COCHRANE CONSTRUCTION CONSULTANTS

161 ARLINGTON ROAD, LONDON NW1 7ET

Basement Impact Assessment

Project Ref:	S 2930
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REVISION HISTORY

Revision	Date	Purpose /Status	Author
00	08/04/2024	Initial Issue	BC
01	11/11/2024	Updated for resubmission for planning	BC
02	26/11/2024	Update on groundwater issues, question 1b carried forward from SSR, waterprrofing section & app I added Review bof reports by suitably accredited professionals to meet Camden's BIA requirements. Note added to author section and letters included as Appendix J.	BC

AUTHOR

This report has been prepared by:

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To meet the qualification requirements set out in the Camden Basement SPD **s**urface water, groundwater and geological aspects of the following reports have been reviewed by suitably qualified professionals.

See letters confirming reports and conclusions are accurate are included as Appendix J.

Reports submitted: to Review:

S 2930. DSR. 161 Arlington Road NW1 - Desk Study Report - Rev 02

S 2930. SSR. BIA Stage 1 - Screening+Scoping Report - Rev 02

S 2930. BIA. 161 Arlington Road NW1 - Basement Impact Assessment - Rev 02 (this report)

Reviewers:

Geological & groundwater - Joe Gomme (CGeol, FGS) Associate Director H Frasier Consulting

Surface Water - Henry Kelly (MSc, C.WEM) Director HK Hydrology Ltd

NON TECHNICAL SUMMARY

This Desk Study Report looks at the site of 161 Arlington Road in relation to the planning application for the proposed refurbishment of the property. These proposed works include lowering the basement floor level by 400mm, and rebuilding the rear extension over an enlarged basement. Under Camden's Basement CPG the works require a Basement Impact Assessment, for which this document forms part.

The property lies within London Borough of Camden, Camden Town ward. It lies within LBC's Camden Town Conservation Area and is a Grade II listed. The site postcode is NW1 7ET, and National Grid reference TQ288837.

The site lies on the higher ground on the western slopes to valley of the former River Fleet which drained the Hampstead Heights. The Fleet is one of London's Lost Rivers and has been culverted in Camden since 1812 and incorporated into London's sewer system.

The ground strata to the area is London Clay, this is overlain by a thin layer of made ground / topsoil of variable depth. A groundwater level of 4.9m below ground level was encountered during site investigation. This is 1.5m below the proposed foundation level and 2.3m below the proposed basement floor level. The site does not lie within a Groundwater Source Protection Zone.

There is a very low risk of groundwater flooding at the surface and a low risk of groundwater flooding within the basement. However, seepage and perched water in the shallow subsurface cannot be discounted. Mitigation measures comprise:

- Arrangements for dewatering the excavation to deal with groundwater seepage and superficial runoff during rainfall events are recommended during construction.
- The basement should be constructed so that no water penetration or dampness is permitted

The residual risk of groundwater flooding within the basement is very low. There are no impacts to the wider hydrogeological environment, including cumulative impacts.

The building was constructed c1830 as part of a terrace, comprising Nos155-169, on the west side of Arlington Road just south of the junction with Parkway. The remaining buildings further south on the west side of Arlington Road were constructed later in the 1840s. The buildings at 155-163 were demolished in 1927 to allow construction of the church buildungs which currently occupy the site.

The properties along the western side of Arlington Road are typically three storey over basement and have lightwells front and back to provide natural light and ventilation to the basement rooms. The buildings are of traditional construction with the original buildings having London butterfly roofs, replaced on many properties, including No161, by mansard extensions.

The properties in the northern terrace, now comprising Nos155-161, differ from those further south in having only a single window on each upper floor – the properties further south having two windows per floor. No161 differs from the adjacent properties in that it has a shop front at ground floor level which appears historic. Refurbishment works in 1987 combined the shop and flat into one residence, why works in 1992 added a mansard extension, and constructed a rear basement extension with a conservatory at ground floor with terrace at first floor. The latter refurbishment also appears to have replaced much of the original structure, with walls and floors being modern.

As is the case for most properties of this period in London, the front elevation of both the house and terrace have retained an ordered character whilst the rear of the properties are more eclectic due to the addition of rear extensions at different times.

The topography of the site locality is a very gentle downward slope to the northeast (Fleet River valley) with a slope of approximately 1.4 degrees. There are no steep slopes in the vicinity (apart from lightwells which have an engineering support and the railway cuttings to the southwest) and therefore there is no risk of slope instability.

The site is within Flood Zone 1, has an approximate area of 0.1 hectare and has no history of flooding. Therefore, as the site is less than one hectare, no Flood Risk Assessment is required.

CONTENTS

1 INTRODUCTION

This report details the Basement Impact Assessment (BIA) carried out by Cochrane Construction Consultants Limited (CCC) for 161 Arlington Road Camden, London NW1 7ET (the 'site'), on behalf of our clients, Asli and Taylan Karagul.

The BIA has been prepared in support of a planning application to be made to the London Borough of Camden in relation to the property at 161 Arlington Road, a single domestic residence. The proposed works involve the general refurbishment of the property, minor structural alterations, lowering the basement floor level by 400mm. and the rebuilding of the rear extension. The new rear extension will be similar to the existing but with a larger basement occupying much of the footprint of the ground floor.

This BIA has been prepared in accordance with the following:

- Camden Planning Guidance – Basements 2021,
- Arup's Camden Geological, Hydrogeological and Hydrological study - Guidance for Subterranean Development, 2010 (CGHHS)
- The Camden Local Plan 2017, in particular policies A5-Basements, and CC3-Water and Flooding apply.

The BIA provides information on the site and location, the existing buildings and their stability, the proposed works, the impact of the proposed works on neighbouring properties, the hydrology of the site and its impact on the drainage and surface water regime.

This report should be read in conjunction with the following CCC documents prepared as part of this planning submission:

- Desk Study Report
- Basement Impact Assessment – Stage 1: Screening & Scoping Report
- All relevant drawings and reports by others

This report summarises the findings of the above reports and reference should be made to the original reports for full details of the matter considered and the supporting information.

The Executive Summary contains an overview of key findings and conclusions. However, no reliance should be placed on it without the whole report having been read as other sections of the report may contain information which puts into context the conclusions noted within the Executive Summary.

2 LEGISLATIVE STATUS OF PROPERTY

Arlington Road lies within Camden Town ward in the London Borough of Camden.

The property, along with the adjacent buildings at 157 and 159, is Grade II listed (List Entry Number: 1272258).

The site lies within LBC's Camden Town Conservation Area.

The property shares a party wall with No 159 Arlington Road. The arrangement on the church side is more complex, with a double wall structure to the front four storey building but a party wall in two storey link section, between the front building and the main hall, where the flank wall has been enclosed upon since c1992.

3 PROPOSED WORKS

The current proposals for 161 Arlington Road include:

- General refurbishment of the property
- Demolishing the existing and rebuilding a new rear extension at basement and ground floor levels, and extending the basement to occupy the ground floor footprint
- Lowering the basement floor level by 400mm.

The proposed works involve the lowering of the existing floor level by 400mm and rebuilding the existing rear extension over a larger basement.

Lowering the basement floor will require an excavation of approximately 750m below the existing floor level, this allows for the drop in floor level, finishes and construction depth. This will require the existing footings to be underpinned, with the exception of the church walls which already found at a deeper level with the front wall having been underpinned during construction of the church. The proposed foundations and underpinning will still lie within the London Clay, and below any made ground, the same strata as the existing foundations.

The new rear extension is to be of similar scale to the existing, but the basement will be extended to occupy the full ground floor footprint.

The existing site is approximately 150m2 (0.015 hectare) in area.

4 THE SITE

The following sections provide a brief summary of the general site and buildings, for further details refer to the Desk Study Report.

4.1 SITE LOCATION

Arlington Road is in the London Borough of Camden, situated to the east of Primrose Hill at the northeast corner of Regent's Park. Arlington Road is situated on the west side of Camden High Street, to which it runs parallel, from Mornington Crescent in the south to Jamestown Road (adjacent the Regents Canal) in the north.

The site postcode NW1 7ET, National Grid reference TQ288837.

The location is shown on the following map.

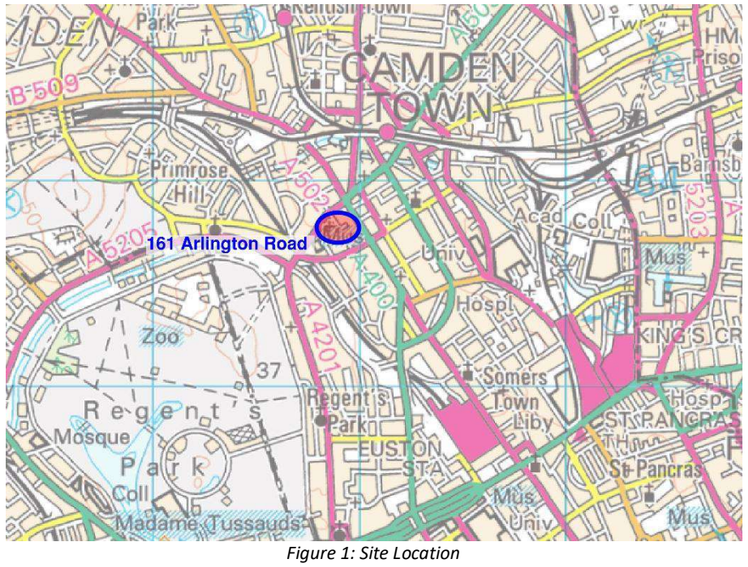


Figure 1: Site Location

4.2 SITE TOPOGRAPHY

The site lies on the eastern slope of the high ground from Hampstead to Primrose Hill, Ordnance Survey gives the street level adjacent the site to be 29.4mOD, with the area falling to the northeast, towards the valley of the River Fleet. The average slope of the area is 1.4 degrees, defined as a 'very gentle slope', and is significantly less than the slope of 7 degrees as set by Arup in the CGHHS as maximum angle for slope stability in London Clay where groundwater is close to the surface.

There are no major cuttings in the vicinity (the nearest are the railway lines to the southwest) and therefore slope stability is not an issue.

4.3 SITE GEOLOGY

The British Geological Survey map (Geology Map Sheet TQ28SE – Solid & Drift Edition) for the area indicates the site is underlain by the London Clay Formation.

This has been confirmed by nearby and site boreholes. A copy of Site Investigation the factual report is included in the appendices and other boreholes used are included in the Desk Study Report.

This presents potential issues due to the seasonal movement in the clay because of changes in moisture content. However, as the proposed basement founds at depth, is outside the main building, there are no large trees in the vicinity and the garden to No161, like that in No159, is largely hardstanding which will limit changes in the moisture content of the clay and consequently restrict the amount of movement in the clay.

4.4 SITE HYDROLOGY

As typical of the inner city the surrounding locality is highly developed with over 90% of surface covered by hardstanding (highways, buildings, and paved areas).

The 161 Arlington Road site, with a site area of 110m2 (0.11 hectare), is largely impermeable with the front lightwell having a concrete slab, and the existing garden to the largely paving on a concrete subbase. Planting within the garden, approximately 10m2, exists around the rear of the garden and is to remain as existing.

The proposed scheme does not alter the permeability of the site with the new rear extension replacing being similar in size to the existing and the existing hardstanding retained. Any rainwater run-off will be collected and disposed via the sewer system as currently happens. The following photograph shows the existing rear garden around the extension.

Figure 2: Existing Rear Gardens to Nos 159/ No161 Showing Hardstanding

4.5 SURFACE WATER FEATURES

The site topography means that there are no natural surface water features within 100m of the site, with the nearest being the man-made The Regent's Canal 400m to the north,

The courses of two of London's 'Lost Rivers' run near the site. The course of the River Fleet runs in the valley to the east of the site. The river starts from its headwaters on Hampstead Heath, passes north of Camden Town tube station before following the line of Lyme Street and St Pancras Way on its way to the Thames at Blackfriars. At its nearest its course is 420m from the site. The river has been culverted and incorporated into London's drainage infrastructure since c1812.

To the west, the Tyburn runs through the west side of Regents Park, where it supplies the boating pond, 1.3km from the site.

As there are no surface ponds in the area, and surface water features are distant from the site and will have no impact.

4.6 GROUNDWATER

The site sits on London Clay, which The Environment Agency (EA) classifies as 'Unproductive Strata' due to its negligible permeability,and therefore no significant groundwater flow is expected to occur beneath the site. There may be a porewater pressure differential, but this will naturally dissipate down the slope.

Local boreholes or monitoring standpipes did not encounter groundwater near the surface. The deeper borehole at Camden Town borehole (BGS) reported a water table 91m below ground level in the chalk (the lower aquifer). Standing water was found in the bottom of the site borehole (at 4.9m below ground level), but this is assumed to be surface water collecting rather than ground water.

The site topography means the pre water pressure will have a 'gradient' downhill away from the site and groundwater will not be an issue for the site.

4.7 AQUIFER & GROUNDWATER VULNERABILITY

The site does not lie on an established aquifer. As established in section 3.3 the geology underlying the site is London Clay classified by the EA as 'Unproductive Strata with low permeability' that have negligible significance for water supply or river base flow. The London Clay acts to protect the chalk aquifer beneath, but the depth of the proposed

works means that there is no risk to this aquifer.

The Groundwater Vulnerability Map indicates that the site is not located within a Groundwater Source Protection Zone. A source protection zone is located 1km west of the site, this is assumed to pick up the Barrow Hill abstraction point, which ceased in 2012, or that supplying Regents park and London Zoo.

The proposed works do not affect these abstraction points or the underlying aquifer and therefore this is not an issue for the site.

4.8 WATER WELLS

From BGS Geoindex map of well locations, the nearest well to the site is located at 25 Carol Steet, 260m from the site. Thie well at Carol Street is 109m deep and draws water from the chalk lower aquifer beneath the London Clay.

The well will not be affected by the proposed works.

5 HISTORICAL DEVELOPMENT OF THE SITE

Arlington Road is initially laid out from the south, starting at Mornington Crescent and extending north, in the early 1800s before the present day setting out was completed in the mis 1820s. The original properties along the eastern side of Arlington Road date from the early 1800s and were part of the growth of Camden High Street, from which they were accessed via passages such as Underhill Street. The development on the west side of the street occurs later, and dates from the 1830s and 1840s, prior to which the land on the west was still in use as pasture.

The site at No161 Arlington Road and its relation to the surrounding buildings is shown on the following plan, with each of the properties considered in more detail below.

Figure 3: Site Plan showing Adjacent Properties

5.1 NO 161 ARLINGTON ROAD

The existing property at 161 Arlington Road is located on the west side of the street, south of the junction with Parkway, and was constructed as part of a terrace in the 1830s and linked to development of Parkway, unlike the properties further south on the west side which were constructed in the 1840s.

Historical maps and inspection of the buildings which remain show that the original terrace extended from No155 to No 169, with the buildings being three storey over basement with front and rear lightwells serving the basement rooms. Brick vaults accessed from the front lightwell extended under the pavement. The buildings were of traditional construction with timber floors and a London butterfly roof supported off the external and central spine walls. The properties have a single window on each floor, with the entrance at ground floor set adjacent the southern party wall.

No161 differs from the remaining original properties in having a shopfront at ground floor and was, prior to 1987, a shop at basement and ground floor and a separate flat above which had a separate entrance. Whether this is original, or an alteration is not known, but a historic photograph from 1977 show the arrangement to be similar to existing.

From planning records, the shop and flat above were converted into a single residence c1987, and extended c1992 when a mansard and rear extension were added. The latter extending over basement and ground floors with a terrace at first floor level. The refurbishment works appear to have generally rebuilt the internal structure to No161 as no little structure has been found in investigation works, no period features are present, and the floors are level.

Refer to Desk Study Report for further information on the development of the site and No 161.

5.2 ADJACENT PROPERTIES

There are three buildings adjacent the site at No 161 Arlington Road:

5.2.1 159 ARLINGTON ROAD

Located south of No161, this property is part of the original terrace and appears largely as built, with the original butterfly roof still present. From initial observation this building appears to be largely original. The building has a rear lightwell, partially infilled adjacent No157 to provide garden access for the ground floor. To the rear an existing brick lightwell exists adjacent the rear elevation, which founds below the existing basement level (see site investigation).

Planning records indicate that c 1976 the property was split into a basement flat with a maisonette, with a small rear extension built, adjacent the boundary with No157, in the rear lightwell c2004 to provide garden access to the ground floor flat.

The property shares a party wall with No161.

5.2.2 OUR LADY OF HAL RC CHURCH

Opened in 1933 the church sits on the site of the demolished 163-165 Arlington Road, while the Presbytery next to the church is a later construction and appears to have been built in the early 1950s on the site of Nos167-169.

The Church building comprises three parts.

To the front is a four-storey block over partial basement, on the north side away from No161, to the rear the main church hall with no known basement, and between a two storey link block.

To the rear of No161 a single storey side extension to the church contains a side chapel, while midway along the garden a single storey giving access to the church yard areas separating the church hall from the wall which forms the boundary between the church and No161. Inspection shows that wall to the front yard area was rebuilt when the church was constructed, while that to the rear area appears original.

No record drawings of the original construction are held by the church and based on inspection the church appears to be a framed building with reinforced concrete floors. The main external staircase from ground to first floor is located adjacent the No161 party wall with masonry walls on either side which appear to be load bearing.

The presbytery on the right-hand side of the church, was constructed later, assumed in the 1950s, and is four storey over full basement.

The party wall arrangement to the church side has two different sections. On the main front building there is a double wall structure between No161 and the taller front building of the church, with the flank wall to No161 having been underpinned during construction of the church. At the rear the c1992 extension to No161 enclosed on the flank wall to the link section.

5.2.3 ORT HOUSE / 126 ALBERT STREET

The island site to the rear of the houses along Arlington Road was the site of Park Chapel School from the 1870s until after WWII, when the site was redeveloped as the Curry and Paxton's optical works. These buildings were demolished, and the site redeveloped again c1972 to the current office use.

The current building is a modern fully framed building which includes a large basement, which does not extend near No161. The building is separated from No161 by an outside space and the rear garden of No161.

5.3 ADJACENT BASEMENTS

From visual inspection of the buildings along Arlington Road, Parkway and Albert Street, the majority have basements as evident in the presence of lightwells and smoke vents.

The following table summarises the buildings immediately around 161 Arlington Road with regards to the presence of existing basements.

Building	Description	Basement Depth
161 Arlington Road	Existing residential building	Existing basement 2210mm below ground floor/pavement Proposed basement 400mm bgf below existing, approx 2600mm below pavement level.
Our Lady of Hal	Church built c1933, Presbytery constructed later (1950s).	Built on site of No163-169, assumed to have basement similar to No161.
	Church - partial basement plantroom under centre of front 4 storey building to church.	Plantroom on northern side, approx. 3300mm below ground floor 2900mm below pavement (pavement on slight slope)
	Presbytery has full basement under building.	Full basement, assumed as church
159 Arlington Road	Existing residential building	As No161 existing
157 Arlington Road	Existing residential building	As No161 existing
147-155 Arlington Road	Five buildings refurbished c1996. Basement floor lowered.	2600mm below ground floor 2200mm below pavement
142-152 Arlington Road	Building converted from electricity sub-station to community c1979, converted to residential c2018.	Basement 3300mm below ground floor / pavement level
154-160 Arlington Road (building opposite)	Residential building rebuilt c2004	Basement 3000mm below ground floor / pavement
128 Albert Road (building behind)	Warehouse converted into mixed use A3 / residential c1994	Basement 30m from rear wall of No161, 2700mm below ground floor
Ort Centre/126 Albert Street	Offices built c1972	Basement 21m from rear wall of No161, basement lvl 28.3m, approx. 2.4m below Arlington Road pavement.

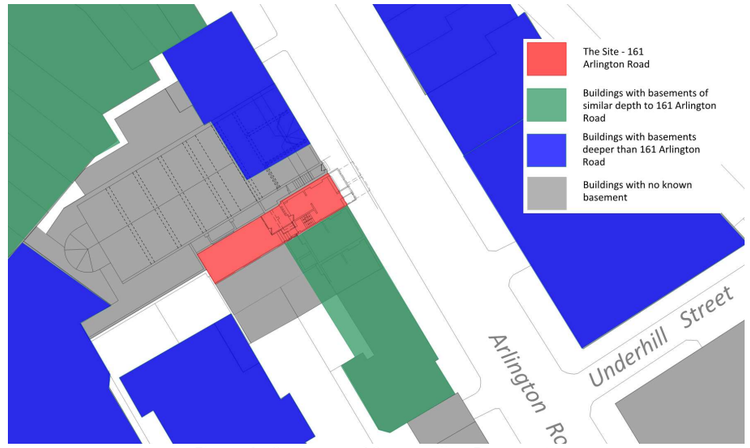


Figure 1: Summary of Surrounding Basements

The information on the surrounding basements is summarised in the Figure above. This shows that No161 is surrounded by basements which are similar or deeper than the proposed basement to No161. On this basis it is clear that the proposed basement works will have limited impact on the groundwater regime in the area.

5.4 UTILITIES - SEWERS AND SERVICES

Thames water records indicate that the existing sewer (1524x940 with an invert level of 7.2m below street level) and water mains run within Arlington Road.

The age of the building means it is likely that other utilities will also run within the bounds of the pavement and carriageway.

5.5 INFRASTRUCTURE AND TUNNELS

No known tunnels or other major infrastructure runs within the site boundary of 161 Arlington Road or within 50m of the site.

To the east of the site, approximately 100m away, the Northern Line tube tunnels run under Camden High Street with the Deep level bomb shelters from WWII set under. An air shaft and access to the shelters are located in Stanmore Place approximately 60m to the east of the site.

To the west of the site the railway lines into Euston run in a cutting approximately 240m from the site. The proposed HS2 tunnel to Euston will follow the railway lines.

The Thames Water Ring Main runs to south of the site (between Barrow Hill and Islington, but at a depth of 80m is not affected by the proposed works.

The site lies outside the zone of influence and safeguarding zones for the tube, railway tunnels and HS2 near the site.

5.6 FLOODING AND FLOOD RISK

The site is with the London Borough of Camden but does not lie within any of LBC's critical drainage areas or local flood risk zones and records show no history of flooding in the area – Thames Water and LBC Flooded Street List.

The Environment Agency's Flood Risk for Planning shows the site to lie within Flood Zone 1, with the long term flood risk maps showing the site has a very low probability of flooding (fluvial, pluvial, reservoirs and groundwater).

As expected from the site topography, there is a very low flood risk and as the site is in Flood Zone 1 and less than 1 hectare (site area approx. 0.11hectare) a sequential test and full Flood Risk Assessment are not required.

6 SCREENING AND SCOPING

The following section give a summary of the Screening and Scoping Report, setting out the results of the Screening Flowcharts and associated Scoping Assessment. For further information refer to the Screening and Scoping Report.

6.1 SCREENING ASSESSMENT

The initial Screening assessment returned the following positive or unknown responses:

Screening Checklist for Subterranean (Groundwater) Flow

Question 1b *Will the proposed basement extend beneath the water table surface*?

Unknown. Nearby BGS borehole records indicate a groundwater level of c.10 m bgl, within the London Clay ((DSR Fig 10 to 15). This is well below the proposed foundation level of 2.6 m bgl.
However, the current site groundwater level is unknown.

Screening Checklist for Slope Stability

Question 5 I*s the London Clay the shallowest strata at the site?*

Yes, ground conditions on the site, and local area, comprise a thin layer of made ground/topsoil (400mm thick) over London Clay to depth.

(DTS Fig 12-17 & Site investigation)

Question 12 *Is the site within 5m of a highway or pedestrian right of way?*

The pavement to Arlington Road forms the eastern boundary of the property and is separated from the house by the front lightwell and vaults. The front vaults extend under the pavement.
The rear of the pavement is approx 2m from the front wall of the house and the kerb line 3900mm from the front wall.
The underpinning to the front wall extends to approx 800mm below the existing lightwell level. The proposed underpinning will not affect the the stability of the existing vaults, pavement or highway based on 45deg line of influence.
(*Refer to drawings S2930/S001, S002, S005 and S010*)
The rear extension (basement extension) is approximately 8.5m from the back of the pavement and the proposed works will not affect the pavement or public highway.
(*Refer to drawing S 2930 S002*)

Screening Checklist for Surface Water and Flooding

None

6.2 SCOPING ASSESSMENT

The matters identified Screening Assessment above identified the following items relating to Slope Stability which require further discussion and more detailed response.

Question 1b *Will the proposed basement extend beneath the water table surface*?

Unknown. Nearby BGS borehole records indicate a groundwater level of c.10 m bgl, within the London Clay ((DSR Fig 10 to 15). This is well below the proposed foundation level of 2.6 m bgl.
However, the current site groundwater level is unknown.

Response

The proposed basement formation level may be below groundwater level. A site investigation is planned to confirm the ground conditions and groundwater level, if close to surface.

Existing boreholes indicate that the groundwater was generally not encountered to 10m below ground level so unlikely to be an issue but needs to be confirmed for site.

Screening Checklist for Slope Stability

Question 5 I*s the London Clay the shallowest strata at the site?*

Yes, ground conditions on the site, and local area, comprise a thin layer of made ground/topsoil (400mm thick) over London Clay to depth.

(DTS Fig 12-17 & Site investigation)

Response

Yes, ground conditions on the site and local area comprise a thin layer of made ground/topsoil (400mm thick) over London Clay to depth.

(DTS Fig 12-17 & Site investigation)

This question relates to fact that London Clay has a high shrinkage potential and is prone to seasonal shrink-swell movement because of changes in the moisture content of the clay. Consequently, buildings which found in London Clay can suffer from structural movement due to subsidence and heave.

We have inspected the property at No161, and visually inspected the buildings adjacent and no indications of ground movement is evident. The front and back facades show no visible distortion in the brickwork indicating structural movement.

The basement to the rear extension is outside the existing building and will found at a similar level to exiting (the formation will be approximately 500mm lower than the formation levels to the main house) and bear onto the same ground strata.

Therefore, whilst there will be some interaction between the new basement and the existing foundations to No161 and adjacent properties this will be minimal and dealt with by shallow underpinning to avoid ground loss.

Considering the above, this matter will not be considered further as the solution is in line with standard procedures for foundations in clay.

Question 12 *Is the site within 5m of a highway or pedestrian right of way?*

The pavement to Arlington Road forms the eastern boundary of the property and is separated from the house by the front lightwell and vaults. The front vaults extend under the pavement.
The rear of the pavement is approx 2m from the front wall of the house and the kerb line 3900mm from the front wall.
The underpinning to the front wall extends to approx 800mm below the existing lightwell level. The proposed underpinning will not affect the the stability of the existing vaults, pavement or highway based on 45deg line of influence.
(*Refer to drawings S2930/S001, S002, S005 and S010*)
The rear extension (basement extension) is approximately 8.5m from the back of the pavement and the proposed works will not affect the pavement or public highway.
(*Refer to drawing S 2930 S002*)

Response

Yes, the pavement to Arlington Road forms the eastern boundary of the property and is separated from the house by the front lightwell.

The underpinning to the front walls will found at approximately 900mm below lighwell slab level, and as the lightwell is approximately 1950mm wide this will be outside the zone of influence for the foundations of the vault walls and will have no effect. (*Refer to drawings S2930/S001, S002, S005 and S010*)

The rear extension (basement extension) is approximately 8.5m from the back of the pavement and the proposed works will not affect the pavement or public highway. (Refer to drawing S 2930 S002)

Question 5 - Is the London Clay the shallowest strata at the site?

Response

Yes, ground conditions on the site and local area comprise a thin layer of made ground/topsoil (400mm thick) over London Clay to depth.

(DTS Fig 12-17 & Site investigation)

This question relates to fact that London Clay has a high shrinkage potential and is prone to seasonal shrink-swell movement because of changes in the moisture content of the clay. Consequently, buildings which found in London Clay can suffer from structural movement due to subsidence and heave.

We have inspected the property at No161, and visually inspected the buildings adjacent and no indications of major ground movement is evident. The front and back facades show no visible signs of significant distortion in the brickwork which would indicate structural movement.

The basement to the rear extension is outside the existing building and will found at a similar level (the formation will be approximately 500mm lower than the formation levels to the main house) and into the same ground strata. Therefore, whilst there will be some interaction between the new basement and the existing foundations to No161 and adjacent properties this will be minimal and dealt with by shallow underpinning to avoid ground loss.

Considering the above, this matter will not be considered further as the solution is in line with standard procedures for foundations in clay.

Question 12 - Is the site within 5m of a highway or pedestrian right of way?

Response

Yes, the pavement to Arlington Road forms the eastern boundary of the property and is separated from the house by the front *lightwell.*

The rear extension (basement extension) is approximately 8.5m from the back of the pavement and the proposed works will not affect the pavement or public highway.

(Refer to drawing S 2930 S002)

As noted in our response the shallow depth of the proposed underpinning means that the works will not adversely affect the stability of the front vaults, and hence the pavement and highway. The basement is located at the rear of the property, 8.5m from the public highway, and will have no impact.

Due to its levels and position the proposed basement will have no impact on the public highway and pavement and no

further consideration is required.

7 SITE INVESTIGATION

7.1 VISUAL INSPECTION AND INVESTIGATION

Visual inspections of the property at No161 and those adjacent have been undertaken to establish the nature and arrangement of the buildings and identify any existing defects. In addition, a visual inspection of the adjacent church hall building has been carried out to allow the nature of the structure and its arrangement to be determined in the absence of any drawings of the original building.

As established in the Desk Study the original building was originally built in the 1830s but was extensively refurbished c1987 when the separate shop and flat were combined into a single residence, and again c1992 when a mansard and rear extensions were added.

From our inspections and opening up works it appears that much, if not all, of the original floor and partition structure has been replaced. This is evident, not only where the structure has been exposed, but also in that the floors and ceilings are level and the absence of original period features and use of modern materials.

The rear extension, added c1992, consists of a basement extension with concrete slab over which extends beyond the basement and carries the timber framed conservatory structure. The nature of the basement walls is not known, but blockwork is visible at the head in several areas and a reinforced blockwork option, such as Stepoc blockwork is possible.

Generally, the building and those adjacent are in good condition with no signs of structural movement or distress present. The existing structure to No161 is summarised on drawings S2930 / E001-E009 included in the appendices.

The garden wall between Nos159 and 161 has moved and has distinct lean and bulging. This appears to be an historic problem as the wall has been partly rebuilt and piers added previously.

7.2 GEOTECHNICAL INVESTIGATION

Geotechnical investigations were undertaken on 12 February 2024 to confirm the ground conditions on site and the nature of the existing foundations. A copy of the factual report is included in the appendices.

A borehole, carried out in the rear garden, confirmed the ground conditions to comprise topsoil/made ground over London Clay to depth with shear strengths of 124/130kPa at the proposed formation depth. The ground conditions confirm the geology maps and local boreholes referred to in the Desk Study.

The trial pits to existing walls, see the Site Investigation Report and drawing E 009. The investigation revealed that the foundations to the existing house are traditional brick corbels bearing onto the London Clay 330-370mm below basement floor level; the foundations on the church side are deeper, with the house wall being previously and the link building built off a deep strip footing. The footings to the existing rear wall where not exposed and need to be confirmed at the start of the works – they are assumed to be similar to the existing house footings.

The individual trial pits are described below:

7.2.1 159 ARLINGTON ROAD – MAIN HOUSE

Trial pit (TP1) gave the existing formation level of the party wall to be 360mm below existing basement floor level. The existing floor build up was 50mm finishes on 100mm unreinforced concrete slab on 130mm hardcore.

7.2.2 159 ARLINGTON ROAD – REAR RETAINING WALL

Trial pit (TP4) confirmed that the wall to the existing lightwell at the rear of No159 to be brickwork founding 1580mm below the path level, this equates to 480mm below existing basement floor level. This is assumed to be the original wall separating the rear lightwells with the No161 side backfilled in building rubble when the rear extension to No161 was built.

7.2.3 CHURCH – FRONT HOUSE

Trial pit (TP2) confirmed that the original foundations to the front and side walls were similar to that on No159, founding at 350mm and 410mm below basement floor level. However, the party wall has also been underpinned to a depth of 1010mm below ffl, the underpinning also projects significantly (varies but 150mm min) beyond the original corbel. The underpinning is assumed to have been carried out when the church was constructed C1933.

7.2.4 CHURCH – LINK BLOCK

The trial pit to the rear link block was dug in the plant room in the existing basement extension to No161. The wall and floor in the plant room have a cement render finish (assumed to be waterproofing) and the existing wall floor junction has 130mm chamfer The trial pit reveals the footing to be a corbelled brick footing (with another corbel within the chamfer) on mass concrete strip with a formation level 680mm below existing basement ffl.

7.2.5 GROUNDWATER

No groundwater was found within the proposed excavation depth in the site borehole or other boreholes in the locality. Standing water was found in the borehole 4.9m below ground level (rear garden), approximately 1.5m below the proposed foundation level.

Water was encountered in trial pit TP2 (front church side) but it is believed that this is water ingress from above and not groundwater. The source of this needs further investigation as CCTV revealed that the were in good condition.

7.3 ASSESSMENT OF SITE INVESTIGATION

The implications of the finding from the site investigation are set out below.

7.3.1 GEOTECHNICAL

The site investigation confirmed that the ground conditions comprised a thin layer of made ground / topsoil over London Clay to depth. Design parameters are given in Section 8.

7.3.2 EXISTING FOUNDATIONS

The existing foundations to the structural walls have been foun to be shallow brick corbel footings typical of the period.

The existing party/flank wall adjacent the church has been previously underpinned, assumed for construction of the church. The existing walls, except the church wall, will require underpinning to accommodate lowering of the basement floor.

The rear building (link building) to the church already founds at a deeper level, but may require local underpinning to prevent ground loss – to be confirmed on site.

The existing footings to the garden walls (No159 and church yard) are not known and require confirmation on site.

The foundations on the No159 side are likley to be shallow strip footings bearing onto the clay 300-400 below garden level. This makes this wall prone to movement due to changes in moisture levels in the underlying London Clay, and can be seen in the verticality of the wall and previous localised rebuilding of the wall.

TRhe church yard wall foundations are aloso likley to be strip footings, but founding at a lower depth than on the No159 side, around 1000mm below ground level. The presence of the adjacent deep foundations to the church link

building means that these foundations may locally step up from the deeper link building level.

7.3.3 GROUNDWATER

The ground conditions on site comprise of topsoil and Made Ground to between 0.28 m and 1.5 m depth over London Clay, with no intermediate banding, proven to 5 m.

A standing water level of 4.9 m below ground level was encountered during site investigation. This is 1.5m below the proposed foundation level and 2.3 m below the proposed basement floor level.

It is noted that the borehole was backfilled the same day; therefore the measured groundwater level may not be representative of site conditions.

Water was also recorded in one of the four trial pits (TP2). This may represent the presence of small pockets of water in the Made Ground.

The ground conditions on site means that significant groundwater inflow during construction is unlikely, but seepage and perched water in the shallow subsurface cannot be discounted, especially due to identification of a shallow band of Made Ground. Therefore

- Arrangements for dewatering the excavation to deal with groundwater seepage and superficial runoff during rainfall events are recommended during construction. See section 8.9.
- The basement should be constructed so that no water penetration or dampness is permitted. See section 8.4.

As set out in Section 5.3 the site is surrounded by basements of similar depth to the proposed basement, with a significant number extending to levels deeper than the basement level proposed.

The presence of deeper basements surrounding the site, the low permeability of the site geology (London Clay) and the groundwater level occurring 1.5m below the proposed foundation level shows that the construction of the proposed basement will have negligibe impact on the groundwater regime of the area and create no adverse effects, such as backing up of the groundwater, which could impact on neighbouring properties.

7.4 CCTV SURVEY OF EXISTING DRAINAGE

A CCTV survey of the existing drainage was carried out from the existing manhole in the front lightwell which found that the existing drainage connects directly to the downpipes at the rear of the property without a rear manhole.

The existing drainage was found to be in good condition and laid using plastic pipe, and therefore dates from the 1992 refurbishment. From the levels it appears that the existing drainage was set above the original drainage until the connection to the front manhole where it dropped and reused the original drain connection.

A copy of the CCTV is included ion the appendices.

As the existing drainage will clash with the reduced slab level it will be replaced in the proposed scheme, running at the original lower level and reusing the existing front manhole. Flowrates will be as existing as site is unchanged.

8 BASEMENT CONSTRUCTION AND METHODOLOGY

The following sections set out the design information and the sequence of works assumed in the design and sets out a construction methodology which allows the works to be carried out safely and without adversely affecting the existing buildings or their stability.

8.1 PROPOSED BASEMENT

The proposals allow for the demolition of the existing rear extension and basement and construction of a new rear extension over a basement which occupies the full footprint of the ground floor extension. The existing extent and proposed basement are shown on the existing and proposed drawings included in the appendices. The following extracts from the structural drawings show the general arrangement of the new basement.

The new basement will be constructed as a reinforced concrete 'box' bearing onto the underlying London Clay.

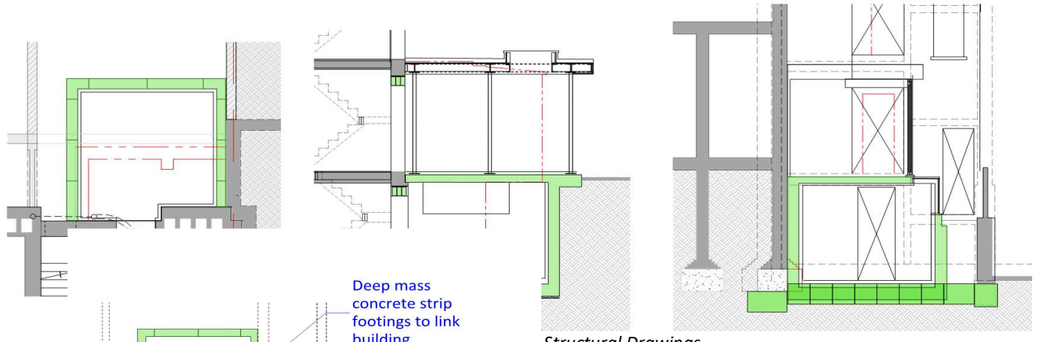
At the rear, adjacent the garden, it is proposed to construct the new basement by battering back the soil faces adjacent the new basement area to create a safe working area for the construction of the new structure. This will require the demolition and rebuilding of the existing garden walls adjacent the rear of the new basement as shown on drawing S 002.

At the front of the basement, adjacent the house, the circumstance is different as the new basement is surrounded by existing walls (Nos159, No161 and the church link building) which found at a similar level to the proposed formation level only shallow underpinning will be required. The foundation level of the existing walls will be need to be checked at the start of works to ensure that the trial pit details are true around the perimeter.

The new basement will be cast monolithically with the only joints being between the slab and walls. The concrete to the new basement will incorporate waterproof additive and all joints will have double hydrophilic water stops to prevent water penetration.

Waterproofing to the basement is dealt with in Section 8.4.

The proposed structure is shown on drawings S 2930 / S 001- S008 included in the appendices. Extracts from the structural drawings showing the basement arrangement are included below.



Structural Drawings

Figure 3: Extent of Underpinning

8.2 PROPOSED UNDERPINNING

The main walls to the main house, with the exception of the walls on the church side, are to be

underpinned using mass concrete to allow the basement floor level to be lowered by 400mm and, if required, allow the construction of the new basement to the rear extension.

The mass concrete underpinning is to be carried out in the traditional hit and miss approach with individual mass concrete pins approx 900mm deep and a maximum 1000mm long.

The stem width of the pins will match the thickness of the wall above, with the base width increased to match the existing footing width.

The extent of the the proposed underpinning is shown on the plan on the left (extract from S001) with the extent and details given in the structural drawing package.

The methodology for the construction of the underpins (TW 003) and specification notes are included in the appendices.

8.3 GROUND CONDITIONS AND GEOTECHNICAL PARAMETERS

Based on geology maps, nearby boreholes, and the site borehole, Fastrak Report 27798, the soil strata on site was confirmed to be topsoil/made ground over brown London Clay. The site borehole is included below.

Based on the site borehole and general geotechnical information the Conceptual Site Model for the site are summarised as follows:

- The site is level.
- Made ground / topsoil to 0.45m depth below ground level(bgl) (rear garden).
- Mid brown Clay (weathered London Clay) to 5m bgl, beginning to show grey mottling from 2.2m bgl.
- Some water was encountered at 4.9m bgl. This is assumed to be percolation from the topsoil/made ground overlying the London Clay.
- Signiificant ground water is not expected to be encountered in the excavation but rainfall will need to be dealt with.
- The depth of the proposed basement excavation is taken as 3.5m below rear garden level and approximately 1.5m below this level.

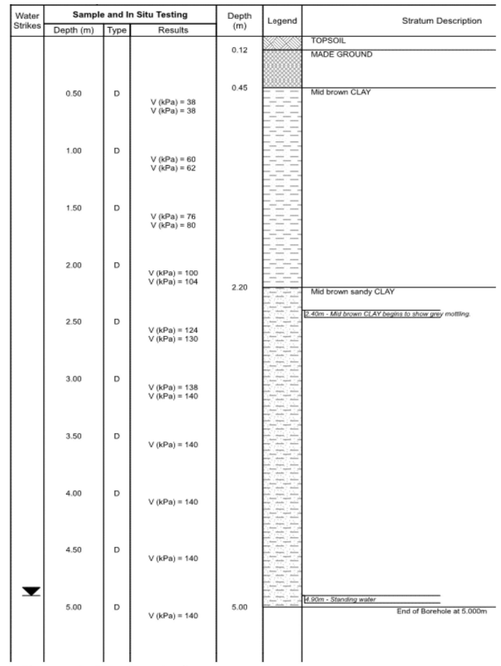


Figure 4: Site Borehole

For the design of the new basement and retaining walls the following effective stress parameters will be adopted in the design:

Design Soil Parameters		
Cohesion	C’	0kN/m^2
Angle of Shearing Resistance	ϕ'	23 degree
Density of London Clay	γ	20 kN/m^3
Density of water	γ_w	10 kN/m^3
Other Parametrs		
Design Surcharge	q	5 kN/m^2
Density of Concrete		24 kN/m^3
Design water level		Full height
Design life		50 yr min

8.4 WATERPROOFING TO BASEMENT

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. The current code of practice is BS 8102:2022 ‘Code of practice for protection of below ground structures against water from the ground.’

The above British Standard, and relevant guidance such as the NHBC chapter 5.4, gives technical guidance and best practice recommendations on methods of dealing with and preventing the entry of water from external sources into structures that are partly or wholly below ground.

The standard introduces four environmental grades based on the level of water pentration / dampness permitted. It also sets out the three main approaches for protecting below ground structures against water from the ground.

The two tables are summarised below for ease of reference.

Type	Waterproof protection
A	Internal or external barrier protection (tanking)
B	Structurally integral protection
C	Internal drained cavity protection with a sump and pump for removal of water or its disposal by gravity

Grade	Required level of performance	Typical Use
1a	Some seepage and dampness is permitted	Retaining walls
1b	No seepage. Damp areas from internal and external sources are tolerable.	Car parks
2	No water penetration, but dampness is permitted	Storage room, plant room
3	No water penetration or dampness is permitted	Habitable space

As habitable space, the new basement needs to meet the requirements for Grade 3 protection - no water penetration or dampness permitted.

As the external perimeter conditions around the new basement vary and access limited, an external tanking system was not considered feasible and internal tanking possibly suffers from loss of bonding if significant water pressure develops.

Therefore a combined system using structurally integral protection and an internal drained cavity system is proposed to achieve the required protection for the proposed basement. The broad principles of the waterproofing design are set out below but need to be developed with the design team as part of the design development process.

The reinforced concrete basement structure is designed to withstand the design pressures from earth forces, ground water and surcharge loading as set out in Section 8.3.

It is proposed to achieve the type B protection by enhancing the resistance of the concrete structure to water penetration by adding Pudlo 2.5 CWP or similar admixture to the concrete mix for use in the the new basement and ground floor in accordance with the manufacturers recommendations. Pudlo is s concrete admixture which works by blocking the pores which naturally in the concrete as a result of the hydration of concrete mix.

Hydrophilic waterstops are to be used in all construction joints, and between the new and existing structure to prevent water seepage via these weak points. Refer to structural drawings.

Internally, the new basement will be lined with a cavity drainage membrane to act as a second line of protection, collecting any water which penetrates the concrete structure and acting as a vapour barrier to prevent moisture penetration. It is proposed to use Delta MS20 for the slab and Delta MS500 as the cavity membranes for the walls and ceiling respectively.

A secondary concrete floor screed, dry lining to the walls, and suspended ceiling will be constructed inside of the cavity membrane, incorporating insulation, giving protection to the waterproofing, and providing the finished face to the new space. The wall insulation will need to carry across the soffit of the ground floor slab to prevent cold bridging.

A typical arrangement is shown on the extract from the structural drawings below, refer to Appendix B for the proposed structural drawings.

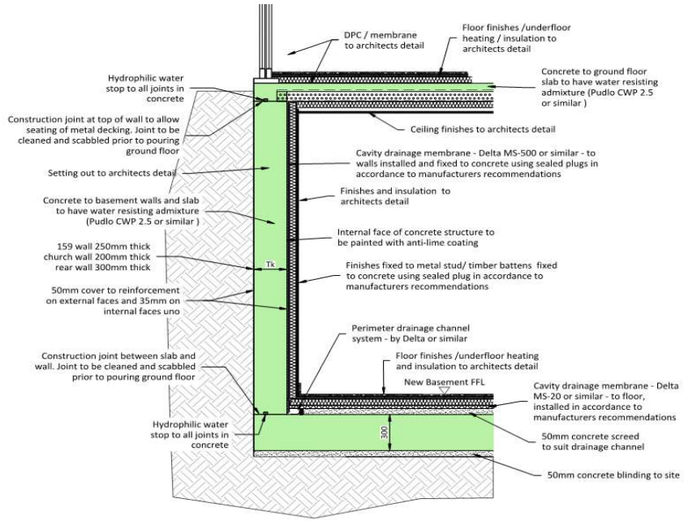


Figure 5: Typical Basement Construction

On the main basement floor slab, it is proposed that a more traditional approach of employing a damp proof membrane with sealed joints is placed under the slab and carried 1100mm up the walls to prevent the passage of water from external sources. Details of the waterproofing to the main slab will be developed by the architect as aprt of the design development process.

A copy of the Basement Information Centre guidance on basement waterproofing, along with manufacturers data sheets, is included in the appendics for information.

8.5 PARTY WALL MATTERS

The proposed works fall under the scope of the Party Walls Act 1996. Procedures under the Act will be dealt with in full by the Employer's Party Wall Surveyor, who will prepare and serve necessary all Notices under the provisions of the Act and agree Party Wall Awards in the event of disputes.

The Contractor will be required to provide the Party Wall Surveyor with appropriate drawings, method statements and other relevant information covering the works that are notable under the Act. The resolution of matters under the Act and provisions of the Party Wall Awards will protect the interests of all owners.

The designs for No161 Arlington Road will be developed so as not to preclude or inhibit similar, or indeed any, works on the adjoining properties. This will be verified by the Surveyors as part of the process under the Act.

8.6 CONSTRUCTION SEQUENCE

The construction sequence assumed in the design is shown on drawing TW001 and TW 002 and is expanded upon below:

Stage	Description of Works
Stage 0	Existing Building – Existing drainage layout confirmed. Levels of drainage at rear of building to be confirmed by opening up. – Absence of asbestos to be confirmed, though unlikely as major refurbishment in 1992.

Stage	Description of Works
	General
	– Removal of demolition debris / soil will be a major issue for this project and either a 'bag and load' or skip located in a suspended parking bay in the street are possible. The contractor will decide which method suits the proposed works and obtain all necessary permits etc.
	– It is assumed that the contractor will use the ground floor as site accommodation. The impact of the proposed works on the existing drainage means that temporary welfare facilities may be required.
Stage 1	Site Preparation and Initial Demolition
	– Contractor set up on site.
	– Install temporary surface water drainage diversion to serve the rear – picks up existing RWP and water from the rear excavation. It is assumed that a silt tank will be required to remove any fines from the water before it is discharged into the existing manhole. Silt tank located in front lightwell and rear RWP diversion to run at high level basement or ground floor.
	– Existing services in the extension (electricity, gas, water, waste water) striped out and services taken back or capped.
	– Existing conservatory structure at ground floor demolished and debris removed from site.
	– Commence demolition of basement slab in house.
Stage 2	Main Demolition
	– Demolish garden walls adjacent new basement as shown on structural drawings. Extent to be agreed in Party Wall process.
	– Demolish ground floor slab to rear extension. Temporary propping installed to existing basement walls if required. Debris removed from site.
	– Existing basement walls demolished at rear and soil behind battered back to safe slope and arisings removed from site.
	– Basement slab in house removal complete
Stage 3	Excavation
	– Excavate for new basement leaving berm around front and sides and battering back
	– Reduce dig in front area (can commence underpinning)
Stage 4	Underpinning
	– Underpin existing walls (see S001). See underpinning methodology drawing (TW 003) for details of typical underpinning sequence.
	– Once underpinning completed cast site blinding over new basement area.
	– Once underpinning complete commence installation of new drainage.
	It is currently envisaged that the new drainage can be installed before the existing drainage is cut off, requiring isolation of the drainage for a short period during the swap over.

Stage	Description of Works
Stage 5	Cast Basement Slab in House and Rear Extension
	– Complete installation of new below slab drainage.
	– Fix reinforcement to basement slab with starter bars to walls to be cast into slab.
	– Cast new slabs
Stage 6	Cast Basement Walls
	– Allow basement slab to rear extension to cured
	– Place outer shutter on rear and sides. Outer slab to project above ground floor slab level.
	– Place slip membranes against church wall (see basement detail).
	– Fix reinforcement to walls and clean out area, tie bars to ground floor slab to be cast into top of wall and left projecting to be cast into ground floor slab.
	– Fix inner shutters and prop back to basement slab.
	– Cast walls to underside of ground floor slab. Formwork to walls to be stabilised using temporary props fixed back to new slab.
Stage 7	Construct Ground Floor Slab
	– Once walls cured remove inner shutter and re prop walls using push-pull props fixed to slab
	– Place metal decking to ground floor slab and fix reinforcement, bending tie bars cast into walls to fix into slab reinforcement.
	– Clean out and cast slab
Stage 8	Backfill
	– Let basement walls cast cure.
	– Once walls cured remove all shuttering
	– Start backfilling outside walls using suitable material, either excavated material or suitable fill, compacted in 225mm deep layers
Stage 9	Rebuild Garden Walls
	– Rebuild garden walls on new mass concrete foundation.
Stage 10	Construct Superstructure
	– Erect new steel structure to sun-room and install new roof timbers.
	– Install glazing and rooflight
	– Apply finishes and waterproofing to roof.
	– Complete finishes.
Stage 11	Completion

Stage	Description of Works
	• Fit out and complete new extension.

8.7 GROUND SETTLEMENT & DAMAGE ASSESSMENT

8.7.1 THE BURLAND SCALE

The Burland Scale is used to describe or measure the damage (or risk of damage) to properties as a result of structural movement, and relates the likely damage to the tensile strain developed in the wall.

Classification of visible damage to walls (after Burland et al, 1977, Boscardin and Cording, 1989, and Burland, 2001)

Category of damage	Description of typical damage (ease of repair is underlined)	Approximate crack width (mm)	Limiting tensile strain, ε_{lim} (%)
0 Negligible	Hairline cracks of less than about 0.1 mm are classed as negligible	<0.1	0.0-0.05
1 Very slight	Fine cracks that can easily be treated during normal decoration. Perhaps isolated slight fracture in building. Cracks in external brickwork visible on inspection	<0.1	0.05-0.075
2 Slight	Cracks easily filled. Redecoration probably required. Several slight fractures showing inside of building. Cracks are visible externally and some repointing may be required externally to ensure weathertightness. Doors and windows may stick slightly.	<5	0.075-0.15
3 Moderate	The cracks require some opening up and can be patched by a mason. Recurrent cracks can be masked by suitable lining. Repointing of external brickwork and possibly a small amount of brickwork to be replaced. Doors and windows sticking. Service pipes may fracture. Weathertightness often impaired.	5-15 or a number of cracks > 3	0.15-0.3
4 Severe	Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Windows and frames distorted, floor sloping noticeably. Walls leaning or bulging noticeably, some loss of bearing in beams. Service pipes disrupted.	15-25 but also depends on number of cracks	>0.3
5 Very severe	This requires a major repair involving partial or complete rebuilding. Beams lose bearings, walls lean badly and require shoring. Windows broken with distortion, Danger of instability.	Usually > 25 but depends on number of cracks	

8.7.2 REAR BASEMENT

As the new basement sits outside the footprint of the existing building it will have negligible impact on the existing walls, as would happen with retrofit basements. An assessment of the anticipated settlement / heave for the new basements is given below.

Front (House)	Immediate Settlement	0.49mm
	Consolidation Settlement	0.86mm
	Total Settlement	1.35mm

Rear (Garden)	Heave	Settlement	Net Total
Immediate Settlement	-2.19	0.49	-1.69
Consolidation Settlement	-3.80	0.86	-2.95
Total Settlement	-5.99	1.35	-4.64

From the above the construction of the new basement will have negligible impact on the existing foundations and adjacent buildings.

Referring to the Burland Scale for damage this equates to ‘category 0 – negligible’ with no or aesthetic damage.

8.7.3 UNDERPINNING

Based on a traditional 5-pin underpinning sequence and taking the effective increase factor for the short term loading due to underpinning of 1.8q, the calculated settlements for the underpinning are:

Immediate settlement	1.85mm
Long term (consolidation) settlement	2.13mm
Total	**3.98mm**

In reality, the settlements are likely to be less than these once the stiffness of the existing wall and soil cohesion are taken into consideration with a reduction factor of 0.6 reasonable for the party wall. This gives the likely settlement for the party wall of 2.3mm.

This gives a maximum tensile strain in the wall of 0.04%, which referencing the Burland Scale for Damage equates to ‘category 0 – negligible’ with no or aesthetic damage.

8.8 TEMPORARY WORKS

Based on the sequence of works set out below and visual inspection of the adjacent buildings the temporary works requirements required for the construction of the new basement extension will be limited to local propping during various stages of the works, e.g. stability of the new basement walls during casting.

However, as the sequence proposed assumes the demolition and rebuilding of the garden walls which will require Party Wall Agreement and may be subject to change as part of this process.

8.9 DEALING WITH WATER IN EXCAVATION

During construction of the rear basement water may occur in the excavation which needs to be disposed of without causing issues to the excavation or neighbouring buildings.

The ground conditions on site have been confirmed as comprising a shallow band of topsoil / Made Ground over London Clay to depth with no intermediate banding.

During the construction of the basement, a significant groundwater inflow during excavation stage is unlikely, but groundwater seepage, water from perched water in the shallow subsurface strata, and superficial runoff during

rainfall events need to be dealt with a dewatering scheme designed to deal with the anticipated flow.

Allowing for the area of the excavation and the rear of the roof (the existing RWP from the roof will need to be picked up) an anticipated flow rate under storm conditions of 30l /min will apply. This is within the range of submersible dewatering pumps.

Water was found in one of the trial pits at the front on the church side (Trial Pit 2). As no water was encountered in any other trial pits or boreholes, this is assumed to be a local water ingress issue (for example from the flashings to the flank wall at roof level). If required a local sump can be formed to deal with any water found once the existing basement slab has been demolished and the site conditions established.

In brief, any water encountered in the excavations will be dealt with as follows:

- Locate a silt tank in the front lightwell. Silt tank to be Siltbuster HS Lamella Clarifier, or similar, to remove any silt or debris from water before discharge.
- Make a tempory connection to pick up existing rainwater pipe on back elevation and run to silt tank/ manhole.
- Excavate a local sump within the excavation. Line sump with geotextile to limit loss of fines during pumping, form chamber to take a submersible pump, and back fill around chamber with suitable granular material to maintain stability.
- Pump water from the rear sump to the silt tank, where any fines will be removed from the water.
- Discharge the outflow from the slit tank into the existing manhole. Volume of water is less than the existing discharge, so is within capacity of the existing sewer connection.

The arrangement envisaged is shown in the following sketch layout:

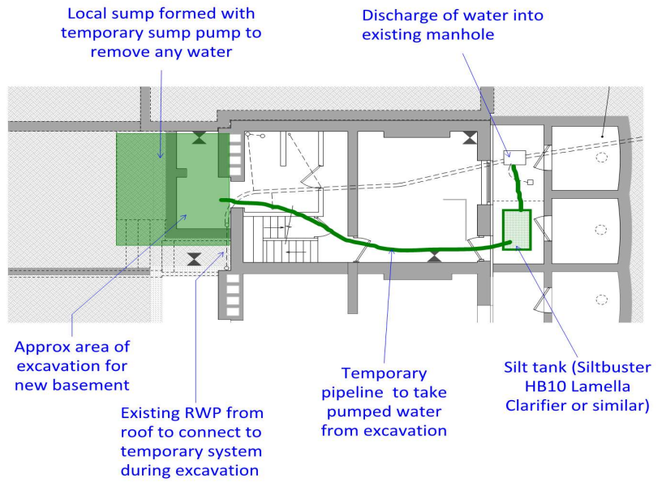


Figure 6: Proposed Dewatering Arrangement

8.10 MONITORING DURING EXCAVATION AND CONSTRUCTION

The Contractor shall provide visual inspection and monitoring to all structures and infrastructure adjacent to the basement excavation at the time of excavation and construction.

Monitoring proposals/requirements will be confirmed with the Contractor and adjoining Owner's Surveyor prior to works.

As the impact of the proposed works have negligible impact on the adjacent buildings it is assumed that visual inspection and fixed monitoring points, such as tell tales, will be sufficient on this project with the existing lightwell walls to No159 and the link building to the church to be monitored during the demolition, excavation and basement construction phases.

8.11 NOISE, VIBRATION AND DUST

As far as practically possible, the contractor is to adopt methods that ensure that construction impacts such as noise, vibration and dust are kept to acceptable levels for the duration of the works.

Methods such as cutting reinforced concrete elements into smaller pieces for removal from site rather than breaking out should be considered by the contractor.

The contractor should liaise with the neighbouring properties with regards periods of noisy works to minimise their impact. In particular the contractor shall avoid noisy work during the time of services in the church.

8.12 IMPACT ON ADJACENT PROPERTIES

From our assessment of the adjacent properties the proposed works will have no significant structural impact on them.

There will be some short-term disturbance and disruption during the works from noise and vibration etc, but this will be minimised by the contractor choosing suitable methods of working and liaison between the contractor and adjacent properties.

The scope of the works require a Party Walls Award to be agreed with the adjacent properties and any issues can be highlighted and dealt with at this stage.

8.13 TREES

No trees will be affected by the proposed extension.

9 BASEMENT IMPACT ASSESSMENT

9.1 IMPACT ON NEIGHBOURING PROPERTIES

The Conceptual Site Model (CSM), based on the Desk Study Report and site specific geotechnical investigation, shows the site is level, it has a very gentle fall to the north east, and found on the London Clay, which continues to depth, and is overlain on the site by a thin layer of made ground/topsoil.

Site investigations have confirmed that the existing foundations to No161 found into the London Clay 360mm below existing basement floor level. This level is consistent on all walls in No161, and also applies to No159 which is contemporary with No161. The retaining wall to the rear lightwell founds at a similar depth, approximately 480mm below existing basement floor level.

The church building founds into the London Clay at a slightly deeper level, 680mm below basement floor level. This deeper formation also meant that the flank wall adjacent the church was underpinned, to a depth of 1000mm below basement floor level, when the church was constructed in 1933.

The proposed works include the underpinning of the existing walls to allow lowering the basement floor level and construction of a basement at the rear of the property, approximately 8.5m from the pavement. These works will have negligible impact on the neighbouring properties and highway structures.

9.2 LAND /SLOPE STABILITY

The site investigation confirms that the proposed basement will bear into the London Clay, which underlies the site to depth. A settlement assessment indicates that the proposed basement will generate a maximum total settlement of

3.55mm. As the underpinning is the only works to the foundations to the adjacent buildings and the settlement of the new basement is focused in the area outside the existing buildings, settlement in clay tend to be and located towards the centre of the new slab, it will have negligible impact on the foundations to the adjacent buildings with the Damage Impact has been assessed as Category 0 in accordance with the Burland Scale.

9.3 SUBTERRANEAN FLOW

The measured groundwater level was 4.9 m bgl, which is 1.5 m below the proposed foundation level and 2.3 m below proposed basement floor level. There is a very low risk of groundwater flooding at the surface and a low risk of groundwater flooding within the basement. However, seepage and perched water in the shallow subsurface cannot be discounted. Mitigation measures comprise:

- Arrangements for dewatering the excavation to deal with groundwater seepage and superficial runoff during rainfall events are recommended during construction.
- The basement should be constructed so that no water penetration or dampness is permitted

The residual risk of groundwater flooding within the basement is very low.

There are no impacts to the wider hydrogeological environment, including cumulative impacts

9.4 FLOODING AND FLOOD RISK

The site is with the London Borough of Camden but does not lie within any of LBC critical drainage areas or local flood risk zones and records show no history of flooding in the area – Thames Water and LBC Flooded Street List.

The Environment Agency's Flood Risk for Planning shows the site to lie within Flood Zone 1, with the long-term flood risk maps showing the site has a very low probability of flooding (fluvial, pluvial, reservoirs and groundwater).

There is a very low flood risk and as the site is in Flood Zone 1 and less than 1 hectare (site area approx. 0.11hectare) a sequential test and full Flood Risk Assessment are not required.

APPENDIX A: EXISTING STRUCTURE

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APPENDIX B: PROPOSED STRUCTURE

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APPENDIX C: STRUCTURAL CALCULATIONS

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APPENDIX D: CONSTRUCTION SEQUENCE

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APPENDIX E: SITE INVESTIGATION REPORT

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APPENDIX F: UNDERPINNING METHODOLOGY

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APPENDIX G: CCTV REPORT

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APPENDIX H: TEMPORARY DRAINAGE INFORMATION

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APPENDIX I: BASEMENT WATERPROOFING INFORMATION

APPENDIX J: CONFIRMATION LETTERS ON REVIEW OF BIA DOCUMENTS

APPENDIX A: EXISTING STRUCTURE

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DRAWING ISSUE SHEET			
Project No	S 2930	Page	1
Project	161 Arlington Road, Camden NW1 7ET		
Date	Feb-24	Rev	By BC

DATE OF ISSUE (WITH REVISION AS SHOWN)

DWG. No.	DRAWING TITLE	SIZE	ORIG.	23/2/2024	8/4/2024	8/8/2024	Nov 2024	
	Existing Structure						*New Planning Application – Revised Scheme*	
E 001	Existing Site Location Plan	A1	1:50	/	/	/		/
E 002	Floor Plans - Basement & Ground Floor	A1	1:50	/	/	A		B
E 003	Floor Plans - First & Second Floor	A1	1:50	/	/	A		B
E 004	Floor Plans - Third Floor & Roof	A1	1:50	/	/	A		B
E 005	Section A-A	A1	1:50	/	/	A		B
E 006	Elevation B-B: Church Party Wall	A1	1:50	/	/	A		B
E 007	Elevation C-C: No159 Party Wall	A1	1:50	/	/	A		B
E 008	Rear Elevation D-D & Section E-E	A1	1:50	/	/	/		A
E 009	Trial Pit Information	A1	1:20	/	/	/		/
E 010		A1	1:50					

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MEDIA TYPE:		E	E	E		E
ISSUE STATUS:		P	I	I		A

PURPOSE OF ISSUE:- P - Preliminary, A - Approval, T - Tender, C - Construction, I - Information, R - Record

MEDIA TYPE: P - Print, E - Electronic, D - Disk