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# Rosehill Lodges

POROSITY TESTING REPORT

ISSUE 1 .....23 JAN 2022

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## Introduction

Planning permission for two self-catering units was granted by Staffordshire Moorlands Council on 12 August 2021. The development proposed that the two lodges use the existing septic tank and drainage field system which currently discharges into the adjoining field, (The Paddock), within the boundaries of Rosehill. As part of the planning permission condition 16 required....

“The foul drainage from the proposed development shall discharge to a system which meets the requirements of British Standard 6297:2007 + A1:2008 Code of Practice for the design and installation of drainage fields for use in wastewater treatment.

- a) There is no connection to any watercourse or land drainage system and no part of the soak away system is situated within 10 metres of any ditch or water course
- b) Porosity tests are carried out to the satisfaction of the local planning authority to demonstrate that suitable subsoil and adequate land area is available”

The existing sewerage system comprises a septic tank and second separate treatment tank ( a type 2 system) with treated wastewater discharging into Rosehill’s one acre Paddock. The existing septic tank is cleaned out annually. A six-inch clay pipe runs from the separate treatment tank to manhole 1, (M1). Manhole M1 is connected to manhole M2 by four-inch perforated plastic pipe. Manhole 2 then connects via four-inch perforated plastic pipe to a soakaway )refer Appendix A Sk1 – Plan on existing Septic Tank & field drainage system

## Scope

The scope of this report is to ...

- To demonstrate that there is no connection to any watercourses or land drainage system and no part of the soakaway system is situated within 10metres of any ditch or water course
- To carry out porosity testing to determine the infiltration rate in three trial pits by trench and trial pit excavation, identifying whether the subsoil is suitable to provide controlled wastewater treatment and adequate land area is available to do this.
- To demonstrate that the existing drainage field and soakaway is suitable to accept additional capacity required by two additional self-catering units or will require replacement
- All porosity testing and drainage field design will be carried out in accordance with the requirements of BS 6297:2007 + A1:2008 Code of Practice for the design and installation of drainage fields for the use in wastewater treatment

## Field Investigation/Testing Results

Site investigation was carried out on Sat 22 January 2022 using a mini excavator. The field testing was carried out in accordance with BS 6297:2007 ( +A1;2008).

A series of percolation tests within a test holes determines the rate of wastewater infiltration through the subsoil.

Three trial trenches were excavated at 850mm, 500mm and 200mm to the top of porosity test holes ; 300mm (l) x 300mm(w) x 300mm deep (refer Appendix A Sk1 for location of trial pits and Appendix B for photographs of Trial Pits P1, P2, and P3)

Porosity ( Infiltration rate ) testing was carried out with each 300mm test hole filled up with water and left for 24hrs such that operational conditions were simulated. The weather conditions were dry. The trial pit area selected was considered representative of the infiltration area.

Porosity (Infiltration rate) Tests were carried out on Trial pits 2(500mm) and 3(200mm) on Sunday 23 January and the average test result was recorded over three separate tests per hole. It was not possible to carry out filtration testing in Trail pit 1 (850mm) as the water level did not fall below the top of the 300mm test hole.

### Trial Pit 1 -850mm deep

The excavated trench indicated 150mm topsoil/grass, on top of 350mm medium/high sandy/clayey soil, on top of 350mm low/medium sandy clay to a depth of 850mm.(refer Appendix A Sk2 -trench trial pit sections.) A 300x300x300mm deep test hole was then hand-dug to carry out the porosity test. No porosity test could be carried out on day 2 as the water level did not drain.( refer P1 Appendix B). A test report was completed to record an impervious clay layer level at 850mm.

### Trial Pit 2 – 500mm deep

The excavated trench indicated 300mm topsoil/grass, on 200mm medium/high sandy/clayey soil . A 300x300x300mm deep test hole was hand-dug at a depth of 500mm. Two wooden test markers were inserted into the side of the test hole at 75mm (75% full level) and 225mm (25% full level) respectively below the surface such that the time for the water to fall 150mm could be recorded.

The test results indicated a pervious layer of low/medium sandy clay between 500mm and 800mm deep.

### Trail Pit 3 – 200mm deep

The excavated trench indicated 200mm topsoil/grass. . A 300x300x300mm deep test hole was hand-dug into sandy clay. Two wooden test markers were inserted into the side of the test hole at 75mm (75% full level) and 225mm (25% full level) respectively below the surface such that the time for the water to fall 150mm could be recorded.

The test results indicated a pervious layer of medium/high sandy clay between 200mm and 500mm.

## Field Investigation/Testing Results (Cont)

Results Table 1 ( Occupancy at Rosehill 5 bedroom; P=5, self-catering units 2 bedroom/unit; P=4

Total Occupancy P5 +P4 + contingency P4 = P13

| Trial Hole | Depth below ground level | Depth of Water (minimum 300mm) | Time taken between 75% & 25% full(seconds) (T) | Percolation Value $V_p = T/150$ (Vp) | Occupant Capacity (P) | Minimum Area $A = P \times V_p \times 0.25$ (A) |
|------------|--------------------------|--------------------------------|------------------------------------------------|--------------------------------------|-----------------------|-------------------------------------------------|
| 1          | (Test 1- 850mm)          | 300                            | No test                                        | Nil                                  | Nil                   | Nil                                             |
| 2          | (Test 1- 500mm)          | 300                            | 13,220                                         | 88.1                                 | 13                    | 286                                             |
|            | (Test 2 – 500mm)         | 300                            | 13,195                                         | 87.9                                 | 13                    | 285                                             |
|            | (Test 3 – 500mm)         | 300                            | 13,210                                         | 88.0                                 | 13                    | 286                                             |
| 3          | (Test 1- 200mm)          | 300                            | 10800                                          | 72                                   | 13                    | 234                                             |
|            | (Test 2- 200mm)          | 300                            | 10790                                          | 71.9                                 | 13                    | 233                                             |
|            | (Test 3- 200mm)          | 300                            | 10850                                          | 72.3                                 | 13                    | 235                                             |
| Average Vp |                          |                                |                                                | 80                                   | Average A             | 260m <sup>2</sup> ♠                             |

**Site Location:**\_\_\_Rosehill, Nabb lane, Alton, ST10 4AY

**Description of ground strata:**\_Topsoil over sandy clay over stiff clay

**Date test carried out:**\_\_\_\_\_

**Name of person carrying out the test:**\_\_\_\_\_

The water table is more than 1m below the bottom of the distribution pipes and I further confirm that there are no wells, springs or water abstraction points within 100m of the proposed infiltration area.

**Signed:**\_\_\_\_\_ **Date:**\_\_\_\_\_

# Discussions/Conclusions

## Local Planning Condition 16

- a) “There is no connection to any watercourse or land drainage system and no part of the soakaway system is within 10m of any ditch or water course”

Answer – There is no connection to any water courses or land drainage and no part of the soakaway system is within 10m of any ditch or watercourse.

- b) “Porosity testing is carried out to the satisfaction of the Local Planning Authority to demonstrate the suitability of the subsoil and adequate land area is available”.

Answer – Successful Porosity testing was carried out in three trial pits demonstrating that impervious subsoil is present at a depth of approximately 850mm below ground level. The other two tests demonstrated an average infiltration rate of 80mm/sec resulting in a need for a drainage field area of 260m<sup>2</sup>.

## Suitability of the existing soakaway for additional wastewater from two new self-catering units.

In accordance with the British water code of practice “Drainage Fields for disposal of septic tank and small wastewater treatment systems” a drainage field has two principal purposes namely to

1. Allow infiltration of the treated/partially treated effluent into the ground at a controlled rate
2. Allow further treatment of partially treated effluent before it reaches the ground water level

A soakaway is principally used for surface water (rainwater from roofs, paved areas etc being typically a hole or structure filled with rubble/drainage crates. The purpose of a soakaway is to distribute water into the ground as fast as possible. Therefore, they do not provide the two required features of a drainage field.

At Rosehill there is approximately 80m of perforated 100mm dia plastic pipe with invert 600mm below surface level feeding into a soakaway. The existing soakaway system is therefore a combination of drainage field using perforated plastic pipe and a soakaway. The existing drainage field is approximately 5 years old and will require replacement in the near future. It would therefore be prudent to replace the existing soakaway and perforated plastic pipe with a new field drain system given it is near life expired.

Given the existing drainage field performance is not known, we therefore recommend a new drainage field is designed to meet Rosehill main House needs and the additional capacity required by the new self-catering units. The existing drainage field and soakaway be abandoned & end-plugged with the new drainage field connecting to and new manhole down stream of MH1.

## Field Drainage Design

The slope of the existing ground to the north-east of MH1 ( towards Denstone Lane) is approximately one in twenty, ( 1 in 20), refer Appendix B P4- Paddock Ground Slope to the East from MH1

The area of drainage field required was calculated as 260m<sup>2</sup> within the above section “Porosity/Infiltration rate Calculations. The drainage field will comprise 150mm perforated pipes at a minimum of 2 metres apart in a 600mm trench therefore the width of the drainage field will be approx. 4.9m. The length of the trench therefore requires to be 53m long

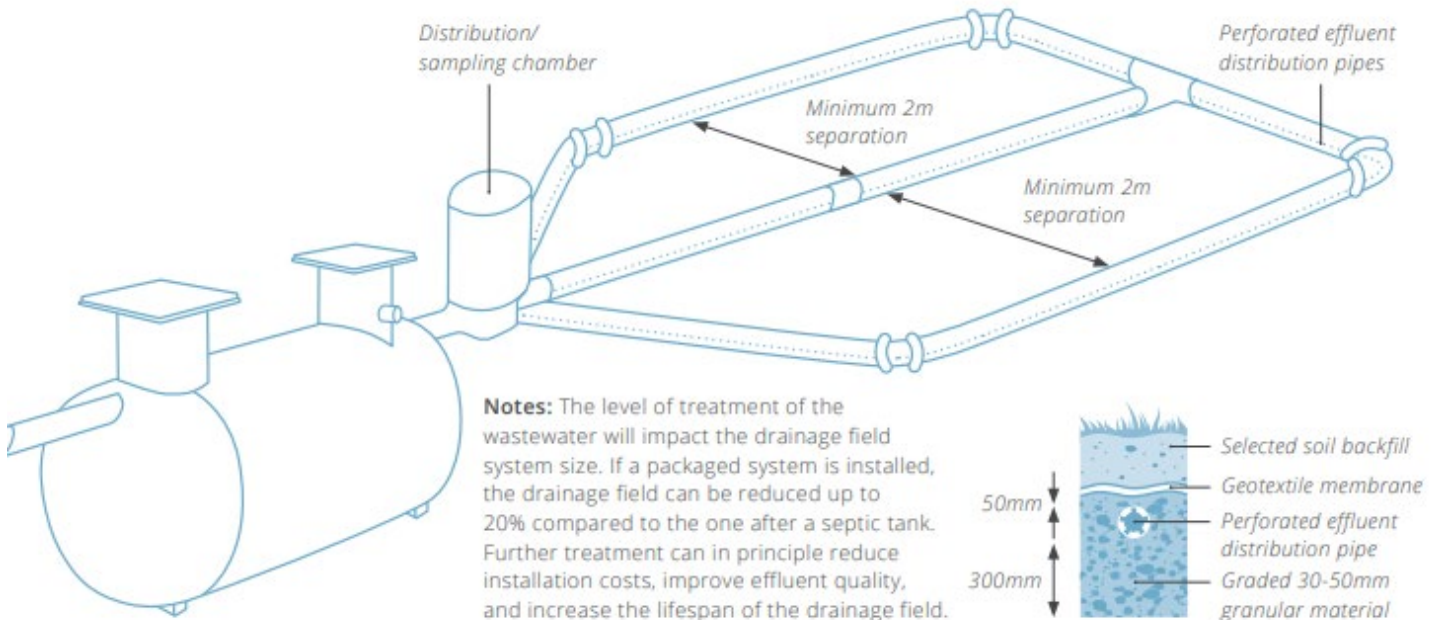
## Discussions/Conclusions (Cont)

### Field Drainage Design (Cont)

Typical Drainage Field design is indicated in the sketch below....

#### DRAINAGE FIELD

(The Building Regulations 2010- Drainage and Waste Disposal). In Scotland drainage fields need to be designed in accordance with the Building Control Technical Handbook.



## Recommendations

1. Planning Condition 16 (a) – Provide a new drainage field with no connection to any water courses or land drainage and no part of the soakaway system is within 10meters of any ditch or watercourse. The new drainage field meets these requirements.
2. Planning Condition 16 (b) – The report records that Porosity testing by percolation test was carried out in accordance with BS 6297:2007, (+A1:2008) to demonstrate the suitability of the subsoil and adequate land area is now available within this report.
3. Given the existing drainage field performance is not known, and the drainage system contains a soakaway, we recommend a new drainage field 54m long is installed in a similar configuration to the typical drainage field schematic above. The existing drainage field and soakaway be abandoned with the new drainage field connecting to a new manhole downstream of MH1.

END of REPORT

Yours Faithfully,

**Colshaw Construction Ltd**

