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PROPOSED NEW BUNGALOW LAND ADJACENT TO THORNLEA, CARLETON DRAINAGE STRATEGY

Introduction

Tweddell and Slater Ltd have been appointed to prepare a surface water and foul drainage statement that is compliant with the National Planning Policy.

This report has been prepared in support of the proposed construction of a residential dormer bungalow at Carleton, near Egremont in Cumbria. The closest postcode to the site is CA22 2NU and the development area is currently greenfield.

The layout of the proposed site is indicated in Figure 1 below.



Figure 1 – Proposed Site Location and Boundary

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In accordance with the recognised guidance, there is a hierarchy of where surface water should be discharged. This hierarchy where practicable, is as follows:

- 1) Infiltration
- 2) Watercourse
- 3) Public sewer

A site walkover was undertaken in August 2021. The existing site surface water appears to be drained straight to ground. An analysis of the area's topography has shown that the flow direction of overland flow in saturated conditions would generally fall to the west due to the topography on site.

The EA flood risk maps and flood map for planning show that the entirety of the site is not identified as at risk from flooding from rivers and is categorised as Flood Zone 1. Flood Zone 1 is considered to be land having a 1 in 1000 or lesser annual probability of river or sea flooding.

By review of the government long term flood risk information, it has been determined that the site is at a very low risk from surface water flooding (Appendix D).

Existing Site Runoff

The greenfield runoff rate calculation for the site is shown within Appendix B. The greenfield runoff rates for the site are shown below:

Event	Greenfield Runoff Rate
1 in 1 year	0.73 l/s
Q Bar	0.84 l/s
1 in 30 years	1.42 l/s
1 in 100 years	1.74 l/s

Soil infiltration testing has been undertaken at the site by GEO Environmental Engineering in August 2021 in accordance with the method prescribed in BRE Digest 365, with percolation testing undertaken in 2x trial pits within the site.

Infiltration testing has demonstrated that the ground has insufficient infiltration properties therefore, soakaways and permeable paving are not considered viable options for the site. Further information of the percolation testing is contained within Appendix C.

The closest watercourse to the site is an unnamed watercourse leading to "Beggar Gill". This watercourse is located approximately 270m north of the proposed development and within the boundary of an agricultural field. This watercourse is not classified as a main river by the Environment Agency (EA). The closest main river to the site is the River Ehen which lies approximately 600m to the northwest. Due to the significant distance to these watercourses and the land ownership issues involved, discharging to either of these watercourses is not considered to be a viable option for the development.

Surface Water Proposals

Sewer records obtained from United Utilities (UU) show that there is a 150mm diameter combined sewer located to the north of the site and beneath the unnamed road running through Carleton. There are no surface water or foul sewers located within close proximity to the site.

A surface water drainage strategy (Appendix A) has therefore been developed to discharge the runoff generated by the roof and driveway area of the proposed residence to the combined sewer north of the development. This is in line with the drainage hierarchy as outlined above.

To achieve a discharge rate in line with the site's QBAR value it is proposed to attenuate surface water within an attenuation tank on site and then have a controlled outflow to the existing combined sewer via a flow control device.

These proposals have been presented to UU and have been agreed as per application reference SC5677.

The attenuation tank and surface water system will be designed such that it will not be surcharged in events up to 30 years recurrence and that there will be no flooding in events up to 100 years with an allowance for climate change of 40%.

The proposed surface water drainage system will be designed to building regulations to ensure the structural integrity under anticipated loading conditions over the design life, this includes the cover to pipes that have been designed in accordance with the manufacturer's requirements and specification.

Foul System Proposal

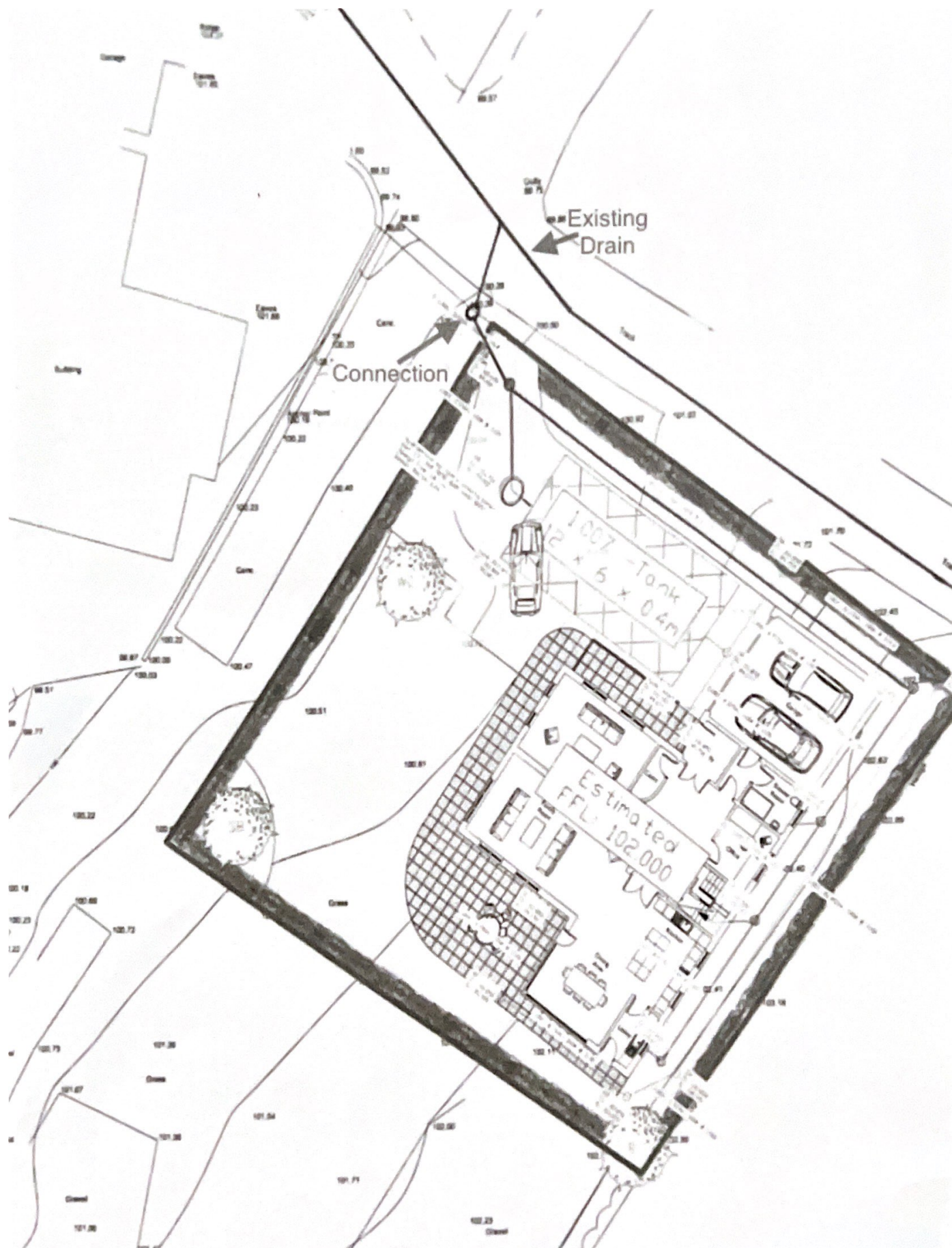
It is anticipated that foul discharge from the development will connect to the existing combined sewer located to the north of the site.

The proposal is to collect all foul drainage from the new property, and then connect to an available 100mm combined connection via an existing public transferred lateral drain located within the development site.

As per the surface water proposals, the foul proposals have been presented to UU and have been agreed as per application reference SC5677.

The use of a foul drainage field is not viable due to the ground conditions. The proposed foul water drainage connection will be designed to building regulations to ensure the structural integrity under anticipated loading conditions over the design life this includes the cover to pipes that have been designed in accordance with the manufacturer's requirements and specification.

APPENDIX A -
DRAINAGE STRATEGY DRAWING



APPENDIX B -
GREENFIELD RUNOFF CALCULATIONS

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by: Simon Johnston
 Site name: Land Adjacent to Thornlea
 Site location: Carleton

Site Details
 Latitude: 54.46899° N
 Longitude: 3.51819° W
 Reference: 3230204333
 Date: Feb 23 2022 12:23

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 0.09667

Methodology

Q_{BAR} estimation method: Calculate from SPR and SAAR

SPR estimation method: Calculate from SOIL type

Soil characteristics Default Edited

SOIL type: 4 4

HOST class: N/A N/A

SPR/SPRHOST: 0.47 0.47

Hydrological characteristics Default Edited

SAAR (mm): 1154 1154

Hydrological region: 10 10

Growth curve factor 1 year: 0.87 0.87

Growth curve factor 30 years: 1.7 1.7

Growth curve factor 100 years: 2.08 2.08

Growth curve factor 200 years: 2.37 2.37

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates Default Edited

Q_{BAR} (l/s): 0.84 0.84

1 in 1 year (l/s): 0.73 0.73

1 in 30 years (l/s): 1.42 1.42

1 in 100 year (l/s): 1.74 1.74

1 in 200 years (l/s): 1.99 1.99

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.