, self-adhesive grade, 1.0 mm minimum thickness, 0.1 mm thickness polyethylene face.

.2 Foam Seal: In accordance with Section 07 21 19 – Foamed-In-Place Insulation

.3 Sealant: butyl rubber base, single component, solvent release, non-skinning, as recommended by membrane manufacturer.

.4 Substrate cleaner: Non-corrosive type recommended by sealant manufacturer compatible with adjacent materials.

.5 Termination mastic: rubberized asphalt-based mastic.

.6 Adhesive: Compatible with sheet seal and substrate, permanently non-curing.

.7 Surface conditioner: Latex-based, water-dispersible liquid for substrate preparation, as required by project.

.1 Flash point: no flash to boiling point.

.2 Solvent type: water.

.3 Application temperature: -4 deg C and above.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that surfaces and conditions are ready to accept the Work of this section.

.2 Ensure surfaces are clean, dry, sound, smooth, continuous, and comply with air/vapour barrier manufacturer's requirements.

.3 Report unsatisfactory conditions to Departmental Representative in writing.

.4 Do not start work until deficiencies have been corrected. Start of Work implies acceptance of conditions.

3.2 PREPARATION

.1 Remove loose or foreign matter which might impair adhesion of materials.

.2 Ensure substrates are clean of oil or excess dust; masonry joints struck flush, and open joints filled.

.3 Ensure substrates are free of surface moisture prior to application of membrane and primer.

.4 Prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.

3.3 PRIMER

.1 Apply primer by brush or heavy nap, natural-material roller at rate recommended by manufacturer prior to membrane installation.

.2 Allow primer to dry completely before membrane application.

3.4 INSTALLATION

.1 Install membrane AVB to dry surfaces at air and surface temperatures of -4 deg C and above in accordance with manufacturer's recommendations, to locations indicated.

.2 Precut pieces of membrane AVB into easily-handled lengths.

.3 Remove silicone-coated release paper, where applicable, and position membrane carefully before placing length horizontally against the surface.

.4 Begin installation at base of wall placing bottom edge of membrane over sheet metal flashings, and shelf angles, as indicated.

.5 When properly positioned, place against surface by pressing firmly into place by means of hand roller ensuring full contact.

.6 Overlap adjacent pieces 50 mm, and roll seams.

.7 Apply subsequent sheets of membrane above, overlapping sheet below by 50 mm. Stagger vertical joints minimum 300 mm. Roll firmly into place.

.8 Seal around penetrations with termination mastic.

.9 Continue membrane into openings in walls, including but not limited to doors and windows. Terminate at points that will prevent visibility from interior. Continue membrane over junctions, at changes in wall construction, and other construction. Reinforce corners with additional piece of membrane cut and formed to seal corners. Caulk to ensure complete seal. Position lap seal over firm bearing.

.10 At end of each working day seal top edge of membrane AVB to substrate with termination mastic.

.11 Do not allow rubberized asphalt surface of membrane AVB to come in contact with polysulfide sealants, creosote, uncured coal tar products or EPDM.

.12 Do not expose membrane AVB to sunlight for more than thirty days prior to enclosure.

.13 Inspect installation prior to enclosing. Repair punctures, damaged areas and inadequately lapped seams with a patch of membrane sized to extend 150 mm in all directions from perimeter of affected area.

.14 When required by dirty or dusty site conditions; by surfaces having irregular or rough texture, or if difficultly is encountered in adhering membrane AVB to substrate, apply surface conditioner by spray, brush, or roller at rate recommended by manufacturer, before membrane installation. Allow surface conditioner to dry completely before applying primer or membrane.

3.5 FIELD QUALITY CONTROL

.1 Membrane AVB installation will be inspected by the Departmental Representative.

.2 Visual inspections will include:

.1 Review and report on the following:

.1 Continuity of membrane AVB has been achieved throughout the wall and adjacent assemblies with no gaps or holes.

.2 Continuous structural support of membrane AVB system has been provided.

.3 Site conditions for application temperature and dryness of substrates have been maintained.

.4 Maximum exposure time of materials to UV deterioration has not been exceeded.

.5 Surfaces have been primed.

.6 Laps in sheet materials have complied with minimum requirements and have been shingled in the correct direction (or mastic applied on exposed edges), with no fishmouths.

.7 Termination mastic has been applied on cut edges.

.8 Membrane AVB has been firmly adhered to substrate.

.9 Compatible materials have been used.

.10 Transitions at changes in direction and structural support at gaps have been provided.

.11 Connections between assemblies (membrane and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.

.12 All penetrations have been sealed.

.13 Interfaces between different assemblies, membrane AVB and openings: report specifically on the tie-in methodology and installation between materials.

3.6 PROTECTION, REPAIR, AND CLEANING

.1 Protect work from damage and wear during remainder of construction period.

.2 Correct deficiencies in or remove work that does not comply with requirements; repair substrates, reapply membrane AVB, and repair flashings.

.3 Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

.4 Provide cleaning during construction in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 73 00 – Execution, for cutting and patching, coring of existing construction

.2 Section 01 78 00 – Closeout Submittals

.3 Section 03 30 00 – Cast-in-Place Concrete

.4 Section 04 04 99 – Masonry for Minor Works

.5 Division 07 – Thermal and Moisture Protection

.6 Section 09 21 16 – Gypsum Board Assemblies

.7 Division 21 – Fire Suppression

.8 Division 22 – Plumbing

.9 Division 23 – Heating, Ventilating, and Air Conditioning

.10 Division 26 – Electrical

.11 Division 28 – Electronic Safety and Security

1.2 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM E814-00, Standard Test Method for Fire Tests of Penetration Firestop Systems

.2 ASTM E2174-10ae1, Standard Practice for On-site Inspection of Installed Firestops

.3 ASTM E2307-10, Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate Scale, Multi-storey Test Apparatus

.4 ASTM E2393-10, Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers

.2 Underwriters Laboratories of Canada (ULC)

.1 ULC-S115-05, Fire Tests of Firestop Systems

1.3 DEFINITIONS

.1 Barrier/Assembly: A wall, floor, or other partition with a fire-smoke rating of 1, 2, 3 or up to 4 hours.

.2 Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, water and hot gases through penetrations in/ joints between fire rated wall and floor assemblies.

.3 Fireblocking: building materials installed to resist the free passage of flame, smoke and noxious gases to other areas of the building through concealed spaces.

.4 Fire resistive joint: any joint or opening, whether static or dynamic, within or between adjacent sections of fire rated interior or exterior walls, floors, ceilings or roof decks.

.5 Intumescent: materials that expand to seal around objects threatened by fire.

.6 Membrane penetration: Any penetration of a fire rated barrier that breaches one side, but does not pass completely through to the other side.

.7 Multi-penetration: two or more service penetrations through a fire separation where the minimum space between pipes must exceed 50 mm and where sizes of pipe are larger than 50 mm, the space must be larger than the largest pipe between.

.8 Non-rated fire separations: a fire separation with no fire-resistance rating that acts as a barrier to the spread of fire and smoke for a time period that allows the fire suppression system to activate and control a fire. Non-rated fire separations indicated on drawings, shall be fire stopped on both sides of the separation based on a fire-resistance rating of 1-hour.

.9 Through-penetration: Pipes, conduits, ducts, cable trays, cable, wire or any other element passing completely through an opening in a fire rated barrier/assembly.

.10 Single penetration: one service penetration through a fire separation.

.11 System: The combination of specific materials and/or devices, including the penetrating item(s) required to complete the firestop, as tested by an independent third party test facility.

.12 F-Rating: the time a Firestop, penetrating item, building, material, firestop material, can withstand direct flame without a burn through as tested to ASTM E814/UL 1479.

.13 L-Rating: based on a volume of air flowing per unit of time through the opening around a penetration and/or joint under a specified pressure difference applied across the surface of the system.

.14 T-Rating: The amount of time a through-penetration firestop limits the temperature rise on the cold side-outside the test furnace - as tested to ASTM E814/UL 1479.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings: convene pre-installation meeting minimum two weeks prior to beginning work of this Section, with Contractor's representative, firestopping subcontractor, and Departmental Representative 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.
- .5 Project sequencing.
- .6 Environmental conditions.
- .7 Marriage details.
- .8 Top-of-wall joints (shrinkage, expansion, contraction requirements).
- .9 Perimeter joints.
- .10 Multi-penetration.
- .11 Close-out submittals
- .12 Inspection guidelines.

.2 Site Meetings: as part of Manufacturer's Field Services described in Part 3, 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.

.3 Sequencing and Scheduling:

- .1 Inform parties involved with firestopping process of roles and how they can affect firestopping.
- .2 Do not cover up firestopping installations until Departmental Representative or Authorities Having Jurisdiction have examined installation.

1.5 SUBMITTALS

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

.2 Action Submittals:

- .1 Shop Drawings: Submit shop drawings to show proposed material, fastenings, methods of installation. Construction details should accurately reflect actual job conditions.
- .2 Samples: Submit duplicate 300 x 300 mm samples showing actual firestop material proposed for project.

.3 Product Data:

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

.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.

.3 Informational Submittals:

.1 Certificates: Certification by manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs), are non-toxic to building occupants, are asbestos-free, and comply with applicable regulations.

.2 Manufacturer's field reports.

1.6 CLOSEOUT SUBMITTALS

.1 Submit operations and maintenance manual in accordance with Section 01 78 00 – Closeout Submittals. Provide a schedule with the following information:

.1 Label (reference tag)

.2 Room number/name

.3 Location within room

.4 Fire barrier rating

.5 Service penetration or joint description including size

.6 Firestop design listed system or engineering judgements

.7 Photographs (if required)

.8 Notes (unique installation requirements)

.2 Product description

.3 Maintenance requirements.

.4 Certificates

1.7 QUALITY ASSURANCE

.1 Fire-Test-Response Characteristics: Provide firestop design listed system by independent testing and inspection agency in accordance with appropriate ASTM standard(s). Qualified independent testing and inspection agencies include UL, ULC, cUL, Intertek Testing Services, or another agency performing testing and follow-up inspection services for firestop materials that is acceptable to authority having jurisdiction.

.2 Manufacturer’s direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to review contractor personnel in following procedures:

.1 Selecting correct firestop design listed system.

.2 Verifying environmental conditions in accordance with product data.

.3 Verifying service penetration annular opening and/or joint width/height.

.4 Preparing service penetration and/or joint, as well as substrate.

.5 Installing damming material to correct compression (width and depth).

.6 Installing firestop product to correct width and depth.

.7 Installing firestop labels.

.3 Single Source Responsibility: Obtain firestop systems for each type of penetration and construction conditions indicated, from a single primary firestop systems manufacturer.

.1 Do not intermix materials of different manufacturers than allowed by tested and listed system in same firestop system or opening.

.2 Tested and listed firestop systems are to be used first. If such systems are not possible, provide Engineering Judgement (EJ) or Equivalent Fire Resistance Rated Assembly (EFRRA).

.4 Schedule pre-construction meeting for parties involved prior to start of construction.

1.8 DELIVERY, STORAGE, AND HANDLING

.1 Deliver firestopping products to Project Site in original, unopened containers, or packages with intact and legible manufacturer's labels identifying product and manufacturer.

.2 Store and handle firestopping materials in accordance with manufacturer's written instructions.

.3 Comply with recommended procedures, precautions and remedies described in MSDS as applicable.

.4 Do not use damaged or expired material.

.5 Waste management and disposal requirements: Refer to Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

1.9 SITE CONDITIONS

.1 Environmental Conditions: Install firestopping in accordance with manufacturers written instructions.

.2 Ventilation: Ventilate in accordance with firestopping manufacturers' instructions or Material Safety Data Sheet (MSDS).

Part 2 Products

2.1 PERFORMANCE REQUIREMENTS

.1 Penetrations: firestopping systems produced to resist spread of fire and passage of smoke and other gases according to requirements indicated, including but not limited to:

.1 Firestop penetrations passing through fire resistance rated wall and floor assemblies, and other locations as indicated.

.2 Complete penetration firestopping systems tested and approved by third party testing agency.

.2 Where no specific third party tested and classified firestop system is available for a particular firestop configuration, obtain Engineering Judgement (EJ) or Equivalent Fire Resistance Rated Assembly (EFFRA) for submittal from firestop manufacturer.

.3 Comply with manufacturer's product data, including product technical bulletins, product catalogue installation instructions, and product carton instructions for installation.

.4 Maintain jobsite file and comply with Material Safety data Sheets (MSDS) for each product delivered to jobsite.

2.2 MATERIALS

.1 Use only firestop products that have been ULC or cUL tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

.1 Asbestos-free materials and systems capable of maintaining an effective barrier against the passage of flame, smoke, water and toxic gases in compliance with requirements of CAN4-S115 or ASTM E814, and not to exceed opening sizes for which they are intended, in accordance with ULC or cUL Design Numbers or other Design System Listings acceptable to local Authority Having Jurisdiction.

.2 Firestopping materials/systems shall be flexible to allow for movement of building structure (refer to architectural and structural) and penetrating item(s) without affecting the adhesion or integrity of the system.

.2 Firestop products may include, but not be limited to:

.1 Sealants, sprays, mortars, fire straps, and breaks.

.2 Fire barrier mouldable putties, with or without backing.

.3 Fire barrier self-locking pillows containing intumescent composition.

.4 Fire barrier composite sheets used to cover large or blank openings, made up of steel sheet on one side with intumescent composition inside and steel wire mesh/foil on back side.

.5 Firestop devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

.3 Firestopping and smoke seal systems: in accordance with ULC-S115.

.4 Firestop products: produced by FCIA Manufacturer Members in good standing.

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

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

.7 Fire-resistance rating of installed firestopping assembly in accordance with National Building Code and local statutes and regulations.

.8 Firestopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.

.9 Firestopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical and electrical items requiring sound and vibration control: firestop collars or wrap devices; elastomeric seal.

.10 Firestopping at large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways: blocks and boards.

.11 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.

.12 Sealants for vertical joints: non-sagging, non-shrinking, asbestos-free.

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

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

.15 Labels: self-adhering-type metal or plastic labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

.1 The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."

.2 Contractor's name, address, and phone number.

.3 Designation of applicable testing and inspecting agency.

.4 Date of installation.

.5 Manufacturer's name.

.6 Installer's name.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 EXAMINATION

.1 Examine substrates and conditions with installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping. Notify Departmental Representative of unsatisfactory conditions. Do not proceed with installation until unsatisfactory conditions have been corrected.

.2 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.

.3 Verify that penetrating elements and supporting devices have been properly installed, and that temporary lines, and markings, have been removed.

.4 Verify that field dimensions are as indicated and as recommended by manufacturer.

.5 Ensure no additional items have been installed through openings that do not appear on approved Design Listing.

.6 Ensure areas that are to be firestopped are accessible for proper application and conditions are suitable for installation and inspection of firestop system.

.7 Report in writing to the Departmental Representative any defective surfaces or conditions affecting the firestop system installation, immediately and prior to commencing any installations.

.8 Proceed only when defected surfaces or conditions have been corrected.

3.3 PREPARATION

.1 Prepare surfaces in contact with firestopping materials and smoke seals to manufacturer's instructions.

.2 Maintain insulation around pipes and ducts penetrating fire separation without interruption to air/vapour barrier.

.3 Mask where necessary to avoid spillage and over coating onto adjoining surfaces.

.4 Remove masking as soon as possible, without disturbing seal between firestopping and substrates. Remove stains on adjacent surfaces.

.5 Ensure temperature within the areas of installation meets or exceeds the minimum temperature range for the products that will be installed in those areas, as based on the manufacturer’s recommendations for a minimum two days prior and three days after installation.

3.4 INSTALLATION

.1 General:

.1 Install fire-stop material to obtain fire-resistance rating not less than the fire resistance rating of surrounding floor and wall assembly.

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

.3 Seal holes or voids made by through penetrations, poke-through termination devices, and un-penetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

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

.5 Tool or trowel exposed surfaces to neat finish.

.2 Penetration Firestops:

.1 Coordinate with other trades to ensure pipes, conduit, cable, and other items, which penetrate fire rated construction, have been permanently installed prior to installation of firestop assemblies.

.2 Schedule Work to ensure partitions and other construction that conceals penetrations are not erected prior to installation of firestop and smoke seals.

.3 Install fill materials for through-penetrations firestop systems to produce following results:

.1 Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.

.2 Install materials so they contact and adhere to substrates formed by opening and penetrating items.

.3 For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces.

.3 Firestop Joint Systems:

.1 Install joint fillers to provide support of firestop materials during application. Install joint filler at position required to produce cross-sectional shapes and depths of installed firestop material relative to joint widths that allow optimum sealant movement capability and develop fire-resistance rating required.

.2 Install systems by proved techniques that result in firestop materials:

.1 Directly contacting and wetting joint substrates.

.2 Filling recesses provided for each joint configuration.

.3 Providing uniform, cross-sectional shapes and depths relative to joint width that optimize movement capability.

.3 Tool non-sag firestop materials immediately after application and prior to skinning. Form smooth, uniform beads of configuration indicated or required to:

.1 Produce fire-resistance rating.

.2 Eliminate air pockets.

.3 Ensure contact and adhesion with sides of joint.

.4 Perimeter Fire Barrier Systems:

.1 Install metal framing, mineral wool insulation, mechanical attachments, safing materials, and firestop materials as applicable within system design.

3.5 SPECIAL REQUIREMENTS

.1 Install firestopping within existing buildings and in fire walls between existing buildings and new construction immediately after an opening requiring firestopping has been made in a fire separation.

3.6 LABELING

.1 Install labels adjacent to through wall/floor service penetrations and joints that are firestopped, and at joint penetrations. Provide one assembly identification label per penetration opening and one assembly identification plate at every 6000 mm along bottom and top of wall joints, and wall to wall joints.

.2 Fill out and install labels prior to Substantial Completion.

.3 Clean substrate prior to applying label.

.4 Securely apply label to substrate.

.5 Install label 50 mm away from penetration or joint.

3.7 MANUFACTURER'S FIELD SERVICE

.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.

3.8 INSPECTION

.1 Departmental Representative may engage a qualified independent testing agency to perform tests and inspections.

.2 Testing agency will examine firestop systems for proper installation, labelling, adhesion and curing as may be appropriate for the respective seal material before concealing or enclosing areas.

.1 Examination will be based on format similar to ASTM E2174 and ASTM E2393.

.2 Random review of installation will include:

.1 Construction progress.

.2 Construction photographs.

.3 Product storage, handling and delivery.

.4 As-built schedules and drawings.

.5 Penetration / Joint plate installation.

.6 Barrier marking installation

.7 Protection of installed systems.

.3 Contractor's responsibilities:

.1 Provide minimum 72 hours notice prior to requesting examination.

.2 Keep areas of work accessible and notify code authorities, or designated inspectors, of work completion released for inspection.

.3 Where deficiencies are found or firestopping is damaged or removed because of testing, repair or replace firestopping to comply with requirements.

.4 Proceed with enclosing firestopping with other construction only after inspection reports are issued and installations comply with requirements.

.5 Document completion, and inspection.

3.9 CLEANING

.1 Remove excess materials and debris and clean adjacent surfaces immediately after application. Use methods and cleaning materials approved by manufactures of firestopping products and assemblies in which openings and joints occur.

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

3.10 PROTECTION

.1 Protect firestopping during and after curing period from contact with contaminating substances.

3.11 SCHEDULE

.1 Firestop and smoke seal at:

.1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.

.2 Top of fire-resistance rated masonry and gypsum board partitions.

.3 Intersection of fire-resistance rated masonry and gypsum board partitions.

.4 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.

.5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.

.6 Openings and sleeves installed for future use through fire separations.

.7 Around mechanical and electrical assemblies penetrating fire separations.

.8 At expansion joints between fire-rated walls and other assemblies.

.9 Openings around structural support members that penetrate floors/walls.

.10 Openings and penetrations in fire rated walls or partitions containing fire doors.

.11 Penetrations made through fire-resistant rated assemblies in existing buildings for, but not necessarily limited to, mechanical and electrical services.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Division 04 – Masonry, for masonry control and expansion joint fillers and gaskets

.2 Section 09 21 16 - Gypsum Board Assemblies, for sealing perimeter joints

.3 Division 22 - Plumbing, for sealant around fountains, urinals, water closets, sinks, and lavatories

1.2 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM C834-10, Standard Specification for Latex Sealants

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

.3 ASTM C1193-11a, Standard Guide for Use of Joint Sealants

.4 ASTM C1248-08, Standard Test Method for Staining of Porous Substrate by Joint Sealants

.5 ASTM C1330-02(2007), Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants

.2 Canadian General Standards Board (CGSB)

.1 CGSB 19-GP-5M-84, 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 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act, 1999 (CEPA)

.4 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA)

.5 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1113, Architectural Coatings. Rules in affect January 1, 2004

.2 SCAQMD Rule 1168, Adhesives and Sealants Applications. Amended January 7, 2005; Rules in affect July 1 2005

1.3 SUBMITTALS

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

.2 Action Submittals:

.1 Product Data: describing.

.1 Sealant compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other, and in contact with laminated glass.

.2 Samples:

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

.2 Provide Samples with joint sealants in 13-mm- wide joints formed between two 150-mm- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

.3 Where custom colours are requested, submit colour samples of actual product for review by Departmental Representative.

.3 Informational Submittals:

.1 Manufacturer's instructions for installation of each product specified.

.2 Statement of Compatibility: Compatibility between sealants primers, and substrates is essential. Provide written declaration to Departmental Representative stating that materials meet this requirement.

.3 For products specified to comply with SWRI Sealant Validation Program, provide written confirmation from SWRI of product compliance.

.4 Test Reports.

1.4 QUALITY ASSURANCE

.1 Testing: Test sealants in contact with samples of porous materials to be sealed to ensure no staining of material will result in accordance with ASTM C1248.

1.5 DELIVERY, STORAGE, AND HANDLING

.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.

.2 Waste management and disposal requirements: Refer to Section 01 74 21 – Construction/Demolition Waste Management and Disposal

1.6 PROJECT CONDITIONS

.1 Environmental Limitations:

.1 Do not proceed with installation of joint sealants under following conditions:

.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.

.2 When joint substrates are wet.

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 Labour Canada.

.2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.3 Ventilate area of work by use of approved portable supply and exhaust fans.

.1 For work within existing buildings, arrange with Departmental Representative for ventilation system to be operated on maximum outdoor air and exhaust during installation of caulking and sealants.

Part 2 Products

2.1 SUSTAINABLE REQUIREMENTS

.1 Adhesives, sealants, and sealant primers: VOC quantities lower than stated in SCAQMD Rule #1168. Maximum VOC content.

.2 Primers, paints, sealers, coatings and wood finishes: VOC quantities lower than limits stated in Green Seal’s Standards GC-03 and GS-11 and SCAQMD Rule #1113. Maximum VOC content.

2.2 GENERAL

.1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks are not possible, confine usage to areas which offgas 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 those primers.

.4 Sealants used as structural component: tested and approved by sealant manufacturer prior to application, to confirm adhesion and compatibility with substrates.

.1 Provide samples of substrates to sealant manufacturer for testing.

.5 Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

.6 Colours: match sealant colour to adjacent materials, as selected and approved by the Departmental Representative.

.7 Comply with ASTM C920 and other requirements indicated for each liquid-applied chemically curing sealant, including those referencing ASTM C920 classifications for type, grade, class and uses.

.8 Compatibility: Provide joints sealants, primers and backings that are compatible with one another, and with joint substrates under conditions of service and application as demonstrated by joint sealant manufacturer based on proven test results and field experience.

.9 Sealants: not exude materials that travel into or onto adjacent materials, causing damage, or attracting soiling, which becomes apparent during service life of building.

2.3 SEALANTS

.1 Neutral cure, one part, low modulus silicone, movement range to ±50%, for exterior and interior use on concrete, masonry, stone, metals, glass, porcelain, control joints, expansion joints, between insulating glass units of curtain wall assembly, to ASTM C920, Type S, Grade NS, Class 50 (and inactive CAN/CGSB 19.13), colour selected by Departmental Representative. Test for staining for use with limestone cladding.

.2 One component, polyurethane, for interior, exterior use in aluminum, wood, glazing, curtain wall joints, heel beads, toe beads, air seals, to CAN/CGSB 19.13, colour selected by Departmental Representative.

.3 Multi-component, polyurethane, for finished, interior, exterior areas in control joints, concrete, tile, floors, walks, plazas, patios, to CAN/CGSB 19.24, Type II, Class B, colour selected by Departmental Representative. Ensure non-staining for use with limestone cladding.

.4 Mildew-resistant, to ASTM C920, Type S, Grade NS, Class 25, one part, high modulus silicone, movement range ±25%, for interior use in wet areas around bathtubs and shower stalls and shower bases, vanity tops, kitchen countertops, other counter surfaces. Colour selected by Departmental Representative.

.5 Mildew-resistant, paintable silicone, to ASTM C920, Type S, Grade NS, Class 25, one part, high modulus silicone, movement range ±25%, for interior use around vanity tops, kitchen countertops, other counter surfaces adjacent to painted surfaces.

.6 Acrylics One Part: general purpose, one part, paintable translucent acrylic to CGSB 19-GP-5M, movement range ±10%, for interior use in dry areas around windows, door frames, interior caulking to gypsum board, masonry, and metals.

.7 Acoustical Sealant, for use at perimeter joints in sound rated gypsum board partitions, and masonry partitions:

.1 For exposed and joints: non-sag, paintable, non-staining latex sealant complying with ASTM C834.

.2 For concealed joints: to CAN/CGSB-19.21, non-drying, non-hardening, non-skinning, non-staining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

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

.9 Primer: as recommended by manufacturer, meeting maximum VOC requirements.

.10 Back-up Materials:

.1 Backer rod: polyethylene, closed cell foam backer rod, compatible with sealant, recommended by manufacturer, diameter oversize 30 to 50% to suit joint.

.2 Bond breaker tape: polyethylene, pressure sensitive bond breaker tape which will not bond to sealant.

.3 Expanding Foam Sealant: Precompressed, open cell, chemically stabilized acrylic impregnation, adhesive backed, high density polyurethane foam, precompressed size indicated, width indicated, grey colour.

Part 3 Execution

3.1 EXAMINATION

.1 Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.2 Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

3.2 PROTECTION

.1 Protect installed Work of other trades from staining or contamination.

3.3 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.

.6 Test materials being sealed, caulked for staining, adhesion.

3.4 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.

3.5 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.

3.6 MIXING

.1 For multi-component sealants, mix materials in strict accordance with sealant manufacturer's instructions.

3.7 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.
.9 Apply non-paintable silicone sealants after wall surfaces have been painted.

.2 Curing:

.1 Cure sealants in accordance with sealant manufacturer's instructions.
.2 Do not cover up sealants until proper curing has taken place.

.3 Cleanup:

.1 Clean adjacent surfaces immediately and leave Work neat and clean.

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

.3 Remove masking tape after initial set of sealant.

END OF SECTION