

**MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS  
VOLUME 1 SPECIFICATION FOR HIGHWAY WORKS**

**SERIES 5000  
MAINTENANCE PAINTING OF  
STEELWORK**

**Contents**

Clause	Title	Page
5001	Introduction	2
5002	Surface Preparation - General Requirements	2
5003	Surface Preparation - Materials and Methods	3
5004	Surface Preparation - Workmanship Standards	4
5005	Metal Coatings	6
5006	Testing of Metal Spray Coatings	6
#5007	Paint and Similar Protective Coatings	7
5008	Surface Preparation and Protective Systems	7
#5009	Testing of Paints	15
5010	Storage Requirements and Keeping Periods for Paints	16
5011	Procedure Trials	16
5012	Application of Paint	17
5013	Form HA/P1 (Maintenance) Paint System Sheet (Appendix 50/1)	19
	Form HA/P2 Paint Data Sheet (Appendix 50/3)	19
5014	Access, Containment and Lighting	19
5015	(11/03) Additional Requirements for the Protection of CCTV Masts, Cantilever Masts, Steel Lighting Columns and Bracket Arms	19

**NATIONAL ALTERATIONS OF THE  
OVERSEEING ORGANISATIONS OF  
SCOTLAND, WALES AND NORTHERN  
IRELAND**

**Scotland**

Clause	Title	Page
5007SE	Paint and Similar Protective Coatings	S1

# denotes a Clause which has a substitute National Clause for one or more of the Overseeing Organisations of Scotland, Wales or Northern Ireland.

# MAINTENANCE PAINTING OF STEELWORK

## 5001 Introduction

1 Surface preparation and the maintenance painting of steelwork shall be carried out in compliance with Clauses 5001 to 5015, using systems appropriate to the information given in Appendix 50/1, Form HA/P1 (Maintenance) Paint System Sheet (parts 3 to 9) and Appendix 50/2 if applicable, as appropriate to the design, accessibility and condition of the components.

2 (05/05) The Manual of Paints for Structural Steelwork, which is included in Standard BD 35 (DMRB 2.4.1), provides data on paints and similar materials for use in the Overseeing Organisation's contracts. The Manual contains item numbers and a summary is also given in Table 50/1.

3 Subject and without prejudice to the Conditions of Contract, the Contractor shall comply with any measures to contain people, plant, materials, dust and debris described in Appendix 50/5.

4 Compliance with sub-Clause 3 of this Clause does not confer immunity from relevant legal requirements.

5 The appropriate level of surface preparation and the suitable protective system shall depend on reported results from the assessment of the existing protective system, which is determined as described in Clause 2.5 of BD 87 (DMRB 3.2.2).

6 (11/08) Corrosion protection of steelwork shall comply with National Highways Sector Scheme 19A 'For corrosion protection of ferrous metals by industrial coatings', described in Appendix A and be undertaken by a Contractor registered to the scheme by an approved UKAS accredited certification body.

## 5002 Surface Preparation - General Requirements

1 The general requirements are specified in sub-Clauses 5002.2 to 5002.11. The various materials and methods are specified in Clause 5003. The standards to be achieved are specified in Clause 5004. Definitions of terms used are given in Clause 5004. The particular requirements for surface preparation for the structure(s) included in the Contract are specified in Appendix 50/1.

2 (05/05) Areas contaminated by oil or grease shall be prepared by wet cleaning the affected areas as described in sub-Clause 5003.8, prior to surface preparation by other specified methods. Unless otherwise described in Appendix 50/5, solvents shall not be used.

3 Clean water, which does not leave any harmful residues on the surface shall be used for cleaning and rinsing.

4 Only cleaning agents which do not leave harmful residues on the surface after final rinsing shall be used for cleaning.

5 (05/05) Surface preparation shall be continued until the required standard has been achieved. The surfaces are required to be free from condensation, oil, grease, dust residues and detrimental contamination such as chlorides and sulphides. These shall be tested using the procedures of DD ENV ISO 8502-1: 2001, BS EN ISO 8502-2 BS EN ISO 8502-3, BS EN ISO 8502-4, BS EN ISO 8502-6 and 'BS EN ISO 8502-9, BS 7079-B9'.

6 After dry surface preparation of internal surfaces and before any wet cleaning, all dust and debris shall be removed from accessible areas by sweeping and vacuum cleaning.

7 Immediately before application of each coat of paint, the Contractor shall ensure that the surfaces:

- (i) meet the required standard of preparation;
- (ii) are free from harmful residues, including mortar, concrete, dust, grit and paint degradation products;
- (iii) are free from detrimental contamination;
- (iv) are free from moisture detrimental to the coating to be applied.

8 The edges of existing coatings adjacent to abraded or blast cleaned areas shall be bevelled back where practicable into sound and firmly adhering material.

9 (05/05) Unless otherwise specified in Appendix 50/5, fasteners shall be prepared and painted to the same standard as adjacent main surfaces.

10 After surface preparation by methods using water or when the steelwork has been exposed to the weather after surface preparation by other methods or when there are deck leaks, areas containing riveted or bolted joints or built up sections shall be freed of any standing water which may be present in the nominal joint gaps; compressed air or other approved methods shall be used. When drying out has been completed or when surfaces are dry after surface preparation, line gaps around the perimeter of joint or along plies shall be sealed effectively by successive applications of undercoat paint. All wider gaps shall be sealed with a sealant compatible with the primer.

**11** (05/05) The use of an inhibitor during wet blast cleaning or cleaning shall not be permitted.

### 5003 Surface Preparation - Materials and Methods

#### Abrading

**1** (05/05) Any encrusted rust, foreign matter or paint which may be difficult to remove by abrading alone shall be dislodged by scraping, aided by hand or power wire brushing. This work shall be completed before abrading of the areas so affected.

**2** Abrading shall be carried out using abrasive paper or other material or a flexible abrasive disc mounted on a power drive flexible pad, or a power driven arbor or spindle-mounted flexible abrasive flap wheel. Abrading tools may be used to remove weld spatter. Wet abrading may be employed for the preparation of finishes over sound undercoats, over unsound systems over hot dip galvanizing, or hot dip galvanizing. Wet abrading shall not be allowed to come into contact with exposed thermally sprayed metal coatings unless the metal coating is to be entirely removed.

**3** (05/05) All equipment including tools, abrasive sheets, abrasive discs and abrasive wheels shall be of a type, capacity and in a condition appropriate for the work. The use of hard grinding wheels for abrading shall not be permitted.

**4** A polished surface appearance caused by the polishing in of old paint, rust or dirt shall not be acceptable.

**5** Areas of corroded steel or unsound metal coatings, which have been prepared by abrading down to St3 steel, bright steel or bright metal coating, as appropriate, shall be protected by the primer and next coat of paint before any cleaning down or other preparation of adjacent surfaces specified in Appendix 50/1 is undertaken.

**6** Areas of unsound hot dip galvanizing which have been prepared down to bright steel by abrading shall be protected by the application of the primer and next coat of paint before cleaning down or other preparation of adjacent surfaces specified in Appendix 50/1 is undertaken.

**7** After surface preparation by wet abrading of hot dip galvanizing, but prior to any cleaning down of adjacent painted or hot dip galvanised surfaces specified in Appendix 50/1, any exposed areas of steel shall be dry abraded down to bright steel and protected by the primer and the next coat of paint, including the stripe coat, before cleaning down or other preparation of adjacent surfaces specified in Appendix 50/1 is undertaken.

#### Dry or Wet Cleaning

**8** Wet cleaning shall be carried out by scrubbing with a stiff bristle brush using water and a cleaning agent or a pressure washer. Immediately after cleaning down, the surfaces shall be thoroughly rinsed using clean cold water.

**9** Dry cleaning shall be carried out by scrubbing with a dry stiff bristled brush.

**10** Where the existing surfaces are affected by embedded metallic grit or other abrasive particles, they shall be scraped to dislodge looser particles and then dusted off. This work shall be carried out after any final rinsing and when the surface is dry.

#### Dry Blast Cleaning using Dry Air/Abrasive System

**11** (05/05) Unless otherwise specified in Appendix 50/5, chilled-iron grit complying with 'BS EN ISO 11124-2, BS 7079-E2'; high carbon cast-steel grit complying with 'BS EN ISO 11124-3, BS 7079-E3' with a hardness value greater than 650 HV; fused aluminium oxide complying with BS EN ISO 11126-7; non-metallic abrasive such as almandite garnet to 'BS 7079-F10, ISO 11126-10', copper slag to 'BS EN ISO 11126-3, BS 7079-F3' or recycled glass complying with BS EN ISO 11126-7 shall be used.

Grades for metallic abrasives shall comply with the following:

Profile (see sub-Clause 5004.3)	Grade
Fine	G050 or S060
Medium	G070 or S100
Coarse	G100 or S120

**12** The particle size of metallic abrasive in plant or equipment shall not exceed the maximum for the relevant grade as specified above.

**13** Before the start of blast cleaning and during blast cleaning the Contractor shall ensure that the abrasive is free from matter which could leave detrimental contamination, as defined in sub-Clause 5004.1 (vii), on the surfaces to be coated.

**14** Metallic grit or aluminium oxide abrasive shall be used for dry blast cleaning of relatively small areas on site which are to be thermally sprayed metal coated, such as at areas prepared to clean steel. The Contractor shall ensure that the grade and particle shape of non-metallic abrasives are adequate for the purpose intended. Excepting for aluminium oxide non-metallic abrasives shall not be recycled.

### **Wet Blast Cleaning using Low Pressure Air/Water/Abrasive System**

**15** Unless otherwise specified in Appendix 50/5, the air/water pressure at the nozzle shall not exceed 7.0 kgf/cm<sup>2</sup> and shall be fully adjustable below this level. The system shall incorporate a mechanical metering device, remote controlled by the operator from the nozzle, to regulate from zero to maximum the quantity of non-metallic abrasive being fed into the air/water mixture. During abrasive blast cleaning the air/water/abrasive shall be thoroughly mixed and the mixture shall be projected onto the surface to be cleaned through a single bore nozzle/tube. The use of an inhibitor during wet blast cleaning or washing shall not be permitted.

### **Wet Blast Cleaning using High Pressure Water/Abrasive System or Ultra High Pressure Water System**

**16** Unless otherwise specified in Appendix 50/5, the water pressure shall not exceed 562 kgf/cm<sup>2</sup> for high pressure or between 1750 and 2860 kgf/cm<sup>2</sup> for ultra high pressure. The system shall incorporate a mechanical metering device controlled by the operator at the nozzle, to regulate from zero to maximum the quantity of non-metallic abrasive being fed into the water.

**17** (05/05) Within 60 minutes of wet blast cleaning, the whole of the cleaned surface shall be thoroughly washed using the blast cleaning equipment with air and water. Any further deposits of abrasive on already rinsed surfaces shall be removed in a similar manner also within 60 minutes of being deposited. All accumulated deposits of abrasive and debris on other parts of the structure shall be removed by the same method before the end of the working day. After washing, the surfaces shall be free from all contamination. Tests for freedom from detrimental contamination shall be made after the washing.

### **Combined Wet/Dry Blast Cleaning**

**18** (05/05) Wet blast cleaning using the low pressure air/water/abrasive system in accordance with sub-Clause 5003.15 and 17 shall be followed, at a minimal interval, by dry blast cleaning in accordance with sub-Clauses 5003.11 to 14 of all the previously wet blast cleaned areas.

**19** The specified standard of surface preparation shall have been achieved in full, initially by wet blast cleaning and washing to achieve the required cleanliness, before any later dry blast cleaning of the same areas to remove flash rusting or to restore the required surface profile.

### **Other Requirements**

**20** When surface preparation is to be carried out by dry blast cleaning and, on adjacent surfaces by wet cleaning down and/or abrading, then unless otherwise dictated by traffic management requirements etc., the wet cleaning down and any wet abrading shall be carried out first.

**21** When surface preparation is to be carried out by wet blast cleaning, any wet cleaning down and/or wet abrading of adjacent surfaces may be carried out after the wet blast cleaning. In such cases areas to be blast cleaned and/or abraded shall be cleaned down in accordance with sub-Clause 5002.8, and thoroughly rinsed using the blast cleaning equipment before any final preparation by dry blast cleaning or dry abrading is carried out.

**22** Any prepared steel surfaces shall be protected from the effects of any further wet method of surface preparation by the application of a minimum 75 microns dry film thickness of paint.

### **Grinding**

**23** Grinding wheels and discs shall be of the size, shape and grade of coarseness appropriate to the particular operation. The speed of revolution shall be appropriate for the work.

**24** Grinding shall normally be carried out after surface preparation by other methods, including cleaning down, has been completed, except where it is necessary to achieve a blast profile and this would necessitate blast cleaning after grinding.

**25** Surfaces prepared by grinding to bright steel shall be protected by the application of the primer and the next coat of paint, including any stripe coats, before cleaning down or other preparation of adjacent surfaces specified in Appendix 50/1 is undertaken.

## **5004 Surface Preparation - Workmanship Standards**

**1** Definitions of terms in sub-Clause 5004.2 describing coatings, the extent of surface preparation and chemical cleanliness of surfaces are given below:

- (i) 'unsound paint'. Paint showing signs of disruption, rusting through, having inadequate adhesion or covering, rust scale, loose rust, loose mill scale or other detrimental products;
- (ii) 'sound paint'. Paint which is sound down to a metal substrate;



- (iii) 'unsound metal coating'. A metal coating showing signs of disruption, inadequate adhesion or penetration by rust or other corrosion products;
  - (iv) 'sound metal coating'. A metal coating which complies with Clause 5005 or a metal coating restored to these requirements by blast cleaning, but with a reduced thickness;
  - (v) Visual cleanliness of a steel substrate prepared to:
    - (a) 'clean steel' by blast cleaning  
Appearance:  
There shall be a blast cleaning pattern overall. The surface profile shall be free from mill scale, rust and foreign matter when viewed by normal vision;
    - (b) (05/05) Sa2 to 'BS EN ISO 8501-1, BS 7079-A1' and 'BS EN ISO 8501-2, BS 7079-A2' by blast cleaning  
Appearance:  
The surface shall be free from all rust scale, loose rust and loose mill scale;
    - (c) 'bright steel' by abrading  
Appearance:  
The surface shall be free from all surface rust, mill scale and defects, and shall have an overall bright appearance;
    - (d) (05/05) St3 to 'BS EN ISO 8501-1, BS 7079-A1' and 'BS EN ISO 8501-2, BS 7079-A2' by abrading  
Appearance:  
The surface shall be free from all rust scale, loose rust and loose mill scale;
    - (e) 'Bright steel' by grinding  
Appearance:  
The surface shall be free of weld spatter, shelling, internal discontinuities and other surface defects, leaving an overall bright appearance. Rounding of sharp edges shall be to a radius of about 1 mm;
  - (vi) visual cleanliness of a metal coating restored or prepared to:
    - (a) 'sound metal coating' by blast cleaning  
Appearance:  
The surface shall be free from corrosion products and embedded abrasive particles and shall have a bright appearance overall;
    - (b) 'bright metal coating' by abrading  
Appearance:  
The surface shall be free from surface corrosion and corrosion products and shall have a bright appearance overall;
    - (vii) 'freedom from 'harmful residues' or contamination': Surfaces shall only be deemed to be free from 'harmful residues' or 'contamination' after surface preparation when any such remaining matter shall not reduce the required durability of the specified protective system.
- 2** The following standards of surface preparation shall be achieved:
- (i) areas containing existing sound finishing paint shall be freed of:
    - (a) any visible gloss which may prevent adequate adhesion of the next coat; and
    - (b) contamination;
  - (ii) areas of existing unsound paint coating(s) over a steel substrate shall be freed of:
    - (a) any unsound paint down to sound paint;
    - (b) any unsound paint down to clean steel;
    - (c) any unsound paint down to Sa2 or St3 quality steel;
    - (d) any unsound paint down to bright steel;
    - (e) all paint down to Sa2 or St3 quality steel;
    - (f) all paint down to clean steel; and
    - (g) contamination;
  - (iii) areas of existing unsound paint coating(s) over a metal coated steel substrate shall be freed of:
    - (a) any unsound paint down to sound paint or to sound metal coating;
    - (b) any unsound metal coating down to bright metal coating;
    - (c) any unsound metal coating down to clean steel;
    - (d) any unsound metal coating down to bright steel;
    - (e) all paint and unsound metal coating down to sound metal coating or to clean steel;

- (f) all paint and metal coating down to clean steel; and
- (g) contamination;
- (iv) areas of sound hot dip galvanizing exposed through a paint system during surface preparation shall be abraded to an extent necessary to ensure effectiveness of adhesion promoter and/or adhesion of the primer;
- (v) areas of unsound metal coating over a steel substrate shall be freed of:
  - (a) any unsound metal coating down to bright metal coating;
  - (b) any unsound metal coating down to sound metal coating;
  - (c) any unsound metal coating down to clean steel;
  - (d) any unsound metal coating down to bright steel;
  - (e) all metal coating down to clean steel; and
  - (f) contamination.
- (vi) when either 'clean steel', 'Sa2 or St3 quality steel' or 'bright steel' is exposed through a metal coating during surface preparation, the standard shall be as defined in sub-Clause 5004.1 as appropriate, except for the profile of previously blast cleaned steel surfaces. In the case of aluminium and zinc metal spray, remnants of soundly adhering and clean aluminium or zinc may be retained. Any sound metal spray which is contaminated by lead shall be completely removed.

**3** (05/05) The surface profile to be achieved by blast cleaning, either 'Fine' 'Medium' or 'Coarse' as appropriate, shall be within the limits set by the Surface Profile Comparator for the Assessment of Abrasive Blast Cleaned Surfaces, conforming to 'BS EN ISO 8503-1, BS 7079-C1'.

## 5005 Metal Coatings

### Hot Dip Galvanised Coatings

**1** Unless otherwise specified in Appendix 50/5, structural members which were originally hot dipped galvanised and display signs of deterioration shall be replaced by newly hot dipped galvanised members or alternatively the surface shall be cleaned to bright metal and protected by the application of coatings.

### Thermally Sprayed Metal Coatings

**2** Thermally sprayed metal coatings shall, unless otherwise described in the Contract, comply with BS EN 22063 and with the following:

- (i) aluminium coating shall be of a material with minimum quality in accordance with type Al 99.5 (1050A) of ISO 209-1. Zinc coating shall have a composition in accordance with type Zn 99.99 of ISO 752;
- (ii) the thickness of either coating shall be not less than 100 microns;
- (iii) The strength of adhesion of thermally sprayed metal coatings shall not be less than the following:
 

Aluminium	50 kgf/cm <sup>2</sup>
Zinc	50 kgf/cm <sup>2</sup> ;
- (iv) thermally sprayed metal coatings shall be applied continuously over each 0.5m<sup>2</sup> per gun or the area of the component whichever is the lesser until the specified thickness has been achieved;
- (v) the application of thermally sprayed metal in separate layers shall not be permitted;
- (vi) (05/05) all surfaces to be thermally metal sprayed shall be blast cleaned and the standard shall be Sa3 quality to 'BS EN ISO 8501-1, BS 7079-A1', medium profile;
- (vii) thermally sprayed metal coatings shall be de-nibbed.

### Other Requirements

**3** When a metal coating is required on only part of a component it shall be applied before the rest of the component receives paint.

**4** New items that are electroplated and that are under torque or tension conditions shall be stress relieved by heat treatment at appropriate temperature and time to prevent failure by hydrogen embrittlement.

### 5006 Testing of Metal Spray Coatings

**1** (05/05) At the start of the Works, and subsequently at intervals scheduled in the Contract (with the exception of coatings on steel in bearings, curved surfaces, repairs to mechanical damage, local failure of thermally sprayed metal coating at site joints or areas restored on site), the Contractor shall demonstrate by means of a tensile test in accordance with BS EN 22063, that the minimum adhesion requirement

is being attained as detailed in sub-Clause 5005.2 (iii). In the excepted areas, the Contractor shall demonstrate that the adhesion is satisfactory by means of grid tests in accordance with BS EN 22063. Areas affected by the tests shall be restored in accordance with Clause 1907.

**2** The tensile tests shall be carried out initially on flat panels 150 mm x 150 mm x 6 mm which are of the same grade of steel as the parent material and which before blast cleaning had the same surface condition. The panels shall be blast cleaned and thermally metal sprayed together with the parent material to the same standard and using the same technique.

**3** The Contractor shall ensure that adhesion tests have been carried out satisfactorily before any further work continues.

**4** If the adhesion requirement on any test panel is not met, the Contractor shall carry out a further test on the parent material adjacent to the test panel position. In the case of adhesion failure on the steelwork itself by either method of test, unsound thermally sprayed metal coating shall be restored and the tests repeated.

**5** If more than two local areas of faulty adhesion occur on any one component, the whole of the thermally sprayed metal coating on the component shall be considered as having failed, and it shall be restored.

## #5007 Paint and Similar Protective Coatings

**1** (05/05) The term paint shall be deemed to refer to protective coatings in general.

**2** (05/05) The paints permitted for use by the Overseeing Organisation in the Works are listed in the Manual of Paints for Structural Steelwork which is included in BD 35 (DMRB 2.4.1) and which also contains details of the quality assurance scheme for paints and similar protective coatings. All paints shall have a current BBA HAPAS Roads and Bridges Certificate or equivalent.

**3** (05/05) All paints shall be supplied in sealed containers of not more than 25 litres capacity and these shall be used in order of manufacture and batch number. Each container shall have a completely removable lid and be clearly marked on the side to show the name of the manufacturer, registered description of the material (including purpose, e.g. whether primer, undercoat or finish), colour, Item No, paint manufacturer's reference number, batch number and date of manufacture. Where date of manufacture is coded, the Contractor shall provide the code key. In addition paints shall be supplied in sealed containers of no greater than 5 litre capacity for testing purposes in accordance with Clause #5009, for 'A' samples.

**4** (05/05) The Contractor shall ensure that the properties of the paints he has selected are compatible with the existing system and suitable for the atmospheric conditions on site, including temperature and humidity, and that he is able to apply the paints satisfactorily to all parts of the structure in these conditions.

**5** (05/05) Unless otherwise described in Appendix 50/5, all paints forming any one protective system or overlapping systems, shall be obtained from the same manufacturer as named by the Contractor in Appendix 50/1 Form HA/P1 (Maintenance) Paint System Sheet.

## 5008 Surface Preparation and Protective Systems

**1** The particular methods of surface preparation are to be detailed in Appendix 50/1 Form HA/P1 (Maintenance) Paint System Sheet, parts 1 to 9.

**2** (05/05) Protective systems

Note: mdft = minimum dry film thickness

B = apply by brush

AS = apply by airless spray

HB = High Build (dft: above 75 µm)

NB = Normal Build (dft: between 50 and 75 µm)

LB = Low Build (dft: below 50 µm)

(i) (05/05) Item numbers in the Protective Systems are listed in the Manual of Paints for Structural Steelwork which is included in BD 35 (DMRB 2.4.1) and a summary is shown in Table 50/1.

(ii) (05/05) Details of Protective Systems for Steelwork are given in Table 50/2.

**TABLE 50/1 - (05/05) BD 35: Quality Assurance Scheme for Paints and Similar Protective Coatings - Annex A Manual of Paints for Structural Steelwork Current Paint Item Numbers**

Item	Description	Coat Type	Build	Applied by
14	Zinc Phosphate Epoxy Ester (single-component)	Primer/Undercoat	LB or NB	B or AS
32	MIO Modified Phenolic (single component)	Undercoat	LB	B or AS
35	MIO Modified Phenolic (single component)	Undercoat/Finish	LB	B or AS
47	MIO Phenolic (single component)	Undercoat	LB	B or AS
50	MIO Phenolic (single component)	Undercoat/Finish	LB	B or AS
70	Silicone Alkyd (single component)	Finish	LB	B or AS
74	Silicone Alkyd (single component)	Undercoat	LB	B
110	Zinc Phosphate Epoxy (two-pack)	Blast Primer/Sealer	NB	B or AS (B to small areas only)
111	Zinc Phosphate High Build Quick Drying Epoxy (two-pack)	Blast Primer	HB	AS (B to small areas only)
112	MIO High Build Quick Drying Epoxy (two-pack)	Undercoat/Finish	HB	AS
113	Water based epoxy primer for blast cleaned internal surfaces (two-pack)	Primer	HB	B or AS
114	Water based epoxy undercoat/sheen finish for internal use (two-pack)	Undercoat/Sheen Finish	HB	B or AS
115	High Build Aluminium Epoxy (two-pack)	Surface tolerant maintenance primer (e.g. for abraded surfaces)	HB	B or AS
116	High Build Epoxy (two-pack)	Surface tolerant maintenance undercoat	HB	B or AS
121	Extended Cure Epoxy MIO (two-pack)	Primer, Undercoat, and/or Finish	HB	AS (B to small areas only)
123	High Build Glass Flake Epoxy (two-pack)	Undercoat for blast cleaned steel new construction	HB	AS (stripe coats and small repairs only by brush)
124	High Build Glass Flake Polyester (two-pack)	Undercoat for blast cleaned steel new construction	HB	AS (stripe coats and small repairs only by brush)
132	Vinyl/Vinyl Copolymer MIO Zinc Phosphate (single-component)	Primer	NB or HB	B
133	Vinyl/Vinyl Copolymer Zinc Phosphate (single-component)	Primer	NB or HB	B
134	Vinyl/Vinyl Copolymer MIO Zinc Phosphate (single-component)	Primer/Undercoat/Finish	NB or HB	B
135	Vinyl/Vinyl Copolymer Sheen Finish (single-component)	Finish	NB or HB	B

**(05/05) Notes:**

- 1 Colour reference shall be as per the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate.
- 2 Dry Film Thickness (dft) range shall be as per the manufacturer's data sheet. The minimum dry film thickness of the paint coats and paint system shall be as per the protective systems detailed in Table 50/2 where given.



**TABLE 50/1 - (05/05) BD 35: Quality Assurance Scheme for Paints and Similar Protective Coatings - Annex A Manual of Paints for Structural Steelwork Current Paint Item Numbers (continued)**

Item	Description	Coat Type	Build	Applied by
141	Thixotropic Bitumen (single-component)	Primer/Finish	HB	B or AS
150	Pitch Epoxy (two-pack) Polyamide Cured	Undercoat/Finish	HB	B or AS
151	High Build Epoxy (two-pack) Hydrocarbon Resin Modified	Finish	HB	B or AS
155	'T' Wash	Adhesion promoter for hot dip galvanized steel	LB	B
156	Ultra low VOC adhesion primer (single-component)	To promote substrate adhesion properties of coating systems for hot dip galvanised steel, aluminium and stainless steel surfaces	LB	B or AS
157	Adhesion promoting (single-component)	To promote substrate adhesion properties of coating systems for hot dip galvanised steel, aluminium and stainless steel surfaces	LB	B or AS
159	Aluminium Epoxy (two-pack)	Sealer/Primer	LB	B or AS
160	Red Oxide Moisture Cured Polyurethane (single-component)	Primer/Blast Primer for maintenance or new works	LB	B or AS
162	MIO Moisture Cured Polyurethane	Undercoat/Finish	NB or HB	B or AS
164	Moisture Cured Polyurethane (single-component)	Semi-gloss Finish	LB	B
			NB	AS
168	Polyurethane (two-pack)	Gloss Finish	LB	B
			NB	AS
169	Polyurethane (two-pack)	Semi-gloss Finish	NB	B (small areas by brush)
			HB	AS
185	Organic Modified Polysiloxane (two-pack)	Gloss Finish for new works or maintenance	NB	B
			HB	AS
200	Grease Paint	Primer		B (AS for difficult access areas)
201	Grease Paint	Undercoat/Finish	HB	B or AS

**(05/05) Notes:**

- 1 Colour reference shall be as per the manufacturer's declared colour given with reference to BS 4800 and/or BS 381C where appropriate.
- 2 Dry Film Thickness (dft) range shall be as per the manufacturer's data sheet. The minimum dry film thickness of the paint coats and paint system shall be as per the protective systems detailed in Table 50/2 where given.

**TABLE 50/2: (05/05) Requirements for Bridges, Parapets, Bearings, CCTV Masts, Cantilever Masts, Steel Lighting Columns and Bracket Arms and other Highway Structures: Protective Systems**

Type	Substrate Type	Surface preparation		1st Coat	2nd Coat	3rd Coat	Minimum total dry film thickness of the paint system (microns)
I (M) – High Build Epoxy (two-pack) / Polyurethane (two-pack) finish	Steel	Clean, bright Sa2 or St3 quality steel	Item No.	115	116	168	300
			Min dry film thickness (µm)	100		50	
	Aluminium metal spray, zinc metal spray	Bright or sound metal coating	Item No.	115	116 or 112	168	300
			Min dry film thickness (µm)	100		50	
	Existing paint coats	Sound finishing coat or last undercoat	Item No.	Nil	Nil	168	50
			Min dry film thickness (µm)	-	-	50	
		Other sound coats	Item No.	Nil	116 or 112	168	175
			Min dry film thickness (µm)	-	100	50	
STRIPE COATS:							
Item 116 or 112. Brush or airless spray. One stripe coat in area prepared to clean steel or sound metal coating. Applied over 1st coat							
PATCH COATS:   NIL							
NOTES:							
1. (05/05) When a light tint gloss finish is required an extra coat of Item 168 shall be applied. Item 169 Polyurethane Finish, may be used in lieu of Item 168 to provide a semi-gloss finish, alternatively Item 164 (Moisture Cure Polyurethane finish) can provide a semi-gloss finish and is tolerant of surface moisture (but not running water) and low temperatures during application and curing.							
2. (05/05) Types I (M) and II (M) can be combined to allow paint maintenance to proceed when temperature falls and relative humidity increases and for night work.							
HEALTH AND SAFETY: (05/05)							
Polyurethane (two-pack) and Moisture Cured Polyurethane paints contain isocyanate and can be injurious to health if not used correctly. An assessment of the risks and controls for their safe use shall be carried out before use.							

**TABLE 50/2: (05/05) Requirements for Bridges, Parapets, Bearings, CCTV Masts, Cantilever Masts, Steel Lighting Columns and Bracket Arms and other Highway Structures: Protective Systems (continued)**

Type	Substrate Type	Surface preparation		1st Coat	2nd Coat	3rd Coat	4th Coat	Minimum total dry film thickness of the paint system (microns)
II (M) – MC/ Polyurethanes	Steel	Clean or bright steel	Item No.	160	162	162	164 /169	275/325
			Min dry film thickness (µm)	40		70	40/50	
		Sa2 or St3 quality steel	Item No.	N/A	N/A	N/A	N/A	
			Min dry film thickness (µm)	-	-	-	-	
	Aluminium metal spray, zinc metal spray	Bright or sound metal coating	Item No.	160	162	162	164 /169	275/325
			Min dry film thickness (µm)	40		70	40/50	
	Existing paint coats	Sound finishing coat or last undercoat	Item No.	-	-	-	164 /169	50/100
			Min dry film thickness (µm)	-	-	-	40/50	
		Other sound coats	Item No.	-	162	162	164 /169	225/275
			Min dry film thickness (µm)	-	70	70	40/50	
STRIPE COATS:								
Item 162: Brush or airless spray. Two stripe coats, the first applied over 1st coat, the second coat applied over 2nd coat								
PATCH COATS: NIL								
NOTES:								
1. Item 168, Polyurethane (two-pack) gloss finish may be used in lieu of Item 164 MC Polyurethane semi-gloss finish (two-pack Polyurethane gloss finishes are less tolerant of moisture and low temperatures during application and curing than MC Polyurethanes and shall therefore only be specified when conditions preclude the formation of moisture on surfaces and when the ambient temperature is likely to remain above 5°C during application and the curing period).								
2. Types I (M) and II (M) can be combined to allow paint maintenance to proceed when temperature falls and relative humidity increases and for night work.								
HEALTH AND SAFETY:								
Moisture cured Polyurethane and Polyurethane (two-pack) paints contain isocyanate and can be injurious to health if not used correctly. An assessment of the risks and controls for their safe use shall be carried out before use.								

**TABLE 50/2: (05/05) Requirements for Bridges, Parapets, Bearings, CCTV Masts, Cantilever Masts, Steel Lighting Columns and Bracket Arms and other Highway Structures: Protective Systems (continued)**

Type	Substrate Type	Surface preparation		1st Coat	2nd Coat	3rd Coat	Minimum total dry film thickness of the paint system (microns)
III (M) – Extended Cure Epoxy/ Polyurethanes	Hot dip galvanizing	Bright or sound metal coating	Item No.	155 or other adhesion promoter	121	164, 168 or 169	175/250
			Min dry film thickness (µm)		100	40/50/50	
III (M) (alternative) – Extended Cure Epoxy/ Polyurethanes	Hot dip galvanizing	Bright or sound metal coating	Item No.	121	164, 168 or 169		
			Min dry film thickness (µm)	100	50		175
STRIPE COATS:							
Item 121: Brush or airless spray. One stripe coat in area prepared to clean steel or sound metal coating. Applied over 1st coat							
PATCH COATS: NIL							
NOTES:							
1. Some Item 121 formulations have been developed for direct application to hot dipped galvanised surfaces with excellent adhesion without the need for an adhesion promoter (to be checked with and guaranteed by paint manufacturer).							
2. When a light tint gloss finish is required an extra coat of Item 168 shall be applied. Item 164, Moisture Cured Polyurethane Finish, may be used in lieu of Item 168 to provide a semi-gloss finish tolerant of surface moisture (but not running water) and low temperatures during application and curing.							
HEALTH AND SAFETY:							
Polyurethane (two-pack) and Moisture Cured Polyurethane paints contain isocyanate and can be injurious to health if not used correctly. An assessment of the risks and controls for their safe use shall be carried out before use.							



**TABLE 50/2: (05/05) Requirements for Bridges, Parapets, Bearings, CCTV Masts, Cantilever Masts, Steel Lighting Columns and Bracket Arms and other Highway Structures: Protective Systems (continued)**

Type	Substrate Type	Surface preparation		1st Coat	2nd Coat	3rd Coat	Minimum total dry film thickness of the paint system (microns)
IV (M) – MC/Epoxy/ Polyurethane	Steel	Clean, bright or Sa2 or St3 quality steel	Item No.	160	116 or 112	164 or 168	250
			Min dry film thickness (µm)	50		50	
STRIPE COATS:							
Item 112: Brush or airless spray. One stripe coat in area prepared to clean steel or sound metal coating. Applied over 1st coat							
PATCH COATS: NIL							
NOTE:							
1. When a light tint gloss finish is required an extra coat of Item 168 shall be applied. Item 164, Moisture Cured Polyurethane Finish, may be used in lieu of Item 168 to provide a semi-gloss finish tolerant of surface moisture (but not running water) and low temperatures during application and curing.							
HEALTH AND SAFETY:							
Polyurethane (two-pack) and Moisture Cured Polyurethane paints contain isocyanate and can be injurious to health if not used correctly. An assessment of the risks and controls for their safe use shall be carried out before use.							

**TABLE 50/2: (05/05) Requirements for Bridges, Parapets, Bearings, CCTV Masts, Cantilever Masts, Steel Lighting Columns and Bracket Arms and other Highway Structures: Protective Systems (continued)**

Type	Substrate Type	Surface preparation		1st Coat	2nd Coat	3rd Coat	Minimum total dry film thickness of the paint system (microns)
V (M) - Grease Paints	Steel	Clean, bright or Sa2 or St3 quality steel	Item No.	200	201	201	350
			Min dry film thickness (µm)	-	150	150	
	Aluminium metal spray, zinc metal spray or hot dip galvanizing	Bright or sound metal coating	Item No.	Nil	201	201	350
			Min dry film thickness (µm)	-	150	150	
	Existing paint coats	Sound finishing coat or last undercoat or other sound coats	Item No.	Nil	Nil	201	150
			Min dry film thickness (µm)	-	-	150	
<b>STRIPE COATS:</b>							
Item 201, 150 µm mdft. Brush							
One stripe coat in all areas over 2nd coat							
<b>PATCH COATS:</b>							
Item 201, Brush, over 2nd coat							
The total dft of existing coats plus new coats including patch coats, shall not be less than 400 µm. Number of patch coats to suit.							

## #5009 Testing of Paints

### Provision of Samples

1 (05/05) Unless otherwise described in Appendix 50/5, the Contractor shall provide unopened 5 litre samples, known as 'A' samples, for quality assurance purposes, for each type of paint to be used for the Works in accordance with this Clause. In addition the Contractor shall supply at least 500 ml samples, known as 'B' samples, for application control purposes.

2 (05/05) 'A' and 'B' samples are tested for paint composition and/or properties against the original formulation issued by the paint manufacturer to the certifying body.

### 'A' Samples

3 (05/05) 'A' samples are required where more than 1000 litres of paint for any one coat are supplied to a single Contract. For two-pack systems separate samples of the base and activator shall be despatched by the Contractor to the testing authority.

4 (05/05) 'A' samples are not required for footbridge steelwork or CCTV masts, cantilever masts, steel lighting columns and bracket arms.

5 (05/05) The first 'A' samples shall be taken from the first representative batch of each type of paint delivered to site.

6 (05/05) If paint is to be supplied in tins of greater than 5 litre capacity then, for 'A' sampling, a minimum of four 5 litre tins of paint taken from each batch to be sampled shall be provided by the paint manufacturer. The 'A' samples shall be selected from these 5 litre tins.

7 (05/05) Additional 'A' samples of paints subject to testing under sub-Clause 3 of this Clause shall be provided by the Contractor depending on the volume of paint for each coat to be used in the Contract. Additional samples shall be provided in accordance with the following:

- (i) for 'Ready or Difficult Access' steelwork.  
Over 1000 litres: a further set of samples for each part or whole 1000 litres.

The Contractor shall also provide an 'A' sample:

- (ii) of any replacement batch of paint subject to testing under sub-Clause 3 of this Clause;
- (iii) of any returned paint described in sub-Clause 5010.4;
- (iv) when the paint is showing unsatisfactory application characteristics under Clause 5012.

8 (05/05) Immediately after selection, the 'A' samples shall be despatched by the Contractor to the testing authority, together with Appendix 50/4 Form HA/P3.

9 (05/05) Paint shall be supplied in sufficient time to allow for sampling, delivery to the testing authority and testing before the start of application.

10 (05/05) Except for procedure trials, paint shall not be applied until the 'A' sample from the paint to be applied has been tested and confirmed as being satisfactory for use.

### 'B' Samples

11 (05/05) For single component coatings the Contractor shall take 'B' samples from painters' kettles or from nozzles of airless spray guns directly into clean, new 500 ml tins which shall be filled and then sealed prior to despatch to the testing authority. The Contractor shall take 'B' samples for two-pack systems as separate unmixed samples of the base and activator (cure) components. The 'B' samples shall be taken following the stirring of the individual components and immediately prior to mixing the two components for use in the Works. The samples shall be decanted directly into clean, new 500ml tins which shall be filled and immediately sealed prior to despatch to the testing authority. 'B' samples shall be taken as site spot checks, with a minimum of, say, one batch in three being sampled. Also for each set of 'A' samples taken, a further 'B' set of samples is required to be submitted for testing. 'B' samples are required for footbridge steelwork and CCTV masts, cantilever masts, steel lighting columns and bracket arms even though 'A' samples are not required.

12 (05/05) Immediately after selection, the 'B' samples shall be despatched by the Contractor to the testing authority, together with Appendix 50/4 Form HA/P3. For two-pack systems separate tins containing the activator and the base shall be despatched to the testing authority.

### Provision of 500ml Tins, Packing and Transport of 'A' and 'B' Samples

13 (05/05) The Contractor shall provide 500 ml tins with lids and lid clips for 'B' samples at the start of painting or before any procedure trials required by Clause 5011. The quantity of tins supplied shall be sufficient to avoid any delay in taking 'B' samples throughout the work.

14 (05/05) The Contractor shall ensure that the lids of all tins of sample paint are securely clipped down when they are despatched for testing.

**15** (05/05) The Contractor shall be responsible for handling, packing as necessary, prompt despatch and transit of 'A' and 'B' samples, including collection of samples from the testing authority for use or disposal as appropriate, following satisfactory testing and reporting.

**16** (05/05) The Overseeing Organisation shall report back to the Supervising Firm, as stated on Appendix 50/4 Form HA/P3, all results of the testing, who shall then notify the Contractor of the results.

### 5010 Storage Requirements and Keeping Periods for Paints

**1** (05/05) On delivery to site, paint shall be unloaded directly into one or more secure paint stores which shall be located approximately within 100 metres of the painting area. Insulation and means of heating and ventilation shall be provided as necessary to maintain the temperature of paint stores between 5°C and 27°C.

If at any time or place, paint in tins, painters' kettles or airless spray containers is allowed to reach temperatures outside the 5°C and 27°C limits, or the paint manufacturer's recommended storage temperature, the paint shall be discarded and not used for the Works. Two pack products which produce an exothermic reaction when mixed, may be allowed to exceed the specified higher temperature limit. The Contractor shall also implement any additional storage restrictions recommended by the paint manufacturer.

**2** (05/05) Unless excepted in sub-Clause 4 of this Clause, paint which has not been used within the shelf life recommended by the manufacturer or within 18 months of the date of manufacture, whichever is the lesser, shall be discarded or returned to the manufacturer and not used in the Works.

**3** Chemically cured or moisture cured paints shall not be used after the expiry of the pot life stipulated by the paint manufacturer. They shall be discarded on expiry of the pot life or at the end of each working day/night whichever is the less. All other paints in opened tins or open containers including painters' kettles shall be returned to store and kept in sealed containers with not more than 10% ullage.

**4** (05/05) Exceptionally, components of two-pack epoxy paints may have their keeping periods extended to 24 months from the date of manufacture provided that the Contractor returns the paints to the paint manufacturer and ascertains that the manufacturer examines the contents of each tin and reconstitutes the paints as necessary so that such paints are equal in all respects to the paints described in the Contract. The Contractor shall provide a Certificate of Conformity

confirming that such paints have been inspected and where necessary reconstituted and conform in all respects to the Contract.

**5** (05/05) Each tin of reconstituted paint returned to site by the manufacturer shall have an additional label affixed stating 'Extended Shelf Life to (date)'. The previous date marking shall remain and not be obscured. Testing in compliance with Clause #5009 shall apply to reconstituted paints.

### 5011 Procedure Trials

**1** (05/05) Unless otherwise described in Appendix 50/5, at the start of the Works, the Contractor shall carry out procedure trials on areas totalling between 2 m<sup>2</sup> and 10 m<sup>2</sup>, employing the labour and equipment to be used in the Works. The Contractor shall demonstrate his ability to carry out the specified methods of surface preparation to the standard required and to apply the paints he has selected in accordance with the specification. The Contractor shall supply sufficient paint for the trials as required for the size of the test area. The remaining surface preparation shall not be started until the first stage of the procedure trials specified in sub-Clause 2 of this Clause are confirmed as satisfactory.

**2** (05/05) Immediately following the satisfactory completion of the first stage of the procedure trials, the Contractor shall carry out the second and third stages, employing the labour and equipment to be used in the Works.

In order to avoid delay, the trials may be carried out in three stages:

- (i) surface preparation and primer;
- (ii) undercoat(s);
- (iii) finish.

Paint application of the various coats on the remaining parts of the structure shall not be started until the relevant stage of the procedure trials are confirmed as satisfactory.

**3** Procedure trials shall be completed within a 7 day period.

**4** (05/05) Any adjustment to the registered paint formulations shown to be required by the trials, other than an adjustment to the solvent shall be agreed with the Overseeing Organisation and made at the paint manufacturer's works.

**5** The Contractor shall carry out further procedure trials whenever he employs replacement skilled labour or proposes to use equipment of a different type.



## 5012 Application of Paint

**1** The application of paint shall be supervised at all stages by the Contractor's supervisory staff. The companies contracted to apply protective coating systems to steel structures, and their personnel, shall be capable of carrying out the work properly and safely. The personnel carrying out the work shall have the necessary skills and/or qualifications.

**2** Paint shall be supplied from the Contractor's paint store to the painters ready for application, the only adjustment of formulation permitted being as described in sub-Clause 5011.4. In exceptional circumstances any addition of solvent necessary to improve application shall be advised and if possible carried out by the paint manufacturer, preferably in the paint process plant with adequate equipment and controlled measurements.

**3** (05/05) During the application of paint, surfaces to be treated shall be safely accessible and well illuminated. When using the coating materials, the manufacturer's technical data sheet shall be observed. Prior to and during the application, the coating materials shall be verified to ensure:

- (i) conformity of the container label with the specified product description;
- (ii) no skin formation;
- (iii) any sediment present shall be easily redispersible with no irreversible settling;
- (iv) usability under the given site conditions.

**4** Paint shall be applied only to surfaces which have been prepared and cleaned as described in this Series. Areas of adjacent surfaces which are not to be painted shall be masked before application of paints to the prepared and cleaned surfaces. Accidental overspray on adjacent unpainted surfaces shall be removed immediately.

**5** Unless otherwise described in Appendix 50/2, a coat of paint in a system shall be applied by one of the following methods:

- (i) brush (B);
- (ii) airless spray (AS);
- (iii) (05/05) air assisted spray (S).

**6** Paint shall not be applied under the following conditions:

- (i) when the ambient temperature falls below 5°C or the relative humidity rises above 90% or, for types of paints in sub-Clause 5012.14, outside the temperatures and humidities recommended by the paint manufacturer;

- (ii) during rain, snow, fog, mist or in a dust-laden atmosphere;
- (iii) when the amount of moisture likely to be deposited on the surface by condensation or rain before or after painting, may have a harmful effect on the paint;
- (iv) when wind-borne dust may have a harmful effect on the paint.

**7** Before starting the procedure trials described in Clause 5011, the Contractor shall make available details of the overall wet film thickness for each coat he proposes to apply. He shall also make available information as to the total amount of paint he expects to use for each coat of each system during any Contract for which procedure trials are required. The calculation of the amount of paint to be used shall be based on the volume solids plus an allowance for waste.

**8** The following requirements on paint film thicknesses shall apply:

- (i) wet film thickness gauges shall be used where practicable to check that the wet film thickness is not less than:

$$\frac{\text{min dry film thickness (mdft)} \times 100}{\text{volume solids \%}}$$

- (ii) during the application of a paint system, the Contractor shall ensure that the progressive total thickness of the applied coats shall allow the specified minimum total dft of the system to be attained without exceeding, overall, the proposed wet film thickness referred to in sub-Clause 7 of this Clause by more than 20%;
- (iii) in no case shall the total dry film thickness of a paint system or the mdft of the last undercoat and finish be less than that specified in Appendix 50/1 Form HA/P2 (Maintenance) Paint System Sheet;
- (iv) the local dry film thickness for any primer shall not exceed the specified mdft by more than 30% and for other paints by more than 75%.

**9** Each coat of paint of a specified system shall have satisfactory adhesion.

**10** (05/05) Each applied specified paint coat, shall be free from defects, including cratering, pin-holing blistering, rivelling, sagging, bittiness, dry spray and cissing etc. The presence of any of these defects shall be determined by unaided visual assessment. The presence of pin-holing or porosity shall be determined by low or high-voltage detectors (at corners, bolted joints and welds pin-holing shall be exempted). The

finished system shall have an even and uniform appearance with no defects and the finishing paint in visually sensitive areas shall be from the same batch.

**11** (05/05) The gloss level of the finishing paint shall be established before the procedure trials. A painted tinsplate reference panel, 150 mm x 100 mm, shall be provided by the Contractor for this purpose.

**12** Unless otherwise specified, patch painting described in Appendix 50/1 shall only be applied over areas of an existing system which have been prepared to sound paint.

**13** All coats in a system including the stripe coat(s) (see sub-Clauses 5012.14 to 20), but excepting repeat coats of the same patch paint, shall be in contrasting colours to aid identification. Before starting the procedure trials described in Clause 5011, the Contractor shall provide a reference panel, coated with the stepped-back paint system to indicate the contrast between each coat of paint.

**14** (05/05) Two-pack chemically cured and moisture cured paints shall not be applied when the steel temperature falls below 3°C above dew point and/or 0°C or when the steel or ambient temperatures are below those advised by the paint manufacturer, nor shall such paints be applied when the temperatures are likely to fall below the advised temperatures during the curing period.

### Stripe Coat(s)

**15** (05/05) Unless otherwise described in Appendix 50/5, the stripe coat(s) shall be applied by brush over all welds, edges and all fasteners including washers and to all external corners except those of RHS members.

**16** In areas prepared down to the substrate or to a metal coating, the first stripe coat, using second undercoat paint, shall be applied over the primer or the first undercoat; when a second stripe coat is specified it shall be separated from the first stripe coat by an undercoat. The first stripe coat on fasteners treated with Item 155 shall be applied by brush; other stripe coats may be applied by brush or airless spray as appropriate.

**17** In areas prepared down to sound paint, the stripe coat(s) shall be applied before the priming coat.

**18** (05/05) Stripe coat(s) applied on existing paint coats shall be applied by brush.

**19** The first stripe coat on fasteners treated with Item 155 shall be applied by brush.

**20** Wet cleaning as described in sub-Clause 5003.8 shall be used to remove final traces of grease from fasteners before treatment with Item 155.

**21** The Contractor shall enter the details of the stripe coats he has selected in Appendix 50/1 Form HA/P1 (Maintenance) Paint System Sheet giving the Item No., colour and method of application.

**22** Square solid infill bars shall, after the second undercoat has been applied, be given an extra coat of the thickest undercoat in lieu of stripe coat or coats.

### Exposure times for prepared steel surfaces and for metal coated surfaces.

**23** Clean steel prepared by dry blast cleaning or bright steel prepared by abrading or by grinding shall be primed within 4 hours.

**24** Clean steel prepared by wet blast cleaning only, shall be primed within 4 hours of being dry enough for painting.

**25** Clean steel prepared by combined wet/dry blast cleaning shall be primed within 4 hours of dry blast cleaning.

**26** Sa2 or St3 steel prepared by dry blast cleaning or abrading shall be overcoated within 48 hours.

**27** Sa2 steel prepared by wet blast cleaning or combined wet/dry blast cleaning shall be primed within 24 hours of being dry enough for painting or within 48 hours of dry blast cleaning.

**28** Steelwork which has been thermally metal spray coated at site shall be primed or sealed within 4 hours and in any case before the surfaces have been affected by moisture.

**29** Areas prepared down to bright or sound thermally sprayed metal coating shall be sealed or primed within 4 hours of preparation by dry blast cleaning or abrading and in any case before the surfaces have been affected by moisture.

**30** Hot dip galvanizing which has been abraded to bright metal prior to painting shall be primed within 4 hours, or within 4 hours of being dry enough for treatment if wet abraded, and overcoated within 48 hours of priming.

**31** Gaps at joints or plies shall be sealed in accordance with sub-Clause 5002.10 either before or after the application of the primer as appropriate.

### Paint Overcoating Times

**32** (05/05) Unless otherwise specified in Appendix 50/5, overcoating times shall be as follows:

- (i) (05/05) primers on steel or sealed thermally sprayed metal coating or first coats over Item 155 or etch primed hot dip galvanizing shall be overcoated within 72 hours and the next

coat applied within 14 days or as recommended by the paint's manufacturer;

- (ii) surfaces of existing paint coats which have been prepared to sound paint, cleaned down only or abraded only to remove gloss, shall be overcoated within 7 days;

- (iii) (05/05) coats following those referred to in i and ii above, shall be applied within 14 days of each coat or as recommended by the paint's manufacturer.

### **5015 (11/03) Additional Requirements for the Protection of CCTV Masts, Cantilever Masts, Steel Lighting Columns and Bracket Arms**

#### **Applicable Clauses**

- 1 Unless otherwise described in Appendix 50/5, the work described in this Clause shall be carried out in compliance with Appendix 50/1 and with Clauses 5001 to 5014 except that, only one stripe coat in undercoat paint is required.

### **5013 Form HA/P1 (Maintenance) Paint System Sheet (Appendix 50/1) Form HA/P2 Paint Data Sheet (Appendix 50/3)**

- 1 As soon as the Contract has been awarded the Contractor shall prepare and make available a copy of Appendix 50/1 Form HA/P1 (Maintenance) Paint System Sheet, of which he shall have completed parts 10 to 14 together with relevant copies of Form HA/P2 Paint Data Sheet (Appendix 50/3).

- 2 (05/05) Following any relevant approvals in accordance with the Contract, Appendix 50/1 Forms HA/P1 (Maintenance) Paint System Sheet shall be adopted for the Works.

### **5014 Access, Containment and Lighting**

- 1 Without prejudice to the Conditions of Contract, access for inspection shall be provided, erected and maintained by the Contractor. The access shall be adequate in all respects for inspection purposes.
- 2 (05/05) Manual surface preparation and coating application work shall not be carried out when light intensity at the workface is less than 500 lux. When the natural light intensity falls below this level, the Contractor shall install and maintain temporary lighting which shall provide a minimum light intensity of 500 lux over at least 1.0 m<sup>2</sup> at the workface during the work and also for inspection when required

# NATIONAL ALTERATIONS OF THE OVERSEEING ORGANISATION OF SCOTLAND

## 5007SE Paint and Similar Protective Coatings

**1** The term paint in this specification shall be deemed to refer also to similar protective coatings including specialist coatings such as grease paints.

**2** (05/05) The paints permitted for use by the Overseeing Organisation in the Works are listed in the Manual of Paints for Structural Steelwork which is included in BD 35 (DMRB 2.4.1) and which also contains details of the quality assurance scheme for paints and similar protective coatings. All paints shall have a current BBA HAPAS Roads and Bridges Certificate or equivalent.

**3** All paints shall be supplied in sealed containers of not more than 5 litre capacity and these shall be used in order of delivery. Each container shall be of the completely removable lid type and be clearly marked on the side to show the name of the manufacturer, registered description of the material (including purpose, e.g. whether primer, undercoat or finish), colour, Item No, paint manufacturer's reference number, batch number and date of manufacture. Where date of manufacture is coded, the Contractor shall provide the code key.

**4** The Contractor shall ensure that the properties of the paints he has selected are suitable for the conditions on site, including temperature and humidity, and that he is able to apply the paints satisfactorily to all parts of the structure in these conditions.

**5** Unless otherwise described in Appendix 50/5, all paints forming any one protective system, or overlapping systems, shall be obtained from the same manufacturer, as named by the Contractor in Appendix 50/1 Form HA/P1 (Maintenance) Paint System Sheet.

**6** (05/05) The requirements of Clause #5009 and their respective Tables shall apply in Scotland.