
Foul Drainage Calculations



Middlewood Farm, Threapwood
(Reference: 2207015)

January 2023

Revision A | Feb '23

1.0 FOUL WATER INFILTRATION TESTING

3no. percolation tests were undertaken in 2no. locations across Wednesday 4th, Thursday 5th and Thursday 12th January with dry and windy to overcast with light drizzle weather conditions.

Works were undertaken by the Client, Ms Samantha Andrews.

Approximate excavation dimensions: 0.30 x 0.30m x 1.00m depth.

Depth of water: 0.30m to 0.38m.

2.0 FOUL WATER INFILTRATION TESTING RESULTS

Time (in seconds) taken for percolation tests to drain from 75% to 25% depth of water:-

TEST 1	TEST 2	TEST 3	TEST 4	TEST 5	TEST 6
14,430	15,060	15,300	14,340	14,940	14,700

The Vp has been calculated based upon the average time for the water level to drop from 75% full to 25% full level by dividing the depth of water by half:-

TEST 1 Vp	TEST 2 Vp	TEST 3 Vp	TEST 4 Vp	TEST 5 Vp	TEST 6 Vp
75.95	86.06	80.53	95.60	96.39	84.00

AVERAGE Vp

86.42

The infiltration testing establishes an infiltration Vp value of between 12 and 100 and is therefore suitable for the viability to discharge foul water to a foul drainage field.

3.0 FOUL DRAINAGE FIELD DESIGN & FOUL FLOW CALCULATIONS

$$At = Vp \times 0.20 \times \text{No. of people} = \text{Area (m}^2\text{)}$$

$$At = 86.42 \times 0.20 \times 20 = 345.68\text{m}^2$$

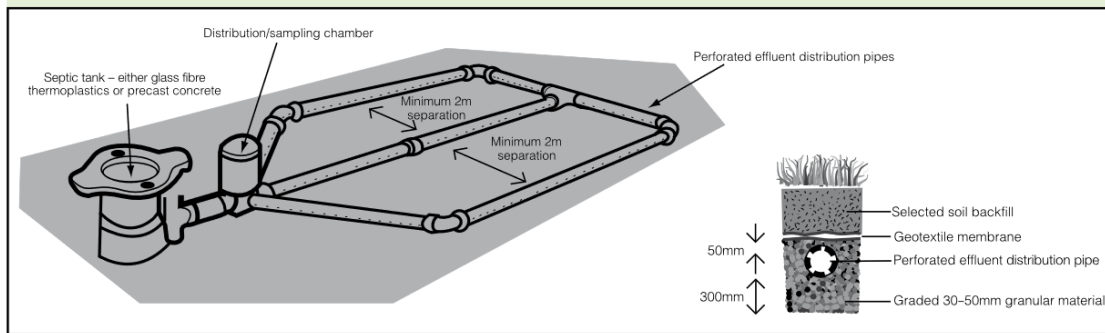
In accordance with British Water 'Flows and Loads: 4', where the total number of persons exceeds 12 a reduction may be made. Based on the total number of persons, an adjusted value can be calculated by multiplying by 0.9.

$$20 \times 0.9 = 18.00$$

$$At = 86.42 \times 0.20 \times 18 = 311.11\text{m}^2$$

4.0 FOUL DRAINAGE FIELD & FOUL TREATMENT PLANTS

The foul drainage field shall have a minimum surface area of 311.11m² and should be sited in accordance with Building Regulations Part H (E.g. 15.0m minimum from a structure). The drainage field should be installed by a suitably qualified contractor.

Diagram 1 **Drainage field**

Extract from Buildings Regulations Part H

A treatment plant is to be installed upstream of the foul drainage field serving 4no. dwellings and should be sited in accordance with Building Regulations Part H (E.g. 7.0m minimum from a habitable room). It is understood that the existing foul treatment plant shall be utilised.

The existing foul treatment plant is a Tricel Novo UK18 by Tricel Environmental approved to BS EN 12566-3:2005. The foul treatment plant is understood to have been installed in accordance with the manufacturer's specification.



Typical Tricel Novo sewage treatment plant

Link to Tricel product information:

<https://tricel.co.uk/sewage-treatment/sewage-treatment-plants/>

5.0 NATURAL RESOURCE WALES (NRW)

The foul treatment plant should be registered with Natural Resource Wales (NRW) by the Client.

Due to the volume of treated foul domestic sewage effluent to discharge to ground being greater than 2.0m³ per day, it is understood that either a NRW Water Exemption or environmental permit, Part B6.5, may be required.

Any requirement for a NRW Water Exemption or environmental permit will not prejudice the River Dee and Bala Lake Special Area of Conservation (SAC).

Foul Water

DETAILS OF PERCOLATION TEST

NAME: Mark & Samantha Andrews

FULL ADDRESS OF PROPERTY TO BE DRAINED: Barn at Middlewood farm,
Sarn Road, Thesapwood, Malpas
SY14 7AW

Before carrying out the testing procedure, a trial hole should be dug to determine the position of the standing water table. The trial hole should be minimum of 1.0m² in area and 2.0m deep, or a minimum 1.5m below the invert of the proposed drainage field pipework. The ground water table should not rise to within 1.0m of the invert level of the proposed effluent distribution pipe.

Is the drainage field >15m from a building?	<u>Yes</u> / No	If no, consult Engineer prior to commencement.
Is the drainage field >10m from a watercourse?	<u>Yes</u> / No	
Is the drainage field >50m from a water abstraction point?	<u>Yes</u> / No	

PROCEDURE

Note: Do not carry out test during abnormal conditions, i.e., heavy rain, severe frost, drought etc.

- 1) A hole 300mm square should be excavated to a depth 300mm below the proposed invert level of the effluent distribution pipe.
- 2) Fill the 300mm square section of the hole to a depth at least 300mm with water and allow it to seep away overnight.
- 3) Next day, refill the test section with water to a depth of at least 300mm and observe the time, in seconds, for the water to seep away from 75% full to 25% full level. Divide this time by 150mm. The answer gives the average time in seconds (Vp) required for the water to drop 1mm.
- 4) The test should be carried out at least 3 times with at least two trial holes.
- 5) Record results.

SIGNED: S. Andrews

Soil Water

Trial Hole 1

TEST No 1

Date: 4/1/22 Weather Conditions: Dry and windy

A. Depth of water (minimum 300mm) 380 mm $(75\% - 25\% = 285 - 95)$

B. Time in seconds taken to seep away 14.430 seconds

285 mm $\rightarrow$ 95 mm

Therefore, average time for water to drop to 1mm = B/A 75.95

TEST No 2

Date: 5/1/22 Weather Conditions: Overcast, intermittent light drizzle

A. Depth of water (minimum 300mm) 350 mm 263 - 86 = 177 mm

B. Time in seconds taken to seep away 15.060

Therefore, average time for water to drop to 1mm = B/A 85.08

TEST No 3

Date: 12/1/23 Weather Conditions: Dry & breezy

A. Depth of water (minimum 300mm) 380 mm 285 - 95 mm = 190 mm

B. Time in seconds taken to seep away 15.300

Therefore, average time for water to drop to 1mm = B/A 86.44

SIGNED: [Signature]

Foul Water

Balance

TEST No 1

Date: 4/1/23 Weather Conditions: Dry & Windy

A. Depth of water (minimum 300mm) 300mm (225 - 75) = 150mm

B. Time in seconds taken to seep away 14.340

Therefore, average time for water to drop to 1mm = B/A 95.6

TEST No 2

Date: 5/1/23 Weather Conditions: Overcast, intermittent light drizzle

A. Depth of water (minimum 300mm) 310mm (230 - 75) = 155mm

B. Time in seconds taken to seep away 14.940

Therefore, average time for water to drop to 1mm = B/A 96.39

TEST No 3

Date: 12/1/23 Weather Conditions: Dry & breezy

A. Depth of water (minimum 300mm) 350mm 263 - 86 = 177mm

B. Time in seconds taken to seep away 14.700

Therefore, average time for water to drop to 1mm = B/A 83.05

SIGNED: [Signature]

