



**DUBBO  
REGIONAL  
COUNCIL**

**TECHNICAL SCHEDULE**

**DRC-W306**

**PIPE BURSTING OF SEWER MAINS**

**TECHNICAL SCHEDULE DRC-W306 – PIPE BURSTING OF SEWER MAINS**

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## DRC-W306: PIPE BURSTING OF SEWER MAINS

### DRC-W306.1 SCOPE

This Specification applies to the replacement of existing gravity sewer mains or pressure sewer mains using pipe bursting. Pipe bursting is a method using an apparatus which travels along the existing pipe breaking it out as it goes while drawing a replacement pipe into the space previously occupied by the pre-existing main. This process is to be completed with minimal excavation.

The replacement pipe may be required to have an internal diameter similarly sized to the pre-existing pipe or may be required to have a larger internal diameter than the pre-existing pipe.

All live connections and side lines are to be reinstated.

Details of the individual sewer mains to be replaced by pipe bursting 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-W306.2, unless specified otherwise herein.

### DRC-W306.2 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

AS 4130 Polyethylene (PE) pipes for pressure applications

Works shall also comply with the current versions all other relevant Australian Standards where not specifically listed above.

#### Water Services Association of Australia Standards

WSA02 Sewerage Code of Australia  
WSA05 Conduit Inspection and Reporting Code of Australia  
N/A WSAA Product Specifications

### DRC-W306.3 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-W306.4 SAFETY**

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

#### **DRC-W306.5 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-W306.6 PROVISION OF INFORMATION TO THE CONTRACTOR**

The Superintendent will, where available, provide the Contractor with information regarding the sewers selected for rehabilitation, including:

- a) Location of the sewer (plan or map).
- b) Approximate length of the sewer.
- c) Sewer material type.
- d) Diameter of sewer.
- e) Depth to invert of upstream and downstream maintenance holes.
- f) Location of deficiency to be repaired/rehabilitated.
- g) Summary of condition of the sewer as assessed from previous CCTV inspections carried out by the Principal.

Where the Principal has carried out previous CCTV inspections of the sewer to be rehabilitated, and previous documentation is available, CCTV footage and reports may be made available to the Contractor as background information.

It should be noted that information regarding flow rates within the sewerage system are normally not available. The Contractor will need to make its own assessment of likely flows through the sewer.

#### **DRC-W306.7 REPLACEMENT PIPE**

The replacement pipe shall be polyethylene (PE). PE pipe and fittings shall be compliant with WSAA Product Specifications WSA PS-207 and WSA PS-208 and shall be:

- High-density PE (PE100).
- Manufactured in accordance with AS 4130.
- Minimum pipe Standard Dimension Ratio (SDR) of 17.
- Coloured solid black for gravity sewerage.
- Butt welded jointed.
- Capable of withstanding all forces imposed on the pipe during pipe bursting as well as final installed conditions. All pipes must be able to withstand a tensile loading greater than the pulling load of the pipe busting machine. Where pushing processes are used, the pipe must be able to withstand the compressive load.
- Capable of withstanding scoring damage as it is drawn into place, or alternatively provide with a sacrificial outer casing pipe.

The SDR of the replacement PE pipe shall be calculated in accordance with AS 2566. The loads used in the design of the pipe shall be the most severe of any combination of earth pressure, ground water hydrostatic pressure, traffic loading and internal hydrostatic pressure.

Traffic surcharge loads shall be calculated in accordance with Clause 4.7 of AS 2566.1 for the following types of traffic loadings:

- Type A Main Road: Multiple adjacent lanes of Standard T44 or Standard W7 wheel loads.
- Type B Light Road: Single lane of Standard T44 or Standard W7 wheel loads.
- Type C Field Load: 60% of light road loading.

Hydrostatic loading shall be calculated assuming an internal pressure from sewage and external hydrostatic loading shall be calculated assuming a water table located at the ground surface, acting in isolation from, or in combination with, any other loads. Hydrostatic loading internally with sewer surcharged to maintenance hole cover level shall be calculated, acting in isolation from or in combination with any other loads.

#### **DRC-W306.8 CONTRACTOR SUBMISSION**

Prior to commencing any work the Contractor shall submit the following:

- Clear and detailed work method statement for the installation of the replacement pipe.
- Manufacturer and type of bursting equipment, operating system proposed and capability of equipment chosen. Documentary proof of the power, condition, and operational characteristics of all equipment to be used.
- Ground monitoring equipment and methods, for example heaving, fluid loss or frac-out.
- Type of existing pipe and services reconnection joints used and their relevant specification.
- Location of launching and receiving chambers, trench support and work sites layout. Calculation of size, depth exit pit required.
- Sewer bypass pumping plan, including all details of proposed equipment, installation and hydraulic calculations.
- Existing underground utility services location and special precautions required.

#### **DRC-W306.9 PIPE BURSTING**

The Contractor shall launch and recover the bursting head from a maintenance hole by removing a section of pipe from the conduit to be replaced. The bursting head shall travel along the conduit breaking the conduit as it goes and pushing the broken pieces into the surrounding ground.

The bursting head shall draw behind it a replacement pipe which shall occupy the space previously occupied by the burst conduit.

The bursting process shall cause minimal disturbance to the surface.

The pulling end and intermediate points of the pipe shall be protected against damage.

All work shall be carried out under the technical direction of a qualified and experienced person who has had suitable training and experience in the installation of the liner, nominated by the Contractor in its Tender and accepted by the Principal.

The Contractor shall have submitted with its Tender full details of the installation procedure and the Installation Quality Plan for the lining to the Superintendent for approval based on the proposal made in its Tender. The Contractor shall provide all the equipment for the safety of its workforce, and for installing the replacement pipe, in accordance with the procedures approved by the Superintendent.

The Contractor shall ensure that the pipe bursting equipment has the capability of limiting the bursting force during the installation, so as not to exceed the manufacturers recommended tension loads for the pipe. This is to ensure the newly installed pipe is not damaged by the excessive pulling force.

### **DRC-W306.10 EXISTING SERVICES**

The Contractor shall be responsible for the identification and protection of existing services where these are crossed by pipe bursting activities.

The Contractor shall ensure that all utilities crossing within 600 mm of the existing bursting pipe have soil excavated and removed to relieve pressure caused by heaving during the bursting operation.

### **DRC-W306.11 SETTLEMENT AND SURFACE HEAVE MONITORING**

The Contractor shall take all care and necessary precautions to protect existing structures, utilities and services in planning and execution of the works. All potential affected work areas shall be visually inspected to document conditions prior to any work being conducted. Any damage to adjacent properties caused by all or part of this work shall be repaired and restored to its original condition at the Contractor's expense.

The Contractor shall ensure that the pipe bursting system is monitored by the operator at all times. The minimum information that must be monitored shall include, rate of advance length of conduit installed, thrust or pull force, deviation from line and gradient, and valve positions.

Where crossing of roadways and railways are involved, the Contractor shall be required to record and report any ground settlement to the satisfaction of the respective controlling agencies.

Where crossing any utilities and pipelines during the horizontal directional drilling after the utility or pipeline intersection.

The Contractor shall cease operations when monitoring points indicate any surface disruption that exceed the degreed specification. The Contractor shall propose immediate action for review and approval by the Client to remedy the problem.

Should voids in the ground occur during the pipe bursting operation, the voids shall be backfilled promptly to the extent practicable with soil. Where the local ground material is not suitable for this purpose, the Contractor shall import suitable materials.

**DRC-W306.12 PIPE JOINTING**

All pipe jointing of PE pipe shall be undertaken in accordance with WSA01 and the manufacturer's recommendations and specifications.

All PE pipes shall be jointed using the butt-fusion method, with the exception of connections to existing pipes that may be undertaken using electrofusion. All joints shall be leak-free, straight and true and have uniform roll-back beads within limits specified by the manufacturer. All butt-fusion joints in gravity sewers shall have the internal bead removed.

Should the pre-inspection of the pipe material reveal defects, the defective section shall be cut out of the pipe. Similarly, should a joint be found to be defective, the joint shall be cut out and a new joint made. All such work shall be at these cost of the Contractor.

**DRC-W306.13 CONNECTION TO EXISTING LINES**

The Contractor shall connect the new PE pipe to existing lines at each end of the job and at all live side connections in accordance with Principal's standard specifications using approved fittings and practices, to the satisfaction of the Superintendent.

**DRC-W306.14 RE-ESTABLISHMENT OF EXISTING MAINTENANCE HOLES AND CONNECTIONS**

The Contractor shall re-establish all pre-existing maintenance holes, live sewer junctions and side connections on the new PE pipe in accordance with Principal's standard specifications using approved fittings and practices, to the satisfaction of the Superintendent.

**DRC-W306.15 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-W306.16 POST-REPAIR CCTV INSPECTION**

A post-repair CCTV inspection shall be completed on all replaced sewers. CCTV inspection shall be carried out in accordance with Technical Schedule DRC-W303 and the WSAA Conduit Inspection Reporting Code of Australia WSA05-2008.

The post-repair CCTV inspection shall show that no obvious defects are present and that all live property connection sewers have been opened fully and reconnected.

#### **DRC-W306.17 AIR PRESSURE AND VACUUM TESTING OF SEWERS**

All replacement sewers shall be vacuum or air pressure tested in accordance with WSA02-2014 Clause 21.4. At no stage shall air pressure used exceed 50 kPa.

The Contractor shall provide the Superintendent with a minimum of three clear working days written notice prior to carrying out hydrostatic pressure testing. This notice must be in writing and specify the pipeline sections to be tested, as well as the time, date and location of the test and equipment to be used (refer to Appendix A for an example notification form).

Testing shall not be carried out during wet weather unless otherwise approved by the Superintendent.

#### **DRC-W306.18 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
<b>Up to 5</b>	20%	100%
<b>6 to 10</b>	20%	50%
<b>11 to 20</b>	20%	33%
<b>More than 20</b>	20%	25%

#### **DRC-W306.19 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.



Measurement for payment shall be based on the sewer length in metres measured from the centre of maintenance hole to centre of maintenance hole.

#### **DRC-W306.20 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.
- CCTV inspection report.