Eckersley O'Callaghan

Supplementary Report to Discharge Condition 9

This report has been prepared in response to a request for further information from the Planning Officer, in order to discharge condition 9. The officer requested the following:

Consideration to the London Plan drainage hierarchy is required including justification for the selected drainage strategy features on the proposed development.

London Plan Drainage Hierarchy –

2. Proposed Discharge Arrangements	2b. Drainage Hierarchy		
		Feasible (Y/N)	*Proposed (Y/N)*
	1 store rainwater for later use	N	N
	2 use infiltration techniques, such as porous surfaces in non-clay areas	N	N
	3 attenuate rainwater in ponds or open water features for gradual release	N	N
	4 attenuate rainwater by storing in tanks or sealed water features for gradual release	N	N
	5 discharge rainwater direct to a watercourse	N	N
	6 discharge rainwater to a surface water sewer/drain	N	N
	7 discharge rainwater to the combined sewer.	Y	Y

1. Store rainwater for later use.
   Conventional roofwater recycling utilises roofwater only as this is a relatively clean, uncontaminated source of water. The proposal does not have a roof as such and is a landscaped area of external paving above the proposed basement. This is has a potential high level of contamination and is and is therefore unsuitable for reuse.
   We suggest the client could install a water butt to provide some additional benefit and watering of the lower terrace.

2. Use infiltration techniques, such as porous surfaces in non-clay areas.
   Site investigation by Soiltechnics identified competent clay material of the Claygate Member throughout the site, therefore infiltration is not a viable means of stormwater management for the site. See Appendix A for extract from the site investigation.

3. Attenuate rainwater in ponds or open water features for gradual release.
   There is a relatively small formal garden area around the existing terrace. The terrace is to be removed and replaced and there is not deemed to be sufficient space to replace the small formal garden with surface attenuation features.

4. Attenuate rainwater by storing in tanks or sealed water features for gradual release.
   An attenuation manhole with a maximum discharge rate of 2l/s has been utilised, see Appendix B. Calculations are as 'SUDS Discharge report_iss1' under planning reference 2021/1003/P.

5. Discharge direct to a watercourse.
   N/A – there are no nearby watercourses.

6. Discharge rainwater to a surface water sewer/drain.
   N/A – there are no nearby surface water sewers.

7. Discharge rainwater to the combined sewer.
   Utilised within design, along with attenuation to flow as 4.

Appendix A – Site Investigation Extract

6 Ground conditions encountered

6.1 Soils

6.1.1 Each exploratory excavation encountered a similar profile of soils considered to be Made Ground overlying Claygate Member.

6.1.2 Brick paving and reinforced concrete and were present at surface in DTS01 and HDTS02/TP02, respectively. Beneath the hardstanding and from surface in the remaining excavations, Made Ground was encountered to depths in the range of 0.4m to 0.7m and locally to 1.9m in TP01. Made Ground comprised dark brown, brown and orange brown slightly clayey to clayey slightly gravelly to gravelly sand. Gravels consisted of brick, sandstone, concrete, gabbro and timber.

6.1.3 The Claygate Member was encountered in the borehole excavations to depths in excess of 4.0m and generally comprised firm orange brown very sandy clay and medium dense very clayey sand.

6.2 Geotechnical parameters

6.2.1 The following table summarises test data in the Made Ground and Claygate Member:

Table summarising soil testing and derived geotechnical parameters

Geotechnical parameter	Geological unit	Method	Value range	Characteristic value	Comments	Notes
Bulk density	Made Ground	Laboratory testing	1.9	1.9	-	1
Dry density	Made Ground	Laboratory testing	1.5	1.5	-	1
Weight density (above water table)	Claygate Member	Soil descriptions – *Medium strength Clay*	16 to 20	16	Derived from BS 8004 figure 1. Most onerous value to be used in structural design	-
Weight density (below water table)	Claygate Member	Soil descriptions – *Medium strength Clay*	16 to 20	16	Derived from BS 8004 figure 2. Most onerous value to be used in structural design	-

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WELL	STRATA: DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND	WATER STRIKES	SPT TESTING: TYPE / DEPTH (m)	SPT TESTING: RESULT	SPT TESTING: CASING DEPTH (m)	SPT TESTING: WATER LEVEL (m)	OTHER IN SITU TESTING: TYPE / DEPTH (m)	OTHER IN SITU TESTING: RESULT	SAMPLING: FROM (m)	SAMPLING: TO (m)	SAMPLING: TYPE
	BRICK PAVING. (MADE GROUND)	0.12	47.62											
	Brown gravelly SAND. Gravel consists of fine to medium sub-angular sandstone and gabbro. (MADE GROUND)	0.40	47.34							PP 0.50	PP=100	0.60		D
	Firm high strength orange brown slightly gravelly very sandy CLAY. Gravel consists of fine to medium sub-rounded flint. (CLAYGATE MEMBER)					C 1.00-1.45	(4) 18		DRY	PP 0.80	PP=125	0.90		D
										PP 1.00	PP=79			
										PP 1.20	PP=108	1.30		D
										PP 1.50	PP=75	1.50		D
	Firm high strength orange brown very sandy CLAY. (CLAYGATE MEMBER)	1.60	46.14									1.60		D
										PP 1.75	PP=100			
	Medium dense orange brown slightly gravelly very clayey SAND. Gravel consists of fine to medium sub-rounded flint. (CLAYGATE MEMBER)	1.90	45.84			C 2.00-2.45	(3) 10		DRY			1.90	3.00	B
	CONTINUED ON NEXT SHEET													

Key

D Small Disturbed Sample
B Bulk Disturbed Sample
ES Environmental Sample
W Water Sample
C Core sample
UT Undisturbed Sample

S Standard Penetration Test
C Standard Penetration Test (solid cone)

PP Pocket Penetrometer test
SV Shear Vane test
PID Photo Ionisation Detector test

Notes

Hand tools used to excavate from 0.0m to 0.4m depth. Borehole sides remained upright and stable upon completion.

Groundwater observations

No groundwater encountered.

Title

Driven tube sampler record

Recovery details		Method	Logged by	Date(s)
Range (m)	Recovery (%)	Driven tube sampler	DN	18/09/2018
0.00 - 1.00	85	**Level (m OD)**	**Compiled by**	**Sheet number**
1.00 - 2.00	100	-	TH	Sheet 1 of 2
2.00 - 3.00	65	**Co-ordinates**	**Checked by**	**DTS01**
3.00 - 4.00	65	-	KB	

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	Medium dense orange brown slightly gravelly very clayey SAND. Gravel consists of fine to medium sub-rounded flint. (CLAYGATE MEMBER)	3.00	44.74			C 3.00-3.45	(2) 6		DRY					
	Soft medium to high strength orange brown very sandy CLAY. (CLAYGATE MEMBER)									PP 3.20	PP=42			
												3.30		D
												3.30		D
	...from 3.7m depth, becoming sandy.									PP 3.70	PP=75			
												3.80		D
	BOREHOLE TERMINATED AT 4.00m	4.00	43.74			C 4.00-4.45	(5) 23		DRY					

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PID Photo Ionisation Detector test

Notes

Hand tools used to excavate from 0.0m to 0.4m depth. Borehole sides remained upright and stable upon completion.

Groundwater observations

No groundwater encountered.

Title

Driven tube sampler record

Recovery details: Range (m)	Recovery (%)
0.00 - 1.00	85
1.00 - 2.00	100
2.00 - 3.00	65
3.00 - 4.00	65

Method Driven tube sampler	**Logged by** DN	**Date(s)** 18/09/2018
Level (m OD) -	**Compiled by** TH	**Sheet number** Sheet 2 of 2
Co-ordinates -	**Checked by** KB	**DTS01**

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	Dark brown slightly clayey slightly gravelly SAND. Gravel consists of fine to coarse sub-angular brick, concrete and sandstone. (MADE GROUND)											0.30		D
	Orange brown slightly gravelly clayey SAND. Gravel consists of fine to medium sub-angular brick and sandstone. (MADE GROUND)	0.40	49.04											
	Soft medium to high strength orange brown very sandy CLAY. (CLAYGATE MEMBER)	0.70	48.74									0.80		D
										PP 1.10	PP=46	1.10		D
										PP 1.30	PP=113			
	Firm to stiff high strength orange brown very sandy CLAY. (CLAYGATE MEMBER)	1.40	48.04									1.60		D
										PP 1.70	PP=125			
										PP 1.90	PP=121	1.90		D
										PP 2.10	PP=100			
												2.30		D
										PP 2.40	PP=100			
	Orange brown very clayey SAND. (CLAYGATE MEMBER)	2.60	46.84							PP 2.60	PP=100	2.60		D
												2.90		D
	CONTINUED ON NEXT SHEET													

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PID Photo Ionisation Detector test

Notes

Hand tools used to excavate from 0.0m to 1.0m depth. Infiltration testing performed. Borehole sides remained upright and stable upon completion.

Groundwater observations

No groundwater encountered.

Title

Driven tube sampler record

Recovery details: Range (m)	Recovery (%)
0.00 - 1.00	100
1.00 - 2.00	100
2.00 - 3.00	100
3.00 - 3.40	100

Method Driven tube sampler	**Logged by** DN	**Date(s)** 18/09/2018
Level (m OD) -	**Compiled by** TH	**Sheet number** Sheet 1 of 2
Co-ordinates -	**Checked by** KB	**HDTS01**

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	Orange brown very clayey SAND. (CLAYGATE MEMBER)													
		3.10	46.34							PP 3.10	PP=88	3.20		D
	Firm high strength orange brown very sandy CLAY. (CLAYGATE MEMBER)									PP 3.35	PP=75			
		3.40	46.04											
	BOREHOLE TERMINATED AT 3.40m													

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Notes

Hand tools used to excavate from 0.0m to 1.0m depth. Infiltration testing performed. Borehole sides remained upright and stable upon completion.

Groundwater observations

No groundwater encountered.

Title

Driven tube sampler record

Recovery details	
Range (m)	Recovery (%)
0.00 - 1.00	100
1.00 - 2.00	100
2.00 - 3.00	100
3.00 - 3.40	100

Method Driven tube sampler	**Logged by** DN	**Date(s)** 18/09/2018
Level (m OD) -	**Compiled by** TH	**Sheet number** Sheet 2 of 2
Co-ordinates -	**Checked by** KB	**HDTS01**

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WELL	STRATA DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND	WATER STRIKES	SPT TESTING TYPE / DEPTH (m)	SPT RESULT	SPT CASING DEPTH (m)	SPT WATER LEVEL (m)	OTHER IN SITU TESTING TYPE / DEPTH (m)	OTHER IN SITU RESULT	SAMPLING FROM (m)	SAMPLING TO (m)	SAMPLING TYPE
	Light grey reinforced CONCRETE comprised of aggregates of flint up to 20mm nominal size. 10mm diameter reinforcement bar located at 0.12m depth. (MADE GROUND)													
	Brown very gravelly SAND with frequent cobbles of sub-angular brick and concrete. Gravel consists of fine to coarse angular concrete and brick. (MADE GROUND)	0.22	47.19									0.40		D
	Firm medium strength orange brown very sandy CLAY. (CLAYGATE MEMBER)	0.70	46.71							PP 0.80	PP=50	0.80		D
	Grey brown clayey SAND. (CLAYGATE MEMBER)	0.90	46.51									1.00		D
	Firm medium strength brown very sandy CLAY. (CLAYGATE MEMBER)	1.10	46.31							PP 1.20	PP=71	1.20 1.20		D D
										PP 1.40	PP=71	1.50		D
										PP 1.80	PP=54	1.80 1.80		D D
	BOREHOLE TERMINATED AT 2.00m	2.00	45.41											

Key

D Small Disturbed Sample
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UT Undisturbed Sample

S Standard Penetration Test
C Standard Penetration Test (solid cone)

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SV Shear Vane test
PID Photo Ionisation Detector test

Notes

Hand tools used to excavate from 0.0m to 0.8m depth. Infiltration testing performed. Borehole sides remained upright and stable upon completion.

Groundwater observations

Groundwater measured at 1.0m on completion.

Title

Driven tube sampler record

Recovery details		Method	Logged by	Date(s)
Range (m)	Recovery (%)	Driven tube sampler	DN	18/09/2018
0.00 - 2.00	100	**Level (m OD)** -	**Compiled by** TH	**Sheet number** Sheet 1 of 1
		Co-ordinates -	**Checked by** KB	**HDTS02**

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Appendix B – Proposed Drainage Layout