

2100 Litre Below Ground Tank Installation Guide

Customer Responsible For Groundworks

This document sets out the specific requirements you must follow to ensure:

- **THE INSTALLATION IS COMPLETED CORRECTLY FOR YOU,
FIRST TIME AND ON SCHEDULE**
- **THE SAFETY OF EVERYONE COMPLETING THE WORK**

• Suitable tank location agreed.	Calor & Customer
• Installation schedule date confirmed.	Calor
• Excavation & pipework trench completed correctly, (excavation suitably supported, battered or stepped). Ref: 2.3 & 3.1	Customer
• Excavator & spoil positioned correct distance from excavation and spoil fully covered to keep it dry. Ref: 2.4	Customer
• Tank delivered into the excavation and secured.	Calor
• Engineer completes the underground service pipework installation from the property back to the edge of the excavation. Ref: 3.4	Calor
• Excavation part backfilled and fully compacted in layers throughout. Ref: 2.6	Customer
• Engineer connects the underground pipework to the tank.	Calor
• Tank installation and pipework tested.	Calor
• Excavation backfill fully completed and levelled. Ref: 2.6	Customer
• First delivery of gas arranged	Calor

The following guide provides the necessary information to enable your 2100 Litre Below Ground Tank Installation to be completed correctly, first time and on schedule and will ensure the safety of everyone completing the work.

1. Step by Step Installation Guide

1.1. Installation Sales Agreement (ISA)

A Calor sales representative will agree with you a suitable location for the below ground tank and the route of the pipework connecting the tank to your property.

The tank position, including the minimum separation distances, and the route of the pipework are shown on the ISA.

- If you have chosen to complete the ground works yourself, or using your own ground workers, then these will need to be completed in accordance with the excavation requirements detailed in Section 2.
- The Groundworks Legal document (copy enclosed with this guide) will need to be signed and returned before Calor can complete the tank installation.
- To enable the installation to be completed in 1 day the excavation will need to be part backfilled and compacted whilst the engineer is on site. See Section 2.6 for further guidance.

Note: If the part backfill can not be completed on the same day then an additional engineer visit will need to be scheduled. The engineer will wait for up to two hours whilst the part backfill is completed.

1.2. Scheduling

- On receipt of the ISA, a Calor Customer Engineering co-ordinator will contact you to confirm the scheduled week commencing date for the below ground tank installation.
- The actual installation date will be confirmed with you 2 - 3 weeks prior to the installation date. The Customer Engineering co-ordinator will also confirm that the excavation will be completed as per the requirements detailed in this guide and as per the Groundworks Legal document, and that the part backfill will be completed whilst the engineer is on site.
- The Customer Engineering co-ordinator will then confirm 2 - 3 days before the scheduled delivery date, that the excavation and pipework trench will be prepared ready for the tank delivery and pipework installation, and that the part backfill will be completed on the day to enable the installation to be completed.

1.3. Preparation

- The tank excavation should be prepared at least one day prior to the delivery of the tank in the location specified on the ISA, ensuring the minimum separation distances are maintained.
- The tank excavation shall be supported on all sides, or be suitably battered or stepped as per the guidance given in Section 2.3 and the Groundworks Legal document.

Note: Failure to complete the excavation in the correct location or to suitably support the excavation sides will result in an aborted visit and could incur additional charges.

- You will need to prepare the trench for the gas pipe, before the tank can be connected. It should, where possible, be in a straight line between the gas tank (normally from the centre of the long side of the excavation) to the agreed gas supply entry point as shown on the ISA. The trench requirements are detailed in Section 3.

1.4. Tank Delivery & Installation

- On the day of the tank delivery ensure that the excavation is not flooded, the excavation requirements are correct and that there is suitable access for the crane vehicle.
- The engineer and crane operator will confirm the excavation meets the required specification and that the tank separation distances are correct.

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- The tank and the pre-cast concrete bases will be lowered into position and the tank secured to the concrete bases. The tank cathodic protection anodes will then be positioned by the engineer.
- Once the tank is in position the excavation will need to be part backfilled so that the remaining excavation is between 900mm – 1100mm from the finished ground level, see Section 2.6 for further guidance. The backfill should be compacted in layers; each layer should be no more than 300mm - 400mm deep.
- Whilst the excavation is being part backfilled the engineer will prepare for the connection to the tank and complete the installation of the pipework, terminating at the agreed point of entry at the property with an Emergency Control Valve (ECV).
- Once the part backfill has been completed the engineer will complete the final connection of the pipework to the tank and test to ensure the pipework and equipment is sound. On completion of a successful tightness test the pipework will be purged up the ECV ready for connection by your own engineer.

Note: You will require a suitably qualified engineer to install the pipework beyond the ECV and connect on to your appliance(s). An engineer can be found on the Gas Safe website <https://www.gassaferegister.co.uk/>

- The excavation backfill can now be completed up to the finished ground level. At 200mm below the finished ground level the yellow tank warning mesh, supplied by Calor, shall be installed.
- On completion of the backfill the ground shall be levelled and the tank marker pegs installed flush to the ground level at the tank extremities.

(The yellow tank warning mesh and tank marker pegs can be found in the tank turret.)

1.5. Gas Delivery

- After completing the final backfill contact your local Calor Operation Centre (COC) to arrange for a first gas delivery. Contact details for your local COC can be found by following the link below:
<https://www.calor.co.uk/help-and-support/existing-customer>

Note: A gas delivery will not be made until the final backfill has been fully completed.

This section provides the excavation & backfill requirements for a 2100 Litre Below Ground Tank using Calor Pre-Cast anchor blocks to be installed flush with the finished ground level. The turret lid will be slightly above the finished level to enable the turret to be opened.

IMPORTANT: The Below Ground Tank shall not be located in areas with a high water table or areas likely to flood. For information on areas that are likely to flood see the Environment Agency website: <http://www.environment-agency.gov.uk/homeandleisure/floods/default.aspx>

2. Ground Work Requirements

- A competent civil contractor should be consulted before completing the ground works.
- Ground workers must be qualified to complete the ground works and follow the guidance given in HSG150 - Health and Safety in Construction.

2.1. Underground Services

- Before any excavation takes place, a site survey should be completed by a competent person to determine the presence of any underground services. HSG47 – Avoiding danger from underground services gives further information.
- The excavation must not have any other utilities or pipework within the excavation area where the below ground tank is to be installed.

2.2. Excavation Dimensions

The dimensions shown are the minimum required to locate and install the tank with all associated equipment. They should not be taken as the actual size of the excavation, which may vary with location, as well as ground conditions.

Item Description		Dimension (mm)
Diameter of tank	A	1200
Length of tank	B	2466
Minimum width of excavation (at bottom)	C	2700
Minimum length of excavation (at bottom)	D	3720
Depth of excavation	E	1800

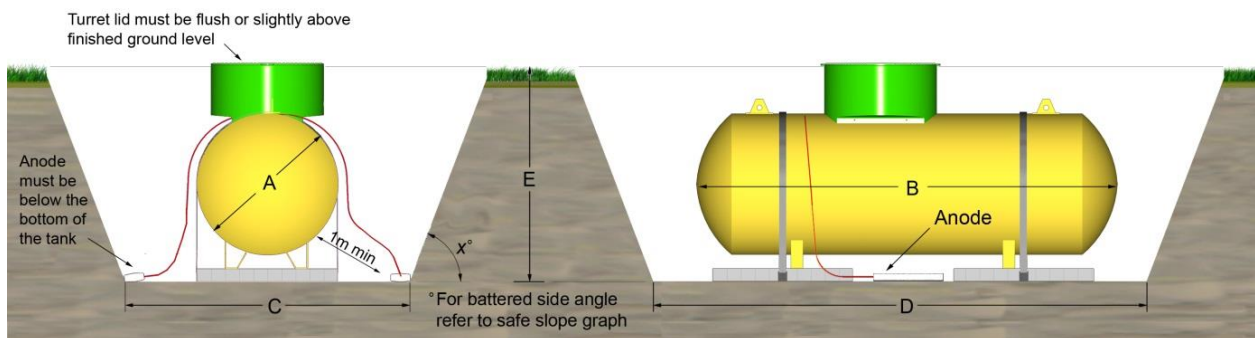


Figure 1: Excavation Dimensions

2.3. Ground Support

To prevent the excavation from collapsing, adequate support is required to ensure the safety of the engineers completing the installation. The excavation must have one of the following types of ground support systems:

- Support system i.e. trench box: 4 sided and secured
- battered (sloped) edge excavation
- stepped excavation

2.3.1. Support System

The support system shall be installed on all 4-sides of the excavation using sheeting or proprietary support systems, as shown below. The support system should be installed immediately as the excavation progresses and should not be removed until all the work has been completed and the excavation can be safely backfilled.



Figure 2: Excavation/Trench Support System

2.3.2. Battered (sloped) Excavation

A stepped excavation, battering back the sides of an excavation to a safe angle or a combination of these, is an acceptable means of preventing instability. The angle will depend upon the type of material encountered. In granular soils the angle of slope should be less than the natural angle of repose of the material being excavated. In wet ground a considerably flatter slope will be required. Typical angle of repose for various soils is shown in Figure 3.

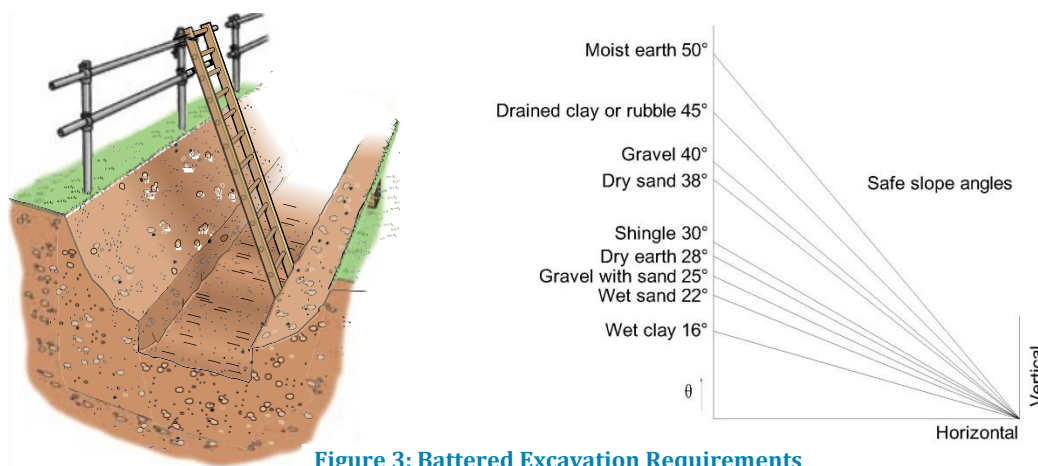


Figure 3: Battered Excavation Requirements

2.3.3. Stepped Excavation

A stepped excavation is where one or more steps are cut into the excavation side(s). The vertical depth of any stepped part of the excavation shall not exceed 1.2 metres.

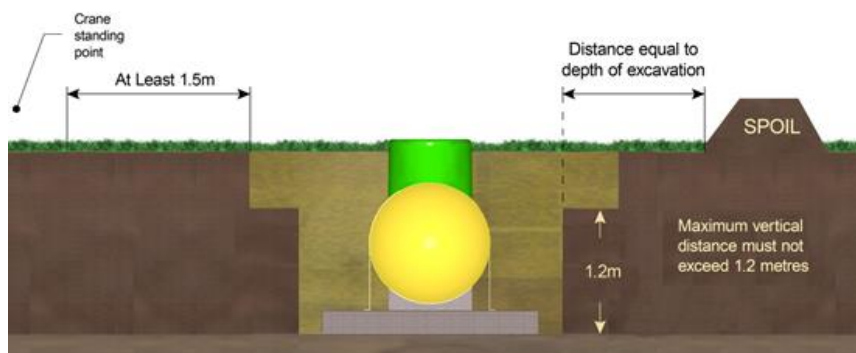


Figure 4: Stepped Excavation Requirements

2.4. Excavated materials

- Excavated materials must be placed away from the edge of excavation at a minimum distance equal to the depth of the excavation.
- Any backfill material that is to be reused must be kept dry. It is recommended that all materials that are intended to be reused as backfill material are fully wrapped on all sides by tarpaulins or similar protective sheeting.
- If any saturated ground is encountered this should be replaced with suitable dry material such as Type 1 MOT stone for the backfill process.

2.5. Flooding

- Ensure that the area chosen for the installation is free from groundwater and is not in a position liable to flooding from surface water.
- During the excavating process if any ground water is discovered at any depth, it is essential that consideration is given to either to: a) installing an above ground vessel, or b) altering the design of the below ground installation to semi mounded, where the tank turret will be above the ground level.
- If ground water is encountered you should contact Calor to ensure the correct specification for semi-mounding the tank is provided.

2.6. Backfill

- It is essential that during the backfill process all of the backfill material is suitably compacted to avoid ground sinking, to protect and prevent flooding the Equipment. It is essential that the backfill material is totally compacted throughout the excavation including underneath the Calor tank where voids are more likely to occur. The backfill should be compacted in layers; each layer should be no more than 300mm-400mm deep.
- It is recommended that a suitably sized vibro tamper (trench rammer) is used to compact the backfill material.
- Under no circumstances should the excavator bucket be used to compact backfill materials within the trench.
- In order to permit safe entry of the excavation for the engineers to complete the installation and connect the service pipework to the tank, the excavation must be partly backfilled once the tank is in position and has been strapped down.
- The excavation shall be backfilled to a point approximately halfway up the shell of the tank. The actual depth of the part backfill will vary slightly depending on the size of the tank but the remaining depth of the excavation shall be between 900mm and 1100mm as shown in [Figure 5](#).

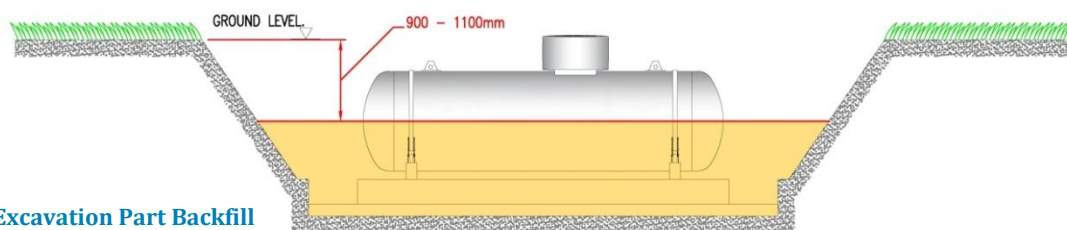


Figure 5: Excavation Part Backfill

- For semi-mounded installations, the point halfway up the tank may be at or above the surrounding ground level. In this case, the trench for the pipework should be brought up to the tank lid. A minimum depth of cover of 300mm must be achieved over the tank shell and 600mm over the pipework when the installation is finished.
- The finished ground level must at all times be maintained so that the turret lid of the Calor tank is not below the surrounding ground level.
- The yellow tank warning mesh should be installed at 200mm below the finished ground level, and the tank marker pegs installed flush to the ground level at the tank extremities.

The following section provides the trench requirements for the underground PE service pipework from the ECV at the property entry point to the tank installation.

In all circumstances Calor shall install the underground PE pipework to ensure it is installed correctly.

3. Installation of underground service pipework

3.1. Trench Preparation

- Trenches shall be excavated to the required depth and width. This will depend upon the routing and protection of the pipework.
- The trench shall be free from stones, rocks, bricks or other materials that may cause damage to the PE pipework.
- There should be no sharp bends.
- Trenches should normally be dug from the centre of the long side of the excavation and square up to the outside wall of the property.
- Consideration should be given to the tank delivery, where the open trench may impede access for the delivery vehicle; it should not be excavated until after the delivery.

3.2. Depth of Cover

- The trench must be excavated to give a minimum depth of cover of 600mm above the top of the pipework. If the pipework is to be laid in agricultural land or across public roadways contact Calor for further guidance.
- The PE pipework will normally be 32mm diameter unless otherwise specified by Calor.
- Where the base of the trench is in rock or ground of irregular consistency, the trench should be excavated to 75mm below the required depth and a layer of sand provided to protect the pipe.

3.3. Adjacent Services

- The gas pipework must be a minimum of 250mm from any other service or utility.

3.4. Footing Preparation

- If the property has a concrete raft a channel (minimum of 50mm) should be provided to allow the pipework to be fitted correctly and to the required depth. Alternatively, the brickwork can be blocked out to allow the emergency control valve to be fitted and the installation pipework routed from this point, see [Figure 6](#).

Note: It is recommended that a structural engineer should be consulted prior to cutting into or altering structural supports.

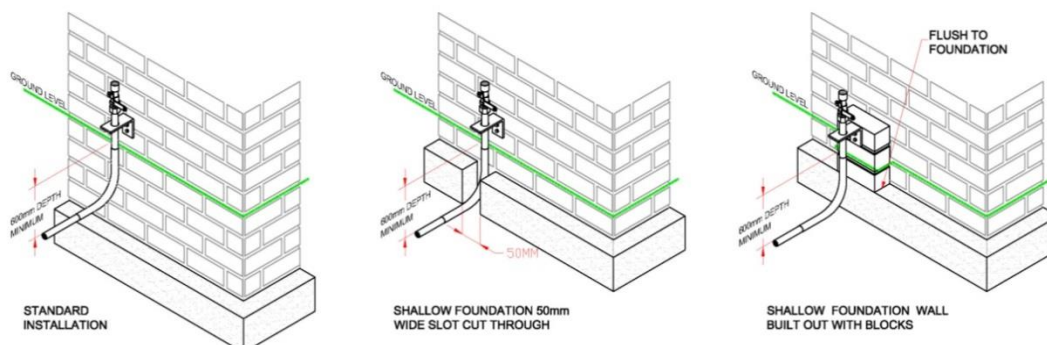


Figure 6: Footing Preparation

3.5. Trench backfilling

- The back fill at the sides of the pipe and immediately above it should be sand or similar soft material free from stones or sharp objects.
- The initial cover of backfill shall be placed in layers and carefully consolidated by hand to provide lateral support between the pipe and trench sides.