

recycled water
a valuable
resource



DOMESTIC SYSTEM
INFORMATION BOOKLET

UltraClear

WASTEWATER TREATMENT SYSTEMS

Looking for a Safe Wastewater Solution?

- Maintaining proven efficiency
- Main baffle extended to lid to prevent cross contamination of chambers
- Large contact chamber
- Dual aeration chambers to prevent short circuiting
- Large self cleaning pump chamber
- Larger pump cycle for extended pump life & greater irrigation cover
- Specifically designed media pack
- Long life irrigation pump
- Energy efficient air blower
- Battery back up alarm with 24 hour mute reset
- Fully automatic operation
- Nitrogen reduction
- Quiet operation

Quality Systems

Concrete Tanks & Baffles

Advanced Technology

Results Proven Under Test

Single Tank Systems

Commercial Systems

Nitrogen Removal

excellence in
wastewater treatment technology

FRECALL 1800 049 911

www.ultraclear.com.au

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MANUFACTURER OF AERATED
WASTEWATER TREATMENT SYSTEMS
NSWHD Accreditation
No. 0011, No. 0019, No. 0020
StandardsMark Licence No. SMK2224

Ultra Clear Model ST10 NSWHD Accreditation No. 0020

Concrete single tank system for up to 10 persons

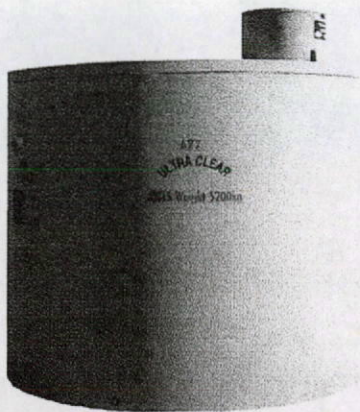
Liquid Volume Capacity 6,576 litres

Tank Capacity 7,300 litres

ST10 has a measurement of 550mm from bottom of inlet to top of lid

Specifications

- * 7315 litre collection well
- * 3006 litre primary treatment chamber
- * 2 x 1273 litre aeration chambers containing one media pack and two air diffusers each
- * 433 litre settling chamber
- * 591 litre irrigation pump chamber
- * chlorine disinfection unit
- * XP80 air blower
- * 10 metre head submersible irrigation pump



Commercial Systems

Specifically designed for your on-site requirements.

Ultra Clear commercial systems are installed at convention & community centres, pre-schools, wineries, industrial areas, caravan parks & camping grounds, etc.

Ultra Clear Model ST8 NSWHD Accreditation No. 0019

Concrete single tank system for up to 8 persons

Liquid Volume Capacity 5,563 litres

Tank Capacity 6,230 litres

ST8 has a measurement of 780mm from bottom of inlet to top of lid

Specifications

- * 6230 litre collection well
- * 2552 litre primary treatment chamber
- * 2 x 1053 litre aeration chambers containing one media pack and two air diffusers each
- * 384 litre settling chamber
- * 521 litre irrigation pump chamber
- * chlorine disinfection unit
- * XP80 air blower
- * 10 metre head submersible irrigation pump

The System

Ultra Clear domestic systems have been designed to meet the NSW Health Department Guidelines. All systems were tested at the AWTS Manufacturers Association Ltd test site located at the Moss Vale Sewer Plant, with testing program monitored by JAS/ANZ accredited company SAI Global (previously QAS). Testing in this Southern Highlands site provided extreme temperature ranges during testing, from less than -1° Celsius to over 30° Celsius, ensuring the systems function in all climates, unlike other systems that have been tested only in warm climates.

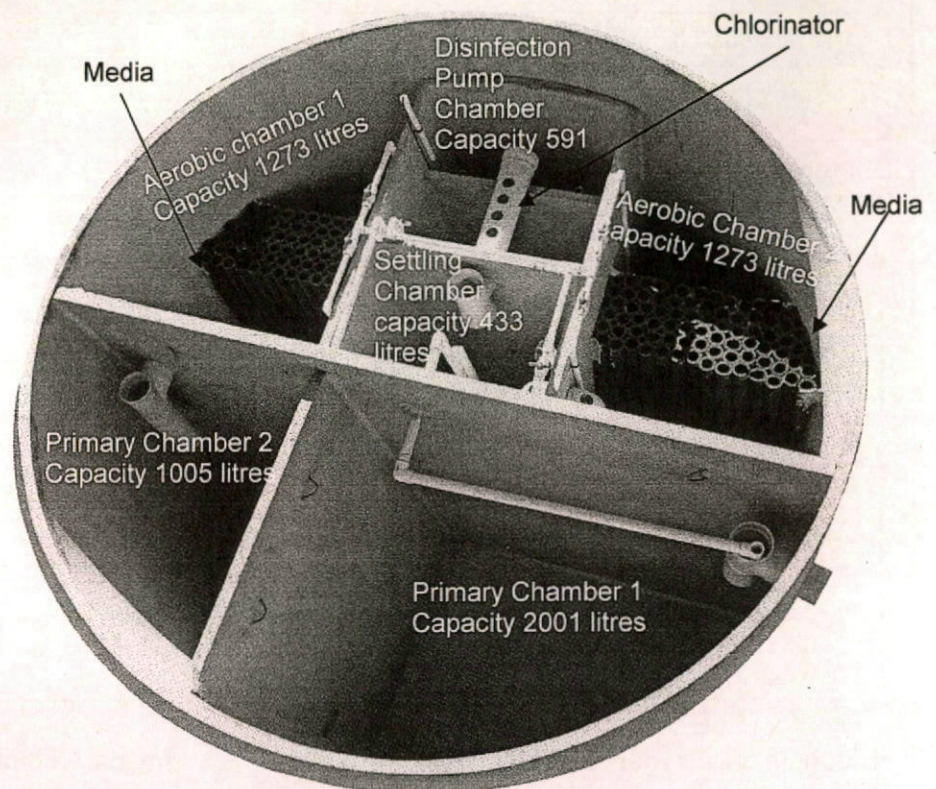
An average of over 1,600 litres per day of raw sewage, with BOD of between 200 and 300 mg/L, was pumped through the system during testing of Model Ultra 10. The average daily loading of raw sewage during testing was 1,600 litres for Model ST8 and 2,000 litres for ST10. The average BOD for the single tanks was 183.3 mg/L. The minimum BOD influent required by NSWHD is 150 mg/L.

All Ultra Clear systems consistently achieved far in excess of the required results during testing. Ultra Clear has been proven to remove over 98% of suspended solids, with removal of harmful micro organisms. Ultra Clear was able to achieve these results, whilst maintaining a low chlorine residual, reducing the impact on your environment. This ensures that the water irrigated onto your property is clear and safe.

Ultra Clear systems have been designed by Darryl Rebbeck, a consultant in the manufacturing industry, who has had over 18 years experience in the maintenance industry and has a full knowledge of the operation of most types of aerated systems. The systems have been designed for efficient maintenance and servicing by providing easy and full access to all chambers for complete maintenance. This enables the system to function at optimum efficiency at all times.

The single tank systems have inlets of 550mm for Model ST10 and 780mm for Model ST8, which allow for a greater fall to the tank from the house, for easier installation and also decreasing the need for risers.

Ultra Clear systems are manufactured using concrete tanks and baffles manufactured by Highland Tanks Pty Ltd trading as Highland Concrete Tanks, at 16 Gantry Place, Braemar, to comply with Australian Standards to AS/NZS 1546.1:2008. NSW Health Department Certificate of Accreditation No. CofA 005-20582 and StandardsMark Licence SMKB20582.



The Test Results

Model ST10 – 10 person single tank system

CHARACTERISTIC	NSWHD maximum permitted	ST10 test average
* BOD 5	20 mg/L	6.60 mg/L
* Faecal Coliforms	30 cfu/ml	median – 0 cfu/100ml
* Suspended Solids	30 mg/L	3.98 mg/L
* Free Residual Chlorine	0.2 – 2.0 mg/L	0.43 mg/L
	NSWHD minimum requirement	
* Dissolved Oxygen	2 mg/L	5.50 mg/L

Model ST8 – 8 person single tank system

CHARACTERISTIC	NSWHD maximum permitted	ST8 test average
* BOD 5	20 mg/L	6.52 mg/L
* Faecal Coliforms	30 cfu/ml	median – 0 cfu/100ml
* Suspended Solids	30 mg/L	2.42 mg/L
* Free Residual Chlorine	0.2 – 2.0 mg/L	0.85 mg/L
	NSWHD minimum requirement	
* Dissolved Oxygen	2 mg/L	5.96 mg/L

•Biochemical Oxygen Demand (BOD)

BOD measures the amount of organic matter in effluent. The lower the test result the cleaner the water.

•Suspended Solids

Suspended solids measure solid particles in the water.

•Free Residual Chlorine

Measures the amount of free chlorine remaining in the water prior to irrigation. The lower the reading, with a low faecal coliform reading, the more efficient the system.

•Faecal Coliforms

Faecal coliforms measure the amount of harmful pathogens in the water. Ultra Clear achieved almost total elimination of harmful pathogens with an average reading of 0.1 cfu/ml. The lower the reading, the clearer and cleaner the irrigated water.

•Dissolved Oxygen

Measures the amount of oxygen diffused into the water by the air pump. The higher the reading, the more efficient the method of air diffusion.

*BEFORE PURCHASING A SYSTEM ASK TO SEE THE TEST RESULTS
to ensure you are choosing a system that has been proven to deliver superior results*

REDUCTION IN NITROGEN LEVELS

MODEL ST10 achieved a 57.9% reduction of Total N (TN) concentration

MODEL ST8 achieved a 66.2% reduction of Total N (TN) concentration

Reduction in Nitrogen Levels for Environmentally Sensitive Areas

During the testing of the Ultra Clear AWTs the treated effluent was tested for total N (TN) concentrations. The treatment process has the capacity to reduce the total N concentration as follows, as certified by NSW Health on our Certificate of Accreditation.

Ultra Clear Model ST10

Total N concentration from an average of 53.44 mg/l to an average of 22.5 mg/l which represents a reduction of 57.9%

Ultra Clear Model ST8

Total N concentration from an average of 53.44 mg/l to an average of 18.08 mg/l which represents a reduction of 66.2%

How the system operates

Primary Treatment

All waste water and solids from house, including bath, shower, toilet, washing machine, dishwasher, etc., enter primary chamber where the digestion process takes place. The presence of anaerobic micro organisms quickly multiplies to break down faecal solids to an inert waste. To maintain the highest level of anaerobic action in the primary chamber, the exclusion of certain chemical and anti-bacterial cleaning products is important.

Aerobic Treatment

The aerobic treatment consists of two chambers with media pack fixed below water level. Oxygen is supplied to the liquid through diffusers to produce an aerobic state. Microbes quickly form and attach to media pack. These microbes, called aerobes, clean the water as it passes through.

Disinfection

Although clear, the clarified water will contain some pathogens which need to be removed. Water flows through a regulated chlorination device to the retention chamber, removing final bacteria before flowing into the pump chamber.

Surge Control

There is an allowance for water to rise and fall throughout the entire system by up to 250 litres, to reduce water surging through the aeration/settling chambers, allowing complete treatment of effluent.

Settling Chamber

Suspended solids are allowed to settle under still conditions. Settled particles (referred to as sludge) return automatically to primary chamber inlet, by venturi device, which is set by the service technician.

Sludge Return

The settling sludge in the sedimentation chamber is returned to the primary inlet of the septic chamber.

Effluent Disposal

Treated effluent is automatically pumped onto gardens and lawns. Disposal area is to comply with local Council requirements.

Operation

When all drainage and electrical supply is connected to the unit by licensed contractors, the system is commissioned by our service technician — 7 days notice is usually required. Landscaping must be completed by the owner to comply with local council requirements. The system operates automatically. It does not need any additives to produce an anaerobic or aerobic state. Any adjustments to the system should be carried out by authorised technicians.

General

Power consumption to run system is similar to an average household refrigerator.

Intended Use

Model ST10 is intended for the treatment of all domestic wastewater for up to 10 persons per household. All household wastewater is recycled by treatment using anaerobic and aerobic bacteria, with a final disinfection agent. Safe, clean, treated effluent is irrigated onto lawn and gardens, according to government regulations.

Product Usage

Aerated systems, like all sewage treatment/disposal systems are biological, if a product destroys bacteria in the house, it will also destroy the bacteria needed for the sewage treatment. So it is important to avoid products with bleaches and ammonia entering the system.

Servicing Requirements

The systems must be serviced every 3 months as required by NSWHD and local Councils.

The Advanced Multi Stage Process

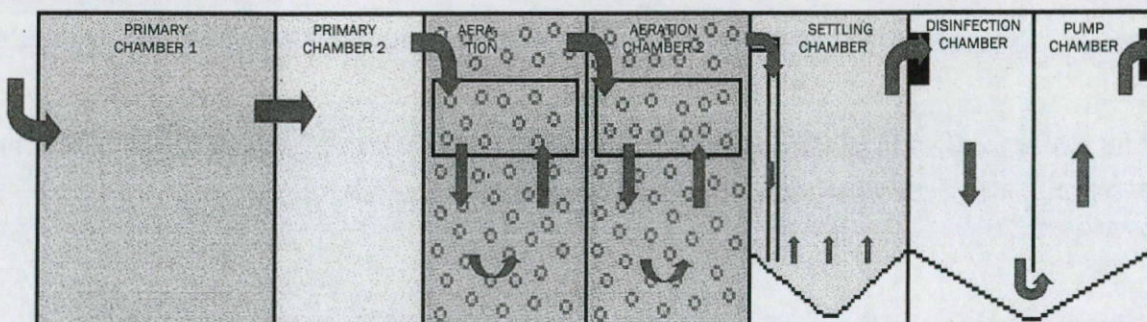
January 2013

Waste water from the house enters the 1st Primary Chamber.

Stage 2
Further breakdown of solids.

Stage 4
Additional purification takes place in Aeration Chamber 2.

Stage 6
Water flows through chlorination device for final disinfection.



Stage 7
The now treated water enters the Pump Chamber, prior to automatically irrigating your lawns & gardens.

Stage 1
The presence of micro organisms multiplies breaking down organic solids to an inert waste.

Stage 3
Water enters Aeration Chamber 1 where it is oxygenated & purified by aerobic bacteria as it passes through the media modules.

Stage 5
Water enters settling chamber. Settled sediment is returned to Primary Chamber 1.

Ultra Clear Wastewater Treatment Systems

Model ST10
Model ST8

WARRANTY

SYSTEM

15 YEARS

Including tanks and internal concrete components, other than mechanical and electrical parts as specified below, all labour and materials to be supplied free of cost by the manufacturer during warranty period
-warranty commencing on installation date

ALL MECHANICAL AND ELECTRICAL PARTS

2 YEARS

Including air blower, irrigation pump, control box, alarm panel and internal pipework
-warranty commencing on installation date

NOTE: This warranty is subject to a continuous service agreement being held with Ultra Clear Wastewater Treatment Systems or authorised agents, to ensure proper maintenance of the system. Also subject to installation in accordance with our Plumber's & Electrical Installation Manuals.

STATEMENT OF SERVICE LIFE

All fittings, fasteners and components of the Ultra Clear AWTS other than pumps and motors and electrical are of non-corroding material and designed to function reliably with a MINIMUM SERVICE LIFE OF 15 YEARS.

All mechanical and electrical parts have a MINIMUM SERVICE LIFE OF 5 YEARS.

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Health

Certificate of Accreditation

Aerated Wastewater Treatment System

This Certificate of Accreditation is hereby issued by the Director-General of the NSW Ministry of Health pursuant to Clause 41(1) of the Local Government (General) Regulation 2005.

System: Ultra Clear model ST10 AWTS

Manufacturer: Highland Tanks Pty Ltd

Trading as Ultra Clear Wastewater Treatment Systems

Of: 16 Gantry Place, Braemar, NSW, 2575

This is to certify that the Ultra Clear model ST10 AWTS as described in Schedule 1, has been accredited as a sewage management facility for use in a single domestic premises in NSW. This accreditation is subject to the conditions of accreditation and permitted uses specified in Schedule 2, and in accordance with the Sewage Management Facility Accreditation Guideline, May 2005.

*Director, Environmental Health Branch
for Director-General (delegation PH335)*

Date of Issue: 20 June 2013

Certificate No: AWTS 020

This Certificate of Accreditation is in force until 31 December 2016



Health

Certificate of Accreditation

Septic Tanks & Collection Wells

This Certificate of Accreditation is hereby issued by the Director-General of the NSW Department of Health pursuant to Clause 41(1) of the Local Government (General) Regulation 2005.

Manufacturer: Highland Tanks Pty Ltd

Trading as: Highland Concrete Tanks

Of: 16 Gantry Place, Braemar, NSW, 2575

This is to certify that the septic tanks and collection wells, as described in the attached Schedule, have been accredited as a sewage management facility for use in single domestic premises in NSW. The septic tanks and collection wells are manufactured to the Australian/New Zealand Standard AS/NZS 1546.1:2008 – On-site domestic wastewater treatment units – Septic Tanks.

*A/Director, Environmental Health Branch
for Director-General (delegation PH335)*

Date of Issue: 2 October 2012

Certificate No: 005-20582

This Certificate of Accreditation is in force until 31 December 2015

Schedule 1: Specification

Ultra Clear model ST10 Aerated Wastewater Treatment System

General Description

The Ultra Clear model ST10 Aerated Wastewater Treatment System (AWTS) is designed to treat the wastewater from a residential dwelling occupied by a maximum of 10 persons. The Ultra Clear model ST10 AWTS is contained in a single vertical axis type cylindrical precast concrete collection well with a design capacity of 7300 litres. The operational water level in the system is 1530 mm. The system consists of:

- A primary sedimentation chamber with a total capacity of 3006 litres;
- Two aeration chambers with a total capacity of 2546 litres and containing two packs of BTM200 Bio Tube with a volume of .25 m³ and a total surface area of 100 m²;
- A settling chamber with a capacity of 433 litres;
- An irrigation pump chamber with a total capacity of 591 litres including a minimum of 405 litres designated as a disinfection contact volume;
- A chlorine disinfection unit installed on the outlet of the settling chamber;
- Air is supplied to the aeration chambers by a Hiblow HP-80 air pump producing air at a nominal rate of 80 litres/minute;
- A 10 metre head submersible irrigation pump with automatic pump controls.



Health

Accreditation Schedule

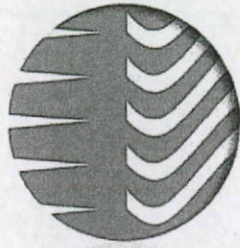
The Certificate of Accreditation applies to the following septic tanks and collection wells.

Model	Description	Size
Septic Tank	Vertical axis cylindrical precast steel fibre reinforced concrete, with partition, lid, access cover.	3300 L 4300 L
	Tank lid burial depth is restricted to 0 mm	4500 L
Collection Well	Vertical axis cylindrical precast steel fibre reinforced concrete tank, with lid and access covers.	4500 L 7500 L
	Certification applies only to the construction of the tank, lid and access covers. It does not include the internal fittings or partitions.	7300 L 7800 L 8800 L 10000 L
	Tank lid burial depth is restricted to 0 mm	2500 L (Clearwater)
Combined Septic Tank and Collection Well (7800 L)	Vertical axis cylindrical precast steel fibre reinforced concrete tank, with lid and access covers.	2450 L S/T 5100 L C/W
	Certification applies only to the construction of the tank, lid and access covers. It does not include the internal fittings or partitions.	2550 L S/T 5000 L C/W
	Tank lid burial depth is restricted to 0 mm	3000 L S/T 4550 L C/W

Date of Issue: 2 October 2012

Certificate No: 005-20582

This Certificate of Accreditation is in force until 31 December 2015



STANDARDSMARK LICENCE

SAI Global hereby grants:

Highland Tanks Pty Ltd

16 Gantry Place, Braemar, NSW 2575, Australia

StandardsMark Licence

Manufactured to:

AS/NZS 1546.3:2001 - On-site domestic wastewater treatment units -Aerated wastewater treatment systems

& AS/NZS 1546.3:2008 - On-site domestic wastewater treatment units - Aerated wastewater treatment systems

"the StandardsMark Licensee" the right to use the STANDARDSMARK as shown below only in respect of the goods described and detailed in the Schedule which are produced by the Licensee or on behalf of the Licensee* and which comply with the appropriate Standard referred to above as from time to time amended. The Licence is granted subject to the rules governing the use of the STANDARDSMARK and the Terms and Conditions for certification and licence. The Licensee covenants to comply with all the Rules and Terms and Conditions.

Certificate No:SMK02224

Issued: 15 April 2013

Expires: 26 November 2015

Originally Certified: 27 November 2000

Current Certification: 15 April 2013

Paul Butcher
Global Head – Assurance Services

Samer Chaouk
Head of Policy, Risk and Certification



WWW.JAS-ANZ.ORG/REGISTER

* For details of manufacture, refer to the licensee

The STANDARDSMARK is a registered certification trademark of SAI Global Limited (A.C.N. 050 644 642) and is issued under licence by SAI Global Certification Services Pty Limited (ACN 108 716 669) ("SAI Global") 286 Sussex Street, Sydney NSW 2000, GPO Box 5420 Sydney NSW 2001. This certificate remains the property of SAI Global and must be returned to SAI Global upon its request. Refer to www.saiglobal.com, for the list of product models.



ELECTRICAL INSTALLATION MANUAL

UltraClear WASTE WATER TREATMENT SYSTEMS

MODELS - ST10, ST8 & Commercial Systems

ELECTRICAL CIRCUIT SPECIFICATIONS ULTRA CLEAR AWTS

IMPORTANT: This manual must be given to your electrical contractor with the control box and the alarm panel.

The Ultra Clear AWTS warranty will be void if these Specifications are not adhered to.

The power source circuit is to be connected to a dedicated single phase plus earth circuit, protected by a 16 amp MINIMUM circuit breaker of 8Ka or greater type suitable for motor start, such as Weber/Martec As168 type or Clipsal "U" type; and marked as **ULTRA CLEAR**. Minimum cable size 2.5mm. Connected to and run from an EXTERNAL building switchboard.

The alarm panel is a low voltage device (12 volt) that decodes a data signal from the main control box at the treatment tank. A two conductor cable with a minimum cross sectional area of 0.8mm per conductor is required to inter-connect the two. It is normal practice to use 1mm squared twin TPS if the alarm plate conductor is in the same conduit as the power feed. The two conductors are not polarity conscious, and may be connected any way around.

There is a battery located in the control box which must be connected **AFTER** the alarm plate is terminated. The warranty will be void if the alarm plate is not terminated before the battery is connected in the control box.

The alarm panel has three LEDs. **Under normal operating conditions, the green power led will light.** If power supply to the treatment system fails, the power led will flash on briefly every 3 seconds, and the alarm will give a brief beep in sequence with the power led. This beep can be muted for 24 hours.

NOTE: Electrical work must be carried out in accordance with A.S. 3000 and Supply Authority Rules. A "Notification of electrical work" certificate must be lodged with the Supply Authority for your wiring.

Continuous running current is 0.6 amp with a maximum intermittent current up to 3.1 amps (dependent upon submersible pump size).

WARNING: Water resistant control box IP55. Power supply to be made on external points of control box only. The intrusion of control box will void warranty.

HIGHLAND TANKS PTY LTD

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Phone: 0448 898 286 or 02 4889 8288 Fax 02 4889 8566

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UCEIM 75
Revision 3
01/06/2013

Ultra Clear

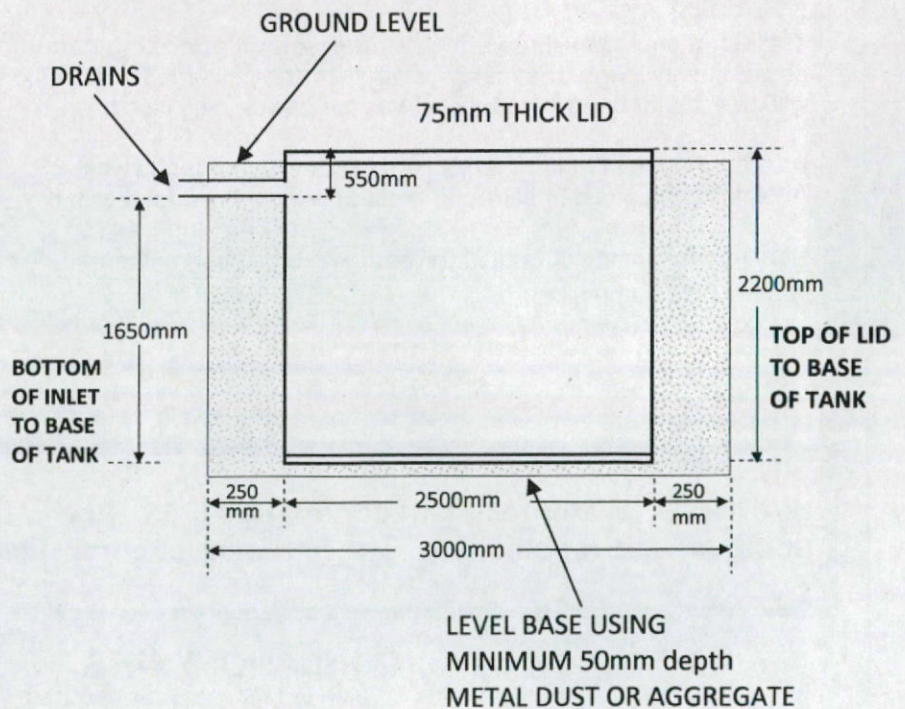
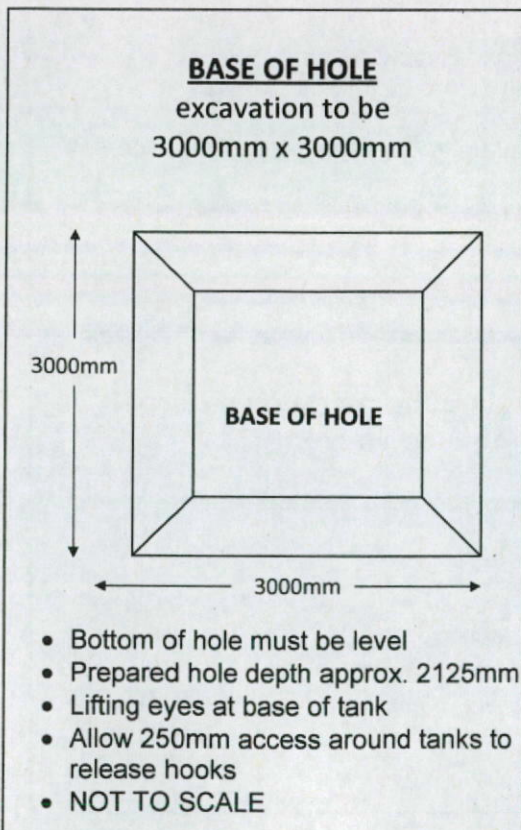
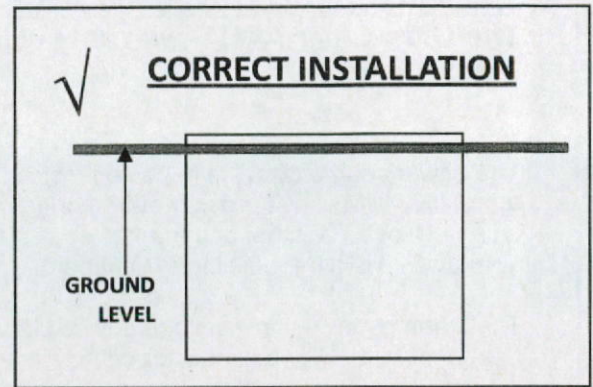
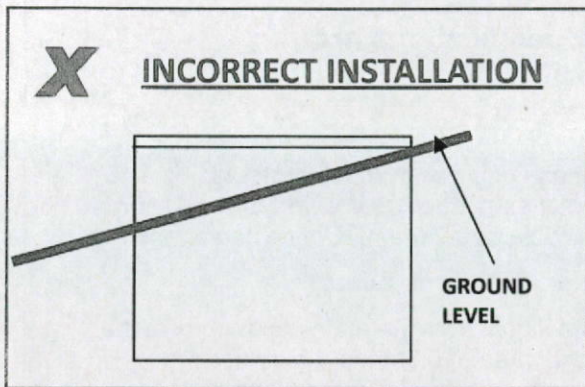
WASTE WATER TREATMENT SYSTEMS

HIGHLAND TANKS PTY LTD.
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MODEL ST10

10 person single tank system

HOLE EXCAVATION



Ultra Clear

WASTE WATER TREATMENT SYSTEMS

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MODEL ST10

10 person single tank system

PLUMBER'S INSTALLATION MANUAL

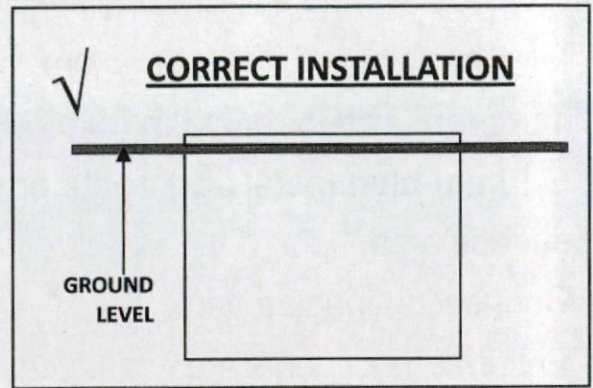
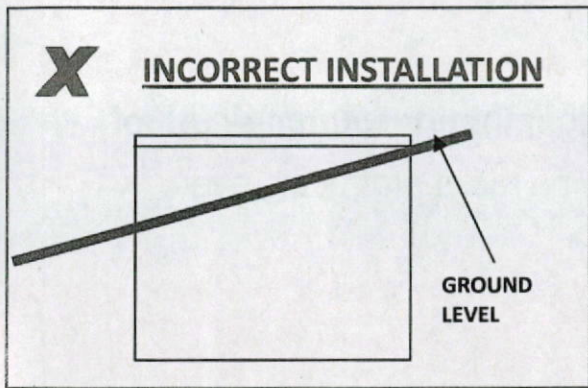
1. Excavation of hole to drawing specifications, allowing 50-100mm above ground level as shown. Lid depth 75mm.
2. **Tank must be installed in hole on level base using minimum 50mm depth of 5-10mm blue metal aggregate or metal dust, with no rocks protruding over surface area.**
3. Connect drainage to tank.
4. Ensure E duct vents are constructed.
5. Backfill tank.
6. Half fill tank with water to prevent lifting of tank.
7. It is the plumber's or owner's responsibility to provide all weather access for delivery truck to the excavated hole. **Ensure access is free of power lines and overhanging trees.**
8. Location of tank – avoid storm water run off areas.
9. When backfilling tank ensure no large rocks enter hole. Any damage to tanks, e.g. large rocks or machinery damage, during backfilling, is the responsibility of the contractor and/or owner.
10. **Tank must be backfilled to a minimum 200mm from top of lid around the entire tank.**
11. Any damage to tanks due to incorrect installation is the responsibility of the contractor and/or owner and is not covered by warranty.

Ultra Clear WASTE WATER TREATMENT SYSTEMS

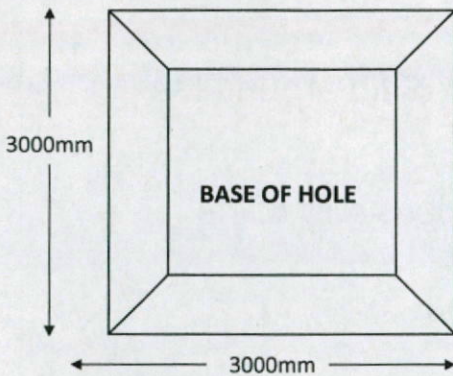
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MODEL ST10 10 person single tank system

HOLE EXCAVATION



BASE OF HOLE
excavation to be
3000mm x 3000mm



- Bottom of hole must be level
- Prepared hole depth approx. 2125mm
- Lifting eyes at base of tank
- Allow 250mm access around tanks to release hooks
- NOT TO SCALE

