



**CHIEF EXECUTIVE APPROVAL 06/2016**  
*Plumbing and Drainage Act 2002, part 5.*

**Approval**

1. The **Eco Safe Advanced Secondary Wastewater Treatment Plant 10-20EP** ("the system") described in the Specifications and Drawings in the attached Schedule and manufactured by **B V Hawthorne Pty Ltd** ("the manufacturer") (ABN 70 276 315 218) has been assessed in accordance with the Queensland Plumbing and Wastewater Code (QPW Code) dated 15 January 2013.
2. Approval is granted for an advanced secondary quality wastewater treatment system, subject to compliance by the manufacturer with the requirements of the *Plumbing and Drainage Act 2002*, part 5 and the conditions of approval detailed below.
3. This approval, the conditions of approval and the Schedule comprise the entire Chief Executive 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 Chief Executive Approval.
6. The advanced secondary quality wastewater treatment system may only be used on premises that generate per day:
  - (a) a maximum hydraulic loading of 2000L; and
  - (b) a maximum organic loading of 500g BOD<sub>5</sub>
7. For the system to meet the requirements of an advanced secondary quality wastewater treatment system, the system must produce the following effluent quality —
  - (a) 90% of the samples taken must have a BOD<sub>5</sub> less than or equal 10g/m<sup>3</sup> with no sample greater than 20g/m<sup>3</sup>; and
  - (b) 90% of the samples taken must have total suspended solids less than or equal 10g/m<sup>3</sup> with no sample greater than 20g/m<sup>3</sup>; and
  - (c) 90% of the samples taken must have thermotolerant coliform count not exceeding 10 organisms per 100 mL with no sample exceeding 200 organisms per 100mL.
  - (d) Where chlorination is the disinfections process, the total chlorine concentration shall be greater than or equal to 0.5gm<sup>3</sup> and less than 2.0g/m<sup>3</sup> in four out of five samples taken.
8. Each system must be serviced in accordance with the manufacturers details supplied in the owner's service and maintenance manuals.
9. Each system must be supplied with —
  - (a) a copy of this Chief Executive Approval document;
  - (b) details of the system and ancillary equipment;

- (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.
10. This approval does not extend, apply to, or include the land application system used in conjunction with an approved system installed on premises.
11. At each anniversary of the Chief Executive Approval date, the manufacturer must submit to the Chief Executive a list of all systems installed in Queensland that they have received an installation and commissioning certificate for during the previous 12 months.
12. Where the Chief Executive is notified of any system failures that they believe are a result of poor design or faulty manufacture, may randomly select a number of installed systems for audit. The Chief Executive will notify the National Association of Testing Agencies (NATA) accredited laboratory nominated by the manufacturer, which systems are to be audited for Biochemical Oxygen Demand (BOD<sub>5</sub>) and Total Suspended Solids (TSS). The sampling and testing of the selected systems, if required, is to be done at the manufacturer'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) Biochemical Oxygen Demand (BOD<sub>5</sub>).
  - (e) Total Suspended Solids (TSS).
13. The Chief Executive may, by written notice, cancel this approval if the manufacturer fails — to comply with one or more of the conditions of approval; or within 30 days, to remedy a breach, for which a written notice been given by the Chief Executive.
14. This approval may only be assigned with the prior written consent of the Chief Executive.
15. This approval expires on 25 August 2021 unless cancelled earlier in accordance with paragraph 13 above.



**Lindsay Walker**  
**Director**  
**Strategic Policy (Plumbing, Drainage, Committees and Special Projects)**

Date approved: 28 July 2016

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**CHIEF EXECUTIVE APPROVAL No. 06/2016**  
*Plumbing and Drainage Act 2002, part 5, division 1, section 93*

**SCHEDULE**

**Attachment 1**

Specifications for the

**Eco Safe Advanced Secondary Wastewater Treatment Plant**



Department of Housing and Public Works  
**Chief Executive Approval**  
 Approval No: 06/2016  
 Date of Issue: 28/7/16  
 Delegate Signature: [Signature]  
 Building Codes Queensland

**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/m<sup>2</sup>; &
- Allowable organic loading rate:.....50gm BOD<sub>5</sub>/d/m<sup>2</sup>

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

Hydraulic 10x200 L = 2000 L/d

Organic 10x50gm BOD<sub>5</sub> = 500gm BOD<sub>5</sub> /d

**EXTRAPOLATION OF ECOSAFE SAND FILTER TO 20EP**

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

**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.*



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## Specification No. 2

# DESCRIPTION OF PLANT SECTIONS & TREATMENT PLANT STRUCTURE AND MATERIALS OF CONSTRUCTION – GRAVITY & PRESSURISED SYSTEMS

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.

**Dosing Tank:** Note: Dosing Tank is used for Pressurised systems only and is NOT required for Gravity systems. Refer enclosed Standard Drawings. Dosing Tank is a 450L concrete Pumpwell fitted with 350W / 550W automatic submersible pump. The Dosing Tank 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.

**Sand Filter:** Surface area 20m<sup>2</sup>. 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 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 all relevant Standards, including AS1260 & AS1477.

**PATENT PENDING**



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Document Ref:  
EC.ADV.SEC.Spec.02  
Description of Plant

**Attachment 1: Specifications** Page 3 of 6



ECO SAFE WASTEWATER TREATMENT

Department of Housing and Public Works	
Chief Executive Approval	
Approval No:	06/2016
Date of Issue:	28/7/16
Delegate Signature:	
Building Codes Queensland	

Ref: EC.ADV.SEC.Spec.03

**Specification No. 3:**

**MECHANICAL AND ELECTRICAL EQUIPMENT**

The following are incorporated in the Ecosafe system:

- Grundfos 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 from Grundfos is attached 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.

**PATENT PENDING**



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Document Ref:  
EC.ADV.SEC.Spec.03 Mechanical and  
Electrical Equipment



Department of Housing and Public Works <b>Chief Executive Approval</b>	
Approval No:	06/2016
Date of Issue:	28/7/16
Delegate Signature:	
Building Codes Queensland	

**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.

**PATENT PENDING**



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**Specification No. 5**

**ECOSAFE WASTEWATER TREATMENT PLANT**  
**SERVICING REQUIREMENTS**

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

<b>Primary Tank</b>	- 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.
<b>Distribution Box</b>		Clean if necessary. Check levelness.
<b>Sand Filter</b>		Check permeability of soil cover.
<b>Ground Venting</b>		Clean insect proofing.
<b>Pumpwell</b>		Check for ingress of ground water.
<b>Chlorine Residual</b>		Check chlorine residual at pumpwell (if chlorination is provided)
<b>Sampling</b>		To be taken from pumpwell.
<b>Report Form</b>		Complete Report Form and forward to Owner, Council and Ecosafe.

**PATENT PENDING**



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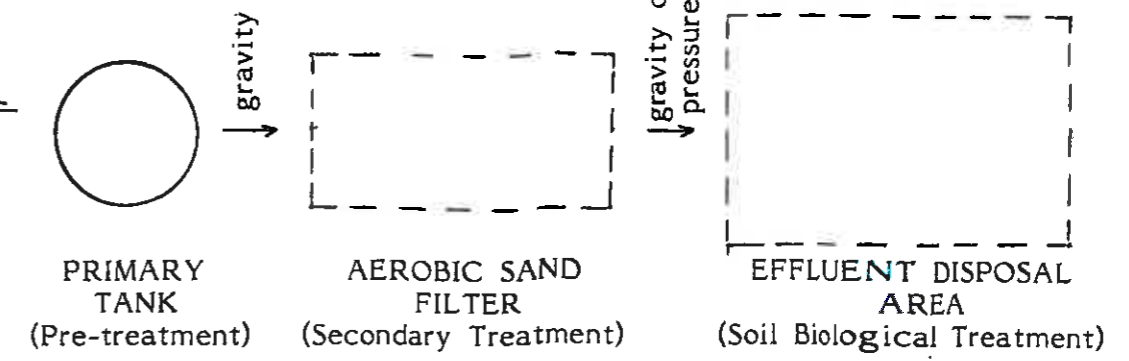
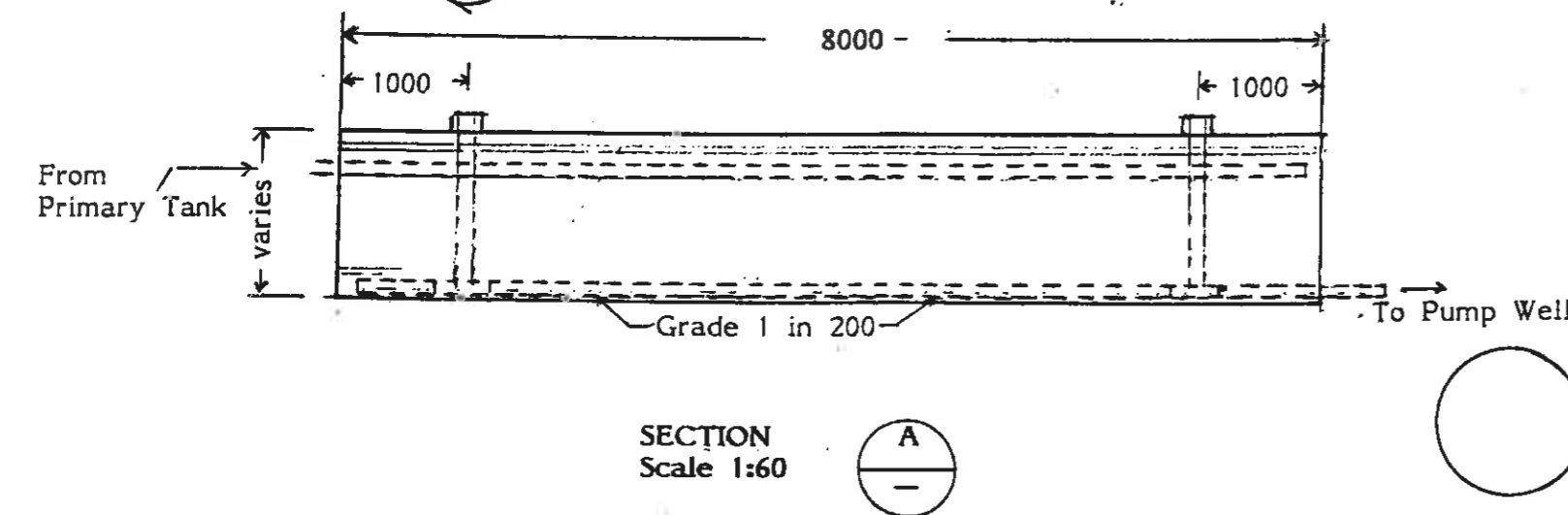
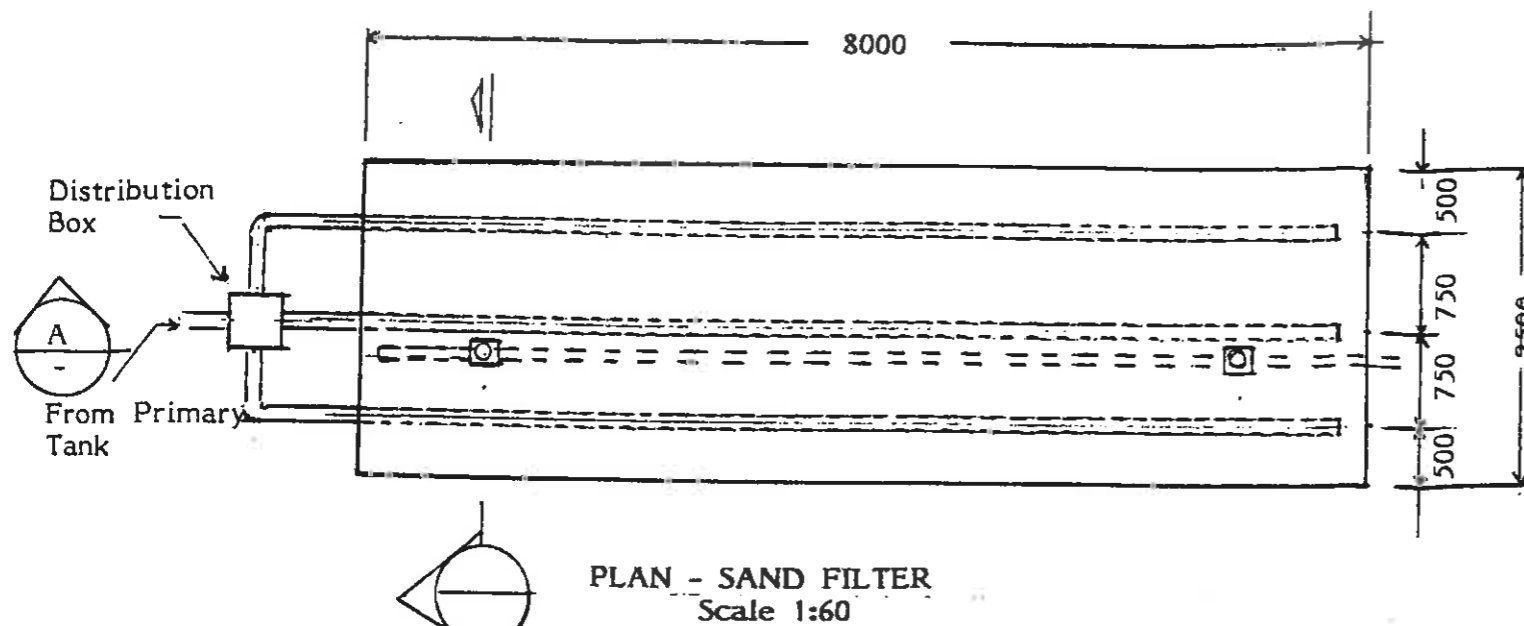
**SCHEDULE**

**Attachment 2**

Drawings for the

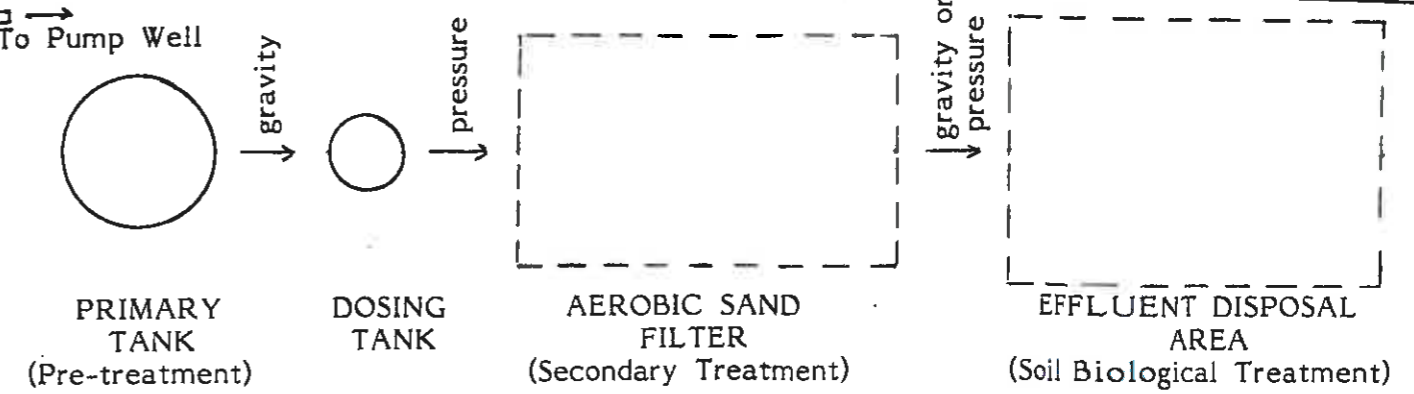
**Eco Safe Advanced Secondary Wastewater Treatment Plant**

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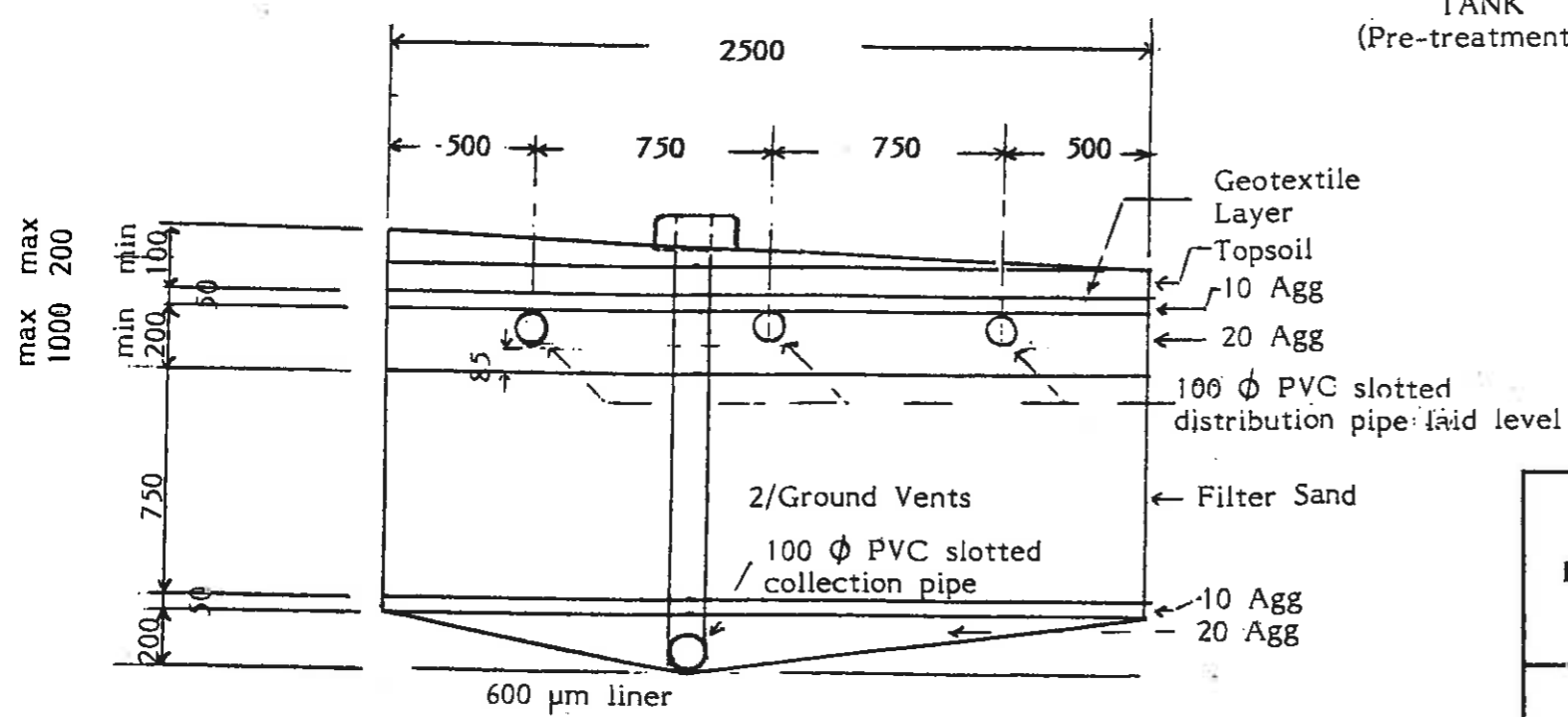
**SYSTEM COMPONENT LAYOUT**  
 (Filter Area to 50m<sup>2</sup>)

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**SYSTEM COMPONENT LAYOUT**  
 (Filter Area > 50m<sup>2</sup>)

- NOTE**
- Minimum Filter Area for Domestic Unit 20m<sup>2</sup>
  - Allowable Hydraulic Loading shall be 50L
  - Filter Areas > 50m<sup>2</sup> shall be dosed by pressure
  - Refer Specifications for details of Primary Tank, Dosing Tank & Pump Well



**SECTION**  
 Scale 1:25



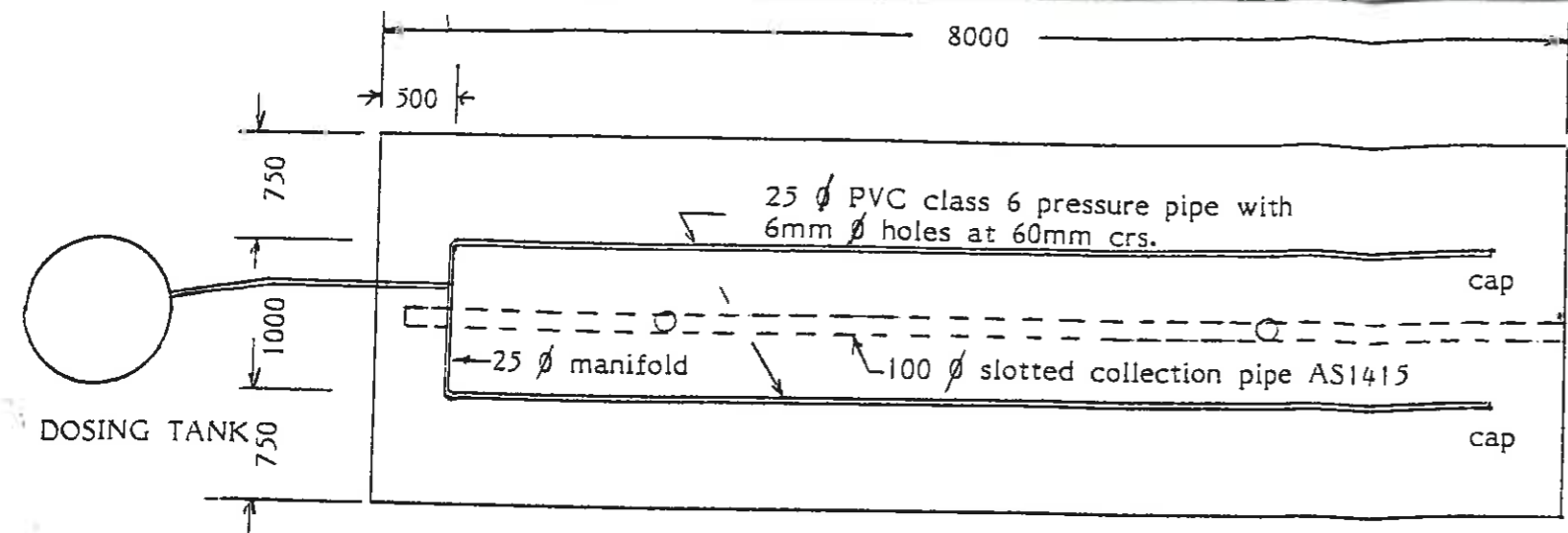
**WASTEWATER TREATMENT**

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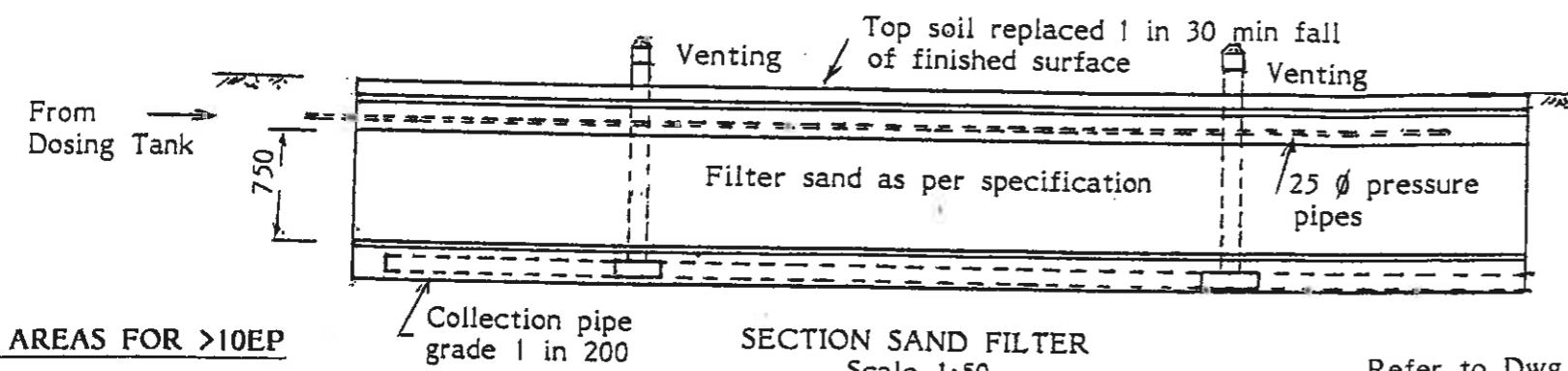
**TITLE: CONSTRUCTION DETAILS OF AEROBIC SAND FILTRATION  
 WASTEWATER TREATMENT PLANT**

DRG. NO. <b>EC-0010</b>	APPROVED: <u>[Signature]</u> B.V. HAWTHORNE - RPEQ 3100	ENG'D: <u>[Signature]</u> P.B. HAWTHORNE - RPEQ 1111	DO NOT SCALE DRAWING - ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
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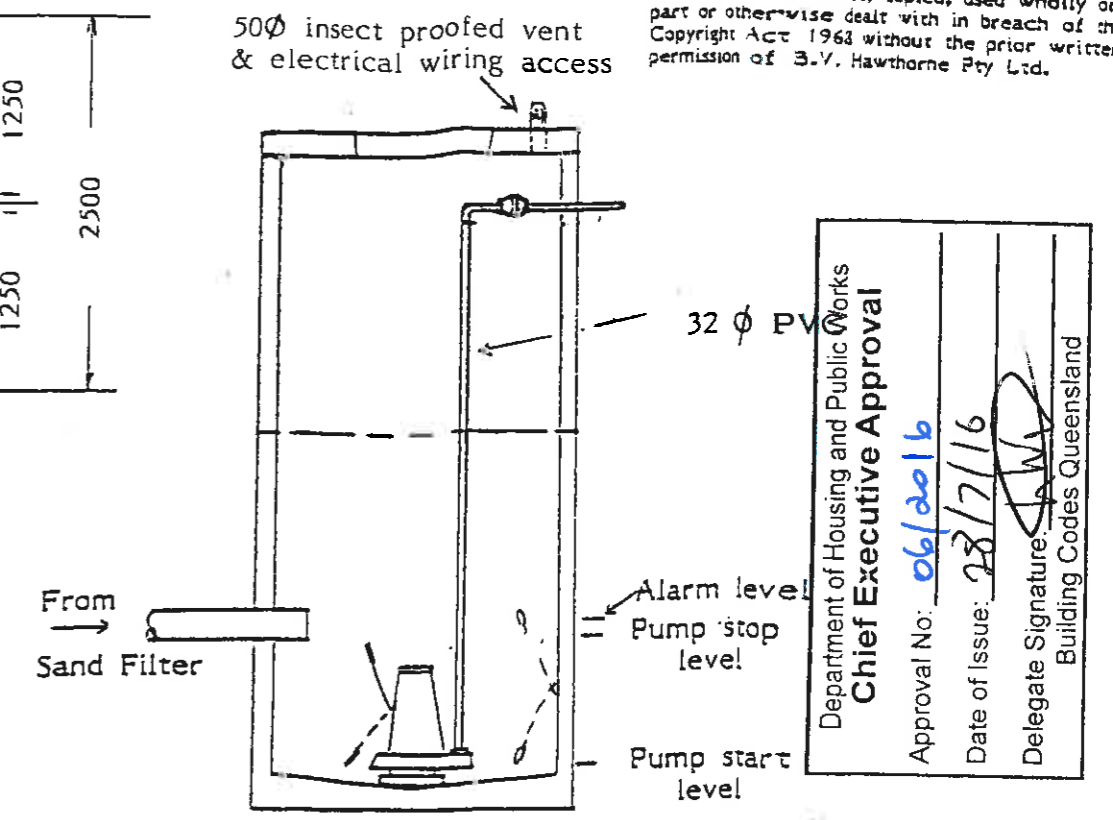
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PLAN SAND FILTER  
 Scale 1:50



SECTION SAND FILTER  
 Scale 1:50



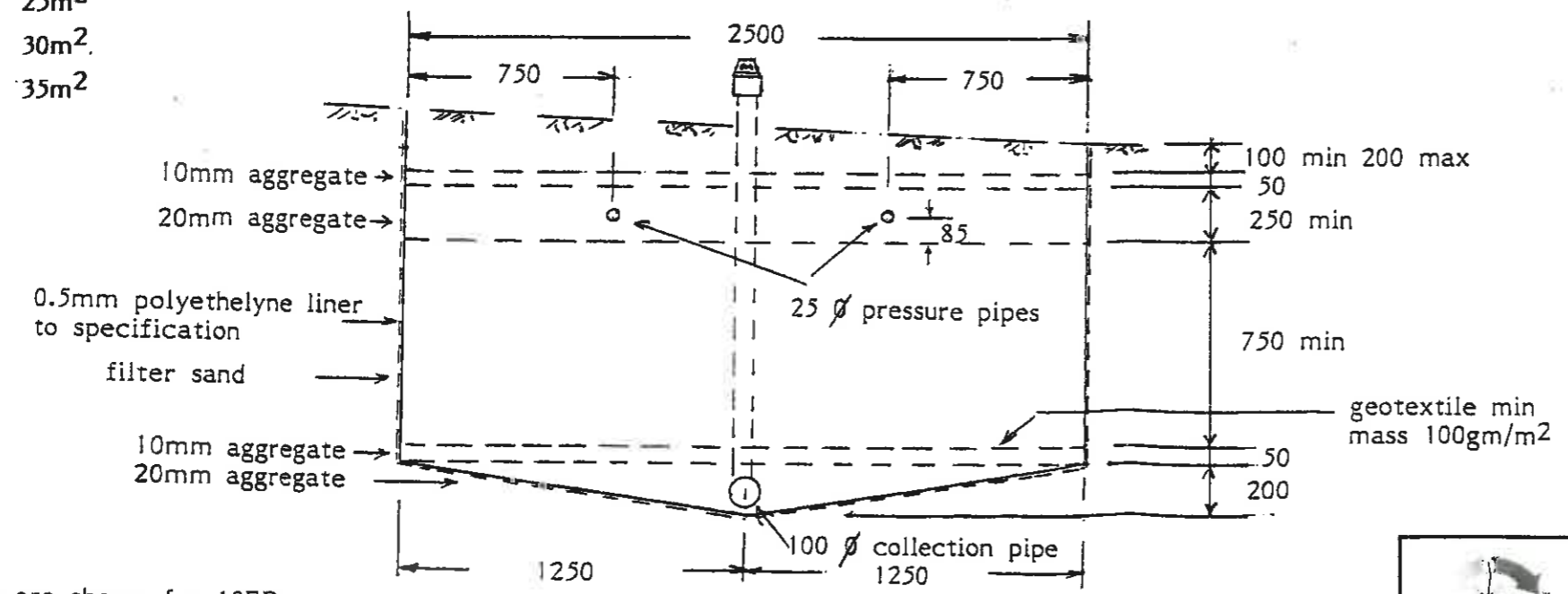
PUMP WELL  
 Everhard 450L w/- Riser  
 Scale 1:25

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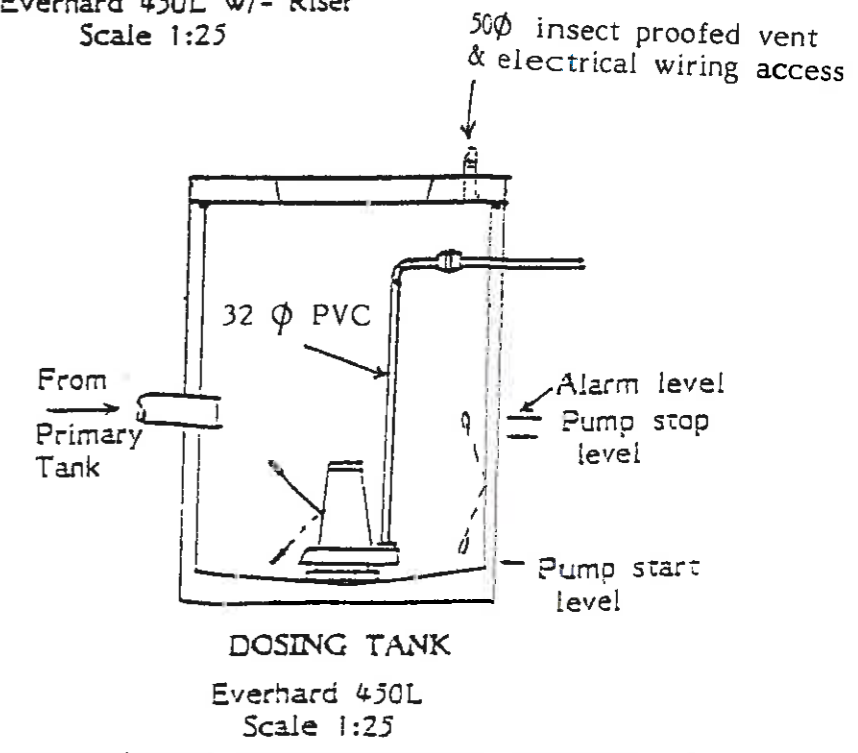
**FILTER AREAS FOR >10EP**

EP	AREA
15	25m <sup>2</sup>
18	30m <sup>2</sup>
20	35m <sup>2</sup>

Refer to Dwg EC- 016 for Disinfection Unit Details



SECTION SAND FILTER  
 Scale 1:25



DOSING TANK  
 Everhard 450L  
 Scale 1:25

NOTE Dimensions are shown for 10EP

- Minimum Filter Area for Domestic Unit 20m<sup>2</sup>
- Allowable Hydraulic Loading shall be 120L/d/m<sup>2</sup> \*
- Filter Areas > 50m<sup>2</sup> shall be dosed by pressure
- Refer Specifications for details of Primary Tank, Dosing Tank & Pump Well

\* based on 200L/p/d

**WASTEWATER TREATMENT**

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**TITLE: AEROBIC SAND FILTRATION TREATMENT OF DOMESTIC WASTEWATER USING PRESSURISED DISTRIBUTION PIPES**

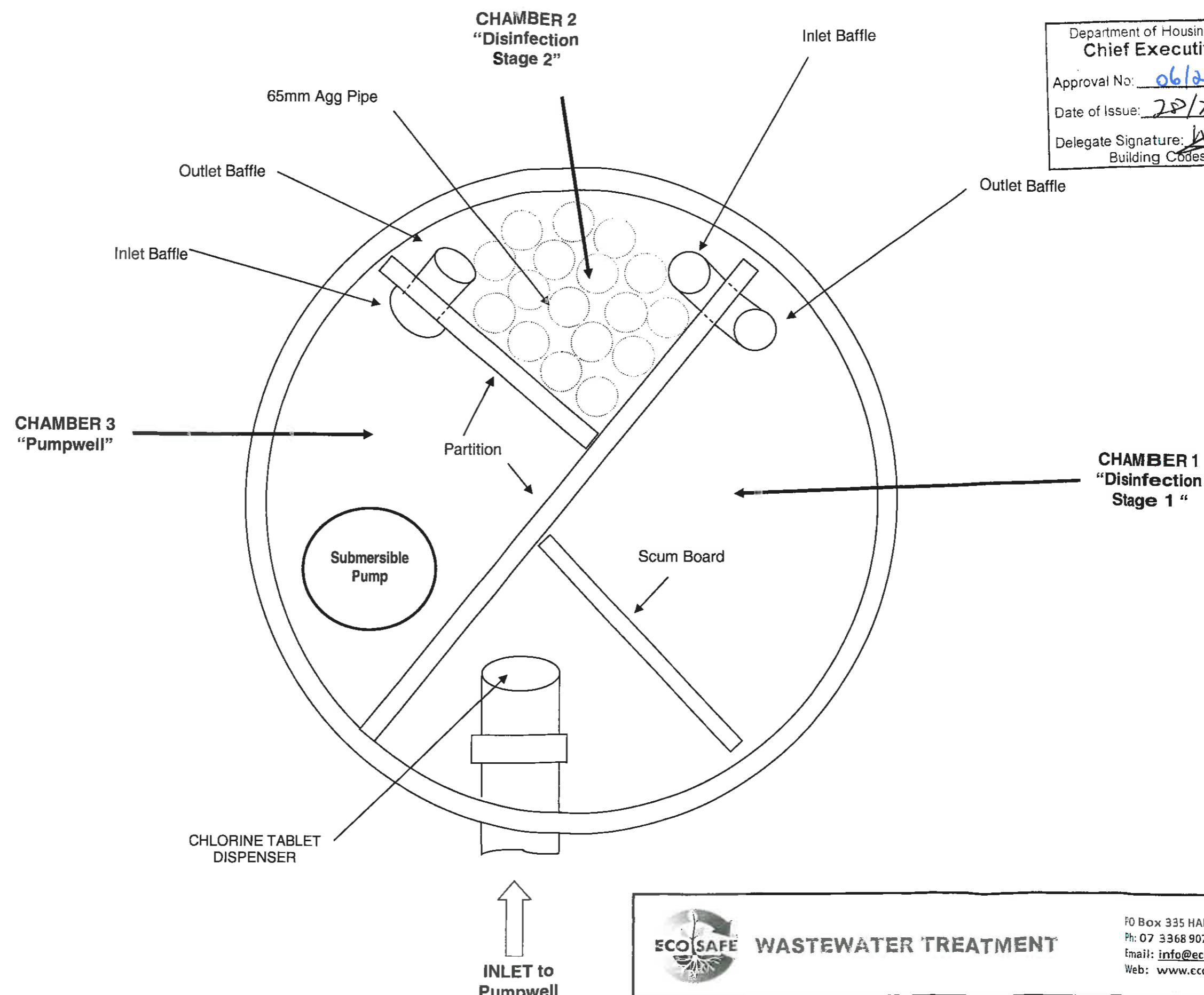
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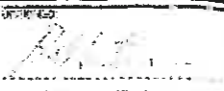
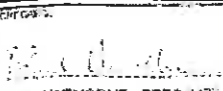
DESIGNED  
  
 B V HAWTHORNE - RPEQ 5 25

CHECKED  
  
 P B HAWTHORNE - RPEQ 747

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	<b>TITLE: ECOSAFE PUMPWELL ADVANCED SECONDARY PUMPWELL AND DISINFECTION UNIT – PATENT PENDING</b>		
DRG. NO. <b>EC-005</b>	DESIGNED  B. V. HAWTHORNE - RPEQ 5026	CHECKED  F. L. HAWTHORNE - RPEQ 1477	DO NOT SCALE DRAWING – ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE