1.0 SCOPE

This document summarises the procedure for the application of a 2 pack High Build Epoxy coating with ≥ 80% volume solids suitable for use on new and old concrete structures.

Refer Design Standard, DS95 (Standard for the Selection, Preparation, Application, Inspection and Testing of Protective Coatings on Water Corporation Assets) for additional information or clarification.

It shall be read in conjunction with Water Corporation surface preparation specification A5 - Surface Preparation and Protective Coating on Concrete.

2.0 PURPOSE

The purpose of this coating specification is to prevent the deterioration of concrete structures due to Hydrogen Sulphide (H₂S) gas attack above the water line on waste water treatment assets e.g.: Primary Sedimentation Tanks, Secondary Sedimentation Tanks, Oxidation Ditch, Clarifiers etc.

This coating shall extend down to a level 500 mm below the lowest service water level in the structure [Refer: Figure 1].

![Figure 1 – Coating termination on the concrete wall.](image)

Note: Colours in the above diagram is indicative only, standard coating colours to be used.
3.0 DEFINITIONS


Adhesion Testing: Testing to determine the bonding strength of the coating to the substrates to which they are applied.

Contractor: The service provider or its sub-contractor who will undertake the works.

Corporation: The Water Corporation and the Principal for the purposes of externally contracted asset delivery.

DFT: Dry Film Thickness.

ITP: The detailed Inspection and Test Plan(s) for the Works.

NACE: National Association of Corrosion Engineers.

Spark Testing: Testing of the continuity of a fully-cured coating film for evidence of defects, pin holes, holidays (misses) or damage.

Superintendent: The Superintendent for the contract, as defined in the conditions of the contract, who is appointed by the Water Corporation to manage/oversee the work under the contract on behalf of the Water Corporation.

TDFT: Total Dry Film Thickness.

Works: The surface preparation, coating application and inspection to be undertaken by the contractor to which this coating specification applies.

4.0 SURFACE PREPARATION

4.1 The concrete structure surface intended to be coated is to be prepared in accordance with Corporation specification A5.

4.2 All visible contaminations dirt, laitance, sludge and other foreign matter shall be removed from the surfaces to be coated by “appropriately rated pressure” water blasting of the structure. Follow the paint manufacturer recommendation for water wash pressure.

4.3 Prior to coating of new and old concrete structures, moisture content of the concrete shall be measured and should be less than 5%.
4.4 Repair imperfections (bug holes, cold joints etc.) in the wall and floor concrete surface using a 100% solids epoxy paste mortar screed. The hardening time shall be in accordance with manufacturer’s recommended practice.

5.0 MATERIALS

5.1 Coating materials used for attaining the specified standard shall be selected in accordance with Appendix 3 of DS-95- commonly used coatings in potable water and wastewater infrastructures unless approved otherwise by the Team Leader – Asset Durability. This approval is required before coating commences.

5.2 For wastewater environment applications Novalac epoxy suitable for a hydrogen sulphide environment shall be used.

5.3 The coating components shall be thoroughly mixed in the specified proportions. Material so prepared shall be used within the “pot-life” period claimed by the manufacturer for the relevant site conditions.

5.4 Coating specifications inclusive of datasheets, coating application method statements and ITP’s shall be submitted to the Principal for approval at least 10 working days prior to commencement of work.

5.5 Surfaces to be coated which will become inaccessible after assembly or erection shall be cleaned and painted before they become inaccessible.

5.6 Welds, edges, crevices, seams, joints and corners shall be brush coated before commencement of spray application of the coating.

5.7 Mixing, thinning, application and curing of protective coatings shall be carried out in accordance with the coating manufacturer's recommended practice for the on-site conditions.

5.8 Recommended drying times between coats shall not be exceeded.

5.9 Applied coatings shall be protected from rain or moisture until cured.

6.0 COATING THICKNESS

6.1 The surfaces specified shall be given two or more coats of the 2 pack epoxy coating to produce a minimum dry film thickness of 500 microns. This coating shall extend down to a level 500 mm below the lowest service water level in the structure.
COATING SPECIFICATION

HIGH BUILD EPOXY COATING ON NEW AND OLD CONCRETE STRUCTURES

COATING SPECIFICATION: D3 ISSUE: 3 DATE: JULY 2019

7.0 COATING FINISH

7.1 The finished coating shall be of uniform thickness, colour, appearance and gloss. It shall be adherent, coherent and free from pinholes, sags, blistering, checking, wrinkling, overspray and any other defect that may impair the performance of the coating.

7.2 Paint colour shall be approved by the Project Superintendent.

8.0 COATING APPLICATOR/PERSONNEL QUALIFICATION

8.1 Work shall only be carried out by a competent person.

8.2 The work shall be undertaken by an approved Water Corporation Corrosion Control Panel Services member, unless approved otherwise by the Team Leader – Asset Durability.

8.3 The Applicator’s Coating Supervisor shall possess as a minimum one of the following certifications:
   - ACA - Coating Inspector; or
   - NACE - CIP Level I Coating Inspector.

The Applicator’s Coating Inspector shall possess as a minimum one of the following certifications:
   - ACA - Coating Inspector; or
   - NACE - CIP Level I Coating Inspector.

9.0 INSPECTION AND TESTING OF COATING

9.1 The finished coating shall be holiday tested in accordance with NACE Standard SP0188 – Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.

9.2 Where the combined surface area of the surfaces to be coated exceeds 1000m² (on a single component or multiple components) adhesion testing using pull off dollies shall be conducted, after the coating is fully cured to determine the bonding strength of the coating to the substrates to which they are applied.

9.3 This test shall be carried out in accordance with AS 3894.9 Method C using 50mm dollies to determine the adhesion strength of the coating to the substrate. Reference shall also be made to ASTM Standard D4541-09, ASTM D7234-05 and ASTM C1583/C1583M-04.
9.4 The minimum acceptable adhesion value for High Build Epoxy coatings on concrete shall be in accordance with the coating manufacturer’s recommendation. If not stated by the manufacturer a minimum pull off strength of 1.5N/mm² (1.5MPa) shall be adopted.

9.5 The location of test sites shall be identified and agreed upon by both the Contractor and the Principal prior to the start of attaching the dollies to the substrate.

9.6 The results of all testing shall be submitted to the Superintendent at the completion of work.

10.0 REPAIR OF A DEFECTIVE COATING AND RETESTING

10.1 Coatings with the defective area is equal to 20% or more of the total coated surface, will be rejected outright.

10.2 Defects such as pinholes, cracks, blisters, voids, foreign inclusions and irregular profile peaks shall be marked for repair and retested upon full cure of the repaired coating.

11.0 RECORDING AND REPORTING

11.1 Following testing a report shall be submitted by the Contractor. The Contractor shall keep detailed records and reports including the following:

  • Environmental conditions (relative humidity, dew point etc.);
  • Surface preparation;
  • Surface profile;
  • Coating application;
  • Coating testing; and
  • General failure

11.2 To supplement these records, prior to any works commencing, an Inspection Test Plans (ITP) shall be forwarded to the Water Corporation for review a minimum of ten working days prior to the commencement of work.

12.0 CONTRACTOR'S RESPONSIBILITY

12.1 The Contractor shall supply all necessary plant, equipment, materials and labour, prepare the surface and apply and maintain the protective coating in accordance with this specification.
13.2 A list of all items to be inspected and the relevant drawing reference shall be forwarded to the Water Corporation Coating Inspector prior to the inspection being undertaken.

12.3 The preceding inspection clauses shall not relieve the Contractor of their responsibility to supply materials and perform work in accordance with the requirements of any overriding contract documentation.

--- End of Document ---