

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM).
 - .1 ASTM C208, Specification for Cellulosic Fibre Insulating Board.
 - .2 ASTM C591, Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
 - .3 ASTM C612, Standard Specification for Mineral Fibre Block and Board Thermal Insulation.
 - .4 ASTM C726, Standard Specification for Mineral Fibre Roof Insulation Board.
 - .5 ASTM C728, Standard Specification for Perlite Thermal Insulation Board.
 - .6 ASTM C1126, Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation.
 - .7 ASTM C1289-, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
 - .8 ASTM E96/E96M, Standard Test Methods for Water Vapour Transmission of Materials.
- .2 Canadian Gas Association (CGA).
 - .1 CAN/CGA-B149.1, Natural Gas and Propane Installation Code Handbook.
 - .2 CAN/CGA-B149.2, Propane Storage and Handling Code.
- .3 Canadian General Standards Board (CGSB)
 - .1 CGSB 71-GP-24M, Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.
- .4 Underwriters Laboratories of Canada (ULC).
 - .1 CAN/ULC-S604, Standard for Type A Chimneys.
 - .2 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
 - .3 CAN/ULC-S102, Surface Burning Characteristics.
 - .4 CAN/ULC-S702, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
 - .5 CAN/ULC-S704, Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).

1.2 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet.
- .2 Manufacturer's Instructions:

- .1 Submit manufacturer's installation instructions.

1.3 QUALITY ASSURANCE

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

Part 2 Products

2.1 INSULATION

- .1 Board insulation: mineral (rock slag) wool board to CAN/ULC-S702, thickness as indicated on Drawings, butt edges. Acceptable material: Roxul RHT-80 or approved equivalent in accordance with B7.

2.2 ACCESSORIES

- .1 Fasteners: concrete anchors with flat discs or washers, for attachment of insulation to concrete surfaces

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 INSTALLATION

- .1 Install insulation after building substrate materials are dry.
- .2 Install insulation to maintain continuity of thermal protection to building elements and spaces. Fit insulation tight around electrical, plumbing and heating pipes and ducts, around exterior doors and windows and other penetrations and protrusions. Cut and trim insulation neatly to fit spaces.
- .3 Install insulation boards in parallel rows. Butt joints tightly, offset vertical joints. Interlock boards at corners. Use longest pieces possible to reduce number of joints. Cut and trim insulation neatly to fit spaces. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
- .4 Install insulation boards on outer surface of inner wythe of wall cavity with plastic insulation clips over masonry ties to hold insulation tight to backup wall. Install boards horizontally between masonry ties, with horizontal joints centred on ties.
- .5 Install insulation over foundation waterproofing with concrete anchors complete with nailing discs or washers. Provide a minimum of five (5) anchors per 600 x 1200 mm of insulation board. Provide additional anchors spaced at 300 mm on centre around perimeter of openings, corners and abutments. Ensure concrete anchors are securely

seated. Replace loose fasteners or provide additional fastener adjacent to loose fasteners. Install insulation to maintain continuity of thermal protection to building elements and spaces.

- .6 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.
- .7 Offset both vertical and horizontal joints in multiple layer applications.

3.3 EXAMINATION

- .1 Examine substrates and immediately inform Contract Administrator 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 CLEANING

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Aluminum Association (AA).
 - .1 AA DAF-45, Designation System for Aluminum Finishes - 9th Edition.
 - .2 AA ASM-35, Specifications for Aluminum Sheet Metal Work in Building Construction, Section 5.
- .2 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM A167, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .2 ASTM A240/A240M, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
 - .3 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .4 ASTM A792/A792M, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process.
 - .5 ASTM B32, Standard Specification for Solder Metal.
 - .6 ASTM B370, Standard Specification for Copper Sheet and Strip for Building Construction.
 - .7 ASTM D523, Standard Test Method for Specular Gloss.
 - .8 ASTM D822, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
- .3 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-37.5, Cutback Asphalt Plastic Cement.
 - .2 CAN/CGSB-37.29, Rubber-Asphalt Sealing Compound.
 - .3 CAN/CGSB-51.32, Sheathing, Membrane, Breather Type.
 - .4 CAN/CGSB-93.1, Sheet Aluminum Alloy, Prefinished, Residential.
- .4 Canadian Standards Association (CSA International).
 - .1 CAN/CSA A123.3, Asphalt Saturated Organic Roofing Felt.
- .5 National Research Council Canada (NRC)/Institute for Research in Construction (IRC) - Canadian Construction Materials Centre (CCMC).
 - .1 CCMC, Registry of Product Evaluations.

1.2 SUBMITTALS

- .1 Submit product data sheets.
- .2 Submit shop drawings sealed by an Engineer registered in the Province of Manitoba indicating arrangements of sheets and joints, types and locations of fasteners and special

shapes and relationship of panels to structural frame, and anchorage details to the Contract Administrator for review prior fabrication and installation.

- .3 Prefinished roof deck supplier to design connections to substructure for 2.0 kPa uplift, or as required by NBCC if greater.

1.3 QUALITY ASSURANCE

- .1 Roofing Contractor must be a member in good standing with the Roofing Contractors Association of Manitoba.
- .2 The contractor is responsible for ensuring that the design, supply and total installation of this project are supervised and executed by fully trained and qualified personnel.
- .3 Installer shall demonstrate at least five years experience in projects similar in scope.
- .4 The materials and installation shall meet the applicable standards of the National Building Code, Underwriters Laboratories of Canada (ULC), the Canadian Standards Association (CSA) and any other applicable codes, standards and by-laws.
- .5 Written confirmation of conformance with these standards shall be provided to The City.

1.4 GUARANTEE

- .1 Provide a written guarantee, signed and issued in the name of The City of Winnipeg stating that the entire roofing system is guaranteed against leaking for a period of two (2) years from the date of completion.

Part 2 Products

2.1 SHEET METAL MATERIALS

- .1 AWR roof sheets as manufactured by Behlen Industries, or approved equal.
- .2 Roof panels:
 - .1 Fabricated from 26 gauge galvanized or Galvalume sheet steel to ASTM A653M, Grade 230 or better, with Z275 zinc or AZ 150 aluminum-zinc coating.
 - .2 Finish: factory precoated with Dofasco 8000 Series or better paint system, Colour to be chosen by owner from manufacturer's standard colours.
 - .3 Colour sample to be approved by Contract Administrator.
- .3 Metal flashings, trim, closures exposed to view: prefinished steel sheet of same gauge and finish as roof panels.
- .4 Sheet metal accessory components not exposed to ground level view: galvanized steel sheet, minimum 24 gauge.

- .5 Screws anchors: as recommended by roofing supplier. Use galvanized anchors, with length and size to meet roof system design. Exposed fasteners are to be colour matched to panels and trims
- .6 Deck closures: gauge and profile as recommended by manufacturer

2.2 WATERPROOF MEMBRANE

- .1 Self-adhesive, modified bitumen sheet, minimum 1 mm (40 mils) thick, non-slip surface. Acceptable material: IKO Armour Gard Ice and Water Protector, W.R. Grace Ice and Water Shield; Domtar Eavesshield; Nordshield Water Stopper; Bakor Eave Guard; BPCO ProGard; EMCO Gripgard

2.3 TRIMS

- .1 Form trim of prefinished steel sheet of same material, thickness, finish and colour as roof panels.
- .2 Provide trims in full lengths where possible. Multiple pieces of small segments is not acceptable (maximum of 1 joint in 10 feet).

Part 3 Execution

3.1 WATERPROOF MEMBRANE INSTALLATION

- .1 Install self-adhesive membrane in accordance with manufacturer's instructions.
- .2 Roll out sheets and press firmly to substrate. As installation progresses roll with hand roller to ensure positive bond.
- .3 Set first course along eaves. Overlap each succeeding course over lower. Side and end laps minimum 75 mm. Ensure full bond to roof deck and sealed at side and end laps. Avoid excessive bubbles and fish mouths.
- .4 Flash and seal around openings and items penetrating roof deck. Cut and fit membrane neatly and snug fitting, leave no gaps. Seal with mastic sealant. Make water tight.

3.2 METAL ROOFING INSTALLATION

- .1 Install metal roofing system in strict accordance with reviewed shop drawings and manufacturer's instructions.
- .2 Install factory manufactured panels in longest practical lengths with special panels to suit valleys and penetrations. Fasten panels as indicated by supplier including all side laps.
- .3 Provide notched and formed closures, to shed water, at changes in pitch and at peaks, ridges and eaves.

3.3 FIELD QUALITY CONTROL

- .1 Inspection of roof application may be carried out by an independent agency selected by the Contract Administrator.
- .2 Notify inspection agency minimum 48 hrs. prior to commencing roofing operations to arrange inspections. Permit agency full access to all portions of work.
- .3 Note that the last inspection is to be a “final inspection”, carried out after all roofing is complete, including installation of equipment and openings, and shall be in the presence of the Contract Administrator and the Contractor.

3.4 TOUCH-UP AND CLEANING

- .1 Touch up minor paint abrasions with touch-up paint provided by roof panel manufacturer to match colour of roof panels.
- .2 Clean roof by dry-wiping.
- .3 Leave job site completely clean.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C919, 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 (incorporating Amendment No. 1).
 - .2 CAN/CGSB-19.13, Sealing Compound, One-component, Elastomeric, Chemical Curing.
 - .3 CGSB 19-GP-14M, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.
 - .4 CAN/CGSB-19.17, One-Component Acrylic Emulsion Base Sealing Compound.
 - .5 CAN/CGSB-19.24, Multi-component, Chemical Curing Sealing Compound.
- .3 General Services Administration (GSA) - Federal Specifications (FS)
 - .1 FS-SS-S-200, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.

1.2 SUBMITTALS

- .1 Submit product data.
- .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 manufacturer's instructions.
 - .1 Instructions to include installation instructions for each product used.

1.3 DELIVERY, STORAGE, AND HANDLING

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

1.4 ENVIRONMENTAL 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 5 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.
- .4 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.
- .5 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

Part 2 Products

2.1 SEALANT MATERIALS

- .1 Type 1 – Silicones One Part: to CAN/CGSB-19.13. Acceptable material: Dow Corning 795, GE Silpruf, Tremco Spectrum 2.
- .2 Type 2 – Silicones One Part: to CAN/CGSB-19.22-M89 (Mildew resistant). Acceptable material: Dow Corning 786.
- .3 Type 3 – Acrylic Latex One Part: to CGSB 19-GP-5M. Acceptable material: Tremco 100 Latex Caulk, GE Acrylasil Latex Caulk.
- .4 Type 4 – Butyl: to CGSB 19-GP-14M. Acceptable material: Tremco Butyl Sealant

2.2 ACCESSORIES

- .1 Preformed Compressible and Non-Compressible back-up materials.
 - .1 High-Density Foam. Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m density, or neoprene foam backer, size as recommended by manufacturer.
 - .2 Bond Breaker Tape. Polyethylene bond breaker tape that will not bond to sealant.
- .2 Joint cleaner: non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

- .3 Primer: as recommended by manufacturer.

2.3 SEALANT SELECTION

- .1 Perimeters of exterior openings where frames meet exterior facade of building: Sealant Type 1.
- .2 Miscellaneous flashing joints and metal cladding: Sealant Type 1.
- .3 Perimeter of washroom fixtures (e.g., sinks, urinals, water closets, vanities, etc.): Sealant Type 2.
- .4 Interior paintable joints: Sealant Type 3.
- .5 Bedding aluminum doorsills: Sealant Type 4.

2.4 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 3 Execution

3.1 PROTECTION

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

3.2 SURFACE PREPARATION

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

3.3 PRIMING

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

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

3.5 MIXING

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

3.6 APPLICATION

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