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DIVISION 7

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**RIGID WALL INSULATION
MOISTURE BARRIER, SHEET AIR / VAPOUR BARRIERS**

1. GENERAL

1.1 Work Included

- .1 Perimeter foundation insulation
- .2 Exterior wall insulation
- .3 Sheet air/vapour barrier

1.2 References

- .1 ASTM D2842 - Water Absorption of Rigid Cellular Plastics
- .2 CGSB 51-GP-20M - Thermal Insulation, Expanded, Extruded Polystyrene
- .3 CGSB 51-GP-21M - Thermal Insulation, Urethane and Isocyanurate

1.3 Testing

- .1 Testing of the air barrier system will be performed by a testing agency appointed and paid for by the City.
- .2 Performance of the air barrier system will be evaluated with respect to Part 5 of the National Building Code of Canada 1995 and as amended by the Manitoba Building Code 1998.

2. PRODUCTS

2.1 Materials

- .1 Thermostud channel: available from Construction Products Division, W.R. Grace & Co. of Canada, Ltd.

2.2 Moisture Barrier

- .1 Moisture Barrier for Below Grade Application: Bithuthene 3000

2.3 Board Insulation

- .1 Rigid Insulation (foundation): CGSB 51-GP-20M, Type 4, extruded cellular polystyrene, square edges: Celfort by Celfortec; thickness as indicated on Drawings.
- .2 Rigid Insulation (walls): glass fibre reinforced polyisocyanurate foam core with reflective foil facer on both sides. 610 mm wide boards. Thickness as indicated on Drawings. Thermax as manufactured by Celotex.

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- .3 Rigid Insulation (roof): CGSB 51-GP-20M, Type 4, extruded cellular polystyrene, square edges: 'Roofmate' as manufactured by Dow. Thickness as indicated on Drawings

2.4 Air / Vapour Barrier

- .1 Membrane type (wall to foundation)
 - .1 Self-Adhesive: SBS modified bitumen membrane reinforced with glass scrim; 1 mm thick minimum; Blueskin SA. Primer to membrane manufacturers' recommendations.
 - .2 Sealant: to membrane manufacturers' recommendations.
 - .3 Primer: to membrane manufacturers' recommendations.

3. EXECUTION

3.1 Preparation

- .1 Verify substrate and adjacent materials and insulation boards are dry and ready to receive insulation and adhesive.
- .2 Verify substrate surface is flat, free of honeycomb, fins, irregularities and material that will impede adhesion of insulation.
- .3 Verify insulation boards are unbroken, free of damage, with face membrane undamaged.
- .4 Verify surfaces within walls being insulated have been inspected and accepted.

3.2 Vapour Barrier – Concrete Block Walls

- .1 Prime surfaces to membrane manufacturers' recommendations.
- .2 Apply membrane to manufacturer's recommendations.
- .3 Apply membrane horizontally starting at bottom of wall and weather lap 50 mm.
- .4 Lap ends 50 mm.
- .5 Roll membrane, including seam, with hand roller to ensure full contact.
- .6 Cut membrane neatly around projections to form a tight seal. Seal area around any projections with application of sealant.
- .7 Seal membrane where it meets the substrate, at the end of the days work.

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3.3 Board Insulation – Foundation Walls

- .1 Install insulation vertically.
- .2 Butt edges and ends tight to adjacent board, protrusions or steel studs.
- .3 Ensure boards are fitted tight to vapour barrier leaving no voids at joints.
- .4 Weatherlap insulation joints.

END OF SECTION

PREFORMED METAL CLADDING

1. GENERAL

1.1 Description

- .1 General requirements:
 - .1 Division 1 General Requirements, is part of this Specification and shall apply as if repeated here.
- .2 Work furnished and included:
 - .1 Cladding profile
 - .2 Closures
 - .3 Associated flashings
 - .4 Supporting sub-girts
 - .5 Associated sealants, concealed and exposed
- .3 Related Work not included:
 - .1 Structural framing members including girts, purlins, base angles and other elements required to support the cladding system.
 - .2 Caulking of elements in 1.1.3.1.
 - .3 Doors, louvers, sashes, ventilators as well as their supporting framing.
 - .4 Cant or parapet flashings and flashings associated with other trades.

1.2 Standards and Design Criteria

- .1 Design cladding system in accordance with:
 - .1 CAN/C.S.A. – S136 for the Design of Cold Formed Steel Structural Members
 - .2 Canadian Sheet Steel Building Institute Standard 20M Sheet Steel Cladding for Architectural and Industrial Applications
 - .3 National Building Code of Canada
- .2 Deflection of the cladding system is not to exceed 1/180 of the span for the specified wind forces acting on it.
- .3 Design cladding to accommodate thermal movement caused by ambient temperature range of -50 to +40°C, without causing deterioration of the cladding.

PREFORMED METAL CLADDING

- .4 Design expansion joints to accommodate movement in cladding and between cladding and structure, to prevent permanent distortion or damage to the cladding.
- .5 Design wall system to maintain the following installation tolerances:
 - .1 Maximum variation from plane or location shown on Shop Drawings: 20 mm/10 m (0.75 inch /30 feet).
 - .2 Maximum offset from the true alignment between two adjacent members abutting end to end in line: 1 mm (0.04 inch).

1.3 Quality Assurance and Substitutions

- .1 Manufacturer of cladding and installer shall demonstrate at least five years experience in projects similar in scope.
 - .1 This Section establishes the standard of quality required for the cladding system. Proposed substitutions must meet this standard, and will be evaluated in accordance with B6 Substitutes.

1.4 Submittals

- .1 Submit Shop Drawings in accordance with Section 01300.
 - .1 Indicate arrangement of cladding, including dimensions, location of joints, profiles, types and locations of supports, fasteners, flashing, closures and all metal components related to the cladding installation.
 - .2 Each Shop Drawing shall be sealed and signed by a Professional Engineer.
- .2 Submit samples of pre-finished metal cladding for review by the Contract Administrator, prior to fabrication.

1.5 Handling and Protection

- .1 Store cladding products in accordance with manufacturer's recommendations, and protected from elements.
- .2 Protect pre-finished steel during fabrication, transportation, site storage and erection, in accordance with CSSBI Standards.

2. PRODUCTS

2.1 Steel Cladding

- .1 Fabricated from ASTM A653 structural quality Grade 230 galvanized steel, with Z275 Zinc coating, as designated by ASTM A653M thickness as shown on the Drawings. Vertical application.

PREFORMED METAL CLADDING

- .2 Prepainted with Colorite 10000 Series, one side. Colour as selected by the Contract Administrator.
- .3 Acceptable products: VICWEST profile CL

2.2 Supporting Sub-Girts

- .1 Minimum 1.2 mm (0.048 inch) thick formed galvanized steel, ASTM A653M Grade 230 with Z275 zinc coating.

2.3 Fastening Systems

- .1 Fasteners: galvanized, with exposed fasteners colour matched to cladding.

2.4 Accessories

- .1 Flashing, Trim and Closures: fabricate to profiles indicated on Shop Drawings, or as required to meet performance requirements. Use preformed corner pieces only. Double back exposed edges. Material to match cladding in exposed locations, galvanized material in concealed locations.
- .2 Sealants:
 - .1 Concealed: tape or compound, non-skinning, non-drying, butyl rubber
 - .2 Exposed: one part silicone to CGSB CAN2-19.13
- .3 Prepare frame for silencers. Provide three (3) single silencers for single doors and mullions of double doors on strike side, and two (2) single silencers on frame head at double doors without.

3. EXECUTION

3.1 Examination

- .1 Examine Work of other trades over which cladding will be applied, for conformity to Drawings. Report all discrepancies to the Contract Administrator before beginning Work on the roof system.

3.2 Installation

- .1 Install sub-girt framing system.
- .2 Install starter flashing, drip and other flashings, and corners, edgings, window and door flashing as shown on the Drawings.
- .3 Install cladding and standard trims in accordance with manufacturer's standard erection procedures.

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- .4 Install finishing flashing and cap flashing.
- .5 Provide sealant at junctions with adjoining Work, and where shown on the Drawings, in accordance with Section 07900.

3.3 Touch-up and Cleaning

- .1 Touch up minor paint abrasions with touch-up paint.
- .2 Clean cladding by dry wiping.

END OF SECTION

MODIFIED BITUMINOUS MEMBRANE ROOFING

1. GENERAL

1.1 Work Included

- .1 Conventional, 2-ply, modified bituminous roofing.

1.2 References

- .1 CAN2-51.32M – Sheathing, Membrane, Breather Type
- .2 CGSB 51-GP-20M – Thermal Insulation Extruded, Expanded Polystyrene

1.3 System Description

- .1 Conventional roof system: two-ply torched on conventional SBS membrane system with insulation and gypsum board on steel deck.

1.4 Qualifications

- .1 Applicator: company specializing in performing the Work of this Section with three years documented experience and approved by system manufacturer.
- .2 Work of this Section to conform to manufacturers' instructions.

1.5 Manufacturer's Representative

- .1 The roofing material manufacturer shall delegate a representative to visit the Work at commencement of Work and periodically during Work in progress.
- .2 At all times permit and facilitate access to the Work Site and roofs to the manufacturer's representative.

1.6 Delivery, Storage, and Handling

- .1 Deliver, store, protect, and handle products to Site under provisions of Division 1.
- .2 Deliver products in manufacturers' original containers, dry, undamaged, seals and labels intact.
- .3 Store products in weather-protected environment, clear of ground and moisture.
- .4 Stand roll materials on end.

MODIFIED BITUMINOUS MEMBRANE ROOFING

1.7 Environmental Requirements

- .1 Do not apply roofing membrane during inclement weather.
- .2 Do not apply roofing membrane to damp or frozen deck surface.
- .3 Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during the same day.

1.8 Warranty

- .1 Provide warranty in accordance with General Conditions but for a period of five years.

2. PRODUCTS

2.1 Membrane Materials

- .1 Membrane Air/Vapour Barrier: Soprema, torch-on.
- .2 Membrane Base Sheet, Base and Cap Sheet Flashing: Soprema Sopralene Flam 180.
 - .1 Description: roofing membrane with a non-woven polyester reinforcement and thermofusible SBS modified bitumen. Both sides shall be protected by a thermofusible plastic film. This membrane is to be applied by torching only.
 - .2 Components:
 - .1 Reinforcement: non-woven polyester, 180 g/m²
 - .2 Thermofusible elastomeric bitumen: mix of selected bitumen and SBS thermoplastic polymer.
- .3 Membrane Cap Sheet Flashing: Soprema Sopralene Flam 250 GR.
 - .1 Description: roofing membrane with a non-woven polyester reinforcement and thermofusible SBS modified bitumen. The top side shall be self-protected with coloured granules. The underside shall be protected by a thermofusible film. This membrane is to be applied to torching only.
 - .2 Components:
 - .1 Reinforcement: 250 g/m² of non-woven polyester
 - .2 Elastomeric asphalt: mix of selected bitumen and SBS thermoplastic polymer.
- .4 Torchable Self-Adhesive Membrane: "Sopraflam".

MODIFIED BITUMINOUS MEMBRANE ROOFING

2.2 Sheet Materials

- .1 Fibreboard protection board: to CSA-A247-M, Type 2, 13 mm thick, asphalt impregnated.
- .2 Gypsum board: CSA A82.27, sheathing grade, 13 mm thick, uncoated faces, fire rated.
- .3 Torchable overlay: recovery board "Sopraboard" two (2) layers as per Drawings, thickness as indicated.

2.3 Insulation

- .1 CGSB 51-GP-20M, flat, Type 4 extruded polystyrene board with skin surface, Roofmate by Dow Chemical. Total thickness of 125 mm. Other acceptable manufacturers: Celfortec.
- .2 Sloped, Type 2 expanded polystyrene board. Minimum thickness: 13 mm. Acceptable manufacturers: Dow Chemical, Celfortec.

3. EXECUTION

3.1 Preparation

- .1 Gypsum board: screw gypsum board to metal deck. Butt ends and edges tight. Butt ends over firm bearing.
- .2 Insulation: install two (2) layers of insulation, maximum thickness of 75 mm per layer; stagger joints of second layer with joints of first layer. Butt insulation tight with adjacent boards at all edges.
- .3 Protection board: mop on one layer of fibreboard. Offset joints of fibreboard with joints of insulation.
- .4 Torchable board: mop on one layer of recovery board.

3.2 Roof Membrane

- .1 Install roofing membrane to manufacturers' written instructions.
- .2 Base sheet Installation
 - .1 Base sheet membrane shall be unrolled dry on torchable overlay panels for alignment.
 - .2 Base sheet shall be torch welded on torchable overlay, in accordance with recommendations of the membrane manufacturer. Base sheet shall have side laps of 75 mm and end laps of 150 mm.
 - .3 Make sure the membrane is properly welded, without air pockets, wrinkles, fishmouths, or tears.

MODIFIED BITUMINOUS MEMBRANE ROOFING

- .4 Torch welding speed varies depending on the weather. In cold conditions, it slows down, in warm and dry conditions, it speeds up.
- .3 Base sheet flashing installation
 - .1 Surface where membrane is applied shall receive an asphalt primer coating at the rate of 0.25 L/m². Primer must be dry before application of the base sheet flashing.
 - .2 Base sheet shall be laid in strips 1 m wide to the vertical surfaces, extending on to the flat surface of the roof a minimum of 100 mm. Side laps shall be 75 mm and shall be staggered a minimum of 100 mm with the laps of the base sheet in order to avoid excessive thickness.
 - .3 Base sheet shall be torch welded directly on its support from bottom to top. Torch welding shall soften the underside of the base sheet without overheating, resulting in a uniform adhesion over the entire surface. When allowed by the support, the base sheet top edge shall be nailed on 300 mm centres.
- .4 Cap sheet installation
 - .1 Once the base sheet and stripping has been applied and does not show any defects, the cap sheet can then be laid.
 - .2 Cap sheet shall be unrolled starting from the lowest point of the roof. Cap sheet shall be rerolled from both ends prior to torching. Care must be taken to ensure alignment of the first roll (parallel with the edge of the roof).
 - .3 Cap sheet shall be torch welded on to the base sheet membrane. During this application, both surfaces shall be simultaneously melted, forming an asphalt bead that shall be pushed out in front of the cap sheet.
 - .4 Avoid overheating.
 - .5 Base sheet and cap sheet shall be staggered a minimum of 300 mm.
 - .6 Cap sheet shall have side laps of 75 mm and end laps of 150 mm.
 - .7 Make sure the two (2) membranes are properly welded without unwelded areas.
 - .8 After installation of the cap sheet, check all lap seams on the cap sheet.
 - .9 For aesthetics, care should be taken to avoid excessive asphalt seepage along the joints.
- .5 Cap sheet flashing installation
 - .1 Cap sheet stripping shall be laid in strips 1 m wide. There must be at least 150 mm of cap sheet overlap on the deck. Side laps shall be 75 mm and shall be staggered a minimum of 100 mm from cap sheet laps and base sheet laps, in order to avoid excessive thickness.

MODIFIED BITUMINOUS MEMBRANE ROOFING

.2 Cap sheet stripping shall be torch welded directly on its base sheet, proceeding from bottom to top. Torching shall soften the two membranes and ensure a uniform weld. Use a degranulator.

.6 Walkway installation

.1 Install over addition cap sheet (granulated) ply.

.2 Install adhesive between 10°C to 35°C and as per manufacturers' instructions.

3.3 Cleaning

.1 Remove bituminous markings from finished surfaces.

.2 In areas where finished surfaces are soiled caused by Work of this Section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

.3 Repair or replace defaced or disfigured finish due to Work of this Section.

3.4 Protection

.1 Protect building surfaces against damage from roofing Work.

.2 Where traffic must continue over finished roof membrane, protect surfaces.

3.5 Coordination with Other Trades

.1 Coordinate with electrical and mechanical sub-trades for making all penetrations through roofing weather- and moisture-tight.

END OF SECTION

SHEET METAL FLASHING

1. GENERAL

1.1 Work Included

- .1 Parapet cap flashings
- .2 Base/drip flashings

1.2 Reference Standards

- .1 CRCA - "Canadian Roofing Contractors Association"
- .2 ASTM A525 - Sheet Steel, Zinc Coated, Galvanized by the Hot-Dip Process
- .3 CGSB 37-GP-5M - "Sealing Compound, Rubber Asphalt"

1.3 Existing Conditions/Protection

- .1 Exercise care when working on or about roof surfaces to avoid damaging or puncturing membrane or flexible flashings.
- .2 Place plywood panels on roof surfaces to Work of this Section and on access routes. Keep in place until completion of Work.

2. PRODUCTS

2.1 Sheet Metals

- .1 Galvanized steel: minimum 24 gauge core steel; conforming to requirements of ASTM A525 G90 galvanized coating.
- .2 Pre-finished galvanized flashing: ASTM A446; G90 zinc coating; 24 gauge core steel; shop pre-coated; colour as per schedule.

2.2 Accessory Materials and Components

- .1 Fasteners: concealed clip type, of same materials as flashings; sized to suit application.
- .2 Rubber-Asphalt Sealing Compound: conforming to requirements of CGSB 37-GP-5M.
- .3 Bituminous paint: acid and alkali resistant type; black colour.

SHEET METAL FLASHING

2.3 Fabrication

- .1 Fabricate metal flashings in accordance with recommendations of CRCA and as indicated on Drawings.
- .2 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .3 Form sections in 2438 mm (8 foot) lengths. Make allowances for expansion at joints.
- .4 All seams are to be flat lock type except corners. Fabricate corners minimum 460 mm, mitered, soldered or welded, and sealed as one piece.
- .5 Hem exposed edges of flashings on underside 13 mm.
- .6 Backpaint flashing with bituminous paint where expected to be in contact with cementitious materials or dissimilar metals. Fabricate scuppers as detailed.

3. EXECUTION

3.1 Examination

- .1 Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets in place, and nailing strips located.
- .2 Verify membrane termination and base flashings are in place, sealed, and secure.
- .3 Beginning of installation means acceptance of existing conditions.

3.2 Preparation

- .1 Field measure Site conditions prior to fabricating Work.
- .2 Install starter and edge strips, and cleats before starting installation.

3.3 Installation

- .1 Install flashings in accordance with CRCA recommendations and as indicated on Drawings.
- .2 Secure flashing in place using concealed type fasteners. Use exposed fasteners in locations approved by the Contract Administrator only. When using exposed fasteners, they are to be of the same finish as flashings.
- .3 Apply sealing compound at junction of metal flashings and asphalt felt flashings.
- .4 Lock seams and end joints. Fit flashing tight in place. Make corners square, surfaces true and straight in all planes and all lines accurate to profiles.

SHEET METAL FLASHING

- .5 Counter-flash all mechanical and electrical items projecting through.
- .6 Install galvanized flashing to all locations indicated on Drawings.
- .7 Install pre-finished flashing to all locations indicated on Drawings.
- .8 Seal metal joints watertight.

END OF SECTION

SEALANTS AND CAULKING

1. GENERAL

1.1 Work Included

- .1 Supply and installation of all sealant and backing materials as required.

1.2 Environmental Conditions

- .1 Sealant and substrate materials to be minimum 5°C.
- .2 Should it become necessary to apply sealants below 5°C, consult sealant manufacturer and follow their recommendations.

1.3 Reference Standards

- .1 CAN 19-GP-13M - "Sealing Compound, One Component, Elastomeric, Chemical Curing"
- .2 CGSB 19-GP-22M - "Sealing Compound, One Component, Silicone Base, Chemical Curing" - Mildew Resistant
- .3 CGSB 19-GP-17M - Sealing Compound, One Component, Acrylic Emulsion Base

1.4 Warranty

- .1 Provide warranty in accordance with the General Conditions, but for three years.
- .2 Warranty: include coverage of installed sealants and accessories which fail to achieve air tight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

2. PRODUCTS

2.1 Materials

- .1 Primers: type recommended by sealant manufacturer.
- .2 Joint Fillers:
 - .1 General: compatible with primers and sealants, oversized 30 to 50 percent.
 - .2 Polyethylene, urethane, neoprene or vinyl: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa.
 - .3 Neoprene or butyl rubber: round solid rod, Shore A hardness 70.
 - .4 Polyvinyl chloride or neoprene: extruded tubing with 6 mm minimum thick walls.

SEALANTS AND CAULKING

- .5 Impregnated pre-compressed polyurethane foam sealant tape. Acceptable Product: Emseal "Grayflex".
- .3 Bond Beaker: pressure sensitive plastic tape, which will not bond to sealants.
- .4 Sealants:
 - .1 Sealant shall be UV resistant and ozone resistant, capable of supporting their own weight: conforming to CAN2-19.13.
 - .2 Sealants for vertical and horizontal non-traffic bearing joints, to Table 1, CGSB19-GP-23.
 - .3 Colour of sealants: to match adjacent surface. Colours are to be selected by the Contract Administrator, from standard colour range.
 - .4 Joint Cleaner: xylol, methylethyleketon or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

2.2 Acceptable Products

- .1 For all non-traffic bearing joints unless indicated otherwise Dow Corning No. 790.
- .2 For joints between exterior doors, windows, ductwork, etc., and adjacent materials: Dow Corning No. 795.

3. EXECUTION

3.1 Preparation

- .1 Remove dust, paint, loose mortar and other foreign matter. Dry joint surfaces.
- .2 Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.
- .3 Remove oil, grease, and other coatings from nonferrous metals with joint cleaner.
- .4 Prepare concrete, glazed, and vitreous surfaces to sealant manufacturer's instructions.
- .5 Examine joint sizes and correct to achieve depth ratio half of joint width with minimum width and depth of 6 mm, maximum width 25 mm.
- .6 Install joint filler to achieve correct joint depth.
- .7 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .8 Apply bond breaker tape where required to manufacturers' instructions.

SEALANTS AND CAULKING

- .9 Prime sides of joints are in accordance with sealant manufacturers' instructions immediately prior to caulking.

3.2 Application

- .1 Apply sealants, primers, joint fillers, bond breakers, to manufacturers' instructions. Apply sealant using gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.
- .2 Apply sealant to joints between door, window frames to adjacent building components, around perimeter of every external opening, to control joints in concrete slabs and where indicated.

END OF SECTION