

Supporting Statement for Stormwater Soakaway

Land to the South of Sundown Littleheath Road Fontwell BN18 0SR

Introduction

This statement is in support of an application to discharge condition 3 of Planning Reference AL/62/19/PL - Appeal Ref PP/C3810/W/19/3241407 on land to the South of Sundown, Littleheath Road Fontwell West Sussex BN18 0SR.

Condition 3

Prior to the commencement of the development hereby permitted, other than works of site survey and investigation, full details of the proposed surface water drainage scheme shall be 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. The dwelling shall not be occupied until the complete surface water drainage system serving it has been implemented in accordance with the agreed details and the details so agreed shall thereafter be maintained in good working order.



Aerial Image (Site within Red Line)

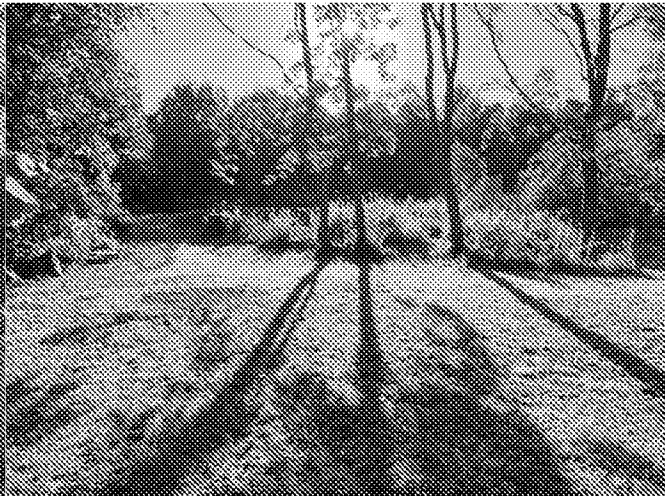
The application site is a parcel of land which formed a portion of the garden to Sundown located at the semi rural junction of Littleheath Road and Dukes Road in the Parish of Aldingbourne. Access to the site is gained directly off Littleheath Road on the Western Boundary, South West corner, though an existing vehicular gate access point.

The site has two distinct levels, an upper level for the front portion (West) of the site and a lower section to the rear (East) which has a number of tall self-seeded trees and a steep bushed embankment.

The lower level is to accommodate the surface water drainage soakaway (Refer to drawing 17-1197- DR 501) issued to support the application to discharge the condition. (Westwards View)



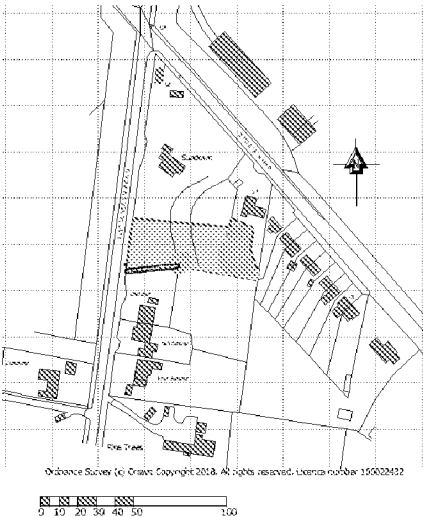
View Eastwards



View Westwards

The site is also confirmed to be:

- Within a Flood Zone 1 with no specific flood issues

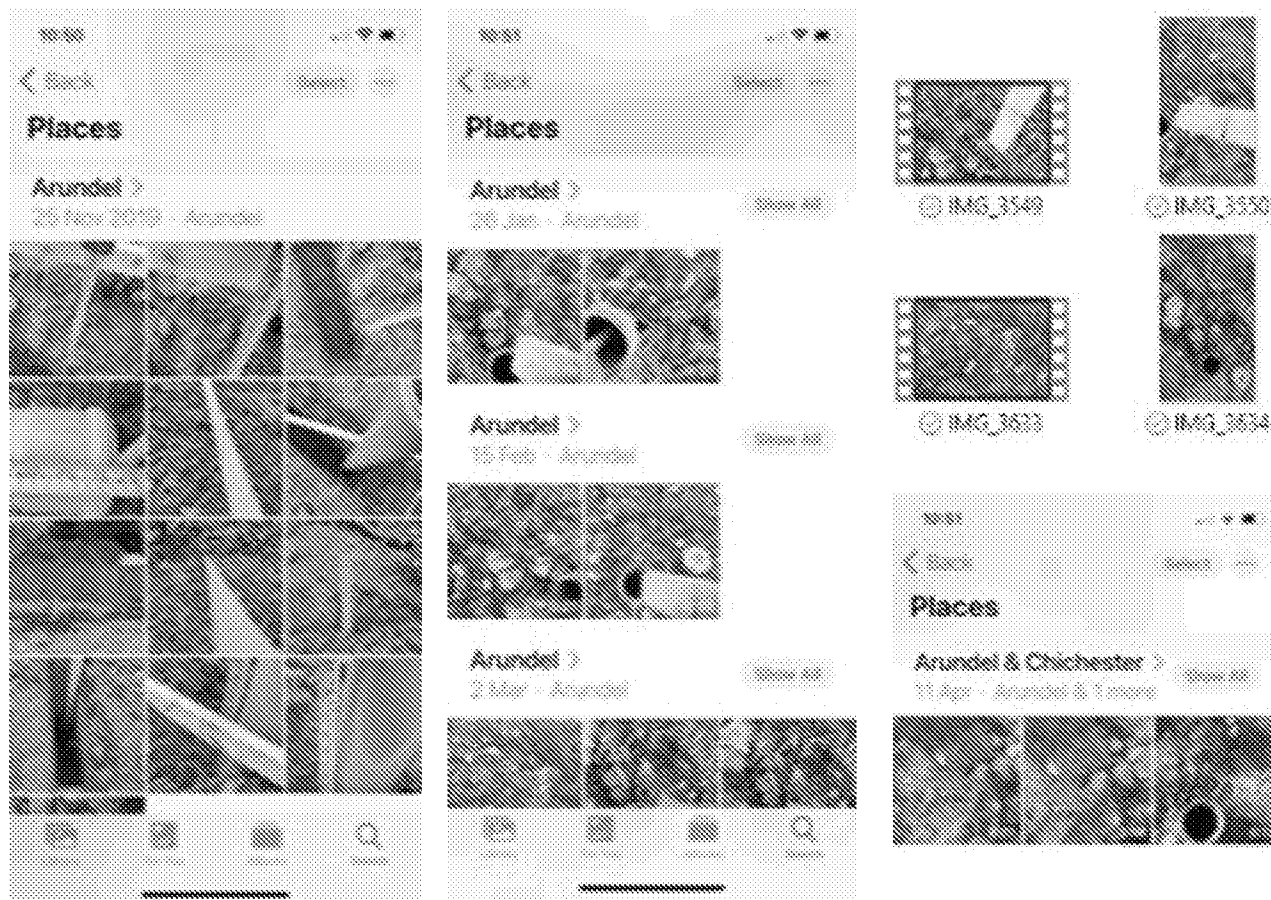


Site Location Plan (Application Site noted with red boundary and shading)

A programme of winter ground water table monitoring has been undertaken from 25 November 2019 to 11 April 2020. Two locations were chosen, and these are plotted on drawing 17-1197-DR 501, one on the upper level and one in the lower level with the depth of the access pipe being 2.4m below current site ground level. A series of 9 checks were carried out to check the position of any ground water. The result of the monitoring was that no water was encountered within the test pipe holes.

Ground Investigation Results				
Results Required	Results Provided?			
Winter groundwater monitoring results (Please refer to guidance note 1 below)	Yes	✓	No	
Period of winter groundwater monitoring Note 1	From	28/11/2019		
	To	11/04/2020		
Maximum recorded groundwater level	mAOD None Encountered mBGL			
Winter infiltration test results Note 2	Yes	✓	No	
Date of winter infiltration testing	28-11-2019 Start 19-12-2019 27-12-2019 08-01-2020 26-01-2020 15-02-2020 02-03-2020 13-03-2020 11-04-2020 Finish			
Details of the location and depth of the infiltration testing Note 3	Yes	✓	No	
Minimum infiltration rate Note 4	2.77 E -4 m/s			

A series of videos and mobile phone images were captured and some are noted below



The results are also backed up by historic BGS data logs for the area which note that the boreholes taken in 1986 resulted in a dry borehole to a depth of 9.0m. You can see the AOD depth is relative to the site level (See drawing 17-1197-DR 501) AOD 37.10 at the main access gate location.

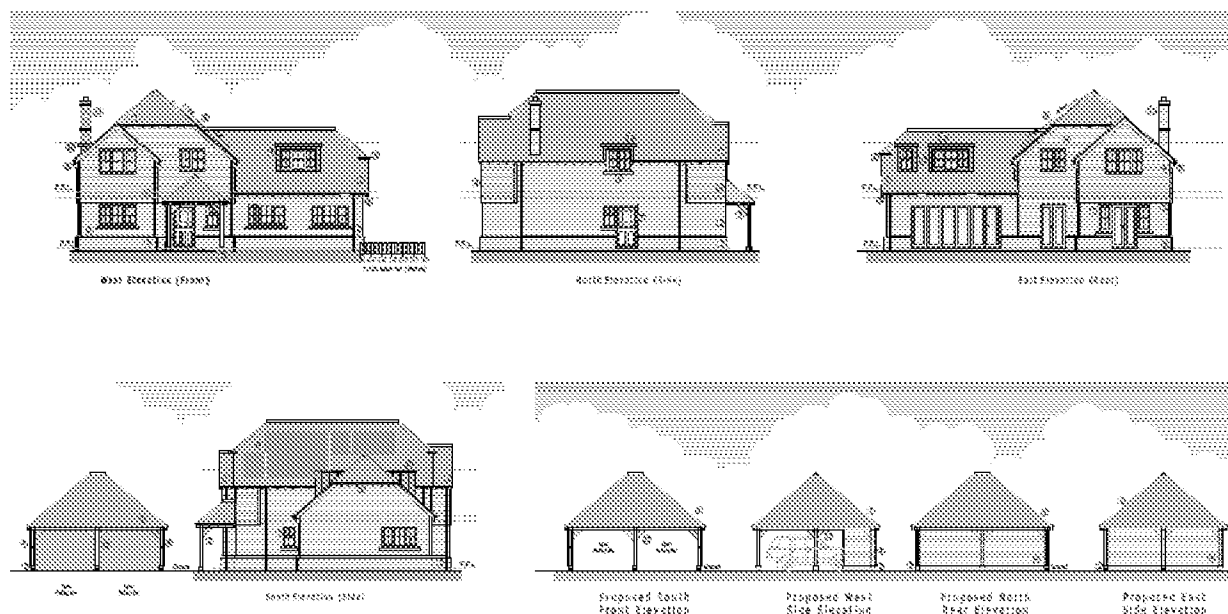
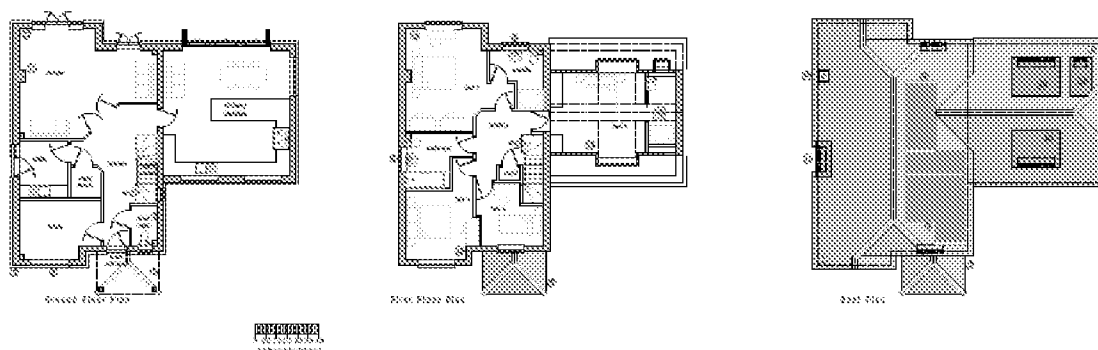
Contract Name		Borehole No.		
FORNELL		2		
Method of boring		Light cable percussion		
Diameter		200mm		
Co-ordinates		494510E 107664N		
Ground level		37.01m O.D.		
Start		2.9.86		
Finish		2.9.86		
SU 90		NW 79		
Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata	Legend
0.20	36.81	0.20	Moist Ground (intermediate material)	
3.80			Brown clayey slightly sandy coarse to fine subangular GRAVEL	
4.00	33.01	0.80	Coarse to fine subangular GRAVEL in a matrix of silty sandy clay	
4.80	32.21	1.30	Brown slightly clayey SAND and coarse to fine subangular GRAVEL	
6.10	30.91	1.30	Fine brown silty CLAY with occasional flints	
7.40	29.61	1.60	CHALK fragments in a matrix of soft remoulded chalk, becomes rubble at depth, over thin clay seams	
9.00	26.01		Bottom of Borehole	
Notes Borehole not - 1 1/2 hours Chiselling used between 0.20 to 4.0m - 2 hours borehole remained dry throughout drilling				
Terresearch Limited		Report No.	A.36/696	Appendix 1 Sheet 2

Contract Name		Borehole No.		
FORNELL		3		
Method of boring		Light cable percussion		
Diameter		200mm		
Co-ordinates		494510E 107664N		
Ground level		37.09m G.D.		
Start		1.9.86		
Finish		3.9.86		
SU 90		NW 80		
Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata	Legend
0.20	36.89	0.20	Moist Ground (intermediate material)	
3.80		1.80	Medium dense brown slightly clayey sandy coarse to fine subangular flint GRAVEL	
4.00	33.09	0.80	Coarse to fine angular FLINTS in a matrix of brown silty clay	
4.80	32.29	1.20	Brown slightly clayey SAND with occasional flints	
6.10	30.99	1.15	Fine brown silty sandy CLAY with bands of sand	
7.25	29.84	1.75	CHALK fragments in a matrix of soft remoulded chalk, becomes rubble at depth, some thin clay seams	
9.00	26.09		Bottom of Borehole	
Notes Borehole not - 1 1/2 hours Chiselling used between 0.20 to 4.0m - 2 hours Chiselling used between 4.00 to 6.0m - 2 hours Borehole remained dry throughout drilling				
Terresearch Limited		Report No. S.36/896		Appendix 1 Sheet 3

Contract Name		FORNELL		Borehole No. 5	
				Sheet 1 of 2	
Method of boring		Light cable percussion		Ground level 36.93m O.D.	
Diameter		200mm		Start 1.9.86.	
Co-ordinates		694510E 107659N		Finish 1.9.86.	
				NW 78	
Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata	Legend	
0.20	36.73	0.20	Moist ground (intermediate material)		
5.30			Brown clayey SAND with coarse to fine subangular flint gravel		
5.70	31.23	2.10	Brown SAND with bands of brown silty clay and traces of gravel and flints		
7.80	29.13	0.20	Fine brown CLAY with bands of sand		
8.00	28.93	0.40	Large FLINTS		
8.40	28.53	1.60	Hard CHALK fragments in a matrix of soft remoulded chalk, occasional flints		
10.00	26.93		Bottom of Borehole		
Notes					
Chiselling from 0.20 to 5.0m - 2 1/2 hours					
Borehole remained dry throughout drilling					
Terresearch Limited		Report No. 8.36/696		Appendix 1 Sheet 5	

Item	Area (Plan). (m2)	Pitch Factor	Area (m2)	Urban Creep (10%) (m2)	Total (m2)
House	134	1.44	193	19	212
Garage	46	1.44	66	7	73
Total	180		259	26	285

The above table tabulates the impermeable roof area and includes 10% Urban Creep and a factor for the roof pitch of 40°. The figure of 285m2 has been used in the soakaway BRE365 spreadsheet to calculate the soakaway required using Wavin Aquacells (see separate sheet). The Wavin Eco AquaCell has been used due to the remote location at the end of the garden (Refer to manufacturers details).

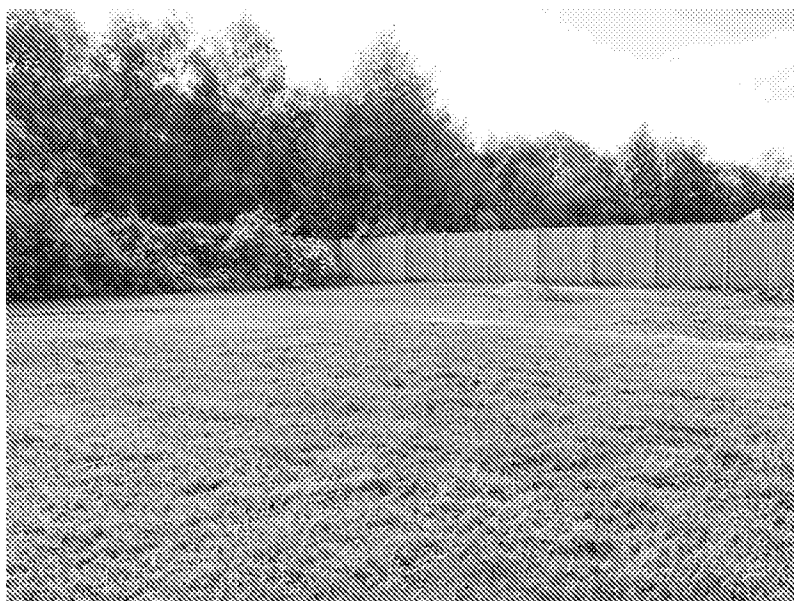


Proposed Images of new Dwelling and detached Garage

It is also proposed to install a rainwater harvester to store and reuse some of the rainfall water. The final harvester is yet to be confirmed, It's size dependant on the final garden planting and the embankment configuration. Prior to the harvester a silt trap is located. It's position will stop the harvester from becoming silted, thus the overflow from the harvester will be desilted water that will flow into the soakaway. The volume of the harvester has not been included within the volume of the soakaway, thus allowing for a

degree of attenuation. This also assists in reducing the amount of surface water discharging back to the soil and assists in reducing the amount of potable water used by each occupant.

The drive is to be of permeable paving and or migrating granular finish, therefore no allowance for this has been included.



View North West of main building area (Former Sundown garden area) Position of house and garage)



Image of initial test taken on site within a 300 x 300 test hole at 800mm depth. This was adopted as the water filtered very quickly.

The average time taken to empty hole was approximately 3 minutes (180 seconds). Filtration was videoed and the water can be seen dispersing very quickly. From previous experience this type of material normally provides a filtration rate “f” in the region of 2.77×10^{-4} m/s. A factor of Safety (FoS) of 2 has been adopted and this results in f being **1.84×10^{-4} m/s**

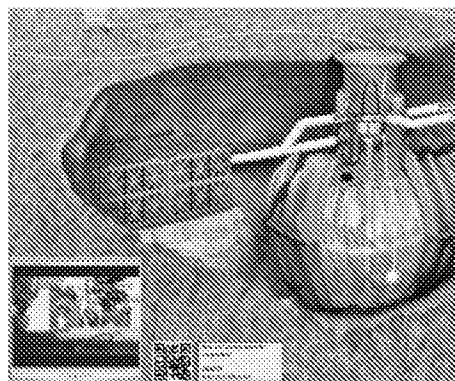
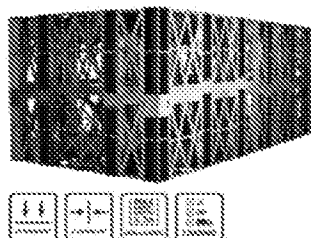
Whilst not a formal BRE365 test it does demonstrate the porosity of the soil and allows for a soakaway design to be carried out. The software is based on the BRE365 design procedure, which normally does not allow for design factors of safety as it's based on test results. The design is then based on a 1:100 yr storm with 40% climate change and 0% with a reduced infiltration rate and includes a 10% urban creep allowance, thus including all the necessary criteria for a sustainable soakaway. Two designs were performed to demonstrate the difference that the FoS makes to the size of the soakaway

AquaCell Eco

Approved for use in residential and commercial applications, the AquaCell Eco is a high quality, lightweight, and durable product designed for use in drainage systems. It is suitable for use in both new and existing drainage systems and is available in a range of sizes and quantities.

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Soakaway Aquacells or equivalent

GRAF Rain Harvester tank

Conclusion

Overall the presented documents provide evidence that condition (no. 3) has been fully considered and complied with, to ensure that surface water is safely dealt with and will not cause issues for adjoining properties and provides for future climate change and additional growth at the property, along with a sustainable reuse of some of the rainfall water from the buildings roof elements.