Kerry Flanagan Wastewater
On-site Wastewater Management

PO Box 3100
Grose Vale NSW 2753
Telephone 45721057
Fax 0245 721065
kerry@kerryflanaganwastewater.com.au
Lic No 162101C / L10163
www. kerryflanaganwastewater.com.au

1st August 2020

# On-site Wastewater Management Assessment & Design
# Additional Information

## Site: Lot 2414 DP 752038 / 19 Morgan Road Belrose NSW

Commissioner: David Conway

## Introduction

The following assessment/design has been commissioned by the owner, to provide a design for the On-site Sewer Management System for a 5-bedroom residence at the above address. This design expands on the information provided in the On-site Wastewater Management Report compiled by Enviro Engineers Australia 16th June 2020 to provide construction details. This also provides additional information requested by Northern Beaches Council Environmental Health and Protection Officers.

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## Summary

- **Unique design incorporating Black and Grey separation for treatment to allow Greywater reuse and reduce DLR. Also incorporates wet weather storage, timed dose loading and emergency pump away.**
- **Land application by Ausdrain Enviro Module with top of trench distribution**
- **Beds turfed in Matilda soft leaf buffalo with barrier plantings of Vetiver grass**

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## Site Summary

This 711.2m2 property feed by reticulated potable water is restricted by size and the proposed development for on-site disposal. While we found the calculations were based on 2 x 2 person bedrooms and 5 single bedrooms not unreasonable in this high socio-economic area. An allowance of 150lts/day/person is required in reticulated main feed homes. This calculates to 1050lts/day.
Soil depths vary, our own investigation showed beds 3,4 & 5 would require raised trench beds while 1 & 2 provided sufficient undersoil for inground trench beds. Those trench beds that are on sloping ground require raised beds to enable equal hydraulic resistance of soil depth above the application level. The beds are to be covered with Matilda soft leaf buffalo turf.

The features of the following Unique design are used to ensure even distribution of applied treated effluent and provide long term performance. The proposed design could not provide sufficient buffers to boundaries and buildings and therefore require additional safeguards. The design utilizes the previous reserve areas to lower the DIR to 16.40mm/day

## Design Details

1. The sewer system is to be divided into separate Grey and Black systems with individual surcharge and venting.
2. Greywater will be considered all fixtures except WCs and kitchen sink.
3. The excess and overflow are to be directed from the greywater system to a 10klt combination wet weather/dosing/emergency pump away tank via the blackwater drainage for application to raised beds.
4. Greywater will be collected in a 500lt sump to be dosed to the above ground Ultra GTS Greywater Treatment System
5. The greywater sump overflow will be connected to the black water sewer.
6. Treated Greywater is to be pumped to a 1klt above ground holding tank fitted with emergency potable water ball float, 4.9watt air pump with floor air ring and pressure pump. The overflow is to be connected to the blackwater sewer.

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7. Treated greywater is to supply washing machine, WC cisterns and recycled taps. (Taps, hoses, and sprays are not to be interchangeable with potable water taps and clearly marked as not for drinking)
8. Blackwater is to be treated by a Bioseptic Performa AWTS two tank system and drain to the 10klt wet weather/dosing/emergency pump away tank.
9. Collected treated Grey & Black effluent is to be dose loaded to the beds as indicated on plan by PC timer at no more than the maximum total Design Loading Rate/day 1050lts with an application rate of 16.40mm/day.
10. The 10klt tank is to be fitted with the following, an adjustable rain indicator to cut power to the submerged auto 400watt disposal pump during rain events, a float to indicate 80% capacity, a float to indicate 95% capacity, both connected to strobe lights. In addition, a 40lt/air pump with a 300mm fine bubble defuser and controlled by a float, set to provide power at more than 1-day storage.
11. A storz connection point is to be provided at the boundary to allow pump away to be carried out by a licensed contractor
12. The land application raised beds are to be feed by 25mm Lilac poly pipe and be fitted at each entry by a 25mm throttling valve within a lilac turf box
13. The beds total area of 64m2 and are to be fitted with Enviro module drain cells with 100mm PVC slotted distribution pipes laid on top with drilled 32mm low density poly pipe within the slotted pipe. The cells and slotted pipe are to be wrapped in textile cloth to the floor of the trench.
14. A barrier of Vetiver grass (Vetiveria zizanioides Monto) to be planted at 15cm spacings to act as a barrier to the boundary.

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NOTE:
It is expected that pump away will be required in the winter months when pan evaporation rates are lowest. Wet weather storage will occur during prolong rain events, however as full occupation is not expected, due to the socio-economic level of the area the total DLR is unlikely to be reached. Stored effluent will be disposed of over days and possibly weeks using the gap between the calculated total DLR and actual produced DLR. As each bed is controlled by throttling valves the system can be adjusted to suit variations in uptake from bed to bed.

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**Response to Environmental Health Referral 23/07/2020 Additional information**

1. The tank incorrectly labeled Proposed Water Tank (10klt) on the report plan is a Wet Weather Collection/Dosing/ Emergency Pump-Away Tank.
2. The incorrectly labeled tanks "Proposed AWTS" and "Proposed DGTS" tanks are in fact a two tank AWTS (Bioseptic Performa). Grey and Black sewer streams are separated into two drainage systems, however the excess greywater, treated and untreated overflow to the black sewer to be treated in the AWTS and passed on to the 10klt tank.
3. The Greywater system has a 500lt collection sump fitted with a 400watt vortex pump which is controlled by the control system in the above ground Greywater Treatment System (Ultra GTS). There is no inground water tank, an above ground 1klt poly tank stores treated Greywater for recycle use. An disconnection tank is located next to the Greywater storage tank, due to the low supply pressure from the Sydney Water supply.
4. These are indicated on the new plan.
5. The cores were not indicated on the report plan. They have been indicated on the new plan.
6. We did not find the nominated number of 7 persons to be unreasonable in this locality. However, an amount of 150lts/person is used for reticulated potable water (1050lts DLR) in our calculations.

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7. We found the soils to be high in sand content and high to moderately structured and would warrant the 30mm/day loading rate, however due to the constrained site we suggest all indicated beds be active, reducing the application rate to 16.40mm/day. We found no limitations to application of secondary effluent, pH 5.0-5.5, using on-site soil texture (Hazelton & Murphy 1992) <3ECe. \A modified Emerson test was used to determine slating did not find a lost of structure. Samples would not form a ribbon. Applied effluent will change the pH. No augmentation is recommended.
8. A minimum depth of 600mm under bottom of trench is proposed. In those areas where the soil depth is shallow the bed will be raised. The design uses a combination of a trench and bed to enhance both uptake methods. The effluent is pressure dosed along the top of a self-supporting box drain. this elevates the effluent into the evapotranspiration area of the bed while providing greater storage in the large void of the trench.
9. Shadow fall will affect both side application areas the front receiving sun for most of the day except for tree shade.
10. Due to reduced buffers the design has used all available areas to reduce the application rate/day. Plantings of Vetiver grass as barriers provides high hydraulic and nutrient uptake to reduce movement off site. Failsafe to pump-out reduces risk caused by operation failures.
11. Above.

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For any questions regarding this assessment and design please contact our office.

Regards

Kerry-Martin Flanagan
PDGL Lic No 162101C
HIA 802853
Aerated Wastewater Inspection Provider
CET Certified
Associate lecturer for the Centre for Environmental Training

Attachments

1. On-site Wastewater plan
2. Site Analysis
3. Floor plan (2)
4. NSW Accreditation AWTS 007
5. NSW Accreditation DGTS011
6. NSW Accreditation STCW003
7. Vetiver Grass
8. Ausdrain Enviromodule,

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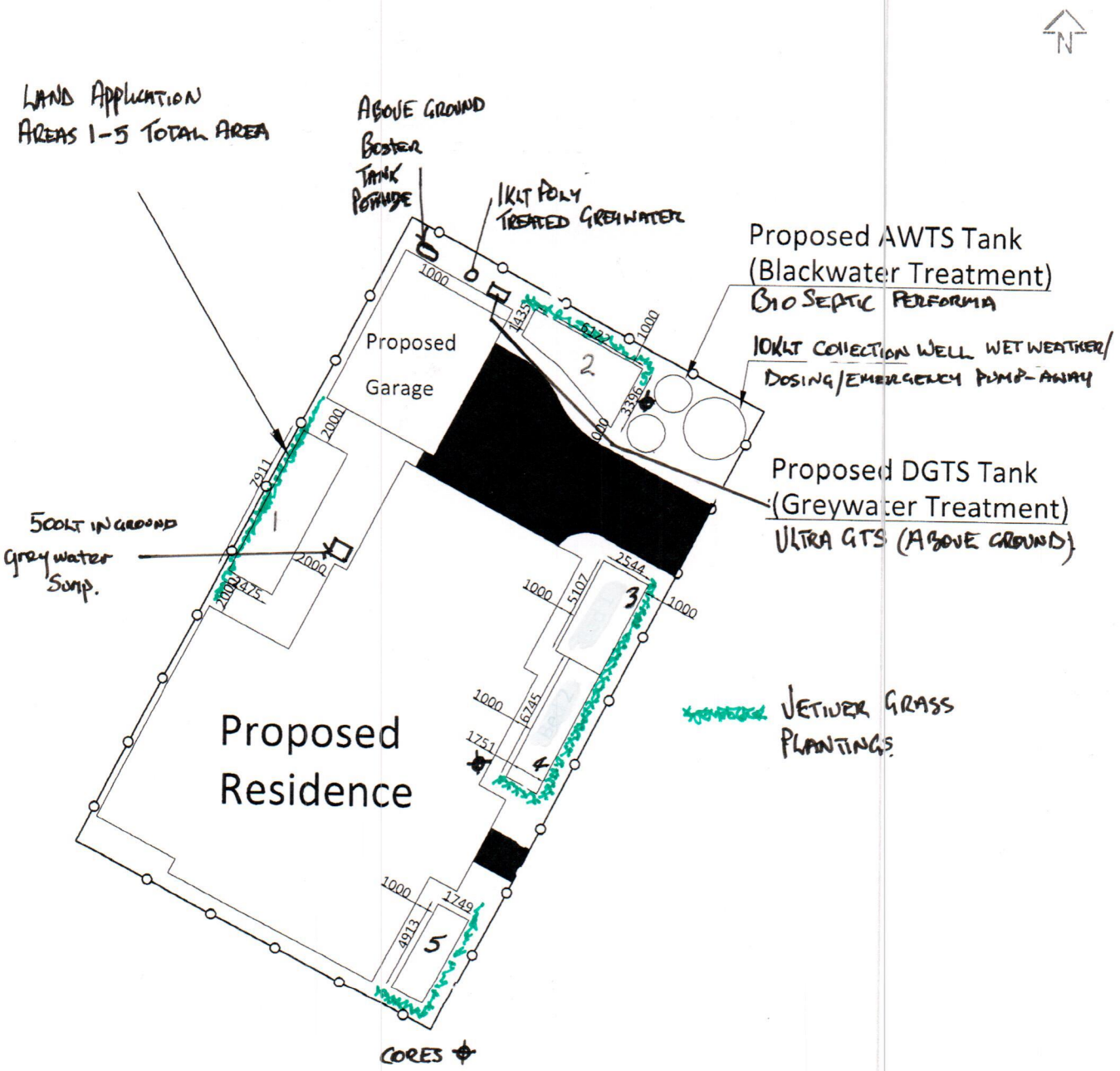



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LEGEND: Site Boundary; Other Fences; Landform Element; Watercourses, Dams; Overland Flow Path; Surface Spray Sprinkler; Irrigation Pipework; Soil Borehole; Photo Location; Building Area; Land App. Area; Paved Area

| | | | |
|---|---|---|---|
| TITLE: Wastewater System Layout Plan | | SHEET SIZE: A4 | SCALE: 1:300 @ A4 |
| CLIENT: CONWAY | PROJECT: 19 Morgan Road, BELROSE, NSW | SHEET: 1/1 | DATE: 1/8/2020. |

## AREA CALCULATIONS

EXISTING SITE AREA - 711.2m sqm

SITE COVER = XXXX sqm

SOFT LANDSCAPED AREA = XXXX sqm (%)

TOTAL PRIVATE OPEN SPACE AREA - XXXXsqm
- includes internal garden, pergola, covered outdoor area and pool area and water body

GROUND FLOOR GFA = sqm
FIRST FLOOR GFA = Sqm
TOTAL GFA = sqm

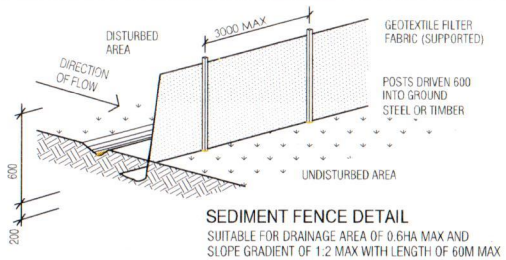
## SEDIMENT CONTROL

INSTALL SEDIMENT CONTROL STRUCTURES IN LOCATIONS INDICATED ON THIS DRAWING AND AS OTHERWISE REQUIRED TO CONTROL SEDIMENT DURING ALL EXCAVATIONS AND WHICH EVER AREAS OF THE SITE ARE EXPOSED TO EROSION.

CONTROL STRUCTURES TO BE AS DETAILED OR AS OTHERWISE REQUIRED.

REVIEW CONTROL MEASURES AND MAINTAIN STRUCTURES DURING CONSTRUCTION.

IF ADDITIONAL MEASURES ARE REQUIRED FOR EROSION CONTROL OR BY COUNCIL REQUIREMENTS REFER TO "URBAN EROSION AND SEDIMENT CONTROL" GUIDELINES PREPARED BY DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT.




SEDIMENT FENCE DETAIL

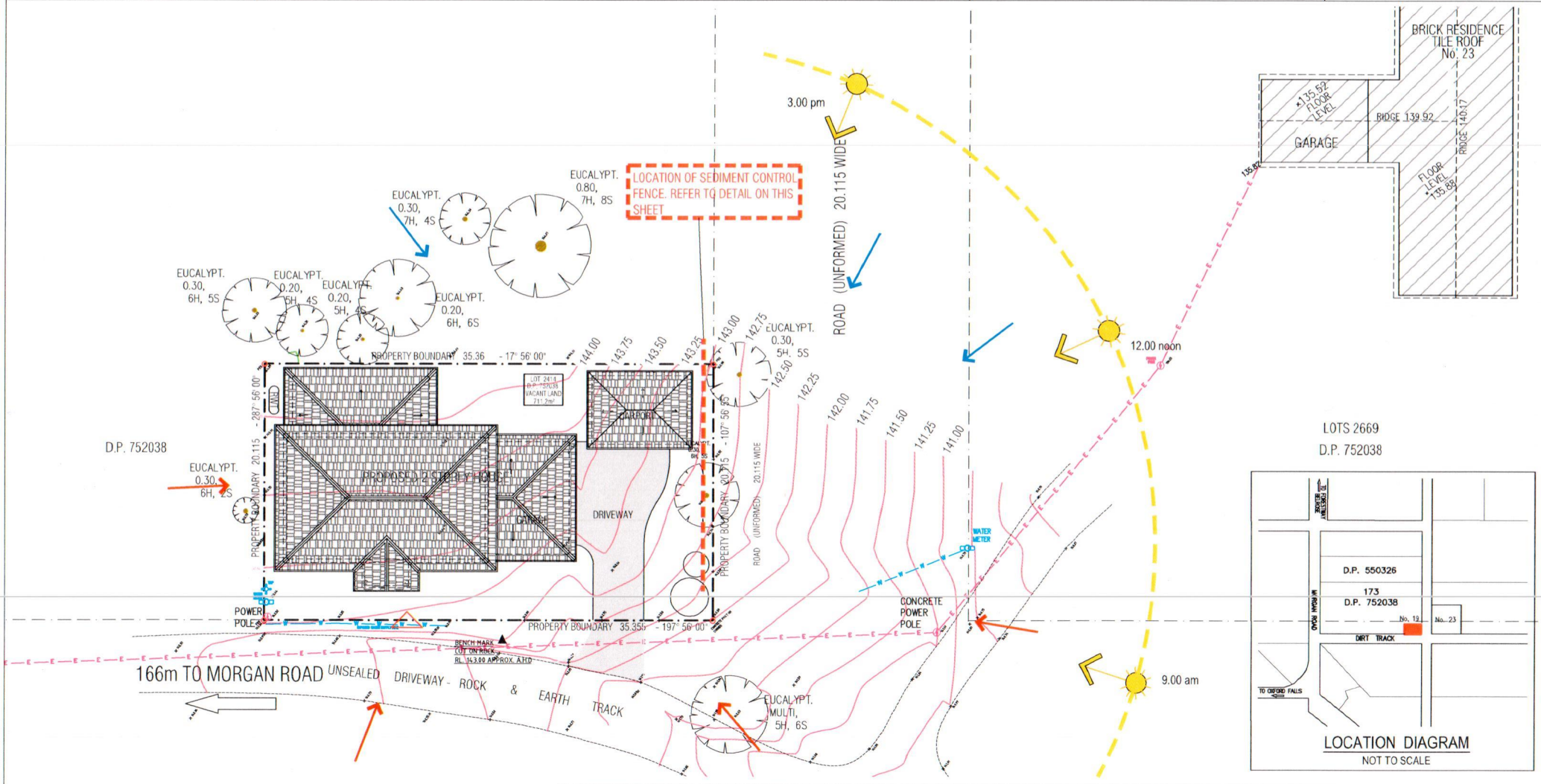
SUITABLE FOR DRAINAGE AREA OF 0.6HA MAX AND SLOPE GRADIENT OF 1:2 MAX WITH LENGTH OF 60M MAX

## NOTES

1. STORMWATER DRAINAGE DESIGN NOT SHOWN. RAINWATER COLLECTION TANKS TO RE-USE FOR GARDEN AND AS PER BASIX REPORT
2. FOR MORE DETAILED SITE INFORMATION REFER TO GROUND FLOOR PLANS
3. REFER TO SEPERATE BASIX REPORT FOR ENERGY REQUIREMENTS
4. REFER TO LANDSCAPE ARCHITECTS DRAWINGS FOR PLANTING STRATEGY
5. REFER TO ENVIROTECH REPORT FOR WASTEWATER TREATMENT DETAILS
6. REFER TO BUSHFIRE REPORT FOR FLAME ZONE CONDITIONS
7. REFER TO STATEMENT OF ENVIRONMENTAL EFFECTS FOR DEVELOPMENT DETAILS AND PLANNING CONSIDERATIONS

## KEY

- SUN DIRECTION - 21st JUNE
- SITE ENTRY
- PREVAILING SUMMER WINDS
- PREVAILING WINTER WINDS
- +24.500 EXISTING GROUND LEVEL
- + 66.070 PROPOSED NEW LEVEL
- EXISTING TREES TO REMAIN




01 SITE & SITE ANALYSIS PLAN
1:400 @ A3

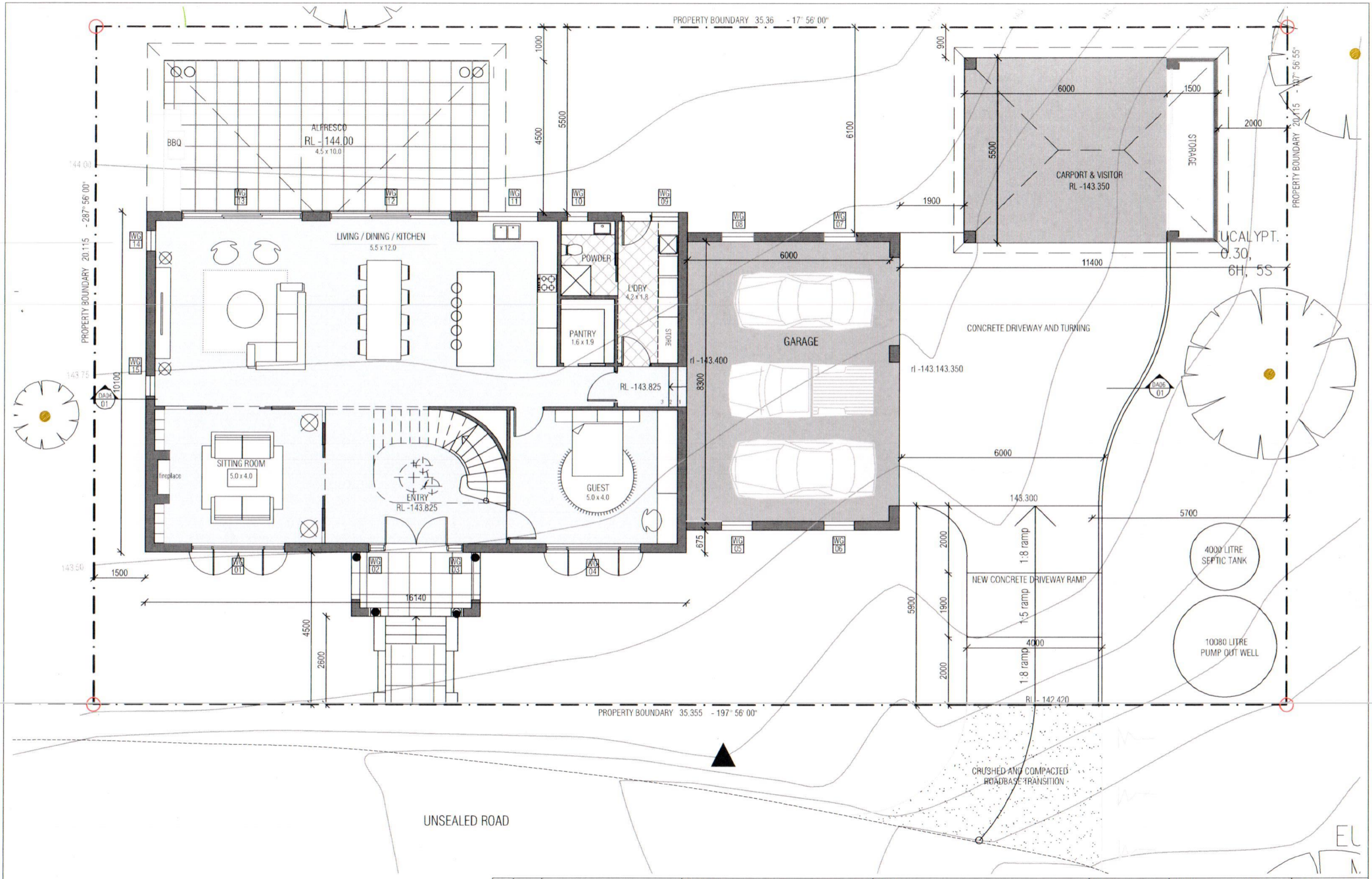
| No | DATE | REVISION |
|---|---|---|
| 01 | | |

ARCHITECT
muri ARCHITECTS + INTERIOR DESIGNERS
t: 0415 792 733 e: info@muri.com.au www.muri.com.au
NSW Reg No 8718

CLIENT: DAVID AND LANDI CONWAY
PROJECT: PROPOSED NEW RESIDENCE 19 MORGAN ROAD, BELROSE
TITLE: SITE PLAN & SITE ANALYSIS

NORTH

| DRAWN | DATE | SCALE |
|---|---|---|
| SL | Feb 2020 | 1:100 @ A3 |
| CHECKED | DATE | ISSUE |
| JOB No. 1904 | DRAWING No. DA01 | REV. |




01 GROUND FLOOR PLAN
1:100 @ A3

| No | DATE | REVISION |
|---|---|---|
| 05 | 07.02.20 | ISSUED TO ALL CONSULTANTS |
| 04 | 31.01.19 | STORE ADDED TO CARPOORT. HOUSE RELOCATED |
| 03 | 16.12.19 | HOUSE INCREASED BY 1M . STAIR CHANGE |
| 02 | 06.12.19 | DRIVEWAY MOVED TO SIDE.CARPORT ADDED |
| 01 | 03.12.19 | ISSUED FOR DISCUSSION |

ARCHITECT
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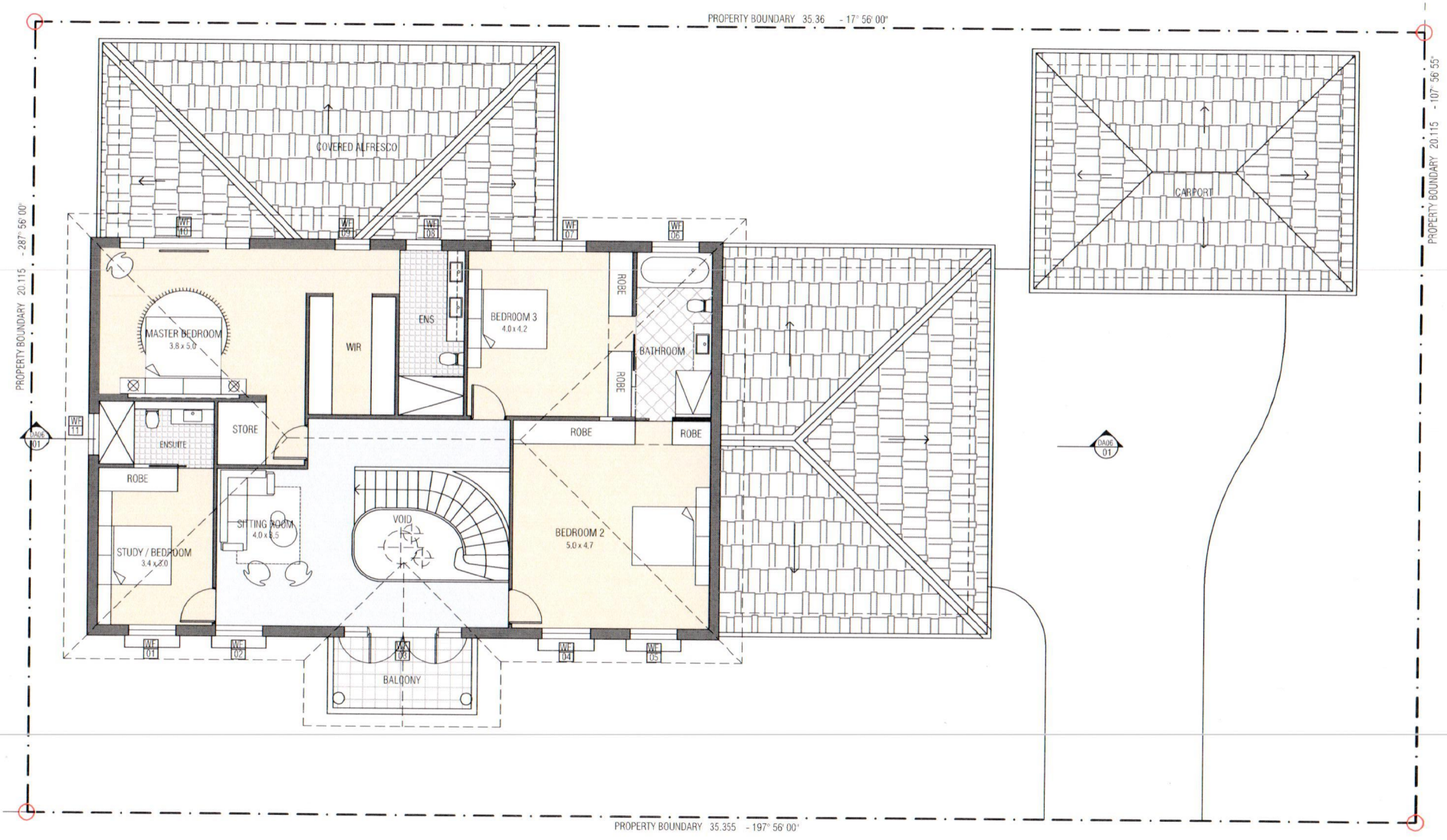
t 0415 792 733 e info@muri.com.au www.muri.com.au
NSW Reg No 8715

CLIENT: DAVID AND LANDI CONWAY
PROJECT: PROPOSED NEW RESIDENCE
19 MORGAN ROAD, BELROSE
TITLE: PROPOSED GROUND FLOOR PLAN

NORTH

| DRAWN | DATE | SCALE |
|---|---|---|
| SL | Feb 2020 | 1:100 @ A3 |
| CHECKED | DATE | ISSUE |
| JOB No. | DRAWING No. | REV. |
| 1904 | DA02 | 05 |




FLOOR PLATE = 140 sqm

01 FIRST FLOOR PLAN
1:100 @ A3

| No | DATE | REVISION |
|---|---|---|
| 05 | 07.02.20 | ISSUED TO ALL CONSULTANTS |
| 04 | 31.01.19 | STORE ADDED TO CARPOORT. HOUSE RELOCATED |
| 03 | 16.12.19 | HOUSE WIDEN BY 1m AND RELOCATED |
| 02 | 06.12.19 | ISSUED FOR DISCUSSION |
| 01 | 03.12.19 | ISSUED FOR DISCUSSION |

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NSW Reg No 8715

CLIENT: DAVID AND LANDI CONWAY
PROJECT: PROPOSED NEW RESIDENCE
19 MORGAN ROAD, BELROSE
TITLE: PROPOSED FIRST FLOOR PLAN

NORTH

| DRAWN | DATE | SCALE |
|---|---|---|
| SL | Feb 2020 | 1:100 @ A3 |
| CHECKED | DATE | ISSUE |
| JOB No. | DRAWING No. | REV. |
| 1904 | DA03 | 05 |

NSW GOVERNMENT | Health

# Certificate of Accreditation

## Sewage Management Facility
## Aerated Wastewater Treatment System

*This Certificate of Accreditation is issued by the Secretary of the NSW Ministry of Health pursuant to Clause 41(1) of the Local Government (General) Regulation 2005.*

*System:* ***BioSeptic Performa AWTS***

*Manufacturer:* ***BioSeptic Pty Ltd***

*Of:* ***67 Smeaton Grange Road,***
***Smeaton Grange, NSW, 2567***

*The BioSeptic Performa AWTS as described in Schedule 1, has been accredited as a sewage management facility for use in a single domestic premises in NSW. This accreditation is subject to the conditions of accreditation and permitted uses specified in Schedule 2.*

*A/Director, Environmental Health*
*for Secretary (delegation PH335)*

***Issued:*** *17 November 2015*
***Certificate No:*** *AWTS 007*
***Expires:*** *31 December 2020*

## Schedule 1: Specification

### BioSeptic Performa Aerated Wastewater Treatment System

General Description

The BioSeptic Performa Aerated Wastewater Treatment System (AWTS) is designed to treat the wastewater from a residential dwelling occupied by a maximum of 10 persons. The BioSeptic Performa AWTS is contained in a vertical axis type cylindrical precast concrete septic tank and collection well with design capacities of 3550 litres and 3750 litres respectively. The operational water level in the system is 1485 mm. The system consists of:

- A primary treatment/septic tank with a capacity of 3550 litres;
- A secondary treatment/collection well with a capacity of 3750 litres and containing:
    - Two aeration chambers with a total capacity of 2500 litres;
    - A clarification chamber with a capacity of 500 litres;
    - A chlorine contact and irrigation pump well chamber with a capacity of 400 litres;
- A chlorine disinfection unit installed on the outlet of the clarifying chamber;
- Air is supplied to the aeration chambers by an air blower with a nominal 80 capacity of 80 litres/minute;
- An automatic, submersible irrigation pump with a minimum 7 metre head.

## Schedule 2: Conditions of Accreditation

### 1.0 General

1.1 For each installation the owner/occupier of the premises shall make an application to the local council to install a BioSeptic Performa AWTS as a sewage management facility in accordance with Section 68, Part C of the Local Government Act 1993 and Clause 26 of the Local Government (General) Regulation 2005.

1.2 The BioSeptic Performa AWTS shall be supplied, constructed and installed in accordance with the design as submitted and accredited by the NSW Ministry of Health.

1.3 Any modification or variations to the accredited design of the BioSeptic Performa AWTS shall be submitted for separate consideration and variation of the Certificate of Accreditation by the Secretary of the NSW Ministry of Health.

1.4 Each BioSeptic Performa AWTS shall be permanently and legibly marked on a non-corrosive metal plaque or equivalent, attached to the lid with the following information:

- The brand name of the system;
- The manufacturer's name or registered trademark;
- The month and year of manufacture.

1.5 The manufacturer shall supply with each BioSeptic Performa AWTS an owner's manual, which sets out the care, operation, maintenance and on-going management requirements of the system.

1.6 The manufacturer shall provide the following information to each local authority where it is intended to install an AWTS in their area once Departmental accreditation has been obtained:

- Statement of warranty
- Statement of service life
- Quality Assurance Certification
- Installation Manual
- Service Manual
- Accreditation documentation from NSW Health.
- Owner's Manual
- Service Report Form
- Engineering Drawings on A3 format
- Detailed Specifications
- A4 Plans

### 2.0 Installation and Commissioning

2.1 The local council should require that on completion of the installation of the BioSeptic Performa AWTS, the system is inspected and checked by the manufacturer or the manufacturer's agent. The

manufacturer or the agent is to certify that the system has been installed and commissioned in accordance with its design, conditions of accreditation and any additional requirements of the local council.

2.2 The local council should require that all electrical work must be carried out by a licensed electrician and in accordance with the relevant provisions of AS/NZS 3000.

### 3.0 Maintenance

3.1 The local council shall require the owner/occupier of a premises to enter into an annual service contract with a representative of BioSeptic Pty Ltd or a service contractor or company acceptable to the Council.

3.2 The BioSeptic Performa AWTS shall be serviced at three monthly intervals in accordance with the details set out in the owner's and service manual.

3.3 Each three monthly service shall include a check on all mechanical, electrical and functioning parts of the system including:

- The chlorinator and replenishment of the disinfectant,
- Pumps, air blower, fan or air venturi,
- The alarm system,
- Slime growth on the filter media,
- Operation of the sludge return system,
- The effluent irrigation area,
- On-site testing for free residual chlorine, pH and dissolved oxygen.

3.4 The local council should require that a service report sheet, in triplicate, is completed for each service. The original shall be given to the owner, the duplicate forwarded to the local council and the triplicate retained by the service contractor.

### 4.0 On-going Management

4.1 The owner's manual prepared by the manufacturer shall contain a plan for the on-going management of the BioSeptic Performa AWTS. The plan shall include details of:

- the treatment process,
- procedures to be followed in the event of a system failure,
- emergency contact numbers,
- maintenance requirements,
- inspection and sampling procedures to be followed as part of the on-going monitoring program developed by the local authority.

4.2 Effluent from the BioSeptic Performa AWTS taken in any random grab sample shall comply with the following standard:

| | |
|---|---|
| • $BOD^5$ | less than 30 mg/L |
| • TSS | less than 45 mg/L |
| • E. coli | less than 100 cfu/100 ml |
| • Free residual chlorine | greater than 0.2 and less than 2.0 mg/L |

### 5.0 Permitted uses

5.1 The effluent is suitable for re-use for garden purposes by way of any of the forms of irrigation as described in AS/NZS 1547:2000:

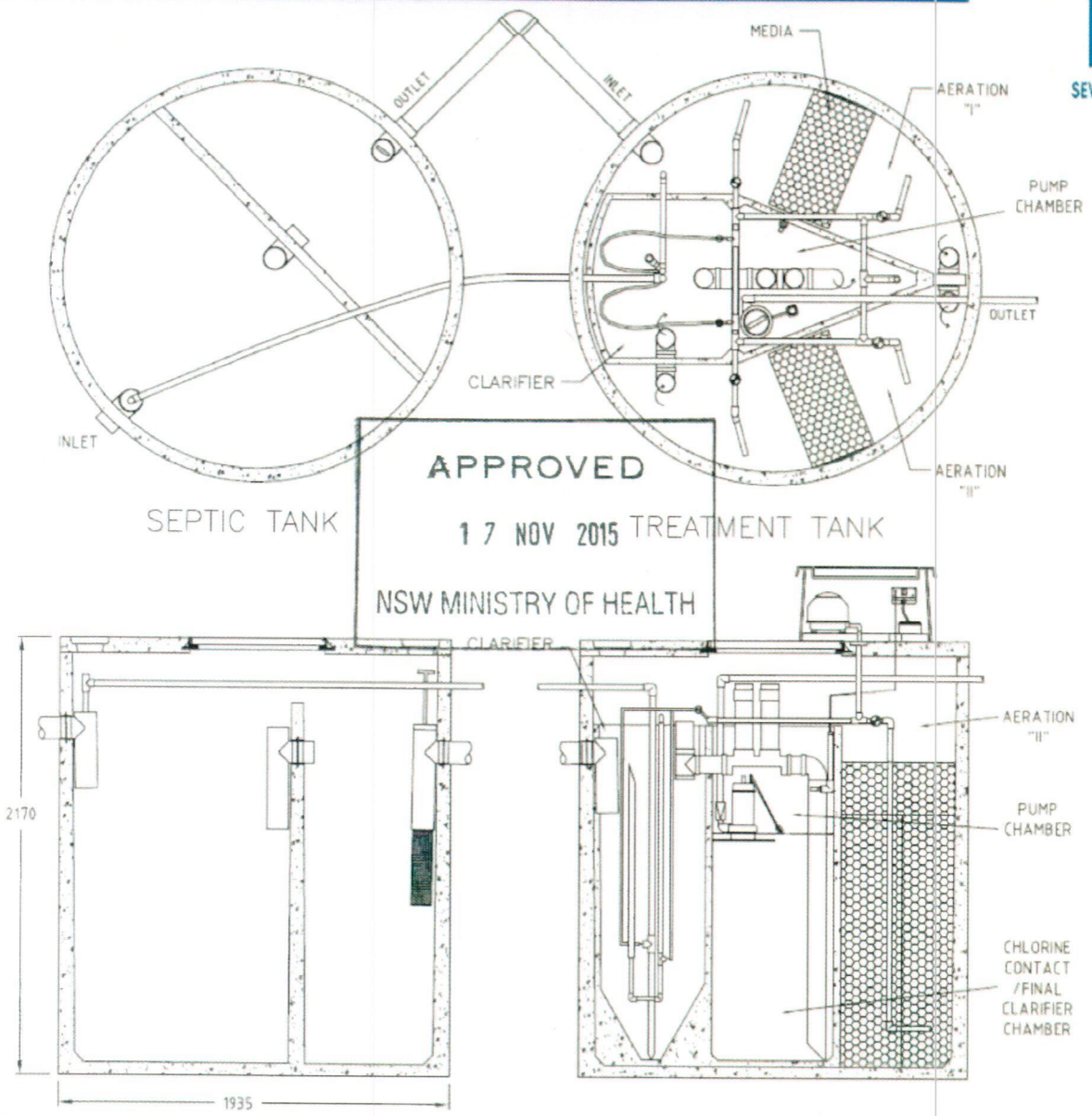
- above ground spray irrigation; or
- surface drip irrigation covered by mulch; or
- sub-surface drip irrigation installed at around 100 mm depth.

Each of the three forms of irrigation is subject to the approval of the Council.

# BioSeptic **PERFORMA** 10 Person AWTS

NSW Health Certificate of Accreditation - 007

BIO septic
SEWAGE SYSTEMS




## DESCRIPTION

- The BioSeptic Performa is a ten person aerated wastewater treatment system (AWTS)
- The BioSeptic Performa AWTS uses concrete tanks and chambers and has been in production since 1993.
- NSW Health Department Certificate of Accreditation – 007
- BioSeptic holds SAI Global third party accreditation for Product Certification to:
  - NSW Health Department aerated wastewater treatment systems (AWTS) Approval Guideline Part 3
  - AS/NZS1546.3 – On site domestic wastewater treatment systems
  - AS/NZS1546.1 – On site wastewater treatment systems
  - Part 1 septic tanks

| | |
|---|---|
| Septic Tank | 3550L |
| Aeration 1 | 1250 L |
| Aeration 2 | 1250 L |
| Clarifier | 500 L |
| Chlorine Contact Chamber | 300 L |
| Pump Chamber | 100 L |
| Surcharge Volume | 1050L |
| Tested at | 2137 L/day |

Certified Product
AS/NZS 1546.3
Lic No. SMK 02221

**BioSeptic Pty Ltd**
ABN 95 056 461 226
67 Smeaton Grange Road, Smeaton Grange, NSW, 2567
Po Box 3250, Narellan, NSW, 2567
Ph: 1300 658 111 – Fax: 02 4629 6655
reception@bioseptic.com.au – www.bioseptic.com.au

Certified Product
AS/NZS 1546.1
Lic No. SMKH21556

NSW GOVERNMENT | Health

# Certificate of Accreditation

## Sewage Management Facility

## Domestic Greywater Treatment System

*This Certificate of Accreditation is issued by the Secretary of the NSW Ministry of Health pursuant to Clause 41(1) of the Local Government (General) Regulation 2005.*

*System:* ***ultra GTS Greywater Treatment System***

*Manufacturer:* ***Wastewater Australia Pty Ltd***

*Of:* ***1a / 39 Bennu Circuit, ALBURY, NSW, 2640***

*The ultra GTS DGTS as described in Schedule 1, has been accredited as a sewage management facility for use in a single domestic premises in NSW. This accreditation is subject to the conditions of accreditation and permitted uses specified in Schedule 2.*

*Director, Environmental Health*
*for Secretary (delegation PH335)*

***Issued:*** *1 December 2015*
***Certificate No:*** *DGTS011*
***Expires:*** *31 December 2020*

## Schedule 1: Specification

### ultraGTS Greywater Treatment System

### General Description

The ultraGTS greywater treatment system is designed to treat the greywater waste stream from the shower, bath, laundry and basin from a residential dwelling occupied by a maximum of 10 persons. The ultraGTS greywater treatment system is assembled within an above ground roto moulded heavy duty polyethylene tank with a capacity of 500 litres. The treatment tank contains the membrane filter module and diffuser assembly pipe system along with the working level float switch. The operation of the ultraGTS is set out below:

- Greywater enters the system via an in-ground collection sump (ultraWELL) with a design capacity of between 300-500 litres. The ultraWELL is fitted with a submersible vortex pump with a 5 metre head which transfers the greywater at regular intervals to the ultraGTS. The ultraWELL is designed with an inbuilt overflow to the sewer to cater for high loads.
- The ultraGTS is a Membrane Bio-Reactor which uses a combination of biological treatment and advanced membrane filtration. Air is introduced into the base of the ultraGTS via a course bubble aeration pipe system to ensure proper mixing and the biological treatment is achieved through the oxidation of the wastewater. The Secoh EL80 aeration pump or equivalent is used for the aeration of the wastewater and the scouring of the membranes filter.
- The membrane filter unit consists of a membrane cartridge containing 6 flat sheet membranes, 490 mm wide x 600 mm high each, with a pore size of 0.2 microns or a hollow fibre membrane module with a pore size of 0.2 microns. The membranes are self cleaning, utilising the shearing action of the diffused air and mixed liquor to scour off any built up of bio-mass. The transfer of the wastewater through the membrane module and the UV disinfection unit is controlled by a suction pump. The UV disinfection unit is capable of disinfecting the wastewater at a rate of 4 litres/min. The treated greywater is collected and stored in the above ground storage tank ready for internal re-use.
- The motor box, located on top of the ultraGTS, contains all the electrical components together with the air blower, the suction pump and the UV disinfection unit.

## Schedule 2: Conditions of Accreditation

### 1. General

1.1 For each installation the owner/occupier of the premises shall make an application to the Local Council to install an ultraGTS greywater treatment system as a waste management facility in accordance with Section 68, Part C of the *Local Government Act 1993 and Clause 26 of the Local Government (General) Regulation 2005.*

1.2 The ultraGTS greywater treatment system shall be supplied, constructed and installed in accordance with the design as submitted and accredited by the NSW Ministry of Health.

1.3 Any modification or variations to the accredited design of the ultraGTS greywater treatment system shall be submitted for separate consideration and variation of the Certificate of Accreditation by the Secretary of the NSW Ministry of Health.

1.4 Each ultraGTS greywater treatment system shall be permanently and legibly marked on a non-corrosive metal plaque or equivalent, attached to the lid with the following information:

- The brand name of the system;
- The manufacturer's name or registered trademark;
- The month and year of manufacture.

1.5 The manufacturer shall supply the owner/occupier of the premises with an owner's manual, which sets out the care, operation, maintenance and on-going management requirements of the system.

1.6 The manufacturer shall provide the following information to each local authority where it is intended to install a greywater treatment system in their area once Departmental accreditation has been obtained:

- Statement of warranty
- Statement of service life
- Quality Assurance Certification
- Installation Manual
- Service Manual
- Owner's Manual
- Service Report Form
- Engineering Drawings on A3 forma
- Detailed Specifications
- A4 Plans
- Accreditation documentation from NSW Health.

## 2. Installation and Commissioning

2.1 The Local Council should require that on completion of the installation of the ultraGTS greywater treatment system, the system is inspected and checked by the manufacturer or the manufacturer's agent. The manufacturer or the agent is to certify that the system has been installed and commissioned in accordance with its design, conditions of accreditation and any additional requirements of the Local Council.

2.2 The Local Council should require that all electrical work must be carried out by a licensed electrician and in accordance with the relevant provisions of AS/NZS 3000.

## 3. Maintenance

3.1 The Local Council shall require the owner/occupier of the premises to enter into an annual service contract with a representative of Wastewater Australia Pty Ltd or a service contractor registered with the Local Council as an accredited person to carry out maintenance work.

3.2 The ultraGTS greywater treatment system shall be serviced at four monthly intervals in accordance with the details set out in the owner's and service manual.

3.3 At each service a check shall be made of all mechanical, electrical and functioning parts of the system including:

- Visual inspection and service of the suction pump, air blower, air diffuser and membrane assembly,
- The condition of the ultraWELL and sump pump,
- The operation of the alarm system and UV disinfection unit,
- The effective operations of the effluent re-use options.

3.4 A service report sheet, in triplicate, shall be completed for each service. The original shall be given to the owner, the duplicate forwarded to the Local Council and the triplicate retained by the service contractor.

## 4. On-going Management

4.1 The owner's manual prepared by the manufacturer shall contain a plan for the on-going management of the ultraGTS greywater treatment system. The plan shall include details of:

- the treatment process,
- procedures to be followed in the event of a system failure,
- emergency contact numbers,
- maintenance requirements,
- inspection and sampling procedures to be followed as part of the on-going monitoring program developed by the local authority.

4.2 Effluent from the ultraGTS greywater treatment system taken in any random grab sample shall comply with the following standard:

- $BOD^5$ less than 20 mg/L
- TSS less than 20 mg/L
- E. coli less than 10 cfu/100 ml

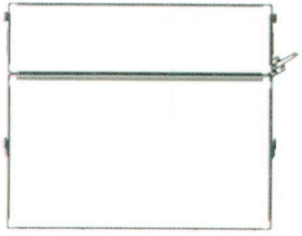
## 5. Permitted uses

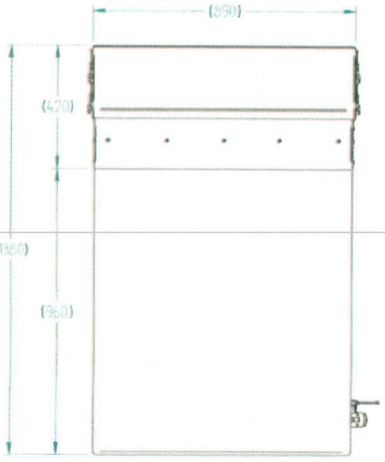
5.1 The effluent from the ultraGTS greywater treatment system is suitable for re-use for the following purposes:

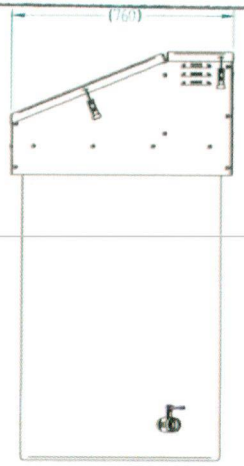
- toilet flushing;
- cold water supply to washing machine;
- garden purposes by irrigation of a type approved by the Local Council.

| TITLE | MATERIAL | SIZE | FUNCTION |
|---|---|---|---|
| 240V POWER CONNECTION | | 10A | POWER SOURCE |
| AIR PUMP | | 80L/min | TREATMENT/MEMBRANE CLEANING |
| CONTROL PANEL | | 150x190mm | CONTROLS PLANT |
| FLOAT SWITCH | PVC | 1m | CONTROLS PROCESS PUMP |
| GREYWATER INLET | PVC | 25mm PP | INLET TO PLANT |
| MEMBRANE CARTRIDGE | | 500x500mm | MICROFILTRATION |
| MOTOR BOX | | - | HOUSES COMPONENTS |
| OVERFLOW TO SEWER | PVC | 50mm DWV | OVERFLOW TO SEWER |
| SLUDGE REMOVAL VALVE | BRASS | 20mm | SLUDGE REMOVAL |
| SUCTION PUMP | | | PROCESS GREYWATER |
| TREATED WATER OUTLET | BRASS | 15mm MALE | TREATED WATER FOR STORAGE |
| TREATMENT TANK | | 500L | MAIN TREATMENT TANK |
| UV DISINFECTION | STAINLESS STEEL | 4L/min | DISINFECTION |

Refer to drawing for location of all components



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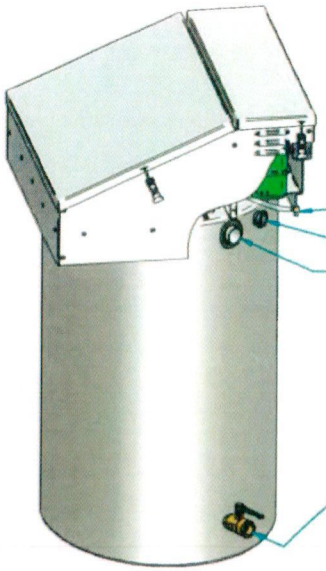
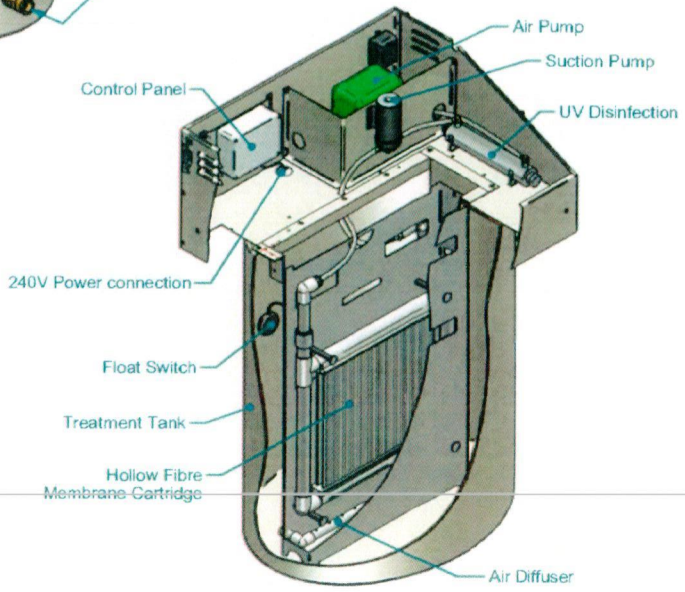
1 DEC 2015

NSW MINISTRY OF HEALTH








ultra Greywater Treatment System GTS

GENERAL TOLERANCES UNLESS OTHERWISE STATED
HOLES +.03 -.06
FOLDING +.05 -.05

| LENGTH | | TOLERANCE |
|---|---|---|
| +6 | 6 | 0.1 |
| 6 | 30 | 0.2 |
| 30 | 120 | 0.3 |
| 120 | 315 | 0.5 |
| 315 | 1000 | 0.8 |
| 1000 | +1000 | 1.0 |
| ALL ANGLES | | 30' |

wastewater Australia



UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MM

DATE PRINTED 5/04/2011
SCALE DO NOT SCALE
DRAWN BY P. MCKAY
MODELLED BY MCKAY P.
DRAWING LAST MODIFIED BY P. MCKAY
MODEL LAST MODIFIED BY P. MCKAY

PROJECT ultraGTS
TITLE CERTIFICATION DRAWING
PROCESS -
FOAM/TREAT -
SHEET SIZE A3
PART # 118_010 CERT.
REVISION A1.H
SHEET No 1 OF 1

NSW GOVERNMENT | Health

# Certificate of Accreditation

## Sewage Management Facility
## Septic Tanks & Collection Wells

*This Certificate of Accreditation is issued by the Secretary of the NSW Ministry of Health pursuant to Clause 41(1) of the Local Government (General) Regulation 2005.*

*Manufacturer:* **BioSeptic Pty Ltd t/a BioSeptic**

*Of:* **67 Smeaton Grange Road**
**Smeaton Grange, NSW, 2567**

*The Septic Tanks, Collection Wells and Pump Well as described in the following Schedule have been accredited as sewage management facilities for use in single domestic premises in NSW.*

*A/Director, Environmental Health*
*for Secretary (delegation PH335)*

***Issued:*** *10 December 2018*
***Certificate No:*** *STCW003*
***Expires:*** *31 December 2023*

NSW GOVERNMENT | Health

# *Accreditation Schedule*

*The Certificate of Accreditation applies to the following Septic Tanks and Collection Wells*

| Model | Description | Size |
|---|---|---|
| Septic Tank | Vertical axis type, cylindrical precast steel fibre reinforced concrete, with lid, access cover, inlet and outlet fittings. | 3550 L<br>6950 L |
| Collection Well | Vertical axis type, cylindrical precast steel fibre reinforced concrete, with lid, access cover and inlet fitting. Certification applies only to the construction of the tank, lid and access cover. It does not include internal fittings or partitions. | 3750 L<br>7200 L<br><br>3800 L<br>5000 L (2.0 dia)<br>5000 L (2.5 dia)<br>6100 L<br>10,000 L |
| Combined Septic tank/ Collection well | Vertical axis type, cylindrical precast steel fibre reinforced concrete, with lid, access cover and inlet fitting. Certification applies only to the construction of the tank, lid and access cover. It does not include internal fittings or partitions. | 2300 L/4700 L<br><br>2750 L/5500 L<br><br>2300 L/6000 L |

# 10,000L Collection Well

10,000Litre 2.5m diameter concrete collection well

Weight 5400kg

To collect sullage water from a septic tank for disposal by:

- Periodic removal by vacuum tanker
- Pump to disposal area/trench/sewer

Retention feet to prevent flotation:

- In rock or high water table locations, consider backfilling with 2.0m³ concrete.

Suitable for use as a water tank or Onsite Detention Tank (OSD)

**LOCKABLE & LIGHTWEIGHT** composite resin access cover:

- Weigh only 8.5kg and easy to lift
- Lockable with removable turnkey
- Sealed to prevent the ingress of surface water
- Access turret can be extended to increase fall into tank

Manufactured from 40mpa wet cast concrete with fibre steel reinforcing

150mm concrete lid tested to 3000kg:

- Reinforced with F82 steel mesh
- Access cover top load limit – 510kg

Installation:

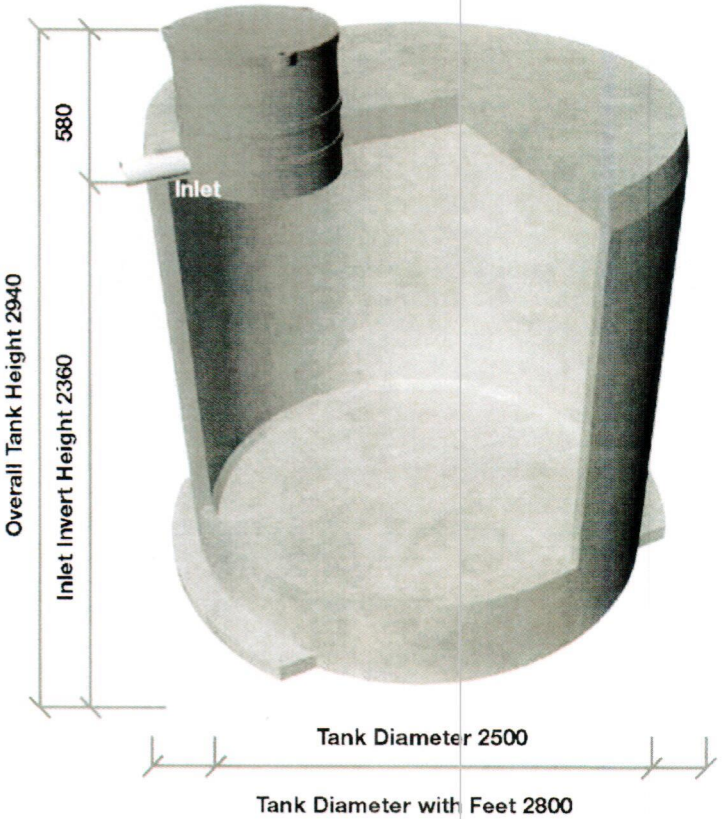
- Top of turret lid can be flush with finished ground level
- Provide 75mm level bed of aggregate under tank

APPROVED

1 0 DEC 2018

NSW MINISTRY OF HEALTH

30 YEARS WARRANTY




Certified Product
Australian Standard
AS/NZS1546.1
Lic SMKH21556
SAI Global

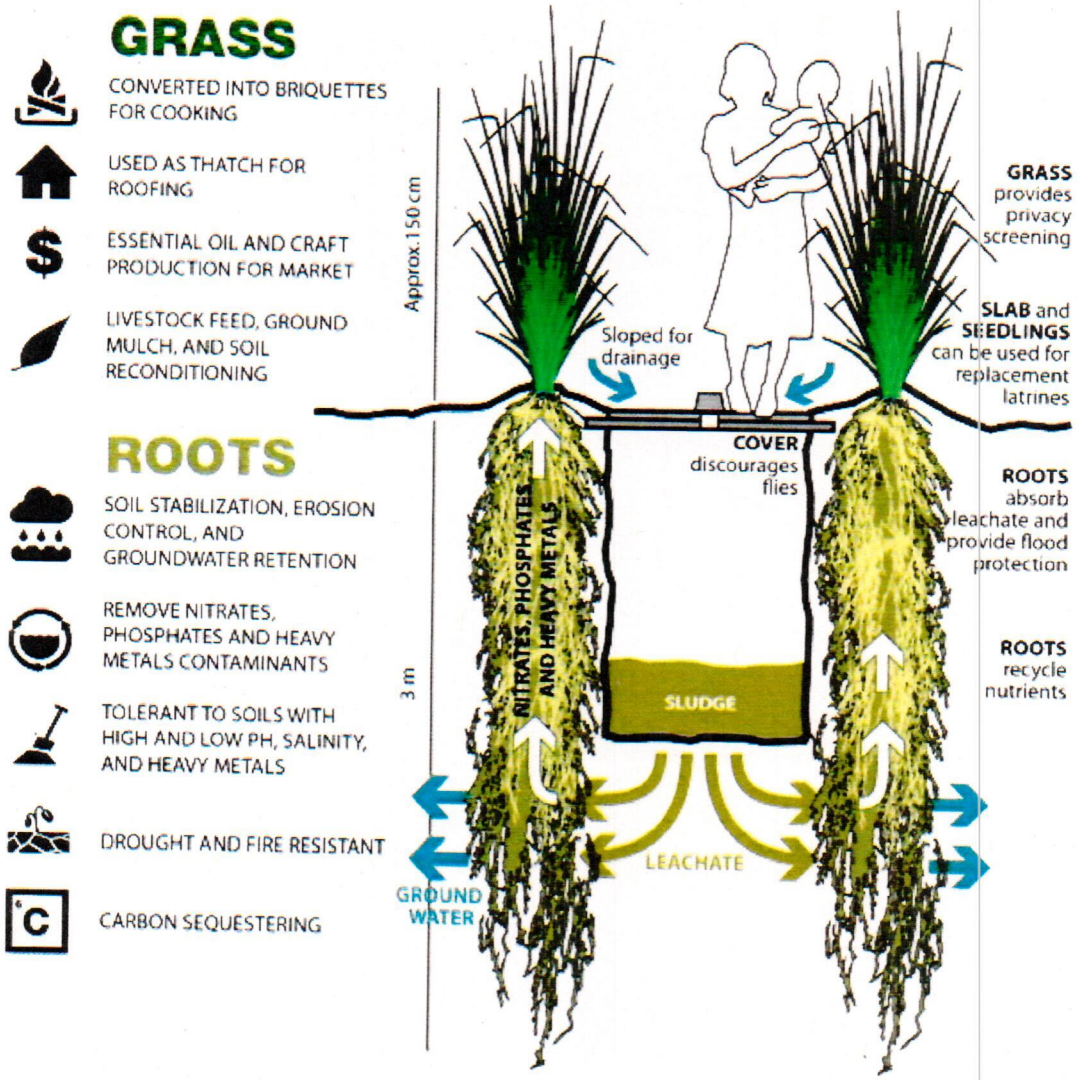
NSW Ministry of Health Certificate of Accreditation 003-21556

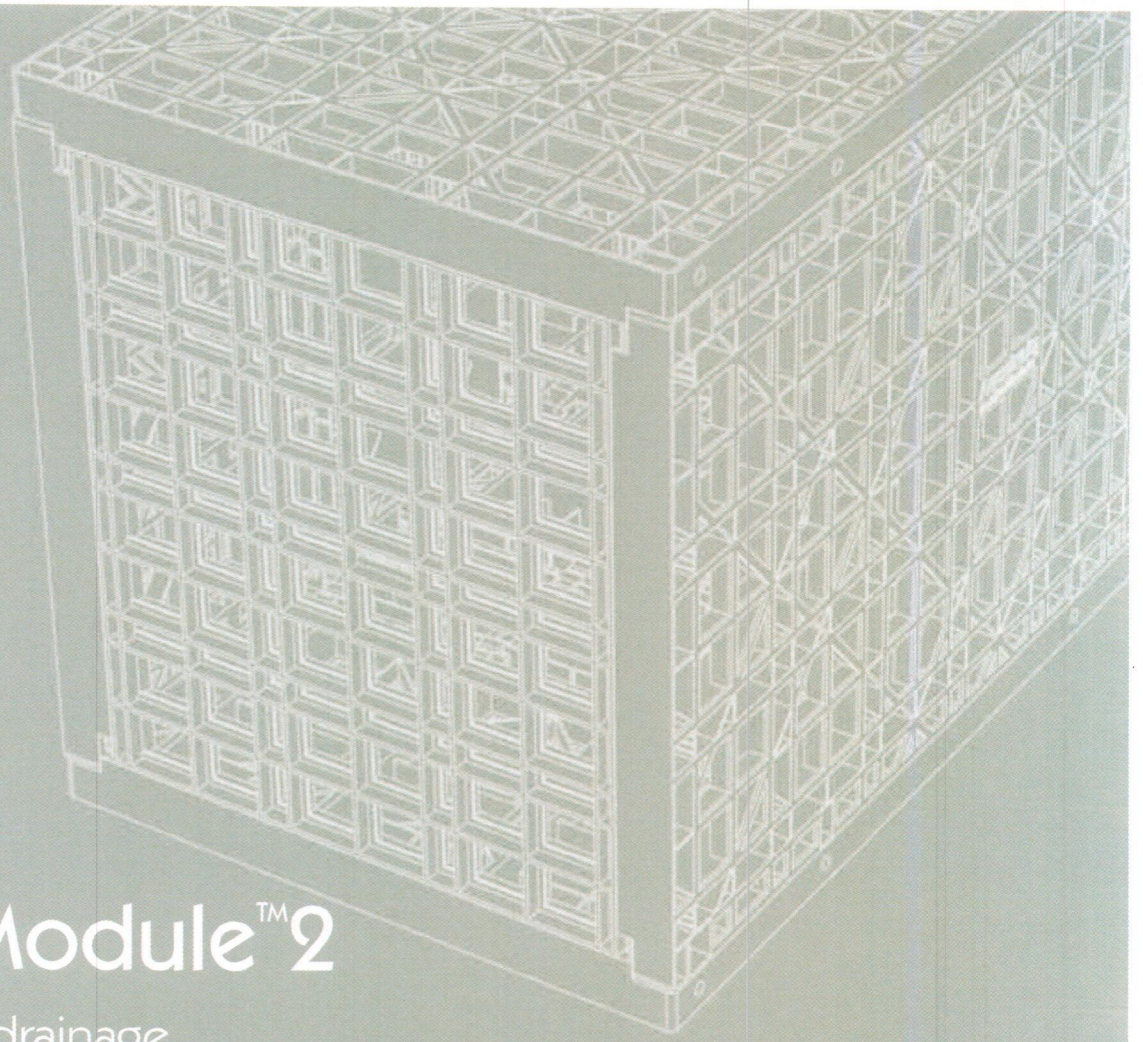
67 Smeaton Grange Road,
Smeaton Grange, NSW 2567
EMAIL sales@bioseptic.com.au
ABN 95 056 461 226

**BIOSEPTIC**

**PHONE 1300 658 111**

## Appendix B – The Vetiver Latrine Concept





# EnviroModule™2

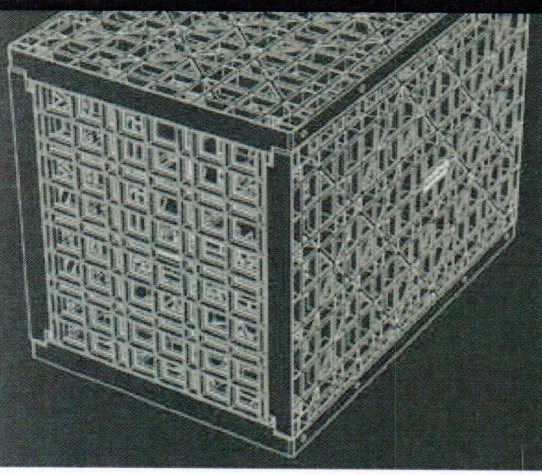
## septic leach drainage

ausdrain
STORMWATER SOLUTIONS

# septic leach drainage

## AUSDRAIN sets the benchmark in septic leach drainage with the new EnviroModule™2 leach drain system. Ausdrain EnviroModules are manufactured in Australia from 100% recycled plastic.

### EnviroModule™2



### features

- Sub-surface
- Modular
- High compressive strength
- High durability
- High void storage
- Open structure
- Lightweight
- Low maintenance
- Connectors
- Flat-pack form
- Slide and lock assembly
- 100% recycled

### benefits

- More useable land area
- Design flexibility
- Trafficable
- Long life expectancy
- Cost-effective
- High flow rate
- Install by hand
- No cleaning required
- Makes installation easy
- Economical to transport
- Quick to assemble
- Environmentally friendly

The AUSDRAIN leach drain system is practical, cost-effective and easy to install. AUSDRAIN EnviroModules are lightweight, have an open structure providing high flow rates and are extremely robust enabling installation under trafficable areas such as car parks and driveways.

AUSDRAIN EnviroModules are delivered to site in flat-pack form saving on transportation costs. The modules feature a slide and lock assembly function that minimises the time and effort required to assemble each module.

Once assembled the modules are easily carried and lifted by hand into the trench. They are then placed end to end in a line and covered on the top, sides and ends with a recommended geotextile.

AUSDRAIN has further simplified the installation of leach drains with the 150mm pipe connector. The connector clips effortlessly to the top, side or end of the module, providing a positive and secure connection. The fabric can then be clamped to the connector. For smaller pipe diameters, reducers can be used.

The AUSDRAIN leach drain system has been approved by councils and regulatory authorities including the Department of Health in Western Australia and the Northern Territory.

# product specifications

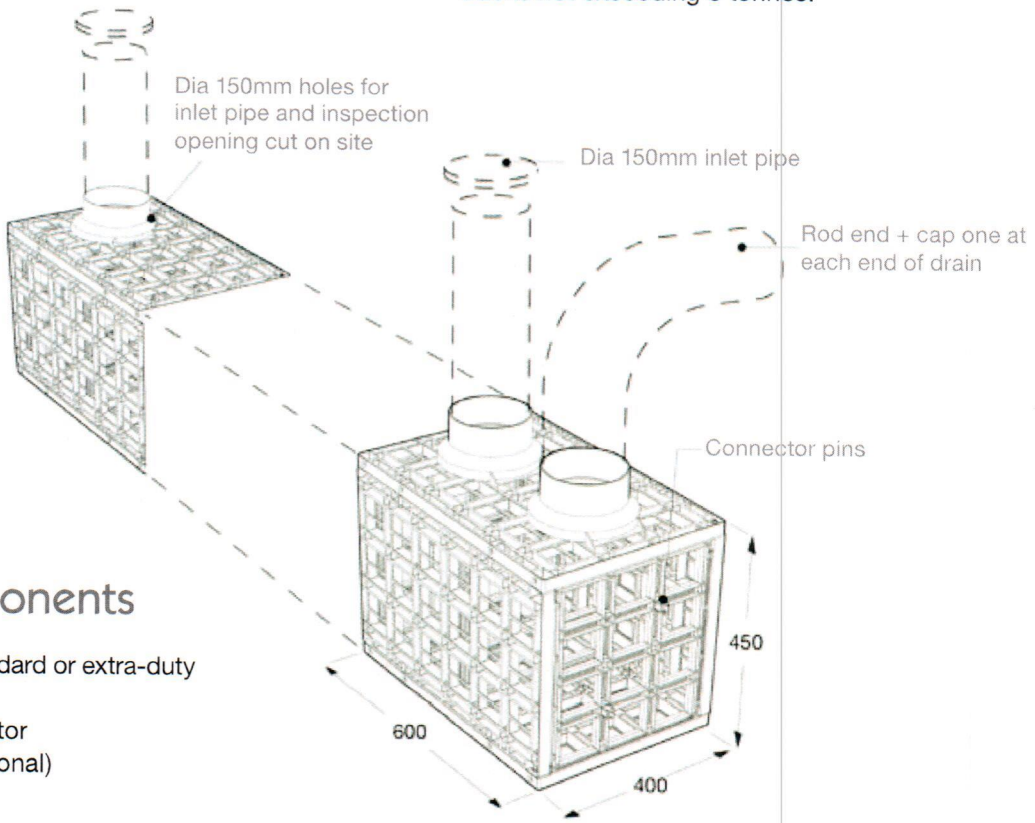
## technical data

| | |
|---|---|
| Length: | 600mm |
| Width: | 400mm |
| Height: | 450mm |
| Weight: | 4 - 5 kg |
| Void area: | 95% |
| Storage volume: | 105 litres |
| Unrestricted flow rate: | 3510 litres/min |
| **Compressive strength** | |
| Standard duty module - 3 braces: | 27.5 tonnes/m2 |
| Extra duty module - 4 braces: | 37.5 tonnes/m2 |
| **Minimum cover recommended** | |
| Standard duty module: | 400mm |
| Extra duty module: | 400mm |
| **Maximum cover recommended** | |
| Standard duty module: | 1200mm |
| Extra duty module: | 1800mm |
| Service temperature: | -30°c + 120°c |
| Module material: | Recycled polypropylene |

**Please note:**
Compressive strength tests were conducted by a certified testing authority and represent the maximum strength in a controlled environment that replicates the case when soil is uniformly distributed under a short term static load. AUSDRAIN recommends a safety factor of 10 is applied to these results for actual design loads.

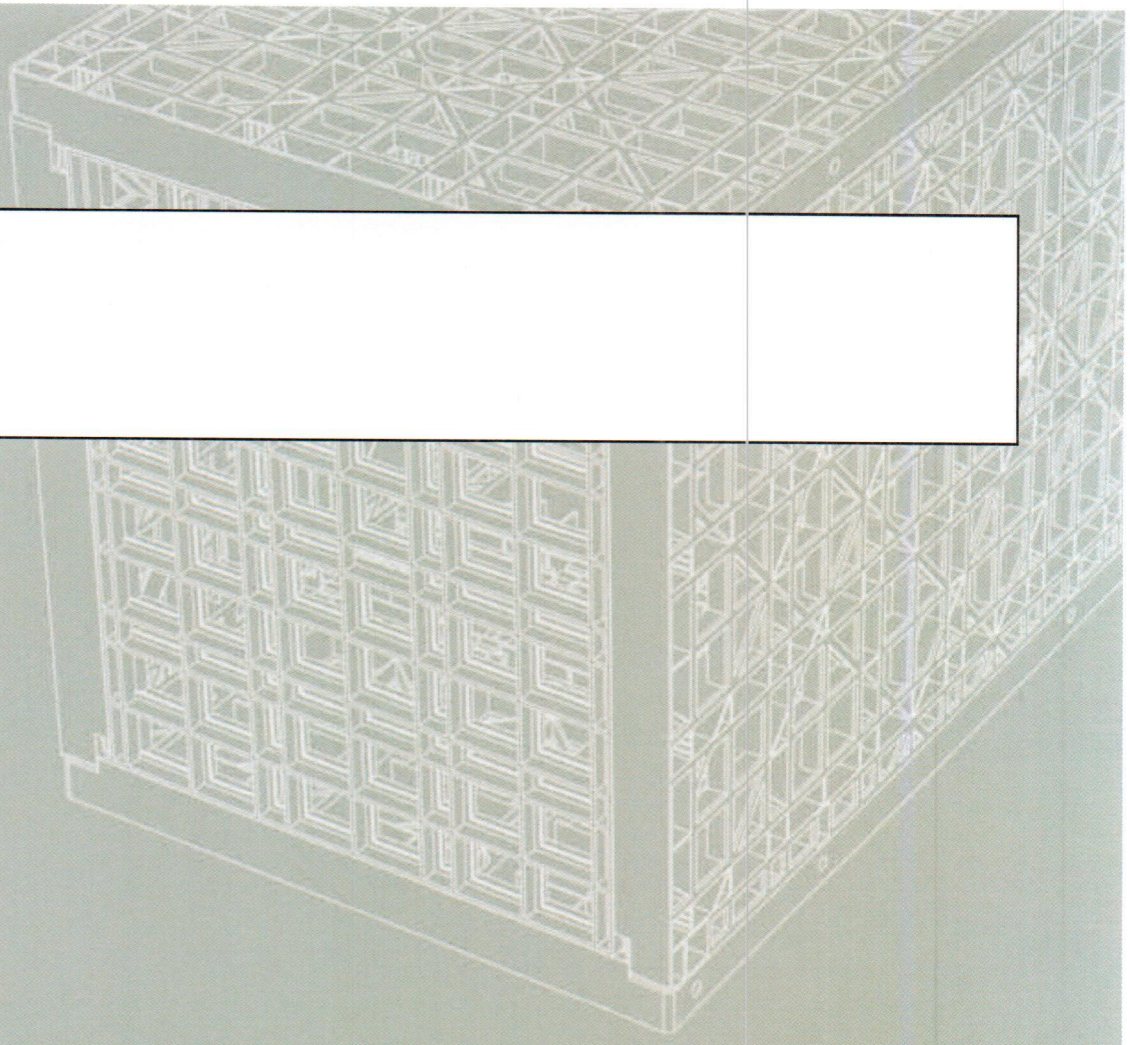
## installation procedure

1. Excavate trench allowing for 100mm to each side of the drain and 400mm above the drain to the surface. Level base using a 50-100mm layer of sand.
2. Assemble the modules using 4 sides and 3 braces for a non-trafficable landscaped area and 4 sides and 4 braces for a trafficable area. Please note that a suitable pavement consisting of road base and bitumen or a re-enforced concrete slab is required over the drain for trafficable situations.
3. Place the modules end to end along the length of the trench ensuring the 450mm side is in the upright position.
4. Attach the 150mm pipe connectors where required to the modules for inlet and inspection pipes.
5. Cover the top, sides and ends of the drain with the geotextile provided. If overlaps are required use a minimum of 300mm.
6. Cut an X in the fabric at each connector and seal the fabric to the connectors using adjustable clamps.
7. Backfill with coarse washed river sand to the sides of the drain and 100mm over the surface of the drain.
8. Place a minimum of 300mm of clean fill/topsoil over the sand layer and compact using machinery on tracks not exceeding 8 tonnes.




## system components

- EnviroModules – standard or extra-duty
- Geotextile fabric
- 150mm pipe connector
- Connector pins (optional)



Distributed by:

## Manufactured from 100% environmentally friendly recycled plastics

## For more in-depth information about AUSDRAIN™ and the products the company provides contact: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F 61 2 9929 7655
E enquiries@ausdrain.com

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Cammeray NSW 2062
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**www.ausdrain.com**