

TECHNICAL SPECIFICATION

CEMENT MORTAR LINING REPAIRS IN NEW MSCL PIPES

SPECIFICATION: M8

ISSUE: 6

DATE: OCTOBER 2024

1.0 SCOPE

This document summarises the procedure for the cement mortar lining repairs in new MSCL pipes. Repairs include but not limited to weld bends, banded joints, and general repairs. This specification shall be read in conjunction with Water Corporation Standard Drawing AY58-19-1M, AS 1281 and AS/NZS 1516.

2.0 DEFINITIONS

Contractor: The service provider or its subcontractor who will undertake the works.

Principal: The Water Corporation.

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 contract on behalf of the Water Corporation.

Specification: This technical specification.

Works: This Technical Specification includes joint preparation and cement mortar lining application or any repair work to be undertaken by the Contractor to which this Technical Specification applies.

3.0 STANDARDS / CODES

- 3.1 All cement mortar lining shall comply with the Australian Standards AS1281, AS1516 and Water Corporation Drawing No. AY58-19-1M or Code(s) of practice (including amendments) specified in the Contract Specification or stated on the Contact Drawings. Cement mortar lining material shall be suitable for use in contact with drinking water in accordance with AS/NZS 4020.
- 3.2 The applicable edition(s) of standards/codes are those current two weeks prior to tender close date.
- 3.3 The relevant standards/codes are deemed the minimum standard applicable unless otherwise stated in the specification.

4.0 QUALIFICATIONS

- 4.1 Work shall only be carried out by companies with experience on projects of similar nature. The Contractor shall be responsible for allocating trained and experienced (minimum 4 years) applicator to carry out the repair.

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5.0 MATERIALS

- 5.1 The repair mortar shall be proprietary single component polymer-modified self-compacting cementitious micro concrete conforming the requirements of Class R4 of EN1504-3, such as Fosroc Renderoc HB70 or similar approved equivalent.
- 5.2 The primer shall be high strength solvent-free epoxy resins such as Fosroc Nitobond EP or similar approved equivalent.
- 5.3 The curing agent shall be water-based acrylic conforms to AS3799 such as Fosroc Concure A99 or equivalent approved.
- 5.4 All materials in contact with drinking water shall comply with AS4020-2018.

6.0 SURFACE PREPARATION

- 6.1 All weld spatter, slag and sharp edges on the internal and external welded joints shall be removed prior to the reinstatement of the cement mortar lining.
- 6.2 The surface of the pipe or fitting shall be free of loose rust, loose mill scale, dirt, debris, oil, grease, and any other detrimental material as outlined in clause 6.0 of AS 1281. Specification M8 Appendix – A provides further guidance on surface preparation.
- 6.3 For the existing cement mortar lining shall be cut back a minimum of 50 mm from the edge of steel. The edge of the cut lining shall be finished with an undercut (backward chamfered) angle range of 75° to 85° to assist in keying in of the cement mortar joint reinstatement, unless otherwise agreed between the purchaser and manufacturer [**Refer:** Figure 1].

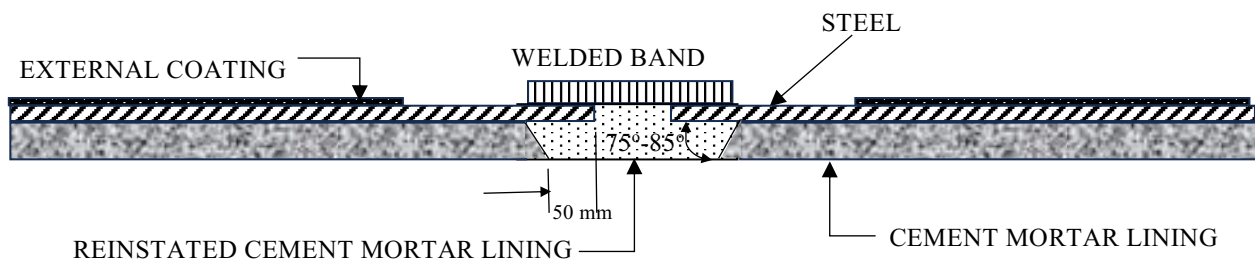


Figure 1– Typical cement mortar lining repair details at banded joint

- 6.4 For full cement mortar lining restoration of MSCL fittings to DS61, the cold joint shall be chamfered to 75° to 85° to assist in keying in of the cement mortar joint reinstatement, unless otherwise agreed between the purchaser and manufacturer. [**Refer:** Figure 1].

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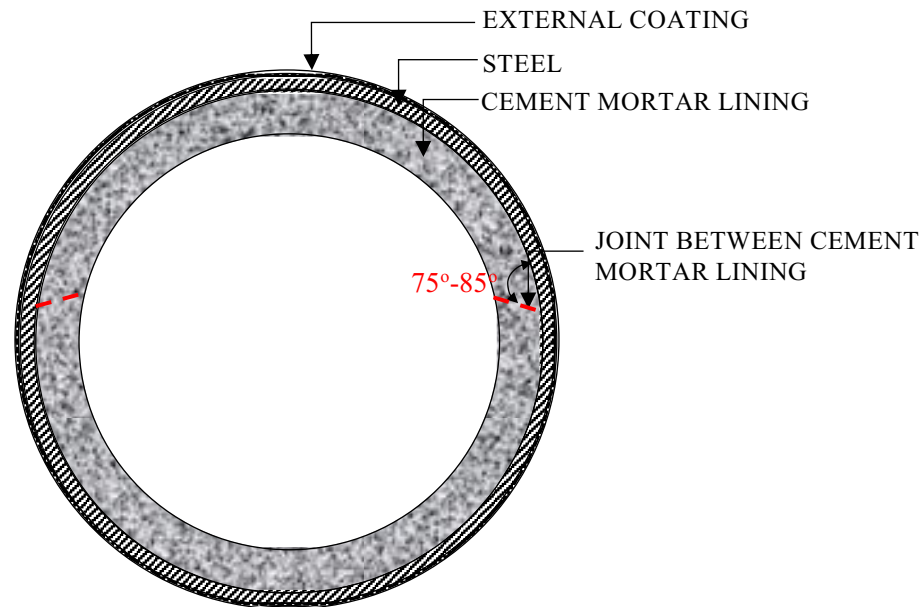


Figure 2 – Typical cement mortar lining cold joint details.

7.0 AMBIENT AND APPLICATION CONDITIONS

- 7.1 The repair materials shall not be applied if the substrate and ambient temperatures $<5^{\circ}\text{C}$ and $>35^{\circ}\text{C}$.

8.0 APPLICATION

- 8.1 The adjacent sound cement mortar lining concrete shall be damped with clean water and any excess water removed prior to applying one coat of Fosroc Nitobond EP[®] primer.
- 8.2 All pipe sections that include a manhole shall be post-installation rendered.
- 8.3 A repair mortar such as Fosroc Renderoc HB 70[®] with Nitobond EP primer. The mixing and application of the mortar material shall be in accordance with the manufacturer's recommended practice.
- 8.4 Immediately after the application of the lining to the pipe or fitting, apply a potable water-approved curing agent such as Fosroc Concure A99 in accordance with the manufacturer's recommendations.
- 8.5 Pipe spools and fittings shall not be transported till the cement lining/render has cured for a minimum of 2 days at a minimum average temperature of 20°C or to achieve compressive strength of 25MPa. In cold weather condition, if the average temperature is below 20°C the minimum curing time shall be increased to achieve a minimum compressive strength of 25MPa.

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9.0 INSPECTION & TESTING

- 9.1 The finished repair lining shall be smooth and free from major surface irregularities. Projections exceeding 2 mm, as measured from the general surface of the lining, shall be removed either by trowelling before the mortar has set or by grinding after the lining has cured.
- 9.2 Defects such as voids, sand and clay pockets, blisters, thin areas, disbonded areas, and cracks within the repaired areas, shall be repaired. Refer to **Appendix A Acceptance Criteria for Cement Mortar Lining in Pipework** Table A1 for more information.
- 9.3 If the measured thickness of the reinstated cement mortar lining does not meet the criteria for thickness as specified in AS1281 (refer Appendix A Table A2), the cement mortar lining shall be removed and reinstated to conform to the requirements of AS1281.
- 9.4 All plant, equipment, materials, and methods used may be subject to inspection by the Superintendent.

10.0 CONTRACTOR'S RESPONSIBILITY

- 10.1 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.
- 10.2 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 - Acceptance Criteria For Cement Mortar Lining in Pipework

Table A1 Typical performance testing

Characteristics	Clause/ Standard	Test Method	Criteria
Surface preparation and cleanliness of prepared surface	5.0 AS1281-Clause 6.0	Visual Inspection	Free from loose rust, loose millscale, dirt, debris, oil, grease, and other detrimental material such as chemicals.
Cut back existing lining	Clause 5.3	Visual Inspection	Min 50 mm from edge and edge of cut lining at 10 to 30 degrees backward chamfered
Dampness of adjacent sound lining	5.4	Visual inspection	Damped surface with no free water
Primed surface	5.6	Visual Inspection	Uniform thickness and tacky prior to application
Surface quality/workmanship	6.2	Visual Inspection	Uniform and smooth surface flush with existing lining with no apparent cracks and delamination's.
Lining thickness	Appendix A Table A2	Green state–pin gauge After curing - the lining thickness gauge/meter	Appendix A Table A2, AS/NZS 1516
Curing		Visual inspection	No discontinuity of curing compound

Table A2 - Thickness criteria for Cement Mortar Lining in pipework (AS1281-2001)

Pipe Size Outside Diameter (mm)	Lining Thickness (mm)	Tolerance (mm)
$100 \leq OD \leq 273$	9	± 3
$273 < OD \leq 762$	12	± 4
$762 < OD \leq 1219$	16	± 4
$1219 < OD \leq 1829$	19	± 4
$1829 < OD$	Should be agreed between manufacturer and purchaser.	

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Document Revision History					
Sect	Issue	Date	Revision Description	RVWD	APPR
Title	4	19/10/22	Update Specification title	AO	SS
1	4	19/10/22	Re-wording scope	AO	SS
4	4	19/10/22	Clarify qualifications requirements	AO	SS
5	4	19/10/22	Update joint preparation and application	AO	SS
6	4	19/10/22	Update Inspection and testing criteria	AO	SS
A. B	4	19/10/22	Delete Guide to use Parchem HB40. Appendix B	AO	SS
A.C	4	19/10/22	Update table of typical performance testing	AO	SS
4.1	5	18/10/23	Delete 'Only skilled personnel...'	AO	SS
5.6	5	18/10/23	Delete 'EZILINE'.	AO	SS
5.8	5	18/10/23	Change curing to 2 days or minimum 25 MPa	AO	SS
4,5,6,7,8,9 A, B	6	17/10/2024	Full document revised and updated	AO/MI	SS

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