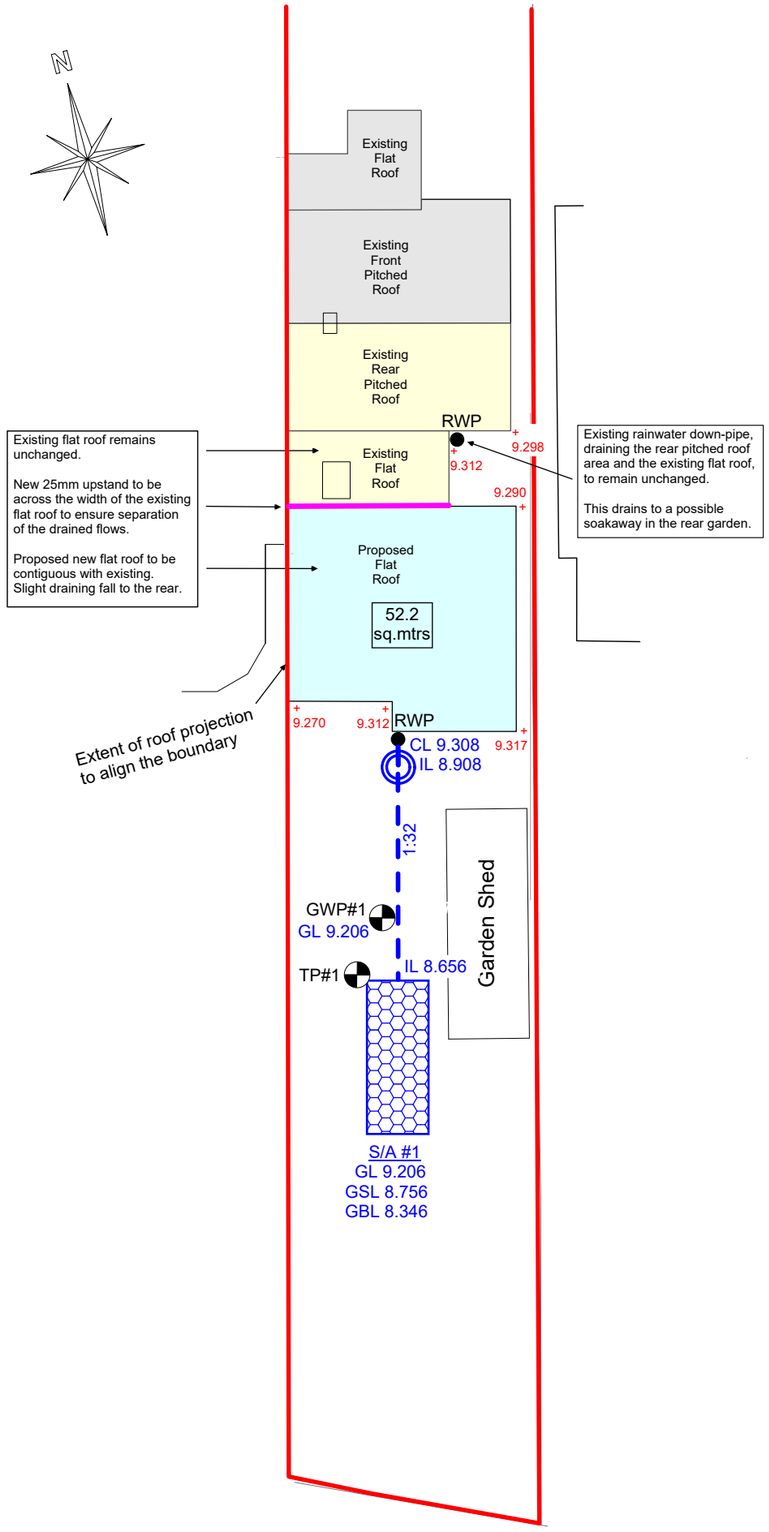


## Detailed Drainage Layout Scale 1:200

## 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 the Lambeth Group. The bedrock was not encountered in either the Groundwater Monitoring BoreHole or the Percolation Test Trial Pit.

In early December 2020 a BoreHole was augered to a depth of 2095mm (7.111 AOD) below ground level (BGL) and groundwater was encountered at a depth of 2000mm BGL. An Open Head Piezometer (a slotted monitoring pipe) GWP#1 was installed to this maximum depth at the approximate position of the proposed soakaway installlation and groundwater was monitored on a weekly basis from early December 2020 to end February 2021.

During the monitoring period, the highest level of groundwater of 1034mm BGL at 8.172 AOD, was recorded on 1st February 2021. A second highest level of groundwater was recorded on 29th December 2020, after "Storm Bella", at 1050mm BGL at 8.156 AOD. These to inform the use of infiltration systems for the rear garden soakaway to a typical depth of 800mm BGL whilst still maintaining some freeboard.

The drainage design is based on percolation tests carried out at the end February 2021 to BRE365 principles within trial pit TP#1, at a depth of 790mm BGL. The Soil Infiltration Rates obtained are detailed in the table below. The testing produced a range of values and a minimum Soil Infiltration Rate, for the rear garden soakaway, of 1.015 E-05 metres / second was obtained. In the calculations, this minimum rate, from TP#1, has had a Factor of Safety of 2 applied, where the consequence of failure is "no damage or inconvenience".

A 400mm deep rectangular geocellular soakaway SA#1 has been designed, 5.00 metres long x 2.00 metres wide, with a cover of 450mm, which will be suitable to drain the proposed new extension flat roof area of 52.2 square metres. This 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.

The infiltration structure has been designed to meet, below its 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.

Investigations as to the final draining of the rear pitched roof and existing flat roof proved difficult and inconclusive, and they both drain into a single rainwater down-pipe, which will remain unchanged. It is considered that this down-pipe drains to an unknown original soakaway in the rear garden.

The proposed overall extension consists of replacing the two existing small roof areas, one flat and one slightly pitched, and creating a single new flat roof contiguous with the existing flat roof area.

The rear garden is long and very narrow, and is challenging to fit a large soakaway to accommodate all the existing, as well as the proposed, roof areas, where groundwater is high and soil infiltration rates are low. It was decided to maintain the “existing” soakaway, as unchanged, for the rear pitched and flat roof areas and to drain the proposed new flat roof areas to a new soakaway, whilst siting it further from the proposed new extension than the minimum distance (of 5 metres) required, to maintain the greatest possible (existing) soakaway to (new) soakaway separation.

In order to maintain the correct flows for the existing, and proposed new, rainwater down-pipes it is necessary to create a small barrier consisting of a 25mm upstand along the line of the existing flat roof, which will separate all the existing flows from the proposed new flows. The flat roof membrane covering, which will replace the existing and fully cover the proposed new, will run upto and over this upstand to maintain roof water ingress integrity.

All drainage connections are to be made with 45 degree oblique junctions. The rear patio and the path remain as existing.

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.

### Winter Soil Infiltration Testing Results

TP#1 BRE365 Trial Pit

1200mm long x 450mm wide x 790mm deep

February 26th 2021 -- 2.801 E-05 m/s
February 27th 2021 -- 1.524 E-05 m/s
February 28th 2021 -- 1.015 E-05 m/s

The Minimum Rate used in the calculations from the three tests within the Trial Pit TP#1 was 1.015 E-05 metres / second.

A Factor of Safety of 2.0 was applied in the calculations for the design for Soakaway S/A#1.

### KEY

GWP Groundwater Monitoring Test Point.

TP Soil Infiltration Testing BRE365 Trial Pit.

Proposed silt trap inspection chamber
Polypipe Ridgistorm Basic or similar approved.

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

Proposed Geocellular Soakaway.
S/A #1 to be 5m00 x 2m00 x 400mm deep.

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 or storage & infiltration structure
GBL #.### Base level of Geocell or storage & infiltration structure

+ 5.999 All levels are to AOD unless otherwise stated

Mate GeoTechnic Services

| Rev. | Description | Drn. | Date |
|---|---|---|---|
| 01 | Original | RC | 26-4-21 |

Project
Proposed New Rear Extension
“Wayside” Yapton Road
Barnham
Bognor Regis
PO22 0BA

Client: Mr S. & Mrs K. Hynd
Drawing Title: Surface Water Drainage

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Scale: As Shown
Drawing Original: A3
Drawing Number: MGS -- BN/23/21-rev01