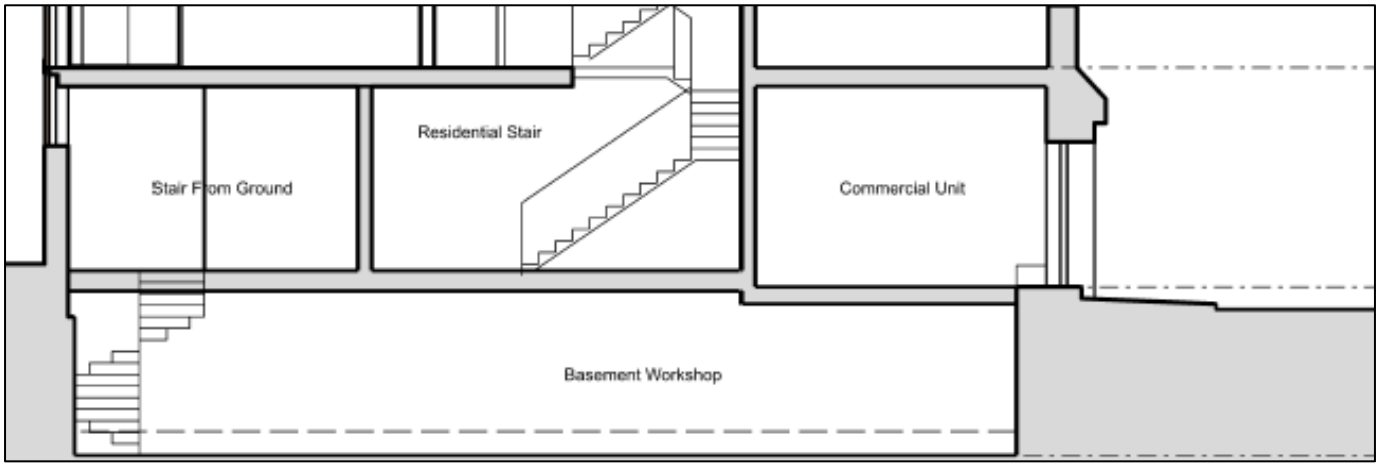
H Fraser Consulting
Contaminated Land and Hydrogeology

21 Baldwins Gardens, EC1N 7TJ

Hydrogeological and hydrological aspects of Basement Impact Assessment (BIA)



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NON-TECHNICAL SUMMARY

The site location is 21, Baldwin's Gardens / 43 Leather Lane, Camden, EC1N 7TJ (NGR 531250, 181855; see Figure 1.1). The site comprises a five-storey terraced building (including partial basement) with commercial and residential use, with no outdoor area. Two neighbouring properties have single level basements / lower ground floor, the nearest of which is c.10 m from the site.

The proposed development extends the first, second and third floors towards the rear (above the existing ground floor) and adds a fourth floor. It also extends the basement towards the rear. The base of the proposed basement extension is c.0.4 m below existing, with the existing basement to be underpinned by a new 1 m deep foundation.

The following assessments are presented:

- Desk study
- Site investigation
- Screening
- Scoping
- Impact assessment

The author of the assessment is Joe Gomme (CGeol), a hydrogeologist with over 30 years' experience.

The site is underlain by Hackney Gravel (a Secondary aquifer), with London Clay beneath at an anticipated depth of at least 7 m below ground. The proven ground conditions are Made Ground (clayey Sand / sandy Clay with gravel and occasional brick / concrete) to between 0.3 m and 0.8 m below the base of the proposed basement extension, underlain by Hackney Gravel (Sand with gravel) to at least 1.3 m. The monitored groundwater level is at least 1.3 m below the base of the proposed basement extension (and at least 0.7 m below the proposed underpin).

There is a very low risk of groundwater flooding at ground level, but a low-medium risk that the water table intercepts the proposed basement / underpin. This may cause damage to the building and backing up of groundwater. The following mitigation measures are recommended:

1. Arrangements for minor dewatering during construction
2. The basement should be waterproofed, in line with British Standard BS 8102:2009 'Code of practice for protection of below ground structures against water from the ground.'
3. Installation of a drainage layer beneath the new underpin and new basement

If the recommended mitigation measures are implemented, residual impacts to the property and the wider hydrological environment, including cumulative impacts, are negligible.

The site has a very low risk of flooding by surface water, river, groundwater or sewer. However, for good practice a sump and automatic positively pumped system with non-return valves is recommended for any basement WC or other wastewater facilities.

The proposed development does not change the quantity of rainfall run-off from the site, therefore there are no significant impacts to the wider hydrological environment resulting from the proposed development.

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1 INTRODUCTION

1.1 Objective

The purpose of this assessment is to consider the hydrogeological and hydrological impacts of a proposed basement development at 21 Baldwin's Gardens / 43 Leather Lane, Camden, EC1N 7TJ including potential impacts to neighbours and the wider environment. The site location is presented in Figure 1.1.[1]

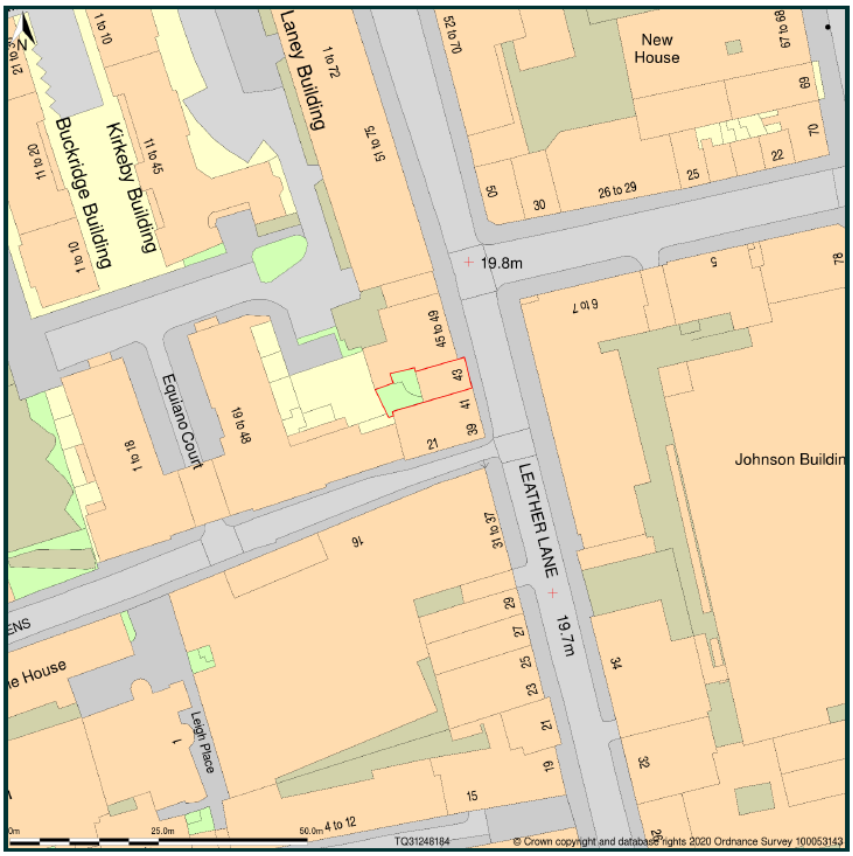


Figure 1.1 Site location
Contains Ordnance Survey data © Crown copyright and database right 2024

The BIA approach follows current planning procedure for basements and lightwells adopted by LB Camden and comprises the following elements (CPG Basements):

- Desk Study;
- Screening;
- Scoping;
- Site Investigation, monitoring and interpretation;
- Impact Assessment

[1] 43 Leather Lane, EC1N 7TJ is the relevant address for the basement work, since the entrance for the basement and ground floor of the property are at this address. Access to the upper floors is at 21, Baldwins Gardens, EC1N 7UY.

1.2 Scope of works

RSA Geotechnics (the client) has instructed H Fraser Consulting Ltd (HFCL) to provide the groundwater and surface water aspects of a Basement Impact Assessment (BIA) at the above property.

The agreed scope of work is as follows:

- Desk study
- Screening and scoping assessments
- Site investigation interpretation
- Impact assessment
- Non-technical summary
- Provision of a report in pdf format

1.3 Authors

The report was undertaken by Joe Gomme. Joe is a Chartered Geologist (CGeol) and is Associate Director of HFCL, with over 30 years' experience as a hydrogeologist and consultant. Joe has experience of undertaking Basement Impact Assessments in many London Boroughs.

The surface water and flooding aspects of the report were reviewed by Henry Kelly. Henry has an MSc in Hydrology and Water Resources Management from Imperial College London and is a chartered member of CIWEM (C.WEM). He also has over 10-years' experience in environmental consultancy, predominantly specialising in flood risk and drainage work. Henry has experience in drafting and reviewing Basement Impact Assessments in several London Boroughs.

2 DESK STUDY

2.1 Sources of information

The following data have been used in this study:

- Existing and proposed plans (Appendix A);
- Existing and proposed cross-sections (Appendix B);
- Geological information: British Geological Survey on-line mapping and borehole database (relevant data in Appendix D);
- Ordnance Survey mapping: MagicMap on-line mapping;
- Flood risk mapping https://flood-warning-information.service.gov.uk/long-term-flood-risk/;
- Relevant guidance documentation from Camden Borough Council:
    - LB Camden, Strategic Flood Risk Assessment (produced by URS, 2014);
    - LB Camden, Floods in Camden, Report of the Floods Scrutiny Panel (2013);
    - LB Camden, Planning Guidance (CPG) – Basements (March 2018);
    - LB Camden, Camden Geological, Hydrogeological and Hydrological Study – Guidance for Subterranean Development (produced by Arup, 2010);
    - LB Camden, Local Plan Policy A5 Basements (2017);
    - LB Camden's Audit Process Terms of Reference;
- Site investigation report (Appendix E)
- Landmark report and historic mapping (included within Appendix E)

2.2 Site description

The site is located at 21, Baldwin's Gardens / 43 Leather Lane, Camden, EC1N 7TJ. The site location is presented in Figure 1.1. According to Ordnance Survey (OS) mapping, it sits at approximately 20 m above Ordnance Datum (m aOD) and has an area of c.90 m^2. The existing property is a five-storey (including partial basement) terraced building.

2.2.1 Neighbouring buildings

The terrace lines the west side of Leather Lane and turns the corner to Baldwins Gardens. Immediately behind the building is a courtyard (partly hard-surfaced and partly garden).

The planning portal has records of basements at two large buildings within 20 m of the site, namely:

- a lower ground floor at 6-7 St Cross Street c.10 m east of the site; and
- single level basement at 16-16a Baldwin's Gardens and 31-37 Leather Lane c. 14 m south of the site (excluding access).

At both of these sites, the basements are thought to underlie the entire property. Further details are provided in Table 2.1.

Table 2.1 Details of nearby basements

Address	Distance from site	Planning ref.	Description
16-16a Baldwin's Gardens and 31-37 Leather Lane	c.14 m south	2016/3239/P	Reconfiguration of floorspace at basement level to provide additional dedicated jewellery workshops (Class B1(c)). The proposed basement plan indicates that the basement underlies the full footprint of the building*
5, 6 - 7 St Cross Street	c.10 m east	2021/5942/P	Change of use of the lower ground floor level of 6-7 St Cross Stree (Withdrawn). The existing basement plan indicates that the lower ground floor underlies the full footprint of the building**

*http://camdocs.camden.gov.uk/HPRMWebDrawer/Record/6701222/file/document?inline

**http://camdocs.camden.gov.uk/HPRMWebDrawer/Record/9368569/file/document?inline

2.2.2 Existing development

Existing and proposed drawings are presented in Appendix A and Appendix B.

The existing development comprises a five-storey building with a former café in the basement and ground floor fronting Leather Lane and residential accommodation in the upper three floors, which are accessed from Baldwin's Gardens. The entire site is covered by the building (see Figure 2.1).

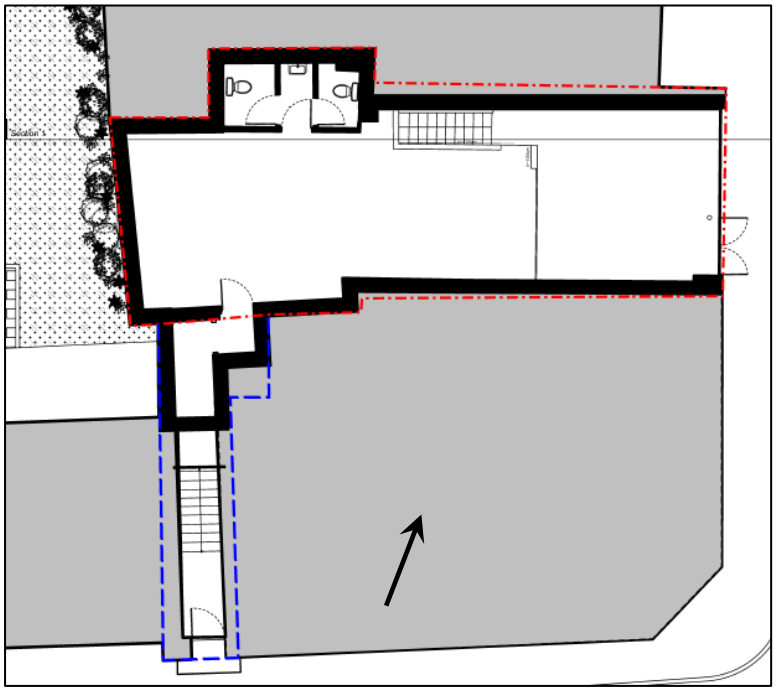


Figure 2.1 Extract from existing ground floor plan

Arrow pointing north. Development area outlined in red. Neighbouring buildings in grey shading and neighbouring garden area stippled.

The basement sits beneath the front of the site, close to Leather Lane.

The existing basement dimensions are approximately 8.6 m by 4.1 m (c.35 m2) with a floor level c.2.4 m below ground floor level (c.17.6 m aOD; based on inspection of drawings). Pavement level is 19.655 m aOD, ground floor level (to the rear of the property) is 19.955 m aOD and the base of the existing basement is 16.933 m aOD.

The site surface area is currently 100 percent impermeable with run-off to sewer.

2.2.3 Proposed development

The proposed development extends the first, second and third floors towards the rear (above the existing ground floor) and adds a fourth floor. It also extends the basement towards the rear. Illustrative cross sections of the existing and proposed buildings are presented in Appendix B and extracts from them in Figure 2.2. The basement will be accessed through a set of internal stairs at the rear.

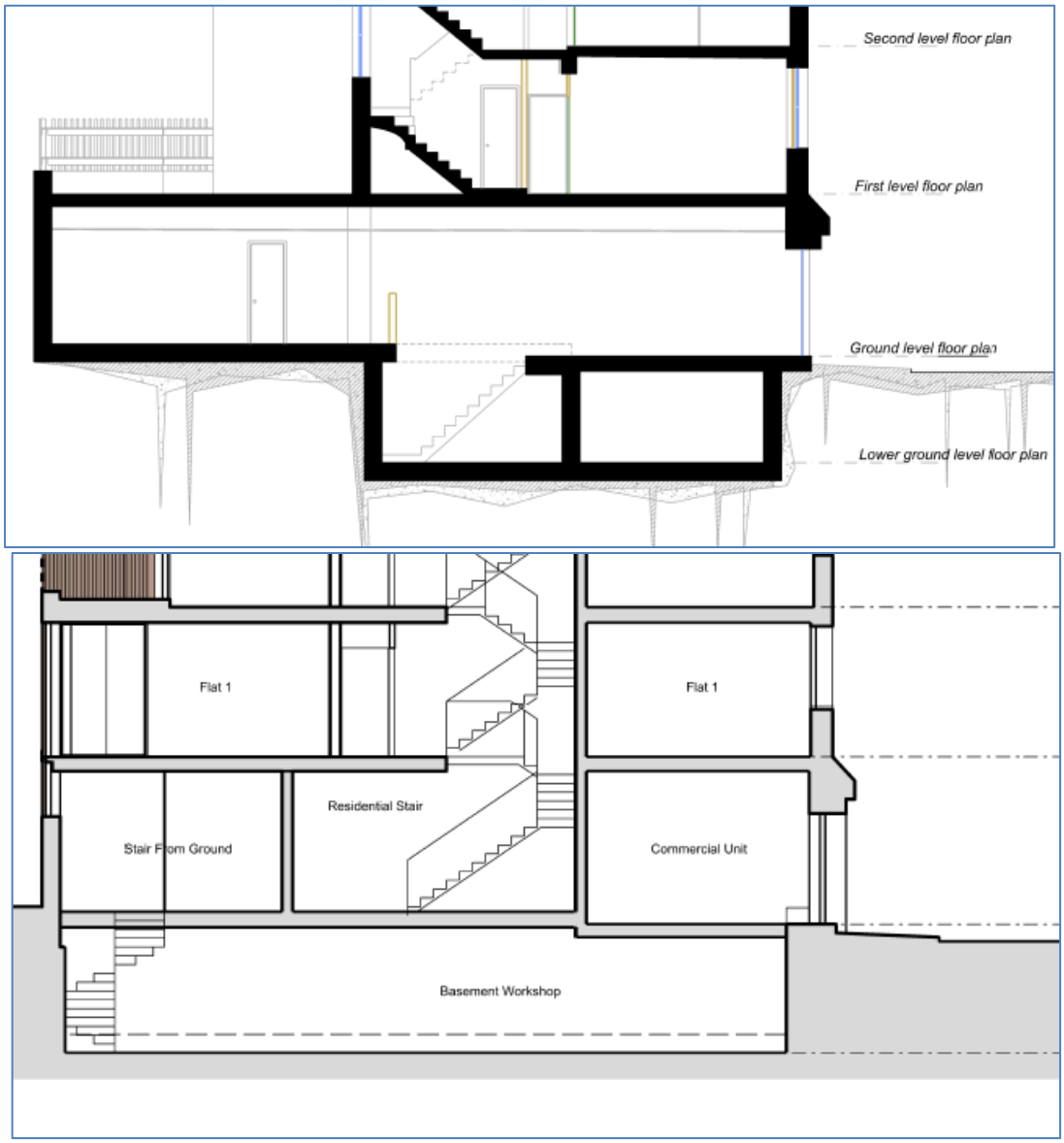


Figure 2.2 Extract from basement cross sections

Upper image shows existing; lower image shows proposed layout.

The proposed basement fills most of the plot and has an area of 58.0 m^2. Final floor level (FFL) for the proposed basement is c.2.6 m below the ground-floor level (17.333 m aOD).

It is proposed that the existing basement footing (base at 16.933 m aOD) is underpinned by 1 m deep new foundations (base at 15.933 m aOD), as shown in Figure 2.3.

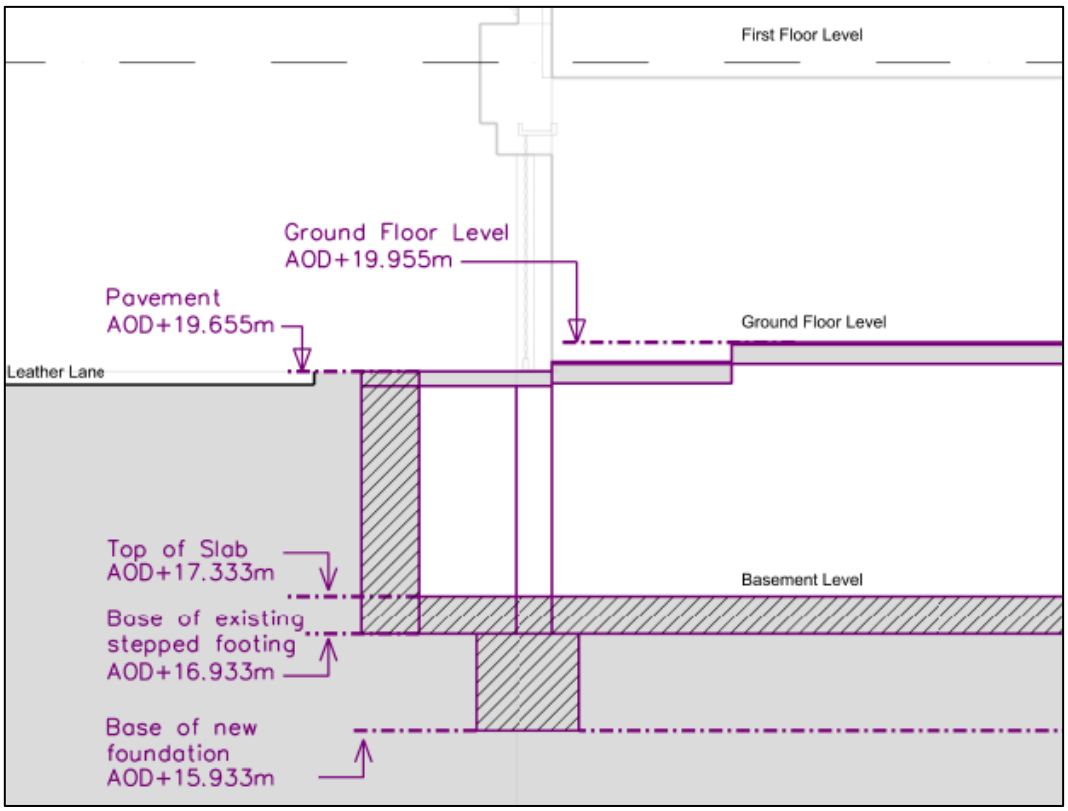


Figure 2.3 Cross-section of proposed basement (fronting onto Leather Lane)

The new basement excavation (to the rear of the property, not shown on Figure 2.3) is at 16.5 m aOD.

The proposed building, like the existing building, will cover the entire plot; there will therefore be no change to the proportion of the plot that is covered by hard surfaces.

2.3 Local environmental information

Data relevant to the local geology and water resources are presented in Table 2.2.

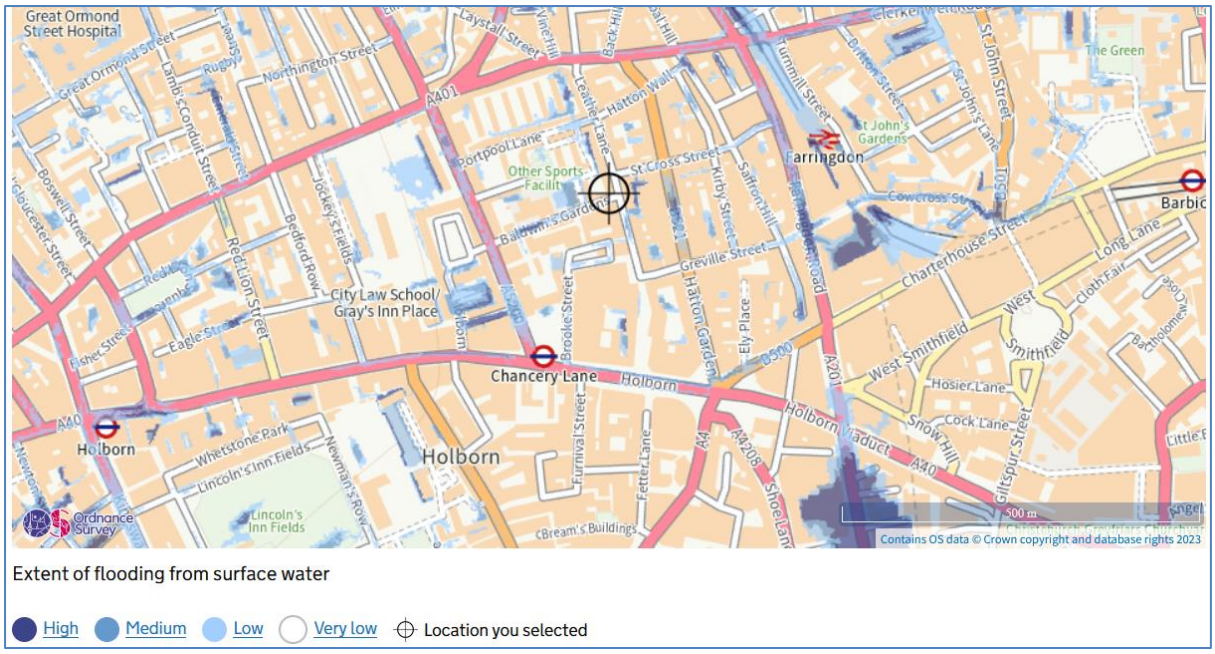
Table 2.2 Background information

Site location	The National Grid Reference for the site is 531250, 181855.
Topography	The site area is flat, with an elevation close to 19 m aOD. Surrounding ground rises gently to the west towards Bloomsbury (up to 25 m aOD, 1 km from the site) and slopes more steeply to the east towards Farringdon Road (c.12 m aOD approximately 200 m to the east of the site).
Geology	The British Geology Survey (BGS) web site shows that the superficial geology at the site is the Hackney Gravel member, and that this is underlain by the

	London Clay Formation (see Appendix C, which shows the site location on the geological figure taken from Arup (2010).[2] The London Clay mainly comprises bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay.[3] The Hackney Gravel member is sand and gravel, locally with lenses of silt, clay or peat.[4] Westward the Hackney Gravel is succeeded by the Lynch Hill Gravel, a similar formation that is found some 200 m to the west. The three nearest records from the BGS borehole database (40 m north northeast, 75 m northwest and 110 m west southwest of the site) are presented in Appendix D.[5] These show Made Ground between 1 and 4.5 m thick above sand and gravel that extends to a depth between 7 and 11 m below ground.[6] The London Clay was found beneath the sand and gravel. The borehole to the northwest is the only one that recorded groundwater levels. In this location groundwater at the time of construction (1953) was recorded at c.14.5 m aOD. Site investigation data is provided in Appendix E and discussed in Section 3
Aquifer status	The site is underlain by a superficial Drift aquifer (a "Secondary A" aquifer)[7] according to the Environment Agency designations.[8] Regarding bedrock aquifers, the London Clay is classified by the Environment Agency as unproductive.[9]
Source Protection zone	The site is not within a groundwater source protection zone[10]
Watercourses	The River Thames, c.1 km to the south, is the only mapped water body near the site.[8] One of London's "lost" rivers, the Fleet, runs beneath Farringdon Road, c.200 m east of the site. It has a small tributary that rises around Holborn Circus, c.300 m southeast of the site. The potential impacts relating to the proximity of these watercourses are flood risk and waterlogging. However, the site is

[2] British Geological Survey, Geology of Britain viewer, accessed June 2023 at https://geologyviewer.bgs.ac.uk.
[3] https://www.bgs.ac.uk/lexicon/lexicon.cfm?pub=LC
[4] https://webapps.bgs.ac.uk/lexicon/lexicon.cfm?pub=HAGR
[5] https://mapapps2.bgs.ac.uk/geoindex/home.html
[6] We note that Arup (2010, Figure 6) suggests on the basis of indicative geological mapping by BGS that the gravel thickness is much less than this; however, we consider the local borehole information quoted here to be more reliable as a data source.
[7] Secondary A aquifers are permeable layers that can support local water supplies, and may form an important source of base flow to rivers.
[8] https://magic.defra.gov.uk/magicmap.aspx
[9] Rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
[10] https://magic.defra.gov.uk/magicmap.aspx

	sufficiently distant, and elevated from, the "lost" river that no impacts are anticipated. The site is not within the catchment of the Hampstead Heath Pond Chain, which is c. 5 km to the northwest.
Springs	There are no springs shown on OS mapping within 500 m of the site.[8]
Wells	The site is not located within a source protection zone (SPZ). The nearest, which is for an abstraction from the deep Chalk aquifer beneath the London Clay, is c.1 km to the northeast.[8]
Flood risk	The site is classed as being at very low risk of flooding by either rivers, surface water (Figure 2.4) or reservoir flooding.[11] The site does not lie within a critical drainage area or local flood risk zone, according to information from Camden Borough Council.[12] The Council's information also indicates that the site is outside any areas susceptible to groundwater flooding and has no history of sewer flooding. However, there is the potential for flooding of property below ground level.[13]



[11] https://check-long-term-flood-risk.service.gov.uk/risk. Each year this site has a chance of flooding less than 0.1%.
[12] URS, 2014, London Borough of Camden Strategic Flood Risk Assessment.

[13] Landmark report (Appendix E)

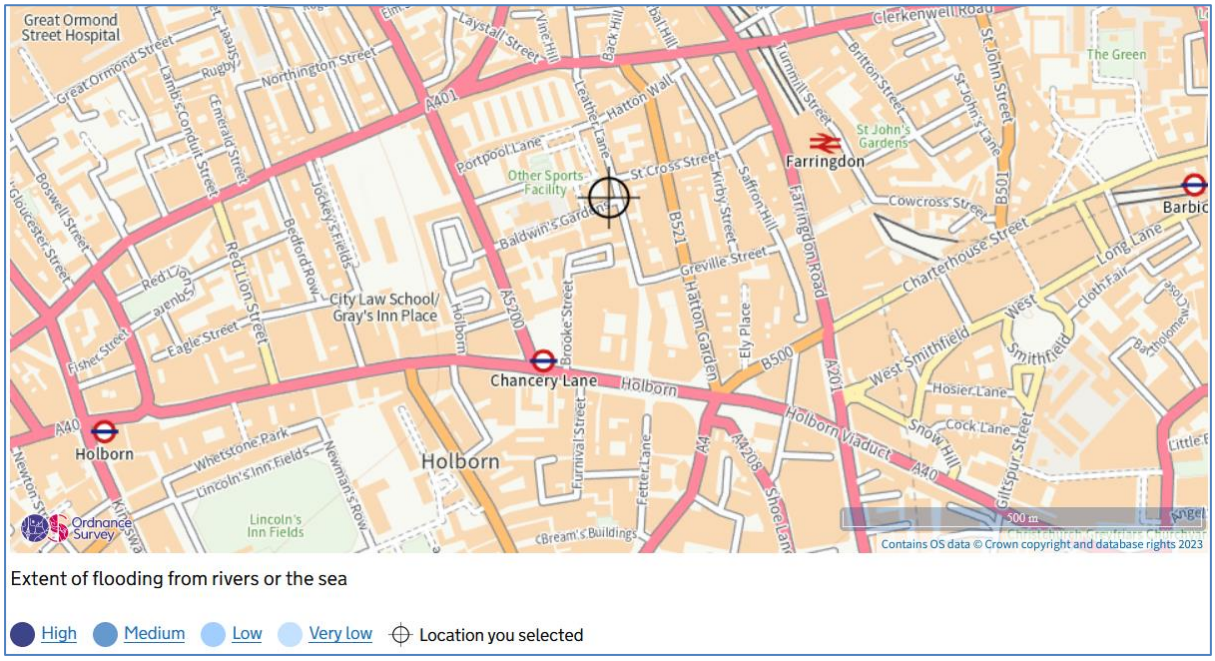


Figure 2.4 Flood risk map extracts: surface water (above) and rivers (below)

Taken from Environment Agency on-line mapping (https://check-long-term-flood-risk.service.gov.uk/map?easting=531247&northing=181846&map=SurfaceWater)

3 SITE INVESTIGATION

3.1 Description

Site investigation was conducted by RSA Geotechnics Ltd on 6 September 2023. A site investigation report is presented in Appendix E. Two boreholes (WS1 and WS1A) were drilled within the basement (ground level c.16.5 m aOD) using a handheld window sampler, to a maximum depth of 1.3 m (at WS1A).

Borehole WS1 comprised Made Ground (clayey Sand / sandy Clay with some gravel, brick and concrete) to 0.3 m, underlain by Hackney Gravel (slightly silty, slightly clayey Sand with gravel), to 0.6 m, with drilling unable to proceed deeper.

Borehole WS1A comprised Made Ground (sandy Clay with gravel and occasional brick / concrete) to 0.8 m, underlain by Hackney Gravel (described as slightly silty, slightly clayey Sand, with much gravel) to 1.3 m, with drilling unable to proceed deeper due to the density of the Sand. This borehole was equipped with a standpipe.

No groundwater was encountered during drilling. Borehole WS1A was dry during groundwater level monitoring on 9 October 2023.

3.2 Interpretation

The proven geology is Made Ground (clayey Sand / sandy Clay with gravel and occasional brick / concrete) to between 0.3 m and 0.8 m, underlain by Hackney Gravel (slightly silty, slightly clayey Sand with gravel) to at least 1.3 m below the base of the proposed basement and 0.7 m below the base of the proposed underpin.

Site investigation results suggest that the water table is at least 1.3 m below the base of the proposed basement and at least 0.7 m below the base of the proposed foundation (i.e. groundwater level lies below 15.2 m aOD). This is in accordance with BGS borehole records which indicate groundwater level at c.14.5 m aOD at a borehole 75 m northwest of the site.

Based on the geological descriptions in the borehole logs, the permeability of both the Hackney Gravel and the Made Ground is likely to be moderate.

4 SCREENING

4.1 Groundwater

A groundwater screening assessment has been undertaken and the results are presented in Table 4.1.

Table 4.1 Groundwater screening assessment

Question	Response	Details
1a. Is the site located directly above an aquifer?	Yes	There is a superficial aquifer. The site is underlain by the Hackney Gravel Member, which is classed as a Secondary A aquifer.
1b. Will the proposed basement extend beneath the water table surface?	No	Site investigation indicates that the water table is at least 1.3 metres below basement level .
2. Is the site within 100 m of a watercourse, well (used/ disused) or potential spring line?	No	There are no watercourses, wells or springs recorded within 100 m. The nearest is the River Fleet at c.200 m.
3. Is the site within the catchment of the pond chains on Hampstead Heath?	No	Hampstead Heath ponds are well to the north and upstream of the site.
4. Will the proposed basement development result in a change in the proportion of hard surface/paved areas?	No	The hard surface/paved area of the development area will not change.
5. As part of the drainage, will more surface water (e.g., rainfall and run-off) than at present be discharged to the ground (e.g., via soakaways and/or SuDS)?	No	Surface water drainage and foul water associated with the proposed development will go into the existing mains system. Rainfall and run-off discharge will be unchanged from the existing situation.
6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to, or lower than, the mean water level in any local pond or spring line?	No	There are no local ponds or spring lines.

4.2 Surface water and flooding

A surface water screening assessment has been undertaken and the results are presented in Table 4.2.

Table 4.2 Surface water screening assessment

Question	Response	Details
1. Is the site within the catchment of the pond chains on Hampstead Heath?	No	Hampstead Heath ponds are well to the north and upstream of the site.
2. As part of the proposed site drainage, will surface water flows (e.g., volume of rainfall and peak run-off) be materially changed from the existing route?	No	There is no anticipated change to surface water flows from the site.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	No	The existing and proposed site both have 100 % impermeable areas.
4. Will the proposed basement result in changes to the profile of the inflows (instantaneous and long-term) of surface water being received by adjacent properties or downstream watercourses?	No	The hard surface/paved area of the development area will not change.
5. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No	During construction of the proposed basement the potential exists for sediment to be mobilised and/or fuel/oil to be accidentally spilt and transported off site in site runoff. Standard pollution control measures will be in place during construction and will mitigate this risk. The proposed basement development will be constructed so that the basement walls will be impermeable, sealed and isolated from surface water and cannot influence surface water quality.
6. Is the site in an area identified to have surface water flood risk according to either the Local Flood Risk Management Strategy (LFRMS) or the Strategic Flood Risk Assessment (SFRA) or is it at risk from flooding, for example because the proposed basement is below the static water level of nearby surface water feature.	No	The SFRA did not highlight the site as being in an area of flood risk. The site is classed as being at very low risk of surface water flooding or river flooding (see Figure 2.4). There are no nearby surface water features.

5 SCOPING

This Scoping assessment reviews the risks that were not screened out in the Screening assessment in the previous section.

5.1 Presence of an aquifer

The nature of the bedrock in the area (London Clay) means that significant movement of groundwater is unlikely. However, above the bedrock the site is underlain by superficial deposits of the Hackney Gravels, which are a Secondary A aquifer and are likely to contain groundwater. Local records indicate that the base of the gravel formation in the area is likely to be 10 to 13 m aOD, between 6 and 9 m below ground.

The site is at low risk of flooding of property below ground level. The measured water table depth at site is at least 1.3 m below the base of the proposed basement and at least 0.7 m below the proposed foundation base, however it is possible that at times the water table rises such that it intercepts the basement / foundations. It is likely that groundwater flow direction is towards the east, based on local topography, and the presence of a "lost" river c.200 m to the east.

Two nearby properties have single level basements / lower ground floor, the nearest of which is c.10 m from the site.

If the water table intercepts the basement / foundations, there is potential for:

- flooding of property below ground level
- backing up of groundwater

5.1.1 Flooding of property below ground level

To mitigate against flooding of the property below ground level:

- Arrangements for minor dewatering of the excavation to deal with potential groundwater seepage and near-surface flows during rainfall events are recommended during construction.
- The basement should be constructed so that no water penetration or dampness is permitted. There are well documented best-practice methods for waterproofing basement structures, to prevent ingress of groundwater to the built structure, and to counter the effects of soil moisture, as outlined in British Standard BS 8102:2009 'Code of practice for protection of below ground structures against water from the ground.' The National House Building Council (NHBC) requires basements which are to be used for habitable accommodation to be constructed to prevent any water penetration or dampness, and relevant protection is described in BS 8102.[14]

5.1.2 Backing up of groundwater

If basements disrupt groundwater flow and the ground permeability is moderate, there is potential for backing up of groundwater around the structure, which may cause damage on site or nuisance to neighbouring properties.

The base of the proposed basement (excluding new underpinned foundation) is 0.4 m deeper than the existing basement, and the proposed underpin is 1 metre deeper than the existing basement. Site investigation showed that the measured water table is at least 1.3 m below the new basement and at least 0.7 m below the underpin, but it may at times be higher. In order to assess whether the

[14] NHBC Standards 2017

water table is likely to rise above the underpin and new basement, a deeper borehole would be required. However, this may not be possible due to access constraints (the fully built property limits the type of drill rig). Furthermore, no groundwater level information regarding the nearby basements (Table 2.1) was identified on the planning portal.

The permeability of the underlying geology is likely to be moderate, and it is possible that groundwater level rises above the base of the proposed basement / underpin, therefore the proposed development risks causing seasonal backing up of groundwater, which may impact neighbouring properties, particularly those with basements (the nearest is believed to be c.10 m away).

To mitigate against the potential backing up of groundwater, installation of a drainage layer beneath the underpin and new basement is recommended.

5.2 Sewer flooding

The site is located within a postcode area that has no historical incidents of sewer flooding.[12] However, for good practice and to further reduce the risk of sewer flooding, a sump and automatic positively pumped system with non-return valves is recommended for any basement WC or other wastewater facilities. Such facilities in the basement should drain to a sump equipped with an automatic pumping system capable of pumping against the backpressure of a flooded sewer.

6 BASEMENT IMPACT ASSESSMENT

6.1 Conceptual site model

The proven ground conditions are Made Ground (clayey Sand / sandy Clay with gravel and occasional brick / concrete) to between 0.3 m and 0.8 m below the base of the proposed basement, underlain by Hackney Gravel (Sand with gravel) to 1.3 m, with the monitored groundwater level at least 1.3 m deep (groundwater level lies below 15.2 m aOD).

The existing basement dimensions are approximately 8.6 m by 4.1 m (c.35 m^2) with a floor level c.2.4 m below ground floor level and base of basement at c.16.9 m aOD.

The proposed basement area is 58 m^2 with a floor level of c.2.6 m below ground floor level and base of basement extension at c.16.5 m aOD. The existing basement will be underpinned by 1 m deep new foundations (base at 15.933 m aOD).

The measured water table depth is at least 1.3 m below the base of the proposed basement, and at least 0.7 m below the proposed foundation base. Groundwater level may at times rise above the base of the basement/foundations. The permeability of both the Hackney Gravel and the Made Ground is likely to be moderate.

Two nearby properties have single level basements / lower ground floor, the nearest of which is c.10 m from the site.

6.2 Groundwater

There is a very low risk of groundwater flooding at ground level, but a low-medium risk that the water table intercepts the proposed basement / underpin. This may cause damage to the building and backing up of groundwater. The following mitigation measures are recommended:

1. Arrangements for minor dewatering during construction
2. The basement should be waterproofed, in line with British Standard BS 8102:2009 'Code of practice for protection of below ground structures against water from the ground.'
3. Installation of a drainage layer beneath the new underpin and new (not existing) basement

If the recommended mitigation measures are implemented, residual impacts to the property and the wider hydrological environment, including cumulative impacts, are negligible.

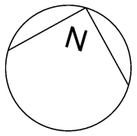
6.3 Surface water

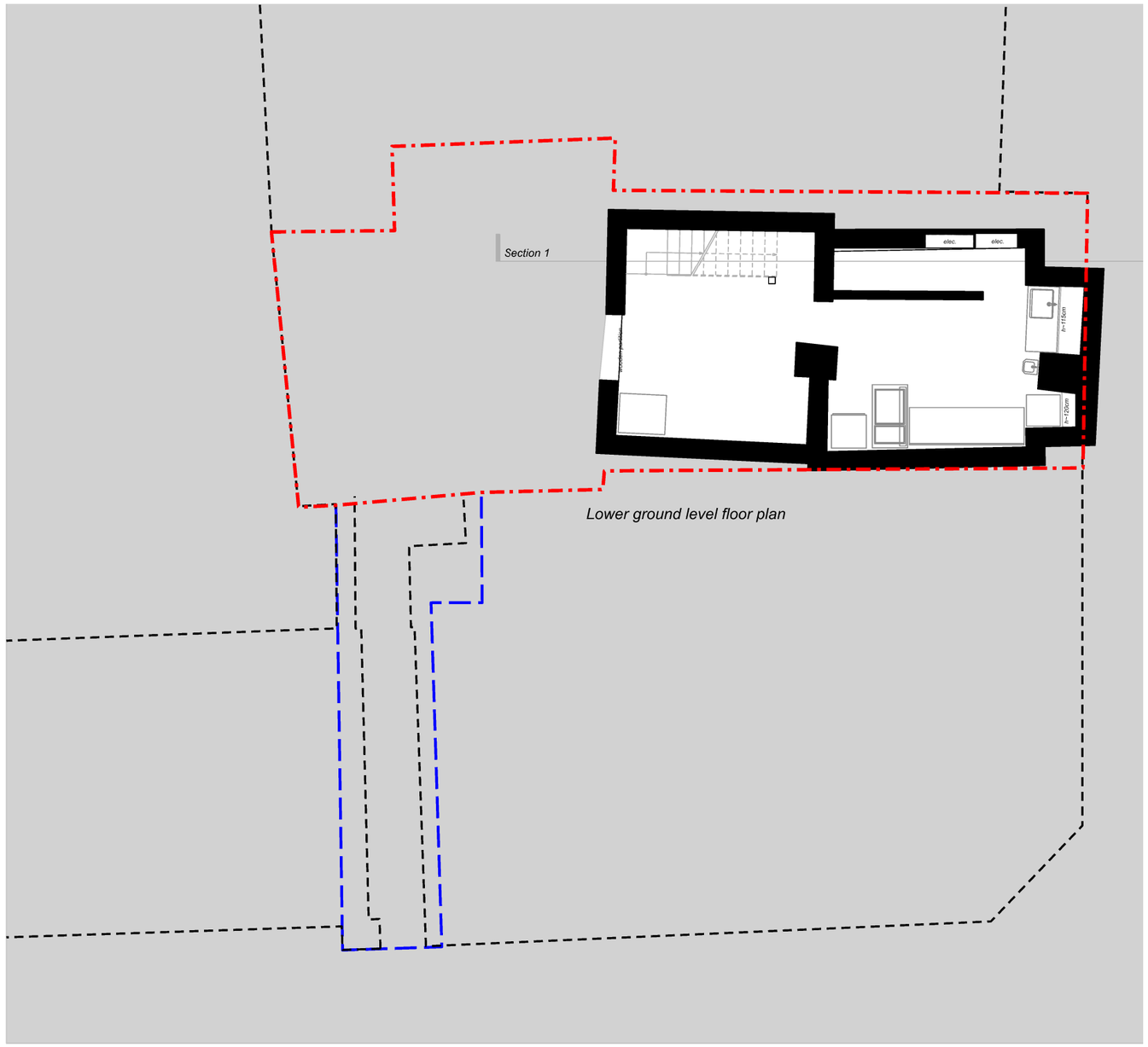
The site has a very low risk of flooding by surface water, river, groundwater or sewer. However, for good practice a sump and automatic positively pumped system with non-return valves is recommended for any basement WC or other wastewater facilities.

The proposed development does not change the quantity of rainfall run-off from the site, therefore there are no significant impacts to the wider hydrological environment resulting from the proposed development.

APPENDIX A

Existing and proposed plans





Existing Basement Plan

General Notes
1. Do not scale
2. All dimensions are shown in millimetres unless otherwise noted
3. Refer to project based risk assessments before undertaking any work
4. Notify the architect of any discrepancy immediately

Boundary of Proposal
(Estimated extent of property incuding party walls etc.)

Land in applicants ownership

Rev	Date	Reason For Issue
P2	2023-04-05	Boundary clarified
P1	2020-12-15	First Issue

0m 1m 2m 3m 4m 5m

David Lees Architects
david@davidleesarchitects.co.uk 07597 573 892

Client

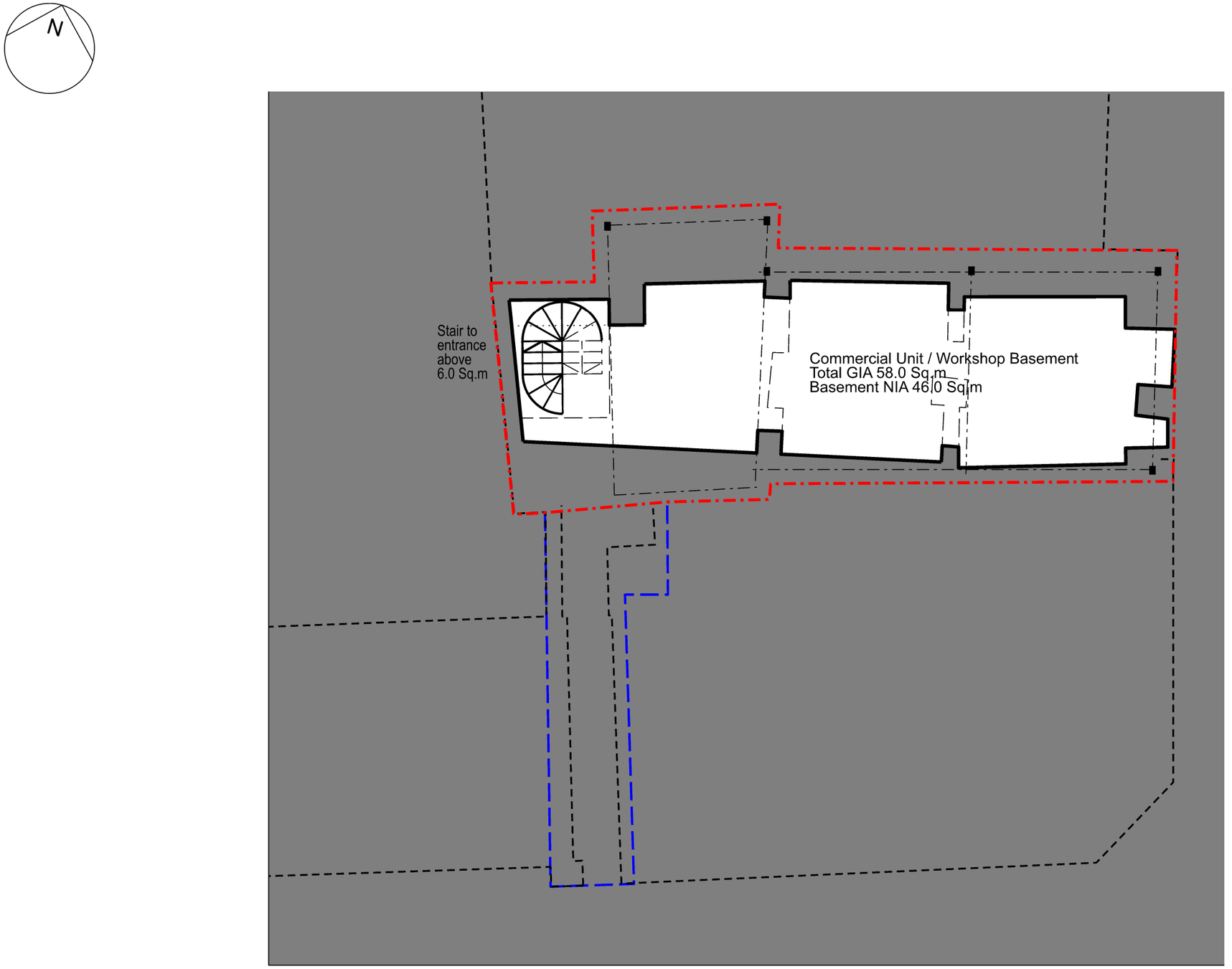
Project
21 Baldwin Gardens / 43 Leather Lane

Title
Existing Basement Plan

Status
Planning

Project Number	Date	Checked By
2009	2020-12-15	DL
Revision	**Scale @ ISO A3**	**Approved By**
P2	1:100	DL

Drawing Number
A-0-100



Proposed Basement Plan

General Notes
1. Do not scale
2. All dimensions are shown in millimetres unless otherwise noted
3. Refer to project based risk assessments before undertaking any work
4. Notify the architect of any discrepancy immediately

Boundary of Proposal (Estimated extent of property incuding party walls etc.)

Land in applicants ownership

Rev	Date	Reason For Issue	Chk
P5	2023-04-05	Boundary clarified	
P4	2021-08-12	Note amended	
P3	2021-08-12	Revised following planning comments.	
P2	2020-12-09	Minor update	
P1	2020-07-13	First Issue	

0m 1m 2m 3m 4m 5m

David Lees Architects
david@davidleesarchitects.co.uk 07597 573 892

Client

Project
21 Baldwin Gardens / 43 Leather Lane

Title
Proposed Basement Plan

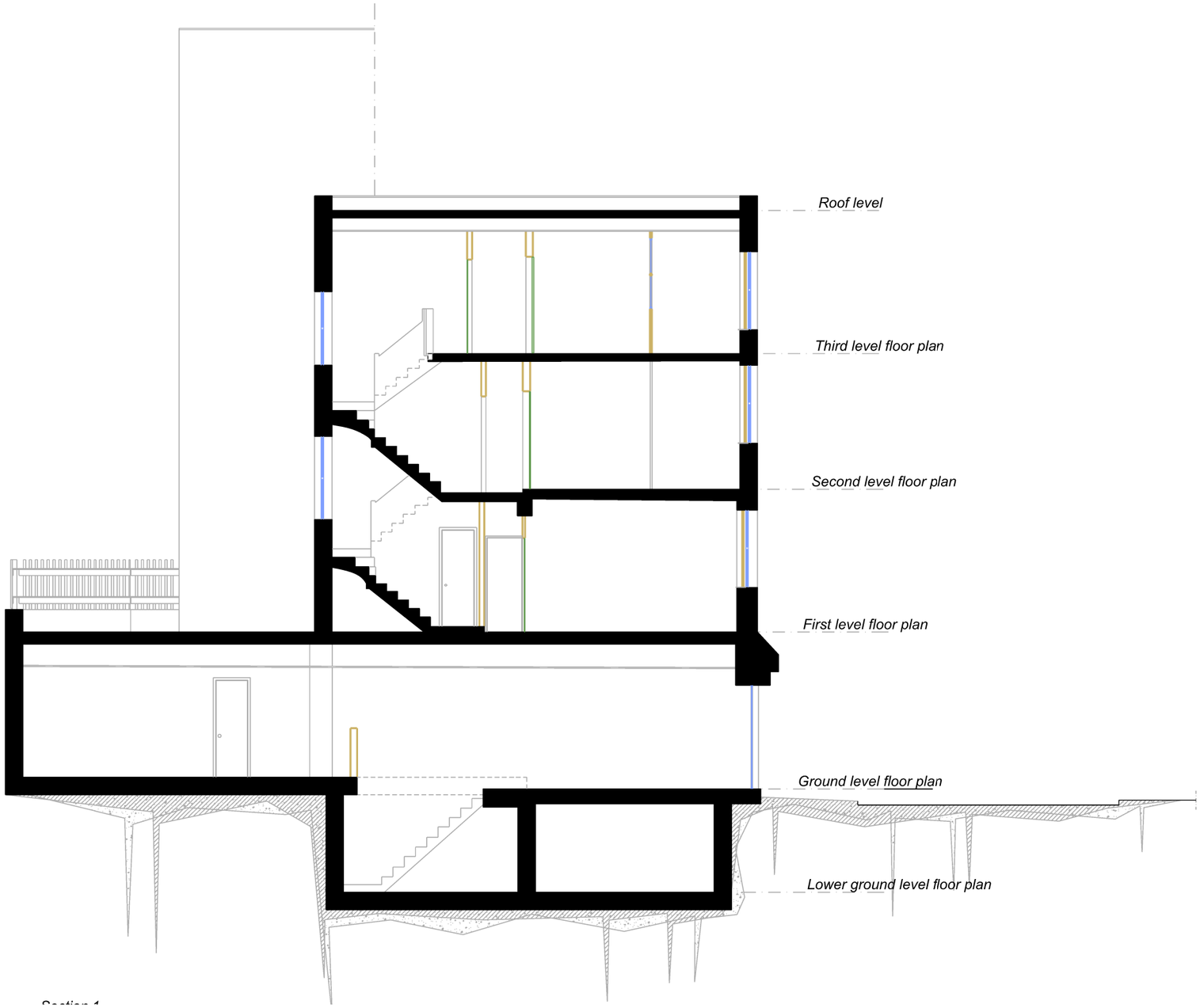
Status
Planning

Project Number	Date	Checked By
2009	2020-12-02	DL
Revision	**Scale @ ISO A3**	**Approved By**
P5	1:100	DL

Drawing Number
A-1-100

APPENDIX B

Existing and proposed cross sections



Existing Section AA

General Notes
1. Do not scale
2. All dimensions are shown in millimetres unless otherwise noted
3. Refer to project based risk assessments before undertaking any work
4. Notify the architect of any discrepancy immediately

P1 2023-05-16 First Issue

Rev	Date	Reason For Issue	Chk

0m 1m 2m 3m 4m 5m

David Lees Architects
david@davidleesarchitects.co.uk 07597 573 892

Client

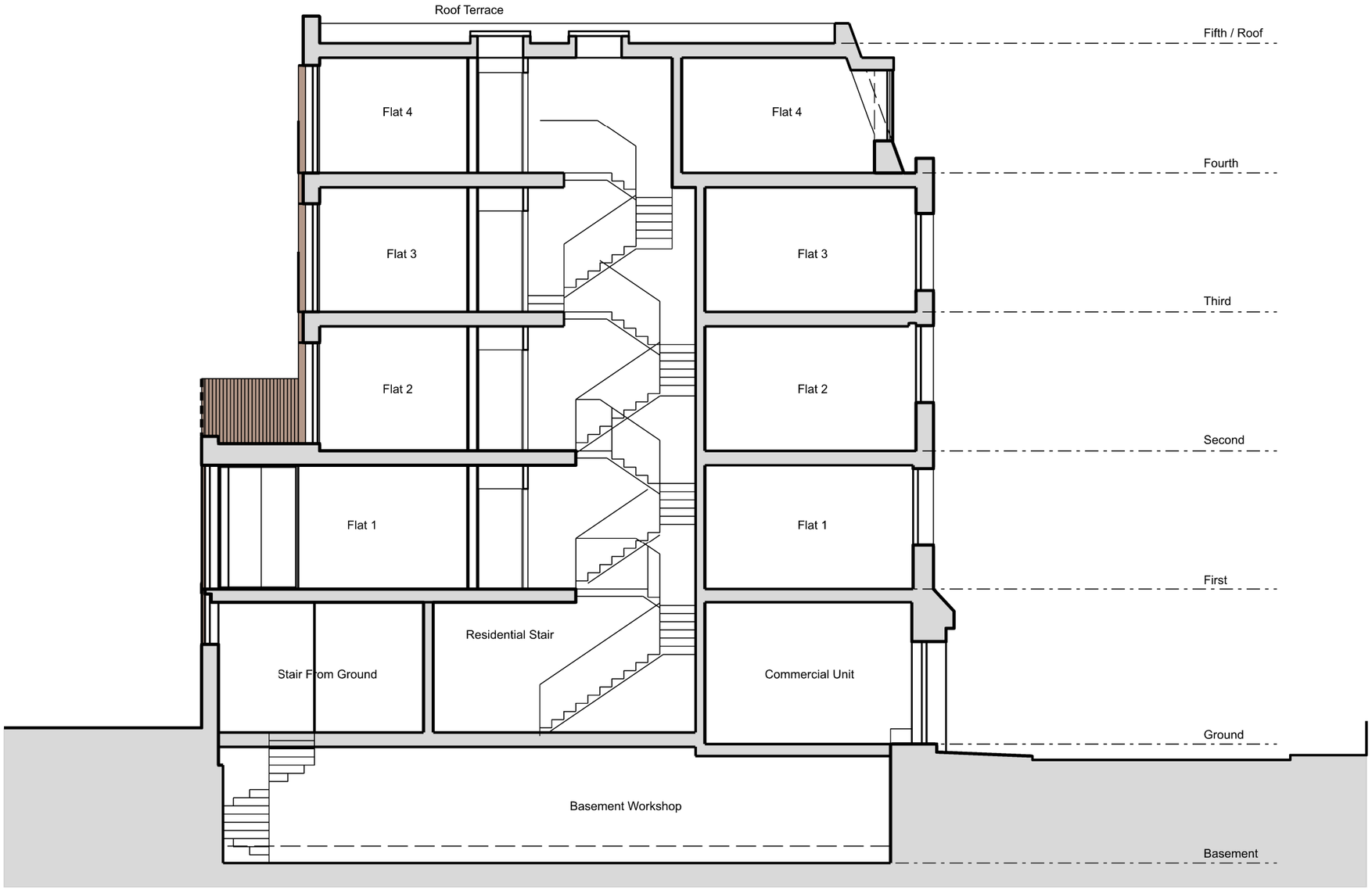
Project
21 Baldwin Gardens / 43 Leather Lane

Title
Existing Section AA

Status
Information

Project Number	Date	Checked By
2009	2020-12-08	DL
Revision	**Scale @ ISO A3**	**Approved By**
P1	1:100	DL

Drawing Number
A-0-300



Proposed Section AA

General Notes
1. Do not scale
2. All dimensions are shown in millimetres unless otherwise noted
3. Refer to project based risk assessments before undertaking any work
4. Notify the architect of any discrepancy immediately

P4	2021-08-12	Amended following planning advice
P3	2020-12-16	Planning
P2	2020-12-09	Minor amendment
P1	2020-12-08	First Issue

Rev	Date	Reason For Issue	Chk

0m 1m 2m 3m 4m 5m

David Lees Architects
david@davidleesarchitects.co.uk 07597 573 892

Client

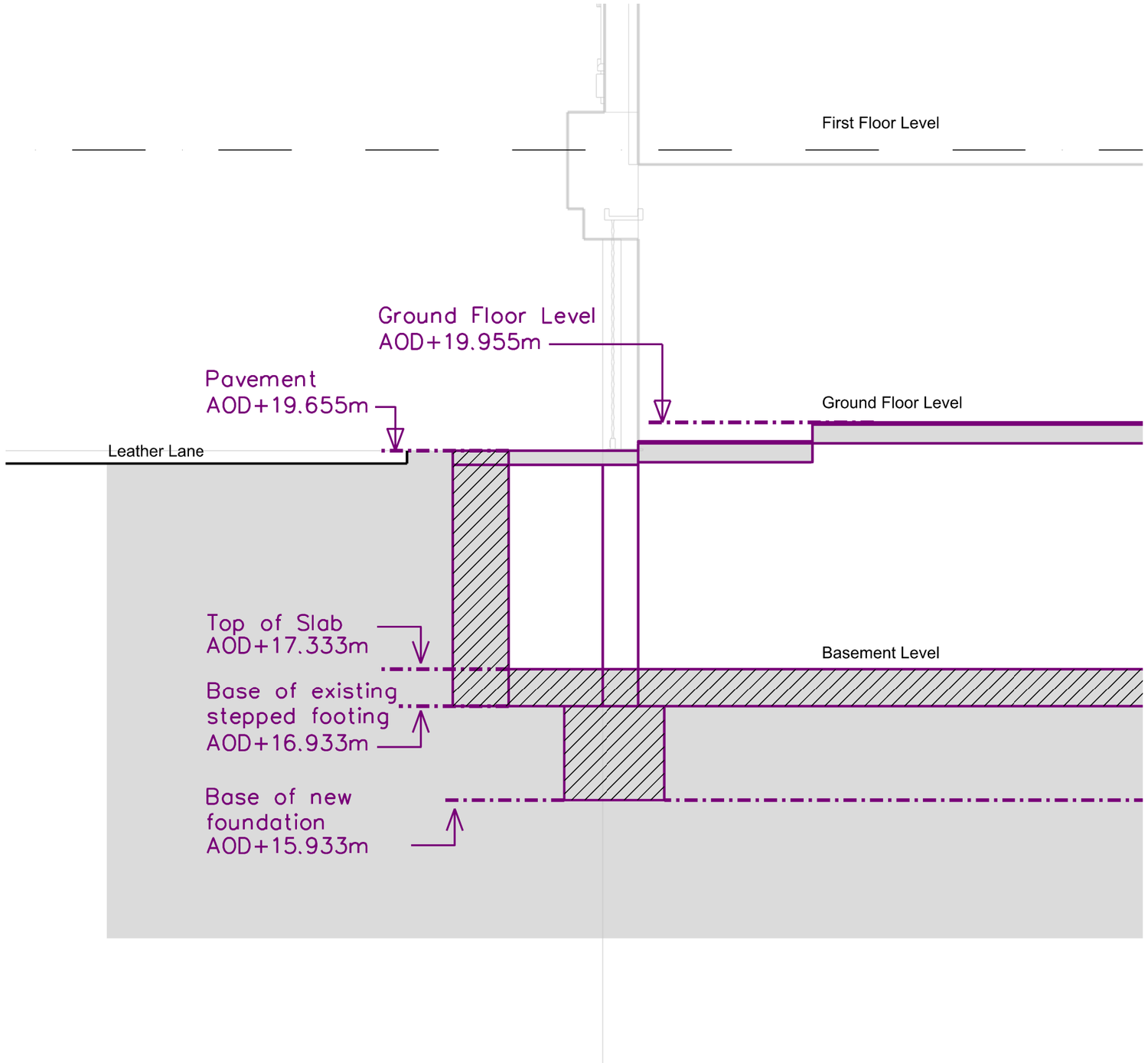
Project
21 Baldwin Gardens / 43 Leather Lane

Title
Proposed Section AA

Status
Planning

Project Number	Date	Checked By
2009	2020-12-08	DL
Revision	**Scale @ ISO A3**	**Approved By**
P4	1:100	DL

Drawing Number
A-3-300



General Notes

1. Do not scale
2. All dimensions are shown in millimetres unless otherwise noted
3. Refer to project based risk assessments before undertaking any work
4. Notify the architect of any discrepancy immediately

Rev	Date	Reason For Issue	Chk
P2	2023-10-16	Note added	
P1	2023-10-09	For information	

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Client

Project
21 Baldwin Gardens / 43 Leather Lane

Title
Proposed Basement Section
Indicating Levels Relative fo Ordnance Survey Datum

Status
Planning

Project Number	Date	Checked By
2009	2023-10-09	DL
Revision	**Scale @ ISO A3**	**Approved By**
P2	1:50	DL

Drawing Number
A-3-302

APPENDIX C

Geological map (taken from Arup, 2010)

526000 528000 530000

184000 182000

Data source: BGS Mapping - Scale 1:10,000

N

Scale at A3: 1:15,000

Coordinate System:
British National Grid
GCS_OSGB_1936

0 0.25 0.5 1 1.5
Kilometers

Legend

- London Borough of Camden
- Railway Lines
- A Roads
- Site location

BGS 1:10K Artificial Ground
- MADE GROUND
- WORKED GROUND

BGS 1:10K Drift Geology
- ALLUVIUM
- HACKNEY GRAVEL FORMATION
- LANGLEY SILT FORMATION
- LYNCH HILL GRAVEL FORMATION
- STANMORE GRAVEL FORMATION

BGS 1:10K Solid Geology
- BAGSHOT FORMATION
- CLAYGATE MEMBER
- LAMBETH GROUP
- LONDON CLAY FORMATION

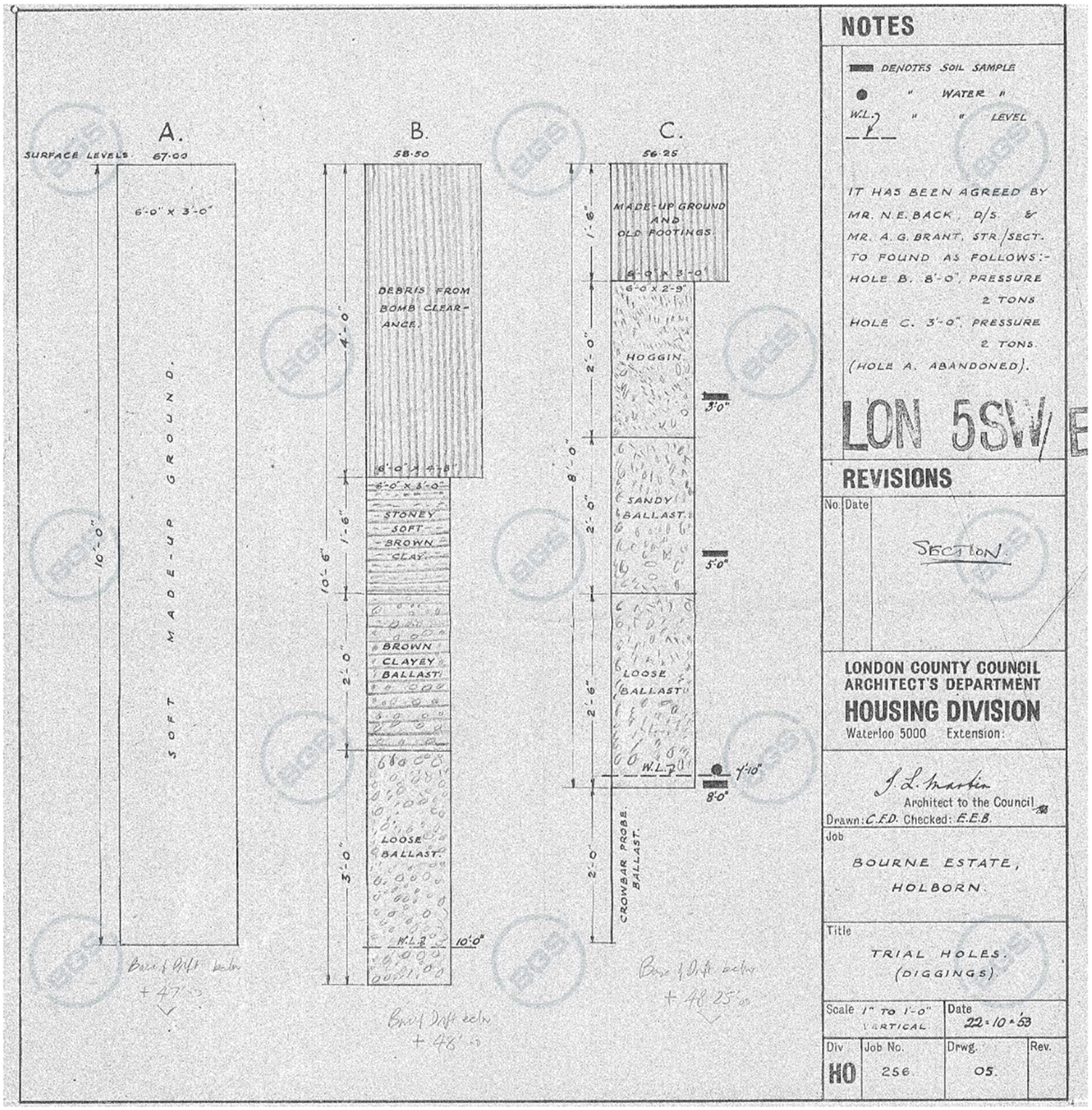
NB. Geological boundaries are largely indicative based on available geological mapping data

Camden Geological, Hydrogeological and Hydrological Study

South Camden Geological Map

213923 FIGURE **5**

TQ38SW738


A.
SURFACE LEVELS 67·00
6'-0" X 3'-0"
SOFT MADE-UP GROUND.
10'-0"
Basic Rift below +47'-0"
B.
58·50
DEBRIS FROM BOMB CLEARANCE.
4'-0"
6'-0" X 4'-8"
6'-0" X 3'-0"
STONEY SOFT BROWN CLAY.
1'-6"
10'-6"
BROWN CLAYEY BALLAST.
2'-0"
LOOSE BALLAST.
3'-0"
W.L. 10'-0"
Basic Drift below +48'-0"
C.
56·25
MADE-UP GROUND AND OLD FOOTINGS
1'-6"
6'-0" X 3'-0"
6'-0" X 2'-9"
HOGGIN.
2'-0"
3'-0"
SANDY BALLAST.
8'-0"
2'-0"
5'-0"
LOOSE BALLAST.
2'-6"
W.L. 7'-10"
8'-0"
CROWBAR PROBE. BALLAST.
2'-0"
Basic Drift below +48·25'-0"
NOTES
DENOTES SOIL SAMPLE
" WATER "
W.L. " " LEVEL
IT HAS BEEN AGREED BY MR. N.E. BACK, D/S. & MR. A.G. BRANT, STR/SECT. TO FOUND AS FOLLOWS:-
HOLE B. 8'-0", PRESSURE 2 TONS
HOLE C. 3'-0", PRESSURE 2 TONS.
(HOLE A. ABANDONED).
LON 5SW/E
REVISIONS
No. Date
SECTION.
LONDON COUNTY COUNCIL
ARCHITECT'S DEPARTMENT
HOUSING DIVISION
Waterloo 5000 Extension:
J. L. Martin
Architect to the Council
Drawn: C.F.D. Checked: E.E.B.
Job
BOURNE ESTATE, HOLBORN.
Title
TRIAL HOLES. (DIGGINGS).
Scale 1" TO 1'-0" VERTICAL
Date 22·10·53
Div HO
Job No. 256
Drwg. 05.
Rev.

APPENDIX D

Records of nearby boreholes

British Geological Survey

Site: CROSSRAIL PACKAGE C

Borehole Number: RT42

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion		119.73	LONDON UNDERGROUND LIMITED	2165
	Location	Dates: 01/05/1992	Engineer: OVE ARUP AND PARTNERS	Sheet: 1/4

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				Water strike(1) at 0.00m.	119.58	(0.15) 0.15	MADE GROUND: Black tarmacadam.		▽1
					119.33	(0.25) 0.40	MADE GROUND: Off white gravelly concrete.		
0.50	B1						MADE GROUND: Loose grey brown slightly silty fine to coarse sand and fine and medium occasional coarse gravel including brick and some oyster shells (up to coarse gravel size).		
1.50-1.95	CPT 0*/0 0/450		DRY	/					
1.50	B2					(4.10)			
2.50-2.95	CPT 0*/0 0/450	2.50	DRY	/					
2.50-3.00	B3								
3.50-3.95	CPT 0*/0 0/450	3.50	2.80	/					
3.50-4.00	B4								
4.50-4.95	CPT 0*/0 0/450	4.50	3.10	/	115.23	4.50	Medium dense brown sandy (fine to coarse) fine to coarse subangular to subrounded flint GRAVEL.;(THAMES TERRACE GRAVEL);;Below 5.50m; Becoming very sandy locally a sand and gravel.		
4.50-5.00	B5			01/05/2008:4.40m					
				01/05/2008: 01/05/2008:DRY					
5.50-6.00	B6								
5.50-5.95	CPT 0*/0 0/450	5.50	4.60	05/05/2008: /		(2.70)			
6.50-6.95	CPT 0*/0 0/450	6.50	4.90	/					
6.50-7.00	B7								
7.20	D8				112.53	7.20 (0.20)	Soft to firm brown silty sandy (fine and medium) CLAY.;;(WEATHERED LONDON CLAY)		
7.40	U9			40 blows	112.33	7.40	Very stiff closely to very closely fissured brownish grey silty CLAY. Locally with silt partings and a little evidence of bio turbation.;;(LONDON CLAY);;Above 8.20m; Becoming very closely fissured with a little black staining on some of the fissure planes.;;At 8.50m; With occasional black silt lenses.;;Below 11.50m; Becoming stiff and slightly sandy locally without sand.;;At 15.50m; Locally sandy (fine) with occasional pockets of sand (up to coarse gravel size).;;Below 18.00m; Becoming very stiff.;;Below 19.00m; Becoming sandy.;;At 19.90m; Locally slightly sandy.;;Below 21.00m; Also mottled purple.		
8.00	U10			35 blows					
8.50	D11								
9.50-9.95	SPT 0*/0 0/450	7.50	DRY	/					
9.50	D12								

Remarks
1) An inspection pit for services was dug prior to boring to a depth of 1.20m and probed to a depth of 1.50m (2hrs).;2) Water was added to assist boring and to maintain hydrostatic head from 2.50m to 5.00m; 5.00m to 7.20m; 28.00m to 28.40m.;3) Standard penetration tests were carried out using 1 1/2' Whitworth square boring rods.;4) A problem with surging casing caused the borehole to be abandoned at 32.10m.;5) On completion of the borehole, a standpipe piezometer was installed with the tip at 28.00m, and the hole backfilled with the following detail:;Bentonite/cement grout 32.10m to 29.50m; bentonite seal 29.50m to 28.50m; sand filter response zone 28.50m to 27.50m; bentonite seal 27.50m to 27.00m; bentonite/cement grout 27.00m to 1.20m; stopcock cover set in concrete 1.00m to ground level.

Scale (approx): 1:50

Logged By: NWH

Figure No.

British Geological Survey

Site	Borehole Number
CROSSRAIL PACKAGE C	RT42

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion		119.73	LONDON UNDERGROUND LIMITED	2165
	Location	Dates 01/05/1992	Engineer OVE ARUP AND PARTNERS	Sheet 2/4

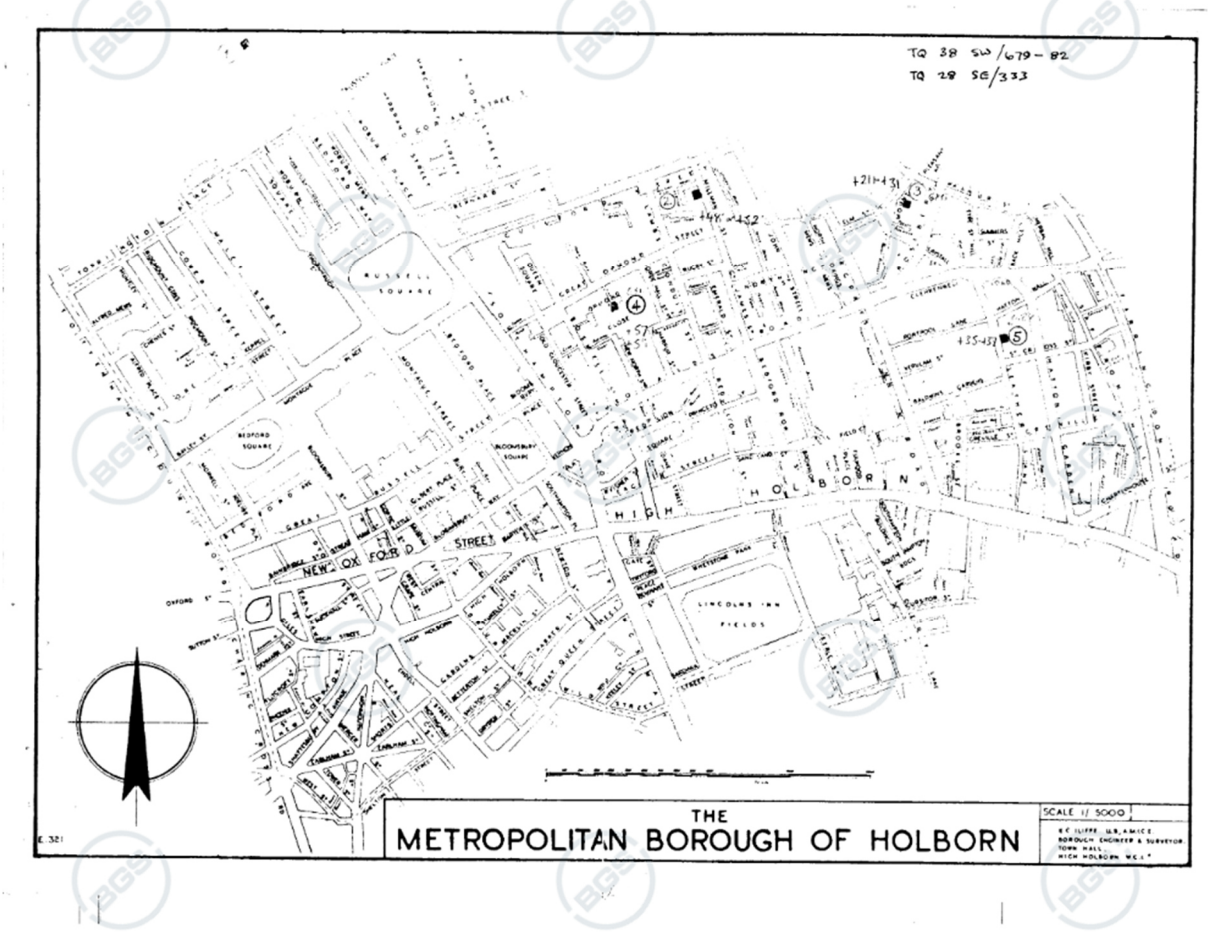
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.00	U13			60 blows					
11.50	D14								
12.50-12.95	SPT 0*/0 0/450	7.50	DRY	/					
12.50	D15								
14.00-14.45	U16			60 blows					
14.50	D17								
						(12.90)			
15.50-15.95	SPT 0*/0 0/450	7.50	DRY	/					
15.50	D18								
17.00	U19			55 blows					
17.50	D20								
17.50	U21			50 blows					
18.00	D22								
18.00	U23			50 blows					
18.50	D24								
18.50	U25			55 blows					
19.00	U27			55 blows					
19.00	D26								
19.50	D28								
19.50-19.90	U29			50 blows					

Remarks

Scale (approx)	Logged By
1:50	NWH

Figure No.

TQ38SW682



TQ 38 SW / 682 3126 3191.

SITE REFERENCE NO.5
Hatton Garden
Borehole No.1

June 1959

Borehole commenced 9'0" below pavement level

0' - 1'3" (0.38)	Made up ground OD ca + 56'
1'3" - 4'0" (0.71)	Moist loamy sand
4'0" - 8'0" (1.22)	Sandy gravel with some clay
8'0" - 10'6" (3.20)	Wet coarse brown sand and small gravel
10'6" - 12'6" (3.81)	Dense, wet brown coarse sand Base of Drift at +36.5'
12'6" - 13'6"	Soft brown sandy clay
13'6" - 28'0"	Firm blue laminated clay with fine bands of silty sand

APPENDIX E

Site investigation report