

Onslow Caravan Park, Onslow Drive
Ferring, BN12 5RX

Planning permission: FG/37/17/PL

Planning Condition Number: 4

Surface Water Drainage Scheme

Condition 4 Surface Water Drainage

Condition 4 on planning permission FG/37/17/PL states:

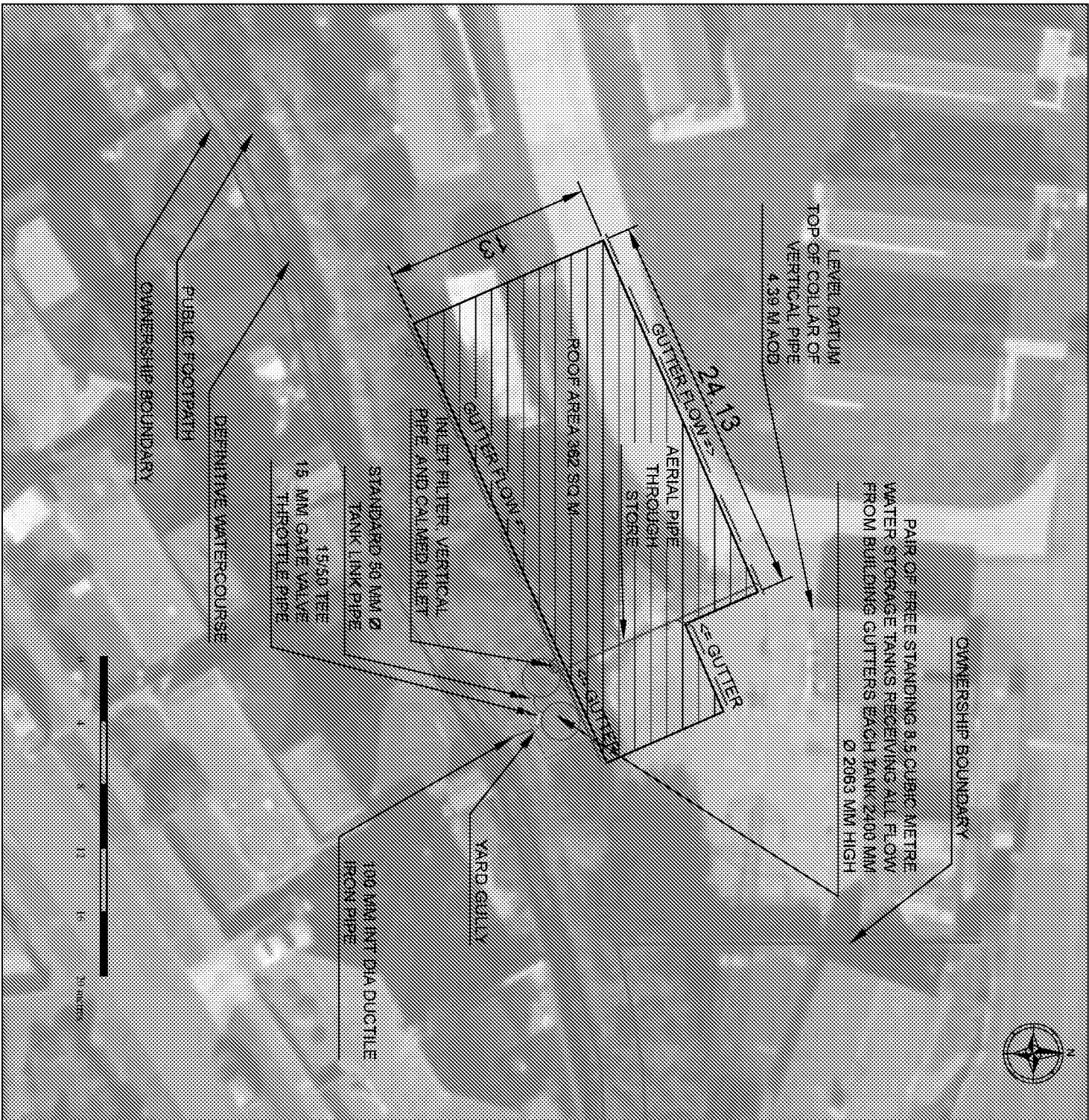
Development shall not commence until full details of the proposed surface water drainage scheme have been submitted to and approved in writing by the Local Planning Authority.

The design should follow the hierarchy of preference for different types of surface water drainage disposal systems as set out in Approved Document H of the Building Regulations, the recommendations of the SUDS Manual produced by CIRIA.

Winter groundwater monitoring to establish highest annual ground water levels and Percolation testing to BRE 365, or similar approved, will be required to support the design of any Infiltration drainage.

No building shall be occupied until the complete surface water drainage system serving

Attached to this document is a Statement setting out the proposed surface water drainage scheme.



NOTES

1. INFILTRATION TESTING ON 11 SEPTEMBER 2017. RESULTS APPENDED, DEMONSTRATED THAT A BLANKET SOAKAWAY SERVING THE SHED ROOF IS NOT VIABLE.
2. SHED ROOF GUTTERS WILL DRAIN VIA A FILTER TO A PAIR OF LINKED ABOVE GROUND STORAGE TANKS SITED IN THE TWO METRE GAP BETWEEN THE SHED AND THE TIMBER CLOSE BOARDED FENCE TO THE PUBLIC FOOTPATH. DETAILS OF A SUITABLE TANK ARE APPENDED.
3. THE STORAGE TANKS WILL BE LINKED TO THE DEFINITIVE WATERCOURSE LOCATED WITHIN THE SAME OWNERSHIP AS THE SITE BY A 100 MM DIAMETER PIPE.
4. THE MAXIMUM RATE OF FLOW FROM ROOF TO WATERCOURSE WILL BE LIMITED BY A THROTTLE PIPE LOCATED BETWEEN THE TANK AND A YARD GULLY AT THE UPSTREAM END OF THE 100 MM DIAMETER PIPE.
5. THE THROTTLE PIPE SHALL COMPRISE A 1.2 METRE LENGTH OF BLACK 20 MM NS MDPE WATER PIPE TERMINATING AT A 90° BEND DIRECTED TOWARDS THE YARD GULLY GRILLE.
6. THE MAXIMUM FLOW IN THE THROTTLE PIPE WILL BE 0.5 LITRES PER SECOND WHICH IS THE EQUIVALENT OF 14 LITRES PER SECOND PER HECTARE OF ROOF. HYDRAULIC CALCULATIONS FOR THE THROTTLE PIPE ARE APPENDED.
7. THE TANK IS SIZED TO STORE A 100 YEAR PLUS 20% EXTRA RAINFALL STORM WITHOUT OVERFLOW. THE 20% EXTRA RAINFALL IS AN ALLOWANCE FOR CLIMATE CHANGE IN THE LIFETIME OF THE DEVELOPMENT.
8. THE DRAINAGE SYSTEM SHALL BE INSPECTED SIX MONTHLY INCLUDING CLEANING THE TANK FILTER. MINIMUM ANNUAL MAINTENANCE OF THE DRAINAGE SYSTEM SHALL COMPRISE CLEANING OUT THE GUTTERS, REMOVING, FLUSHING AND REPLACING THE THROTTLE PIPE AND FLUSHING THE PIPE TO THE STREAM.
9. THE EXISTING CONCRETE PAVED ESTATE ROAD IS TO BE DIVERTED AS SHOWN ON THE PLANNING CONSENT DRAWINGS. NO SPECIAL DRAINAGE IS PROPOSED AS THE NEW SECTION OF ROAD HAS THE SAME AREA AS EXISTING, WHICH CURRENTLY DRAINS SATISFACTORILY BY OVER THE EDGE FLOW TO THE GRASS ON ITS NORTHERN SIDE.

4. Development shall not commence until 148 m³ of the proposed surface water storage tanks have been submitted to and approved by the local planning authority.

The design should follow the hierarchy of preference for different types of surface water drainage disposal systems as set out in Approved Document H of the Building Regulations, the recommendations of the SUDS Manual published by C101A.

Where groundwater monitoring is established, agreed ground water levels and

FG37/17/PL

Permitted under the BSE 300, or similar, agreement, will be required to accept the design of any infiltration drainage.

No building shall be constructed until the complete surface water drainage system serving the property has been implemented to accordance with this agreed design.

Reason: To ensure that the proposed development is satisfactorily drained in accordance with policies DEV1 and DEV2 of the Arun District Council Local Plan. This is intended to be a pre-conditioned consideration because it is necessary to incorporate the surface water drainage system prior to commencing any building works.

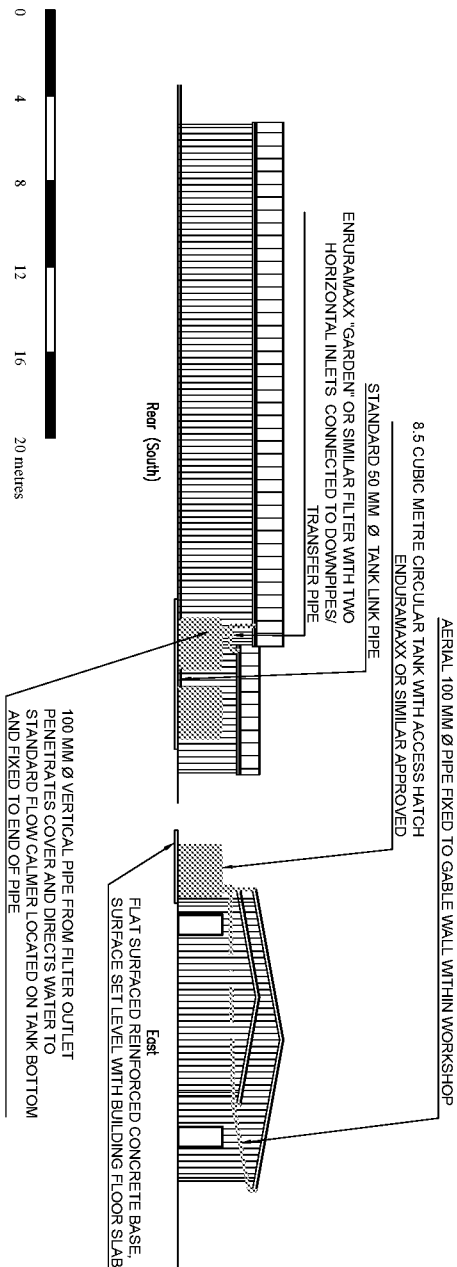
Rev A 13/3/18 Tanks and connections revised, notes revised

Simon Jones, Party BSC CEng MICE, Chartered Civil Engineer
Swans Farm Winchfield Hook RG27 8DB Tel 01265 704940
Island Meadow Parks
NEW MACHINERY STORE AT
ONSLLOW DRIVE, FERRING

DRAINAGE PLAN - PLANNING
CONDITION 4

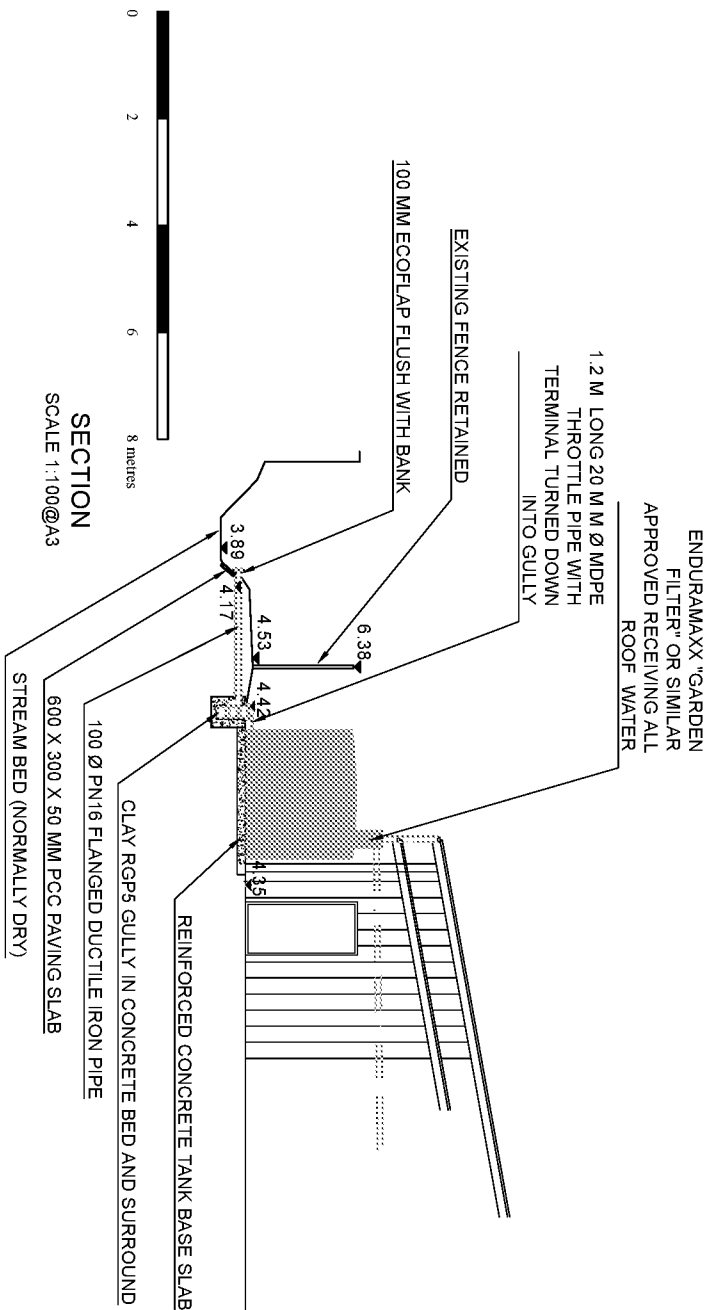
Scale 1:250 Date 03.11.17 Drawing No 100 A

- NOTES
1. REFER ALSO TO PLAN DRAWING 100
 2. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM



ELEVATIONS

SCALE 1:250@A3



REV A 13.03.18 TANKS AND PIPEWORK REVISED, LEVELS ADDED

Simon Jones-Parry BSc CEng MICE Chartered Civil Engineer
Swans Farm Winchfield Hook RG27 8DB Tel 01256 704940

Island Meadow Parks

NEW MACHINERY STORE AT
ON SLOW DRIVE, FERRING

DRAINAGE ELEVATIONS -
PLANNING CONDITION 4

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Scale
AS SHOWN

Drawing No
101 A

NEW MACHINERY SHED AT ONSLOW DRIVE, FERRING

Infiltration test results

Weather dry, no recent heavy rain, no groundwater encountered.

Test Pit 1

See drainage plan for test pit location

Pit length **1870 mm**
Average pit width **310 mm**
Pit depth **588 mm**

Topsoil
Clayey silt

Test 1A

Time	Dip to water	Delta time hh:mm:ss	Delta time hrs	Height loss mm	Volume loss m ³	Base area m ²	Wall area m ²	Total area m ²	Infiltration rate m/hr	Infiltration rate m/sec
11/09/2017 08:33:00	Start filling hole with ½ inch hose pipe									
11/09/2017 08:54:00	225 mm									
11/09/2017 09:01:00	308 mm	00:07:00	0.12	83	0.048	0.580	1.402	1.981	2.08E-001	5.78E-005
11/09/2017 09:06:00	352 mm	00:05:00	0.08	44	0.026	0.580	1.125	1.705	1.80E-001	4.99E-005
11/09/2017 09:13:00	405 mm	00:07:00	0.12	53	0.031	0.580	0.913	1.493	1.76E-001	4.90E-005
11/09/2017 09:20:00	432 mm	00:07:00	0.12	27	0.016	0.580	0.739	1.319	1.02E-001	2.83E-005
11/09/2017 09:38:00	488 mm	00:18:00	0.30	56	0.032	0.580	0.558	1.138	9.51E-002	2.64E-005
11/09/2017 09:58:00	530 mm	00:20:00	0.33	42	0.024	0.580	0.344	0.924	7.90E-002	2.20E-005
11/09/2017 10:40:00	588 mm	00:42:00	0.70	58	0.034	0.580	0.126	0.706	6.80E-002	1.89E-005
		01:46:00		363	0.210	cubic metres				

NOTE: A WATER SERVICE PIPE CROSSED THE BOTTOM OF THE PIT. BECAUSE THE RESULTS WERE MUCH BETTER THAN EXPECTED, A NEW PIT WAS DUG AND TESTED

NEW MACHINERY SHED AT ONSLOW DRIVE, FERRING

Infiltration test results

Weather dry, no recent heavy rain, no groundwater encountered.

Test Pit 2

See drainage plan for test pit location

Pit length 1660 mm
Average pit width 305 mm
Pit depth 652 mm

Topsoil
Clayey silt

Test 2A

Time	Dip to water	Delta time hh:mm:ss	Delta time hrs	Height loss mm	Volume loss m ³	Base area m ²	Wall area m ²	Total area m ²	Infiltration rate m/hr	Infiltration rate m/sec
11/09/2017 09:15:00	Start filling hole with ½ inch hose pipe									
11/09/2017 09:23:00	295 mm									
11/09/2017 09:37:00	298 mm	00:14:00	0.23	3	0.002	0.506	1.397	1.903	3.42E-003	9.50E-007
11/09/2017 10:00:00	308 mm	00:23:00	0.38	10	0.005	0.506	1.372	1.878	7.03E-003	1.95E-006
11/09/2017 10:40:00	320 mm	00:40:00	0.67	12	0.006	0.506	1.328	1.835	4.97E-003	1.38E-006
11/09/2017 11:10:00	330 mm	00:30:00	0.50	10	0.005	0.506	1.285	1.791	5.65E-003	1.57E-006
		01:47:00		35		0.018 cubic metres				

NOTE: THIS TEST CONFIRMED THAT THE TP1 RESULT WAS INFLUENCED BY THE WATER PIPE. THE MEASURED INFILTRATION RATE AT TP2 IS TOO LOW FOR A BLANKET SOAKAWAY SERVING A BUILDING TO BE EITHER PRACTICABLE OR TO MEET THE HALF DRAIN DOWN TIME LIMIT. BASED ON THE OBSERVATIONS MADE IN THE FIRST TWO HOURS OF TESTING, THE TEST WAS ABANDONED.

**ONslow CARAVAN PARK, FERRING
NEW MACHINERY STORE AND WORKSHOP
ROOFWATER STORAGE TANK OUTLET CONTROL
20 MM NS BLACK MDPE THROTTLE PIPE**

Pipe int dia	15.3 mm
Pipe internal area	184 mm²
Pipe length	1.2 metres
Tank base level	4.35 M AOD
Tank outlet level	4.45 M AOD
Throttle pipe outlet level	4.4 M AOD
Pipe fitting/entry/exit losses	1.5 V²/2g
Tank top water level	6.41 M AOD

<u>Hydraulic</u> <u>gradient</u> %	<u>Colebrook</u> <u>White pipe</u> <u>flow</u> l/s	<u>velocity</u> m/s	<u>Fitting/entry/e</u> <u>xit losses</u> m	<u>Tank water</u> <u>level</u> M AOD	<u>Water depth</u> <u>in tank</u> m
10.00%	0.18	0.98	0.07	4.59	0.24
20.00%	0.26	1.41	0.15	4.79	0.44
30.00%	0.32	1.74	0.23	4.99	0.64
40.00%	0.37	2.01	0.31	5.19	0.84
50.00%	0.42	2.28	0.40	5.40	1.05
60.00%	0.46	2.50	0.48	5.60	1.25
70.00%	0.5	2.72	0.57	5.81	1.46
80.00%	0.53	2.88	0.64	6.00	1.65
90.00%	0.57	3.10	0.73	6.21	1.86
100.00%	0.61	3.32	0.84	6.44	2.09
average	0.422				

RESULTS OF BALANCING PROGRAM EXECUTION

PARAMETERS

Project Name:- ONSLOW DRIVE, FERRING

Designer:- SJP

Comment:- TANKS SERVING SHED ROOF

Time and date:-Wed Mar 14 09:40:06 2018

FSR location indicator:- 0

Gross area:- 362 square metres

Areal reduction factor at D=1:- 0.998929

Nominal impermeable area:- 362 square metres

Base flow:- 0 litres per second

Maximum discharge from balancing device:- 0.4 l/s reducing to 0.4 l/s after six hrs

Estimated ratio of average to maximum discharge from balancing device:- 0.7

UCWI:- 130

Soil index:- 0.45

FSR M5-60:- 20 mm

FSR R:- 0.4

Rainfall uplift factor:- 1.2

RESULTS (FSR RAINFALL)

Contributing area = 302.596 square metres (ie 83.59% of impermeable)

Storm length hours	100 year rain mm	Average inflow m3/hr	Base flow m3/hr	100 year storage cu.metre	Empty-empty time hours
1.0	48.496	14.67	0.000	13.7	14.6
2.0	58.597	8.87	0.000	15.7	17.6
3.0	64.563	6.51	0.000	16.5	19.4
4.0	68.739	5.20	0.000	16.8	20.6
5.0	72.038	4.36	0.000	16.8	21.6
6.0	74.912	3.78	0.000	16.6	22.5
7.0	77.402	3.35	0.000	15.9	
8.0	79.605	3.01	0.000	15.2	
9.0	81.584	2.74	0.000	14.3	
10.0	83.383	2.52	0.000	13.4	
11.0	85.035	2.34	0.000	12.5	
12.0	86.564	2.18	0.000	11.5	
13.0	87.987	2.05	0.000	10.5	
14.0	89.321	1.93	0.000	9.5	
15.0	90.575	1.83	0.000	8.4	
16.0	91.760	1.74	0.000	7.3	
17.0	92.883	1.65	0.000	6.2	
18.0	93.951	1.58	0.000	5.1	
19.0	94.970	1.51	0.000	4.0	
20.0	95.944	1.45	0.000	2.8	
21.0	96.877	1.40	0.000	1.7	
22.0	97.773	1.34	0.000	0.5	

The maximum storage is 16.8 cubic metres at 4.3 hours

C++ Program (c) Simon Jones-Parry 2003-8 (Tel +44 1256 702429)

FEHPOND.EXE Version (2.10) 15 September 2008

**Water Storage Tank
Installation Guide**



Please read the following instructions carefully

**CODE: 172205, 172210, 172212, 172215, 172217,
172220, 172225, 172230, 172235**

10 Year Pro Rata Warranty

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INSTALLING YOUR VERTICAL TANK SAFELY

Congratulations on your purchase of an Enduramaxx Vertical Water Storage Tank. If this product is correctly installed and regularly maintained, it should give you trouble free services for years to come.

CORRECT TANK INSTALLATION IS THE SOLE RESPONSIBILITY OF THE PURCHASER

(Enduramaxx DO NOT install Tanks)

IMPORTANT: When full depending on size your tank will weigh up to 21 tonnes. Therefore, special attention to a properly constructed and compacted base is most essential. In the rare incidence of trouble with a tank (even with the roof), the majority of cases can be traced to an unstable base, which in turn can void the Warranty.

INSTALLATION STEPS

1. PREPARING THE TANK BASE

The base material can be either concrete or compactable material;

Concrete

A 150mm (6") reinforced concrete slab that is exactly level and flat in all directions;

Compacted Material

A 75mm (3") pad of compacted crusher dust/road base, which must be at least 600mm larger in diameter than the tank.

The tank base must be free from any rocks or stones or any sharp or foreign matter that may damage the base of the tank. The base must be thoroughly compacted and be exactly level and flat in all directions. The outsides of the base must be supported by a retaining wall of some kind to ensure that no erosion can occur through washout, vermin or any other factor.

**FAILURE TO PROVIDE A STABLE BASE WILL VOID
WARRANTY.**

2. FLUSH OUT THE TANK

Remove outlet bung/s and flush out tank to remove any dust or foreign matter before connecting pipe work. Apply thread tape to outlet fittings. Do not over tighten any fittings as this can damage the thread.

3. INSTALLING A GATE VALVE

A flexible hose of at least 300mm (12”) in length should be installed between the gate valve/tank outlet and any subsequent pipe work. This is to void strain on the Tank should the pipe work move. Apply thread tape to all fittings to prevent leakage.

4. SUPPORTING OF PIPEWORK

All pipe work must be supported so that there is no added strain on the tank. Never support pipe work of any description off the tank. Apply thread tape to all fittings to prevent leakage.

5. MAINTENANCE OF THE TANK

Regular checking and maintenance is the Owner’s responsibility and is a condition of the Warranty.

Some areas to be considered:

- Consistent inspection of base, so that it is not eroded or tank undermined.
- Checking of pipe work to ensure there are no leaks.
- Check all valves and outlets are working properly.

6. QUALITY OF TANK

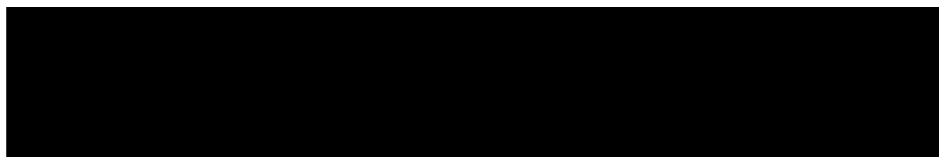
Your vertical tank is manufactured from UV stabilised Polyethylene.

The proven self supporting roof design for larger tanks sizes eliminates the need for a support pole. The unique internal truss design provides adequate roof support while not detracting from the tank’s traditional look, also eliminating the need to enter the tank at any time. The Guaranteed one-piece tank construction ensures long term structural strength.

10 Year Extended Warranty Conditions – Vertical Tanks

- 1.1 These extended warranty conditions ("Extended Warranty") will form part of the standard terms and conditions for the sale of goods (the "Contract") entered into between the Company and the Buyer. Where there is a discrepancy between this Extended Warranty and the Contract, the terms and conditions of this Extended Warranty will prevail.
- 1.2 All words and phrases used in this Extended Warranty shall have the meanings as set out in the Contract unless the context otherwise requires.
- 1.3 The Company warrants that (subject to the other provisions of these conditions) on delivery, and for a period of ten (10) years from the date of delivery, the Goods shall be of satisfactory quality within the meaning of the Sale of Goods Act 1979.
- 1.4 The Company shall not be liable for a breach of the warranty in condition 1.3 unless:
 - 1.4.1 The Buyer gives written notice of the defect to the Company, and, if the defect is as a result of damage in transit by the carrier, within 3 working days of the time when the Buyer discovers or ought to have discovered the defect;
 - 1.4.2 The Company is given a reasonable opportunity after receiving the notice of examining such Goods and the Buyer (if asked to do so by the Company) returns such Goods to the Company's place of business at the Company's cost for the examination to take place.
- 1.5 The Company shall not be liable for a breach of the warranty in condition 1.3 if:
 - 1.5.1 The Buyer makes any further use of such Goods after giving such notice; or
 - 1.5.2 The defect arises because the Buyer failed to follow the Company's oral or written instructions as to the storage, installation, use or maintenance of the Goods or (if there are none) good trade practice; or
 - 1.5.3 The Buyer alters or repairs such Goods without the written consent of the Company.
- 1.6 Subject to conditions 1.4 and 1.5, if any of the Goods do not conform with the warranty in condition 1.3 the Company shall at its option repair or replace such Goods (or the defective part) or refund the price of such Goods at the pro rata Contract rate provided that, if the Company so requests, the Buyer shall, at the Company's expense, return the Goods or the part of such Goods which is defective to the Company.
- 1.7 If the Company complies with condition 1.6 it shall have no further liability for a breach of the warranty in condition 1.3 in respect of such Goods.
- 1.8 Any Goods replaced shall belong to the Company and any repaired or replacement Goods shall be guaranteed on these terms for the unexpired portion of the ten (10) year period.

CUSTOMER SERVICES FREEPHONE



OWNERSHIP CERTIFICATE

VERTICAL WATER STORAGE TANK

Tank Size / Code:

Serial Number:

(You will find these details on the Base Plate)

Purchased From:

Purchase Date:

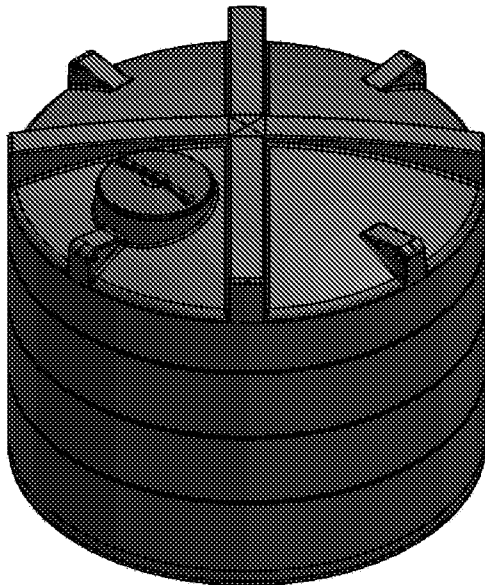
Installed By:

Installation Date:

Please keep this booklet and your purchase docket safe as this VERTICAL WATER STORAGE TANK has a 10 Year Pro-rata Warranty.

Think Tank Think ENDURATANK

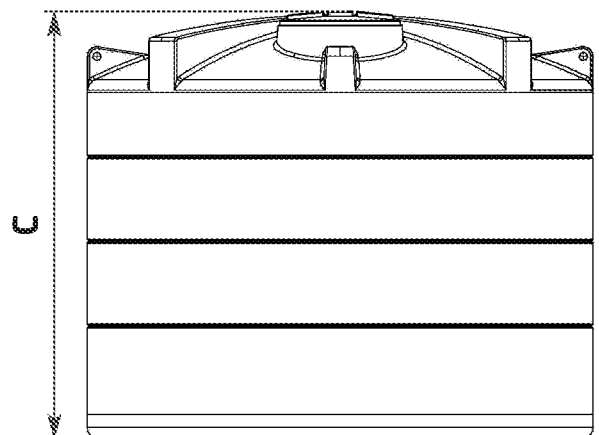
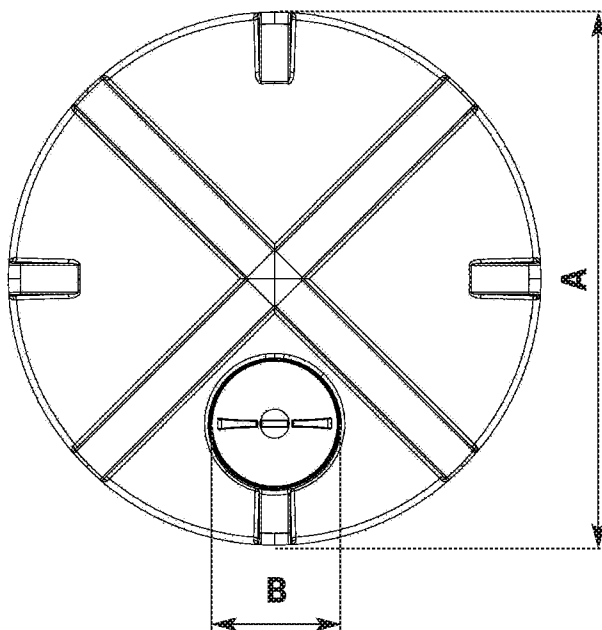
NEED
MORE HELP?
CALL US ON
01778 562810



VERTICAL TANK TECHNICAL SPECIFICATION

NON POTABLE	172118		
CAPACITY (Litres)	8500	CAPACITY (Gallons)	1870

A (mm)	2600	B (mm)	620
C (mm)	2063	Standard Outlet	2"



Please note:
Tank sizes quoted are subject to a +/- 3% variation

ENDURATANK®

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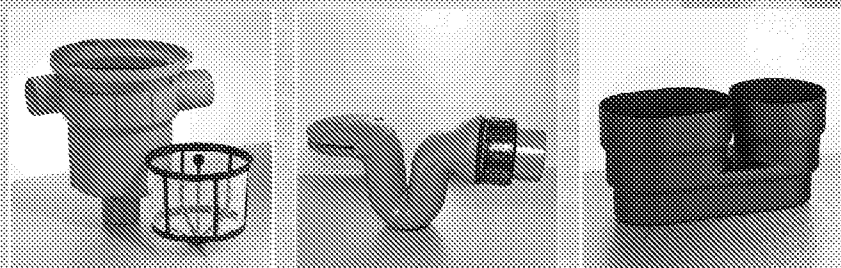
sales@enduratank.co.uk

Visit us at www.enduratank.co.uk

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Rainwater Filter Kit - Kit A
Installation Guide



Think Tank
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ARUN DISTRICT COUNCIL FG/48/16/000



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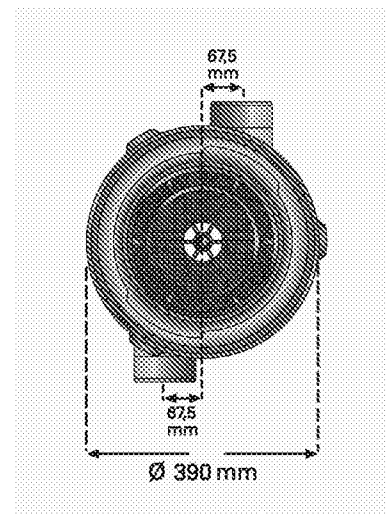
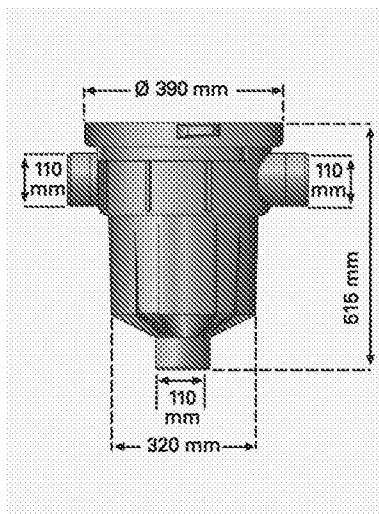
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INSTALLING YOUR RAINWATER FILTER KIT CORRECTLY

Congratulations on your purchase of an Enduratank Rainwater Filter Kit.

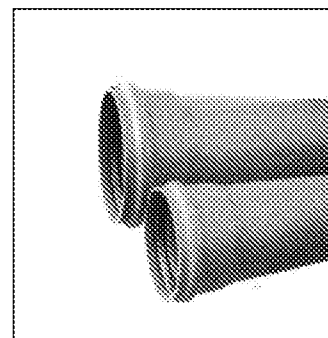
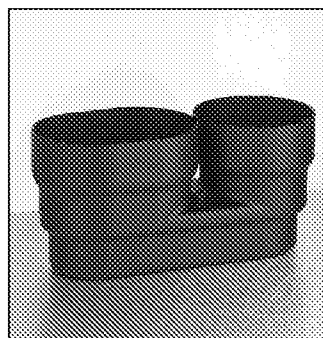
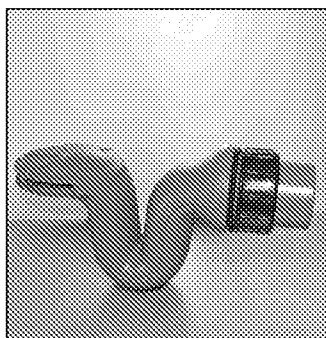
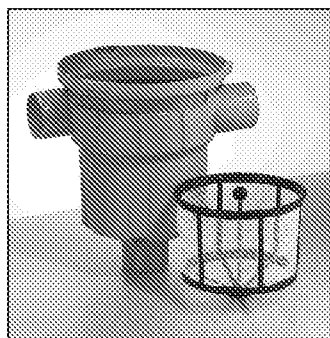
If this product is correctly installed and regularly maintained, it should give you trouble free service for years to come.

**CORRECT INSTALLATION IS THE SOLE
RESPONSIBILITY OF THE PURCHASER.**



CONTENTS OF RAINWATER FILTER KIT A

- Garden Filter with lid
- Overflow siphon tube
- Calmed inlet
- Enough pipe to go from the bottom of the filter to the bottom of the tank (calmed inlet)



If you have any questions regarding the operation or warranty of this product, please contact us direct:

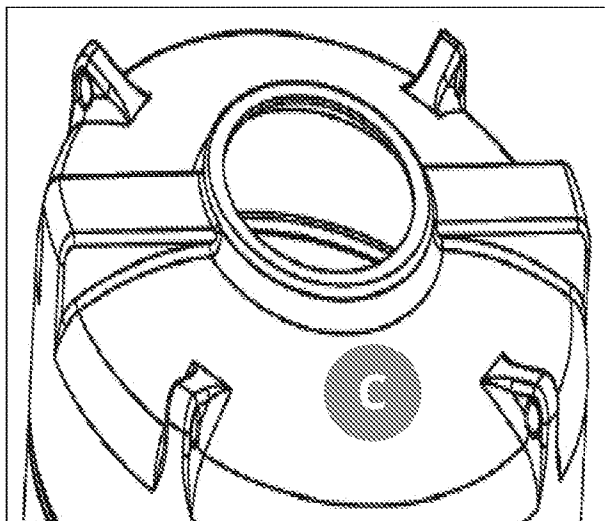
Telephone: **01778 562810** | Email: **enduratank@enduramaxx.co.uk** | **www.enduratank.co.uk**
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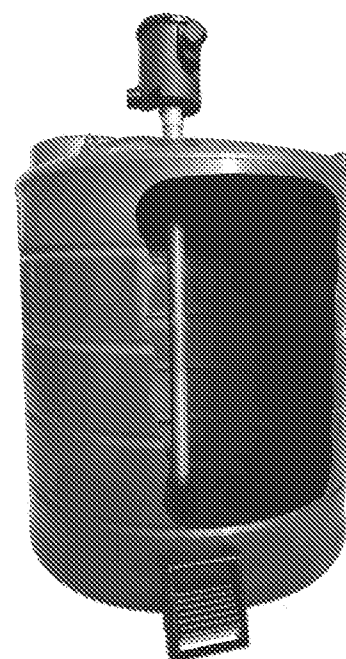
Rainwater Filter Kit - Kit A Installation Steps

1. Locate the tank into position and identify where you would like the filter to sit in relation to current pipe work on the building.
2. Ensure the pipes entering the filter have a shallow incline in order to allow water to flow over the weir within the filter.
3. Decide whether you would like to use the hole from the screw lid on the water tank or whether you would be better to drill a purpose made hole to the side of the screw lid.
4. A typical point would be at the letter 'C' as illustrated below.



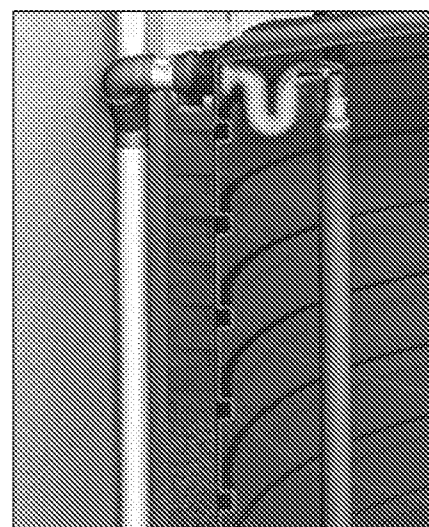
5. Drill a 4" round hole at your point 'C'.
6. Put the drainage pipe through the hole.
7. With the aid of the inspection screw lid put the calmed inlet on the end of the pipe.
8. Continue to lower the pipe until the calmed inlet is touching the base of the tank.
9. Insert the filter unit onto the top of the pipe.

You will have something like the illustration shown on the right...



9. The purpose of the siphon tube is to siphon away any floating algae from the top of the water. It should therefore be fitted as high as possible on the tank wall.
10. Drill a 4" hole, remove the plastic nut and insert the siphon tube through from the inside of the tank.
11. With the aid of the inspection screw lid put the calmed inlet on the end of the pipe.
12. With the nut – tighten up from outside the tank.
13. Silicone around where any pipe and fittings come out of the tank.

Further pipe and fittings may be required to finish connecting the unit to existing drainpipes and also drainage to a soakaway etc.



Think Tank
Think ENDURATANK