

Surface Water Drainage Design Notes

As detailed from the British Geological Survey, the Superficial Geological ground conditions here indicates River Terrace Deposits of sand, silt and clay over Bedrock of Chalk of the Lewes Nodular Chalk Formation et seq. The Chalk was not encountered in either the Groundwater Monitoring BoreHole or the Percolation Test BoreHole.

In early November 2019 a test BoreHole was augered to a depth of 2057mm (5.343 AOD) below ground level and groundwater was not encountered at this depth. An Open Head Piezometer (a slotted Groundwater Monitoring Pipe) was installed to this maximum depth at the position of the proposed soakaway and groundwater was monitored on a weekly basis from mid November 2019 to end February 2020. During the monitoring period, the monitoring pipe indicated Dry except for two peaks, one in late December 2019 of 1878mm bgl and one in late February 2020. A highest level of groundwater of 1355mm bgl ie 6.045AOD was recorded on February 29th 2020. This highest level of groundwater precluded the use of infiltration at depths greater than ~1300mm bgl, since no Freeboard would then be available. Note the Met Office (the national meteorological service for the UK) determined February 2020 as being the wettest, month of February, on record.

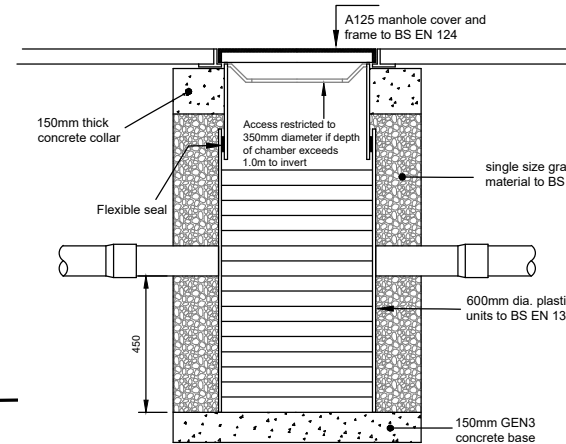
The drainage design is based on percolation tests carried out in early January 2020 to late February 2020 to BRE365 principles within a single 160mm diameter test borehole at increasing depths of ~1072mm, ~1390mm and ~1705mm bgl. The details of the Soil Infiltration Rates obtained are detailed in the table below. Results from the same day indicate that the second test was done in quick succession to the first test. The Groundwater Monitoring exercise subsequently indicated a maximum depth of 1355mm bgl, where, testing at this approximate depth, a minimum soil infiltration rate of 3.141 E-05 metres/second was obtained to which a Factor of Safety of 2 has been applied, where the consequence of failure is "no damage / minor inconvenience".

During site investigations it was found that drainage from the front (north) single roof went to a small undetermined soakaway, probably dating from when the property was built. It was of unknown size and structure and it's existing position could possibly compromise the foundations of the proposed new extension and would certainly fail current Build Regulations. It was deemed prudent to include this roof area to drain into the proposed new Infiltration Structure -- Soakaway.

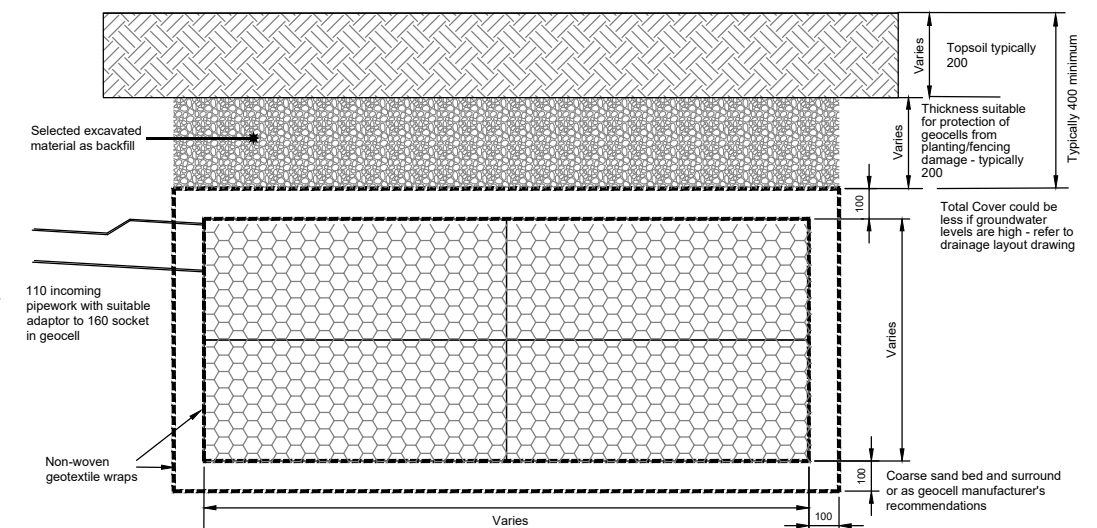
Again during site investigations it was found that drainage from the rear (south) single roof also went to an undetermined soakaway, again probably dating from when the property was built. It was of unknown size and structure and it's location was approximated. It's existing position could possibly compromise the proposed new Soakaway and would probably fail current Build Regulations. It was deemed prudent to include this roof area to drain into the proposed new Infiltration Structure -- Soakaway.

An 800mm deep rectangular geocellular soakaway has been designed, 4.00 metres long x 1.5 metres wide, with a cover of 500mm, which will be suitable to drain the proposed new extension plus the existing roof, totalling a full Roof Area of 87.00 square metres, without flooding above ground level on a 1 in 100 year rainfall return event plus 40% climate change addition. The soakaway should be sited a minimum of 5 metres from any habitable building to avoid any saturation of the ground and settlement affecting the building structure.

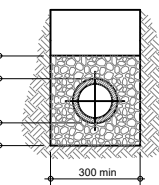
Typical Silt Trap Inspection Chamber (use in soft landscaped areas)



Typical Geocellular soakaway Unit (for use in soft landscaped areas)



GRANULAR SURROUND (CLASS S)



Under private soft landscaped areas to be used where the cover of ground level to the crown of the pipe is greater than 350mm and under drives to be greater than 600mm.

Concrete bed and surround to be used elsewhere.

Winter Soil Infiltration Testing Results

BH#2 (1072mm deep bgl)
December 20th 2019 -- 4.218 E-05 m/s
January 7th 2020 -- 8.458 E-05 m/s
January 12th 2020 -- 6.701 E-05 m/s

BH#2 (1390mm deep bgl)
February 4th 2020 -- 3.141 E-05 m/s
February 24th 2020 -- 5.013 E-05 m/s
February 24th 2020 -- 3.995 E-05 m/s

BH#2 (1705mm deep bgl)
February 25th 2020 -- 3.435 E-05 m/s
February 26th 2020 -- 3.208 E-05 m/s
February 27th 2020 -- 3.412 E-05 m/s

The Depth designed for the installation of the proposed Infiltration Structure was from tests at 1390mm deep below ground level.

Minimum Rate used in the calculations from the three tests within the borehole BH#2 was 3.141 E-05 metres / second.

A Factor of Safety of 2.0 was used in the calculations for the design.

Construction Details scale 1:25

KEY

Proposed surface water drainage.
100mm diameter PVC pipe.
Minimum fall of 1:100



Soil Infiltration Test Borehole



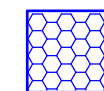
Groundwater Monitoring Point



Proposed silt trap inspection chamber



Proposed 250mm diameter surface water inspection chamber.
Osma shallow IC or similar approved.



Proposed Geocellular Soakaway.
4.00 metres long x 1.50 metres wide
giving a footprint of 6.00 square metres
of 800mm deep geocells.

GL #### Ground level at detailed items
CL #### Cover level of surface water chambers
IL #### Invert level of surface water drains
GSL #### Soffit (top) level of Geocell structure
GBL #### Base level of Geocell structure

+ 5.999 All levels are to AOD unless otherwise stated

Mate GeoTechnic Services

02	Finalise Soakaway Size	RC	19-4-20
01	Original	RC	01-4-20
Rev.	Description	Drn.	Date

Project

Proposed Side Extension
#49 Johnson Way
Ford
BN19 0TS

Client

Mr & Mrs Kennedy

Drawing
Title

Surface Water Drainage

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Scale	As Shown	Drawing Original	A3
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Drawing
Number

MGS -- F/17/19-rev02

Detailed Drainage Plan scale 1:100

NOTE

This drawing had been produced for discharge of planning conditions only. All levels and details to be checked for Building Regulations approval and construction purposes

