1.0 GENERAL

1.1 WORK SEQUENCE

.1 Provide all labour, materials, equipment and supervision to: prepare the horizontal and vertical surfaces, detail all cracks and joints, patch perimeter and voids and install a pedestrian coating systems to areas designated on drawings Phasing of work is required as per Phasing drawings.

.2 Crack detailing to include crack face surface preparation and installation of a flexible waterproof sealant.

.3 Work to include preparation, patching, and membrane upturn at all vertical surfaces including columns, walls, cast-in-place curbs, islands, and pipe penetrations.

.4 Specified material thicknesses are minimum thicknesses, not average. Contractor shall grind down or patch rough surfaces to ensure minimum thickness of membrane is applied everywhere; or if approved by Manufacturer, additional membrane may be applied to achieve minimum thickness.

1.2 REFERENCE STANDARDS

.1	AASHTO T277-07-UL	Standard Method of Test for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration
.2	ASTM C957/C957M-10	Standard Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with Integral Wearing Surface
.3	ASTM D412-06ae2	Standard Test Methods for Rubber Properties in Tension
.4	ASTM D4541-09e1	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers (Metal Substrates)
.5	ASTM D7234-12	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers (Concrete Substrates)
.6	ASTM E96/E96M-05	Test methods for water vapour transmission of materials

1.3 SITE EXAMINATION

.1 Bidders should visit the Site and determine the slab surfaces to receive coating. Rough surfaces may require additional surface preparation after sandblast cleaning. Bid shall include all costs of surface preparation and patching of rough

surfaces. No extras for surface preparation or additional material will be entertained after bid closing.

1.4 PERFORMANCE REQUIREMENTS

.1 The pedestrian deck coating system shall satisfy the following requirements for the duration of the warranty:

.1 The system shall be totally waterproof, flexible and thermally compatible with the substrate under applicable service conditions.

.2 The system shall not allow moisture penetration at termination details, drains, upturns, or splices.

.3 The system shall remain slip resistant under its intended use, wet, snow, or dry.

.4 The system shall exhibit zero chloride permeability when tested in accordance with AASHTO T-277-07-UL test procedure for the rapid determination of the chloride permeability of concrete.

.5 The system shall withstand active cyclical crack movements to a maximum of 1.5 mm and remain waterproof.

.6 Adhesion of the coating, primer, or surface patching to the concrete substrate shall meet or exceed 0.7 MPa.

.7 Adhesion of all layers of the system to each other shall meet or exceed 0.7 MPa.

.8 The system shall not debond, crack, or wear excessively. Loss of aggregate in any area will constitute failure.

.9 The coating system shall not support combustion.

1.5 SUBMITTALS

.1 Contractor is to submit details of the coating system not indicated in these documents including material specifications, thicknesses, details at joints, cracks, upstands, walls, drains, and termination points to the Departmental Representative for review prior to starting work.

.2 Contractor is to submit installation procedures to the Departmental Representative for review prior to starting work including slab preparation requirements.

.3 Contractor shall submit a 215 mm x 280 mm product sample indicating proposed finish and material thickness to be obtained for each specific application under the Contract with Bid. These samples will represent the quality of finish of completed installation. All reds and whites are to be selected to match existing, as indicated on the drawings.

.4 If Contractor chooses to patch rough surfaces to accommodate the pedestrian deck coating, then Contractor to submit a description of the products to be used to patch rough surfaces suitable for coating application.

.5 The pedestrian deck coating applicator shall submit certificates confirming the following:

.1 The system will meet the warranty requirements as specified in this section.

.6 Provide a certificate signed by the Contractor and system manufacturer certifying the following:

.1 Surfaces to receive systems were acceptable and found to be satisfactory to receive the system, as per the Manufacturer's requirements and these Specifications. Application of coating shall imply acceptance of surfaces.

.2 Pedestrian deck coating was applied in accordance with Manufacturer's recommendations and these Specifications.

.3 Completed system conforms with system described here in.

.7 Any existing conditions, not specified, which may adversely affect the bonding or performance of the coating shall be brought to the attention of the Departmental Representative, in writing, for resolution prior to installation of the coating.

.8 Contractor shall provide electronic copies of maintenance instructions for finished surfaces prior to Substantial Performance. Hard copies shall also be provided if requested by the Departmental Representative.

1.6 PEDESTRIAN DECK COATING ACCEPTANCE

.1 If the pedestrian deck coating system fails to achieve the minimum adhesion requirement as specified in Paragraph 3.3.6, the following shall apply:

.1 If the average of the adhesion tests is between .50 MPa and .69 MPa with no test less than .60 MPa, 50 % of the pedestrian coating system price in the Contract shall be withheld until system meets the minimum adhesion requirements as specified in Paragraph 3.3.6 Contractor is to pay for all testing and all costs incurred by the Departmental Representative to prove conformance with Specifications.

.2 If the average of the adhesion tests is less than 0.49 MPa, 100% of the pedestrian coating system price in the Contract shall be withheld until the system meets the minimum adhesion requirements as specified in Paragraph 3.3.6. If the traffic coating system fails to conform to the requirements in Paragraph 3.3.6, the system shall be removed and replaced. All cost incurred by the Departmental Representative, to accommodate the removal and replacement of the traffic coating system will be the responsibility of the Contractor.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Do not install coating when ambient air temperature or substrate temperature is less than 10 degrees C. If this temperature is not reached, installation of temporary heaters is required.

.2 Maintain air temperatures and substrate base temperature of installation area above 10 degrees C for 12 hours before, during and 72 hours after installation, or until materials have adequately cured.

.3 Protect materials from moisture damage or dust contamination until adequately cured.

.4 All working conditions shall meet the requirements of the Occupational Health and Safety Act of the Province of Ontario.

.5 Contractor to provide forced air circulation during period for enclosed applications.

.6 During application of the system, the work area must be well ventilated such that odours from the system do not disturb users of the garage or building above.

2.0 PRODUCTS

2.1 PEDESTRIAN DECK COATING SYSTEMS

.1 The pedestrian deck coating system shall by a two-component fluid applied polyurethane composite waterproofing membrane and wearing surface.

.2 The pedestrian deck coating system shall be suitable for Exterior Applications.

.3 Colour to be selected by the Departmental Representative from the standard range of colours to match existing.

.4 Base Coat and Wearcourse Thickness

.1 Minimum dry film thickness of the base coat for the pedestrian deck coating systems shall be 30 Mils (0.76mm).

.2 Minimum neat dry film thickness of the wearing surface for the pedestrian deck coating systems shall be 18 Mils (0.46mm) with aggregate loadings as per manufacturers specification. Wearing surface is to be non-slip and be easily cleaned.

2.2 SURFACE PATCH MATERIALS

.1 Products used to patch rough surfaces shall be 100% solids epoxy and shall contain no additives or fillers. Coating material may be used to fill rough areas if approved by Manufacturer.

.2 No extras for surface preparation or additional coating material will be entertained after bid closing.

3.0 EXECUTION

3.1 PREPARATION

.1 Guardrail shall be removed and re-installed as required for application of coatings to slab surfaces.

.2 Preparation of horizontal and vertical surfaces is to be in strict accordance with the requirements of the system manufacturer’s recommendations and these Contract Documents including the following: preparation and smoothing of rough surfaces, detailing of slab cracks, joints and voids as required.

.3 Minimum standard of slab cleaning shall be sandblast, leaving slab surfaces free of all laitance and removing a minimum of 0.20 mm of concrete surface.

.4 Minimum standard of vertical surface cleaning shall be sandblast for all systems.

.5 Surfaces shall be cleaned of all grease and oil with an emulsifier where required which will not affect performance of the coating.

.6 New concrete surfaces shall be allowed to air dry a minimum of 14 days after moist curing and not exhibit any condensation under plastic sheet test prior to the placement of the waterproof membrane. Refer to clause 3.3.3 regarding plastic sheet test.

.7 All rough surfaces, vertical amplitude exceeding 40 mils (1.0 mm), must be ground and/or filled to provide a smooth surface.

.8 Sawcut cracks or joints shall be straight sided and follow the extent of crack. Locations of crack sealing shall be as directed by Departmental Representative. Do not overcut beyond actual extent of crack. Abrasive-blast sawcut surfaces.

.9 Remove all existing crack sealants and sand blast exposed surface.

.10 Fill sawcut cracks and joints with approved sealant materials flush with slab surface. Application to be in strict conformance to the Manufacturer's recommendations and these Contract Documents.

.11 Install a continuous 20 mm fillet bead of compatible caulking at the base of vertical surfaces receiving coating prior to application of coating system's basecoat.

.12 Provide double application of membrane at all vertical surfaces and at cracks and joints up to 1.6 mm wide.

.1 Joints greater than 1.6 mm wide to be specially detailed. Submit details to Departmental Representative for review.

.13 The preparation of vertical surfaces for membrane application shall include removal of existing paint and/or existing coating upturn by abrasive-blasting or water blasting, hand patching voids or depressions in concrete surfaces and re-pointing masonry block wall joints as required. No extras shall be entertained for this item after the award of Contract. This applies to all walls, columns, and curbs.

.14 The coating shall be turned up all vertical surfaces a minimum of 100 mm. Mask top of upturn to ensure neat straight finish to coating. All vertical surface irregularities to be patched prior to coating application.

.15 No primer or first coat shall be applied until the surface preparation has been reviewed by Departmental Representative and inspected and accepted in writing by a representative of the system manufacturer, per Clause 1.6.6.

.16 Commencement of work shall imply Contractor's acceptance of the previously prepared concrete surfaces and assumption of full responsibility for the surfaces prepared to receive the primer and membrane.

.17 Application procedures that result in toxic fumes or flammable solvent collecting or endangering workmen or building occupants are not permitted.

.18 Paint and finishes damaged by Contractor must be repaired to match existing.

3.2 INSTALLATION

.1 Prior to application of primer and membrane, test of moisture content by concrete mass shall be made by the Contractor to confirm substrate moisture content does not exceed coating manufacturers specification. The minimum number of tests shall be 1 test per 464m2 at locations designated by Departmental Representative. The Contractor may perform and pay for whatever additional tests he feels are required. Test results shall be submitted to Departmental Representative prior to coating application.

.2 System applications shall be in strict accordance with the more stringent requirements of the Manufacturer's specifications and these Contract Documents.

.3 Application of coatings along slab edge and soffit shall include additional applications at a lower application rate than used on horizontal surfaces. Additional applications shall result in minimum specified thickness of coating. Any areas of sagging and dripping coating shall be cut out and surfaces recoated in such a manner as to ensure repairs are visible and specified thicknesses are achieved.

.4 Material quantities and placement procedures are to be strictly monitored. Areas to receive a typical material batch or container volume shall have their perimeters clearly marked prior to application to ensure uniform thickness of materials.

.5 Finished surfaces shall be of uniform appearance, with no variations in light reflection, surface roughness, or ridges in sloped areas.

.6 Ensure environmental and site condition requirements as recommended by the membrane Manufacturer and these Contract Documents are suitable for installation of work of this Section.

.7 Wearcourse aggregate type, size, and distribution to be in strict conformance with Manufacturer's requirements.

3.3 INSPECTION AND TESTING

.1 Testing to be conducted by a testing agency designated by the Departmental Representative. The Departmental Representative will pay costs of inspection and testing described in this section.

.2 Contractor shall inform Departmental Representative and testing agency 24 hours in advance of work to be performed under this section.

.3 Prior to application of membrane, test of moisture content of concrete mass shall be made by taping down a 450 mm x 450 mm polyethylene sheet for a period of 16 hours minimum to detect evaporation from slab surface. Number of tests shall be designated by the membrane Manufacturer, or Departmental Representative. Minimum number to be 1 test per 464m2. Locations to be determined by Departmental Representative. Additional tests may be located by manufacturer.

.4 To confirm base coat thickness, Departmental Representative to perform wet film thickness tests and dry-film cut tests. Number of tests to be 1 test per 51m2 of coating minimum.

.5 To confirm wearcourse thickness, Departmental Representative to perform wet film thickness tests and dry-film cut tests. Number of tests to be 1 test per 102m2. of coating minimum.

.6 To evaluate bonding of membrane to substrate, and/ or basecoat to wearcourse, adhesion tests shall be conducted by means of direct tensile pull test at a minimum 7 days after installation of the system and performed by the Designated Testing Agency. Number of tests shall be 1 test per 232m2. of membrane, minimum. Adhesion of the membrane layers to each other and to the concrete substrate shall exceed 0.7 MPa.

.7 Additional tests may be performed at the discretion of the Departmental Representative to confirm in-situ material thickness and bond.

.8 Contractor to repair coating system at test locations at no extra cost.

END OF SECTION