Technical Specification

Transport and Main Roads Specifications
MRTS85 Repainting Steel Bridges

July 2017

Queensland Government

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1 Introduction

This Technical Specification applies to the repainting of steel bridges where the paint system can either:

a) have an existing red lead or other prime coat well adhering to the steelwork and an existing micaceous iron oxide top coat, where:

   i. in urban areas or areas with a significant number of pedestrians on or under the bridge, less than 1% of the paint system is broken down, or

   ii. in other areas, less than 10% of the paint system is broken down.

b) have an existing red lead or other prime coat which has been assessed as no longer providing protection to the structure

This Technical Specification is based on encapsulation of the red lead prime coat, where applicable or the complete removal of the existing paint system.

This Technical Specification shall be read in conjunction with MRTS01 *Introduction to Technical Specifications*, MRTS50 *Specific Quality System Requirements* and other Technical Specifications as appropriate.

This Technical Specification forms part of the Transport and Main Roads Specifications Manual.

2 Definition of terms

The terms used in this Technical Specification shall be as defined in Clause 2 of MRTS01 *Introduction to Technical Specifications.*

3 Referenced documents

Table 3 lists documents referenced in this Technical Specification.

Table 3 – Referenced documents

Reference	Title
AS 1580	*Paints and related materials – Methods of test – Introduction and list of methods*
AS 1580.301.1	*Paints and related materials – Methods of test – Non-volatile content by mass*
AS 1627	*Metal Finishing – Preparation and pretreatment of surfaces*
AS 2855	*Paints and related materials – Micaceous iron oxide pigment*
AS 4361.1	*Guide to lead paint management – Industrial applications*
AS/NZS 1580.401.1	*Paints and related materials – Methods of test – Surface dry condition*
AS/NZS 1580.404.1	*Paints and related materials – Methods of test – Recoating properties*
ISO 8501	*Visual Assessment of Surface Cleanliness*
ISO 8503	*Surface Roughness Characteristics of Blast-Cleaned Substrates*
ISO 8504	*Surface Preparation Methods*
MRTS01	*Introduction to Technical Specifications*
MRTS50	*Specific Quality System Requirements*

Reference	Title
MRTS88	*Protective Coating for New Work*
NOHSC:1003	*National Exposure Standards*
NOHSC:1012	*National Standard for the Control of Inorganic Lead at Work*
NOHSC:2015	*National Code of Practice for the Control and Safe Use of Inorganic Lead at Work*
TN144	*Paint Systems for MRTS88*

4 Quality system requirements

4.1 Hold Points, Witness Points and Milestones

General requirements for Hold Points, Witness Points and Milestones are specified Clause 5.2 of MRTS01 *Introduction to Technical Specifications*.

The Hold Points, Witness Points and Milestones applicable to this Technical Specification are summarised in Table 4.1.

Table 4.1 – Hold Points, Witness Points and Milestones

Clause	Hold Point	Witness Point	Milestone
5.1	1. Paint Inspector		
6.2	2. Categories of Repainting		
7.3			Submission of proposed paint system (28 days)
7.4	3. Alternative Paint System		Submission of proposed paint system (28 days)
8.2	4. Defective Substrate Steelwork		
8.6	5. Assessment of Substrate		
9.4	6. Procedure for abnormal weather conditions		Submission of proposed procedure (28 days)
10.2	7. Defective Steelwork		
10.3.5		1. Substrate Profile Verification	
10.9	8. Procedure for abnormal weather conditions		Submission of proposed procedure (28 days)
12.1	9. Inspection and Test Plan		Submission of proposed procedure (28 days)
14.2	10. Submission of Manufacturer Data Record		

4.2 Construction procedures

The Contractor shall prepare documented procedures for all construction, environmental, safety, paint removal and paint application processes in accordance with the quality system requirements of the Contract.

Construction procedures for those activities listed in Table 4.2 shall be submitted to the Administrator in accordance with the quality system requirements of the Contract.

Table 4.2 – Construction procedures

Clause	Procedure
10	Painting procedures

4.3 Conformance requirements

The conformance requirements which apply to lots of work covered by this Technical Specification are summarised in Table 4.3

Table 4.3 – Conformance requirements

Clause	Procedure
12	Inspection of Paint System

4.4 Inspection

The Administrator will carry out examination of the work and shall be given reasonable access to the Site for this purpose. Hold Points for inspection shall be agreed between the Administrator and the Contractor before work commences. The Administrator may refer to the Contractor's records of other jobs as the basis for inspection. Defects shall be marked with school grade chalk, adhesive inspection labels or masking tape or a product that does not affect the paint or surface.

5 Qualification requirement

5.1 Paint inspector

The Administrator shall appoint an approved painting inspector to oversee the painting operation **Hold Point 1** The painting inspector shall either:

a) hold Level 1: National Association of Corrosion Engineers (NACE) Accreditation; or

b) satisfy the Administrator of sufficient technical knowledge to undertake the inspections under the Contract.

5.2 Competence of tradesperson

The Contractor shall ensure all surface preparation and coating application is performed by tradespeople who are specialists or have a minimum of five years experience in this particular field. The Contractor shall produce evidence of satisfactory and lengthy experience. Experienced industrial painters shall be employed and the foreman shall possess a current Coating Inspection Ticket issued or lengthy relevant experience which is acceptable to the Administrator.

6 Inspection of existing paint system and structure

6.1 Investigation

Prior to undertaking any repainting activities the existing paint system shall be assessed to determine the condition of the existing paint system.

The following testing shall be undertaken:

a) adhesion testing to determine the location of the failure in the existing paint system

b) percentage lead in the existing paint

c) presence of significant corrosion where loss of section is occurring, and

d) knife Test Inspection.

6.2 Categories for repainting

Prior to preparing for repainting, the existing steel work shall be classified by the Contractor and accepted by the Administrator as one of the categories listed in this clause. **Hold Point 2**

a) Full re-coating

Full re-coating shall include:

i. all areas where the steelwork is rusty

ii. areas where the paintwork is crazed, cracked or delaminating, and

iii. all areas previously painted with non-micaceous iron oxide paint

b) Top Coating Only

Top Coating Only includes only existing paintwork which is in sound condition and is compatible with the existing paintwork.

6.3 Defective steelwork

Any defective areas shall be repaired prior to the repainting of the bridge, and painted as per the full recoating.

6.4 Patch painting

In the event structural repairs are required to the structure, patch painting of the corroded areas is permitted to prevent further degradation of the steel members prior to repainting. The patch painting shall consist of an inorganic zinc rich prime which is compatible to the paint system being applied.

6.5 Selection of paint system

The assessment of the existing paint system will determine the type of repainting to be undertaken.

6.5.1 Existing paint sound

Existing paint systems which have a prime coat which is well adhered to the steelwork can be encapsulated by applying additional coats over the existing paint system. Prior to undertaking repainting, paint trials shall be undertaken to ensure the new paint system is compatible with the existing paint. Only paint systems which are compatible with the existing paint shall be utilised.

6.5.2 Existing paint not sound

Existing paint system which are not providing protection to the steelwork shall be removed back to bare steel and a new coating applied to the structure. The existing paint shall be removed using Clauses 8 to 12 of this Technical Specification and the new coating applied in accordance with MRTS88 *Protective Coating for New Work*.

7 Materials

7.1 General

All paint systems shall not contain lead nor chromium. All paint systems shall comply with the requirements of AS/NZS 2312.

The paint system shall be defined in Clause 2 of Annexure MRTS85.1.

The Contract documents will outline the paint system which will be used under the contract. Annexure MRTS85.1 can be completed by referring to the departmental technical note TN144 *Paint Systems for MRTS88*. All the previously used paint systems which have been assessed under Appendix A of MRTS88 *Protective Coating for New Work* are listed in this technical note.

7.2 Paint repair procedure

All repair paint systems shall not contain lead nor chromium. The paint repair systems shall comply with the requirements of AS/NZS 2312.

Paint repair system and procedures are required to repair paint systems where the paint has been damaged during handling or construction and in service defects.

The paint repair system shall be defined in Clause 2 of Annexure MRTS85.1.

The Contract documents will outline the paint repair system which will be used under the contract. Annexure MRTS85.1 can be completed by referring to the departmental Technical Note TN144 *Paint Systems for MRTS88*. All the previously used paint systems which have been assessed under Appendix A of MRTS88 *Protective Coating for New Work* are listed in this technical note.

7.3 Equivalent paint systems

Contractors wishing to use an equivalent paint system to the one specified in Clause 2 of Annexure MRTS85.1 shall submit the equivalent paint system to the Administrator at least 28 days prior to ordering paint. **Milestone**

TN144 *Paint Systems for MRTS88* outlines a number of paint systems from various paint manufactures. The Administrator may specify a particular paint company system, however the Contract may prefer to use another paint manufacturer's product. This Clause permits the Contractor to propose an equivalent paint system provided the paint system is listed in TN144.

7.4 Alternate paint systems

Contractors wishing to use an alternate paint system shall submit the alternate paint system to the Administrator at least 28 days prior to ordering paint. Any alternate paint system proposed shall comply with the requirements outlined in Appendix A of MRTS88. **Milestone**

Paint shall not be ordered until the alternate paint system has been approved by the Administrator. Paint system trials shall be completed before approval. **Hold Point 3**

8 Paintwork of sound existing paint

8.1 General

The scope of the work to be undertaken under the Contract shall be as stated in Clause 1 of Annexure MRTS85.1.

8.2 Defective steelwork

Prior to preparation for repainting, the Contractor shall notify the Administrator of any defective steelwork and propose corrective action. **Hold Point 4**

8.3 Pre-cleaning

All surfaces shall be cleaned and free of contaminates prior to preparing the surface for the application of the paint system. The surface shall be free of dust, dirt, grease, oil, chemicals and salts. The minimum standards employed shall be in accordance with AS 1627.1 *Removal of oil, grease and related contamination*.

8.3.1 Surface decontamination

Surface decontamination is required when uncoated steel has been exposed to a corrosive environment.

The surface shall be tested with a test kit using ferrous ion indicator strips, titration analysis indicator test strips, and pH indicators strips.

The allowable maximum ranges for contamination shall be:

a) soluble iron salts: < 3 mg/l

b) sodium chloride: less than 30 ppm

c) pH: between 6 and 8

When the ranges are exceeded, high-pressure water blasting with potable water using a minimum nozzle pressure of 25,000 kPa shall be used to remove the salts, dirt and other contaminates from the surface and re-tested. Any detergents used shall be of a non-ionic type and be approved by the Administrator.

If contamination values are still exceeded, blast the substrate and re-test. The frequency of testing shall not be less than one for every 50 m². High pressure cleaning shall continue until the contaminates are removed.

8.4 Preparation of surface prior to painting

8.4.1 General

The method of specifying and assessing the degree of surface preparation prior to painting shall be in accordance with the requirements of the following standards:

a) ISO 8501 Visual Assessment of Surface Cleanliness

b) ISO 8503 Surface Roughness Characteristics of Blast-Cleaned Substrates, and

c) ISO 8504 Surface Preparation Methods.

8.4.2 Preparation required

All rusty steel shall be prepared back to sound metal using a needle gun or similar equipment approved by the Administrator. All surfaces shall be blasted with potable water at 25,000 kPa pressure and water flow of 22 L/min to remove all dirt, grease and loose metal. An “St 3” surface preparation classification is required in accordance with the requirements of ISO 8504.

Surface preparation grades are defined in ISO 8501 as follows:

> ***St 2 Thorough hand and power tool cleaning***
>
> *When viewed without magnification, the surface shall be free from visible oil, grease and dirt, and from poorly adhering mill scale, rust, paint coatings and foreign matter.*
>
> ***St 3 Very thorough hand and power tool cleaning***
>
> *As for St 2, but the surface shall be treated much more thoroughly to give a metallic sheen arising from the metallic substrate.*

All other surfaces to be painted shall be washed down with high pressure water cleaning equipment to remove all surface contamination and loose and under-bound existing coatings.

All existing coatings that are removed or dislodged by this process shall be chased back with the cleaning nozzle to a point where the coating is well adhered and sound.

All edges of the remaining coating shall be scraped back with a painter’s scraper to ensure that the coating is well adhered. The leading edges of the original coating shall be sanded smooth to feather out the leading edge of the paint film.

The area where the paint has delaminated shall be abraded before applying the new coating. The degree of surface preparation shall depend on the condition of the surface.

If degreasing detergents have been used to assist in the cleaning process, the surface shall be fully rinsed with potable water as the final process of the cleaning work.

Surface of existing paint can be cleaned with thinners as an alternative to cleaning with water.

8.5 Water blaster

A water blaster is defined as a specialist purpose-built item of plant. Spraying equipment is not permitted to be used as a water blaster.

8.6 Assessment of substrate

The Contractor shall use ISO 8501 to assess, classify and record the grade of preparation and surface profile and roughness characteristics of the newly prepared surface. The following procedure from Clause 5, Note 2 of ISO 8501 shall be used:

For previously painted surfaces that have been prepared for renewed painting, only photographs (in ISO 8501) with rust grade designations D or C may be used for the visual assessment. The choice depends on the degree of pitting.

ISO 8503 shall be used to define the surface roughness.

A record of these assessments shall be provided to the Administrator for approval. **Hold Point 5**

9 Application of paint

9.1 General

All coatings shall be applied in accordance with the Manufacturer's recommendations. All coatings shall be thoroughly mixed and the amount of thinners shall be approved by the Administrator.

Each coat of paint shall be applied at the application rate stated in Clause 2 of Annexure MRTS85.1.

The curing time for each coat shall be strictly adhered to.

Coatings shall be applied so as to produce a smooth, even coating free of lumps, ripples, sags, air holes and other defects.

9.2 Condition of steelwork

All steelwork shall be dry, clean and free of any loose or flaky material prior to the application of each coat.

9.3 Weather conditions

All coatings shall be applied to a dry surface. Coatings shall not be applied in the following conditions:

a) when the temperature of the ambient air or the receiving surface is less than 10°C, or

b) when the temperature of the receiving surface is greater than 55°C, or

c) when the humidity is greater than 85%. Paint shall not be applied if adverse weather conditions are likely to occur before the paint can cure.

The coating shall not be applied when the surface temperature of the metal is within 3°C above the dew point, or when the surface is in direct strong sunlight.

All painting shall be monitored using a total weather station which records the following information:

a) time and date

b) ambient temperature

c) relative humidity, and

d) dew point.

9.4 Abnormal weather conditions

Where the environment or weather conditions do not permit the application within the limits outlined in Clause 9.3, the Contractor shall submit a procedure for adjusting the application process or changing the environment to the Administrator 28 days prior to the preparation of the substrate outlining the following: **Milestone**

a) method of changing the environment

b) process to be used for the preparation of the substrate

c) process for the application of the paint, and

d) process for the curing of the paint.

All painting within the changed environment shall be monitored using a total weather station which records the following information:

a) time and date

b) ambient temperature

c) relative humidity, and

d) dew point.

Paint application in abnormal weather conditions shall not be undertaken until the paint procedure has been approved by the Administrator. **Hold Point 6**

9.5 General storage of paint

Paint shall be stored in sealed containers in a lock-up store that is not exposed to extreme temperature. The temperature within the storage area shall be kept within the limits nominated by the paint manufacturer.

Paint which has not been used within the shelf life period specified in Annexure MRTS85.1, or within 18 months of manufacture, shall be removed and replaced.

9.6 General Site painting

All on-site applied painting systems shall be undertaken by brush or roller. The Contractor may apply for an exemption to apply the paint system using spray gun, provided the Contactor can demonstrate that:

a) there is a system to prevent paint droplets being carried by the wind from an area being painted

b) there is a system to monitor the overspray around the site

c) surrounds and adjacent areas to the surface being painted will be protected from paint overspray, and

d) there is a system to repair overspray, drips, spills and damage caused by wind drift of paint droplets.

9.7 Work Place Health and Safety

All surface preparation and painting shall be undertaken in accordance with the current Work Place Health and Safety requirements.

9.8 Environment Acts and Regulations

All surface preparation and painting shall be undertaken in accordance with the current Environment Acts and Regulations.

9.9 General equipment

The Contractor shall be responsible for the supply and maintenance of the painting and blasting equipment. The compressors shall be of adequate size for the work to be undertaken and be in good working order. Air shall be free of oil and water. Suitable water and oil traps shall be fitted to air lines and regularly maintained.

9.10 Inspection and acceptance

Each coat of the paint system shall be inspected as per Clause 13. The dry film thickness of the paint shall be measured with an appropriate calibrated Digital Electronic Coating Thickness Gauge. Instruments shall be calibrated in accordance with Method 108.1 of AS 1580 using non-magnetic shims on polished steel.

10 Paintwork of non sound existing paint

10.1 General

The scope of the work to be undertaken under the Contract shall be as stated in Clause 1 of Annexure MRTS85.1 and Clause 2 of Annexure MRTS88.1

10.2 Defective steelwork

Prior to preparation for repainting, the Contractor shall notify the Administrator of any defective steelwork and propose corrective action. **Hold Point 7**

10.3 Preparation of surface prior to painting

The preparation of the surface shall be as per Clause 2 of Annexure MRTS88.1.

Any repairs carried out after preparing the substrate surface shall be re-prepared in accordance with the Clause 2 of Annexure MRTS88.1.

10.3.1 Abrasive blast cleaning

The existing paint system shall be removed back to bare steel.

Particular attention shall be paid to joints, angles, pits and welded areas to ensure that the surface is brought to the standard required in AS 1627.4 *Abrasive blast cleaning of steel* and AS 1627.9 *Pictorial surface preparation standards for painting steel surfaces*. The class of finish specified for the coating system is the minimum standard required for all parts of the surface to be coated.

Blasting carried out outside a blast chamber shall contain less than 5% free silica. The Contractor shall comply with any environmental standards.

After blasting, all the dust and grit shall be removed from the entire blasted surface of the steelwork including any pockets and corners using dry compressed air.

The surface of the steel shall be further tested for the presence of soluble salts in accordance with Appendix E of AS 1627.4 and where these are identified the surface shall be re-cleaned in accordance with Clause 8.3 of this Technical Specification until all traces of the contaminates have been removed, prior to applying the prime coat.

Between cleaning and priming, the steel shall not be allowed to be contaminated in anyway.

The Contractor shall ensure that the weather conditions, wind borne dust, further blasting activities, equipment or paint do not prevent the application of a priming coat within the prescribed period.

10.3.2 Collection and Disposal of red lead waste

All red lead waste shall be collected in accordance with the requirements of AS 4361.1.

10.3.3 Disposal of red lead waste

The Principal will be responsible for the disposal of the red lead waste.

10.3.4 Storage of red lead waste

The Contractor shall transport all waste to the location designated in Clause 4 of Annexure MRTS85.1. All waste shall be contained in 200 L steel drums. The drums shall be in good sound condition and the lids welded closed. The drums shall be marked by permanent waterproof means with the following information:

a) Job Name and Job Number

b) description of contents, and

c) Toxic Characteristic Leaching Procedure test value in pH 7 solution. (The test shall be undertaken by a laboratory accredited by NATA for the test).

10.3.5 Substrate profile verification

Prior to the application of the primer coat, the surface profile shall be measured in accordance with AS 1627.4 and conformed as complying with the relevant paint system specification. The Painting Inspector shall ensure the blasting profile has been achieved prior to the application of the primer coat **Witness Point 1**

10.4 Application

All coatings shall be thoroughly mixed and applied as per Clause 2 of Annexure MRTS88.1 and the approved paint system technical data sheets.

Any thinners which are added to allow for the application of the paint, the wet film thickness shall be adjusted by calculating the added thinners in the paint. The Contractor shall revise the wet film thickness values as defined in Clause 2 of Annexure MRTS88.1.

All surfaces shall be dry, clean and free of any loose or flaky material prior to the application of each layer.

All coatings shall be applied so as to produce a smooth, even coating free of lumps, ripples, sags, air holes, cracks, lack of adhesion, incomplete curing / hardening, mechanical damage, nibs, excessive brush marks and other defects.

10.5 Curing

The curing time for each coat shall be strictly adhered to in accordance with Clause 2 of Annexure MRTS88.1 and the approved paint system technical data sheets.

10.6 Inspection and acceptance

Each coat of the paint system shall be inspected as per Clause 13. The dry film thickness of the paint shall be measured with an appropriate calibrated Digital Electronic Coating Thickness Gauge. Instruments shall be calibrated in accordance with Method 108.1 of AS 1580 using non-magnetic shims on polished steel.

10.7 Condition of steelwork

All steelwork shall be dry, clean and free of any loose or flaky material prior to the application of each coat.

10.8 Weather conditions

All coatings shall be applied to a dry surface. Coatings shall not be applied in the following conditions:

a) when the temperature of the ambient air or the receiving surface is less than 10°C, or

b) when the temperature of the receiving surface is greater than 55°C, or

c) when the humidity is greater than 85%. Paint shall not be applied if adverse weather conditions are likely to occur before the paint can cure.

The coating shall not be applied when the surface temperature of the metal is within 3°C above the dew point, or when the surface is in direct strong sunlight.

All painting shall be monitored using a total weather station which records the following information:

a) time and date

b) ambient temperature

c) relative humidity, and

d) dew point.

10.9 Abnormal weather conditions

Where the environment or weather conditions do not permit the application within the limits outlined in Clause 10.8. The Contractor shall submit a procedure for adjusting the application process or changing the environment to the Administrator 28 days prior to the preparation of the substrate outlining the following: **Milestone**

a) method of changing the environment

b) process to be used for the preparation of the substrate

c) process for the application of the paint, and

d) process for the curing of the paint.

All painting within the changed environment shall be monitored using a total weather station which records the following information:

a) time and date

b) ambient temperature

c) relative humidity, and

d) dew point.

Paint application in abnormal weather conditions shall not be undertaken until the paint procedure has been approved by the Administrator. **Hold Point 8**

10.10 General storage of paint

Paint shall be stored in sealed containers in a lock-up store that is not exposed to extreme temperature. The temperature within the storage area shall be kept within the limits nominated in Clause 2 of Annexure MRTS88.1. Any special storage conditions recommended by the Manufacturer shall be observed.

Paint which has not been used within the shelf life period specified in Clause 2 of Annexure MRTS88.1, or within 18 months of manufacture, shall be removed and replaced.

10.11 General Site Painting

All on-site applied painting systems shall be undertaken by brush or roller. The Contractor may apply for an exemption to apply the paint system using spray gun, provided the Contactor can demonstrate that:

a) there is a system to prevent paint droplets being carried by the wind from an area being painted

b) there is a system to monitor the overspray around the site

c) surrounds and adjacent areas to the surface being painted will be protected from paint overspray, and

d) there is a system to repair overspray, drips, spills and damage caused by wind drift of paint droplets.

10.12 Work Place Health and Safety

All surface preparation and painting shall be undertaken in accordance with the current Work Place Health and Safety requirements.

10.13 Environment Acts and Regulations

All surface preparation and painting shall be undertaken in accordance with the current Environment Acts and Regulations.

10.14 General equipment

The Contractor shall be responsible for the supply and maintenance of the painting and blasting equipment. The compressors shall be of adequate size for the work to be undertaken and be in good working order. Air shall be free of oil and water. Suitable water and oil traps shall be fitted to air lines and regularly maintained.

10.15 Inspection and acceptance

Each coat of the paint system shall be inspected as per Clause 13. The dry film thickness of the paint shall be measured with an appropriate calibrated Digital Electronic Coating Thickness Gauge. Instruments shall be calibrated in accordance with Method 108.1 of AS 1580 using non-magnetic shims on polished steel.

11 Statutory requirements

11.1 General

In most cases, the structure may have been previously painted with toxic red lead paint. Special procedures shall be implemented to protect all personnel and the environment.

11.2 Legislation

All relevant Acts and Regulations shall be observed.

Table 11.2 summarises the role of Government Departments administering various aspects of the handling of red lead.

Table 11.2 – Contractor responsibilities

Department	Role
Department of Employment and Industrial Relations	• Health of site staff • Safety
Department of Natural Resources and Water	• Responsible for all red lead deposited on ground • Definition of contaminated ground • Responsible for all red lead deposited in air or water, as well as any red lead likely to be washed from the land into a stream • Responsible if water from the stream is used for domestic drinking • Definition of toxic level for stream or air • Approval of disposal method
Department of Primary Industries and Fisheries	• Shall be consulted if water from the stream is used for irrigation • Shall be consulted if red lead debris falls onto crops or grazing land
Port Authority or Harbour Board	• Shall be consulted if bridge is located in an area under their authority

11.3 Worksafe Australia Standard

All procedures on the Site shall conform to the following Worksafe Australia Standards:

a) *National Standard for the Control of Inorganic Lead at Work* (NOHSC:1012)

b) *National Code of Practice for the Control and Safe Use of Inorganic Lead at Work* (NOHSC:2015), and

c) *National Exposure Standards* (NOHSC:1003).

12 Compliance

12.1 Painting procedure

The Contractor shall submit a procedure and an Inspection and Test Plan at least 28 days prior to commencing painting. **Milestone** No painting shall be undertaken prior to acceptance of the procedure by the Administrator. **Hold Point 9**

The procedure shall cover at least the topics described in Clauses 12.2 to 12.6, inclusive.

12.2 Health of workers

The painting procedure shall address the following:

a) clothing for site personnel (e.g. overalls, toxic masks, gloves)

b) washing and shower facilities

c) hygiene

d) blood testing of workforce for lead levels

e) medical supervision of workforce

f) induction training for site personnel

g) work history of site personnel

h) adequate ventilation

i) “No Smoking” and “Flammable Liquid’ signs

j) First Aid kits, and

k) training program.

12.3 Waste

The painting procedure shall address the following:

a) collection, storage and disposal system for toxic debris

b) monitoring system to determine percentage of red lead collected

c) monitoring system for lead content in ground and stream, and

d) sampling of waste.

12.4 Competent person

Within 14 days of being awarded the Contract, the Contractor shall nominate in writing, to the Administrator, a Competent Person for the project. This person shall always be present on the Site when any activity involving lead is taking place and shall have the authority to act and implement all procedures required to conform with the Contract.

The duties of the Competent Person include:

a) testing and issuing of safety equipment

b) training staff

c) reviewing blood lead levels

d) liaising with the Administrator, and

e) monitoring lead levels on the Site.

12.5 Regulated area

The Contractor shall define a regulated area within which all lead related activities shall be contained.

12.6 Painting

The Contractor shall be responsible for ensuring that the standard set for surface preparation is maintained, the dry film thickness of paint is as specified, the finish of all paint coats is of a high standard and any areas that may require repairs are reported.

The Contractor shall have a monitoring and recording system for at least the following:

a) condition of existing paintwork

b) surface preparation

c) paint system adopted

d) thickness of existing paint

e) dry film thickness of each paint coat

f) batch number of paint used for each layer

g) quantity of paint used

h) method of application, and

i) weather.

13 Inspection of paint system

13.1 Inspection

The approved Inspector shall have reasonable access to the site by the Contractor for all inspections. Hold points for inspection shall be agreed between the Administrator and the Contractor before work commences. The Inspector may refer to the Contractor's records as the basis for inspection.

13.2 General inspection criteria

The average dry film thickness of the coating shall not be less than the specified thickness.

Any individual dry film coating thickness readings shall not be less than 90% of the specified thickness and no more than 120% of the specified thickness.

The number of readings taken shall be determined as follows:

a) for pipe work, the following readings shall be taken:

   i. for pipes less than 150 mm diameter, two readings shall be taken evenly around the circumference per linear metre

   ii. for pipes 150 mm but less than 300 mm diameter, four readings shall be taken evenly around the circumference per linear metre, and

   iii. for pipes 300 mm but less than 600 mm diameter, six readings to be taken evenly around the circumference per linear metre.

b) for beams and angles where the face is less than 300 mm wide, one reading on each flat face for every linear metre, and

c) for flat surfaces on steel, concrete and timber, a minimum of four readings per square metre shall be taken.

d) for all other areas, the minimum requirements shall be approved by the Administrator.

13.3 Marking of defects

The marking of all paint defects shall be marked with school grade chalk, adhesive inspection labels or masking tape. The Contractor shall repair all the defects found.

13.4 Repair of paint system

To reinstate a damaged coating system or to rebuild the dry film thickness, the following procedure shall be followed:

a) any sharp edges of the damaged coating shall be feathered or tapered

b) any oil, grease, dirt or other contaminants shall be removed from the surface with a suitable solvent or oil emulsifier and degreaser and the surface abraded by use of a suitable tool, emery cloth or by whip blasting

c) the appropriate coating system shall be applied as specified to the damaged area

d) foreign particles shall not be permitted within the coating, and

e) areas of low thickness shall be rebuilt to that specified, by applying the appropriate coating.

14 Final acceptance of painting

14.1 Paint lot

All painted items shall be broken into painting lots. Painting lots shall be either:

a) span of bridge girders

b) members forming an individual structure, and

c) a section / item defined by the Administrator.

14.2 Final acceptance of paint lot

The Contractor shall provide a Manufacturer Data Record containing the following for the acceptance of a paint lot. **Hold Point 10**

a) Records of inspection of surface preparation and surface profile

b) Graphical results showing that the paint was applied in accordance with the weather conditions

c) Substrate surface temperature for each layer

d) Batch number of paint used for each layer

e) Location of Dry Film Thickness measurements, and

f) Dry Film Thickness reading for each layer

Any non-conformances identified during inspections shall be repaired by the Contractor prior to the acceptance of the lot.

15 Supplementary requirements

The requirements of MRTS85 *Repainting Steel Bridges* are varied by the Supplementary requirements given in Clause 5 of Annexure MRTS85.1.