Part 1 GENERAL

1.1 Intent

.1 This Section covers the Work of:

.1 Waterproofing the concrete below grade.

1.2 Applicator

.1 Ensure that all Work is done by an experienced, competent waterproofing applicator licensed and/or approved by the waterproofing material Manufacturer. Submit the Manufacturer's certification of this approval along with a list of similar projects and references where the proposed contractor has installed the same waterproofing systems.

.2 Ensure applicator's installation equipment and methods are approved by waterproofing material Manufacturer. Submit proof of this approval.

1.3 Guarantee

.1 Select the waterproofing system compatible with and suitable for, the given conditions and long term requirements.

.2 Provide completely watertight work with no leakage through or around the waterproofing.

.3 Furnish a written, single source guarantee covering the waterproofing materials and workmanship for a period of three (3) years from the Date of Acceptance of the Work, and be responsible for making good, at no cost to the Owner, any and all defects due to the failure of the waterproofing materials, workmanship or overall performance.

.4 Provide a leakage test before backfill and before waterproofing.

1.4 Schedule of Waterproofing

.1 Apply waterproofing to protect concrete below grade, including:

.1 All around the exterior walls

.2 Where waterproofing is discontinued, extend waterproofing 1 m beyond the required location.

.3 Confirm locations and details with the Contract Administrator prior to proceeding with waterproofing.

1.5 Submittals

.1 At the early stages of the project, well before any intended waterproofing or dampproofing activity on Site, submit the following information for the Contract Administrator's review:

.1 Product Manufacturer's written approval of the proposed waterproofing contractor

.2 List of reference contacts and similar projects completed by the proposed contractor using the same waterproofing products

.3 Product samples and Manufacturer's technical literature for materials and application procedures

.2 Submit details of the proposed waterproofing systems for each area. Include material data sheets, layer sequence and thickness, surface preparation and acceptance criteria, and protection criteria.

.3 Submit the waterproofing Manufacturer's instructions and details for application, membrane thickness, number of layers, cant beads, protection board, expansion joints, cracks, reinforcing sheets, pipe protrusions, etc.

.4 During the course of the project, immediately prior to commencing work in each area, submit a Letter of Acceptance for the concrete surfaces to be waterproofed, signed by the applicator's authorized representative.

.5 Product Manufacturer's Representative to inspect the waterproofing contractor's work on a regular basis and submit inspection reports to the Contract Administrator.

.6 Upon completion and formal Acceptance of the Work, submit a three (3) year, single source, 100% labour and materials guarantee covering materials, workmanship and long term performance of the overall waterproofing system.

Part 2 PRODUCTS

2.1 For Exterior Use

.1 Vulkem 201 System by Tremco Ltd.:

.1 Primer - Vulkem 191.

.2 Membrane - Vulkem 201L - 1.5 mm thick, on horizontal surfaces. Apply in 2 passes. Vulkem 201H, - 1.5 mm thick, on walls. Apply in 2 passes.

.3 Protection - use 3 mm thick protection boards on buried structures.

.2 Hydrotech flexible membrane 6125 system as manufactured by Hydrotech:

.1 Primer

.2 1 layer 4.5 mm thick on vertical surfaces and 2 layers of 4.5mm each on horizontal surfaces.

.3 Protect with 3 mm thick protection boards on walls and 6 mm thick protection boards on buried roofs.

.3 Elasto-Seal 790-11 system as manufactured by Bakor:

.1 Primer

.2 1 layer 4.5 mm thick on vertical surfaces and 2 layers of 4.5 mm each on horizontal surfaces.

.3 Protect with 3 mm thick protection boards on walls and 6 mm thick protection boards on buried roofs.

Part 3 EXECUTION

3.1 General

.1 Deliver materials to job Site in factory sealed containers with Manufacturer's identification of each package.

.2 Store materials in a manner to prevent damage or deterioration.

3.2 Surface Preparation, Inspection and Certification for Concrete Walls and Slabs

.1 As an initial step, clean all surfaces to be waterproofed of any and all deleterious material.

.2 Inspect all subject surfaces to identify imperfections including, but not limited to, uneven surfaces, joints, cracks, honeycombing, spalls, delaminated areas, previous waterproofing materials, exposed reinforcing steel or any other existing conditions that may affect the performance of the new waterproofing system.

.3 Repair cracks in concrete using polyurethane or epoxy injection. After injection, remove any related coatings or injection nipples and prepare the surfaces affected.

.4 Repair other surface imperfections and surfaces of cracks by chipping out and filling with repair mortar to the satisfaction of the Contract Administrator and the waterproofing materials manufacturer prior to beginning final surface preparation steps.

.5 Blast clean all surfaces to a dry, roughened texture using approved equipment, materials and methods; while adhering to the waterproofing Manufacturer's requirements and environmental considerations.

.6 Waterproofing Manufacturer's authorized agent to inspect surfaces to be waterproofed with the Contract Administrator and waterproofing contractor. Provide to the Contract Administrator a written certification from the waterproofing Manufacturer that the surfaces are acceptable for the application of the waterproofing system, and that the proposed waterproofing system is appropriate for the location and required service. Do not apply any waterproofing until the Contract Administrator receives the written certification from the Manufacturer.

3.3 Pre-Treatment and Detailing

.1 Ensure the surfaces are approved.

.2 Pre-treat repaired areas with a layer of reinforced coating as recommended by waterproofing manufacturer.

.3 Provide cants, reglets, and edge preparations as per the reviewed submissions.

.4 Apply primers as recommended by waterproofing Manufacturer.

3.4 Application of Waterproofing

.1 Conform to the waterproofing Manufacturer's instructions and details for application, membrane thickness, number of layers, cant beads, protection board, expansion joints, cracks, reinforcing sheets, bonding of layers, bonding of wall waterproofing to waterproofing on skim slabs, etc.

.2 Schedule the Work to allow twenty eight (28) days curing for new concrete prior to waterproofing.

.3 Apply waterproofing only when atmospheric conditions are suitable. Do not apply during rain or when temperatures are below 10°C. Maintain material and substrate temperatures within limits recommended by product Manufacturer. Provide suitable enclosures of areas to be waterproofed if necessary to satisfy the work condition requirements.

.4 Lap joints in waterproofing in accordance with the Manufacturer's instructions.

.5 Cure membrane in accordance with the Manufacturer's instructions.

.6 Use special designed spray machines where recommended by the Manufacturer.

.7 Application of Vulkem 201 Waterproofing:

.1 Apply Vulkem 191 primer

.2 Apply Vulkem 201 L, 1.5 mm thick, on horizontal surfaces. Apply in 2 passes.

.3 Apply Vulkem 201H, 1.5 mm thick, on external walls. Apply in 2 passes.

.4 Allow to cure

.5 Protect waterproofing with 3 mm thick protection boards on buried structures.

.8 Application of Vulkem 450 Waterproofing:

.1 Apply Vulkem 191 primer

.2 Apply Vulkem 450 in according with Manufacturer's published application directions.

.9 Application of Hydrotech 6125:

.1 Apply compatible primer followed by 1 layer 4.5 mm thick on vertical surfaces and 2 layers of 4.5 mm each on horizontal surfaces. Protect with 3 mm thick protection boards on walls and 6 mm thick protection boards on buried roofs.

.10 Application of Elasto-Seal 790-11:

.1 Apply 1 layer 4.5 mm thick on vertical surfaces and 2 layers of 4.5 mm each on horizontal surfaces. Protect with 3 mm thick protection boards on walls and 6 mm thick protection boards on buried roofs.

3.5 CLEAN-UP

.1 Promptly, as the Work proceeds and upon completion, clean-up and remove from the Site, rubbish and surplus material resulting from the Work of this Section.

END OF SECTION

Part 1 GENERAL

1.1 Work Included

.1 Perimeter foundation wall insulation between existing and new tank walls.

.2 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

1.3 Testing

.1 Testing of the air barrier system will be performed by a testing agency appointed and paid for by the Owner.

.2 Performance of the air barrier system will be evaluated with respect to the NBC of Canada 2005.

Part 2 PRODUCTS

2.1 Board Insulation

.1 Rigid insulation: to CAN/ULC S701, Type 2, expanded polystyrene insulation. Dow Chemical, Celfortec; thickness as indicated on Drawings.

.2 High Strength Rigid insulation for below grade: to CAN/ULC S701, Type 4, Styrofoam HI 60 by Dow Chemical, Foamular 400 by Owens Corning; thickness as indicated on Drawings.

.3 Rigid insulation for below grade: to CAN/ULC S701, Type 4, Styrofoam SM by Dow Chemical, Celfort 300 by Owens Corning; thickness as indicated on Drawings.

2.2 Thermostud Channel

.1 Available from Construction Products Division, W.R. Grace and Co. of Canada Ltd.

2.3 Protection

.1 Rigid insulation (air/vapour protection board): extruded closed cell type, polystyrene, square edge, fan folded panels at 610 on centre: DOW Protection Board III.

2.4 Air and Vapour Barrier

.1 Membrane type (masonry wall, concrete wall): Self-adhesive: SBS modified bitumen membrane reinforced with cross-laminated polyethylene film; 1 mm thick minimum; Blueskin SA by Bakor or Aquabarrier AVB by IKO. Primer to membrane Manufacturer’s recommendations. Sealant: To membrane Manufacturers' recommendations.

2.5 Through Wall Flashing

.1 Membrane type: Self-adhesive: SBS modified bitumen membrane reinforced with cross-laminated polyethylene film; 1 mm thick minimum; Blueskin TWF by Bakor. Primer to

membrane Manufacturers' recommendations. Sealant: To membrane Manufacturers' recommendations.

Part 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 Board Insulation – Between New and Existing Foundation Walls

.1 Install insulation vertically.

.2 Butt edges and ends tight to adjacent board and protrusions.

.3 Weatherlap insulation joints.

.4 Secure thermostuds at 600 on center.

3.3 Air/Vapour Barrier – Concrete Block Walls

.1 Prime surfaces to membrane Manufacturers' recommendations.

.2 Apply membrane to Manufacturers' 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 day’s Work.

3.4 Protection of Air/Vapour Barriers below Grade

.1 Determine from the waterproofing Manufacturer prior to construction protection measures required to protect waterproofing from damage.

.2 Provide and use protection boards, as required by the waterproofing Manufacturer.

.3 Inspect waterproofing for damage before any other operations. Repair any damage found.

.4 Do not backfill against or work on top of waterproofing until protection measures satisfactory to the waterproofing manufacturer are in place.

.1 Protect waterproofing from the elements until curing of membrane is complete.

END OF SECTION

Part 1 GENERAL

1.1 Work Included

.1 Batt insulation and vapour barrier.

Part 2 PRODUCTS

2.1 Materials

.1 Batt and roll insulation: glass fibre, resistance value as shown on the Drawings, Johns Manville.

.2 Vapour barrier: 0.15 mm, (6 mil), clear polyethylene film, with self-adhesive polyethylene or PVC tape for sealing joints.

Part 3 EXECUTION

3.1 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 to electrical boxes, plumbing and heating pipes and ducts, around external doors and protrusions.

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

3.2 Batt Insulation Application

.1 Install insulation between trusses and wood framing components.

.2 Lap insulation membrane edges, retain in position with framing members, to prevent movement.

3.3 Vapour Barrier Film Installation

.1 Install polyethylene on warm side of insulation and tight to insulation.

.2 Lap joints 150 mm minimum and tape seal. Ensure joints occur over framing members.

.3 Extend vapour barrier tight to items interrupting continuity of membrane. Tape seal or seal with sealant.

END OF SECTION

Part 1 GENERAL

1.1 Work Included

.1 Roof cap

.2 Sheet metal roofing

.3 Pre-finished fascia, vented soffit, downspouts and gutters

1.2 Reference Standards

.1 CRCA Roofing Specifications Manual.

.2 ASTM A 653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.3 CSSBI standards

1.3 Protection

.1 Exercise care when working on or about roof surfaces to avoid damaging metal products

.2 Scratched or damage metal as determined by the Contract Administrator will be replaced at the Contractors expense.

1.4 Submittals

.1 Submit samples in accordance with CW1100.

.2 Submit 300 mm x 300 mm samples of sheet metal roofing and vented ridge material.

.3 Submit Vicwest Colorite sheet metal colour samples.

.4 Submit samples of fasteners.

Part 2 PRODUCTS

2.1 Sheet Metals

.1 Pre-finished galvanized ridge cap: 0.76 mm thick (22 gauge) with Z275 zinc coating; pre-finished topcoat. Colour to match roof sheet metal.

.2 Pre- finished galvanized roof metal: style CL815R, 0.76 mm thick (22 gauge) with Z275 zinc coating and pre-finished top coat as manufactured by Vicwest or Approved Equal in accordance with B6. Colours from Manufacturer’s standard colour range.

.3 Pre-finished galvanized metal fascia, gutters and downspouts: 26 gauge with Z275 zinc coating; pre-finished topcoat as manufactured by Vicwest or Approved Equal in accordance with B6. Colour to match roof sheet metal.

.4 Pre-finished aluminum vented soffit: SP-600 Vented, 410 mm (16”) as manufactured by Kaycan.

2.2 Ice and Water Shield

.1 Amourgard Ice and Water Protector as manufactured by IKO.

2.3 Accessory Materials and Components

.1 Fasteners: stainless steel complete with neoprene gasket, colour coated to match pre-finished metal roofing, sized to suit application.

.2 Rubber-asphalt sealing compound: conforming to requirements of CGSB 37-GP-5M, non-skinning, non-drying.

.3 Bituminous paint: acid and alkali resistant type; black colour.

.4 No. 15 Perforated Asphalt Felt to ASTM D226. Acceptable manufacturers, Soprema and IKO.

2.4 Fabrication

.1 Fabricate metal cap 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 of cap flashing in 2438 mm (8 ft) lengths. Make allowances for expansion at joints.

.4 No joints are allowed in panel length. Overlap sheet metal in order to shed water.

.5 Backpaint flashing with bituminous paint where expected to be in contact with cementitious materials, pressure treated wood or dissimilar metals.

.6 Gutter width and depth to be 100 mm. Downspout to be 100 mm x 100mm, enclosed for top 50% of its length. For remainder of length provide one open face.

.7 Ridge Cap width to be 279mm each side of ridge.

Part 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 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 before starting installation.

3.3 Installation of Roofing

.1 Install ice and water shield over entire roof surface.

.2 Install pressure treated strapping and over lay with ice and water shield or mopped perforated roofing felt.

.3 Install sheet metal roofing and appurtenances in accordance with CRCA recommendations and as indicated on Drawings.

.4 Apply sealing compound at junction of metal roof sheets.

.5 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.

.6 Counter-flash all mechanical and electrical items projecting through.

.7 Seal metal joints watertight.

END OF SECTION

Part 1 GENERAL

1.1 Work Included

.1 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.

Part 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.

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 ft) lengths. Make allowances for expansion at joints.

.4 All seams are to be flat lock type except corners. Fabricate corners minimum 460 mm, mitred, 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.

Part 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.

.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.

3.4 Skirting

.1 Install skirting in accordance with CRCA recommendations and as indicated on Drawings. Vicwest Corrugated Galvanized metal skirting.

.2 Secure skirting 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 Secure with thermostuds at 600 mm on center.

.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.

END OF SECTION

Part 1 GENERAL

1.1 Work Included

.1 Supply and Install 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/CGSB-19.13 - Sealing Compound, One Component, Elastomeric, Chemical Curing

.2 CAN/CGSB-19.24 - Multicomponent, Chemical-Curing Sealing Compound.

.3 CAN/CGSB-19.17 - One Component Acrylic Emulsion Base Sealing Compound.

1.4 Warranty

.1 Provide a three year warranty under provisions of D24.

.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.

Part 2 PRODUCTS

2.1 Materials

.1 Primers: type recommended by sealant manufacturer.

.2 Joint Fillers:

- .1 General: compatible with primers and sealants, outsized 30 to 50%.
- .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 PVC or neoprene: extruded tubing with 6 mm minimum thick walls.
- .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 CAN/CGSB-19.13.
- .2 Sealants for vertical and horizontal non-traffic bearing joints, CAN/CGSB-19.24.
- .3 Colour of sealants: to match adjacent surface. Colours 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.

Part 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 ½ 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 Manufacturer's instructions.

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

3.2 Application

.1 Apply sealants, primers, joint fillers, bond breakers, to manufacturer's 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 access frames to adjacent building components, around perimeter of every external opening, to control joints in concrete slabs and where indicated.

END OF SECTION