COATING SPECIFICATION

ULTRA HIGH BUILD EPOXY COATING ON STEEL OR CAST IRON FOR BURIED STRUCTURES

COATING SPECIFICATION: D4 ISSUE: 4 DATE: JANUARY 2023

1.0 SCOPE

This document summarises the procedure for the application of a 2 pack Ultra High Build (UHB) Epoxy Coating, with ≥ 90% volume solids, on steel or cast iron.

Refer Design Standard, DS 95 (Standard for the Selection, Preparation, Application, Inspection and Testing of Protective Coatings on Water Corporation Assets) for additional information and/or clarification.

This Speciation shall be read in conjunction with Water Corporation Specification **A1 - Surface Preparation for the Application of Protective Coatings on Steel or Cast Iron**.

2.0 PURPOSE

This coating system is primarily used on buried steel or cast iron elements, e.g crotch plates. UHB Epoxy coating can also be utilised in immersed areas, which are subjected to high wear, and erosion subject to approval by the Superintendent.

For applications in potable water, the specified coating shall be compliant to AS/NZS 4020 (testing of products for use in contact with drinking water) requirements.

3.0 DEFINITIONS

ACA: Australasian Corrosion Association.

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

APAS: Australian Paint Approval Scheme.

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.

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

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 All visible mill scale, rust, oxides, paint and other foreign matter shall be removed from the surfaces to be coated by blast cleaning to a **Class 3** (white metal) finish as specified in AS/NZS 1627 Part 4.

4.2 The blast cleaned surfaces shall have a uniform metallic appearance, a surface profile which provides satisfactory anchorage for the coating, as per paint manufacturer's recommendation and be otherwise compatible with the coating to be applied.

4.3 Coating shall not be applied to any prepared surface(s) exhibiting "flash corrosion" or that has been abrasive blasted more than 4 hours prior to commencement of coating.

5.0 COATING MATERIALS

5.1 The coating components shall be thoroughly mixed in the specified proportions. Prepared materials shall be used within the "pot-life" period at relevant site conditions, as stated by the manufacturer

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

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

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

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

5.7 While curing, applied coatings shall be protected from rain or moisture.

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6.0 ATMOSPHERIC CONDITIONS

6.1 Prior to and during coating application, the Contractor shall record details pertaining to environmental conditions including ambient and surface temperature, relative humidity and dew point.

6.2 Coating application shall not commence if any one of the following conditions exists:

- The relative humidity is above 85%;
- The substrate temperature is less than dew point plus 3°C;
- The substrate temperature is below 10°C;
- The substrate temperature is above 55°C;
- The surface to be coated is wet or damp;
- The specified surface cleanliness deteriorates, such that primer cannot be applied;
- If the weather is deteriorating or is unfavorable for application or curing;
- If the pot life of the paint has been exceeded.

7.0 COATING THICKNESS

7.1 The steel surface shall be given two or more coats of **2 pack ultra-high build epoxy** coating to produce a minimum of **2000 microns dry film thickness**. Recommended drying times between coats for relevant on-site conditions shall not be exceeded.

7.2 Finished coating thickness shall be determined using suitable instruments that are standardised (zeroed) on a smooth uncoated metal plate in accordance with AS/NZS 3894.3.

8.0 COATING FINISH

8.1 The finished coating shall be of uniform thickness, colour, appearance and gloss. It shall be fully cured, insoluble, adherent, coherent and free from mud cracking, holidays, laps, sags, blistering, checking, wrinkling, overspray, patchiness and any other defects that may impair the performance and/or appearance of the coating.

8.2 Protective coating colours shall comply with AS/NZS 2700 - Colour Standards for General Purposes and Water Corporation DS95 Section 11. If approved colour is not available, the Contractor shall propose alternative colour, subject to approval of Water Corporation prior to use.

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9.0 COATING APPLICATOR/PERSONNEL QUALIFICATION

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

9.2 The work shall be undertaken by an approved Water Corporation Protective Coating and Concrete Repair Services panel member unless approved otherwise by the Principal.

9.3 The Contractor shall nominate a certified coating inspector to perform inspections and maintain appropriate records for the work performed. The coating Inspector engaged in testing, monitoring, and verification of surface preparation and coating application shall hold relevant inspection qualifications and current certifications (e.g. NACE or ACA) or approved by the Principal. The coating inspector shall conduct the following:

- Prepare Quality Assurance documentation to meet the specified standards given herein and the required acceptance criteria.
- Perform inspections and maintain appropriate records for work performed.
- Testing, monitoring, and verification of surface preparation and coating application.

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10.0 INSPECTION AND TESTING OF COATING

10.1 **Visual Testing** - Coating shall be visually examined for surface defects and any discontinuity arising after curing shall be recorded.

10.2 **Spark Testing** - The finished, fully cured coating shall be holiday tested in accordance with AS 3894.1.

10.3 **Adhesion Testing** - Adhesion testing shall be carried out if requested by the Superintendent. Testing shall be carried out in accordance with AS/NZS 1580 Method 408.5 and AS 3894.9 Method C, Clause 4.2. A test panel/coupon (of similar substrate material) shall be prepared and a pull off test consisting of a minimum 3 dollies, 100mm apart, shall be carried out to confirm the adhesion of the coating. The minimum acceptable adhesion value for Ultra High Build Epoxy coatings on Steel or Cast Iron shall be 5MPa.

10.3.1 In the event of test failure, additional adhesion tests shall be carried out on the asset under construction.

10.3.2 The results of all adhesion tests shall be submitted to the Superintendent as part of the overall quality control documentation.

11.0 REPAIR OF DEFECTIVE COATINGS AND RETESTING

11.1 Defects such as pinholes, cracks, blisters, voids, foreign inclusions and irregular profile peaks (e.g. runs) and / or deviations from the specified coating thickness shall be marked for repair and retested upon full cure of the repaired coating.

11.2 Coatings with defective areas equal to 20% or more of the total coated surface, will be rejected outright requiring the affected area to be blasted and re-coated, unless agreed otherwise by the Superintendent or delegate.

12.0 RECORDING AND REPORTING

12.1 Prior to any works commencing, an Inspection Test Plans (ITP) shall be forwarded to the Superintendent for review a minimum of ten working days prior to the commencement of work.

12.2 During the course of the works, the following information shall be recorded:

- Environmental conditions (relative humidity, dew point etc.);
- Surface preparation;
- Surface profile;
- Coating application method;

- Coating testing results; and
- General failure.

12.3 On completion of the works a report shall be submitted by the Contractor to the Superintendent. This report shall include all coating test results, details of any failures and subsequent repairs if required.

13.0 CONTRACTOR'S RESPONSIBILITY

13.1 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 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.

Document Revision History					
Sect	**Issue**	**Date**	**Revision Description**	**RVWD**	**APROV**
1 & 9	4	01/02/2023	Sections 1 & 9 updated	AO	SS

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