

DRAINAGE STRATEGY

Three Bedroom House
South of L'abbi
Holbeach Drove Gate
Holbeach Drove
Spalding
PE12 0RX

Ref: V3393

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INTRODUCTION

This statement has been prepared on behalf of the client Mr K Vaughan in support of his Planning Application for erection of a three bedroom detached dwelling with on-site parking for two vehicles with space for turning to enable vehicles to enter and leave in a forward gear.

The property is located within the Holbeach Drove Development Area Boundary and is a previously developed site, therefore brownfield with a presumption in favour of development.

FOUL DRAINAGE

The effluent discharged from the dwelling will equate to 0.72m³ per day assuming an occupancy level of 4 persons.

It is intended to discharge to a private sewage treatment plant type tested to BS7781 or otherwise tested by a notified body. It will be designed to function for up to six hours without power.

A notice should be fixed within the building and shall be robust, indelibly marked and securely fixed and describe the necessary maintenance. An example of such a notice is:

The foul drainage system from this property discharges to a packaged treatment works. Maintenance is required six monthly and should be carried out by the owner in accordance with the manufacturer's instructions. The owner is legally responsible to ensure that the system does not cause pollution, a health hazard or a nuisance.

The plant shall discharge its treated effluent to a series of Aquacell units as indicated on plan of adequate capacity to cater for the discharge of both the treatment plant and surface water from roofs only, landscaping being permeable or free draining.

The units should be installed as shallow as possible to prevent the units being below the water table. The whole installation shall be in accordance with the Manufacturers specification.

There shall be a proprietary catch pit chamber prior to the junction to the effluent discharge connection to facilitate access to the drainage system for maintenance and repair.

SURFACE WATER DRAINAGE

Surface water drainage is to discharge to Wavin Aquacell units as before described with a catch pit, minimum 300mm deep below invert, to catch debris to prevent it entering the soakaway system.

Downpipes sealed into rest bend with proprietary cap with neoprene o ring, drains as described above.

The soakaway size is to be ascertained by carrying out a Percolation Test thus:-

1. A hole 300mm square should be excavated to a depth 300mm below the proposed invert level of the incoming pipe. Where deep drains are necessary, the hole should conform to this shape at the bottom, but may be enlarged above the 300mm level to enable safe excavation to be carried out. Where very deep excavations are necessary, you should seek specialist advice.
2. Fill the 300mm square section of the hole to a depth of at least 300mm with water and allow it to seep away overnight.
3. Next day, refill the 300mm square section of the hole 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 (that is a depth of 150mm). Divide this time by 150mm. The answer gives the average time in seconds (V_p) required for the water to drop 1mm. For example 60mins divided by 150mm = 24 seconds ($V_p = 24$ seconds)
4. The test should preferably be carried out at least three times with at least two trial holes. The average figure from the tests should be taken. The test should not be carried out during abnormal weather conditions such as heavy rain, severe frost or drought.

Where the test is carried out as described above, the soil infiltration rate (f) is related to the value (V_p) derived from the test by the equation:

Formula to calculate the Soil Filtration rate

$$f = \frac{10^{-3}}{2V_p}$$

The storage volume should then be calculated so that, over the duration the storm, the storage volume is sufficient to contain the difference between the inflow volume and the outflow volume. The inflow volume is calculated from the rainfall depth and the area drained. The outflow volume (O) is calculated from the equation:

$$O = a^{s50} \times f \times D$$

Where a^{s50} is the area of the side of the storage volume when filled to 50% of its effective depth (for example $(1\text{m}^2 / 2) \times 4 = 2\text{m}^2$) and (D) is the duration of the storm in minutes (for example 5 minutes).

Example

Drained area = 25m²

Incoming water is 25m² area x 10mm of rainfall = 0.25m³ of water to be disposed of.

Outflow volume is: $O = a^{s50} \times f \times D$ therefore $O = 2 \times 0.0002 \times 5$ and thus $O = 0.002\text{m}^3$

Therefore required capacity is $0.25\text{m}^3 - 0.002\text{m}^3 = 0.248\text{m}^3$. Which means that a traditional rubble filled soakaway measuring 1m³ below the inlet pipe and with, say, 20% void, that is 0.2m³ storage capacity, will not be adequate and the soakaway volume should increase to 1.24m³ capacity.