



technical & installation manual
manual technique et installation

Tricel® wastewater treatment systems

Technical & installation manual



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It is important to read the full technical and installation guide prior to installation. This document should be retained for the lifetime of the product and in the event of change of ownership be transferred to the new owner.

Precaution

Prior to installation, please consider finished garden level when installing the system. If you envisage that a manhole riser/extension may be required to ensure manhole lid remains above finished ground level, the system must be installed with the appropriate excavation foundation and backfill to accommodate the riser. Please refer to page 14 for manhole riser details.

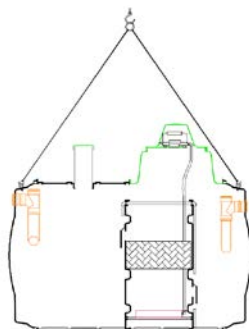
Health & safety precautions:

As safety and security are of vital importance, the following aspects are critical.

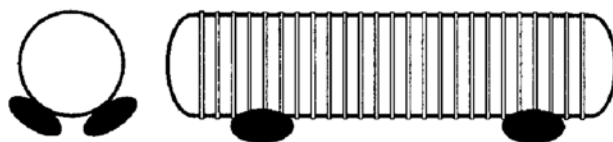
- Ensure that all the information contained in this manual is adhered to at all times
- All electrical work to be carried out by competent persons using suitable materials for the application.
- Do not open the Tricel® cover without firstly isolating the mains power
- Electrical work must be carried out strictly to the manufacturer's instructions and to the relevant national rules for electrical installations.
- When working with machinery / electrical equipment, proximity of water shall be noted.
- Equipment shall not be wet when working with it.
- There is potential danger when de-sludging and therefore this shall never be done alone.
- Never enter a tank unless qualified to do so.
- Naked flames shall not be used in the vicinity of the tank due to the danger of combustion.
- The manhole covers shall never be left off an unattended tank.
- Sewage and sewage effluent can carry micro-organisms and gases harmful to human health. Any person carrying out maintenance on the system must be appropriately trained. Suitable protective clothing; including gloves, goggles should be worn at all times. Always remove contaminated clothing and protective equipment after working with sewage treatment systems. Wash hands and face prior to eating, drinking or smoking.
- A second person shall be present when carrying out maintenance inside the tank.
- A sampling box shall be constructed to facilitate sampling and inspection without placing personnel at risk.
- Great care shall be taken when handling sludge.
- Always lock the cover of the system when maintenance is completed.
- Treated wastewater is not suitable for human consumption therefore it's important that locks are fitted to the lid to prevent accidental access.

Transportation, unloading and storage of tanks:

1. Tanks must be held down during transportation using nylon straps, do not use cables or chains to secure tanks. Do not over tighten straps to cause deformation of the tank shell
2. Always set the tank(s) on flat smooth ground free from debris etc. To prevent movement, tanks may need to be tied down and chocked.
3. Tanks are best lifted by crane and webbing lifting straps – do not use chains or wire ropes in contact with the tank. Ensure tank is empty when lifting.
4. Tanks from one to five modules (5.6m) in length should be lifted using the eyebolts that come with the tank.



5. Smaller 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.
6. Move tanks only by lifting and setting, do not drag or roll
7. Do not drop or roll tanks from truck



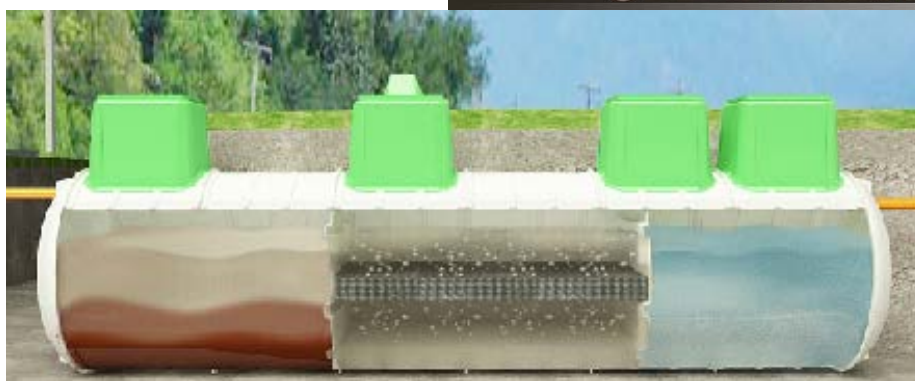
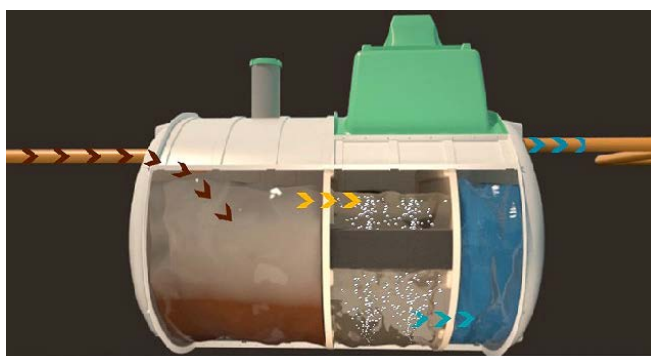
In high wind conditions, consideration should be given to strapping down the tanks to prevent damage

Introduction:

Tricel® SMC tanks:

The Tricel® SMC modular below ground tank & wastewater treatment systems “Design Registered & Patent Pending” are manufactured from Sheet Molding Compound (SMC) ensuring a durable and strong product. The Tricel is manufactured in modular components and these modules are fabricated together to make different size tanks. Tanks may also be supplied flat packed in larger quantities and detailed assembly instructions are available.

The Tricel® System is a Submerged Aeration System, suitable for domestic and light commercial applications. The system is relatively simple, using proven technology, to give superior results. Tricel Wastewater treatment systems have 3 treatment zones, generally in one tank. In each zone a different stage of the treatment occurs. Wastewater from the dwelling, toilets, sinks, shower etc, enters the system and the purification process begins.



The wastewater purification process:

Stage 1: Primary settlement chamber

Anaerobic breakdown takes place in the primary settlement chamber where the wastewater is introduced into the system. The large volume of this chamber reduces velocity of the wastewater. This along with the long flow path allow the wastewater maximum time in the first chamber resulting in a higher settlement rate. Settlement occurs when the heavier solids, drop out of the wastewater and settle to the bottom of the tank to create sludge or when lighter solids, like fats or oils, float to the top of the water to create a scum. Up to 70% of the solids are removed in Primary settlement zone. Anaerobic breakdown begins to occur and improve the water quality.

A baffling system holds the sludge and scum in the primary settlement zone and ensures that water from the centre of the chamber moves into the aeration zone. The large sludge storage volume increases the de-sludging intervals.

Stage 2: Aeration (treatment) chamber

Stage 2 takes place in the aeration chamber where submerged aeration combines the principles of the bio film and activated sludge processes.

Masses of naturally occurring bacteria inhabit specially designed plastic filter media. The filter media, has large surface area, and is supported within the aeration zone. As the liquid flows slowly through the filter media the bacteria feed on the waste removing them from the liquid.

These bacteria are sustained with air, which is continuously supplied from a purpose built low pressure, high volume air compressor in the top section of the unit. The air is delivered through a diffused aeration system, which break the air into bubbles as they are dispersed through the aeration zone.

The continuous circulation of the wastewater within the aeration zone means that the wastewater is passed through the filter media over and over, thus ensuring very high treatment efficiency. The purified liquid is then passed into the final settlement zone.

Stage 3: Final settlement chamber

As the liquid flows from the aeration zone into the final settlement zone small quantities of bacteria may be carried with the liquid. Before discharge from the system, these solids must be separated from the liquid. With the velocity of the liquid once again slowed down and the flow path maximised the bacteria is encouraged to settle to the bottom of the tank, like sludge, through the up flow nature of the zone. A sludge return system pumps this sludge back to the primary settlement zone.

The remaining treated liquid now meets the required standard to be safely passed out of the Tricel Unit.

System dimensions:

Tricel® wastewater treatment systems, certified to EN 12566-3:2005

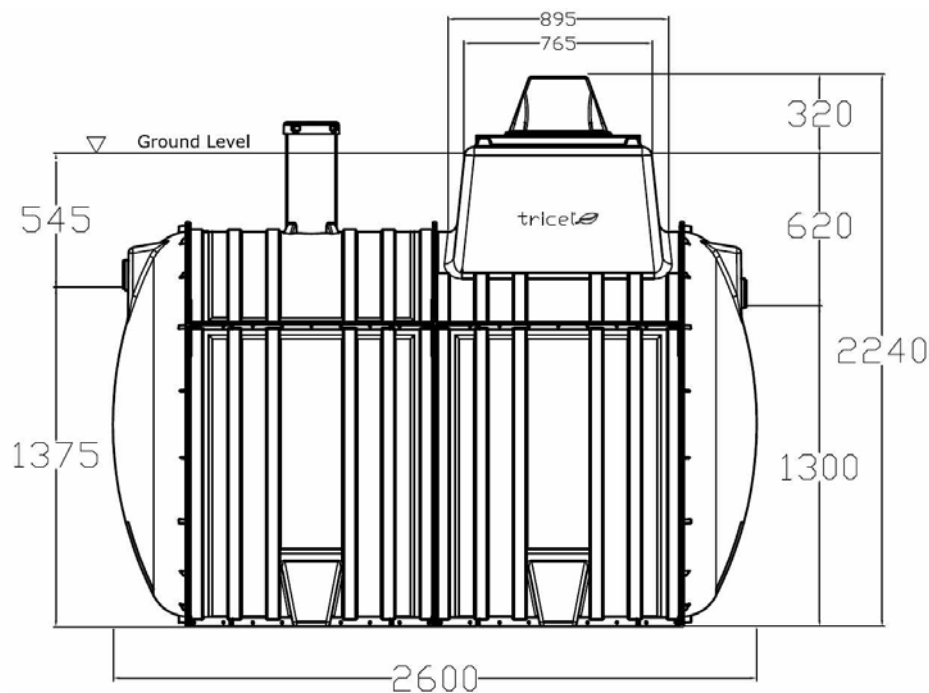
Design population		IRL6	IRL9	IRL12	IRL18	IRL24	IRL30
Nominal inlet/outlet pipe diameter	mm	110	110	110	110	150	150
Overall length	m	2.6	3.1	3.6	4.6	5.6	6.6
Overall width	m	1.64	1.64	1.64	1.64	1.64	1.64
Overall height	m	2.24	2.24	2.24	2.27	2.27	2.27
Inlet invert to base	m	1.375	1.375	1.375	1.375	1.35	1.35
Outlet invert to base	m	1.3	1.3	1.3	1.3	1.3	1.3
Inlet invert to ground level	m	0.545	0.545	0.545	0.545	0.57	0.57
Outlet invert to ground level	m	0.62	0.62	0.62	0.62	0.62	0.62
Height above ground level	m	0.32	0.32	0.32	0.35	0.35	0.35
Weight empty	kg	300	300	400	500	600	700
Design flow rate	litres/day	1200	1800	2400	3600	4800	6000
Air blower rating (mean)	watts	60	100	100	100 (x2)	270	270
Desludge period (minimum)	year	1	1	1	1	1	1
Thickness (minimum)	mm	5	5	5	5	5	5

Design population		IRL36 *		IRL42*		IRL50*	
		Plant A	Plant B	Plant A	Plant B	Plant A	Plant B
Nominal inlet/outlet pipe diameter	mm	150	150	150	150	150	150
Overall length	m	2.6	5.6	3.6	5.6	3.6	6.6
Overall width	m	1.64	1.64	1.64	1.64	1.64	1.64
Overall height	m	2	2.27	2	2.27	2	2.27
Inlet invert to base	m	1.35	1.35	1.35	1.35	1.35	1.35
Outlet invert to base	m	1.3	1.3	1.3	1.3	1.3	1.3
Inlet invert to ground level	m	0.47	0.57	0.47	0.57	0.47	0.57
Outlet Invert to ground level	m	0.52	0.62	0.52	0.62	0.52	0.62
Height above ground level	m	0.18	0.35	0.18	0.35	0.18	0.35
Weight empty	kg	300	600	400	600	500	700
Design flow rate	litres/day	7200		8400		10000	
BOD load	kg/day	2.16		2.52		3	
Air blower rating (mean)	watts	100 + 270		131 + 270		270 x 2	
Desludge period (minimum)	year	1		1		1	
Thickness (minimum)	mm	5		5		5	

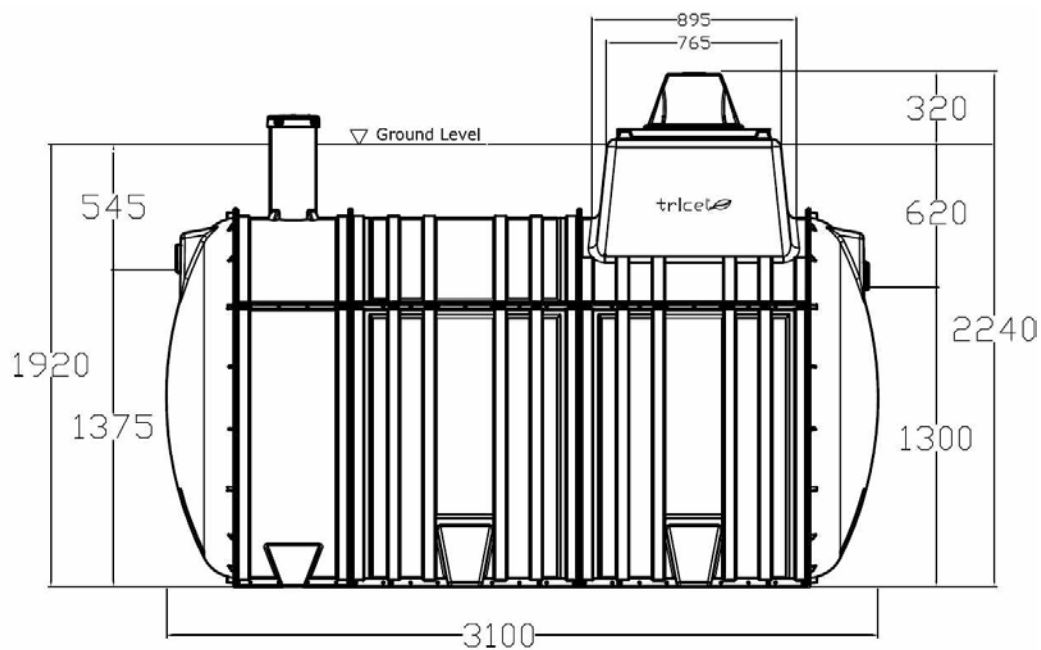
*Systems may require a stepped foundation, with "Tank B" lower than "Tank A" by 100mm approx.

Technical drawings:

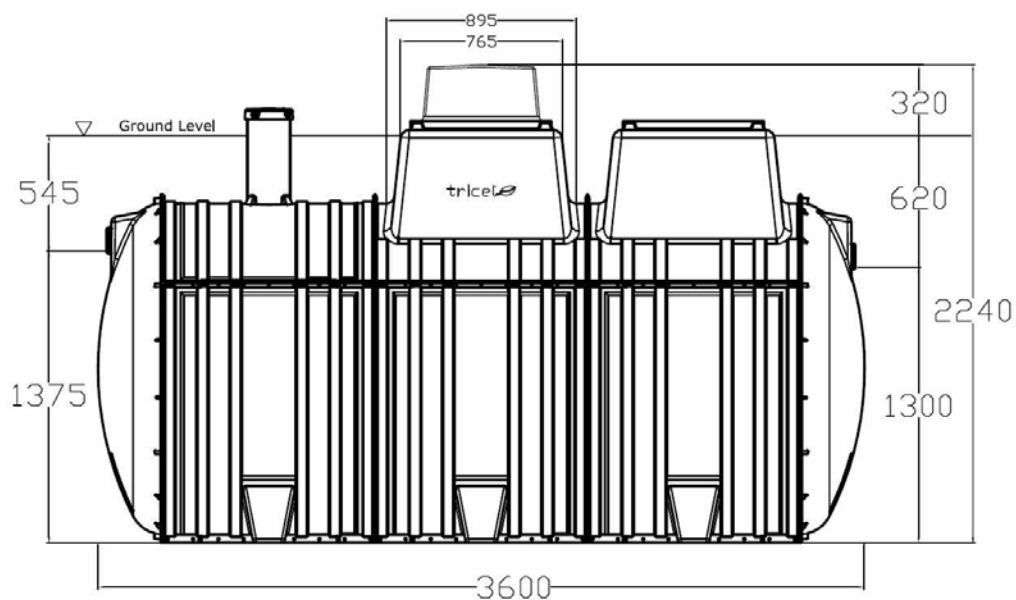
Tricel® IRL6 gravity system:



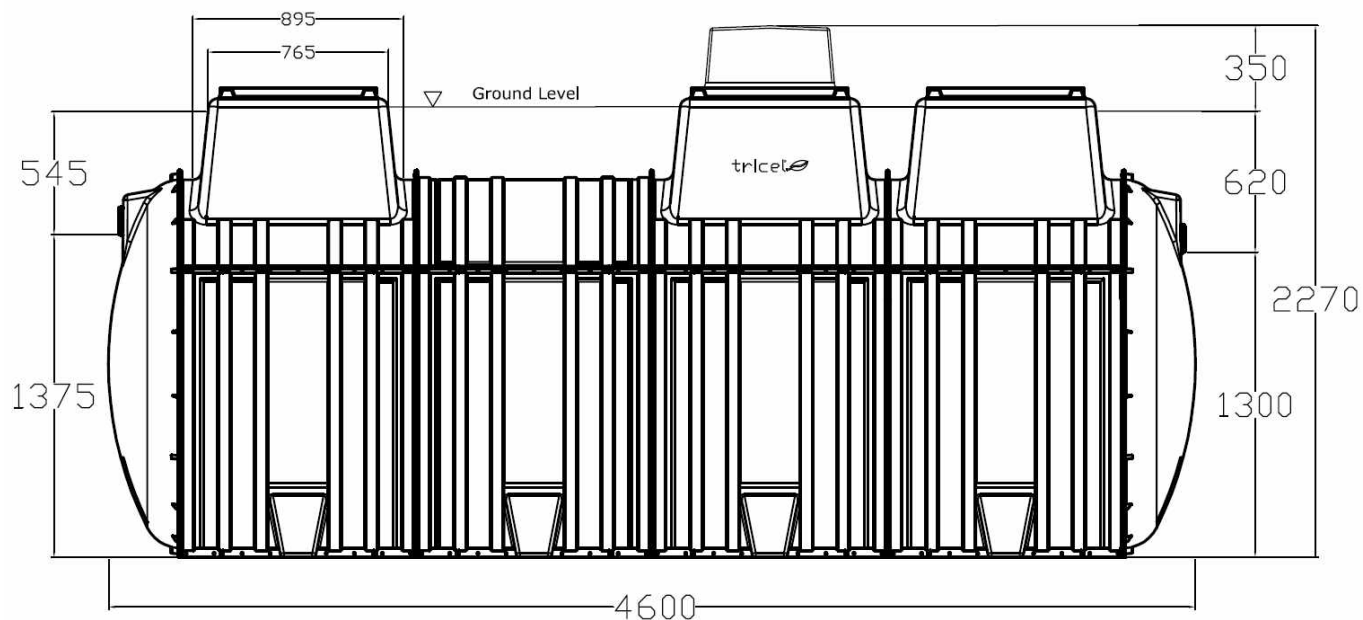
Tricel® IRL9 gravity system:



Tricel® IRL12 gravity system:



Tricel® IRL18 gravity system:



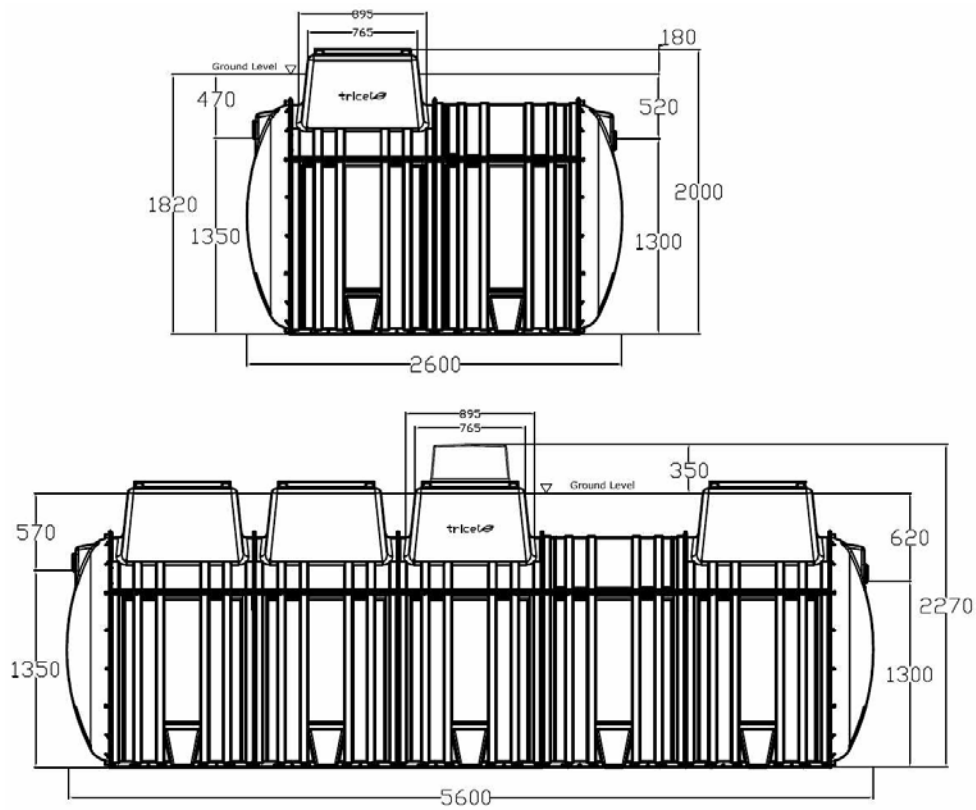
Technical drawing of the side elevation of the 'tricycle' bench. The drawing shows a long, low-profile bench with a metal frame and vertical slats. It features four large, white, trapezoidal backrests. Dimensions are provided in millimeters: total width 5600, total height 1350, and backrest height 570. A 'Ground Level' marker is shown. The brand name 'tricycle' is visible on the central backrest.

Technical drawing of the Tricel 1000 container showing dimensions and ground level. The drawing includes the following dimensions:

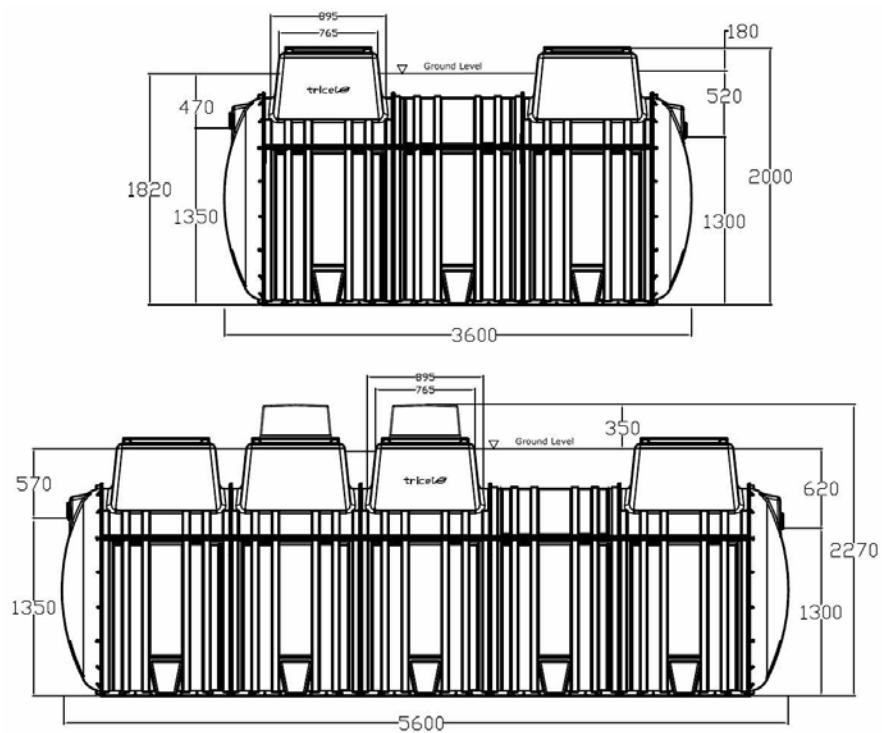
- Overall width: 6600
- Overall height: 1920
- Height from ground level to the top of the container: 570
- Height from ground level to the top of the container (alternative measurement): 1350
- Height from ground level to the top of the container (alternative measurement): 1300
- Height from ground level to the top of the container (alternative measurement): 2270
- Height from ground level to the top of the container (alternative measurement): 350
- Height from ground level to the top of the container (alternative measurement): 620
- Height from ground level to the top of the container (alternative measurement): 765
- Height from ground level to the top of the container (alternative measurement): 895

The drawing also indicates the ground level and the container's width.

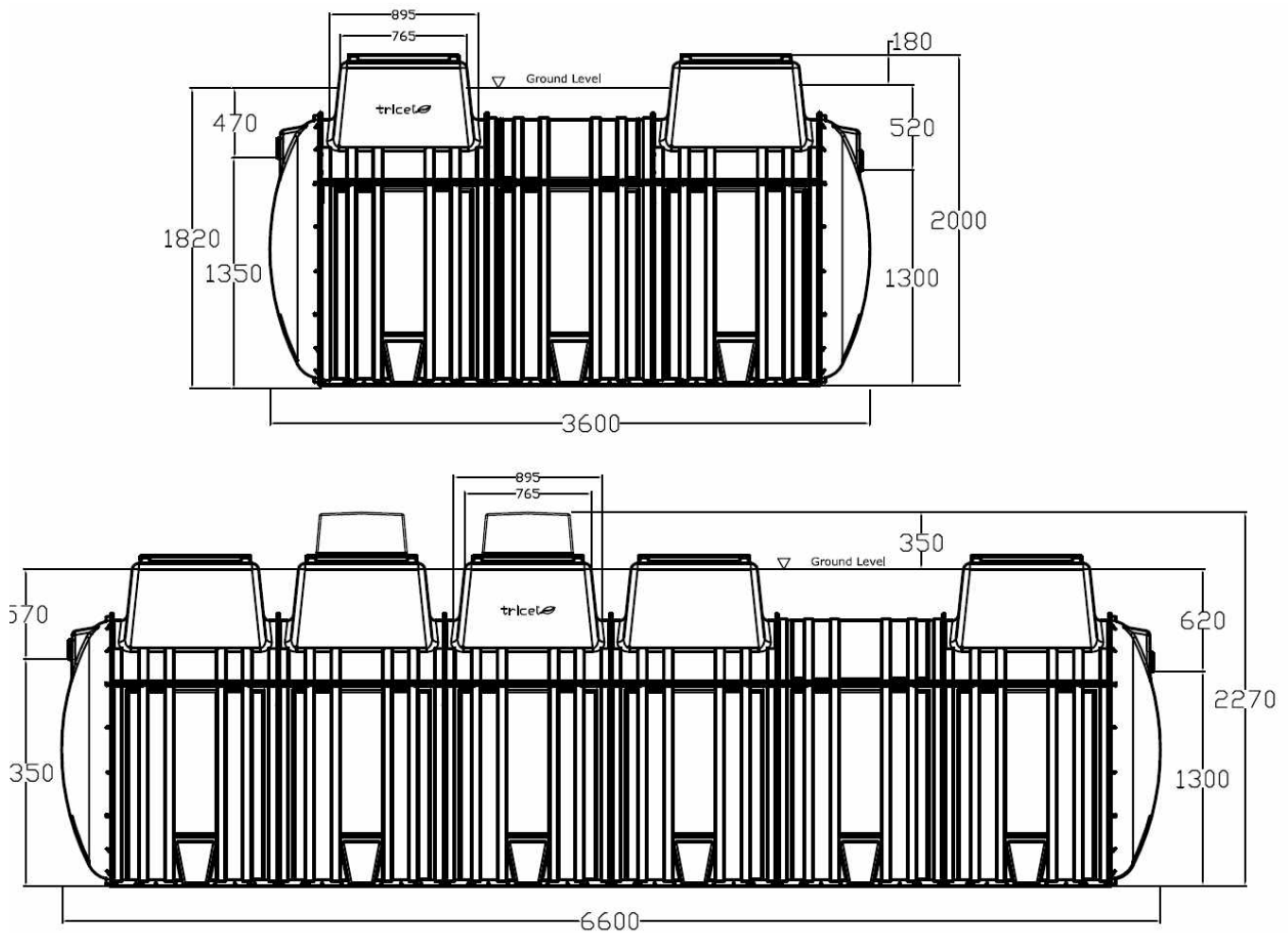
Tricel® IRL36 gravity system – 2 tank system:



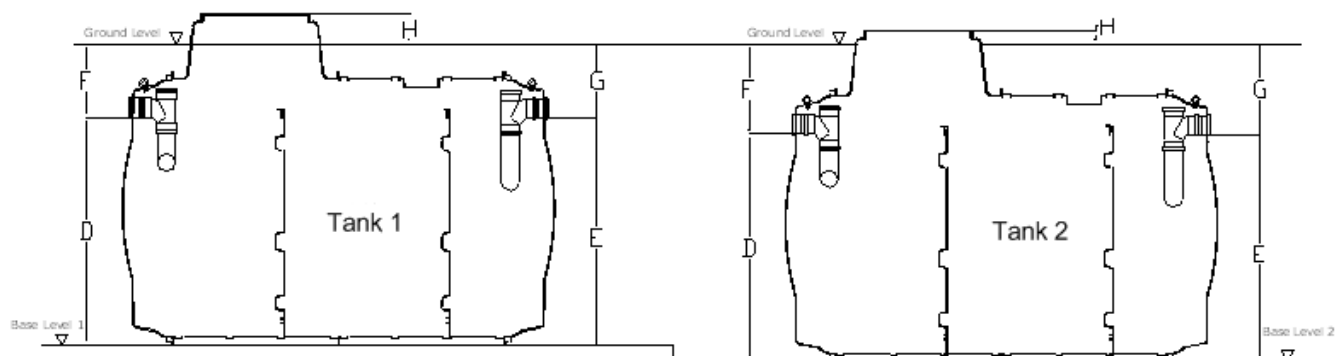
Tricel® IRL42 gravity system – 2 tank system:



Tricel® IRL50 gravity system 2 tank system:



Example of “stepped installation”.

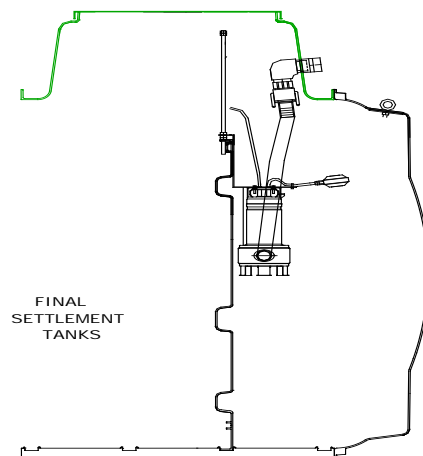


Technical drawing of Tricel® pumped system :

All systems are available as pumped options. The pump is housed in the final settlement chamber of each system. The standard sewage pump will pump to, a maximum distance of 80 meters at a “Head” of 4 meters above the ground level. Larger pump options are available to customer specifications.

Pump Specification

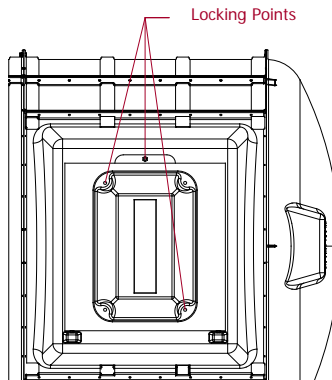
- Capacity: 40m³/hr
- Head 4m
- Distance pumped up to 80m
- Continuous duty with 35°C liquids & fully submerged
- Dry motor (class F insulation)
- IP68 protection
- Max immersion 5m
- Single phase 220-240 V 50 Hz 2 poles
- 0.55 to 1.1 kW for single phase
- Rp 1 ½” delivery port (female gas)
- Handles solids upto 35mm



Lid locking points:

All manholes should be locked for safety. Manholes are rated to 125kg and are for pedestrian use only. All maintenance work is done through these manholes. Electrical equipment is situated under the housing on top of these manholes.

Note: Tanks are supplied with 3 optional locking points, as seen above. It is strongly recommended that all these points be locked with a suitable locking device to prevent unauthorised access.



Manhole risers – (deep inverts):

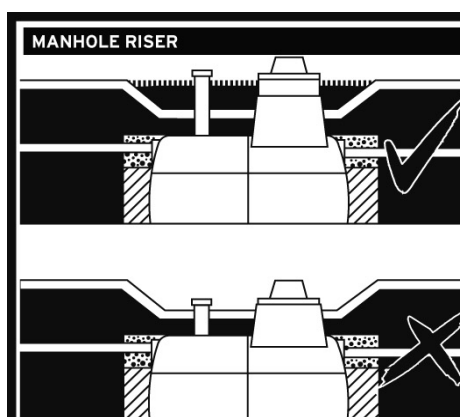
Manhole risers are available for deeper installation requirements

- **250mm** manhole risers require a standard installation.
- **500mm*** manhole risers require a **complete concrete** backfill – See notes on deeper tank installation and wet sites installation.
- **750mm*** manhole risers require a **complete concrete** backfill – See notes on deeper tank installation and wet sites installation.
- Never install the cover of the system under ground level.
- Never let groundwater enter the system.

Never place the covers of the tank below ground level.

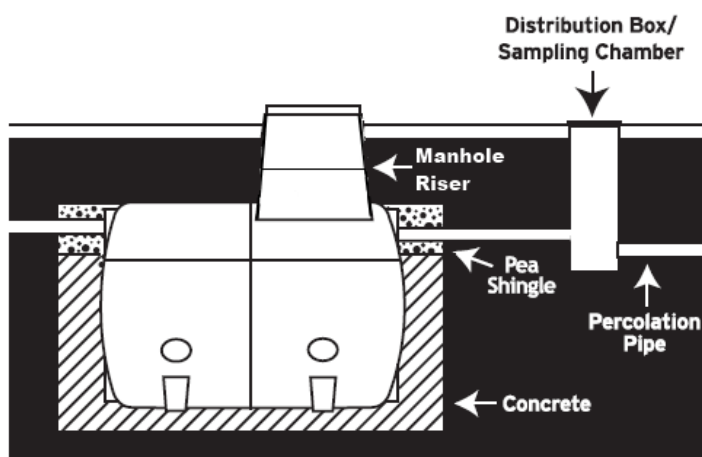
Do not allow ground water enter the system

Only a Tricel® manhole riser should be used



Manhole risers are available as standard
250mm
500mm
750mm

**Systems with a manhole riser of 500mm or 750mm must have a concrete surround. 500mm and 750mm risers cannot be retrofitted unless the correct base and backfill requirements are adhered to.*



Installation:



Pre –installation inspection:

- Tanks should be subject to a visual inspection prior to installation
- Check for, fractures to the shell or ribs, de laminations, scratches or abrasions deeper than 1.5mm.
- Any damage should be notified to the delivery driver and/or to your supplier
- Do not attempt to carry out any un-authorised repairs, as this will invalidate the warranty on the tank.
- Once the tank has been installed, we cannot accept claims for damage

Quick installation overview:

A **dry site** is one where the water table never rises higher than the base of the Tricel® unit.

A **wet Site** is one where the water table may rise higher than the base of the Tricel® unit.

The unit should never be installed where ground water can rise higher than the outlet pipe.

Guidelines	Dry Site	Wet Site
All installations must be “fit for purpose” to suit the on-site conditions, which will vary from site to site. This is the responsibility of the onsite contractor.	✓	✓
Never roll the tank. Tanks shall be lifted into position in accordance with supplier’s instructions.	✓	✓
The tank should be located as far away from the dwelling as is practically possible considering topography and pipe work levels. Separation distances must meet all National and Local regulations.	✓	✓
Dig a hole circa 500mm larger than the system in plan. Allow for manhole riser if using.	✓	✓
Remove any soft spots or boulders of significant size from the base or sides of the excavation.	✓	✓
Ground water must be pumped to give a dry excavation and excavation lined with polythene.		✓
A base is then formed using compacted gravel and this must be flat and level.	✓	
A base is constructed of a thin layer of compacted gravel covered with a 250mm layer of 25n semi dry concrete.		✓
Ensure gravel/concrete is clean and contains no large materials.	✓	✓
Lift tank into position and align as required for connecting pipe work, access shafts etc.	✓	✓
Ensure that the correct orientations are achieved of the system, which may contain 1 or more tanks.	✓	✓
Ensure that each tank is 100% level, and that inlet/outlets are in the correct orientations.	✓	✓
Secure anchor straps if required.	✓	✓
Connect any low-level pipe work, as required.	✓	✓
Ballast the tank with water.	✓	✓
Mount and seal any turret extensions.	✓	✓
Commence gravel backfilling in 300mm layers approximately up to 50mm over the cylindrical body of the tank, ensuring tank and any pipe work is properly supported.	✓	
Commence concrete backfilling in 300mm layers approximately up to the pipe work level, ensuring tank and any pipe work is properly supported.		✓
Continue backfilling with primary material up to 50mm over the cylindrical body of the tank		✓
Complete backfilling with topsoil up to the max ground level line. Ensure that surrounding finished ground level is never higher than the max ground level line.	✓	✓
Compaction should be by lightweight rollers or vibratory plate compactor until “traffic” depth has been achieved.	✓	✓
Compact evenly around the riser extensions to reduce risk of distortion.	✓	✓
Ensure that No surface loadings are transferred from the cover direct to the tank. Cover frame construction should allow movement.	✓	✓
An access chamber should be installed before and after the tank for sampling and to assist in clearing possible blockages	✓	✓
If sewage consists of high quantities of grease e.g. from a restaurant, a grease trap may have to be installed on a separate drain prior to the system.	✓	✓

Note: The option of a reinforced concrete slabs or deadman anchor may also be used on wet sites. This should be designed by an on-site structural engineer to suit site conditions.

Detailed installation information:

The system must be situated a minimum of 7m from the dwelling and as far away as practically possible considering topography and pipe work levels.

Control of groundwater

Tanks must not be subjected to buoyant forces during installation, taking account of ground water levels and surface water run-off, and their accumulation in the tank pit, even if tanks are anchored.

The excavation area should be adequately drained, to permanently remove ground water from the proximity of the tank (or tanks). This is critical in order to avoid flotation of the tanks. Incorrectly installed tanks that are subject to movement, rotation or floatation may become damaged, for which we cannot accept liability. Water should be removed as much as possible from around the tanks using piped drains.

Note: water logged sites

The Tricel system is not suitable to be used in water logged sites, where the ground water may rise above the outlet level. Please contact the supplier of the system if there are difficulties on site due to adverse water logging. Adequate drainage is important to improve wet sites, or sites with a high water table level. It is critical that water is removed from the area surrounding the system to prevent flotation, or ingress of water that could cause electrical failure within the system. Excessive loading caused by site water can harm the system, please consult with the manufacturer or a qualified engineer if in doubt.

Excavation size:

Suitably sized equipment will be required to excavate the hole and to crane the system into place.

Installation depends on on-site conditions, water, slopes, location etc. Excavation should be planned with due regard to health and safety requirements, and should be either shored or battered back to a “safe” angle. The excavation should allow a minimum 250mm clearance between the tank and the excavation wall or face of shoring. A minimum of 500mm is also required between adjacent tanks. Unstable ground with excessive sand, peat swamps etc may require larger excavations. The excavation should be maintained dry by pumping or whatever suitable means.

External dimensions: Dia in meters x length in meters

Total excavation: {Dia + 250mm} x {Length + 250mm}

Excavation depth: Allow 250mm for a tank base/plinth.

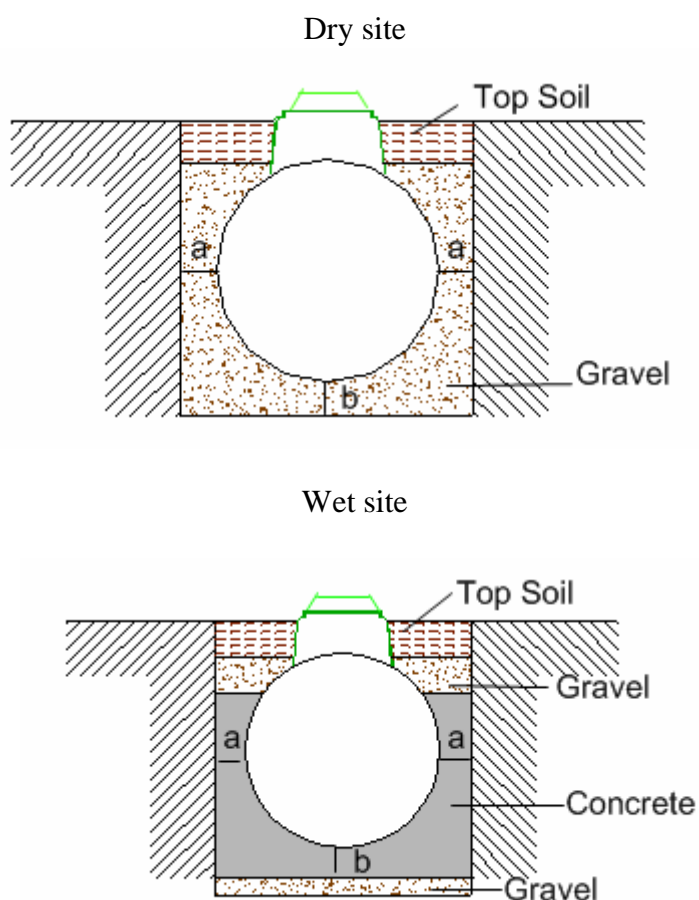


Tank Size	Excavation Size Tank A (m)	Excavation Size Tank B (m)
IRL6	3.1 x 2.15	N/A
IRL9	3.6 x 2.15	N/A
IRL12	4.1 x 2.15	N/A
IRL18	5.1 x 2.15	N/A
IRL24	6.1 x 2.15	N/A
IRL30	7.1 x 2.15	N/A
IRL36	3.1 x 2.15	6.1 x 2.15
IRL42	4.1 x 2.15	6.1 x 2.15
IRL50	4.1 x 2.15	7.1 x 2.15

Excavation depth:

The excavation depth is determined by the inlet and outlet pipe, invert levels relative to the bottom of the tank, and allowing for the minimum base thickness shown. Dimension details of the tank are shown on the relevant drawing, supplied with the system. Ground instability at formation level e.g. running sand may necessitate over-excavation and stabilisation with hardcore or blinding concrete.

NOTE: Check that the depth to the base slab is within the Service Specification requirements for the tank.



Tank Dia in mm	"a" minimum in mm	"b" minimum in mm
1650	250	250

Dry site installation :

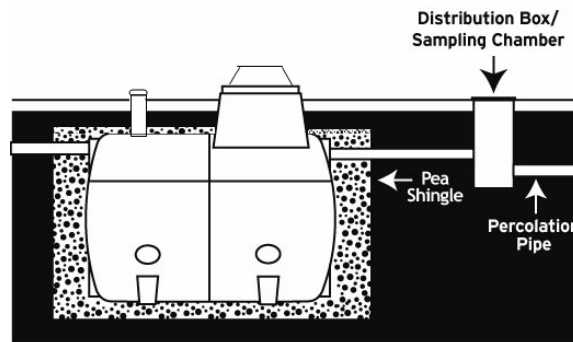
Tank base/plinth:

- Remove any soft spots or large stones and boulders.
- The base is constructed of compacted gravel (*please see below specification details for compacted gravel*).
- Ensure that base is level and ensure that correct orientations are determined to accommodate the incoming pipe work.

Installing onto the base/plinth:

- Lift the unit carefully into the hole and place on the prepared plinth
- The unit must sit dead level on the plinth
- The higher pipe on the tanks is to be connected to the inlet pipe work and the lower pipe on the tank is to be connected to the outlet pipe work. Connect and seal the pipe work to the tank, checking alignment to ensure there is an adequate fall for each pipe.
- Mount and seal manhole extensions (if used)

Backfilling dry site:



Refer to backfill specification appropriate for site conditions

- Fill each chamber of the unit with clean water to a depth of 300mm and recheck the pipe work levels. Commence backfilling evenly around the tank ensuring that there are no voids. Continue filling the chambers whilst backfilling, ensure that the progressive water level is no more than 300mm above the backfill level.
- Continue to backfill until material has reached 50mm over the cylindrical body of the tank.
- Complete backfilling with topsoil up to the max ground level line.

Deeper tank installation & wet site installation:

A concrete surround is required, where a tank is buried greater than 800mm from ground level to the top of the tank and where sites conditions are considered wet.

A wet site is one where the water table may rise higher than the base of the Tricel® unit.

The option of a reinforced concrete slab or deadman anchor may also be used. This should be designed by an on-site structural engineer to suit site conditions.

Concrete surround and plinth:

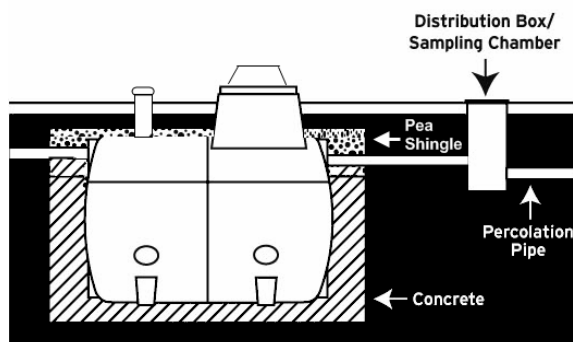
Tank base/plinth:

- Remove any soft spots or large stones and boulders.
- The base is constructed of a thin layer of compacted gravel, covered with a 250mm layer of semi dry concrete (*please see below specification details for compacted gravel and concrete plinths and surrounds*).
- Ensure that base is level and ensure that correct orientations are determined to accommodate the incoming pipe work.
- It is important to maintain a completely dry excavation until the final pour of concrete is set. It may be necessary to line the excavation with a continuous layer of 1200 gauge polythene to maintain the integrity of the concrete.

Installing onto the base/plinth:

- Lift the unit carefully into the hole and place on prepared plinth before the concrete sets
- The unit must be dead level on the plinth
- The higher pipe on the tanks is to be connected to the inlet pipe work and the lower pipe on the tank is to be connected to the downstream outlet pipe work. Connect and seal the pipe work to the tank, checking alignment to ensure there is an adequate fall for each pipe.
- Mount and seal manhole extensions (if used)

Backfilling a wet site:



Refer to backfill specification appropriate for site conditions

- Fill each chamber of the unit with clean water to a depth of 300mm and recheck the pipe work levels. Commence backfilling evenly around the tank ensuring that there are no voids. Continue filling the chambers whilst backfilling, ensure that the progressive water level is no more than 300mm above the backfill level.
- Backfill with concrete until it has reached the invert of the outlet pipe.

- Continue backfilling with stone until has reached 50mm over the cylindrical body of the tank.
- Complete backfilling with topsoil up to the max ground level line.

Concrete backfill specification:

Semi dry concrete 25n grade with a ratio of 4.5 aggregate to 1 cement.

Note: Standard concrete mixes should not be used, where sulphates or similar aggressive chemicals are present in the groundwater.

Lift height (rate of rise):

Determine the lift height (m), or rate of rise (m/h) for the specific concrete type used, to ensure that a design pressure (P max) of 15kN/m^2 on the tank is not exceeded.

Vibration:

The design of the tank assumes minimal compaction of the surrounding concrete. Where necessary, this may be extended to include light internal vibration. Never use deep revibration which will substantially increase the pressure on the tank, possibly causing failure.

Impact of concrete on discharge:

Under no circumstances should concrete be discharged directly onto the tank.

Gravel backfill specification:

Primary backfill specification:

Primary backfill material should be free-flowing granular material. Compaction should be by lightweight rollers or vibratory plate compactor until “traffic” depth has been achieved. Compact backfill evenly around the turret extensions to reduce risk of distortion. Tanks must be installed with Primary Backfill only within the region immediately surrounding the tanks. This Primary Backfill must extend a minimum of 250mm outward from the tank, and directly beneath the tank.

The following materials are approved as Primary Backfill:

Rounded pea gravel:

Minimum particle size 3mm, maximum 18 mm, compacted to a relative density of >70%. Gravel shall be clean and free flowing, free from large rocks, dirt, sand, roots, organic materials or debris. Upon screening analysis the backfill material shall have no more than 5% by weight passing 2.36 mm Sieve

Or

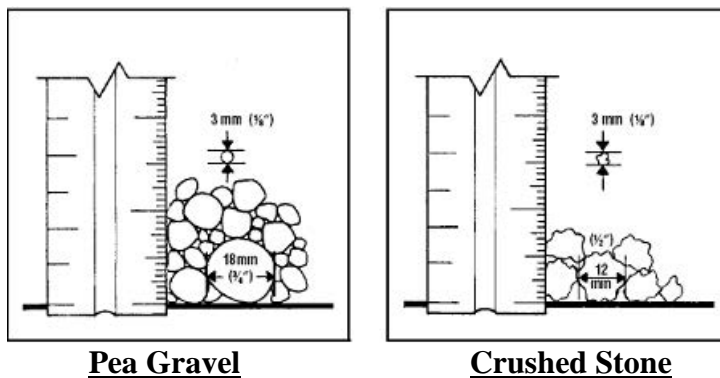
Crushed or processed stone:

Minimum particle size 3 mm, maximum 12 mm, compacted to a relative density of >40%

Dry Gravel density must be at least 1500 kg/m^3 . 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 2.36 mm Sieve

Use of other than specified backfill and bedding materials will void the tank warranty.

Backfill material shall not be frozen or contain lumps of frozen material at any time during placement.



Top soil:

Clean native top soil shall not contain rocks larger than 36mm on largest dimension.

Note: The use of geo textile 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 to prevent the movement of fine soil particles into the Primary Backfill material.

Burial depth:

Generally, the depth from finished ground level to the top crown of the main shell should be no more than 1 meter. This may vary dependant upon ground water conditions.

Loadings:

If the tank is installed in an area where traffic or other superimposed loadings can be applied, consult a structural engineer for the design of a reinforced concrete slab to prevent the load being transmitted to the tank (or its concrete surround). If this slab is constructed immediately above the tank, it should be separated from the concrete surrounding the tank by a compressible material. *Installation guidelines are available from Tricel® upon request.*



Electrical installation:

Notes:

Electrical installations vary from country to country. Please ensure that the system supplied complies with all local requirements.

The customers' minimum responsibility shall consist in the provision of:

- A single run of 1.5mm² 3 core (two conductors plus earth conductor) steel wire armoured (SWA) cable from the customer's distribution cabinet to the tank unit socket box.
- Cable protection via 10 amp MCB protected by (RCD), rated 230V, 30mA.
- The cable armour must be properly bonded to the main earth at the premises.
 - Never disconnect the power to the air pump. It is imperative that it is running 24 hours a day, every day.

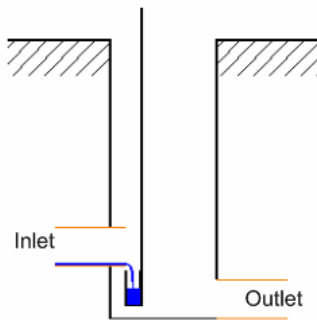
The relevant wiring (diagram to instruction) is supplied with each unit.

Plumbing the system:

Do not: Plumb storm-water (water) from roofs, drains, footpaths etc., into the Tricel® Wastewater treatment system. A competent person in accordance with this manual should connect the plumbing from the dwelling to the wastewater treatment system.

Sampling chamber:

Best practice indicates that a chamber be fitted after every unit to allow easy access for sampling purposes. The inlet of the chamber must be 150mm up from the base of the chamber to facilitate sampling cup.



Finishing the garden to ground level:

The finished ground level should be to the level indicated on the system.

Ventilation:

Ventilation is crucial to the system. The unit has a built in vent in the primary access cover. Further information is available from BS8301, BS6297, EPA Wastewater Treatment Manuals 1999.

Control housings:

Monitoring equipment, alarms, blowers or pumps if supplied, may be placed into separate control housing. These can be fitted with visual / audio / alarms along with other equipment. If so, a mains supply may be required. Only a qualified and competent person should attempt to do this wiring. This is not our responsibility. Only appointed personnel are allowed to hold a key this cabinet or kiosk. Mains must be

disconnected before maintaining the system. The tank & control housing should be fenced off in a lockable compound along with the Tricel® underground system.

Fencing (optional):

Once the system has been completely installed, we recommend that a suitable fenced area should be constructed to ensure that access is restricted to the system and/or cabinet / kiosk. Access must be restricted to suitable trained personnel only. Access for maintenance or de-sludging must be available. Local authority / government regulations must be adhered to in relation to fence specifications and design.

System start up:

Once installation, plumbing and the electrical installation are completed, the Tricel® is now operational. The system should already be filled with water during installation. If not, it should be filled before its first use. If the system is running correctly, a slight “hum” will be heard from the air blower and there will be air bubbles coming up from the bottom of the middle chamber, rising to the surface. The unit runs 24hours a day 7 days a week all year round for optimum purification. In periods of low occupancy the sludge return re-circulates the liquid in the system ensuring continuous performance. In periods of overload the sludge return system passes the liquid back into the primary so it passes through the aeration chamber again ensuring continuous performance. It may take up to 13 weeks for the biomass to become fully established and to reach optimum purification.

All units are fitted with an alarm, which will alert of irregularities in the system.

Disposal of treated water:

The Tricel® Sewage treatment plant discharges treated water to the required standards (20:30:20) or better once maintained and operated as per manufacturer guidelines. The best disposal method can depend on a variety of site factors. Refer to planning regulations applicable to your application.

Maintenance:

Precaution

Any maintenance carried out inside the tank represents a confined space. Therefore the maintenance person must be suitably trained to work in confined spaces. Sewage and sewage effluent can carry micro-organisms and gases harmful to human health. Any person carrying out maintenance on the system must be appropriately trained. Suitable protective clothing; including gloves, goggles should be worn at all times. Always remove contaminated clothing and protective equipment after completion of work. Wash hands and face prior to eating, drinking or smoking.

A certain amount of system maintenance is required, on an ongoing basis to ensure that the system is working correctly. This is the responsibility of the homeowner.

3 - monthly maintenance:

There are two vents on the Tricel®. The vent under the blower housing, guarantees a fresh supply of air to the system through the blower. The vent under the de-sludging cover allows gas to escape and stops the tank from becoming pressurised. The vents should be checked to make sure they are not blocked or obscured by overgrown grass.

Yearly maintenance:

The inlet and outlet should be inspected and rodded to remove any chance of blockages. The Tricel® system will require a full service (available from your supplier) every year to guarantee the efficiency of the system is maintained.

Yearly service (available from your supplier)

During routine servicing contracts the following items are checked:

Sludge return	Functionality of blower and / or pump
Pump pressures	Pump filters are replaced
Pump Diaphragm checked	Alarm checked
Ventilation function tested	Diffuser monitored to check for dispersion of air
Tricel® Covers and locks inspected	

Production of sludge:

When the sludge is occupying 50% of the volume of the primary chamber de-sludging is required. This is when the sludge is 700mm deep.

Approximate de-sludging periods are shown in the table on page 6. The de-sludging of the Tricel® system is the responsibility of the homeowner. The Tricel® system has a separate 180mm de-sludging access, the smaller of the two covers. De-sludging is done with a vacuum tanker (we recommend the use of a licensed company).

De-sludging (emptying the solid waste from chamber 1 the primary chamber)

- Remove the de-sludging access cover.
- Empty the Tricel® system using the vacuum tanker. Care must be taken not to damage the Tricel® system with the hose of the vacuum tanker.
- Replace the de-sludging access cover securely.

Notes:

- Do not allow this equipment drive over the system. Maintain a distance of at least 4 meters away from the covers on the Tricel® wastewater treatment system.
- The access cover should never be left off while the unit is unattended.
- De-sludging should never be carried out alone.

The property owner has a legal responsibility to ensure that the system does not cause pollution, a health hazard or nuisance.

Operating conditions:

- The manufacturers instructions outlined in the technical manuals must be followed at all times. A service contract does not remove this responsibility from the customer / homeowner.
- It is important that the unit is operated under the conditions for which it is designed. Any variation in these conditions could lead to the unit not performing to its full potential and the discharge may not meet the required standards.
- The end user of the wastewater treatment system is responsible for the operation of the unit and for ensuring that the quality of the effluent does not breach the required discharge standards.
- De-sludging is a critical part of the successful operation of the Tricel® Wastewater treatment system and is the responsibility of the customer. Only competent approved personnel should carry out de-sludging. De-sludging must be carried out yearly, however the system should be inspected regularly to check the depth of sludge in the primary chamber. If desludging is required it should be done as soon as possible.
- If the electrical connection fails to the air blower in the system, the system will not function correctly. It is imperative that a continuous air supply, via the air blower, enters the system in order for the system to function correctly.
- The discharge to the ground is also a critical part of the operation of the system. Correctly constructed distribution chambers and distribution drains or polishing filters are necessary as part of the treatment process. Incorrectly constructed drains or polishing filters could result in poor treatment of effluent and the manufacturer does not accept any responsibility in this regard.
- If the system is not installed correctly, flooding, overloading, electrical shock or floatation may occur. We are not responsible for incorrectly installed systems.
- Soak ways, drains and the emptying of primary chamber remains the responsibility of the client. Damage to the installation due to the influx of surface water or the backing up of soak ways or drains is not covered by the manufacturer.
- The manufacturer shall not be liable for any damage or loss, including consequential loss, caused by the failure of any plumbing equipment or failure caused by the inclusion of gross solids, (e.g. – disposable diapers or sanitary towels etc) in the wastewater treatment unit.
- To ensure the continuance of the systems performance, the user has to take certain precautions including the following:
 - The design loading of the plant should not be exceeded.
 - High volume discharges such, as those from swimming pools and Jacuzzi's must never enter the system.
 - Surface water must not enter the system.
 - Do not allow large quantities of chemicals to enter the system including:
 - Water softener regenerate.
 - Disinfectants.
 - Strong Acids and Alkalis, or Photographic Chemicals.
 - Oil or Grease.
 - Petrol or diesel.
 - Pesticides.
 - Large quantities of milk, alcohol or food.
 - Large quantities of bleaches or cleaners
 - Baby wipes
 - Sanitary towels
 - Kitchen paper

- Nappies
- Medication

- Service personnel must be accommodated with clear access to the system.
- If others size the system, we will supply a system to these specifications and not it's own specifications. In this case, the responsibility lies with others, in relation to the maximum flow / litres per day, the system capacity and retention times.
- If we size the system, and a greater load is placed on the system by the addition of extra houses, bedrooms in the houses, schools, crèche etc or by any other means, we are not responsible for the system in terms of overloading or the quality of the effluent as the retention times may be compromised.
- Should the system be used intermittently or if extended periods of non-use are expected, it is recommended that the system remain on and in operation. The contents of the system should not be allowed to go septic due to non-use.
- The unit is not suitable for vehicular traffic. We also recommend fencing off the area to prevent livestock herds from accessing the system. Where possible, unnecessary human traffic around the system should be avoided.

Terms & conditions


Subject to our standard terms and conditions, which are available on request.

Certification:

The Tricel® Wastewater treatment systems have successfully passed the stringent European testing and are now approved to the new European standard EN 12566-3 Small wastewater treatment systems for up to 50 PT-Part 3: Packaged and/ or site assembled domestic wastewater treatment plants.

Tricel® Wastewater treatment systems were placed through a rigorous 38-week test, by the certified laboratory PIA GmbH-Testing Institute for wastewater technology in Aachen, Germany www.pia-gmbh.com. Results received from the biological tests carried out in Aachen on the Tricel® system shows a treatment efficiency of 95.8% for BOD₅ and 95.2% for SS.

Tricel® passed all structural testing (crush test & durability test) carried out by PIA staff. Watertightness tests were performed by PIA at our headquarters on the range of tanks up to P50 successfully passed all of the required tests.

	
Tricel[®]	
I.S. EN 12566-3	
Packaged domestic wastewater treatment plant for treatment of domestic wastewater	
Product's reference code: “Tricel IRL6-IRL50”	
Material: GRP	
Effectiveness of treatment:	
Treatment efficiency ratios	BOD5: 95.8 % SS: 95.2 %
Nominal organic daily load (BOD5)	See table
Nominal hydraulic daily flow (<i>Q</i>_N)	See table
Water tightness:	Pass
Crushing resistance:	Pass
Durability	Pass

Tank	BOD ₅	QN
IRL6	0.36 kg/d	1.2 m ³ /d
IRL9	0.54 kg/d	1.8 m ³ /d
IRL12	0.72 kg/d	2.4 m ³ /d
IRL18	1.08 kg/d	3.6 m ³ /d
IRL24	1.44 kg/d	4.8 m ³ /d
IRL30	1.8 kg/d	6.0 m ³ /d
IRL36	2.2 kg/d	7.2 m ³ /d
IRL42	2.52 kg/d	8.4 m ³ /d
IRL50	3.0 kg/d	10.0 m ³ /d



Troubleshooting :

The number of Tricel® systems, when properly installed, experiencing any problem will be extremely small. All units are fitted with an alarm, which will alert of irregularities in the system. If the blower or pump stops working a buzzer will sound to indicate there is a problem with the unit. The buzzer can be muted until the problem is fixed. Once fixed, the alarm will reset automatically and the mute switch should be turned on. All electrical work shall be carried out by a qualified person.

Symptom	Possible causes	Corrective action
Blower/Pump won't start or run	Blown Fuse Tripped Breaker Low line voltage Defective Blower/Pump	Replace with fuse of proper size Reset Breaker If voltage under recommended minimum, check size of wiring from main switch on property. If OK contact, power company. Replace Blower/Pump
Blower operates but delivers no air	Low Line voltage Filter blocked Diaphragm Broken Defective Blower	If voltage under recommended minimum, check size of wiring from main switch on property. If OK contact, power company. Replace Filter Replace diaphragm Replace blower
Pump operates but delivers no water	Low Line voltage Something caught in impellers Delivery hose blocked Defective Pump	If voltage under recommended minimum, check size of wiring from main switch on property. If OK contact, power company. Clean out impellers or replace pump Find blockage and remove or replace damaged hose Replace Pump
Blowers runs intermittently	Thermal overload tripped	Protect installation from Sun. Air supply vent blocked, clean if necessary Filter blocked, replace if necessary Discharge hose blocked or kinked, remove obstruction
Pump runs intermittently	Thermal overload tripped	Check for clogged impeller The Pump has run dry so add water. Ensure the pump is plugged out before you attempt to unclog it.
System fills above working water level	Subsurface disposal system clogged Storm water flooding Pump not working Discharge hose/pipe blocked	Contact installer to repair sub surface disposal system/ Percolation area. Redirect storm water drains. Storm water must never enter the system Check pump is functioning properly as above Find blockage and remove or replace damaged hose/pipe
Alarm is sounding but the pump and blower are working	Air return pipe to the alarm not returning an air signal. Electrical fault.	Check that the air pipe is not damaged or bent. Ensure there is air blowing through this pipe. Check that the pipe is inserted to the alarm correctly. Get a qualified person to check that the alarm is installed correctly.

Please Note:

Before taking any corrective action, always positively identify the real source of the odour. Check if the odour is coming from another outside source such as a storm drain. All wastewater disposal systems vent gases back through soil pipe and out roof vents. Improperly installed roof vents can cause odour problems. Traps in drains prevent odours from entering the home. To function they must contain water and be sealed correctly.

Symptom	Possible causes	Corrective action
Effluent odour directly outside the house or inside the house	Pipe connections to toilets / drains not connected correctly.	Check that the traps / U - bends in the drains are fitted and the joints sealed
	Air vent on pipe work not fitted or fitted incorrectly	Ensure all effluent pipes are vented correct, vents are normally fitted to all pipes and they should be higher than the eave of the roof.
	Pipe work is damaged or blocked or fitted incorrectly	Inspect pipe work to ensure it is undamaged and clear of obstructions or sagging
Bad effluent odour directly over the tank	Pipe work to or from the tank is blocked	Check the level of liquid in the tank. Ensure the pipes are not blocked and are fitted correctly to the tank. Ensure Pumps are working properly if applicable.
	Chemical kill of bacteria	If symptom persists for 48 hours or more, remove all liquid and replace with clean water.
	No air delivery	Check blower is functioning properly
	Hydraulic/Organic Overloading	Reduce flow and/or organic load
	Tank vent blocked	Clear tank vents

In accordance with our normal policy of product development, this specification is subject to change without notice. July 2012



www.tricel.co.uk

www.tricel.ie

www.tricelstationdepuration.com