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MAJOR CHANGES INCORPORATED IN THE XXXX EDITION

The following lists the major changes to the XXXX edition of TG 120, which have been incorporated in this edition:

1. First Edition

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Referenced Documents

- SA Water’s Water Supply and Sewer Manuals
- Water Supply Code of Australia (produced by Water Supply Association of Australia, WSAA)
- AS/NZ 2566.2 “Buried Flexible Pipelines – Installation”
- AS/NZ 4799 “Installation of Underground Utility Services within Railway Boundaries”
- SA Water’s “Technical Standards and Drawings”
- Commissioner of Highways’ Standard Specification “Excavation and Reinstatement of Road Pavement”

Section 1: Purpose

The purpose of this document is to provide practical guidance to Commissioner of Highways personnel in regard to alterations that SA Water may require to its infrastructure as a result of roadworks being carried out by the Commissioner of Highways

The document aims to:

- Provide information on SA Water's design requirements so that when planning and designing new roads or upgrading existing roads, alterations to SA Water infrastructure are avoided or minimised wherever possible; and
- Establish a common understanding between SA Water and Commissioner of Highways personnel of SA Water's standard design (cover) requirements.

The decision on what alterations are required to SA Water infrastructure as a result of roadworks rests entirely with SA Water, however in general those alterations will accord with the requirements expressed in this document. Roadworks in the proximity of SA Water infrastructure must not be constructed without first referring the project to SA Water for determination of what alterations to the infrastructure will be required and for approval to proceed.

SA Water's requirements stated in this document are sourced from relevant information in SA Water's Water Supply and Sewer Manuals, Water Supply Code of Australia (produced by the Water Supply Association of Australia, WSAA) and Australian Standards.

Section 2: Reasons for Altering SA Water Infrastructure

SA Water's infrastructure must be altered where roadworks create an unacceptable risk to one or more of the following operational requirements:

- The ability to provide water and waste water services to customers.
- The integrity and long term performance of the infrastructure.
- Access for operations and maintenance.

Action is generally necessitated as a result of the following:

- Inadequate cover over pipe or valve spindle (refer to Section 3 to 7),
- Excessive cover (depth) over pipe due to change of surface level,
- Loss of embedment side support,
- Insufficient clearance to other underground services, or
- Structure or obstruction over pipe, restricting access or affecting pipe integrity.

Section 3: General Requirements for Cover

The majority of water supply and sewer pipes comprising SA Water infrastructure are flexible pipes. Pipes made of steel, ductile iron, cast iron and various plastics, including those lined with concrete or other materials, are classed as flexible pipes.

Adequate cover is required over a pipeline to ensure the long term integrity of the asset by:

- ensuring surcharge loadings, e.g., traffic and construction equipment, are distributed over an adequate area,
- giving sufficient clearance to overlying layers that require heavy mechanical compaction, e.g., road sub-bases, and
- ensuring the pipe or side support is appropriate, having regard to the proposed land use and any foreseeable lowering of finished surface levels.

In determining required covers for structural purposes, SA Water is guided by the standards AS/NZS 2566.2 Buried flexible pipelines Part 2: Installation; and AS 4799-2000 Installation of underground utility services and pipelines within railway boundaries.

There are also other factors that influence the cover requirements such as special conditions, operational and maintenance considerations, and the provision of sufficient space to accommodate valves and access covers.

The standard covers that SA Water has chosen as appropriate for its pipes are set out in the following Sections.

Section 4: Standard Cover for Water Supply & Pressure Sewer Mains

This Section gives the standard cover required for water supply and pressure sewer mains. Cover is defined as the distance between the top of the pipe and finished surface level.

The table below is based on the minimum cover required to provide the additional space required to accommodate valves installed on the main (i.e. top of pipe to top of valve spindle) plus 150 mm (minimum) to 300 mm (maximum) to allow for access cover and some level adjustment.

The minimum cover requirements for pipes are:

Nominal Pipe Diameter (mm)	Minimum Cover (mm)
63 - 250	800
300	875
375	950
450	1100
500	1200
600	1450
750	1700

Table 4.1

The pipe depth (cover) should be constant for the full length of the main to allow additional valves and off-take valves to be installed. However, SA Water is prepared to consider locally raising or lowering a pipe in specific situations.

Maximum cover would generally be approximately 400 mm greater than minimum cover.

SA Water recommends that for freeways and critical routes the cover should be increased further to at least 1200 mm to reduce damage to road pavement in the event of failure of the pipe. Alternatively, consideration should be given to installing the pipe in a sleeve, e.g. box culvert, larger pipe.

Where possible, a maximum trench depth of 1.5 metres is preferred to avoid shoring for maintenance and operational purposes.

Section 5: Standard Cover for Water Supply Service Connections

SA Water aims to achieve a cover of 450 mm at the kerb line for all service connections in order to clear other services generally located in the footpath. The service connection is graded from the kerblines towards the main to connect into the side of the main.

Section 6: Standard Cover for Sewer (Gravity) Mains

Sewer gravity mains are set at depths that allow for maximum solids collection with a minimum grade over the maximum possible area. The cover requirements for sewer gravity mains are as follows:

Minimum Cover	600 mm
Minimum Cover in Roadways	1000 mm
Maximum Cover	6000 mm

Table 6.1

The maximum practical depth is based on the practicality of digging in a road environment and it is the point where a third tier of shoring is required.

Section 7: Minimum Cover during Construction of Roadworks

The minimum cover to SA Water pipework during construction of roadworks shall not be less than the following:

COMPACTION EQUIPMENT	Minimum Cover (mm)
Heavy Vibrating Equipment	750
Heavy Non Vibrating Equipment	750
Hand Compaction Equipment	300

Table 7.1

In special circumstances and some loading conditions, cover could be reduced to 150 mm provided side support is maintained to this height and the pipe is bridged by a rigid reinforced concrete slab supported on solid natural or compacted soil a minimum of 300 mm wide on both sides of the pipe. This treatment is considered to be only appropriate for transverse road crossings rather than longitudinal situations.

Any treatment options must be agreed to by SA Water.

Section 8: SA Water's Technical Standards and Drawings

Information on SA Water's technical standards can be found at the SA Water website:
<http://www.sawater.com.au/SAWater/DevelopersBuilders/EngStandardsGuidelines/Standards.htm>

Further information on the installation of water pipes and sewers can be found at the SA Water website:

<http://www.sawater.com.au/SAWater/DevelopersBuilders/NetworkInfrastructureStandards/>

Section 9: Reinstatement of Trenches

Trenches constructed by SA Water as part of altering its infrastructure for roadworks will generally need to be reinstated. The standard and extent of reinstatement will depend on the circumstances at the time, including whether the alterations are being undertaken in advance of roadwork's or in conjunction with roadworks, and whether the existing pavement is being retained or reconstructed. There may be situations where it is agreed that the Commissioner of Highways undertakes the reinstatement works. Reinstatement of trenches shall be undertaken in accordance with DTEI's Standard Specification "Works by Other Organisations on Roads Maintained by the Commissioner of Highways", unless agreed otherwise with the Project Manager. The Standard Specification can be found on DTEI's Internet site at:

http://www.dtei.sa.gov.au/documents/contractsandtenders/works_on_roads_by_other_organisations;

or on DTEI's Intranet site at:

[http://cms.dtei.sa.gov.au/caps/standard_contract_documents.](http://cms.dtei.sa.gov.au/caps/standard_contract_documents)