



naturalflow

eco-wastewater & sewage systems  
by Waterflow NZ Ltd

# NaturalFlow Series NF11000 Treatment System

System Specifications & Installation Instructions



# NATURALFLOW SERIES NF11000

## System Specification & Installation Instructions

*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 Series NF11000 System comprises of a 1.8m diameter x 1.7m high WORMORATOR® module where the black water (B/W), (which in the NaturalFlow System includes the kitchen sink waste) in order to remove the solids, is directed onto a bed of natural medium lined with a textile cloth which is designed to retain maximum solids.

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 at its source from the B/W, flows first into the Grey Water Treatment Tank that retains the bulk of the scum and solids and then trickle filters through an aerating matrix filter and layers of natural media. It is then combined with the B/W in the Wormorator® Chamber for disposal in accordance with AS/NZS 1547:2012 This filter chamber has a buffering capacity of 1000ltrs to contain any surge flows.

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.

The Wormorator® and associated dose tank has a 2000ltr reserve capacity where pump loading is necessary to allow for 24hrs emergency storage should a pump fail. The operating capacity of the NaturalFlow Series NF11000 Treatment System is 1600ltrs 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 de-sludging requirements.

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

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### **Worminator® & Dose Chamber Specifications**

Tanks are made of Cotene 9050 which is a linear medium density polyethylene, designed specifically for rotational molding of large tanks and products that require a high level of rigidity. It contains a fully formulated long term UV stabilization package (with a minimum UV8 rating) and is suitable material for wastewater treatment containment meeting all the requirements of Section 4.3.3 of AS/NZS 1547:2012 which cross references the structural performance requirements of its section 2.4.2.3 back to the relevant provisions of AS/NZS 1546.1, which for plastic septic tanks constructed via by rotational molding using thermoplastics (polyethylene) are set out in Section 9 of that Standard. These tanks have an expected lifespan of 50 years.

#### **SXL5000 Worminator® Module**

4000ltrs Nominal capacity  
1800mm Diameter over main body  
2200mm over feet  
1700 mm O/A height

#### **Dose Chamber**

1600ltrs Nominal capacity  
1200mm Diameter over main body  
732mm Riser Diameter  
2125mm O/A height

#### **Grey Water Treatment Tank**

1200ltrs Nominal capacity  
1200mm Diameter over main body  
1700mm 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 with support ribbing for maximum strength, 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. Roto-Molded tanks 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 NF11000

## System Specification & Installation Instructions

### *NaturalFlow Series NF11000 Dose Installation Instructions*

The NaturalFlow system is to be installed or signed off by a registered Drain layer to the design specified by Waterflow NZ Ltd.

The following installation instructions and procedures followed correctly will ensure System performance is not compromised in any way.

1. Excavate a 2.5m diameter level platform for the Wormorator® at the appropriate depth to ensure adequate fall for inlet pipe from the source. This has to be installed on virgin ground.
2. Lay 100mm of bedding metal on platform and place Wormorator®. Do this before excavating for dose chamber as this helps keep the excavations to a minimum.
3. Analyze where the dose chamber needs to be placed (this needs to line up with one of the feet at the base of the WORMORATOR®) and excavate a 1.3m diameter level platform 550mm below the Wormorator platform (this allows for 100mm of bedding material).
4. Very carefully drill a 127mm hole with a hole saw at the lowest point of the foot on Wormorator and fit Uniseal (see Uniseal instruction details appendix B below).
5. Lay 100mm of bedding metal on dose chamber platform and place tank.
6. Measure the distance between the Wormorator outlet and dose chamber inlet allowing 50mm both ends to insert into tanks. Mark pipe before inserting to ensure there is 50mm of pipe inside both tanks also fit the directional junction with flow being towards dose chamber.
7. Fit enough riser pipe to directional junction, to bring it up to grey water outlet level.
8. Trench from Dose Chamber outlet to disposal field, ensuring there is a constant fall from outlet to disposal field.
9. Where possible excavate a trench away from System and lay drain coil and drainage metal at the base of the system to drain away any surface or ground water. On a flat or high water table site System must be bedded in as per appendix A below.
10. Take a minimum of 3 photos at this point to showing connections and back fill, to ensure correct installation for sign off.
11. Back fill around the installed tanks until the required depth for the Grey Water module is reached, then excavate a level platform off 1.5m diameter and position tank on 100mm of bedding material and connect to 'riser'.
12. Back fill around tanks with pea-metal or similar. DO NOT back fill with soil or clay of any type as this can cause point pressure on the modules, through expansion and contraction, and will cause distortion.

**Caution:** System must be protected from excessive super imposed loads both lateral and top loads. E.g. loads from vehicular traffic. There needs to be at least 2m of clearance maintained around system.

**Worms:** Ensure adequate moisture in the Wormorator® and add worms once installed unless systems is not going to be used within 2 months of installation.

*If in doubt contact the experts on 0800 628 356 or [sales@waterflow.co.nz](mailto:sales@waterflow.co.nz)*

# NATURALFLOW SERIES NF11000

## System Specification & Installation Instructions

### *NaturalFlow Series NF11000 Pump Installation Instructions*

The NaturalFlow system is to be installed or signed off by a registered Drain layer to the design specified by Waterflow NZ Ltd.

The following installation instructions and procedures followed correctly will ensure System performance is not compromised in any way.

1. Excavate a 2.5m diameter level platform for the Wormorator® at the appropriate depth to ensure adequate fall for inlet pipe from the source. This has to be installed on virgin ground.
2. Lay 100mm of bedding metal on platform and place Wormorator®. Do this before excavating for dose chamber as this helps keep the excavations to a minimum.
3. Analyze where the dose chamber needs to be placed (this needs to line up with one of the feet at the base of the WORMORATOR®) and excavate a 1.3m diameter level platform 550mm below the Wormorator platform (this allows for 100mm of bedding material).
4. Very carefully drill a 127mm hole with a hole saw at the lowest point of the foot on Wormorator and fit Uniseal (see Uniseal instruction details appendix B below).
5. Lay 100mm of bedding metal on dose chamber platform and place tank.
6. Measure the distance between the Wormorator outlet and dose chamber inlet allowing 50mm both ends to insert into tanks. Mark pipe before inserting to ensure there is 50mm of pipe inside both tanks also fit the directional junction with flow being towards dose chamber.
7. Fit enough riser pipe to directional junction, to bring it up to grey water outlet level.
8. Where possible excavate a trench away from System and lay drain coil and drainage metal at the base of the system to drain away any surface or ground water. On a flat or high water table site System must be bedded in as per appendix A below.
9. Take a minimum of 3 photos at this point to showing connections and back fill, to ensure correct installation for sign off.
10. Back fill around the installed tanks until the required depth for the Grey Water module is reached, then excavate a level platform off 1.5m diameter and position tank on 100mm of bedding material and connect to 'riser'.
11. Trench from Dose Chamber outlet to disposal field, ensuring there is a constant fall from outlet to disposal field.
12. Back fill around tanks with pea-metal or similar. DO NOT back fill with soil or clay of any type as this can cause point pressure on the modules, through expansion and contraction, and will cause distortion.

**Caution:** System must be protected from excessive super imposed loads both lateral and top loads. E.g. loads from vehicular traffic. There needs to be at least 2m of clearance maintained around system.

**Worms:** Ensure adequate moisture in the Wormorator® and add worms once installed unless systems is not going to be used within 2 months of installation.

# NATURALFLOW SERIES NF11000

## System Specification & Installation Instructions

### Appendix A and B

#### Appendix A

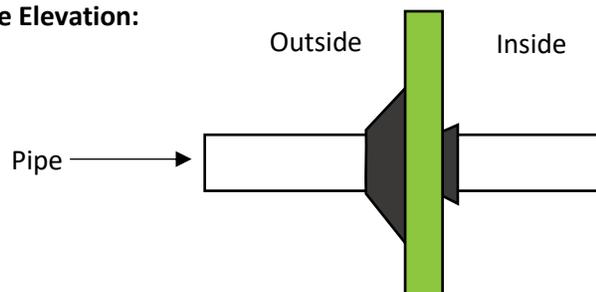
**High Water Table:** For installation in high water table areas, make sure you have a pump to pump away ground water whilst installing. Excavate a pump cavity to one side of the platform and pump ground water away during entire installation process. Half fill dose tank with water, this will flow back 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.

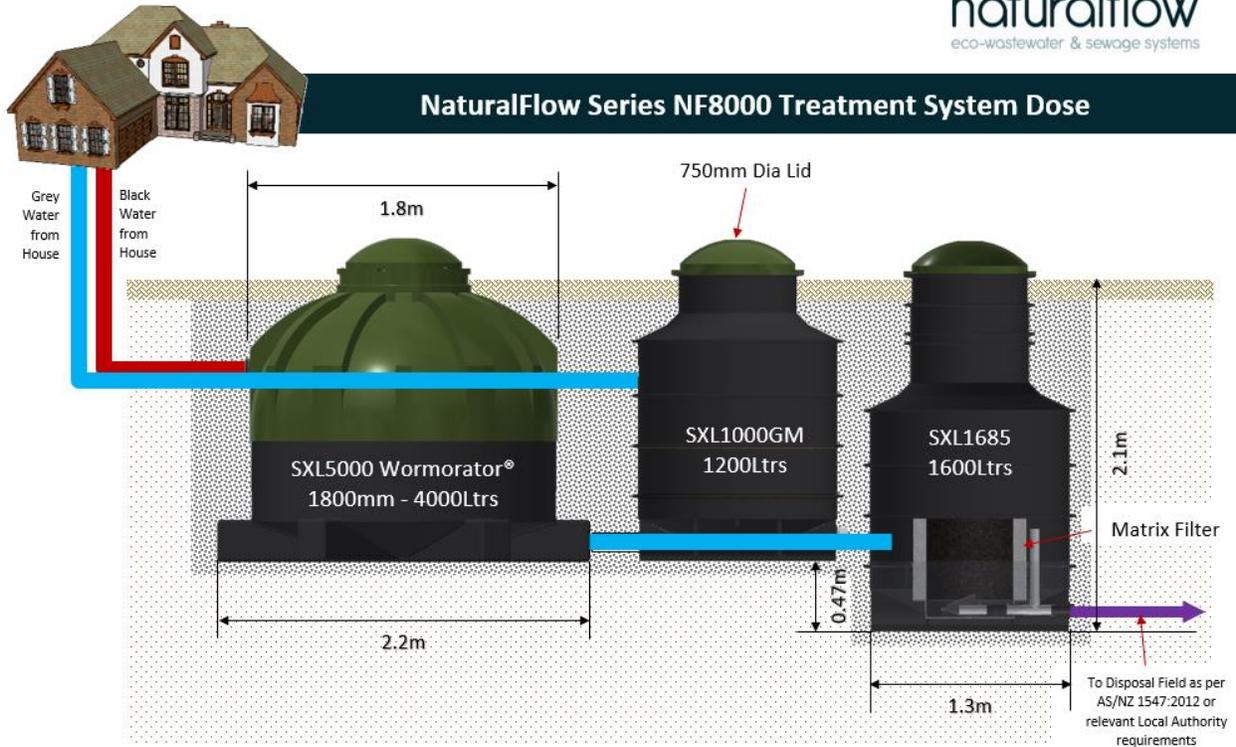
Side Elevation:



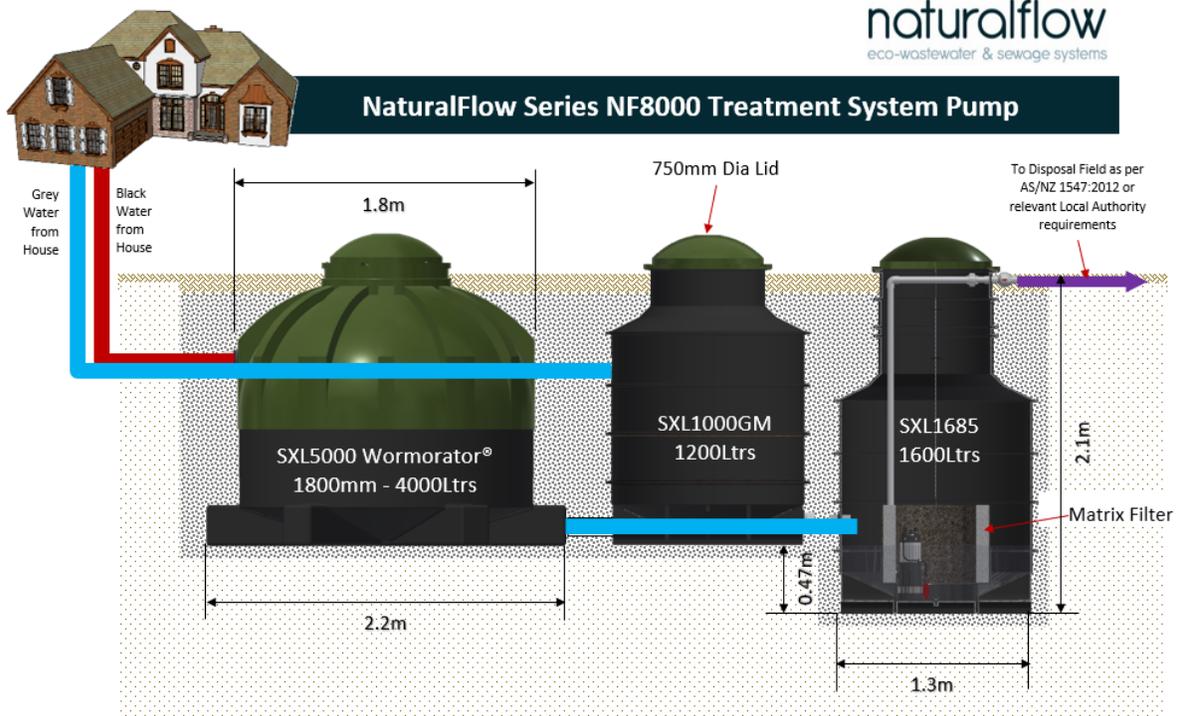
# NATURALFLOW SERIES NF11000

## System Specification & Installation Instructions

### NaturalFlow Series NF11000 Flow Charts



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**Call us today to discuss your needs**

**0800 628 356**

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Head Office  
Waterflow NZ Ltd  
PO Box 24, 1160 State Highway 12,  
Maungaturoto 0547, New Zealand  
P. 09 431 0042  
E. [sales@waterflow.co.nz](mailto:sales@waterflow.co.nz)

South Island Office  
Activeflow  
15B Wilkinsons Road,  
Harewood, Christchurch 8051  
P. 03 323 8541  
E. [hello@activeflow.co.nz](mailto:hello@activeflow.co.nz)

[www.naturalflow.co.nz](http://www.naturalflow.co.nz)