

Surface Water Drainage Design Notes

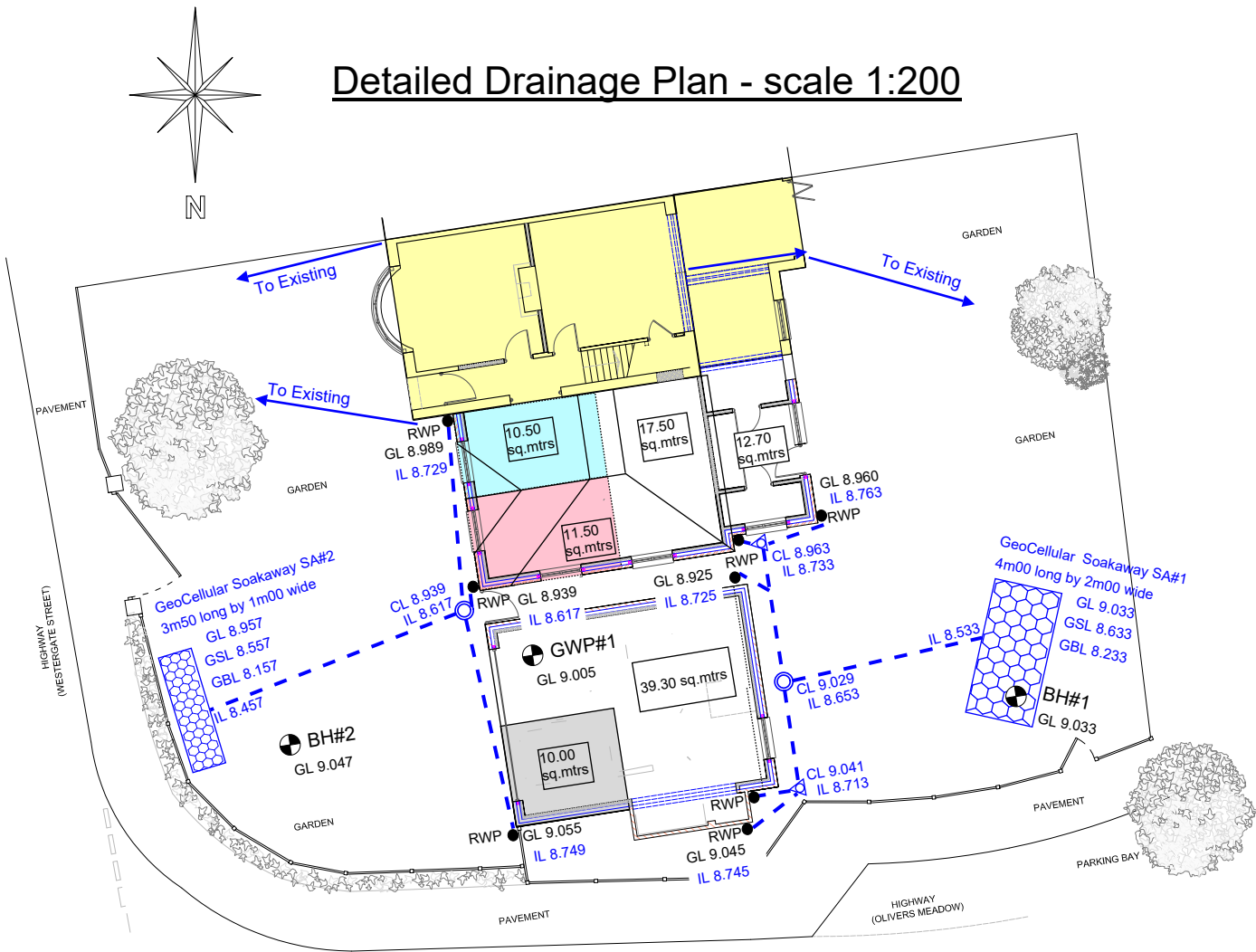
As detailed from the British Geological Survey the Superficial Geological ground conditions here indicates Head Deposits of gravel, sand, silt and clay overlaying Bedrock of the London Clay of clay, silt and sand. The Head Deposits were encountered typically 450mm below the Topsoil and some (possibly) made-up soils and consisted of small to medium angular irregular flinty gravel in a gritty clay matrix. The bedrock was not encountered even in the deeper groundwater monitoring BoreHole.

In very early January 2019 a test BoreHole was augered to a depth of 1.245 metres below ground level. Groundwater was encountered within the BoreHole at a depth of 960mm below ground level -- 8.045 AOD. An Open Head Piezometer (a slotted Groundwater Monitoring Pipe) -- GWP#1 was installed at a depth of 1.240 metres below ground level at an approximate position between the proposed soakaways and groundwater was monitored on a weekly basis from very early January 2019 to late March 2019. A highest groundwater level was recorded on 4th March 2019 at 804mm bgl -- 8.201 AOD, with a second peak previously in early February 2019. In addition both Percolation Test BoreHoles -- BH#1 and BH#2 were left open (not backfilled) after completion of the percolation testing and were additionally monitored for groundwater levels during the continuation of the formal groundwater monitoring period to late March. BH#1 recorded a highest groundwater level of 816mm bgl -- 8.217AOD on 4th March 2019 with a second peak previously in early February 2019. BH#2 recorded a highest groundwater level of 990mm bgl -- 8.057AOD on 7th February 2019 with a second peak later on in early March 2019.

The drainage design is based on percolation tests carried out, during the winter period of early January 2019 to mid January 2019, to BRE365 principles, within these two additional BoreHoles -- BH#1 at a depth of ~890mm and BH#2 at a depth of ~1052mm. Minimum soil infiltration rates, from two tests within each of the two BoreHoles of, BH#1 4.263 E-05 metres/second and BH#2 6.044 E-05 metres/second were obtained. Since both Boreholes exhibited very similar soils, it is prudent to use the overall minimum result obtained (from BH#1 of 4.263 E-05) for the design calculations, to which a Factor of Safety of 2 (the consequences of failure resulting in no Damage or Inconvenience) has been applied. Since only maximum depths of ~890mm bgl and 1052mm bgl were tested, and, with commensurate high groundwater levels recorded, soakage structures of only one 400mm deep Geocell have been designed.

Two rectangular soakaways, using 400mm deep Geocells, have been designed, each draining a part of the roof area. Soakaway SA#1 of 4.0 metres long x 2.0 metres wide will drain 70 square metres of new roof area, consisting of the rear (approximate) half of the new pitched roof (17.20 square metres), all of the new flat roof (12.70 square metres) and most of the new Garage roof (39.30 square metres) using the minimum percolation result from BH#1. Soakaway SA#2 of 3.5 metres long x 1.0 metres wide will drain 32 square metres of new roof area, consisting of the front (approximate) half of the new pitched roof (22.00 square metres) and a small portion of the new Garage roof (10.00 square metres) using the minimum percolation results from BH#1 as discussed above. These will be suitable to drain all the proposed additional roof areas without flooding on a 1 in 100 year rainfall event plus 40% climate change addition as per the Decision Notice Condition #3. The proposed soakaways should be sited a minimum of 5 metres from any building to avoid any saturation of the ground and settlement affecting the structure and 5 metres from any existing soakaways.

All of the existing roof areas will drain as currently into existing rainwater downpipes, then into existing soakaways.



Winter Groundwater Monitoring Results		
Weekly Monitored -- 2 Highest Levels Recorded -- as Below		
GWP#1 (1240mm deep)	BH#1 (~890mm deep)	BH#2 (~1052mm deep)
4th March -- 8.201AOD	4th March -- 8.217AOD	7th February -- 8.057AOD
7th February -- 8.186AOD	7th February -- 8.206AOD	4th March -- 8.049AOD
	24th December -- 8.139AOD	

Winter Soil Infiltration Testing Results	
BH#1 (~890mm deep)	BH#2 (~1052mm deep)
January 3rd 2019 -- 5.376 E-05	January 4th 2019 -- 8.230 E-05
January 4th 2019 -- 4.263 E-05	January 5th 2019 -- 6.044 E-05
Minimum Rate used of 4.263 E-05	Minimum Rate used is from BH#1
Factor of Safety used of 2.0	Minimum Rate used of 4.263 E-05
	Factor of Safety used of 2.0

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

Mate GeoTechnic Services

Rev.	Description	Drn.	Date
01	Original	RC	18-5-19

Project
Extension
the Red House
Westergate Street
Westergate

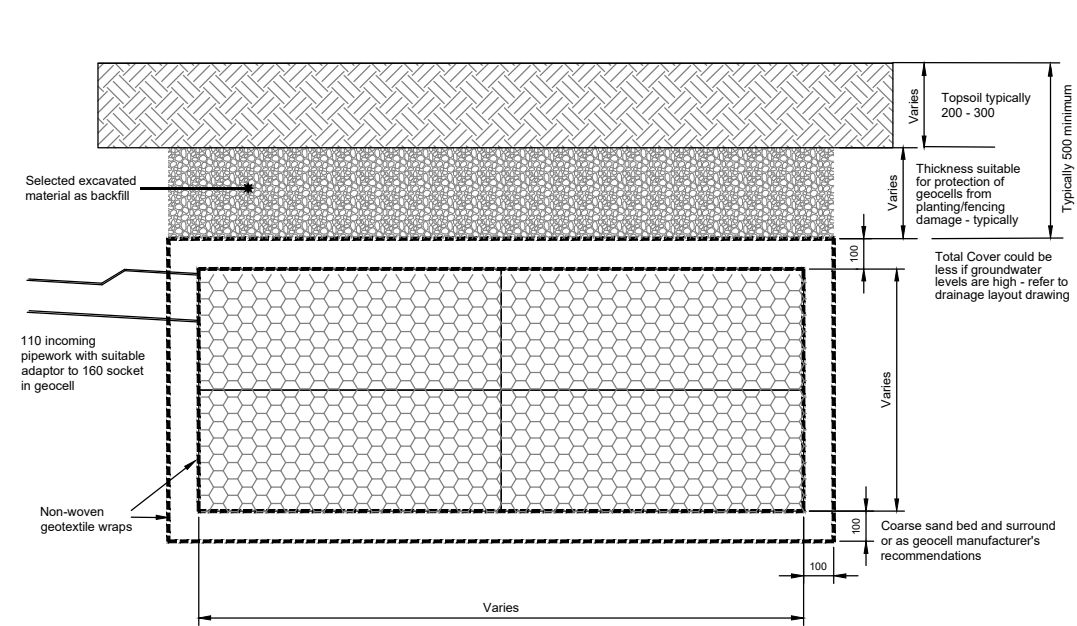
Client
Mr & Mrs Rowledge

Drawing Title
Surface Water Drainage

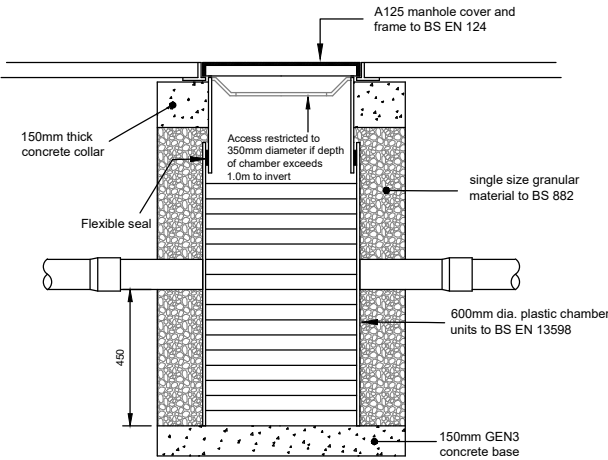
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Scale **As Shown** Drawing Original **A3**

Drawing Number **MGS -- AL/102/18-rev01**



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



Typical Silt Trap Inspection Chamber Detail
(for use in soft landscaped areas and footways)

Construction Details - scale 1:25

- KEY**
- Proposed surface water drainage. 100mm diameter pipe. Minimum fall of 1:100
 - BH#1 Soil Infiltration Test Borehole
 - GWP#1 Groundwater Monitoring Point
 - 250mm diameter surface water inspection chamber
 - Proposed silt trap inspection chamber
 - Proposed Geocellular Soakaways. SA#1 8.0 square metres & SA#2 3.5 square metres footprint of 400mm deep geocells.
 - GL #### Ground level at detailed items
 - CL #### Cover level of surface water items
 - IL #### Invert level of surface water drains
 - GSL #### Soffit (top) level of Geocell structure
 - GBL #### Base level of Geocell structure
 - +9.055 All levels are to AOD unless otherwise stated.