

# DISCLAIMER

This Standard Technical Specification was developed by Hunter Water to be used for construction or maintenance of water and/or sewerage works that are to become the property of Hunter Water. It is intended that the works be designed in accordance with Hunter Water's Water and Sewer Design Manual and that this Standard Technical Specification be used in conjunction with the Standard Drawings, other Standard Technical Specifications and requirements prepared specifically for each particular project. Hunter Water does not consider this Standard Technical Specification suitable for use for any other purpose or in any other manner. Use of this Standard Technical Specification for any other purpose or in any other manner is wholly at the user's risk.

Hunter Water makes no representations or warranty that this Standard Technical Specification has been prepared with reasonable care and does not assume a duty of care to you. Hunter Water has no responsibility to inform you of any matter relating to the accuracy of this Standard Technical Specification which is known to Hunter Water at the time of downloading or subsequently comes to the attention of Hunter Water.

This document is current at the date of downloading. Hunter Water may update this document at any time.

Copyright in this document belongs to Hunter Water Corporation.



Hunter Water Corporation A.B.N. 46 228 513 446  
Standard Technical Specification for:

**REHABILITATION OF SEWERMAINS BY  
GROUTING**

**CONTENTS**

**1. GENERAL..... 1**

1.1 Intent ..... 1

1.2 Scope ..... 1

1.3 General ..... 1

**2. DESIGN OF GROUT..... 1**

2.1 Materials ..... 1

2.2 Root Inhibitor..... 2

**3. INITIAL CCTV INSPECTION & CLEANING ..... 2**

**4. STOPPING AND DIVERSION OF SEWER FLOWS ..... 2**

**5. SURCHARGE ..... 2**

**6. EXECUTION ..... 2**

6.1 General ..... 2

6.2 Principal's Mains ..... 3

6.3 House Service Lines ..... 3

6.4 Service Disruptions ..... 3

6.5 Hydrostatic Test ..... 3

**7. FINAL CCTV INSPECTION ..... 3**

**AMENDMENTS FROM THE PREVIOUS EDITION - SEPTEMBER 2001**

Clause	Amendment
All	General formatting, rewording and referencing changes to improve clarity but no change to technical requirements

## 1. GENERAL

### 1.1 Intent

This Standard Technical Specification details requirement for sealing nominated main sewers and House Service Lines (HSL) to prevent infiltration or exfiltration of water into or out of the conduit by use of grouting.

### 1.2 Scope

This specification covers the requirements for the grouting of Principal's sewers and House Service Lines. Grout Main Sewers and HSL to the following extents:

Main Sewers

- grout the entire line.

House Service Line

- grout from the main sewer junction up to the Boundary trap (BT), including the vertical, in the case of a boundary trap type connection; or
- grout from the main sewer junction up to the first inspection opening within a property boundary, in the case of a non-BT type connection

### 1.3 General

Carry out tests on grouted lines to demonstrate that materials and methods adopted for grouting are appropriate, and the grout installed is of acceptable standard. The tests are specified in Clauses "Design of Grout" and "Execution".

## 2. DESIGN OF GROUT

### 2.1 Materials

Use polyurethane materials for grouting. Provide technical data on the characteristics and performance of grouting materials to be used. Use grout used with a design life of 15 years.

If desired, use tested and approved additives to improve the performance of grout. Setting agents may be used to manipulate setting time. Filler materials and reinforcing agents may also be used.

Proportion the components of chemical sealing materials such that;

- while being injected the sealant / grout should be able to react/perform in presence of water (ground water). On curing it must be flexible;
- the resultant sealant/grout formation must prevent the passage of water;
- the cured grout must withstand, without degradation, the environment in and around the pipe and its periodic/seasonal variations in moisture content, shrinkage and expansion or any other normal ground movement; and
- clean-up is carried out without the use of inflammable or hazardous chemicals. It should be easy to remove residual material so that there is no adverse effect on sewer hydraulics.

#### **Hold Point**

Before application of any materials. submit to the Superintendent details of; the properties of the proposed material(s), past relevant experience in use of the material(s), and acceptance by appropriate authority(ies) for the type of use.

## 2.2 Root Inhibitor

Add root inhibitor dichlobenil (DCB) to the grout mix to prevent penetration and regrowth of tree roots into grouted pipe lines. Use DCB with solids not more than 40 micron in size. Use a concentration of DCB in grout water mix of 200 mg/L in emulsified form.

## 3. INITIAL CCTV INSPECTION & CLEANING

Clean all foreign materials, roots, grease, encrustations from inside the pipe line before application of grout.

Undertake a closed circuit television inspection of the full length of the pipeline prior to commencement of the rehabilitation work to provide an up to date assessment of the condition of the pipeline.

Submit a colour video recording and report of the inspection made in accordance with STS901.

## 4. STOPPING AND DIVERSION OF SEWER FLOWS

Plug off mains and property service lines as required to prevent flow of sewage in the length of pipeline. Pump flow around the length of main to be grouted. Flow from HSL need not be pumped if there is sufficient storage capacity without surcharge in the HSL for the duration of the isolation.

<b>Hold Point</b>
-------------------

Submit details of the bypass system to Superintendent prior to installation.
--

Monitor the lines that have been plugged and ensure surcharging does not occur (if the bypass system equipment fails bring the sewer pipeline back into normal operation immediately).

Give written notice two days in advance if shut down of upstream pumping stations is required. Approval of shut down of pumping stations will depend on operating conditions (including weather) to be determined by the Superintendent.

Ensure that the line and Access Chambers are clear of material before removing the plugs and ceasing any bypass pumping. Remove the plugs at the earliest possible time.

## 5. SURCHARGE

Prevent surcharging during all stages of the work. If surcharging occurs immediately notify the Superintendent and thoroughly clean up the affected.

## 6. EXECUTION

### 6.1 General

Force chemical sealing materials from inside the pipe through the pipe joints. Maintain sufficient head of grout so that grouting materials are pushed out through the faults, into the soil outside the pipe with a minimum penetration of 50 mm. Jetting or driving of injection pipes from the ground surface to form an exterior seal is not allowed.

Determine the method of grouting to suit the soil condition around pipe, condition of the pipeline, pipeline slope and junctions. Adopt a method which does not damage pipes. In backfill conditions where large voids outside the pipe exist, grouting may have to be carried out in two or more applications, spaced in time by the gel time of the grout first to form an initial barrier in the surrounding soil, then additional application(s) to form an effective seal.

Test each line grouted to ensure that the line is sealed. Supply a certified report on the grouting of each line including test results.

## **6.2 Principal's Mains**

Maintain a minimum head on the grout of 600 mm above ground surface level until the grout is about to gel and the minimum penetration into the soil has been achieved.

Grout junctions to the first joint of the sideline/HSL using appropriate techniques.

Remove all excess grout immediately after completion of grouting and clean the line. Dispose of excess grout at a site approved by the relevant Local Government authority.

## **6.3 House Service Lines**

Seal all leakages from the Principal's junction up to the boundary trap/vertical, including the vertical. While planning this work, keep in consideration the pipe diameters (150 mm and less), features and variation in fittings; layout, length and slopes; conditions, support arrangement, access and working area etc. of house service lines.

Clean the pipelines in accordance with STS901 before grouting.

Position appropriate plugs to prevent grouting materials from getting into building plumbing.

Remove all excess grout immediately after completion of grouting and clean the line. Dispose of excess grout at a site approved by the relevant Local Government authority.

Determine whether the property under consideration is a boundary trap or non-boundary trap connection, locate boundary trap or verticals of HSLs and raise these as necessary, to ground level complete with all fittings.

In case of non-boundary trap connections, and where directed by the Superintendent, locate verticals and raise those to ground level. Comply with the NSW Code of Practice Plumbing and Drainage (June 1996).

Prior to grouting, repair broken boundary traps in HSLs being grouted. Make the repair in accordance with the NSW Code of Practice Plumbing and Drainage (June 1996). Raising the boundary trap vertical pipe to ground level with appropriate fitting.

Carry out all repairs after full cleaning and de-rooting of the line.

## **6.4 Service Disruptions**

The grouting work, especially house service line grouting operation is likely to stop the use of kitchen, toilet and laundry during the work. Notify the customers beforehand as to the time and duration of disruption. Make every effort to reduce the time of disruption to a minimum.

## **6.5 Hydrostatic Test**

Test all grouted lines under a hydrostatic head equivalent to the maximum ground surface level along the length being tested.

## **7. FINAL CCTV INSPECTION**

Submit a colour video recording and report on the full length of the lined pipeline in accordance with STS901.

If the CCTV tapes reveal that the work carried out is defective or unsatisfactory, then the Contractor shall re-run the CCTV after rectifying such work at no extra cost to the Principal.

[END OF STS702]