Tasmanian Government

Certificate of Accreditation

On-Site Waste Water Management System

This Certificate of Accreditation is hereby issued by the Minister for Building and Construction pursuant to Section 59(2) of the *Building Act 2000* and the Plumbing Code of Australia as applicable.

System: Fuji Clean CE1500EX With Nutrient Reduction

Manufacturer or Supplier: Fuji Clean Australia Pty Ltd, ACN 129 181 137

Of: 16 Waterway Drive, Coomera, QLD 4210

This is to certify that the Fuji Clean CE1500EX as described in Schedule 1, has been accredited for use as an on-site waste water management system in single dwellings (within plumbing installations in Tasmania). This accreditation is subject to the conditions and permitted uses specified in Schedule 2, and the Plumbing Code of Australia as applicable.

Dale Webster
Director of Building Control
Delegate of the Minister for Building and Construction

Date of Issue: 8/12/2016 Certificate Number: DOC/16/84418

This Certificate of Accreditation is valid until 8/12/2021 subject to conditions unless withdrawn earlier by the Director

Schedule 1: Specification

Fuji Clean CE1500EX Aerated Waste Water Treatment System

General Description

The Fuji Clean CE1500EX (*'the system'*) collects and treats domestic wastewater.

The *system* comprises:

One 4359 litre Fibreglass Reinforced Plastic (FRP) moulded tank containing:

- 1114L sedimentation chamber (primary treatment);
- 982L anaerobic filtration chamber(primary treatment);;
- 580L aerobic contact filtration chamber containing contact and filter media;
- 281L Storage chamber
- 308L Chlorine disinfection/ irrigation chamber containing the chlorinator unit and irrigation pump. The chamber has further emergency capacity of 1094L
- 80L/minute Air Blower;
- High and low level float switch; and
- Alarm panel monitoring power, high water and air pressure faults. This is connected to a remote audio and visual alarm to alert the householder.

The *system* requires a 240V AC power supply.

The *system* has been certified by SAI Global to AS/NZS 1546.3. The *system* is designed to treat a Hydraulic Load of 1500 litres of domestic wastewater per day from a residential premises. The Raw Influent used in the testing of the *system* met the requirements AS/NZS 1546.3:2008 Appendix A4.1. The effluent test results for 100% of samples showed:

- BOD_5 less than or equal to 10mg/L
- TSS less than or equal to 10mg/L.
- E. coli less than or equal to 10cfu/100mL

For *system* cutaway drawings, flow path schematic, sectional diagram and components diagram refer to Appendix A.

For Engineering drawings refer to Appendix B.

For treatment *system* components list refer to Appendix C

Energy consumption:

Estimated Electricity Usage for a 4 person household with average wastewater flows and loads:

Electrical Equipment	Watts	Daily operation (hours) specified by manufacturer	kWh/year	Estimated ~Annual Cost @ ~$0.25/kWh
Claytech Blue Diver 30 irrigation pump	750	0.8	219	$55
Fuji MAC80N Blower	54	24	473	$118
Alarm system	3	24	26	$7

Description of Treatment Processes

Sedimentation Chamber

Wastewater enters the Sedimentation Chamber which is designed to physically separate the gross solids and fat and grease from the incoming wastewater.

Anaerobic Filtration Chamber

This chamber contains a spherical-skeleton type of filter media. Anaerobic bacterial growth on the surface of the filter media captures and decomposes suspended solids. The bacteria in this chamber convert nitrates in the recirculated water returning from the aerobic chamber to gaseous nitrogen.

Aerobic Contact Filtration Chamber

The aeration chamber consists of an upper section with plastic lattice board media plates and hollow net media in the lower section. An air diffuser continuously supplies the micro-organisms with oxygen. In the upper section, the lattice board media adjusts inflow from the anaerobic filtration chamber and organic matter is decomposed by micro-organisms/bacteria on the contact media surface. Also, organic matter is decomposed by micro-organisms/bacteria on the lower filter media surface while suspended solids are captured in the lower section. Suspended solids accumulated on the bottom are constantly transferred to the sedimentation chamber by a recirculation air-lift pump.

Clarification Chamber

This chamber is designed to temporarily store the treated water coming out of the aeration chamber. The treated water is pumped out to the disinfection chamber by an air-lift pump.

Pump Chamber

The treated water from the Clarification chamber passes through the chlorinator for final disinfection. After disinfection, the treated effluent is stored in the pump chamber. The irrigation pump in this chamber is controlled by a high and low water level float switch.

Hydraulic Loading and Effluent Quality

CE-1500EX is designed to treat all household wastewater from the kitchen, bathroom, toilet and laundry and capable of producing Secondary Quality Effluent as specified below. The daily design flow rate of CE-1500EX is 1,500 L/day (10EP).

- BOD_5 equal to or less than 20mg/L
- Total Suspended Solids equal to or less than 30mg/L
- E. coli equal to or less than 10cfu/100mL
- Total nitrogen concentrations less than or equal to 20mg/L
- Total phosphorous concentrations less than or equal to 5mg/L

Schedule 2: Conditions of Accreditation

1.0 Definitions

In this schedule:

AS/NZS 1547 means the Joint Australian/New Zealand Standard '*AS/NZS 1547:2000 On-site domestic-wastewater management*';

AS/NZS 1546.3 means the Joint Australian/New Zealand Standard '*AS/NZS 1546.3:2001 On-site domestic wastewater treatment units, Part 3: Aerated wastewater treatment systems*';

AS/NZS 3000 means the Joint Australian/New Zealand Standard '*AS/NZS 3000:2000 Wiring rules*'

AS/NZS 5667 means the Joint Australian/New Zealand Standard '*AS/NZS 5667.1:1998 Water quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and preservation and handling of samples*';

BOD_5 means '5-day Biochemical Oxygen Demand';

Council means 'the Municipal Council having jurisdiction';

Commissioned means 'when the test results from a NATA Certified Laboratory show that the water quality requirements for the *system* have been met and all pre-commissioning tests have been carried out in accordance with AS/NZS 1547 on all associated equipment including the land application system';

Designer means 'a person that is an accredited building practitioner or licensed plumber under the Act and who has a specialty in the area of designing on-site waste water management system installations'.

Director means 'the Director of Building Control';

EC means electrical conductivity

E. coli means 'Escherichia coli of the family Enterobacteriaceae which is a bacterium used in public health as an indicator of faecal pollution';

g/m^3 means grams per cubic metre

Manufacturer means '**Fuji Clean Pty Ltd'**;

N means 'Nitrogen';

NATA means 'National Association of Testing Authorities';

PCA means 'Vol. 3 of the National Construction Code (Plumbing Code of Australia)';

Permit means 'a Permit issued by the *council* pursuant to section 82 of the *Building Act 2000*';

Permit authority means 'a person or body authorised for that purpose by the *council* of the municipal area in which the on-site waste water management system is installed';

Plumber means a person who holds an appropriate class of licence under the *Occupational Licensing Act 2005* as a Plumber Practitioner (Certifier).

Supplier means 'the party that is responsible for ensuring that products meet and, if applicable, continue to meet, the requirements on which the certification is based.' The supplier for the **Fuji Clean CE1500EX is Fuji Clean Pty Ltd.**

System means '**Fuji Clean CE1500EX**

TPC means the 'Tasmanian Plumbing Code'.

TSS means 'Total Suspended Solids'.

2.0 General

2.1 The *system* must be supplied, constructed and installed in accordance with the design submitted and accredited by the *Director*.

2.2 The *system* must not be installed in a plumbing installation other than in accordance with the conditions of permit issued by the *Permit Authority*.

2.3 The *system* must not be used in a plumbing installation other than in accordance with the conditions of permit issued by the *Permit Authority*.

2.4 Each *system* must be permanently and legibly marked on a non-corrosive metal plaque or equivalent, attached to the lid with the following information:

- The brand and model name or designation of the *system*;
- The *manufacturer's* name or registered trademark;
- Top load limitations; and
- The month and year of manufacture.

2.5 The *supplier* must supply the owner and occupier, of each installation, with a user manual setting out the following:

(a) the treatment process;
(b) procedures to be followed in the event of a *system* failure;
(c) emergency contact number;
(d) care, operation, monitoring and maintenance requirements; and
(e) inspection and sampling procedures to be followed as part of the on-going monitoring and program required by the *permit authority*.

2.6 Any proposed modifications to the *system's* specified processes, equipment, materials, fittings or manuals must have prior authorisation in writing from the *Director* and may be subject to additional verification or testing.

2.7 Each application to a *permit authority* to install a *system* must be accompanied by a site-and-soil evaluation report and design report in accordance with *AS/NZS 1547* as appropriate.

2.8 The *supplier* must provide the following information to each *permit authority* where it is intended to install a *system* in their jurisdiction:

- Statement of warranty
- Statement of service life
- Quality Assurance Certification
- Installation Manual
- Service Manual
- Owner's Manual
- Service Report Form
- Engineering Drawings on A3 format
- Detailed *system* Specifications
- Copy of Certificate of Accreditation and Schedules.

2.9 This Certificate of Accreditation is valid for five (5) years from the date of issue or until withdrawn by the *Director* and is not transferable.

2.10 At each anniversary of the accreditation date the *supplier* must submit to the *Director* a list of all *systems* installed in Tasmania during the previous 12 months. The *Director* may randomly select up to 10% of the installed *systems* from each year of installation. The *Director* will notify the *supplier's* nominated *NATA* accredited laboratory which *systems* are to be sampled and tested for BOD_5 and *TSS* and Chlorine residual. The sampling and testing of the selected *systems* is to be done at the *supplier's* expense. The following results must be reported to the *Director:*

- Address of premises;
- Date inspected and sampled;
- Sample identification number;
- Chlorine Residual;
- BOD_5;
- *TSS*;
- *E.*coli and
- Service history

2.11 Where, due to a design fault, the *system* has been found not to operate satisfactorily during its service life and as a result requires modification to achieve the required water quality limits, all installed *systems* are to be modified accordingly.

2.12 When granting a *permit* the *permit authority* is to satisfy itself that the *designer's* choice of the *system* configuration is optimal for the proposed use and site conditions.

2.13 The *system* must not be deployed to areas where seasonal climatic conditions will negatively affect its proper operation (refer to *manufacturer's* specifications).

2.14 Prior to the granting of a *permit* to install a *system* the following reports must be submitted with an application to the *permit authority*:

Site-and-soil evaluation report

The site and soil evaluation report is to detail results of an assessment of the individual lot(s) for the public health, environmental, legal and economic factors which are likely to impinge on the location and design of a land-application system. (Refer to AS/NZS 1547 Clause 4.1.5 and associated appendices to 4.1).

Design report

The Design Report is to include the following:

(a) Relevant aspects of the Site-and-soil Evaluation Report.

(b) A report on the selection of the land-application system. (Refer to AS/NZS 1547, Clause 4.2.4 and associated appendices to Clause 4.2 for further information).

(c) A report on the selection of the wastewater-treatment unit. (Refer to AS/NZS 1547, Clause 4.3.6 and associated appendices to Clause 4.3 for further information).

(d) Sufficient information to show that the relevant performance requirements set out in the *PCA* have been met.

(d) A loading certificate which sets out the design criteria and the limitations associated with use of the *system* and incorporates such matters as:

(i) *System* capacity (number of persons and daily flow);

(ii) Summary of design criteria;

(iii) The location of and use of reserve areas;

(iv) Use of water efficient fittings, fixtures, or appliances;

(v) Allowable variation from design flows (peak loading events);

(vi) Consequences of changes in loading (due to varying wastewater characteristics);

(vii) Consequences of overloading the *system*;

(viii) Consequences of underloading the *system*;

(ix) Consequences of lack of operation, maintenance and monitoring attention; and

(x) Any other relevant considerations related to the use of the *system*.

2.15 The following reports must be submitted to the *permit authority* and owner and be made available to the *Director* upon request after *commissioning* of the *system*:

Installation and commissioning report

The Installation and Commissioning Report is to cover the 'as-constructed' records of the *system* installation together with the results of *commissioning* tests to demonstrate correct construction and installation and is to be provided to the owner and *permit authority* on completion of the work. (Refer to and AS/NZS 1547 Clause 4.5.6.3 and associated appendices to Clause 4.5).

Inspection and Maintenance Report

Maintenance reports cover ongoing inspection and maintenance operations in order to monitor the operation of the installation. (Refer to AS/NZS 1547 Clause 3.7.4 and associated Appendix 3A).

2.16 Where the supplied pump is not suitably rated for the proposed land application area it must be replaced with a pump which has a rated capacity that matches the hydraulic characteristics of the irrigation system and be capable of discharging at least 50% more than the 30 minute flow rate. For drip irrigation systems, ensure that drip emitter flow rates do not vary more than 10% from the design rate over the whole of the system when installed on a sloping site.

Note: The pump selection is to be based on flow, head loss and pressure requirements.

2.17 Effluent distribution by sub-surface application may be permitted where the *Permit Authority* is satisfied that the application for a *permit* to install the *system* has demonstrated that the:

(a) effluent can be retained within the authorised land application area;

(b) where applicable the land application system has been designed and is capable of being installed and maintained in accordance with *AS/NZS 1547*;

(c) the location of the land application system satisfies the relevant requirements of the *State Policy on Water Quality Management 1997*; and

(d) the discharge is capable of satisfying the relevant water quality limits (see 5.2).

3.0 Installation and Commissioning

3.1 The installation and operation of the *system* must comply with the conditions of accreditation and the *manufacturer's* instructions.

3.2 All plumbing work carried out in connection with the *system* installation must satisfy the requirements of the *Building Act 2000*, *TPC* and the Tasmanian Plumbing Regulations and be carried out by a registered plumber with appropriate training and competencies.

3.3 All installations of the *system* must satisfy the installation requirements set out in *Appendix A1 – On-site Waste Water Management Systems* of the *TPC*.

3.4 All electrical work must be carried out by a licensed electrician and in accordance with relevant provisions of *AS/NZS 3000*.

3.5 The *system* requires a 240V AC power supply. A weather-proof isolating switch must be provided at the power outlet. The power supply must have its own clearly marked designated circuit breaker in the electricity supply fuse box.

3.6 Each *system* installation must be inspected and checked by the *designer* or the designer's agent. The *designer* on completion is to certify that the *system* has been constructed, installed and *commissioned* in accordance with its design, the conditions of accreditation and any additional requirements set out in the *permit*.

Note: Where the designer is not available to supervise the installation the designer should obtain signed certification from the installing plumber stating that the installation has been constructed/installed and commissioned in accordance with its design, the conditions of accreditation and any additional requirements of the council and/or permit authority

3.7 Where discharging wastewater to a land application system by irrigation, a lockable sampling tap or gate valve is to be provided on the outlet pipe to the irrigation system.

3.8 A report is to be prepared by the installing *plumber* detailing the inspection of the installation and the results of the *commissioning* tests and be accompanied by a certificate certifying that the *system* is operating and performing adequately (see 2.15).

3.9 Copies of the following reports/certificates must be submitted to the *council* and the owner as soon as practicable after the commissioning of the *system* and after each scheduled or unscheduled service or inspection for the period specified in the *permit*:

(a) The initial plant installation and commissioning report;

(b) All required laboratory analytical test reports; and

(c) All inspection and maintenance reports

3.10 Copies of any report or certificate required by the conditions of accreditation must be made available to the *Director* on request.

3.11 The *designer* is to provide a statement warning the user of which items and products that must not be placed in the *system*.

3.12 To verify that the plant is commissioned, sampling must be carried out, by a *council* approved person, for BOD_5, *TSS* and Free Residual Chlorine. The samples are to be tested and reported on by a NATA certified laboratory.

4.0 Maintenance and monitoring

4.1 Each installation must be serviced and monitored at not less than 3 monthly intervals in accordance with the conditions of accreditation, the conditions of *permit* and *manufacturer's* requirements.

NOTES:

1. Only a plumber can carry out the maintenance and required monitoring of the system other than electrical work unless licensed to do so.
2. The plumber may need to complete training by the supplier before carrying out any maintenance on the system.
3. The maintenance and monitoring intervals may be combined provided the monitoring frequency remains at 3 month intervals.

4.2 The owner of the *system* must enter into and maintain a maintenance contract with the *council*, the *supplier* of the *system*, or plumbing contractor.

4.3 The owner must enter into an agreement with the *council* to maintain the maintenance contract where that contract is with the *supplier* of the *system* or other *council* approved plumbing contractor.

4.4 The *system* must be operated and maintained to ensure it performs continuously and without any intervention between inspections carried out by the *plumber*.

4.5 A service report is to be prepared by the *plumber* who carried out the work detailing the inspection of the installation and the results of all servicing tests and conditions at the completion of all scheduled or unscheduled services or inspections.

4.6 The service report is to be accompanied by a signed document certifying that the *system* is operating and performing adequately.

4.7 A copy of the service report and certifying document is to be provided to the occupant and *council*. Each service report is to contain a statement reminding the user about items and products that must not be placed in the *system*.

4.8 Each service must include monitoring the operation of the *system* and associated land application system.

4.9 Maintenance must be carried out on all mechanical, electrical and functioning components of the *system* including the associated land application system as appropriate.

4.10 The monitoring, servicing and reporting of the installation must include but not be restricted to the following matters, as appropriate:

(a) Reporting on weather conditions, ambient temperature, effluent temperature;

(b) Odour;

(c) Check and test pump

(d) Check and test air blower, fan or air venturi and clean/replace air filters;

(e) Check and test alarm system;

(f) Check slime growth on membranes and report the on condition of membranes;

(g) Check and report operation of sludge return, sludge level and de-sludging;

(h) Check and record water meter reading (if fitted);

(i) Check and record operation of irrigation area, irrigation fittings;

(j) Check and clean/replace irrigation filters;

(k) Check and report on water quality (testing for pH, Turbidity, EC and dissolved oxygen);

(l) Check, and replenish chlorine disinfection system;

(m) Cleaning of the following items at above the waterline–

I. clarifier,

II. pipework,

III. valves

IV. walls of chambers

5.0 Performance

5.1 Hydraulic and Organic Loading:

The *system* is accredited for treatment of domestic wastewater from residential and commercial premises with the following MAXIMUM hydraulic and organic loads:

Model	Hydraulic load (L/day)	Biochemical Oxygen Demand (g/day)
Fuji Clean CE1500EX	1500	700

5.2 Water Quality Limits:

Treated effluent from the *system* must not exceed the following limits (90% of samples): for the uses specified in section 7.0, or those specified by the Permit Authority (whichever are the more stringent).

For sub-surface irrigation:	
5-day Biochemical Oxygen Demand (BOD_5)	20 g/m^3 (max. 30 g/m^3)
Total Suspended Solids (TSS)	30 g/m^3 (max. 45 g/m^3)
For surface irrigation:	
5-day Biochemical Oxygen Demand (BOD_5)	20 g/m^3 (max. 30 g/m^3)
Suspended Solids (SS)	30 g/m^3 (max. 45 g/m^3)
E. coli	10 cfu/100 mL (max. 20 cfu/100 mL)
Free Residual Chlorine concentrations	≥ 0.5 $g/m^3$and less than 2.0 g/m^3

6.0 On-going management

6.1 The mandatory servicing and monitoring is to commence 3 months after the *system* is *commissioned*. The servicing and monitoring is to coincide with the *supplier's* required on-going routine scheduled maintenance program.

6.2 Where a *system* installed at a site has been found not to operate satisfactorily during its service life, and as a result requires modification to achieve the required performance requirements, in particular, water quality limits, the installed *system* is to be modified accordingly. Any modifications must be recorded on the service report.

6.3 In the event of failure to comply with the water quality limits set out in these conditions, fortnightly sampling and testing for *BOD_5*, *TSS* and Free Residual Chlorine must be carried out until the plant is *re-commissioned.*

6.4 The method of preserving and the handling of samples taken from the plant must satisfy the relevant requirements of *AS/NZS 5667.*

6.5 Copies of the following reports and certificates must be submitted to the *permit authority* and the owner as soon as practicable after the *commissioning* of the *system* and after each scheduled or unscheduled service for the period specified in the *permit:*
(a) the initial plant installation and *commissioning* report
(b) all laboratory analytical test reports; and
(c) all inspection and maintenance/service reports

6.6 The *system* is to be de-sludged strictly in accordance with the *manufacturer's* recommendations and the sludge is to be disposed of in accordance with the Tasmanian Biosolids Reuse Guidelines and the conditions of *permit.*

6.7 Only persons with a waste transport business Environment Protection Notice are to be engaged for the removal, transporting and disposal of accumulated sludge removed from the *system.*

6.8 Any waste material removed from the *system* must be collected and disposed of or utilised by an approved facility or agency.

6.9 Measures are to be put in place so that during servicing activities all persons and the environment will be protected from the results of the servicing activities.

7.0 Permitted uses

7.1 The effluent is suitable for land application by any of the following methods:

(a) sub-surface by:

i. subsurface drip irrigation

ii. trenches, beds, mounds, evapo-transpiration systems

(b) above ground by:

i. spray irrigation

ii. surface drip irrigation

Note: Each of the above forms of Land Application is subject to consent from the permit authority and must be in accordance with the relevant provisions of AS/NZS 1547.

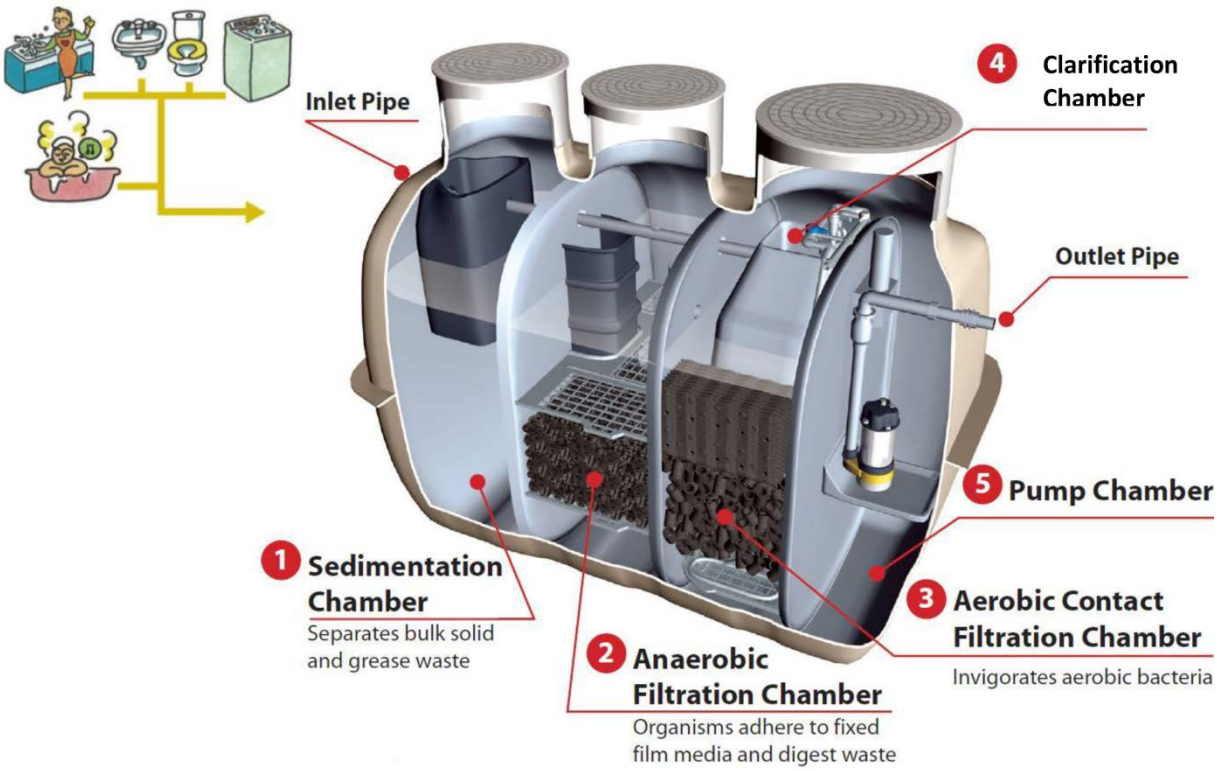
7.2 Where it is not practicable for effluent from the system to be applied in accordance with *AS/NZS 1547* the method of discharge must satisfy contemporary relevant regulatory requirements to the satisfaction of the *permit authority*.

Appendix A

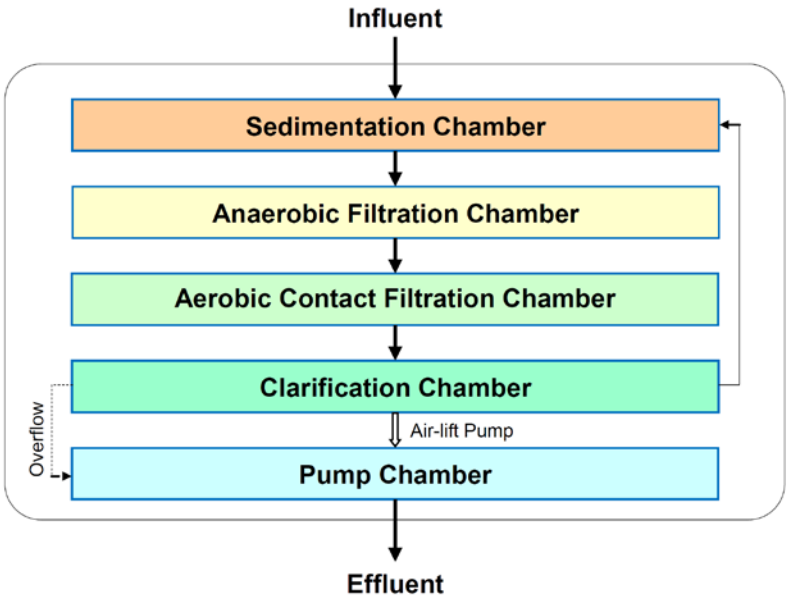
Cutaway drawings, schematic and sectional view

Fuji Clean CE-1500EX

Cutaway view of the tank



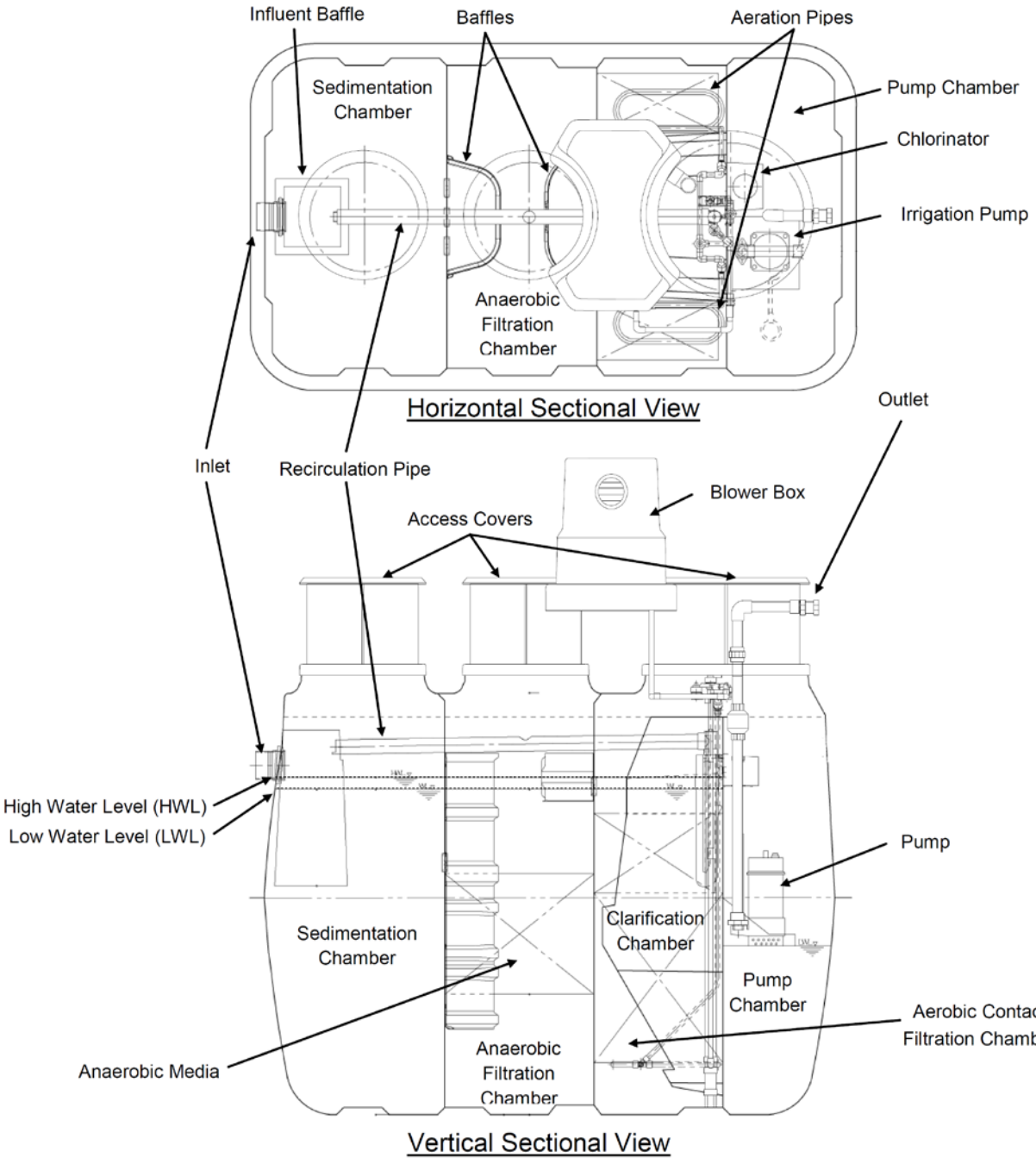
Schematic diagram of treatment process



System Components and dimensions

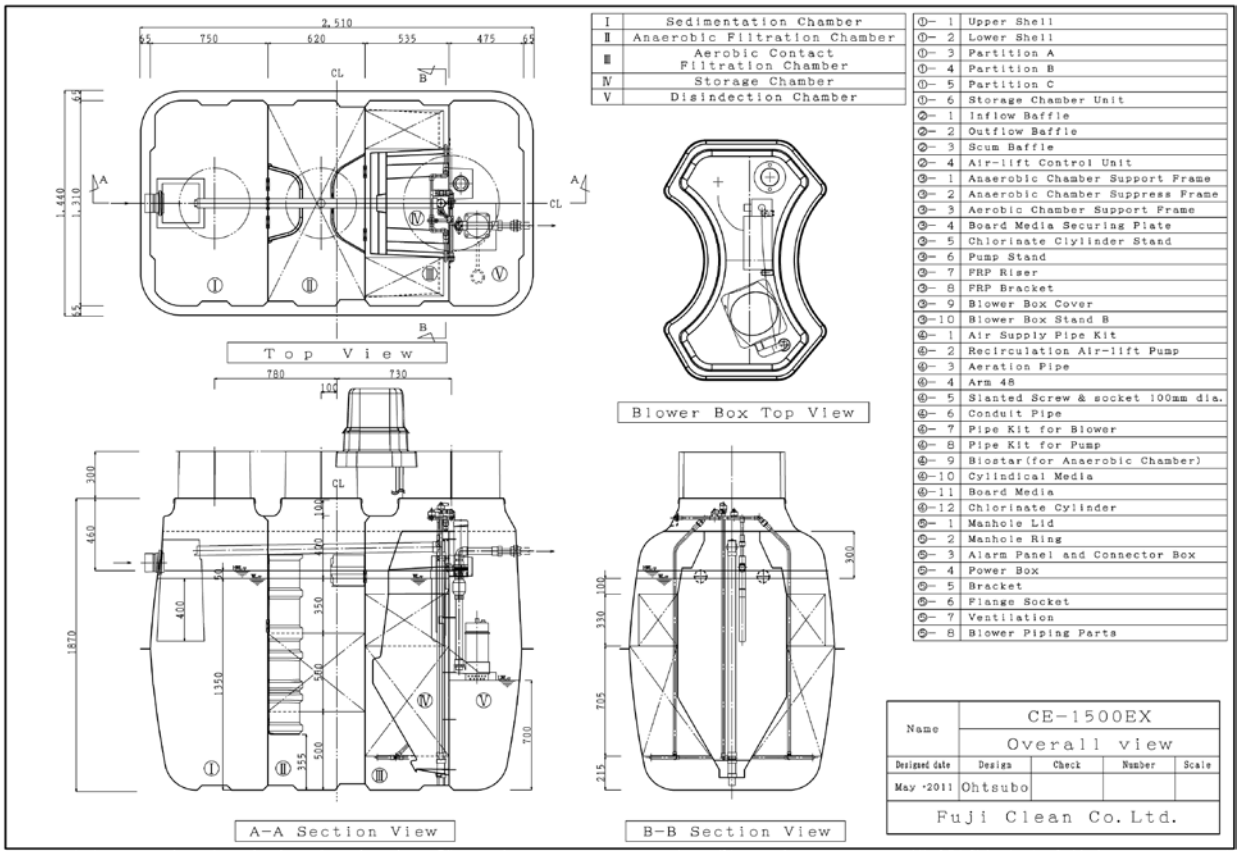
Volume (L)	
Sedimentation Chamber	1,114
Anaerobic Filtration Chamber	982
Aerobic Contact Filtration Chamber	580
Clarification Chamber	281
Pump Chamber	803
Total Volume	3,265
Weight (kg)	430

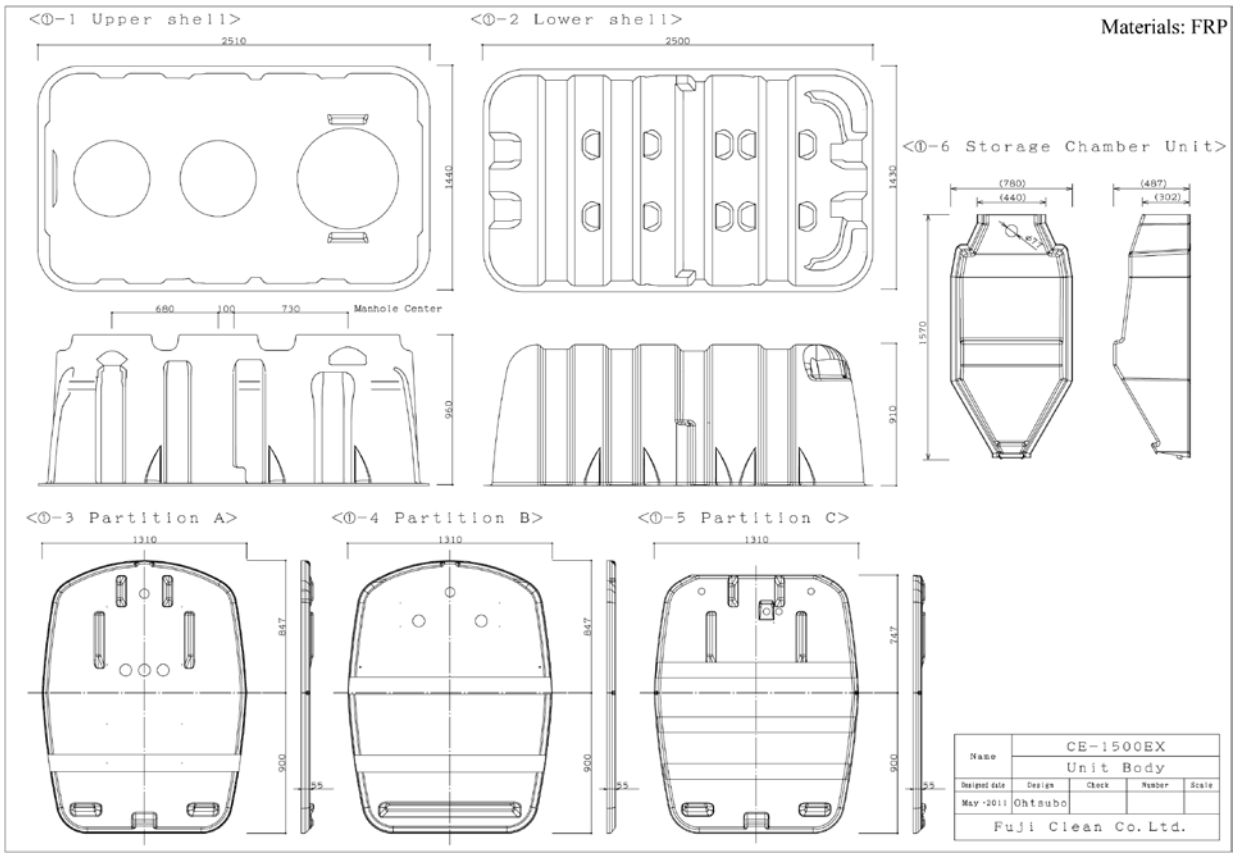
Dimensions (mm)	
Max. Width	1,440
Max. Length	2,510
Max. Height (Standard)	1,870
Max. Height (with 300mmH risers)	2,170
Inlet Invert (Standard)	460
Inlet Invert (with 300mmH risers)	760
Inlet Pipe Nominal Size	Dia. 100
Outlet Pipe Nominal Size	Dia. 25



Appendix B

Engineering Drawings

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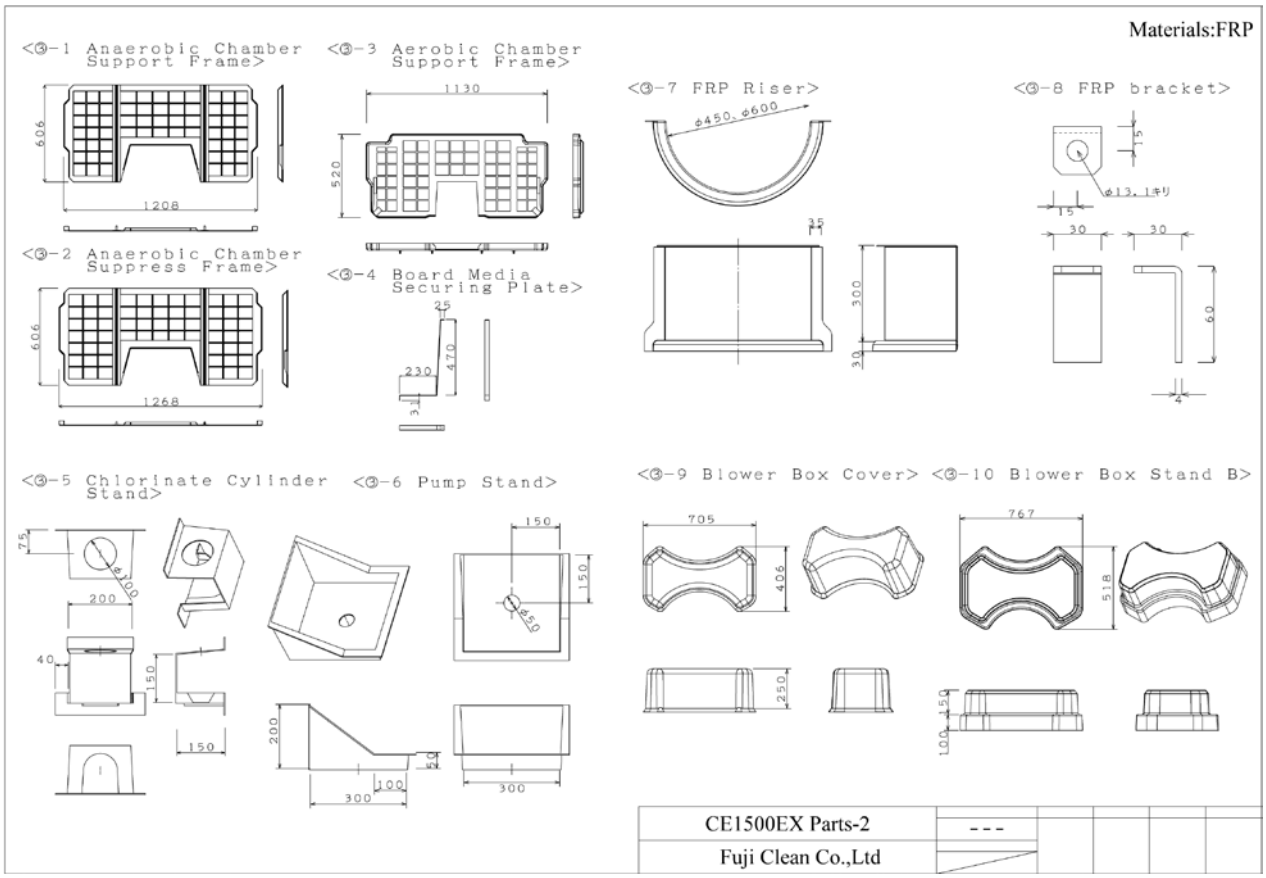
Unit Body
Designed date
Design
Check
Number
Scale
May -2011
Ohtsubo
Fuji Clean Co. Ltd.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<③-5 Chlorinate Cylinder Stand>
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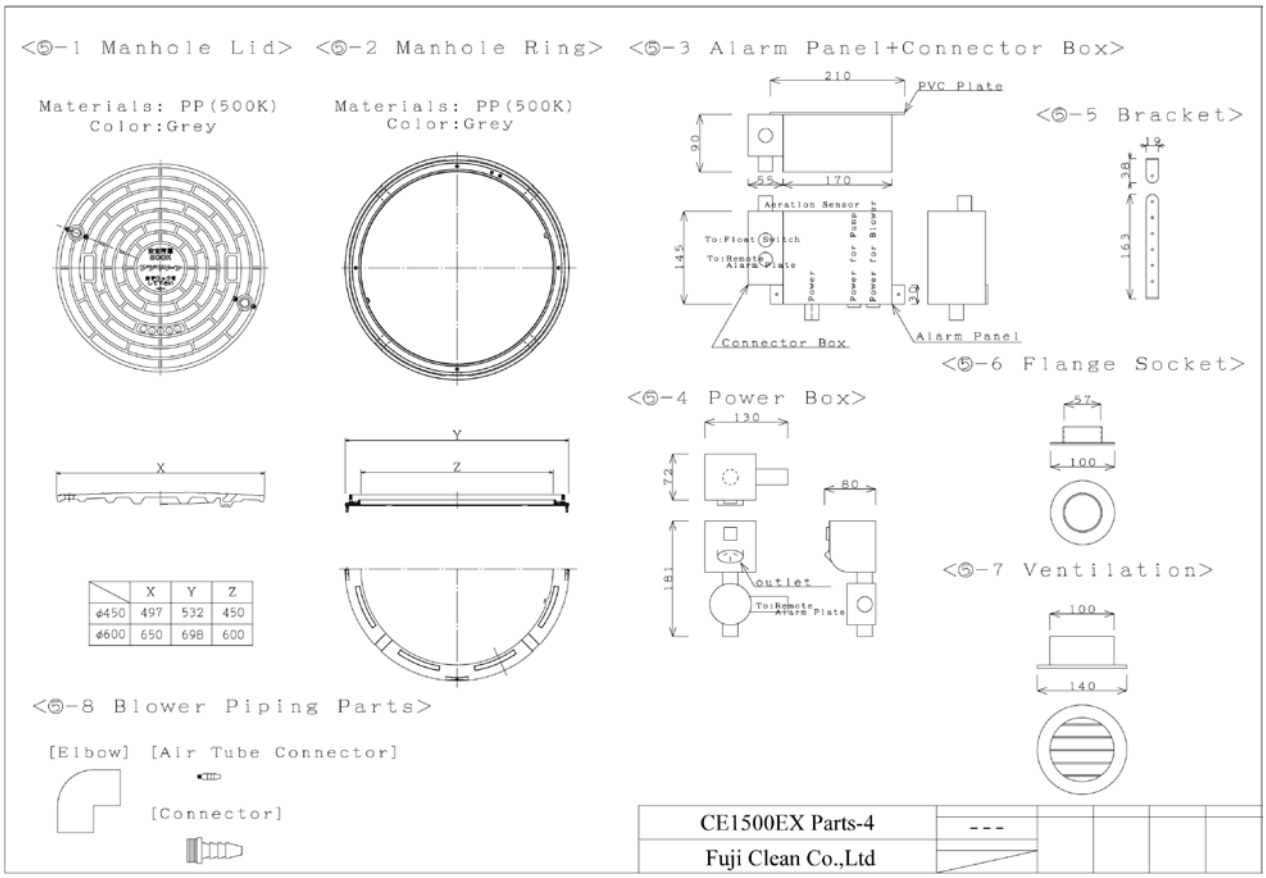
CE1500EX Parts-2

Fuji Clean Co.,Ltd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90
55
170
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To:Remote Alarm Plate
145
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Power for Pump
Power for Blower
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CE1500EX Parts-4

Fuji Clean Co.,Ltd

Appendix C

Component list and specifications

1) Tank

Material:	Fibreglass Reinforced Plastic (FRP)
Height:	1870mm
Width:	1400mm
Length:	2510mm
Total Volume:	4359L

2) Influent/effluent pipes

Material:	Rigid PVC
Diameter:	100mm

3) Other pipes

Material:	Rigid PVC
Diameter:	various

4) Filter or contact media

Material:	PVC/PP/PE
Diameter:	various

5) Air Blower - MAC80N

Weight:	5kg
Air flow volume:	80L/min
Pressure:	15kPa
Power consumption:	54W
Power Source:	240V/50Hz

6) Pumps – Claytech BlueDiver 30

Height:	375mm
Diameter:	149mm
Weight:	8kg
Flow rate:	68L at 10m Head
Motor Power:	750W
Power Source:	240V/50Hz