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# INSTALLATION GUIDELINES FOR SPHERICAL a TANKS (SEPTIC TANKS & CESSPOOLS)

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These Guidelines represent Best Practice for the installation of Klargester spherical tanks. Many years of specialist experience has led to the successful installation of thousands of units. It must be noted, however, that these Guidelines are necessarily of a general nature. It is the responsibility of others to verify that they are appropriate for the specific ground conditions and in-service loads of each installation. Similarly, a qualified specialist (e.g. civil engineering consultant or certified installer) must verify any information or advice given by employees or agents of Klargester regarding the design of an installation.

## BEFORE INSTALLING YOUR TANK

- Ensure Building Regulation approval.
- Ensure ground porosity is suitable.
- Inspect tank for damage before installation. Our tanks have been fully tested before despatch from our factory. Once the tank has been installed, we cannot accept claims for damage.
- Check that you have the correct invert drain depth (neck height) of tank. A label indicates the maximum permissible depth.
- Ensure access for desludging tanker.
- Check orientation and heights of inlet and outlets.
- Check that the tank is suitable for its application. Septic tanks and cesspools should not be used for silage effluent, chemical toilet waste or any other chemicals. Consult Klargester if in doubt.

## DO:-

- Use the correct backfill material.
- Site tank at furthest practical location from habitable dwellings. Most building regulations recommend a minimum of 15m, some require 25m.
- Fit the correct cover & frame CFL 460E or CFL 460A (pedestrian duty).
- Consider ventilation arrangements.
- Consider drainage falls, generally 1 in 60/70 between house and tank and max. 1 in 200 for irrigation system.
- Lift the tank using ropes or slings through both of the shackles fitted either side of the neck.
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## DO NOT:-

- Subject the tank to impact or contact with sharp edges.
- Add neck extensions to the tank, nor, build a brick manhole above the tank neck (as this increases burial depth of the tank). We do not recommend extending the neck of the tank under any circumstances.
- Install tank deeper than the depth that the fitted neck will allow.
- Install in trafficked areas without a suitable backfill design.

- Site the tank so that it is subjected to excess ground pressure (e.g. sloping sites) or applied loads such as may be generated by the proximity of vehicular traffic.
- Lift using only one of the shackles.
- Fill an unsupported tank.

## INSTALLATION OF SEPTIC TANKS INTO WET GROUND AND INSTALLATION OF CESSPOOLS INTO ALL GROUND CONDITIONS

Wet ground is where ground water lies above the base of tank at any time or in slow draining clay soils.

- 1.) Excavate a hole to appropriate depth allowing at least 300mm for concrete and hard-core base. Allow for tank width plus at least 400mm with additional allowance for any necessary shuttering. De-water the excavation using suitable pumping equipment. Ensure that the pump discharge does not saturate the ground in the immediate vicinity. De-watering is to continue until you are satisfied that the concrete has cured.
- 2.) Lay at least 150mm of hard-core in the base of the excavation. Line the complete excavation with polythene sheeting.
- 3.) Lay a bed of concrete (minimum 150mm thick) on top of the polythene at the base of the excavation.
- 4.) Lower the tank onto the concrete bed, ensuring that the inlet and outlet (septic tank only) are in the correct position.
- 5.) Ensure the tank is upright, then ballast it with water to a maximum of 500mm deep.
- 6.) Haunch up the concrete bed at least 450mm all round the base, ensuring that all voids in the concrete are eliminated and at least 150mm of concrete is left below the tank base.
- 7.) Backfill to the invert depth with concrete. Ensure that the water level inside the tank is maintained no more than approx. 250-300mm above concrete backfill level. Backfill evenly all round the tank, consolidating in layers. The backfilling should start before the base has hardened and be a single continuous operation so that the tank has a full concrete jacket without joints.
- 8.) DO NOT use vibrating rammers to consolidate concrete. DO NOT discharge concrete directly on to tank.
- 9.) Align and connect pipework. The septic tank inlet pipe should be least 25mm above the outlet pipe.
- 10.) Build up a shell of concrete around neck of tank to 150-200mm thickness before completing the backfill with a suitable material. Care must be

taken to avoid distortion of the neck whilst concreting this area. Support the neck with a temporary internal brace or frame. (Covers & frames are available for separate purchase).

- 11.) Trim the tank neck to ground level using a fine toothed saw. 450mm is the recommended minimum invert depth for frost protection of pipes. Do not cut the neck to less than 350mm above the inlet invert.
- 12.) Fit cover and frame. Apply surface finish e.g. turf.
- 13.) Do not empty tank until the concrete backfill has cured. Septic tanks may be left filled with water, this will be displaced as sewage enters. cesspools may be emptied once the concrete has cured.

### **INSTALLATION OF SEPTIC TANKS INTO DRY GROUND**

Where ground water lies below base of tank at all times and ground is free draining.

Important - Cesspools must be installed using the wet ground method.

- 1.) Excavate a hole at least 300mm wider and 150mm deeper than the tank, with additional allowance for any necessary shuttering.
- 2.) The tank must be bedded on concrete. Lay a bed of concrete (minimum 150mm thick) at the base of the excavation.
- 3.) Lower the tank onto the concrete bed, ensuring that the inlet and outlet are in the correct position.
- 4.) Ensure the tank is upright, then ballast it with water, to a maximum of 500mm deep.
- 5.) Haunch up the concrete bed at least 450mm all round the base, ensuring that all voids in the concrete are eliminated and at least 150mm of concrete is left below the tank base.
- 6.) Backfill to invert depth with pea-shingle or similar non cohesive and non compressible, rounded, free-flowing material. Ensure that the water level inside the tank is maintained approx. 250-500mm above the backfill level. Backfill evenly all round the tank. **DO NOT USE SAND OR SITE SPOIL AS A BACKFILL MATERIAL.**
- 7.) Align and connect pipework. The septic tank inlet pipe should be least 25mm above the outlet pipe.
- 8.) Continue backfilling to ground level. Care must be taken to avoid distortion of the neck when backfilling this area. Use either a temporary brace to support neck from inside or use a suitable frame. (Covers & frames are available for separate purchase).
- 9.) Trim the tank neck to ground level using a fine toothed saw. Do not cut the neck to less than 350mm above the inlet invert. 450mm is the recommended minimum invert depth for frost protection of pipes.
- 10.) Fit access cover and frame (pedestrian duty only). Apply surface finish e.g. turf.
- 11.) Leave septic tank filled with water, this will be displaced as sewage enters.

### **MATERIAL SPECIFICATIONS**

#### Concrete -

All references to concrete are for 20 N/mm<sup>2</sup> - 20mm aggregate - 25mm slump mix. BS5328 Parts 1, 2, 3 and 4.

#### Pea Shingle -

6mm-10mm rounded pea-shingle offering low point loading characteristics is the most suitable material for back filling tanks.

#### Polythene Sheet -

Building Quality 500 gauge.

### **CONNECTING PIPEWORK / TRENCHING / INSPECTION CHAMBERS / VENTILATION ARRANGEMENTS**

Building regulations provide guidance as to the specification of materials used and fitted. It is important that these are consulted and complied with as the operation of the septic tank/cesspool can be adversely affected. No surface water should be allowed to enter a septic tank system as this impairs its performance and affects the size of unit selected. Surface water should also be excluded from cesspools as it can seriously affect emptying frequency.

#### Notes for Septic Tank and Cesspool Users

The septic tank is part of a foul water system and toxic wastes should not be permitted to enter. All household chemicals may be used in moderation but the user should be aware that excess use may affect the performance and lead to odour problems and increased desludging requirements. Do not use septic tanks or cesspools to dispose of Motor Oils, Grease, Paint, Thinners, Chemical Toilet Waste, Photographic Developers or similar chemicals. Desludge septic tanks at least annually. Empty cesspools as required. Owners have a responsibility to use licensed waste contractors.

### **SELECTION AND SITING**

Before specifying or installing a Klargestor tank you should consider the following points:

A Septic Tank System comprises a Septic Tank, a suitable Cover & Frame and a Sub-surface Irrigation/Distribution System (soakaway system).

If there is insufficient area or the ground is not suitable for the construction of an effective sub-surface irrigation system, a septic tank will not function and some other means of sewage disposal must be used. Please consult Technical Data Sheet TDS0005 for detailed guidance on assessing ground conditions and soakaway design.

Cesspools are storage vessels with no outlet. They must be emptied when full. Septic tanks and Cesspools are not suitable for chemical toilet waste or silage effluent.

A septic tank discharge requires permission from the Environment Agency (England and Wales), the Scottish Environmental Protection Agency or Local Authority Public Health Department (Ireland).

Planning permission and Building Regulation approval may be required.

Building Regulations require the tank/system to be sited to avoid contamination of water supplies. We suggest that septic tanks and cesspools should be sited at the maximum practical distance from the

property(ies). Where possible they should be sited a minimum of 15 metres from any dwelling and 25 metres is suggested in the regulations.

If your sewage results from a commercial source, i.e. from a pub or restaurant, then you may require a grease trap, installed on a separate drain, prior to the septic tank. Please contact us for guidance.

Roof and surface water drains must not be connected to any tank system, but should be connected to a separate soakaway.

**SEPTIC TANK SELECTION - Size and invert depth.**

The number of people using the facility, and the level at which it is to be installed governs the tank model selected. We supply 1.0 metre invert depth - 1.5 metre invert depth available to order. The figures provide suction tanker access. The vertical distance from the base of the tank to the ground level of the hard standing area should be less than 5 metres.

Avoid siting tanks in sloping ground, as this can cause excessive ground pressure on the tank.

Klargester tanks are not designed to accept any traffic loads. A minimum traffic clearance must be provided as indicated in the table above. If this is not possible the tank must be protected from superimposed loads, e.g. by a reinforced concrete surround and provided with an appropriate cover, which must not bear on the structure of the tank. Please contact a consultant civil engineer.

Klargester pumping systems are available, (details on request) to raise the discharge from a septic tank to a soakaway system at a higher level.

Building Regulations require the system to be adequately ventilated. Covers and frames allow

given below are for domestic households. For advice on other situations such as office developments please contact us.

**SITING CONSIDERATIONS**

Where possible, take advantage of site gradients to minimise the invert depth at the tank inlet, as this will reduce excavation. The tank neck can be trimmed to suit, subject to retaining a minimum of 350mm above the inlet invert. For frost protection a minimum invert depth of 450mm is recommended.

Septic tanks require desludging at least annually, possibly more frequently for tanks serving multiple properties. Cesspools must be emptied when full. Tanks should be sited within 30 metres of a hard standing area to

ventilation via the soil stack at the head of the drains. An additional local air inlet can be fitted to the tank where circumstances require it. If there is no open soil stack (e.g. drainage systems with air admittance valves only), then the septic tank must be independently vented. The direction of the prevailing wind in relation to the property(ies) should be considered when selecting the tank site.

We recommend the installation of inspection chambers down stream of the Septic Tank so that the effluent quality and soakaway system can be checked.

**FURTHER INFORMATION**

Is available on request.

TDS0004 - Points to Consider when purchasing a spherical Septic Tank

TDS0005 - Sub-surface Irrigation Systems

TDS0006 - Operation of Klargester Septic Tanks

Septic Tank Volume in Litres	Number of people assuming a flow of 180L/person/day	Number of people assuming a flow of 250L/person/day	Minimum protected radius (Drain depth plus *m)
2800	4	3	* 2.1
3800	10	7	* 2.4
4600	14	10	* 2.6



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In keeping with the Company policy of continuing research and development in order to offer our clients the most advanced products, Klargester reserve the right to alter specifications and dimensions without notice.

FRAME TO BE BEDDED ON CONCRETE & BENCHED OVER FLANGE AS SHOWN

TITAN COVER AND FRAME CFL 460E ILLUSTRATED (SEE PD0255)

∅ 460 (I.D.)

INLET INVERT 1.0M

CAPACITY	DIA. 'A'	OUTLET INVERT 'B'	OVERALL HEIGHT 'C'	WEIGHT KGS.
2800L	1905	1540	2565	105
3800L	2070	1770	2795	154
4600L	2080	2010	3035	169

TANKS HAVE AN INLET INVERT DEPTH OF 1.0M. ON REQUEST MAY HAVE AN INVERT DEPTH OF 1.5M. DO NOT EXTEND TANK NECK

STANDARD INLET/OUTLET PIPES ARE 110MM PVCu UNDERGROUND DRAINAGE TO BS4660 WITH KLARGESTER GROMMETS

SHINGLE UNDER PIPE

BACKFILL TO SUIT DRY SOIL CONDITIONS (PEA SHINGLE)

NOT SUITABLE FOR CESSPOOLS

CONCRETE BACKFILL AROUND NECK (WET SOIL CONDITIONS)

SUITABLE FILL/SOIL

EXTEND TEE WITH VERTICAL RISER IF USING CFL 460A OR SIMILAR. BLANK OFF WITH 4" (102mm) UPVC CAP IF USING CFL 460E OR SIMILAR.

PIPEWORK SHOWN IN DOTTED LINES IS NOT SUPPLIED BY KLARGESTER

SHINGLE UNDER PIPE

ENSURE SEPTIC TANK OUTLET HEIGHT IS SET 25MM BELOW INLET

NO OUTLET FITTED TO CESSPOOLS

BACKFILL TO SUIT WET SOIL CONDITIONS (CONCRETE)

CESSPOOLS MUST BE BACKFILLED WITH CONCRETE IN ALL SITE CONDITIONS

CONCRETE BED HAUNCH UP AROUND BASE

