

TREATMENT PLANT APPROVAL 04/2021

Plumbing and Drainage Act 2018

Approval

1. The **Ecosafe Aerobic Sand Filter – Advanced Secondary Treatment Plant 10-20 EP** (“the system”) described in the Specifications and Drawings in the attached Schedule and manufactured by **Ecosafe Wastewater** (ABN 70 276 315 218) (“the manufacturer”) has been assessed in accordance with the Queensland Plumbing and Wastewater Code (QPW Code) dated 26 October 2017.
2. Approval is granted for the advanced secondary quality wastewater treatment system, subject to compliance by the manufacturer with the requirements of the *Plumbing and Drainage Regulation 2018*, and the conditions of approval detailed below.
3. This approval, the conditions of approval and the Schedule comprise the entire Treatment Plant Approval document.
4. Any modification by the manufacturer to the design, drawings or specifications scheduled to this approval must be approved by the Chief Executive.

Conditions of approval

5. The manufacture, installation, operation, service and maintenance of the systems must be in conformity with the conditions of this Treatment Plant Approval.
6. The advanced secondary quality wastewater treatment system, which is an example of the approved systems, may only be used on premises that generate per day:
 - (a) a maximum hydraulic loading of 2,000 litres; and
 - (b) a maximum organic loading of 500grams BOD⁵
7. The system must continue to meet the requirements of advanced secondary quality wastewater treatment system, producing the following effluent quality:
 - (a) 90% of the samples taken must have a BOD⁵ less than or equal to 10 g/m³ with no sample greater than 20g/m³.
 - (b) 90% of the samples taken must have total suspended solids less than or equal to 10g/m³ with no sample greater than 20g/m³.
 - (c) 90% of the samples taken must have a thermotolerant coliform count not exceeding 10 organisms per 100 mL with no sample exceeding 200 organisms per 100 mL.
 - (d) Total chlorine concentration must be between 0.5g/m³ and 2.0 g/m³ in four out of five samples taken.
8. Each system must be serviced in accordance with the details supplied in the owner’s operation and maintenance manual.
9. This approval does not extend, apply to, or include the land application system used in conjunction with an approved system installed on premises.

Treatment Plant Approval

Approved by: Lindsay Walker

Delegated Authority

Department of Housing & Public Works

10. Each system must be supplied with —
- (a) a copy of this Treatment Plant Approval document;
 - (b) details of the system;
 - (c) instructions for authorised persons for its installation;
 - (d) a copy of the owner's manual to be given to the owner at the time of installation; and
 - (e) detailed instructions for authorised service personal for its operation and maintenance.
11. At each anniversary of the Treatment Plant Approval date, the supplier must submit to the Chief Executive a list of all systems installed in Queensland during the previous 12 months. Where the Chief Executive is notified of any system failures the Chief Executive may randomly select a number of installed systems for audit. The Chief Executive will notify the supplier's nominated NATA accredited laboratory which systems are to be audited for BOD⁵ and TSS. The sampling and testing of the selected systems, if required, is to be done at the supplier's expense. The following results must be reported to the Chief Executive;
- a) Address of premises;
 - b) Date inspected and sampled;
 - c) Sample identification number;
 - d) BOD⁵ for influent and effluent; and
 - e) TSS for influent and effluent.
12. The Chief Executive may, by written notice, cancel this approval if the manufacturer/supplier fails —
- a) to comply with one or more of the conditions of approval; or
 - b) within 30 days, to remedy a breach, for which a written notice been given by the Chief Executive.
13. This approval may only be assigned with the prior written consent of the Chief Executive.
14. This approval expires on 01 January 2024 unless cancelled earlier in accordance with paragraph 12 above.

Lindsay Walker

**Director
Plumbing, Drainage and Special Projects
Building Legislation and Policy**

Date approved: 01 February 2021

Treatment Plant Approval

Approved by: Lindsay Walker
Delegated Authority
Department of Housing & Public Works



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TREATMENT PLANT APPROVAL No. 04/2021
Plumbing and Drainage Act 2018

SCHEDULE

Attachment 1

Drawings and Specifications for the

Ecosafe Aerobic Sand Filter – Advanced Secondary Treatment Plant 10-20 EP

Treatment Plant Approval

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Delegated Authority

Department of Housing & Public Works



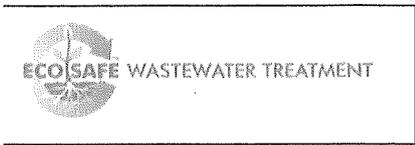
Attachment 1: Specifications INDEX

No	Document:	Ref:
1	Design Capacity	<i>EC.ADV.SEC.Spec.01</i>
2	Description of Plant Sections & Treatment Plant Structure and Materials of Construction	<i>EC.ADV.SEC.Spec.02</i>
3	Mechanical and Electrical Equipment	<i>EC.ADV.SEC.Spec.03</i>
4	Filter Sand Specification	<i>EC.ADV.SEC.Spec.04</i>
5	Ecosafe Advanced Secondary Wastewater Treatment Plant Servicing Requirements	<i>EC.ADV.SEC.Spec.05</i>

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 Delegated Authority
 Department of Housing & Public Works



PATENT PENDING



The Ecosafe Wastewater Treatment Plant and all design detail are the subject of a Patent Application. In addition, all plans, drawings and specifications are protected by Copyright.

Document Ref:
EC.ADV.SEC.SpecsINDEX

Specification No. 1:

DESIGN CAPACITY

The basis of design (which is performance based) for the Ecosafe Aerobic Sand Filter is as follows:

- Allowable hydraulic loading rate:.....120 L /d/m²; &
- Allowable organic loading rate:.....50gm BOD₅/d/m²

For the basic Ecosafe Unit (10EP Domestic) the following loadings are generated:

Hydraulic 10x200 L = 2000 L/d

Organic 10x50gm BOD₅ = 500gm BOD₅ /d

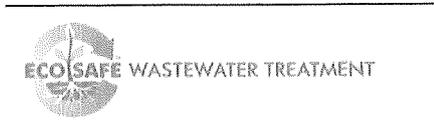
EXTRAPOLATION OF ECOSAFE SAND FILTER TO 20EP

EP	Hydraulic Load	ES Sand	UC	Area
10	2000 L /d	≥0.3mm	<4.0	20m ²
15	3000 L /d	≥0.3mm	<4.0	25m ²
18	3600 L/d	≥0.3mm	<4.0	30m ²
20	4000 L/d	≥0.3mm	<4.0	35m ²

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Specification No. 2

DESCRIPTION OF PLANT SECTIONS & TREATMENT
PLANT STRUCTURE AND MATERIALS OF
CONSTRUCTION

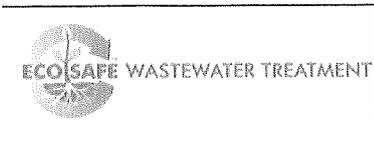
The Plant sections and structure including construction materials are fully described on the enclosed standard drawings.

- Primary Tank:** 3900L concrete (or plastic) septic tank fitted with internal outlet filter.
- Sand Filter:** Surface area 20m². The filter media is fully enclosed in a watertight polyethylene liner with one penetration to cater for the exit of the collection pipe to the Pumpwell.
- Pumpwell:** 450L concrete Pumpwell fitted with 350W / 550W Lowara / similar automatic submersible pump. The Pumpwell is fitted with a float switch which closes a circuit with a wall plate containing a neon light when the water rises above the start position of the built-in float switch.
- Pipework:** Distribution and collection pipework is sewer grade PVC pipes complying with AS1260 & AS1477

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Ref: EC.ADV.SEC.Spec.03

Specification No. 3:

MECHANICAL AND ELECTRICAL EQUIPMENT

The following are incorporated in the Ecosafe system:

- Grundfos / Lowara / similar automatic submersible pumps sized to suit each particular application taking into consideration head losses due to differences in elevation of the components and friction losses in pipework. A manual is provided from the pump manufacturer setting out operation and maintenance requirements.
- a.t.m.i. Model AT920VR 5M PVC float switch closes the circuit to wall plate with neon light fitted inside the residence. The circuit closes and light is actuated when the treated effluent rises above the start position of the automatic pump built-in float switch and tilts the float. Refer to the attached installation details.
- A wall plate with neon light.
- A weather-protected power outlet is fitted on the pumpwell for connection to the submersible pump by 3-point plug.

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Specification No. 4:

FILTER SAND SPECIFICATION

1. The effective sand particle size (ES) shall not be less than 0.25mm and not greater than 0.6mm.
2. The sand shall have a uniformity coefficient (UC) of less than 4.
3. The sand shall contain less than 5% volume of clay and fine silts as determined by the test method in AS1141.33.

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Specification No. 5

ECOSAFE WASTEWATER TREATMENT PLANT
SERVICING REQUIREMENTS

Servicing of Ecosafe Wastewater Treatment Plants shall be performed annually.
 The servicing requirements are set out below.

Primary Tank	- Outlet Filter (if fitted)	Hose off accumulated screenings back into tank.
	- Scum	Access if removal warranted.
	- Sludge	Measure average depth. If greater than 1.0 metre – recommend in report that removal be carried out.
Distribution Box		Clean if necessary. Check levelness.
Sand Filter		Check permeability of soil cover.
Ground Venting		Clean insect proofing.
Pumpwell		Check for ingress of ground water.
Chlorine Residual		Check chlorine residual at pumpwell (if chlorination is provided)
Sampling		To be taken from pumpwell.
Report Form		Complete Report Form and forward to Owner, Council and Ecosafe.

PATENT PENDING



ECO|SAFE WASTEWATER TREATMENT

Attachment 2: Drawings

INDEX

No.	Document:	Ref:
1	Ecosafe Wastewater Treatment Plant: "Aerobic Sand Filtration Treatment of Domestic Wastewater using Pressurised Distribution Pipes"	Ref: EC.SEC.Drg.EC-0004
2	Ecosafe Wastewater Treatment Plant: "Construction Details of Aerobic Sand Filtration"	Ref: EC.SEC.Drg.EC-0010
3	Ecosafe Wastewater Treatment Plant "Advanced Secondary Pumpwell"	Ref: EC.ADVSEC.Drg. EC-005

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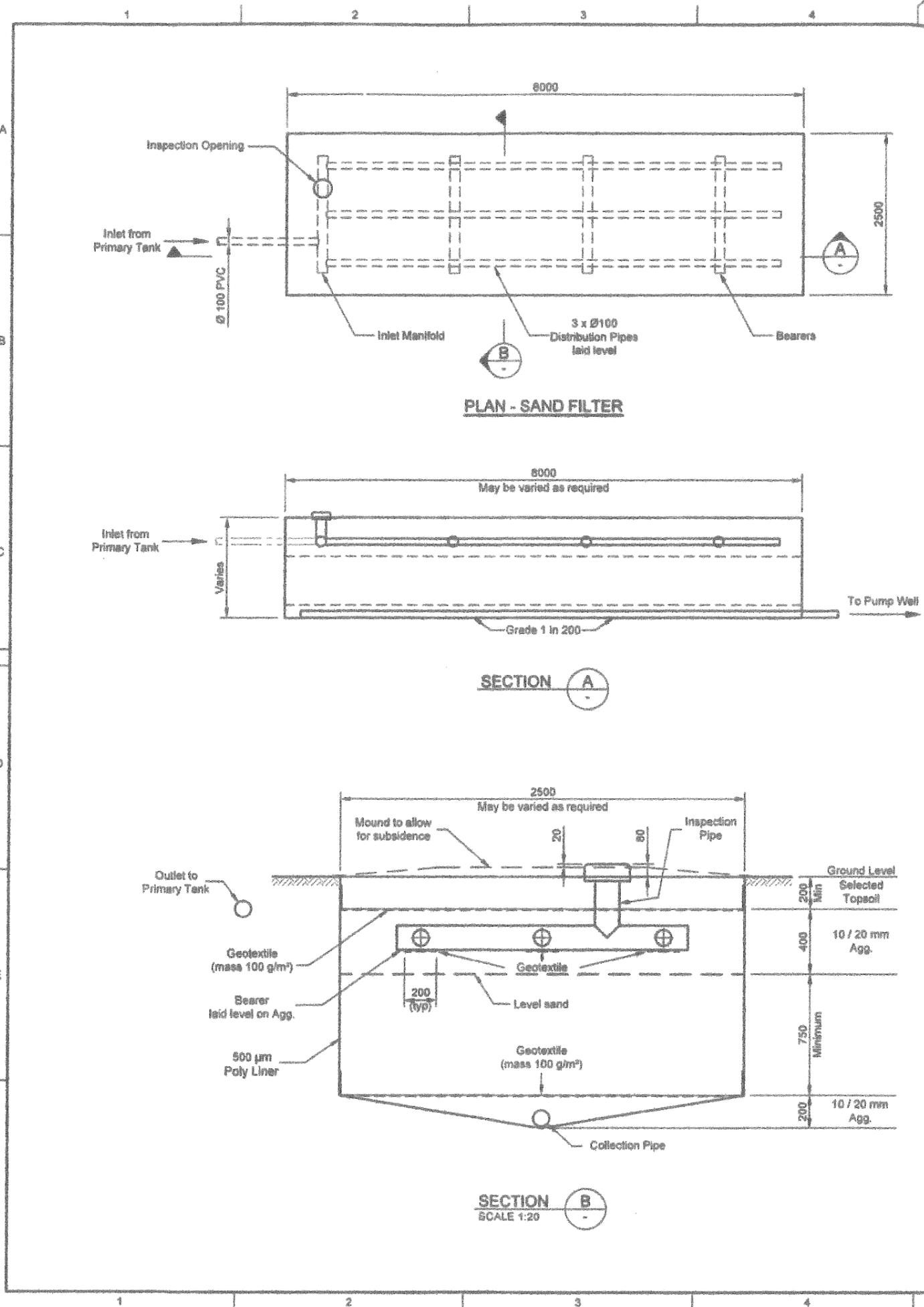
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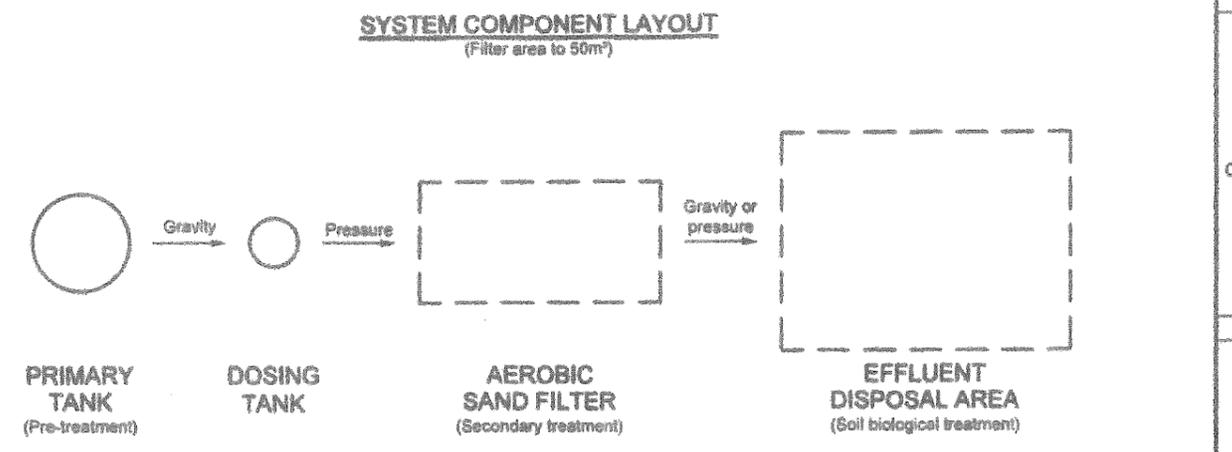
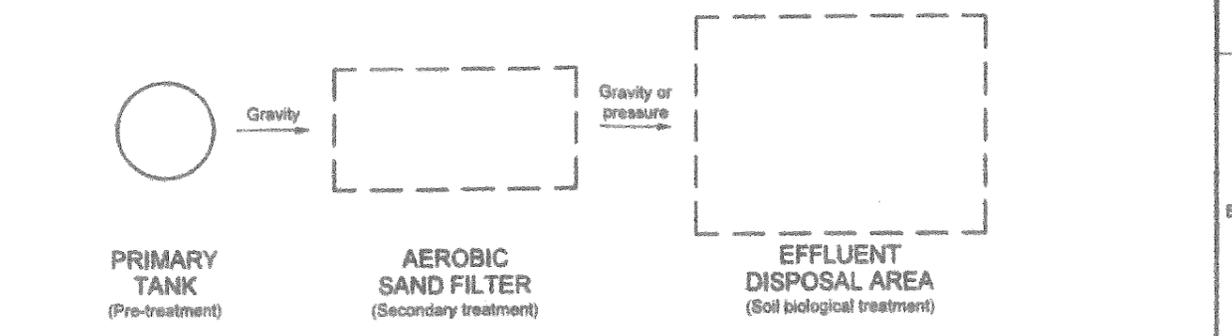
Document Ref:
EC.SEC.Spec.00.Index

Attachment 2: Drawings



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REVISIONS					
REV	DATE	DESCRIPTION	DRWN	CHKD	APPV
A	12/8/10	ISSUED FOR INFORMATION	CF		
B	8/9/10	DRAWING REVISED	CF		
C	13/9/10	DRAWING REVISED & DRAWING NUMBER UPDATED	CF		
D	10/11/10	DRAWING REVISED	CF		
E	15/2/11	TITLE BLOCK REVISED	CF		



- NOTE:**
- Minimum Filter Area for Domestic Unit 20 m²
 - Allowable Hydraulic Loading shall be 50 L/p/d/m²
 - Filter Areas > 50m² shall be dosed by pressure
 - Refer Specifications for details of Primary Tank, Dosing Tank & Pump Well

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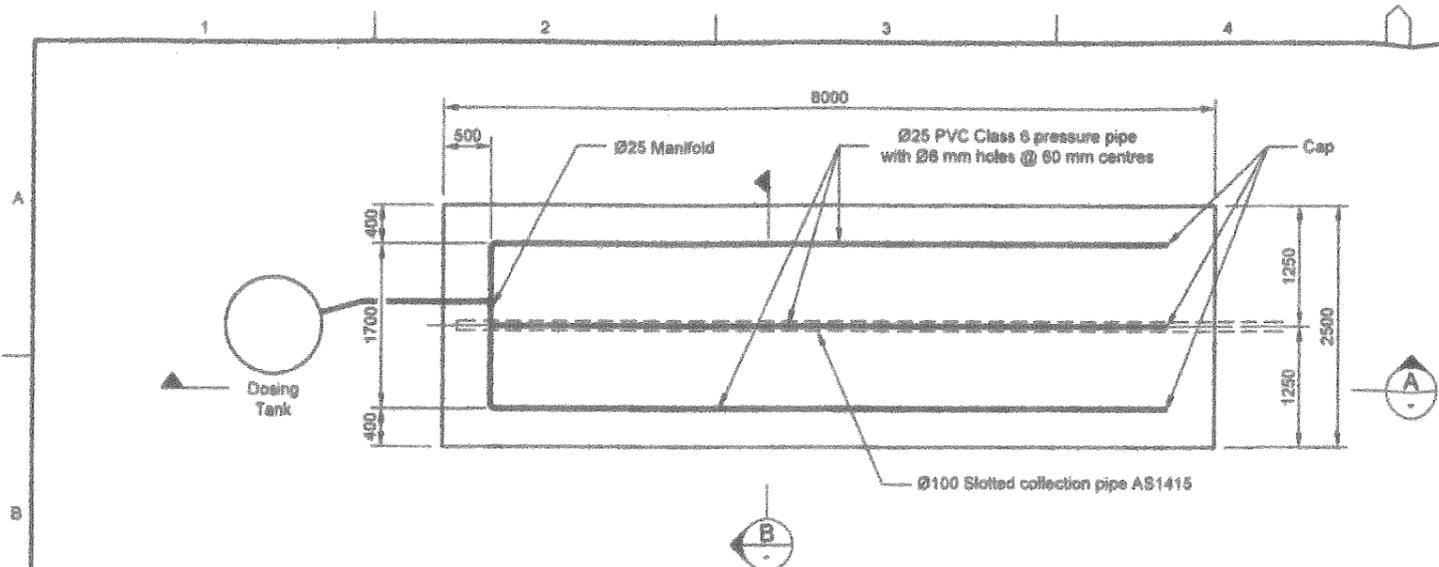
TITLE
ADVANCED SECONDARY CONSTRUCTION DETAILS OF AEROBIC SAND FILTRATION WASTEWATER TREATMENT PLANT

DRG. NO. **EC-0010**

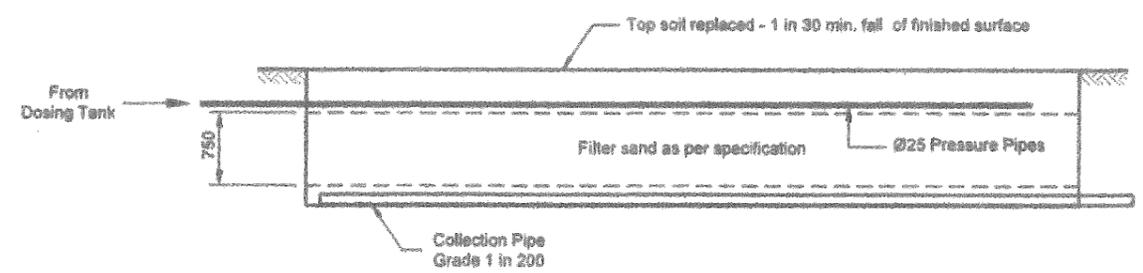
SHT. **1 / 1** REV. **E**

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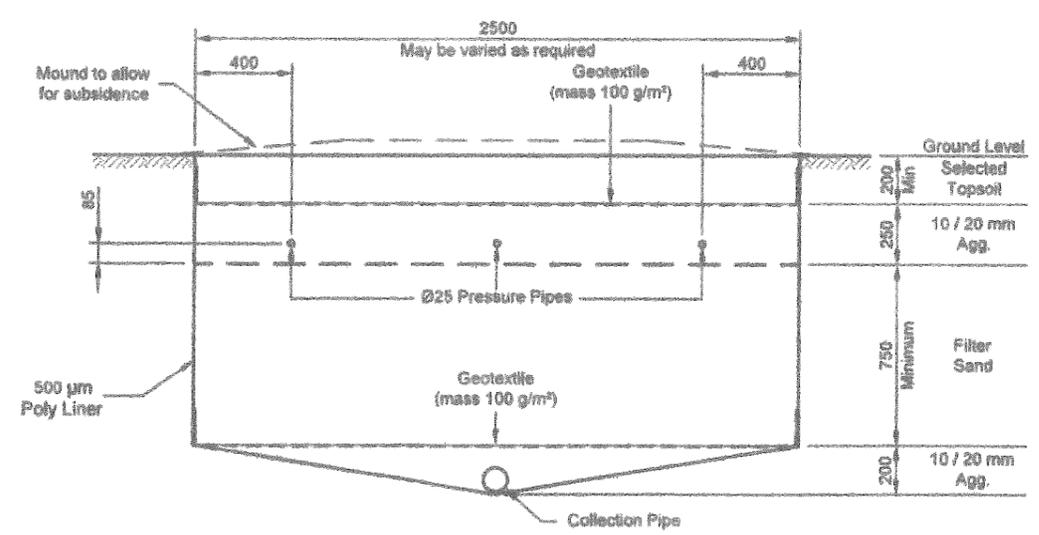
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 THIRD ANGLE PROJECTION



PLAN - SAND FILTER



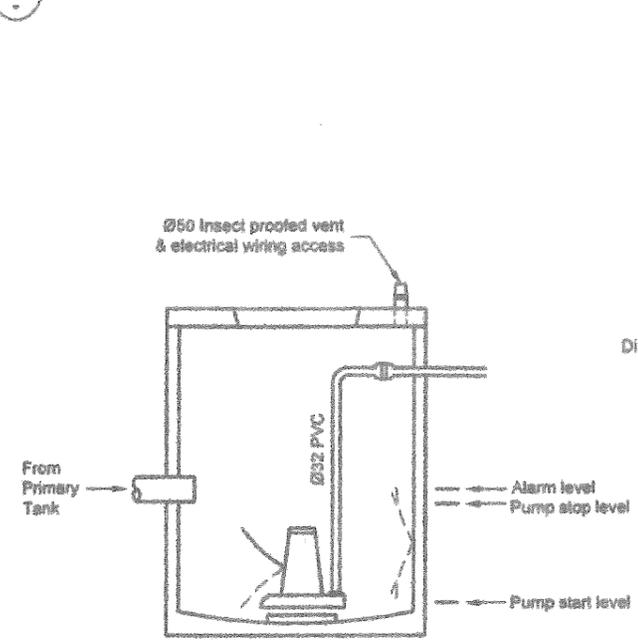
SECTION A



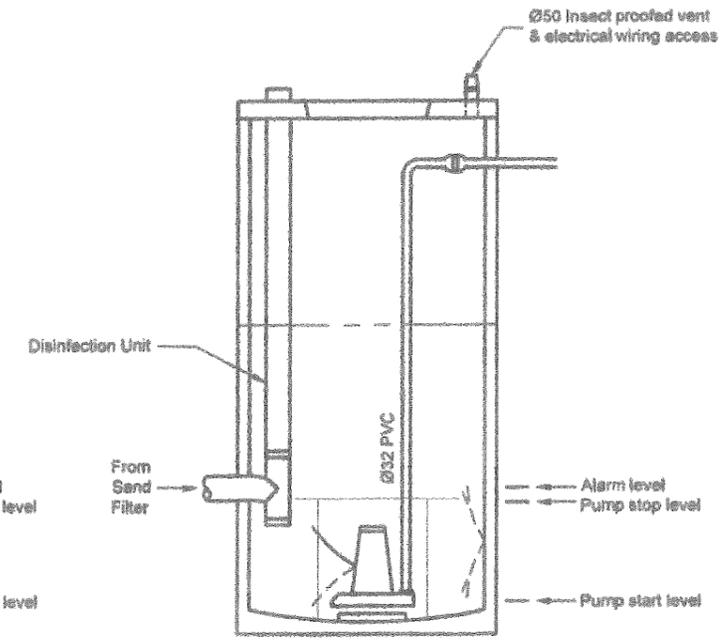
SECTION B
SCALE 1:20

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REVISIONS					
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A	0/10/10	ISSUED FOR INFORMATION	CF		
B	10/11/10	DRAWING REVISED	CF		
C	15/2/11	TITLE BLOCK REVISED	CF		



DOSING TANK
Everhard 450 L
Scale 1:20



PUMP WELL
Everhard 450 L w/- Riser
Scale 1:20

- NOTE:**
- Dimensions are shown for 10EP
 - Minimum Filter Area for Domestic Unit 20 m²
 - Allowable Hydraulic Loading shall be 120 L/d/m²
 - Filter Areas > 50m² shall be dosed by pressure
 - Refer Specifications for details of Primary Tank, Dosing Tank & Pump Well
 - Based on 200 L/p/d.

FILTER AREAS FOR >10EP

EP	AREA
15	25 m ²
18	30 m ²
20	35 m ²

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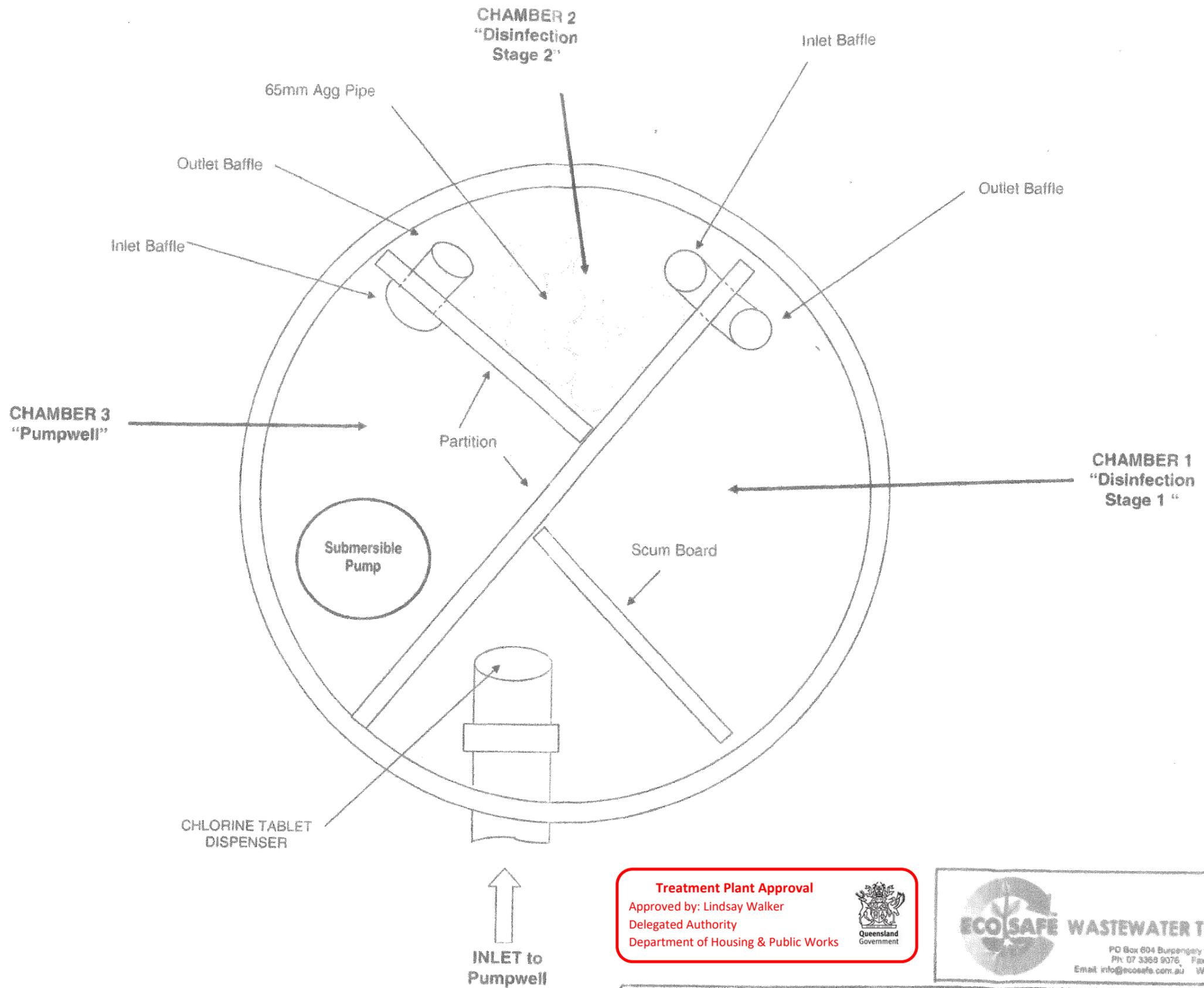
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TITLE
ADVANCED SECONDARY AEROBIC SAND FILTRATION TREATMENT OF DOMESTIC WASTEWATER USING PRESSURISED DISTRIBUTION PIPES

P B Hawthorne
P B HAWTHORNE - RPEQ 7477

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ECOSAFE WASTEWATER TREATMENT

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TITLE: ECOSAFE PUMPWELL ADVANCED SECONDARY PUMPWELL AND DISINFECTION UNIT – PATENT PENDING		
DRG. NO. EC-005		DO NOT SCALE DRAWING – ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
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