

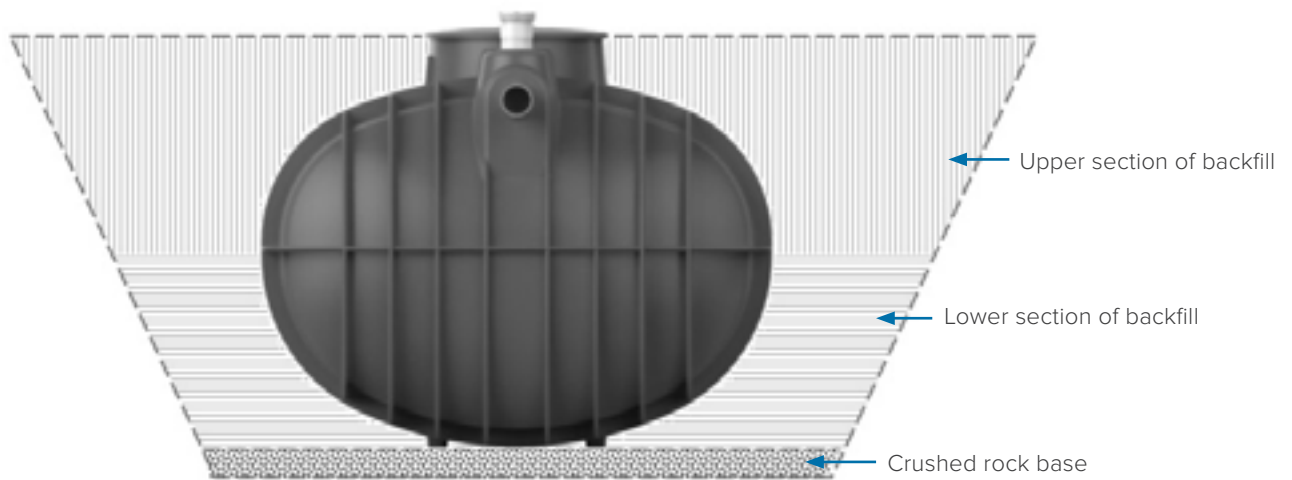
A large, dark blue, ribbed underground tank is being installed in a trench. The tank has a grid-like structure on top and several pipes protruding from its top and side. The trench is dug into reddish-brown soil, and the surrounding area is covered with dry grass and some green vegetation. The tank is positioned horizontally, and its top surface is visible, showing a circular access point with a white cap. The overall scene depicts the installation of a water management system in a rural or agricultural setting.

# **INSTALLATION GUIDE FOR UNDERGROUND TANKS**

# STEP 1

## EXCAVATION FOR UNDERGROUND TANK

- Be aware of the safe working practices for working at depth.
- Follow all protocols for site safety and for determining position of excavation.
- Excavate hole according to dimensions of underground tank and in accordance with engineer's report.
- Remove all loose soil from base of hole and ensure base is firm, flat and level.
- Add approximately 100mm 6-7mm crushed rock, and screed to create a firm level pad.
- If surrounding water table level is *below* the base of the hole, it is *recommended* to install an 'ag drain', i.e. sub-ground drainage channel, trench, pipework or similar, to drain water away from the underground tank area.
- If surrounding water table level is constantly above the base of the hole, it is necessary to make any possible provisions for sub-ground drainage, to prevent (where possible) water from collecting around the underground tank. This may include, though not be limited to, installation of an 'ag drain', i.e. sub-ground drainage channel, trench, pipework or similar, to drain water away from the underground tank area.



# STEP 2

## POSITION UNDERGROUND TANK IN HOLE

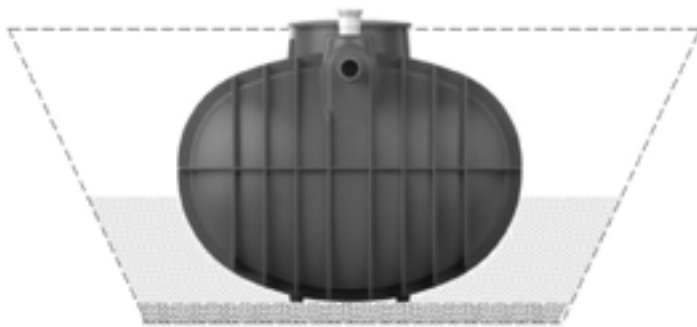
- Use only the moulded lifting points in the top of the underground tank, for attachment of lifting slings or other lifting attachments. If no moulded lifting points are available (e.g. on sizes 500lt – 1250lt tanks), use slings placed right around the body of the tank.
- NEVER use the inlet or outlet pipes to attach slings or other lifting attachments.
- ALWAYS use properly rated lifting attachments to lift underground tanks.
- ALWAYS ensure any fluid has been evacuated from tank prior to attempting to lift tank.
- NEVER attempt to lift the tank if there is more than 10 litres of fluid remaining in the tank.
- Using the moulded lifting holes as slinging points, lift underground tank by use of a backhoe, excavator, crane or similar. Place the tank in the hole.
- Level underground tank in both directions. Ensure the tank does not sink into loose soil of hole, chock if necessary to maintain position.
- For septic tanks, invert of the outlet pipe should be minimum 50mm lower than the invert of the inlet pipe.
- For underground tanks for uses other than septic tanks, fit-up requirements may vary according to application.
- Install any risers, pipe extensions, etc. required to bring access lids and inspection opening lids up to ground level or pavement level. Separate guides are available regarding procedures and recommendations for installation of tank lid risers.
- Connect inlet, outlet and overflow pipes, as required according to your specific application.

## STEP 3

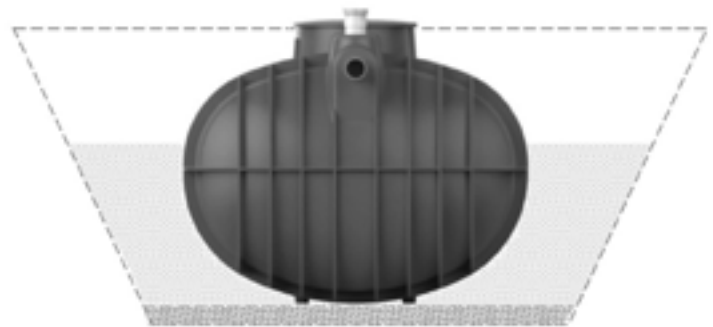
### PLACE WATER INTO TANK

After underground tank has been set into position, prior to backfilling around the tank, it is necessary to fill (or at least part-fill) the tank with water, to prevent the tank moving while backfill material is placed around the underground tank.

- When surrounding water table level is below base of hole, before backfilling place a minimum of 1000 litres of water into tank. If sufficient water is available to completely fill the tank, that is even better.
- When surrounding water table level is constantly above the base of the hole, but below midline horizontal rib of underground tank, before backfilling place a minimum of 2000 litres of water into tank. If sufficient water is available to completely fill the tank, that is even better.
- When surrounding water table level is above midline horizontal rib of underground tank, before placing concrete ballast around tank, or backfilling, completely fill the tank with water. Tank must remain full of water until backfilling is complete.



Ground water level below midline



Ground water above midline

## STEP 4

### PLACE CONCRETE BALLAST AROUND TANK IF REQUIRED.

**(PLEASE NOTE, THIS REQUIREMENT WILL NOT APPLY TO EVERY INSTALLATION)**

In certain situations, it may be necessary, or be recommended, to 'anchor' an underground tank with a concrete ballast. This will help to ensure that tank does not 'pop' out of the ground if the tank is pumped out while surrounding water table level is high. In situations where surrounding water table level is constantly above the base of the underground tank, the following notes apply:

- When surrounding water table level is usually above the base of the hole, but below midline horizontal rib of underground tank, and when sub-ground drainage to drain away groundwater is not practical or effective, it is **recommended** that the tank be anchored with a concrete ballast.
- When surrounding water table level is usually **above** midline horizontal rib of underground tank, it is necessary that the tank be anchored with concrete ballast.

#### Specifications for anchoring an underground tank with concrete ballast:

- Concrete must be minimum strength of 25MPa, with 10mm aggregate to ensure no voids occur within the ribbed sections
- It is **recommended** that concrete be reinforced with F72 trench mesh around all sides.
- Concrete is to be poured around the base of the tank, covering to minimum of 50mm and maximum of 200mm above the midline horizontal rib.
- The minimum volume of concrete required as ballast is 2.5 cubic metres for an underground tank of capacity between 3000lt - 3700lt, and 4.0 cubic metres for an underground tank with capacity between 4000lt – 5000lt.
- Concrete must be allowed to set before further backfilling around tank is completed.

## STEP 5

### BACKFILLING AROUND TANK

- All underground tanks must be backfilled once installed.
- If ground water or high water table level is present, de-watering of excavated hole must be maintained until backfilling is complete.
- If concrete ballast has been poured around tank as per step 4, backfilling must be completed within a few days of concrete being placed, but after concrete has set.
- If concrete ballast has been poured around tank as per step 4, the concrete ballast forms the backfill material around the lower section of the tank.
- For applications or situations *not* requiring concrete ballast, backfill the lower section of the underground tank using cohesionless materials such as crusher dust, crushed rock (ideally 6-7mm size), or similar free-draining materials, up to 50-200mm above the horizontal midline rib of the underground tank.
- The backfill material should be placed and compacted into place around the tank, in layers not exceeding 200mm per layer.
- Once the backfill material has been placed around the lower section of the underground tank as per above, the backfilling can continue around the upper section of the underground tank using further layers of materials such as crusher dust, crushed rock, appropriately screened topsoils, sand, etc. as a backfill material.

## IMPORTANT!

### HEALTH AND SAFETY CONSIDERATIONS

Much effort and thought has gone into the design of Orion Australia's underground tank products, and every precaution has been taken to ensure the customer's health and safety. The following points must be carefully observed:

- Use a qualified plumber/installer to install tank
- When lifting tank into place use the appropriate lifting lugs and lower evenly into the hole. Do not manhandle the tank into place or try lifting manually as injury could occur.
- All Worksafe regulations and safe work practices should be adhered to when installing Orion Australia underground tanks.
- Once installed, never leave access lids unsecured or off the tank. This is a serious hazard particularly to young children and animals, and could result in serious injury or death by drowning.

