DUBBO REGIONAL COUNCIL

TECHNICAL SCHEDULE

DRC-W307

SEWER MAINTENANCE HOLE RESTORATION

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DRC-W307.1 SCOPE

This Specification applies to the repair and rehabilitation of nominated sewer maintenance holes. Examples of the type of works which may be covered by this Contract are as follows:

- Sealing cracks and voids to prevent infiltration.
- Coating of internal surfaces.
- Replacement of benching and channelling.
- Alteration of surface level.
- Replacement of components.
- Removal and replacement of entire maintenance hole.

Details of the maintenance holes are listed separately in the Contract Specific Scope of Work document or shown on the Contract drawings.

The work required to be performed under this contract shall comply with the referenced documents in Clause DRC-W307.2, unless specified otherwise herein.

This Specification details a number of different rehabilitation and repair tasks for maintenance holes. Only the specific tasks for the specific maintenance holes nominated are to be included in this Contract.

DRC-W307.2 REFERENCED DOCUMENTS

The following documents are referred to in this Specification. The latest version of the document, including any published amendments, shall apply unless noted otherwise. Where the drawings or a project specific specification are in conflict or inconsistent with these referenced documents or this Specification, then the details on the drawings or project specific specification shall apply.

Australian Standards

Works shall comply with the current versions all relevant Australian Standards.

Water Services Association of Australia Standards

WSA02	Sewerage Code of Australia
WSA201	Manual for Selection and Application of Protective Coatings
N/A	WSAA Product Specifications

DRC-W307.3 GENERAL REQUIREMENTS

The Contractor shall comply with the general requirements for sewer maintenance activities and accessing sewer maintenance holes as detailed in Technical Schedule DRC-W301.

DRC-W307.4 SAFETY

Refer to Technical Schedule DRC-W301 for details of safety requirements.

DRC-W307.5 CUSTOMER NOTIFICATION AND COMPLAINTS

The Contractor is responsible for notifying customers where entry to private property is required and also for handling and addressing any customer complaints. Refer to Technical Schedule DRC-W301 for details of customer notification and complaints requirements.

DRC-W307.6 PROTECTIVE COATING PRODUCTS

All products and materials to be used on the Work Under Contract shall be provided with the following documentation by the Contractor to the Superintendent prior to use:

- Supplier instructions for supply, storage mixing equipment, surface preparation, application, curing, inspection testing and repair of defects.
- Product Material Safety Data Sheet.
- Test certificates/reports issued by independent testing bodies indicating that the requirements of this Specification and the relevant standards have been met.

DRC-W307.7 REPAIR MORTAR

For mortar plugs, patches and crack repair, the Contractor shall use non-shrink hydraulic cement suitable for use in sewers and specifically designed for repair work of concrete subject to hydrostatic pressure.

DRC-W307.8 PROTECTIVE COATINGS

The selection, supply and application of protective coatings shall comply with WSA201 Manual for Selection and Application of Protective Coatings. Protective linings such as calcium aluminium cement mortar (CAC), protective liners (CPL), ultra-high build solvent free epoxy (EUH), or high build novolac epoxy system (NOV) may be considered for internal surfaces of maintenance holes.

Protective coatings shall be:

- Suitable for use in the presence of water.
- Resistant to chemical, biological and mechanical degradation by domestic and industrial sewage and corrosive soils and substances generally.
- Resistant to sewer gases.
- Prevent the passage of water.

Coating application shall be performed by competent and experienced personnel under close supervision to ensure that the specified standard of surface preparation has been achieved and the coating application requirements are being followed. The Contractor shall only use equipment that is recommended and/or approved by the coating supplier when applying the coating product.

The Contractor shall record all details of surface preparation, paint application, ambient weather conditions and film thickness measurements on daily inspection reports.

DRC-W307.9 SEALING CRACKS AND VOIDS

The Contractor is to inject the chemical sealant into cracks and voids as required. Excess sealant is to be removed or trowelled flush.

Sealing compounds shall be:

- Suitable for use in the presence of water.
- Flexible when cured.
- Prevent the passage of water.
- Resistant to chemical, biological and mechanical degradation by domestic and industrial sewage and corrosive soils and substances generally.

DRC-W307.10 SURFACE PREPARATION

Where required for grouting, chemical injection, bonding, epoxy coating or other procedures, the Contractor shall clean off all loose material and contaminants from surfaces and ensure all surfaces are prepared in accordance with manufacturer's recommendations for the particular product(s) being used and WSA201.

DRC-W307.11 REPLACEMENT OF STEP IRONS OR LADDERS

The Contractor shall remove existing defective step irons by grinding them off flush with the internal wall of the maintenance hole. The remaining section embedded in the maintenance hole wall is to be drilled out. New step irons are to be inserted in the maintenance hole wall where the old step irons have been drilled out. The new step irons are to be secured in place with a suitable bonding compound.

Step irons shall comply with WSAA Product Specification WSA PS-314 and shall be either plastic encapsulated or stainless steel grade 316.

Fixed ladders shall comply with WSAA Product Specification WSA PS-315 and shall be either stainless steel grade 316 or fibre reinforced plastic.

DRC-W307.12 BENCHING AND CHANNELLING

The Contractor shall to use 2:1 sand:cement mix to reform defective benching and channelling in accordance with WSAA Standard Drawings (WSA02). Render shall be no less than 25 mm thick at any point. Type C or D cement and sand clean and free of deleterious materials is to be used.

Channelling shall be shaped and finished to ensure minimal turbulence and be free from any irregularities or differences in level which may cause accumulation of solids (ie debris, silt, rags, etc).

DRC-W307.13 ALTERATION OF COVER LEVEL

The Contractor shall add or remove maintenance hole components to raise or lower the height of the maintenance hole cover to suit the surrounding surface level in accordance with the table below:

Location	Height of Cover Above Surface
Undeveloped area	100 mm
New subdivisions	75 mm
Roads, laneways, footways and driveways	Flush
Existing built-up areas	25 mm

The cover slope, arrangement and surrounding ground shall be installed in accordance with WSA02.

The Superintendent may specify exceptions to the above requirements due to special considerations, such as flood prone areas. Where a level maintenance hole cover is not practical the Contractor shall form a wedge of concrete on the maintenance hole barrel to conform to the required slope.

Where raising a maintenance hole cover will result in the top step iron or top ladder rung exceeding 600 mm from the ground surface, then the Superintendent's direction shall be obtained.

DRC-W307.14 REPLACEMENT MAINTENANCE HOLE COVERS

Replacement access covers shall be compliant with WSAA Product Specification WSA PS-290 and shall be:

- Manufactured in accordance with AS 3996.
- Class D unless stated otherwise on the drawings.
- Circular DN600 mm unless stated otherwise on the drawings.
- Infilled with concrete (where required) in accordance with AS 3996. Concrete infill shall be a minimum of N32 and have a cement content of 400 kg/m^3. Concrete infill shall be vibrated during installation to eliminate air pockets.
- Gas and water tight.
- Greased using approved sealing grease on all metal to metal seals after installation.
- Installed with vegetation rings where access covers are not located in a paved or sealed area.

DRC-W307.15 REPLACEMENT OF MAINTENANCE HOLES AND COMPONENENTS

Where it is not practical to repair damaged pre-cast manhole components the Contractor shall remove the damaged components and replace them in accordance with WSA02 standard drawings. Suitable sealing strips in accordance with manufacturer's recommendations shall be used.

Where replacement of an entire maintenance hole is required the Contractor shall construct the new maintenance hole in accordance with WSA02 standard drawings.

In all cases where the Contractor is required to remove, add or replace pre-cast maintenance hole components, the final configuration of the maintenance hole is to comply with WSAA standard drawings. While complying with the standard drawings, the Contractor is to select components which will minimise the number of joints required.

Where pre-cast concrete maintenance holes or components are permitted they shall be compliant with WSAA Product Specification WSA PS-323 and shall be:

- Manufactured in accordance with AS 4198.
- Cement type SR with minimum cement content of 450 kg/m^3.

- Concrete characteristic strength of 50 MPa.
- Aggregate durability exposure condition C as per AS 2758 Clause 9.
- Provided with minimum cover to reinforcement of 40 mm internally and 25 mm externally, except at joint ends where a minimum cover of 20 mm shall be provided.
- Provided with two lifting inserts on each component, each having a safe-lift rating of at least 1 tonne.
- Either EPDM elastomeric joint sealed in accordance with AS 1646, AS 681 or butyl rubber joint sealed in accordance with ASTM C990M-09.

DRC-W307.16 CONTROL OF SEWAGE FLOWS

It is the full responsibility of the Contractor to control sewage flows as necessary to enable the Work Under Contract to be successfully carried out. No spilling of sewage in any situation is acceptable and the Contractor will be held fully responsible and accountable. The Contractor shall be responsible for the full cost of clean-up and associated activities that may be required to rectify the effects of any spillage as well as any fines by EPA or other authorities.

No work is to be undertaken during conditions where the reticulation sewer is flowing under surcharge conditions.

If required, sewers may be plugged by the Contractor to prevent flow of sewage into the subject length of sewer. The Contractor must monitor the lines that have been plugged to ensure surcharging does not occur. The Contractor shall remove the plugs at the earliest possible time after the lines have been cleaned, and ensure that all material has been removed from the downstream manhole.

The Contractor shall install a diversionary system if required after prior approval of the Superintendent. It must be designed with sufficient capacity and security to ensure surcharge does not occur. Bypass pumping and diversion of sewer flows shall be undertaken in accordance with Technical Schedule SW-308.

All costs associated with plugging and diversion systems are to be fully borne by the Contractor.

If the Contractor requires the Principal to shut down upstream pumping stations then a written request must be received by the Superintendent at least 24 hours prior to the intended commencement of the work.

DRC-W307.17 VACUUM TESTING OF MAINTENANCE HOLES

Any replaced concrete maintenance holes shall be vacuum tested in accordance with WSA02-2014 Clause 21.4.5 based on the following frequency.

Number of each type of MHs in the project	Cast in-situ concrete - minimum % tested initially	Pre-cast concrete - minimum % tested initially
Up to 5	20%	100%
6 to 10	20%	50%
11 to 20	20%	33%
More than 20	20%	25%

DRC-W307.18 MEASUREMENT AND PAYMENT

The rates tendered in the Schedule of Rates shall be deemed to be inclusive of all responsibilities and obligations of the Contractor under the Contract including accommodation, travel, site establishment, waste disposal and reporting.

DRC-W307.19 REPORTING

For each maintenance hole where work is carried out the Contractor is to submit to the Superintendent a written report detailing the following:

- Address of maintenance hole
- Maintenance hole number
- Date work commenced
- Date work completed
- Description of work carried out
- Photographs of repair work

The Contractor shall submit each maintenance hole report to the Superintendent within one week of work on the maintenance hole being completed.

DRC-W307.20 PRACTICAL COMPLETION

Practical Completion for the Contract will not be granted until all of the following requirements are achieved:

- The Superintendent is satisfied that the work complies with the requirements of the Contract in all respects (subject to such minor omissions as may be accepted by the Superintendent) and that the Contractor has carried out all of its obligations under the Contract except as regards his obligations during the Defects Liability Period.
- Maintenance hole reports.