KiwiTreat

Eco Wastewater Treatment System

For Individual Households.

Producer Statement

Designed and Built in New Zealand
by

KiwiTreat Ltd

Horrelville.
RD1.
Rangiora
Phone: 03 3125787
Fax: 03 3125780

Organic Load.

The strength of the wastewater from a house is calculated in terms of grams per day of BOD_5.
The design figure is 560 grams per day, and is derived from the industry-accepted figure of 70 grams of BOD_5 per person per day.

The septic tank reduces the organic load by acting as a primary sedimentation tank and an anaerobic digester. The reduction allowance is 30% of organic strength. This results in a BOD_5 to be treated by the aerobic module of 392 grams per day.

Process Description.

The sewage treatment plant is an activated sludge type, incorporating a measured batch discharge, and with an in-plant surge capacity of 1700 litres.

The initial component of the plant is a septic tank that acts as a primary settling tank and solids digester.

A chamber where aerobic treatment occurs follows this. During the aeration phase, activated sludge is pumped back to the septic tank to enhanced the treatment process.

The treated wastewater then passes through a clarifier to the pump station, where it is then pumped to the disposal area through a large sediment filter, when sufficient volume is available for discharge.

Septic Tank.

The primary treatment is achieved by the utilisation of a septic tank upstream of the aerobic module.
A Reln two-chamber 3200 litre septic tank is used, with a primary chamber working volume of 2130 litres, and a secondary chamber working volume of 830 litres.
The Reln tank carries the AS/NZ Standard 1546:1-1998 Lic. 1651, and is manufactured by Reln, a Quality Endorsed Company (AS/NZS ISO9001:2000 QEC 5189)

Most of the insoluble waste remains within the primary chamber. The liquid fraction and small volume solids pass through to the secondary (anoxic) chamber, where

Aeration.

The activated sludge tank supplies controlled aeration for 24 hours each day.

This process promotes denitrification and hence stable biomass and suitable pH in the mixed liquor of the aeration tank.

More than 2.4 grams of oxygen per gram of BOD_5 is provided to the system through a venturi. This is the chosen method of aeration, for the following reasons:

1. It supplies large volumes of air in relation to the energy input.
2. It operates without creating a buildup of bacteria around the air discharge area.
3. It aerates to the full depth of the tank, and therefore treats the total volume of the liquid in the aeration chamber.
4. It has the ability to be shut down at specified times for further de-nitrification to take place, which helps promote stable biomass and suitable pH.
5. The venturi system does not require any maintenance or servicing.

The air for the venturi is sourced from outside the tank, so only fresh air is made available for the process.

Clarifier.

A 810-litre clarifier chamber is part of the activated sludge system.
The purpose of this chamber is to assist in the removal of suspended solids before the treated liquid reaches the pump chamber for disposal.
The chamber also controls surging to ensure that the wastewater is properly treated before further downstream processing.

Discharge Quality.

Treatment quality of the resultant liquid is recognised to be of paramount importance.
The system is designed to meet the following standards:

1. BOD5 – not greater than 20mg/litre
2. Suspended solids – not greater than 30mg/litre.
3. Faecal coliforms – not more than 30cfu/100 mls, when disinfected.
4. Free chlorine – not less than 0.5mg/litre, when chlorinated.

Servicing.

Servicing of the system is recommended at six monthly intervals

Home Away

This system can switch to a slow processing mode which is an advantageous is holiday situations when the house is not being used.

File Ref: U060081

Case Officer: Jenny Keene

ISO 9002
Form Ref CI 521

30 June 2006

S88 RMA 1991
More info letter

Abacus Design
PO Box 309
Blenheim

Dear Sir,

Receipt of application for resource consent - U060081 - Ericson, Francis Milton - 55 Hope Drive Okiwi Bay Croisilles Harbour

The Council acknowledges receipt of the following application for resource consent:

To discharge domestic wastewater to land on Lot 1 DP 7465 and Sec 1 SO 15624.

I have received the soil and site assessment, and design report. To complete processing I need the type and specifications of the secondary treatment plant.

The application will remain on hold under Section 88 of the Resource Management Act until this is received.

Yours faithfully

Jenny Keene
RESOURCE MANAGEMENT OFFICER

File Ref: U060081

Case Officer: Opus

ISO 9002
Form Ref CI 521

12 May 2006

S88 RMA 1991
More info letter

Ericson, Francis Milton
55 Hope Drive
RD 3
Okiwi Bay
RAI VALLEY 7156

Dear Mr Ericson,

Receipt of application for resource consent - U060081 - Ericson, Francis Milton - 55 Hope Drive Okiwi Bay Croisilles Harbour

This application has been returned from Opus to Council to process. My name is Jenny Keene and I am the processing officer. I am writing this letter to clarify the current status of your septic system, and review Council requirements.

As you are aware, the septic system which was installed in 2001 did not have the required building consent and as such was not legally established. This system does not therefore have the existing system exclusion contained within Plan Change 7 of the Marlborough Sounds Resource Management Plan. In short, the house does not have a legal septic system, and a resource consent is required under the current rules. Under these current rules, specific design guidelines must be met. I believe Rebecca Beals (Opus) has previously advised you of this situation, but as I am now the processing officer I wanted to ensure we are on the same page.

I believe that Gus Laird (Opus) has provided you with a list of accredited providers who can assist applicants with meeting discharge application design guidelines, and that you are aware that you will need to engage a suitably qualified professional to provide the information for a discharge application.

The application is on hold under Section 88 of the Resource Management Act, until a full application for a discharge permit is received. The current system is not legal, so this situation needs to be rectified as soon as possible. Please have the necessary information to me by June 2 2006, so the application can be progressed.

Yours faithfully

Jenny Keene
RESOURCE MANAGEMENT OFFICER

ABACUS DESIGN
ARCHITECTS PROJECT MANAGERS ENGINEERS

ABACUS DESIGN LIMITED
TEL 03 577 8857
FAX 03 577 9966
PO BOX 309
56 SCOTT STREET
BLENHEIM
NEW ZEALAND

19 June 2006

Marlborough District Council
PO Box 443
BLENHEIM

Attention: Jenny Keene

Dear Jenny,

Ericson Effluent Disposal U 060081– Okiwi Bay

Abacus Design have been commissioned by the Ericsons to conduct a Site and Soil Assessment and effluent disposal design for the Okiwi Bay property. As the existing system does not meet current standards it shall be replaced with a new Secondary Treatment Plant and irrigated disposal field. Please find attached the Site and Soil Evaluation and design report and application for a Discharge Permit.

Yours faithfully

Bronwen Frazer

sj842-lt-01

ABACUS DESIGN

ARCHITECTS PROJECT MANAGERS ENGINEERS

Site and Soil Evaluation Report

1.0 SITE INFOMATION

1.1 Location details:

Owner: F & A Ericson

Location: Okiwi Bay

Address: 55 Hope Drive
RD3 Okiwi Bay
Rai Valley

1.2 Site Description:

The site is located in Okiwi Bay and is described as Lot 1 DP 7564. The site is south east facing and is bounded at the rear by Wharf Road. The front boundary of the property is adjacent to a Legal Road, which runs along the foreshore. The site is developed with a two bedroom dwelling on which the owners intend to carry out alterations to increase the living space. The number of bedrooms will remain at two. The existing wastewater disposal system consists of a 3300L septic tank and trench disposal field. The system was not established lawfully and must therefore be replaced with a new system, which meets current standards. The site features moderate south east slopes vegetated with native bush. No water bodies are located on or in the vicinity of the site.

1.3 Climate:

Annual rainfall (mm): Unknown

Annual Evaporation (mm): Unknown

1.4 Existing water supply:

Community Scheme

1.5 Existing on-site systems:

Existing septic tank and trench disposal field

1.6 Site Evaluator:

Name: Bronwen Frazer

Company/agency: Abacus Design

Address: PO Box 309
Blenheim

Phone: 5778857

Fax: 5779966

2.0 ON-SITE EVALUATION

2.1 Work Undertaken:

Details: Site visit & soil testing

Date: June 2006

Weather (on day and preceding week): dry some rain in week previous

Photo Attached: NO

2.2 Topography:

Slope: moderate

Drainage Patterns: SE Slope

Ground Cover: native bush

Boundaries: noted

Waterways: coastal water

Well/Bores: none

Buildings: two bedroom dwelling

Other:

Site History (land Use): Residential

Site Plan Attached: YES

2.3 Site Exposure:

Site Aspect: South East

2.4 Environmental concerns: (e.g. High water table, wetlands, water ways etc.):

None

2.5 Site Stability:

Is expert assessment necessary: no

2.6 Drainage Controls:

Depth to seasonal water table: site situated on elevated hillside no ground water contamination risks.

Need for cut off drains/diversion banks: N/A

Need for surface water collector/cut off drains: N/A

2.7 Set back Distances:

min + 2.0m from boundaries

Reserve area: Available

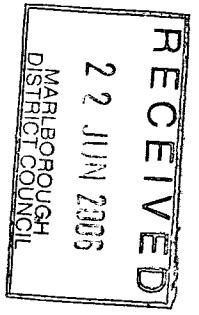
3.0 SOIL INVESTIGATION

3.1 Soil profile determination Method: Auger Hole
A range of soil properties have been assessed in accordance with the procedures outlined in Appendix 4.1D of NZS1547:2000

3.2 Reporting

Test Site 1

Layer	Lower Depth	Moisture content	Colour (moist)	Field Texture	Coarse Fragments %	Structure	Other
1	100mm	Moist	Brown	Clay Loam	<2	Moderate	Topsoil
2	900mm	Moist	Red Brown	Light Clay	<15	-	Light Clay, imperfectly drained Moderately plastic, smooth to manipulate ribbon length 50mm With some fragments of fractured /decaying rock
3	1400mm	Moist	Red Brown	Broken Rock	-	-	Fractured /decaying rock



Test 2

Layer	Lower Depth	Moisture content	Colour (moist)	Field Texture	Coarse Fragments %	Structure	Other
1	50mm	Moist	Brown	Clay Loam	<2	Moderate	Topsoil
2	1000mm	Moist	Red Brown	Light Clay	<15	-	Light Clay, imperfectly drained Moderately plastic, smooth to manipulate ribbon length 50mm With some fragments of fractured /decaying rock

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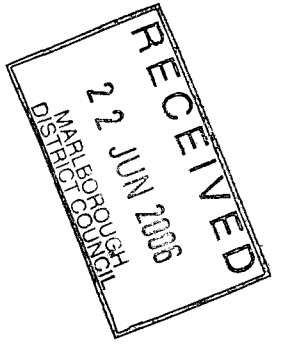
ARCHITECTS PROJECT MANAGERS ENGINEERS

Test site 3

Layer	Lower Depth	Moisture content	Colour (moist)	Field Texture	Coarse Fragments %	Structure	Other
1	200mm	Moist	Brown	Clay Loam	<2	Moderate	Topsoil
2		Moist	Red Brown	Light Clay	<15	-	Light Clay, imperfectly drained Moderately plastic, smooth to manipulate ribbon length 50mm With some fragments of fractured /decaying rock



3.3 Estimated Soil Category:

Soil Test	1	2	3	4	5
Soil Category	5	5	5		

The estimated soil category has been determined based on Table 4.1.1 NZS 1547:2000 The assignment of soil category 5 is based on the texture and structure of the soil as described in 3.2 above and observations made during the site visit.

3.4 Recommended DLR / DIR

DLR: 2.8mm/day
Reason: Values based on soil category

3.5 General Comments

We recommend the use of a secondary treatment plant and irrigated disposal field due to the slope of the site and clay soils. The secondary treatment plant needs to be suitable for intermittent use as the dwelling is to be used as a holiday home or batch.

4.0 DESIGN

4.1 Soil Category found on site: 5

4.2 Number of Bedrooms: 2

4.3 Average Daily Flow Rate (Q) (Litres): 720L

Design Occupancy: up to four people (2 people per bedroom)
Flow Allowance: 180L per person per day.

4.4 Septic Tank Capacity (Litres): Treatment Plant (required suited to Intermittent loading if dwelling is to be used as a batch).

4.5 Treatment Quality Required:

Equal to or better than: 20g/m3 BOD5: 30g/m3 Total Suspended Solids

4.6 Loading Rate (DLR): 2.8mm/day

4.7 Field spacing (m): 1m min between lines

5.0 CALCULATIONS

$$A = \frac{720L}{2.8mm/day \times 1m}$$

Disposal Area = 257 square meters

6.0 Assessment of other possible systems:

Due to the moderate slopes and the clay soil conditions the low rate of loading offered by a treatment system makes it ideal for this application. Shallow bed disposal is not a possible option.

7.0 Best Practical Option

The best practical option for management of domestic wastewater is through the use the proposed system (as detailed in section 4.0 above). The low loading rates will ensure maximum evapo-transpiration of effluent in the clay soils. It is my opinion that this system is the best method for preventing or minimizing any adverse effects on the environment.

ABACUS DESIGN

ARCHITECTS PROJECT MANAGERS ENGINEERS

Maintenance Schedule for Septic Tank and Effluent Disposal Field

1.1 Owner detail:

Owner: F & A Ericson

Location: Okiwi Bay

Note: Owners and occupiers are legally responsible to keep their on-site system in good working order.

1.2 System Detail:

Capacity: Minimum capacity 4000L Secondary Treatment Plant.

Disposal Field: 257m^2 irrigated disposal field for two bedroom dwelling

(See site and soil evaluation report dated June 2006 for details of system)

1.3 Use of System:

The Manufactures guidelines for correct use of the system should be followed.

1.4 Maintenance of Secondary treatment plant:

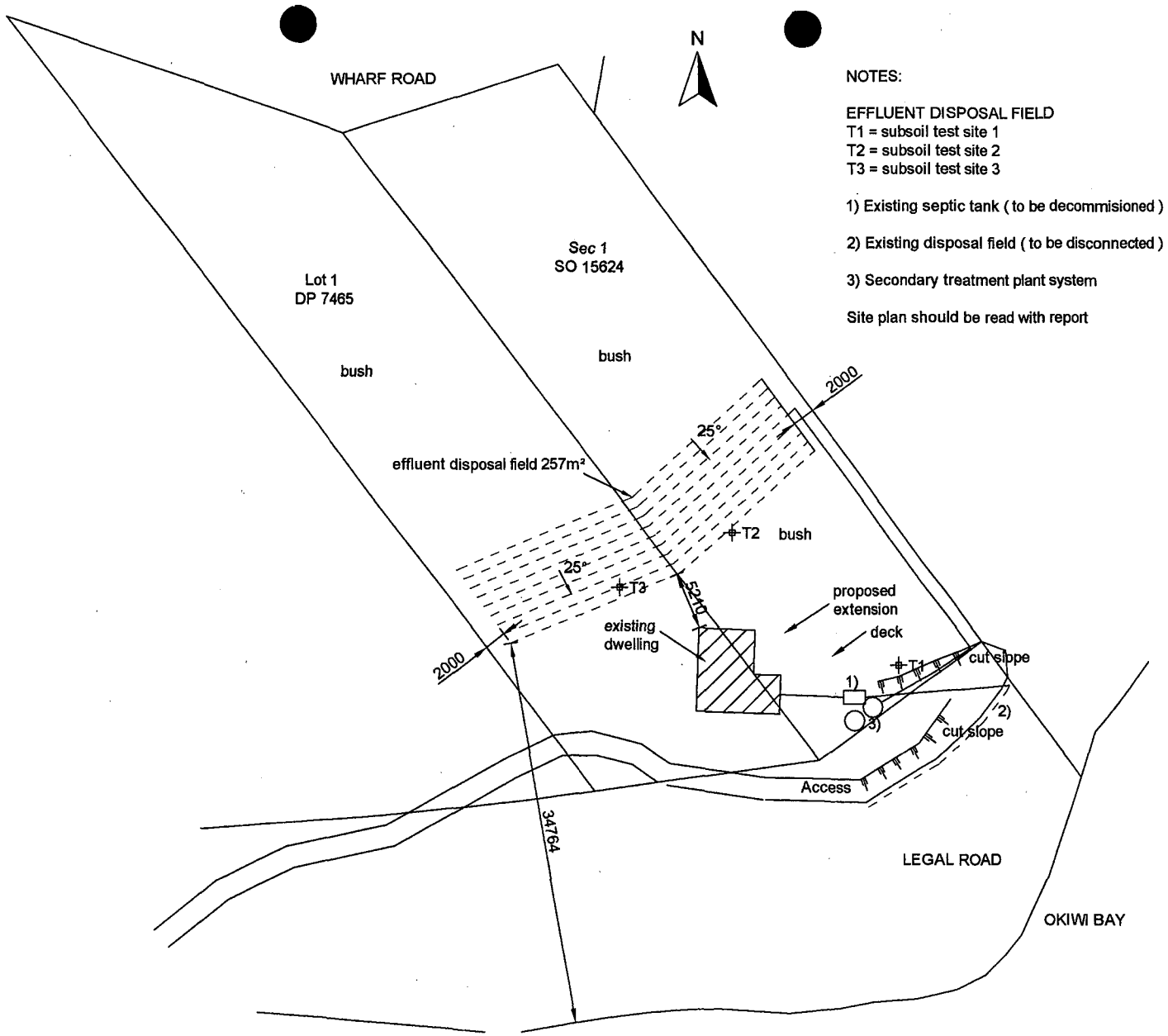
The owner shall arrange for the following Maintenance in accordance with manufactures recommendations:

- The Primary chamber is required to be desluged regularly (3-5 years) or when sludge and scum occupies 2/3 of the volume. At the time of desludging all components of the system shall be checked and maintained as detailed below.
- Check any operation and timer controlled control panel.
- Effluent filters shall be inspected and cleaned annually or more frequently if required.
- The pump and switches shall be checked annually to insure that both are working reliably.

1.5 Maintenance of disposal field:

- The disposal field shall be inspected for any signs of failure (wet soggy areas, sewerage smell) Should the field be found to be operating inadequately the best practical option shall be employed to rectify the problem.
- Check operating pressure in disposal field and flush lines if required

NOTE: Manufactures Instructions for maintaining and cleaning of Effluent Filters, Pumps and Switches shall be followed at all times.



NOTES:

EFFLUENT DISPOSAL FIELD
T1 = subsoil test site 1
T2 = subsoil test site 2
T3 = subsoil test site 3

1) Existing septic tank (to be decommisioned)

2) Existing disposal field (to be disconnected)

3) Secondary treatment plant system

Site plan should be read with report

For Info

01 19/06/06 For Info AMENDMENT DATE DETAILS	AMENDMENT DATE DETAILS	CONSULTANTS ABACUS DESIGN abacusdesign@xtra.co.nz - TEL 03 577 8857 - FAX 03 577 9966 - PO BOX 309 - 141 HIGH STREET - BLENHEIM - NEW ZEALAND	CLIENT F & A ERICSON OKIWI BAY	PROJECT EFFLUENT DISPOSAL DRAWING SITE PLAN	DATE 19/06/06 AMENDMENT 01 DWG NO. SJ842-Fig01 SCALE 1:400 CAD FILE REF: SJ842-F1	A3

COPY

2 February 2006

Mr F Ericson
55 Hope Drive
RD 3 Okiwi Bay
RAI VALLEY

Dear Mr Ericson,

Receipt of Resource Consent Application – U060081 –F Ericson – 55 Hope Drive, Okiwi Bay

Council has received the above resource consent application for the erection of a 27m^2 extension to an existing building, with this being located within 8m of foreshore reserve.

The plans that I have been supplied with the proposal do not clearly show the area that is to be extended. Can you please provide me with plans for the extension to the existing bach that show the extension area, and the scale of this in relation to the existing building. Plans showing the floor plan of the bach once the extension has been constructed would also be of assistance. Once this has been received and is sufficient to process the application, the proposal shall be accepted for processing pursuant to Section 88 of the Resource Management Act 1991.

Council have altered their provisions under the Marlborough Sounds Resource Management Plan in relation to effluent disposal. This is now based on potential loading, calculated through the habitable spaces within a building. The floor plan of the bach once the extension has been completed will enable this calculation. Please also advise where the effluent disposal field for the current system is located. In order to address the discharge requirements, please advise:

- Whether the capacity of the existing system is sufficient to meet the new loading as a result of the extension, and is in compliance with current standards; or
- Whether the existing system can be upgraded to comply with the current standards and the increased capacity; or
- Whether a new system is required to be constructed in order to provide for the increased loading.

With an increase in the potential loading on an existing system, the alteration of an existing system, or the requirement for a new system, arises the requirement for a resource consent to be obtained. In order for this to also be processed in conjunction with the land use application, please also provide an assessment of environmental effects in relation to the discharge.

Until the details requested in this letter are provided, the proposal shall remain on hold. The time taken by applicants to provide further information is excluded from the calculation of working days for processing your consent (s88B(b) RMA).

Opus International Consultants Limited
Blenheim Office

3rd Floor, NZI House, Market St North
PO Box 563
Blenheim, New Zealand

Telephone 03 579 2600
Facsimile 03 579 2601
Website www.opus.co.nz

Once the details requested above have been supplied, a determination shall be made in relation to notification of the proposal or whether any written approvals are required and you shall be advised of the outcome.

Opus International Consultants have been employed by Council to process an overload of resource consent applications and your application has been passed to us. Please do not hesitate to contact me on (03) 579 2610 if you have any questions or concerns regarding the above matters.

Yours faithfully,

REBECCA BEALS
Resource Management Planner
Opus International Consultants Ltd.

0064 35289362

ALPHA PRECASTS Ltd.
SPECIALISTS IN PRECAST CONCRETE

23A King Edward St
Motueka, New Zealand
Phone (03) 528 1018
Fax (03) 528 9362

ATT. Rebbaca Beal

Facsimile—Personal & Confidential

To: Francis

Company:

Fax. No: 035725376

From: Jon Underwood

Date: 24/2/06 No. Pages: 2

Subject: Septic Tank

Message:

Following is a sketch and sizes of 3300 Septic Tank

Regards

JON

As requested by Andrea Erikson

0064 35289362
ALPHA PRECAST (NZ) LTD.
23A King Edward St, Motueka • Phone: 03 528 1018
Precast & Prestressed Concrete

Att Rebbeca

Page	Brad
By	J.U.
Date	24/2/06
Job Ref	

Project 3300 Septic Tank - Precast Concrete

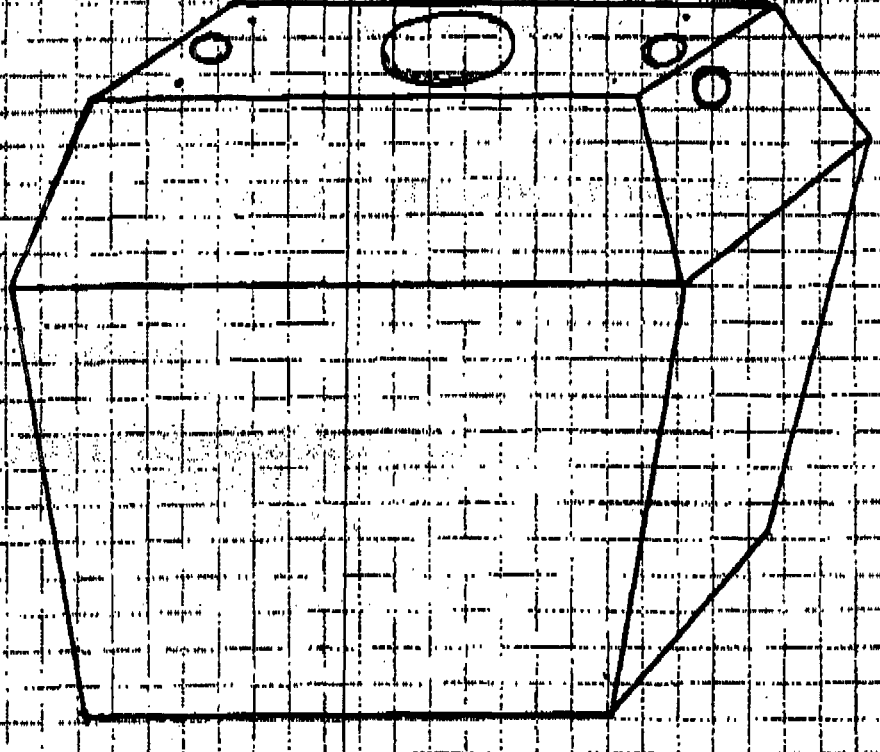
Description

3300 Litre (Working Capacity) Septic Tank

Weight - 2450 Kg

Overall Dimensions 2400 long
1200 Wide
1730 high + 40 for M/H Lid

Height from Base of Tank to invert of inlet = 1565



Erickson tank to be fitted with FTW0444 Biotube Effluent filter