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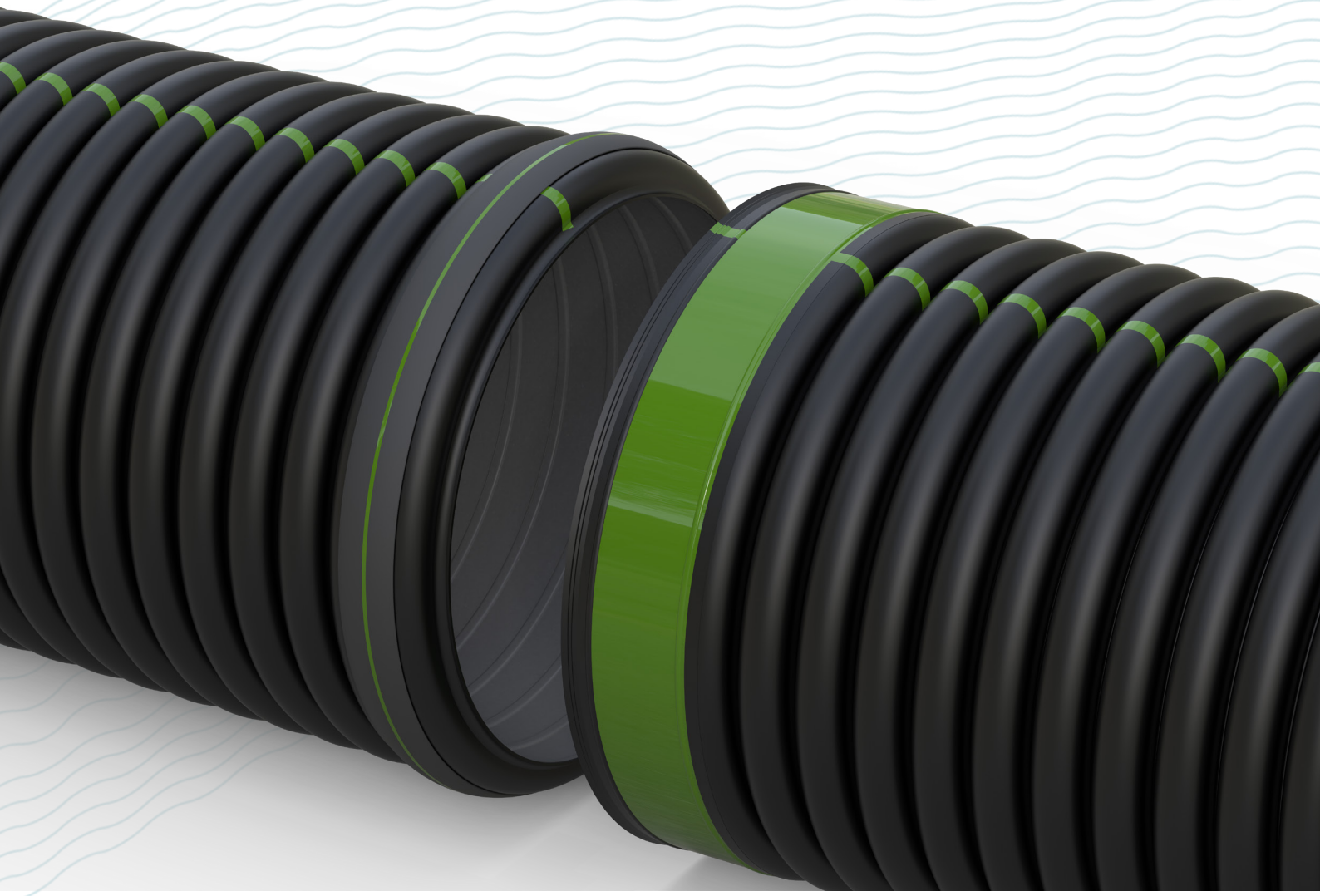
## Installation Guide

# Spel ADS Pipes®



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# INSTALLATION GUIDE
## N12 WT HDPE PIPE INSTALLATION

The recommendations presented here detail how to install a dependable piping system. Installation with proper backfill materials, compaction levels and placement procedure are essential to achieve long term system performance.

These recommendations assume that the designer used design criteria available from AS NZS 2566. 1. The designer should discuss installations involving conditions not covered by these documents (poor soils, high loads, or other factors that may affect the performance of the system) with an ADS representative.

### Backfill Selection

- Only native soil meeting class as described in Table 1, are acceptable backfill materials.
- Gravel - single size and Gravel – graded (GW) can be dumped around pipe. Lightly tamp or knifed to ensure voids are eliminated.
- Non-cohesive sand, sand/gravel mixes and other materials must be compacted to remove voids.
- Minimum compaction figures shown in Table 1 are for field installation and should not be used for roadways

**Table 1 – Embedment Soil**

| DESCRIPTION | AS 1726 | Min. Compaction Required (Relative density %) | Maximum Compaction Layer height (m) |
|---|---|---|---|
| Gravel – single size | - | Dumped | 0.50 |
| Gravel - graded | GW | Dumped | 0.50 |
| Sand and coarse grained soil with less than 12% fines | GP, SW, SP and GM-GL, GC-SC etc. | 85 | 0.15 |
| Coarse grained soil with more than 12% fines | GM, GC, SC, SM, and GM-SC, GC-SC | 90 | 0.15 |
| Fine grained soil (LL<50%) with medium to no plasticity and containing more than 25% coarse grained particles | CL, ML, mixtures ML-CL and ML-MH | 90 | 0.10 |
| Fine grained soil (LL<50%) with medium to no plasticity and containing less than 25% coarse grained particles. | CI, CL, ML, mixtures ML-CL, CL-CH and ML-MH | 95 | 0.10 |

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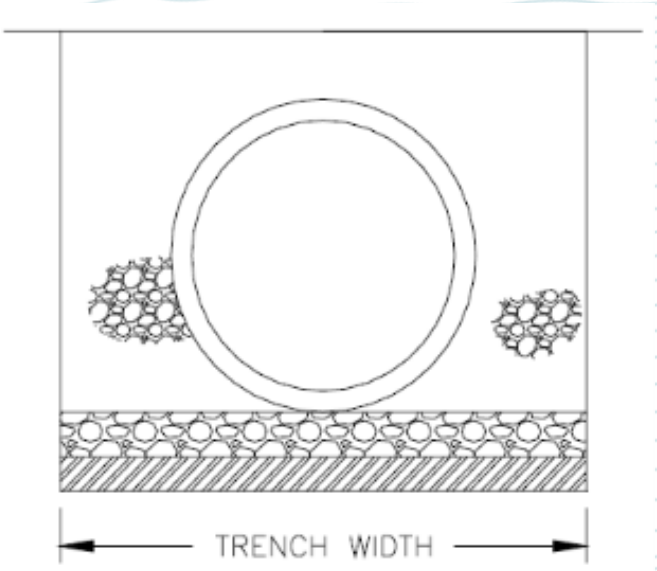
### Trench Construction

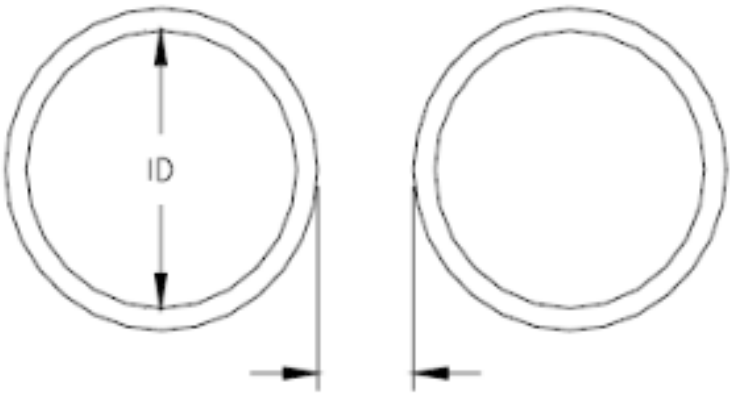
Trench should be just wide enough to place and compact backfill around the entire pipe. Increasing the trench width increases the soil load on the pipe. Where trench walls are stable or supported, provide a width sufficient, but no greater than necessary, to ensure working room to properly and safely place and compact embedment materials. The space between the pipe and trench wall must be enough for the compaction equipment used in the pipe zone.

**Table 2 – Recommended Minimum Trench Widths**

| Pipe Diameter (mm) | Trench Width (mm) |
|---|---|
| 300 | 700 |
| 375 | 800 |
| 450 | 1050 |
| 600 | 1200 |
| 750 | 1350 |
| 900 | 1600 |
| 1050 | 1750 |
| 1200 | 1900 |
| 1500 | 2200 |




For parallel pipe installations of diameters 450 mm and smaller, allow 200 mm between the pipes. For diameters 600 mm to 900 mm allow 300mm between. For diameters above 900mm allow 350mm between pipes.



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- As with any pipe, groundwater or seasonal high water tables may impede installation. De-watering is necessary for a safe, and effective installation.

- Trench bottoms containing bedrock, soft muck or refuse, or other material unable to provide long-term pipe support are unacceptable. Unsatisfactory backfill shall be removed as specified by the design engineer.

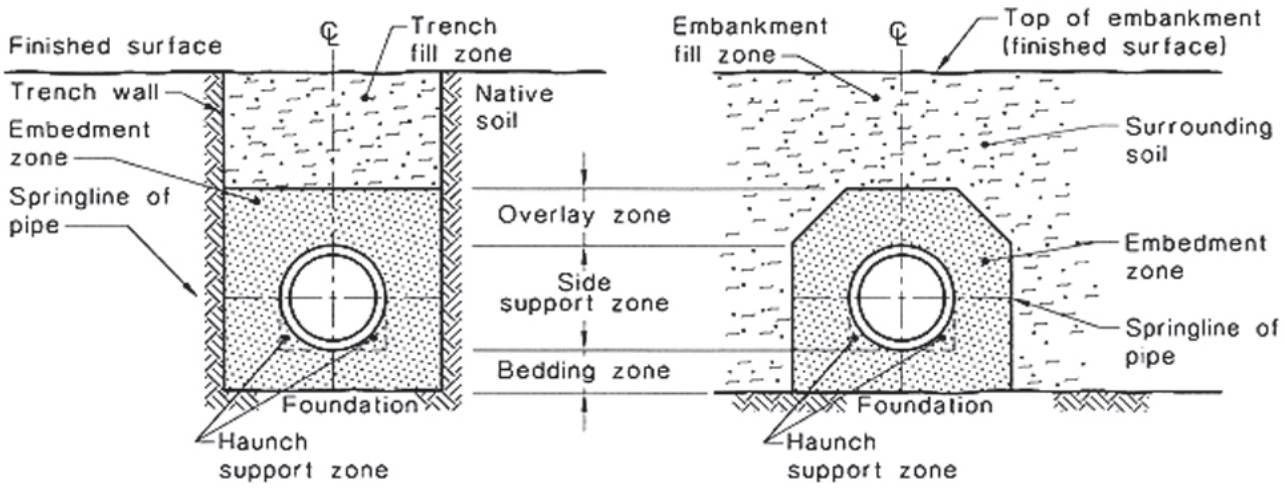
- Unless otherwise specified or instructed by a soils specialist, rock or unyielding material shall be removed to 300mm below grade and 150mm on either side of pipe and replaced with a suitable material as directed by the design engineer.

- Unless otherwise specified or instructed by a soils specialist, soft areas shall be excavated approximately 600mm below grade and three times pipe width and replaced with a suitable material as directed by the design engineer.

- For a flat bottom trench, bedding must be used for support as in Figure 1. Bedding shall be loosely placed directly under the pipe while the remainder shall be compacted in accordance with Table 1. Shaped trench bottoms may be used, and only for pipe diameters 600mm and less, see Figure 3.

- If soft area remains after excavation or if native soil can migrate into backfill, use an approved synthetic fabric (geotextile) to separate native soil from backfill as recommended by the design engineer.

**Figure 1 – Typical Backfill Structure**



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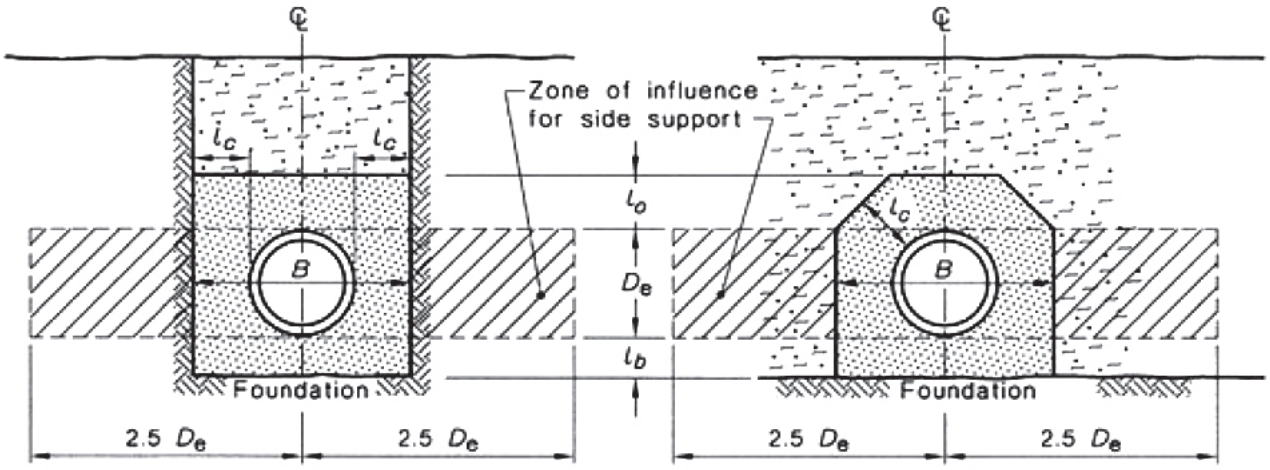
## Figure 2 – Embedment Geometry




## Table 3 – Recommended Minimum Embedment Zone Dimensions

| PIPE DIA (mm) | MIN. "lb" (mm) | MIN. "lc" (mm) | MIN. "lo" (mm) |
|---|---|---|---|
| 300 | 100 | 200 | 150 |
| 375 | 100 | 200 | 150 |
| 450 | 100 | 200 | 150 |
| 600 | 150 | 300 | 150 |
| 750 | 150 | 300 | 150 |
| 900 | 150 | 300 | 200 |
| 1050 | 150 | 350 | 200 |
| 1200 | 350 | 350 | 200 |
| 1500 | 350 | 350 | 200 |

## Backfill Envelope Construction

- Place and compact backfill in layers to the meet the requirements of Table 1.
- Pipes laid in parallel installations require the same backfill support.
- Place and compact initial backfill in layers around pipe and at least 150mm above the top of pipe as shown in Figure 1.
- Avoid impacting pipe with compaction equipment. Inspect if there is a question regarding damage.
- The final minimum cover (H) shall be as per Table 4, measured from the top of the pipe to final grade.
- If sufficient cover is not provided, mound and compact material over pipe to provide minimum cover needed for load during construction.

Note: Construction traffic is heavier than typical roadway vehicles and may require a greater amount of minimum cover.

### Table 4 – Minimum Recommended Cover

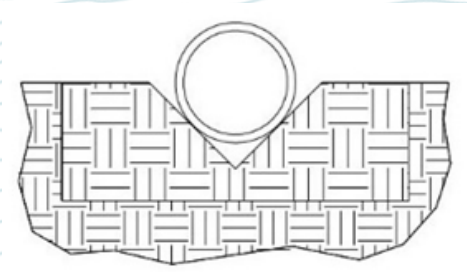
| LOADING CONDITION | MINIMUM COVER H*(m) |
|---|---|
| NOT SUBJECT TO VEHICLE LOADING | 0.30 |
| LAND ZONED FOR AGRICULTURAL USE | 0.50 |
| UNDER UNSEALED PRIVATE ROADWAYS | 0.50 |
| UNDER COUNCIL ROADWAYS | 0.60 |
| UNDER STATE ROAD AUTHORITY ROADWAYS | 0.60 |

*Subject to variation by the regulatory authority
*In areas with high water table additional cover may be required to prevent flotation

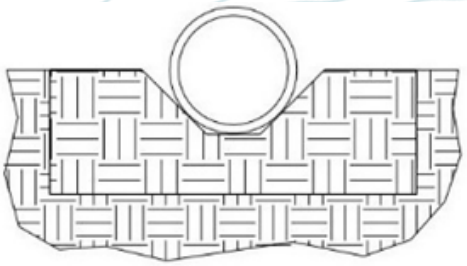
## Alternate Backfill Methods – Shaped Trench Bottoms

Shaped trench bottoms may be used in lieu of the standard trench detail shown in Figure 1, provided a free flowing pea gravel or small rock chips are used to fill in the resultant void areas. Pea gravel or small chips shall be clean material passing a 9.5mm sieve. This applies only to those insitu soil conditions where the native soil can be cut to a stable shaped trench. Line and grade may be affected due to the use of a modified trench bottom which may affect the pipe hydraulics.

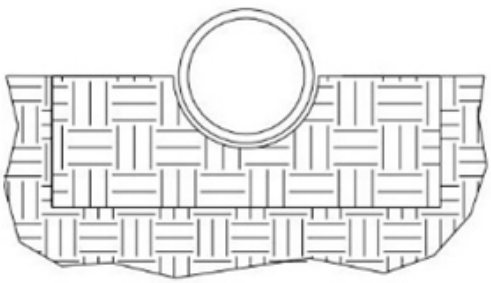
**Figure 3 – Shaped Trench Bottoms**



3a – "V" Groove Bottom



3b – Trapezoidal Bottom



3c – Circular Bottom

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