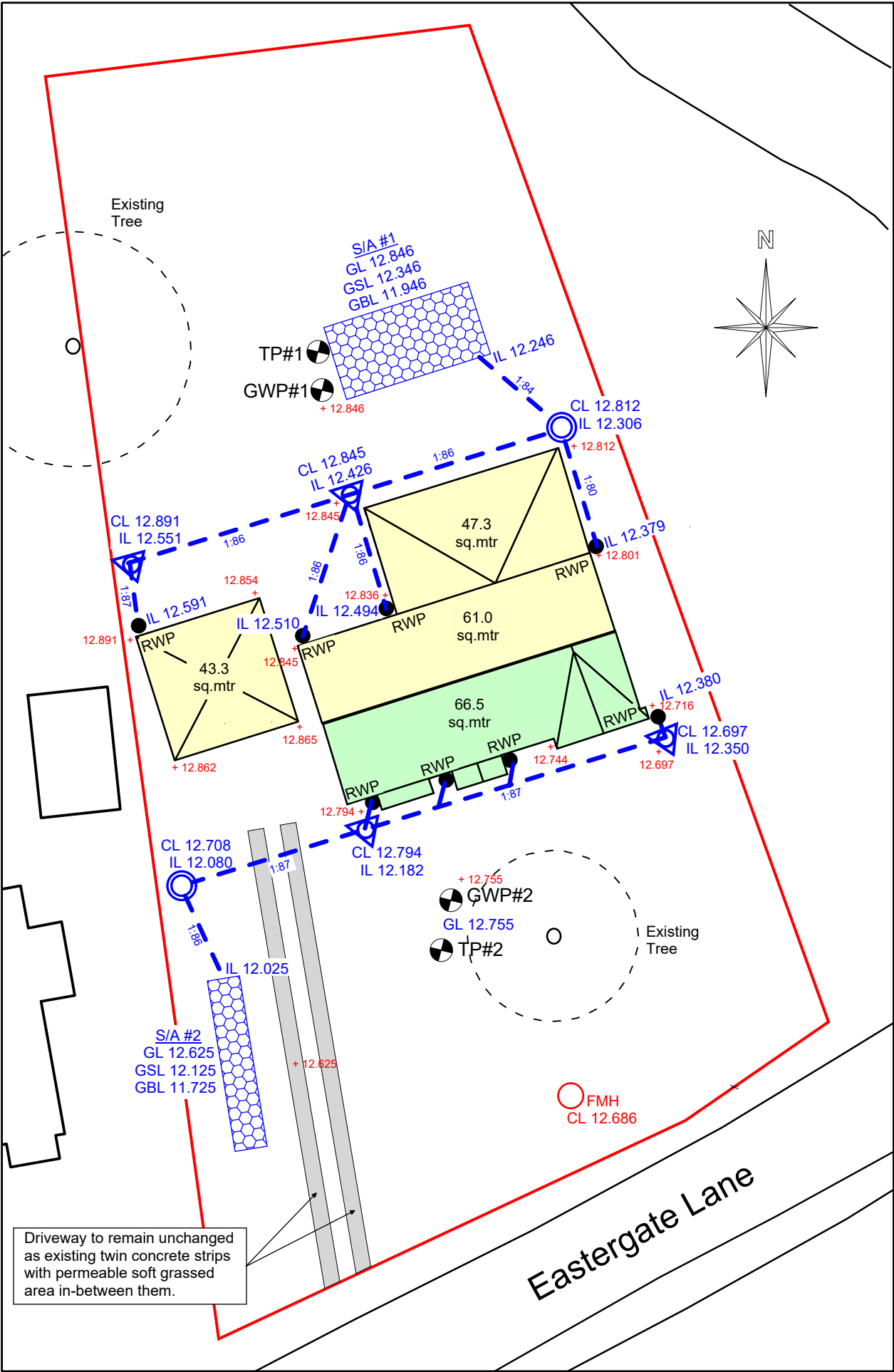


Detailed Drainage Layout Scale 1:250



Winter Soil Infiltration Testing Results

TP#1 BRE365 Trial Pit (situated in the rear garden)
1050mm long x 350mm wide x 980mm deep
January 25th 2021 -- 2.345 E-05 m/s
January 26th 2021 -- 2.566 E-05 m/s
February 7th 2021 -- 1.889 E-05 m/s

The Minimum Rate used in the calculations from the three tests within the Trial Pit TP#1 was 1.889 E-05 metres / second. A Factor of Safety of 3.0 was used in the calculations.

TP#2 BRE365 Trial Pit (situated in the front garden)
1100mm long x 360mm wide x 920mm deep
January 25th 2021 -- 1.754 E-05 m/s
January 28th 2021 -- 1.021 E-05 m/s
February 7th 2021 -- 1.309 E-05 m/s

The Minimum Rate used in the calculations from the three tests within the Trial Pit TP#2 was 1.021 E-05 metres / second. A Factor of Safety of 2.0 was used in the calculations.

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 over Bedrock of the London Clay Formation. The London Clay was not encountered in either the Groundwater Monitoring BoreHoles or the Percolation Test Trial Pits.

In mid January 2021 two BoreHoles were augered to a depth of 995mm below ground level (BGL) (11.851 AOD), in the rear garden, and to a depth of 1075mm BGL (11.680 AOD) in the front garden. Groundwater was not encountered in either borehole at these maximum depths on installation. The positions of the two boreholes were in the approximate location of any proposed soakaways. Groundwater was monitored on a weekly basis from mid January 2021 to early March 2021. During the monitoring period no groundwater was recorded in either borehole. This means that the level of groundwater was typically deeper than 1000mm BGL (11.850 AOD) during the Monitoring Period. This to inform the use of infiltration to a typical depth of 900mm below ground level whilst still maintaining a freeboard.

In late January 2021 a BRE365 Trial Pit, of size 1050mm long by 350mm wide was excavated, in the rear garden, to a depth of 980mm BGL, and a second BRE365 Trial Pit, of size 1100mm long by 360mm wide was excavated, in the front garden, to a depth of 920mm BGL.

The drainage design is based on percolation tests carried out in late January 2021 to early February 2021, to BRE365 principles, within these trial pits. The Soil Infiltration Rates obtained are detailed in the table above. Testing produced a range of Infiltration Rates and a minimum soil infiltration rate of 1.889 E-05 metres / second was obtained, from Trial Pit TP#1 (in rear garden) to which a Factor of Safety of 3 has been applied. (this being where the consequence of failure is "minor inconvenience"). and a minimum soil infiltration rate of 1.021 E-05 metres / second was obtained, from Trial Pit TP#2 (in front garden) to which a Factor of Safety of 2 has been applied, (this being where the consequence of failure is "no damage or inconvenience").

As a result of preliminary investigations it seemed that the south roof areas would need to drain into a soakaway in the front garden area and the rear north roof areas would need to drain into a soakaway in the rear garden. It was not possible to establish where the existing front and rear roof areas currently drain to. It was assumed that they would drain to soakaways and that, in the case of the rear garden existing soakaway, its location could be compromised. In addition both the existing rainwater down pipes would be lost when the proposed new extensions are built. It was therefore concluded, and seemed prudent, to drain all the existing, as well as the proposed new roof areas, including the proposed new garage, into two new soakaway structures meeting current specifications.

Since Groundwater Monitoring and Percolation Testing was only available down to ~1000mm BGL any design would be limited to this depth. Two 400mm deep rectangular geocellular soakaways have been designed. S/A#1, in the rear garden, has been designed to be 7.00 metres long x 3.50 metres wide, with a cover of 500mm, which will be suitable to drain the existing rear roof plus the rear roof of the proposed new side extension of 61.0 square metres, the proposed new rear extension of roof area of 47.3 square metres and the full garage roof of 43.3 square metres, totalling a contributing roof area of 151.6 square metres.

In addition S/A#2 in the front garden, adjacent to the existing driveway, has been designed to be 8.00 metres long x 1.50 metres wide, with a cover of 500mm, which will be suitable to drain the existing front roof plus the front roof of the proposed new side extension of roof area of 62.8 square metres, the proposed, new bay window and open air porch of roof areas 3.7 square metres, totalling a contributing roof area of 66.5 square metres.

Both soakaways has been designed to meet, below their lowest incoming pipe, on a 1 in 10 year rainfall return event plus 40% climate change addition, Building Regulations, and, without flooding above ground level, on a 1 in 100 year rainfall return event plus 40% climate change addition. Each soakaway should be sited a minimum of 5 metres from any habitable building or garage to avoid any saturation of the ground and settlement affecting the building structure.

Half of the rear extension roof area joins into the rainwater down-pipe, from the main rear roof, on the north east gable corner, and the other half drains with its own rainwater down-pipe. The rear roof drains at each gable corner. The front bay joins into the front roof rainwater down-pipe on the front elevation. All drainage connections are to be made with 45 degree oblique junctions. The driveway and hard-standing remain as existing.

KEY

- Proposed surface water drainage. 100mm diameter PVC pipe. Minimum fall of 1:100
- GWP Groundwater Monitoring Test Point.
- TP Soil Infiltration Testing BRE365 Trial Pit.
- Proposed 250mm diameter surface water inspection chamber. Osma shallow IC or similar approved.
- Proposed silt trap inspection chamber Polypipe Ridgistorm Basic or similar approved.
- Proposed Geocellular Soakaways of 400mm deep Geocells. S/A#1 7.00 metres long x 3.50 metres wide. A footprint of 24.5 square metres. S/A#2 8.00 metres long x 1.50 metres wide. A footprint of 12.0 square metres.
- 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

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
03	Rainwater Downpipes Modified	RC	10-5-21
02	Junctions Added	RC	07-5-21
01	Original	RC	22-4-21

Project

Proposed Side & Rear Extension
"Ross Cottage" Eastergate Lane
Walberton
BN18 0BA

Client Mr R. Lynes
Drawing Title Surface Water Drainage

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Scale As Shown Drawing Original A3

Drawing Number MGS -- WA/78/20-rev03