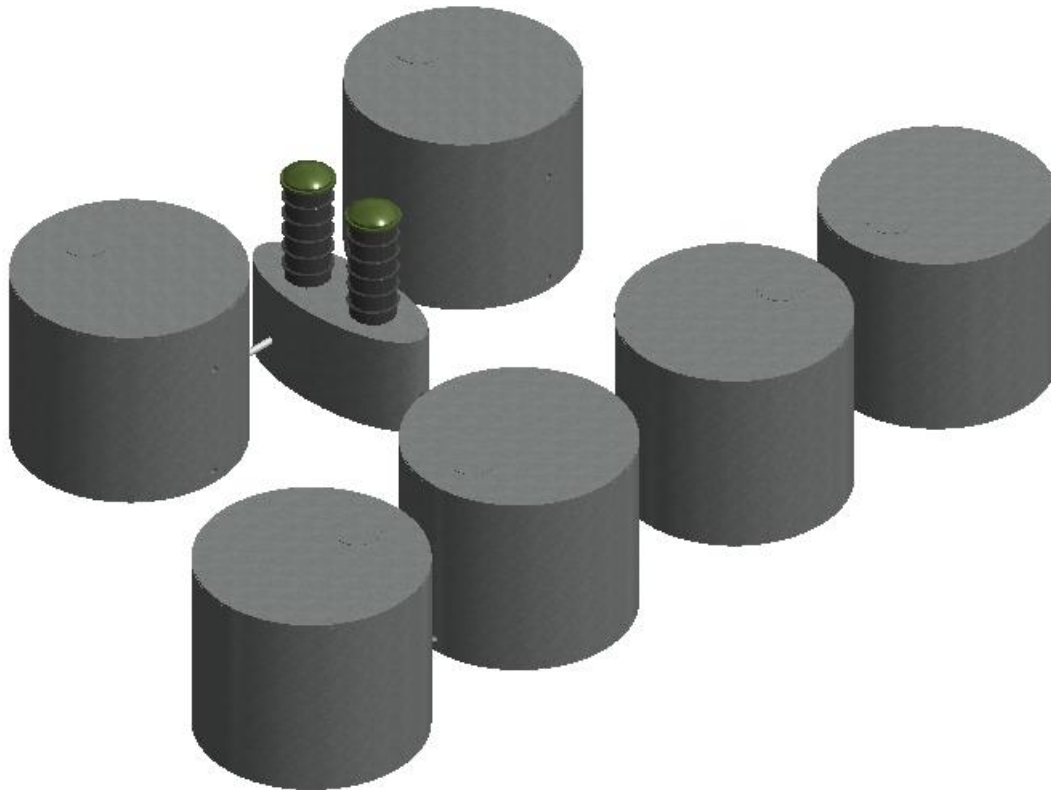




# NaturalFlow Series CSX300 Treatment System

## System Specifications



# NATURALFLOW SERIES CSX300

## System Specifications

*New Zealand's Leaders in Eco-Sustainable, Odourless Wastewater and Sewage Systems*

### Compliance Requirements

All NaturalFlow Treatment Systems meet the requirements of the NZ Building Code G13-VM4.

Section 9 of AS/NZS 1546.1:2008 state that tanks constructed to these Standards will meet the requirements of the Code for Clauses B1 and B2, structure and durability.

Compliance with Section 9 of AS/NZS 1546.1:2008 and also Clauses G13.3.4 relating to on-site treatment and disposal systems and G14.3.1 and 14.3.2 relating to the control of foul water as an industrial waste are covered in the 'NaturalFlow Compliance Requirements' document.

Please feel free to ask for a copy of this complete document, if required.

### The Treatment Process

The NaturalFlow Commercial Series CSX300 Treatment System is an expansion of the standard Series NF11000 System, with volumes to cater for flows up to 30,000 L/p/d, with extra volume in the grey water treatment allowed for, to further accentuate its treatment.

The Commercial Series CSX300 comprises of two 3.2m diameter x 2.70m high WORMORATOR® modules where the black water (B/W), (which in the NaturalFlow System includes the kitchen sink waste) in order to remove the solids, is directed into a Solids Separator module, which is designed to separate the total solids while diverting the carriage water into the dose chamber to be directed into the bio-reactor chamber.

These residual solids are seeded with tiger worms which proceed, as results of long term testing have shown, to digest them reducing the volume by approximately 95%, leaving only residual vermicasts which are virtually free of harmful bacteria and other pollutants. The B/W then flows through a secondary filter tray which further treats the water reducing the TSS & BOD and also reducing the particle size, in the TSS, to less than 1mm. This secondary treatment tray acts as an in-built outlet filter AS/NZS 1546 1:2008 Clause D3.3. and has a minimum life expectancy of 15 years. It then flows into the Dose Treatment Chamber where it is combined with the grey water (G/W) and settlement and filtration takes place. Its final treatment, through an aerating matrix filter, brings its treatment level up to meet the 20/30 BOD/TSS, Secondary Treatment criteria and it is then reintroduced into the environment in accordance with AS/NZS 1547:2012 and the relevant local authorities' requirements.

The G/W, which is separated from the B/W through the 'Solids Separator' module, flows first into the dose chamber before being dosed into the four Grey Water Treatment Tanks (bio-reactor chambers). The grey water is sprayed on to the initial receiving bed of natural media, that retains the bulk of the scum and solids, and then trickle filters through the subsequent various media layers and into the dose treatment chamber where it combines with the B/W for disposal in accordance with AS/NZS 1547:2012 These bioreactor chambers have a buffering capacity of 16000ltrs to contain any surge flows or emergency storage.

The size and extent of the disposal system is determined by the receiving environment and the expected flow volumes. Factors such as soil types, slope and the proximity of potentially sensitive environments such as creeks, wells, bores and other water ways determine the extent, location and type of disposal system chosen.

**See our website: [www.naturalflow.co.nz](http://www.naturalflow.co.nz)**

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The Wormorators® and associated dose tank has a 36,000ltr reserve capacity where pump loading is necessary to allow for 24+hrs emergency storage should a pump fail. The operating capacity of the NaturalFlow Series Commercial Series CSX300 is 30,000ltrs per day of combined Black and Grey water.

Because the Wormorator® is a dry vault system there is negligible sludge build up so it does not require any regular de-sludging. This specifically meets clause AS/NZS 1547:2012 4.2.2.1 as to desludging.

### **Wormorator® Bio-Reactor & Dose Chamber Specifications**

Tank modules are constructed out of concrete with an expected lifespan of over 15 years.

#### **CWX22500 Wormorator® Module**

22500ltrs Nominal capacity  
3440mm Diameter over main body  
2830 mm O/A height

#### **Dose Treatment Tank**

4500ltrs Nominal capacity  
3300mm Diameter over main body  
1500mm O/A height

### **Bio-Reactor Specifications**

#### **CBR2250 Bio-Reactor Module**

22500ltrs Nominal capacity  
3440mm Diameter over main body  
2830mm O/A height

### **Installation Location and Certification**

These tanks are not designed for vehicle loads and shall be located no closer than 1.50m to a driveway, road frontage or a building. If for any reason the tank is located where vehicle traffic may drive over the tank or approach closer than 1.50m, or where it may be trampled on by farm stock then the tank should be protected by a concrete slab designed to support these loads. Surface water must also be diverted from flowing into the installation.

Installation must be certified to AS/NZS 1547:2012, the certificate to be issued and held by the regulatory authority.

### **High Water Table Installations**

All tanks have been engineered and designed in accordance with the NZC 3604. Clauses B1 and B2 for structure and durability, to withstand any hydraulic pressures, both lateral and uplift, created by high water table conditions, even when the tanks are completely empty at install stage.

As per the NaturalFlow Systems installation instructions, in these conditions, tanks must be anchored in with concrete around base, as per the installation instructions, to height as specified.

### **Plumbing Pipes and Fittings**

All internal plumbing is done with PVC pipes with appropriate connections according to AS/NZS 1260 and AS/NZS 4130.

***If in doubt contact the experts on 0800 628 356 or sales@waterflow.co.nz***

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### **Backfill and Bedding**

Place and bed to NZBC G13/AS2, using compacted granular metal, in layers not exceeding 100mm.

### **Electrical**

Where a pump is required on a flat site electrical connection must be installed according to AS/NZS 3000 and the control and alarm system must be in a weatherproof housing located in a readily visible position.

### **Warranty**

WATERFLOW NZ LTD warrants that the NaturalFlow System will be free from defects in material and workmanship for the following periods of time from the date of installation as set out in the following conditions:

1. Concrete Modules 15yrs
2. Filter media 15yrs
3. Dosing float/and or pumps 2yrs
4. WATERFLOW NZ LTD will at its discretion replace or repair such components that prove to be faulty with the same or equivalent part at no charge.
5. Warranty of operation covers the performance of the NaturalFlow systems as connected to the effluent inflow for which they are designed, and also installed to the criteria as set out in the relative installation instructions and procedures.

Warranty excludes defects due to:

- A) Failure to use the system in accordance with owner's manual.
- B) A force majeure event outside the reasonable control of WATERFLOW NZ LTD such as (but not limited to) earthquake, fire, flood soil subsidence ground water table variations or plumbing fault.
- C) Modifications to surrounding landscape contours after installation
- D) The actions of a third party
- E) The system required to bear loads (either hydraulic or biological) greater than that for which it was designed
- F) Any modifications or repairs undertaken without the consent of WATERFLOW NZ LTD
- G) Failure, where applicable, to fence and plant land application system (disposal field)



1st June 2014  
Dean Hoyle  
Managing Director

# NATURALFLOW SERIES CSX300

## System Specifications

### Appendix A and B

#### Appendix A

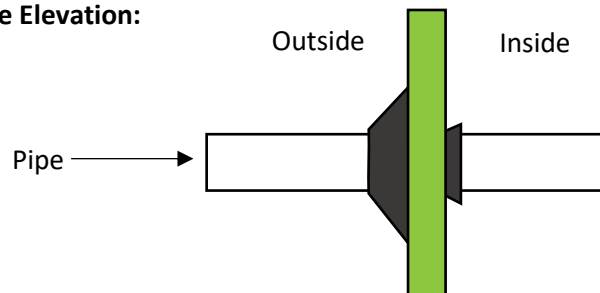
**High Water Table:** For installation in high water table areas, make sure you have a pump to pump away ground water whilst installing. Excavate a pump cavity to one side of the platform and pump ground water away during entire installation process. Half fill dose tank with water, this will flow back into Wormerator as well and will help with resisting the hydraulic uplift (ensure that Wormerator is not completely flooded). Either lay 2-3m<sup>3</sup> of concrete around the base of the tanks or mix 3 bags of cement/cube of GAP20 (or similar) metal to form a mass to stop any hydraulic uplift. Leave water in tanks for at least 12 hours after installation is completed and then pump out to allow Wormerator to dry out.

#### Appendix B

Instructions for fitting UNISEAL®

1. Cut hole to the Hole saw size indicated for the UNISEAL® you are using. Either 127mm hole for a 4"/100mm pipe or 67.2mm hole for a 2"/50mm pipe.
2. Ensure that the hole is clean cut with sharp edges. Irregularities could cause poor seating and ultimate leakage.
3. Insert the UNISEAL® into the hole with the wide side facing the pipe to be inserted.
4. Make certain that the pipe end to be inserted is clean cut. File the edges so that there are no sharp points to cut UNISEAL®.
5. Using Detergent, lubricate the outside of the pipe end to be inserted, then push the pipe through the UNISEAL® from the large flange side. The detergent will be squeezed off as the pipe passes through the UNISEAL®. The co-efficient of friction of the rubber holds the pipe tightly in place.

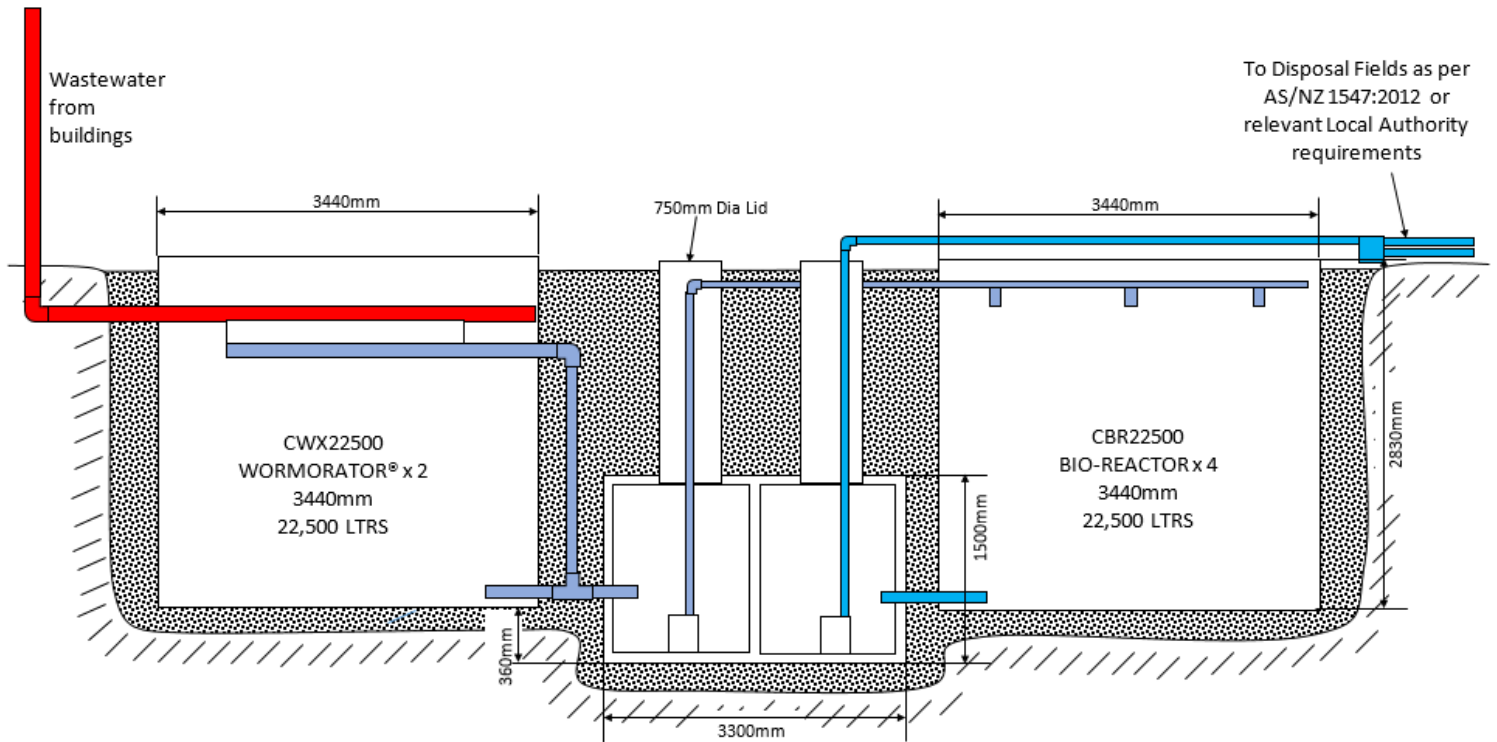
Side Elevation:



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### NaturalFlow CSX300 Flow Chart



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