PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Self adhesive or Torch applied elastomeric sheet membrane waterproofing.

.2 Protective cover.

1.2 RELATED SECTIONS

.1 Section 03 30 00 - Cast - In - Place Concrete: Concrete substrate.

.2 Section 07 21 15 - Insulation: Rigid Thermal Insulation Cover.

.3 Section 07 92 00 - Joint Sealants.

.4 Section 31 23 23 - Backfilling.

1.3 REFERENCES

.1 ASTM D412 - Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.

.2 ASTM D2240 - Test Method For Rubber Property - Durometer Hardness.

.3 ASTM D4637 - Vulcanized Rubber Sheet Used in Single Ply Roof Membrane.

.4 ASTM E96 - Test Methods For Water Vapour Transmission of Materials.

1.4 SYSTEM DESCRIPTION

.1 Waterproofing System: Capable of preventing moisture migration to interior.

1.5 QUALITY ASSURANCE

.1 Perform Work in accordance with NRCA Waterproofing Manual.

.2 Applicator: Company specializing in performing the work of this section with minimum five years documented experience. approved by manufacturer.

.3 Ensure waterproofing system is inspected by C prior to being covered up by other trades.

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until liquid or mastic accessories have cured.

PART 2 PRODUCTS

2.1 MANUFACTURERS

.1 Bituthene 3000 - manufactured by W.R. Grace and Co

.2 Other Acceptable Manufacturers:

.1 IKO Aquabarrier FP

.2 Bakor WP200

2.2 MEMBRANE MATERIALS

.1 Modified Bituminous Membrane: Asphalt and polymer modifiers of styrene-butadiene-styrene (SBS) type, reinforced with non-woven cross laminated polyethylene; smooth surfaced; 60 mills thick; 36 inch wide roll.

2.3 ACCESSORIES

.1 Sealant: mastic sealer as recommended by membrane manufacturer.

.2 Primer: Water based surface conditioner as recommended by membrane manufacturer.

.3 Fillet: latex modified cement mortar as recommended by membrane manufacturer.

.4 Protection Board: Rigid insulation specified in Section 07 21 15.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of waterproofing system.

.2 Verify surfaces are free of cracks, depressions, waves or projections which may be detrimental to successful installation.

.3 Verify items which penetrate surfaces to receive waterproofing are securely installed.

.4 Do not apply sheet waterproofing to damp, frozen, dirty, dusty or surfaces unacceptable to manufacturer.

3.2 PREPARATION

.1 Protect adjacent surfaces not designated to receive waterproofing.

.2 Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions.

.3 Do not apply waterproofing to surfaces unacceptable to manufacturer

.4 Seal cracks and joints with recommended material and sealant. Use proper depth-width ratio as recommended by sealant manufacturer.

.5 Fillet inside corners with material compatible with sheet membrane.

.6 Apply primer at a rate recommended by the materials manufacturer. Protect surface conditioner from rain or frost until dry.

3.3 INSTALLATION

.1 Install membrane waterproofing in accordance with manufacturer's instructions.

.2 Cover inside and outside corners with 12 inch wide strip of membrane.

.3 Roll out membrane. Minimize wrinkles and bubbles.

.4 Remove release paper layer. Roll out on substrate with a mechanical roller to encourage full contact bond. Or:

.5 Apply membrane by torch application, coated side down.

.6 Lap sides and ends in accordance with membrane manufacturer's instructions.

.7 Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.

.8 Weather lap joints on sloped substrate in direction of drainage. Seal joints and seams.

.9 Install elastomeric sheet waterproofing to all concrete basement walls below finish grade and where indicated.

.10 Seal membrane and flashings to adjoining surfaces. Apply a trowelled bead of mastic to all vertical and horizontal terminations.

.11 Seal items protruding to or penetrating through membrane and install counter flashing membrane material.

.12 Seal all daily terminations with trowelled bead of mastic.

3.4 INSTALLATION PROTECTION BOARD

.1 Have waterproofing inspected and approved prior to installation protection board

.2 Place protection board directly against membrane; butt joints.

3.5 PROTECTION OF FINISHED WORK

.1 Do not permit traffic over unprotected or uncovered membrane.

.2 Protect membrane from damage by adhering protection board, applied with mastic over membrane surface. Scribe and cut boards around projections and interruptions.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Work in this section consists of furnishing all labour, material, equipment, supervision, and incidentals as necessary to prepare the existing substrate and install a complete traffic-bearing waterproofing membrane system. Existing surface preparation is also included in this section.

1.2 RELATED SECTIONS

.1 Section 07 92 10 – Concrete Joint Sealants.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C957/C957M-10, Standard Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane With Integral Wearing Surface.

.2 ASTM C1127-01(2009), Standard Guide for Use of High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with an Integral Wearing Surface.

.3 ASTM D4263-83(2005), Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.

.2 Canadian Standards Association (CSA)

.1 CSA- S413-07, Parking Structures.

.3 International Concrete Repair Institute (ICRI)

.1 ICRI concrete Repair Terminology (2010 Edition).

.2 ICRI Guideline No. 310.2–1997, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays (formerly No. 03732).

1.4 MEASUREMENT PROCEDURES

.1 No measurement will be made under this section.

1.5 SUBMITTALS

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

.2 Upon request, manufacturer to submit independent laboratory certification attesting that the materials conforms to the latest edition of ASTM C957. Complete documentation, including a referenced method, the material specification limits, and typical test results to be included.

1.6 QUALITY ASSURANCE

.1 Contractor Qualifications:

.1 Minimum of 5 years experience in application of specified (or similar) products on projects of similar size and scope.

.2 Successful completion of a minimum of 5 projects of similar size and complexity to specified Work within the last 3 years.

.2 Field Mock-up:

.1 Install field mock-up at Project site or pre-selected area of building or location approved by Contract Administrator. Install material in accordance with this Section.

.2 Provide mock-up of at least 100 square feet to include surface profile, sealant joint, crack, flashing, and juncture details and allow for evaluation of slip resistance and appearance.

.3 Field mock-up will be standard for judging workmanship on remainder of Project.

.4 Maintain field sample during construction for workmanship comparison.

.5 All costs associated with the installation of the field mock-up are to be included in the fixed price for membrane installation.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Comply with Section 01 61 00.

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

.3 Store tightly sealed materials off ground and away from moisture, direct sunlight, extreme heat, and freezing temperatures.

.4 Keep materials in manufacturer’s original, unopened containers and packaging until installation.

.5 Protect materials during storage, handling, and application to prevent contamination or damage.

1.8 PROJECT CONDITIONS

.1 Environmental Requirements:

.1 Ensure that substrate surface and ambient air temperature are minimum of 4°C and rising at application time and remain above 4°C for at least 24 hours after application. Ensure that frost or frozen surfaces are thawed and dry.

.2 Ensure that substrate surface and ambient air temperature are below of 32°C and remain below 32°C for at least 8 hours after application.

.3 Do not apply material if snow, rain, fog, and mist are anticipated within 12 hours after application. Allow surfaces to attain temperature and conditions specified before proceeding with application.

1.9 WARRANTY

.1 The system manufacturer shall furnish a written single-source performance warranty that the membrane system will be free of defects related to workmanship or material deficiency for a ten (5) year period from the date of Substantial Performance. The following problems shall be specifically covered under the warranty:

.1 cohesive or adhesive failure of the system;

.2 deficiencies resulting in crack-bridging failure of the system;

.3 leakage as a result of any installation or material deficiency.

.2 The waterproofing contractor shall supply the Contract Administrator with a written and signed document, guaranteeing that all work (supply and installation of membrane) completed shall remain as installed, free from any application defect and to be bonded, for a period of three (3) years from date of acceptance of the Work of this trade and so stated by the Contract Administrator.

Part 2 Products

2.1 MANUFACTURERS

.1 The waterproofing membrane shall be of the same manufacturer throughout the work of this section.

.2 Alternates to acceptable manufacturer will be considered only on basis of written requests by the Contractor at the time of tender. Include substantiation of product performance and confirmation that it meets or exceeds the performance criteria specified herein.

.1 Alternates will be subject to approval based on performance requirements. A site mockup will also be required to confirm suitability.

2.2 MATERIALS

.1 The waterproofing membrane shall be complete system of compatible materials including primer coat, base coat, top coats, flashings, aggregates and miscellaneous materials as required by the system manufacturer and meet the following performance requirements.

.1 Compliance:

.1 ASTM C957/C957M.

.2 [Sealant Waterproofing & Restoration Institute Deck Coating Validation.]

.2 Weight loss of base coat: to ASTM C1250

.1 Maximum 20%.

.3 Low Temperature Flexibility and Crack Bridging to ASTM C1305 (modified):

.1 no cracking in base coat.

.4 Adhesion-in-Peel after Water-Immersion (Base Coat) to ASTM C794 (modified):

.1 Concrete: minimum 22.2 N (5 lbf).

.5 Chemical resistance to ASTM D471 (modified), average tensile retention:

.1 Water exposure: minimum 70%.

.2 Ethylene glycol exposure: minimum 70%.

.3 Mineral spirits exposure: minimum 45%.

.6 Weather Resistance and recovery from elongation:

.1 Recovery from elongation: minimum 90%

.2 Average tensile retention: minimum 80%

.3 Elongation retention: minimum 90%

.7 Abrasion resistance: to ASTM C501(modified):

.1 Maximum 50 mg.

.8 Stability: to ASTM C957

.1 Minimum 6 months.

2.3 ACCEPTABLE SYSTEMS

.1 Duodeck by Duochem Inc.

.1 Primer: as per manufacturer's recommendations.

.2 Base Coat: Duochem 390 at 25 wet mils.

.3 Wearing Surface Coat: Duochem 392 at 25 wet mils with 16-30 mesh silica sand at 10-25 lbs./100 ft².

.2 Sonoguard by BASF Building Systems

.1 Primer: as per manufacturer's recommendations.

.2 Base Coat: Sonoguard Base Coat at 30 wet mils.

.3 Wearing Surface Coat: Sonoguard Top Coat at 25 wet mils with 16-30 mesh silica sand at 10-25 lbs./100 ft².

.3 Peda-Gard by Neogard.

.1 Primer: as per manufacturer's recommendations.

.2 Base Coat: 70400 polyurethane at 30 wet mils.

.3 Wearing Surface Coat: 7400 series polyurethane at 25 wet mils with 16-30 mesh silica sand at 10-25 lbs./100 ft².

2.4 ACCESSORIES

.1 Sealants: to Section 07 92 10.

Part 3 Execution

3.1 PROTECTION

.1 Protect adjacent surfaces against any damage that could result from the waterproofing installation.

3.2 EXAMINATION

.1 Inspect existing caulked joints to ensure there is no deteriorated sealant, adhesion loss or non elastomeric sealants installed in joints. Remove and replace all deficient sealant in accordance with Section 07 92 10.

.2 Inspect all deck penetrations, including electrical, lighting, signage, plumbing, HVAC, fire sprinkler piping for watertight seal. Remove and replace deficient sealant in accordance with Section 07 92 10 and as shown on the drawings.

3.3 SURFACE PREPARATION

.1 Substrates must be sound and free of dust, dirt, laitance, paints, oils, grease, curing compounds, or any other contaminants.

.2 Preparation of Concrete Surfaces:

.1 All new concrete surfaces to have minimum compressive strength of 21 MPa and be cured for minimum of 28 days or 80 percent of design strength.

.1 All surfaces must be clean and dry. Ensure relative humidity is below 75% at 40% of the slab depth.

.2 There may be surface voids, pop outs, or rough areas of repair which must be prepared prior to membrane application. Limit surface irregularities to within 1/16". The concrete deck surface shall be made free of all ridges, surface voids, bugholes, and sharp projections.

.1 Smooth out localized ridges, voids, bug holes, popouts, and scaled areas (generally 1/16 to 1/8 inch), which are otherwise sound, by applying a levelling material consisting of epoxy resin and silica sand mixture.

.1 Profile and prepared substrate by bush hammering, sandblasting, shot blasting, and/or grinding to obtain a smooth surface with a profile of ICRI-CSP-3 or greater.

.2 Apply a slurry coat with a flat squeegee to fill in the voids. The slurry coat would consist of resin mixed with 2-3 parts 20/40 or 16-30 mesh silica sand.

.3 Fill larger voids with a mortar consisting of resin with 4-5 parts silica sand. Where defects are shallow or sporadic apply resin neat, tight squeegee and broadcast to refusal

.4 While the resin is still wet, broadcast silica sand (16-30 mesh) to refusal, allow to cure then remove all loose sand. The repair area must have a sand finish, not smooth. If a smooth surface results, it must be sandblasted or shotblasted.

.5 The costs of localized repairs are to be carried in the fixed price for the membrane installation.

.3 Larger areas of scaling, top surface deterioration will be repaired by the mechanical removal of the deteriorated concrete and infilling with a proprietary repair mortar or concrete in accordance with the applicable Sections. The cost of these repairs will be paid for on a unit price basis.

.4 Shotblast all horizontal surfaces to remove existing coatings, laitance, and miscellaneous surface contamination, and to clean and texture the surface. The specified surface profile is ICRI-CSP-3.

.5 Sandblast all perimeters, vertical projections, and areas not accessible by shotblasting to remove existing coatings, laitance, and miscellaneous surface contamination, and to clean and texture the surface. The specified surface profile is ICRI-CSP-3.

.6 Additional surface preparation may be required where contamination remains after the initial surface preparation and cleaning. Costs for additional cleaning, shotblasting and/or sandblasting are to be included in the Contractor's price.

.7 Surfaces contaminated with oil, grease, car fluids or other materials, are to be vigorously scrubbed with a stiff bristle broom and a strong non-sudsing detergent acceptable to the manufacturer. Thoroughly wash, clean, and dry surface. Where oil or other contaminants penetrate deep into the concrete, removal by mechanical methods may be required and will be paid for on a unit price basis.

.8 After the concrete surface has been prepared to the required soundness and surface profile, complete final cleaning by vacuuming and/or air blasting with oil free compressed air to remove the residue created by the surface preparation method and to remove spent media.

.9 Cleaned surfaces are to be covered and protected against exposure to vehicles, dust, and debris.

.10 If the prepared surface becomes wet, or is contaminated, repeat surface preparation as described above.

.11 Install membrane to prepared and approved surfaces within 24 hours of completion of surface preparation.

.3 Surface Preparation of Metals:

.1 Sandblast or wire brush all incidental metal to bright metal. Prime surfaces according to manufacturer's recommendations.

.2 Vent, drain pipe, and post penetrations: Clean metal surfaces to bright metal and prime with manufacturer approved primer. Allow to dry. Reprime surfaces according to manufacturer's recommendations.

.3 Install appropriate sealant cant as shown on drawings. Refer to Section 07 92 10. Allow sealant to cure.

3.4 APPLICATION

.1 The elastomeric coating shall be applied in strict accordance with the system manufacturer's recommendations, by a certified installer with proven experience with the specified systems. Where discrepancies exist between the manufacturer's specifications, project specifications and drawings, the more stringent will govern.

.2 The elastomeric coating shall be applied in strict accordance with the system manufacturer's recommendations, by a certified installer with proven experience with the specified systems.

.3 Unless otherwise indicated, all costs associated with detailing joints, surface defects, cracks and joints, terminations, and corners described above are to be included in the fixed price for membrane installation.

.4 Cracks and Joints:

.1 Rout and clean cracks and joints over 1/16" wide to minimum of 1/4" wide x 1/4" deep as directed by the Contract Administrator. Joint sizes will be determined on-site.

.1 Install bond breaker tape, prime joint faces and seal with manufacturer approved sealant in accordance with Section 07 92 10. Allow sealant to cure. Costs associated with the routing and caulking of joints and random cracks will be paid for on a unit price basis.

.2 Pre-stripe all joints and cracks (sealed or not) with 25 wet mils of base coat. Note: Increase application rate if required by manufacturer's specifications. Fill and overlap joint or crack 3 inches on each side. Costs associated with the pre-striping of random cracks, and caulked joints are to be included in the fixed price for membrane application.

.5 Inside Corners and Penetrations:

.1 Sealant cants to be installed at all inside corner details.

.2 Prime surface and form sealant cant into corner at junction of all horizontal and vertical surfaces (e.g. wall sections, curbs, or columns). Unless otherwise noted on the drawings, install bond breaker tape or 1/4" diameter foam rod in corner and apply 1" x 1" (25 mm x 25 mm) cant of sealant. Tool to 45 degree cant. Allow sealant to cure.

.3 Prime and apply 25 wet mils of base coat over sealant cant and minimum 4 inches (100 mm) up vertical surface and onto deck surface.

.4 At locations of potential high movement, install reinforcing fabric and/or membrane flashing sheet in accordance with manufacturer's recommendations.

.5 Costs associated with preparing and detailing corners and penetrations are to be included in the fixed price for membrane installation.

.6 Use slope grade base coat for sloped areas and vertical surfaces.

.6 Vertical Terminations:

.1 Waterproofing membrane to extend minimum 6 inches up all vertical surfaces, unless otherwise approved by the Contract Administrator.

.2 Apply masking tape at at appropriate height to provide clean and straight termination.

.3 Costs to be included in the fixed price for membrane installation.

.7 Outside Corners:

.1 Round all outside corners to create a 3/8" (10 mm) fillet.

.2 Prime and apply 25 wet mils of base coat minimum 4 inches (100 mm) up vertical surface and onto deck surface.

.3 Costs associated with preparing and detailing outside corners to be included in the fixed price for membrane installation.

.8 Horizontal Terminations:

.1 Rout a 3/8" wide by 1/4" deep reglet into concrete deck where coating system will be terminated.

.2 Prime surface and fill reglet with sealant in accordance with Section 07 92 10. Bond breaker tape will not be required in this instance.

.3 Costs associated with completing horizontal terminations shown on the Drawings are to be included in the fixed price for membrane installation.

.9 Primer: Where required by manufacturer, apply manufacturer's specified primer to all areas receiving deck coating. Apply at to manufacturer's recommendations.

.1 Roll apply uniform coat to penetrate concrete surface, avoid puddling.

.2 Force primer into pores and voids to eliminate pinholes.

.3 Do not apply Primer over prestriping.

.4 Allow primer to dry tack free.

.5 Apply membrane base coat [same working day][or][within manufacturer’s specified timeframe].

.10 Base Coat:

.1 All preparatory work must be completed and cured before application of membrane basecoat begins.

.2 Apply base coat with properly sized squeegee to arrive at required [wet][dry] mil thickness. Back roll to level base coat.

.3 Apply base coat to achieve a dry film thickness of 25 mils to entire deck surface, over coating prepared cracks, joints, and integral flashings. Verify mil thickness of all coats by use of wet mil thickness gauge.

.4 Use slope grade material for sloped areas and vertical surfaces.

.5 Allow base coat to cure before proceeding with top coat.

.11 Top Coat:

.1 Ensure previous coat is free of dust which may inhibit bond. If dust is present, clean surface according to manufacturer’s recommendations.

.2 Apply top coat with properly sized squeegee to arrive at required wet mil thickness. Back roll to level coat. Verify mil thickness of all coats by use of wet mil thickness gauge.

.3 Broadcast aggregated at specified rate to produce an even finish consistent with field mockup. Work in small sections to ensure aggregate is applied before the membrane begins to skin over.

.4 Back roll aggregate into top coat immediately with short nap roller lightly wetted initially with top coat. Apply sufficient pressure to encapsulate aggregate and distribute evenly.

.5 Allow top coat to cure before opening to traffic. Extend curing time as required at low temperatures.

.12 Plan membrane installation carefully to avoid unnecessary walking in freshly applied material.

3.5 FIELD QUALITY CONTROL

.1 Calculate and submit for review by the Contract Administrator, theoretical wet mil thickness and coverage rates required for each phase of the installation. Make allowances for loss of material resulting from surface irregularities and detailing.

.2 Confirmation of theoretical wet mil film thickness (Applicable to membrane base coat and wearing coat(s)):

.1 Wet mil thickness measurements will be taken at random locations throughout the application of all coats of the membrane.

.2 Apply additional material where the measure wet mil thickness is 5 mils less than the specified wet mil thickness.

.3 Confirmation of dry mil film thickness (Applicable to membrane base coat only) :

.1 Cut tests of the membrane base coat will be completed at locations selected by the Contract Administrator to confirm thicknesses.

.2 If a discrepancy exists between the theoretical wet mil thickness and the measured dry mil thickness, dry mil thickness readings will govern.

.3 A minimum of five (5) cut tests will be completed for each day of application. The Contract Administrator will measure the thicknesses using a microscope and/or micrometre and the average thickness calculated. The base coat application will be considered acceptable if the average thickness is **not less than 25 dry mils**. The following remedial work will be required where membrane thickness is less than specified.

.1 Average thickness is less than 25 dry mils: place additional 8 wet mils of material to increase average thickness to greater than 25 dry mils. Contract Administrator will determine extent of the area requiring additional application.

.2 Individual cut test reading is less than 18 dry mils: place additional 8 wet mils of material. Contract Administrator will determine extent of the area requiring additional application.

.4 Unless the Contract Administrator deems the waterproofing contractor to be negligent in the application of the membrane, costs associated for the application of additional membrane material will be paid for by the City via the unit price rates.

.4 Manufacturer's Field Service. Final inspection: Warranty request. Manufacturer's representative will inspect finished surface preparation, application, and finished coating and may require further preparation or application to achieve appropriate result. In no case will manufacturer's representative approve surface or finish if following conditions are found: pinholes, insufficient coating thickness, or any other conditions, that, in manufacturer's representative's opinion, may cause failure of installation.

.1 Acceptance of any stage of the work by the manufacturer’s representative does not necessarily reflect the opinion of the Contract Administrator.

.2 Do not take instructions directly from the manufacturer’s representative unless approved by the Contract Administrator.

3.6 CLEAN UP

.1 Clean site of refuse of this work, including adjacent areas or fixtures. Use of manufacturers applied solvent will be required. Use caution as solvents are extremely flammable.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Board insulation at cavity wall construction, perimeter foundation wall.

.2 Batt insulation.

1.2 RELATED SECTIONS

.1 Section 04 20 00 - Unit Masonry: Cavity space for thermal board insulation.

.2 Section 06 10 00 - Rough Carpentry.

.3 Section 07 52 13 - SBS modified Bituminous Roofing.

1.3 REFERENCES

.1 ASTM C578 - Preformed, Cellular Polystyrene Thermal Insulation.

.2 ASTM D2842 - Water Absorption of Rigid Cellular Plastics.

Part 2 Products

2.1 INSULATION MATERIALS

.1 Rigid Insulation (foundation): CAN/ULC S701-97, Type 4, extruded cellular polystyrene, square edges; thickness as indicated on drawings

.1 Acceptable Manufacturers: Dow Chemical; Owens Corning.

.2 Rigid insulation (SBS Roof): Specified in Section 07 52 13.

.3 Batt Insulation: ASTM C665; preformed glass fiber batt, roll, blanket; friction fit.

.1 Acceptable manufacturers:

.1 Owens Corning

.2 Johns Manville.

.4 Batt Insulation (acoustic): ASTM C665; preformed glass fibre batt, roll, blanket; friction fit.

.1 Acceptable manufacturers:

.1 Owens Corning.

.2 Johns Manville.

.5 Primer: Type recommended by insulation manufacturer.

2.2 ACCESSORIES

.1 Protective Boards (upper 24” foundation): mineral fibre cement board; manufactured by James Hardie, ½” thick.

.2 Protective Board (Below grade): 1/8” hardboard; masonite.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that substrate, 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, materials or substances that may impede installation.

.3 Verify insulation boards are unbroken, free of damage, with face membrane undamaged.

.4 Verify surfaces within walls being insulated have been inspected and approved.

3.2 RIGID INSULATION - FOUNDATION PERIMETER

.1 Fasten insulation and ½" cement board protection board to foundation wall with Tapcon concrete fasteners with 25 mm dial washers, 6 per 24" x 8' board.

.2 Cut and fit insulation tight to protrusions or interruptions to the insulation plane.

3.3 RIGID INSULATION – ROOF

.1 Refer to Section 07 52 13 for installation of insulation on flat SBS roof.

3.4 BATT INSULATION

.1 Install batt insulation locations as noted on drawings without gaps or voids.

.2 Fit insulation tight in spaces and behind exterior side of mechanical and electrical services leaving no gaps or voids.

3.5 ACOUSTIC INSULATION

.1 Install acoustic insulation to walls indicated on drawings.

.2 Fit insulation tight in spaces and tight to one side of mechanical and electrical services leaving no gaps or voids.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Sheet and sealant materials for controlling vapour diffusion.

.2 Sheet air barriers.

1.2 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 07 52 13 - SBS Membrane Roofing:

.3 Section 07 92 00 - Joint Sealant.

1.3 REFERENCES

.1 ASTM C920 - Elastomeric Joint Sealants.

.2 ASTM E283 - Test Method For Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen..

1.4 SEQUENCING

.1 Sequence Work to permit installation of materials in conjunction with other barrier materials and seals.

.2 Do not install vapour barriers until items penetrating it are in place.

1.5 WARRANTY

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

Part 2 Products

2.1 VAPOUR BARRIER

.1 Film Type vapour barrier: CAN2-51.33M, Translucent polyethylene film, 0.06 inch thick for walls and ceiling.

2.2 AIR BARRIER

.1 Air Barrier: spun bonded polyolefin or polypropylene

.1 Acceptable materials:

.1 Tyvek Building Wrap manufactured by Dupont Canada.

.2 Typar Housewrap manufactured by Reemay Inc.

.3 Styrofoam Weathermate Plus manufactured by Dow Canada.

2.3 SEALANTS

.1 Sheet vapour Barrier: sealant to membrane manufacturer's recommendations.

.2 Film vapour barrier: acoustic sealant specified in Section 07 92 00.

2.4 ACCESSORIES

.1 Tape: permanent acrylic adhesing back, polypropylene, 3M Contractors Sheathing Tape.

.2 Vapour Barrier transition strip: Self Adhesive: SBS modified bitumen membrane reinforced with glass scrim; 1 mm thick minimum.

.1 Acceptable manufacturers: Blueskin SA, manufactured by Bakor; Perma Barrier manufactured by Grace Construction Products; Sealtight Air Shield by W.R.Meadows. Aquabarrier AVB by IKO.

.2 Primer to membrane manufacturers recommendations.

.3 Sealants: As recommended by membrane manufacturer

Part 3 Execution

3.1 EXAMINATION

.1 Verify condition of substrate and adjacent materials are acceptable for application of the product.

3.2 VAPOUR BARRIER

.1 Install preformed polyethylene vapour barrier box behind all electrical boxes in exterior wall . Staple and seal flanges to film vapour barrier.

.2 Attach a 24 inch wide vertical strip of poly film on exterior wall at all locations where interior partitions will intersect.

.3 Prior to installation of sheet polyethylene film, provide a continuous bead of sealant around perimeter of poly film at electrical outlets and at poly wrap at doors and windows.

.4 Install polyethylene film using the largest sheets possible to minimize seams. Overlap seams minimum 12 inches and provide continuous bead of sealant between layers of film. Seal any perforations with polyethylene tape.

.5 Provide continuous bead of sealant along top and bottom of walls and press poly film into sealant. Staple film edges at minimum 24 incheso.c.

.6 Tape poly film around all protrusions from wall.

3.3 AIR BARRIER

.1 Apply air barrier over exterior surfaces of walls.

.2 Lap minimum of 12” and seal with tape.

.3 Fasten to framing or strapping at 24” on centre.

.4 Seal to window and door frames. Seal to all penetrations in exterior walls.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Demolition and replacement of roof system.

.2 New modified bitumen membrane roofing, vapour barrier, insulation and base flashings.

1.2 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 07 21 15 - Insulation.

.3 Section 07 28 00 - Air and Vapour Barriers.

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

1.3 REFERENCES

.1 CAN/CGSB-51.26-M86 – Urethane and Isocyanurate Boards, faced.

.2 CRCA (Canadian Roofing Contractors Association) "Roofing Specification"

1.4 SYSTEM DESCRIPTION

.1 SBS Modified Bitumen Conventional Roofing System: Two ply membrane system with vapour barrier, insulation, and flashings.

1.5 QUALITY ASSURANCE

.1 Perform Work in accordance with CRCA Roofing and Waterproofing Manual and manufacturer's instructions.

1.6 QUALIFICATIONS

.1 Manufacturer: Company specializing in manufacturing the products specified in this section with three years documented experience.

.2 Applicator: Company specializing in performing the work of this section with three years experience and approved by system manufacturer.

1.7 REGULATORY REQUIREMENTS

.1 Conform to applicable code for roof assembly fire hazard requirements.

1.8 MANUFACTURERS REPRESENTATIVE

.1 The roofing material manufacturer shall delegate a representative to visit the work site at commencement of work and periodically during work in progress.

.2 At all times the contractor shall permit and facilitate access to the work site and roofs to manufacturers representative.

1.9 INSPECTION / TESTING

.1 Coordinate inspection of roof assembly.

.2 Testing and inspection of roof installation will be performed by an independent inspection firm appointed and paid for by the City. Testing / inspection will be performed so as to least encumber the performance of the work.

.3 The cost of inspection on the areas being evaluated shall be paid from the cash allowance. Pay for costs of additional inspections as required due to improper performance of work.

.4 If, during progress of Work, tests indicate that materials do not meet specified requirements, remove defective work, replace and retest at own expense, as directed by the Contract Administrator.

1.10 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store, protect, and handle products to site.

.2 Deliver products in manufacturer's 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.

1.11 ENVIRONMENTAL REQUIREMENTS

.1 Do not apply roofing membrane to damp or frozen deck surface.

.2 Do not apply roofing membrane during inclement weather.

.3 Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.12 COORDINATION

.1 Coordinate the existing roof removal with the installation of new roof system.

.2 Coordinate the work with installing associated metal flashings as the work of this section proceeds.

1.13 FIRE PROTECTION

.1 Adhere to manufacturers fire safety regulations.

.2 At the end of each work day, survey roof with a heat detector gun to spot any smoldering or concealed fire. Workers must be on site minimum one hour after torch application. Do not apply torch directly to old and dry wood surfaces. Apply Soprema fire guard tape at all parapet and curb junctions, or where there is a risk of flame entering building components.

.3 Maintain a clean site and have one approved ABC fire extinguisher within 6 meters of each roofing torch. Comply to all safety measures described in technical data sheets. Torches shall not be placed near combustible or flammable products.

1.14 WARRANTY

.1 Provide a 10 year manufacturer's warranty.

Part 2 Products

2.1 MANUFACTURERS - MEMBRANE MATERIALS

.1 Soprema Waterproofing Inc.

.2 IKO Commercial Roofing.

.3 Bakor.

2.2 MEMBRANE MATERIAL

.1 Membrane composition : bitumen and SBS Polymer; Reinforced.

.1 Base sheet: Thermofusable surface both sides; 180 g/sq.m. non woven polyester reinforcement; 3 mm thick.

.1 Soprema Sopralene Flam 180,

.2 IKO Torchflex TP-180 –FF-base

.3 Bakor Modified Plus NP 190G T4

.2 Base Sheet Stripping: Thermofusable surface both sides; 180 g/sq.m. non woven polyester reinforcement; 3 mm thick.

.1 Soprema Sopralene Flam 180.

.2 IKO Torchflex TP-FF-base.

.3 Bakor Modified Plus NP 180 P/P

.3 Membrane Cap Sheet: Thermofusable bottom surface; granule top surface of grey colour; 250 g/sq.m. non woven polyester reinforcement.

.1 Soprema Sopralene Flam 250 granules.

.2 IKO Torchflex TP-250-cap.

.3 Bakor Modified Plus NP250 T4

.4 Cap sheet stripping: Thermofusable bottom surface; granule top surface of grey colour; 250 g/sq.m. non woven polyester reinforcement.

.1 Sopralene Flam 250 granules.

.2 IKO Torchflex TP-250-cap.

.3 Bakor Modified Plus NP250 T4

2.3 SHEET MATERIALS

.1 Vapour barrier: CGSB 37-GP-56M SBS modified bitumen reinforced with glass fires, thermofusable bottom side sanded upper side;

.1 Soptrms Elastophene SP;

.2 Bakor Vapor Block SA.

.3 IKO Torchflex TF-95-SF.

2.4 BITUMINOUS MATERIALS

.1 Rubberized sealant:

.1 Polyroof; one part rubberized asphalt.

.2 Sopramastic 200; synthetic plasticized with bitumen and solvents.

2.5 INSULATION

.1 Insulation: ASTM C1013, polyisocyanurate foam with specially formulated facers, 2 ½" thick.

.1 Genflex Roofing Systems - Model Genflex Iso.

.2 Celotex – HyTherm AP

.3 Firestone – ISO 95+

.4 IKO - Ikotherm

.2 Tapered insulation ASTM C578 Type II, Molded expanded polystyrene board; manufactured by Plastispan. Other acceptable manufacturers AMC Styrobar.

2.6 FLASHINGS

.1 Flexible Flashings: membrane manufacturer recommended flashing materials.

2.7 ACCESSORIES

.1 Insulation Adhesive: Duotack by Soprema.

.2 Sealants: As recommended by membrane manufacturer.

Part 3 Execution

3.1 DEMOLITION

.1 Remove existing roofing system down to concrete deck.

.2 Remove all loose vapour barrier material.

.3 Only remove as much existing roof as can be covered in one days work.

3.2 EXAMINATION

.1 Verify that surfaces and site conditions are ready to receive work.

.2 Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains.

.3 Verify deck surfaces are dry and free of snow or ice.

.4 Verify all loose existing vapour barriers have been removed.

.5 Verify roof openings, curbs, pipes, conduit, sleeves, ducts, and vents through roof are solidly set, and are in place.

3.3 VAPOUR BARRIER APPLICATION

.1 Prime deck surface to membrane manufacturers recommendations

.2 Apply vapour barrier to deck in accordance with manufacturer's directions. Lap and seal seams.

3.4 INSULATION APPLICATION

.1 Apply tapered layer of insulation to vapour barrier with adhesive.

.2 Apply adhesive to the top surface of tapered insulation.

.3 Embed the second layer of polyiscoyanurate insulation into adhesive, with joints staggered minimum 6" from joints of first layer.

.4 Adhere torchable protection board to top layer of insulation, stagger joints.

.5 Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

.6 Apply no more insulation than can be covered with membrane in same day.

3.5 MEMBRANE APPLICATION

.1 Apply membrane and primer in accordance with manufacturer's written instructions, latest edition.

.2 Base sheet: Torch apply base sheet. .

.3 Base sheet stripping: Torch apply base sheet stripping in 3' widths lapping roofing 4" and side laps 3".

.4 Cap Sheet: Torch weld cap sheet to base sheet. Offset cap sheet 12" with base sheet. Side laps to be 4" and end laps to be 6". Degranulate lapped surfaces

.5 Cap sheet stripping: install caps sheet stripping in 3' widths. Side laps to be 3" ; over laps to cap sheet to be 6". Stagger base and cap sheet by 12". Run up over top of parapet.

.6 Seal membrane around roof protrusions and penetrations.

.7 Install waterproof cut-off to membrane at end of day's operation. Remove cut-off before resuming roofing.

3.6 FLASHINGS AND ACCESSORIES

.1 Apply flexible sheet base flashings to seal membrane to vertical elements.

.2 Coordinate installation of roof drains, curbs, and related flashings.

.3 Seal flashings and flanges of items penetrating or protruding through the membrane.

3.7 CLEANING

.1 In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.

.2 Repair or replace defaced or disfigured finishes caused by work of this section.

3.8 PROTECTION

.1 Protect building surfaces against damage from roofing work.

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

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Coping, parapet, cap, flashings.

.2 Counter flashings for roof hatches.

.3 Counter flashings at roof mounted equipment and vent stacks.

1.2 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry:

.2 Section 07 52 13-SBS Modified Bituminous Roofing.

.3 Section 07 92 00 - Joint Sealants.

.4 Mechanical systems.

.5 Electrical Systems.

1.3 REFERENCES

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

.2 CRCA (Canadian Roofing Contractors Association) "Roofing Specification"

.3 SMACNA - Architectural Sheet Metal Manual.

1.4 SUBMITTALS

.1 Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

.2 Submit two samples 8” x 8” in size illustrating metal finish colour.

1.5 QUALITY ASSURANCE

.1 Perform work in accordance with SMACNA standard details and requirements.

1.6 QUALIFICATIONS

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

1.7 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store, protect and handle products to site.

.2 Stack prefinished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

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

1.8 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 MATERIALS

.1 Pre-Coated Galvanized Steel: ASTM A653/A653M, G90 zinc coating; 24ga. core steel, shop pre-coated with 8000 Series Defasco coating of colour as selected by Contract Administrator.

2.2 ACCESSORIES

.1 Fasteners: Same material and finish as flashing metal, with soft neoprene washers.

.2 Protective Backing Paint: Bituminous.

.3 Sealant: Polyurethane type, specified in Section 07 90 00.

2.3 FABRICATION

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

.2 Fabricate cleats of sheet metal, same material as sheet.

.3 Form pieces in longest possible lengths.

.4 Hem exposed edges on underside ½"; miter and seam corners.

.5 Form material with flat lock seams.

.6 Fabricate corners from one piece with minimum 18" long legs; seam for rigidity, seal with sealant.

.7 Fabricate vertical faces with bottom edge formed outward ¼" and hemmed to form drip.

2.4 FINISH

.1 Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 0.4 mm.

Part 3 Execution

3.1 EXAMINATION

.1 Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set and nailing strips located.

.2 Verify roofing termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

.1 Install starter and edge strips, and cleats before starting installation.

3.3 INSTALLATION

.1 Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

.2 Apply plastic cement compound between metal flashings and felt flashings.

.3 Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

.4 Counter-flash all mechanical and electrical items projecting through membrane roofing

.5 Install prefinished flashing to all locations indicated on drawings.

.6 Seal metal joints watertight.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Fireproof firestopping materials and accessories.

1.2 RELATED SECTIONS

.1 Section 04 20 00 - Unit Masonry

.2 Section 07 92 00 - Joint Sealants.

.3 Section 09 21 16 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.3 REFERENCES

.1 ULC-S115-1995, Fire Tests of Firestop Systems, Underwriter's Laboratories of Canada (ULC)

.2 ULC - Fire Hazard Classifications.

.3 ULC-S115, Standard Method of Fire Tests of Firestop Systems.

1.4 SYSTEM DESCRIPTION

.1 Firestopping Materials: ULC to achieve a fire rating as noted on Drawings.

.2 Firestop all interruptions to fire rated assemblies, materials, and components.

.3 Fire stopping and smoke seal systems: in accordance with CAN4-S115.

1.5 SUBMITTALS

.1 Section 01 33 00 Submittal procedures.

.2 Product Data: Provide data on product characteristics, performance and limitation criteria.

.3 Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

.4 Provide cut sheets of each fire stop type with test number and products installed.

1.6 QUALIFICATIONS

.1 Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.7 REGULATORY REQUIREMENTS

.1 Conform to applicable code for fire resistance ratings and surface burning characteristics.

.2 All fire stopping products to be ULC listed for each system and penetration type.

.3 Provide certificate of compliance from authority having jurisdiction indicating approval of materials used.

1.8 ENVIRONMENTAL REQUIREMENTS

.1 Apply materials within the temperature range as recommended by the manufacturer.

.2 Maintain this temperature before, during, and for 3 days after installation of materials.

1.9 SEQUENCING

.1 Sequence work to permit firestopping materials to be installed after adjacent and surround work is complete.

Part 2 Products

2.1 MATERIALS

.1 Fire stopping and smoke seal systems: asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of CAN4-S115 and not to exceed opening sizes for which they are intended in accordance with CAN4-S115.

.2 Acceptable Manufactures:

.1 Tremco Inc.

.2 Johns Manville.

.3 Bio Fireshield

.4 Hilti.

.5 A/D Fire Protection Systems Inc.

2.2 ACCESSORIES

.1 Primer: Type recommended by firestopping manufacturer for specific substrate surfaces.

.2 Dam Material: mineral fibreboard, permanent.

.3 Installation Accessories: Clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

Part 3 Execution

3.1 EXAMINATION

.1 Verify openings are ready to receive the work of this section.

3.2 PREPARATION

.1 Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.

.2 Install backing and damming materials to arrest liquid material leakage.

3.3 APPLICATION

.1 Install material at walls or partition openings which contain penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.

.2 Install firestop materials in accordance with published ULC systems.

.3 Apply primer and materials in accordance with manufacturer's instructions.

.4 Apply firestopping material in sufficient thickness to achieve rating to uniform density and texture.

.5 Place foamed material in layers to ensure homogenous density, filling cavities and spaces. Place sealant to completely seal junctions with adjacent dissimilar materials.

3.4 CLEANING

.1 Clean adjacent surfaces of firestopping materials.

3.5 PROTECTION OF FINISHED WORK

.1 Protect adjacent surfaces from damage by material installation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Preparing substrate surfaces.

.2 Sealant and joint backing.

1.2 RELATED SECTIONS

.1 Section 07 13 00 - Dampproofing: Sealants required in conjunction with waterproofing.

.2 Section 07 21 15 - Insulation.

.3 Section 07 28 00 - Air and Vapour Barriers

.4 Section 07 84 00 - Firestopping: Sealants required in conjunction with firestopping.

.5 Section 07 52 13 - SBS Modified Bitumen Roofing: Sealants required in conjunction with roofing.

.6 Section 07 62 00 - Sheet Metal Flashing and Trim: Sealants required in conjunction with metal flashings.

.7 Section 08 80 00 - Glazing: Sealants required in conjunction with glazing methods.

.8 Section 09 21 16 - Gypsum Board Assemblies: Sealants required in conjunction with acoustic treatment.

1.3 REFERENCES

.1 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.

.2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.

.3 CAN/CGSB-19.22-M89, Mildew Resistant, Sealing Compound for Tubs and Tiles.

.4 CAN/CGSB-19.21-M87, Sealing and Bedding Compound Acoustical.

.5 ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.

1.4 SUBMITTALS

.1 Include the following paragraph for submission of physical samples for selection of finish, colour, texture, etc.

.2 Samples: Submit two samples, ¼” x 6” in size illustrating sealant colours for selection.

1.5 QUALITY ASSURANCE

.1 Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

1.6 QUALIFICATIONS

.1 Applicator: Company specializing in performing the work of this section with minimum Three years documented experience and approved by manufacturer.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.8 WARRANTY

.1 Provide five year warranty.

.2 Warranty: Include coverage for installed sealants and accessories which fail to achieve air tight seal, water tight seal, exhibit loss of adhesion or cohesion, or do not cure.

Part 2 Products

2.1 SEALANTS

.1 Acrylic Sealant (Type A): CAN/CGSB-19.17, paintable; single component, solvent curing, non-staining, non-bleeding, non-sagging; Tremco latex 100. Colour to be selected by Contract Administrator.

.2 Acoustic Sealant (Type B): CAN/CGSB-19.21, Acoustic grade, single component, solvent release, non-skinning, non-sagging, synthetic rubber, Tremco Acoustic Sealant Grey colour.

.3 Polyurethane Sealant (Type C): CAN/CGSB-19.13, single component, chemical curing, non-staining, non-bleeding, Elongation Capability25 percent, non-sagging ; Tremco Dymonic; PRC RC-1; Sonneborn NP-1; Vulkem 931. Colour as selected by Contract Administrator

.4 Silicone Sealant (Type D): CAN/CGSB-19.22, single component, fungus resistant, acidic curing, non-sagging, non-staining, non-bleeding; General Electric 'Sanitary 1700; Dow Corning 786. Colours as selected by Contract Administrator.

2.2 ACCESSORIES

.1 Primer: Non-staining type, recommended by sealant manufacturer to suit application.

.2 Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

.3 Joint Backing: ASTM D1056; round, closed cell polyethylene foam rod; oversized 30 to 50 percent larger than joint width.

.4 Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that substrate surfaces and joint openings are ready to receive work.

.2 Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

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

.2 Clean and prime joints in accordance with manufacturer's instructions.

.3 Perform preparation in accordance with manufacturer's instructions.

.4 Protect elements surrounding the work of this section from damage or disfiguration.

3.3 INSTALLATION

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

.2 Measure joint dimensions and size materials to achieve required 2:1 width/depth ratios.

.3 Install bond breaker where joint backing is not used.

.4 Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

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

.6 Tool joints concave.

3.4 CLEANING

.1 Clean adjacent soiled surfaces.

3.5 PROTECTION OF FINISHED WORK

.1 Protect finished installation.

.2 Protect sealants until cured.

3.6 SCHEDULE

.1 Apply sealant type 'A' to junctures of millwork items and adjacent building components and perimeter of door frames as directed by Contract Administrator.

.2 Apply sealant type 'B' in two continuous beads around perimeter of plates, at top, bottom and sides of all acoustic rated partitions.

.3 Apply double bead sealant type 'B' around designated fire separations ie. before setting top and bottom plates, where studs set around other materials, etc

.4 Apply sealant Type `C' to exterior condition joints between door frames, window frames, siding components, masonry control joints, etc. and where indicated on drawings.

.5 Apply sealant Type 'D' to perimeter joints of all sanitary components, vanities, counters, sinks, water closets, shower heads, etc. unless noted otherwise on drawings.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 This section covers the installation of an elastomeric joint sealant in cleaned and routed cracks and joints in concrete. The work covered under this section consists of all labour, material, equipment, supervision and incidentals required to prepare and seal the joints and cracks as shown and detailed on the drawings, and as specified herein.

1.2 RELATED SECTIONS

.1 Section 03 30 00 – Cast-in-Place Concrete.

.2 Section 03 93 20 – Pressure Grouting.

.3 Section 03 93 30 – Form and Pour.

.4 Section 07 18 17 – Pedestrian Traffic Coatings.

1.3 REFERENCES

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

.1 ASTM C719-93(2010), Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).

.2 ASTM C920-11, Standard Specification for Elastomeric Joint Sealants.

.3 ASTM C1193-09 Standard Guide for Use of Joint Sealants.

.4 ASTM C1330-02(2007) Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

1.4 MEASUREMENT PROCEDURES

.1 No measurement will be made under this section.

.2 The Contractor is to note that if he increases the area of repair over that originally measured of his own accord and without consultation with the Contract Administrator, he will not be paid for the increased area.

1.5 SUBMITTALS

.1 Comply with Section 01 33 00.

.2 Product Data: Submit manufacturer's technical bulletins and MSDS on each product.

.3 Samples: For each product exposed to view, manufacturer's standard bead consisting of strips of actual products showing full range of colors available.

1.6 QUALITY ASSURANCE

.1 Contractor Qualifications:

.1 Minimum of 5 years experience in application of specified (or similar) products on projects of similar size and scope.

.2 Successful completion of a minimum of 5 projects of similar size and complexity to specified Work within the last 3 years.

.2 Field Mock-Ups:

.1 Upon request, perform mock-up of required sealant Work at location identified by the Contract Administrator. Perform minimum of one mock-up for each different combination of substrates to be sealed.

.2 Install mock-ups and test in presence of sealant manufacturer's authorized representative and Contract Administrator to assure installation procedures are consistent with warranty requirements and Specifications.

.3 After sealant has achieved sufficient cure the Contract Administrator will conduct adhesion pull-tests, or non-destructive testing, at discretion of the Contract Administrator. Conduct tests per ASTM C1521.

.4 Leave approved mock-ups in place to establish standards and guidelines for acceptable installation of sealant Work and acceptable appearance.

1.7 DELIVERY STORAGE AND HANDLING

.1 Comply with Section 01 60 00.

.2 The sealant shall be delivered to the jobsite in the manufacturer's original unopened

.3 Deliver products in original factory packaging bearing identification of product, manufacturer, and batch number. Provide Material Safety Data Sheets for each product.

.4 Store products in a location protected from freezing, damage, construction activity, precipitation, and direct sunlight per manufacturer's recommendations.

.5 Handle products with appropriate precautions and care as stated on Material Safety Data Sheet.

1.8 PROJECT CONDITIONS

.1 Environmental Requirements:

.1 Ensure that substrate surface and ambient air temperature are minimum of 4°C and rising at application time and remain above 4°C for at least 24 hours after application. Ensure that frost or frozen surfaces are thawed and dry.

.2 Ensure that substrate surface and ambient air temperature are below of 32°C and remain below 32°C for at least 8 hours after application.

.3 Do not apply material if snow, rain, fog, and mist are anticipated within 12 hours after application. Allow surfaces to attain temperature and conditions specified before proceeding with application.

1.9 WARRANTY

.1 The Contractor and/or system manufacturer shall furnish a written performance warranty covering labour and materials at the time of tender submission or approval, stating that the installed sealant will be free of defects related to workmanship or material deficiency for a

minimum of five (5) years from the date of Substantial Performance. The Contractor shall co-sign the warranty and the approved warranty shall be made part of the contractual agreement. The following problems shall be specifically covered under the warranty in writing:

.1 Cohesive or adhesive failure of the seal.

.2 Abrasion or tear failure of the seal resulting from normal weathering.

.3 Moisture leakage through a sealed joint or crack.

.4 Chalking, cracking, sliding, debonding, shrinkage in the sealant.

.2 The manufacturer to provide a 5 year material warranty. and/or Contractor shall submit a detailed warranty statement consistent with the terms of this specification at the time of tender submission for approval. The approved warranty shall be made part of the contractual agreement.

Part 2 Products

2.1 MATERIALS

.1 Polyurethane sealant for use in routing and caulking of random cracks below pedestrian traffic coatings: Multi-component, non-sag, chemically curing sealant, with consistency suitable for application by hand or pressure caulking gun, or by hand tool. The sealant when completely cured shall form an elastomeric solid capable of maintaining a weatherproof seal.

.1 Compliance: ASTM C920 Type M, Grade NS, Class 25, Use T, NT, M, and A.

.2 Acceptable Products:

.1 Sikaflex 2C NS EZ Mix by Sika Canada Inc.

.2 Sonolastic SL2 (Slope Grade) by BASF Building Systems.

.2 Silicone joint sealant for use in control joints: Low-modulus, one-component, non-sag, silicone sealant with consistency suitable for application by hand or pressure caulking gun, or by hand tool. The sealant when completely cured shall form an elastomeric solid capable of maintaining a weatherproof seal.

.1 Compliance: ASTM C920, Type S, Grade NS, Class 100/25, Use T, A, M, and O.

.2 Acceptable product: NS Parking Structure Sealant by Dow Corning.

2.2 ACCESSORIES

.1 Primers, bond breakers and miscellaneous materials required to install the sealant shall be in accordance with manufacturer's recommendations, and as approved by the Contract Administrator. Use of aggregate bond breakers is prohibited.

.1 Primer: Use only manufacturer's approved primer.

.2 Closed-cell foam backing rod shall conform: to ASTM C1330.

.3 Bond breaker tape: self-adhesive, pressure sensitive tape made from TFE-flourocarbon (Teflon), polyethylene, or similar which will not react with or adhere to the sealant.

Part 3 Execution

3.1 PROTECTION

.1 Protect adjacent surfaces against any damage that could result from sealant installation.

3.2 EXAMINATION

.1 Inspect existing caulked joints and cracks to ensure there is no deteriorated sealant, adhesion loss or non elastomeric sealants installed in joints. Remove and replace deficient sealant at location identified by Contract Administrator.

.2 Inspect all deck penetrations, including electrical, lighting, signage, plumbing, HVAC, fire sprinkler piping for watertight seal. Remove and replace deficient sealant at location identified by Contract Administrator.

3.3 PREPARATION

.1 Substrates must be sound and free of dust, dirt, laitance, paints, oils, grease, curing compounds, or any other contaminants.

.2 All new concrete surfaces to have minimum compressive strength of 21 MPa and be cured for minimum of 28 days or 80 percent of design strength.

.3 Joint and crack preparation:

.1 Completely remove sealant from existing joints and cracks designated for repair.

.2 Sawcut reglet along cracks and joints identified by Contract Administrator.

.3 Reglet dimensions are to be site confirmed based on crack dimensions and pattern and be uniform over the given length. The depth of the reglet must be consistent with the type of backing material (ie. bond breaker tape, or backing rod) and sized to produce a width to depth ratio of of approximately 2:1.

.4 Thoroughly clean joints and reglets by grinding, sandblasting, or wire brushing to expose a sound surface free of contamination and in order to provide a clean, sound substrate for optimum seal adhesion.

.5 Remove loose particles present or resulting from grinding, abrading, or blast cleaning by blowing out joints with oil-free compressed air, or vacuuming prior to primer application.

.6 Ensure that surfaces to be sealed are sound, dry, free from dirt, water, frost, loose scale, corrosion, oil, grease, waterproofing or water-repellent treatments, or other contaminants which may adversely affect the performance of the sealing materials.

.7 If the substrate is suspected of being substandard, an on-site trial application is to be conducted to verify that the substrate is satisfactory. Work will not proceed until unsatisfactory conditions have been corrected in a manner acceptable to the manufacturer. All costs associated with verification to be carried by Contractor.

.8 Prior to installation of the sealant an inspection of both the joint and substrate is required to confirm the joint design and to ensure that the substrate is sound and acceptable for sealant application. A substrate that is unsound, cracked, or weak must be repaired prior to sealant.

.9 Do not proceed with Work until any unsatisfactory conditions have been corrected in a manner acceptable to the Contract Administrator.

3.4 INSTALLATION

.1 Primer: Unless otherwise approved by the sealant manufacturer, priming of all substrates is mandatory.

.1 Prime substrates as recommended by the sealant manufacturer.

.2 Primer to be installed prior to installation of the sealant backing.

.3 Allow primer to dry until all the solvent evaporates. This typically takes 15 to 120 minutes, depending on temperature and humidity.

.4 Prime only those surfaces that will be sealed with sealant the same day. If a previously primed surface that was performed the day before is encountered it must be reprimed.

.2 Sealant backup: Where joint depth requires backup, pack joints continuously with closed cell backer rod meeting ASTM C1330

.1 Backer rod to be installed under adequate compression to hold it in-place in the joint opening and to resist the pressure applied when tooling a non-sag sealant into place. Backer rod diameter to be at least 25% greater than the joint width.

.2 Do not install backer rod with a sharp tool which could puncture the rod. Ensure surface skin of the backer rod is not punctured or cut during installation. A puncture in the backer rod may result in out-gasing into the uncured sealant resulting in voids or other defects in the cured sealant.

.3 Install backer rod without stretching.

.4 Under no circumstances should backer rod that is too small for the joint be doubled up or braided together to fit the opening.

.3 Bond breaker: A bond breaker will be required in the bottom of all joints containing a rigid, non-flexible backing material to preclude three-side adhesion where movement will occur. A bond breaker is not required to prevent a sealant from adhering to a soft, flexible, sealant backing material that would not significantly restrict movement.

.1 Install bond breaker tape in joint to be sealed on top of back-up material to prevent adhesion of sealant to back-up material. The tape shall be installed continuously with no skips or voids in the tape application.

.4 Mixing:

.1 Prepare sealants that require mixing; follow manufacturer's recommended procedures, mixing thoroughly.

.2 Mix only as much material as can be applied within manufacturer's recommended application time period.

.3 Mix in a manner to prevent inclusion of foreign materials.

.5 Sealant installation:

.1 Apply sealants only within manufacturer's specified application life period. Discard sealant after application life is expired or if prescribed application period has elapsed.

.2 Application of sealants must be completed by skilled applicators installed in accordance with manufacturer's printed directions and this Section.

.3 Do not install sealant on wet or damp substrates. Wet or damp substrates should be allowed to dry before application of primer and/or sealant.

.4 Do not install sealants under conditions of precipitation or temperatures below 4°C. Use appropriate measures for protection and supplementary heating to ensure proper curing conditions in accordance with manufacturer's recommendations if application during inclement weather occurs.

.5 All sealants have a temperature range for optimum handling which can vary considerably, and should be stored at a temperature within this range for at least 4 hours before use.

.6 Do not use sealant that has started to set in its container, exceeded shelf life or installation times as stated by the manufacturer.

.7 Sealant to be installed in a manner that will completely fill the cavity formed in the joint opening by the substrates and sealant backing or bond breaker.

.8 Apply sealant by any of the common types of hand operated guns. Nozzles shall be sized and shaped to fit the intended joint opening width, which will confine the sealant to the joint and aid in building pressure to force the sealant into the cavity. joint. Ensure that mixing and placing procedures do not entrain air within the sealant.

.9 Immediately after applying the sealant, tool the bead. Tooling forces material into cavities and into more intimate contact with the substrate. Wet tooling will not be permitted.

.10 Tool sealant to produce a concave shaped surface. Specifically, the sealant and concrete are to be flush at the edges but recessed at the joint centre, forming a parabolic arc. Do not re-use any material forced outside of the joint by the tooling procedure.

.11 Sealant bead to be free of air pockets, embedded impurities, and free of ridges, wrinkles and sags.

.12 Use anti-tack solutions only with the approval and directions of the sealant manufacturer.

3.5 CLEANING

.1 Do not clean inadvertent spills or splatters of sealant on concrete or masonry with solvent because of possible permanent staining of the substrate. Scrape, wipe or scrub such spills with dry tools or rags.

.2 Clean bulk caulking guns, barrel and nozzle completely after every day's use.

.3 The special precautions recommended by the manufacturer shall be rigidly followed where hazardous materials are involved.

3.6 FIELD ADHESION TESTING

.1 Field adhesion testing of miscellaneous joints and cracks will be complete at the discretion of the Contract Administrator.

.2 Field adhesion testing will be performed during the field mockup and throughout the course of the work by the Contract Administrator in the presence of and with the assistance of the Contractor and be completed throughout the course of the work. The purpose of the field adhesion testing is to help detect application problems such as improper cleaning, use of improper primer, poor primer application, or improper joint configuration.

.3 A minimum three (3) field adhesion tests will be completed for each type of sealant used for the first 500 lineal feet and two (2) tests per 500 lineal feet thereafter.

.4 Field adhesion test criteria:

.1 Dow Corning NS: the sealant should tear cohesively within itself or elongate the 1" gauge length to 3" (300% extension) before releasing from either substrate adhesively.

.2 Urethane Sealants: the sealant should tear cohesively within itself without bond loss.

.5 At this time the joint will be inspected for complete fill. The joint should not have voids, and joint dimensions should match those shown on the drawings.

.6 This testing will be completed by the Contract Administrator in the presence of and with the assistance of the Contractor and results recorded by the Contract Administrator, retained and made available for review upon request. A sample log form has been appended with this specification.

.7 Repair of Sealant at Field Adhesion Test Locations

.1 Repair the sealant pulled from the test area by applying new sealant to the test area. Assuming good adhesion was obtained, use the same application procedure to repair the area as was used originally for the joint. Care should be taken to ensure that the original sealant surfaces are clean and that the new sealant is in contact with the original sealant.

.2 Contractor shall carry costs associated with sealant testing and repair in their bid including but not limited to access, labour, materials, etc.

END OF SECTION