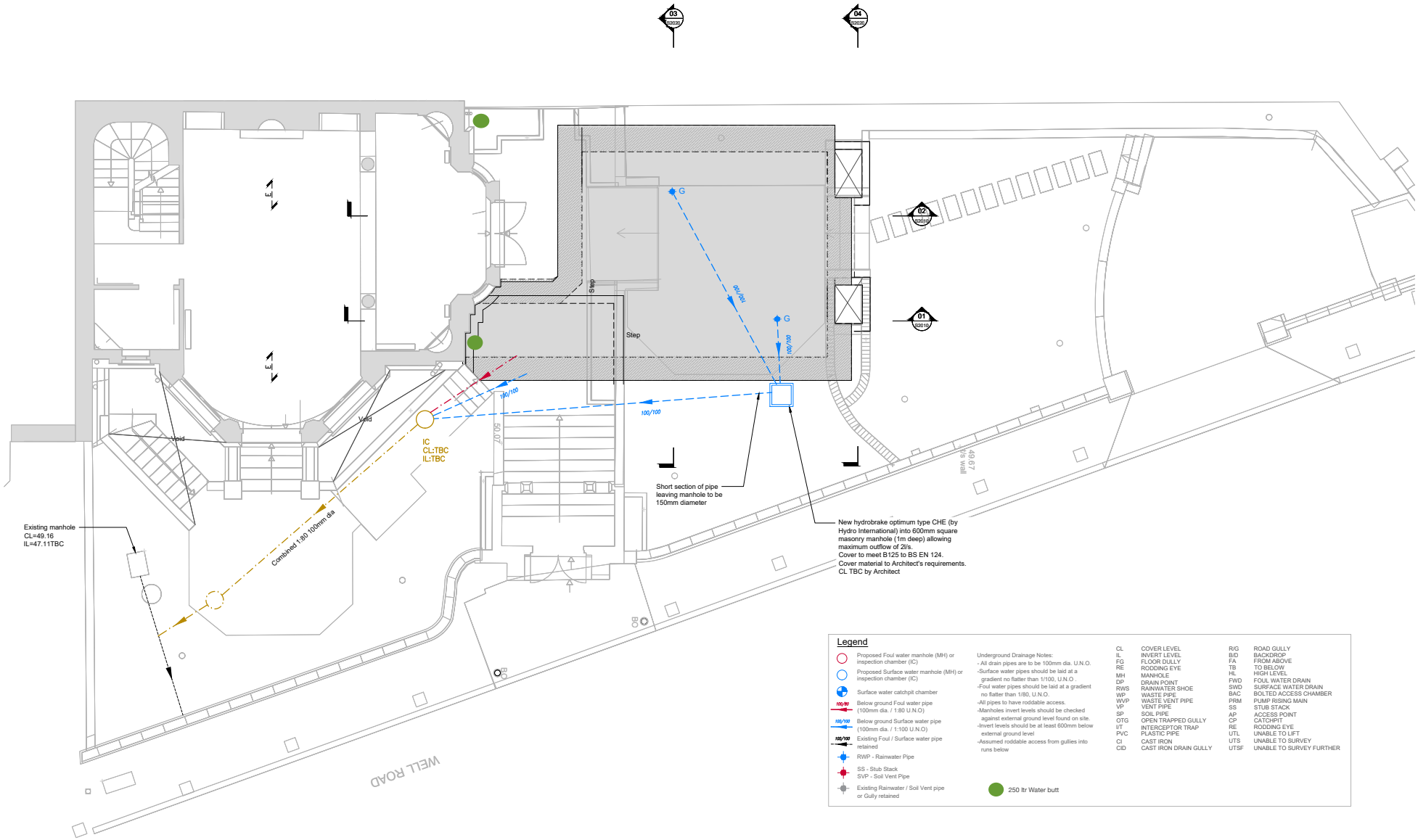
General Notes

1. This drawing is to be read in conjunction with all relevant architects & engineers drawings & specifications.
2. The contractor is to be responsible for all dimensions & for the correct setting out of the works on site.
3. Do not scale from this drawing.
4. Assumed span direction of existing structure shown with 'E' annotation
5. Basement requires internal cavity drained wall construction to comprise delta membrane or similar system routed to sump with positively pumped anti-flood valve system.
6. Insitu concrete walls and floor slab to comprise 'Puldo' or similar warranted waterproof concrete additive



Legend

- Proposed Foul water manhole (MH) or inspection chamber (IC)
- Proposed Surface water manhole (MH) or inspection chamber (IC)
- Surface water catchpit chamber
- 100/90 Below ground Foul water pipe (100mm dia. / 1:80 U.N.O)
- 100/100 Below ground Surface water pipe (100mm dia. / 1:100 U.N.O)
- 100/100 Existing Foul / Surface water pipe retained
- RWP - Rainwater Pipe
- SS - Stub Stack
  SVP - Soil Vent Pipe
- Existing Rainwater / Soil Vent pipe or Gully retained

Underground Drainage Notes:
- All drain pipes are to be 100mm dia. U.N.O.
- Surface water pipes should be laid at a gradient no flatter than 1/100, U.N.O .
- Foul water pipes should be laid at a gradient no flatter than 1/80, U.N.O.
- All pipes to have roddable access.
- Manholes invert levels should be checked against external ground level found on site.
- Invert levels should be at least 600mm below external ground level
- Assumed roddable access from gullies into runs below

250 ltr Water butt

CL	COVER LEVEL	R/G	ROAD GULLY
IL	INVERT LEVEL	B/D	BACKDROP
FG	FLOOR DULLY	FA	FROM ABOVE
RE	RODDING EYE	TB	TO BELOW
MH	MANHOLE	HL	HIGH LEVEL
DP	DRAIN POINT	FWD	FOUL WATER DRAIN
RWS	RAINWATER SHOE	SWD	SURFACE WATER DRAIN
WP	WASTE PIPE	BAC	BOLTED ACCESS CHAMBER
WVP	WASTE VENT PIPE	PRM	PUMP RISING MAIN
VP	VENT PIPE	SS	STUB STACK
SP	SOIL PIPE	AP	ACCESS POINT
OTG	OPEN TRAPPED GULLY	CP	CATCHPIT
I/T	INTERCEPTOR TRAP	RE	RODDING EYE
PVC	PLASTIC PIPE	UTL	UNABLE TO LIFT
CI	CAST IRON	UTS	UNABLE TO SURVEY
CID	CAST IRON DRAIN GULLY	UTSF	UNABLE TO SURVEY FURTHER

DRAWING No 4

Rev	Date	By	Chkd	Description
T1	03/03/21	ASM	SP	Issued for Tender

Eckersley O'Callaghan
London Office 8th Floor, 236 Gray's Inn Rd, London WC1X 8HB
+44 (0) 20 7354 5402 eocengineers.com

Project Title
19 Well Road
London NW3 1LH

Drawing Title
Drainage
Ground Floor Plan

Project Number 18151
Scale 1:50 [A1]

Drawn By ASM
Date Jan/2021

Drawing Suitability D2 - For Tender
Version

Drawing Number WEL-EOC-V1-00-DR-S-5020
Revision T1

Drainage Maintenance Schedule

The below schedule indicates the recommended minimum maintenance requirement to provide a fully functioning drainage system. It is recommended that this schedule is regularly reviewed by the operator and where necessary the actions and frequency are updated to reflect the ongoing operation of the facility.

The property will be under single ownership so there will be no conflict. The homeowner will undertake maintenance where practical and specialist contractors will be used where necessary.

No man entry is permitted into manholes or enclosed spaces unless performed by fully qualified personnel. Main yearly inspection to be undertaken after leaf fall in Autumn.

Approved safety procedures must be followed.

Ref	Maintenance Item	Required Action	Frequency
01	Below Ground Drainage Pipework	All drainage to be fully jetted and inspected for integrity by CCTV survey. Where pipework is damaged or obstructed localised repairs will be needed immediately to ensure operation of drainage systems.	10 yearly As required
02	Manholes	Inspect manholes and for integrity and debris. Remove cover and ensure water is flowing freely and unobstructed. Clean out blockages and repair damage	5 yearly As required
03	Roof Gutters	Visually inspect gutters for leaves and debris. Clearing/jetting of gutters to remove build-up of debris and leaves to prevent carry of material to below ground system. Waste material to be disposed to refuse.	Annually As required
04	External gullies	Inspect surface water gullies and silt traps To be cleaned with vacuum tanker when silt exceeds 50% of catch pit depth	Annually As required
05	Overland flow paths	Inspection of overland flow routes to ensure route not blocked by new structures, furniture, overgrown vegetation, walls or debris. Remove and maintain as necessary	6 Monthly
06	Vortex Flow Control	Remove cover and inspect, ensuring that water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt.	Annually

Ref	Maintenance Item	Required Action	Frequency
07	Pumping Station	Supplier/Specialist to be appointed on maintenance contract to service inspect and maintain pumping stations to ensure they are functioning correctly, and that all alarms and controls are operational. Service provider to be enabled with remote connected communications to provide 24 hour monitoring of alarms. Contract to be a minimum level to ensure any emergency call out is undertaken within 24 hours.	6 Monthly

Record Keeping

To ensure the above maintenance regime is followed the operator will draw up a suitable maintenance schedule for completion by the site operatives and to be signed off by the relevant manager. The schedule will be based on the above table and will include:

- Date of maintenance inspection.
- 'Undertaken By' boxes to confirm inspection items carried out and by whom.
- A comments column to record condition of items inspected and what maintenance actions need to be taken or procedures to be instigated to correct any non-compliance with the operation strategy
- A column for confirming maintenance and/or rectification works have been carried out.
- An overall signature space for sign off by a competent member of the company's management team.

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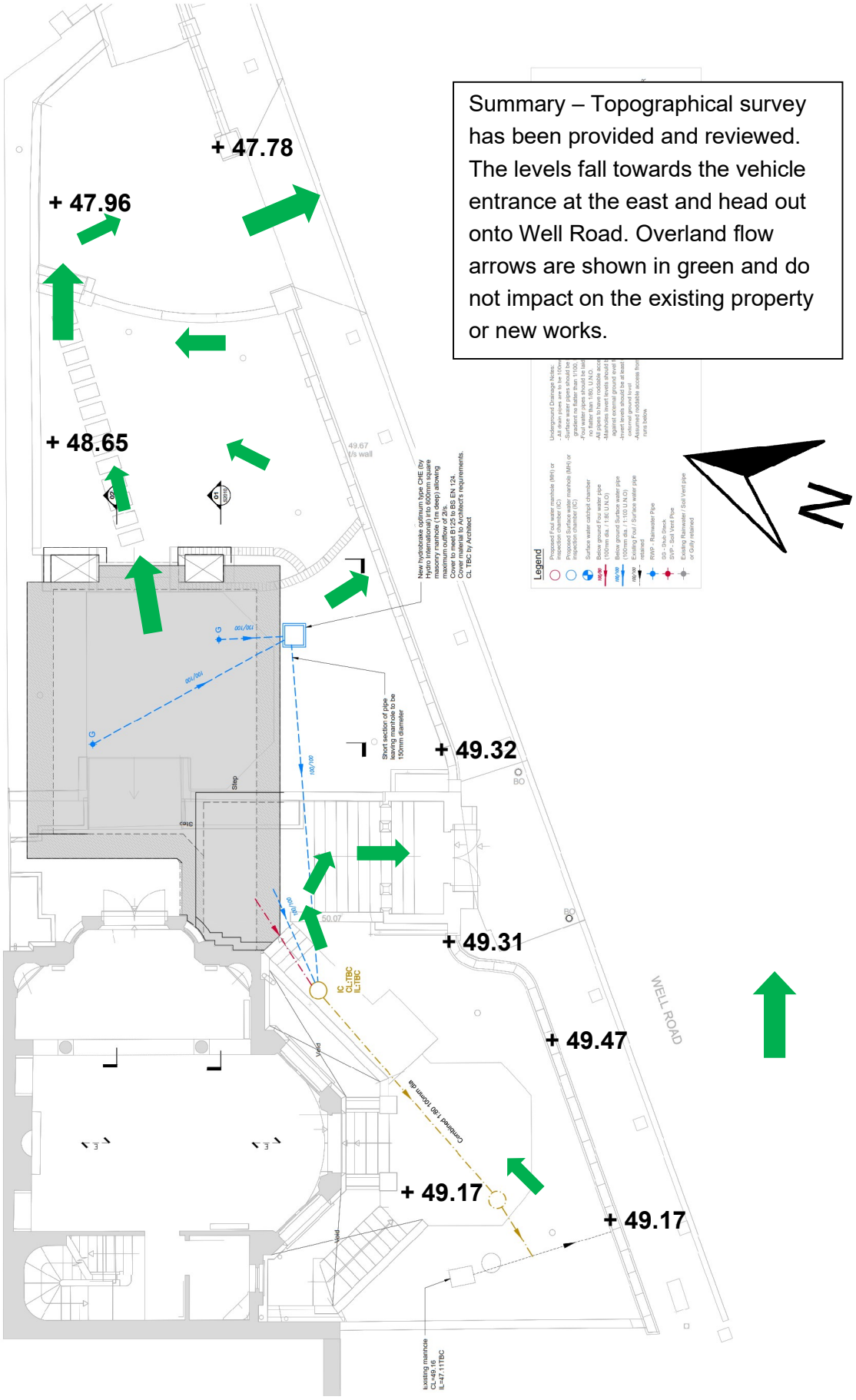
Overland Flood Exceedance Routing Plan



Summary – Topographical survey has been provided and reviewed. The levels fall towards the vehicle entrance at the east and head out onto Well Road. Overland flow arrows are shown in green and do not impact on the existing property or new works.

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
6.2	Groundwater
6.3	Evidence of contamination
6.4	Obstructions and instability
6.5	Existing foundation arrangements

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	-

Proposed redevelopment
19 Well Road, Hampstead

soiltechnics
environmental and geotechnical consultants

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: 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 1 of 2
Co-ordinates -	**Checked by** KB	**DTS01**

Report ref: STQ4531-G01 **Revision:** 0

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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
	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					

Key

D Small Disturbed Sample
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ES Environmental Sample
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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: 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**

Report ref: STQ4531-G01 **Revision:** 0

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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
	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
	CONTINUED ON NEXT SHEET											2.90		D

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 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**

Report ref: STQ4531-G01 **Revision:** 0

Eckersley O'Callaghan

Proposed redevelopment
19 Well Road, Hampstead

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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
	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													

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 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**

Report ref: STQ4531-G01 **Revision:** 0

Eckersley O'Callaghan

Proposed redevelopment
19 Well Road, Hampstead

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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		D
												1.20		D
										PP 1.40	PP=71			
												1.50		D
										PP 1.80	PP=54	1.80		D
												1.80		D
	BOREHOLE TERMINATED AT 2.00m	2.00	45.41											

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 0.8m 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**

Report ref: STQ4531-G01 **Revision:** 0

Eckersley O'Callaghan

Camden

GREATERLONDONAUTHORITY

LoDEG

1. Project & Site Details

Project / Site Name (including sub-catchment / stage / phase where appropriate)	19 Well Road, London NW3 1LH
Address & post code	19 Well Road, London NW3 1LH
OS Grid ref. (Easting, Northing)	E 526694
	N 186185
LPA reference (if applicable)	2021/1003/P
Brief description of proposed work	Extension to existing basement under front garden, including 2x lightwells
Total site Area	54.3 m^2
Total existing impervious area	54.3 m^2
Total proposed impervious area	54.3 m^2
Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	No
Existing drainage connection type and location	Existing combined sewer
Designer Name	Stella Pyrza/Duncan Walters
Designer Position	Project Engineer/Associate Director
Designer Company	Eckersley O'Callaghan

2. Proposed Discharge Arrangements

2a. Infiltration Feasibility

Superficial geology classification	None recorded
Bedrock geology classification	Claygate Member - Clay, Silt and Sand
Site infiltration rate	0 m/s
Depth to groundwater level	1 (perched - see SI) m below ground level
Is infiltration feasible?	No

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

2c. Proposed Discharge Details

Proposed discharge location	Existing Combined Sewer
Has the owner/regulator of the discharge location been consulted?	No

Camden

GREATERLONDONAUTHORITY

LoDEG

3. Drainage Strategy

3a. Discharge Rates & Required Storage

	Greenfield (GF) runoff rate (l/s)	*Existing discharge rate (l/s)*	*Required storage for GF rate (m^3)*	*Proposed discharge rate (l/s)*
Qbar	0.45			
1 in 1	0.38			2
1 in 30	1.04			2
1 in 100	1.44			2
1 in 100 + CC				2
Climate change allowance used		40%		
3b. Principal Method of Flow Control		Hydrobrake		

3c. Proposed SuDS Measures

	Catchment area (m^2)	*Plan area (m^2)*	*Storage vol. (m^3)*
Rainwater harvesting	0		0
Infiltration systems	0		0
Green roofs	0	0	0
Blue roofs	0	0	0
Filter strips	0	0	0
Filter drains	0	0	0
Bioretention / tree pits	0	0	0
Pervious pavements	0	0	0
Swales	0	0	0
Basins/ponds	0	0	0
Attenuation tanks	54.3		0.5
Total	**54.3**	**0**	**0.5**

4. Supporting Information

4a. Discharge & Drainage Strategy	*Page/section of drainage report*
Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Soiltechnics Well Road Report
Drainage hierarchy (2b)	
Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	
Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	19 Well Road Discharge report_iss1
Proposed SuDS measures & specifications (3b)	19 Well Road Discharge report_iss1

4b. Other Supporting Details	*Page/section of drainage report*
Detailed Development Layout	
Detailed drainage design drawings, including exceedance flow routes	1583-Condition Discharge Report
Detailed landscaping plans	
Maintenance strategy	1583-Condition Discharge Report
Demonstration of how the proposed SuDS measures improve:	19 Well Road Discharge report_iss1
a) water quality of the runoff?	
b) biodiversity?	
c) amenity?	

Dear Sofie,

Thank you for your email.

Could you please pass the following comments from our drainage consultant back to your sustainability team:

- Water butts (recommended but no details on proposals)

We have identified that a water butt could be provided within the client ownership, and this would be for irrigation purposes. Whilst this is beneficial if used, it has negligible effect when irrigation is not occurring. So it would only have a storm water reduction effect during peak sunny/dry periods.

It's vital that a water butt is provided in a location to suit the client so it has a chance of being utilised. Furthermore if the client does not irrigate, the installation of a water butt system would be unnecessary with the additional drainage, installation, upkeep and would have potentially a negative environmental impact.

We therefore strongly suggest that a Water Butt must be recommended to the client, any installed if it will be utilised.

- Permeable paving with attenuation under for new terrace area (no evidence of consideration)

The hierarchy list 2b states option 2 as consider porous surfaces over non-clay areas. The paving is over a basement roof slab so this is not acceptable.

We are attenuating so designing to option 4. This could be undertaken by storage in a chamber or beneath paving, but either way its attenuation so both are compliant with Option 4.

The reason porous paving attenuation is not suitable is due to the re-use of the paving tiles and the construction buildup.

1. The terrace is constructed over the basement roof, so construction depth and hence attenuation depth is not sufficient.
2. The existing terrace is partially listed. Consisting of listed encaustic tiles which need to be catalogued, lifted, set aside and re installed to the conservation officers approval. This requires a concrete base, full mortar bed and approved grouting. Therefore this area is not acceptable for a porous paved solution.

I look forward to hearing back from you

Kind regards

Ted

LLFA 1st comments	Response	LLFA 2nd comments
- **Water butts (recommended but no details on proposals)**	We have identified that a water butt could be provided within the client ownership, and this would be for irrigation purposes. Whilst this is beneficial if used, it has negligible effect when irrigation is not occurring. So it would only have a storm water reduction effect during peak sunny/dry periods. It's vital that a water butt is provided in a location to suit the client so it has a chance of being utilised. Furthermore if the client does not irrigate, the installation of a water butt system would be unnecessary with the additional drainage, installation, upkeep and would have potentially a negative environmental impact. We therefore strongly suggest that a Water Butt must be recommended to the client, any installed if it will be utilised.	**Client to install 2 no 250 litre water butts for irrigation purposes/ (see drawing no 4)**
- **Permeable paving with attenuation under for new terrace area (no evidence of consideration)**	The hierarchy list 2b states option 2 as consider porous surfaces over non-clay areas. The paving is over a basement roof slab so this is not acceptable.	The issue is addressed. **Resolved**