
SURFACE PREPARATION FOR APPLICATION OF PROTECTIVE COATING ON CONCRETE

SPECIFICATION: A5

ISSUE: 4

DATE: DECEMBER 2022

1.0 SCOPE

The scope of this specification applies to concrete surface preparation prior to coating application.

Refer Design Standard, DS 95 (Standard for the Selection, Preparation, Application, Inspection and Testing of Protective Coatings on Water Corporation Assets) for additional information or clarification.

2.0 PURPOSE

The purpose of this specification is to prepare a concrete substrate that is suitable for application of protective coating system.

3.0 DEFINITIONS

ACA: Australasian Corrosion Association.

Contractor: The service provider or its sub-contractor who will undertake the works.

Corporation: The Water Corporation and the Principal for the purposes of externally contracted asset delivery.

ITP: The detailed Inspection and Test Plan(s) for the Works.

NACE: National Association of Corrosion Engineers.

Superintendent: The Superintendent for the contract, as defined in the conditions of the contract, who is appointed by the Water Corporation to manage/oversee the work under the contract on behalf of the Water Corporation.

Works: The surface preparation, coating application and inspection to be undertaken by the contractor to which this coating specification applies.

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4.0 PERSONNEL QUALIFICATION

- 4.1 Work shall only be carried out by competent personnel.
- 4.2 The work shall be undertaken by an approved Water Corporation Panel -Protective Coating and Concrete Repair Services member.
- 4.3 The coatings contractor/subcontractor shall nominate a Certified Coating Inspector (NACE or ACA), qualification to SSPC and equivalent will require written approval by the Principal to conduct the following:
- Prepare Quality Assurance documentation to meet the specified standards given herein and the required acceptance criteria.
 - Perform inspections and maintain appropriate records for work performed.
 - Testing, monitoring and verification of surface preparation and coating application

5.0 ATMOSPHERIC CONDITIONS

- 5.1 Prior to and during surface preparation, the contractor shall record details pertaining to environmental conditions including ambient and surface temperature, relative humidity and dew point.

6.0 SURFACE PREPARATION

- 6.1 The surface preparation method, or combination of methods, should be chosen based on the condition of the concrete and the requirements of the coating system to be applied and any specific manufacturers recommendations. References shall be made to the SSPC-SP13/NACE 6 standards on surface preparation of concrete structures.
- 6.2 The surfaces to receive the coating shall be clean and free from contaminants (such as dirt, oil, grease, chemicals, and existing incompatible coatings etc.), laitance, loosely adhering concrete, dust, and other residual coatings and shall provide a sound, uniform substrate suitable for the application of protective coating or lining system. Concrete surfaces shall be prepared using a suitable method such as high pressure water jetting, blast cleaning or grinding. The concrete surface profile (CSP) shall be appropriate with type of applied coating in accordance with coating manufacturer's recommendation or to ICRI Technical Guideline No. 310.2R (Refer to Appendix A).
- 6.3 For submerged surface or at water line, coating shall be terminated with grooves, cut to a size of 5mm (wide) x 5mm (depth) [Refer to Figure 1]. An approved cutting method for the groove shall be provided to the Principal prior to commencement of works. The appropriate surface preparation shall extend to at least 100mm beyond the termination groove.

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Figure 1 – Termination groove and prepared concrete substrate.

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7.0 INSPECTION

- 7.1 The Contractor shall maintain records and evidence of the original surface, blast surface and blast profile. These shall be made available to the Superintendent and/or delegate at the completion of the project. Evidence of these parameters shall be provided by means of photographic evidence.
- 7.2 The Contractor shall provide the Superintendent (or nominated delegate) adequate prior notice as to when and where the surface preparation and coating operations will be conducted to facilitate all specified inspections.
- 7.3 If recognised as a hold point in the ITP, the coating application shall not be carried out until the Superintendent (or nominated delegate) has accepted the surface preparation.
- 7.4 Minimum surface preparation requirements are listed below:

Characteristic	References	Frequency	Control/Criteria
Cleanliness of concrete surface	Visual AS3894.6	After preparation & immediately before application	Free from loose and friable materials
Surface profile	Visual ICRI Technical Guideline No. 310.2R	After preparation	As per manufacturer's recommendation or Appendix A
Moisture content	ASTM D4263	Prior to coating application	As per manufacturer's recommendation
Ambient Conditions	AS3894.7 AS3894.13	Throughout the application	As per the specified requirements

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8.0 CONTRACTOR'S RESPONSIBILITY

- 8.1 The Contractor shall supply all necessary plant, equipment, materials and labour, prepare the surface and apply and maintain the protective coating in accordance with this specification.
- 8.2 An Inspection Test Plan (ITP) shall be forwarded to the Water Corporation for review a minimum of ten working days prior to the commencement of work.
- 8.3 A list of all items to be inspected and the relevant drawing reference shall be forwarded to the Water Corporation Coating Inspector prior to the inspection being undertaken.
- 8.4 The preceding inspection clauses shall not relieve the Contractor of their responsibility to supply materials and perform work in accordance with the requirements of any overriding contract documentation.

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APPENDIX A

Table 7.1: Protective Systems

Material to be applied	Concrete Surface Profile									
	CSP 1	CSP 2	CSP 3	CSP 4	CSP 5	CSP 6	CSP 7	CSP 8	CSP 9	CSP 10
Sealers, 0 to 3 mils (0 to 0.075 mm)	■	■	■	■	■	■	■	■	■	■
Thin films, 4 to 10 mils (0.01 to 0.025 mm)	■	■	■	■	■	■	■	■	■	■
High-build coatings, 10 to 40 mils (0.025 to 1.0 mm)	■	■	■	■	■	■	■	■	■	■
Self-leveling toppings, 50 mils to 1/8 in. (1.2 to 3 mm)	■	■	■	■	■	■	■	■	■	■
Polymer overlays, 1/8 to 1/4 in. (3 to 6 mm)	■	■	■	■	■	■	■	■	■	■
Concrete overlays and repair materials, >1/4 in. (>6 mm)	■	■	■	■	■	■	■	■	■	■

Table 7.2: Preparation Methods

Surface preparation method	Concrete Surface Profile									
	CSP 1	CSP 2	CSP 3	CSP 4	CSP 5	CSP 6	CSP 7	CSP 8	CSP 9	CSP 10
Detergent scrubbing	■	■	■	■	■	■	■	■	■	■
Low-pressure water cleaning	■	■	■	■	■	■	■	■	■	■
Grinding	■	■	■	■	■	■	■	■	■	■
Acid etching	■	■	■	■	■	■	■	■	■	■
Needle scaling	■	■	■	■	■	■	■	■	■	■
Abrasive blasting	■	■	■	■	■	■	■	■	■	■
Shotblasting	■	■	■	■	■	■	■	■	■	■
High- and ultra-high-pressure water jetting	■	■	■	■	■	■	■	■	■	■
Scarifying	■	■	■	■	■	■	■	■	■	■
Surface retarder (1)	■	■	■	■	■	■	■	■	■	■
Rotomilling	■	■	■	■	■	■	■	■	■	■
Scabbling	■	■	■	■	■	■	■	■	■	■
Handheld concrete breaker	■	■	■	■	■	■	■	■	■	■

(1) Only suitable for freshly placed cementitious materials

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Document Revision History					
Sect	Issue	Date	Revision Description	RVWD	APROV
4	4	12/12/2022	Update coating application qualifications	AO	SS
6	4	12/12/2022	Amend Surface preparation	AO	SS
Fig 1	4	12/12/2022	Amend Figure 1	AO	SS
	4	12/12/2022	Add Appendix A	AO	SS

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