

**INSTALLATION, OPERATING & MAINTENANCE
GUIDELINES FOR 18000 - 55000 TANKS
LARGE (2.6M & 1.8M DIAMETER)
CESSPOOL/SILAGE & SEPTIC TANKS**



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HEALTH & SAFETY

These warnings are provided in the interest of safety. You must read them carefully before installing or using the equipment.

It is important that this document is retained with the equipment for future reference. Should the equipment be transferred to a new owner, always ensure that all relevant documents are supplied in order that the new owner can be acquainted with the functioning of the equipment and the relevant warnings.

Installation should only be carried out by a suitably experienced contractor, following these guidelines.

We recommend the use of a dust mask and gloves when cutting GRP components.

Electrical work should be carried out by a qualified electrician.

Contaminated surface water can contain substances harmful to human health. Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves. Good hygiene practice should also be observed.

Access covers should be selected with reference to the location of the unit and traffic loads to be accommodated. These are not (normally) part of the units supply.

When covers are removed precautions must be taken against personnel falling into the unit.

Should you wish to inspect the operation of the equipment, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.

Ensure that you are familiar with the safe working areas and accesses. Ensure that the working area is adequately lit.

Take care to maintain correct posture, particularly when lifting. Use appropriate lifting equipment when necessary. Keep proper footing and balance at all times. Avoid any sharp edges.

ALARM SYSTEMS

High level alarm systems are available for use in Cesspool and Silage tanks.

MAINTENANCE

The correct ongoing maintenance is essential for the proper operation of the equipment. Operators who rely on high level alarms to prompt them to empty the unit run the risk of polluting, should the alarm not work, hence the ongoing maintenance of the alarm systems is fundamental if pollution incidents are to be avoided.

The removal of sludge and liquid from the unit should be carried out by a contractor holding the relevant permits to transport and dispose of such waste. The contractor should refer to the guidelines in this document.

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- Dimensioned unit drawings
 - 2.6 DIAMETER TANKS
 - 18180, 22500, 27000, 36000, 45,000 55,000 DS0617
 - 1.8 DIAMETER TANKS 12,000 DS0618

1.0 Introduction

These Guidelines cover cesspools and silage tanks where no discharge is permitted. These guidelines also cover septic tanks where a discharge is permitted to a correctly sized and designed soakaway system. Should you require information regarding soakaway system design and sizing please contact us.

The instructions are written to cover all the units, but there are no discharge permitted from or outlets fitted to either Cesspools or Silage tanks.

These guidelines represent Best Practice for the installation of the above Klargestor Units. 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) must verify any information or advice given by employees or agents of Klargestor regarding the design of an installation.

For guidance of Unit selection and application, please refer to the most recent issue of Environment Agency Pollution Prevention Guidelines PPG 4.

Silage tanks include a chemically resistant lining, suitable for storing farm silage. For alternative applications, please consult us.

2.0 Handling & Storage

- 2.1. Care must be taken to ensure that units are not damaged during delivery and handling on site.
- 2.2. The design requirements of Klargestor products will frequently mean that the centre of gravity of the unit is "offset". Care must therefore be taken to ensure that the unit is stable when lifting. Rainwater may also collect inside units, particularly if they have been stored on site prior to installation, adding weight and increasing instability. Check units before lifting and pump out any excess water.
- 2.3. When lifting units, use webbing slings of a suitable specification. DO NOT USE CHAINS.
- 2.4. A suitable spreader bar should be used to ensure that units are stable and that loads are evenly distributed during lifting. When lifting units, a spreader bar should be used where the slings would otherwise be at an angle > 30 degrees to the vertical.
- 2.5. Lifting equipment should be selected by taking into account the unit weight, length and the distance of lift required on site.
- 2.6. Klargestor Environmental accepts no responsibility for the selection of lifting equipment.
- 2.7. Whenever Klargestor units are stored or moved on site, ensure that the storage location is free of rock, debris and any sharp objects, which may damage the unit. The units must be placed on ground, which is flat and level to evenly support the base of the unit. Do not roll units.

3.0 Site Planning

The following points should be considered before installation of the equipment:

- 3.1. The discharge (Septic tanks only) should have the consent of the relevant Environmental Regulator. See Environment Agency Guidelines PPG4.
- 3.2. The installation should have Planning and Building Control approval. See DETR 3/99 Planning requirement in respect to use of non- mains sewerage incorporating septic Tanks in new development and building regulations H2.
- 3.3. Position the unit at the maximum distance from habitation. Distances in excess of 15m are usually the minimum acceptable to the planners, but this varies depending on your local authority. The installation must be sited so as not to be prejudicial to health, nor to contaminate water supplies.
- 3.4. See BS EN 752-4 Drain & sewer systems outside Buildings.
- 3.5. Consider placing inspection points in the drain line before and after Units
- 3.6. Consider venting of the unit. Comply with local regulations.
- 3.7. Uncontaminated run off such as roof and surface water should be excluded from the unit to avoid over frequent filling.
- 3.8. Ground conditions and water table level should be assessed. If the water table will be above the base of the unit at any time of the year, adequate concrete backfill must be provided to avoid flotation. In poorly draining ground, consideration should also be given to the likelihood of flotation due to surface water collecting in the backfill, and an appropriate installation method devised to avoid this.
- 3.9. Septic Tanks only. If the discharge is to a soakaway, a porosity test should be carried out as part of the assessment of suitability for sub-soil drainage.
- 3.10. The unit must be installed at a level that will allow connection to the incoming drain and a free discharge at the system outlet.
- 3.11. Do not install the unit deeper than necessary, ensure that you purchase any necessary neck extension shafts at the same time as the unit purchased. The minimum invert depth of the unit is shown on the relevant equipment drawing. Units installed with an invert greater than 1.0m will require a civil design specific to the installation.
- 3.12. Adequate access to the unit must be provided for routine maintenance. Vehicles should not be permitted within a distance equal to the depth of the unit, unless suitable structural protection is provided to the installation.
- 3.13. There must be at least 1 metre of clear, level ground all around the access covers to allow for routine maintenance.
- 3.14. Provide electrical supply for alarm system. (If required)
- 3.15. Installation should only be carried out by suitably qualified and experienced contractors in accordance with current Health and Safety Regulations. Electrical work should be carried out by a qualified electrician, working to the latest edition of IEE.

4.0 Installation – General

- 4.1. When units are installed in unstable ground conditions where movement of the surrounding material and/or unit may occur, the connecting pipework should be designed to minimise the risk of damage from differential movement of the unit(s) and/or surrounding material.
- 4.2. For units with burial depths greater than 1000mm from cover level to the top of the unit, specific site conditions should be taken into consideration and the backfill designed to bear any loads which may be applied during and after installation to prevent the tank being subjected to these loads.
- 4.3. The excavation must be deep enough to provide bedding and cover depth as determined by the type of surface pavement and loading. Asphalt and concrete pads should extend a minimum of 300mm horizontally beyond the unit in all directions.
- 4.4. In situations where the excavation will not maintain a vertical wall, it will be necessary to shore up the side walls of the excavation with suitable trench sheets and bracing systems to maintain a vertical wall from the bottom to the top of the excavation. DO NOT completely remove the shoring system until the backfilling is complete, but before the concrete fully hardens.

- 4.5. In areas where the water table is above the bottom of the excavation and/or the excavation is liable to flood, the excavation should be dewatered using suitable pumping equipment and this should continue until the installation is complete.
- 4.6. During installation care must be taken to ensure that the body of any unit is uniformly supported so that point loads through the unit are avoided.
- 4.7. Concrete Specification SK296 is a *general* specification. It is not a site specific installation design.

CONCRETE SPECIFICATION SK296 IN ACCORDANCE WITH BS 5328 PARTS 1,2,3 AND 4	
TYPE OF MIX	DESIGN
PERMITTED TYPE OF CEMENT	BS 12 (OPC): BS 12 (RHPC): BS 4027 (SRPC)
PERMITTED TYPE OF AGGREGATE (coarse & fine)	BS 882
NOMINAL MAXIMUM SIZE OF AGGREGATE	20 mm
GRADES: C30 (30 N/mm ²) C20 (20 N/mm ²)	REINFORCED & ABOVE GROUND WITH HOLDING DOWN BOLTS REINFORCED (EG. FOR HIGH WATER TABLE) UNREINFORCED (NORMAL CONDITIONS)
MINIMUM CEMENT CONTENT	C30 C20
	270 – 280 Kg/m ³ 220 – 230 Kg/m ³
SLUMP (NOT IN ACCORDANCE WITH BS 5328)	25mm
RATE OF SAMPLING	READY MIX CONCRETE SHOULD BE SUPPLIED COMPLETE WITH APPROPRIATE DELIVERY TICKET IN ACCORDANCE WITH BS 5328 PART 3
NOTE: STANDARD MIXES SHOULD NOT BE USED WHERE SULPHATES OR OTHER AGGRESSIVE CHEMICALS EXIST IN GROUND WATER	

5.0 Unit Installation

- 5.1. Excavate a hole of sufficient length and width to accommodate the tank and a minimum 225mm concrete surround and to a depth that allows for the burial depth of the unit plus concrete base slab.
- 5.2. Construct a suitable concrete base slab appropriate to site conditions. Ensure that the slab is flat and level.
- 5.3. When the concrete base slab has set enough to support the installed load, lower the unit onto the slab using suitable webbing slings and lifting equipment.
- 5.4. Pour no more than 300mm depth of clean water into the unit, avoiding shock loads. **DO NOT OVERFILL**, the unit is not designed to hold water whilst unsupported.
- 5.5. Place concrete backfill to approximately 300mm depth under and to the sides of the tank ensuring good compaction to remove voids. **DO NOT use vibrating pokers**. If the unit does not have stabilising feet, i.e. units of 2.6 diameter, allow initial concrete set to occur before proceeding.
- 5.6. Continue adding concrete backfill, simultaneously keeping the internal water level no more than 300mm above the backfill level at all times, until the backfill is just below the underside of the outlet drain, giving sufficient room to connect the inlet and outlet pipework.
- 5.7. Connect inlet and outlet drains and vent pipes when safe access to the backfill can be gained.
- 5.8. Extension necks. Temporarily strut the extension neck(s) to avoid distortion during the concrete installation and back filling.

Flanged extension necks are supplied with mastic and bolts. Line up the nicks. Ensure good & even compression of the mastic so as to provide a watertight seal.

Spigoted extension necks should be slipped inside the neck and sealed with silicone or mastic (not supplied)

Sites with high ground water will require special attention. Consider sealing by GRP lamination (if skilled operatives are available).

Where more than one neck section is required to suit a deep invert, back-fill section by section. If the extension neck is too long, it can be trimmed using a fine-toothed saw. Ensure that the vent socket if cut out, is replaced elsewhere.

- 5.9. The maximum recommended inlet invert is 1500mm.
- 5.10. Continue backfilling with concrete over the tank body to the required level. Build up a shell of concrete, minimum 225mm thick, around the access shaft(s). Temporarily strut the access shaft to avoid distortion.
- 5.11. Continue back-filling, ensuring minimum 225mm concrete thickness around the access shaft/extension neck and alarm access tube (as applicable).
- 5.12. Do not install in trafficked areas unless a suitable top slab has been designed and constructed. The top slab should bear on a suitable foundation to prevent superimposed loads being transmitted to the unit and access shafts. Loads applied to covers and frames must bear on the top slab, not the access shaft.
- 5.13. The unit should be filled with clean water up to the invert level of the outlet pipe. Check that there is a discharge.
- 5.14. Leave until the concrete is fully cured. Septic tanks are now ready for use. Cesspools and Silage units should be emptied of water.

6.0 Operation

Cesspools and Silage tanks gradually fill with incoming liquid. They must be emptied when full

Septic tanks have both an inlet and outlet. Separated solids both floating and sinking are retained within the tank. Separated liquid discharges through the outlet into a soakaway system.

Cesspools & silage tanks are sized to store a defined volume of liquid.

Septic tanks are sized according to a population equivalent formula.

7.0 Maintenance

Septic tanks accumulate solids and must be emptied periodically. The period between emptying depends up on the population served by the tank or, the amount of use to which the tank is put. Generally the period is at least 3 months, however, tanks which are over utilised may require more frequent emptying. All sludge should be removed when the unit is emptied. Solids should not be allowed to accumulate in more than half the tank as this reduces the retention time and separation efficiency and will detrimentally affect the soakaway system. **DO NOT EXTEND THE EMPTYING FREQUENCY**

The following calculation can be used to estimate emptying frequency.

Tank volume (in litres) divided by 2 divided by 1.2 = Population x No of days

E.g. 27000 litre tank

$27000 / 2 = 13500 / 1.2 = 11250$

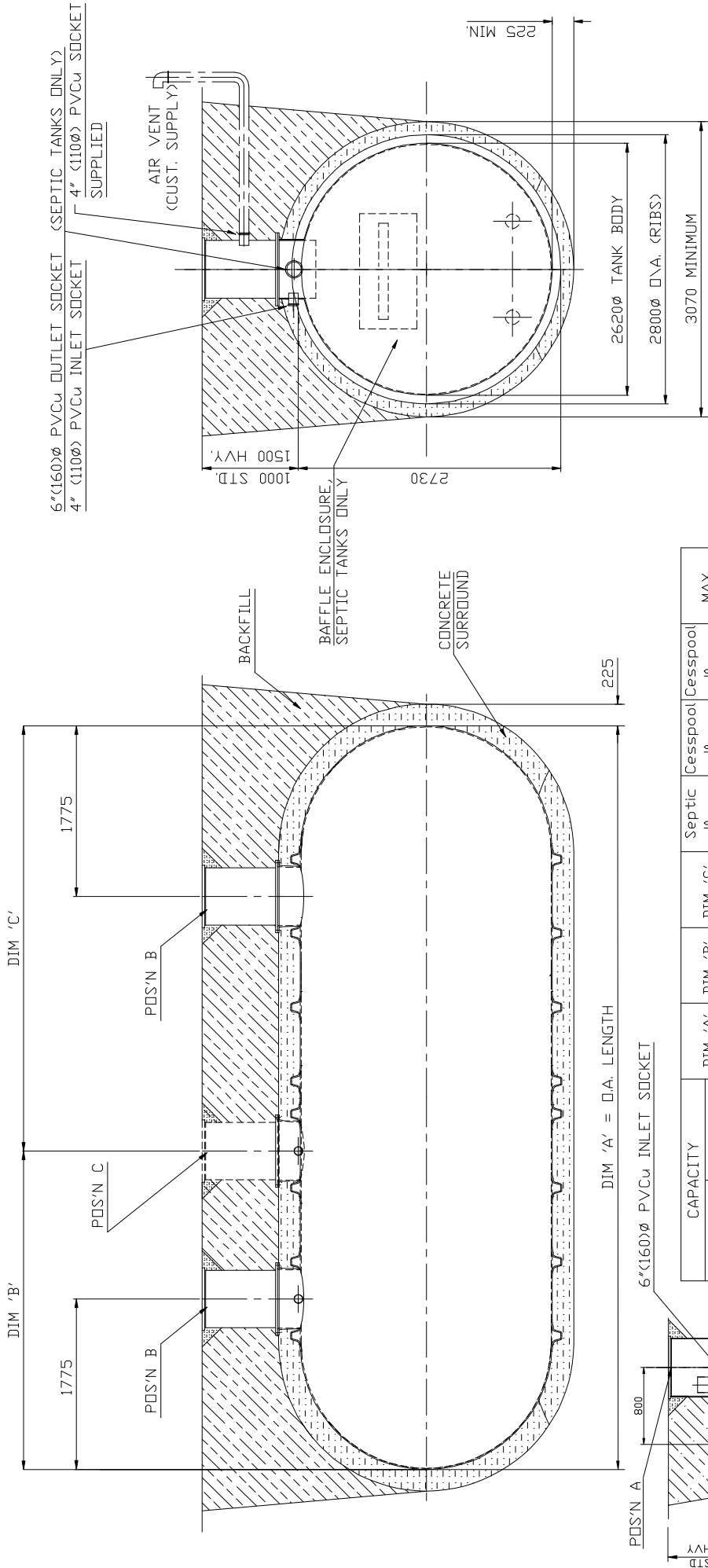
If the population being served by the tank is 30, then the tank needs emptying approx. every 375 days

If the population is 80, then the tank needs to be emptied approx. every 140 days.

Different allowances/calculations should be made for non domestic inputs such as pubs and other commercial premises. Consult Klargestar.

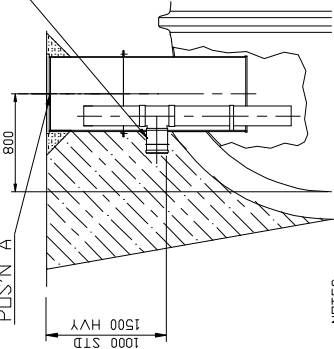
Cesspools and silage tanks require emptying when full. A log should be kept recording the frequency of emptying Alarm probes where fitted, should be removed and inspected to ensure that they are clean and working whenever the waste material is removed from the unit

The waste should be removed under the terms of The Waste Management Code of Practice. The Code imposes a duty of care on the waste producer to ensure that the Cleansing contractor is registered with the Environment Agency and that the final disposal of the waste is to a licensed facility.



DIM 'A' = O.A. LENGTH

6" (160) PVC INLET SOCKET



NOTES:-

- TANK SHAFT MAY BE TRIMMED TO SUIT INVERT DEPTH, BUT MUST NOT BE EXCEEDED IN ANY WAY.
- ALL PIPEWORK IS 6" (160) PVC ON SEPTIC TANKS & 4" (110) ON CESSPOOLS. UNDERGROUND DRAINAGE STANDARDS ARE TO BS 4660. ADAPTORS ARE AVAILABLE TO SUIT ALTERNATIVE PIPEWORK.
- PEDESTRIAN DUTY MANHOLE COVERS & FRAMES ARE AVAILABLE FOR PURCHASE FROM KLARGESTER LTD.
- INSTALLATION PROCEDURE IS SUPPLIED WITH EACH UNIT.
- FOR INVERT LEVELS OVER 1500mm DEEP PLEASE CONTACT KLARGESTER LTD.
- WEIGHTS SHOWN ARE FOR HANDLING PURPOSES ONLY AND DO NOT INCLUDE BOLT ON EXTENSION NECKS.
- CESSPOOLS HAVE 2 NECKS WHEN > 27000 LITRE CAPACITY.

CAPACITY	DIM 'A' mm	DIM 'B' mm	DIM 'C' mm	Septic Tanks		Cesspool		MAX WEIGHT
				No	POS'N	No	POS'N	
LITRES (NOMINAL)	GALLONS							
18180	4000	1775	2545	2	A	1	B	930
22500	5000	1775	3315	2	A	1	B	1095
27000	6000	2540	3650	2	A	2	B	1355
36000	8000	3305	4435	2	A	2	B	1685
45000	10000	4075	5385	2	A	2	B	2075
55000	12000	4845	6335	2	A	2	B	2405

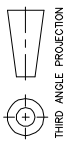
ALL DIMENSIONS ARE IN MILLIMETRES - DO NOT SCALE

TITLE: 18180 TO 55000 LITRE SEALED CESSPOOLS & SILAGE TANKS SINGLE & TWIN NECK SEPTIC TANKS CUSTOMER DATA SHEET.

SCALE: 1:30 SHEET SIZE: A1

DRAWING No. DS0617 ISSUE: 1

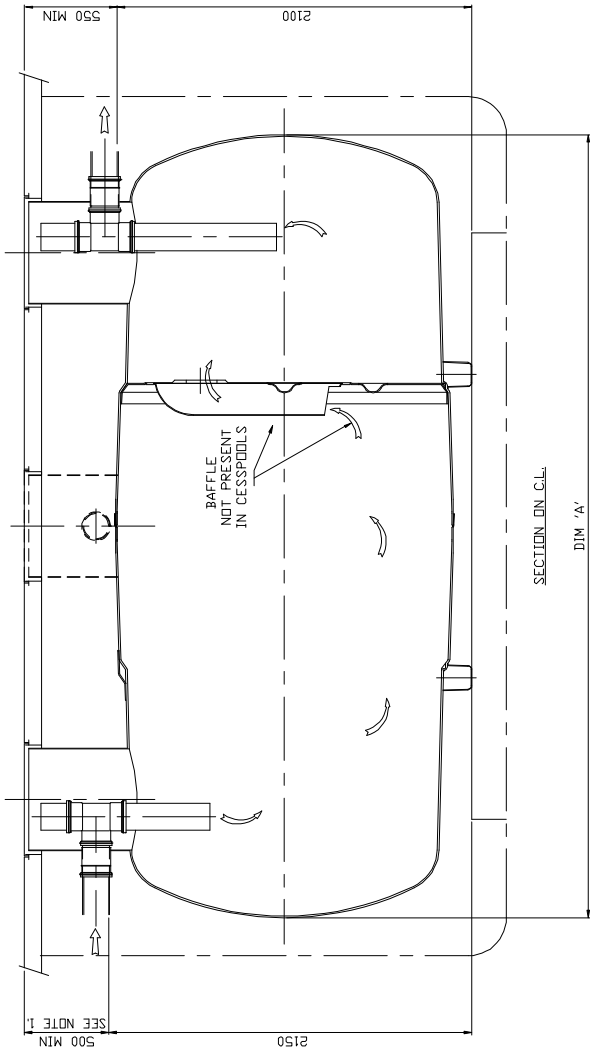
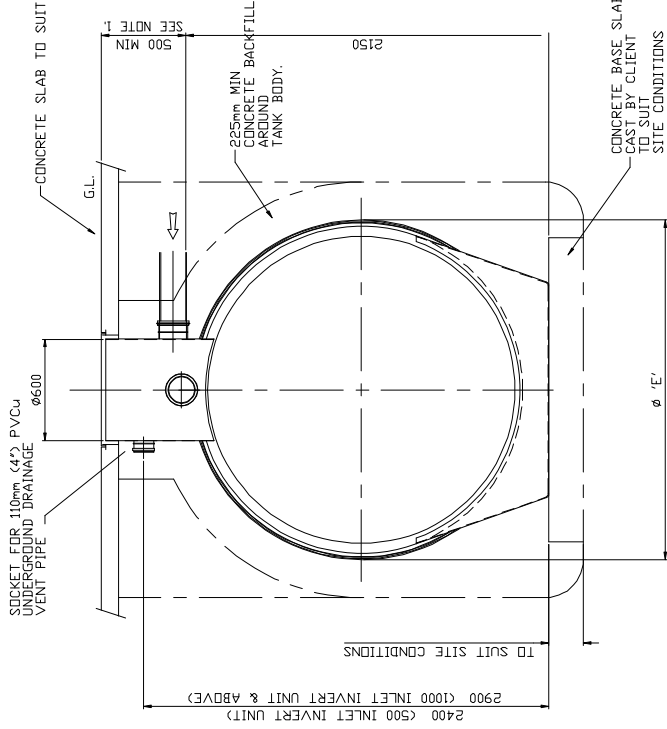
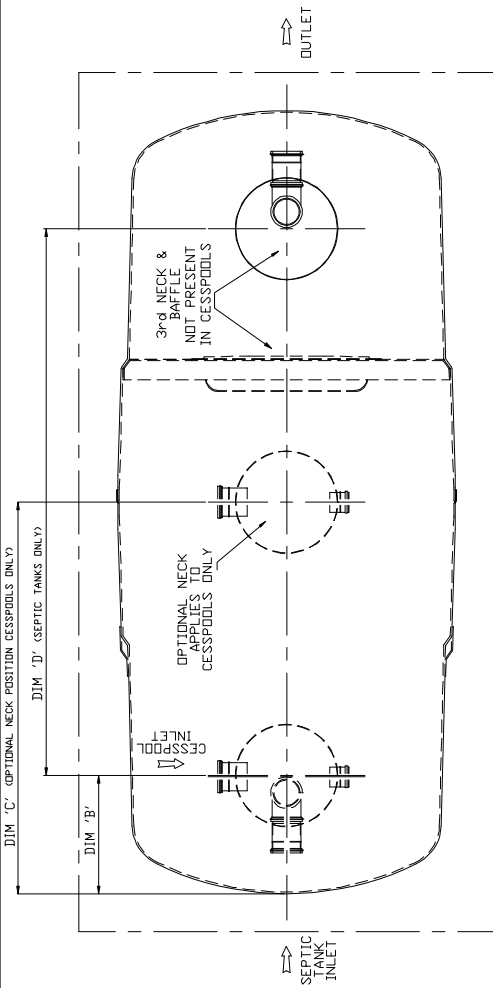
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ISSUE	DATE	A.L.	INITIAL	ISSUE	MODIFICATION
1	20.06.01				

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UNIT	WORKING CAPACITY (LITRES)	DIM 'A' (mm)	DIM 'B' STANDARD (mm)	DIM 'C' OPTIONAL (mm)	DIM 'D' (mm)	DIA 'E' (mm)	APPROX. WEIGHT (kg)	
							EMPTY	FULL
CP120	12000	4640	700	2320	-	Ø2020	775	12775
CP150	15000	5435	700	2720	-	Ø2075	935	15935
ST120	12000	4640	700	-	3240	Ø2020	795	12795



NOTES:-

- 1) UNITS CAN BE PROVIDED WITH EXTENSION SHAFTS IN 0.5m INCREMENTS.
- 2) STANDARD INLET/OUTLET PIPES ARE 160mm DIA PVCu UNDERGROUND DRAINAGE TO BS.4660 FOR OTHER PIPE SIZES AND TYPES AVAILABLE CONSULT KLARGESTER.

3. IT IS ESSENTIAL THAT THIS DRAWING IS READ IN CONJUNCTION WITH DATA SHEET PD0115 (SUPPLIED WITH UNIT) GIVING INSTALLATION DETAILS. THIS DRAWING SHOULD BE USED FOR DIMENSIONAL INFORMATION ONLY.

ALL DIMENSIONS ARE IN MILLIMETRES - DO NOT SCALE

TITLE
ST120
CP120 & CP150
CESSPOOLS &
SEPTIC TANKS
CUST DATA SHEET

SCALE 1:15
DRAWING NO. DS0618
SHEET SIZE A1
ISSUE 1

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1 20.06.01 A.L. INITIAL ISSUE
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