Queensland Government

CHIEF EXECUTIVE APPROVAL 01/2019

Plumbing and Drainage Act 2002, part 5.

Approval

1. The **BioFicient Series 1** ("the system") described in the Specifications and Drawings in the attached Schedule and manufactured by **Kingspan Water & Energy Pty Ltd** ("the manufacturer") (ABN 62 108 491 881) has been assessed in accordance with the Queensland Plumbing and Wastewater Code (QPW Code) dated 15 January 2013.

2. Approval is granted for a 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 secondary quality wastewater treatment system may only be used on premises that generate per day:

   (a) a maximum hydraulic loading of 1500L; and

   (b) a maximum organic loading of 70g/person BOD_5

7. For the system to meet the requirements of a secondary quality wastewater treatment system, the system must produce the following effluent quality —

   (a) 90% of the samples taken must have a BOD less than or equal to 20g/m³ with no sample greater than 30g/m³; and

   (b) 90% of the samples taken must have total suspended solids less than or equal to 30g/m³ with no sample greater than 45g/m³; and

   (c) Where disinfection is provided 90% of the samples taken over the test period must have a thermotolerant coliform count not exceeding 200 organisms per 100ml with no sample exceeding 1000 organisms per 100ml.

   (d) Where chlorination is the disinfection process, the total chlorine concentration must be greater than or equal to 0.5g/m³ and less than 2.0g/m³ 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;

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(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, the Chief Executive 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_5) 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_5).

    (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 19 February 2024 unless cancelled earlier in accordance with paragraph 13 above.

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

Date approved: 20 February 2019

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Plumbing and Drainage Act 2002, part 5, division 1, section 93

SCHEDULE

Attachment 1

Specifications for the

BioFicient Series 1

Department of Housing and Public Works
Chief Executive Approval
Approval No: 01/2019
Date of Issue: 20/2/19
Delegate Signature:
Building Codes Queensland

Water Management Solutions

Designed to	Designed to	60 Years Experience
AS/NZS 1546.1: 2008	AS 1546.3: 2017	

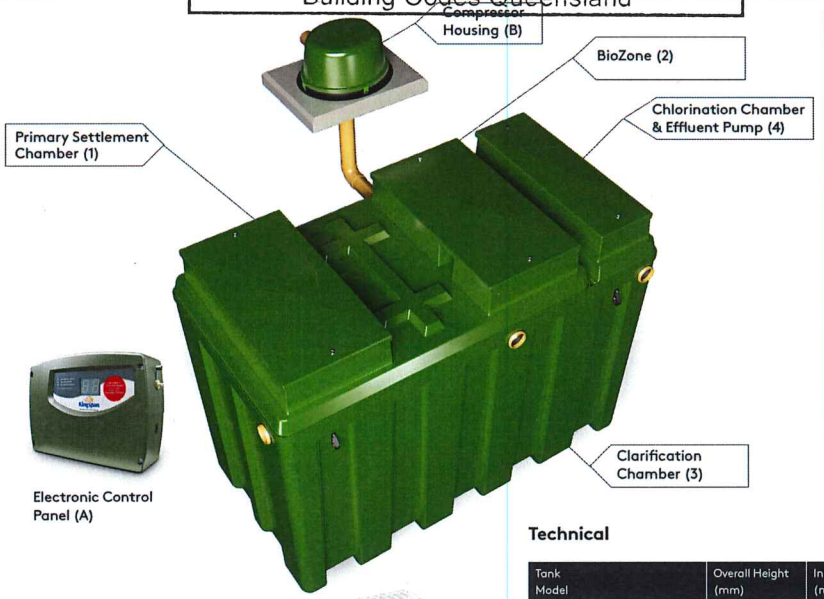
Domestic BioFicient®

The BioFicient® Aerated Wastewater Treatment System provides a reliable and effective solution, suitable for homes with up to ten people.

Why Kingspan?

With over 60 years of experience in premium wastewater treatment solutions worldwide, you can trust Kingspan to help you select the correct wastewater treatment solution tailored to your home's individual needs. The BioFicient® AWTS provides a reliable and effective solution for domestic applications without access to mains drainage.

Suitable for homes with up to 10 people, the BioFicient® is manufactured from high quality Fibre Reinforced Plastic (FRP) and uses the latest treatment technology to deliver a high quality of water discharge. The BioFicient® AWTS is designed to be fully compliant with all relevant Australian standards.



Product Benefits

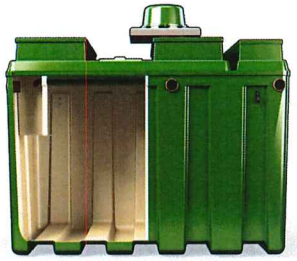
- Over 60 years of manufacturing premium Wastewater Treatment Systems
- Designed to the latest Australian Standard –AS1546.3:2017
- High performance, efficient treatment technology
- Low, energy efficient power consumption
- 15 year structural & 2 year mechanical warranty
- Minimal, simple, cost effective maintenance requirement
- System status monitor with audible & visual alarm activation
- Compact & shallow single tank construction
- Aesthetically pleasing, low profile covers
- Lightweight yet robust corrosion resistant FRP construction

Technical

Tank Model	Overall Height (mm)	Inlet Invert (mm)	Outlet Invert (mm)	Length (mm)	Width (mm)
BFS1 (10PE) – 500mm Invert	2215	500	430	2850	1482
BFS1 (10PE) – 700mm Invert	2415	700	630	2850	1482
BFS1 (10PE) – 1200mm Invert	2915	1200	1130	2850	1482

Compressor Housing (B)

The Compressor Housing **(B)** provides a home for the high quality, energy efficient compressor (blower) and Electronic Control Panel **(A)**. The compressor provides the air that is driven in to the BioZone to provide oxygen and movement to the media **(H)** and the Control Panel operates and powers the mechanical components within the BioFicient. The Control Panel provides constant system status which can be viewed on the integrated LCD display. Fault signal to the Audible/Visual Alarm is supplied, in the unlikely event of system/power error. A standard battery backup power supply is installed to ensure fault signal is active in the event of power failure to the system.

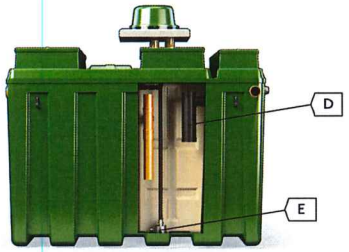


1. Primary Settlement Chamber

Wastewater from the home will flow to the Primary Settlement Chamber **(1)**, where a physical separation of foreign material and sewage solids will occur. At this stage the TSS (Total Suspended Solids) and BOD (Biochemical Oxygen Demand – the measurement of organic matter contained with the water) are greatly reduced. This primary treated effluent is then displaced into the BioZone for further treatment. The settled solids in the Primary Settlement Tank should be removed periodically, as required.

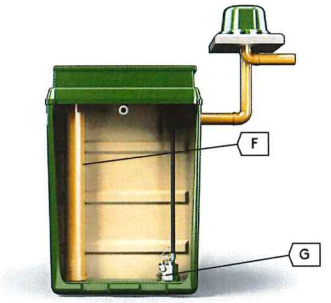
2. BioZone Chamber

The BioZone **(2)** is where most of the biological treatment process will occur. This chamber contains thousands of maintenance free, patented, high surface area biofilm carrying media **(H)**, specifically designed for this type of treatment system. The naturally occurring microorganisms present in the wastewater will adhere to the media and, in turn, will consume the organic based pollutants within the wastewater – thus providing the highly efficient treatment process.
Air/Oxygen is delivered from the Air Compressor to a fine bubble disc diffuser **(C)**, positioned at the bottom of the chamber. The air provides the oxygen required by the microorganisms to live and creates movement within the tank to ensure complete contact between the media and the wastewater. Following this biological treatment process, the effluent is then displaced into the Clarification Chamber **(3)**.



3. Clarification Chamber

This chamber allows fine particles, present in the treated effluent, to easily settle out. The chamber contains a timer controlled effluent pump **(E)** to remove these settled particles and deliver them back to the Primary Settlement Tank **(1)** thus ensuring the excellent quality of the treated effluent. The treated effluent then discharges to the Chlorination Chamber **(4)** via a fine particle filter **(D)**.



4. Chlorination Chamber

The biologically treated effluent will pass through a Chlorine Tablet Feeder **(F)** system that will dose the final effluent and provide the final disinfection process required for most applications. The fully disinfected effluent will then be delivered to the disposal system (irrigation/soakaway system) via an integrated stainless-steel float controlled effluent pump **(G)**

SYSTEM DESCRIPTION

General Description and Product Specification

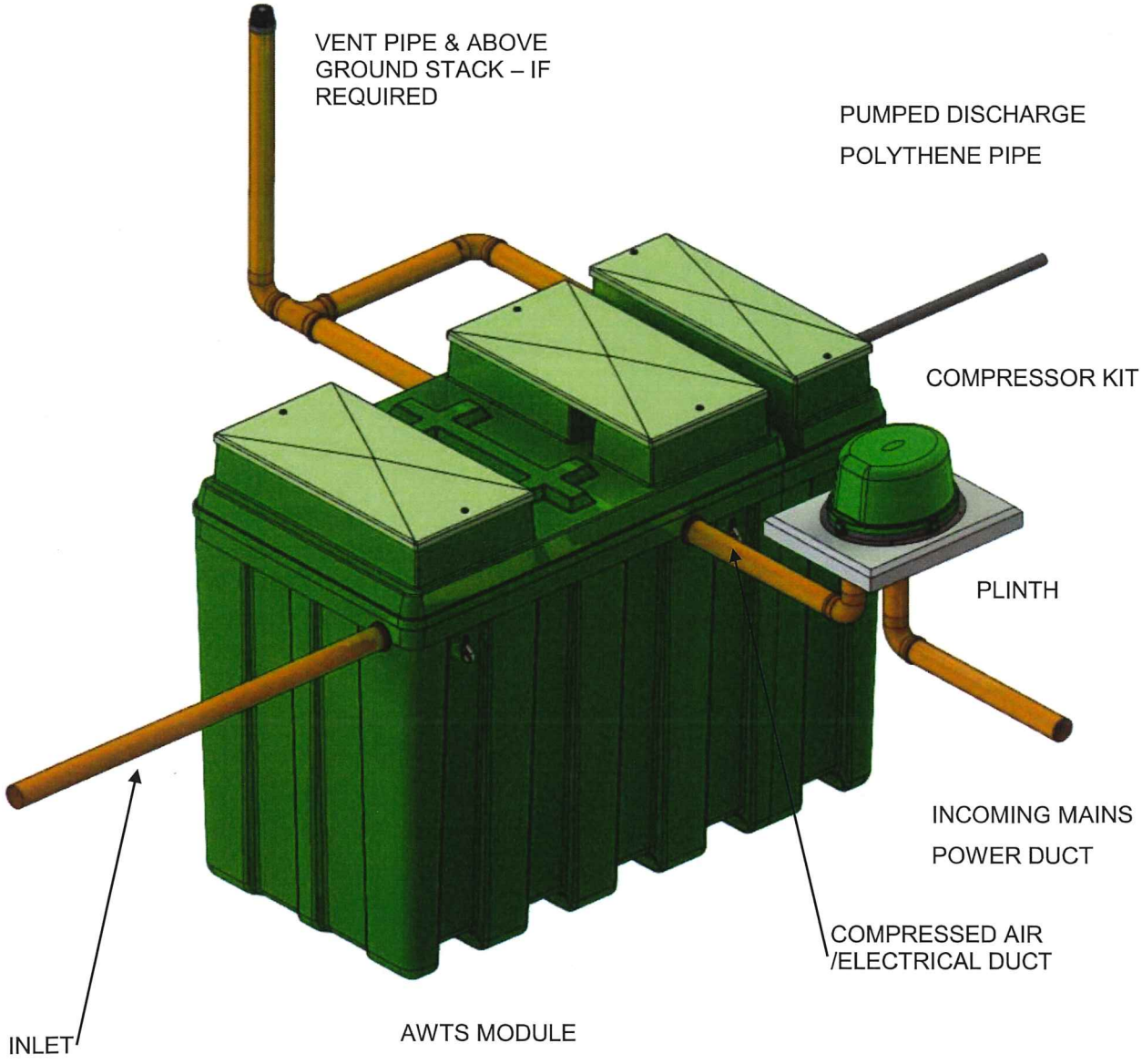
Description of the System

The Kingspan BioFicient Series 1 AWTS provides a reliable and economic solution for homes not connected to mains drainage. Suitable for homes up to 10 persons, the BioFicient is manufactured from high quality Fibre Reinforced Plastic (FRP) and uses the latest treatment technology to deliver a high level of water discharge quality.

System Overview

NOTE: -

EXTERNAL PIPEWORK, DUCTING AND PLINTH NOT SUPPLIED WITH WASTE WATER TREATMENT PLANT



Kingspan BioFicient Series 1

The Kingspan BioFicient Series 1 Aerated Wastewater Treatment Plant is a single piece tank which has the following chambers / compartments. Internal walls are designed to fit and be fully sealed around the body of the unit preventing contamination between the chambers, only allowing sewage to transfer using the proposed flow path.

Primary Treatment Chamber

Sewage from the domestic dwelling will flow to the Primary Settlement Chamber of the AWTS, where a physical separation of foreign material and sewage solids will occur.

This initial separation/treatment chamber will reduce the Biochemical Oxygen Demand and Total Suspend Solids concentration within the incoming wastewater, before passing this Primary Treated Effluent, by displacement, in to the following Biological Treatment Chamber of the AWTS.

The primary chamber is sealed from the rest of the treatment plant. In normal operation there will be no contamination between the primary chamber and the final effluent tank.

Air Supply

Situated in the supplied external compressor housing, a SECOH BIBUS JDK-S-120 or similar specification Air Compressor is used to provide a nominal airflow of 120 ltrs/min to the Disc Diffuser, located at the bottom of the Biological Aeration Chamber.

Biological Aeration Chamber

The Biological Aeration Chamber(Biozone) is the main treatment chamber of the BioFicient Series 1.

The treatment process employed would be described as a Moving Bed Bioreactor (MBBR).

Loose, patented high surface area media is contained in the Biozone and allows the healthy growth of the required micro-organisms (biomass) on this surface area.

The naturally occurring biomass requires a source of organic "food" and oxygen to live. The organic "food" source is supplied in the incoming sewage liquor. The biomass will biologically process the organic matter in the liquor solution.

Air (Oxygen) is driven in to the MBBR from the fixed fine bubble disc diffuser in the bottom of the chamber. The air serves two main purposes in the BioFicient Series 1 STS - The air flow provides the required oxygen for the biomass and drives the moving bed of biomass holding media. The constant movement of air in the Biozone re-circulates the sewage liquor and moving media, thus ensuring maximum contact and biological reaction.

The media is made from polypropylene and is 40mm diameter by 40mm long. Each piece weighs 7.2 grams. There is 47 Kg of media in the biozone which is evenly distributed by the air diffuser.

Clarifier

The Biologically treated wastewater flows in to the Clarification Chamber of the AWTS. This Chamber will allow fine solids, within the final effluent, to settle out. Once settled, the fine solids will be periodically removed from the Chamber and transferred back to the Primary Treatment Chamber.

The transfer is executed using a Grundfos Unilift KP250 Stainless Steel Submersible Pump on a timer control. The timer is factory set but can be adjusted, if necessary, by the Service provider.

Fine Filtration

On exit of the Clarification Chamber, the treated effluent will pass through a Polylok PL-250 Fine Filter, thus removing any fine solids still present in suspension, in the pre-disinfected effluent.

Chlorine Disinfection

Following fine filtration, the effluent will pass through a none mechanical Chlorine Tablet Feeder. Effluent passes over the Chlorine tablet, causing it to dissolve and release the active chemical in to the effluent flow. The greater the flow, the more the tablet will dissolve.

This process then allows the required disinfection of the treated effluent, within the final outlet chamber.

The Feeder is designed to use industry standard Chlorine Tablets, designed for use in a Wastewater Treatment Plant and will be easily replenished during the quarterly service visit.

Final Chamber

The Final Effluent Chamber contains a Grundfos Unilift KP250 Stainless Steel Submersible Pump to facilitate delivery of the final treated effluent to the drainage irrigation system.

The KP250 can be substituted with similar pumps from the Grundfos range, when greater pump heads are required. The Grundfos pump will operate as required using a level float switch to start and stop.

Access Covers

The BioFicient Series 1 has 3 separate access covers to the different stages of the treatment process. These access covers are pedestrian duty and lockable. The access openings are large and will easily facilitate access for routine maintenance and periodic sludge removal. They are not sealed rendering them airtight.

Control Panel

All of the mechanical functions of the AWTS are controlled from an external Electronic Control Panel. The IP65 Panel is contained within the external compressor housing.

The panel will receive the protected incoming power source from the property and will then distribute power to the Air Compressor, the Sludge Return Pump and the Discharge Pump.

The Panel will also power the system alarm function and operate the alarm beacon/buzzer.

Compressor

The compressor is rated at ≤ 40 dB(A) Leq at a distance of 1m when situated in the supplied external compressor housing.

Installation

The wastewater treatment plant must be buried in the ground up to the ground level stated on design drawings. It should never be operated partially buried or above ground. When fitted all parts are self-contained and do not require bracing.

Parts not supplied

The installer will need to supply all electrical cables, inlet/outlet pipework and chlorine tablets.

Design Parameters – Hydraulic & Organic Loading

1	**MODEL**	**Bioficient Series 1**	**MBBR Treatment**
2	**MANUFACTURER**	Kingspan Environmental PTY Ltd	Kingspan Environmental Ltd
3	**DESIGN PARAMETERS**	Minimum/Maximum Hydraulic Load	1500 L/day
		Equivalent Persons	10
		Average BOD_5	70,000mg/day per person (460mg/L)
		Daily BOD_5 Range	150mg/L to 750mg/L
		Average Total Suspended Solids (TSS)	70,000mg/day per person (460mg/L)
		TSS Range	150mg/L – 750mg/L
		Average Daily Total Nitrogen	15,000mg/day per person (100mg/L)
		Daily Total Nitrogen Range	20mg/L – 150mg/L
		Average Total Phosphorous	2500mg/day per person (17 mg/L)
		Daily Total Phosphorous Range	4mg/L – 25mg/L
		Average Annual Sludge and Scum Loading Rate	80 L/Person
		Effluent grade	Secondary
4	**TANK**	Total Volume	5.9m³
		Width	1.482m
		Length	2.85m
		Water Depth	1.55m
5	**PRIMARY CHAMBER 1st Stage**	Primary Treatment	Water Depth 1.55m
		Sludge Storage	Volume 2.869m³
6	**REACTOR CHAMBER 2nd Stage**	Aeration	Water Depth 1.55m
			Volume 1.09m³
7	**FINAL CHAMBER 3rd Stage**	Clarification & Sludge Return	Water Depth 1.55m
			Volume 0.54m³
8	**PUMP WELL 4th Stage**	Disinfection Discharge	Water Depth 1.55m
			Total Volume 1.2m³
			Minimum Level 0.3m³
			High Level 1.4m³
9	**AIR COMPRESSOR**	Fine Bubble Diffusion	Operation Total Time 24 Hrs.
10	**SERVICE INTERVAL**	Frequency	Refer to Service Manual

Operating Parameters

- The Bioficient Series 1 can work in ambient air temperatures between 1°C and 40°C.
- Temperature range of influent for effective treatment would be between 8°C and 30°C.
- Emergency storage volume of Chlorination Chamber is 1.403m³
- The Bioficient Series 1 can also continue to treat wastewater during periods of no Incoming Flow.

Australian Standard – AS 1546.3:2017

On-Site Domestic Wastewater Treatment Units – Part 3 : Secondary Treatment Systems

The BioFicient Series 1 Wastewater Treatment Plant has been tested and certified to AS 1546.3:2017.

This latest Australian Standard supersedes the previous 2008 version. All Domestic Wastewater Treatment units sold in Australia must be certified to the 2017 standard by December 2020.

The BioFicient Series 1 Wastewater Treatment Plant has been tested and certified to produce a final effluent quality exceeding the Standard for Secondary Treated Effluent.

Australian Standard compliance criteria –

Parameter	Secondary Effluent – 90% of samples
BOD_5 – Biochemical Oxygen Demand	*≤ 20mg/L*
TSS – Total Suspended Solids	*≤ 30mg/L*
E.coli	*≤ 10 cfu/100 mL (where disinfection is required)*
FAC – Free Available Chlorine	*0.5 mg/L (minimum level – not 90% of samples)*
Turbidity	*N/A*

State/Territory accreditation

Each Australian State/Territory has its own accreditation process for Domestic Wastewater Treatment Systems.

The following States/Territories have certified the BioFicient Series 1 Domestic Wastewater Treatment Plant for installation and use.

State / Territory	Accreditation
New South Wales	*Yes*
Queensland	*Yes – meets Queensland Plumbing & Wastewater Code*
Western Australia	*Yes*
South Australia	*Yes*
Northern Territory	*Yes*
Victoria	*Yes*
Tasmania	*Yes*

CHIEF EXECUTIVE APPROVAL No. 01/2019
Plumbing and Drainage Act 2002, part 5, division 1, section 93

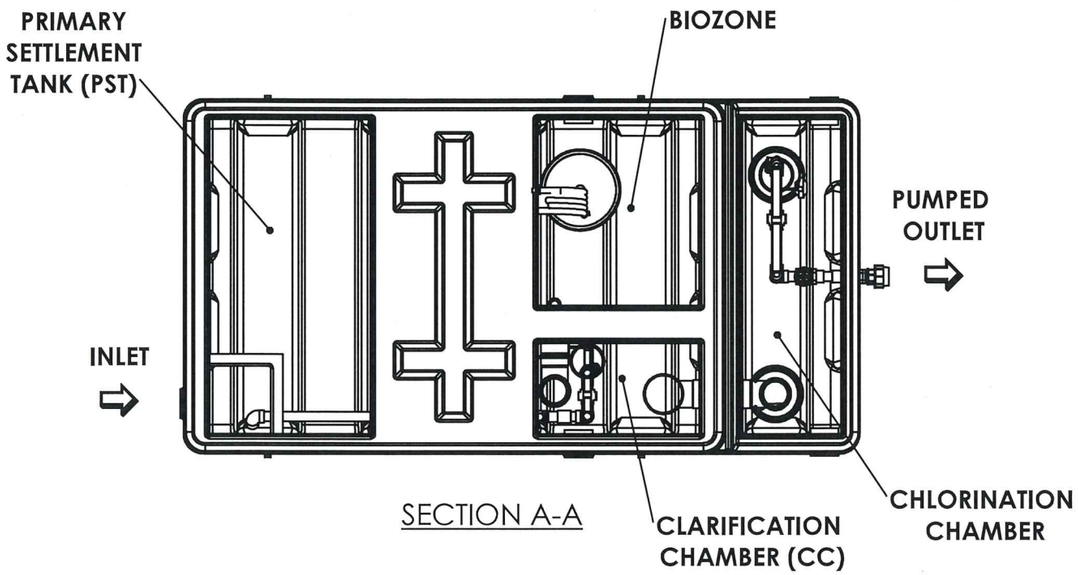
SCHEDULE

Attachment 2

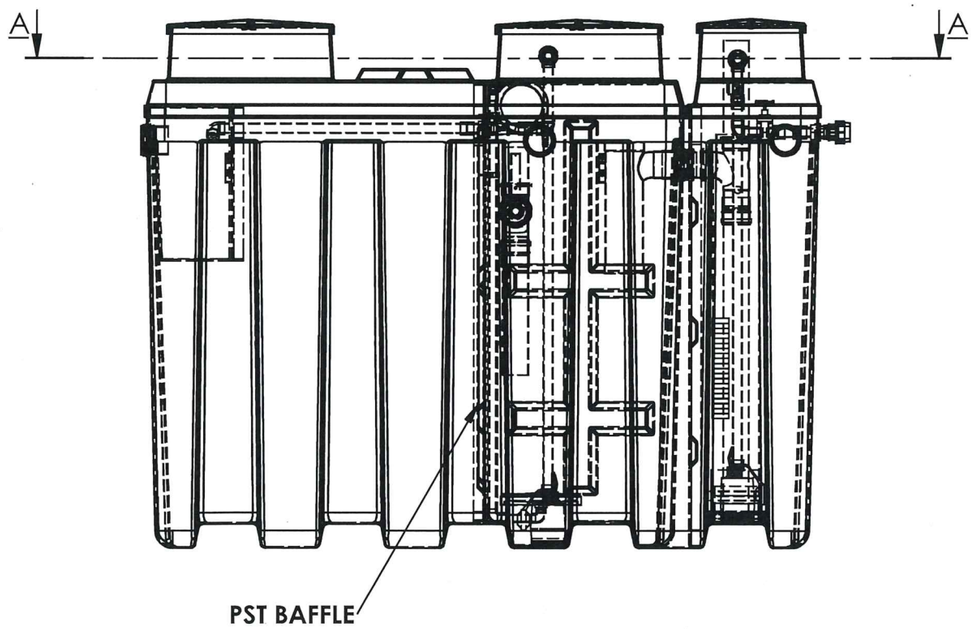
Drawings for the

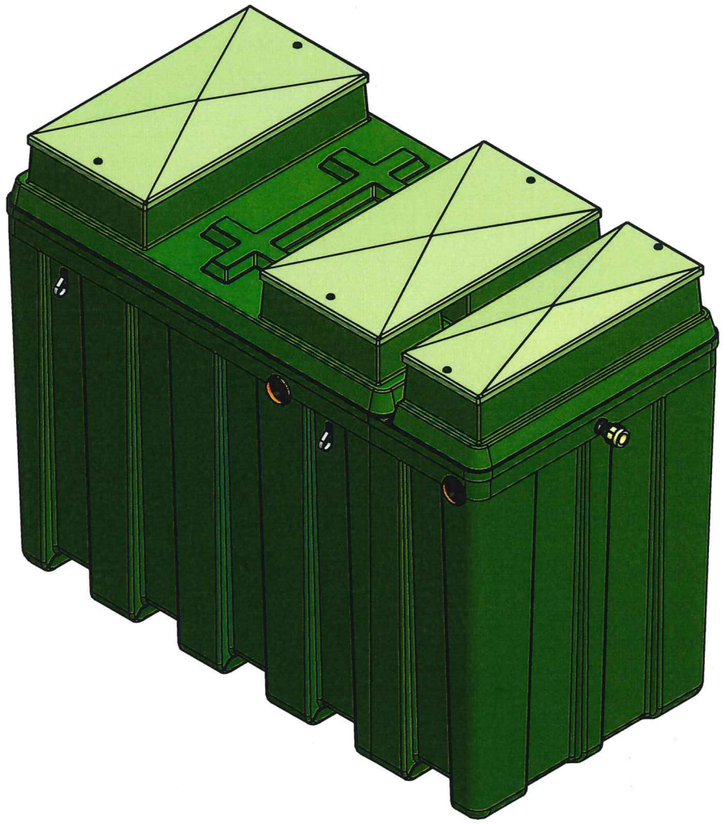
BioFicient Series 1

Department of Housing and Public Works
Chief Executive Approval
Approval No: 01/2019
Date of Issue: 20/2/19
Delegate Signature:
Building Codes Queensland



SECTION A-A





Department of Housing and Public Works
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Delegate Signature:
Building Codes Queensland

Please Check with Kingspan Environmental For The Latest Issue Of This Drawing				
Issue	Date	Drawn by	Approved by	Description
03	06/08/18	W.DYER		Chlorination Chamber Vents and Duct Added
02	26/07/18	W.DYER		Minor Ammendments Made

Material : Various	Tolerance (unless stated) :	**Drawing : SK843**
Finish :	Thickness : n/a	Page 1 of 2
Weight :	Surface Area : m²	BioFicient Series 1 - Flow Path
Modelled By : Name		

All Dimensions In mm | Scale: Do Not Scale | Third Angle Projection

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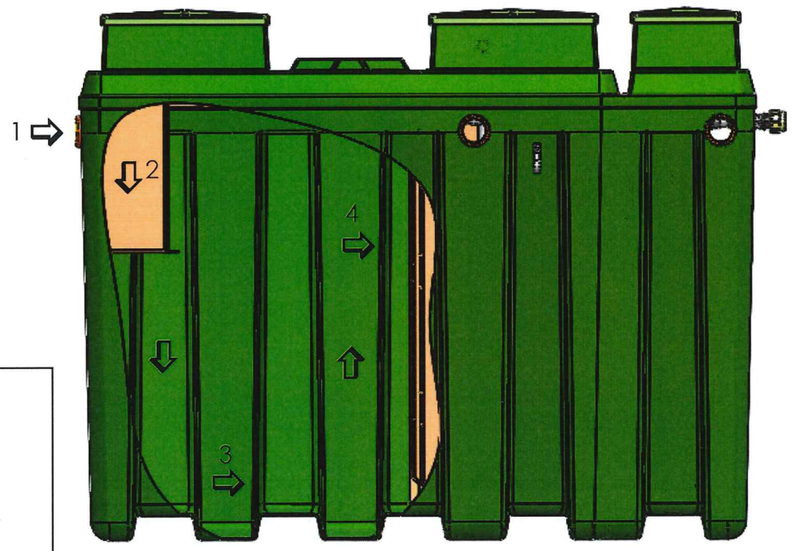
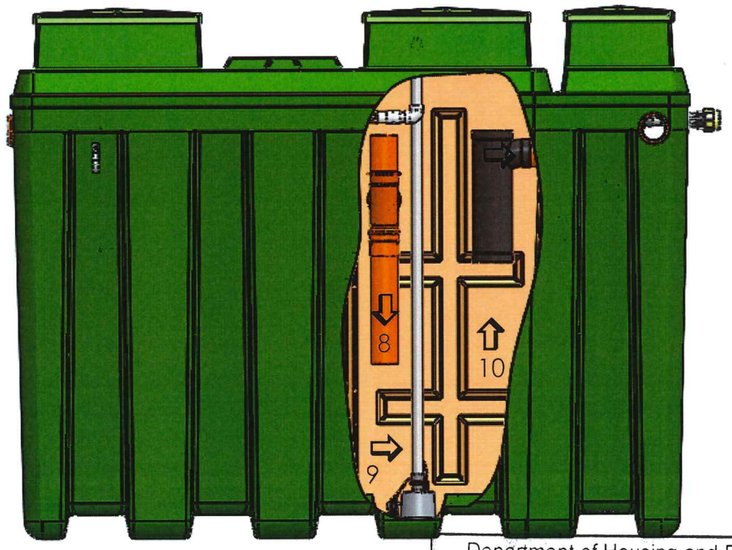
Kingspan Environmental

PRIMARY SETTLEMENT TANK (PST)



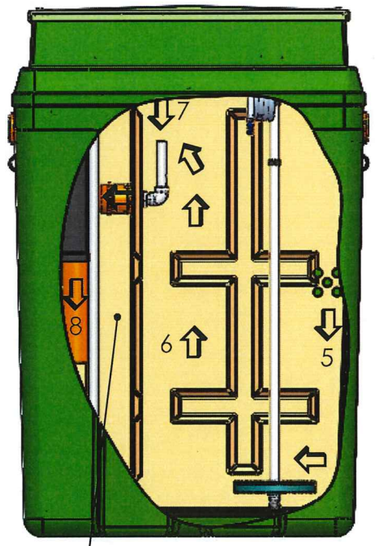
CLARIFICATION CHAMBER



FLOW PATH:

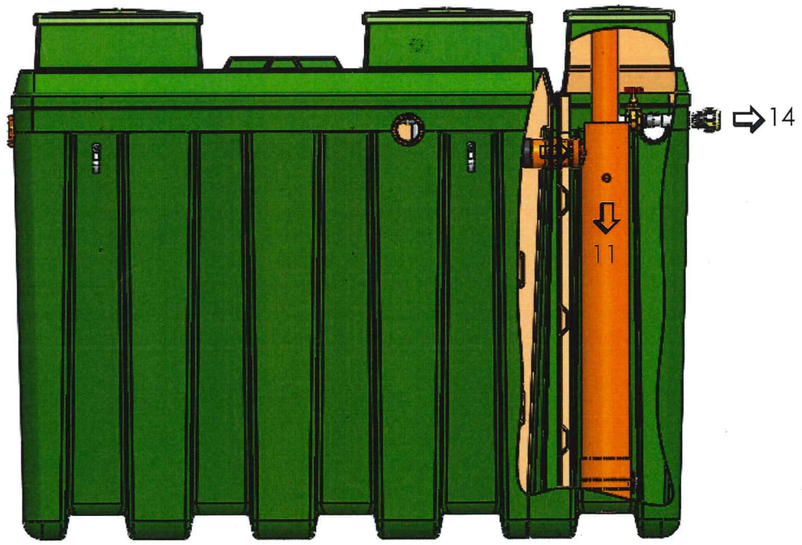
1. Sewage enters the treatment plant through the inlet pipe.
2. The liquid passes through calmed inlet.
3. Heavy solids settle at the bottom of the PST while lighter fluids will float to the top.
4. The liquid is transferred from the PST to Biozone through the holes in the baffle.
5. The liquid enters the Biozone.
6. The liquid purifies as the microorganisms start growing on the surface of the media in the Biozone. (Media not shown).
7. The liquid is transferred from the Biozone to the Clarification Chamber through the transfer pipe.
8. The liquid flows down through the transfer pipe into the Clarification Chamber.
9. Small solids settle at the bottom of the Clarification Chamber. Small Particles that collect in the Clarification Chamber are pumped back to the primary of the unit for recycling
10. The liquid is transferred from the Clarification Chamber through the Effluent filter. This removes any remaining solids before transferring to the Chlorination Chamber
11. The liquid flows down through the Chlorination Feed.
12. Effluent (Treated Liquid) enters the pump.
13. The effluent is pumped through the internal pipework.
14. The effluent exits the treatment plant through the pumped outlet.

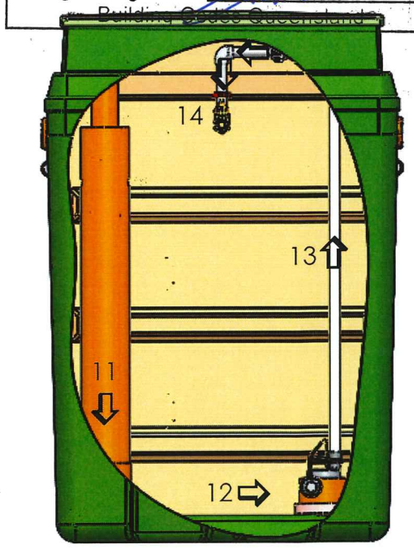
BIOZONE



Clarification Chamber

CHLORINATION CHAMBER





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Delegate Signature:

Material : Various	Tolerance (unless stated) :
Finish :	Thickness : n/a
Weight :	Surface Area : m²
Modelled By : Name	

Drawing : SK843

All Dimensions In mm | Scale: Do Not Scale | Third Angle Projection

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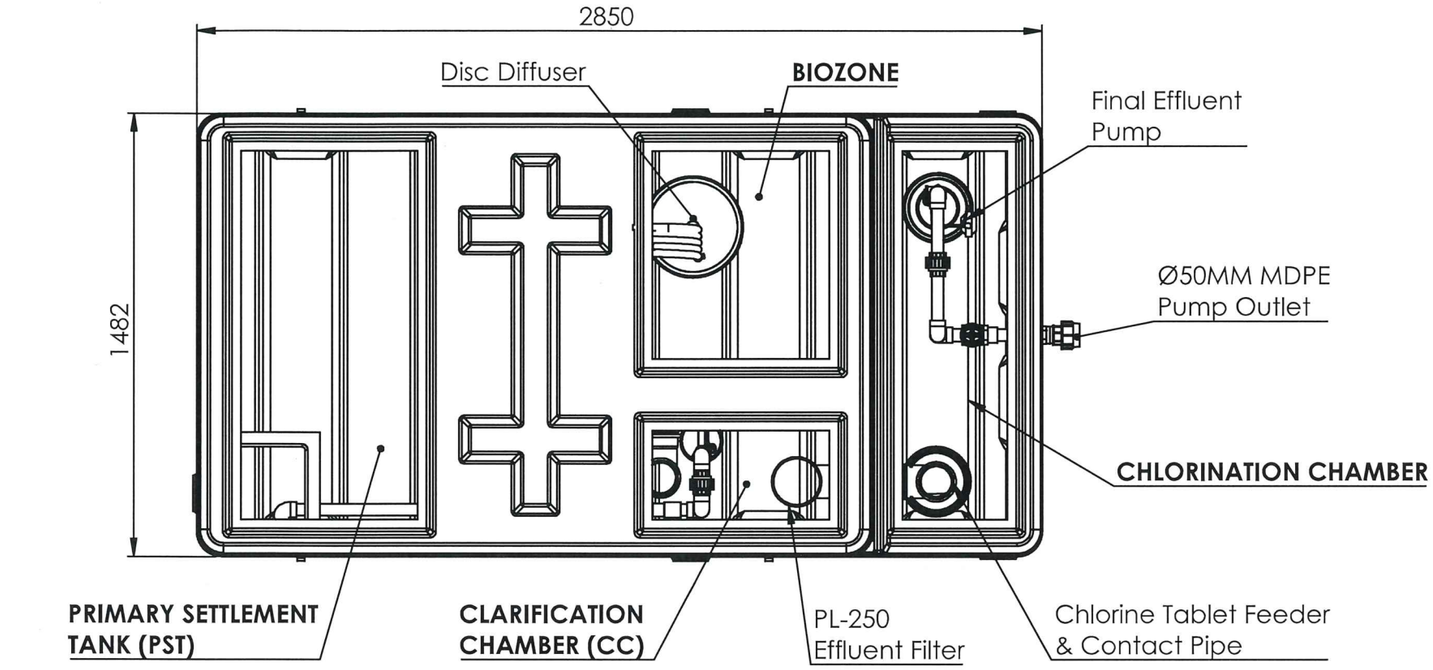
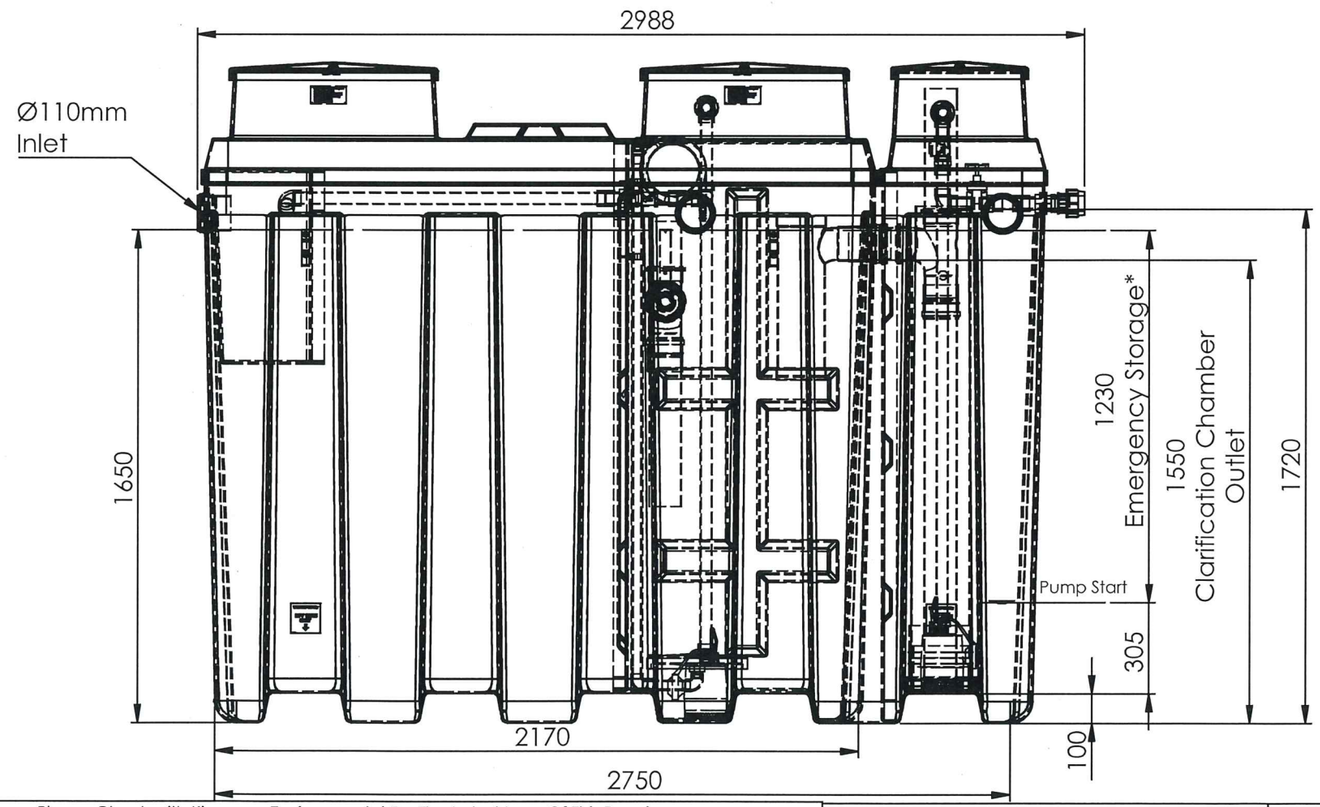
Kingspan Environmental





Notes:
1. * denotes - Emergency Storage in Chlorination Chamber Only

Chamber	Volume (Ltrs)
PST	2869
BIOZONE	1097
CC	545
EMERGENCY STORAGE	1403

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Building Codes Queensland

Please Check with Kingspan Environmental For The Latest Issue Of This Drawing

Issue	Date	Drawn by	Approved by	Description
04	06/08/18	W.DYER		Chlorination Chamber Vents and Duct Added
03	30/07/18	W.DYER		Minor Ammendments Made

Material : Various
Finish :
Weight : 348106.08 Kg
Modelled By : Name

Tolerance (unless stated) :
Thickness : n/a
Surface Area : m²

Drawing : SK842

AU BioFicient Tank Clarification-Manufactured Unit

All Dimensions In mm

Scale: Do Not Scale

Third Angle Projection

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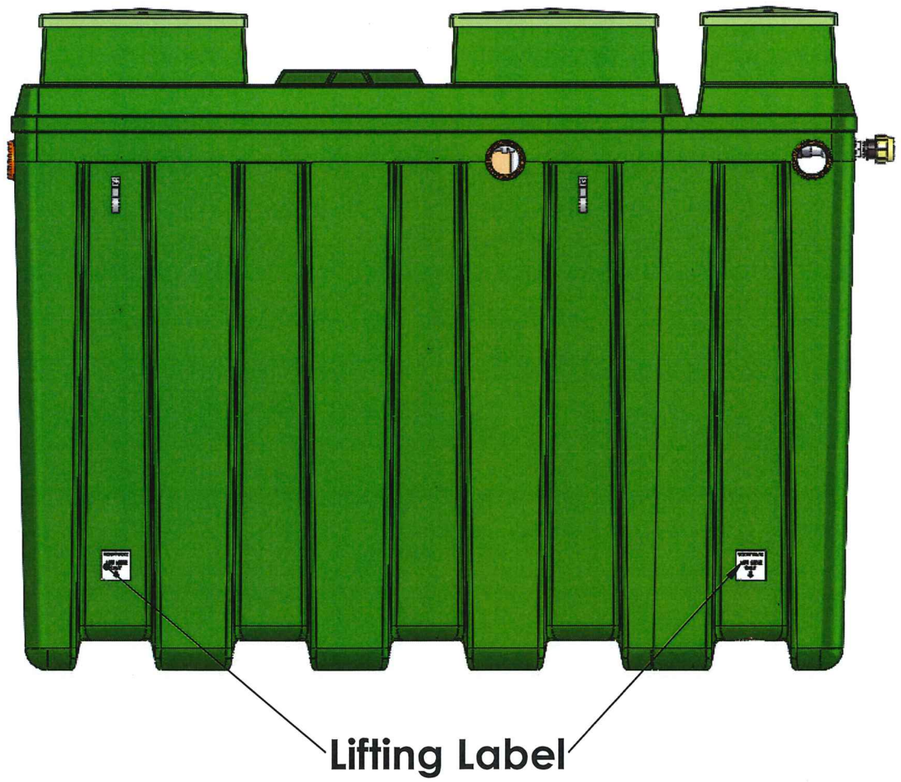
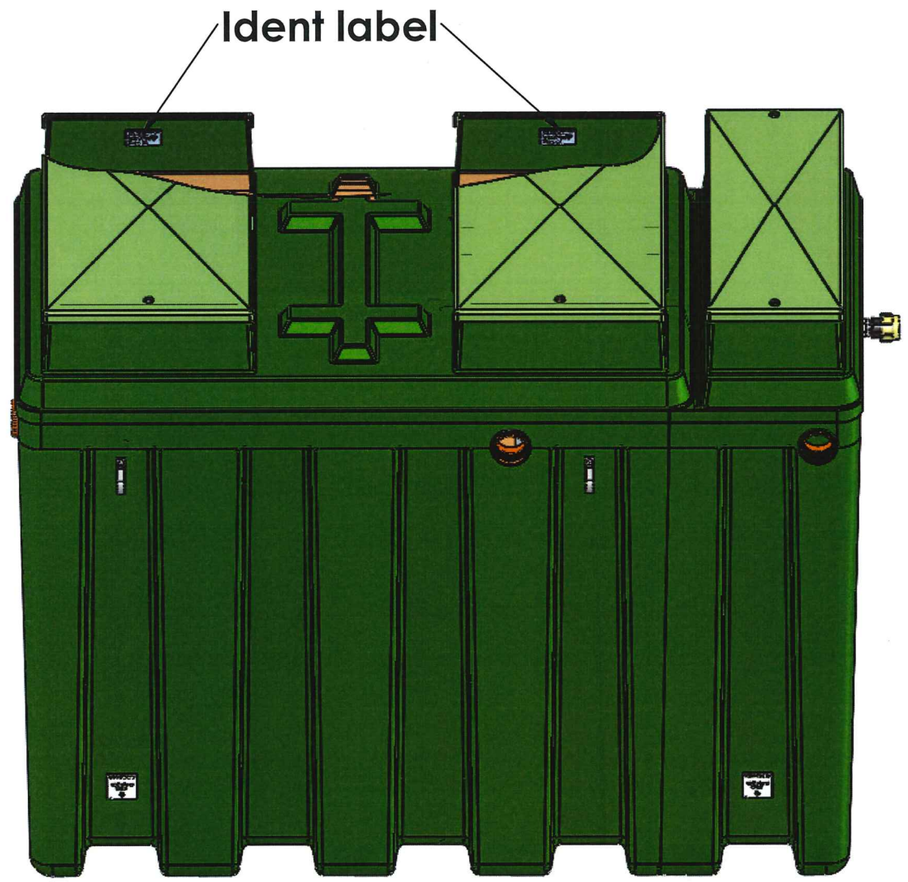
Kingspan Environmental





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Delegate Signature:

Building Codes Queensland

Material : Various	Tolerance (unless stated) :
Finish :	Thickness : n/a
Weight : 348106.08 Kg	Surface Area : m²
Modelled By : Name	

Drawing : SK842

All Dimensions In mm

Scale: Do Not Scale

Third Angle Projection

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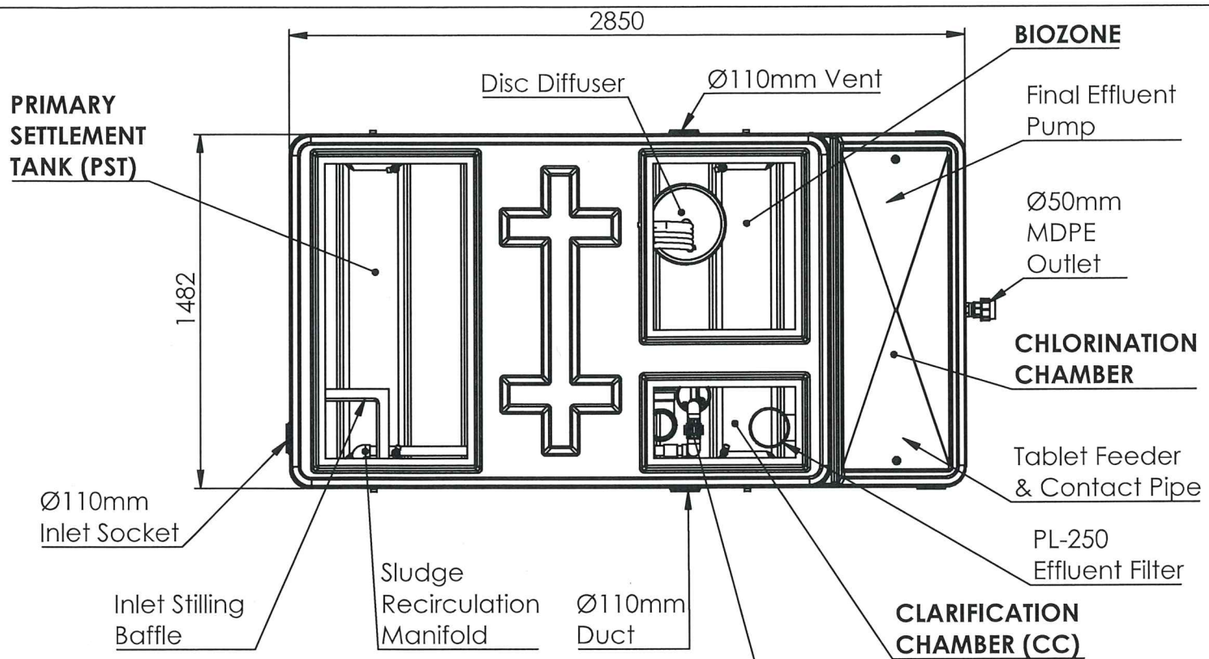
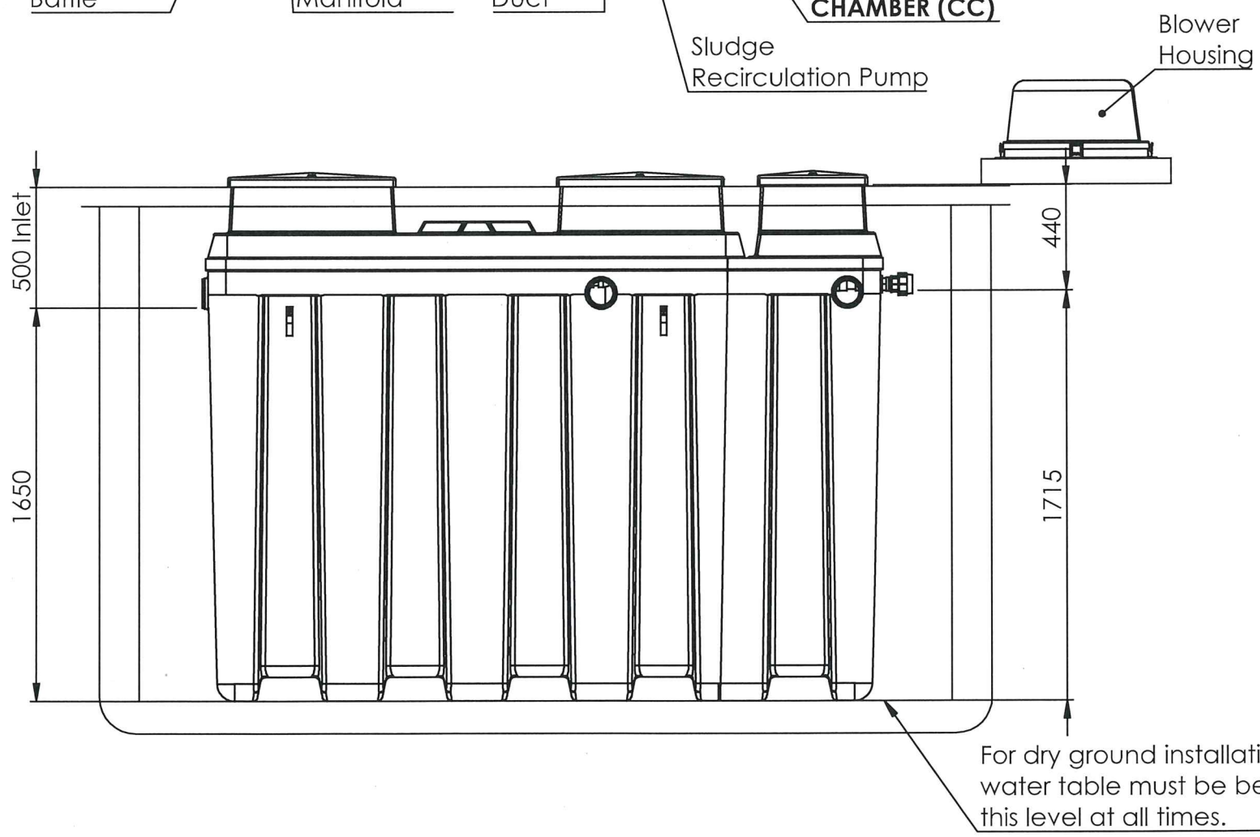
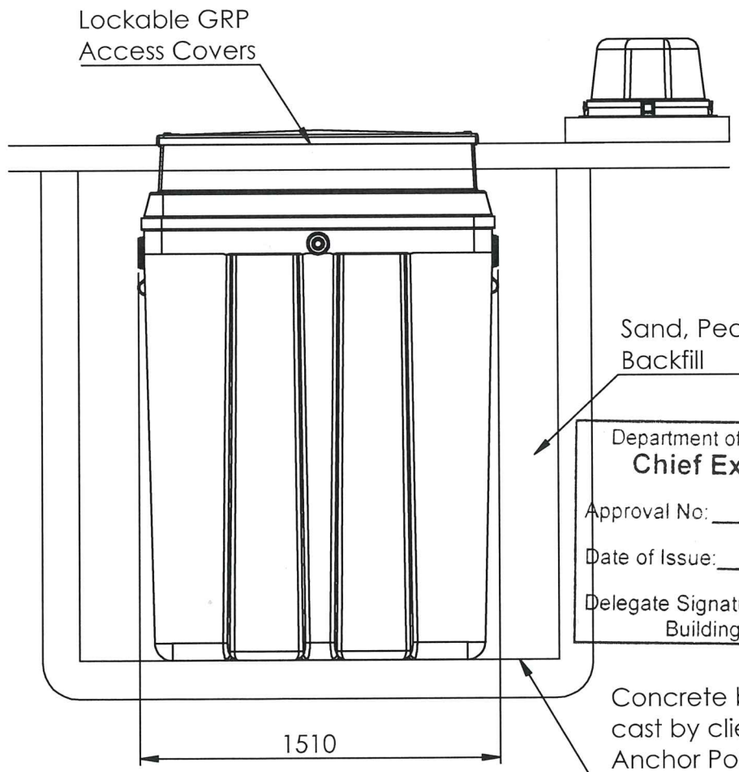
Kingspan Environmental







Notes :

1. It is important to read and understand installation operation and maintanance guidelines before attempting to install this unit.
2. INLET is Ø110 mm & OUTLET IS Ø50 mm. Suitable reducers should be used to step down from bigger pipework. Supplied by others.
3. Selection of correct invert is key and must be suitable for drainage and ground levels on site.
4. Extension neck kits available for deeper inverts - 700mm & 1200mm.
5. Vent pipe connections are supplied but vent runs and stacks are supplied by others.
6. The unit will normally need de sludged annually. However this is dependant on use.
7. *Pea-Shingle/Sand backfill is reliant on use of correct strapping and anchoring.
8. **Tank to be strapped and anchored at points below when using Pea Shingle/Sand backfill in wet site conditions.
9. Tank Weight (Empty) - 650 Kgs

Chamber	Volume (Ltrs)
PST	2869
BIOZONE	1097
CC	545
EMERGENCY STORAGE	1403

Department of Housing and Public Works
Chief Executive Approval
Approval No: 01/2019
Date of Issue: 20/2/19
Delegate Signature:
Building Codes Queensland

Please Check with Kingspan Environmental For The Latest Issue Of This Drawing

Issue	Date	Drawn by	Approved by	Description
03	06/08/18	W.DYER		Chlorination Chamber Vents and Duct Added
02	30/07/18	W.DYER		Weight Changed to 650 Kg

Material : Various | Tolerance (unless stated) :
Finish : | Thickness : n/a
Weight : | Surface Area : m²
Modelled By : Name

All Dimensions In mm | Scale: Do Not Scale | Third Angle Projection

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Drawing : DS1344P

AU BioFicient Series 1 Sales Drawing

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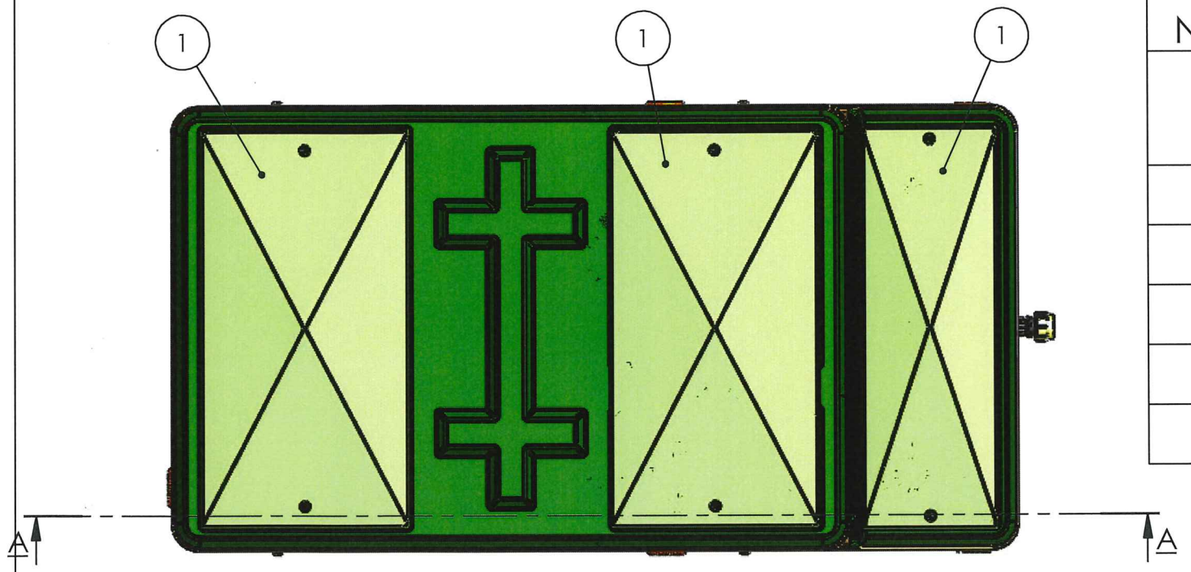
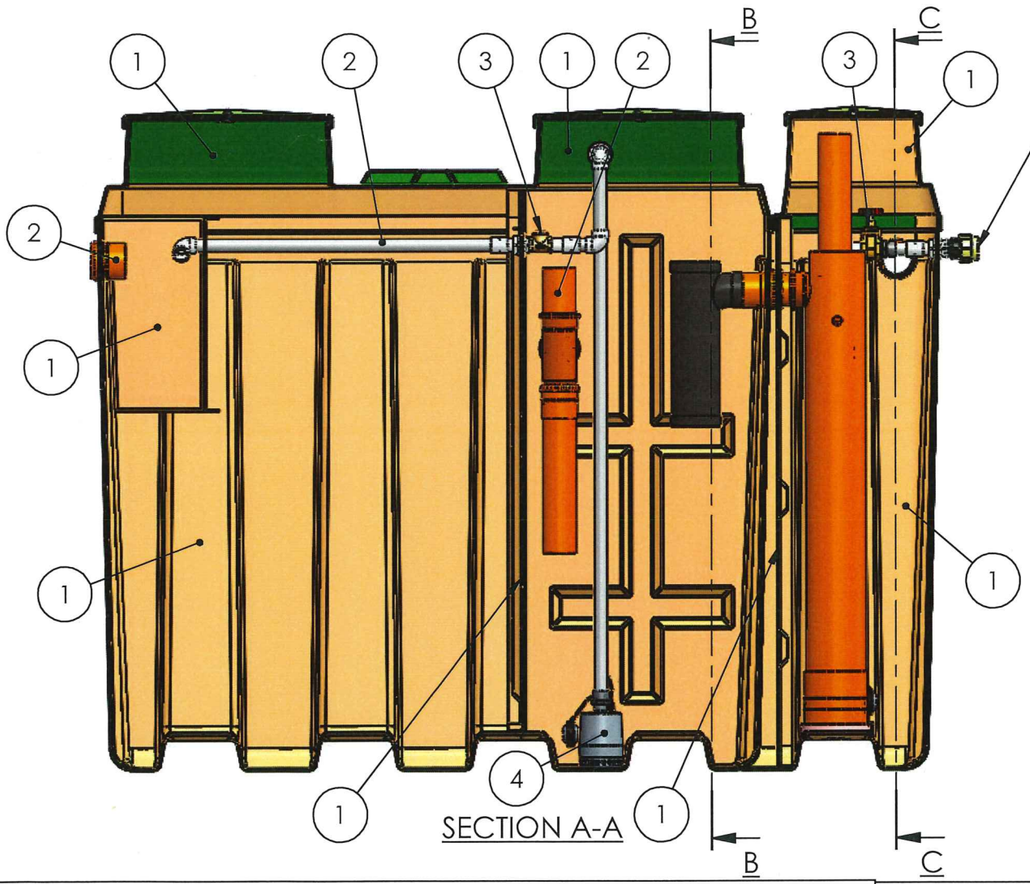
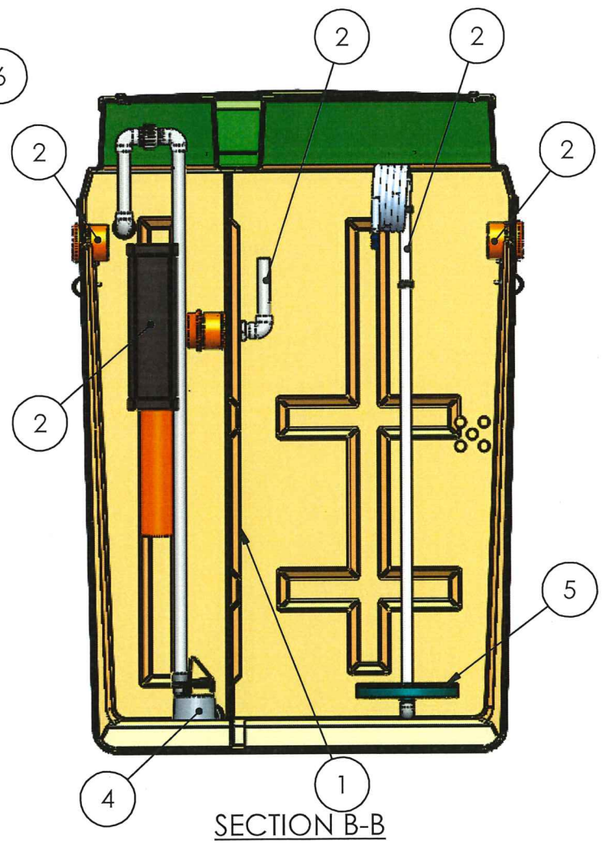


Item Number	Description	Material
1	Access Covers Main Casing/Body Baffles	FRP (Fiber Reinforced Polymer)
2	Pipework	uPVC/ ABS
3	Valves	Brass
4	Pumps	Stainless Steel
5	Disc Diffuser	EPDM (PP GF30 disc)
6	Outlet Fitting	Polythene

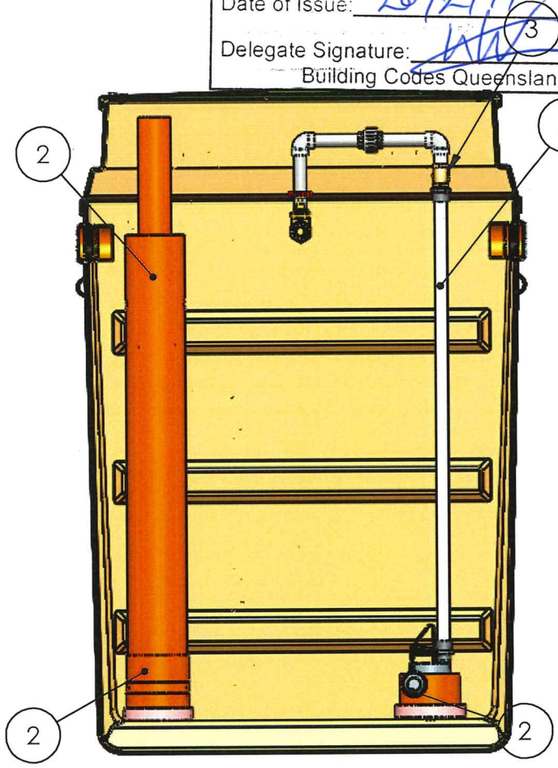
Department of Housing and Public Works
Chief Executive Approval
Approval No: 01/2019
Date of Issue: 20/2/19
Delegate Signature:
Building Codes Queensland



SECTION A-A



SECTION B-B



SECTION C-C

Please Check with Kingspan Environmental For The Latest Issue Of This Drawing				
Issue	Date	Drawn by	Approved by	Description
02	06/08/18	W.DYER		Chlorination Chamber Duct and Vent Added
01	17.07.18	WMD		Initial Issue

Material : Various	Tolerance (unless stated) :	**Drawing : SK846** Page 1 of 1
Finish :	Thickness : n/a	
Weight :	Surface Area : m^2	BioFicient Series 1 - Materials
Modelled By : Name		

All Dimensions In mm | Scale: Do Not Scale | Third Angle Projection

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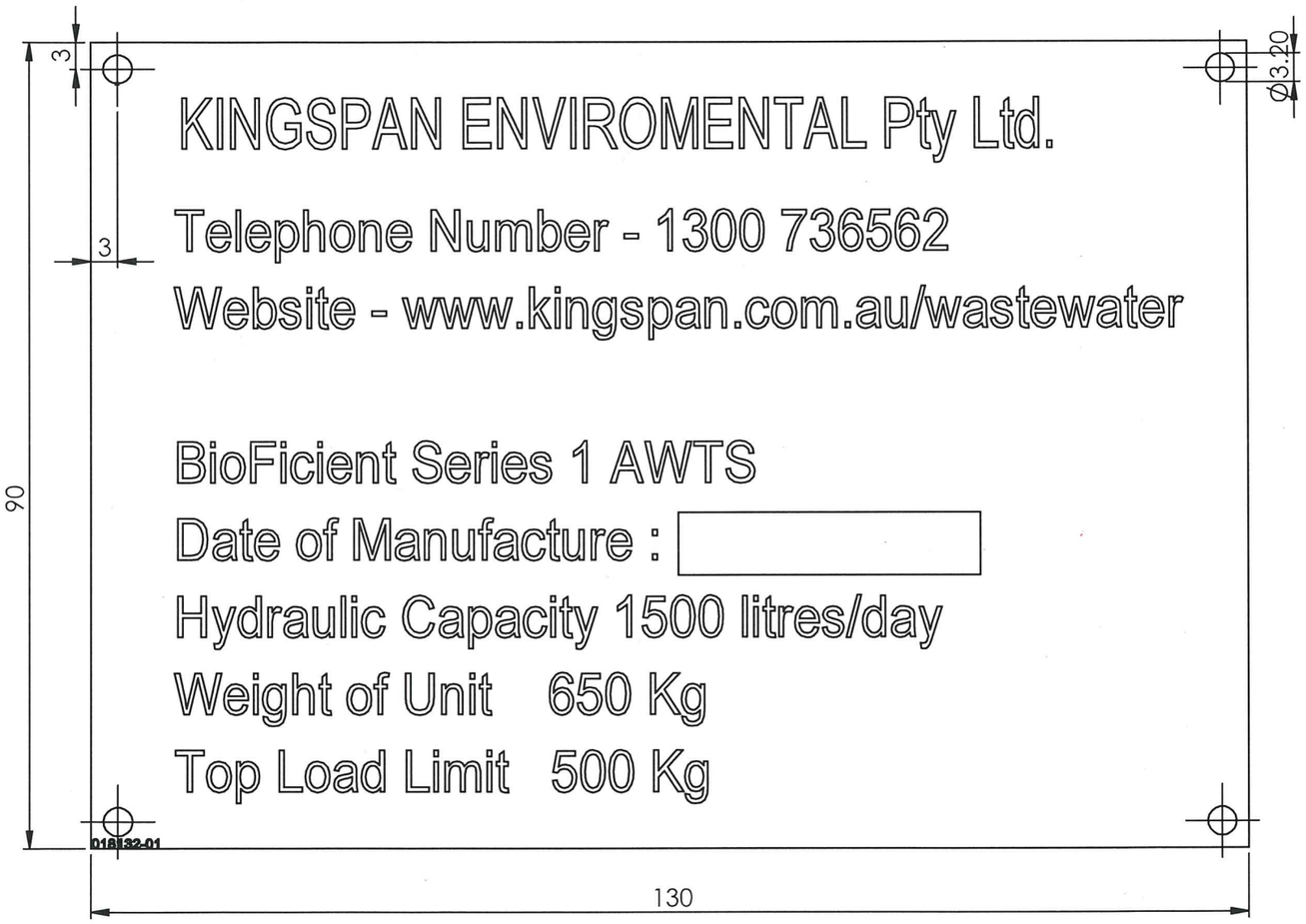
NOTES

1. LABEL MATERIAL - ALUMINIUM PLATE 1mm
2. FOR TEXT FONT, SIZE AND DESIGN SEE ARTWORK.
3. NOT ARTWORK.



Department of Housing and Public Works
Chief Executive Approval
Approval No: 01/2019
Date of Issue: 20/2/19
Delegate Signature:
Building Codes Queensland

Please Check with Kingspan Environmental For The Latest Issue Of This Drawing

Issue	Date	Drawn by	Approved by	Description
03	27/09/18	W.DYER		Contact Number and URL Added
02	30/07/18	W.Dyer		Weight of Unit Added

All Dimensions In mm | Scale: Do Not Scale | Third Angle Projection

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Material : 1060 Alloy	Tolerance (unless stated) : +/- 1mm
Finish : n/a	Thickness : n/a
Weight : 61.52 Kg	Surface Area : n/a m²
Modelled By :	

Drawing : 018132

BioFicient Aluminium Label Plate

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