

## TRENCH-FILL SPECIFICATION - WATER

### 1. TRENCH FILL ZONES

The trench-fill zones comprise the following:

- (a) Embedment Zone;
- (b) Backfill Zone;
- (c) Road Base and Surface Course Zones in trafficable areas, OR;
- (d) Topsoil/Footway Zone in non-trafficable areas.

#### 1.1 Embedment Zone

The embedment zone extends from the excavated floor of the trench to above the pipe.

The minimum depth of embedment material below the pipe shall be 100mm and the minimum depth of overlay material above the pipe shall vary depending upon pipe material and size in accordance with the following table.

Pipe Material	Overlay Material Depth	
	DN100-≤DN450	>DN450-≤DN900
DICL or MSCL	150mm	150mm
PVC or GRP or PE	200mm	300mm

#### 1.2 Backfill Zone

The backfill zone extends from the embedment zone to the underside of the topsoil/footway or road base zone.

The depth of the backfill zone will vary depending upon the cover required to be provided above the pipe.

#### 1.3 Road Base Zone

The road base zone in trafficable areas extends from the top of the backfill zone to the underside of the surface course zone.

The depth of the road base zone shall match the requirements of the road owner.

#### 1.4 Surface Course Zone

The surface course zone in trafficable areas extends above the road base zone to the finished surface.

The depth of the surface course zone shall match the requirements of the road owner.

#### 1.5 Topsoil/Footway Zone

The topsoil/footway zone in non-trafficable areas extends from the top of the backfill zone to the finished surface.

The minimum depth of the topsoil/footway zone shall be 150mm.

### 2. TRENCH FILL MATERIALS

The specification of the trench fill material will vary from zone to zone and whether the trench is in a trafficable or non-trafficable area.

## 2.1 Embedment Zone

The material to be used in the embedment zone shall be compacted sand or processed aggregate.

For DICL pipe material, only compacted sand is to be used in the embedment zone.

Compaction sand shall be compliant with WSAA Purchase Specification WSA PS-350 – Grade A.

Processed aggregate shall be compliant with WSAA Purchase Specification WSA PS-351 and have a maximum particle size not exceeding 10mm.

## 2.2 Backfill Zone

### 2.2.1 Trafficable areas

The material to be used in the backfill zone in trafficable areas shall be FCR Class 3 or as required by the road owner.

### 2.2.2 Non-trafficable areas

The material to be used in the backfill zone in non-trafficable areas shall be select material from the excavation free from any organic matter and containing no particles greater than 75mm in size.

Where insufficient material is available from the excavation, suitable backfill material shall be imported.

## 3. COMPACTION

The degree of compaction of the trench fill material will vary from zone to zone and whether the trench is in a trafficable or non-trafficable area.

### 3.1 Embedment Zone

The embedment material shall be placed and compacted in layers to uniformly support the pipe and achieve a uniform density throughout, whilst ensuring that the pipe is not damaged or distorted.

#### 3.1.1 Trafficable areas

The degree of compaction shall be a minimum 70% of the Density index (ID) of the material as determined in accordance with AS 1289.5.6.1.

#### 3.1.2 Non-trafficable areas

The degree of compaction shall be a minimum 60% of the Density index (ID) of the material as determined in accordance with AS 1289.5.6.1.

### 3.2 Backfill Zone

The backfill material shall be placed and compacted in layers to achieve the required density uniformly throughout the depth of each layer.

Mechanical compaction directly above the pipe shall not commence until at least 200mm of cover is provided when using hand-held equipment or 300mm when using self propelled equipment.

#### 3.2.1 Trafficable areas

The degree of compaction shall be a minimum 95% of the Dry density ratio (RD) of the material as determined in accordance with AS 1289.5.4.1 and AS 1289.5.1.1, or as nominated by the road owner.

### 3.2.2 Non-trafficable areas

The degree of compaction shall be a minimum 90% of the Dry density ratio (RD) of the material as determined in accordance with AS 1289.5.4.1 and AS 1289.5.1.1.

### 3.3 Road-Base Zone

The road-base material in trafficable areas shall be compacted to achieve the same degree of compaction as the undisturbed road-base material adjacent to the trench.

### 3.4 Topsoil/Footway Zone

The topsoil/surface material in non-trafficable areas shall be compacted to achieve an optimum growing regime for the selected plant material being re-sown.

## 4. COMPACTION TESTING

### 4.1 Embedment Zone

Only when specified, compaction tests of the embedment zone for water mains  $\leq$ DN375 shall be taken at the spring-line ( $\pm$ 50mm), in each 100 lineal metres of main or part thereof.

For water mains  $>$ DN375, compaction tests shall be taken at the spring-line ( $\pm$ 100mm) in each 50 lineal metres of main or part thereof.

### 4.2 Backfill Zone

#### 4.2.1 Trafficable zone

For trenches located in a trafficable zone, a compaction test shall be taken in each 300mm layer of fill and each 50 lineal metre of main or part thereof.

#### 4.2.2 Non-trafficable zone

For trenches located in a non-trafficable zone, compaction tests are not required to be completed.

### 4.3 Retesting

If one or more of the initial test results fail to comply, two additional tests shall be conducted in the length of that layer of trench fill represented by the initial test. If at least one of the repeat tests does not comply, the full length of that layer of trench fill shall be re-compacted and re-tested. This cycle shall be continued until the compaction test results comply.