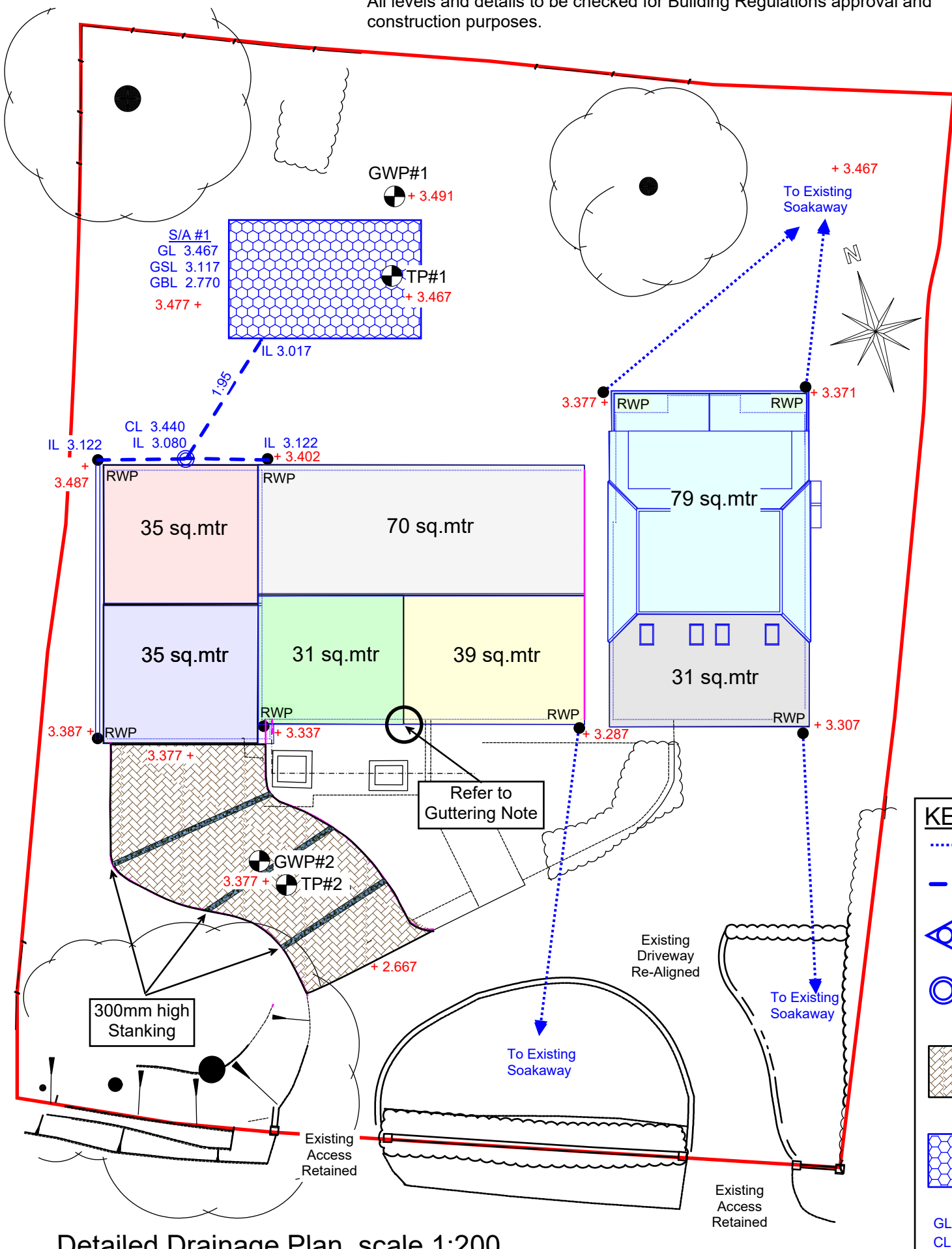


NOTE

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.



Detailed Drainage Plan scale 1:200

Guttering Note– The guttering need to be split with end stops to maintain flows to their appropriate infiltration locations.

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 Lewes Nodular Chalk u.s.w. The bedrock was not encountered in either of the Groundwater Monitoring BoreHoles.

In early November 2020 a 75mm diameter BoreHole was augered to a depth of 1780mm (1.711 AOD) below ground level (BGL) and groundwater was not encountered at this depth. An Open Head Piezometer (a slotted monitoring pipe) GWP#1 was installed to this maximum depth at the approximate position of the proposed soakaway and groundwater was monitored on a weekly basis from mid November 2020 to end February 2021. During the monitoring period, the highest level of groundwater of 733mm BGL at 2.761 AOD, was recorded on 31st January 2021. A second highest level of groundwater was recorded on 29th December 2020, after "Storm Bella", at 776mm BGL at 2.715 AOD. These to inform the use of infiltration systems for the rear garden soakaway to a typical depth of 700mm BGL whilst still maintaining a minimum of freeboard.

In early January 2021 a second 75mm diameter BoreHole was augered to a depth of 1500mm BGL (1.877 AOD), as groundwater monitoring point GWP#2 and groundwater was encountered at 1250mm BGL. This borehole was left open but covered. Groundwater was monitored on a weekly basis from mid January to end February 2021. During the monitoring period, the highest level of groundwater of 1100mm BGL at 2.277 AOD, was recorded on 31st January 2021. These to inform the use of infiltration systems for the proposed front access and parking areas to a typical total depth of 510mm BGL, whilst maintaining freeboard.

The drainage design is based on percolation tests carried out in mid February 2021 to BRE365 principles within trial pit TP#1, at a depth of 750mm BGL and within trial pit TP#2, at a depth of 820mm BGL. The Soil Infiltration Rates obtained are detailed in the table below. Testing produced a range of Infiltration Rates and a minimum soil infiltration rate, for the rear garden soakaway, of 1.170 E-05 metres / second was obtained. Testing in Trial Pit TP#2, for the front permeable paving areas, produced a minimum soil infiltration rate of 3.979 E-06 metres/second. In the calculations, the minimum rate from TP#1 has a Factor of Safety of 3 applied, where the consequence of failure is "minor inconvenience" and TP#2 has a Factor of Safety of 2 applied where the consequence of failure is "no damage".

The proposed "Holiday Lets" has a negligible increase in impermeable roof area and as such is left as existing, with drainage of the front roof to a presumed existing soakaway in the front garden and drainage of the flat and rear roof area to a presumed existing soakaway in the rear garden.

The existing main building front roof has an impermeable area of 39 square metres and this amount is left to drain to a presumed separate existing soakaway in the front garden. In order to maintain this maximum flow, the guttering on the front roof of the proposed alterations need to be separated as detailed on the layout. The balance of the front roof drains via it's rainwater down pipe discharging onto the front garage roof which drains via it's rainwater down pipe, which will have to be fixed onto the garage gable end wall and run diagonally across it to connect into the garage rear roof rainwater down pipe above ground level. This drainage plus the proposed main rear roof will drain through a silt trap to the soakaway S/A#1 in the rear garden.

A 347mm deep rectangular geocellular soakaway SA#1 has been designed, 7.80 metres long x 4.80 metres wide, with a cover of 350mm, which will be suitable to drain the the balance of the front roof area of 31 square metres, plus the garage front and rear roof area of 70 square metres, plus the proposed rear roof area of 70 square metres, totalling an impermeable Roof Area of 171 square metres. The existing rear roof drainage is to a presumed existing soakaway which will be compromised by the development and has been discounted.

The proposed driveway access of 74 square metres, to the proposed garage, is 'self-draining' only with a depth of 360mm Coarse Grained Aggregate, has no storage features but stanking of 300mm high is included to eliminate overspill at it's low end with a linear fall of approximately 1:18. The existing driveway has been slightly re-aligned at its entrance but there has been no increase in impermeable surface area as such.

This separation of the impermeable roof areas, optimises the available infiltration resources. The proposed soakaway S/A#1 has been designed to meet Building Regulations, below it's lowest incoming pipe, on a 1 in 10 year rainfall return event plus 40% climate change addition, and it, and the permeable paved driveway, has been designed, without flooding above ground level, on a 1 in 100 year rainfall return event plus 40% climate change addition. Soakaway S/A#1 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.

KEY

- Existing surface water drainage.
- Proposed surface water drainage. 100mm diameter PVC pipe. Minimum fall of 1:100
- Proposed 250mm diameter surface water inspection chamber. Osmo shallow IC or similar approved.
- Proposed silt trap inspection chamber Polypipe Ridgistorm Basic or similar approved. A15 Cover and Frame to BS EN 124
- Proposed Permeable Paving. Self Draining Only. CGA Type 4 / 20 aggregate, (minimum 30% voids) with a Minimum Hydraulic Depth of 360mm. Structural Depth to be Calculated by Others.
- Proposed Geocellular Soakaway S/A#1 7.80 metres long x 4.80 metres wide. A footprint of 37.5 square metres. Brett-Martin StormCrate55 GeoCells 1200mm x 600mm x 347mm
- 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

Winter Soil Infiltration Testing Results

TP#1 BRE365 Trial Pit
(situated in the rear garden)
1230mm long x 450mm wide x 750mm deep

February 14th 2021 -- 1.573 E-05 m/s
February 15th 2021 -- 1.678 E-05 m/s
February 16th 2021 -- 1.170 E-05 m/s

The Minimum Rate used in the calculations from the three tests within the Trial Pit TP#1 was 1.170 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)
1420mm long x 450mm wide x 820mm deep

February 17th 2021 -- 3.979 E-06 m/s
February 19th 2021 -- 4.557 E-06 m/s
February 21st 2021 -- 6.082 E-06 m/s

The Minimum Rate used in the calculations from the three tests within the Trial Pit TP#2 was 3.979 E-06 metres / second. A Factor of Safety of 2.0 was used in the calculations.

Mate GeoTechnic Services

02	Finalised	RC	22-06-21
01	Original	RC	03-05-21
Rev.	Description	Drn.	Date

Project
**Proposed Extension
"The Crickets" Hoe Lane
Flansham
Bognor Regis
PO22 8NT**

Client **Mr Brenden Brogan**
Drawing Title **Surface Water Drainage**

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

Drawing Number **MGS -- Y/42/20-rev02**