3 Fitzroy Road
London
NW1 8TU

Basement Impact Assessment

Mr MacNamara

August 2024

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Rev 0

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Executive summary

This executive summary contains an overview of the key findings and conclusions. No reliance should be placed on any part of the executive summary until the whole of the report has been read. Other sections of the report may contain information that puts into context the findings that are summarised in the executive summary.

Brief

This report describes the findings of a basement impact assessment (BIA) carried out by Geotechnical and Environmental Associates Limited (GEA) on the instructions of Momentum Structural Engineers on behalf of Mr MacNamara, with respect to the proposed extension of the existing lower ground floor level beneath part of the front garden area.

The purpose of the report has been to provide an assessment of any impact of the proposed extension of the existing lower ground floor on the local hydrology, hydrogeology or surrounding structures. This has been carried out through a review of the information provided by Momentum Structural Engineers and a previous investigation by GEA of the adjoining site of No 1 Fitzroy Road (report ref. J15311 – Rep Issue 2, dated June 2016).

The report includes information required to comply with London Borough of Camden Planning Guidance, with respect to the requirement for a Basement Impact Assessment (BIA).

Site History

The earliest Ordnance Survey (OS) map studied, dated 1873, shows the site to have been occupied by the existing building, with the existing road networks and terraced housing present in the local area. There were minor commercial buildings in the area, including a piano factory 170 m southwest of the site and a number of buildings associated with goods yards and engineering works for the railway yard to the north. By 1895, on previously disused land present beyond the eastern boundary of the site, a piano factory had been constructed which was later redeveloped in 1954 as a chemical and medicine factory, again in 1966 as a telephone supply and service centre, and finally by 1987 it was redeveloped as offices and light commercial units of Utopia Village. Off-site a range of commercial and industrial uses were present throughout the site history, largely confined to three areas located 90 m north of the site, 60 m east of the site and 170 m south of site. These included uses as oil stores, engineers' workshops, garages, builders' yards, cleaners and textiles. By 2000, the majority of these uses had been converted to residential or office purposes and thereafter few significant changes have subsequently been made to the site and immediately surrounding area.

Site Setting

The majority of the site is occupied by the existing buildings and areas of external hardstanding, with very limited areas of planting at the front and rear of the site.

The adjoining property of No 1 Fitzroy Road to the northeast comprises a two-storey semi-detached house with a lower ground floor and additional basement level that extends beneath the full footprint of the house and the front garden area. No 5 Fitzroy Road, immediately to the southwest comprises a three-storey end of terrace house, with lower ground floor level.

The site is not within the exclusion zone of any Network Rail or London Underground tunnels.

Ground conditions

The British Geological Survey (BGS) map of the area indicates that the site is underlain by the London Clay Formation, which was confirmed by the previous investigation of the adjoining site, in that , below a variable thickness of made ground, London Clay was encountered and proved to the full depth of the investigation of 20.00 m (12.50 m OD).

The made ground, generally comprised brown to dark brown or grey silty clay, with gravel, occasional rootlets and variable amounts of extraneous material including brick, concrete and ash, was encountered to depth between 0.30 m (30.2m OD) and 3.50m (29.0 m OD). The London Clay Formation was found to comprise an initial horizon of firm medium strength brown to brownish grey silty clay with partings of silty sand, proven to depths between 4.00 m (28.5 m OD) and 9.00 m (26.5 m OD). This upper weathered horizon was underlain by an unweathered horizon comprising stiff becoming very stiff fissured high strength brownish grey becoming dark grey silty clay with occasional partings of sandy silt, which extended to the maximum depth investigated, of 20.00 m (12.5 m OD).

Slow seepages and accumulations of perched water were recorded during the previous investigation of the adjoining site. However, as a permanent groundwater table is not considered to be present within the London Clay, the development will not have any impact on the local groundwater regime .

Basement Impact Assessment

The BIA has not indicated any concerns with regard to the effects of the proposed basement on the site and surrounding area. It has been concluded that the impacts identified can be mitigated by appropriate design and standard construction practice.

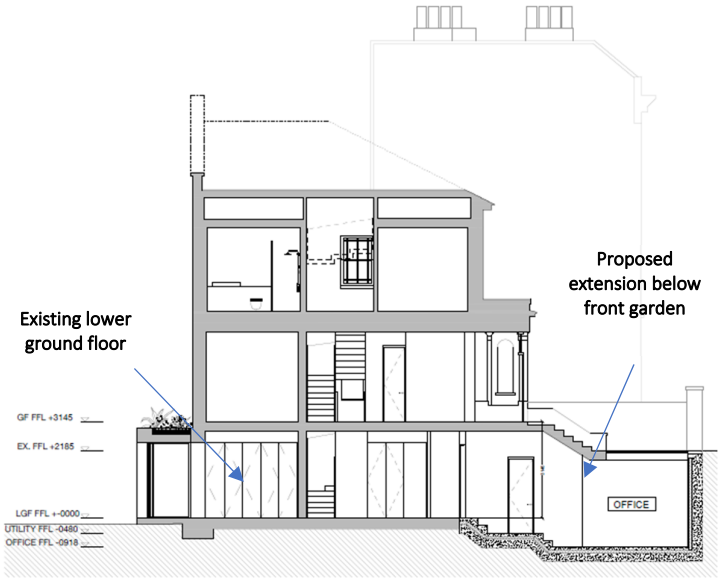
1.0 Introduction

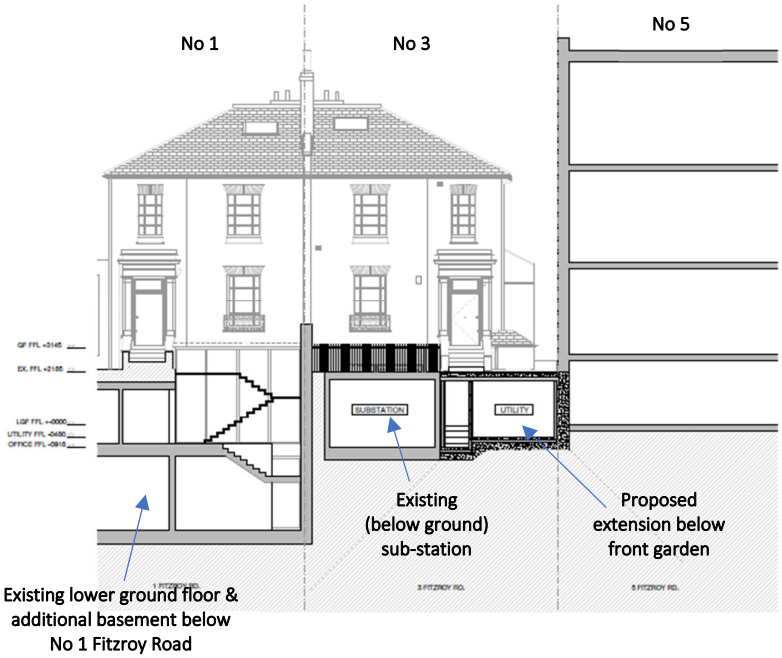
Geotechnical and Environmental Associates Limited (GEA) has been commissioned by Momentum Structural Engineers on behalf of Mr MacNamara to carry out a basement impact assessment in accordance with guidelines from the London Borough of Camden (LBC), at 3 Fitzroy Road, London NW1 8TU.

The assessment has been carried out through a review of the information provided by Momentum Structural Engineers and a previous investigation of the adjoining site of No 1 Fitzroy Road (report ref. J15311 – Rep Issue 2, dated June 2016).

1.1 Proposed Development

It is understood that is proposed to extend the single-storey lower ground floor below part of the front garden. Formation level for the proposed basement is understood to be approximately 3.20 m below ground level at the front of the house. Sections through the proposed development are included below and opposite in order to aid understanding.





This report is specific to the proposed development and the advice herein should be reviewed if the development proposals are amended.

1.2 Purpose of Work

The principal technical objectives of the work carried out were as follows:

- to check the history of the site with respect to previous contaminative uses;
- to determine the ground conditions and their engineering properties;

- to provide advice and information with respect to the design of suitable foundations and retaining walls; and
- to assess the impact of the proposed basement on the local hydrogeology, hydrology and stability of the surrounding natural and build environment.

1.3 Scope of Work

In order to meet the above objectives, a desk study and geotechnical appraisal have been completed, which comprised:

- a review of historical Ordnance Survey (OS) maps and environmental searches sourced from the Envirocheck database;
- a review of readily available geology maps;
- a review of the findings of the previous site investigation undertaken at No 1 Fitzroy Road;
- provision of a report presenting and interpreting the above data, together with our advice and recommendations with respect to the proposed development.

1.3.1 Basement Impact Assessment

The work carried out includes a Hydrological and Hydrogeological Assessment and Land Stability Assessment (also referred to as Slope Stability Assessment). These assessments form part of the BIA procedure specified in the London Borough of Camden (LBC) Planning Guidance CPG[1] and their Guidance for Subterranean Development[2] prepared by Arup (the "Arup report") in accordance with Policy A5 of the Camden Local Plan 2017. The aim of the work is to provide information on surface water, groundwater and land stability and in particular to assess whether the development will affect neighbouring properties or groundwater movements and whether any identified impacts can be appropriately mitigated by the design of the development.

1.3.2 Qualifications

The land stability element of the Basement Impact Assessment (BIA) has been carried out by Martin Cooper, a BEng in Civil Engineering, a chartered engineer (CEng), member of the Institution of Civil Engineers (MICE), and Fellow of the Geological Society (FGS) who has over 20 years' specialist experience in ground engineering. The subterranean (groundwater) flow assessment has been carried out by Nick Mannix, MSc in Hydrogeology, Chartered Geologist (CGeol) and Fellow of the Geological Society of London (FGS). The surface water and flooding assessment has been carried out by Rupert Evans, a hydrologist with more than ten years consultancy experience in flood risk assessment, surface water drainage schemes and hydrology / hydraulic modelling. Rupert Evans is a Chartered Environmentalist, Chartered Water and Environmental Manager and a Member of CIWEM.

The assessments have been made in conjunction with Steve Branch, a BSc in Engineering Geology and Geotechnics, MSc in Geotechnical Engineering, a Chartered Geologist (CGeol) and Fellow of the Geological Society (FGS) with some 30 years' experience in geotechnical engineering and engineering geology.

All assessors meet the qualification requirements of the Council guidance.

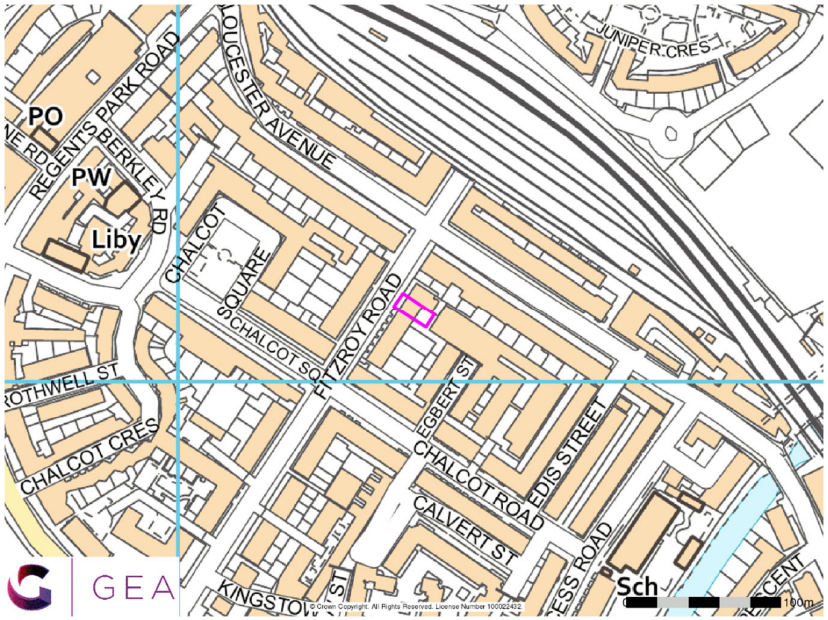
1 London Borough of Camden Planning Guidance CPG (January 2021) *Basements*

2 Ove Arup & Partners (2010) *Camden geological, hydrogeological and hydrological study. Guidance for Subterranean Development.* For London Borough of Camden November 2010

2.0 The Site

2.1 Site Description

The site is located within the London Borough of Camden, approximately 365 m south of Chalk Farm London Underground station, 765 m to the west of Camden Town London Underground station and 822 m southwest of Kentish Town West London Overground station. It fronts onto Fitzroy Road to the northwest and is bounded by the adjoining properties of No 1 and No 5 Fitzroy Road to the northeast and southwest, respectively, with Utopia Village, a two-storey and three-storey studio and office space, to the southeast. The site may additionally be located by National Grid Reference 528155, 184049 and is shown on the map extract below.



The site is approximately rectangular in shape, measuring roughly 24 m east to west by 10.0 m northwest to southeast at its maximum extent.

The site is occupied by No 3 Fitzroy Road, a two-storey semi-detached property, with additional lower ground floor level and areas of external hardstanding to the front and rear of the property. The front and rear garden areas are mainly hard landscaped, with low shrubbery along the east and west boundaries.

An underground electrical substation is present in the northern half of the front garden of the property.

The general topography of the area slopes down towards the east and southeast at a very shallow angle. The site is not shown on Figure 16 of the Arup Report to be within an area of critical slope angles of greater than 7º..

2.1.1 Adjoining Structures

The adjoining property of No 1 Fitzroy Road to the northeast, comprises two-storey semi-detached house with an existing lower ground floor and additional basement level that extend to a depth of about 7.0 m beneath the full footprint of the house and front garden area.

The adjoining property of No 5 Fitzroy Road to the southwest, comprises a three-storey end of terrace house, with an existing lower ground floor level beneath the full footprint of the property, which extends to a similar depth to the lower ground floor level beneath the site.

2.2 Site History

The history of the site and surrounding area has been researched by reference to historical Ordnance Survey (OS) maps sourced from the Envirocheck database.

The earliest map studied, dated 1872, shows the site to be developed with the existing building, albeit with a much larger garden space at the rear of the property which extended beyond the current site boundary. Much of the existing road network had also been established by this time, alongside what appears to be the existing terraced housing. A goods depot and engine sheds associated with Camden Town Railway Station were present approximately 90 m to the north and northeast of the site. To the rear of the property boundary at that time appears to have been disused land, extending to the east of Egbert Street. A pianoforte factory is noted approximately 170 m southwest of the site.

By 1895, the area of undeveloped land to the east of the site had been developed with a number of large rectangular buildings associated with an additional pianoforte factory. No significant changes are observed until maps dating to 1927, which show the pianoforte

factory building immediately to the east of the site boundary of the site as a gramophone factory and elsewhere within the factory complex there were polishing and veneering rooms and a machine shop. Additionally, large units present to approximately 80 m north of the site, between the railway and properties on the north side of Gloucester Avenue, are shown to comprise garages, engineers' workshops and a petrol tank. Builders' yards and stores are also noted as present approximately 60 m northwest of the site.

The World War II (WWII) bomb maps for the Borough of Camden shows the closest bomb to No 3 landing approximately 98 m northeast of the site, close to the junction between Gloucester Avenue and Sunn Mews and the London County Council Bomb Damage Map for this area indicate that the site did not suffer any damage, which is corroborated by the historical maps and aerial photographs from this period.

Maps dating to 1954 indicate that the pianoforte factory adjacent to the site had been repurposed as chemical works, later identified as a medical and pharmaceutical laboratories and manufacturing works comprising workshops, laboratories, storage tanks, oil tanks and drug manufacturing facilities. The pianoforte factory to the southwest of the site also appears to have been repurposed as a number of small businesses, including workshops, garages, a car wash, an oil store and factories of unknown usage. A textiles business is also noted at the junction between Gloucester Avenue and Dumpton Place.

By 1966, the medical laboratory had been repurposed again as a telephone supply and service buildings. The units to the southwest and west of the site, along with the textiles business, appear to have been redeveloped from commercial purposes to residential properties by this time. Limited changes are noted after this time, until the redevelopment of the telephone supply works into Utopia Village prior to 1987. The depots and works present alongside the railway were demolished and replaced with residential properties and offices at various times after 2000. The site and surrounding area have otherwise remained essentially unchanged to the present day.

2.3 Other Information

A search of public registers and databases has been made via the Envirocheck database and relevant extracts from the search are appended. Full results of the search can be provided if required.

There are no historic or existing landfill sites within 1km of the site, and no records of potentially infilled land within 250 m. There are no licenced waste transfer, treatment or disposal sites within 500 m of the site. Two Category 3 Minor Incidents of pollution to controlled waters are recorded to have occurred over twenty years ago, located 148 m west and 364 m southeast of the site.

Reference to records compiled by the Health Protection Agency (formerly the National Radiological Protection Board) indicates that the site falls within an area where less than 1 % of homes are affected by radon emissions and therefore basic radon protective measures will not be necessary.

The site is not located within a nitrate vulnerable zone or any other area of sensitive land uses, and the closest surface water feature is Regents Canal located 172m southeast of the site at its nearest position.

There is a trade directory entry relating to the site itself for scaffolding purposes, and a further eight within 100 m of the site pertaining to activities including garages, plaster manufacturing, textiles and printers. However, all these entries are listed as inactive.

Information on Urban Soil Chemistry provided by the BGS indicates that background concentrations for lead in the vicinity of the site are likely to be greater than 900 mg/kg. Therefore, whilst relatively high concentrations of lead may be encountered within any near surface soils present on the site, a significant proportion of the measured concentration is likely to be the result of residual airborne sources, and this will need to be taken account of in any subsequent risk assessment.

2.4 Geology

The British Geological Survey (BGS) map of the area (Sheet 256) indicates that the site is underlain by London Clay, which according to the British Geological Society (BGS) Memoir, comprises a homogenous, slightly calcareous silty clay to very silty clay, with some beds of clayey silt grading to silty fine-grained sand.

GEA has previously carried out a ground investigation of the adjoining property to the northeast, which included a deep borehole within the front garden area immediately adjacent to the boundary with thew site. The investigation generally encountered the anticipated ground conditions, in that beneath a variable thickness of made ground, the London Clay Formation was encountered to the maximum depth investigated of 20.00 m (12.5 m OD).

The made ground generally comprised brown to dark brown or grey silty clay, with gravel, occasional rootlets and variable amounts of extraneous material including brick, concrete and ash, was encountered to depth between 0.30 m (30.2m OD) and 3.50m (29.0 m OD). It was noted that the instance of greatest made ground thickness was located within the front garden of the property, which is likely to relate to a vault extending below this area.

The London Clay Formation was found to comprise an initial horizon of firm medium strength brown to brownish grey silty clay with occasional grey markings, partings of silty sand and occasional pockets of selenite crystals, proved to depths between 4.00 m (28.5 m OD) and 9.00 m (26.5 m OD). This upper weathered horizon was underlain by an unweathered horizon comprising stiff becoming very stiff fissured high strength brownish grey becoming dark grey silty clay with occasional partings of sandy silt, which extended to the maximum depth of investigation 20.00 m (12.5 m OD). The London Clay is categorised by the BGS as presenting a moderate hazard of shrinking or swelling clay. Atterberg limit tests undertaken on the London Clay during this investigation showed very high plasticity clays present.

The ground investigation undertaken at No 1 Fitzroy Road did not encounter onerously elevated levels of contamination, with only lead showing increased concentrations. However, whilst measured concentrations of lead were in excess of the Teir 1 screening values, they well below the range of background levels for lead reported by the BGS.

Other ground investigations previously carried out locally by GEA, undertaken on Egbert Road located 60 m southeast and on Gloucester Avenue 125 m east, also encountered ground conditions generally concordant with those anticipated, in that below a significant thickness of made ground, extending to depths between 3.70 m and 4.30 m, the London Clay Formation was proved to the maximum exploratory depths at each site of 4.00 m and 30.0m respectively. The London Clay was recorded at Egbert Road as comprising soft and firm becoming stiff fissured clay with bluish grey veins and pockets of fine sand and selenite crystals. At Gloucester Avenue it was recorded as comprising an initial weathered horizon of firm becoming stiff fissured medium to high strength brown silty clay with partings of bluish grey silt and occasional selenite crystals.

A search of the BGS borehole database has found records of two boreholes drilled at the junctions between Fitzroy Road with Chalcot Road and Gloucester Avenue, 79 m southwest and 53 m north respectively. These boreholes indicated made ground to depths of 2.00 m and 3.00 m respectively, before encountering the London Clay Formation to the maximum investigation depth of 15.00 m in each borehole.

A record of a deep borehole located within the railway sidings north of Dumpton Place, approximately 110 m north of the site, established the base of the London Clay Formation to be present at a depth of 60.35 m.

2.5 Hydrology and Hydrogeology

The London Clay is classified as Unproductive Strata, which refers to rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow, as defined by the Environment Agency (EA).

As the London Clay comprises predominantly clay soils, it cannot support groundwater flow and as such does not support a continuous piezometric surface. Boreholes constructed within clay do fill with water due to the often high water content of shallow clays; however, this is not reflective of a continuous water table where groundwater flow occurs in a porous and permeable saturated strata. However, perched water may be present within the made ground or weathered horizons of the underlying London Clay.

The aforementioned GEA investigation at No 1 Fitzroy Road encountered groundwater during drilling as isolated seepages at depths of 1.80 m (28.7 m OD) and 2.50 m (28.0 m OD), with two subsequent monitoring visits encountering water at depths between 0.21 m (30.29 m OD) and 6.67 m (25.83 m OD), exhibiting high seasonal and spatial variability between the three monitoring locations. As discussed above, boreholes constructed entirely within clay soils often fill with water due to their high water content, as well as being susceptible to the retention of any surface or near surface inflows, and this is the most likely explanation for the high water levels recorded within the standpipes, particularly given the absence of any significant groundwater inflows at these depths during drilling. Water may still flow into an excavation from within the saturated zone; but, due to the very low permeability of these soils, the rate of any potential inflow would be very slow and is unlikely to result in any instability of the proposed excavations.

There are five water abstraction within 500m of the site, four located between 326 m and 338 m east and one located 343 m southeast. The nearest source protection zone is a Zone 2 (Outer Catchment) located around 297 m to the west of the site, but this relates to the chalk principal aquifer at a significant depth beneath the site.

A former tributary of the Tyburn, one of the 'lost' rivers of London[3], flowed in a generally southerly direction towards the River Thames, approximately 900 m to the west of the site.

The site is not located in an area at risk of flooding from rivers or sea, as defined by the EA, nor is it identified as being within an area with a potential for groundwater flooding.

Fitzroy Road is not listed within a London Borough of Camden report[4] as having suffered from surface water flooding in the 1975 or 2002 flooding event, nor is it shown on Figure 15 of the Arup report as being at potential risk from surface water flooding. However, the EA surface water flood maps and Figures 3i of the SFRA dated 2014 do indicate a low to medium risk of surface water flooding, although this is restricted to the lower garden area on the eastern part of the site and does not impact on the western part of the site where the proposed lower ground floor extension is to be constructed.

The site is currently predominantly covered by the existing building or areas of existing hardstanding, with very limited areas of soft landscaping present around the borders to the front and rear of the property. Infiltration of rain water therefore generally only occurs within the planted garden borders, with the majority of the surface runoff likely to drain into combined sewers in the road.

The proposed lower ground floor extension will be entirely beneath areas of existing hardstanding, such that there will be no change to the present conditions, for example through the loss of any permeable areas, and there will not be an increase in runoff rate or volume into the existing sewer system, or that could have a potentially adverse impact on the surrounding area. There should not, therefore, be any requirement for any mitigation measures.

2.6 Preliminary Contamination Risk Assessment

Part IIA of the Environmental Protection Act 1990, which was inserted into that Act by Section 57 of the Environment Act 1995, provides the main regulatory regime for the identification and remediation of contaminated land. As part of the new regime local authorities are required to carry out inspections of their area to identify sites that may be contaminated. The determination of contaminated sites is based on a "suitable for use" approach which involves managing the risks posed by contaminated land by making risk-based decisions. This risk assessment is carried out on the basis of establishing one or more "pollution linkages"; a pollution linkage requires a source of contamination, a sensitive target or receptor that is at risk from the contamination and a pathway by which the contamination can travel from the source to the target.

A risk assessment should be carried out for consideration by the Local Planning Authority (LPA) before the planning application is determined. Where unacceptable risks are identified proposals will need to be made to address these risks as part of the development process. The guidance recognises the benefits of a phased approach, and the desk study is the first phase in the process of investigating and identifying contamination to assist in the determination of a planning application.

Source

The desk study findings indicate that the site itself does not have a potentially contaminative history as it has apparently been developed with the existing property since prior to 1872. The site is, however, located close to a former piano factory and chemical works, which with reference to the most relevant DoE Industry Profiles, could be a source of potential contaminants including metals, solvents, coal tar, polychlorinated biphenyls and asbestos, although no evidence of significant contamination was recorded during the previous investigation of the adjoining site. The other commercial and industrial site uses with the history of the local area are not considered likely to have generated significant quantities of contamination or are otherwise not deemed close enough to the site to require further consideration.

Made ground may be present below and beyond the footprint of the existing buildings. However, given the history of the site and findings of the previous investigation of No 1 Fitzroy Road, it is likely to comprise re-worked natural soils with a low organic content and be of limited thickness. It does not therefore represent a potential source of gas generation, as sufficient quantities of relatively recently deposited methanogenic materials are unlikely to be present, such that no sources of soil gas have been identified. Furthermore, there are no historical or existing landfill sites, or records of any infilled land, within 250 m of the site, such that a risk of soil gas migrating onto the site has not been identified.

Receptor

The proposed use of the site for continued residential end use represents a relatively high sensitivity end-use and end users are therefore considered to be potential sensitive receptors. Buried services are likely to come into contact with any contaminants present within the soils through which they pass, and site workers are likely to come into contact with any contaminants present during construction works. The presence of the London Clay beneath the site means that the chalk aquifer at depth represents a relatively low sensitivity receptor.

3 Barton, N, & Meyers, S (2016) *The Lost Rivers of London (revised and extended edition with colour maps).* Historical Publications Ltd

4 London Borough of Camden (2003) *Floods in Camden, Report of the Floods Scrutiny Panel*

Pathway

Within the site, end users will be isolated from direct contact with any contaminants present within the made ground by the presence of the building and external hardstanding areas. This will also prevent infiltration, thus limiting the potential for soluble contaminants within the made ground or to migrate onto adjacent sites. The anticipated negligible permeability of the London Clay will limit the potential for groundwater percolation into the underlying chalk, and thus a pathway is not considered likely to exist to the principal aquifer.

Buried services and concrete may be exposed to any contaminants present within the soil through direct contact and site workers will come into contact with the soils during construction works. The majority of made ground soils present within the development area are anticipated to be removed during construction of the basement, and no new areas of soft landscaping is anticipated to be included in the development

There is thus considered to be a low potential for a contaminant pathway to be present between any potential contaminant source and a target for the particular contaminant.

Preliminary Risk Appraisal

On the basis of the above it is considered that there is a LOW risk of there being a significant contaminant linkage at this site, which would result in a requirement for major remediation work.

3.0 Screening Assessment

The Camden guidance suggests that any development proposal that includes a basement should be screened to determine whether a full BIA is required. A number of screening tools are included in the Arup report and for the purposes of this report reference has been made to Appendices E1, E2 and E3 which include a series of questions within screening flowcharts for surface flow and flooding, subterranean (groundwater) flow and land stability. The flowchart questions and responses to these questions are tabulated below.

3.1 Subterranean (Groundwater) Screening Assessment

Question	Response for 3 Fitzroy Road
1a. Is the site located directly above an aquifer?	No. The underlying London Clay is classified as unproductive strata
1b. Will the proposed basement extend beneath the water table surface?	Unlikely. The London Clay is classified as unproductive strata and cannot support a continuous water table although isolated pockets of perched groundwater can occur within fissures and silt and sand partings.
2. Is the site within 100 m of a watercourse, well (used/ disused) or potential spring line?	No. There are no local ponds, wells, watercourses or spring lines within 100 m
3. Is the site within the catchment of the pond chains on Hampstead Heath?	No. Figure 14 of the Arup report confirms that the site is not located within these catchment areas.
4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No. The area above the proposed lower ground floor extension is already covered by hard standing such that there will be no change in the proportion of hard surfaced / paved areas
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)?	No.
6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than, the mean water level in any local pond or spring line?	No. There are no local ponds or spring lines.

The above assessment has identified the following potential issues that need to be assessed:

Q1b. There is a possibility that the proposed excavations may encounter local and perched groundwater.

3.2 Land Stability Screening Assessment

Question	Response for 3 Fitzroy Road
1. Does the existing site include slopes, natural or manmade, greater than 7°?	No.
2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7°?	No. The site will not be significantly re-profiled as part of the development.
3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?	No. As indicated on the Slope Angle Map Fig 16 of the Arup report.
4. Is the site within a wider hillside setting in which the general slope is greater than 7°?	No. Reference to Figure 16 of the Arup report indicates that the site is not in an area where slopes are generally greater than 7˚.
5. Is the London Clay the shallowest strata at the site?	*Yes. As indicated on the geological map and Figures 3 and 5 of the Arup report, the site is underlain by the London Clay.*
6. Will any trees be felled as part of the proposed development and / or are any works proposed within any tree protection zones where trees are to be retained?	No.
7. Is there a history of seasonal shrink-swell subsidence in the local area and / or evidence of such effects at the site?	*Yes. The area is prone to these effects as a result of the presence of shrinkable London Clay.*
8. Is the site within 100 m of a watercourse or potential spring line?	No. There are no watercourses or potential spring lines within 100 m of the site.
9. Is the site within an area of previously worked ground?	No. Not according to BGS mapping and Figure 3 of the Arup report.
10. Is the site within an aquifer?	No. The underlying London Clay is classified as an Unproductive Stratum.
11. Is the site within 50 m of Hampstead Heath ponds?	No. Figure 14 of the Arup report confirms that the site is not located within this catchment area.
12. Is the site within 5 m of a highway or pedestrian right of way?	*Yes. The development is bounded to the northwest by Fitzroy Road.*
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	*Unlikely. The proposed basement extension will not significantly change the founding depth relative to the neighbouring properties which already include existing basement and lower ground floor level construction .*
14. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?	No. An online search for London Underground Tunnels and railway tunnels did not indicate any in the proximity of the site. This is confirmed with reference to ARUP's Transport Infrastructure map, Figure 18. Thames Water has been contacted and their plans indicate no deep sewers or tunnels under or in close proximity of the site.

The above assessment has identified the following potential issues that need to be assessed:

Q5. The London Clay is the shallowest strata across much of the site.
Q7. The site is in an area likely to be affected by seasonal shrink-swell.
Q12. The development is within 5 m of Fitzroy Road.
Q13. The basement may result in a small increase in foundation depths relative to the neighbouring property to the southwest.

3.3 Surface Flow and Flooding Screening Assessment

Question	Response for 3 Fitzroy Road
1. Is the site within the catchment of the pond chains on Hampstead Heath?	No. Figure 14 of Arup report confirms that the site is not located within this catchment area.
2. As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?	No. The proposed lower ground floor extension will extend beneath an existing area of hardstanding. There will not therefore be an increase in impermeable area across the site, so the surface water flow regime will be unchanged.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No. There will not be a change in impermeable area across the ground surface above the basement.
4. Will the proposed basement development result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?	No. The proposed lower ground floor extension will extend beneath an existing area of hardstanding. There will not therefore be an increase in impermeable area across the site, so the surface water flow regime will be unchanged.
5. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No. The proposed basement is very unlikely to result in any changes to the quality of surface water being received by adjacent properties or downstream

Question	Response for 3 Fitzroy Road
	watercourses as the surface water drainage regime will be unchanged and the land uses will remain the same.
6. Is the site in an area identified to have surface water flood risk according to either the Local Flood Risk Management Strategy or the Strategic Flood Risk Assessment or is it at risk of flooding, for example because the proposed basement is below the static water level of nearby surface water feature?	No. The findings of this BIA together with the Camden Flood Risk Management Strategy dated 2013 and Figures 3ii, 4e, 5a and 5b of the SFRA dated 2014, in addition to the Environment Agency online flood maps, show that the western part of the site, where the proposed lower ground floor extension is to be constructed, has a very low flooding risk from surface water, sewers, reservoirs (and other artificial sources), groundwater and fluvial/tidal watercourses It is possible that the basement will be constructed within pockets of perched water and the recommendations outlined in the BIA with regards to water-proofing and tanking of the basement will reduce the risk to acceptable levels. In accordance with paragraph 6.16 of the CPG a positive pumped device and non-return valve will be installed in order to further protect the site from sewer flooding.

The above assessment has not identified any potential issues that need to be assessed with respect to surface flow and flooding.

4.0 Scoping Assessment

The purpose of scoping is to assess in more detail the factors to be investigated in the impact assessment. Potential impacts are assessed for each of the identified potential impact factors.

4.1 Potential Impacts

The following potential impacts have been identified by the screening process.

Potential Impact	Consequence
There is a possibility that the proposed excavations may encounter local and perched groundwater.	It is possible that the proposed excavations could encounter local perched groundwater. Should this happen, the proposed structure is capable of diverting groundwater flow such that groundwater level is affected on both the up slope and down slope side of the sub-terranean structure. This in turn has the potential to affect the local hydrogeology and any adjacent structures.
London Clay is the shallowest stratum at the site. There is a moderate potential of seasonal shrink-swell subsidence in the local area	The London Clay is prone to seasonal shrink-swell (subsidence and heave). If a new basement is not dug to below the depth likely to be affected by tree roots this could lead to damaging differential movement between the subject site and adjoining properties, however new trees do not form part of the proposed development
The site is within 5 m of a highway or pedestrian right of way.	Excavation of a basement may result in structural damage to the road or footway.
The proposed development may result in an increase in differential depth relative to neighbouring properties.	The stability of all surrounding structures will need to be ensured at all times. An analysis of the predicted ground movements will be completed once the scheme is finalised, to assess the impact on neighbouring buildings.

5.0 Ground Model

It is understood that it is proposed to extend the lower ground floor level beneath part of the front garden area on the western part of the site to create a new utility room and subterranean office.

The new extension is expected to extend to a depth of approximately 3.2 m below the front garden level, or approximately 1.0 m below existing lower ground floor level and will be formed through localised underpinning (where required) of the boundary with No 5 Fitzroy Road and a contiguous bored piled wall along the frontage with the public highway.

The desk study revealed that the site is unlikely to have a potentially contaminative history, having had a residential end use, and on the basis of the previous investigation of the adjoining site and nearby borehole data, the ground conditions can be characterised as follows:

- the site is likely to be underlain by cohesive soils of the London Clay Formation;
- any made ground is expected to comprise re-worked natural soils, with variable amounts of extraneous material, likely to extend to depths close to existing lower ground floor level;
- the underlying London Clay is likely to comprise an upper weathered layer of firm becoming stiff brown to brownish grey clay with occasional selenite and partings of silty sand, which is expected to be present to a depth of about 6.0 m beneath the font garden area;
- the London Clay is then expected to comprise stiff becoming very stiff fissured brownish grey becoming dak grey silty clay, which is expected to extend to a depth of at least 65.0 m below the site;
- perched groundwater is likely to be encountered within the made ground and upper weathered layers of the underlying London Clay; and
- the findings of the investigation of the adjoining site indicates that the near surface soils are unlikely to be significantly contaminated, in addition to which, they are likely to be removed from site through excavation of the proposed lower ground floor extension.

5.1 Recommended Parameters

The table below summarises the vertical soil parameters to be used in any subsequent analysis and is based on the findings of the previous investigation of the adjoining site and nearby borehole data. Values of stiffness for the soils at this site are readily available from published data[5, 6, 7 & 8] and a well-established method has been used to provide the estimated values.

Stratum	Base of Stratum (m)	Bulk Unit Weight (kN/m^3)	Effective Friction Angle (ϕ' °)	Undrained Cohesion (C_u - kN/m^2)	Undrained Young's Modulus* (E' - kN/m^2)	Drained Young's Modulus* (E_u - kN/m^2)
Made Ground	2.0 (varies)	17.0	27	25	12,500	7,500
London Clay (weathered)	6.0	19.0	23	50 to 75	25,000 to 37,500	15,000 to 22,500
London Clay	20.0+	19.5		75 to 160	37,500 to 80,000	22,500 to 48,000
	>20.0**			160 +7.5	80,000 + 3750	48,000 + 2250

+Maximum depth of investigation. *Values based on the highly conservative relationship of E_u = 500 C_u and E' = 300 C_u for the London Clay. **An increase in cohesion of 7.5 kN/m^2 per metre increase in depth has been adopted to provide a conservative estimate of the likely strength profile below the depth of the investigation.

The values in the above table are unfactored and are considered to be moderately conservative 'characteristic' parameters suitable for routine calculations that require cautions, or lower bound, estimates of strength and stiffness, such as those required for single pile and shallow foundation design. The designer may therefore need to consider alternative characteristic values where an upper bound estimate is considered more appropriate, such as in the evaluation of structural forces within the proposed structures.

5 Padfield CJ and Sharrock MJ (1983) *Settlement of structures on clay soils.* CIRIA Special Publication 27
6 Butler FG (1974) *Heavily over-consolidated clays: a state-of-the-art review.* Proc Conf Settlement of Structures, Cambridge, 531-578, Pentech Press, Lond.
7 O'Brien AS and Sharp P (2001) *Settlement and heave of over-consolidated clays - a simplified non-linear method.* Part Two, Ground Engineering, Nov 2001, 48-53
8 Burland JB, Standing, JR, and Jardine, FM (2001) *Building response to tunnelling, case studies from construction of the Jubilee Line Extension.* CIRIA Special Publication 200

6.0 Advice & Recommendations

Excavations for the proposed lower ground floor extension will require temporary support to maintain stability of the excavation and surrounding structures at all times. The existing foundations will need to be underpinned prior to construction of the proposed new basement or will need to be supported by new retaining walls.

Formation level for the new structure will be within the London Clay, which should provide an eminently suitable bearing stratum for spread foundations excavated from proposed ground floor level.

Some form of groundwater control is likely to be required to deal with any inflows of perched groundwater within the made ground, or from any siltier horizons within the London Clay.

6.1 Basement Construction

Is understood that the proposed lower ground floor extension will extend to a depth of about 3.2 m below the front garden area, or approximately 1.0 m below lower ground floor level, respectively; formation level is therefore expected to be within the firm clay of the London Clay.

Perched water is likely to be encountered in the proposed excavations. However, the predominantly clayey nature of the made ground and underlying London Clay suggests that the rate of inflow is likely to be very slow. Any potential inflows are therefore unlikely to be significant and should be adequately dealt with through sump pumping. However, it would be prudent for the chosen contractor to have a contingency plan in place to deal with more significant or prolonged inflows as a precautionary measure. It would also be prudent, once access is available, to carry out a number of trial excavations, to depths as close to proposed formation level as possible, to provide an indication of the likely ground water conditions.

There are a number of methods by which the sides of the basement excavation could be supported in the temporary and permanent conditions. The choice of wall may be governed to a large extent by the requirement to prevent ground water inflows and whether it is to be incorporated into the permanent works and have a load bearing function. Consideration will also need to be given to the support of the adjacent buildings and structures on all sides.

On the basis of the previous investigation, it should be possible to form the retaining walls by underpinning of the existing foundations, using a traditional 'hit and miss' approach, which is understood to be the preferred approach where the new lower ground floor extension will adjoin with the existing lower ground floor structure beneath No 5 Fitzroy Road. Inflows could conceivably occur from perched water tables, particularly in the vicinity of existing foundations but should be adequately dealt with through sump pumping. Careful workmanship will be required to ensure that movement of the surrounding structures does not arise during underpinning of the existing foundations, but this method will have the benefit of minimising the plant required and maximising usable space in the new basement.

Consideration may also be given to piled retaining walls, particularly across the frontage of the site, where the proposed lower ground floor extension extends up to the existing pavement and it should be possible to utilise contiguous bored piles without the requirement for significant groundwater control, with grouting between the piles if necessary. A contiguous bored piled wall would have the disadvantage of reducing usable space in the basement, and in this respect a secant wall may be preferable as it would overcome the requirement for any secondary groundwater protection in the permanent works and maximise the basement area.

The ground movements associated with the basement excavation will depend on the method of excavation and support and the overall stiffness of the basement structure in the temporary condition. Thus, a suitable amount of propping will be required to provide the necessary rigidity. In this respect the timing of the provision of support to the wall will have an important effect on movements. The stability of the adjacent foundations will need to be ensured at all times and the existing foundations will need to be underpinned prior to construction of the proposed new basements or will need to be supported by new retaining walls.

6.1.1 Basement Retaining Walls

The following parameters are suggested for the design of the permanent basement retaining walls.

Stratum	Bulk Density (kg/m^3)	Effective Cohesion (c' – kN/m^2)	Effective Friction Angle (ϕ' – degrees)
Made ground	1750	Zero	27
London Clay	1950	Zero	23

Provided that a fully effective drainage system can be ensured in order to prevent the build-up of groundwater behind the retaining walls from surface water inflows and periodic seepages within the made ground, it should be possible to design the basement on the basis that water will not collect behind the walls. If an effective drainage system cannot be ensured, then a water level of two-thirds of the basement depth, subject to a minimum depth of 1.0 m, should be assumed. The advice in BS8102:2009[9] should be followed in this respect and with regard to the provision of suitable waterproofing.

6.1.2 Excavation Heave

The excavation of up to 3.2 m of soil to form the lower gro8ind floor extension will result in a net unloading of between 55 kN/m^2 and 60 kN/m^2, which will result in heave of the underlying London Clay. This will comprise immediate elastic movement, which will account for approximately 40 % of the total movement and be expected to be complete during the construction period, and long-term movements, which will theoretically take many years to complete.

These movements will, to some extent, be mitigated by the loads applied by the proposed development, and should be considered in more detail once the proposals have been finalised.

6.2 Spread Foundations

On the basis that all foundations bypass any made ground then moderate width pad or strip foundations, bearing beneath proposed lower ground floor or basement level within the firm clay of the London Clay may be designed to apply a net allowable bearing pressure of 110 kN/m^2.

This value provides an adequate factor of safety against bearing capacity failure and should ensure that settlement remains within normal tolerable limits.

If for any reason spread foundations are not considered appropriate, piled foundations would provide a suitable alternative although additional investigation will be required to provide pile design parameters.

6.3 Shallow Excavations

It is considered likely that shallow excavations for foundations and services that terminate within the made ground should remain generally stable in the short term, although some instability may occur.

Significant inflows of groundwater into shallow excavations are not generally anticipated, although seepages may be encountered from perched water tables within the made ground, particularly within the vicinity of existing foundations, although such inflows should be suitably controlled by sump pumping.

If deeper excavations are considered or if excavations are to remain open for prolonged periods it is recommended that provision be made for battered side slopes or lateral support. Where personnel are required to enter excavations, a risk assessment should be carried out and temporary lateral support or battering of the excavation sides considered in order to comply with normal safety requirements.

6.4 Basement Floor Slabs

Following excavation to proposed formation level, it is likely that the basement floor slab will need to be suspended over a void or a layer of compressible material to accommodate the anticipated heave, unless the slab can be suitably reinforced to cope with these movements.

6.5 Waste Disposal

Under the European Waste Directive, waste is classified as being either Hazardous or Non-Hazardous and landfills receiving waste are classified as accepting hazardous or non-hazardous wastes or the non-hazardous sub-category of inert waste in accordance with the Waste Directive. Waste classification is a staged process, and this investigation represents the preliminary sampling exercise of that process. Once the extent and location of the waste that is to be removed has been defined, further sampling and testing may be necessary. The results from this ground investigation should be used to help define the sampling plan for such further testing, which could include WAC leaching tests where the totals analysis indicates the soil to be a hazardous waste or inert waste from a contaminated site. It should however be noted that the Environment Agency guidance WM3[10] states that landfill WAC analysis, specifically leaching test results, must not be used for waste classification purposes.

9 BS8102 (2009) *Code of practice for protection of below ground structures against water from the ground*

10 Environment Agency 2015. *Guidance on the classification and assessment of waste.* Technical Guidance WM3 First Edition

Any spoil arising from excavations or landscaping works, which is not to be re-used in accordance with the CL:AIRE[11] guidance, will need to be disposed of to a licensed tip. Waste going to landfill is subject to landfill tax at either the standard rate of £102.10 per tonne (about £190 per m^3) or at the lower rate of £3.25 per tonne (roughly £6.00 per m^3). However, the classifications for tax purposes and disposal purposes differ and currently all made ground and topsoil is taxable at the 'standard' rate and only naturally occurring soil and stones, which are accurately described as such in terms of the 2011 Order, would qualify for the 'lower rate' of landfill tax.

Based on the technical guidance provided by the EA it is considered that the soils likely encountered during this development would be generally classified as follows.

Soil Type	Waste Classification (Waste Code)	WAC Testing Required Prior to Landfill Disposal?	Current applicable rate of Landfill Tax
Made ground	Non-hazardous (17 05 04)	No	£102.10/tonne (Standard rate)
Natural Soils	Inert non-hazardous (17 05 04)	Should not be required but confirm with receiving landfill	£3.25 / tonne (Reduced rate for uncontaminated naturally occurring rocks and soils)

Under the requirements of the European Waste Directive all waste needs to be pre-treated prior to disposal. The pre-treatment process must be physical, thermal, chemical or biological, including sorting. It must change the characteristics of the waste in order to reduce its volume, hazardous nature, facilitate handling or enhance recovery. The waste producer can carry out the treatment, but they will need to provide documentation to prove that this has been carried out. Alternatively, the treatment can be carried out by an approved contractor. The Environment Agency has issued a position paper[12] which states that in certain circumstances, segregation at source may be considered as pre-treatment and thus excavated material may not have to be treated prior to landfilling if the soils can be segregated onsite prior to excavation by sufficiently characterising the soils in-situ prior to excavation.

The above opinion with regard to the classification of the excavated soils is provided for guidance only and should be confirmed by the receiving landfill once the soils to be discarded have been identified. The local waste regulation department of the Environment Agency (EA) should be contacted to obtain details of tips that are licensed to accept the soil represented by the test results. The tips will be able to provide costs for disposing of this material but may require further testing.

11 CL:AIRE March 2011. *The Definition of Waste: Development Industry Code of Practice* Version 2

12 Environment Agency 23 Oct 2007 *Regulatory Position Statement Treating non-hazardous waste for landfill - Enforcing the new requirement.*

7.0 Basement Impact Assessment

The screening identified a number of potential impacts. The desk study and ground investigation information has been used below to review the potential impacts, to assess the likelihood of them occurring and the scope for reasonable engineering mitigation.

7.1 Potential Impacts

The proposed basement may encounter local perched water.

The site is expected to be underlain by a variable thickness of made ground over the London Clay Formation and a continuous groundwater table is not therefore expected to be present within these clayey sediments. As such, groundwater flows are unlikely to be encountered and will not be materially altered by the presence of the proposed lower ground floor and basement structures, such that the local hydrogeological setting will not be impacted.

The investigation of the adjoining site did confirm the presence of localised occurrences of perched water within the near surface deposits and protection measures may therefore be required as part of the proposed construction sequence. However, such inflows should be minor in nature and it is anticipated that a provision for sump pumping will be adequate with respect to this development, although it would be prudent, as with any site, for the chosen contractor to have a contingency plan in place to deal with any short or long-term inflows, that are more significant than expected.

The site is underlain by London Clay which would be subject to seasonal shrink-swell

There are no significant trees within the close vicinity of the proposed lower ground floor extension and desiccation of the shallow soils was not recorded in the previous investigation of the adjoining site. The proposed foundations are, in any case, expected to extend to a depth such that new foundations will bypass any desiccated soils and found below the required founding depths in accordance with National House Building Council (NHBC) requirements.

Subject to inspection of foundation excavations in the normal way to ensure that there is not any unexpectedly deep root growth, it is not considered that the occurrence of shrink-swell issues in the local area will have any bearing on the proposed development.

Location of public highway

The site adjoins the Fitzroy Road carriageway to the northwest, such that the basement excavation could potentially affect this highway. However, the proposed development will include contiguous piled retaining wall along the site boundary adjacent to the road that will be designed to maintain the stability of the surrounding ground, thus protecting the adjacent road and associated infrastructure beyond.

There is nothing unusual or exceptional in the proposed development or the findings of the previous investigation that give rise to any concerns with regard to stability over and above any development of this nature, although this will be confirmed through further site investigation.

Differential founding depths / Neighbouring structures

The sides of an excavation will move to some extent regardless of how they are supported. The movement will typically be both horizontal and vertical and will be influenced by the engineering properties of the ground, groundwater level and flow, the efficiency of the various support systems employed during construction and the efficiency or stiffness of any support structures used. However, provided that the proposed structure is constructed in accordance with current best practice, with adequate controls in places in the temporary condition to support the excavation and control and perched water inflows, it is considered that the proposed development will not initiate any ground instability that may threaten neighbouring properties, the adjoining boundary walls, highways or any other nearby infrastructure.

Based on previous experience of similar projects in the same ground conditions, likely horizontal and vertical ground movements as a result of the proposed basement construction and a maximum retained height of about 3.0 m, would be expected to be in the range of 5 mm to 10 mm, with a zone of influence up to four times the retained height; on this basis buildings likely to be impacted by the proposed development would include Nos 1 and 5 Fitzroy Road to the northeast and southwest, respectively. However, No 1 Fitzroy Road already includes a deep basement such that the proposed development will not result in an increase in foundation depth relative to this property.

No 5 Fitzroy Road includes a lower ground floor level which, based on similarities with the lower ground floor level beneath the site, is expected to extend to a depth of at least 2.0 m below front garden level, with foundations conservatively assumed to extend to a depth of about 0.5 m below this level. The development will not therefore result in a significant increase in foundation depth relative to this structure and given the likely range of movements and orientation of these structures with respect to the proposed basement, it is unlikely that

any potential damage would exceed Category 1 (very slight) and should thus remain within acceptable limits, subject to careful design and a suitable amount of propping.

In conclusion, it is considered that there is nothing unusual or exceptional in the proposed development or the findings of this assessment that give rise to any concerns with respect to stability over and above any development of this nature. However, once the structural design and construction sequence have been advanced, a ground movement analysis and damage assessment should be undertaken to confirm this preliminary assessment.

7.2 BIA Conclusions

A Basement Impact Assessment has been carried out following the information and guidance published by the London Borough of Camden. It is concluded that the proposed development is unlikely to result in any specific land or slope stability issues.

7.2.1 Non-Technical Summary of Evidence

This section provides a short summary of the evidence acquired and used to form the conclusions made within the BIA.

The following table provides the evidence used to answer the subterranean (groundwater flow) and slope stability screening questions.

Question	Evidence
1. Does the existing site include slopes, natural or manmade, greater than 7°?	Topographical maps and Figures 16 and 17 of the Arup report.
2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7°?	The details of the proposed development provided do not include the re-profiling of the site to create new slopes
3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?	Topographical maps and Figures 16 and 17 of the Arup report
4. Is the site within a wider hillside setting in which the general slope is greater than 7°?	
5. Is the London Clay the shallowest strata at the site?	Geological maps and Figures 3, 5 and 8 of the Arup report
6. Will any trees be felled as part of the proposed development and / or are any works proposed within any tree protection zones where trees are to be retained?	The details of the proposed development including architectural drawings.
7. Is there a history of seasonal shrink-swell subsidence in the local area and / or evidence of such effects at the site?	Knowledge on the ground conditions of the area and reference to NHBC guidelines were used to make an assessment of this.
8. Is the site within 100 m of a watercourse or potential spring line?	Topographical maps acquired as part of the desk study and Figures 11 and 12 of the Arup report
9. Is the site within an area of previously worked ground?	Geological maps and Figures 3, 5 and 8 of the Arup report
10. Is the site within an aquifer?	Aquifer designation maps acquired from the Environment Agency as part of the desk study and Figures 3, 5 and 8 of the Arup report.
11. Is the site within 50 m of Hampstead Heath ponds?	Topographical maps and Figures 12 and 14 of the Arup report
12. Is the site within 5 m of a highway or pedestrian right of way?	The details of the proposed development including architectural drawings.
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	Camden planning portal and the site walkover confirmed the position of the proposed basement relative to the neighbouring properties.
14. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?	Maps and plans of infrastructure tunnels were reviewed.

The following table provides the evidence used to answer the surface water flow and flooding screening questions.

Question	Evidence
1. Is the site within the catchment of the pond chains on Hampstead Heath?	Topographical maps acquired as part of the desk study and Figures 12 and 14 of the Arup report
2. As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?	Site conditions confirmed during previous GEA investigation at the neighbouring property. Details provided on the proposed development.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	

Question	Evidence
4. Will the proposed basement development result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?	
5. Will the proposed basement result in changes to the quantity of surface water being received by adjacent properties or downstream watercourses?	
6. Is the site in an area known to be at risk from surface water flooding such as South Hampstead, West Hampstead, Gospel Oak and Kings Cross, or is it at risk of flooding because the proposed basement is below the static water level of a nearby surface water feature?	Flood risk maps acquired from the Environment Agency as part of the desk study, Figure 15 of the Arup report, the Camden Flood Risk Management Strategy dated 2013, the Camden SFRA dated 2014, and the North London Strategic Flood Risk Assessment dated 2008.

7.2.2 Scoping and Site Investigation

The questions in the screening stage that there were answered 'yes', were taken forward to a scoping stage and the potential impacts discussed in Section 4.0 of this report, with reference to the possible impacts outlined in the Arup report.

A ground investigation undertaken previously by GEA in the neighbouring property has been reviewed, which has allowed an assessment of the potential impacts of the basement development on the various receptors identified from the screening and scoping stages. Principally the investigation aimed to establish the ground conditions, including the groundwater level, the engineering properties of the underlying soils to enable suitable design of the basement development and the configuration of existing party wall foundations. The findings of the investigation are discussed in Section 2.5 of this report.

7.2.3 Impact Assessment

Section 5.0 of this report concludes that, on the basis of the findings of the investigation, the proposed development is unlikely to result in any specific land or slope stability issues, surface water or groundwater issues, in accordance with the London Borough of Camden Planning Guidance (CPG).

8.0 Outstanding Risks & Issues

This section of the report aims to highlight areas where further work is required as a result of limitations on the scope of this investigation, or where issues have been identified by this investigation that warrant further consideration. The scope of risks and issues discussed in this section is by no means exhaustive, but covers the main areas where additional work may be required.

8.1 General Risks

The ground is a heterogeneous natural material and variations will inevitably arise between the locations at which it is investigated. This report provides an assessment of the general ground conditions based on the discrete points at which the ground was sampled, but there may be ground conditions (including soil, rock, gas and groundwater) elsewhere on site that have not been revealed by this investigation and therefore could not have been taken into account in this report.

The ground conditions should be subject to review as the development proceeds to ensure that any variations from the Ground Model are properly assessed by a suitably qualified person.

The comments made regarding groundwater are based on observations made during the period the work has been carried out; conditions may therefore vary as a result of seasonal or other effects.

Where any conclusions and recommendations contained in this report have been based upon information provided by others, it has been assumed that all relevant information has been provided by those parties and that such information is accurate. Any such information has not been independently verified by GEA, unless otherwise stated in the report. GEA accepts no liability for any inaccurate conclusions, assumptions or actions taken resulting from any inaccurate information supplied to GEA from others.

8.2 Site-Specific Risks

As discussed throughout the report, groundwater is unlikely to be encountered during the proposed excavations and any perched water inflows should be adequately dealt with through sump pumping. However, trial excavations should be considered to assess the extent of any perched water inflows to be expected within the proposed excavations.

Based on the research carried out and the findings of the previous investigation of the adjoining site, there is considered to be a LOW risk of there being a significant contamination linkage at this site, and as the majority of the made ground will be removed from this site through the excavation of the proposed basement, remedial measures should not be required. However, it is recommended that a watching brief is maintained during any groundworks for the proposed development and that if any suspicious soils are encountered that they are inspected by a geo-environmental engineer and further assessment may be required.

Once the design proposals for the proposed basement construction have been finalised, a ground movement analysis and damage assessment may be required as part of the Construction Method Statement in support of the planning application and / or Party Wall Awards.

These areas of doubt should be drawn to the attention of prospective contractors and further investigation will be required or sufficient contingency should be provided to cover the outstanding risk.

These areas of doubt should be drawn to the attention of prospective contractors and further investigation will be required or sufficient contingency should be provided to cover the outstanding risk.

Appendix

Existing & Proposed Development Drawings

Envirocheck Extracts
Historical Maps

Previous Site Investigation Findings (No 1 Fitzroy Road);
Site Plan
Borehole Logs

KEY

NOTES:

REV	DATE	REVISION NOTES

NOTE

1. Do not scale from this drawing.
2. All dimensions to be checked on site by the contractor and such dimensions to be his responsibility.
3. Report all drawing errors, omissions and discrepancies to the architect.

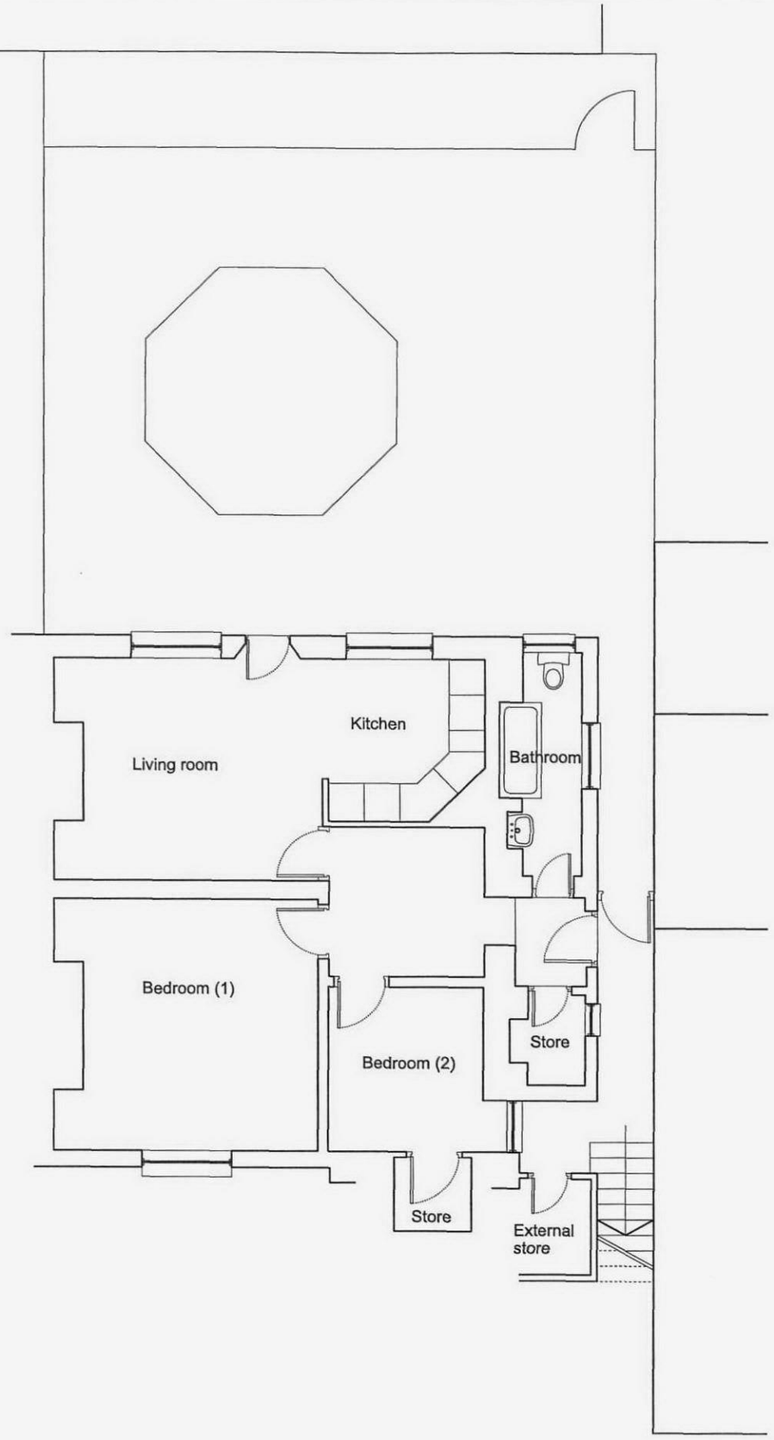
LOCATION

job title
3 Fitzroy Rd

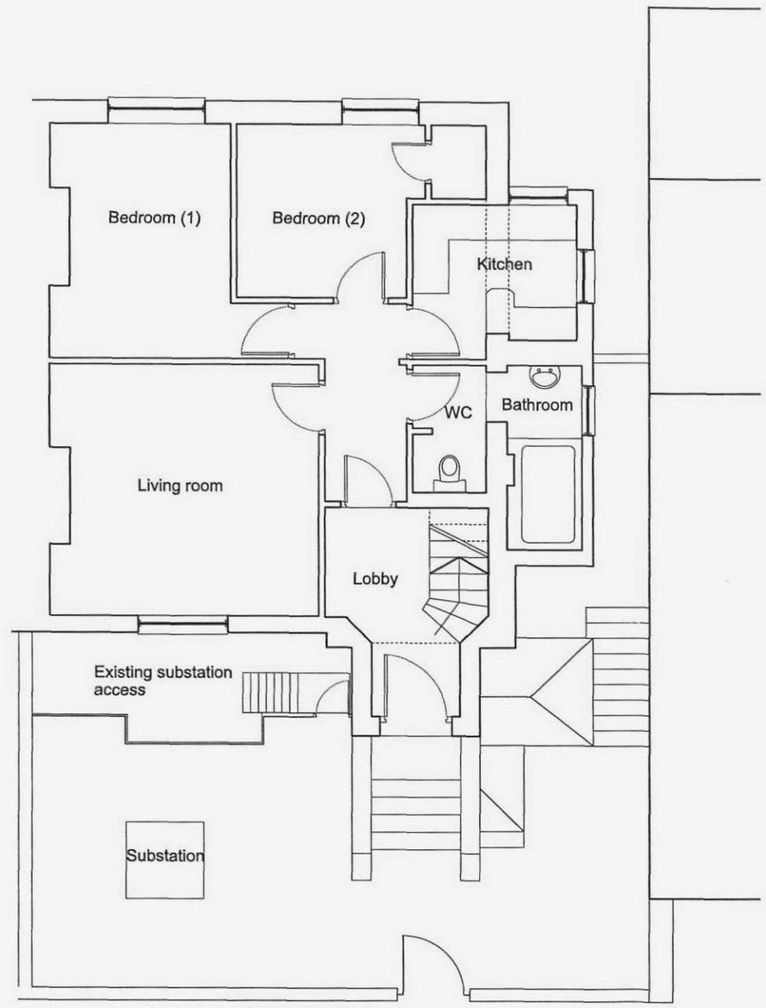
drawing title / location
LOCATION PLAN

drawn by	checked	scale	status
		1:250@A1; 1:500@A3	-

project	zone	type	classification	drawing no	revision
				0 00	



01 LOWER GROUND FLOOR



02 GROUND FLOOR

KEY

NOTES:

REV	DATE	REVISION NOTES

NOTE

1. Do not scale from this drawing.
2. All dimensions to be checked on site by the contractor and such dimensions to be his responsibility.
3. Report all drawing errors, omissions and discrepancies to the architect.

LOCATION

job title
3 Fitzroy Rd

drawing title / location
EXISTING

drawn by	checked	scale	status
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project	zone	type	classification	drawing no	revision
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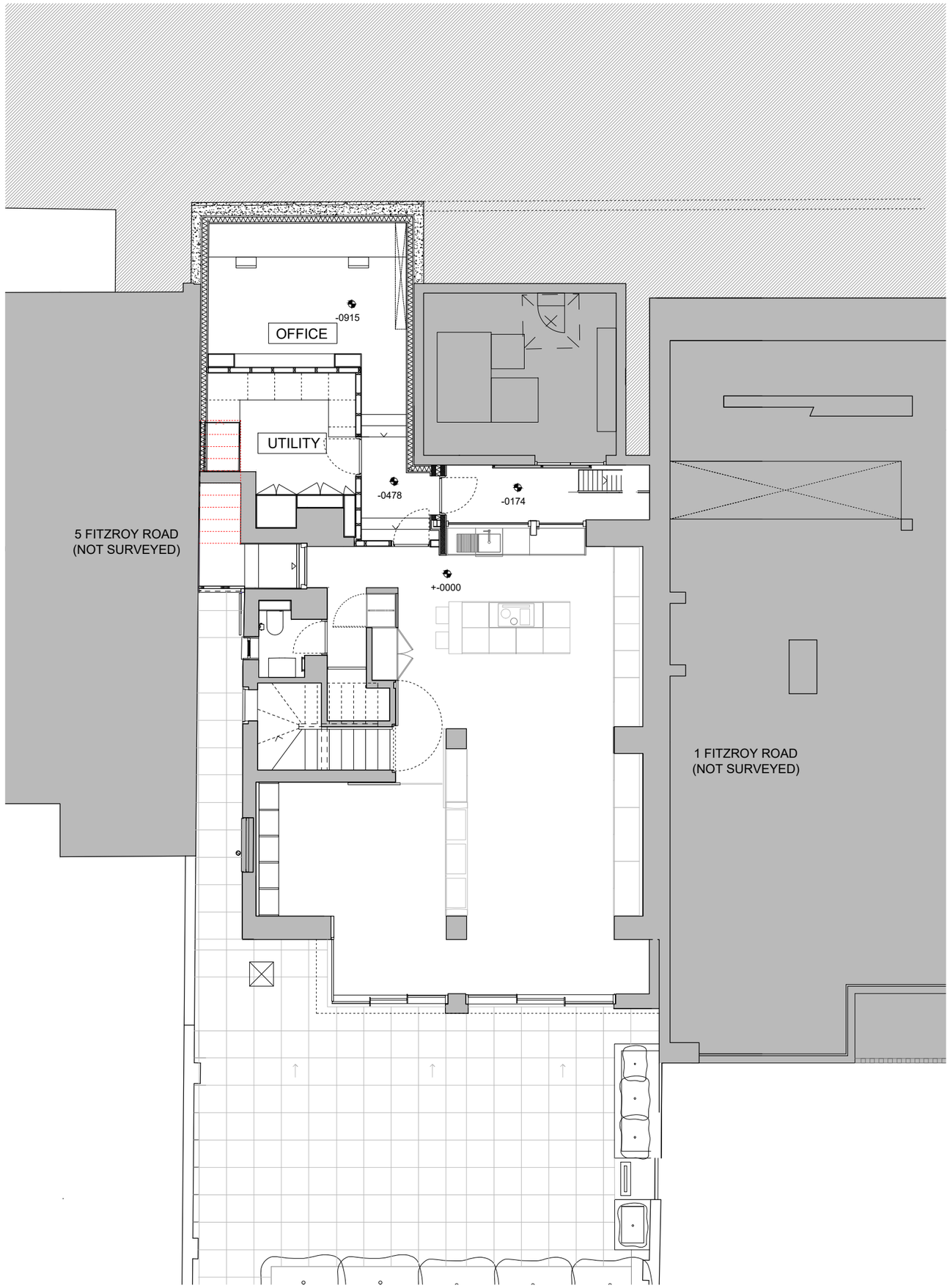

DF__DC

228_FTY FITZROY ROAD
3 Fitzroy Road, London NW1 8TU

BASEMENT PLAN - PROPOSED
GENERAL ARRANGEMENT

FILE NAME.DWG
228-(01)099

PROJECT	PACKAGE	DRAWING NO.	REVISION
228	(01)	099	P1

SCALE
1:100@A3

DATE
2024/06/25

OS REFERENCE LEVEL
± 0,00 = TBC

STATUS
PERMISSION

ARCHITECT
DFN +DC
A 42 Theobalds Road, London WC1X 8NW
T +44 (0)20 7405 9361 E info@df.network W dfndc.co.uk

GENERAL NOTES
Do not scale from this drawing. Use only annotated dimensions. All dimensions to be verified on site by contractor. All dimensions in millimetres unless otherwise noted. Any discrepancies to be notified to DFN +DC and contract administrator.
Company registered in England, no. 09415285.

REVISIONS

REV.	DATE	AMENDMENT
P1	25.06.2024	Issued for pre-planning

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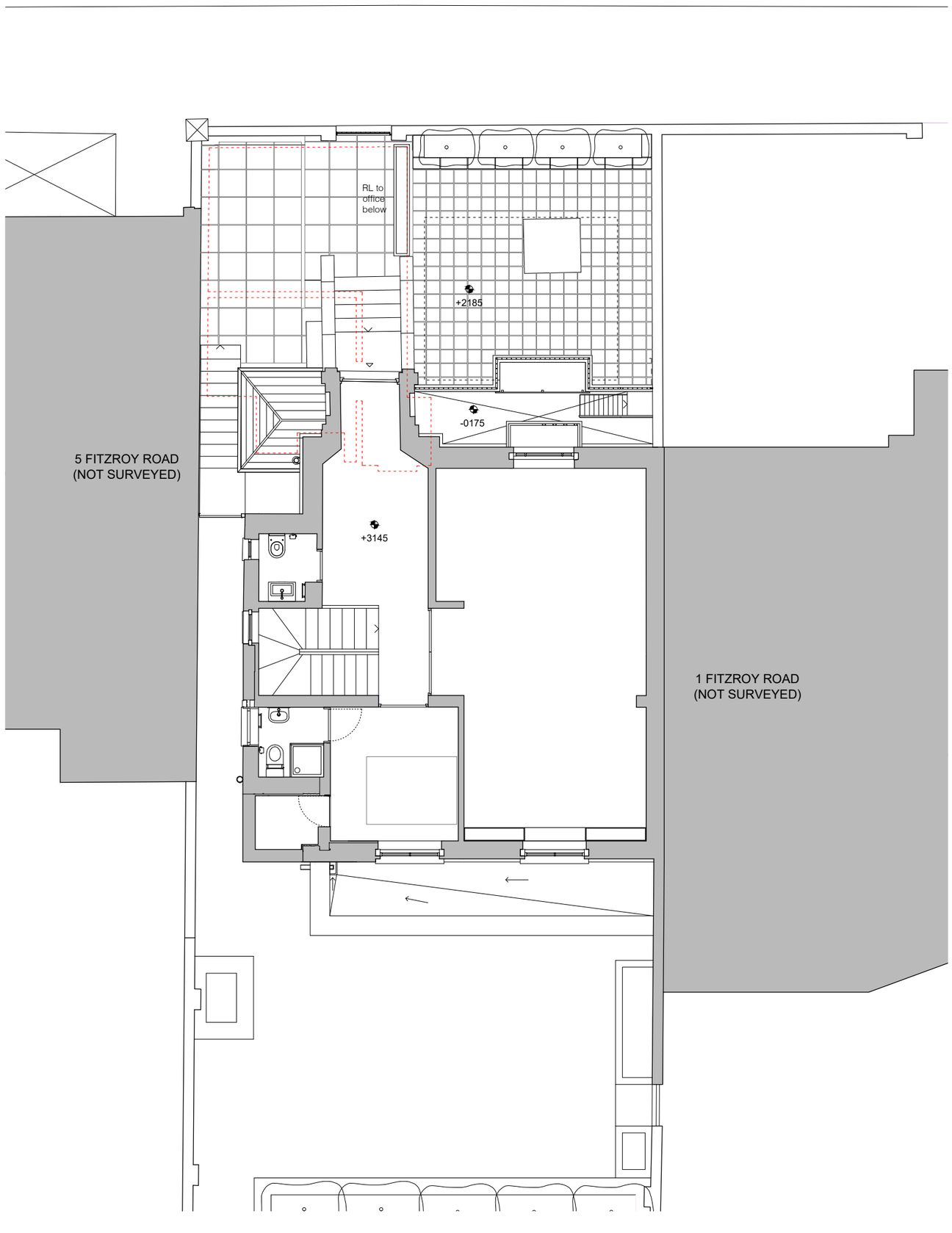

DF__DC

228_FTY FITZROY ROAD
3 Fitzroy Road, London NW1 8TU

GROUND FLOOR PLAN - PROPOSED
GENERAL ARRANGEMENT

FILE NAME.DWG
228-(01)100

PROJECT	PACKAGE	DRAWING NO.	REVISION
228	(01)	100	P1

SCALE
1:100@A3

DATE
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REVISIONS

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0 0.5 1 3m

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228_FTY FITZROY ROAD
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SECTION 01 - PROPOSED
GENERAL ARRANGEMENT

FILE NAME.DWG
228-(01)201

PROJECT	PACKAGE	DRAWING NO.	REVISION
228	(01)	201	P1

SCALE
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DATE
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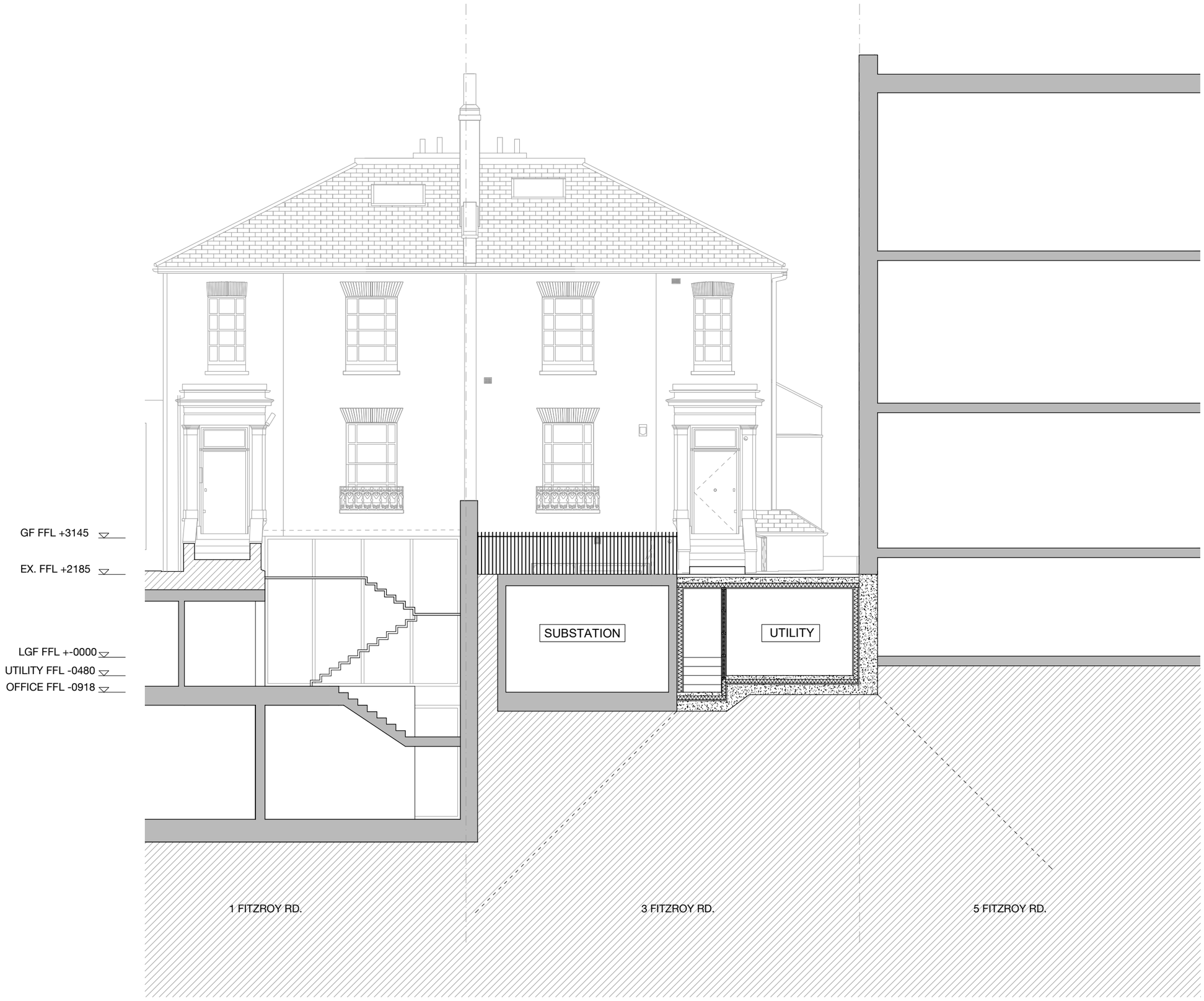
REVISIONS

REV.	DATE	AMENDMENT
P1	25.06.2024	Issued for pre-planning

0 0.5 1 3m



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228_FTY FITZROY ROAD
3 Fitzroy Road, London NW1 8TU

SECTION 02 - PROPOSED
GENERAL ARRANGEMENT

FILE NAME.DWG
228-(01)202

PROJECT	PACKAGE	DRAWING NO.	REVISION
228	(01)	202	P1

SCALE
1:100@A3

DATE
2024/06/25

OS REFERENCE LEVEL
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STATUS
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REVISIONS

REV.	DATE	AMENDMENT
P1	25.06.2024	Issued for pre-planning

0 0.5 1 3m