

SURFACE WATER DRAINAGE DESIGN

Proposed Development of a Single Residential Dwelling

within the grounds of the existing residential dwelling known as The Cottage, Highground Lane, Barnham, West Sussex PO22 0BT.

Approval Reference BN/17/21/PL

Condition 13

Development shall not commence, other than works of site survey and investigation, until full details of the proposed surface water drainage scheme have been submitted to and approved in writing by the Local Planning Authority. The design should follow the hierarchy of preference for different types of surface water drainage disposal systems as set out in Approved Document H of the Building Regulations, and the recommendations of the SuDS Manual produced by CIRIA.

Winter groundwater monitoring to establish highest annual ground water levels and winter Percolation testing to BRE 365, or similar approved, will be required to support the design of any infiltration drainage. No building shall be occupied until the complete surface water drainage system serving the property has been implemented in accordance with the agreed details and the details so agreed shall be maintained in good working order in perpetuity.

SURFACE WATER DRAINAGE

SITE CONDITIONS / EXISTING SURFACES & GROUND WATER MONITORING REQUIREMENTS

The landowner initially spoke with a consultant drainage engineer, Alistair Tyler of Ground Management Ltd, to discuss the winter ground water monitoring at which time it was confirmed that the site suffers with year round high water table levels. Ground water monitoring was deemed not to be suitable as a result of the high water table issues.

An initial trial pit dug by the land owner in November 2021 identified the water table at approximately 700mm below ground level. Subsequent inspections of the ground water level in January and February have confirmed the water table is steady at approximately 700mm below ground level.

Arun District Council's Building Control Officer has inspected and confirmed the water table at 700mm as this has an affect upon the foundation design.

The ground conditions are good with a free draining non clay sub soil with flint hogging to a depth of at least 1000mm below ground level. Excavations ceased due to the ingress of water.

The site comprises part of the curtilage of an existing dwelling, The Cottage, which is located adjacent to several residential properties to the west, north and east. The existing property known as The Cottage was constructed in 1997 comprising a single bungalow, double garage, driveway and associated patio areas.

The defined site for the new dwelling within the curtilage of the existing host dwelling encompasses a largely hard paved / concreted surface serving a detached double garage structure. The defined site is predominantly made up of non porous hard surfaces and the garage structure.

There is existing SW drainage infrastructure currently serving the site. Surface water run-off is intercepted by positive SW drainage apparatus which collects from all historic impermeable areas being roofs, driveway and patios which convey the run-off into a series of existing soakaways. There are some negligible areas of patio to the rear garden that simply drain to verge/planters, however the areas associated with this application drain to existing soakaways and said apparatus has been approved under the Building Regulations previously.

It is understood from the landowner that the SW drainage is in good working order and there are no known recorded drainage or flood risk issues.

Drawing PL004 identifies the existing areas of permeable (green) and non permeable (red) surfaces within the site together with the proposed areas of permeable (green) and non permeable (red) surfaces proposed for the development.

The footprint of the existing garage and the proposed dwelling are also indicated as these are under pitched roofs and require drainage.

The existing areas are as follows:

Permeable	157m ²
Non Permeable	270m ²

The proposed areas are as follows:

Permeable	324m ²
Non Permeable	103m ²

This concludes a net reduction of non permeable areas by approximately 60% and therefore represents an overall betterment for the site.

On review the existing soakaways are not affected by the new footprint and could be retained. However, given the potential for year round high water table levels, a shallow geocellular soakaway is proposed to serve the proposed dwelling incorporating the retained element of the garage structure.

In light of the above, and noting this constitutes minor development, it was concluded that the retained elements of the existing drainage system is suitable post-completion alongside the proposed shallow geocellular soakaway, therefore geotechnical testing is not required.

PROPOSED SURFACE TREATMENTS

Access drive and parking areas.

Open cell permeable tarmac system over fully permeable sub base construction.

Garden areas.

Lawn and wild grass areas with planting beds.

Perimeter of dwelling.

30mm washed gravel over fully permeable sub base construction.

PROPOSED SOAKAWAY

The surface water drainage is designed to collect at a 300mm diameter head chamber with catch pit located adjacent to the north west corner of the garage.

The catch pit discharges via a 100mm dia surface water drain to the shallow geocellular soakaway.

The proposed shallow geocellular soakaway is detailed on drawing PL004 and comprises a shallow 700mm deep excavation to keep it above the high winter water table and is formed from a 400mm deep geocellular network of interlocking crates.

The overall dimensions of the soakaway are 3m x 6m with a capacity of 7200 litres.

The use of fully permeable surfaces to all but the footprint of the proposed dwelling removes any additional areas requiring surface water drainage from the proposed soakaway.

The effective footprint of the proposed dwelling is 103m² with a roof pitch of 45 degrees.

The effective roof plan area is therefore 154.5m².

From the Approved Document H the rainfall intensity for the location of the proposed dwelling is 0.020 and therefore the run off from the roof is 3.1l/s.

The capacity of the soakaway is 7200 litres which, assuming a constant run off of 3.1l/s, would provide approximately 6.5 hours of surface water storage before becoming surcharged. This does not take into account any percolation from the soakaway into the adjoining sub soils.

APPENDICES

Appendix A Drawing PL004 ~ Surface Water Drainage Plan