



OASIS CLEARWATER RETROFIT

(RETROFIT AEROBIC WASTEWATER TREATMENT SYSTEM)

TECHNICAL SPECIFICATION

8 Persons Domestic Situation

1,600 litres maximum intermittent loading per day

COMPLIANCE:

N.Z. TP 58 Approval – 3rd Edition

AUS/NZS 1547 : 2000 – On Site Domestic Waste Water

AUS/NZS 1546S/1998 – Septic Tank Manufacture

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SECTION ONE

SYSTEM PRINCIPLE

The principle of the system we use is not an AWTS (aerated waste water treatment system) which is a general term for any system with air entrained into the unit. Our system principle is a SAFE system (submerged aeration filtered effluent). A major advantage of the SAFE system is its unique ability to handle significant fluctuations in flow and loading without upsetting the performance of the system.

The system consists of a vessel packed with a media which provides a high surface area to volume ratio. The media is submerged in the liquid. Air diffusers below the media provide circulation of the waste to be treated by the media and provide oxygen to the liquid.

Consequently the bacteria, unlike conventional activated sludge suspended growth systems (AWTS) grow on the media. If the loading conditions in the SAFE system vary, the microbial mass will adjust to these conditions. Unlike a conventional active sludge system, the excess mass is not lost in the effluent, but remains in the system attached to the media.

SYSTEM ENGINEERING

WHY THIS TECHNOLOGY IS SO EFFECTIVE

- This system is installed after an adequately sized septic chamber with a Zabel filter fitted, feeding to a secondary treatment chamber. Liquid flows into the aeration chamber, where with the use of our exclusive fine air diffuser assembly, thousands of tiny air bubbles provide oxygen for the aerobic digestion and mix the contents of the aeration chamber.
- Waste water is introduced to the clarification chamber by hydraulic dispersement, where settled sludge material is transferred back to the pre-treatment to further enhance treatment. Further biological and mechanical filtration occurs by the use of the revolutionary **ZABEL A600** high performance clarifying filter, prior to final pump or discharge chamber.
- The system is complete with a high quality alarm for system malfunction.

The Oasis Clearwater SAFE Retrofit Treatment System is divided into three principal chambers.

[a] Aeration Chamber

The System incorporates the use of a 100 litre/minute air pump which feeds directly to our exclusive "*Bacteria Buddy*" diffuser assembly which produces thousands of tiny air bubbles for the aerobic digestion and mixing of the contents of the aeration chamber. This particular form of aeration is the most preferred of all aeration used in the USA.

[b] Clarification Chamber

The clarification chamber incorporates a highly efficient Zabel disc dam filter clarifier in a zone where beneficial bacteria thrive. Activated sludge is also drawn from this chamber and via a venture action is fed back to the primary pre-treatment chamber.

[c] Pumpwell Chamber

The separate pumpwell has a capacity of 1,000 litres and is capable of receiving various sized pumps depending on output requirements.

SECTION TWO

TECHNICAL SPECIFICATIONS

- Primary Pre-Treatment Chamber prior to SAFE Retrofit System minimum capacity required 3,300 litres
- Aeration Chamber 2,000 litres
- Clarifier included in aeration chamber 70 litres
- Pumpwell 1,000 litres
- Total Operating Capacity 3,000 litres
(excludes primary chamber)
- Control Panel - Audio & Visual Alarm
- Purifying Aerator 80 Watts
(Normal Operation = 24 hrs)
- Irrigation Pump 600 Watts
(Normal Operation – 0.5-1hr/day)
- Tank Construction - All Concrete
- Tank Dimensions:
 - Height 2300 mm
 - Diameter 1700 mm
 - Weight 2.8 tonnes
- Maximum Rated Capacity = 8 Persons Domestic Situation.
1,600 litres Hydraulic Flow per Day.

SECTION THREE

SYSTEM PERFORMANCE DETAILS

1. Expected Performance Figures
 - a. BOD after 5 days <20mg/l
 - b. Suspended solids (SS) <30mg/l
 - c. Faecal coliforms <1000/100ml@ 300mm below point of discharge

2. Minimum Hydraulic Loads
 - a. Average / capita flows 150 to 220 litres
 - b. Maximum / capita flow / 2 hrs 70 litres
 - c. Max. instantaneous flow rate / capita 12.5 litres/minute

3. Minimum Biological Loads (Influent)
 - a. Average daily per capita 5 day BOD 65g
 - b. Average daily per capita total suspended solids 65g
 - c. Average daily per capita total nitrogen 15g
 - d. Average daily per capita total phosphorus 2.5g approx.

4. Wetted surface area of chamber 80m²

5. Disinfection options UV

6. Noise level 35 d/BA

7. Alarm monitoring system Yes

8. Single or Three phase Single

SECTION FOUR

SYSTEM CONSTRUCTION

1. TANK

Oasis Clearwater concrete tanks are made of pre-cast concrete, 35mpa strength, with reinforcing mesh for strength and durability. The tank lids are pre-cast. The lids are able to support a live load of 250kg over an area of 0.5m². The lid is separate but sealed to the tank with epoxy grout, as are all internal walls. This prevents the escape of gases and ingress of ground water.

Oasis Clearwater Systems are the only manufacturer to offer a tank of one piece continuous pour construction, offering the strongest system available. This is done by pouring the whole system upside down, the internal core being removed on stripping, with the complete construction then being rotated with base settling on ground. The system is externally vibrated during the pouring process with externally mounted wacker vibrators.

2. CONCRETE

Oasis Clearwater 's concrete manufacture complies with NZS 3104 relating to special grades, plant and testing.

Concrete used in the manufacture of the system consists of 350kg of cement per cubic metre, 12mm aggregate and 80 slump. This results in 35 mpa strength at 28 days/

Tank wall thickness	=	80mm
Tank roof thickness	=	90mm
Tank base thickness	=	100mm

3. STEEL MESH

Steel reinforcement mesh consists of 338 mesh, is centrally located in accordance with AUZ/NZS 1546 and is supported with plastic bar chairs. All mesh overlaps at a rate of 2 times mesh pitch. The tank roof incorporates 665 steel mesh.

SECTION FIVE

SYSTEM COMPONENTRY

[a] LINEAR AIR PUMP

A Yasunaga LP 80 or equivalent diaphragm blower is used as standard equipment on the Oasis Clearwater Series 2000 System. The linear diaphragm mechanism is low in noise and vibration - features which are essential for small scale domestic and commercial aerobic treatment systems.

Operating Principle

The pump operates on a linear movement principle. The connecting rod, with magnets bonded to it, oscillates within an electromagnetic coil. Twin diaphragms are mounted on each end of the connecting rod and provide the pumping action inside twin chambers. The result is air flow of high volume relative to the size of the pump.

Model	Nominal Capacity L/min	Power Watts	Current AMPS	Rated Pressure kPa	Noise level (dB)-2m
LP80	80	80	1.26	18	40

[b] IRRIGATION PUMP

The D42AB pump or equivalent is a multi-purpose submersible pump manufactured of high quality components, including all stainless steel and glassed filled polycarbonate.

Special Features

- Twin glassed filled polycarbonate impellers for high pressure as required with pressure compensated driplines.
- Double mechanical seal, one in oil bath.
- Cast stainless steel and polycarbonate pump housing/casing for outstanding corrosion resistance and long life.

NOTE: The model of pump *may* vary depending on elevation and head requirements.

[c] CONTROL PANEL

The electrical control panel is designed to perform the following tasks:

1. The high water level alarm will sound if the water level is set off by the hi-level float switch mounted in the pump out chamber. This would indicate the submersible pump is not operating or irrigation filter is blocked.
2. The air pressure alarm will sound if the air pump stops functioning. The audible alarm control panel is usually mounted near the mains switchboard in laundry or garage.

Field Isolator

To comply with supply authorities requirements all Oasis Clearwater Series 2000 Systems incorporate a field isolator switch.

Wiring Circuit

Provide a 230 volt AC 2.5 TPS dedicated supply from mains board supply to the Oasis Clearwater 2000 Treatment System.

Provide a 1.5 - 2 core cable from the alarm unit.

POLYLOK/ZABEL FILTER

Oasis Clearwater Systems are the only manufacturer in New Zealand to install the **Zabel A100** commercial and residential filter in their aerated system. While the unit adds considerable cost to the overall unit, we are committed to achieving the highest possible treatment level in respect of BOD and suspended solids [refer to Technical Information at back of Specification details].

SECTION SIX

EFFLUENT DISPOSAL / IRRIGATION SYSTEM

Due to the high quality of treated effluent, various disposal systems are available, depending on engineer design and specifications.

There is however, a tendency to install subsurface or ground cover trickle irrigation for the following reasons:

1. No requirement to chlorinate or UV treat.
2. Final treatment is achieved in the top soil. Where a subsurface trickle irrigation is recommended, Oasis Clearwater incorporates proprietary pressure compensated, non-drain, effluent dripline.

Description

The effluent dripline is a low volume drip-line with integral and evenly spaced pressure compensating emitters at specified intervals.

The emitters have the ability to independently regulate discharge rates with an inlet pressure of 50 - 350 kpa (8 - 50 psi) at a constant flow of 2.35 litres/hour. Non-drain capability to 15 kpa

To complete the satisfactory operation of the system, a filter and various valves for flushing, vacuum release and non leakage are required as part of the complete system.

Each system requires to be engineer designed with consideration to the following:

1. Hydraulic flow (daily)
2. Site elevation and topography
3. Soil percolation

SECTION SEVEN

COMPANY PROFILE

Oasis Clearwater Systems manufactures and distributes a range of wastewater treatment systems throughout New Zealand.

The Company has over 30 years practical experience in the field of wastewater and associated environmental pumping industry.

The Company has built up a world wide association with some of the leading authorities and manufacturers of equipment in this industry.

The Company is a duly incorporated company which was established in March of 1992.

Oasis Clearwater Systems has technical personnel and distributors based in strategic locations throughout New Zealand. We offer a full range of services.

- Design and construction
- Maintenance programmes
- Domestic and commercial applications

To ensure ongoing quality, our products are manufactured, assembled and fitted out at our own concrete product manufacturing plant.