

Tunnelwell® Arch System Installation Instructions (DIY Market)

1. General Notes

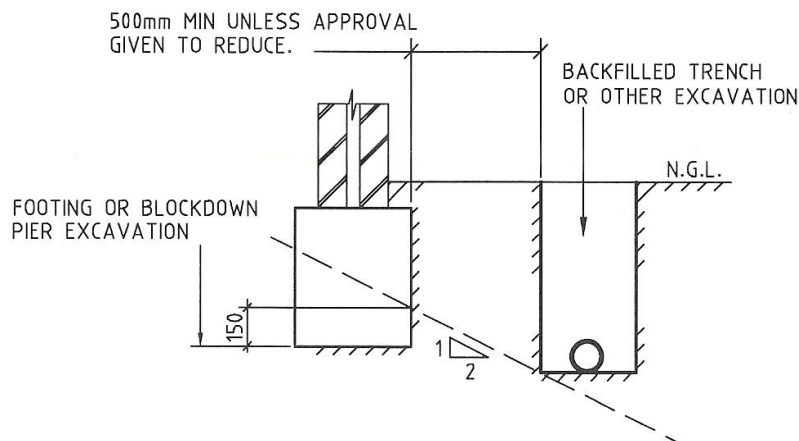
1.1 General

- 1.1.1 If in doubt ask – call 1300 4 TUNNEL.
- 1.1.2 During construction and transport to site, the structures shall be maintained in a stable condition with no part becoming overstressed or permanently deformed.
- 1.1.3 After installation, the arches shall not be subjected to "construction loads".
- 1.1.4 The structural components detailed in these instructions have been designed for the following loads:

In non-trafficable areas: Zero surcharge

1.2 Subgrade

- 1.2.1 Excavate the area where the arches are going down to the correct invert level. Make sure the ground is firm enough so that the arch once backfilled will not sink any further in the hole. If in doubt, hand tamp soil with a 10kg tamper or compact lightly with a small compactor.
- 1.2.2 Arches should not be installed close to building footings. See drawing below for guidance:



The installer shall undertake investigatory localised excavations near existing footings to ascertain their depth prior to excavating adjacent to them. It is noted that excavating to a depth below that indicated above shall not be undertaken without the written approval from a structural engineer.

2. Installation and pegging arch(s) into place

Once the arch excavations have been prepared and meet the criteria set out in Section 1, then level the excavated compacted soil area as necessary and begin to lift in arch sections, starting at one end with the female lip at the end point if you have more than 1 arch to install.

Setting the arches:

Setting the width of each arch size is important! The arches may vary slightly in width from packing and transport to site. The 1m3 arch should be set at 1740mm wide (toe to toe) and pinned accordingly.

Installation of arches:

The next section of arch will then be placed over the male end lip at the other end. The male end of each arch has a foam sealing strip which inserts between the two ribs. It is



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recommended to install all foam strips once the entire arch section is finished and prior to fitting end caps. It is the installer's sole responsibility to ensure the arches seal properly. If for any reason the foam seal is missing, the installer must contact Tunnelwell immediately for a replacement piece of sealing foam before backfilling with the installation. Failure to comply with this note shall void any warranty claim.

Repeat this process until the required lengths of arch have been installed. The installation of the arch units shall be in a straight line or as directed by any relevant design drawings. After all the arch units have been placed, the recommended sequence of installation thereafter is as follows:

- Place first section as above at correct invert level but allow room for end cap to fit over the end. Allow 600mm clear space for backfill and compaction all around the arches for the entire length of arches being installed.
- It is recommended, but not essential, to not install end caps until the Tunnelwell Arch System (TWAS) is completed to allow an internal visual inspection of the arches being installed to ensure that all sections are connected correctly, and male and female lips are locking up correctly. This recommendation is entirely up to the installer who must assess the best way to optimise the installation and backfill methodology. Longer runs may not suit holding off the end cap installations.
- Where a rainwater/stormwater pipe enters the arch, it is recommended to place some blue stone aggregate immediately below that area. For a 100mm diameter pipe install it is recommended to spread the blue stone over a 600mm x 600mm area for top connections and the full width of the base if entering via the end cap section for a length of 1000mm. The blue stone can be 20-25mm sieve grade and allow for 100mm thickness. This blue stone aggregate is available from Bunnings, any good hardware store or quarry supplier.
- As each arch section is installed, insert steel pegs to hold the arch in place as you proceed along the trench distance. These are best fitted using a hand hammer or pneumatic hammer once it has been placed firmly through the pre-set hole in the toe of each arch section. Then drive the pegs to refusal. Make sure each arch section is fitted properly to the last section prior to setting the steel pegs in place.

3. Backfilling and Compaction to the top of the arches

Appropriate backfilling and compaction are critical elements for the successful installation of the arches. Backfill with the same sand you removed. If the ground is not sand and is clay based, then backfill with clean imported fill. If ground water is present, call Tunnelwell on 1300-4-Tunnel (1300 488 663) for further advice.

The backfill material must be a free draining and granular backfill. The backfill should be completed in layers of approximately 300mm high and hand tamped at the end of each layer prior to continuing to the next layer and so on. Each layer of backfill must be installed evenly on each side of the arches prior to going to the next compacted backfill layer. Repeat the backfill compaction process until the crest of the arches is reached.

Backfill should only be done along the sides of the arches until the top/crest of the arch is reached.

DO NOT backfill directly on the top of the arch sections prior to top being reached.

DO NOT install backfill using a front-end loader or backhoe bucket directly over the top of the arches.

4. Connecting pipework to the arches

At this stage make downpipe or stormwater connections to end caps or top of arches. The pipes can be sealed with a suitable butyl mastic sealant which does not harden. Be generous

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with mastic seal around pipes to prevent sand entering the arches when backfill is taking place.

NOTE: Before fitting end caps, place the blue stone rocks inside the arch chamber where downpipe or stormwater connections are made at end cap locations. Where a pipe may be connected to the top entry points of the arches if required, the blue stone rocks at the end caps are not required.

After end cap connections are completed continue to backfill to the top of the arches.

Note: Connections to end caps; inlet pipes must be long enough to discharge over the blue stone rocks.

Note: Connection of UPVC pipes to the arches: The glue made that will stick UPVC pipe to polyethylene material which the arches are made from is very expensive. The installer may elect to use a suitable butyl/silicone mastic sealant applied to completely seal the openings and not allow any backfill sand or debris to enter the arches immediately and over the life term of the installation.

5. Final Backfilling and Compaction above the top of the arches

Once the backfill on either side of the arches has reached the top of the arches and associated pipework has been installed and connected, install backfill as previously specified over the entire width of the arches back to finished ground levels. You should have at least 200mm of sand cover if no top pipe connection is used to allow lawns to grow successfully.
