

# Structures

## Master Specification

### ST-SS-S2 Protective Treatment of Structural Steelwork (Including Previously Painted)

#### Document Information

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## Document Management

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## ST-SS-S2 – Protective Treatment of Structural Steelwork

### 1 General

- 1.1 This Part covers the coating of structural steelwork including new and previously painted, and applies only to steel structures in atmospheric exposure.

### 2 References

#### 2.1 Standards Australia

- |                  |   |
|------------------|---|
| a) AS 1418.10    | Cranes (Including hoists and winches) Part 10: Mobile elevating work platforms  |
| b) AS 1418.16    | Cranes (Including hoists and winches) Part 16: Mast climbing work   |
| c) AS 1576.1     | Scaffolding Part 1: General requirements  |
| d) AS1576.5      | Scaffolding Part 5: Prefabricated split-heads and trestles  |
| e) AS 1627.1     | Metal finishing – Preparation and pre-treatment of surfaces Part 1: Removal of oil, grease and related contamination                    |
| f) AS 1627.2     | Metal finishing – Preparation and pre-treatment of surfaces Part 2: Power tool cleaning   |
| g) AS 1627.4     | Metal finishing – Preparation and pre-treatment of surfaces Part 4: Abrasive blast cleaning of steel                                    |
| h) AS 1627.9     | Metal finishing – Preparation and pre-treatment of surfaces Part 9: Pictorial surface preparation standards for painting steel surfaces |
| i) AS 1680.2.0   | Interior lighting – Recommendations for specific tasks and interiors  |
| j) AS/NZS 1892   | Portable ladders  |
| k) AS/NZS 2312   | Guide to the protection of iron and steel against atmospheric corrosion by the use of protective coatings                               |
| l) AS/NZS 3610   | Formwork for concrete   |
| m) AS 4312       | Atmospheric corrosivity zones in Australia  |
| n) AS/NZS 4361.1 | Guide to hazardous paint management Part 1: Lead and other hazardous metallic pigments in industrial applications                       |

#### 2.2 NACE/ SSPC

- |                     |  |
|---------------------|--|
| a) NACE/ SSPC-VIS 5 | Guide and Reference Photographs for Steel Surfaces Prepared by Wet Abrasive Blast Cleaning |
|---------------------|--|

#### 2.3 Department

- |                 |  |
|-----------------|--|
| a) Part PC-SM2  | Minor Construction - Traffic Management    |
| b) Part PC-ENV2 | Environmental Protection of the Works      |
| c) Part PC-QA1  | Quality Management Requirements            |
| d) Part PC-WHS1 | Work Health and Safety                     |
| e) Part PC-ENV1 | Environmental Management System            |
| f) TP800        | Measurement of Surface Profile             |
| g) TP801        | Development of Dry Film Thickness Targets  |
| h) TP802        | Determination of Salt Content of Abrasives |
| i) TP803        | Monitoring of Paint Application Conditions |
| j) TP913        | Measurement of Dry Film Thickness          |

- k) TP16 Measurement of Surface Salt Levels
- 2.4 Department Test Procedures are available from:  
[https://www.dit.sa.gov.au/materials\\_technology\\_documents/test\\_procedures2](https://www.dit.sa.gov.au/materials_technology_documents/test_procedures2)

## Definitions

- 2.5 The following definitions apply to terms used in this Part:

**Table ST-SS-S2 2-1 Definitions**

| Term       | Definition  |
|------------|---|
| APAS       | Australian Paint Approval Scheme  |
| Durability | Defined as the years of exposure for the structure to return to its new or pre-maintenance painting condition, in terms of extent and type of corrosion. The corrosivity category for the structure will be assessed against AS4312. If already assessed by the Principal, the corrosivity category and expected durability for the Works will be included in the contract specifics. |
| HPCP       | Hazardous Paint Compliance Plan   |
| NACE       | National Association of Corrosion Engineers   |
| PCCP       | Painting Contractors Certification Program  |
| SSPC       | The Society for Protective Coatings   |
| WHS        | Work Health and Safety  |

## 3 Quality Requirements

### PCCP Accreditation

- 3.1 The Contractor shall be PCCP accredited to the following classes:
- a) Class 3 – Site application of coatings for atmospheric service;
  - b) Class 4 – Site application of coatings for immersion service;
  - c) Class 5 – Management of hazardous coatings, heavy metal containing (Lead); and
  - d) Class 6 – Management of hazardous coatings, respirable airborne dusts.

### Quality Plan

- 3.2 The Contractor's Coating Quality Plan shall include the following documents, procedures and / or instructions:
- a) an explanation of how it interfaces with the broader Quality Plan for the Works;
  - b) a list of personnel and their roles on site, which includes training and competencies relevant to this project;
  - c) an access, scaffolding and containment concept design;
  - d) details of mechanical dust extraction and filtering plant, demonstrating compliance with relevant clauses of this Part;
  - e) details of the bunding and volumes of materials to be stored;
  - f) table of Inspection and Test equipment to be employed, to satisfy requirements of all referenced Inspection and Test Procedures, and current calibration status;
  - g) surface preparation and paint application plan;
  - h) a completed Project Design Phase Checklist, AS/NZS 4361.1 Table L1; and
  - i) a project-specific Hazardous Paint Compliance Plan.
- 3.3 This documentation must be submitted at the Pre-Commencement Meeting. Approval by the Principal constitutes a **Hold Point**.

## Contractor's Personnel

3.4 The Contractor's personnel shall include:

- a) a suitably qualified and experienced Painting Quality Management Representative (PQMR) who must personally carry out all testing as described in the Contractor's approved Inspection and Test Plan and maintain associated diary records. The PQMR must be qualified to NACE CIP 11 or ACA Coating Inspector as a minimum;
- b) a supervisor with at least 3 years' experience on projects of a similar size and scope to this work, who must be on site at all times whilst work is in progress. The supervisor shall not be the PQMR;
- c) abrasive blast cleaning operators who are competent in the consistent delivery of the blast cleaning class as specified; and
- d) paint applicators who can demonstrate control of dry film thickness at all times. Consistency shall be assessed against the requirements for "Paint Film Thickness" included in this Part.

3.5 Unless stated otherwise, suitably qualified personnel may undertake more than one of the above roles.

## Responsibilities of the PQMR

3.6 The PQMR's responsibilities shall include the following:

- a) observe and record relevant day to day information including (where relevant to the Works):
  - i) abrasive blast quality;
  - ii) information on an ongoing basis through the day, concerning the operational needs of the works, to appropriate Australian Standards and Department requirements. This includes atmospheric conditions, paint details, equipment function and suitability etc.; and
  - iii) individual dry film thickness readings for each coat.
- b) co-ordinate all rework for the above as required;
- c) address all hold points relevant to these operations;
- d) audit, calibrate and check all measuring equipment where required;
- e) report any Non-conformance with this Part or Australian and Industry Standards;
- f) provide advice and notification of any problems experienced with the coating system; and
- g) be present at all site meetings relevant to the requirements of this Part.

## 4 Commencement of Work

### Program

- 4.1 At least one week prior to the commencement of any work associated with protective treatment, the Contractor shall submit a complete detailed program of work showing all activities required for cleaning and application of protective treatment. The Contractor shall also provide advice of any alteration to the program.
- 4.2 Where the protective treatment includes painting, the program shall show the paint manufacturer's estimated time to full cure.
- 4.3 Where the program no longer reflects the Contractor's actual or planned progress, the Contractor shall provide the Principal with an amended program as soon as practicable.

### Notification

- 4.4 The Contractor shall provide at least 48 hours' notice prior to the commencement of any cleaning process.

## 5 Hazards, Work Health and Safety and Environment

### Existing Paint and Hazardous Coating Work

- 5.1 The AS/NZS threshold concentration criteria for hazardous paint projects are as shown in Table ST-SS-S2 5-1.

**Table ST-SS-S2 5-1 Threshold Concentration of Hazardous Metals**

| Metal    | Total mass of paint (kg) |        |      |
|----------|--------------------------|--------|------|
|          | >250                     | 50-250 | <50  |
| Lead     | 0.1                      | 0.25   | 1    |
| Chromium | 0.05                     | 0.1    | 0.25 |
| Arsenic  | 0.05                     | 0.1    | 0.25 |
| Cadmium  | 0.05                     | 0.1    | 0.25 |

- 5.2 Other potentially hazardous materials not identified in AS/NZS 4361.1 may be present on structures. Where other potentially hazardous materials are present, they shall be identified and included in the Risk Assessment and Hazardous Paint Compliance Plan. Previously identified hazardous materials are included in Table ST-SS-S2 5.2.

**Table ST-SS-S2 5-2 Other Hazardous Materials**

| Material  | Hazard   |   |                           |
|---|--|---|---------------------------|
|   | Short Term Health Effect                           | Long Term Health Effect                         | Exposure Level            |
| Polycyclic Aromatic Hydrocarbon (PAH)<br>– Cold Tar Epoxy | Eye irritation<br>Nausea and vomiting<br>Diarrhoea | Skin damage<br>Photosensitivity<br>Carcinogenic | No Safe Level of exposure |

- 5.3 Where available, the Principal will provide documentation or test sample data on existing paint treatments.
- 5.4 The Contractor shall assess the Works in accordance with the AS/NZS 4361.1 threshold concentration criteria and manage the Works as either hazardous or non-hazardous coating work as appropriate.

### Work Health and Safety Requirements

- 5.5 In addition to requirements of the Contract, all requirements of the Work Health and Safety Act, and associated Regulations shall apply.
- 5.6 Relating to lead, attention is drawn to Chapter 7, Part 7.2, Regulations 319 to 418.
- 5.7 Relating to chromium, cadmium and arsenic, Chapter 7, Part 1 Hazardous Chemicals Regulations 328 to 388 shall apply.

### Hazardous Paint Risk Assessment

- 5.8 A risk assessment specific to the Works shall be carried out in accordance with AS/NZS 4361.1 Appendix B.

### Hazardous Paint Compliance Plan

- 5.9 The Contractor will provide a Hazardous Paint Compliance Plan (HPCP) prior to commencing work.
- 5.10 The HPCP shall address the AS/NZS 4361.1 Steps. The Plan shall reference procedures or documents within the Contractor's Integrated Management System.
- 5.11 Approval of a conforming HPCP by the Principal constitutes a **Hold Point**.

## Worker Protection

- 5.12 The Contractor shall submit a Personnel Management Plan as part of the Hazardous Paint Compliance Plan for hazardous coating work.

## Waste and Environmental Management

- 5.13 Waste and environmental management shall be in accordance with the Contract requirements.

## 6 Materials

### Paint Sampling and Testing

- 6.1 Audit samples, including samples from the painter's pot, may be collected at any time by the Principal.
- 6.2 At least 7 days prior to the commencement of work, the Contractor shall submit:
- a) an APAS record of supply for each batch of APAS approved material to be used for protective Treatment; and
  - b) where non-APAS approved products are used, evidence that each batch of paint supplied has been manufactured to the same formula as the approved sample shall be provided.

### Abrasive

- 6.3 Where required for the Works, the abrasive to be used for dry abrasive blast cleaning shall be garnet. Abrasive shall be clean, dry and free from extraneous material such as dirt, gravel and organic matter, and shall contain no free silica.
- 6.4 Samples representative of all batches of abrasive to be used in conjunction with the works shall be tested before use in accordance with TP802, Determination of Salt Content of Abrasives. The conductivity shall not be greater than 125  $\mu\text{S}/\text{cm}$ . The abrasive to be used for wet abrasive blast cleaning shall be garnet unless otherwise approved by the Principal. Blast media shall not be recycled without the approval of the Principal.
- 6.5 The initial sampling rate shall be the cube root of the number of bulk bags in a batch, and all samples taken shall be tested. Should any batch tested fail to comply with the specified requirements, all remaining bulk bags shall be tested. Any abrasive which fails to comply with the specified requirements shall not be used on this project.
- 6.6 The grade of abrasive used shall be such that the surface profile produced complies with all relevant requirements of this Part. The Contractor shall provide documented results of tests showing compliance of abrasive to the Principal.

### Packaging and Transportation of Abrasive

- 6.7 Where used, blast media shall be delivered to the applicator's premises in the manufacturer's containers, unopened and with the label intact. The following information shall be legibly and durably marked on each container:
- a) material type;
  - b) batch number;
  - c) date of manufacture;
  - d) grading of material; and
  - e) manufacturer's name.

### Paint

- 6.8 All paint which makes up the coating system shall be approved by the Principal. All paints in a system shall be APAS approved unless otherwise approved by the Principal. If the Contractor proposes to



- use a non-APAS approved product, evidence of satisfactory previous performance shall be provided prior to use of the product.
- 6.9 Paint shall be thoroughly mechanically mixed prior to use to ensure that it is homogeneous, and shall be maintained to this condition during use.
- 6.10 Paint shall be delivered to the site in the manufacturer's containers, unopened and with the label intact. The following information shall be legibly and durably marked on each container:
- a) the name or registered mark of the manufacturer;
  - b) the paint type;
  - c) colour to AS 2700 (if applicable);
  - d) the contents by volume in litres, or by mass in kilograms;
  - e) product identification;
  - f) production or batch numbers on packs of 5 kilograms capacity, or greater;
  - g) date of manufacture; and
  - h) information required by statutory regulations.
- 6.11 The colour (in accordance with AS 2700) of the external finish will be specified in the Contract Documents.
- 6.12 The decorative final coat must provide complete coverage to a hiding power chart as described in AS 1580.213.1. Instructions for use and Manufacturer's Safety Data Sheets shall be provided at the time of delivery.
- 6.13 All of the above information shall be kept on site at all times, and made available for inspection by the Principal.

## Water

- 6.14 The conductivity of all water used for blast cleaning or rinsing shall be less than 100  $\mu\text{S}/\text{cm}$ . The Contractor will provide evidence of this requirement being met.

## 7 Surface Preparation Requirements

### Purpose of Surface Preparation

- 7.1 The Contractor shall assess the Contract Document to determine the purpose of the surface preparation activity and which of the following requirements apply.
- 7.2 The purpose of the surface preparation will be one or more of the following:
- a) spot repair of corroded areas and other identified defects only;
  - b) spot repair of corroded areas and other identified defects, followed by total over-coating; and
  - c) removal of all existing coatings, total surface preparation and painting of all surfaces.

### Approval of Surface

- 7.3 Approval by the Principal of any repair work, the surface finish or other pre-coating requirements in accordance with Clause 7 of this Part, prior to application of any coating, shall constitute a **Hold Point**.

### Preliminary Cleaning

#### General

- 7.4 All areas of surface imperfections shall be suitably prepared by filing or grinding before paint application. All sharp edges shall be ground to a minimum 2 mm radius. Chamfering of edges is not permitted.

- 7.5 Deposits of oil and grease shall be removed by solvent cleaning in accordance with AS 1627.1.
- 7.6 Large deposits of bird droppings and other deleterious material shall be removed manually for disposal as per statutory regulations.

#### Sweep Dry Blasting – for “Spot Repair and Overcoat”

- 7.7 All surfaces, including corroded areas and sound paint, shall be sweep blasted using:
- a) fine garnet abrasive, nominally 150 to 200 µm;
  - b) a 10 to 13 mm venturi nozzle;
  - c) a blast pressure at the nozzle of 275 KPa (40 psi) maximum; and
  - d) a distance of 350 to 400 mm from the painted surface, directed at an angle of no greater than 45° to the surface.

#### Sweep Wet Blasting – for “Spot Repair and Overcoat”

- 7.8 All surfaces shall be sweep wet blasted using equipment, materials and techniques which minimise the reduction in film thickness of the existing paint, whilst providing a surface texture suitable for over-coating.

### Final Cleaning

#### Hand or Power Tool Cleaning – for “Spot Repair” or “Spot Repair and Overcoat”

- 7.9 All loose and flaking paint shall be removed by hand or power tool.
- 7.10 All corroding steel surfaces shall be cleaned back to the metal, removing all rust, mill scale, weld slag, or any extraneous material, in accordance with AS 1627.2, “Metal Finishing - Preparation and Pre-treatment of Surfaces – Power Tool Cleaning”, to a Class St 2½ finish as described in AS 1627.9, “Metal Finishing - Preparation and Pre-treatment of Surfaces – Pictorial Surface Preparation Standards for Painting Steel Surfaces”.
- 7.11 Edges of sound paint shall be feathered back by sanding to produce a smooth transition to prepared steel.
- 7.12 All surfaces shall be cleaned to remove any loose contaminants prior to application of the first coat.

### Surface Salt Contamination

- 7.13 Structures which may be subject to salt contamination shall have surface chloride ion levels less than 10 µg/cm². Provision of evidence of this requirement shall constitute a **Hold Point**.
- 7.14 Where relevant, all wash water shall comply with the relevant clauses of this Part.

### Surface Profile Height

- 7.15 When cleaned bare metal areas are measured, all surface profile readings shall be within the approved coating manufacturer’s specified range. A minimum of 5 tests shall be carried out to establish the profile height range delivered by the abrasive blasting process.
- 7.16 This process shall be repeated for each abrasive blast cleaning operator, and before adoption of any change to materials or equipment.
- 7.17 Provision of evidence that the profile height requirement has been achieved constitutes a **Hold Point**.

## 8 Coating System

### General

- 8.1 All paints used in a coating system shall be from the one manufacturer.

- 8.2 A list of generic coating systems, using the System designations from AS/NZS 2312, is provided in Table ST-SS-S2 8-1. Note that the coating thicknesses are for guidance only, and specific coating thicknesses may be required for individual projects.
- 8.3 A list of coating systems not covered by AS/NZS 2312 is provided in Table ST-SS-S2 8-2.
- 8.4 A list of product descriptions and equivalent APAS specifications is shown in Table ST-SS-S2 8-3.
- 8.5 The Contractor shall submit to the Principal details of the manufacturer and products which comprise the coating system.
- 8.6 Approval by the Principal of this information shall constitute a **Hold Point**.

Table ST-SS-S2 8-1 List of Generic Coating Systems

| AS/NZS<br>2312:2014<br>Designation | Primer / 1st Coat |                            | Intermediate / 2nd Coat |                            | Finish / 3rd Coat |                            |
|------------------------------------|-------------------|----------------------------|-------------------------|----------------------------|-------------------|----------------------------|
|                                    | Product           | Nominal DFT, $\mu\text{m}$ | Product                 | Nominal DFT, $\mu\text{m}$ | Product           | Nominal DFT, $\mu\text{m}$ |
| IZS1                               | IZS Solvent-borne | 75                         |                         |                            |                   |                            |
| IZS2                               | IZS Water-borne   | 75                         |                         |                            |                   |                            |
| IZS3                               | IZS Water-borne   | 125                        |                         |                            |                   |                            |
| IZS4                               | IZS Solvent-borne | 125                        |                         |                            |                   |                            |
| EHB5                               | Epoxy primer      | 75                         | HB Epoxy MIO            | 125                        | HB Epoxy MIO      | 125                        |
| EHB6                               | Epoxy zinc        | 75                         | HB Epoxy MIO            | 125                        | HB Epoxy MIO      | 125                        |
| EVH2                               | VHB Epoxy         | 400                        |                         |                            |                   |                            |
| EVH3                               | Epoxy primer      | 75                         | VHB Epoxy               | 400                        |                   |                            |
| EPM3                               | Epoxy mastic      | 200                        | Epoxy mastic            | 200                        |                   |                            |
| PSL2                               | Epoxy zinc        | 75                         | HB Epoxy MIO            | 175                        | Polysiloxane      | 75                         |
| PSL3                               | Epoxy primer      | 75                         | HB Epoxy MIO            | 175                        | Polysiloxane      | 75                         |
| PUR5                               | Epoxy zinc        | 75                         | HB Epoxy MIO            | 200                        | Polyurethane      | 50                         |

Table ST-SS-S2 8-2 List of Alternative Coating Systems

| Department<br>Designation | Primer / 1st Coat          |                            | Intermediate / 2nd Coat |                            | Finish / 3rd Coat |                            |
|---------------------------|----------------------------|----------------------------|-------------------------|----------------------------|-------------------|----------------------------|
|                           | Product                    | Nominal DFT, $\mu\text{m}$ | Product                 | Nominal DFT, $\mu\text{m}$ | Product           | Nominal DFT, $\mu\text{m}$ |
| Z1                        | Zinga                      | 60                         |                         |                            |                   |                            |
| Z2                        | Zinga                      | 60                         | Zinga                   | 60                         |                   |                            |
| Z2                        | Zinga                      | 90                         | Zinga                   | 90                         |                   |                            |
| MCU1                      | MCU Zinc                   | 75                         | MCU MIO                 | 75                         | MCU Finish        | 75                         |
| MCU2                      | MCU Zinc                   | 75                         | MCU Tar                 | 100                        | MCU Tar           | 100                        |
| TAPE1                     | Anti-corrosive Tape Primer | 60                         | Anti-corrosive Tape     | NA                         |                   |                            |

Table ST-SS-S2 8-3 APAS Specifications for Listed Coating Systems

| Product Type                  | APAS Specification |
|-------------------------------|--------------------|
| EPM (Epoxy mastic)            | 2976, 2977         |
| Epoxy primer                  | 2971               |
| Epoxy zinc                    | 2916/1             |
| EHB Epoxy MIO                 | 2972, 2973, 2940   |
| IZS (Inorganic Zinc Silicate) | 2908               |
| MCU (Moisture Cure Urethane)  | 2930               |

| Product Type                | APAS Specification |
|-----------------------------|--------------------|
| PSL (Polysiloxane)          | 2920               |
| PUR (Polyurethane)          | 2911               |
| EVH (Very High Build) Epoxy | 2975               |
| Z (Zinga)                   | 2916/2             |

## Application

- 8.7 All edges shall be stripe coated before application of full coats. Where a gap, crevice or severe pitting is present, the approved paint system shall be brushed into these areas and allowed to cure, before over-coating. Particular attention shall be paid to any gaps under bolt or rivet heads, and all welds.
- 8.8 The Contractor shall provide evidence to the Principal that the stripe coating requirement has been met in accordance with this Part.

## Paint Film Thickness

- 8.9 A dry film thickness range specific to the Works will be developed in accordance with Procedure TP801. This procedure uses manufacturer provided data, surface profile induced error, and uncertainty of measurement to develop a thickness range for Quality Control and Assurance purposes. Paint film thickness will be measured in accordance with TP913.
- 8.10 Where existing paint remains after surface preparation, paint consumption, calculated from used and part used containers, may be used as the acceptance criteria.
- 8.11 Greater than 95% of all single point readings shall be within the specified range. The Contractor shall apply additional paint, or remove excess paint, to any areas which are deemed to be non-conforming.
- 8.12 Where relevant, either the dry film thickness and paint consumption data shall comply with specified requirements, or the lot represented by the data will be deemed non-conforming.

## Application of Paint

### General

- 8.13 Paint shall be mixed, used and applied in accordance with the manufacturer's written instructions.

### Storing and Sampling of Paint

- 8.14 Paint shall be supplied in a ready mixed condition. 2 Pack paint shall be supplied and mixed in strict accordance with manufacturer's recommendations. Both paint and thinners shall be delivered to the job site, in the manufacturer's original containers, with labels and seals unbroken. The exterior of the containers shall not show any signs of exposure to heat, weather, etc., which would indicate that they had been stored incorrectly in the past.
- 8.15 Drums in which paint is stored shall be kept in a cool place. Paints should be used in order of date of manufacture or delivery. Paint which is older than the manufacturer's specified shelf life shall not be used in the work and shall be immediately removed from the work site.

### Deviations from Manufacturer's Data Sheets

- 8.16 Any deviations from the manufacturer's data sheet shall be authorised in writing by the paint manufacturer. Copies of such authorisation shall be forwarded to the Principal at least 48 hours prior to the application of paint.
- 8.17 Provision of the authorisation shall constitute a **Hold Point**.

### Safety Precautions

- 8.18 The Contractor shall abide by all recommendations provided on the paint manufacturer's safety data sheets and shall ensure that work and work-site procedures are carried out in strict accordance with the Work Health and Safety Act and associated Regulations.

### Bunding

- 8.19 All hazardous substances shall be stored within separate banded areas. The capacity of each banded area shall be equal to the volume of hazardous substances stored, plus 20%. The volume of stored material shall not exceed this calculated volume.
- 8.20 The Contractor shall submit details of the bunding and volumes of materials to be stored at the Pre-commencement Meeting.

### Mixing and Thinning

- 8.21 All paint shall be thoroughly mixed before use. Mixing shall be carried out within a banded area.

### Climatic Conditions

- 8.22 All paints shall be applied in accordance with the paint manufacturer's written instructions.
- 8.23 Paint application conditions shall be monitored in accordance with TP803.
- 8.24 Paint shall not be applied under the following conditions, or where these conditions might reasonably be expected, during the application and initial curing period:
- a) when the ambient temperature is below 5°C;
  - b) when moisture is present on the steel surface;
  - c) when the steel surface temperature exceeds 40°C. The surface temperature gauge shall be calibrated and any corrections required shall be applied; or
  - d) when the relative humidity exceeds 85%. Note that only calibrated and corrected sling psychrometers shall be used for the determination of relative humidity.
- 8.25 All atmospheric measurements shall be taken in the paint application area.

## Repair of Damaged Areas

- 8.26 Damaged areas include any access shadow areas and any acts of vandalism done prior to the completion of the Contract. The cost of the repairs shall be borne by the Contractor. Damaged areas shall be repaired as follows:
- a) Minor damage, where the substrate is not visible. Remove loose or flaking paint by sanding, then apply 1 intermediate and 1 finish coat, overlapping existing sound paint by at least 50 mm; and
  - b) Major damage where the steel substrate is visible. Remove loose or flaking paint by sanding, prepare surface as per the initial treatment, then apply the full coating system, overlapping existing sound paint by at least 50 mm.

## 9 Access, Scaffolding and Containment

- 9.1 The purpose of access and scaffolding equipment is to position the workers close to the work, and to provide a safe means of access to the work area. All scaffolding shall comply with the requirements of AS 1576.1. Some types of equipment that incorporate temporary working platforms are not covered by this Standard:
- a) elevating work platforms, AS 1418.10;
  - b) mast climbing working platforms, AS 1418.16;
  - c) portable ladders, AS/NZS 1892;
  - d) formwork constructed primarily to support concrete, AS/NZS 3610;
  - e) stools under 1 m in height which may allow for height adjustment, but do not require assembly prior to use; and
  - f) trestle ladders are covered in AS/NZS 1892, but upon review of AS/NZS 1576.5 may be incorporated into that Standard.

- 9.2 The access system shall also support the containment. Containment requirements will be based on the risk assessment for the Works and the likely level of emissions, which will be a consequence of the final cleaning methodology employed. AS/NZS 4361.1 Table E1 and its associated notes shall be employed in the design of containment for this project.
- 9.3 Approval of an access, scaffolding and containment plan by the Principal prior to commencement constitutes a **Hold Point**.

## 10 Ventilation

- 10.1 Whilst natural ventilation is permissible for some low risk, remote projects, mechanical ventilation will be required in contained workspaces in order to minimise the risk to workers. The high levels of dust or mist produced during high emission activities, such as abrasive blasting, can place workers at risk in terms of hazardous dust exposure levels, and visibility for workers to manage the risk associated with tripping hazards within containment.
- 10.2 Dust collectors shall be sized to ensure that the airflow within the containment complies with the requirements of AS/NZS 4361.1 E4.3:
- 30 m/min cross-draft; and
  - 18 m/min down-draft or up-draft.
- 10.3 The Contractor shall carry out the calculation to ensure that the airspeed complies with the above requirements. The calculation can be undertaken as shown in Table ST-SS-S2 10-1.
- 10.4 Evidence that the appropriate size dust collector will be employed will be provided to the Principal prior to undertaking works requiring ventilation.

**Table ST-SS-S2 10-1 Calculation of Dust Collector Airflow Volume Requirements**

| Containment Dimensions, m   |        |       |       | Volume,<br>m <sup>3</sup>           | Specified Air<br>Speed, m/min | Air Flow<br>Time, min | Minimum Dust<br>Collector Capacity |
|-----------------------------|--------|-------|-------|-------------------------------------|-------------------------------|-----------------------|------------------------------------|
| Furthest Point<br>from Duct | Length | Width | Depth |                                     |                               |                       | m <sup>3</sup> /min                |
| A                           | L      | W     | D     | $V = \frac{L \times W \times D}{x}$ | S                             | $T = \frac{A}{S}$     | $DC = T \times V$                  |

- 10.5 Negative pressure, as evidenced by concave containment fabric, shall be maintained at all times where mechanical ventilation is employed.
- 10.6 AS/NZS 4361.1 E4.4 states that dust collectors should be fitted with a means of detecting dust emissions from the filter exhaust, providing either an audible alarm or shutting down the system. Where neither is fitted, an observer shall be assigned the task of continuously monitoring the exhaust outlet, and shall be authorised to shut down the system in the event of emissions.

## 11 Emissions Monitoring

### Type, Frequency and Duration

- 11.1 An emissions monitoring plan shall be designed and implemented such that emissions are quantified in accordance with the Hazardous Paint Risk Assessment rating.
- 11.2 The type, frequency and duration of monitoring shall be as per AS/NZS 4361.1 Table 2.

### Ambient Air (TSP) Monitoring

- 11.3 Ambient air monitoring shall be carried out using High Volume Air Samplers in accordance with AS/NZS 4361.1 Clause F4.

### Surface Dust Sampling

- 11.4 Surface dust sampling shall be carried out in accordance with AS/NZS 4361.1 Clause F5.

## Mist Fall-out Monitoring

11.5 Mist fall-out monitoring shall be carried out in accordance with AS/NZS 4361.1 Clause F6.

## 12 Inspection and Surveillance

### Inspection

- 12.1 The Contractor QMR shall develop and implement an Inspection and Test Plan which ensures compliance with all aspects of the Part, and shall carry out all Quality Assurance testing required to confirm that the requirements of the Part have been met.
- 12.2 The Contractor's EMR shall manage all environmental aspects associated with the work, and shall manage all environmental sampling and testing associated with this work.

### Surveillance

12.3 The Principal may provide a Surveillance Officer to check any or all work carried out.

### Inspection and Lighting

- 12.4 Sufficient artificial lighting shall be provided within the contained area, as a supplement to any natural lighting present. The minimum average illuminance over the area of inspection must be 300 lux and must comply with requirements of AS 1680.2.0 Table 2 "For the Purpose of Inspection".

### Documentation

- 12.5 Records shall be maintained of all inspection and testing, including those relating to WHS and Environmental Management, and shall be made available to the Principal upon request. All records shall be certified correct by the QMR or EMR as required. Records shall be maintained on a daily basis.

## 13 Inspection and Test Plan

- 13.1 The Inspection and Test Plan shown in Table ST-SS-S2 13-1 shall be considered as the minimum requirement for this Contract.

**Table ST-SS-S2 13-1 Inspection and Test Plan Summary**

| Item                                      | Procedure                     | Frequency              | Requirement                          |
|---|-------------------------------|------------------------|--------------------------------------|
| Sampling and Testing – Abrasive           | TP802                         | All batches before use | Dry abrasive must be < 125 µS/cm     |
|   | TP800                         |                        | Must deliver profile height, see 6.6 |
| Water                                     | TP915 Method A                | Before use             | Conductivity ≤100 µS/cm              |
| Preliminary Cleaning - Defects            | AS 1627.1                     | All surfaces           | No surface defects                   |
| Preliminary Cleaning - Oil and grease     | AS 1627.1                     | All surfaces           | No oil or grease                     |
| Preliminary Cleaning - Bird droppings     | Not Applicable                | All surfaces           | No loose contaminants                |
| Preliminary Cleaning - Sweep Dry Blasting | As per Section 8 of this Part | All surfaces           | Clean profiled surface               |
| Preliminary Cleaning - Sweep Wet Blasting | As per Section 8 of this Part | All surfaces           | Clean profiled surface               |
| Final Cleaning - Hand or Power Tool       | AS1627.2<br>AS 1627.9         | Existing paint         | Remove loose and flaking paint       |
|   |                               | Corroded areas         | Class St2½                           |

| Item                                | Procedure             | Frequency                        | Requirement                          |
|-------------------------------------|-----------------------|----------------------------------|--------------------------------------|
| Final Cleaning - Dry Abrasive Blast | AS1627.4<br>AS 1627.9 | Corroded areas                   | Class Sa2½                           |
| Final Cleaning - Dry Abrasive Blast | AS1627.4<br>AS 1627.9 | All surfaces                     | Class Sa2½                           |
| Final Cleaning - Wet Abrasive Blast | SSPC VIS5             | Corroded areas                   | WAB-10                               |
| Final Cleaning - Wet Abrasive Blast | SSPC VIS5             | All surfaces                     | WAB-10                               |
| Surface Salt Contamination          | TP16 Methods B or C   | As per procedure                 | Maximum 10 µg/cm <sup>2</sup> of Cl- |
| Surface Profile Height              | TP800                 | 5 locations minimum              | Paint manufacturer's specified range |
| Paint Film Thickness                | TP913 / TP801         | All surfaces                     | Thickness range as per TP801         |
| Paint Application Conditions        | TP803                 | Prior to and during application  | As per Clause 8                      |
| Coating Continuity                  | AS 3894.1             | After final application and cure | Shall be no holidays                 |

## 14 Hold Points

14.1 The following is a summary of Hold Points referenced in this Part:

**Table ST-SS-S2 14-1 Hold Points**

| Document Ref. | Hold Point   | Response Time |
|---------------|--|---------------|
| 3.3           | Quality Plan and associated documentation                                    | 7 days        |
| 5.10          | Approval of a conforming HPCP  | 7 days        |
| 7.3           | Approval of any repair work, the surface finish or other pre-coating work    | 7 days        |
| 7.13          | Provision of evidence of chloride ion levels less than 10 µg/cm <sup>2</sup> | 7 days        |
| 7.17          | Provision of evidence that the profile height requirement has been achieved  | 24 hours      |
| 8.6           | Approval of coating system information                                       | 24 hours      |
| 8.17          | Authorisation of deviations from manufacturer's data sheet                   | 24 hours      |
| 9.3           | Approval of an access, scaffolding and containment plan                      | 24 hours      |