

Part 1 General

1.1 SECTION INCLUDES

- .1 Materials and installation for asphalt for use as dampproofing.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .3 Section 01 61 00 - Common Product Requirements.

1.3 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-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
 - .5 CGSB 37-GP-12Ma-84, Application of Unfilled Cutback Asphalt for Dampproofing.
 - .6 CGSB 37-GP-15M-76(R1984), Application of Asphalt Primer for Asphalt Roofing, Dampproofing and Waterproofing.
 - .7 CAN/CGSB 37.28-M89, Reinforced Mineral Colloid Type, Emulsified Asphalt for Roof Coatings and for Waterproofing.
 - .8 CGSB 37-GP-36M-76, Application of Filled Cutback Asphalts for Dampproofing and Waterproofing.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA A123.4-98, 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)

1.4 PRODUCT DATA

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures .
- .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 61 33 - Hazardous Materials.

- .3 Submit product data sheets for bituminous dampproofing products. Including:
 - .1 Product characteristics.
 - .2 Performance criteria.
 - .3 Application methods.
 - .4 Limitations.
- .4 Manufacturer's Instructions: Provide to indicate special handling criteria, installation sequence and cleaning procedures.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .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.

1.6 PROJECT/SITE ENVIRONMENTAL REQUIREMENTS

- .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 Elastomeric Waterproofing Membrane for Green "Concrete":
 - .1 For application and curing at temperatures above 5 degrees C: to CAN/CGSB-37.2.
 - .1 Acceptable materials: Henry AquaBloc, OR Tremco Tremproof 250 GC.
- .2 Transition Reinforcement.
 - .1 Acceptable materials: Non-woven polyester fabric mat.

Part 3 Execution

3.1 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.

3.2 APPLICATION

- .1 Do dampproofing in accordance with CAN/CGSB-37.3 CGSB 37-GP-12Ma.
- .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 where recommended by membrane manufacturer.
- .5 Apply dampproofing in accordance with applicable CGSB application standard.

Material		Application
CAN/CGSB-37.2	use	CAN/CGSB-37.3
CAN/CGSB-37.16	use	CGSB 37-GP-36M

3.3 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 continuous, uniform coating to exterior side of foundation walls enclosing rooms below finished grade. Include exterior portion of interior walls where floors in adjacent rooms are at different elevations.
- .3 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 01 33 00 - Submittal Procedures.
- .2 Section 01 74 11 - Cleaning.
- .3 Section 07 26 00 - Vapor Retarders.

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB).
 - .1 CGSB 71-GP-24M-77(R1983), Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.
- .2 Underwriters Laboratories of Canada (ULC).
 - .1 CAN/ULC-S701-01, Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
- .3 Environmental Choice Program (EPC).
 - .1 CCD-016-97, Thermal Insulation.

1.3 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's insulation products and adhesives.
- .2 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.

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 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 11 - Cleaning.

Part 2 Products

2.1 RIGID INSULATION PRODUCTS

- .1 Extruded polystyrene (XPS) for casting to concrete walls: to CAN/ULC-S701.
 - .1 Type: 4.
 - .2 Compressive strength: 25 PSI.
 - .3 Thickness: as indicated.
 - .4 Edges: shiplapped.
 - .5 Acceptable product:
 - .1 Dow Styrofoam CavityMate.
- .2 Rigid insulation for below grade: Extruded Polystyrene (XPS) Insulation to CAN/ULC-S701
 - .1 Type: 4 (for Underslab and Foundation Walls).
 - .2 Compressive Strength: 30 psi.
 - .3 Thickness: as indicated on drawings.
 - .4 Edges: shiplapped.
 - .5 Acceptable product:
 - .1 Dow Styrofoam SM.
 - .2 Owens Corning Foamular C-300.
- .3 Rigid Insulation for below grade: Expanded Polystyrene (EPS) Insulation to CAN/ULC-S701
 - .1 Type 2 (for Underslab and Foundation Walls)
 - .2 Thickness: as indicated.
 - .3 Size: 24" x 96"
 - .4 Edges: Square and shiplapped.
 - .5 Acceptable Product:
 - .1 Truefoam Foundation Plus or approved equal.

2.2 ADHESIVE

- .1 Adhesive (for polystyrene): to CGSB 71-GP-24 resistant to freezing.
 - .1 Type: 2.
 - .2 Class: C.
 - .3 VOC emission: 0.

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 WORKMANSHIP

- .1 Install insulation after building substrate materials are dry.

- .2 Install insulation to maintain continuity of thermal protection to building elements and spaces.
- .3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.
- .4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, 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 Offset both vertical and horizontal joints in multiple layer applications.
- .7 Do not enclose insulation until it has been inspected and approved by Consultant.

3.3 EXAMINATION

- .1 Examine substrates and immediately inform Consultant in writing of defects.
- .2 Prior to commencement of work ensure:
 - .1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

3.4 RIGID INSULATION INSTALLATION

- .1 Apply Type 2 adhesive to polystyrene in accordance with manufacturer's recommendations.
- .2 Imbed insulation boards into vapour barrier type adhesive prior to skinning of adhesive.
- .3 Leave insulation board joints unbonded over line of expansion and control joints. Bond a continuous 150 mm wide 0.15 mm modified bituminous membrane over expansion and control joints using compatible adhesive and primer before application of insulation.

3.5 FOUNDATION INSULATION

- .1 Foundation walls: as indicated.
- .2 Under slab application: Lay boards on level compacted fill. Extent as indicated.

3.6 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 01 33 00 - Submittal Procedures.
- .2 Section 01 74 11 - Cleaning.
- .3 Section 07 26 00 - Vapor Retarders.
- .4 Division 15: Insulation for mechanical work.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM C553-02, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.
- .2 Environmental Choice Program (EPC).
 - .1 CCD-016-97, Thermal Insulation.
- .3 Underwriters Laboratories of Canada (ULC).
 - .1 CAN/ULC-S702-1997, Standard for Mineral Fibre Insulation.

1.3 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.

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.
- .3 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials.

Part 2 Products

2.1 INSULATION

- .1 Semi-rigid mineral fibre wool blanket: to ASTM C553-02.
 - .1 Type: 1.
 - .2 Thickness: 3".
 - .3 SCS certified recycled content, formaldehyde free.
 - .1 Acceptable Products: CertainTeed Thermafibre, Roxul Plus MB.

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 INSULATION INSTALLATION

- .1 Install insulation to maintain continuity of thermal protection to building elements and spaces.
- .2 Do not compress insulation to fit into spaces.
- .3 Do not enclose insulation until it has been inspected and approved by Consultant.
- .4 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.
- .5 Attach insulation in a manner to ensure stability and eliminate sagging. Install insulation retention clips or furring as required to prevent sagging.

3.3 CLEANING

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

END OF SECTION

Part 1 General

1.1 REFERENCES

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

Part 2 Products

2.1 SHEET VAPOUR BARRIER

- .1 Polyethylene film: to CAN/CGSB-51.34, 0.15 mm thick.
- .2 Underslab Vapour Barrier: Polyolefin-based, reinforced, 10 mm
 - .1 Standard of Acceptance: Perminator by W.R. Meadows or approved equal.

2.2 ACCESSORIES

- .1 Joint sealing tape: air resistant pressure sensitive adhesive tape, type recommended by vapour barrier manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.
- .2 Sealant: To Section 07 92 10 - Joint Sealers.
- .3 Staples: minimum 6 mm leg.

Part 3 Execution

3.1 INSTALLATION

- .1 Ensure services are installed and inspected prior to installation of retarder.
- .2 Install sheet vapour retarder on warm side of exterior wall at the ventilation areas located at the South side of the green house extension prior to installation of the interior aluminum composite panel wall finish to form continuous retarder.
- .3 Use sheets of largest practical size to minimize joints.
- .4 Tape to air barrier at louvre-related rough openings, to the galv-steel sills and to the underside of the roof panels.
- .5 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.
- .6 Install underslab vapour barrier as per manufacturer's instructions.

3.2 EXTERIOR SURFACE OPENINGS

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

3.3 PERIMETER SEALS

- .1 Seal perimeter of sheet vapour barrier as follows:
 - .1 Apply continuous bead of sealant to substrate at perimeter of sheets.
 - .2 Lap sheet over sealant and press into sealant bead.
 - .3 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.4 LAP JOINT SEALS

- .1 Seal lap joints of sheet vapour barrier as follows:
 - .1 Attach first sheet to substrate.
 - .2 Apply continuous bead of sealant over solid backing at joint.
 - .3 Lap adjoining sheet minimum 150 mm and press into sealant bead.
 - .4 Install staples through lapped sheets at sealant bead into wood substrate.
 - .5 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Materials and installation methods providing primary air/vapour barrier materials and assemblies.
- .2 Air/vapour barrier materials to provide continuous seal between components of building envelope and building penetrations.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 61 00 – Common Product Requirements.
- .3 Section 07 92 10 - Joint Sealers.

1.3 REFERENCES

- .1 NBCC 1995; Part 5 - Environmental Separation
- .2 Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification.
- .3 ASTM E 2357/E 21 78: Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.

1.4 SUBMITTALS

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

1.5 QUALITY ASSURANCE

- .1 Perform Work in accordance with Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification requirements for materials and installation.
- .2 Maintain one copy of documents on site.

1.6 QUALIFICATIONS

- .1 Applicator: Company specializing in performing work of this section with minimum 3 years documented experience with installation of air/vapour barrier systems.

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 manufacturer's written instructions.

1.8 SEQUENCING

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

Part 2 Products

2.1 MEMBRANES

- .1 **Poly Olefin Self-Adhesive Water-Resistive Air Barrier Membrane:**
 - Standard of Acceptance:
 - Field Membrane: Blueskin VP160, Vaposhield WrapShield SA System, or Sopraseal Stick VP.

2.2 PREPARATION

- .1 All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants. Fill spalled or pitted areas in substrate to provide an even plane.
- .2 Joints wider than 6 mm between panels of rigid insulation are not permitted.

2.3 PRIMER FOR TRANSITION AND THROUGH-WALL FLASHING MEMBRANE (SELF-ADHERING TYPE ONLY)

- .1 Apply primer for self-adhering membranes at rate recommended by manufacturer.
- .2 Apply primer to all areas to receive transition sheet and or through-wall flashing membrane as indicated in drawings by roller or spray and allow minimum 30 minute open time. Primed surfaces not covered by transition membrane or through-wall flashing membrane during the same working day must be re-primed.

2.4 POLYOLEFIN AIR BARRIER MEMBRANE (SELF-ADHERING TYPE)

- .1 Align and position self-adhering air barrier, remove protective film and press firmly into place. Ensure minimum 50 mm overlap at all end and side laps.
- .2 Tie-in to rough openings for louvres.
- .3 Promptly roll all laps and membrane with a counter top roller to effect seal.
- .4 Ensure all preparatory work is complete prior to applying Air-Barrier.

2.5 INSPECTION

- .1 Notify consultant when sections of work are complete so as to allow for review prior to installing insulation.

2.6 PROTECTION OF FINISHED WORK

- .1 Air Barrier membranes are not designed for permanent exposure. Good practice calls for covering as soon as possible.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify that surfaces and conditions are ready to accept the Work of this section.
- .2 Ensure all surfaces are clean, dry, sound, smooth, continuous and comply with air barrier manufacturer=s requirements.
- .3 Report any unsatisfactory conditions to the Consultant in writing.
- .4 Do not start work until deficiencies have been corrected. Commencement of Work implies acceptance of conditions.

3.2 PREPARATION

- .1 Remove loose or foreign matter which might impair adhesion of materials.
- .2 Ensure all substrates are clean of oil or excess dust; all masonry joints struck flush, and open joints filled; and all concrete surfaces free of large voids, spalled areas or sharp protrusions.
- .3 Ensure all substrates are free of surface moisture prior to application of self-adhesive membrane and primer.
- .4 Ensure metal closures are free of sharp edges and burrs.
- .5 Prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.

3.3 INSTALLATION

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

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.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .3 Section 05 50 00 - Metal Fabrications.
- .4 Section 07 92 10 – Joint Sealers.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM A653/A653M-[02a], Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA S136-[01], North American Specification for the Design of Cold-Formed Steel Structural Members.
 - .2 CSA S136.1-[01], Commentary on North American Specification for the Design of Cold-Formed Steel Structural Members.
- .3 Environmental Choice Program (ECP)
 - .1 CCD-016-[97], Thermal Insulation.
 - .2 CCD-046[95], Adhesives.
 - .3 CCD-046-[95], Sealants and Caulking Compounds.

1.3 SYSTEM DESCRIPTION

- .1 Description
 - .1 Steel faced factory insulated roof panels forming the exterior roof cladding above the ventilation areas at the South end of the Greenhouse expansion. System to be complete w/ colour matched flashings; trims, fastenings and closures.

1.4 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Indicate dimensions, details, materials and finish, anchor details, compliance with design criteria and requirements of related work.
- .3 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

- .2 Submit one sample of roof panel, representative of materials, finishes and colours.

.4 **Manufacturer's Instructions:**

- .1 Submit manufacturer's installation instructions.

.5 **Manufacturers' Field Reports:** Submit copies of manufacturers field reports.

1.5 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.

- .3 **Pre-installation Meetings:** Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

- .4 **Warranty:** Manufacturer shall warrant the panels as free from defects in material and workmanship for 2 years from the date of production. Paint finishes to be warranted for 30 years.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.

Part 2 Products

2.1 MATERIALS

- .1 **Sheet steel:** cladding, structural quality, 26 ga G90 galvanized or A250 Galvanume Steel coated with 30 year 70% PUDF exterior finish with a total dryfilm thickness of 1.0 mil including primer. Exterior colour to be selected by Architect from manufacturer's standard range. White interior finish to be polyester paint system. The continuously foamed in place panel core shall be Class I rigid polyisocyanurate foam.

- .1 Panel thickness 4"; R32, Ribs at 254 mm c/c. Standard of acceptance: All Weather Insulated Panels (VicWest) or Kingspan.

- .2 For copings, flashings, and trims provide prefinished, formed material to match cladding.

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 PREPARATION

- .1 Protect metal surfaces in contact with concrete with isolation coating.

3.3 INSTALLATION (SHOP ASSEMBLED)

- .1 Attach shop assembled roof system to building framing system to manufacturer's instructions.

3.4 CONSTRUCTION

- .1 Site Tolerances:
 - .1 Maintain following installation tolerances:
 - .1 Maximum variation from plane or location shown on approved shop drawings: 10 mm/m of length and up to 20 mm/100 m maximum.
 - .2 Maximum offset from true alignment between two adjacent members abutting end to end, in line: 0.75 mm.

3.5 FIELD QUALITY CONTROL

- .1 Have manufacturer of products supplied under this Section review Work involved in handling, installation/application, protection and cleaning of its product[s], and submit written reports in acceptable format to verify compliance of Work with Contract.
- .2 Manufacturer's field services: 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 Obtain reports within three days of review and submit.

3.6 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Wash down exposed interior and exterior surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths. Wipe interior surfaces clean as part of final clean-up.
- .3 Remove excess sealant with recommended solvent.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 11 – Cleaning.
- .3 Section 06 10 10 – Rough Carpentry.
- .4 Section 07 41 43 – Composite Roof Panels.

1.2 REFERENCES

- .1 Canadian Roofing Contractors Association (CRCA)
 - .1 Roofing Specifications Manual 1997.

1.3 SAMPLES

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, colour and finish.

Part 2 Products

2.1 PREFINISHED STEEL SHEET

- .1 Finish: factory applied coating to CAN/CGSB-93.1
- .2 Galvanized sheet steel conforming to ASTM A653M Grade 230 or A2150 Galvalume.
- .3 Colours: to match colour of insulated roof panels as specified in Section 07 46 19 – Metal Siding.

2.2 ALUMINUM SHEET

- .1 Finish: Clear Anodized.
- .2 Thickness: 0.04" (18 ga) minimum.

2.3 ACCESSORIES

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement: to CAN/CGSB 37.5.
- .3 Underlay for metal flashing: asphalt laminated 3.6 to 4.5 kg kraft paper.
- .4 Sealants: to Section 07 92 10 – Joint Sealers.
- .5 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. same as sheet metal being secured.
- .6 Washers: of same material as sheet metal, 1 mm thick with rubber packings.

- .7 Touch-up paint: as recommended by prefinished material manufacturer.

2.4 FABRICATION

- .1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA 'FL' series details as indicated.
- .2 Form pieces in 2400 mm maximum lengths. Make allowance for expansion at joints.
- .3 Hem exposed edges of steel on underside 12 mm. Sand smooth exposed edges of Aluminum flashings. Mitre and seal corners with sealant.
- .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .5 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

2.5 METAL FLASHINGS

- .1 Form flashings, copings and fascias to profiles indicated of light gauge prefinished galvanized steel and aluminum as required.

Part 3 Execution

3.1 INSTALLATION

- .1 Install sheet metal work in accordance with CRCA FL series details.
- .2 Use concealed fastenings except where approved before installation.
- .3 Provide underlay under sheet metal. Secure in place and lap joints 100 mm.
- .4 Lock end joints and caulk with sealant.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

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

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 45 00 - Quality Control.
- .3 Section 01 61 00 - Common Product Requirements.

1.3 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
 - .2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
 - .3 CGSB 19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.4 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.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

- .2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.
- .3 Fold up metal banding, flatten, and place in designated area for recycling.

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.
- .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.

1.7 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.

1.8 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 off gas time.
- .3 Where sealants are qualified with primers use only these primers.

1.9 SEALANT MATERIAL DESIGNATIONS

- .1 Urethanes One Part
 - .1 Non-Sag to CAN/CGSB-19.13, Type 2, colour as selected by consultant.
 - .2 Acceptable material: Tremco Dymonic.
- .2 Silicones One Part
 - .1 To CAN/CGSB-19.13.
 - .1 Acceptable material: Tremco Spectrum 3.

- .2 Mildew resistant:
 - .1 Acceptable material: Tremco Tremsil 200.
- .3 Preformed Compressible and Non-Compressible back-up materials.
 - .1 Polyethylene, Urethane, Neoprene or Vinyl Foam.
 - .1 Extruded open 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.
 - .5 Premanufactured Expansion Joint Seal
 - .1 Single unit, double sided (silicon faced) intumescent bellows seal for a 1" joint with 50% movement capability (+25% & -25%), 4" deep
 - .1 Standard of Acceptance:
Emshield WFR2.

1.10 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.

Part 2 Execution

2.1 PROTECTION

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

2.2 SURFACE PREPARATION

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

2.3 PRIMING

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

2.4 BACKUP MATERIAL

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

2.5 MIXING

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

2.6 APPLICATION

- .1 Sealant.
 - .1 Apply sealant in accordance with manufacturer's written instructions.
 - .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
 - .3 Apply sealant in continuous beads.
 - .4 Apply sealant using gun with proper size nozzle.
 - .5 Use sufficient pressure to fill voids and joints solid.
 - .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
 - .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
 - .8 Remove excess compound promptly as work progresses and upon completion.
- .2 Curing.
 - .1 Cure sealants in accordance with sealant manufacturer's instructions.
 - .2 Do not cover up sealants until proper curing has taken place.
- .3 Cleanup.
 - .1 Clean adjacent surfaces immediately and leave Work neat and clean.
 - .2 Remove excess and droppings, using recommended cleaners as work progresses.
 - .3 Remove masking tape after initial set of sealant.

END OF SECTION