PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-37.2-M88, Emulsified Asphalt, Mineral-Colloid Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.

.2 CAN/CGSB 37.3-M89, Application of Emulsified Asphalts for Dampproofing or Waterproofing.

.3 CAN/CGSB 37.5-M89, Cutback Asphalt Plastic Cement.

.4 CGSB 37-GP-6Ma-83, Asphalt, Cutback, Unfilled, for Dampproofing.

.5 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.

.6 CGSB 37-GP-11M-76(R1984), Application of Cutback Asphalt Plastic Cement.

.7 CGSB 37-GP-12Ma-84, Application of Unfilled Cutback Asphalt for Dampproofing.

.8 CGSB 37-GP-15M-76(R1984), Application of Asphalt Primer for Asphalt Roofing, Dampproofing and Waterproofing.

.9 CAN/CGSB 37.16-M89, Filled, Cutback, Asphalt for Dampproofing and Waterproofing.

.10 CAN/CGSB 37.28-M89, Reinforced Mineral Colloid Type, Emulsified Asphalt for Roof Coatings and for Waterproofing.

.11 CGSB 37-GP-36M-76, Application of Filled Cutback Asphalts for Dampproofing and Waterproofing.

.12 CGSB 37-GP-37M-77, Application of Hot Asphalt for Dampproofing or Waterproofing.

.2 Canadian Standards Association (CSA International)

.1 CSA A123.4-04(R2013), Bitumen for Use in Construction of Built-Up Roof Coverings and Dampproofing and Waterproofing Systems.

.3 Health Canada

.1 Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 National Research Council Canada (NRC)/Institute for Research in Construction (IRC)
.1 Canadian Construction Materials Centre (CCMC)

1.2 PRODUCT DATA

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

.2 Submit product data sheets for bituminous dampproofing products. Including:
.1 Product characteristics.
.2 Performance criteria.
.3 Application methods.
.4 Limitations.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, handle, store and protect materials in accordance with manufacturer's written instructions.

.2 Provide and maintain dry, off-ground weatherproof storage.

.3 Store materials on supports to prevent deformation.

.4 Remove only in quantities required for same day use.

.5 Store materials in accordance with manufacturer's written instructions.

1.4 ENVIRONMENT

.1 Temperature, relative humidity, moisture content.
.1 Apply dampproofing materials only when surfaces and ambient temperatures are within manufacturers' prescribed limits.
.2 Do not proceed with Work when wind chill effect would tend to set bitumen before proper curing takes place.

.3 Maintain air temperature and substrate temperature at dampproofing installation area above 5 degrees C for 24 hours before, during and 24 hours after installation.

.4 Do not apply dampproofing in wet weather.

.2 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Asphalt:

.1 For application and curing at temperatures above 5 degrees C: to CAN/CGSB-37.2 CSA A123.4 Type 2.

.1 Package label or bill of lading for bulk hot liquid asphalt must indicate type, flash point, equiviscous temperature range and final blowing temperature.

.2 Sealing compound: plastic cutback asphalt cement to CAN/CGSB-37.5.

.3 Asphalt primer: to CAN/CGSB-37.2.

PART 3 - EXECUTION

3.1 WORKMANSHIP

.1 Keep hot asphalt:

.1 Below its flash point.

.2 At or below its final blowing temperature.

.3 Within its equiviscous temperature range at place of application.

3.2 PREPARATION

.1 Before applying dampproofing:

.1 Seal exterior joints between foundation

walls and footings, joints between concrete floor slab and foundation and around penetrations through dampproofing with sealing compound.

3.3 APPLICATION

.1 Do dampproofing in accordance with CAN/CGSB-37.3 except where specified otherwise.

.2 Do sealing work in accordance with CGSB 37-GP-11M except where specified otherwise.

.3 Do priming of surface in accordance with CGSB 37-GP-15M except where specified otherwise.

.4 Apply primer.

.5 Apply dampproofing in accordance with applicable CGSB application standard, an to manufacturer's written instructions.

3.4 SCHEDULE

.1 Apply continuous, uniform coating to entire exterior faces of foundation walls from 50 mm below finished grade level to and including tops of foundation wall footings.

.2 Apply two additional coats of dampproofing to vertical corners and construction joints for a minimum width of 230 mm on each side, and all around and for 230 mm along pipes passing through walls.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 06 10 00 – Rough Carpentry.

.2 Section 08 11 14 - Metal Doors and Frames: Foam fill at frames.

.3 Section 09 21 16 - Gypsum Board Assemblies.

1.2 REFERENCES

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

.1 ASTM C1320-10(2016), Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.

.2 Underwriters Laboratories of Canada (ULC)

.1 ULC-701, Thermal Insulation, Polystyrene, Boards and Pipe Coverings.

.2 ULC-710.1, Standard for Thermal Insulation - Bead - Applied One Component Polyurethane Air Sealant Foam, Part 1.

.3 ULC-710.2, Standard for Thermal Insulation - Bead-Applied One Component Polyurethane Air Sealant Foam, Part 2.

1.3 SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Submit product data and manufacturer's installation recommendations for each product specified.

.3 When requested, provide information concerning installer experience which is similar in scope and scale to requirements of the Project, including location of work and persons to be contracted as references.

1.4 QUALITY ASSURANCE

.1 Installer Qualifications: Qualified by manufacturer to install manufacturer's products, and who has completed installations similar in design, scope and scale to those indicated for this Project.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

.2 Protect from exposure to harmful environmental conditions at temperature and humidity conditions recommended by manufacturer.

Part 2 Products

2.1 BATT INSULATION

.1 Batt and blanket mineral fibre: to ASTM C612, 32 kg/m3, friction fit fibrous mineral insulation to thickness and/or RSI values as indicated on drawings.

.2 Fire Batt Insulation: for fire rated partitions, to ASTM C665, tested to UCL S102.2, thickness required to fill stud depth as indicated. Acceptable Products: Fibrex SAFB, Roxul AFB.

2.2 SPRAY APPLIED POLYURETHANE FOAM

.1 Spray Applied Polyurethane Foam: to CAN/ULC S705.1 medium density, two-part polyurethane foam insulation; minimum LTTR of RSI 1.02mm/ 25mm when tested to CAN/ULC S770, 75mm installed thickness unless noted otherwise.

.1 Acceptable Product: BASF Walltite, Demilec Heatlok, PFSI Polarfoam PF-7300, Icynene MD-C-200.

2.3 SPRAY APPLIED RIGID POLYURETHANE

.1 Spray Applied Rigid Polyurethane: to CAN/CGSB 51.23-92, thickness for full depth of cavity, "FAST FILL " as manufactured by Handi-foam, Insta-Seal by Insta-Foam or an approved equal.

2.4 UNDERSLAB & FOUNDATION INSULATION

.1 Underslab and vertical concrete wallInsulation: extruded polystyrene to ASTM C1126-12, RSI 2.2 minimum, Type 4,

.1 Standard of Acceptance: Formular C-300 by Owens Corning, Styrofoam SM by Dow Chemical, or approved equal.

2.5 SOUND ATTENUATION BATTS

.1 Rock (Mineral) Wool Sound Batts: to ASTM C665, Type 1; mineral wool fibre insulation made from basalt rock and recycled furnace slag:

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

.2 Surface Burning Characteristics to CAN/ULC S102: Flame Spread: 0, Smoke Developed: 0.

.3 Thickness: as indicated on Drawings.

2.6 ATTACHMENT DEVICES AND RELATED ACCESSORIES

.1 Adhesive: Polyurethane construction adhesive, resistant to freezing.

.2 Expanding Foam Insulation and Sealant: CAN-ULC-S710.1, single component, low-expanding polyurethane foam.

Part 3 Execution

3.1 EXAMINATION

.1 Examine the areas and conditions where building insulation is to be installed and identify any conditions detrimental to the proper and timely completion of the work.

.2 Do not proceed with the work until unsatisfactory conditions are corrected.

3.2 PREPARATION

.1 Clean substrates of substances harmful to insulation or vapour retarders, including removing projections capable of puncturing vapour retarders or interfering with insulation attachment.

.2 Clean all surfaces free of dirt, grime, grease, oil or other substances which would be detrimental to proper bond of adhesives.

3.3 INSTALLATION GENERAL

.1 Install insulation after building substrate materials are dry.

.2 Comply with insulation manufacturer's written instructions and recommendation applicable to products and application indicated.

.3 Install insulation in largest possible size to cover areas indicated on Drawings, closely butted together at sides, ends, and against walls, and structural members.

.4 Extend insulation to the full thickness shown over entire area to be insulated. Neatly cut and fit insulation tightly around obstructions, projections such as pipes, conduits, hangers and other elements, and fill voids with insulation. Remove debris in conflict with insulation installation.

.5 Fit insulation tight around and behind electrical boxes, plumbing and heating pipes and ducts.

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

.7 Do not install any insulation that becomes damaged during the course of installation or is no longer in a physical condition to function for the use intended and replace with new material.

.8 Exercise care to avoid damage and soiling of faces on insulation units which will remain exposed to view. Abut joints accurately with adjoining surfaces set flush.

.9 Attach insulation in a manner to ensure stability and eliminate sagging.

.10 Apply a single layer of insulation to the required thickness, unless a double layer is required, to make up the total thickness shown.

.11 Concealed layers of material must not have a vapour retarder facing.

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

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

3.4 INSTALLATION OF BATT INSULATION

.1 Install insulation in accordance with ASTM C1320.

.2 Install batts in cavities formed by framing members as follows:

.3 Use batt widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.

.4 Place batts in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

.5 For wood or metal-framed wall cavities where cavity heights exceed 2440 mm, provide mechanical support to batts.

3.5 INSTALLATION OF SPRAY APPLIED FOAM INSULATION

.1 Apply foam to fill irregular voids and cracks and to interface with building envelope, and around doors, windows, louvres and other openings in exterior walls.

.2 Apply foam in accordance with CAN/ULC S710.2 and the manufacturer's written instructions.

.3 Foam fill shim spaces around perimeter of openings for frames of doors and windows.

.4 Finished surface of foam to be free of voids and imbedded foreign objects. Maintain cured skin.

.5 Remove masking materials and over spray from adjacent areas immediately after foam surface has hardened.

3.6 INSTALLATION OF PERIMETER FOUNDATION INSULATION

.1 Interior application at grade walls: extend boards 1220 mm vertically below finished grade and as indicated, installed on inside face of perimeter foundation walls.

.2 Under slab application: extend boards from perimeter foundation wall at basement entrance on grade. Lay boards on level compacted fill.

.3 Install 50 mm insulation boards under concrete sidewalks and slabs at all building entrances and garage doors for a minimum of 1500 mm from face of building x width of slab plus 1220 mm and to extent indicated.

END OF SECTION

PART 1 - GENERAL

1.1 Related Sections

.1 Section 01 00 01 - Project Specific General Requirements.

.2 Section 01 00 02 - Standard General Requirements.

.3 Section 03 33 00 - Cast-in Place Concrete

.4 Section 06 10 00 – Rough Carpentry

1.2 References

.1 Canadian Urethane Foam Contractors' Association Inc. (CUFCA)

.2 Underwriters' Laboratories of Canada (ULC)
.1 CAN/ULC-S101-14, Fire Endurance Tests of Building Construction and Materials.
.2 CAN/ULC-S102-10, Surface Burning Characteristics of Building Materials and Assemblies.
.3 CAN/ULC-S705.1-15, Standard for Thermal Insulation Spray Applied Rigid Foam, Medium Density, Material Specification.
.4 CAN/ULC-S705.2-05, Standard for Thermal Insulation Spray Applied Rigid Foam, Medium Density, Installer's Responsibilities-Specification.

1.3 Test Reports

.1 Submit test reports, verifying qualities of insulation meet or exceed requirements of this specification, in accordance with Section 01 00 02 - Standard General Requirements.

.2 Submit test reports in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.

1.4 Quality Assurance

.1 Applicators to conform to CUFCA Quality Assurance Program.

1.5 Mock-up

.1 Construct mock-up in accordance with Section 01 00 02 - Standard General Requirements.

.2 Construct mock-up 10 m2 minimum, of spray in place urethane foam insulation including one inside corner and one outside corner, window and door frame. Mock-up may be part of finished work.

.3 Allow 24 hours for inspection of mock-up by Engineer - Architect before proceeding with waterproofing work.

1.6 AIR BARRIER SYSTEM TESTING REQUIREMENTS

.1 Conduct adhesion testing between the transition membranes and, sheathing,
masonry and other substrates for compliance in accordance with the manufacturer's guidelines for use in an air barrier application.

.2 Conduct adhesion testing between the polyurethane foam and transition membranes, sheathing, masonry and other substrates for compliance in accordance with the manufacturer's guidelines for use of SPF in an
air barrier application, and to CAN/ULC-S705.2

.3 Report non-compliant test results along with corrective action taken to the Department Representative and include in daily report.

1.7 Safety Requirements

.1 Protect workers as recommended by CAN/ULC-S705.2 and manufacturer's recommendations:
.1 Workers must wear respirators, eye protection, protective clothing, when applying foam insulation.
.2 Workers must not eat, drink or smoke while applying foam insulation.

1.8 Protection

.1 Ventilate area to receive insulation by introducing fresh air and exhausting air continuously during and 24 hour after application to maintain non-toxic, unpolluted, safe working conditions.

.2 Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area.

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

1.9 Waste Management and Disposal

.1 Separate and recycle waste materials in accordance with construction/demolition Waste Management Plan.

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

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

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

.5 Dispose of waste foam daily in location designated by Consultant and decontaminate empty drums in accordance with foam manufacturer's instructions CAN/ULC-S705.2.

.6 Divert metal drums from landfill to metal recycling facility as approved by Engineer - Architect and to CAN/ULC-S705.2.

1.10 Environmental Requirements

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

.2 Do not install insulation when ambient temperature is outside <-10°C to+40°C>.

.3 Occupancy: In accordance with CAN/ULC-S774, occupancy is only permitted following
delivery of minimum 0.3 air changes per hour for 24 hours following installation.

1.11 COORDINATION

.1 Coordinate with other work having a direct bearing on work of this section.

.2 Coordinate work to ensure timely placement of insulation within construction spaces.

PART 2 - PRODUCTS

2.1 Materials

.1 Polyurethane Foam: To CAN/ULC S705.1, including amendment 1 & 2, closed cell, spray-applied rigid cellular polyurethane foam air barrier and thermal insulation, medium density:

.1 Performance Requirements:

.1 Water Vapour Permeance ASTM E96: 42 ng/Pa-s-sq m (0.70 Perms).

.2 Flame Spread Classification CAN/ULC S102: Flame Spread < 500, Smoke Developed <500.

.3 Hot Surface Performance ASTM C411: Passed when exposed to 93 degC for 96 hours.

.4 Fungi Resistance ASTM C1338: No fungal growth after 28 day incubation.

.5 Long Term Thermal Resistance (LTTR): Conform to the following when tested to CAN/ULC S770.

.1 RSI 20.52 @ 89 mm

.2 Physical Properties:

.1 Density - 29 kg / m3.

.2 Thermal Resistance - 1.22/25mm RSI

.3 Flame spread - 335 Max.

.4 Compressive strength - 186 KPA

.5 Tensile strength - 241 KPA

.6 Open cell content - 8.0%

.7 Water absorption – 1.2% by volumnMax.

.3 Sustainable Requirements:

.1 Zero ozone depleting blowing agents.

.2 Minimum Recycled Content: EcoLogo certified; 5% by weight.

.3 Eco-efficiency, life cycle analysis approved by an independent third party

.2 Products:

.1 Spray-Applied Polyurethane Foam: to CAN/ULC S705.1, medium density, two-part polyurethane foam insulation; minimum LTTR of RSI 1.02mm/25mm when tested to CAN/ULC S770, 75 mm installed thickness unless noted otherwise.

.1 Acceptable Product: BASF Walltite, Demilec Heatlok, PFSI Polarfoam PF-7300, Icynene MD-C-200.

.2 Primer: As required by insulation manufacturer.

2.2 Equipment

.1 Comply with CAN/ULC S705.2 and the equipment manufacturer's recommendations For specific type of application

2.3 AIR BARRIER COMPONENTS

.1 Primers: As required by CAN/ULC S705.2, Annex A and to suit environmental conditions at time of application, use SOPRASEAL STICK PRIMER by SOPREMA, Aquabarrier Primer by IKO, Blueskin Adhesive by Henry or an approved equivalent.

.2 Sealant: Mastic, synthetic rubber compound required by manufacturer to suit environmental conditions at time of application:

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verify existing conditions before starting work.

.2 Verify work within construction spaces or crevices is complete prior to insulation application.

.3 Verify that surfaces are clean, dry, and free of matter that may inhibit adhesion.

3.2 PREPARATION

.1 Mask and protect adjacent surfaces from over spray or dusting.

.2 Apply primer in accordance with manufacturer's written instructions.

.3 Prime all metal and non-porous surfaces when required by polyurethane foam manufacturer's written instructions.

.4 Ensure that work by other trades that may penetrate through the air barrier system is in place and complete.

.5 Provide transition membranes as indicated prior to polyurethane foam application.

3.3 INSTALLATION

.1 Apply insulation to CAN/ULC-S705.2 and manufacturer's written instructions.

.2 Apply insulation by spray method, to a uniform monolithic density without voids, in lifts not exceeding 50 mm thickness in a single pass.

.3 Apply to a minimum cured thickness of 89 mm.

.4 Finished surface of foam to be free of voids and imbedded foreign objects.

.5 Remove masking materials and over spray from adjacent areas immediately after foam surface has hardened.

.6 Repair damaged areas in accordance with SPF manufacturer's application guidelines for insulation in an air barrier.

3.4 FIELD QUALITY CONTROL

.1 Conduct daily visual inspection, adhesion testing and density measurements as required by CAN/ULC S705.2 and the manufacturer's application guidelines for air barrier system

.2 Independent Testing Agency approved by manufacturer is mandatory to conduct visits to verify polyurethane application, foam thickness and density and the quality of the installation of the insulation air barrier system.

.3 Where adhesion strength of transition membrane is less than 103 kPa, mechanically fasten the transition membrane to substrate in accordance with manufacturer's application guidelines for air barrier system.

3.5 PROTECTION OF FINISHED WORK

.1 Do not permit subsequent construction work to disturb applied polyurethane foam.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Vapour retarder for roofs.

.2 Vapour retarder under concrete slabs.

.3 Miscellaneous membrane use for waterproofing transitions and vapour retarder continuity.

1.2 RELATED SECTIONS

.1 Section 31 35 00 - Excavating, Trenching and Backfilling.

.2 Section 06 10 00 – Rough Carpentry

.3 Section 07 21 00 – Building Insulation

.4 Section 07 46 46 – Mineral Fibre Cement Siding.

.5 Section 07 92 10 - Joint Sealing.

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.

1.4 SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Submit manufacturer's product data verifying conformance to requirements of this Section.

.3 Submit documentation from an approved independent testing laboratory certifying that the air leakage and vapour permeance rates of the air/vapour barrier membranes, including primary membrane and transition sheets, exceed the requirements of the National Building Code.

.4 Manufacturer's Instructions: Provide to indicate special handling criteria, installation details and sequence, and repair procedures.

1.5 MOCK-UPS

.1 Construct on site a mock-up in accordance with Section 01 45 00.

.2 Mock-up area shall be minimum 1 sq.m. and include components of the work, AVB membrane, sheathing and interfacing such as attachments, penetrations, openings and corners.

.3 Mock-up shall be reviewed by the Department Representative to verify conformance with the specification, workmanship and appearance.

.4 Mock-up shall be reviewed by Department Representative to determine adhesion characteristics of membrane to substrate.

.5 Mock-up may remain as part of the finished work.

.6 Mock-up shall form the standard of acceptance for the remaining work.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Handle rolls materials with care and proper equipment.

.2 Roll materials shall be carefully stored and adequately protected in accordance with the manufacturer's recommendations.

Part 2 Products

2.1 SHEET VAPOUR BARRIER

.1 Exterior wall Vapour barrier Polyethylene film: to CAN/CGSB-51.34, listed on CGSB Certification Program List, 0.15 mm (6 mil) thick, for use at all exterior walls and at locations indicated.

.2 Underslab vapour retarder: to ASTM E-1745-96 Class C , extruded, single ply, nominal 6 mil virgin polyolefin membrane.

.1 Acceptable Products: Vapour Block 6 as manufactured by Ravin Industries, Nominal 10 mil, Perminator Underslab vapour mat by Sealtight, Viper Vaporcheck II 10 mil. By Insulation Solutions Inc. or an approved equal.

2.2 ACCESSORIES

.1 Joint sealing tape: air resistant pressure sensitive adhesive tape, cloth fabric duct tape, type recommended by vapour barrier manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.

.2 Pipe Boot Kits: Raven or Sealtight VaporBoot System

.3 Polyolefin Sheet Vapour Barrier Sealant: detailing compound; as supplied by membrane manufacturer.

.4 Sealant: butyl, as specified in Section 07 92 10.

.5 Mastic: Rubberized asphalt based mastic to manufacturer's recommendation.

.6 Moulded box vapour barrier: factory-moulded polyethylene box for use with recessed electric switch and outlet device boxes.

3 Execution

3.1 PREPARATION

.1 Ensure services are installed and inspected prior to installation of barrier.

3.2 INSTALLATION

.1 Ensure services are installed and inspected prior to installation of retarder.

.2 Install sheet vapour retarder on warm side of exterior wall assemblies prior to installation of gypsum board to form continuous retarder.

.3 Use sheets of largest practical size to minimize joints.

.4 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.

3.3 EXTERIOR SURFACE OPENINGS

.1 Cut sheet vapour retarder to form openings and ensure material is lapped and sealed to frame.

3.4 PERIMETER SEALS

.1 Seal perimeter of sheet vapour barrier as follows:

.2 Apply continuous bead of sealant to substrate at perimeter of sheets.

.3 Lap sheet over sealant and press into sealant bead.

.4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.5 LAP JOINT SEALS

.1 Seal lap joints of sheet vapour barrier as follows:

.2 Attach first sheet to substrate.

.3 Apply continuous bead of sealant over solid backing at joint.

.4 Lap adjoining sheet minimum 150 mm and press into sealant bead.

.5 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.6 ELECTRICAL BOXES

.1 Seal electrical outlet device boxes that penetrate vapour barrier as follows:
.1 Install moulded box vapour barrier.
.2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

3.7 UNDERSLAB POLYOLEFIN VAPOUR BARRIER

.1 Installation shall be in accordance with manufacturer's instructions and ASTM E 1643-11.

.2 Unroll vapour barrier with the longest dimension parallel with the direction of the pour.

.3 Lap vapour barrier over footings and seal to foundation walls.

.4 Overlap joints 150 mm and seal with manufacturer's tape.

.5 Seal around mechanical and electrical services, support columns or other penetration with site fabricated pipe boot, alternatively; Provide manufacturer's premoulded pipe boot.

.6 Repair damaged areas by cutting patches of vapour barrier, overlapping damaged area 150 mm and taping four sides with tape.

3.8 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

.2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 07 92 10 - Joint Sealing.

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-19.13M, Sealing Compound, One Component, Elastomeric Chemical Curing.
  .2 CAN/CGSB-19.18M, Sealing Compound, One Component, Silicone Base Solvent Curing.
  .3 CAN/CGSB-19.24M, Multi-Component, Chemical Curing Sealing Compound.
  .4 CGSB 19-GP-14M, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.

.2 NBCC 2010; Part 5 - Environmental Separation

.3 Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification.

1.3 SUBMITTALS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  .1 Provide drawings of special joint conditions.

.2 Submit manufacturer=s product data sheets in accordance with Section 01 33 00 - Submittal Procedures.

.3 Submit manufacturer=s installation instructions in accordance with Section 01 33 00 - Submittal Procedures.

1.4 QUALITY ASSURANCE

.1 Perform Work in accordance with Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification requirements for materials and installation.

.2 Perform Work in accordance with National Air Barrier Association - Professional Contractor Quality Assurance Program and requirements for materials and installation.

.3 Perform Work in accordance with Canadian Urethane Foam Contractors Association - Professional Contractor Quality Assurance Program and requirements for materials and installation.

.4 Maintain one copy of documents on site.

1.5 QUALIFICATIONS

.1 Applicator: Company who is currently licensed by certifying organization must maintain their license throughout the duration of the project.

1.6 MOCK-UP

.1 Construct mock-up in accordance with Section 01 45 00 – Testing and Quality Control.

.2 Locate where directed.

.3 Mock-up may remain as part of the Work.

.4 Allow 24 h for inspection of mock-up by Department Representative before proceeding with air/vapour barrier Work.

1.7 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 manufacturers written instructions.

.3 Avoid spillage. Immediately notify Department Representativeif spillage occurs and start clean up procedures.

.4 Clean spills and leave area as it was prior to spill.

1.8 PROJECT ENVIRONMENTAL REQUIREMENTS

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

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.3 Maintain temperature and humidity recommended by materials manufacturers before, during and after installation.

1.9 SEQUENCING

.1 Sequence work to permit installation of materials in conjunction with related materials and seals.

1.10 WARRANTY

.1 Provide a three year warranty.

.2 Warranty: Include coverage of installed sealant and sheet materials which fail to achieve air tight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

Part 2 Products

2.1 SHEET MATERIALS

.1 Sheet Membrane Type 2: Self-adhering membrane consisting of a microporous film laminate, backed with a specially applied adhesive, which allows water vapour to permeate through while acting as a barrier to air and bulk water.
  .1 Membrane Physical Properties:
    .1 Application min 5 deg. C
    .2 Service temperature -40 to 70 deg. C
    .3 Elongation 65%
    .4 Tensile strength (Membrane) min 7.4 MPa
    .5 Puncture Resistance min 133 N
    .6 Water Vapour transmission 2115 ng/Pa.m².s
    .7 Moisture Absorption 0.1%
    .8 Air Leakage at 75 Pa 0.01L/ m²
    .9 Air Leakage of the 500 Pa 0.063 L/ m²
    .10 Standard of Acceptance: Blueskin VP160 by Bakor or approved alternate.

.5 Primer: Spray or roll applied rubber based primer for all wall surfaces applied at a rate of 3 to 6 m^2 per litre and to manufacturer's written recommendation. Primer to be P-3000 by Grace Construction products, Blueskin Primer by Bakor, or an approved equal.
  .1 For cold weather requirements use a solvent based primer as recommended by membrane manufacturer.

2.2 SEALANTS

.1 Sealants in accordance with Section 07 92 10 - Joint Sealing.

Part 3 Execution

3.1 EXAMINATION

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

.2 Ensure all surfaces are clean, dry, sound, smooth, continuous and comply with air barrier manufacturers requirements.

.3 Report any unsatisfactory conditions to the Department Representative in writing.

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

3.2 PREPARATION

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

.2 Ensure all substrates are clean of oil or excess dust.

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

.4 Ensure metal closures are free of sharp edges and burrs.

3.3 INSTALLATION

.1 Prime to Manufacturer's requirements all surfaces to receive AVB materials.

.2 AVB membrane to be carefully installed around openings in wall (windows, doors, etc.) to prevent air leakage.

.3 AVB membrane to be installed to create a continuous seal at all construction elements such as foundations, roofs and walls, and at junctures of different materials or construction types.

.4 Install materials in accordance with manufacturer's instructions.

.5 Install air barrier after sheathing is installed and before windows and doors are installed. Install lower level barrier prior to upper levels to ensure proper shingling of layers.

.6 Overlap air barriers at corners of building by a minimum of 300 mm.

.7 Overlap air barrier vertical seams by a minimum of 150 mm.

.8 Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

3.4 PROTECTION OF WORK

.1 Protect finished Work in accordance with Section 01 61 00 - Common Product Requirements.

.2 Do not permit adjacent work to damage work of this section.

.3 Ensure finished Work is protected from climatic conditions.

3.1 SELF-ADHERING MEMBRANE

.1 Install in accordance with manufacturer's written instructions.

.2 Prime surfaces and apply lap sealant as recommended by manufacturer. Where using glass-mat faced sheathing, multiple coats of primer will be required.

.3 Seal around penetrations through AB membrane using butyl sealant.

END OF SECTION

1 GENERAL

1.1 SECTION INCLUDES

.1 Mineral fibre cement exterior finish panels, shingles and siding, and associated trim.

1.2 RELATED SECTIONS

.1 Section 06 1000 - Rough Carpentry.

.2 Section 07 27 10 – Air Barriers.

.3 Section 07 92 10 – Joint Sealing.

.4 Section 09 91 13 – Exterior Painting.

1.3 REFERENCES

.1 ASTM A 526/A526M-85, Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.

.2 ASTM C 1186-08-(2012), Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets.

.3 Master Painters Institute (MPI).

1.4 SUBMITTALS

.1 Submit in accordance with Section 01 33 00

.2 Product Data: Manufacturer's data sheets on each product to be used, including:

.1 Preparation instructions and recommendations.

.2 Storage and handling requirements and recommendations.

.3 Installation methods, including nailing patterns.

.3 Selections Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

.4 Shop Drawings: Submit elevation and plan layouts showing joints in panels, siding and soffits. Indicate locations of battens and

other joint treatments.

1.5 QUALITY ASSURANCE

.1 Installer Qualifications: Provide installer with not less than five (5)years of documented experience with products similar to those specified.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Stack siding on edge or lay flat on a smooth, level surface. Protect edges and corners from chipping. Store under cover and keep dry prior to installing.

1.7 ENVIRONMENTAL AND SAFETY REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, cutting, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada.

1.8 WARRANTY

.1 Provide minimum 30 year limited warranty against manufacturing defects.

2 PRODUCTS

2.1 MATERIALS

.1 Mineral Fibre Cement Siding: Non-asbestos fibre-cement panels to comply with ASTM C1186 Grade II, Type A; factory primed.

.2 Trim (corner trim, window casing, starter strip, skirting): Mineral fibre cement, smooth finish, 25 mm thickness by width indicated; factory primed.

.3 Soffit - Venting: smooth, perforated venting, maximum size permissible to minimize joints, factory primed.

.4 Soffit - Non-venting: smooth panels, maximum size permissible to minimize joints, factory primed.

2.2 ACCESSORIES

.1 Wood Strapping: Pressure treated SPF species to Section 06 10 00; 25 mm thick x 50 mm wide, installed at 400 mm on centre and aligned with wall framing.

.2 Fasteners: Hot-dip galvanized or stainless steel, large diameter nail head, size recommended by manufacturer. Provide colour-matched fasteners for factory finished siding and panel products.

.3 Sealants: Two component polyurethane, colour-matched to siding, refer to Section 07 92 10.

.4 Metal flashings: Pre-finished galvanized steel sheet, commercial grade to ASTM A653M with Z275 zinc coating, 0.5 mm thick. Colour by Departmental Representative.

.5 Insect Screening: Galvanized insect screen, 16 mesh x 16 mesh cloth.

3 EXECUTION

3.1 INSTALLATION – WINDOW AND CORNER TRIM

.1 Verify that all windows, air barrier and flashings have been installed.

.2 Prime all cuts with latex primer prior to installation.

.3 Fasten through trim into wall framing in accordance with manufacturer's written instructions. Build-out as required to suit wall assembly and strapping installation.

.4 Place fasteners no closer than 19 mm and no further than 50 mm from side edge of trim board and no closer than 25 mm from end. Fasten maximum 406 mm o.c.

.5 Brake form metal flashings to profiles indicated and in accordance with siding manufacturer's written installation requirements, in maximum lengths.

.6 Prime all metal flashings prior to installation. Install to locations indicated.

.7 Trim inside corner with single board.

.8 Install single board of outside corner assembly then align second corner board to outside edge of first corner board. Do not fasten corner boards together.

.9 Allow 3 mm gap between trim and siding.

.10 Seal gap with caulk in accordance with Section 07 92 10.

.11 Field paint to Section 09 91 13.

3.2 INSTALLATION

.1 Verify that all windows, air barrier and flashings have been installed.

.2 Install minimum 6 mm thick starter strip at the bottom course of the wall.

.3 Apply siding products on vertical strapping in accordance with manufacturer's written instructions for rain screen installation. Ensure that strapping is secured through to wall framing.

.4 Install siding using blind nailing technique. Exposed fasteners only permitted at trim.

.5 Install siding with joints butted in moderate contact.

.6 Prime all cuts with latex primer prior to installation.

.7 Align vertical joints of the siding over framing members.

.8 Install battens at joints in vertical wall panels. Install false battens at interval spacing selected by Departmental Representative.

.9 Field paint to Section 09 91 13.

3.3 ACCESSORIES

.1 Install horizontal trim and accessories in continuous runs, in matching lengths, with

joints occurring over framing members. Face fasten with countersunk wood screws. Fill fasteners locations with exterior-use patching compound recommended by manufacturer.

.2 Install soffit panels. Install in strips to full width of soffit where soffit width is larger than panel size. Layout joints as indicated on approved Shop Drawings.

.3 Fabricate radius arched trim using smooth, factory-primed 11 mm thickness mineral fibre cement panel to shapes indicated.

.4 Field paint to Section 09 91 13.

END OF SECTION

1 GENERAL

1.01 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 07 46 46 – Mineral Fibre Cement Siding.

.3 Section 07 62 00 - Sheet Metal Flashing and Trim.

.4 Section 07 92 10 - Joint Sealing.

1.01 REFERENCES

.1 Aluminum Association (AA)
- .1 Aluminum Association Designation System for Aluminum Finishes- Latest Edition.
- .2 Aluminum Association Aluminum Sheet Metal Work in Building Construction- Latest Edition.

.2 American Society for Testing and Materials (ASTM)
- .1 ASTM A 653/A 653M-15e1, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM D 523-14, Test Method for Specular Gloss.
- .3 ASTM D 822/D822M-13, Practice for Conducting Tests on Paint and Related Coatings and Materials Using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.
- .2 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.

.4 Canadian Standards Association (CSA)
- .1 CSA A123.3-05(R2015), Asphalt or Tar Saturated Roofing Felt.

1.02 SUBMITTALS

.1 Submit proof of manufacturer's CCMC Listing and listing number to Department Representative.

1.03 PRODUCT DATA

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

.2 Submit product data sheets for bitumen, and roofing felts. Include:
.1 Product characteristics.
.2 Performance criteria.
.3 Limitations.

1.04 SHOP DRAWINGS

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

.2 Indicate arrangements of sheets and joints, types and locations of fasteners and special shapes and relationship of panels to structural frame.

1.05 SAMPLES

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

.2 Submit duplicate 300mm x 300mm samples of each sheet metal material.

2 PRODUCTS

2.01 PREFINISHED STEEL SHEET

.1 Metal Roofing: Roofing steel sheet: 0.79mm base metal thickness.
.2 Roof panel support system: Clips to be fabricated from 1.27mm. galvanized steel to Z275 coating. Roof fasteners to resist wind loads to NBC 2010.
.3 Acceptable manufacturer:
.1 Tradition 100 by VicWest, Agway or an approved alternate.

.2 VOC content for surface coatings and touch up coatings for prefinished metal sheet maximum 250 g/L.

.3 Surface coatings and touch up coatings manufactured or formulated without aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavelant chromium and their compounds will be acceptable for use

on this project.

.4 Prefinished steel with factory applied, 4 coat metallic series finish.
.1 Class F1S.
.2 Colour to be selected by Departmental Representative.
.3 Specular gloss: 30 units +/-5 in accordance with ASTM D 523.
.4 Coating thickness: not less than 22 micrometres.
.5 Resistance to accelerated weathering for chalk rating of 8, 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.

2.02 ACCESSORIES

.1 Isolation coating: alkali resistant bituminous paint.

.2 Plastic cement: to CAN/CGSB-37.5.

.3 Ice and Water Shield Membrane: High Temperatured Modified Bitumen roll roofing with self-adhesive backing, 1 mm thickness, weight installed 1.45 kg/mý, as manufactured by Soprema, W.R. Meadows, Bakor, or an approved alternate.

.4 Sealant: Refer to Section 07 92 10.

.5 Rubber-asphalt sealing compound: to CAN/CGSB-37.29.

.6 Cleats: of same material, and temper as sheet metal, minimum 50mm wide. Thickness same as sheet metal being secured.

.7 Fasteners: concealed.

.8 Washers: of same material as sheet metal, 1mm thick with rubber packings.

.9 Touch-up paint: as recommended by sheet metal roofing manufacturer.

.10 Snow guards Type 1: Snow guards to be aluminum brackets and tubes with end of row pins, c/w #14 Stainless Steel tapping screws with S.S.

and neoprene washer.

.1 Acceptable product: Snostop snow retention system as manufactured by Roofers World Inc., S-5 retention system X -Gard or approved alternated.

.11 Ridge Vent: Nylon ridge vent complete with weather and insect infiltration protection.

.12 Sloped Roof Stack Jack Flashings: 1.6mm aluminum, size to suit to CSA B272-93, with EPDM triple pressure grommet seal and EPDM base seal.

.1 Acceptable Product: Slope roof jack stack flashing model SJ-45 as manufactured by Thaler Metal Industries.

2.03 FABRICATION

.1 Fabricate aluminum sheet metal in accordance with Aluminum Association "Aluminum Sheet Metal Work in Building Construction".

.2 Form individual pieces in 2400mm maximum lengths. Make allowances for expansion at joints.

.3 Hem exposed edges on underside 12mm, miter and seal.

.4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.5 Apply minimum 0.8mm dry film thickness coat of plastic cement to both faces of dissimilar metals in contact.

.6 Protect metals against oxidization by backpainting with isolation coating where indicated.

3 EXECUTION

3.01 INSTALLATION

.1 Use concealed fastenings except where approved by Department Representative before installation.

.2 Provide membrane under sheet metal roofing lap all joints a minimum of 150mm.

.3 Secure cleats with two fasteners each and cover with cleat tabs.

.4 Align transverse seams in adjacent panels.

.5 Flash roof penetrations with material matching roof panels, and make watertight.

.6 Form seams in direction of water-flow and make watertight.

3.02 ROOFING

.1 Apply sheet metal roofing beginning at eaves. Loose lock pans to valley flashing and edge strips at eaves and gable rakes.

.2 Finish seams as per manufacturers recommendations 25mm high on flat surfaces. Bend up one side edge 38mm and other 44mm. Make first fold 6mm wide single fold and second fold 12mm wide, providing locked portion of standing seam with 5 plies in thickness. Fold lower ends of seams at eaves over at 45°angle. Terminate standing seams at ridge and hips by turning down in tapered fold.

.3 Install snow guards are per manufacturer's layout/instructions. Ensure guards are fastened into appropriate backing as required by manufacturer.

3.03 CLEANING

.1 Clean to Department Representative's approval, soiled surfaces, spatters, and damage caused by work of this section.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

.1 07 61 00 – Sheet Metal Roofing.

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
- .1 ASTM A 653/A 653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM A 792/A 792M-10 (2015), Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- .3 ASTM D 523-14, Standard Test Method for Specular Gloss.

.2 Canadian Roofing Contractors Association (CRCA)
- .1 Roofing Specifications Manual latest edition.

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.

.4 Canadian Standards Association (CSA International)
- .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

1.3 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. - Health and Safety Requirements.

.3 Shop Drawings:
.1 Shop drawings: Submit shop drawings in accordance with section 01 33 00 - Submittal Procedures.

.4 Samples:
.1 Submit 50mm x 50mm samples of each type of sheet metal material, finishes and colours.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials to prevent damage to the flashing. Scope bundles to ensure drainage.

.2 Waste Management and Disposal:
.1 Separate waste materials for recycling.

2 PRODUCTS

2.1 SHEET METAL MATERIALS

.1 Zinc coated steel sheet: 0.61mm thickness, commercial quality to ASTM A 653/A 653M, with Z275 designation zinc coating.

.2 Soffit prefinished sheets to be perforated.

2.2 PREFINISHED STEEL SHEET

.1 Prefinished steel with factory applied 4 coat PVDF metallic paint finish.
.1 Class F1S.
.2 Colour to match cladding /roofing.
.3 Specular gloss: 30 units +/- 5 in accordance with ASTM D 523.

2.3 FABRICATION

.1 Form pieces in 2400 mm maximum lengths.
.1 Make allowance for expansion at joints.

.2 Hem exposed edges on underside 12mm.
.1 Mitre and seal corners with sealant.

.3 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.4 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

2.4 METAL FLASHINGS

.1 Form flashings, copings and fascias and soffits to profiles indicated of 0.61mm thick prefinished sheet steel.

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 Use concealed fastenings except where approved before installation.

.2 Provide underlay under sheet metal.
.1 Secure in place and lap joints 100mm.

.3 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs.
.1 Flash joints using S-lock forming tight fit over hook strips.

.4 Lock end joints and caulk with sealant.

3.3 CLEANING

.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Leave work areas clean, free from grease, finger marks and stains.

END OF SECTION

1 GENERAL

1.01 SECTION INCLUDES

.1 Brake-formed gutters of steel sheet.

.2 Tubular sheet steel downspouts.

1.02 RELATED SECTIONS

.1 Section 07 92 10 - Joint Sealing.

1.03 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

1.04 SUBMITTALS

.1 Section 01 33 00- Submittal Procedures.

.2 Shop Drawings: Indicate material profile, jointing details, fastening methods, and installation details.

.3 Submit two samples 50mm x 50mm in size illustrating metal finish colour.

.4 Submit cross sectional samples, 150mm in length, for each component of this Section.

1.05 QUALIFICATIONS

.1 Fabricator and Installer: Company specializing in sheet metal flashing work with 5 years documented experience.

1.06 DELIVERY, STORAGE AND HANDLING

.1 Stack preformed material to prevent twisting, bending, or abrasion, and to provide ventilation.

.2 Prevent contact with materials which may cause discolouration or staining.

2 PRODUCTS

2.01 SHEET MATERIALS

.1 Prepainted Galvanized Steel Sheet: ASTM A653/A653M, 0.79mm zinc coated galvanized steel sheet. Colour selected by Department Representative from unrestricted range.

2.02 ACCESSORIES

.1 Fasteners: Finish exposed fasteners same as flashing metal. Permitted only on approval of Departmental Representative.

.2 Ferrules: Length to suit gutters width, tubular aluminum or galvanized steel with self-drilling screw fasteners, purpose-made to maintain gutters alignment and width when loaded.

.3 Straps and Cleats: of same material, thickness and temper as sheet metal being secured, minimum 50mm wide.

.4 Exposed Sealant: as specified in Section 07 92 10; colour to match sheet metal finish.

.5 Stainers: Galvanized wire strainers to suit downspout diameter. Install at all gutter outlets.

.6 Downspout connection to hard surface with stainless steel boot.

2.03 FABRICATION

.1 Form gutter sections true to shape, accurate in size, square, and free from distortion or defects.

.2 Fabricate downspouts to follow lines of building. Provide diverted water outlet as indicated.

.3 Fabricate straps and cleats of same material as sheet, minimum 50mm wide.

.4 Form pieces in longest possible lengths and seamless where permissible.

.5 Hem exposed edges on underside 12mm; mitre and seam corners.

3 EXECUTION

3.01 INSTALLATION

.1 Secure gutters and downspouts to locations indicated. Use exposed fasteners only where permitted.

.2 Coordinate installation with waterproofing of roofing assembly.

.3 Coordinate blocking requirements with erection of wall and parapet assemblies.

.4 Seal metal joints watertight.

END OF SECTION

1 GENERAL

1.01 RELATED WORK

.1 Fire stopping and smoke seals within mechanical assemblies (i.e inside ducts, dampers) and electrical assemblies (i.e. inside cable trays) are specified in Mechanical and electrical sections 15 and 16 respectively.

1.02 DESCRIPTION

.1 Work under this section, includes furnishing and installation only those through penetration fire and smoke seals for openings in floors, walls, and other elements of construction that are in accordance with ULC-S115. All penetrations made by Divisions 2 to 44 are to be completed under this section. All openings in firewalls/smoke stops are to be completed under this section by same contractor.

1.03 REFERENCES

.1 Underwriter's Laboratories of Canada (ULC)
.1 ULC-S115, Fire Tests of Firestop Systems.

1.04 SAMPLES

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

1.05 SHOP DRAWINGS

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

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

1.06 PRODUCT DATA

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

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

1.07 QUALITY ASSURANCE

.1 Performance: Materials shall have been tested to provide a fire resistance rating equal to or surpassing that required by the design document.

.2 A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

.3 For those firestop applications that exist for which no ULC or cUL tested system is available through a manufacturer, a manufacturer's engineering judgment derived from similar ULC or cUL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgement drawings must follow requirements set forth by the International Firestop Council (September 7, 1994, as may be amended from time to time).

.4 Applicator Qualifications:
.1 Two years experience installing UL or ULC classified fire stop systems or industry equivalent.

2 PRODUCTS

2.01 GENERAL

.1 Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

.2 Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

.3 Acceptable Material:
.1 Hilti (Canada) Limited (Indicated Below).
.2 A/D Fire Protection Systems Inc.
.3 Johns Manville
.4 3M Canada
.5 Alternative Materials: Approved by addendum in accordance with Instructions to Bidders.
.6 Manufacturer used shall provide a written schedule indicating specific areas products

will be used, as indicated below.

2.02 MATERIALS

.1 Fire stopping and smoke seal systems: in accordance with ULC-S115.
.1 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of ULC-S115 and not to exceed opening sizes for which they are intended.
.2 Provide materials classified by a qualified third party test facility tested in a system to provide fire resistance equal to at least the rating of construction assembly being penetrated, or as dictated by the local code authority.

.2 Cast-in-place firestop devices for use with non-combustible and combustible plastic pipe (closed and open piping systems) penetrating concrete floors, the following products are acceptable:
.1 "CP 680" Cast-In Place Firestop Device.

.3 Sealants or caulking materials for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:
.1 2. "FS 604" Self Leveling Firestop Sealant.

.4 Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:
.1 1. "CP 601s" Elastomeric Firestop Sealant.

.5 Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:
.1 "CP 601s" Elastomeric Firestop Sealant

.6 Intumescent sealants or caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:
.1 "FS-ONE" Intumescent Firestop Sealant

.7 Intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:
.1 "FS-ONE" Intumescent Firestop Sealant

.8 Non curing, re-penetrable intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:
.1 "CP 618" Firestop Putty Stick.

.9 Wall opening protective materials for use with U.L.C. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:
.1 "CP 617" Firestop Putty Pad.

.10 Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:
.1 "CP 642" Firestop Collar.

.11 Materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
.1 Hilti FS 635 Trowelable Firestop Compound.

.12 Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
.1 "FS 657" FIRE BLOCK.

.13 Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable: .l "CP 601s" Elastomeric Firestop Sealant.

.14 For non-combustible pipes, tubing, ducts, optical fibre cables, electrical wires and cables, totally enclosed non-combustible raceways, electrical outlet boxes and similar building services that penetrate through a Fire Separation provide a firestop system with a "F" Rating as determined by ULC or cUL.

.15 For penetrations through a Fire Wall or through a horizontal Fire Separation between a major occupancy area, provide a firestop system with a "FT" Rating as determined by ULC or cUL which is equal to the fire resistance rating of the construction being penetrated.

.16 For joints provide a firestop system with an Assembly Rating as determined by ULC-S115, ULC-S115 or UL 2079 which is equal to the fire resistance rating of the construction being penetrated.

.17 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.

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

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

.20 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

.21 Sealants for vertical joints: non-sagging.

3 EXECUTION

3.01 PREPARATION

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

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

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

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

3.02 INSTALLATION

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

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

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

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

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

3.03 INSPECTION

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

.2 Install a warning card that is clearly visible adjacent to all large and medium openings that may

be re-penetrated. This card should contain the following information:

.1 Warning that the opening has been fire stop protected.
.2 Indicate the fire stop system used (ULC or cUL).
.3 F rating or FT rating.
.4 Fire stop product(s) used.
.5 Person to contact and phone number in case of modification or new penetration of fire stop system.

3.04 SCHEDULE

.1 Firestop and smoke seal at:
.1 Penetrations through fire-resistance rated concrete, and gypsum board partitions and walls.
.2 Top of fire-resistance rated gypsum board partitions.
.3 Intersection of fire-resistance rated gypsum board partitions.
.4 Control and sway joints in fire-resistance rated gypsum board partitions and walls.
.5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
.6 Openings and sleeves installed for future use through fire separations.
.7 Around mechanical and electrical assemblies penetrating fire separations.
.8 Rigid ducts: greater than 129 cm^2: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

3.05 CLEAN UP

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

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

END OF SECTION

1 GENERAL

1.01 SECTION INCLUDES

.1 Materials, preparation and application for caulking and sealants.

.2 Text to complete other various Sections containing sealant or caulking specifications, including Section 07 52 00 - Modified Bituminous Membrane Roofing.

1.02 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 06 20 00 - Finish Carpentry.

.3 Section 07 46 46 – Mineral Fibre Cement Siding.

.4 Section 08 11 14 - Metal Doors & Frames.

.5 Section 08 50 00 - Windows.

1.03 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)
  .1 ASTM C 919-12, Standard Practice for Use of Sealants in Acoustical Applications.

.2 Canadian General Standards Board (CGSB)
  .1 CGSB 19-GP-5M, 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).

.5 Transport Canada (TC)
.1 Transportation of Dangerous Goods Act(TDGA).

1.04 SUBMITTALS

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

.2 Manufacturer's product to describe.
.1 Caulking compound.
.2 Primers.
.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

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

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

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

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

1.05 QUALITY ASSURANCE/ MOCK-UP

.1 Construct mock-up to show location, size, shape and depth of joint (s) complete with back-up material, primer, caulking and sealant.

.2 Mock-up will be used:
.1 To judge workmanship, substrate preparation, operation of equipment and material application.

.3 Locate where directed.

.4 Allow 24 hours for inspection of mock-up by Department Representative before proceeding with sealant work.

.5 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-up may remain as part of

1.06 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.

1.07 PROJECT CONDITIONS

.1 Environmental Limitations:
.1 Do not proceed with installation of joint sealants under following conditions:
.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.
.2 When joint substrates are wet.

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

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

1.08 ENVIRONMENTAL REQUIREMENTS

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

.2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate

moisture content for application and curing of sealants including special conditions governing use.

.3 Ventilate area of work as directed by Department Representative by use of approved portable supply and exhaust fans.

2 PRODUCTS

2.01 SEALANT MATERIALS

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

.2 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize offgas time.

.3 Where sealants are qualified with primers use only these primers.

2.02 SEALANT MATERIAL DESIGNATIONS

.1 Sealants for exterior joints: Epxidized Polyurethane joint sealant conforming to CAN/CGSB-19.24.

.1 Acceptable materials:

.1 "Dymeric" as manufactured by Tremco (Canada) Ltd.

.2 "Sikaflex 2C NS/Sl: as manufactureed by Sika Construction.

.3 "NP 2" as manufactured by Sonneborn, or an approved alternate.

.2 Sealant for interior vertical joints Single Component, Non-Sag Polyurethane Sealant with plus or minus 25 percent movement capability for interior vertical joints; ASTM C 920, Type S, Grade NS, Class 25, uses NT, M, A, O.

.1 Acceptable material:

.1 Sonnolastic NP1

.2 Tremco Dymonic

.3 Sikaflex 1a

.4 or approved equal

.3 Sealant to be used in floor joints: traffic grade, chemically curing polyurethane sealant.
.1 Acceptable materials:
.1 "THC-900" as manufactured by Tremco.
.2 "Loadflex" as manufactured by Sika Construction, or an approved alternate.

.4 Colour of sealant: selected by the Department Representative.

.5 Preformed Compressible and Non-Compressible back-up materials.
.1 Polyethylene, Urethane, Neoprene or Vinyl Foam.
.1 Extruded closed cell foam backer rod.
.2 Size: oversize 30 to 50%.
.2 Neoprene or Butyl Rubber.
.1 Round solid rod, Shore A hardness 70.
.3 High Density Foam.
.1 Extruded closed cell-polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m3 density, or neoprene foam backer, size as recommended by manufacturer.
.4 Bond Breaker Tape.
.1 Polyethylene bond breaker tape which will not bond to sealant.

2.03 JOINT CLEANER

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

.2 Primer: as recommended by manufacturer.

3 EXECUTION

3.01 PROTECTION

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

3.02 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 Remove dust, paint and other foreign matter. Dry joint surfaces.

.4 Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.

.5 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.6 Ensure joint surfaces are dry and frost free.

.7 Prepare surfaces in accordance with manufacturer's directions.

3.03 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.

3.04 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.

3.05 MIXING

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.06 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 Apply sealant to joints between window and door frames to adjacent building components, around perimeter of every external opening, to control joints in concrete slabs and where indicated.

.3 Apply sealant to joints around plumbing fixtures, and adjacent material.

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

.5 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