1.0 SCOPE

This document summarises the procedure for the application of a 2 pack High Build Epoxy Coating, with ≥ 85% volume solids, on steel or cast iron. Refer Design Standard, DS95 (Standard for the Selection, Preparation, Application, Inspection and Testing of Protective Coatings on Water Corporation Assets) for additional information and/or clarification.

It shall be read in conjunction with Water Corporation surface preparation specification A1 - Surface Preparation for the Application of Protective Coatings on Steel or Cast Iron.

2.0 PURPOSE

This coating system is suitable for use on Steel or Cast Iron surfaces which are immersed in potable or wastewater. For potable water applications the coating shall also have AS/NZS 4020 (Testing of products for use in contact with drinking water) approval and a 100% volume solid High Build Epoxy shall 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. |
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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.

**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 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 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 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.

5.3 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.

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

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

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

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;
   - Where the full prime coat application cannot be carried out before the specified cleanliness of the surface deteriorates;
   - 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 surfaces specified shall be given two or more coats of the 2 pack epoxy coating to produce a minimum of 500 microns dry film thickness. Maximum dry film thickness should not exceed 750 microns. Recommended drying times between coats for on-site conditions shall not be exceeded.

7.2 Finished coating thickness shall be determined using suitable instruments 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,
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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. If a suitable approved colour is not available, then the proposed colour shall be referred to the Water Corporation for acceptance prior to use.

Reference shall be made to Water Corporation Colour Code Drawing No. EG71-1-1, Rev. E for details of colours to be used for different applications.

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 Corrosion Control Panel Services member, unless approved otherwise by the Team Leader – Asset Durability.

9.3 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.

9.4 The coating contractor shall nominate a Coating Inspector as their Quality Control Officer to carry out inspections, submit the ITP, undertake the required testing and maintain appropriate records for all work performed.

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.

10.0 INSPECTION AND TESTING OF COATING

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

10.2 **Spark Testing** - The entire finished, fully cured coating subjected to immersion or marine conditions shall be holiday tested in accordance with AS 3894.1.
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10.3 Adhesion Testing - Adhesion testing is only required on the following assets: Tanks, Pressure Vessels, Testing shall be carried out in accordance with AS/NZS 1580 Method 408.5 and AS/NZS 3894.9 Method C, Clause 4.2. In the case of Pressure Vessels 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 High Build Epoxy coatings on Steel or Cast Iron shall be 5MPa.

10.3.1 The location of test sites shall be identified and agreed upon by both the Contractor and the Superintendent prior to the start of attaching the dollies to the coating. This may include completing the adhesion tests on coupons as per DS95.

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

10.3.3 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 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.

13.3 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.

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