

TRENCH FILL SPECIFICATION - SEWER

1.0 GENERAL REQUIREMENTS FOR BACKFILLING

- (a) Backfilling of the excavation shall include all things necessary for –
- (i) Backfill and compaction of fill in accordance with the requirements for the various types of backfilling; and
 - (ii) Restoration of surface course, as detailed on the Drawings and as described in this specification.
- b) To avoid damage to the works, care shall be taken whilst lowering and backfilling material to ensure that the backfilling material is placed and spread uniformly to the same level on each side of the pipe as the work progresses.

In backfilling, the space between shafts and the sides of the excavations, special care shall be taken to ensure that no displacement of any manhole takes place.

- c) The Contractor shall backfill the excavation with Class IV or V backfill when such excavations are in existing or proposed road reserves or car parks unless otherwise ordered or shown on the drawings.
- (d) Where excavation is carried out by open trench methods, backfilling of the excavations shall include all works necessary for replacement of top soil to the original thickness, including spreading and grading of the surface to conform to the original surface levels, or to such other levels as are shown on the drawings.
- (e) Where excavation is carried out by shaft and drive methods, Class IV or V backfill shall be used in drives unless otherwise approved by the Authority.

When backfilling the drives, care shall be taken to prevent the drives becoming airborne and a shaft may need to be sunk to release the air.

1.1 TYPES OF BACKFILLING

Whenever the following terms are used in the Contract Documents, they shall be understood to have the meaning set forth below:

- (i) **Ordinary Material** shall mean earth removed from the excavations but which shall contain not more than 20% rock fragments having dimensions in the range 40 millimetres to 150 millimetres and without any fragment being greater than 150 millimetres.
- (ii) **Selected Material** shall mean material free from stones and selected from the material removed from the excavations included in the Contract.
- (iii) **Crushed rock or Screenings** shall mean hard, sound rock of good quality free from chips, surface stone, honeycomb and dirt and containing not more than 30% of elongated and laminated particles.

- (iv) **Cement Slurry** shall mean slurry consisting of 1 part cement, 1 part lime and not more than 20 parts of sand or other approved granular materials (by volume) and a proper quantity of water. The slurry shall be thoroughly mixed by a method and to a consistency approved by the Authority.

- (v) **Class 1 Backfilling** shall mean ordinary material placed and compacted by the following method:

Pipes shall be laid true to line and grade, with joints closed firmly. Sand or selected loamy material shall be placed around the pipe and consolidated by hand ramming to a depth specified on Goulburn Valley Region Water Authority's standard drawing.

After the sewer has been laid and approved, the excavation shall be immediately refilled and compacted as detailed below. Pipe trenches may generally be filled with loam or other material to levels indicated on the plans.

Material shall be compacted in layers not exceeding 150mm loose measurement for the first two layers above the pipe. The top portion of the trench may be required to be topped up as a provision against settlement of fill.

The application of water to fill material to assist to provide optimum moisture content to obtaining satisfactory compaction is permitted. The application of water to "water in" backfill for trench compaction is not permitted, without prior approval from the Authority.

- (vi) **Class II Backfilling** shall mean selected material placed and compacted by the method specified for class I backfilling.

- (vii) **Class III Backfilling** shall mean either ordinary or selected material placed and compacted as follows:

The material shall be compacted in layers of 150mm compacted thickness, or as directed up to the required surface level using approved compaction equipment so as to completely fill all drive, shafts and trenches. The moisture content of the filling shall be such as to enable the minimum compaction requirement, as set out below, to be achieved:

ZONE OF FILLING	MAXIMUM THICKNESS OF COMPACTED LAYER	MINIMUM COMPACTION REQUIREMENTS*
Pipe to 1000m below finished surface level	150mm to 300mm	90% of standard compaction
1000mm to finished surface	150mm	95% of standard compaction
* Defined as the ratio of $\frac{\text{Field Dry Density}}{\text{Maximum Dry Density}}$ expressed as a percentage of Standard Compaction in accordance with AS 1141-1974		

- (viii) **Class IV Backfilling** shall mean cement slurry or screenings or crushed rock placed and compacted to the minimum requirements set out for Class III backfilling, unless stated otherwise on the Drawings.

1.2 COMPACTING TESTING

The contractor at their own expense shall bear the cost of compaction testing performed by a N.A.T.A. registered tester using an approved compaction test method carried out in accordance with A.S. 1289 i.e. Nuclear Densimeter. The compaction test shall be carried at not greater than 50 metres at a location and depth randomly selected by the tester.

1.3 BITUMINOUS SEALING

The Contractor, immediately after backfilling a trench or shaft in a constructed road, footpath or other pavement, shall provide and lay a temporary bituminous pre-mix surface over all such backfilled openings.

Before the completion of the maintenance period, the temporary bituminous sealing is to be replaced with the final surfacing at the contractor's expense.