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VESTA STRUCTURES

Basement Impact Assessment

69 Grove Avenue, N10 2AL

Prepared by Kanna Selvalingam

5 April 2024

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NOTE: This document is to be read with all other relevant planning documents.

Reviewed and approved by:

Martin Lambert BEng (Hons) CEng MICE
Civil Engineering Consultant

EXECUTIVE SUMMARY

This is a Basement Impact Assessment for the proposed works to the above-named property and has been written in compliance with 'Draft Basement Development Guidance Note' and such that the proposed works have been *"designed to safeguard the structural stability of the existing building, nearby buildings and other infrastructure including London Underground tunnels and the highway".*

This report considers the existing construction and ground conditions, a possible sequence of construction, and the impacts on surrounding structures. To demonstrate the feasibility of the proposed subterranean development, supplementary calculations and drawings have also been provided.

EXISTING CONSTRUCTION AND GROUND CONDITIONS

1. The property comprises a terraced property of inter-war construction, with traditional solid load-bearing masonry construction, providing accommodation on the ground, and first, and loft. The elevations are a combination of painted render and fair-faced brickwork with traditional sliding UPVC encased windows. The property includes small front garden and a large rear garden bounded by both neighbouring properties.

2. There are no significant trees within the boundary or in close proximity to the property.

3. The proposed works are to excavate and create a basement within the footprint of the existing property and to a depth of approximately 2500mm BGL. The proposed works will require underpinning of the perimeter walls. In addition to this, a ground floor rear extension is also proposed. The extension is to be full width and extending 6.0m from the rear original elevation of the property.

4. The property shares party walls with No.67 and No.71 Grove Avenue. It is understood that neither neighbouring property to No.69 have a basement at the time of writing.

5. A geotechnical investigation including a boreholes and interpretive report was prepared (dated December 2023), full details in Appendix C.

    a. The strata below the property is made ground between 0 and 0.3 mbgl and stiff silty Clay below that up to 5.0 mbgl. Therefore, all of the substructure will bear onto the stiff silty Clay, with a design maximum allowable bearing pressure of 150 kN/m^2 as a conservative value due to the assumption that groundwater might be present.

    b. The SPT value were recorded at 8-11 at formation level whilst the value was recorded to be 17 at the base of the borehole log

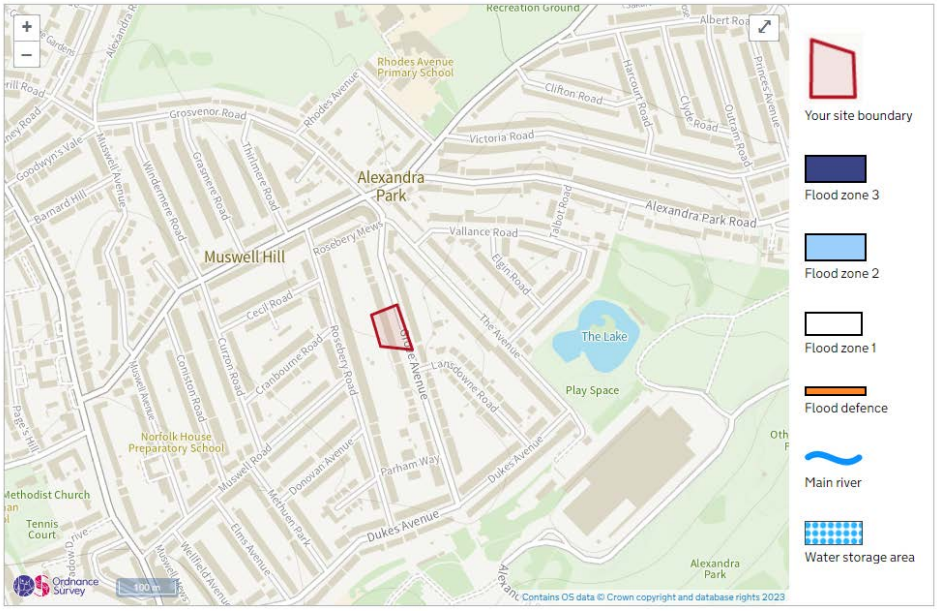
    c. Ground water was not struck during the borehole test. For conservative reasons the substructure should still be designed as a fully sealed structure in accordance with BS 8007 to inhibit any groundwater ingress.

6. A walk round and visual inspection of the property was undertaken. The property shows no significant signs of movement. The property is visually in good condition throughout.

7. The closest tube line is approximately 1370m north-east of the property. The tube line runs north-west to south-east and is approximately 1450m away at its closest point.

8. 69 Grove Avenue is estimated to date from the early-1900s. Through the 19th and 20th centuries a number of changes have been made to the surrounding area, including this property. This includes a ground floor rear extension and internal alterations at loft level.

9. Drainage and Flooding
   a) The property is situated in an area with a chance of flooding less than 0.1 percent a year (Flood Zone 1). No flood defences are required on site. A review of the Flood Maps suggests the property is at *very low risk* of both surface and river flooding



   b) The proposals will be subject to a CCTV drainage survey which will establish the locations, condition, levels and sizes of the existing onsite surface and foul water drainage systems. The findings of the survey can be reviewed in full within Appendix C

   c) Foul waste will be pumped from lower ground floor level to ground level with a sump pump to an inspection chamber, depressurised, and then run under gravity to an existing manhole to join the existing sewer.

   d) The substructure design will include groundwater drainage systems to prevent groundwater backing up around the development and adjacent properties. This could take the form of a free draining granular material beneath the slab. Therefore, local groundwater flooding will not be exacerbated by the development.

   e) To our knowledge, there are no shared utilities running through or underneath the property.

SEQUENCE OF WORKS

Reinforced Concrete Retaining Wall Construction

1. The ground under the property will be excavated and the ground internally battered back. To ensure that the load transfer from any wall into the ground does not change during the construction, the ground will be battered back at a minimum of 45° from the horizontal plane.

2. The underpins will be in the form of reinforced concrete 1.0m wide bays. The stem is to be suitably reinforced with high yield steel bars to resist the lateral forces imposed on the wall.

3. The rest of the retaining walls will be in the form of L-shaped reinforced concrete 1.0m wide bays with the stem to provide restraint against lateral loading.

4. Throughout the underpinning process the ground conditions will be continuously assessed by a competent person to determine the means and method of supporting any face of temporary excavation. Battering back, stepping and benching will all be used to ensure that the ground is stable. Where this is not possible due to site restraints the introduction of sacrificial plywood sheets supported by Acrow props will be used to retain the ground.

5. The sequence of the underpinning is to be confirmed by the contractor although possible sequencing will be given as part of the structural drawings. The sequencing will be such that any underpin will be completed, dry packed and a minimum period of 48 hours lapsed before adjacent excavation works are undertaken.

6. The walls have sections excavated in a “hit and miss” sequence to a founding depth below the existing foundation. The toe then the stem will be cast in a two-stage sequence with reinforcement lapped up in the toe to ensure that both elements are tied in together. Horizontal steel dowels are to be cast into the toe and stem and left a minimum 400mm proud to tie adjacent pins together.

7. The maximum width of any pin is to be 1.0m to minimise the risk of undermining the structure over. This method is carried out until all of the walls have been underpinned.

8. Drawing 1221 – 100 and 101 shows a plan of the basement floor and gives the likely underpinning sequence to be carried out by the contractor. Drawing 1221 – 102 shows a typical sections around the perimeter of the basement whilst drawing 1221 – 101 gives a possible sequence in which the underpins can be excavated and constructed.

IMPACTS ON SURROUNDING STRUCTURES

1. The proposed method of construction is well tested and is considered to be of low technology. The contractor undertaking the works will have suitable experience and all necessary insurances and will follow current standards and good building guides.

2. Providing the works are carried out correctly, movement to the existing building and to all surrounding structures should be no greater than described as 'very slight' under CIRIA C580 Category 1. Procedures, should any movement occur, will be covered by party wall agreements between the relevant parties.

3. No visible change to the adjacent pavement or road is expected. Given the founding depth and bearing strata anticipated, any settlement would be considered immediate and no long-term movement is expected.

UNDERPINNING SPECIFICATION

1. The underpinning legs are to be constructed in the stages indicated on the drawing. Should the contractor wish to undertake the works in different stages this must be agreed with the Structural Engineer prior to undertaking the works.

2. The excavation works are to be undertaken carefully so that the existing footings are not disturbed. Excavations are to be temporarily supported as necessary.

3. When excavating for an underpinning leg, if any deviation is found in the nature of the bearing strata, or if obstacles or obstructions are encountered, the facts are to be reported to the Engineer.

4. All underpinning legs should have keys formed in them for bonding into succeeding legs as indicated on the Engineer's drawing.

5. A minimum of 48 hours after concreting a leg of underpinning, the footings above may be pinned up.

6. The pinning concrete is to be driven into place using a handheld hammer and a 75 mm square hardwood drift against a substantial timber, secured on far side of footing.

7. Concreting and pinning-up must be completed before starting to excavate the next section of underpinning in the sequence.

8. Underpinning legs should preferably be concreted on the same day as they are excavated. If it is necessary to leave them open overnight temporary works and timbering are to be used to ensure that all is secure. On no account are underpinning legs to be left open over the weekend.

9. Pinning concrete shall be approximately 75 mm thick pea-shingle concrete 1:1:5:3 mixing using 5 mm - 10 mm coarse aggregate and "Cebex 100" expanding admixture by Messrs Fosroc UK Ltd in accordance with their instructions.

10. The water content in the pinning concrete is to be the minimum necessary to ensure hydration of the cement and the consistency should be such that the wetted mix will just bind under strong hand pressure.

11. Materials and Workmanship are to comply with BS 8110.

12. Concrete for reinforced concrete structures, including ground bearing slabs, is to be designated mix RC35 to BS 5328, unless noted otherwise on the drawings.

13. Ready mix concrete is to be used unless otherwise allowed by the Structural Engineer. This must be obtained from a plant which holds a current Certificate of Accreditation under the Quality Scheme for Ready Mix Concrete. Details of cement type, aggregate grading and sources, with chloride and sulphate content of mixes to be submitted to the Structural Engineer for their approval prior to ordering any concrete.

14. Concrete is not to be placed when the ambient air temperature is less than 5°C.

CONTROL OF NOISE, DUST AND VIBRATION

1. In compliance with criterion (l) of Policy CL7; the mitigation of noise, vibration, and dust has been considered to ensure they are '*kept to acceptable levels for the duration of the works'*. Criterion (l) is concerned with the demolition, excavation and construction process, and in part with the movement of vehicles on and off the site, however this will be covered in far greater depth in the Construction Traffic Management Plan (CTMP).

2. The primary receptors have been identified as the immediate neighbours. There is also potential for local residents and pedestrians to be affected by the proposed works. The site is in a residential area, existing ambient noise and vibration levels are considered to be relatively low.

3. A 'Prior Consent' for construction works will be applied for through Section 61 of Control of Pollution Act 1974 before works commence. The result of which will be to agree and confirm working methods; noise levels and noise mitigation methods; start and projected end date of works; and community liaison and communications.

Noise and Vibration

1. Works will be carried out according to a stated schedule, production of which is the responsibility of the contractor, and conducted between the hours of 8am and 6pm Monday to Friday and 8am to 1pm on Saturdays, or as agreed with Haringey Council.

2. Contractor will develop a Liaison and Consultation Strategy involving the following:
3. Identifying all stakeholders, and consulting with them **before** commencing works.

4. Maintaining a dialogue and information exchange with all interested parties throughout the proposed works.

5. Responding to complaints and resolving where practical.

6. Ensuring neighbours and interested parties are kept informed of works as they progress and are consulted where necessary.

7. Noise will be kept within the legal limits as defined in the Environmental Protection Act 1990.

8. All works will be carried out in accordance with BS 5228-1:2009 and BS 5228-2:2009. All works will employ Best Practicable Means as defined by Section 72 of the Control of Pollution Act 1974 to minimise the effects of noise and vibration. All means of managing and reducing noise and vibration, which can be practicably applied at reasonable cost, will been implemented.

9. The impact of vibrations on adjacent properties have been considered in compliance BS 7385-1:1990 and BS 7385-2:1993. Contractor to familiarise themselves with both documents.

10. The following general measures will be taken:
    a. The employment of only modern, quiet and well-maintained equipment complying with the EC Directives and UK Regulations set out in BS 5228-1:2009.

11. Avoidance of unnecessary noise such as loud radios, shouting and engines idling between operations by effective site management.

12. Careful handling of materials and waste such as lowering rather than dropping items.

13. Operating the site as a closed site, that is:
    a. Having all windows and doors closed during noisy operations.
    b. Retaining the building front façade and roof during construction.
    c. Installing insulation in the windows and other opening to reduce the amount of noise escaping the site.

14. The following specific measures will be taken during each stage of the construction:
15. Demolition of corbels:
    a. Corbels will be cleanly disk cut back and carefully broken away from masonry. Percussive breaking techniques will not be used.

16. Concrete demolition and removal:
    a. In compliance with the expectations of The Council, concrete is to be demolished using non-percussive breaking techniques (e.g. mechanical concrete pulverisers, hand-held concrete crunchers, diamond saw-cutters and drills and hydraulic bursting equipment).
    b. Any air compressors required are to be located within the site, behind hoarding and if necessary in purpose built acoustic enclosures.
    c. Concrete will be levered from position and broken up off-site.
    d. Where appropriate, structural breaks will be cut between adjacent properties as soon as possible to reduce noise and vibration transfer.

17. Excavation:
    a. The site will be excavated manually, causing minimal noise or vibration.
    b. The conveyors will not be operated outside normal working hours and will be switched off when not in use. Conveyors will be well maintained with well-oiled rollers in good working order and be located as far away from neighbouring properties as practicable.
    c. Lorries removing the spoil will only operate within normal working hours and will have their engines switched off while waiting. Further information regarding the movement of vehicles in and around the site will be provided in the CTMP.

18. Piling:
    a. If piling is required on site, fully silenced modern bored or hydraulically-jacked piling rigs will be used with careful operation of the rig so as to minimised disturbance.
    b. Where practicable, a transmission pathway will be cut by introducing a trench around the piling site.

19. Concrete construction:
    a. RC underpinning will be used to form the retaining structure of the underpins.
    b. Contractors will carefully plan and coordinate with concrete suppliers, subcontractors and any other parties involved in the pour to ensure the concrete pours can be done within normal working hours. Contractor is required to conduct an assessment of potential disruptions to the concrete pour and to include contingency measures to ensure works will not overrun.

20. Steelwork and reinforcement:
    a. All fabrication and cutting of steelwork will be carried out off-site. Where not possible, contractor will erect a mobile acoustic screen or enclosure as appropriate.
    b. ii. Reinforcement bars will be cut to length prior to site delivery. Hydraulic or pneumatic tools will be used in preference to angle grinders when trimming reinforcement bars.

21. Water
    a. If necessary a submersed pump will be used to remove any water from lower ground floor level. This is to be located within the excavation itself so as to provide best possible acoustic screening from neighbouring properties.

Dust and Emissions

1. As defined in the Mayor of London's Best Practice Guidance on The control of dust and emissions from construction and demolition, November 2006, section 4.1 the site is classified as a low risk site, fitting the following criteria:
    a. A development less than 1,000 square metres of land.
    b. A development of ten or less properties.

2. There is potential for emissions and dust to have an infrequent impact on sensitive receptors.

3. Contractor will follow good housekeeping practices with site being regularly swept to avoid the build-up of dust, and where possible washed down with wet methods. This will include the immediate pavement/road area outside the property as well as any hoardings, fences, barriers or scaffolding.

4. Dust will be minimised by effective site planning, including doing the following:
    a. Where practicable prefabricated materials will be utilised to minimise the need for dust generating activities.
    b. Erecting effective barriers around dusty activities.
    c. Covering stockpiles of sand and any other dust generating materials/activities.
    d. Planning the site layout as so dust generating activities and/or machinery are located away from sensitive receptors.
    e. Sealing or completely enclosing cement, sand, fine aggregates and other powders to limit the amount of debris that can be blown from site.

5. In regard to construction traffic:
    a. Idle vehicles to switch off engines.
    b. Vehicles to be effectively washed or cleaned before leaving site.
    c. Construction materials entering or leaving the site to be covered.

6. During demolition works:
    a. Equipment with dust suppression (i.e. water spray) or a dust collection facilities will be used.
    b. Specific dust suppression equipment will be used where substantial levels of dust are generated.
    c. Covering of skips, chutes and conveyors, completely enclosing if necessary, and minimising drop heights.

7. Contact details for the Site Manager from the site will be displayed clearly on the site boundary so that local residents and businesses are able to contact the contractor to raise any issues that they may have and report complaints.

Contractor will provide a method statement and temporary works design which is to be approved by the Engineer, taking into account noise, dust and vibration. Contractor to notify the Engineer of any deviation from the above processes or procedures.

APPENDIX A - PRELIMINARY CALCULATIONS

Party Wall RC Underpins

The party wall is to be underpinned in order to create the basement level. The walls throughout are to be underpinned with L-shaped RC underpins to be designed as free cantilevers at the head whilst propping from the new basement floor slab.

Depth of underpins: 2500mm
The relevant geotechnical properties have been provided below.

Clay:

$\Phi' = 20°$	$K_a = 0.5$	$K_p = 2$	$K_o = 0.65$	Surcharge = 10 kN/m^3
c' = 0 kN/m^2	$\gamma_{bulk} = 20$ kN/m^3	$\gamma' = 10$ kN/m^3	$\gamma_w = 10$ kN/m^3	$\Phi = 20°$

SLIDING & OVERTURNING:
The retaining walls and ground bearing slab will be designed as to ensure lateral loads due to earth pressures can be transferred from one side to another where equal and opposite pressures will provide resistance to movement. The underpins will be constructed in an hit and miss sequence, battering back the ground and using props to ensure that overturning of individual pins will not occur. Therefore, the underpins is in equilibrium and sliding and overturning will not occur.

Typical Loading on underpin

Height = 2500mm

Lateral pressures at varying depths:
@ All levels
Q_k: Surcharge: 10kN/m^2 * 0.5 * 1.0m = 5 kN/m

@ Bottom of retaining wall (2.5m BGL) – Water Present
G_k: Effective earth pressure: 10kN/m^3 * 0.5 * 2.5m * 1.0m = 12.5 kN/m
G_k: Pore water pressure: 10kN/m^3 * 1.0m * 2.5m = 25 kN/m

@ Bottom of retaining wall (2.5m BGL) – No Water Present
G_k: Earth Pressure: 20kN/m^3 * 1.0m * 0.5 * 2.5m = 25 kN/m

@ Uplift due to pore water pressure
G_k: Pore water pressure: 10kN/m^3 * 1.0m * 2.5m = 25 kN/m

@ Residential Live Load on Basement floor
Q_k Residential Live Load: 1.5kN/m^3 * 1.0m = 1.5 kN/m

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APPENDIX B – STRUCTURAL SCHEME

69 Grove Avenue, N10 2AL

Prepared by Kanna Selvalingam

5 April 2024

Title	Document Register
Project Address	69 Grove Avenue, N10 2AL
Client	Georgina Hajipapas
Sheet	1 of 1
Project Number	1221
Issue	Basement Impact Assessment - Rev B

08.12.23	05.04.24															
A	B															

Drawing Number	Document Title	Scale	Paper Size	Revision																
-	Underpinning Notes	-	A2	A	B															
100	BIA: Foundation Plan	1:50	A2	A	B															
101	BIA: Basement Plan	1:50	A2	A	B															
102	BIA: Sequence of Works	1:50	A2	A	B															
103	BIA: Typical Raised Underpin Detail	1:20	A2	A	B															
-	Basement Impact Assessment	-	A4	A	B															

Distribution	Issue																
Native North Architects	X	X															

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Underpinning Specification

The underpinning has been designed so that the maximum bearing pressure is 150 KN/m2 (SLS) based on medium dense sand and gravel indicated on borehole logs local to the site. Should the ground conditions found to be different the structural engineer must be informed prior to the casting of the underpinning.

The Contractor is to be responsible for the accurate construction of the works according to the true intent of the Engineer's drawings and this specification.

The Contractor is to consider the need for any temporary works required to ensure the stability of the walls underpinned and provide any needling, dead shoring, propping etc. as may be appropriate.

The underpinning legs are to be constructed in the stages indicated on the drawing. Should the contractor wish to undertake the works in different stages this must be agreed with the engineer prior to undertaking the works

The excavation works are to be undertaken carefully so that the existing footings are not disturbed. Excavations are to be temporarily supported as necessary

When excavating for an underpinning leg, if any deviation is found in the nature of the bearing strata, or if obstacles or obstructions are encountered, the facts are to be reported to the Engineer.

All underpinning legs should have keys formed in them for bonding into succeeding legs as indicated on the Engineer's drawing.

A minimum of 48 hours after concreting a leg of underpinning, the footings above may be pinned up.

The pinning concrete is to be driven into place using hand held hammer and a 75 mm square hardwood drift against a substantial timber, secured on far side of footing.

Concreting and pinning-up must be completed before starting to excavate the next section of underpinning in the sequence.

Underpinning legs should preferably be concreted on the same day as they are excavated. If it is necessary to leave them open overnight temporary works and timbering are to be used to ensure that all is secure. On no account are underpinning legs to be left open over the weekend.

Particular care is to be taken to clean off and if necessary hack or scabble side of previously cast legs to provide adequate bond before concreting subsequent legs.

If water is encountered in excavation the Contractor is to provide sumps, grips and pumps as necessary to keep the excavations free from water always.

Materials

The concrete used in underpinning legs shall be minimum grade RC40 in accordance with BS EN 206:2013, with a minimum cement content of 330 kg/m³ or a 1:1.5:3 prescribed mix using 20 mm maximum aggregate, subject to proper ganging facilities being available on site.

Pinning concrete shall be approximately 75 mm thick pea-shingle concrete 1:1:5:3 mixing using 5 mm - 10 mm coarse aggregate and "Cebex 100" expanding admixture by Messrs Fosroc UK Ltd in accordance with their instructions.

The water content in the pinning concrete is to be the minimum necessary to ensure hydration of the cement and the consistency should be such that the wetted mix will just bind under strong hand pressure.

Basement waterproofing to Specialist Contractor's design and specification

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DO NOT SCALE FROM THIS DRAWING
All dimensions to be verified on site before commencing work. All error and omissions are to be reported to the Engineer. This drawing is to be read in conjunction with all relevant Design Team drawings and specifications

Issue History

Rev	Date	Drawn	Checked
D1	00.00.00	CW	KS

DETAILED DESIGN
NOT FOR CONSTRUCTION

Title	Standard Notes
Project Address	69 Grove Avenue, N10 2AL
Client	Georgina Hajipapas
Drawing Number	-
Scale	1:50 @ A2
Project Number	1221
Issue	Basement Impact Assessment - Rev B

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Numbers in bay refer to a "possible" excavation and underpinning sequence to be undertaken by the contractor - refer to Structural Specification for more details

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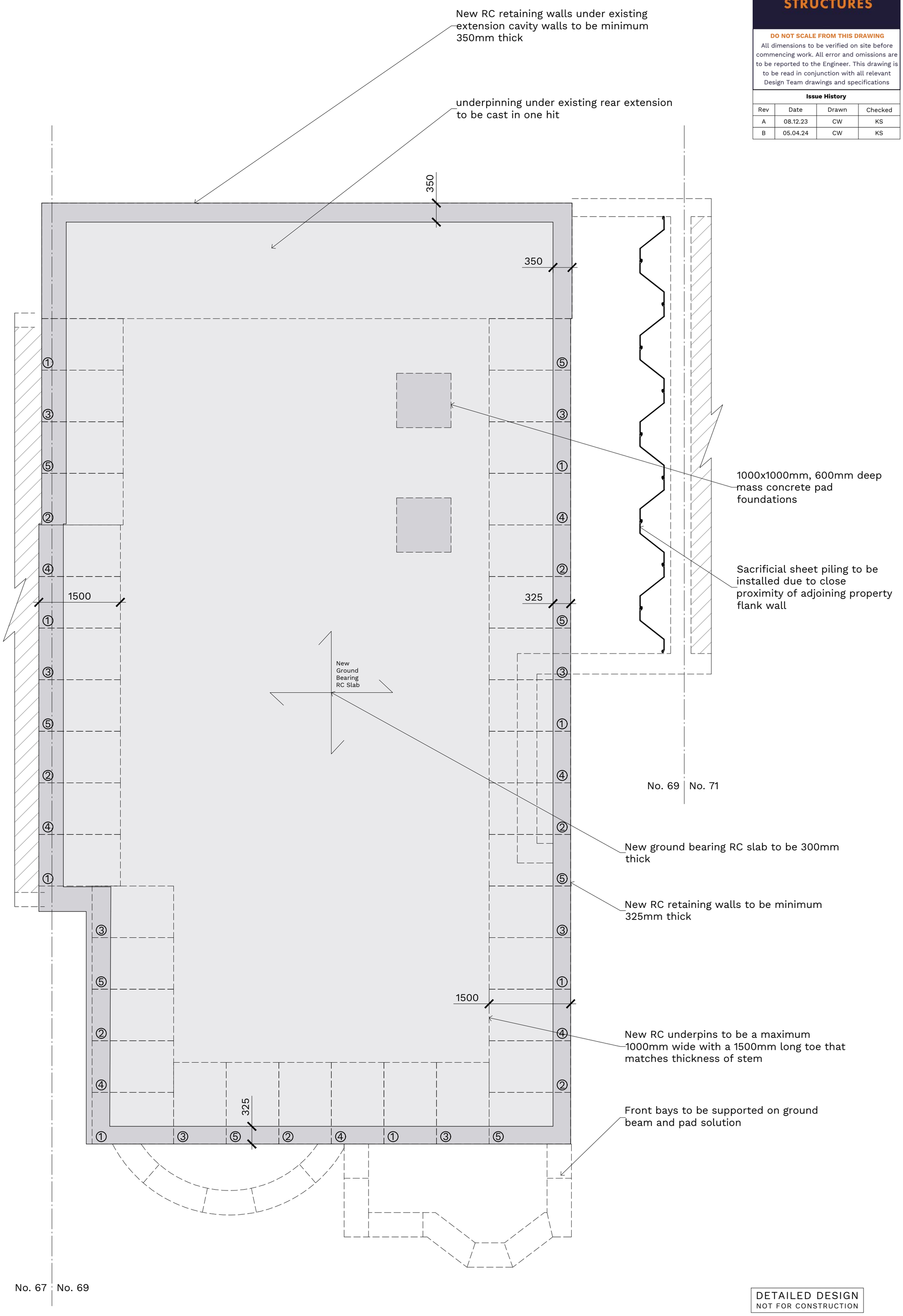
Issue History

Rev	Date	Drawn	Checked
A	08.12.23	CW	KS
B	05.04.24	CW	KS



DETAILED DESIGN
NOT FOR CONSTRUCTION

Title	BIA: Foundation Plan
Project Address	69 Grove Avenue, N10 2AL
Client	Georgina Hajipapas
Drawing Number	100
Scale	1:50 @ A2
Project Number	1221
Issue	Basement Impact Assessment - Rev B

A2

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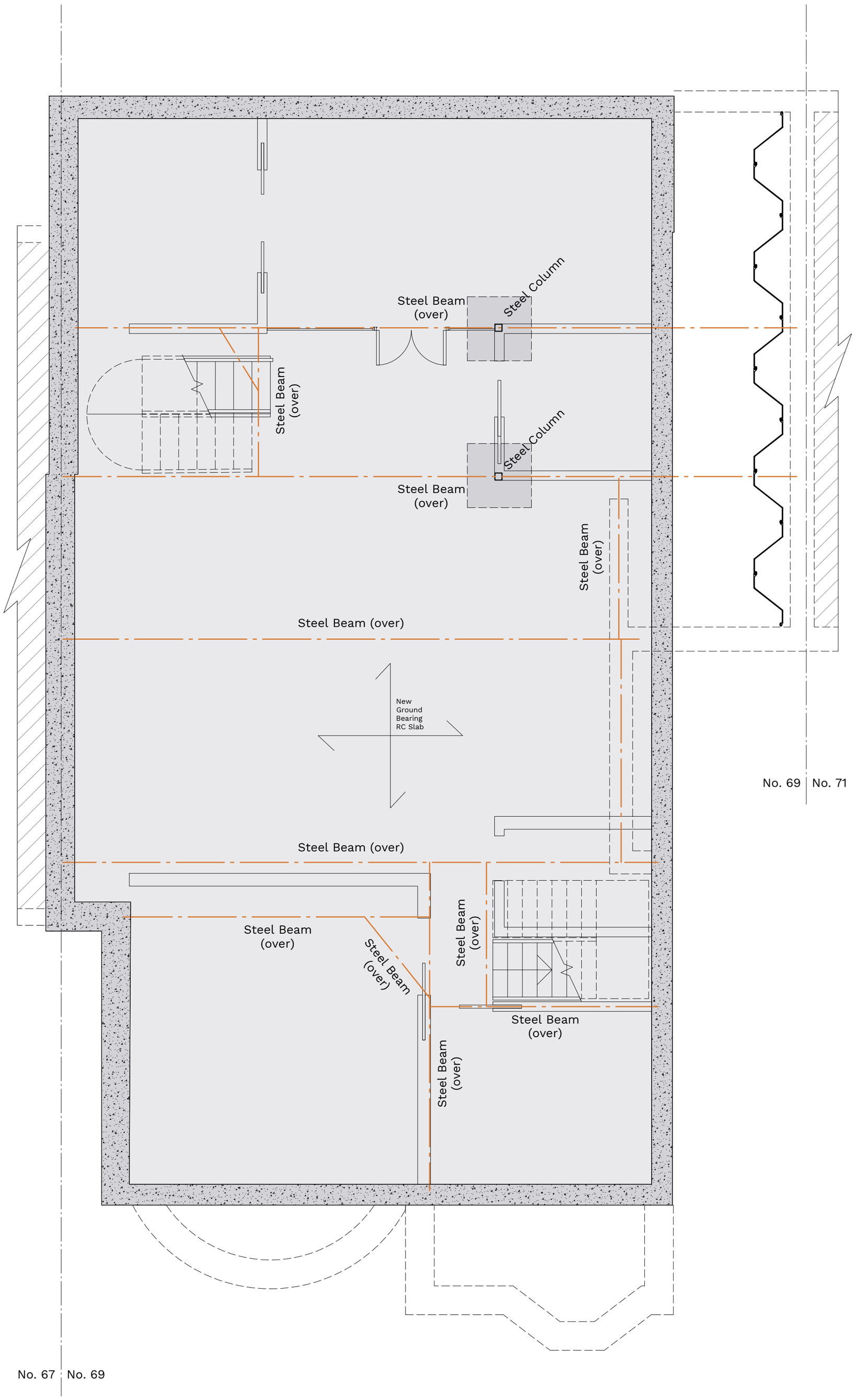

DETAILED DESIGN
NOT FOR CONSTRUCTION

Title	BIA: Basement Plan
Project Address	69 Grove Avenue, N10 2AL
Client	Georgina Hajipapas
Drawing Number	101
Scale	1:50 @ A2
Project Number	1221
Issue	Basement Impact Assessment - Rev B

A2

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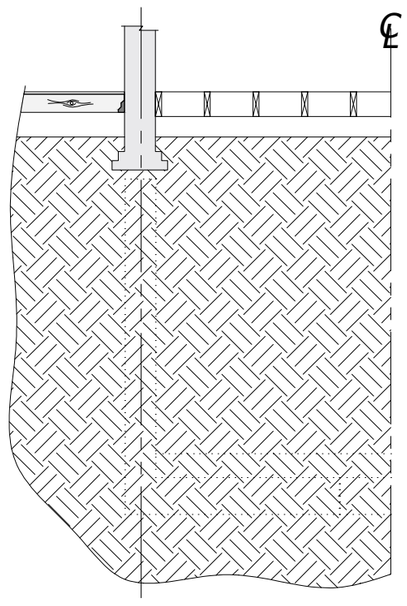
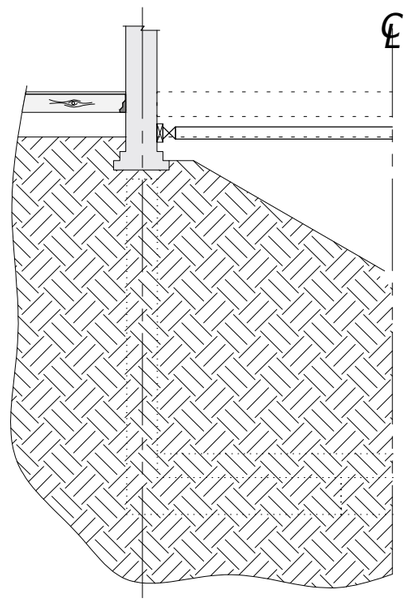
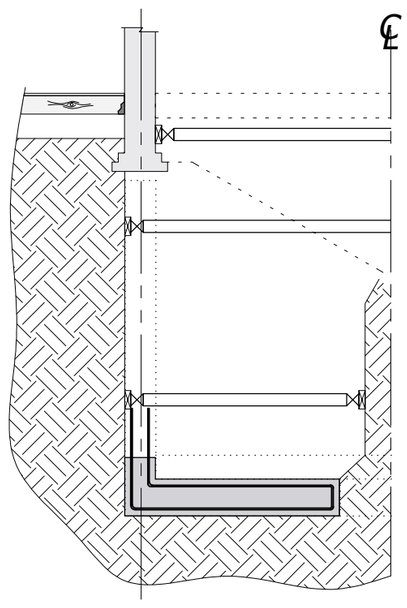


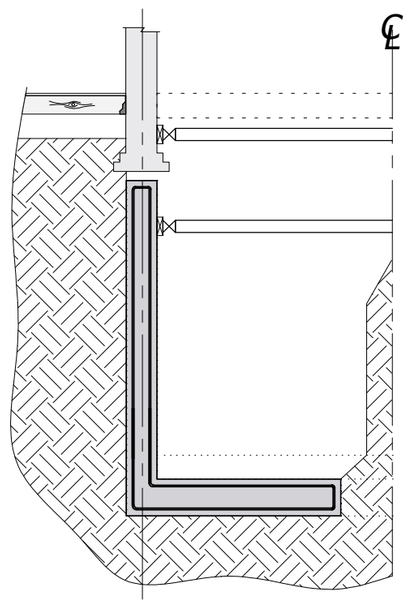
Existing - Before works commence



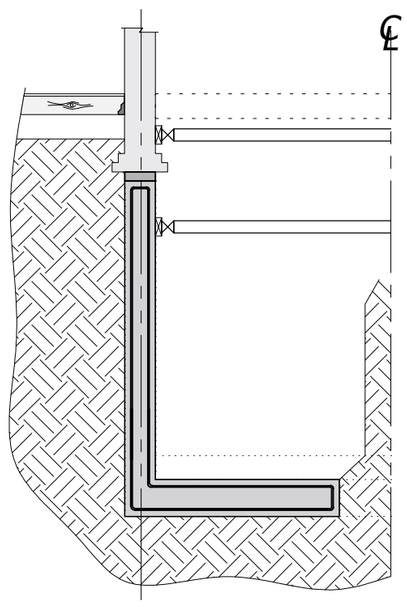
Stage 1 - Reduce ground levels generally throughout and install props between party walls



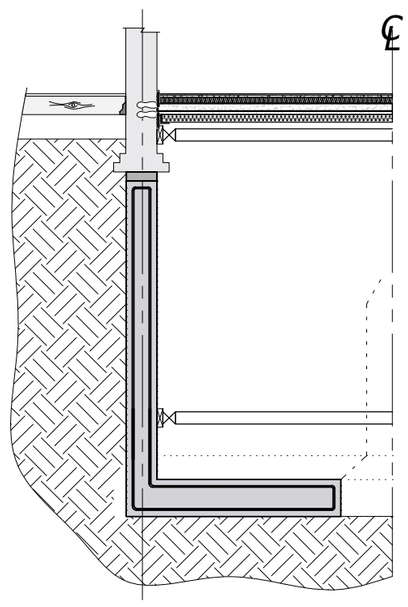
Stage 2 - Excavate to proposed founding depth. Prop any loose material as required. Pour base of retaining wall and form kicker



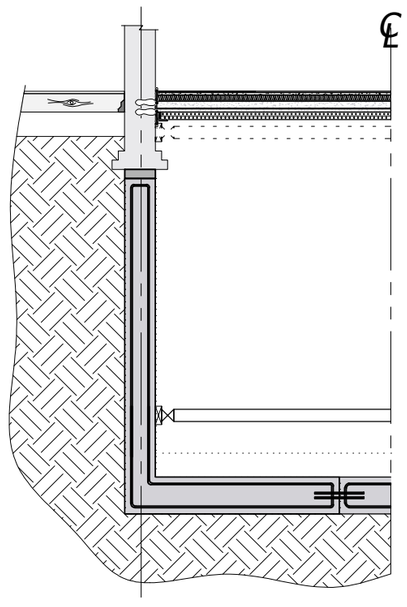
Stage 3 - Pour stem and prop retaining wall off adjacent pins or soil as appropriate



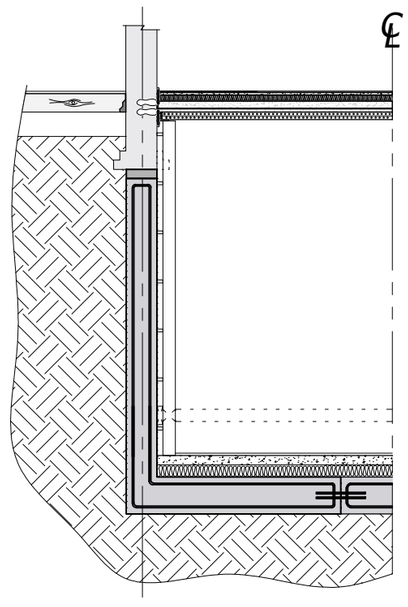
Stage 4 - Tightly dry pack between stem of underpin and underside of existing foundation. Repeat stages 2-4 for all pins



Stage 5 - Reduce level of central soil from front of property to back. Ground floor construction installed, lower props as excavation permits



Stage 6 - Once levels fully reduced cast slab throughout with dowels into retaining pins, remove high level props



Stage 7 - Once all concrete has cured, remove remaining props and demolish any existing foundations projecting internally. Install waterproofing system, internal insulation, screed, etc. Basement structural works completed

VESTA STRUCTURES

DO NOT SCALE FROM THIS DRAWING

All dimensions to be verified on site before commencing work. All error and omissions are to be reported to the Engineer. This drawing is to be read in conjunction with all relevant Design Team drawings and specifications

Issue History

Rev	Date	Drawn	Checked
A	08.12.23	CW	KS
B	05.04.24	CW	KS

DETAILED DESIGN
NOT FOR CONSTRUCTION

Title	BIA: Sequence of Works
Project Address	69 Grove Avenue, N10 2AL
Client	Georgina Hajipapas
Drawing Number	102
Scale	1:50 @ A2
Project Number	1221
Issue	Basement Impact Assessment - Rev B

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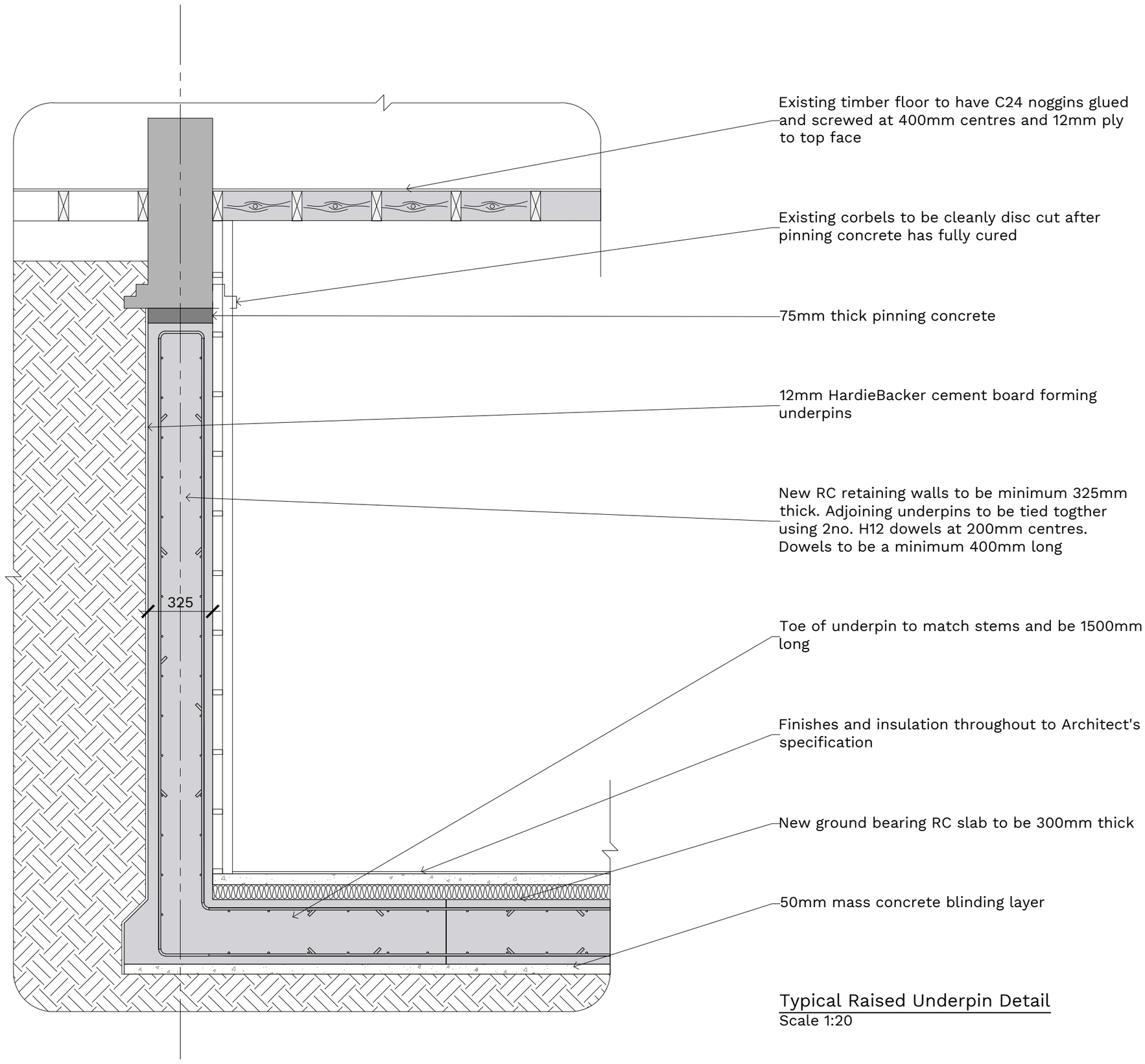
VESTA STRUCTURES

DO NOT SCALE FROM THIS DRAWING
All dimensions to be verified on site before commencing work. All error and omissions are to be reported to the Engineer. This drawing is to be read in conjunction with all relevant Design Team drawings and specifications

Issue History

Rev	Date	Drawn	Checked
A	08.12.23	CW	KS
B	05.04.24	CW	KS



Typical Raised Underpin Detail
Scale 1:20

DETAILED DESIGN
NOT FOR CONSTRUCTION

Title	BIA: Typical Raised Underpin Detail
Project Address	69 Grove Avenue, N10 2AL
Client	Georgina Hajipapas
Drawing Number	103
Scale	1:20 @ A2
Project Number	1221
Issue	Basement Impact Assessment - Rev B

A2

info@vestastructures.co.uk

VESTA STRUCTURES

APPENDIX C – GROUND INVESTIGATION REPORT

69 Grove Avenue, N10 2AL

Prepared by Kanna Selvalingam

5 April 2024

SITE INVESTIGATION AND DRAINAGE REPORT

Client	Georgina Hajipapas
Client Ref	TBC
Site Address	69 Grove Avenue, London, N10 2AL
Project Ref	1587
Date of Site Works	28 November 2023

Report checked by	Tanweer Sharif
Date of issue	06 December 2023

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CONTENTS

Project Ref: 1587 Site: 69 Grove Avenue, London, N10 2AL Date: 28-11-2023

3	Introduction
4	Borehole Location Plan
5	Borehole Log
6	SPT Results
7	Drainage Layout Plan
8-16	Drainage Report
17-46	CCTV Survey Report (MSCC5 standard)
47-48	Node Sheets

INTRODUCTION

Project Ref: 1587 Site: 69 Grove Avenue, London, N10 2AL Date: 28-11-2023

Client	Georgina Hajipapas
Client reference	TBC
Contact Name	Kanna Selvalingam (Vesta Structures)
Client Address	69 Grove Avenue, London, N10 2AL
Integrum Reference	1587
Site Address	69 Grove Avenue, London, N10 2AL
Date(s) of site works	28 November 2023
Integrum on site Engineer	Mariusz Glebocki
Report compiled by	Wayman Leung

Scope of works	Site Investigation / Drainage Survey
Services data provided by client	NO
Asbestos Report supplied	N/A
Health & Safety	RAMS reviewed and signed by site team
Trial Pit locations CAT scanned	N/A
Borehole locations CAT scanned	YES

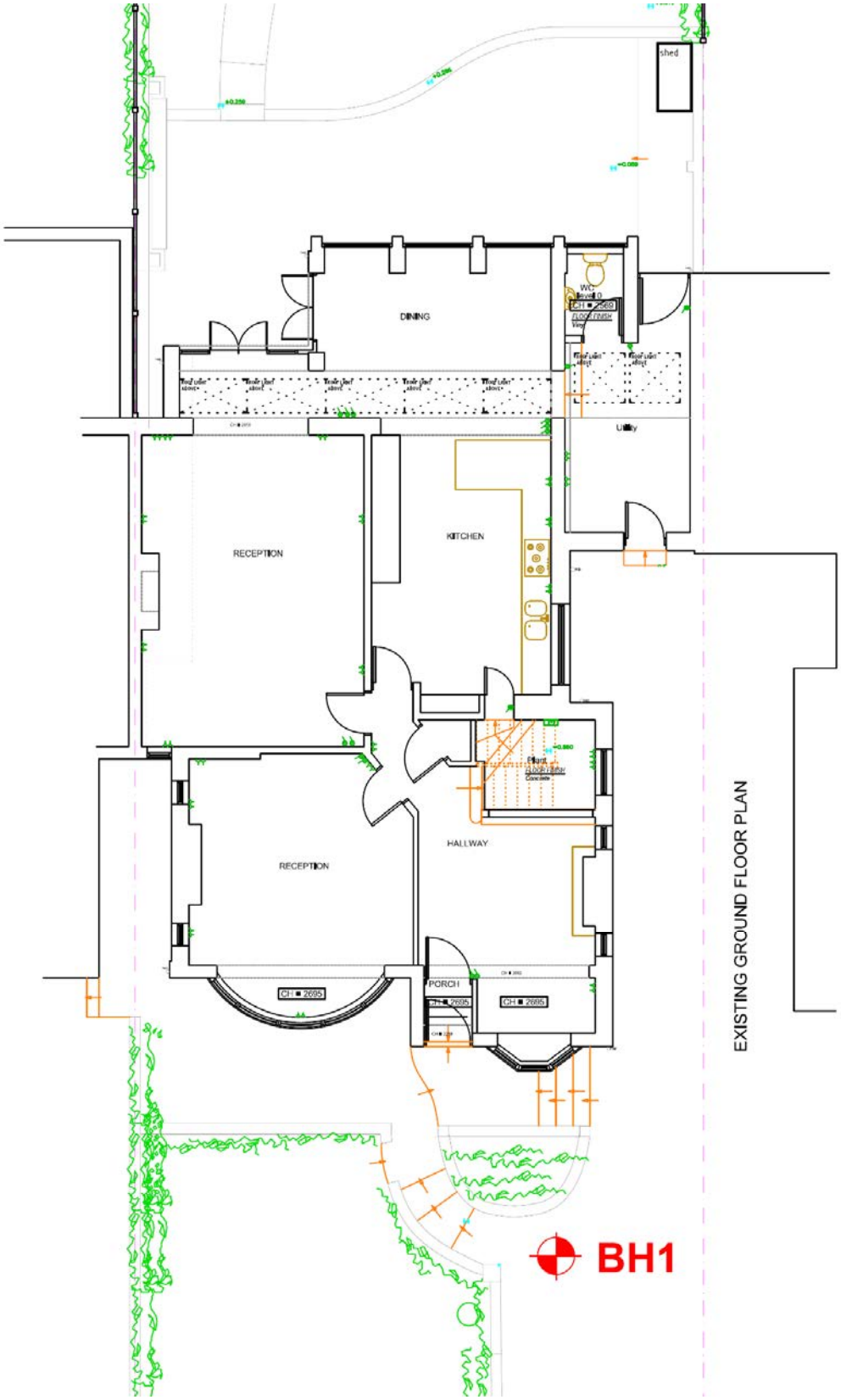
SUMMARY OF WORKS

Instructions were received to undertake the following scope of works:

1. Drilling of a single borehole to a depth of 5m or refusal at the front of the property
2. Insitu testing and installation of a standpipe for groundwater monitoring
3. A CCTV survey of the accessible drainage system

BOREHOLE LOCATION (NTS)

Project Ref: 1587 Site: 69 Grove Avenue, London, N10 2AL Date: 28-11-2023



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BOREHOLE LOG - BH1

Project Ref: 1587 Site: 69 Grove Avenue, London, N10 2AL Date: 28-11-2023

Depth (mm)	Water	SPT N value	Roots	Sample Type	Sample Ref	Legend		Description
GL								Block paving over shingle
			No roots				300	
500								Firm slightly organic dark grey silty CLAY with partings of grey silt/fine sand
1000				D	1A			
1500				D	1B		1500	
2000		SPT 8		D	1C			Stiff mid-brown grey veined silty CLAY with partings of orange silt/fine sand
2500				D	1D			
3000		SPT 11		D	1E		3200	
3500				D	1F			Very stiff mid-brown grey veined silty CLAY with partings of orange silt/fine sand
4000		SPT 14		D	1G			
4500				D	1H			
5000	BH DRY	SPT 17		D	1J		5000	
								Borehole completed to 5000

KEY	FR	Fine Roots	LVFR	Last very fine roots	Window Sample Rig
	RS	Root sample	W	Water	Standpipe installed to 5m

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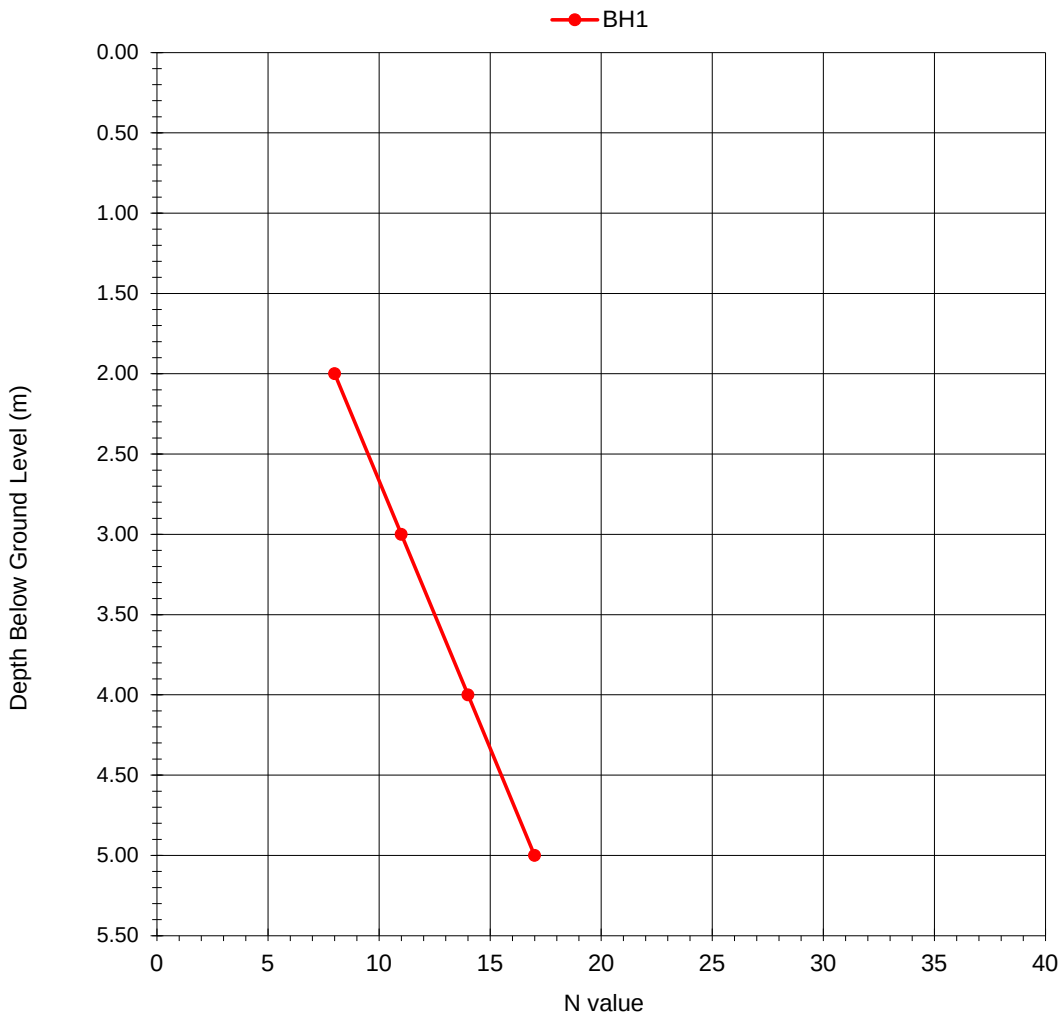
INSITU SPT RESULTS

Project Ref: 1587 Site: 69 Grove Avenue, London, N10 2AL Date: 28-11-2023

SPT READINGS						
Depth	150 Seating	75	75	75	75	N value
2.00	2/2	2	2	2	2	8
3.00	2/2	2	3	3	3	11
4.00	3/3	3	3	3	5	14
5.00	3/4	3	4	4	6	17



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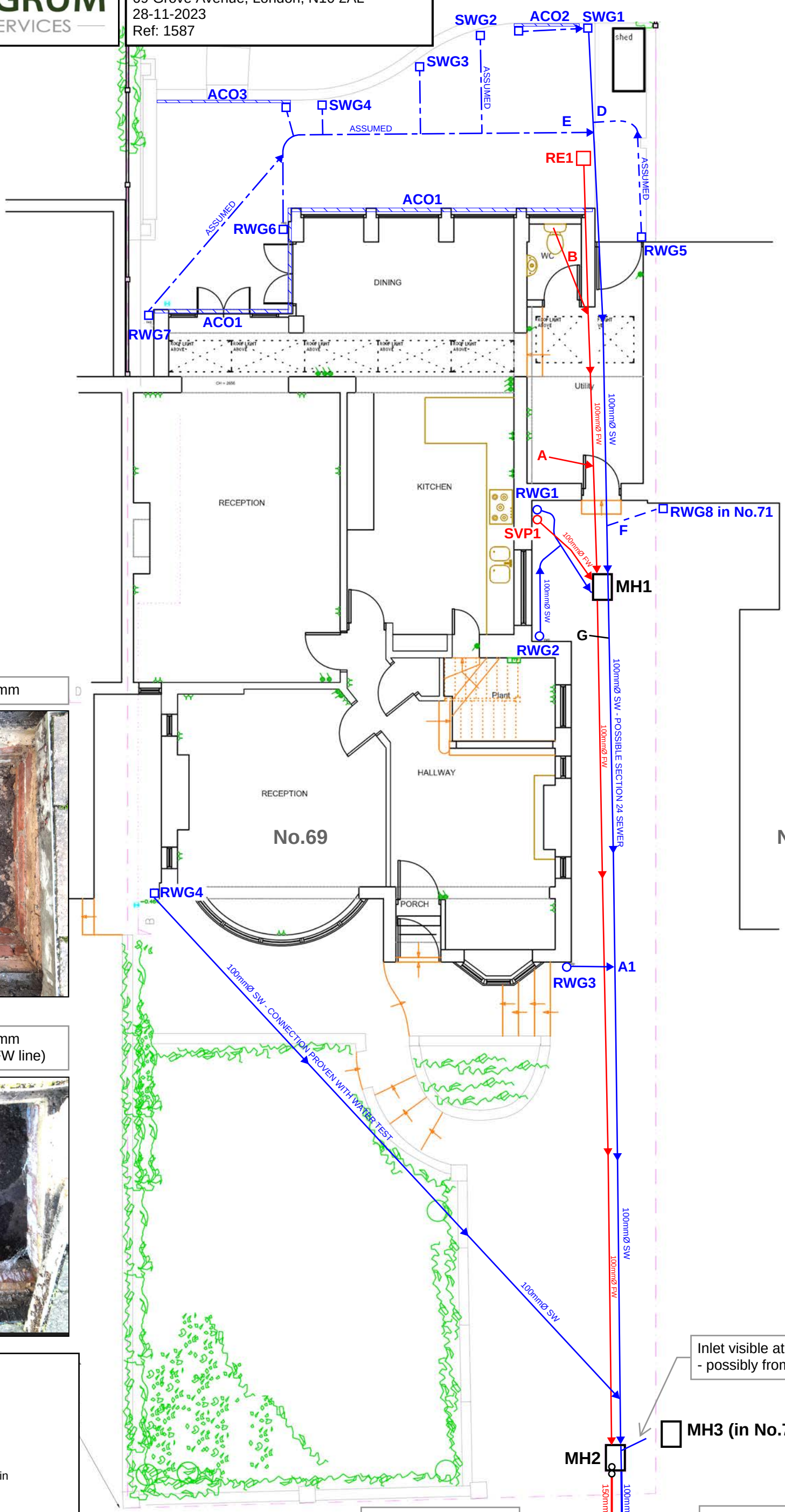
DRAINAGE LAYOUT PLAN (NTS)
69 Grove Avenue, London, N10 2AL
28-11-2023
Ref: 1587



MH1: Depth 650mm

MH2: Depth 750mm
(Interceptor Trap to FW line)

DRAINAGE KEY:

MH = Manhole
SVP = Soil vent pipe
RWG = Rainwater gully
SWG = Surface water gully
RE = Rodding eye
ACO = Linear SW channel drain

Assumed route
Foul Water
Surface Water
Combined

Inlet visible at SW line within MH2 - possibly from MH3

To Main FW Sewer in Grove Avenue, approximately 9.8m downstream from MH2

To Main SW Sewer in Grove Avenue, approximately 11m downstream from MH2

DRAINAGE REPORT

Project Ref: 1587 Site: 69 Grove Avenue, London, N10 2AL Date: 28-11-2023

1.0 SUMMARY OF FINDINGS

A CCTV survey was instructed to establish the layout, condition and status of the drainage on this site.

Investigations identified separate 100mmØ foul and surface water systems, flowing parallel from back to front, in modern plastic pipework at the rear (assumed to have been installed when the property was previously extended).

The foul drainage is readily accessible from manholes MH1 and MH2, whilst the surface water system flows through the benching within the side of these chambers.

Despite there being separate systems it should be noted that the rainwater gullies RWG1 and RWG2 have been connected incorrectly into the foul network.

MH1 at the rear is 650mm deep and takes the local foul waste connections, plus the aforementioned rainwater gullies. The surface water line is concealed within the benching of this chamber.

From MH1 the foul and surface water lines are 100mmØ vitrified clay and flow to MH2 which is located adjacent to the front boundary (foul line has an interceptor trap in MH2); MH2 is 750mm deep.

Access to CCTV survey the surface water drainage was obtained from the surface water gully (SWG1) at the rear. This appears to form the head of the system and has several junctions, including a junction that is believed to be from the shared rainwater gully (RWG8) located on the boundary line with No.71. It is therefore possible that from this junction downstream the line is shared and therefore a Section 24 Sewer for which Thames Water Utilities Limited are responsible.

As with the foul drainage, the rear surface water network is all modern plastic pipework; there are numerous surface water gullies and linear channel drains within the rear patio area which were not accessible to survey. These are believed to be connected into the line downstream from SWG1 at junction E.

Both systems are functioning and generally in a condition commensurate with their age and usage. There are some issues that have been detailed in the recommendations.

A summary of the survey is given in Section 2.0, with recommendations detailed in Section 4.0 (based on retention of existing drainage layout). Please also refer to the CCTV survey inspection report for further details on the individual sections of drainage surveyed.

DRAINAGE REPORT

Project Ref: 1587 Site: 69 Grove Avenue, London, N10 2AL Date: 28-11-2023

2.0 SECTIONS SURVEYED

SURVEY No:	SECTION NAME	MATERIAL	DIAMETER (mm)	DUTY	OWNERSHIP	DEFECTS
1	MH1 - RWG1	Clay/Plastic	100	Surface Water (connected to FW)	Private	Y
2	MH1 - SVP1	Clay/Plastic	100	Foul	Private	Y
3	RWG2 - RWG1 Line	Plastic	100	Surface Water	Private	N
4	MH1 - RE1	Clay/Plastic	100	Foul	Private	N
5	MH1 - MH2	Vitrified Clay	100	Foul	Private	Y
6	MH2 - Main FW Sewer	Vitrified Clay	150	Foul	Private to boundary	N
7	SWG1 - A1	Plastic/Clay	100	Surface Water	Section 24 SW Sewer	Y
8	RWG3 - Main SW Sewer	Clay/Plastic	100/150	Surface Water	Section 24 SW Sewer	Y

3.0 KEY PIPE INVERT LEVELS (depths relative to cover level)

MH1	650mm	Head of system - flows to interceptor manhole MH2	See Node Sheet for details
MH2	750mm	Interceptor trap on FW line FW and SW lines flow to Main Sewer in Grove Avenue	See Node Sheet for details

DRAINAGE REPORT

Project Ref: 1587 Site: 69 Grove Avenue, London, N10 2AL Date: 28-11-2023

4.0 SUMMARY OF RECOMMENDATIONS

SURVEY No:	SECTION NAME	DEFECT DETAILS	RECOMMENDATIONS	PRIORITY
1	MH1 - RWG1	Displaced and open joint at 0.87m SW connected to FW system	CIPP patch line if line is to remain (Ideally divert and connect into SW network)	
2	MH1 - SVP1	Rubber seal rings protruding into line at rest bend	Possible renew rest bend, but line appears unaffected by protruding rubber seals	
3	RWG2 - RWG1 Line	SW connected to FW system	Divert and connect into SW network	
5	MH1 - MH2	Heavy waste deposits in MH2 impeding flow and causing some water ponding	High Pressure Water Jet	
8	RWG3 - Main SW Sewer	Deposits at head of section	Refer to Thames Water Utilities Limited if necessary	
N/A	SW System	No access at MH1	Possible Further Investigation: Expose access plates in MH1 and MH2 Investigate rear patio SW drainage	

DRAINAGE PHOTOGRAPHS

Project Ref: 1587 Site: 69 Grove Avenue, London, N10 2AL Date: 28-11-2023

1. MH1 location overview

2. MH1 location overview

3. MH1 detail

4. RWG1 & SVP1

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DRAINAGE PHOTOGRAPHS

Project Ref: 1587 Site: 69 Grove Avenue, London, N10 2AL Date: 28-11-2023

5. RWG1 & SVP1

6. RWG2

7. RWG2

8. MH2 location overview

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DRAINAGE PHOTOGRAPHS

Project Ref: 1587 Site: 69 Grove Avenue, London, N10 2AL Date: 28-11-2023

9. MH2 location overview

10. MH2 detail

11. RWG3

12. RWG3

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DRAINAGE PHOTOGRAPHS

Project Ref: 1587 Site: 69 Grove Avenue, London, N10 2AL Date: 28-11-2023

13. RE1

14. SWG1

15. RWG4

16. RWG4

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DRAINAGE PHOTOGRAPHS

Project Ref: 1587 Site: 69 Grove Avenue, London, N10 2AL Date: 28-11-2023

17. RWG6

18. RWG7

19. ACO1

20. ACO1

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DRAINAGE PHOTOGRAPHS

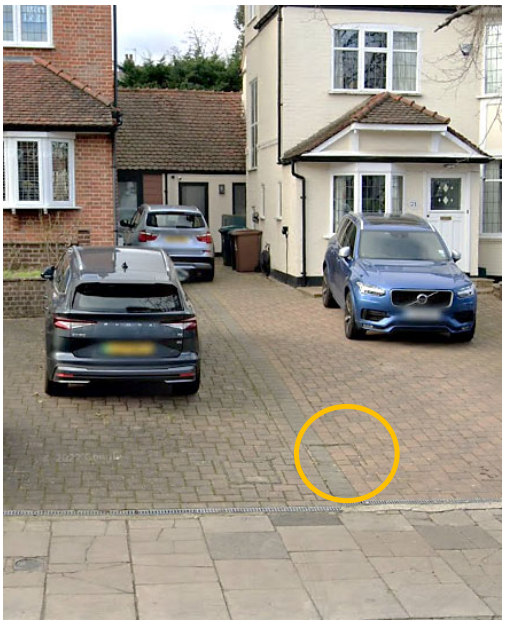
Project Ref: 1587 Site: 69 Grove Avenue, London, N10 2AL Date: 28-11-2023

21. ACO2

22. SWG2, SWG3 & SWG4

23. ACO3

24. MH3 in No.71 Grove Avenue



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Project

Project Name:	1587 - 69 Grove Avenue London N10 2AL
Project Description:	CCTV survey of the accessible drainage system
Project Number:	1587
Project Status:	Complete
Project Date:	28/11/2023

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1587 - 69 Grove Avenue London N10 2AL	1587	28/11/2023

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Project Information

Project Name	Project Number	Project Date
1587 - 69 Grove Avenue London N10 2AL	1587	28/11/2023

Client

Contact: Georgina Hajipapas
Street: 69 Grove Avenue
Town or City: London
Post Code: N10 2AL

Contractor

Company: Integrum Site Services Ltd
Contact: Tanweer Sharif
Street: Airport House, Purley Way
Town or City: Croydon
Post Code: CR0 0XZ
Phone: 020 8154 3200
Email: info@integrum-site.com

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Scoring Summary

Project Name	Project Number	Project Date
1587 - 69 Grove Avenue London N10 2AL	1587	28/11/2023

Structural Defects

Grade 3: Best practice suggests consideration should be given to repairs in the medium term.
Grade 4: Best practice suggests consideration should be given to repairs to avoid a potential collapse.
Grade 5: Best practice suggests that this pipe is at risk of collapse at any time. Urgent consideration should be given to repairs to avoid total failure.

Section	PLR	Grade	Description
8	Main SWX	3	Cracks, multiple from 7 o'clock to 12 o'clock, finish

Service / Operational Condition

Grade 3: Best practice suggests consideration should be given to maintenance activities in the medium term.
Grade 4: Best practice suggests consideration should be given to maintenance activity to avoid potential blockages.
Grade 5: Best practice suggests that this pipe is at a high risk of backing up or causing flooding.

Section	PLR	Grade	Description
1	RWG1X	3	Joint displaced, medium
2	SVP1X	3	Multiple defects
4	RE1X	3	Settled deposits, other, 10% cross-sectional area loss, finish
5	MH1X	3	Multiple defects
6	MH2X	3	Multiple defects
7	SWG1X	3	Multiple defects
8	Main SWX	4	Multiple defects

Abandoned Surveys

Section	PLR	Description
All inspections complete, none are abandoned.		

Information

These scoring summaries are based on the SRM grading from the WRc.

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Section Inspection - 28/11/2023 - RWG1X

Item No.	Insp. No.	Date:	Time:	Client`s Job Ref	Weather	Pre Cleaned	PLR
1	1	28/11/23	10:27	TBC	No Rain Or Snow	No	RWG1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
S.K	Not Specified	Not Specified	Not Specified	Private Drain	1

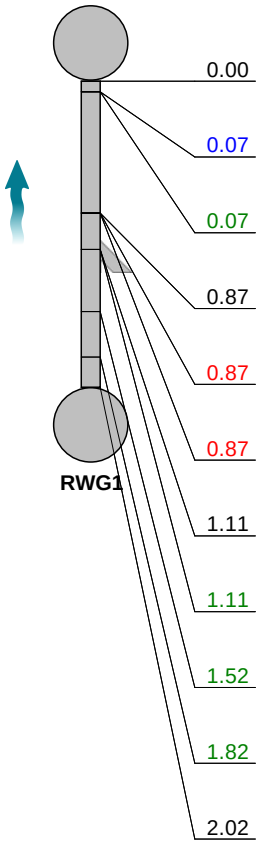
Town or Village:	London, N10 2Al	**Inspection Direction:**	Upstream	**Upstream Node:**	RWG1
Road:	69 Grove Avenue	**Inspected Length:**	2.02 m	**Upstream Pipe Depth:**	
Location:	Other location	**Total Length:**	2.02 m	**Downstream Node:**	MH1
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	0.650 m

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments: Displaced and open joint at 0.87m might cause leakage
Recommendations: CIPP patch line open joint

Scale: 1:50

Depth: 0.65 m
MH1



RWG1

Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH1	00:00:01		
0.07	WL	Water level, 5% of the vertical dimension	00:00:03		
0.07	LR	Line deviates right: Slight deviation right	00:00:03	1-1-3A	
0.87	MCPVC	Pipe material changes to polyvinyl chloride at this point	00:00:17		
0.87	JDM	Joint displaced, medium	00:00:17		1 / 3
0.87	OJM	Open joint, medium	00:00:17	1-1-6A	1
1.11	JN	Junction at 10 o'clock, 100mm dia, from RWG2	00:00:23	1-1-7A	
1.11	LU	Line deviates up	00:00:25		
1.52	LR	Line deviates right	00:00:31	1-1-9A	
1.82	LL	Line deviates left	00:00:35	1-1-10A	
2.02	GYF	Finish node, gully, reference: RWG1	00:00:40		

Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
2	2.0	1.0	2.0	1.0	1	2.0	1.0	2.0	3.0

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Section Pictures - 28/11/2023 - RWG1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
1	Upstream	RWG1X	TBC	1587

1-1-3A, 00:00:03, 0.07 m
Line deviates right, Slight deviation right

1-1-6A, 00:00:17, 0.87 m
Open joint, medium

1-1-7A, 00:00:23, 1.11 m
Junction at 10 o'clock, 100mm dia, from RWG2

1-1-9A, 00:00:31, 1.52 m
Line deviates right

1-1-10A, 00:00:35, 1.82 m
Line deviates left

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Section Inspection - 28/11/2023 - SVP1X

Item No.	Insp. No.	Date:	Time:	Client`s Job Ref	Weather	Pre Cleaned	PLR
2	1	28/11/23	10:34	TBC	No Rain Or Snow	No	SVP1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
S.K	Not Specified	Not Specified	Not Specified	Private Drain	1

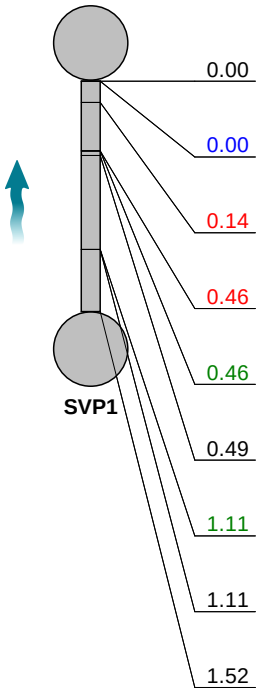
Town or Village:	London, N10 2Al	**Inspection Direction:**	Upstream	**Upstream Node:**	SVP1
Road:	69 Grove Avenue	**Inspected Length:**	1.52 m	**Upstream Pipe Depth:**	
Location:	Other location	**Total Length:**	1.52 m	**Downstream Node:**	MH1
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	0.650 m

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments: Rubber seal rings protruding into line at rest bend / No operational issues
Recommendations: Possible renew rest bend, but line appears to be unaffected by protruding seals at rest bend

Scale: 1:50

Depth: 0.65 m
MH1



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH1	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension	00:00:01	2-1-2A	
0.14	JDM	Joint displaced, medium	00:00:08	2-1-3A	1 / 3
0.46	JDM	Joint displaced, medium	00:00:14	2-1-4A	1 / 3
0.46	LL	Line deviates left: Line bends left and up	00:00:14		
0.49	MCPVC	Pipe material changes to polyvinyl chloride at this point	00:00:15		
1.11	LU	Line deviates up: At rest bend	00:00:38		
1.11	SR	Sealing ring intruding from 12 o'clock to 12 o'clock	00:00:39	2-1-8A	1 / 1
1.52	OCF	Finish node, other special chamber, reference: SVP1: In vertical section of soil stack	00:00:48	2-1-9A	

Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
3	5.0	4.6	7.0	1.0	3	2.0	2.6	4.0	4.0

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Section Pictures - 28/11/2023 - SVP1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
2	Upstream	SVP1X	TBC	1587

2-1-2A, 00:00:01, 0.00 m
Water level, 0% of the vertical dimension

2-1-3A, 00:00:08, 0.14 m
Joint displaced, medium

2-1-4A, 00:00:14, 0.46 m
Joint displaced, medium

2-1-8A, 00:00:39, 1.11 m
Sealing ring intruding from 12 o'clock to 12 o'clock

2-1-9A, 00:00:48, 1.52 m
Finish node, other special chamber, reference: SVP1, In vertical section of soil stack

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Section Inspection - 28/11/2023 - RWG2X

Item No.	Insp. No.	Date:	Time:	Client`s Job Ref	Weather	Pre Cleaned	PLR
3	1	28/11/23	11:33	TBC	No Rain Or Snow	No	RWG2X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
S.K	Not Specified	Not Specified	Not Specified	Private Drain	1

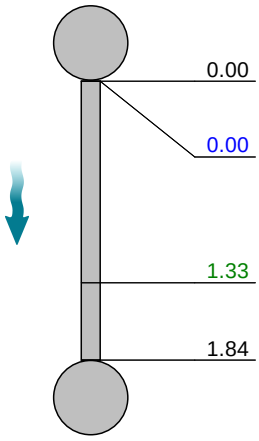
Town or Village:	London, N10 2Al	**Inspection Direction:**	Downstream	**Upstream Node:**	RWG2
Road:	69 Grove Avenue	**Inspected Length:**	1.84 m	**Upstream Pipe Depth:**	0.200 m
Location:	Other location	**Total Length:**	1.84 m	**Downstream Node:**	RWG1 LINE
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments: No serious visual defects / No operational issues
Recommendations: None

Scale: 1:50

Depth: 0.20 m
RWG2



RWG1 Line
Depth: m

Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	GY	Start node, gully, reference: RWG2: Surveyed from accessible outlet to gully	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension	00:00:20	3-1-2A	
1.33	LR	Line deviates right	00:00:29	3-1-3A	
1.84	OCF	Finish node, other special chamber, reference: RWG1 Line: At junction to line from MH1-RWG1	00:00:38	3-1-4A	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Pictures - 28/11/2023 - RWG2X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
3	Downstream	RWG2X	TBC	1587

3-1-2A, 00:00:20, 0.00 m
Water level, 0% of the vertical dimension

3-1-3A, 00:00:29, 1.33 m
Line deviates right

3-1-4A, 00:00:38, 1.84 m
Finish node, other special chamber, reference: RWG1 Line, At junction to line from MH1-RWG1

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Section Inspection - 28/11/2023 - RE1X

Item No.	Insp. No.	Date:	Time:	Client`s Job Ref	Weather	Pre Cleaned	PLR
4	1	28/11/23	10:38	TBC	No Rain Or Snow	No	RE1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
S.K	Not Specified	Not Specified	Not Specified	Private Drain	1

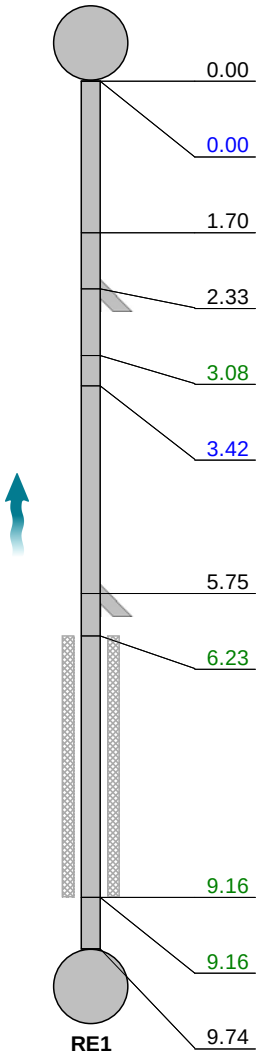
Town or Village:	London, N10 2Al	**Inspection Direction:**	Upstream	**Upstream Node:**	RE1
Road:	69 Grove Avenue	**Inspected Length:**	9.74 m	**Upstream Pipe Depth:**	
Location:	Under a building	**Total Length:**	9.74 m	**Downstream Node:**	MH1
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	0.650 m

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments: No serious visual defects / No operational issues
Recommendations: None

Scale: 1:85

Depth: 0.65 m
MH1



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: MH1	00:00:00		
0.00		WL	Water level, 0% of the vertical dimension	00:00:00	4-1-2A	
1.70		MCPVC	Pipe material changes to polyvinyl chloride at this point	00:00:20		
2.33		JN	Junction at 9 o'clock, 100mm dia: A - not sourced	00:00:29	4-1-4A	
3.08		LU	Line deviates up	00:00:42	4-1-5A	
3.42		REM	General remark: Line levels out	00:00:46	4-1-6A	
5.75		JN	Junction at 9 o'clock, 100mm dia: B - not sourced / assumed from WC	00:01:06	4-1-7A	
6.23	S01	DEX	Settled deposits, other, 10% cross-sectional area loss, start: Debris/waste	00:01:13	4-1-8A	
9.16		LU	Line deviates up: At rest bend	00:01:43	4-1-9A	
9.16	F01	DEX	Settled deposits, other, 10% cross-sectional area loss, finish: Debris/waste	00:01:43		3
9.74		REF	Finish node, rodding eye, reference: RE1: In vertical section to outlet from RE1	00:01:52	4-1-11A	

RE1
Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	2.0	0.6	6.0	3.0

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Section Pictures - 28/11/2023 - RE1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
4	Upstream	RE1X	TBC	1587

4-1-2A, 00:00:00, 0.00 m
Water level, 0% of the vertical dimension

4-1-4A, 00:00:29, 2.33 m
Junction at 9 o'clock, 100mm dia, A - not sourced

4-1-5A, 00:00:42, 3.08 m
Line deviates up

4-1-6A, 00:00:46, 3.42 m
General remark, Line levels out

4-1-7A, 00:01:06, 5.75 m
Junction at 9 o'clock, 100mm dia, B - not sourced / assumed from WC

4-1-8A, 00:01:13, 6.23 m
Settled deposits, other, 10% cross-sectional area loss, start, Debris/waste

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Section Pictures - 28/11/2023 - RE1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
4	Upstream	RE1X	TBC	1587

4-1-9A, 00:01:43, 9.16 m
Line deviates up, At rest bend

4-1-11A, 00:01:52, 9.74 m
Finish node, rodding eye, reference: RE1, In vertical section to outlet from RE1

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Section Inspection - 28/11/2023 - MH1X

Item No.	Insp. No.	Date:	Time:	Client`s Job Ref	Weather	Pre Cleaned	PLR
5	1	28/11/23	11:15	TBC	No Rain Or Snow	No	MH1X

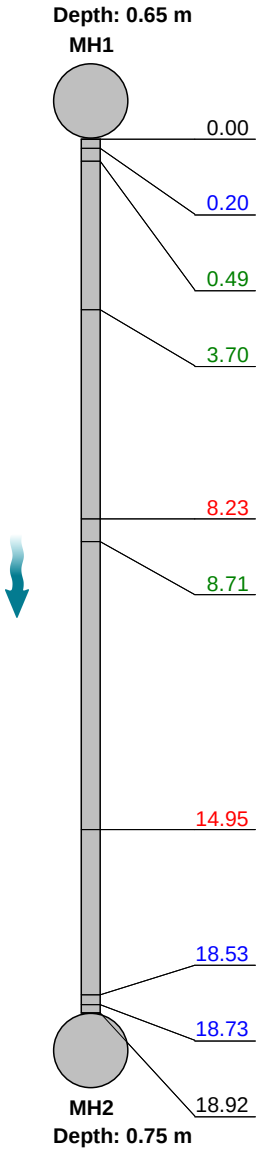
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
S.K	Not Specified	Not Specified	Not Specified	Private Drain	1

Town or Village:	London, N10 2Al	**Inspection Direction:**	Downstream	**Upstream Node:**	MH1
Road:	69 Grove Avenue	**Inspected Length:**	18.92 m	**Upstream Pipe Depth:**	0.650 m
Location:	Other location	**Total Length:**	18.92 m	**Downstream Node:**	MH2
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	0.750 m

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments: Heavy waste deposits in MH2 impeding flow and causing some water ponding
Recommendations: High Pressure Water Jet

Scale: 1:164



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH1	00:00:03		
0.20	WL	Water level, 5% of the vertical dimension	00:00:08	5-1-2A	
0.49	DEZJ	Attached deposits, other at joint from 4 o'clock to 6 o'clock, 10% cross-sectional area loss: Jointing intrusions	00:00:11	5-1-3A	3
3.70	DEZJ	Attached deposits, other at joint from 4 o'clock to 8 o'clock, 10% cross-sectional area loss: Jointing intrusions	00:00:41	5-1-4A	3
8.23	CC	Crack, circumferential from 2 o'clock to 8 o'clock: Hairline crack	00:01:17	5-1-5A	2 / 2
8.71	DEZJ	Attached deposits, other at joint from 4 o'clock to 6 o'clock, 5% cross-sectional area loss: Jointing intrusions	00:01:21		3
14.95	JDM	Joint displaced, medium	00:02:06	5-1-7A	1 / 3
18.53	WL	Water level, 35% of the vertical dimension	00:02:32	5-1-8A	
18.73	REM	General remark: Approaching entry into interceptor manhole MH2	00:02:34	5-1-9A	
18.92	MHF	Finish node, manhole, reference: MH2: At MH2 - heavy waste deposits causing water ponding in channel	00:02:42		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
2	10.0	0.6	11.0	2.0	5	2.0	0.5	9.0	3.0

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Section Pictures - 28/11/2023 - MH1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
5	Downstream	MH1X	TBC	1587

5-1-2A, 00:00:08, 0.20 m
Water level, 5% of the vertical dimension

5-1-3A, 00:00:11, 0.49 m
Attached deposits, other at joint from 4 o'clock to 6 o'clock, 10% cross-sectional area loss, Jointing intrusions

5-1-4A, 00:00:41, 3.70 m
Attached deposits, other at joint from 4 o'clock to 8 o'clock, 10% cross-sectional area loss, Jointing intrusions

5-1-5A, 00:01:17, 8.23 m
Crack, circumferential from 2 o'clock to 8 o'clock, Hairline crack

5-1-7A, 00:02:06, 14.95 m
Joint displaced, medium

5-1-8A, 00:02:32, 18.53 m
Water level, 35% of the vertical dimension

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Section Pictures - 28/11/2023 - MH1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
5	Downstream	MH1X	TBC	1587

5-1-9A, 00:02:34, 18.73 m
General remark, Approaching entry into interceptor manhole MH2

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Section Inspection - 28/11/2023 - MH2X

Item No.	Insp. No.	Date:	Time:	Client`s Job Ref	Weather	Pre Cleaned	PLR
6	1	28/11/23	12:11	TBC	No Rain Or Snow	No	MH2X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
S.K	Not Specified	Not Specified	Not Specified	Other	1

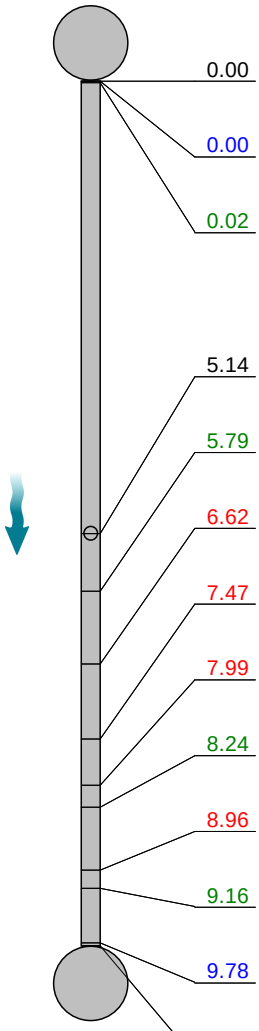
Town or Village:	London, N10 2Al	**Inspection Direction:**	Downstream	**Upstream Node:**	MH2
Road:	69 Grove Avenue	**Inspected Length:**	9.82 m	**Upstream Pipe Depth:**	0.750 m
Location:	Other location	**Total Length:**	9.82 m	**Downstream Node:**	MAIN FW
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments: No serious visual defects / No operational issues
Recommendations: None

Scale: 1:86

Depth: 0.75 m
MH2



Main FW
Depth: m

Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH2	00:00:01		
0.00	WL	Water level, 5% of the vertical dimension	00:00:01		
0.02	DEZJ	Attached deposits, other at joint from 4 o'clock to 8 o'clock, 5% cross-sectional area loss: Jointing intrusions	00:00:03	6-1-3A	3
5.14	JN	Junction at 12 o'clock, 150mm dia: C - not sourced - assumed lamphole	00:00:29	6-1-5A	
5.79	LD	Line deviates down	00:00:34	6-1-6A	
6.62	JDM	Joint displaced, medium	00:00:40	6-1-7A	1 / 3
7.47	JDM	Joint displaced, medium	00:00:43	6-1-8A	1 / 3
7.99	JDM	Joint displaced, medium	00:00:46	6-1-9A	1 / 3
8.24	LR	Line deviates right	00:00:48	6-1-10A	
8.96	JDM	Joint displaced, medium	00:00:52	6-1-11A	1 / 3
9.16	LL	Line deviates left	00:00:53	6-1-13A	
9.78	REM	General remark: At junction to Main FW Sewer	00:01:00	6-1-14A	
9.82	OCF	Finish node, other special chamber, reference: Main FW Sewer: At Main FW Sewer	00:01:06	6-1-15A	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
4	1.0	0.4	4.0	1.0	7	4.0	1.4	14.0	3.0

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Section Pictures - 28/11/2023 - MH2X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
6	Downstream	MH2X	TBC	1587

6-1-3A, 00:00:03, 0.02 m
Attached deposits, other at joint from 4 o'clock to 8 o'clock, 5% cross-sectional area loss, Jointing intrusions

6-1-5A, 00:00:29, 5.14 m
Junction at 12 o'clock, 150mm dia, C - not sourced - assumed lamphole

6-1-6A, 00:00:34, 5.79 m
Line deviates down

6-1-7A, 00:00:40, 6.62 m
Joint displaced, medium

6-1-8A, 00:00:43, 7.47 m
Joint displaced, medium

6-1-9A, 00:00:46, 7.99 m
Joint displaced, medium

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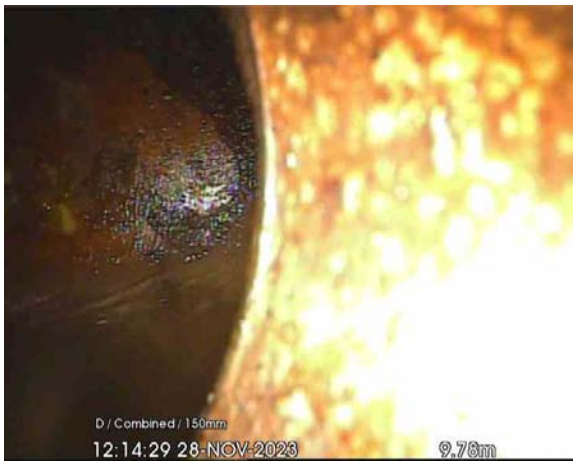
Section Pictures - 28/11/2023 - MH2X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
6	Downstream	MH2X	TBC	1587

6-1-10A, 00:00:48, 8.24 m
Line deviates right

6-1-11A, 00:00:52, 8.96 m
Joint displaced, medium

6-1-13A, 00:00:53, 9.16 m
Line deviates left



6-1-14A, 00:01:00, 9.78 m
General remark, At junction to Main FW Sewer

6-1-15A, 00:01:06, 9.82 m
Finish node, other special chamber, reference: Main FW Sewer, At Main FW Sewer

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Section Inspection - 28/11/2023 - SWG1X

Item No.	Insp. No.	Date:	Time:	Client`s Job Ref	Weather	Pre Cleaned	PLR
7	1	28/11/23	13:53	TBC	No Rain Or Snow	No	SWG1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
S.K	Not Specified	Not Specified	Not Specified	Other	1

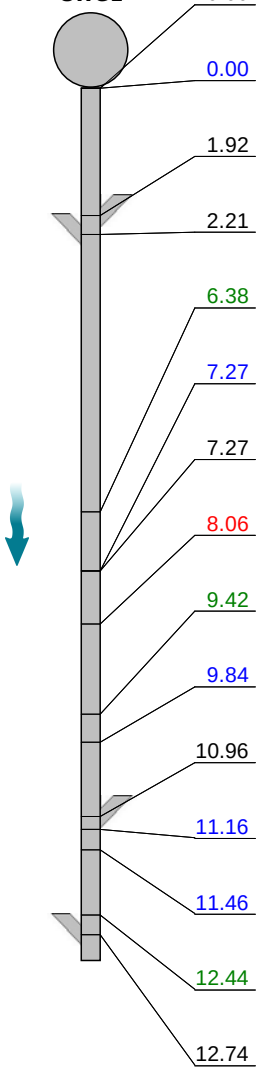
Town or Village:	London, N10 2Al	**Inspection Direction:**	Downstream	**Upstream Node:**	SWG1
Road:	69 Grove Avenue	**Inspected Length:**	20.55 m	**Upstream Pipe Depth:**	0.200 m
Location:	Under a building	**Total Length:**	20.55 m	**Downstream Node:**	A1
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments: No serious visual defects / No operational issues
Recommendations: None

Scale: 1:114

Depth: 0.20 m
SWG1



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: SWG1	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension	00:00:09	7-1-2A	
1.92	JN	Junction at 9 o'clock, 100mm dia: D - not sourced / assumed from RWG5	00:00:40	7-1-3A	
2.21	JN	Junction at 1 o'clock, 100mm dia: E - not sourced/assumed from rear ACOs and SWGs	00:00:44	7-1-4A	
6.38	LD	Line deviates down	00:01:11	7-1-5A	
7.27	REM	General remark: Line levels out	00:01:18		
7.27	MCVC	Pipe material changes to vitrified clay at this point	00:01:18	7-1-7A	
8.06	JDM	Joint displaced, medium	00:01:33	7-1-8A	1 / 3
9.42	RFJ	Roots, fine at joint	00:01:44		2
9.84	WL	Water level, 20% of the vertical dimension	00:01:47	7-1-10A	
10.96	JN	Junction at 10 o'clock, 100mm dia: F - not sourced/possible from No.71	00:02:04	7-1-11A	
11.16	WL	Water level, 5% of the vertical dimension	00:02:12		
11.46	REM	General remark: At access point concealed in MH1 benching	00:02:13	7-1-13A	
12.44	DEZJ	Attached deposits, other at joint from 12 o'clock to 6 o'clock, 5% cross-sectional area loss: Jointing intrusions	00:02:36	7-1-14A	3
12.74	JN	Junction at 1 o'clock, 100mm dia: G - not sourced / assumed original RWG2 junction	00:02:45	7-1-15A	

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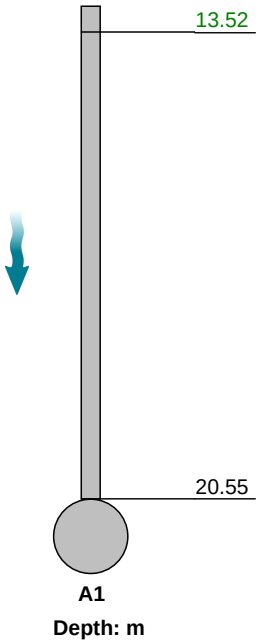
Section Inspection - 28/11/2023 - SWG1X

Item No.	Insp. No.	Date:	Time:	Client`s Job Ref	Weather	Pre Cleaned	PLR
7	1	28/11/23	13:53	TBC	No Rain Or Snow	No	SWG1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
S.K	Not Specified	Not Specified	Not Specified	Other	1

Scale: 1:114



Position [m]	Code	Observation	MPEG	Photo	Grade
13.52	DEZJ	Attached deposits, other at joint from 3 o'clock to 8 o'clock, 10% cross-sectional area loss: Jointing intrusions	00:02:57	7-1-16A	3
20.55	OCF	Finish node, other special chamber, reference: A1: Junction from RWG3	00:03:46	7-1-19A	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
2	1.0	0.1	2.0	1.0	6	6.0	0.5	11.0	4.0

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Section Pictures - 28/11/2023 - SWG1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
7	Downstream	SWG1X	TBC	1587

7-1-2A, 00:00:09, 0.00 m
Water level, 0% of the vertical dimension

7-1-3A, 00:00:40, 1.92 m
Junction at 9 o'clock, 100mm dia, D - not sourced / assumed from RWG5

7-1-4A, 00:00:44, 2.21 m
Junction at 1 o'clock, 100mm dia, E - not sourced/assumed from rear ACOs and SWGs

7-1-5A, 00:01:11, 6.38 m
Line deviates down

7-1-7A, 00:01:18, 7.27 m
Pipe material changes to vitrified clay at this point

7-1-8A, 00:01:33, 8.06 m
Joint displaced, medium

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Section Pictures - 28/11/2023 - SWG1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
7	Downstream	SWG1X	TBC	1587

7-1-10A, 00:01:47, 9.84 m
Water level, 20% of the vertical dimension

7-1-11A, 00:02:04, 10.96 m
Junction at 10 o'clock, 100mm dia, F - not sourced/possible from No.71

7-1-13A, 00:02:13, 11.46 m
General remark, At access point concealed in MH1 benching

7-1-14A, 00:02:36, 12.44 m
Attached deposits, other at joint from 12 o'clock to 6 o'clock, 5% cross-sectional area loss, Jointing intrusions

7-1-15A, 00:02:45, 12.74 m
Junction at 1 o'clock, 100mm dia, G - not sourced / assumed original RWG2 junction

7-1-16A, 00:02:57, 13.52 m
Attached deposits, other at joint from 3 o'clock to 8 o'clock, 10% cross-sectional area loss, Jointing intrusions

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Section Pictures - 28/11/2023 - SWG1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
7	Downstream	SWG1X	TBC	1587

7-1-19A, 00:03:46, 20.55 m
Finish node, other special chamber, reference: A1, Junction from RWG3

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Section Inspection - 28/11/2023 - Main SWX

Item No.	Insp. No.	Date:	Time:	Client`s Job Ref	Weather	Pre Cleaned	PLR
8	1	28/11/23	11:59	TBC	No Rain Or Snow	No	MAIN SWX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
S.K	Not Specified	Not Specified	Not Specified	Other	1

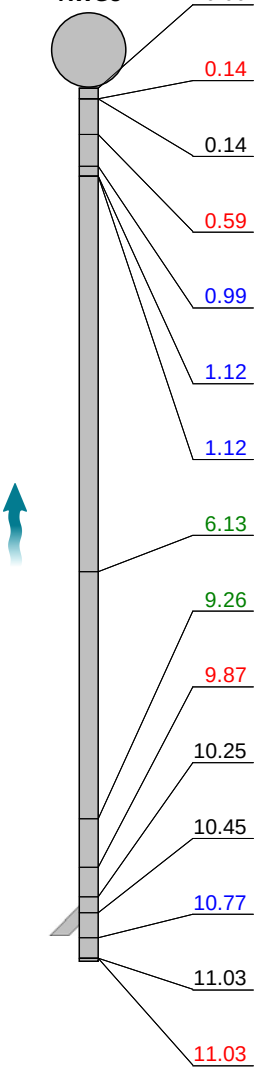
Town or Village:	London, N10 2Al	**Inspection Direction:**	Upstream	**Upstream Node:**	MAIN SW
Road:	69 Grove Avenue	**Inspected Length:**	22.79 m	**Upstream Pipe Depth:**	
Location:	Other location	**Total Length:**	22.79 m	**Downstream Node:**	RWG3
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	0.200 m

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments: Some structural issues / No operational issues
Recommendations: Refer to Thames Water Utilities Limited if necessary

Scale: 1:96

Depth: 0.20 m
RWG3



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	GY	Start node, gully, reference: RWG3	00:00:01		
0.14	JDM	Joint displaced, medium	00:00:05	8-1-2A	1 / 3
0.14	MCVC	Pipe material changes to vitrified clay at this point	00:00:05		
0.59	JDL	Joint displaced, large	00:00:10	8-1-4A	1 / 4
0.99	REM	General remark: At junction to line from SWG1 downstream (point A1)	00:00:17	8-1-5A	
1.12	WL	Water level, 5% of the vertical dimension	00:00:21		
1.12	REM	General remark: Camera enters line from SWG1 downstream	00:00:21	8-1-7A	
6.13	DEZJ	Attached deposits, other at joint from 3 o'clock to 5 o'clock, 10% cross-sectional area loss: Jointing intrusions/scale	00:00:49	8-1-8A	3
9.26	DEXJ	Settled deposits, other at joint, 10% cross-sectional area loss: Jointing intrusions/scale	00:01:12	8-1-9A	3
9.87	JDM	Joint displaced, medium	00:01:16		1 / 3
10.25	MCPVC	Pipe material changes to polyvinyl chloride at this point	00:01:20		
10.45	JN	Junction at 2 o'clock, 100mm dia, from RWG4	00:01:28	8-1-12A	
10.77	WL	Water level, 20% of the vertical dimension	00:01:43		
11.03	MCVC	Pipe material changes to vitrified clay at this point	00:01:46		
11.03	JDL	Joint displaced, large	00:01:46	8-1-15A	1 / 4

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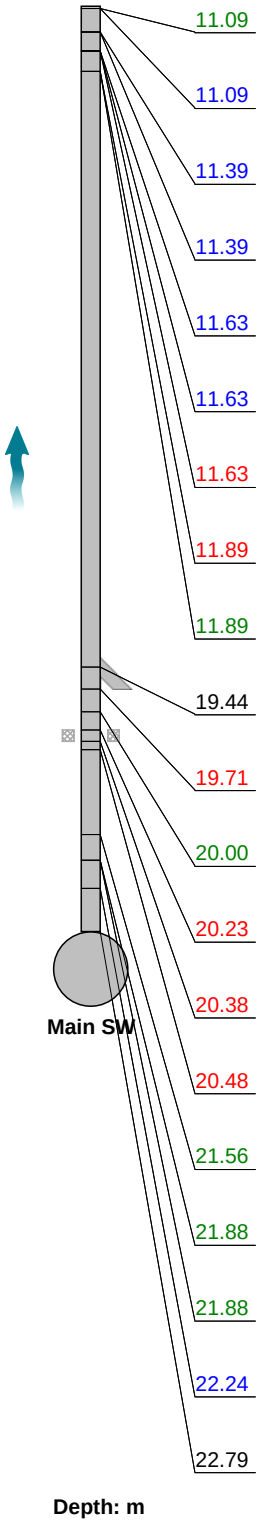
Section Inspection - 28/11/2023 - Main SWX

Item No.	Insp. No.	Date:	Time:	Client`s Job Ref	Weather	Pre Cleaned	PLR
8	1	28/11/23	11:59	TBC	No Rain Or Snow	No	MAIN SWX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
S.K	Not Specified	Not Specified	Not Specified	Other	1

Scale: 1:96



Position [m]		Code	Observation	MPEG	Photo	Grade
11.09		LD	Line deviates down	00:01:48		
11.09		REM	General remark: Approaching entry into manhole MH2	00:01:48	8-1-17A	
11.39		WL	Water level, 5% of the vertical dimension	00:01:52		
11.39		REM	General remark: At access point in MH2 benching	00:01:53	8-1-19A	
11.63		REM	General remark: Possible change to 150mm diameter	00:01:59		
11.63		REM	General remark: Exit MH2	00:01:59		
11.63		JDM	Joint displaced, medium	00:02:00	8-1-22A	1 / 3
11.89		JDM	Joint displaced, medium	00:02:02		1 / 3
11.89		DEZJ	Attached deposits, other at joint from 6 o'clock to 1 o'clock, 10% cross-sectional area loss: Jointing intrusions/scale	00:02:02	8-1-24A	3
19.44		JN	Junction at 11 o'clock, 100mm dia: H - not sourced / assumed lamphole	00:02:39	8-1-25A	
19.71		JDM	Joint displaced, medium	00:02:41	8-1-26A	1 / 3
20.00		LD	Line deviates down	00:02:42		
20.23	S02	CM	Cracks, multiple from 7 o'clock to 12 o'clock, start	00:02:44	8-1-28A	
20.38	F02	CM	Cracks, multiple from 7 o'clock to 12 o'clock, finish	00:02:46		3 / 2
20.48		JDL	Joint displaced, large	00:02:45	8-1-30A	1 / 4
21.56		LD	Line deviates down	00:02:52		
21.88		DEEJ	Attached deposits, encrustation at joint from 12 o'clock to 12 o'clock, 10% cross-sectional area loss: Jointing intrusions/scale	00:02:54	8-1-32A	3
21.88		LL	Line deviates left	00:02:54		
22.24		REM	General remark: Approaching junction to Main SW Sewer in Grove Avenue	00:02:56	8-1-34A	
22.79		OCF	Finish node, other special chamber, reference: Main SW Sewer: At Main SW Sewer in Grove Avenue	00:03:04		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
9	42.0	2.2	51.0	3.0	13	6.0	1.5	34.0	4.0

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Section Pictures - 28/11/2023 - Main SWX

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
8	Upstream	MAIN SWX	TBC	1587

8-1-2A, 00:00:05, 0.14 m
Joint displaced, medium

8-1-4A, 00:00:10, 0.59 m
Joint displaced, large

8-1-5A, 00:00:17, 0.99 m
General remark, At junction to line from SWG1 downstream (point A1)

8-1-7A, 00:00:21, 1.12 m
General remark, Camera enters line from SWG1 downstream

8-1-8A, 00:00:49, 6.13 m
Attached deposits, other at joint from 3 o'clock to 5 o'clock, 10% cross-sectional area loss, Jointing intrusions/scale

8-1-9A, 00:01:12, 9.26 m
Settled deposits, other at joint, 10% cross-sectional area loss, Jointing intrusions/scale

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Section Pictures - 28/11/2023 - Main SWX

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
8	Upstream	MAIN SWX	TBC	1587

8-1-12A, 00:01:28, 10.45 m
Junction at 2 o'clock, 100mm dia, from RWG4

8-1-15A, 00:01:46, 11.03 m
Joint displaced, large

8-1-17A, 00:01:48, 11.09 m
General remark, Approaching entry into manhole MH2

8-1-19A, 00:01:53, 11.39 m
General remark, At access point in MH2 benching

8-1-22A, 00:02:00, 11.63 m
Joint displaced, medium

8-1-24A, 00:02:02, 11.89 m
Attached deposits, other at joint from 6 o'clock to 1 o'clock, 10% cross-sectional area loss, Jointing intrusions/scale

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Section Pictures - 28/11/2023 - Main SWX

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
8	Upstream	MAIN SWX	TBC	1587

8-1-25A, 00:02:39, 19.44 m
Junction at 11 o'clock, 100mm dia, H - not sourced / assumed lamphole

8-1-26A, 00:02:41, 19.71 m
Joint displaced, medium

8-1-28A, 00:02:44, 20.23 m
Cracks, multiple from 7 o'clock to 12 o'clock, start

8-1-30A, 00:02:45, 20.48 m
Joint displaced, large

8-1-32A, 00:02:54, 21.88 m
Attached deposits, encrustation at joint from 12 o'clock to 12 o'clock, 10% cross-sectional area loss, Jointing

8-1-34A, 00:02:56, 22.24 m
General remark, Approaching junction to Main SW Sewer in Grove Avenue

Integrum Notes

Please note that the meterage supplied in this report should be used as a guideline only and not solely relied on for accuracy. Integrum Site Services Ltd does not accept any liability for any cliam made against inaccuracy of the meterage shown in report.

Report is in accordance with MSCC5 standards

The drainage layout is not to scale and is a diagramatic representation of the layout established from the survey.

To find out about the range of services Integrum Site Services offer, please visit our website, www.integrum-site.com, or contact us on 020 8154 3200

MANHOLE SHEET

PROJECT DETAILS			
Client	**Georgina Hajipapas**	Job Ref	**1587**
Site Address	**69 Grove Avenue, London, N10 2AL**	Date	**28/11/2023**

MANHOLE	
Node Ref	**MH1**
Node Type	Manhole
Node Function	Combined
Node Location	Footway
Node Ownership	Private

COVER		
Cover Shape	Rectangle	
Dimension 1	480mm	
Dimension 2	630mm	
Cover Condition	Good	
Cover Construction	In-fill	
Cover Duty	Medium	
Hinged	Yes	No ✔
Locked	Yes	No ✔

CHAMBER		
Invert Level (depth from CL)	650mm	
Dimension 1	450mm	
Dimension 2	600mm	
Chamber Construction	Brick	
Chamber Condition	Good	
Step Iron/Ladder	Not present	
Benching Condition	Good	
Confined Space	Yes	No ✔

LOCATION PHOTO

CHAMBER PHOTO

RECOMMENDATION / NOTES

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SITE SERVICES

MANHOLE SHEET

PROJECT DETAILS			
Client	**Georgina Hajipapas**	Job Ref	**1587**
Site Address	**69 Grove Avenue, London, N10 2AL**	Date	**28/11/2023**

MANHOLE	
Node Ref	**MH2**
Node Type	Manhole
Node Function	Combined
Node Location	Driveway
Node Ownership	Public

COVER			
Cover Shape	Rectangle		
Dimension 1	480mm		
Dimension 2	630mm		
Cover Condition	Good		
Cover Construction	In-fill		
Cover Duty	Medium		
Hinged	Yes	No	✔
Locked	Yes	No	✔

CHAMBER			
Invert Level (depth from CL)	750mm		
Dimension 1	500mm		
Dimension 2	750mm		
Chamber Construction	Brick		
Chamber Condition	Good		
Step Iron/Ladder	Not present		
Benching Condition	Good		
Confined Space	Yes	No	✔

LOCATION PHOTO

CHAMBER PHOTO

RECOMMENDATION / NOTES

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