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Downlands Retail Park Costa

Drainage Strategy further comments

3453-EVE-XX-XX-T-C-0005

Revision A

01/07/25

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Revision	Date	Prepared By	Checked By	Purpose
	01/07/25	PK	PW	Planning update

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1 Introduction

Evolve Consulting Engineers Limited has been appointed by Melford Capital Partners in respect to the proposed development at Downlands Retail Park, Lyons Way, Upper Brighton Road centred at approximate National Grid Reference TQ 15288 05203 (E 515288, N 105203).

The planning application area is approximately 0.118ha and is part of the car parking lot of Downlands Retail Centre.

The proposed development is for the removal of the existing hardstanding comprised of roads and car parking bays

and construction of a Costa Coffee store, external seating area and access roads.

Following comments from received from Adur and Worthing Councils in relation to Condition 12 Surface Water Drainage further infiltration testing was undertaken by Roberts Environmental Ltd on 24th June 2025

Below is a summary of their findings:

1.1 Planning update

Two falling head tests were undertaken in monitoring wells to provide lateral separation of infiltration characteristics.

Initial observations were considered positive for the use of SUDS or soakaways.

Ground conditions as below:

Physical Conditions

A summary of the ground conditions encountered at the site is detailed within the table below.

Note that the table is based on draft investigation logs and may be subject to change:

Table 1: Summary of Ground Conditions

Strata Name	Depth to Top of Stratum (m bcgl)[1]	Depth to Base of Stratum (m bcgl)	Stratum Thickness (m)
Made Ground (Topsoil)*	0.00	0.10	0.10
Made Ground (Hardstanding)	0.00	0.10 – 0.15	0.10 – 0.15
Made Ground (Sub-Base)	0.10 – 0.15	0.30 – 1.20	0.20 – 1.08
Made Ground (Reworked Natural)	0.30 – 1.30	0.80 – 1.50	0.30 – 0.70
Head (Granular)	0.80 – 1.30 *0.10	1.50 – 2.00 *1.40	0.20 – 1.20 *1.30
Head (Cohesive)	1.40 – 2.00	>2.50 - 5.45	>1.10 - 3.95

Falling Head Infiltration Test (FHT) Results

Two FHT's were undertaken in installed monitoring wells WS102 and WS106 to provide lateral separation of infiltration characteristics whilst targeting different response zones and soil compositions. WS102 was installed wholly within granular Head deposits, whilst a deeper response zone targeting cohesive gravelly clay Head deposits was installed within WS106.

Initial observations were considered positive for the use of Sustainable Drainage Systems (SuDS) and / or traditional soakways when also paired with the observed absence of contamination in shallow soils. The contamination status of soils relevant to infiltration potential will be clarified by a Controlled Waters Risk Assessment included in the final Phase II report.

No infiltration rate could be recorded by conventional means as the rate of infiltration was significantly greater than the rate at which water could be introduced to the borehole.

In both locations, water failed to accumulate in the respective wells and infiltrated into natural strata before meaningful depth measurements against time could be undertaken.

Borehole logs for WS102 and WS106 below:

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Dynamic (Windowless) Sampler

WS102
Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
WLS	515270.92	105206.95	17.09	1:50

Project Name	Project No.	Start Date	End Date
Proposed Drive Thru, Downlands Retail Park	250509	2025-06-16	2025-06-16

Client	Consultant	Contractor
Worthing Retail Ltd	Christian Dean	AB Site Investigation Ltd

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
		0.05-0.15	ES		16.94	(0.15) 0.15		MADE GROUND [HARDSTANDING]
		0.30-0.45	ES			(0.30)		*Black Asphalt Hardstanding. (0.00 - 0.15m)*
		0.60-0.70	ES		16.64	0.45		MADE GROUND GRANULAR [SUB-BASE]
		1.00-1.20	D			(0.70)		*Brown sandy angular to subangular fine to coarse GRAVEL. Sand is fine. (0.15 - 0.45m)*
		1.20	SPT(C)	N=9 (3,2/2,2,2,3)	15.94	1.15		MADE GROUND COHESIVE [REWORKED NATURAL]
		1.40-1.60	D			(0.85)		*Brown gravelly CLAY. Gravel is angular to subangular fine to coarse of flint. (0.45 - 1.15m)*
		2.00	SPT	N=22 (3,4/4,5,7,6)	15.09	2.00		Gravelly SAND [HEAD FORMATION]
		3.00	SPT	N=31 (4,8/7,7,7,10)				*Light brown gravelly fine SAND. Gravel is angular to subangular fine to coarse of flint. (1.15 - 2.00m)*
		3.00-3.20	D			(2.10)		Gravelly CLAY [HEAD FORMATION]
		4.00	SPT	N=21 (2,3/4,6,5,6)	12.99	4.10		*Orange gravelly CLAY. Gravel is angular to subangular fine to coarse of flint. (2.00 - 4.10m)*
		5.00	SPT	N=50 for 0mm (12,8/5 for 0mm)		(1.35)		Gravelly CLAY [HEAD FORMATION]
					11.64	5.45		*Brown gravelly CLAY. Gravel is angular to subangular fine to coarse of flint. (4.10 - 5.45m)*
								End of Borehole at 5.45m

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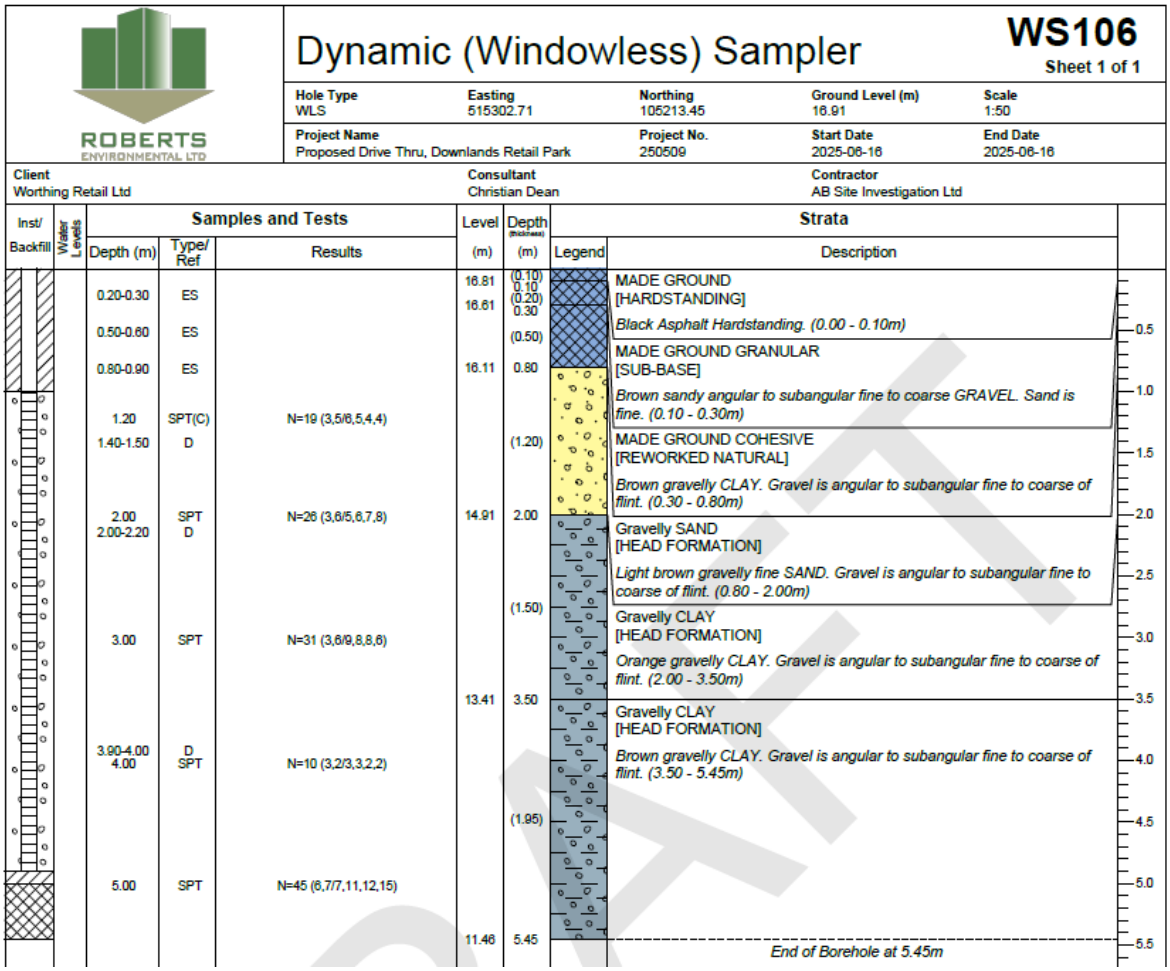

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Dynamic (Windowless) Sampler

WS106
Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
WLS	515302.71	105213.45	16.91	1:50

Project Name	Project No.	Start Date	End Date
Proposed Drive Thru, Downlands Retail Park	250509	2025-06-16	2025-06-16

Client	Consultant	Contractor
Worthing Retail Ltd	Christian Dean	AB Site Investigation Ltd

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
		0.20-0.30	ES		16.81	(0.10) 0.10		MADE GROUND [HARDSTANDING]
					16.61	(0.20) 0.30		*Black Asphalt Hardstanding. (0.00 - 0.10m)*
		0.50-0.60	ES			(0.50)		MADE GROUND GRANULAR [SUB-BASE]
		0.80-0.90	ES		16.11	0.80		*Brown sandy angular to subangular fine to coarse GRAVEL. Sand is fine. (0.10 - 0.30m)*
		1.20	SPT(C)	N=19 (3,5/6,5,4,4)				MADE GROUND COHESIVE [REWORKED NATURAL]
		1.40-1.50	D			(1.20)		*Brown gravelly CLAY. Gravel is angular to subangular fine to coarse of flint. (0.30 - 0.80m)*
		2.00	SPT	N=26 (3,6/5,6,7,8)	14.91	2.00		Gravelly SAND [HEAD FORMATION]
		2.00-2.20	D					*Light brown gravelly fine SAND. Gravel is angular to subangular fine to coarse of flint. (0.80 - 2.00m)*
						(1.50)		Gravelly CLAY [HEAD FORMATION]
		3.00	SPT	N=31 (3,6/9,8,8,6)				*Orange gravelly CLAY. Gravel is angular to subangular fine to coarse of flint. (2.00 - 3.50m)*
					13.41	3.50		Gravelly CLAY [HEAD FORMATION]
		3.90-4.00	D					*Brown gravelly CLAY. Gravel is angular to subangular fine to coarse of flint. (3.50 - 5.45m)*
		4.00	SPT	N=10 (3,2/3,3,2,2)				
						(1.95)		
		5.00	SPT	N=45 (6,7/7,11,12,15)				
					11.46	5.45		End of Borehole at 5.45m

Additional information to be included in final report following lab works and testing.

Evolve Drainage Strategy Doc issued 07/03/25 ref 3453-EVE-XX-XX-T-C-0001 proposes the following:

The proposed drainage strategy is for the use of permeable paving SuDS devices to manage runoff post development.

The external siting area would be provided with typical permeable paving materials (including block pavers, bedding layer and 6-20mm crushed stone sub-base) and the drive thru would be surfaced with traditional asphalt and provided with 6-20mm crushed stone sub-base below for runoff attenuation and infiltration.

Preliminary calculations for the 1 in 100 year + 45%CC design storm event for the respective catchment (0.086ha) and using a volumetric runoff coefficient (Cv) of 1 and assumed infiltration rate of 0.018 m/hr (FoS = 3) at the bottom of the stone sub-base layers, indicates a total runoff attenuation requirement of 69.8m3.

Should the external sitting area be provided with a 0.35m deep sub-base layer, it would provide approximately 24.3m3 of attenuation storage capacity. Similarly, the drive thru road if provided with a 0.4m deep sub-base it would offer 47.5m3 of attenuation storage capacity. The total runoff attenuation capacity of the development would be 71.8m3.

Runoff generated on the commercial roof and tarmacked road areas should be treated by specialist stormwater treatment devices (ie Naylor Smart Sponge) prior to entering the SuDS devices. Runoff generated on the hardstanding areas provided with permeable paving surfacing would be adequately treated, as per the SuDS mitigation index for permeable pavements.

This report demonstrates that the site can be developed in a sustainable manner to manage the surface water discharge from the development.

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