

Underground Water Tank Installation Instructions

Receiving Goods

- ◆ Deliveries to site will be organised in conjunction with Site Agents to ensure that arrangements have been made for safe delivery. Site Agents are advised to thoroughly check all goods received against delivery documentation as items later reported as missing or damaged can not be replaced and will need to be re-ordered.
- ◆ It should also be noted that the condition of the tank becomes the responsibility of the Site Agent once unloading from the delivery vehicle commences.

Health and Safety

The main phases of the installation of the underground tank are:

- ◆ Ground works to prepare the ground for the installation of the tank and installing the associated drainage and service duct runs.
- ◆ Unloading and manoeuvring the tank to the installation position.
- ◆ Installation of the tank and its connection to the drainage runs and service duct.



All health & safety precautions applying to such works are to be implemented, with risk assessments and method statements (RAMS) being prepared.



Preliminaries

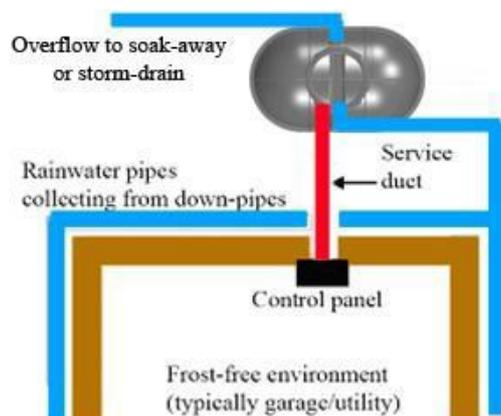
- ◆ The responsibility for ordering the right tank for the project and with the right connections to suit the drainage and service duct connections to suit the underground works lies with the buyer.
- ◆ The Site Agent is responsible for checking that the correct tank has been delivered to site with all concerned knowing all the implications of its installation; these include factors such as:
 - ⇒ Required capacity and any dimension constraints
 - ⇒ Site access and routes to site
 - ⇒ Filter and other fitments requirements
 - ⇒ Orientation of connections and any associated invert-level changes
 - ⇒ Ground conditions, such as soil type, water table, contamination etc.
 - ⇒ Depth of excavation, adjacent structures, their foundations and proximity to utilities
 - ⇒ Traffic bearing characteristics
 - ⇒ Topography (adjacent slopes and banks) and proximity to trees
 - ⇒ Delivery timetables
- ◆ Timing of delivery of the system will always be pre-agreed with the Site Agent and is usually timed to ensure that the tank can be unloaded, transferred to plot, installed and back-filled with the minimum of delay.
- ◆ Responsibility for the tank passes to the Site Agent once unloading commences. It is therefore important that the tank condition is inspected on arrival before they attempt to move or attach lifting equipment.

Handling the Tank

- ◆ This tank has been designed to be lifted and manoeuvred only when empty. They are therefore not to be lifted when containing water under any circumstances as this will add considerable weight.
- ◆ It is recommended that the tanks be unloaded from delivery vehicle, moved around site and lowered in to their installed position by attaching lifting straps/chains and appropriately sized D-shackles to the lifting points provided, or by use of lifting straps around the whole tank. Points to note are
 - ⇒ The centre of gravity of the tank needs to be established by trial and error before fully raising the tank.
 - ⇒ Chain lengths need to be adjusted so that the tank lifts horizontally.
 - ⇒ To stabilise the load when moving around site, guide ropes should be attached to enable operatives to control load-swing from a safe distance.

Installation Overview

- ◆ The tanks are designed to be installed in specific accordance with the instructions that follow; the civils design of a structural engineer is to be followed if any of the following tank installation conditions are present:
 - ⇒ Trafficking by vehicles other than ride on lawn mowers
 - ⇒ Closer than 4 metres to the foundations of another structure
 - ⇒ Closer than 4 metres to an adjacent significant change in ground level
 - ⇒ Outside the depth parameters identified in the two installation diagrams below
- ◆ Installation in heavy clay soil or in areas that will experience high water tables will also affect the installation as highlighted on the installation diagrams.
- ◆ If site personnel are faced with any of the conditions noted above they should seek supervisory advice before commencing tank installation.
- ◆ The tanks are designed to take pedestrian and light mower loading only, with the range of excavation depths shown in the installed diagrams below.
- ◆ The customer may substitute their own brick construction manhole and cover provided these are so constructed that they not transfer any weight on to the tank.
- ◆ Pipe falls must be a minimum of 1:100 in the direction of water flow, ie rainwater delivery pipe and service duct **towards** the tank and the overflow **away** from the tank.
- ◆ The installation of the rainwater storage tank and its connection to the water supply, water overflow and service duct pipes should be undertaken at the same time as the overall underground works for the project.
- ◆ The tank should be aligned to provide the straightest possible service duct run between the tank and the control unit as other pipe work and cabling etc need to be fed through this duct at a later stage. The image below shows this required relationship



- ◆ The tank must be handled strictly in accordance with these instructions and installed in accordance with the step by step guide below. Once installed the position of the tank is to be clearly marked and over-driving by vehicles within 4 metres of the tanks edge is strictly forbidden.
- ◆ All pipe work associated with a rainwater harvesting system must be kept totally clear of site debris, to which end they must have sealed ends when being pulled through.
- ◆ To prevent roof water from entering the tank prior to the system entering service, the in-tank filter is to be covered with polythene until the property is ready for occupancy. This cover is to be removed as part of the commissioning process.

Precautions

- ◆ To ensure the integrity of the tank is not prejudiced during installation and satisfactory subsequent operation of the complete system, the following precautions are to be strictly observed:
 - ⇒ Allow the tank to settle onto the pea-gravel base under its own weight initially and then the weight of the water introduced to it
 - ⇒ Care is to be taken to ensure that site debris/dust is not allowed to enter the tank during or after its installation

Under no circumstances:

- ⇒ Tamp-down the infill with machinery
- ⇒ Tamp-down finished ground level with machinery
- ⇒ Drive vehicles over tanks installed as above

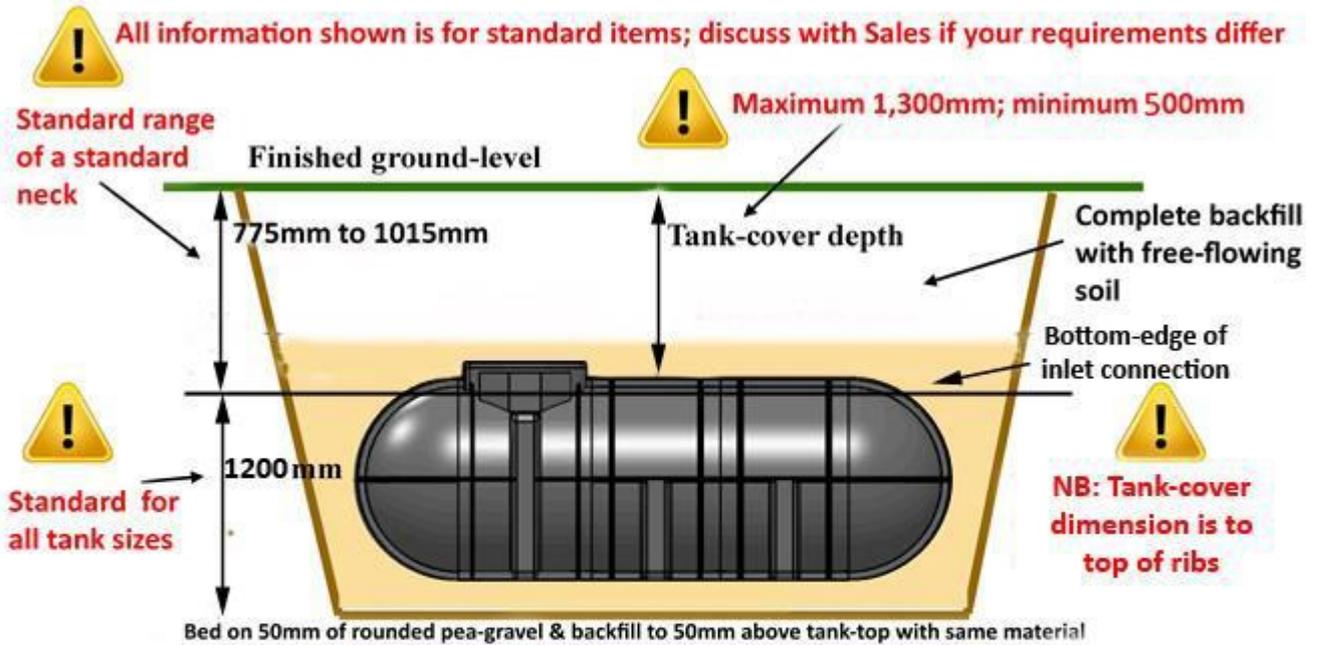
Step-by-Step Guide

The following is a step-by-step guide to the installation of the tank.

- ◆ Arrangements should be made for the tank to be delivered coincident with the day it is due to be installed. With this in mind, when delivery is expected ensure:
 - ⇒ Suitable access and parking arrangements have been made for the delivery vehicle
 - ⇒ Plant is available to unload the tank
 - ⇒ A clear route has been designated between the delivery vehicle and the installation site
 - ⇒ The installation site is level and clear of obstacles and site debris and ideally
 - ◇ The water ingress pipe work is complete and ready for connection
 - ◇ The water overflow pipe work is complete ready for connection and is itself connected to the surface water management system (soak-away, storm drain or attenuation as appropriate)
 - ◇ The service duct is ready for connection complete with:
 - ⇒ Internal daw-cord provided, this should be left in place on completion
 - ⇒ 32mm high performance polyethylene (HPP) delivery pipe fed through, section by section as the service duct is installed
- ◆ Before starting the installation, confirm no added precautions apply; ie, the instructions of a structural engineer must be followed, if any of the following apply:
 - ⇒ Vehicular over trafficking required
 - ⇒ Closer than 4 metres to adjacent foundations, earth bank or raised patio
 - ⇒ Depth of installation or constraints arising from clay soil or high water table not in accordance with the installation diagrams below
- ◆ Complete and sign-off risk assessment

- ◆ Complete and sign-off the method statement
- ◆ Calculate the depth of dig with reference to the diagrams below
- ◆ Confirming minimum and maximum tank cover depth will not be exceeded

NB: All measurements (apart from the tank-cover dimension) are taken from the bottom edge of the rainwater inlet invert level as determined by the drainage plan



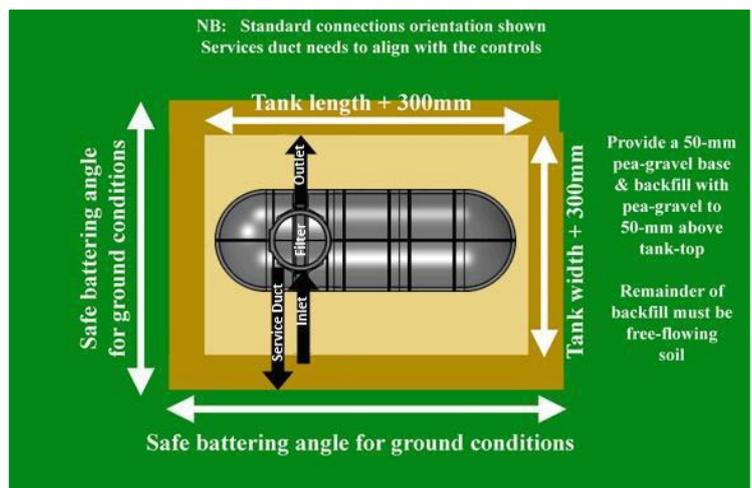
Note: Remember the service duct needs to align with the controls inside the building as the supply-pipe has limited flexibility



Note: There is an invert drop of 66mm across the PF filter

NB: Before commencing the dig, ensure invert-level + 300mm is not less than 500mm or more than 1300mm if the tank is to be unprotected

- ◆ Line-mark dig area allowing for:
 - ⇒ Alignment of tank water entry and exit connections and the service duct connection (NB: the service duct must slope towards the tank on direct pressure systems to gravity-feed the mains water top up)
 - ⇒ (Tank plan-view dimensions) + (300mm for tank manoeuvre/access) + (suitable allowance for battering depending on ground conditions)



- ◆ Dig the excavation anticipating that ground water ingress may be experienced in the process. If necessary, keep water interference to a minimum by use of a pump. If the ground needs to be stabilised to provide a firm base for the tank, the excavation depth should be increased by 250mm and replace with a mixture of hard-core and sand.
- ◆ Bed the bottom of the excavation with 50mm of 10mm washed pea gravel.
- ◆ Position tank on the pea gravel base and check vertical and horizontal alignments between the tank connectors and the drainage runs/service duct, allowing for 10mm of tank settlement at the next step.
- ◆ Fill 1/3rd full of water to settle tank in to the pea gravel and bring connectors and pipe work in to final alignment.
- ◆ Connect all pipe work (i.e. rainwater in, overflow out and service duct).
- ◆ Install neck and seal the joints with a good bead of silicon sealant in order to avoid later ingress of ground water, then fit the lid to ensure that no backfill material can enter the tank.
- ◆ Backfill around and under the tank body and sides of the excavation with more 10mm washed pea gravel up to the level of the water inside the tank.
- ◆ Continue backfilling around and under the tank with pea gravel until the crown of the tank is covered with 50mm of pea gravel.
- ◆ Continue filling the tank water keeping pace with the backfill level up to the level of its inlet/outlet connections.
- ◆ Complete backfill to finished ground level with free flowing material.
- ◆ Once the installation is complete and the tank is connected:
 - ⇒ Install filter (if not already installed)
 - ⇒ Seal filter with strong polythene (to prevent roof water entering the tank until the whole system is ready to be used)
 - ⇒ Secure the tank lid
 - ⇒ Mark out an exclusion zone 4 metres outside the original excavation footprint to prevent site vehicles accidentally driving over the tank during construction work