43 Croftdown Road, London, NW5

Structural Engineer's report and Basement Impact Assessment - Scoping & Screening Study

Contents

Appendices

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Date	Version	Notes / Amendments / Issue Purpose
February 2016	1	For Information

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1 The Site

Croftdown Road runs east to west between Highgate W. Hill and Dartmouth Park Hill, London. The site occupies a rectangular plot of approximately 30m x 7m in plan. The site is bounded by Woodsome Road to the south of the site; La Sainte Catholic School to the north; and other residential properties to the east and west.

Historic maps 3 and 4 included in Appendix A dated 1894 and 1912 show the site being developed with additional residential properties. The WWII Bomb Damage Map (Appendix A map 5) suggests that the site suffered some blast damage but was not structurally related and therefore not affecting the integrity of the existing buildings. There is no known history of seasonal shrink-swell subsidence in the local area. The top layer of natural ground is clay as shown in Appendix A map 6.

Desk study research (in Appendix A) shows the site location.

A four-storey building, including a basement, currently occupies the site. It is likely the building was constructed in the early-20th century and is a residential property. The building is of traditional construction comprising of load bearing brickwork with timber joist floors.

2 Ground Conditions

Published geological maps indicate that the site will be underlain directly by the London Clay stratum in common with much of North London. This has been corroborated by recent experience in nearby areas.

3 Proposed Structure

Substructure

The proposed work involves excavating an existing basement by about 400mm, as well as the lateral extension of the existing basement to cover the full footprint of the property, including a light well to the front of the building. This involves excavating an existing inaccessible limited headroom cellar by approximately 1.1m.

The proposed basement will be constructed using a reinforced concrete slab and by underpinning the existing foundation including the party wall with L shaped reinforced concrete underpins to retain the surrounding ground. Waterproofing will be to the Architects details.

Superstructure

There are no changes to the superstructure apart from removing a door and replacing it with a window, see Architectural plans in Appendix C.

External Works

In the rear garden, an existing paved terrace area will be excavated to basement level with steps up to the existing timber deck level.

4 Design Criteria

Codes and Standards
The works will be designed in accordance with the relevant British Standards.

Loadings
The floors will be designed for 1.5kN/sqm and roofs to 0.75kN/sqm in accordance with BS6399.

Design Fire Periods
Basement Fire protection provided by the cover to the reinforcement.

Design Life
All design will have a design life of 50 years.

5 CPG4 Basement Impact Assessment Screening

The screening below has been carried out in accordance with the procedure outlined in London Borough of Camden Planning Guidance CPG4 (September 2013), Section 2.12. The responses below relate to the Screening Charts in Figures 1, 2 and 3 of CPG4, which are included in Appendix B for reference.

Section 1 Groundwater Flow Screening:

Question 1a: NO – the London Clay is the first stratum occurring below the site, refer to geology map in Appendix A.

Question 1b: NO – London Clay is the first stratum occurring below the site, meaning there is no flowing water table present. There may be a perched water table.

Question 2: YES – The assumed course of the lost River Fleet runs along York Rise which is less than a 100m away.

Question 3: NO – the site is outside of the Hampstead Ponds catchment areas – refer to catchment map in Appendix A.

Question 4: NO – There is a slight increase of $1m^2$ of hardstanding due to the light well at the front. The rest of the increase in overall footprint of the building is already hard landscaping of paving stones and timber decking – refer to Architectural plans in Appendix C.

Question 5: NO – all surface water will be discharged to the existing sewer connection.

Question 6: NO – there is no local pond or spring line nearby – refer to plans in Appendix A.

Screening Summary – One positive response. The site is within 100m of the assumed course of the lost River Fleet

Section 2 Land Stability Screening

Question 1: NO – the site has no significant slopes greater than 7° in the vicinity of the works.

Question 2: NO – there is no re-profiling of existing slopes proposed within the works – refer to the Architects submitted plans.

Question 3: NO – there is no significantly sloped land adjoining the site, and the nearest railway cutting is the Over Ground, Gospel Oak to Upper Holloway, line which lies over 400m away to the South and will not be affected by the minor works proposed in this development.

Question 4: NO – there is no wider hillside setting of significant slope which the site is part of.

Question 5: YES – refer to geological map in Appendix A. This indicates that in common with most of the Borough, the London Clay is the first stratum.

Question 6: YES – the proposed scheme requires one tree to be removed. A full tree survey of all surrounding trees has been completed and an application to remove the existing Silver Birch tree has been lodged. A Young Pear tree is to be transplanted whilst the proposed works go ahead before being replanted once the works are complete, to ensure root and canopy development are not compromised.

Question 7: NO – the building shows no signs of significant or unusual damage due to shrink/swell activity.

Question 8: YES – The Hampstead Heath Ponds are further than 100m from the property. However the assumed course of the lost River Fleet runs along York Rise which is less than a 100m away.

Question 9: NO – refer to geology and historical maps in Appendix A.

Question 10: NO – refer to geology map indicating that London Clay is the first stratum.

Question 11: NO – refer to site location plan in Appendix A.

Question 12: YES – the pavements starts approximately 3.7m from the front of the house, refer to Architects plans.

Question 13: NO – the majority of the proposed development is an extension of the existing basement area laterally not vertically. The foundations will therefore be of a similar depth to those which already exist. Some underpinning will be required but this will be limited to approximately 1m.

Question 14: NO – the nearest railway lines are as mentioned in Q.3 above, and the nearest tube tunnels are the Northern Line which runs more than 500m to the East of the site. Due to the distance of the nearest tunnel being well over 100m there will be no effect on tunnels in the area.

Screening Summary – There are four positive responses. The impact of these positive answers are assessed in the Scoping section of this report.

Section 3 Surface Flow and Flooding Screening:

Question 1: NO – refer to location plan and catchment map in Appendix A.

Question 2: NO – the existing sewer connections will be reused and no other surface water measures are proposed.

Question 3: NO – refer to response under Section 1, Question 4. There is negligible increase to the total hardstanding area.

Question 4: NO – there are no change in flows due to no changes to the overall hardstanding area.

Question 5: NO – there is no change in the means of collection or discharge of the rainwater and therefore no change in its quality.

Question 6: NO – Croftdown Road did not flood in 1975 or 2002, despite a number of surround streets flooding in 1975 including Woodsome Road and York Rise. It is not identified as having the potential for flooding in Map 2 of Camden Policy DP23 and The Environment Agency surface water flooding map (see Appendix A) shows the York Rise flood risk zone and although 43 Croftdown road is very close to this area, it sits outside of the marked zone.

Screening Summary – No positive responses

6 CPG4 Basement Impact Assessment Scoping

Based on the responses given above, the wording of CPG4 and the wording of the Arup Hyrdo-geological report text, the project should proceed to the BIA Scoping stage on the basis of the five positive responses highlighted above.

Scoping is the process of defining in further detail the matters to be investigated as part of the BIA. The matters in this case are as follows:

1. The site is within 100m of the assumed course of the lost Fleet River, but not within 100m of any surface water
    - By finding out further information on the exact location of the lost Fleet and whether or not it runs in a Culvert at this location will enable appropriate precautions to be taken within the design and construction of the proposed work.

2. London Clay is the shallowest strata at the site
    - This is the case for most of the Borough, and does not pose any issues in relation to the proposed scheme

3. The proposed works require a lime tree to be removed.
    - A full arboricultural report has been carried out by Frank Parsons Arboriculturalist, including a survey of trees in relation to design, demolition and construction with recommendations made. Using this information and good practice during the construction should mitigate any further concern.

4. The site is within 5m from a pedestrian right of way – the pavement outside the property
    - This is the case with most properties within Camden and if the correct safety precautions are taken during construction this will cause very little disruption or impact to the surrounding neighbours.

Appendix A: Desk Study
Appendix B: London Borough of Camden CPG4 Screening Flow Charts
Appendix C: Structural Design Sketches

Appendix A

Desk Study

Library Search Results

Map 1: Street Map

Street View of Site

Map 2: Ordinance Survey Map 2001

Map 3: Old Ordinance Survey Map 1912

Map 4: Old Ordinance Survey Map 1894

Map 5: Bomb Damage Map

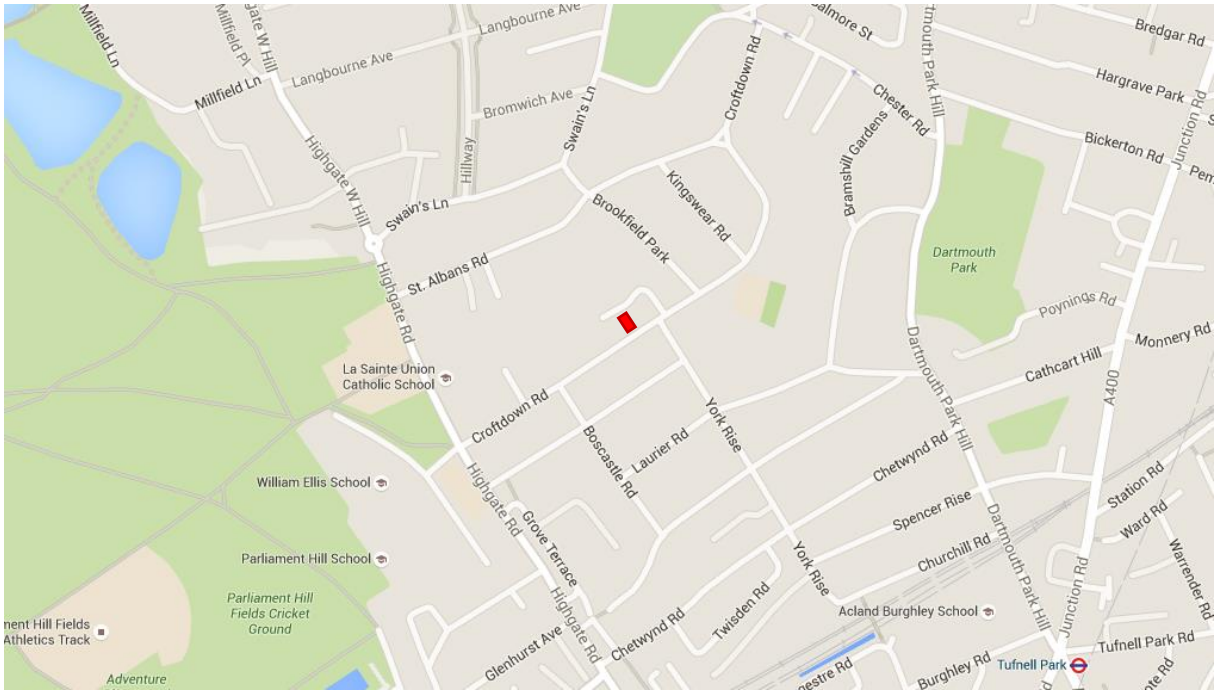
Map 6: Geological Map

Map 7: Lost Rivers of London Map

Map 8: Catchment Areas of Hampstead Heath Ponds

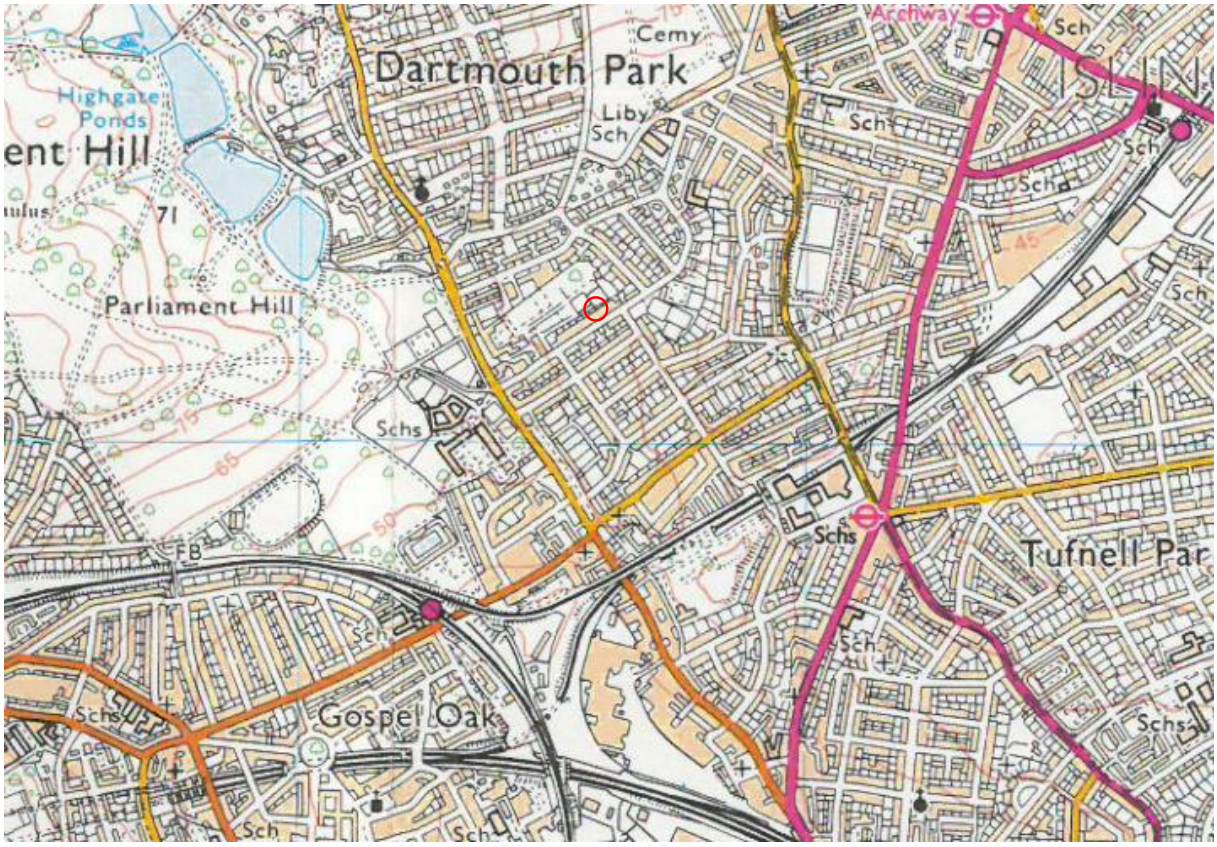
Map 9: Risk of Flooding from Surface Water

Map 10: Camden Flood Risk Map

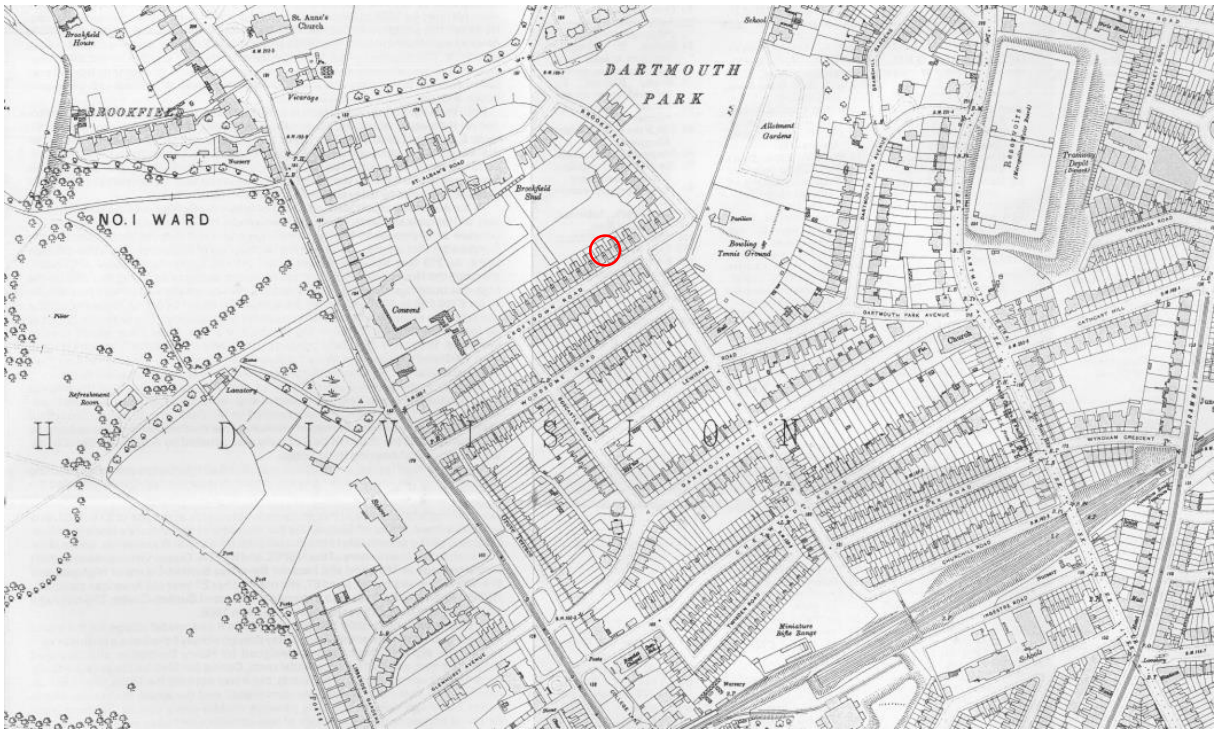


Map 1: Street Map

Street View of Site



Map 2: Ordinance Survey Map 1998

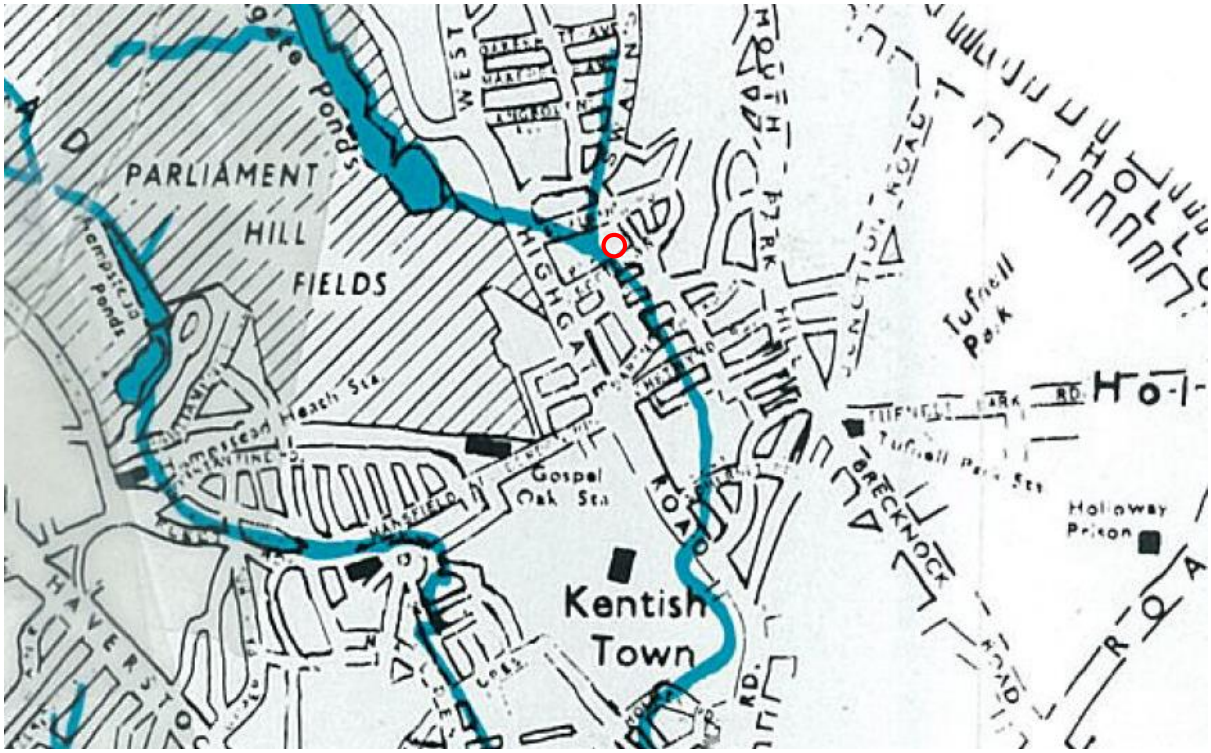


Map 3: Old Ordinance Survey Map 1912

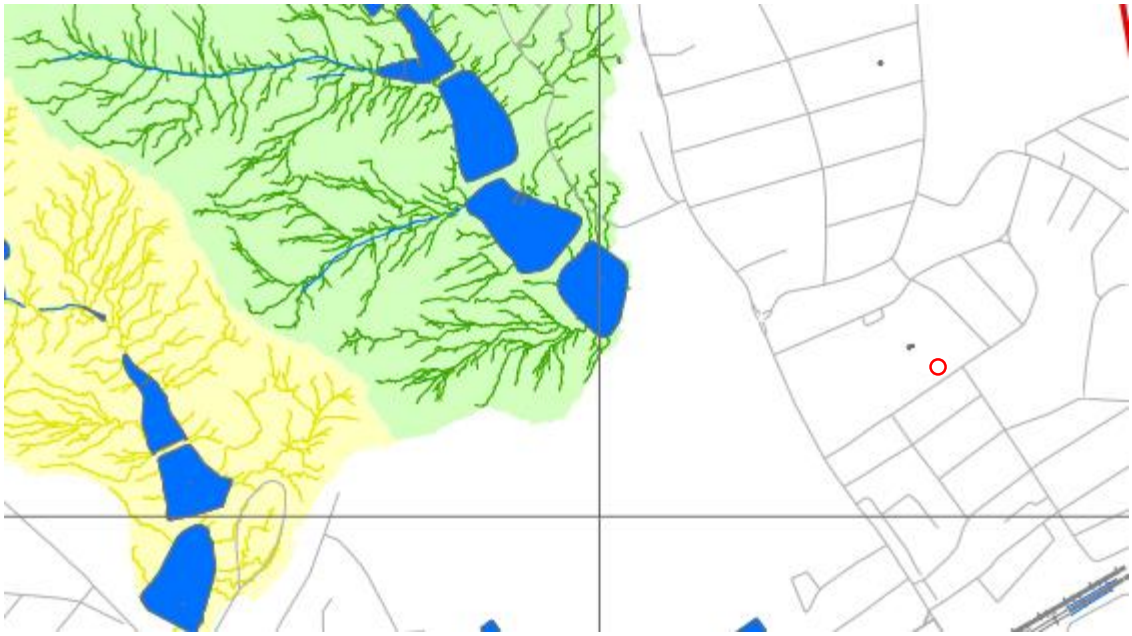
Map 4: Old Ordinance Survey Map 1894

Map 5: Bomb Damage Map

Map 6: Geological Map



Map 7: Lost Rivers of London Map



Map 8: Catchment Areas of Hampstead Heath Ponds

Map 9: Risk of Flooding from Surface Water Flow

Taken from the Environment Agency website

Map 10: Camden Flood Risk Map

Taken from Camden Policy DP23

Appendix B

London Borough of Camden CPG4 Screening Flow Charts

Subterranean (ground water) Flow Screening Flow Chart

Subterranean (ground water) Flow Screening Notes/Sources of Information

Land Stability Screening Flow Chart

Land Stability Notes/Sources of Information

Surface Flow and Flooding Screening Flow Chart

Surface Flow and Flooding Screening Notes/Sources of Information

Subterranean (ground water) Flow Screening Flow Chart:

The Developer should consider each of the following questions in turn, answering either "yes", "unknown" or "no" in each instance.

Consideration should be given to both the temporary and permanent works, along with the proposed surrounding landscaping and drainage associated with a proposed basement development.

Question 1a: Is the site located directly above an aquifer?

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

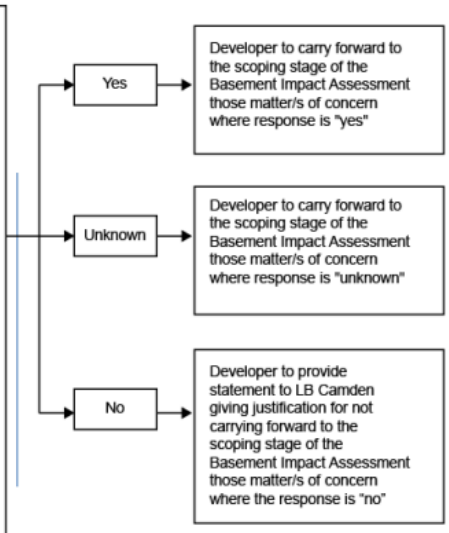
Question 2: Is the site within 100m of a watercourse, well (used/disused) or potential spring line?

Question 3: Is the site within the catchment of the pond chains on Hampstead Heath?

Question 4: Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?

Question 5: As part of the site 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)?

Question 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 (not just the pond chains on Hampstead Heath) or spring line.



Subterranean (ground water) Flow Screening Notes/Sources of Information:

SUBTERRANEAN (GROUND WATER) FLOW SCREENING CHART NOTES AND SOURCES OF INFORMATION

Question 1: In LB Camden, all areas where the London Clay does not outcrop at the surface are considered to be an aquifer. This includes the River Terrace Deposits, the Claygate Member and the Bagshot Formation. The location of the geological strata can be established from British Geological Survey maps (e.g. 1:50,000 and 1:10,000 scale). Note that the boundaries are indicative and should be considered to be accurate to ±50m at best.

Additionally, the Environment Agency (EA) "Aquifer Designation Maps" can be used to identify aquifers. These can be found on the "Groundwater maps" available on the EA website (www.environment-agency.gov.uk) follow "At home & leisure" > "What's in Your Backyard" > "Interactive Maps" > "Groundwater". Knowledge of the thickness of the geological strata present and the level of the groundwater table is required. This may be known from existing information (for example nearby site investigations), however, it may not be known in the early stages of a project. Determination of the water table level may form part of the site investigation phase of a BIA.

Question 2: Watercourses, wells or spring lines may be identified from the following sources:

- Local knowledge and/or site walkovers
- Ordnance Survey maps (e.g. 1:25,000 or 1:10,000 scale). If features are marked (they are not always) the following symbols may be present: W; Spr; water is indicated by blue colouration. (check the key on the map being used)
- British Geological Survey maps (e.g. 1:10,000 scale, current and earlier editions). Current maps will show indicative geological strata boundaries which are where springs may form at the ground surface; of relevance are the boundary between the Bagshot Formation with the Claygate Member and the Claygate Member with the London Clay. Note that the boundaries are indicative should be considered to be accurate to ±50m. Earlier geological maps (e.g. the 1920's 1:10560 scale) maps show the location of some wells.
- Aerial photographs
- "Lost Rivers of London" by Nicolas Barton, 1962. Shows the alignment of rivers in London and their tributaries.
- The British Geological Survey (BGS) GeoIndex includes "Water Well" records. See www.bgs.ac.uk and follow "Online data" > "GeoIndex" > "Onshore GeoIndex".
- The location of older wells can be found in well inventory/catalogue publications such as "Records of London Wells" by G. Barrow and L. J. Wills (1913) and "The Water Supply of the County of London from Underground Sources" by S Buchan (1938).
- The Environment Agency (EA) "Source Protection Zone Maps" can be used to identify aquifers. These can be found on the "Groundwater maps" available on the EA website (www.environment-agency.gov.uk) follow "At home & leisure" > "What's in Your Backyard" > "Interactive Maps" > "Groundwater".
- The EA hold records of licensed groundwater abstraction boreholes. LB Camden is within the North East Area of the
- Thames Region. Details can be found on the EA website.
- LB Camden Environmental Health department may hold records of groundwater wells in the Borough.

Where a groundwater well or borehole is identified, it will be necessary to determine if it is extending into the Lower Aquifer (Chalk) or the Upper Aquifer (River Terrace Deposits, Bagshot Formation, Claygate Member etc). It is water wells extending into the Upper Aquifer which are of concern with regard to basement development.

Question 3: Figure 14 in the attached study, (prepared using data supplied by the City of London Corporation's hydrology consultant, Haycocks Associates) shows the catchment areas of the pond chains on Hampstead Heath.

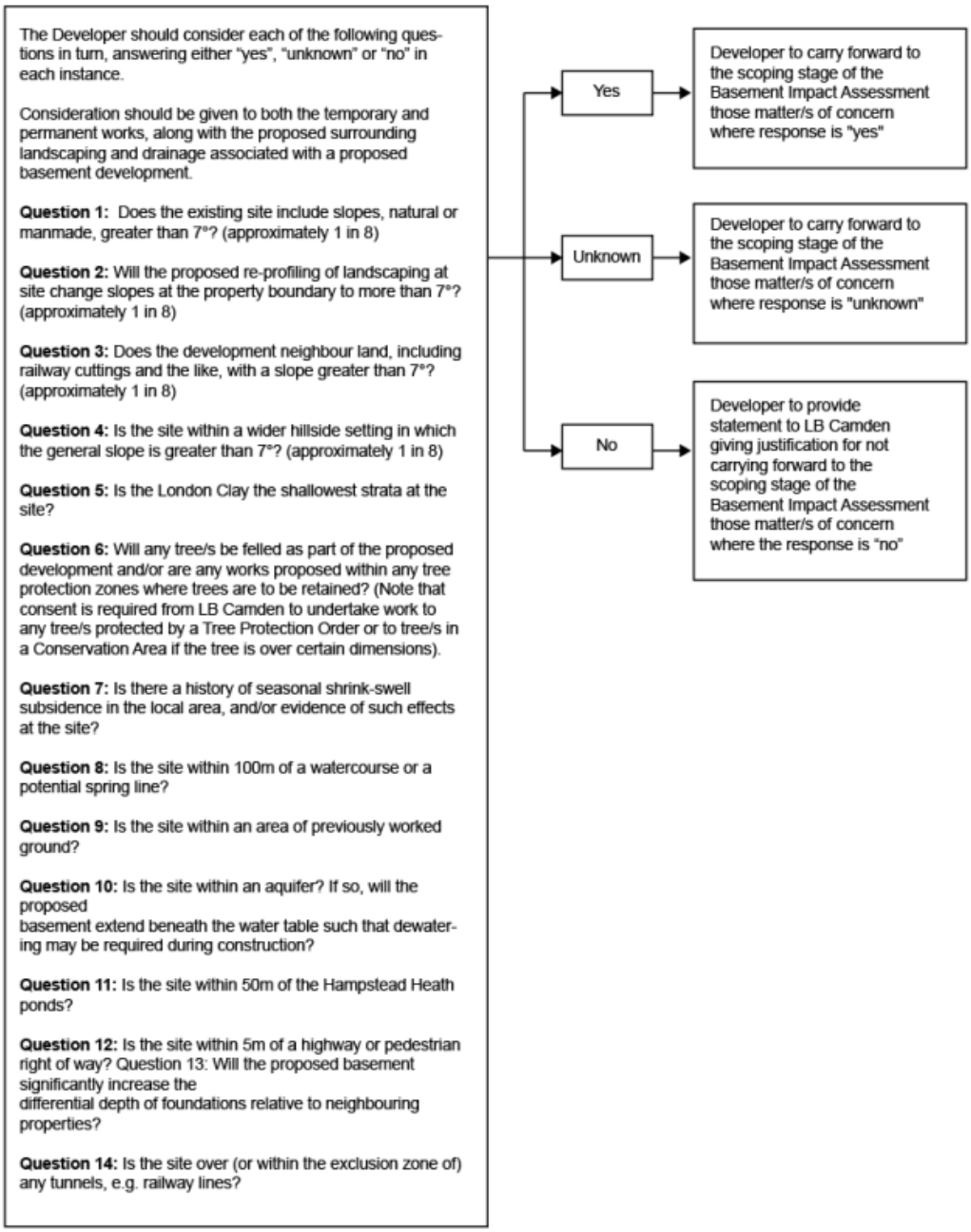
Question 4: This will be specific to the proposed development and will be a result of the proposed landscaping of areas above and surrounding a proposed basement.

Question 5: This will be specific to the proposed development and will be a result of the chosen drainage scheme adopted for the property.

Question 6: The lowest point will be specific to the proposed development. Knowledge of local ponds may be taken from

- Local knowledge and/or site walkovers
- Ordnance Survey maps (e.g. 1:25,000 or 1:10,000 scale). If features are marked (they are not always) the following symbols may be present: W; Spr; water is indicated by blue colouration. (check the key on the map being used)
- Aerial photographs

Land Stability Screening Flow Chart:



Land Stability Notes/Sources of Information:

SLOPE STABILITY SCREENING FLOWCHART
NOTES AND SOURCES OF INFORMATION

Question 1, 3 & 4: The current surface slope can be determined by a site topographical survey. Slopes may be estimated from

1:25,000 OS maps, however in many urban areas such maps will not show sufficient detail to determine surface slopes on a property-by-property scale, just overall trends. With regard to slopes associated with infrastructure, e.g. cuttings, it should be ensured that any works do not impact on critical infrastructure.

Question 2: This will be specific to the proposed development and will be a result of the proposed landscaping of areas above and surrounding a proposed basement.

Question 5: The plan footprint of the outcropping geological strata can be established from British Geological Survey maps (e.g. 1:50,000 and 1:10,000 scale). Note that the boundaries are indicative and should be considered to be accurate to ±50m at best.

Question 6: this is a project specific determination, subject to relevant Tree Preservation Orders etc.

Question 7: this can be assessed from local knowledge and on-site observations of indicative features, such as cracking, Insurance firms may also give guidance, based on post code. Soil maps can be used to identify high-risk soil types. Relevant guidance is presented in BRE Digest 298 "Low-rise building foundations: the influence of trees in clay soils" (1999); BRE Digest 240 "Low-rise buildings on shrinkable clay soils: part 1" (1993); and BRE Digest 251 "Assessment of damage in low- rise buildings" (1995).

Question 8: Watercourses or spring lines may be identified from the following sources:

- Local knowledge and/or site walkovers
- Ordnance Survey maps (e.g. 1:25,000 or 1:10,000 scale). If features are marked (they are not always) the following symbol may be present "Spr"; water is indicated by blue colouration. (check the key on the map being used)
- Geological maps will show indicative geological strata boundaries which are where springs may form at the ground surface; of relevance are the boundary between the Bagshot Formation with the Claygate Member and the Claygate Member with the London Clay. Note that the boundaries are indicative should be considered to be accurate to ±50m at best. British Geological Survey maps (e.g. 1:10,000 scale, current and earlier editions).
- Aerial photographs
- "Lost Rivers of London" by Nicolas Barton, 1962. Shows the alignment of rivers in London and their tributaries.

Question 9: Worked ground includes, for example, old pits, brickyards, cuttings etc. Information can be gained from local knowledge and/or site walkovers, and from historical Ordnance Survey maps (at 1:25,000 or 1:10,000 scale, or better) and British Geological Survey maps (at 1:10,000 scale, current and earlier editions). Earlier geological maps (e.g. the 1:10560 scale series from the 1920s) include annotated descriptions such as "old pits", "formerly dug", "brickyard" etc.

Question 10: In LB Camden, all areas where the London Clay does not outcrop at the surface are considered to be an aquifer.

This includes the River Terrace Deposits, the Claygate Member and the Bagshot Formation. The general footprint of the geological strata can be assessed from British Geological Survey maps (e.g. 1:50,000 and 1:10,000 scale). Note that the boundaries are indicative and should be considered to be accurate to ±50m at best.

The Environment Agency (EA) Aquifer Designation Maps can be used to identify aquifers. These are available from the EA website (www.environment-agency.gov.uk), by clicking on 'At home & leisure' > 'What's in Your Backyard' > 'Interactive Maps' > 'Groundwater'.

Details are required of the thickness of the geological strata present and the level or depth of the groundwater table. This may be known from existing information (for example nearby site investigations); however, it may not be known in the early stages of a project. Determination of the water table level may form part of the site investigation phase of a BIA and may require specialist advice to answer. Depth of proposed development is project specific.

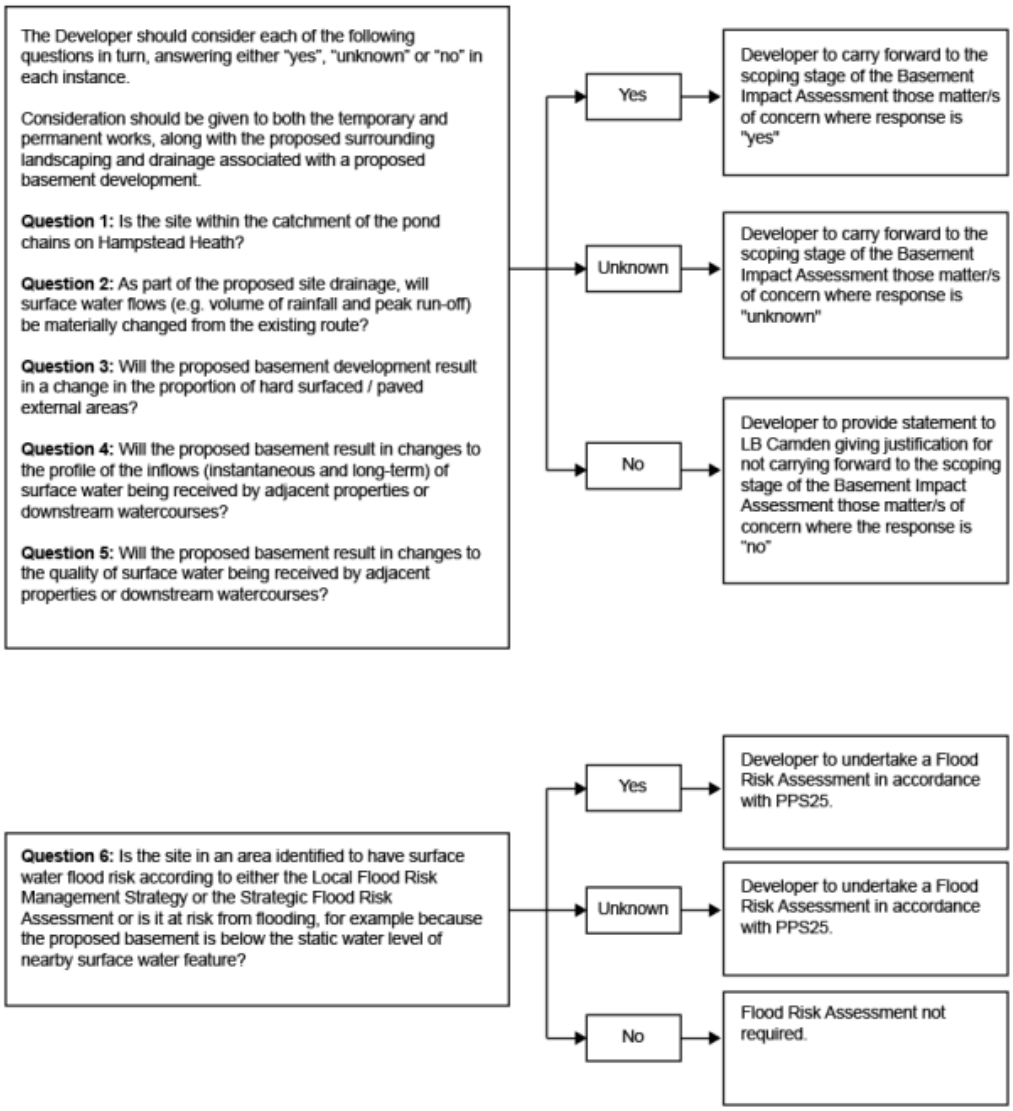
Question 11: From local knowledge and/or site walkovers, and from Ordnance Survey maps (e.g. 1:25,000 or 1:10,000 scale). In relation to the stability and integrity of the pond structures and dams, the guidance of a Panel Engineer should be sought. (Details of Panel Engineers can be found on the Environment Agency website: http://www.environment-agency.gov.uk/ business/sectors/64253.aspx). Duty of care needs to be undertaken during any site works in the vicinity of the ponds.

Question 12: From local knowledge and/or site walkovers, and from Ordnance Survey maps (e.g. 1:25,000 or 1:10,000 scale). Any works should not impact on critical infrastructure.

Question 13: From local knowledge and/or site walkovers. May find some details on neighbouring properties from searches of LB Council databases, e.g. planning applications and/or building control records.

Question 14: From local knowledge and/or site walkovers, from Ordnance Survey maps (e.g. 1:25,000 or 1:10,000 scale) and directly from those responsible for tunnels (e.g. TfL or Network Rail). Any works should not impact on critical infrastructure.

Surface Flow and Flooding Screening Chart:



Surface Flow and Flooding Notes/Sources of Information:

SURFACE FLOW AND FLOODING SCREENING FLOWCHART NOTES AND SOURCES OF INFORMATION

Question 1: Figure 14 in the Camden geological, hydrogeological and hydrological study (prepared using data supplied by the City of London Corporation's hydrology consultant, Haycocks Associates) shows the catchment areas of the pond chains on Hampstead Heath

Question 2: This will be specific to the proposed development and will be a result of the proposed landscaping of areas above and surrounding a proposed basement. The developer should provide documentation of discussion with Thames Water to confirm that the sewers have capacity to receive any increased wastewater flows.

Question 3: This will be specific to the proposed development and will be a result of the chosen drainage scheme adopted for the property

Question 4: This will be specific to the proposed development and will be a result of the proposed landscaping and chosen drainage scheme adopted for the property. SUDS will be required to compensate any increases in peak flow.

Question 5: This will be specific to the proposed development and will be a result of the proposed landscaping and chosen drainage scheme adopted for the property. SUDS will be required to compensate any increases in peak flow.

Question 6: The principles outlined in PPS25 should be followed to ensure that flood risk is not increased.

Appendix C

Structural Design Sketches

Ground Floor Plan as Existing

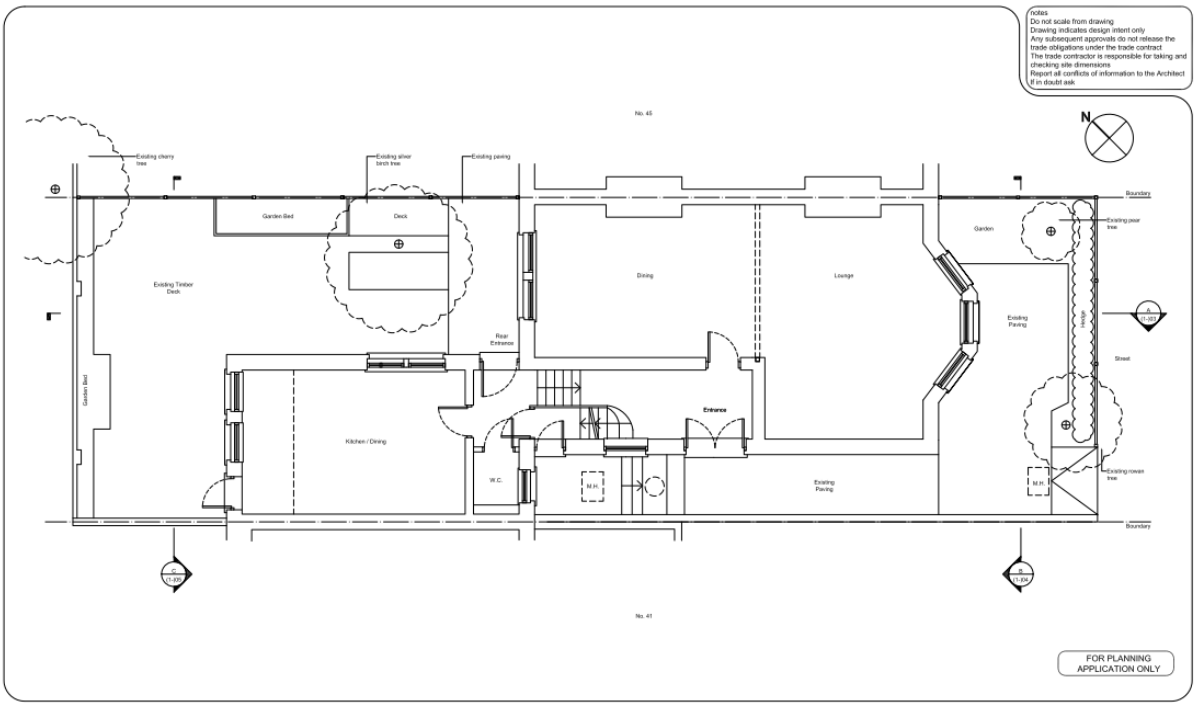
Ground Floor Plan as Proposed

Basement Plan as Existing

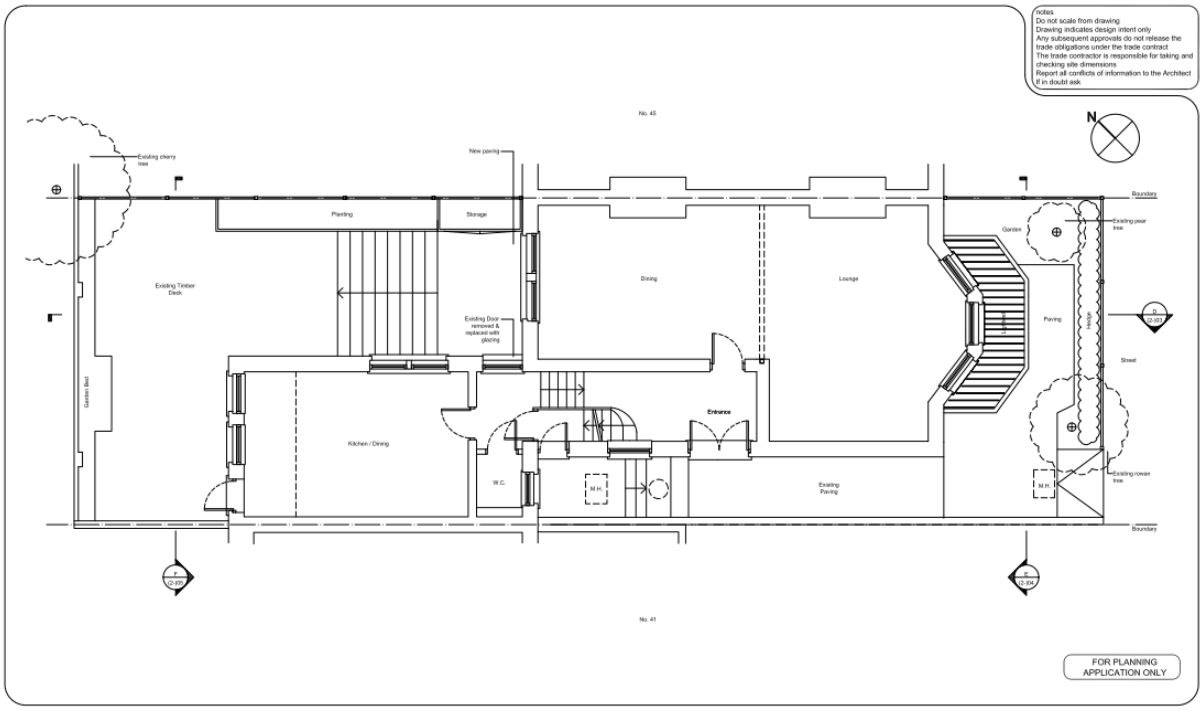
Basement Plan as Proposed

Long Section as Existing

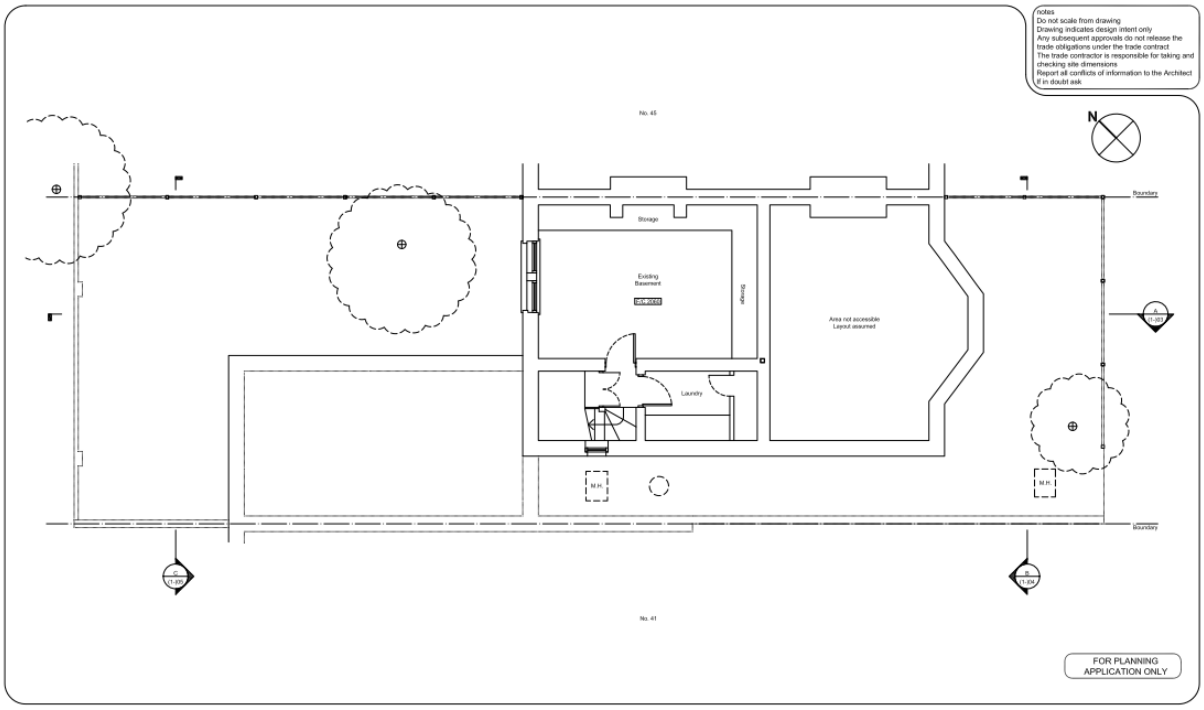
Long Section as Proposed



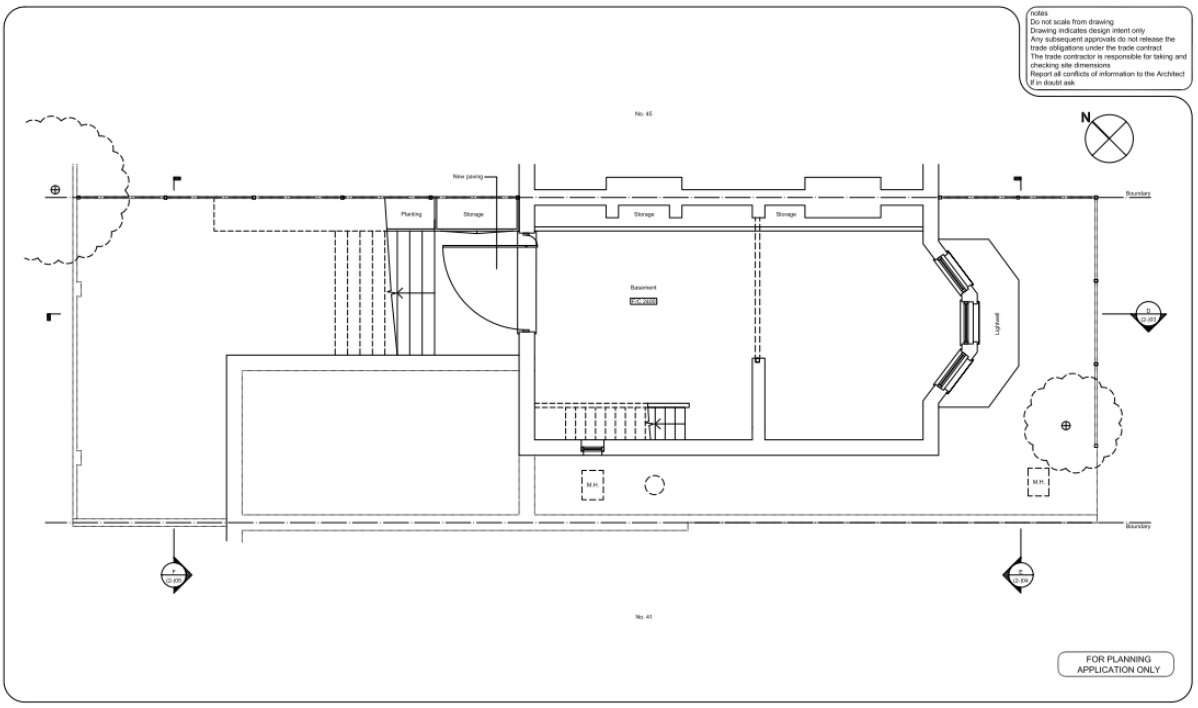
Ground Floor Plan as Existing



Ground Floor Plan as Proposed

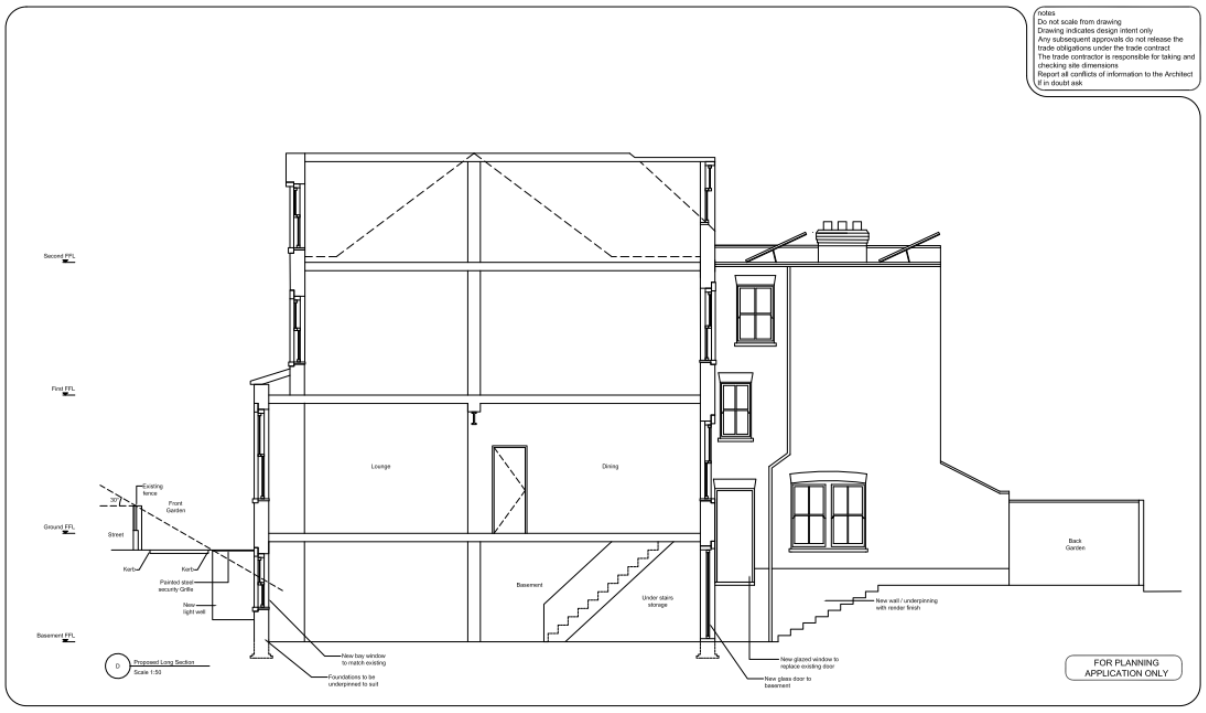


Basement Plan as Existing



Basement Plan as Proposed

Long Section as Existing



Long Section as Proposed