

28 Willoughby Road  
London NW3 1SA

Basement Impact Assessment  
Audit

For

London Borough of Camden

Project Number: 12466-67

Revision: F1

June 2017

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### Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	May 2017	Comment	GMcKgk12466-67-050517-28 Willoughby Road-D1.doc	GMcK	GK	GK
F1	June 2017	Planning	GMcKgk12466-67-260617-28 Willoughby Road-F1.doc	GMcK	GK	GK

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### Document Details

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Project Number	12466-67
Project Name	28 Willoughby Road
Planning Reference	2017/1222/P

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## 1.0 NON-TECHNICAL SUMMARY

- 1.1. CampbellReith was instructed by London Borough of Camden, (LBC) to carry out an audit on the Basement Impact Assessment submitted as part of the Planning Submission documentation for 28 Willoughby Road, London NW3 1SA (planning reference 2017/1222/P). The basement is considered to fall within Category A as defined by the Terms of Reference.
- 1.2. The Audit reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development in accordance with LBC's policies and technical procedures.
- 1.3. CampbellReith was able to access LBC's Planning Portal and gain access to the latest revision of submitted documentation and reviewed it against an agreed audit check list.
- 1.4. The proposed development includes lowering of ground level by up to 1m in association with erection of rear extension at ground floor level to partly replace the existing detached garage; erection of replacement roof extension; infill of front entrance canopy and replacement of all uPVC windows with timber framed windows to front and rear of property. The property is not listed but is in the Hampstead Conservation Area.
- 1.5. A BIA prepared by Price & Myers has been provided for review and includes the screening, a record of the ground investigation and a summary of the issues that require scoping. The reviewer's qualifications are in accordance with CPG4 guidelines for land instability and hydrology, but not hydrogeology. However, the assessment made is considered appropriate, considering the limited scope of the proposed development.
- 1.6. Information within the BIA is broadly in line with aspects recommended within LBC guidance. Due to the shallow nature of the proposed development the information presented appears to be sufficient.
- 1.7. No geotechnical investigation into the natural underlying soils has been undertaken. Two foundation inspection pit logs confirm that the depth of the Party Walls on both sides of the property extend deeper than the proposed development and as such land stability issues associated with undermining of the neighbouring properties are considered to be unlikely.
- 1.8. Due to the shallow foundations and the presence of the London Clay beneath the site it is accepted that the proposed development will not impact the wider hydrogeological environment.
- 1.9. The proposed development increases the impermeable area of the site. The drainage assessment has been updated in the revised submissions to attenuate rainfall via a Sedum roof

blanket. This should be fully assessed and implemented in accordance with LBC guidance at detailed design stage.

- 1.10. The proposed development requires the removal of trees from the garden. Prior to construction an assessment for associated issues should be undertaken to confirm the possible effects on the proposed development (ie potential for shrink swell movements) and the designer / contractor should implement appropriate mitigation. It is accepted that this removal will not impact surrounding structures.
- 1.11. It is accepted that there are no land stability impacts caused by slopes.
- 1.12. It is accepted that the proposed development is at a low risk of flooding.
- 1.13. Queries and matters requiring further information or clarification are discussed in Section 4 and summarised in Appendix 2. With the provision of the updated information, the requirements of CPG4 have been met.

## 2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 21st March 2016 to carry out a Category A Audit on the Basement Impact Assessment submitted as part of the Planning Submission documentation for 28 Willoughby Road, London, NW3 1SA, Camden Reference 2017/1222/P.

2.2. The Audit was carried out in accordance with the Terms of Reference set by LBC. It reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development.

2.3. A BIA is required for all planning applications with basements in Camden in general accordance with policies and technical procedures contained within:

- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Planning Guidance (CPG) 4: Basements and Lightwells.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.

2.4. The BIA should demonstrate that schemes:

- a) maintain the structural stability of the building and neighbouring properties;
- b) avoid adversely affecting drainage and run off or causing other damage to the water environment;
- c) avoid cumulative impacts upon structural stability or the water environment in the local area, and;

evaluate the impacts of the proposed basement considering the issues of hydrology, hydrogeology and land stability via the process described by the GSD and to make recommendations for the detailed design.

LBC's Audit Instruction described the planning proposal as: *"Lowering of ground level in association with erection of rear extension at ground floor level to partly replace existing detached garage; erection of replacement roof extension; infill of front entrance canopy and replacement of all uPVC windows with timber framed windows to front and rear of property."*

2.5. CampbellReith accessed LBC's Planning Portal on 10 April 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment – Screening Report – Job Number 25667 dated 17th February 2017 by Price & Myers
  - Design and Access Statement (ref 1601\_DAS) dated February 2016 by AY Architects.
- 2.6. CampbellReith received additional information from Camden Borough Council on 8<sup>th</sup> June 2017 in response to the D1 revision of this audit, as follows:
- Utilities and Topographical Details Plan by Sumo Services Ltd dated 6<sup>th</sup> June 2017.
  - Construction Program by Unknown dated 29<sup>th</sup> May 2017.
  - Existing Drain Survey by G.O Drainage Services Ltd. Dated 1<sup>st</sup> June 2017.
- 2.7. CampbellReith received additional information from AY Architects directly, and forwarded by Camden Borough Council, on 14<sup>th</sup> June 2017 following a telephone conversation with the owner, Mitja Kostamaj, on the 13<sup>th</sup> June 2017; as follows:
- P17 – Proposed Drainage Plan by AY Architects, DWG No. 1601 – P17 dated 14th June 2017.

### 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	The author's qualifications are in accordance with CPG4 guidelines for hydrology and land stability sections but not for the hydrogeology section. However, hydrogeological assessment accepted based on limited scope of development.
Is data required by Cl.233 of the GSD presented?	Yes	
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Temporary works not detailed. However, BIA appropriate to scale of development.
Are suitable plan/maps included?	Yes	
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Is a conceptual model presented?	Yes	There is sufficient information to allow the ground conditions and groundwater profile to be determined

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	N/A	No scoping provided. The Claygate Member is the shallowest strata which still exhibit shrink swell characteristics. A tree removal study appears to have been undertaken but no assessment of heave is provided. It is accepted the impacts (if any) will be limited to the new development and not affect surrounding structures.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	N/A	No scoping provided. However, proposed development is higher than existing foundations and therefore groundwater issues unlikely.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	Impermeable site area will increase. A sedum roof blanket is proposed to mitigate this increase and should be assessed and implemented during detailed design.
Is factual ground investigation data provided?	Yes	Two shallow foundation inspection pits (labelled trial pits) have been conducted within the property terminating 100mm to 400mm below the proposed development depth.
Is monitoring data presented?	N/A	No monitoring has been undertaken which is accepted.
Is the ground investigation informed by a desk study?	No	No desk study has been undertaken.
Has a site walkover been undertaken?	Unknown	No comment is made on site walkover. Appendix B in the BIA includes an annotated site plan with the foundation inspection pit logs but no site reconnaissance appears to have been undertaken.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	The foundation inspection pits confirm the presence of basements to at least the level of the proposed works at both Party Walls.
Is a geotechnical interpretation presented?	No	No geotechnical information is presented.
Does the geotechnical interpretation include information on retaining wall design?	N/A	Not applicable to scope of development.

Item	Yes/No/NA	Comment
Are reports on other investigations required by screening and scoping presented?	No	Assessment of tree removal on potential for shrink swell not included. It is accepted any movement will only affect the proposed development, not surrounding structures. Should be undertaken for detailed design.
Are the baseline conditions described, based on the GSD	Yes	Information on the ground conditions, groundwater and neighbouring foundations are provided.
Do the base line conditions consider adjacent or nearby basements?	Yes	See above.
Is an Impact Assessment provided?	Yes	Although the provided document is a screening report and no scoping or further assessment has been undertaken, comments are made with regard to the potential issues.
Are estimates of ground movement and structural impact presented?	N/A	Accepted that limited scale of development will not impact surrounding structures.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	However, drainage assessment should be provided for the increased impermeable surface area at detailed design. An assessment of the impact of tree removal should be undertaken prior to construction.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	N/A	A sedum roof blanket has been proposed to mitigate the increase in impermeable surface area. The adequacy of this should be confirmed at detailed design. The Party Walls have been identified extending beneath the proposed excavation so mitigation is not required.
Has the need for monitoring during construction been considered?	N/A	
Have the residual (after mitigation) impacts been clearly identified?	Yes	

Item	Yes/No/NA	Comment
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	The influence of tree removal on the proposed development should be considered prior to construction.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Sedum roof blanket to mitigate increased impermeable surface area to be assessed and implemented during detailed design.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	Provided that the foundations are as shallow as indicated.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	N/A	No comment is provided on Burland Scale. However, accepted that the scheme does not undermine other structures.
Are non-technical summaries provided?	No	However, the BIA is written so as to be understandable.

## 4.0 DISCUSSION

- 4.1. A BIA Screening Report has been provided for review. The BIA prepared by Price & Myers includes the screening, a record of a ground investigation (including two foundation inspection pit logs) and a summary of the issues that require scoping. The reviewer's qualifications are in accordance with CPG4 guidelines for land instability and hydrology, but not hydrogeology. However, the assessment made is considered appropriate, considering the limited scope of the proposed development.
- 4.2. The proposed development includes excavations in the living room, garden and garage and construction of a basement level or lowering of the existing ground floor level by 0.8m and 1.0m. The site is not listed but is located within the Hampstead Conservation Area.
- 4.3. An outline construction programme has been provided.
- 4.4. A utilities plan has been provided showing drains along with a condition report for the current drains. No other services are mentioned or shown on the plans.
- 4.5. A site investigation has been undertaken comprising two foundation inspection pits (labelled trial pits) adjacent to the Party Walls to a maximum depth of 1.44m. No geotechnical investigation into the natural underlying soils has been undertaken. The conceptual model is based on BGS boreholes from 270m away. The ground conditions comprise Made Ground underlain by Claygate Member over London Clay (firm to stiff clay). An interpretative geotechnical report is not provided.
- 4.6. It is accepted that there are no land stability impacts caused by slopes.
- 4.7. The Claygate Member is classified as a Secondary A aquifer but the proposed foundations are too shallow to adversely affect the hydrogeology based on the lack of groundwater encountered in the foundation inspection pits and information inferred from the BGS borehole logs.
- 4.8. It is accepted that the site not in a Flood Risk Zone and is at low risk of flooding.
- 4.9. There is inconsistency with the change in impermeable site area due to the proposed development between and within the provided sources. A review of the drawings provided indicates that there will be an impact to surface water drainage and flow. The proposed drainage plan indicates that a Sedum roof blanket is proposed on the new rear to offset the increase in impermeable surface area. The adequacy of this is a solution should be confirmed at detailed design, and should be augmented if required to meet LBC's attenuation requirements.
- 4.10. Based on the depth of the existing, surrounding foundations on either side it is considered that the effect of the proposed development will be negligible and there are no land stability issues.

Consequently the lack of structural calculations and Damage Impact Assessment for the current structure and the Party Walls is acceptable.

- 4.11. Due to the limited scope of development, and on the basis that development will not undermine adjacent structures, the geotechnical assessment is accepted for the purposes of the BIA audit. However, prior to construction the designer / contractor should satisfy themselves that their proposed foundation solution will be adequate, considering both bearing capacity and potential for shrink swell movements.
- 4.12. A geotechnical assessment for the removal of trees in the garden should be undertaken to assess for heave although this is considered to be a localised issue to the proposed development and should not affect the neighbouring properties due to their foundation depths.
- 4.13. Non-technical summaries should be provided within any revisions to the BIA submitted.
- 4.14. Queries and matters requiring further information or clarification are summarised in Appendix 2.

## 5.0 CONCLUSIONS

- 5.1. The qualifications of the BIA authors are not completely in accordance with LBC requirements. However, they are accepted due to the limited scope of development and the correct interpretation of hydrogeological conditions.
- 5.2. The proposed development includes excavations within the property and in the rear garden to a depth of 0.8 and 1.0m. This will not undermine existing foundations to neighbouring structures, which has been confirmed by foundation inspection pits.
- 5.3. Underground utility infrastructure within the zone of influence has been identified.
- 5.4. It is accepted that the proposed development will not impact the wider hydrogeological environment.
- 5.5. The proposed development increases the impermeable area of the site. A sedum roof blanket is proposed to mitigate the increase. This should be confirmed for adequacy during detailed design, augmented if required, and an attenuation scheme implemented that meets LBC's requirements.
- 5.6. The proposed development requires the removal of three trees from the garden. An assessment for shrink/swell and desiccation issues should be undertaken to confirm the possible effects on the proposed development. This should be undertaken at detailed design and does not influence the outcome of the BIA audit process.
- 5.7. It is accepted that there are no land stability impacts caused by slopes.
- 5.8. It is accepted that the site is at low risk of flooding.
- 5.9. Non-technical summaries should be provided within any revisions to the BIA submitted.
- 5.10. Queries and matters requiring further information or clarification are summarised in Appendix 2. With the provision of the updated information, the requirements of CPG4 have been met.

## Appendix 1: Residents' Consultation Comments

None

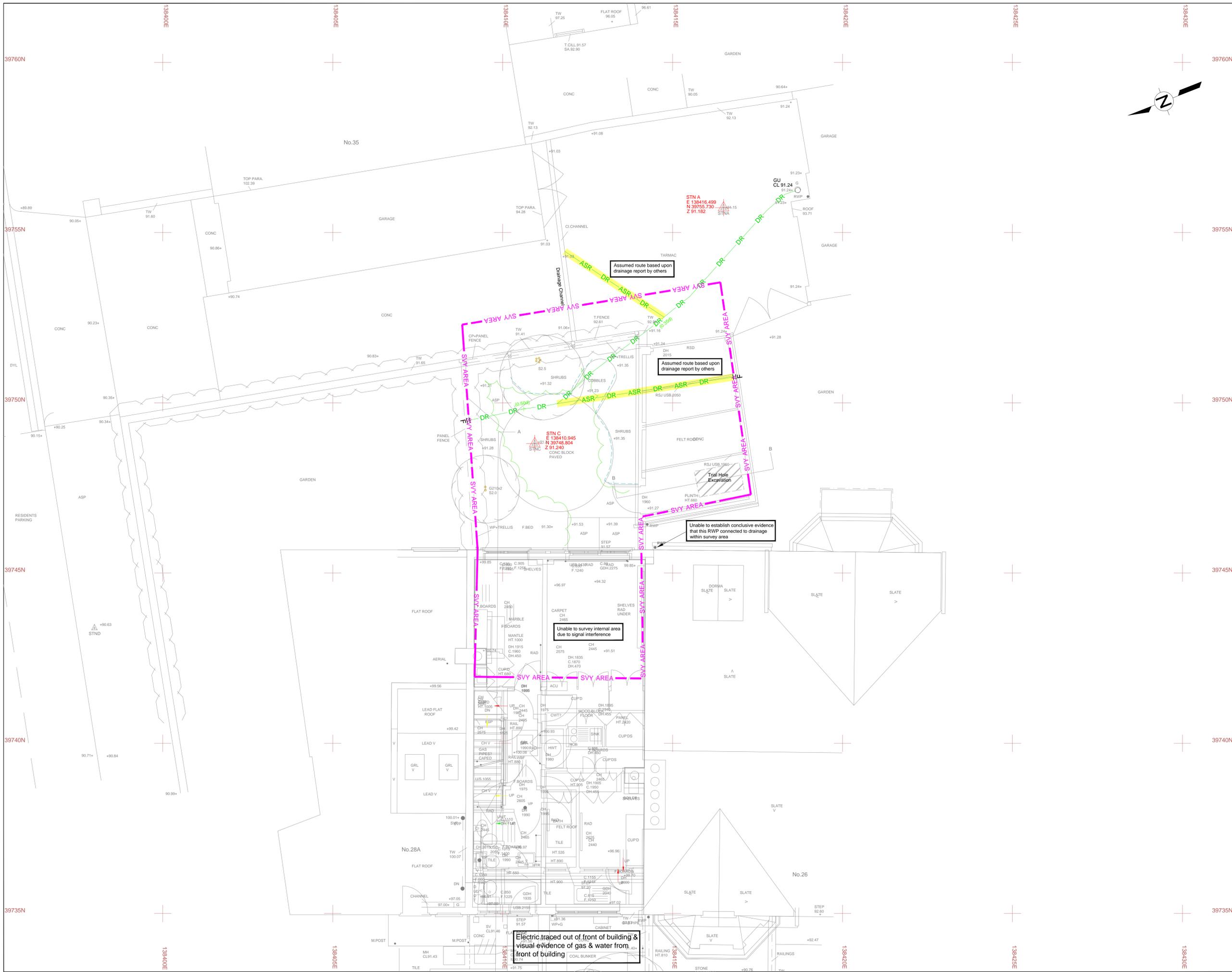
## Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	Underground infrastructure	Closed – underground utility infrastructure information has been provided.	13/6/17
2	BIA	Construction program	Closed – outline construction program has been provided.	13/6/17
3	Hydrology	Change in impermeable site area and assumptions made on drainage design.	A Sedum roof blanket is proposed to offset the increased impermeable surface area and should be implemented at design stage.	June 2017
4	Land Stability	Tree removal effect on proposed development	To be considered at detailed design stage. Accepted this does not impact surrounding structures.	June 2017

### Appendix 3: Supplementary Supporting Documents

Utilities and Topographical Details Plan by Sumo Services Ltd , 6th June 2017  
Construction Program by Unknown, 29th May 2017  
Existing Drain Survey by G.O Drainage Services Ltd, 1st June 2017  
P17 – Proposed Drainage Plan by AY Architects, DWG No. 1601 – P17, 14th  
June 2017.



**LEGEND**

UTILITY LINETYPES	LEGEND	UTILITY LINETYPES
BT	Gas	MSR
Cable Television	Heating Pipes	HP
Closed Circuit Television	HT Cables	MSR
Communications	Multiple Services Route	MSR
Drainage	Drainage	MSR
Drainage - Combined Water	Drainage	MSR
Drainage - Fuel Water	Drainage	MSR
Drainage - Storm Water	Drainage	MSR
Empty Duct	Drainage	MSR
Fire Hydrant Man	Drainage	MSR
Fire Gate	Drainage	MSR
Fuel	Drainage	MSR
Assumed Service Route - See GENERAL NOTES (Using abbreviation of service and colour as above)	Drainage	MSR

**UTILITY SURVEY INFORMATION**

Located by Ground Penetrating Radar	GPR	Unable to Survey	UTS
Area of Concern	ACOC	Unable to Trace	UTL
Contracted Survey Area	CSA	Unable to Trace (due to blockage)	UTB
Previous Survey Area	PSA	Unable to Trace Further	UTF
Depth to Top of Service (metres)	(0.000)	Unable to Trace Further	UTF
		End of Trace	UTL

**ABBREVIATIONS used on a PAS 128 Survey**  
(0.000) = Depth in metres, B2 = Quality Level, P = Post processed GPR

**TOPOGRAPHIC & UTILITY DETAILS**

Barrier (symbol - sized)	Post (symbol)	PO
Belted Beacon (symbol)	Rain Water Pipe (symbol)	RWP
Bolard (symbol)	Road Sign (symbol)	RS
Borehole (symbol)	Road Sign (symbol)	RS
British Telecoms IC	Road Sign (symbol)	RS
Building (incomplete detail)	Road Sign (symbol)	RS
Cable TV Box (symbol)	Road Sign (symbol)	RS
Cable TV Box (symbol)	Road Sign (symbol)	RS
CCTV Camera	Road Sign (symbol)	RS
Control Level in metres	Road Sign (symbol)	RS
Direction of Flow (Drainage)	Road Sign (symbol)	RS
Distribution Board (symbol)	Road Sign (symbol)	RS
Earth Pit (symbol)	Road Sign (symbol)	RS
Electric Cabinet	Road Sign (symbol)	RS
Electric Pole (symbol)	Road Sign (symbol)	RS
Electric Sign (symbol)	Road Sign (symbol)	RS
Enlightenment	Road Sign (symbol)	RS
Feeder Pipe	Road Sign (symbol)	RS
Fire Hydrant	Road Sign (symbol)	RS
Flag Pole (symbol)	Road Sign (symbol)	RS
Flat Roof Level in metres	Road Sign (symbol)	RS
Flood Light (symbol)	Road Sign (symbol)	RS
Gas Valve (symbol)	Road Sign (symbol)	RS
Gas	Road Sign (symbol)	RS
Ground Level in metres	Road Sign (symbol)	RS
Guyley	Road Sign (symbol)	RS
Inspection Cover	Road Sign (symbol)	RS
Invert Level in metres	Road Sign (symbol)	RS
Junction Box - BT	Road Sign (symbol)	RS
Junction Box - Comms	Road Sign (symbol)	RS
Junction Box - Elec	Road Sign (symbol)	RS
Lamp Post (symbol - sized)	Road Sign (symbol)	RS
Light (symbol)	Road Sign (symbol)	RS
Light in ground (symbol)	Road Sign (symbol)	RS
Manhole	Road Sign (symbol)	RS
Manhole Capped Port	Road Sign (symbol)	RS
Manhole Level in metres	Road Sign (symbol)	RS
Pipe Diameter in millimetres	Road Sign (symbol)	RS
Pipe into Ground (symbol)	Road Sign (symbol)	RS

**GENERAL NOTES**

Utilities may continue outside of the survey area. Any point marks outside of the area are for investigative purposes only and may not represent the full extent of the sub-surface utilities.

Only sub-surface utility information is provided. Above ground utility information may be shown where it assists with positional referencing.

Where logic indicates a utility exists but which cannot be positively confirmed with the technology, an assumed route (ASR) is recorded. All Assumed Service Routes (ASR) have been highlighted with a background yellow colour for visual enhancement.

SUMO does not procure statutory or private survey utility information as part of its detection service nor does it record any such information in a utility survey unless otherwise stated. Statutory plans should be consulted to supplement this survey.

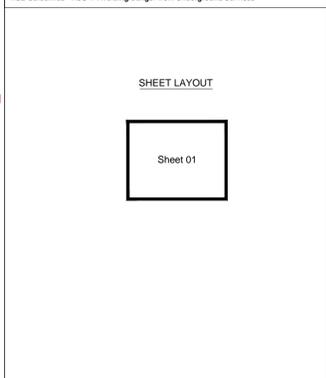
**Vertical & Horizontal Position** - Vertical position (depth) is indicative to the top of the utility feature and is recorded as DTS (depth to top of service) and should not be taken as exact. Where depth information from the technology is unclear, depth is not shown. Drains may have been detected using threading and the depth indicated could be between the top and the bottom of the drain. Horizontal position is indicative to the centre of the utility feature and should not be taken as exact.

**Warranty** - Biodegradable paints are used to mark-out the position of the utilities. Before long point markings may become illegible depending on ground, weather and traffic conditions. No warranty is given in respect of the durability of the paint markings and that they are a complete representation of the sub-surface utilities therefore this drawing should be used as the primary reference for the survey results.

This drawing does not provide an absolute representation of the sub-surface. Utilities have been detected using non-invasive technologies only and the performance can be adversely affected by ground, weather and site conditions outside of SUMO's control therefore some utilities may be undetectable. While SUMO uses reasonable endeavours to detect all utilities it does not warrant that 100% detection will be achieved and that approximate depth penetration of the technologies will be greater than two metres.

Sewer and manhole details shown on this drawing have been obtained by observation and measurement from the surface and as such cannot be guaranteed. Where precise sewer details will be critical to the project design Sumo would recommend that entry into the chamber be undertaken using a specialist team, appropriately qualified for confined space entry. These teams can be supplied on request.

Irrespective of the information provided by a utility survey and statutory plans, excavation work should be undertaken with extreme caution and in accordance with HSE Guidelines - HSG47 Avoiding Danger from Underground Services



Rev	Notes	Drawn	Date

Notes:

Grid Origin and Level Datum are referenced to clients drawing 5240-01-05.dwg which has been inserted into this model for background reference.

**SUMO SERVICES Ltd**  
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**Utilities & Topographical Details**

**Client:** Mitija Kostomaj

**Project:** 28 Willoughby Road, Hampstead, London

**Date Completed:** 6th June 2017    **Post Code:** NW3 1SA

Surveyed:	AP	Scale:	1/50 (A1 Sheet)
Drawn:	MWS		
Checked:	AP		

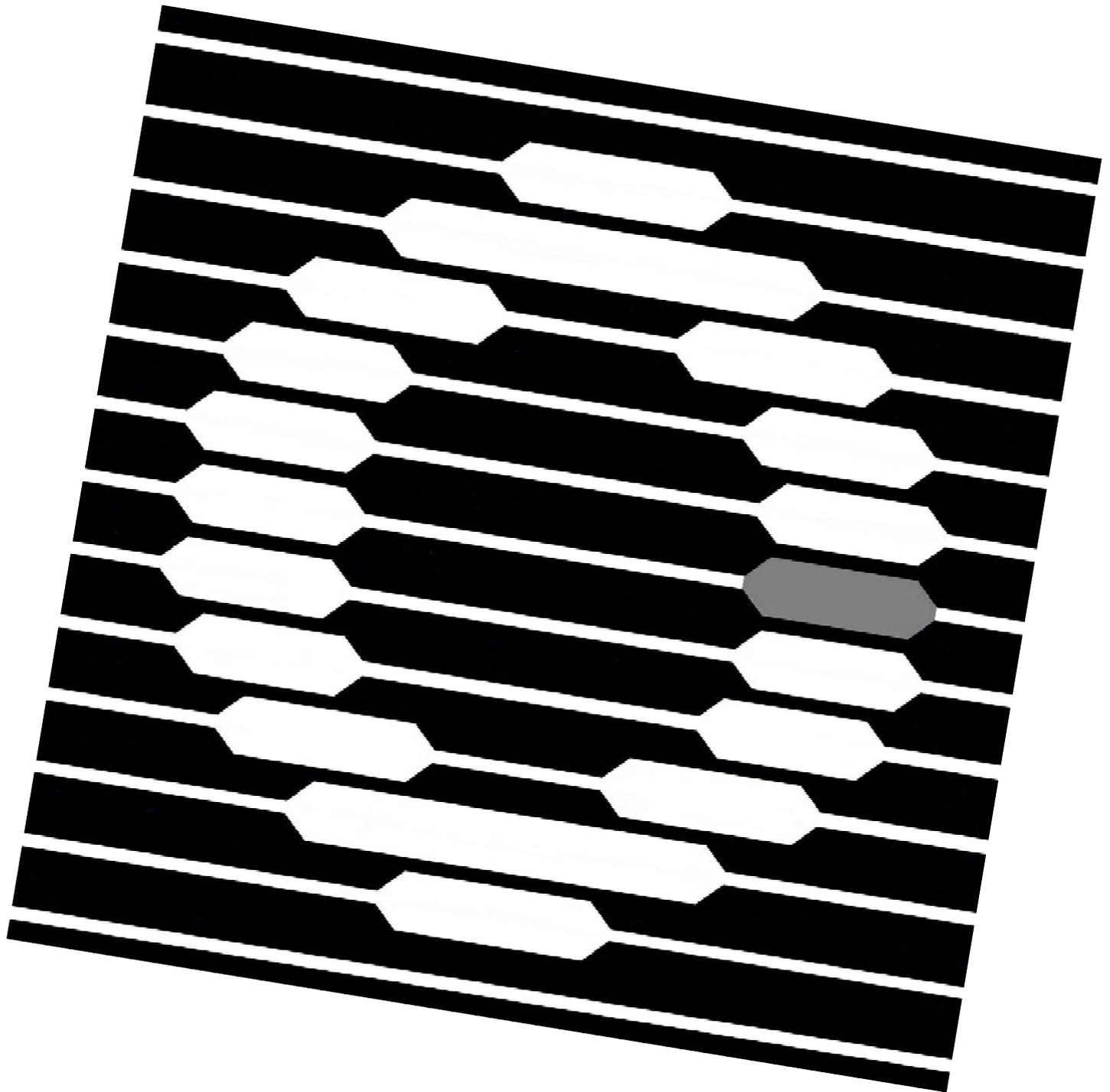
**Dwg No:** Sheet 01    **Job No:** SOR011344    **Rev:**

# CONSTRUCTION PROGRAM

28 Willoghby Road  
London  
NW3 1AS

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
Demolition & Site Clearance / Preparation / Hoarding	X	X	X	X																													
Excavation Work			X	X	X	X																											
Drainage and Laying Mains Supplies - Water / Electrics					X	X																											
Concreting - Foundations/ Subfloor						X	X	X																									
Structure Works - Erecting Steels as per SE Drawings						X	X	X	X	X	X																						
Erections Rear Extension									X	X	X	X																					
New Roof to Rear Extension											X	X	X																				
Resurfacing Roof above Second Floor													X	X																			
Flashings / Water Proofing													X	X																			
Roof Drainage / Guttering													X	X																			
Roof Lights										X				X																			
Sedum Roof																							X	X									
Windows and external doors												X	X																				
First Fix Floors on GF, 1F & 2F														X	X	X																	
Erection of all Internal stud walls on GF, 1F and 2F																X	X																
Installation of all Internal Doors, Skirting, Architraves																X	X	X															
Connection of Water Mains, New Power Supply													X	X																			
Heating / Hot water - First & Second Fix												X	X						X	X				X	X			X					
Electrics - First and Second Fix												X	X						X	X				X	X			X					
Ceilings on GF, 1F and 2F													X	X	X	X																	
Plastering														X	X	X	X																
Bathroom Installation - First & Second Fix															X	X	X		X	X	X												
Kitchen Installation															X	X			X	X													
Painting and Decorating																		X	X	X	X	X	X										
Fittings and Joinery																					X	X	X	X	X					X	X	X	
External Works - Front and Rear																X	X					X	X				X	X	X	X	X		
Project finishing																															X	X	X

# G.O. DRAINAGE SERVICES LTD



**CV.1264 28 WILLOUGHBY ROAD LONDON NW3 1SA**



# G.O. DRAINAGE SERVICES LTD



53 PREMIER AVENUE GRAYS RM16 2SJ TEL:01375 373302 MOB:07792 815977 E-MAIL: godrainage@aol.com

## CCTV SURVEY HEADER SHEET

**CLIENT.** 28 WILLOUGHBY ROAD  
LONDON  
NW3 1SA

**LOCATION.** AS ABOVE

**JOB NO.** CV.1264

**SEWER USE.** COMBINED DRAINAGE

**WEATHER.** DRY

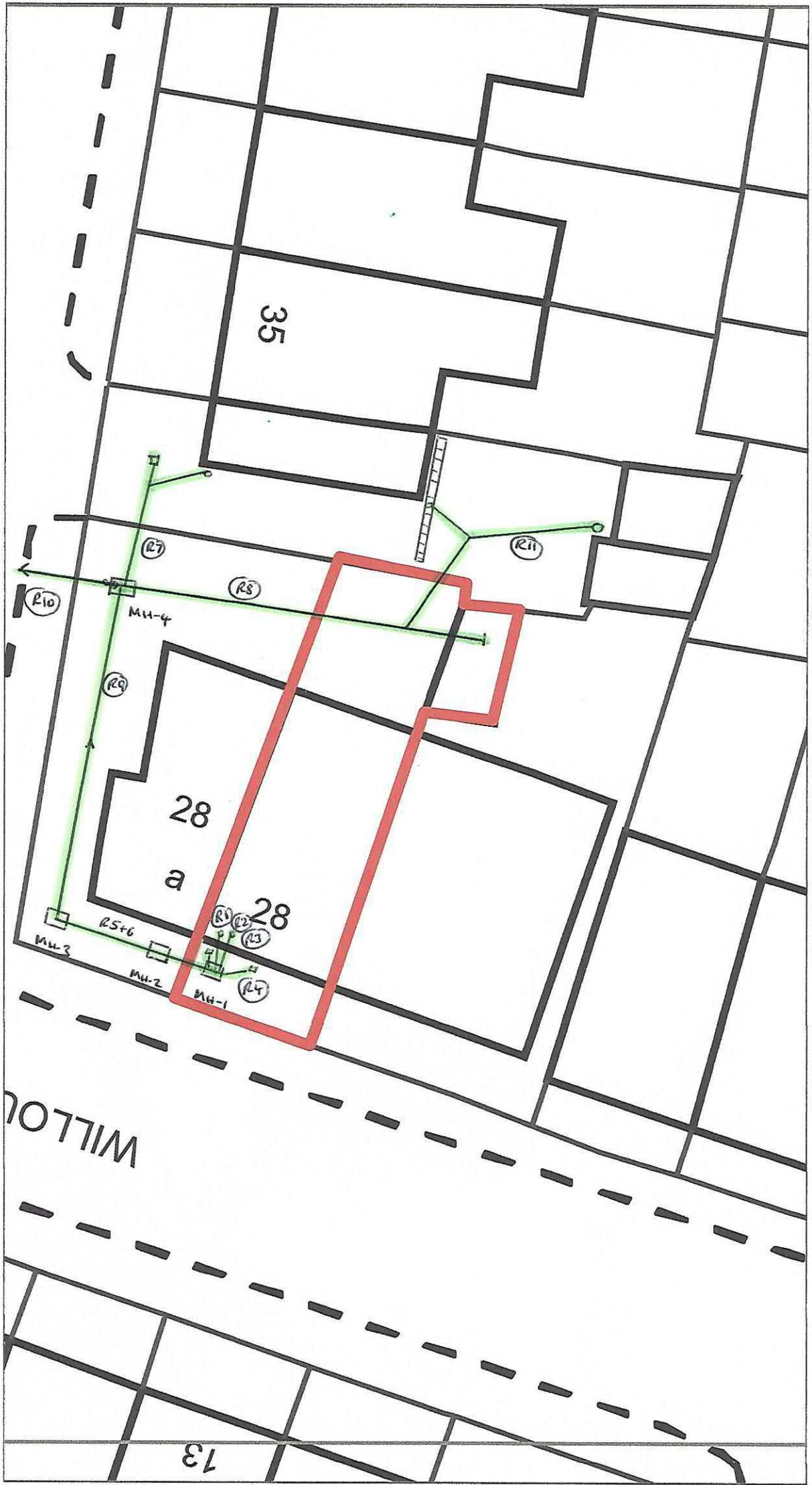
**DATE.** 01/06/17

**OPERATOR.** GO

**CLEANED.** YES

**ORDER NO.** E-MAIL KEREM

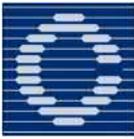
**TOTAL LENGTH SURVEYED.** 56.8 metres






  
 REF.
   
 CLS. 31

WILLOUGHBY ROAD



# G.O. DRAINAGE SERVICES LTD



53 PREMIER AVENUE GRAYS RM16 2SJ TEL:01375 373302 MOB:07792 815977 E-MAIL: godrainage@aol.com

## MANHOLE SURVEY

CLIENT: 28 WILLOUGHBY ROAD LONDON NW3 1SA

LOCATION: 28 WILLOUGHBY ROAD LONDON NW3 1SA

DATE: 01/06/17

JOB: CV.1264

MANHOLE NO.01

COVER 660X510 mm

CHAMBER 610X460mm

C100 VC  
DEPTH 700mm



C100 VC  
DEPTH 710mm

C100 VC  
DEPTH 640mm

MANHOLE NO.02

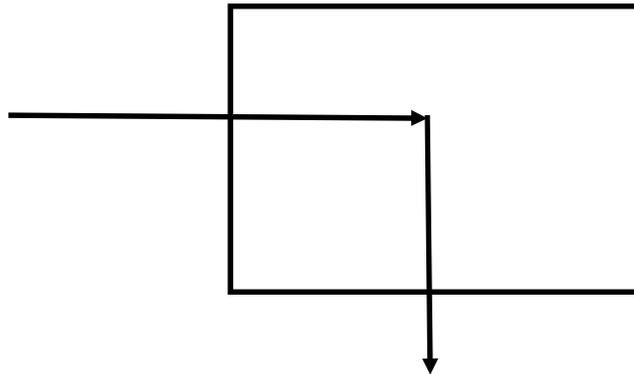
COVER 660X510 mm

CHAMBER 610X460mm



C100 VC  
DEPTH 740mm

MANHOLE NO.03



MANHOLE NO.04

COVER 670X520mm

CHAMBER 800X500mm

C100 VC  
DEPTH 1310mm



C100 VC  
DEPTH 1390mm

C100 VC  
DEPTH 1310mm

C100 VC  
DEPTH 1380mm



# G.O. DRAINAGE SERVICES LTD



53 PREMIER AVENUE GRAYS RM16 2SJ TEL:01375 373302 MOB:07792 815977 E-MAIL: godrainage@aol.com

## INSPECTION REPORT

CLIENT: 28 WILLOUGHBY ROAD LONDON NW3 1SA LOCATION: 28 WILLOUGHBY ROAD LONDON NW3 1SA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.1234	01	01/06/17	COMBINED	640mm	UPSTREAM	100mm	V/CLAY	DRY	YES	GO	1

START	FINISH
ST. MANHOLE No. 01 CONNECTION- 1	FH. GULLY

CHAINAGE	CODE	OBSERVATION
----------	------	-------------



000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.3	LU	LINE OF DRAIN DEVIATES UP ( SHARP )
000.5	LD	LINE OF DRAIN DEVIATES DOWN ( SHARP )
000.5	FH	FINISH OF SURVEY ( GULLY )

**END OF RUN NO.01**

GULLY



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## INSPECTION REPORT

CLIENT. 28 WILLOUGHBY ROAD LONDON NW3 1SA

LOCATION. 28 WILLOUGHBY ROAD LONDON NW3 1SA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.1234	02	01/06/17	COMBINED	640mm	UPSTREAM	100mm	V/CLAY	DRY	YES	GO	1

START	FINISH
ST. MANHOLE No.01	FH. SOIL VENT PIPE

CHAINAGE	CODE	OBSERVATION
----------	------	-------------



000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.3	DEE	ATTACHED DEPOSITS, ENCRUSTATION FROM 03 TO 05 O'CLOCK 05%
001.4	LU	LINE OF DRAIN DEVIATES UP ( SHARP )
001.4	FH	FINISH OF SURVEY ( SOIL VENT PIPE )

**END OF RUN NO.02**

SVP



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## INSPECTION REPORT

CLIENT: 28 WILLOUGHBY ROAD LONDON NW3 1SA LOCATION: 28 WILLOUGHBY ROAD LONDON NW3 1SA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.1234	03	01/06/17	COMBINED	640mm	UPSTREAM	100mm	V/CLAY	DRY	YES	GO	1

START FINISH  
 ST. MANHOLE No. 01 CONNECTION- 3 FH. WC



CHAINAGE	CODE	OBSERVATION
000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
001.2	DEE	ATTACHED DEPOSITS, ENCRUSTATION FROM 05 TO 07 O'CLOCK 05%
00	LU	LINE OF DRAIN DEVIATES UP ( SHARP )
00	FH	FINISH OF SURVEY ( WC )

**END OF RUN NO.03**



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## INSPECTION REPORT

CLIENT: 28 WILLOUGHBY ROAD LONDON NW3 1SA LOCATION: 28 WILLOUGHBY ROAD LONDON NW3 1SA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.1234	04	01/06/17	COMBINED	700mm	UPSTREAM	100mm	V/CLAY	DRY	YES	GO	1

START	FINISH
ST. MANHOLE No. 01 CONNECTION- 34	FH. GULLY

CHAINAGE	CODE	OBSERVATION
----------	------	-------------



000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
001.0	CC	CRACK,CIRCUMFERENTIAL FROM 07 TO 05 O'CLOCK
001.6	LD	LINE OF DRAIN DEVIATES DOWN ( SHARP )
001.6	FH	FINISH OF SURVEY ( GULLY )

**END OF RUN NO.04**

GULLY



# G.O. DRAINAGE SERVICES LTD



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## INSPECTION REPORT

CLIENT. 28 WILLOUGHBY ROAD LONDON NW3 1SA

LOCATION. 28 WILLOUGHBY ROAD LONDON NW3 1SA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.1234	05	01/06/17	COMBINED	710mm	DOWNSTREAM	100mm	V/CLAY	DRY	YES	GO	1

START	FINISH
ST. MANHOLE No. 01 CONNECTION- X	FH. DOWNSTREAM



CHAINAGE	CODE	OBSERVATION
000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.3	RM	ROOTS MASS 90%
000.3	SA	SURVEY ABANDONED DUE TO ABOVE

**END OF RUN NO.05**

D/ST



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## INSPECTION REPORT

CLIENT. 28 WILLOUGHBY ROAD LONDON NW3 1SA

LOCATION. 28 WILLOUGHBY ROAD LONDON NW3 1SA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.1234	06	01/06/17	COMBINED	710mm	DOWNSTREAM	100mm	V/CLAY	DRY	YES	GO	1

START	FINISH
ST. MANHOLE No.01	FH. MANHOLE NO.03



CHAINAGE	CODE	OBSERVATION
000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.4	MH	MANHOLE NO.02
000.8	REM	GENERAL REMARK ( END OF CHAMBER )
000.8	R	ROOTS FINE
004.7	R	ROOTS FINE
005.5	R	ROOTS FINE
005.6	MH	MANHOLE NO.03
005.6	FH	FINISH OF SURVEY

**END OF RUN NO.06**





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## INSPECTION REPORT

CLIENT. 28 WILLOUGHBY ROAD LONDON NW3 1SA

LOCATION. 28 WILLOUGHBY ROAD LONDON NW3 1SA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.1234	07	01/06/17	COMBINED	1310mm	UPSTREAM	100mm	V/CLAY	DRY	YES	GO	1

START	FINISH
ST. MANHOLE No. 04 CONNECTION- 1	FH. GULLY

CHAINAGE	CODE	OBSERVATION
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000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.3	FC	FRACTURE, CIRCUMFERENTIAL FROM 12 TO 12 O'CLOCK
002.2	CM	CRACKS, MULTIPLE FROM 12 TO 12 O'CLOCK
002.9	R	ROOTS FINE
003.7	JN	JUNCTION AT 03 O'CLOCK, DIAMETER 100mm RWP
004.8	LD	LINE OF DRAIN DEVIATES DOWN ( SHARP )
004.8	FH	FINISH OF SURVEY ( GULLY )

**END OF RUN NO.07**

GULLY



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## INSPECTION REPORT

CLIENT: 28 WILLOUGHBY ROAD LONDON NW3 1SA LOCATION: 28 WILLOUGHBY ROAD LONDON NW3 1SA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.1234	08	01/06/17	COMBINED	1380mm	UPSTREAM	100mm	V/CLAY	DRY	YES	GO	1

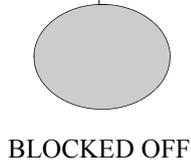
START FINISH  
 ST. MANHOLE No. 04 CONNECTION- 2 FH. BLOCKED OFF

CHAINAGE	CODE	OBSERVATION
----------	------	-------------



000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
010.8	JN	JUNCTION AT 09 O'CLOCK, DIAMETER 100mm GULLYS
015.1	FH	FINISH OF SURVEY

**END OF RUN NO.08**





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## INSPECTION REPORT

CLIENT. 28 WILLOUGHBY ROAD LONDON NW3 1SA

LOCATION. 28 WILLOUGHBY ROAD LONDON NW3 1SA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.1234	09	01/06/17	COMBINED	1310mm	UPSTREAM	100mm	V/CLAY	DRY	YES	GO	1

START FINISH  
 ST. MANHOLE No. 04 CONNECTION- 3 FH. MANHOLE NO.03



CHAINAGE	CODE	OBSERVATION
000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.3	LU	LINE OF DRAIN DEVIATES UP ( SHARP )
000.8	LR	LINE OF DRAIN DEVIATES RIGHT ( SLIGHT )
002.5	CC	CRACK,CIRCUMFERENTIAL FROM 07 TO 01 O'CLOCK
003.2	CC	CRACK,CIRCUMFERENTIAL FROM 12 TO 12 O'CLOCK
011.7	MH	MANHOLE NO.03
011.7	FH	FINISH OF SURVEY

**END OF RUN NO.09**





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## INSPECTION REPORT

CLIENT: 28 WILLOUGHBY ROAD LONDON NW3 1SA LOCATION: 28 WILLOUGHBY ROAD LONDON NW3 1SA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.1234	10	01/06/17	COMBINED	1390mm	DOWNSTREAM	100mm	V/CLAY	DRY	YES	GO	1

START FINISH  
 ST. MANHOLE No. 04 CONNECTION- X FH.MAIN SEWER

CHAINAGE	CODE	OBSERVATION
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### ACCESS 100mm RODDING EYE

000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.4	JN	JUNCTION AT 06 O'CLOCK,DIAMETER 100mm TRAP
006.5	LR	LINE OF DRAIN DEVIATES RIGHT ( SLIGHT )
007.2	FH	FINISH OF SURVEY ( MAIN SEWER )

**END OF RUN NO.10**

MAIN SEWER



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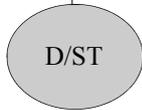
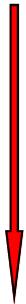
## INSPECTION REPORT

CLIENT. 28 WILLOUGHBY ROAD LONDON NW3 1SA

LOCATION. 28 WILLOUGHBY ROAD LONDON NW3 1SA

JOB NO.	RUN NUMBER	DATE	SEWER USE	DEPTH	DIRECTION	PIPE SIZE	MATERIAL	WEATHER	CLEANED	OPERATOR	PAGE
CV.1234	11	01/06/17	COMBINED	N/A	DOWNSTREAM	100mm	V/CLAY	DRY	YES	GO	1

START	FINISH
ST. GULLY No. 1 CONNECTION- X	FH. DOWNSTREAM



CHAINAGE	CODE	OBSERVATION
000.0	ST	START OF SURVEY
000.0	WL	WATER LEVEL 05%
000.3	LL	LINE OF DRAIN DEVIATES LEFT ( SLIGHT )
003.5	LR	LINE OF DRAIN DEVIATES RIGHT ( SLIGHT )
003.7	JN	JUNCTION AT 09 O'CLOCK, DIAMETER 100mm STRIP GULLY
003.9	OJS	OPEN JOINT SLIGHT
007.2	FH	FINISH OF SURVEY ( JUNCTION WITH SEWER )

**END OF RUN NO.11**

D/ST



## SUMMARY AND RECOMMENDATIONS

CLIENT. 28 WILLOUGHBY ROAD LONDON NW3 1SA	LOCATION. 28 WILLOUGHBY ROAD LONDON NW3 1SA
DATE 01/06/17	JOB. CV.1264

**RUN NO.01 NO WORK NEEDED**

**RUN NO.02 NO WORK NEEDED**

**RUN NO.03 NO WORK NEEDED**

**RUN NO.04 CRACK**

**RUN NO.05 ROOTS**

**RUN NO.06 ROOTS**

**RUN NO.07 ROOTS CRACKS FRACTURE**

**RUN NO.08 NO WORK NEEDED**

**RUN NO.09 CRACK**

**RUN NO.10 NO WORK NEEDED**

**RUN NO.11 NO WORK NEEDED**

**DRAIN & PIPEWORK CCTV  
SURVEYS**

-

**DRAINS  
PIPEWORK  
CULVERTS  
  
DUCTS  
CHUTES  
CHIMNEY FLUES  
  
TANKS**

**HIGH PRESSURE  
WATER JETTING**

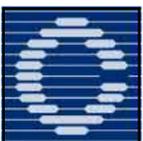
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**SEWER & DRAIN BLOCKAGES  
DESCALING  
SILT REMOVAL  
ROOT CUTTING  
GREASE REMOVAL**

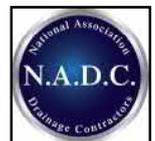
**REMEDIAL WORKS**

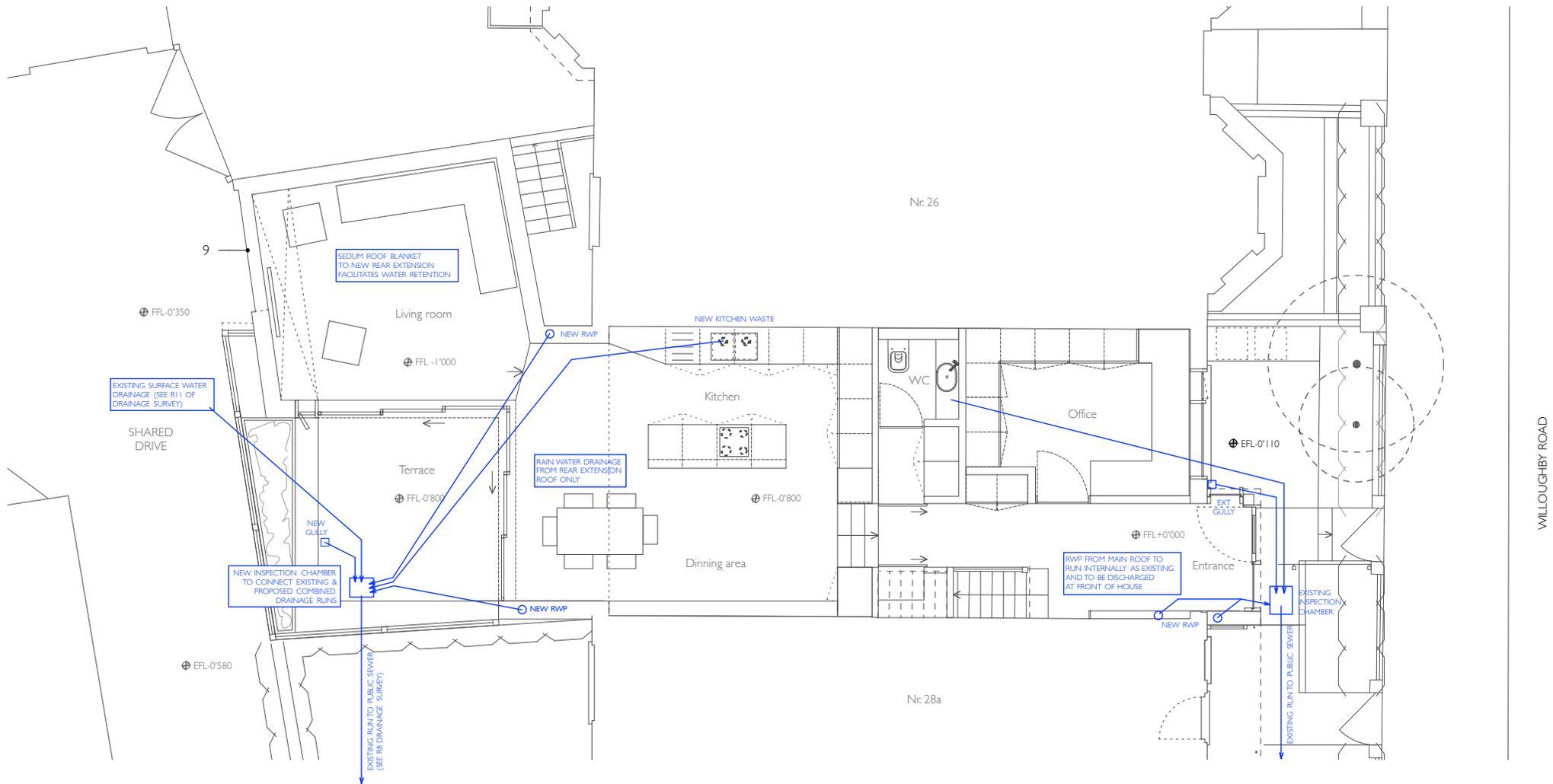
-

**POLYESTER RESIN LINING  
DRAINAGE EXCAVATIONS & REPAIRS**



**G.O. DRAINAGE SERVICES LTD**





GROUND FLOOR - DRAINAGE PLAN



REV DATE BY

**P17 - PROPOSED DRAINAGE PLAN**

DWG NO : 1601 - P17  
 REV : -  
 SCALE : 1:100MM  
 STATUS : PLANNING  
 DATE : 14.06.17  
 BY : AB

USE FIGURED DIMENSIONS ONLY  
 DO NOT SCALE OFF DRAWINGS  
 CHECK DIMENSIONS ON SITE  
 NOTIFY ARCHITECT OF DISCREPANCIES  
 REVISIONS TO APPROVED DESIGN SUBJECT TO LISTED BUILDING CONSENT  
 COPYRIGHT: AY ARCHITECTS

1601- 28 Willoughby Rd

**AY Architects**  
 Studio 23, 25-27 Bickerton Road, London N19 5JT, UK  
 [t] +44(0)20 7272 8899 [e] info@ayarchitects.com

FINAL DRAINAGE LAYOUT TO BE CONTRACTOR'S DESIGN

---

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