

7.0 DRAINAGE CONSTRUCTION

7.1 BEDDING OF PIPES

Pipes shall be laid on a straight line and even grade and bedded in a minimum of 150mm of approved sand, approved aggregate where there is ground water present or as directed by Council's Engineer.

When laying and jointing of a pipeline has been completed, and before backfilling is commenced, the developer shall request the Council's Engineer to inspect the pipeline.

No backfill shall be placed until these checks have been made.

7.2 BACKFILLING OF PIPES

7.2.1 General

Pipes shall be backfilled with fine granular material, to the manufacturers specifications, or to at least 150mm above the pipeline, and in accordance with the Concrete Pipe Association of Australia Concrete Pipe Selection & Installation" manual.

Thereafter, backfilling of pipelines from excavated material may be placed to within 150mm of the pipes. This selected backfill shall be free of gravel, stones, or hard nodules. In the case of cast iron, ductile iron and concrete pipes, a proportion of gravel and small stones may be permitted.

If, in the opinion of the Council's Engineer, insufficient select backfill is available from the adjacent excavated material additional imported selected backfill shall be arranged by the Developer and approved by the Council's Engineer.

7.2.2 Compaction

Compaction shall be by mechanical, flooding or other approved means.

Surplus excavated material shall be removed and disposed of to areas approved by Council at full cost to the developer.

Where compaction is ordered and the trench has been externally dewatered, the dewatering equipment shall be kept operating until the compaction of the trench has been completed. Water discharge from external dewatering equipment may be used for compaction by flooding.

All backfill shall be compacted to the approval of the Council's Engineer, by manual or mechanical tampers in layers of not more than 150mm thick to 95% of standard maximum dry density AS.1289 for cohesive materials and 60% density index determined in accordance with AS.1289 for non-cohesive material for pipelines not under roadways. Compaction densities of at least 100% standard maximum dry density are required for areas under roadways, refer Clause 7.2.3.

Water for compaction by flooding shall be introduced onto each 300mm layer of material placed so as to permeate downwards in order to obtain the highest possible density which can be obtained by this method of compaction.

Backfilling and compaction shall be carried out without damaging the pipe or its external coating or wrapping or producing any movement of the pipe.

7.2.3 Backfilling Pipes Under Roadways

For all trenches that are to be subject to vehicular traffic, or as directed by Council's Engineer, all backfill material shall be fully compacted in layers not more than 150mm thick to 100% of standard maximum dry density AS.1289 for cohesive materials and 65% density index determined in accordance with AS.1289 for non-cohesive material to the subgrade level of the road or the finished surface level as directed.

Backfill to the road surface level shall be an approved road base material to a minimum depth of 300mm. Compaction of the backfill material shall be by mechanical means, unless the backfill material is non-cohesive, in which case compaction by flooding, including mechanical assistance, may be used.

Prior to backfilling and compaction of vehicular trafficable trenches, bulkheads consisting of polyethylene bags or similar of minimum thickness of 0.25mm filled with clay or other approved material and sealed in an approved manner shall be constructed across the full width of the excavated trench directly behind the kerb to contain the compacted material. The bulkheads shall be recessed into the sides of the trench excavation a minimum of 100mm and shall be extended from the top of the pipe surround material to the underside of the kerb.

7.2.4 Restoration

All disturbed areas are to be restored as specified in Clause 3.8.3.

7.2.5 Bulkheads

Bulkheads shall be provided on all piped drainage where longitudinal grades are above 10%. Bulkheads shall be constructed as follows:-

Maximum Spacing Length	10m 500mm	150mm either side of trench 150mm below the trench 100mm above top of pipe
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The provision of bulkheads shall be in accordance with AS3500.3.