

MECHANICAL PROCEDURES



NRA - WESSEX

PROTECTIVE COATING OF STRUCTURES AGAINST CORROSION

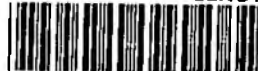
GEN/PTSPEC.001

ISSUE (A) 01-12-92

PROTECTIVE COATING OF STRUCTURES AGAINST CORROSION

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1 GENERAL

The recommendation of BS 5493:1977 Code of Practice for "Protective Coating of Iron and Steel Structure Against Corrosion" shall be followed.

The description of colours shall comply with BS 4800:1981.

Where the contractor wishes to deviate from this specification; that is permissible only where the alternative specification is previously agreed by the engineer to be equal or better.

Where an application requires multiple coatings of protection, each coat shall be compatible and manufactured by the same company unless prior agreement is obtained from the Engineer.

Wherever possible, surfaces should be protected from the elements.

2 SURFACE PREPARATION

2.1 New Fabrications

All burrs and weld splatter shall be removed and the surface cleaned of all dirt, oil and grease. All surfaces shall be blast cleaned to a minimum of second quality finish to BS 7079:1989 - ISO 8501-1: 1988 (Standard ISO SA 2.5). Blast cleaning residue shall be completely removed. A protective coating shall be applied not less than 8 hours after cleaning. It is the contractors responsibility to ensure the surface is maintained at the required state of finish until the protective coat is applied.

2.2 Existing Surface, Complete Recoating

The requirements of 2.1 (above) shall be followed. Where blast cleaning is not possible the required surface finish may be achieved using hand tools, to achieve the surface requirements of the coating to be applied (cleaning to Standard ISO-SA3).

2.3 Existing Surface, Partial Recoating and Coating Maintenance

The surface shall be prepared as required by the protective coating manufacturer. All loose paint, dirt and grease shall be removed. Where rust is present it shall be removed and the surface treated with an approved inhibitor.

The surface shall be roughened to obtain a good "key".

3 PROTECTIVE COATINGS

3.1 General

Unless specified otherwise all protective Coating Systems shall have a life to first maintenance defined as long (no maintenance within first 10 years).

All coatings are to be non-toxic, non-carcinogenic and of the non-convertible type. Lead based paints must not be used. All coating materials shall be stored and applied strictly in accord with manufacturers instructions.

Chlorinated Rubber Systems shall not be used. Surfaces against which concrete is to be placed and stainless steel or other corrosion resistant surfaces shall not be painted unless specified otherwise.

3.2 Application

The manufacturers requirements governing ambient conditions during application shall be strictly followed. The contractor must take whatever precautions are necessary to prevent changes in ambient conditions from effecting application or curing. Warning labels, name plates, grease nipples, vent holes or sight glasses shall be protected during application.

The dry film thickness of each coat shall be measured using an Elcometer or similar and the readings recorded. Each successive protective coat shall be a different colour; to assist even application and full coverage.

3.3 Galvanising

Where galvanic coatings are used they shall be applied using the hot dip process with the thickness and quality conforming to BS 729:Part 1 and BS 5493:1977. Steel subject to hydrogen embrittlement through galvanising shall not be used. Where thicker coatings are required (ie excess of 100 microns) silicon or silicon killed steels may be used by prior agreement with the engineer.

For surfaces greater than 5mm thickness the minimum coating shall be 85 microns. Subsequent surface coating onto the galvanised steel will require preparation using an "etch" primer or "T" wash.

3.4 Zinc Rich Coating

May be organic or inorganic with 90% or more of zinc dust. A suitable sealer coat shall be applied to improve the appearance unless specified otherwise.

3.5 Primer Coats

Zinc chromate type coatings shall not be used.

Where multiple priming coats are required they shall be of different colours. Lead based primers shall not be used.

3.6 Two Pack Chemical Resistant Paints

Coatings that degrade with U-V light and stain (chalking) shall not be used as a final coat unless agreed by the engineer.

Coatings containing Isocyanate shall not be used unless rapid curing times are required for specific tasks.

The coating shall be capable of brush or airless spray application.

3.7 Alkyd Systems

Shall be capable of brush or spray application and be tolerant of a wide range of ambient application conditions.

If applied as a repair system must be fully compatible with the substrate conditions.

3.8 Zinc Sprayed Surfaces

Where zinc sprayed metal coatings are employed, the composition of coating metal, methods of surface preparation and application of coating shall comply with BS 2569 : Part 1. The normal thickness of zinc coating shall be not less than 0.1mm, and the surface of the sprayed coating shall be of uniform texture, free from lumps, coarse areas and loosely adherent particles. Surfaces shall be adequately degreased before the application of any further coating and shall be pretreated with a brush application of etch primer.

4 SELECTION OF SYSTEM

The system shall be described as found in BS 5493 : 1977.

Before any preparation is made, the details of the protection systems to be used will require the prior agreement of the engineer.

The system proposed must be submitted on a "Specification Sheet for Protective Coating" to the engineer for approval. Data sheets for each coating material must be supplied.

An example of a specification sheet layout is:-

COATING MANUFACTURER;

1. COATING:

SURFACE PREPARATION:

DRY FILM THICKNESS (DFT): COLOUR BS 4800:

METHOD OF APPLICATION:

2. COATING:

SURFACE PREPARATION:

DRY FILM THICKNESS (DFT): COLOUR BS 4800:

METHOD OF APPLICATION:

3. COATING:

SURFACE PREPARATION:

DRY FILM THICKNESS (DFT): COLOUR BS 4800:

METHOD OF APPLICATION:

Methods of Maintaining Site Conditions , special safety conditions etc.

5 INSPECTION

The Authority will detail the required inspection stages.

The contractor is required to check and record the DFT of each coat using a magnetic flux or eddy current device. These recorded figures may be checked during the system application and will be required for the Authority's records.

The NRA may request the paint manufacturing company's representative to monitor the system application on its behalf.

6 HEALTH AND SAFETY DATA SHEETS

The requirements of the product data sheets must be met in full. Where the application requires scaffolding, working off ladders, the use of air fed masks or other similar safety measures they shall be discussed and agreed with the engineer prior to work commencing.

7 GRP COVERS AND GUARDS

GRP covers and guards shall be pigmented to give the finished colour without painting.

8 DEFECTS

8.1 General

- 8.1.1 Defects are defined in BS 2105 "Glossary of Paint Terms".
- 8.1.2 The Contractor shall ensure that all coatings are free from defects and adequate in all respects for the purposes intended.

8.2 Failure

The painting system shall be deemed to have failed if:-

- 8.2.1 After painting, damage has been caused by handling, impact, abrasion or welding.
- 8.2.2 Any portion of the paint film separates from any other or the parent metal.
- 8.2.3 After painting the total dry film thickness measured by Elcometer is less than that specified.

Except for electrical switchboards and control panels, failure shall not include:-

- 8.2.4 Loss of gloss.
- 8.2.5 Variation of shade, not affecting the anti-corrosive properties of the system.

9 FUSION BONDED EPOXY POWDER COATING

- 9.1 All steel fabricated pipework and other plant, where specified, shall have a lining and coating, not less than 250 microns thick, of 100% solids, thermosetting fusion bonded, dry powder epoxy coating.
- 9.2 All traces of grit and dust shall be removed and coating commenced before formation of visible oxidation of the surface. The metal shall be pre-heated to a temperature recommended by the manufacturer, the epoxy powder applied by immersion in a fluidised bed following which excess powder shall be removed. The powder shall be allowed to flow out completely before curing.
- 9.3 The thickness of the coating including any repaired areas, shall be checked with a calibrated tester. Spark testing, for pinholes, voids, contamination, cracks and damaged areas being carried out using a high voltage spark generator.
- 9.4 Repairs due to coating imperfections or damage, shall be undertaken using a brush applied compatible two-pack liquid epoxy compound.
- 9.5 The area to be repaired, shall be cleaned to remove dirt, grease, scale and damage coating, which shall be feathered. Pinhole surface preparation is not required other than removal of detrimental contaminants which impair the adhesion of the repair material.
- 9.6 The surface coating shall be applied by an approved applicator in accordance with BGC Standard PS/CW6 or equal approved.

10 COLOUR CODING

- 10.1 Finishing coats shall be applied to the colour schedule in accordance with the requirements of BS 1710, BS 4800, BS 5252 and BS 5378.
- 10.2 Pipes in treatment plants and pumping installations shall be identified by coloured bands rather than by body colour, following the basic coding specified in BS 1710.
- 10.3 Coloured bands 100mm wide, shall be at approximately 2 metre intervals; each side of valves, branches, bulkheads, wall penetrations, and any other places where identification is necessary.
- 10.4 Where two or more pipes in a duct or gallery convey the same fluids, each pipe shall display a separate number, with contents named at each point of entry or outlet.

11 EXAMPLE SYSTEM SPECIFICATIONS

SPECIFICATION SHEET FOR PROTECTIVE COATING

PROJECT: Specimen

APPLICATION: River Structure (Freshwater) above and below waterline

LOCATION OF WORK: NRA Sluice Gate

COATING MANUFACTURER Sigma Coatings

1. COATING: Colturiet Universal Primer (7415)
SURFACE PREPARATION: Wet or Dry blastclean ISO-SA 2½
DRY FILM THICKNESS (DFT): 50 microns
COLOUR BS 4800: Greenish yellow 12B15
METHOD OF APPLICATION: Spray or Brush. Brush only for damp surfaces
2. COATING: Colturiet CM MIO Coat (7427)
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT): 100 microns
COLOUR BS 4800: Eggshell
METHOD OF APPLICATION: Spray or brush
3. COATING:
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:
4. COATING:
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:
5. COATING:
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:
6. COATING:
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:

Methods of Maintaining Site Conditions

Fully Enclosed spray/blast Area with sheeting. Humidity, temp and Dew Point monitored, regularly.

DATA SHEETS FOR ALL COATINGS MUST BE SUPPLIED

SPECIFICATION SHEET FOR PROTECTIVE COATING



PROJECT: Specimen

APPLICATION: River or Coastal Structure (Splash Zone and submerged)

LOCATION OF WORK: NRA Structure

COATING MANUFACTURER Sigma Coatings

1. COATING: Colturiet Universal Primer
SURFACE PREPARATION: 1S0-Sa 2½ wet or dry blast
DRY FILM THICKNESS (DFT): 50 microns
COLOUR BS 4800: Pastel Green 12B15
METHOD OF APPLICATION: Spray or brush. Brush on damp surfaces
2. COATING: Colturiet TCN 300
SURFACE PREPARATION: Min 8 hours inter coat
DRY FILM THICKNESS (DFT): 200 microns
COLOUR BS 4800: Brown
METHOD OF APPLICATION: Airless spray
3. COATING: Colturiet TCN 300
SURFACE PREPARATION: Min 8 hours intercoat
DRY FILM THICKNESS (DFT): 200 microns
COLOUR BS 4800: Black
METHOD OF APPLICATION: Airless Spray
4. COATING:
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:
5. COATING:
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:
6. COATING:
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:

Methods of Maintaining Site Conditions

Monitor humidity/temp and dew point. Sheet over and protect. Maintain dry during application and airing.

DATA SHEETS FOR ALL COATINGS MUST BE SUPPLIED

SPECIFICATION SHEET FOR PROTECTIVE COATING

PROJECT: Specimen

APPLICATION: Local repair

LOCATION OF WORK: River or coastal structure above water

COATING MANUFACTURER Sigma COATINGS

1. **COATING:** Sigma Prime one (4125)
SURFACE PREPARATION: 1S0-St 3
DRY FILM THICKNESS (DFT): 50 microns
COLOUR BS 4800: Grey
METHOD OF APPLICATION: Brush

2. **COATING:** Sigma Pitaguard MIO (7246)
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT): 50-75 microns
COLOUR BS 4800: Light Grey (9553) or Darkgrey (9558)
METHOD OF APPLICATION: Brush or spray

3. **COATING:** Sigma fast enamel (0631 UK)
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT): 40 Microns
COLOUR BS 4800: Black 00F 53
METHOD OF APPLICATION: Brush or spray

4. **COATING:** Sigma Fast Enamel (0631 UK)
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT): 40 microns
COLOUR BS 4800: Black 04 E 53
METHOD OF APPLICATION: Spray or brush

- 5 **COATING:**
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:

6. **COATING:**
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:

Methods of Maintaining Site Conditions

Dry surface protected from rain and water during application and cure.

DATA SHEETS FOR ALL COATINGS MUST BE SUPPLIED

SPECIFICATION SHEET FOR PROTECTIVE COATING

PROJECT: Specimen

APPLICATION: River or Coastal Structures (above splash zone)

LOCATION OF WORK: NRA Gate

COATING MANUFACTURER SIGMA Coatings

1. COATING: Colturiet Universal primer (7415)
SURFACE PREPARATION: Wet or dry blastclean ISO-SA 2½
DRY FILM THICKNESS (DFT): 50 microns
COLOUR BS 4800: Greenish yellow
METHOD OF APPLICATION: Spray or brush. Brush only for damp surfaces
2. COATING: Colturiet CM MIO Coat (7427)
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT): 100 microns
COLOUR BS 4800: Eggshell
METHOD OF APPLICATION: Spray or brush
3. COATING: Colturiet CM Coating (7456)
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT): 100 Microns
COLOUR BS 4800: Black
METHOD OF APPLICATION: Spray or brush
4. COATING:
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:
5. COATING:
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:
6. COATING:
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:

Methods of Maintaining Site Conditions

Maintain dry during application and cure.

DATA SHEETS FOR ALL COATINGS MUST BE SUPPLIED

SPECIFICATION SHEET FOR PROTECTIVE COATING

PROJECT: Specimen

APPLICATION: River or Coastal Structures (above splash zone)

LOCATION OF WORK: NRA River Gate

COATING MANUFACTURER Sterling Paints

1. **COATING:** Zinc Rich 2 pack Epoxy primer 50/1777
SURFACE PREPARATION: 1S0-SA 2½
DRY FILM THICKNESS (DFT): 35 microns (min)
COLOUR BS 4800: Buff
METHOD OF APPLICATION: Brush or Airless Spray
2. **COATING:** 2 Pack Epoxy MIO 50/3745
SURFACE PREPARATION: Min Touch Dry Max 24hr intercoat
DRY FILM THICKNESS (DFT): 75 microns (Min)
COLOUR BS 4800: Charcoal
METHOD OF APPLICATION: Airless Spray
3. **COATING:** 2 Pack Epoxy finish SP50
SURFACE PREPARATION: Min Touch Dry Max 24hr intercoat
DRY FILM THICKNESS (DFT): 75 Microns (Min)
COLOUR BS 4800: Black
METHOD OF APPLICATION: Airless Spray
4. **COATING:**
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:
5. **COATING:**
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:
6. **COATING:**
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:

Methods of Maintaining Site Conditions

Maintain dry during application and curing monitor humidity, temperature and dew point.

DATA SHEETS FOR ALL COATINGS MUST BE SUPPLIED

SPECIFICATION SHEET FOR PROTECTIVE COATING

PROJECT: Specimen

APPLICATION: River or Coastal Structures (Below water and splash zone)

LOCATION OF WORK: NRA Structure

COATING MANUFACTURER Sterling Paints

1. **COATING:** Zinc Rich 2 Pack Epoxy Primer 50/1777
SURFACE PREPARATION: 1S0 SA 2½
DRY FILM THICKNESS (DFT): 50 microns (min)
COLOUR BS 4800: Buff
METHOD OF APPLICATION: Airless Spray or Brush

2. **COATING:** 2 Pack Epoxy MIO 50/3745
SURFACE PREPARATION: Min Touch Dry Max 24hr intercoat
DRY FILM THICKNESS (DFT): 75 microns (Min)
COLOUR BS 4800: Charcoal
METHOD OF APPLICATION: Airless Spray

3. **COATING:** 2 Pack Epoxy MIO 50/3730
SURFACE PREPARATION: Min Touch Dry Max 24hr intercoat
DRY FILM THICKNESS (DFT): 75 Microns (Min)
COLOUR BS 4800: Grey
METHOD OF APPLICATION: Airless Spray

4. **COATING:** 2 Pack Epoxy Finish SP50
SURFACE PREPARATION: Min Touch Dry Max 24 hr intercoat
DRY FILM THICKNESS (DFT): 60 Microns (Minimum)
COLOUR BS 4800: Black
METHOD OF APPLICATION: Airless Spray

5. **COATING:**
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:

6. **COATING:**
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:

Methods of Maintaining Site Conditions

Maintain dry during application and curing. Monitor humidity, temperature and dew point.

DATA SHEETS FOR ALL COATINGS MUST BE SUPPLIED

SPECIFICATION SHEET FOR PROTECTIVE COATING

PROJECT: Specimen

APPLICATION: Local Repair

LOCATION OF WORK: River or Coastal Structure

COATING MANUFACTURER Sterling Paints

1. **COATING:** Zinc Phosphate alkyd primer 50/4160
SURFACE PREPARATION: ISO SA 2½ to SA 3
DRY FILM THICKNESS (DFT): 35 microns (min)
COLOUR BS 4800: Buff
METHOD OF APPLICATION: Brush

2. **COATING:** Alkyd MIO Intercoat 36/3141
SURFACE PREPARATION: Touch Dry
DRY FILM THICKNESS (DFT): 50 microns
COLOUR BS 4800: Grey
METHOD OF APPLICATION: Brush

3. **COATING:** Alkyd Enamel SP/30
SURFACE PREPARATION: Touch Dry
DRY FILM THICKNESS (DFT): 45 Microns (Min)
COLOUR BS 4800: Black
METHOD OF APPLICATION: Brush

4. **COATING:**
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:

5. **COATING:**
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:

6. **COATING:**
SURFACE PREPARATION:
DRY FILM THICKNESS (DFT):
COLOUR BS 4800:
METHOD OF APPLICATION:

Methods of Maintaining Site Conditions

DATA SHEETS FOR ALL COATINGS MUST BE SUPPLIED