

## **PART 1 GENERAL**

### **1.01 REFERENCES**

- .1 All Referenced Standards are latest editions
- .2 ASTM D412 Standard Test Methods for Rubber Properties in Tension.
- .3 ASTM D4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
- .4 ASTM E96 Test Methods for Water Vapour Transmission of Materials.

### **1.02 SITE EXAMINATION**

- .1 Bidders should visit the Site and review the condition the surfaces to receive coating. Rough surfaces may require additional surface preparation after 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.
- .2 Provide all unsatisfactory surfaces and conditions in writing to the Departmental Representative prior to start of Work.
- .3 Starting work of this Section implies acceptance of existing conditions.
- .4 Submit a certified statement issued by the applicator, attesting that all areas and surfaces have been inspected and found satisfactory to receive the wall coating.

### **1.03 PERFORMANCE REQUIREMENTS**

- .1 The wall 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, upturns or splices.

.3 The system shall meet moisture vapour transmission criteria when tested in accordance with ASTM E96 Procedure.

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

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

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

.7 The system shall not debond, crack, discolour, or chalk. The system shall meet accelerated weathering criteria (3000hrs) of ASTM D822.

.8 The coating system shall be UV stable and not support combustion.

.9 The system shall resist fungus and mildew growth in accordance with ASTM D3274.

.10 The system shall have no loss of adhesion due to thermal shock under alternating heat/cold testing.

.11 The minimum tensile strength of the system shall conform with the requirements in 2.4.10 below in accordance with ASTM D412-87 testing.

.12 The system elongation at break to be minimum 300% at 75deg. F under ASTM D412 testing in addition to the requirements specified in 2.4.9 below.

**.13 The system shall have Shore A hardness of 68 to 75 as per ASTM D2240.**

#### 1.04 SUBMITTALS

.1 Contractor is to submit details of the coating system not indicated in these documents including material Specifications, thickness, details at joints, cracks, upstands, walls 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.

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

.5 The wall 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 coating system Manufacturer certifying the following:

.1 Surfaces to receive the 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 Wall coating was applied in accordance with Manufacturer's recommendations and these specifications.

.3 Completed wall coating system conforms to 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 three (3) copies of maintenance instructions for finished surfaces prior to Substantial Performance.

#### **1.05 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.

#### **1.06 PROTECTION**

.1 Provide adequate protection of materials and work of this section from damage by weather and other trades. Protect work of other trades from damage resulting from work of this section. Make good all damage to the satisfaction of the Departmental Representative at no extra cost to the Departmental Representative.

.2 Mask all surrounding surfaces to provide neat, clean, true-junction lines with no spray on adjacent surfaces. Cover all adjacent surfaces as required.

#### **1.07 MAINTENANCE DATA**

.1 Provide maintenance data for coating for incorporation into the manual specified in Division 1.

#### **1.08 CERTIFICATE OF COMPLETION**

.1 Furnish certified statement in triplicate, signed by the Applicator and the coating Manufacturer, attesting that the materials furnished conform to the specified requirements, and that all fluid components are manufactured by a single company. Certificates shall be accompanied by laboratory test reports for the physical properties specified.

#### **PART 2 PRODUCTS**

## 2.01 WALL COATING SYSTEMS

.1 The wall coating systems shall be a water-based silicone or acrylic elastomeric wall coating.

.2 Systems are to be installed in accordance with Manufacturer's written specifications with a minimum surface preparation of waterblasting or sandblasting and a dry film thickness of 15mils.

.3 Colour to be confirmed by Departmental Representative from colour charts at the time of award of Contract.

.4 Final acceptance of material will be at sole discretion of Departmental Representative.

.1 Coverage: 50-100 ft<sup>2</sup>/gal (2 coat min.)

.2 Applied Dry Thickness (five- (5) year Warranty): 15 - 16 mils

Applied Dry Thickness (ten- (10) year Warranty): 20 mils (3 coats)

.3 Accelerated Weathering (ASTM G 26): passes 5000 hrs.

.4 Water Vapor Permeability (ASTM E96): 12 perms

.5 Number of Coats (Base Bid): 2 coats

.6 Number of Coats (Separate Price A9.4) primer plus 2 coats

.7 Durometer Hardness, Shore A (points) see 1.3.1.13

.8 Fungus and Mildew Resistance (TT-C 555B) passes

.9 Wind Driven Rain (ASTM 6904) passes

.10 Elongation (ASTM 412-87) @25 C = 262%, @0 C = 115%

.10 Tensile Strength (ASTM 412-87) @25 C=232 psi,  
@0 C=887 psi

.11 Neat Texture

## 2.02 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 other than that specified in the documents.

## **PART 3 EXECUTION**

### **3.01 REMOVAL OF EXISTING COATINGS**

.1 Existing coatings on the tower shaft have been removed through a previous contract. The Contractor is responsible to verify that the condition of the surfaces to receive coatings meet application requirements.

### **3.02 PREPARATION**

.1 Preparation of all surfaces to receive coating is to be in strict accordance with the requirements of the system Manufacturer's recommendations and these Contract Documents including the following: preparation, grinding and or re-surfacing of rough surfaces, detailing of cracks, joints and voids as required.

.2 Minimum standard of vertical surface cleaning shall be abrasive blasting or high pressure waterblasting, leaving surfaces free of all laitance, grease, and foreign material.

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

.4 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 coating.

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

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

.7 Provide double application of coating at all 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.

.8 The preparation of surfaces for coating application shall include removal of existing paint by sandblasting or water blasting, hand patching voids or depressions in concrete surfaces as required. No extras shall be entertained for this item after the award of Contract. This applies to all walls and columns.

.9 The coating shall be terminated as shown on the Drawings. Mask ends of all terminations to ensure neat straight finish to coating. All vertical surface irregularities to be patched prior to coating application.

.10 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.

.11 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 coating.

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

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

### **3.03 INSTALLATION**

.1 Prior to application of the coating material, test of moisture content by concrete mass shall be made by the Contractor to confirm substrate moisture content does not exceed coating manufacturers specification.

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

.3 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.

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

.5 Ensure environmental and site condition requirements as recommended by the coating manufacturer and these Contract Documents are suitable for installation of work of this Section.

### **3.04 INSPECTION AND TESTING**

.1 Testing to be conducted by a testing agency designated by the Contractor and approved by the Departmental Representative. The Contractor 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 the surface. Number of tests shall be designated by the manufacturer, or Departmental Representative. Minimum number to be 1 test per 465 m<sup>2</sup>. Locations to be determined by Departmental Representative. Additional tests may be located by Manufacturer.

.4 To confirm coating thickness, Departmental Representative to perform wet film thickness tests and dry-film cut tests. Number of tests to be 1 test per 51 m<sup>2</sup> of coating minimum.

.5 To evaluate bonding of coating to substrate, and/or interlayer, adhesion tests may 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 232 m<sup>2</sup> of membrane, minimum. Adhesion of the coating layers to each other and to the concrete substrate shall exceed 1.0 MPa. The average of all tests must exceed 1.0 MPa, with no test less than 0.90 MPa.



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

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

**END OF SECTION**