

# Conder Super Reinforced HDPE Septic Tank: Granular Surround

## Premier Tech Aqua Installation Guidelines

Ref: UTG9507

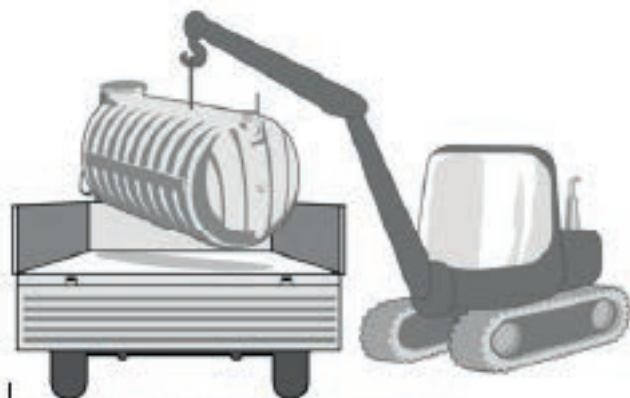
Revision No. C

### General

1. These guidance notes refer only to the installation of Premier Tech Aqua underground HDPE Super Reinforced Septic Tanks suitable for granular surround.
2. Super Reinforced Septic Tanks with granular backfill are to be installed in dry ground only.
3. These guidance notes do not provide specific, site-related installation instructions.
4. If in any doubt about any aspect of the installation please contact Premier Tech Aqua at 08702 640004.
5. Generally the depth from finished ground level to the invert level of the inlet pipe will not exceed 1meter.

### Transportation, unloading and storage of tanks

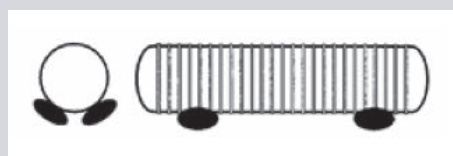
1. Tanks must be held down during transportation using nylon straps, do not use chains, cables or wire ropes to hold tanks.
2. Do not over tighten straps, causing deformation of the tank shell.
3. Ensure tanks are empty before attempting to lift or move.
4. Tanks are best lifted using the moulded lifting eye and webbing lifting strap(s) as shown in the following image; do not use chains, cables or wire ropes in contact with the tank.



From 3 to 5m<sup>3</sup>, it needs 1 single nylon strap (1 handling ring)  
From 6 to 12m<sup>3</sup>, it needs 2 nylon straps (2 handling rings)

5. When lifting horizontal tanks it is recommended that a lifting beam is used for tanks longer than 8 meters.
6. Tanks may be lifted with other suitable site equipment, but greater care is needed to control the lift and to ensure the tank is not damaged.

7. Move tanks only by lifting and setting, do not drag or roll.
8. Do not drop or roll tanks from the delivery vehicle.
9. Place tanks carefully onto a smooth level even surface, free from rocks, large stones or other debris that could cause point loads on the tank shell.
10. Provide adequate chocks to horizontal tanks using tyres, sandbags or similar to prevent the tank rolling unexpectedly while in storage.
11. In high wind conditions, consideration should be given to strapping down the tanks to prevent damage.



### Pre-Installation Inspection

1. Tanks should be subject to a visual inspection prior to installation. Special consideration should be given to strap positions. Check for: fractures to the shell or ribs; shell delamination; scratches or abrasions deeper than 1.5mm; stress cracks or star crazing.
2. Any damage should be notified to the delivery driver and to Premier Tech Aqua.
3. Do not undertake any unauthorised repairs, as this will invalidate the tank warranty.
4. Check the invert depth is correct, the tank is correct grade for granular surround and that the inlet and outlet pipe orientations are correct
5. Where present, all fixings (nuts, bolts, screw fixings etc.) should be checked and retightened to correct any movement during transport. Premier Tech Aqua do not accept responsibility for fixings that have not been checked prior to the tank entering service.



## Excavation

1. Excavations should be planned with due regard to Health and Safety requirements, and should be either shored, tiered or battered back to a “safe” angle based on site specific soil conditions.
2. The excavation should allow for a minimum of 300mm clearance between the tank sides and ends while taking into account any shoring used. Where tanks are placed in series or parallel a minimum of 450mm is required between adjacent tanks.
3. Soils with low bearing capacity (equivalent to less than 12 SPT blow counts) will require all tank clearances to be increased to half the tank diameter.
4. Ground instability at formation level e.g. running sand, may necessitate over-excavation and stabilisation with hardcore blinding or lean mix concrete as necessary.
5. Geotextile material should be used where required to prevent migration of the tank backfill material.

## Buoyancy and Anchoring

1. The HDPE Super Reinforced Septic Tank is designed to be backfilled in granular material ONLY where the ground water table level is below the formation level of the tank as installed. Anti-flotation anchoring is not required under this circumstance. Where it is discovered that the water table is at a level above the formation level of the HDPE tank concrete backfill is required; refer to installations for concrete backfill UTG 9506.
2. To prevent the HDPE Super Reinforced tank becoming buoyant during emptying and maintenance operations ensure that such operations do not take place during periods of heavy precipitation or when the site is waterlogged.

## Primary Backfill Specification

1. Primary Backfill material should be free-flowing granular material consisting of processed stone or gravel with particle size not less than 3 mm and not greater than 12 mm, compacted to a relative density of >40%. Crushed stone or aggregate with sharp and irregular protrusions is not a suitable backfill material. The aggregate shall be clean and free flowing, free from large rocks, dirt, sand, roots, organic materials or debris. The material should be washed or screened to remove fine particles. Upon screening analysis the backfill material shall have no more than 5% by weight passing a 2.38 mm sieve.
2. Use of other than specified backfill /bedding materials will void the tank warranty.

3. All backfill material shall be free of ice and snow at time of installation. Backfill material shall not, during placement, be frozen or contain lumps of frozen material.

## Primary Backfill Installation

1. Tanks must be installed with Primary Backfill only within the region immediately surrounding the tanks.
2. The tank bedding depth, using primary backfill, i.e. directly below the tank, must be a minimum of 300 mm below the tank to natural ground.
3. The Primary Backfill must extend a minimum of 300mm outward from the tank sides and ends.
4. Compaction should be by lightweight rollers or vibratory plate compactor until the minimum cover (with load) depth has been achieved. Compact evenly around the turret extensions to reduce the risk of distortion.
5. The use of geotextile barrier fabrics surrounding the Primary Backfill material is considered good installation practice. The fabric must be chosen to allow the flow of water in and out of the excavation but prevent the movement of fine soil particles into the Primary Backfill material

## Secondary Backfill Material

1. Secondary backfill shall not be used adjacent to the tank.
2. Secondary Backfill may be used only at a distance greater than 300mm from the tank walls.
3. The following are approved as Secondary Backfill materials:
  - a) Coarse Sand or Gravel: Coarse sand or gravel containing rocks no larger than 36 mm on the largest dimension. The material shall be clean and free flowing, free from dirt, clay, fine sand, roots, organic materials or debris. Upon screening analysis this backfill material shall have no more than 5% by weight passing 0.075mm Sieve. During placement this backfill material must be compacted to 95% relative compaction
  - b) Select Native Backfill: Clean native backfill, or clean selected backfill, containing rocks no larger than 36 mm on the largest dimension. The material must be compacted to 95% relative compaction. The quality of this backfill material shall be such that it exhibits an ultimate bearing strength in excess of 170kPa in the compacted state.



## Live Load

1. If the tank is installed in an area where traffic, or other superimposed loadings can be applied, a structural engineer must be consulted and retained to design a reinforced concrete slab spanning over the tank. This is to prevent the load being transmitted to the tank or its concrete surround where the surround is not designed to cater for the increased loading. If this slab is constructed immediately above the tank, it should be separated from the tank backfill material by suitable compressible material.

## Tank Burial Depth

1. The minimum tank burial depth is 500mm without live loading and the minimum cover with live load can be reduced by using a reinforced concrete slab above the tank; a structural engineer will be required to design the reinforced concrete slab.
2. This grade of tank are designed to be installed below ground and completely surrounded with granular material.
3. Generally, the depth from finished ground level to the top crown of the main shell should be no more than 800mm. If the tank is installed outside these parameters it may suffer irreparable damage. Should you be in any doubt regarding suitable tank applications please contact Premier Tech Aqua

## Control Of Groundwater

1. Tanks must not be subjected to buoyant forces during installation or operation taking account of ground water levels and surface water run-off, and their accumulation in the tank excavation.
2. The tank excavation should be maintained empty of water, by pumping or whatever suitable means, until the tank cover depth reaches a minimum of 300mm above the tank
3. If this is not achievable tanks may be filled with water as ballast until required conditions are achieved. Filling of excavations with ground water suggest that there is a high water table; if this occurs during periods of dry weather than the site is not suitable for backfilling the tank with granular material; Premier Tech Aqua should be contacted for advice.

## Installation Procedure

1. Excavation and anchorage provision is to be in accordance with preceding information. Ground water must be pumped to give a dry excavation
2. Place primary backfill bedding material as described in preceding sections. Ensure that material is clean and contains no oversize or sharp material that may damage or pierce the tank shell.
3. Lift tank into position and align as required for connecting pipework, access shafts, etc.
6. Commence backfilling, with primary backfill material, in layers approximately 300 mm, ensuring tank and any pipework is properly "haunched". The tank must be filled with water during the backfill operation to balance the stresses; ensure that the water level in the tank matched the level of the backfill material during the backfill process.
4. Continue backfilling, with primary backfill material, evenly around the tank to at least 300 mm above the tank top, connecting any high-level pipework as necessary. Cut turret extensions to length, mount and seal any turret extensions with butyl tape ensuring a water tight seal.
5. Backfill evenly to grade using the same primary backfill material, or select secondary backfill material.
6. Compaction should be by lightweight rollers or vibratory plate compactor until "traffic" depth has been achieved
7. Compact evenly around the turret extensions to reduce risk of distortion.
8. Important: Ensure that no surface loadings are transferred from the cover direct to the tank. Cover frame construction should allow for ground movement (settlement).
9. Inspect tank internally to ensure roundness is maintained, there is no collapse and deflection does not exceed 1% of the tank diameter.

## Access Shaft Extensions

1. Loose shafts should be sealed using butyl tape sealant or similar prior to installation to prevent ingress of groundwater under high water table conditions. It is the installation contractor's responsibility to ensure a watertight seal.