Eastwood&Partners
CONSULTING ENGINEERS

BASEMENT IMPACT ASSESSMENT

47 DOUGHTY STREET, LONDON, WC1N 2LW

FOR

TG STUDIO

39053-01 **April 2017**

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1.0 INTRODUCTION

Proposals to refurbish 47 Doughty Street include a small extension to the existing basement at the rear. Eastwood & Partners have been asked by TG Studios to prepare a Basement Impact Assessment to satisfy the requirements of Camden Development Policy 27.

All information, comments and opinions given in this report are based on the ground conditions encountered during the site work and information gained from a historical, geological and environmental desk study. However, there may be conditions at the site that have not been taken into account, such as unpredictable soil strata and water conditions between or below investigation points. It should also be noted that groundwater levels vary due to seasonal or other effects, and may at times differ from those measured during the investigation.

This report is prepared by Nicholas Bailes MEng MICE and Catherine Topliss BSc, CEnv, CSci, CGeol, SiLC, AMICE, FGS.

This report is prepared for TG Studios in response to particular instructions. Any other parties using the information in this report do so at their own risk and any duty of care is excluded.

We now have pleasure in presenting our findings.

2.0 DESCRIPTION OF THE EXISTING BUILDING

The site location and existing building is described in detail in the Archaeological Desk Based Assessment and the Heritage Statement.

A sample of drawings by TG Studio showing the existing building is included in Appendix 1.

47 Doughty Street is a Grade II listed mid-terrace town house of five storeys including a basement and mansard. The property dates from c.1807-1809. It has a traditional construction of load bearing brick walls and timber floors. At the rear of the property there is a wing occupying half the width of the house of three storeys plus basement providing additional spaces adjacent to a dropped courtyard. Beyond this wing a single storey pavilion houses the end of the kitchen with a patio extending to the rear boundary. At the front of the property there are arched storage spaces underneath the pavement with a typical basement access well between the pavement and the front of the house.

From external observations the adjacent properties are contemporary with number 47 and take the same layout, including rear wings on the same side of the house rather than being mirrored. The precise extent of the basements of the adjacent properties at the rear are not yet known but it is likely that there are vaults and basements occupying the same plan size.

The properties immediately to the south, No.s 48 and 49, are occupied by the Dickens House Museum and are Grade I listed.

3.0 DESCRIPTION OF THE PROPOSED BASEMENT

Some structural drawings showing the proposed development are included in Appendix 2. The existing basement is to be extended by less than 1m so that the rear wall can act as a foundation for the steelwork above.

The basement structure will consist of a new reinforced waterproof concrete piled raft with a retaining wall on the rear edge and constructed behind the existing basement wall retaining the patio. The new retaining wall will extend to the party wall boundaries on both sides. In the case of No.46 it will butt up against the existing basement wall on that side. At the interface with No.48 the new basement wall is likely to be just behind the extent of the neighbouring basement. The new wall will therefore undermine a short section of the garden wall just beyond the two existing basements.

The upper floor structures over the basement will be mostly traditional timber joists supported by masonry walls, although the ground floor is likely to be insitu concrete cast on profiled metal decking, with a small area of glass floor by the door to the main house. It is proposed to make the new extension completely self-supporting on its piled raft, with vertically sliding ties alongside the adjoining structures. In this way, no new loads will be applied to the party walls.

4.0 STAGE 1 – SCREENING

This stage is concerned with identifying issues which are to be addressed and mitigated in subsequent stages. The question numbers in the sections below relate to the flow charts in Appendix E of the Arup report 'Guidance for Subterranean Development' (GSD). A number of figures from the GSD have been marked up with the site location and included in Appendix 3.

4.1 Groundwater flow

Q1a: Is the site located directly above an aquifer? Yes.

The British Geological Survey (BGS) website indicates that the site is underlain by superficial deposits of the Hackney Gravel Member (Sand and Gravel) over bedrock of the London Clay Formation (Clay, Silt and Sand). The Hackney Gravel Member is classified as a Secondary A Aquifer and the London Clay as Unproductive Strata.

This is in line with Figure 8 of the Camden Geological, Hydrogeological and Hydrological Study (CGHHS) GSD, which indicates that 47 Doughty Street is towards the edge of a 'Secondary A Aquifer', approximately 100 m from the Unproductive Strata (London Clay) to the north. This figure

and a number of other figures from the CGHHS, which have been marked up to indicate the site location, are included in Appendix 3.

Secondary A Aquifers are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers. The proposed basement will not extend beneath the water table surface and therefore the aquifer is not expected to be affected in any significant way.

Unproductive Strata are defined as having low permeability such that they have negligible significance for water supply or river base flow.

This is consequently not considered an impact.

Q1b: Will the proposed basement extend beneath the water table surface? No. The ground investigation shows that the water table is in excess of 10 m deep, which is significantly below the depth of the basement.

This is consequently not considered an impact.

Q2: Is the site within 100 m of a watercourse, well (used/disused) or potential spring line? Yes. Figure 11 of the GSD indicates that there is a culverted tributary of the Fleet river running along the line of Great Ormond Street, Doughty Mews and Roger Street to the south of Doughty Street, approximately 100 m away – an approximate overlay based on the historic map is included in Appendix 3.

Again, as the basement does not extend beneath the water table surface, the flows to this watercourse would not be expected to be impacted in any significant way.

This is consequently not considered an impact.

Q3: Is the site within the catchment of the pond chains on Hampstead Heath? No. This is consequently not considered an impact.

Q4: Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas? Yes. The proposed basement development includes an area of green roof at first floor level over the extension in addition to retaining the shallow bed along the rear wall of the property. The area of hard standing is therefore reduced.

This considered a positive impact, as discussed in later sections.

Q5: 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. The area that is actively drained into the sewer is slightly increasing.

This is not considered a significant or negative impact.

Q6: 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. Yes, most likely. There are no ponds local to the site - the nearest surface water features are approximately 1.5 km away to the north, west and south of the site, namely the Grand Union Canal, the lakes at the Barbican and the Thames river, respectively. However, there is a nearby culverted tributary of the Fleet river which springs in the area, approximately 200 to 560 m away. This is also visible in the overlay in Appendix 3 previously mentioned. These springs are not marked on the Ordnance Survey map but they are also shown on the 1920's Geological Map in Figure 2 of the GSD, albeit in a slightly different location and arrangement – refer also to Appendix 3.

The springs are all upstream of the site and, furthermore, as the basement construction will not be below the water table flows to these would not be expected to be impacted.

This is consequently not considered an impact.

4.2 Land stability

Q1: Does the existing site include slopes, natural or manmade, greater than 7 degrees? No. The site is in an area of generally level ground with no significant slopes in or around the site.

This is consequently not considered an impact.

Q2: Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7 degrees? No. This is consequently not considered an impact.

Q3: Does the development have neighbouring land, including railway cuttings and the like, with a slope greater than 7 degrees? No. This is consequently not considered an impact.

Q4: Is the site within a wider hillside setting in which the general slope is greater than 7 degrees? No. This is consequently not considered an impact.

Q5: Is the London Clay the shallowest strata at the site? No. The London Clay is at least 18m below the surface.

This is consequently not considered an impact.

Q6: Will any tree/s 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. The vaults at the front of the property are close to significant trees but the underpinning work will not increase the size of the vaults in plan. This work is covered by a previous planning application. There are vines and bushes in the rear garden of the property, away from the basement extension.

In summary, the basement construction is not expected to impact any trees and this is consequently not considered an impact.

Q7: Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site? No. From an inspection of the site, there is no evidence that the existing basement suffers from any issues associated with water ingress or ground movements, despite the age of the building and being founded on Made Ground. No reports or observations have been made of seasonal shrink-swell in the local area. The dry nature of the shallow ground and the granular, and therefore unshrinkable, components of the Hackney Gravel Formation rather than London Clay are likely to be contributing to this stability.

This is consequently not considered an impact.

Q8: Is the site within 100 m of a watercourse or a potential spring line? Yes. There is a culverted water course approximately 100 m to the south of the site. This is at a distance where it would not impact the development and vice versa.

This is consequently not considered an impact.

Q9: Is the site within an area of previously worked ground? Yes. A significant depth of 10.8 m of Made Ground was encountered below the rear yard (from ground level), below which there is the sands and gravels of the Hackney Gravel Formation. Results from the ground investigation are included later and Figure 6 of the GSD is marked up and included in Appendix 3.

This potential impact is addressed subsequently.

Q10: Is the site within an aquifer? If so, will the proposed basement extend beneath the water table such that dewatering may be required during construction? Yes then No. The site sits on a Secondary A aquifer in the superficial deposits, as indicated by Figure 8 but the groundwater level is consistently below 10 m deep so the excavation to 2.9m will be dry.

This is consequently not considered an impact.

Q11: Is the site within 50 m of the Hamstead Heath ponds? No. This is consequently not considered an impact.

Q12: Is the site within 5 m of a highway or pedestrian right of way? Yes and No. The front of the site is underneath a pedestrian right of way adjacent to a highway but these works are covered by a previous planning application. The main site and extension to the basement at the rear of the house is not adjacent to a highway or pedestrian right of way.

This is therefore not considered to be an impact for this application.

Q13: Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties? No. The extension to the basement does not go any lower than the current basement.

This is consequently not considered an impact.

Q14: Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines? No. This is consequently not considered an impact.

4.3 Surface flow and flooding

Q1: Is the site within the catchment of the pond chains on Hampstead Heath? No. This is consequently not considered an impact.

Q2: 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? Yes. The provision of the green roof means that the peak run-off will be attenuated and the small extension to the basement slightly increases the area that is actively drained into the sewer and prevented from running into the ground.

This is not considered a significant or negative impact.

Q3: Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas? Yes. The proportion of hard standing, which affects the peak overland flow and flooding, is reduced. This is considered to be a positive impact.

Q4: Will the proposed basement result in changes to the profile of the inflows (instantaneous and long-term) of surface water being received by adjacent properties or downstream watercourses? Yes. The small increase in area being actively drained means that the instantaneous and long-term surface water flows being received by adjacent properties or downstream watercourses is reduced. This is considered to be a positive impact.

Q5: Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses? No. This is consequently not considered an impact.

Q6: Is the site in an area known to be at risk from surface water flooding, such as South Hampstead, West Hampstead, Gospel Oak and King's Cross, or is it at risk from flooding, for example because the proposed basement is below the static water level of a nearby surface water feature? No. The Environment Agency website indicates the site is not within or near a flood plain and is at very low risk of surface water flooding. Figure 15 of the GSD also indicates that the site is not within an area with the potential to be at risk of surface water flooding. As previously discussed, the proposed basement is not below any nearby static water levels or below the ground water table and the reduction in surface water run-off volume and rate due to reduction in the area of free-draining ground is considered to be a positive impact.

4.4 Non-technical summary

Groundwater: The site is situated over a Secondary A aquifer and there is a culverted watercourse and springs in the local area but the ground investigations show that the groundwater is at a level where it will not be impacted by the proposed construction.

Land stability: There is a significant depth of Made Ground on site which the current structures are founded on.

Flooding: The development will result in a reduction in run-off due to the increase of actively drained area. Peak flows will be attenuated by the presence of a green roof system. This is therefore considered to be a positive impact of the proposals.

5.0 STAGE 2 – SCOPING

5.1 Scoping

The screening assessment shows that this BIA is required to address the issues of founding the basement in Made Ground.

Local residents have been consulted, with copies of the Construction Management Plan being distributed to them and comments invited. The consultation is ongoing.

5.2 Non-technical summary

The significant depth of Made Ground is to be addressed by this BIA.

6.0 STAGE 3 – SITE INVESTIGATION AND STUDY

Desk study and site investigations have been undertaken, including the following activities:

- A site walkover

- Desk study, including:
    - An Archaeological Desk-Based Assessment (refer to separate document);
    - A Heritage Statement (refer to separate document);
    - Examination of online geological records including retrieval of records from nearby boreholes (refer to text and Appendix 4);
    - Retrieval of adjacent planning drawings (refer to Appendix 5);
    - An Asset Location Search from Thames Water (refer to Appendix 6);
- A drainage level and CCTV condition survey (refer to Appendix 7)
- Intrusive investigations into the ground conditions at the rear, consisting of:
    - Five trial pits adjacent to foundations which were extended down to 3 m depth with a window sampler
    - A continuous flight auger borehole that was taken down to 18 m (refer to Appendix 8)
- A dimensional survey of the property (not included in this report)

6.1 Desk study

6.1.1 Context and history

The site and surrounding context is described in more detail in the Archaeological and Heritage reports. The existing and proposed developments are detailed in sections 2 and 3. The site is a mid-terrace 5-storey privately owned Georgian house in a suburban area. The site is approximately 27 m x 6 m including the front vaults under the pavement. The rear basement is approximately 11 m x 6 m including structure.

The site is at approximately 20 mOD. There are no significant trees affected by the proposed development at the rear of the property.

The history of the site is described in detail in the Archaeological and Heritage reports. It is thought to have been open farmland until the building of the houses on Doughty Street circa 1800. The potential for contamination of the ground is deemed to be low.

The cause for the considerable depth of Made Ground is not obvious. Close examination of historical maps indicate that it was open farmland until being developed in the early 19th Century. A plan of the fortifications to London from 1642 suggest that the fortified wall runs close to the site

location – approximately along Roger Street and Great Ormand Street, 100 m to the south. This is deduced by overlaying historical and modern maps, a process that has an error margin. However, a map from 1682 doesn't indicate fortifications, showing instead open farmland in the site location. Apart from this, no other unusual uses for the site itself are indicated prior to the houses being built. It is possible that the sands of the Hackey Gravel Member were being quarried at some period prior to development.

6.1.2 Geology

The British Geological Survey (BGS) website indicates the site to be underlain by superficial deposits of the Hackney Gravel Member (Sand and Gravel) over bedrock of the London Clay Formation (Clay, Silt and Sand). This is in agreement with the GSD.

The nearest recorded boreholes on the BGS website are from 1989 and are approximately 40 m away to the east of the site in Brownlow Mews. They extended to a depth of about 25 m and were separated by 15 to 20 m. Borehole 1 recorded Made Ground to 3.2 m over Sand and Gravel to 11 m over Clay. Borehole 2 also recorded Sand and Gravel to 11 m with a thin layer of very sandy Clay at 3.5 to 4.5 m. The location of these boreholes and the logs are included in Appendix 4.

Figure 2 of the GSD shows a 1920 Geological Map which is marked up to indicate the site and included in Appendix 3. There is a borehole record 125 m away from site, in Millman Street in the opposite direction to the more recent boreholes in Brownlow Mews. This historic record from Figure 2 indicates a thickness of Made Ground of 11 feet (3.35 m) over 8 feet of Sand (to 5.8 m) over 48 feet of Clay.

6.1.3 Groundwater

As previously discussed, there is a nearby culverted watercourse and springs within 500 m of the site but there are no surface water features nearby and it is not within an area at risk of surface water flooding.

The nearby boreholes from 1989 extended to a depth of about 25 m. Borehole 2 recorded no water to the finished depth of 25 m. Borehole 1 was done 1 to 2 weeks later and recorded water levels at 11 m, 4 m and 5 m on the 7th, 8th and 15th December (1989) respectively. It is noted that records show that December 1989 was an extremely wet month.

During the site walkover no evidence was found of water ingress issues to the house or any structural damage caused by ground movements (some minor cracking was observed in the stair well at the top floor).

6.1.4 Infrastructure

An Asset Location Search has been obtained from Thames Water – refer to Appendix 6. This indicates that there is a combined sewer running down the centre of Doughty Street as well as a water main. These are at a distance that will not be impacted by the works to the front vaults. No Thames Water assets are indicated in the site. The sewer invert level is approximately 15.3 m which is around 5 m below street level.

A survey of the below ground drainage has been carried out – refer to Appendix 7 which shows the existing below ground drainage on plan. Currently the majority of the drainage is combined and drops at the rear of the house before going under to meet the manhole in the front courtyard. The drain then outlets to the sewer in the street. The CCTV survey is not included in this report but it indicated that the condition of the existing drainage is generally very good.

Apart from the drainage indicated in the survey, there is no evidence of any infrastructure situated under the proposed basement at the rear of the property.

6.1.5 Adjacent structures

The planning drawings for alterations to 21a Brownlow Mews at the rear are included in Appendix 5, which includes a generalised section indicating above ground storeys only and the adjacent gardens of Doughty Street. This is consistent with the finding of a shallow concrete foundation under the rear wall.

The planning drawings for the extension of the basement at No.46 are also included in Appendix 5. These indicate that the closet wing has been extended to the rear by approximately 1.8 m and the basement has been extended by a further 2 m towards the rear of the property. This is consistent with observations on site.

6.2 Site investigation factual report

The purpose of the intrusive investigations was to establish the ground conditions on site, the parameters for foundation design and the presence of any groundwater. Additionally the trial pits are used to establish existing structural foundations.

Intrusive investigations were made by AP Geotechnics on 13th October 2015 and again on 4th February 2016 to excavate five trial pits on the property; two within the existing basement and three in the ground floor patio area including the rear bed. A plan showing the locations and logs of the soil profiles are included in Appendix 8. The profiles of the existing foundations were used to inform the structural drawings.

A borehole was done by Chelmer Site Investigation Laboratories Ltd on 24th May 2016 to a depth of 18 m. The drillers' logs including a plan of the location are also included in Appendix 8. The drillers conducted in situ Mackintosh probe tests to a depth of 3m.

Seven samples of made ground were collected from a borehole, referenced BH1 and sent for chemical testing in QTS Environmental Ltd laboratories (Report Ref: 16-45309 and 16-45310). The samples were taken from depths of between 1.5 and 6.5 m below ground level (bgl).

The samples of made ground were tested for a suite of common contaminants, including metals/metalloids, polycyclic aromatic hydrocarbons (PAHs), as well as petroleum hydrocarbons. Two samples recovered from depths of 1.5 and 3.5 m were screened for the presence of asbestos. WAC testing was also undertaken on one sample at 2.5 m depth.

The results show elevated concentrations of lead and mercury, compared to the residential assessment values, in relation to human health, in all four samples tested for these contaminants. Copper was also found to be elevated in one sample of made ground, compared to the criteria for phytotoxicity. The following table summarizes the elevated concentrations of contaminants.

Contaminant	**Residential Assessment Value mg/kg**		**Elevated Concentrations mg/kg**
	Human Health	**Phytotoxicity**	
Mercury	1.2	1.0	4.9 (1.5m), 3.2 (3m), 1.8 (3.5m), 1.6 (5m)
Lead	200	500 (pH>7)	803 (1.5m), 598 (3m), 489 (3.5m), 868 (5m)
Copper	200 (pH>7)		216 (1.5m)

The PAH and petroleum hydrocarbon concentrations were recorded as below the limit of detection.

With the exception of Antimony which recorded a value of 0.15 mg/kg compared to the inert waste limit of 0.06 mg/kg, the sample at 2.5 m depth passed the Landfill Waste Acceptance Criteria Limit for Inert Waste Landfill.

A percolation test was attempted but results could not be obtained due to not being able to build up the water level in the borehole from a tap because it would seep away rapidly. A 10 m deep standpipe was left in the borehole for the water level to be monitored although it was not possible to take an initial reading due to it remaining dry. The standpipe has since been revisited twice, including after wet weather, to attempt to measure the water level but in both instances the borehole had remained dry.

6.3 Site investigation interpretative report

6.3.1 Geology

Made Ground was found in all trial pits to the full 3 m depth, which clearly extends well below the founding level of the structures. The borehole confirmed that there is a substantial depth of Made Ground – to 10.8 m below the patio level. Below this was Sands and Gravels to the full depth (18 m). The London Clay was not reached.

The Made Ground was identified as Made Ground by the presence of fragments of manmade materials such as brick and lime mortar throughout it's depth. The description of the Made Ground is consistent through each of the trial pits but shows some variation with depth in the borehole log. It is consistent in colour and apparent strength; the in situ Mackintosh probe tests showed stable results slowly increasing with depth. From 4 m depth, the drillers gave estimated results which steadily increased with depth and also reported that "..the Made Ground and underlying Natural Ground was [sic] fairly consistent in terms of strength and make up..". The basement will be founded at a depth of approximately 2.9m. It should also be noted that the Made Ground has been in place at least since the building of the houses on Doughty Street 200 years ago. Even during this period it does not appear to have undergone any significant consolidation which would be likely to result in movements and cracking in the supported structures.

Based on a Mackintosh probe result of 18 at founding level, this suggests an undrained shear strength of (2.5 x 18 =) 45 kPa and an allowable bearing pressure for the basement of 90 kPa.

6.3.2 Groundwater

No water was found in the trial pits. The borehole encountered wet ground at 10.8 m depth and water did not rise up the borehole. A percolation test was attempted but results could not be obtained due to not being able to build up the water level in the borehole from a tap because it would seep away rapidly.

The standpipe was also recorded to be dry when measured on 13 June 2016 after wet weather. The dip meter was only able to reach a depth of 9 m on this occasion due to collapse of the standpipe but this is still well below founding level.

In addition, the extension to the basement does not go any deeper than the current basement which does not show signs of water ingress.

Groundwater is therefore not expected to be encountered during the excavations.

6.3.3 Earthworks and drainage

Excavations to the rear of the property will be conducted to allow the installation of the new retaining wall as described later in this report. During the trial pits undertaken on site, the Made Ground remained stable.

Some elevated levels of contaminants were detected compared with residential assessment values and these will be considered when working with, or disposing of, the arisings. In addition, a 600mm capping layer of clean imported material is required over the existing ground in the garden area. When excavations are made to lay the capping material, consideration will be given to the stability of the garden walls which must not be required to retain any more than 600mm without propping and for no longer than 12 hours.

For the material that is to be removed from site to a landfill, the results should be discussed with the proposed landfill operator. The remaining soil should not require treatment based on these results.

Groundwater is not expected to be encountered. Any rainfall is expected to drain away into the remaining depth of Made Ground rapidly such that pumping is not required.

In the permanent condition, a small amount of additional surface water run-off will be routed into the existing drainage system. Foul waste will be routed to the front and rear of the house in the same way as the existing arrangement. At the rear it is combined with the surface water before it is routed through the drainage under the house.

In the front vaults a new connection to the drain is required which will facilitate the use of appliances in the utility space and also provide drainage from the drained cavity waterproofing system that is proposed in the vault containing the utility space.

6.3.4 Existing foundations

From the trial pit dug in the basement, the party wall with No.48 was observed to be founded on a 400 mm deep brick foundation projecting 460 mm from the face of the wall and reaching 900 mm below floor level.

At the higher level on the patio, two trial pits demonstrated that the garden walls on either side of the patio are founded at about 800 mm below the patio level on simple brick foundations that step out from the wall by 30 to 190 mm. The rear wall which forms part of the neighbouring building was discovered to have a concrete foundation at 1 m depth extending forward 270 mm from the face of the wall.

The rear basement courtyard was found to have a 350 mm thick concrete slab and concrete on the faces of the party wall to No.46 and the retaining wall to the rear garden. This concrete around the

dropped courtyard is presumed to be an alteration to open up a traditional vault that is shown to occupy this space on historical drawings.

Details of the foundations in the neighbouring properties are not entirely confirmed. The possibility of encountering unexpected forms of construction at the two interface points is highlighted as a risk which will be carried through to the building phase of the project.

6.3.5 Proposed foundations and retaining structures

6.3.5.1 Context

The diagram below shows the site in the context of the surrounding structures:

Figure 1 : Structures surrounding the site

6.3.5.2 Bearing pressure

The site investigation results show that the existing structures at the rear of the house are founded on Made Ground, including at least the rear wall of the main house, the closet wing, the garden walls and 21a Brownlow Mews to the rear. Despite this, no significant detriment to the structure due to ground movement was apparent on the site walk around.

The results from the site investigation suggest an allowable bearing pressure value of 90 kPa in the Made Ground under the basement. An analysis of the existing structure suggests that the currently applied bearing pressures reach nearly 100 kPa under the rear wall of the house. This is slightly higher than the predicted allowable bearing pressure of 90kPa from the in situ tests.

The bearing pressure will not be increased because the entire rear extension will be built off a piled raft and the load will be transferred below the made ground. In fact, the loads on the party walls will

reduce slightly. Diagrams showing the existing applied bearing pressures are included in Appendix 9.

6.3.5.3 Retaining structures

The retention required for the rear patio area is approximately 2.9m high. This will be achieved in the permanent condition by a reinforced concrete propped cantilever retaining wall built off a piled raft.

6.3.5.4 Specifications

The basement will be an inhabited space and will be Environmental Grade 3 to BS8102, meaning no water penetration into the basement space. The new retaining wall will be a structural grade waterproof concrete with a drained cavity system applied to the inside faces.

The ground preparation will include the requirement to remove any soft spots and other unsuitable material and replace with approved granular material laid in well compacted layers prior to laying the membrane and pouring the raft slab.

The piles will need to be constructed to a depth in excess of 10m so as to bear on suitable undisturbed natural soil below the made ground. The piles will be constructed using a method that gives minimal vibration and avoids open bores which might collapse. One alternative is continuous flight auger, but the pile type will be considered further at detailed design stage.

6.3.5.5 Temporary stability and propping

The new rear basement wall will be installed by constructing the piled raft and then casting the wall on top within a battered excavation.

At the interface with No.46 the existing basement wall in this area where the neighbouring basement has been extended will provide stability during the excavation. The removal of soil in this short length of wall relieves the retaining requirement for the wall.

Details of the initial underpinning to the garden wall to No.48 are to be agreed with the Adjoining Owners or their appointed surveyors as provided under the Party Wall Etc Act 1996.

Propping to the party wall with No.48 will be provided at ground floor level during the works while the closet wing is removed. This may well be incorporated into the design for retaining the party wall with No.48.

6.3.5.6 Ground settlements

The initial short underpinning if required of the garden wall to No.48 is preferred as a method that minimises the movement of the wall due to the stiff vertical load path provided by the underpinning

block as opposed to relying on horizontal restraint being provided by a retaining wall. Underpinning is often used to prevent settlement of buildings and has been successfully used by Eastwood & Partners on many projects including Roehampton House (Grade I listed) and multiple houses of various ages in the Camden Borough. Once the underpinning and propping is in place, the basement area can be excavated to allow the piles to be installed, then the raft is constructed on top.

The foundation load in the party wall with No.48 while the foundations loads to the party walls and the main rear façade of the house are unaffected.

Significant settlement of the ground due to the applied loads from these proposals or from other factors such as inundation are therefore not expected.

6.4 Non-technical summary

A substantial depth of Made Ground exists on the site which currently supports the existing structures. It will also be used to support the basement extension.

The groundwater level is at least 9m below the surface.

There are not expected to be any infrastructure obstructions to the basement. The existing drainage is in good condition.

The proposed development will have no negative effect on groundwater related issues. It will actively manage more surface water run-off.

The proposals will employ construction methods that are designed to eliminate any ground settlements affecting the adjoining buildings.

7.0 STAGE 4 – IMPACT ASSESSMENT

7.1 Introduction

The purpose of this stage is to assess the impact of the development taking into account the presence of the adjacent basements including at No.46 which has already been substantially extended in plan.

7.2 Hydrogeology and Hydrology

Due to the low groundwater level, the basement will not have an effect on the hydrogeology of the surrounding area.

The development will cause a reduction in the surface run-off due to the increase in planted area and the active draining of a greater area.

7.3 Structural impact of ground movements and monitoring

As discussed in section 6.3.5.6 and shown in the structural drawings, the proposals include a propped cantilever retaining wall so ground movements in the rear patio area are kept to a minimum.

The movements experienced by the ground and subsequently by the surrounding structures are therefore not readily quantifiable in such a rigid system, although it is clear that they will be minimal. Any resulting cracking in the garden walls is expected to be limited to aesthetic cracking only (category (i) on the Burland scale). The main house structures including the neighbouring basements are not expected to be affected by the works.

The new extension will be structurally independent of the adjoining structures, apart from some vertically sliding ties, so this will eliminate the risk of the adjacent properties being affected by any differential settlement.

Just to be sure of this, movement monitoring points will be installed on the structures surrounding the site as or similar to the suggested locations included in Appendix 11. The positions will be measured at the following frequency:

Before construction: Once

During demolition: Weekly

During excavation and construction of new retaining wall: Daily

During erection of superstructure: Weekly (note – pockets will have to be left in the wall to allow the readings to be taken)

Thereafter until completion of the structure: Fortnightly

Trigger levels will be agreed as part of the party wall awards which will follow a traffic light system; an Amber trigger will require action to inspect and specify remedial measures as required, a Red trigger will require work on site to cease except for additional structural support to be provided to ensure safety, along with a review of the construction methods. Visual inspections will also be undertaken regularly and any significant cracks will be monitored with tell-tales.

7.4 Non-technical summary

The development will not affect the groundwater regime.

The development will reduce the surface run-off into the ground.

The adjacent garden walls may experience some aesthetic cracking. The main house structures and basements are not expected to be affected.

8.0 STRUCTURAL STABILITY REPORT FOR LISTED BUILDINGS

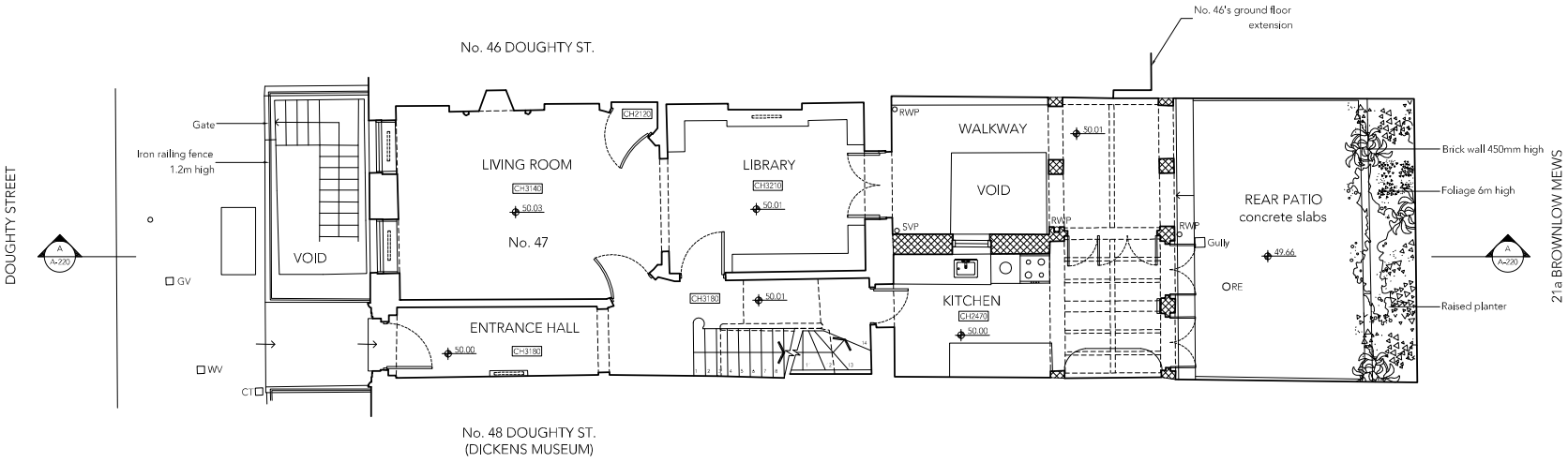
The presence of listed buildings requires particular attention to the stability of the surrounding structures. The site, No.47, and the neighbour to the north, No.46, are Grade II listed properties. The Charles Dickens Museum to the south at No.48 (and 49) is a Grade I listed property. 21a Brownlow Mews to the rear is not listed.

The proposed extension to the basement requires a new retaining wall to be installed behind the existing rear wall to the basement. This wall will be designed as a propped cantilever. The connection to the party walls will be designed such that adequate connection is made, without any loads being applied.

Stability is provided at every stage during construction by initially underpinning the short section of the garden wall to No.48 then providing a limited excavation stabilised by propping against the existing basement wall.

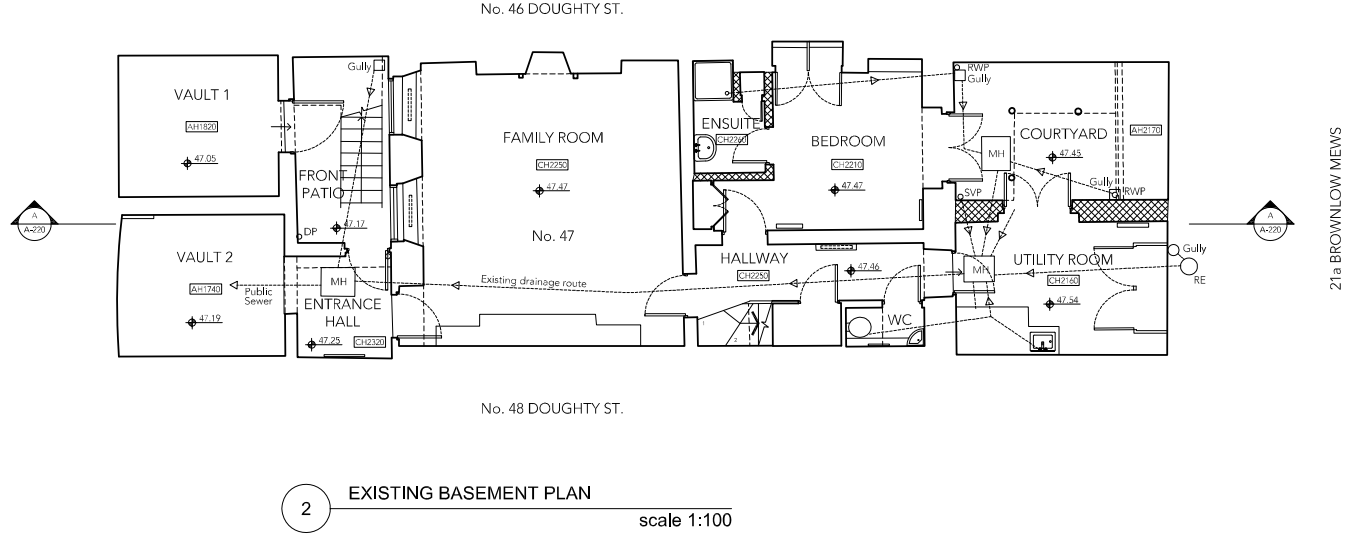
Stability to the superstructure of the new extension is generally provided in a traditional way by masonry walls (including the party walls) with timber or insitu concrete floors acting as diaphragms between them. The entire extension including the basement will be self-supporting on a piled raft, with vertically sliding ties alongside the party walls. No load will therefore be added to the adjoining structures. Around the ground floor patio doors of the extension to No 47 a goalpost frame will be used to provide lateral stability along the rear edge of the first floor. Masonry walls will be tied to existing walls at junctions with ties which are free to slide vertically, so that no load will be transferred. There can therefore be no risk of the adjoining Listed buildings being affected by differential movement caused by the proposed extension to No 47.

Appendix 1 – Sample of drawings showing existing building



1 EXISTING GROUND FLOOR PLAN

scale 1:100



2 EXISTING BASEMENT PLAN

scale 1:100

0 2m 4m

NOTE

DO NOT SCALE FROM THIS DRAWING, EXCEPT FOR TOWN PLANNING PURPOSES.
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THIS DRAWING IS ISSUED ON CONDITION THAT IT IS NOT REPRODUCED USED OR DISCLOSED BY OR TO ANY UNAUTHORIZED PERSON WITHOUT THE PRIOR CONSENT OF TG STUDIO.
THE AREAS ON THIS DRAWING HAVE BEEN CALCULATED FROM A CAD DRAWING AND HAVE NO TOLERANCES ADDED OR SUBTRACTED.

REVISION		DATE
-	PRE-PLANNING	18.09.2015
A	PLANNING SUBMISSION	12.02.2016

LEGEND

	Existing structures
	Structures to be demolished
CH---	Ceiling height
AH---	Arch height

STUDIO
Architecture & Interior Design
10 PATHBONE PLACE LONDON W1T 1HP T 020 7636 3838 F 020 7636 5659 WWW.TG-STUDIO.CO.UK

PROJECT: 47 DOUGHTY STREET, LONDON WC1N 2LW

DRAWING: EXISTING BASEMENT & GROUND FLOOR PLAN

DATE	DRAWN BY	CHECKED BY
12.02.2016	EG	TG

STATUS	SCALE @ A3	
PLANNING	1:100	

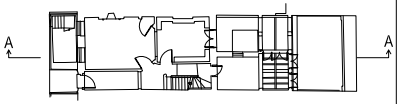
JOB NO.	DWG NO.	REV
163	A-200	A

1 EXISTING SECTION AA

scale 1:100

0 2m 4m

REVISION		DATE
-	PRE-PLANNING	18.09.2015
A	PLANNING SUBMISSION	19.02.2016



SECTION LOCATION PLAN

STUDIO
Architecture & Interior Design

10 RATHBONE PLACE LONDON W1T 1HP T 020 7636 3838 F 020 7636 5659 WWW.TG-STUDIO.CO.UK

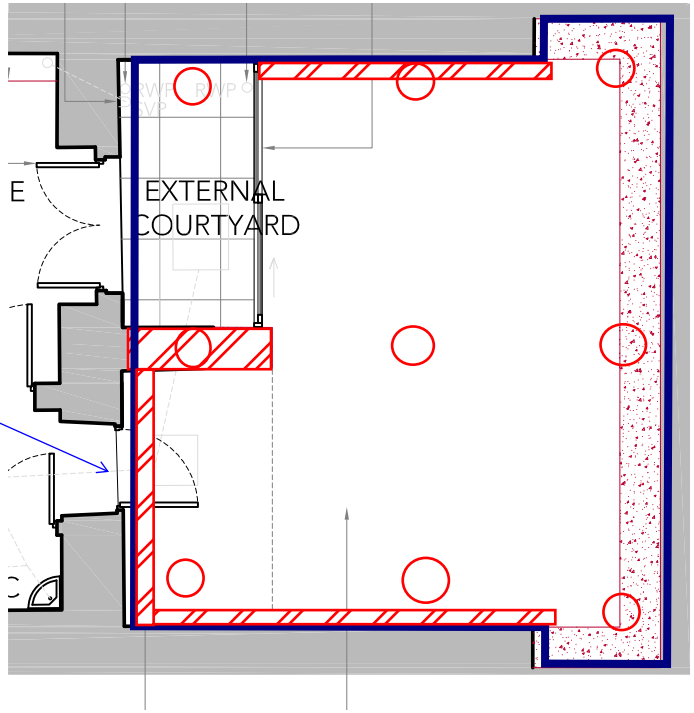
PROJECT: 47 DOUGHTY STREET, LONDON WC1N 2LW

DRAWING: EXISTING SECTION AA

DATE	19.02.2016	DRAWN BY	EG	CHECKED BY	TG
STATUS	PLANNING	SCALE @ A3	1:100		
JOB NO.	163	DWG NO.	A-220	REV	A

Appendix 2 – Structural proposals

Extent of Piled raft foundation shown thus. Reinforced concrete raft 250mm thick . Pile 250kN capacity (SWL),



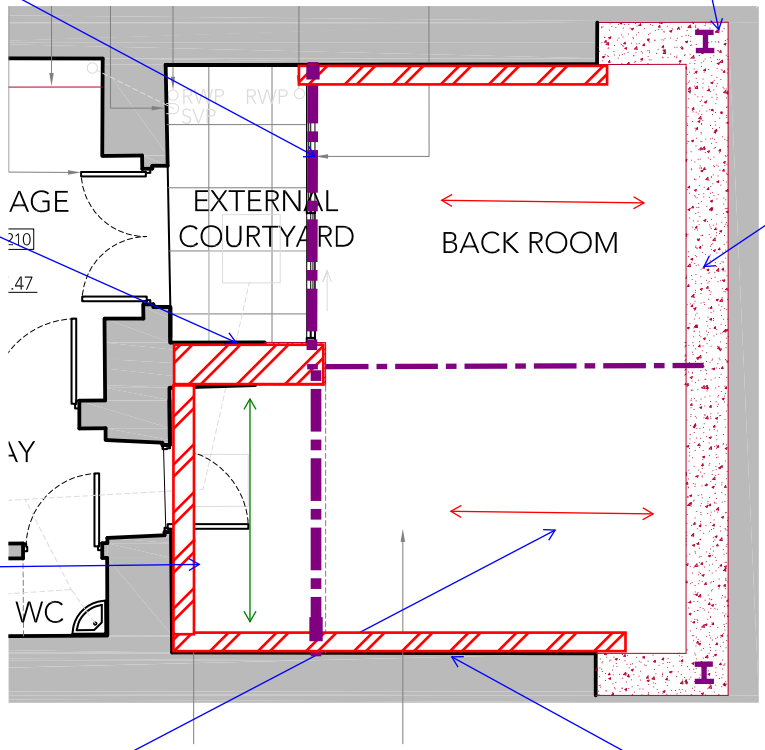
Plan on Basement Showing Foundations

203 deep steels shown thus supported on padstones on new masonry walls.

203 UKC columns bolted to top of retaining wall and supporting first floor steel

300 thick reinforced concrete retaining wall built off edge of piled raft and propped by concrete ground floor structure.

Demolish existing masonry pier and rebuild to length as shown



Glass floor supported on fabricated steel angle sections

New ground floor constructed from reinforced concrete cast on a profiled steel decking.

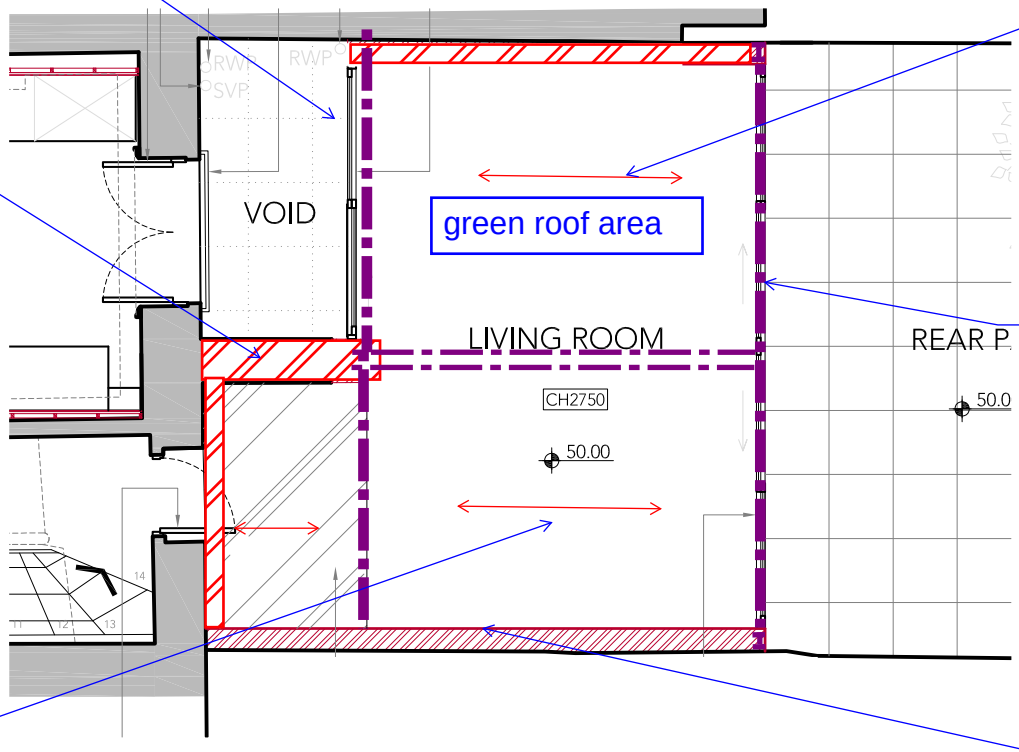
New blockwork skins shown thus built off piled raft and fixed to existing party wall of adjacent property with sliding ties.

Plan on Basement Showing Ground Floor Structure

203 deep steels shown thus supported on padstones on new masonry walls

Span of timber joists shown thus

Demolish existing masonry pier and rebuild to length as shown



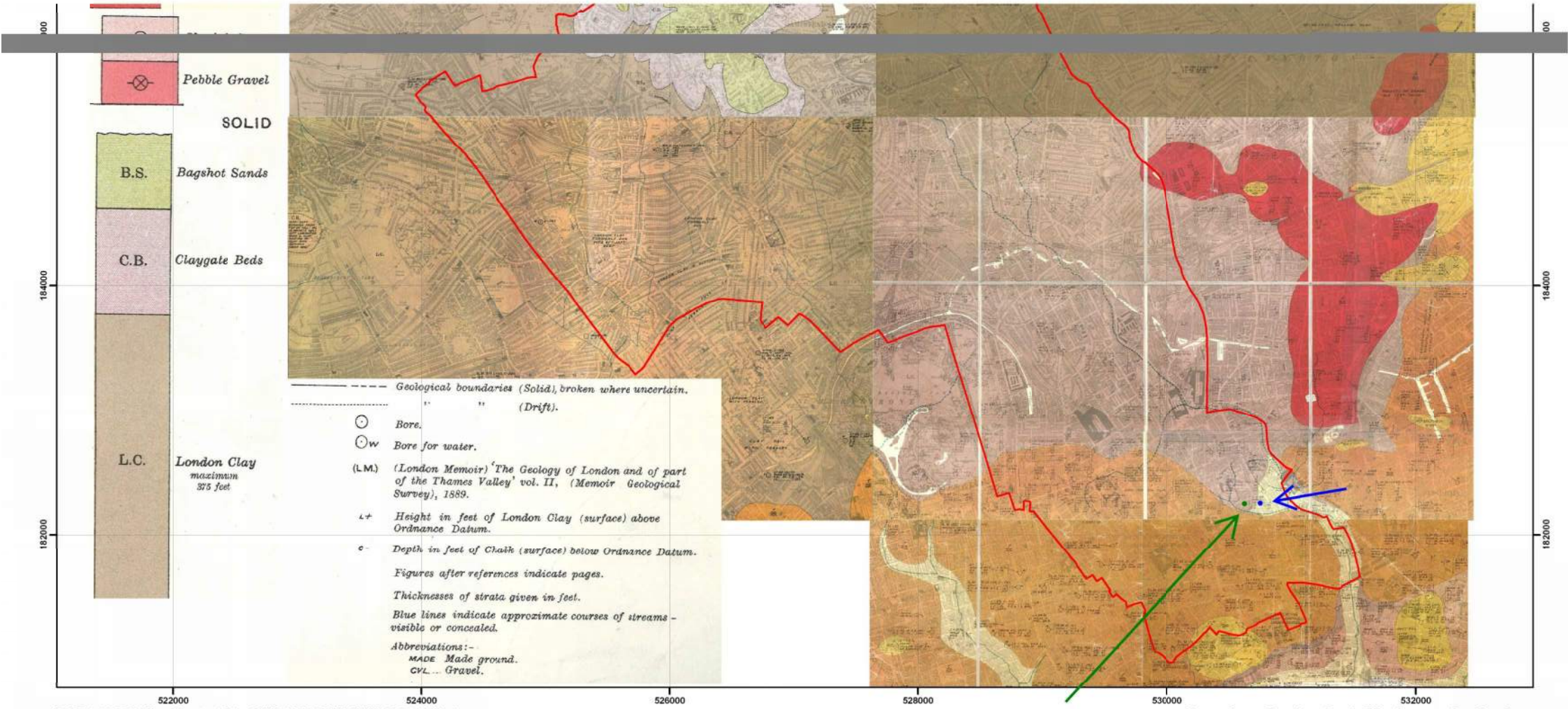
254 UKC steel above supported on 203 UKC columns bolted down to top of retaining wall at ground floor level.

Span of timber first floor joists shown thus

New blockwork skin shown thus - built off new piled raft foundation and fixed to existing party wall of adjacent property with resin fixed sliding wall ties at 900 horizontal centres and 450 staggered vertical centres.

Plan on Ground Floor Showing First Floor Structure

Appendix 3 – Figures 2, 6, 8 and 11 from the "Guidance for Subterranean Development" (GSD) marked up to highlight the site location



BGS 1:10,560 Map Sheets 1SE, 2SW, 4NE, 5SW, 5NW 1920 Edition)

N

Scale at A3: 1:30,000

Coordinate System:
British National Grid
GCS_OSGB_1936

0 0.4 0.8 1.6 2.4
Kilometers

Legend

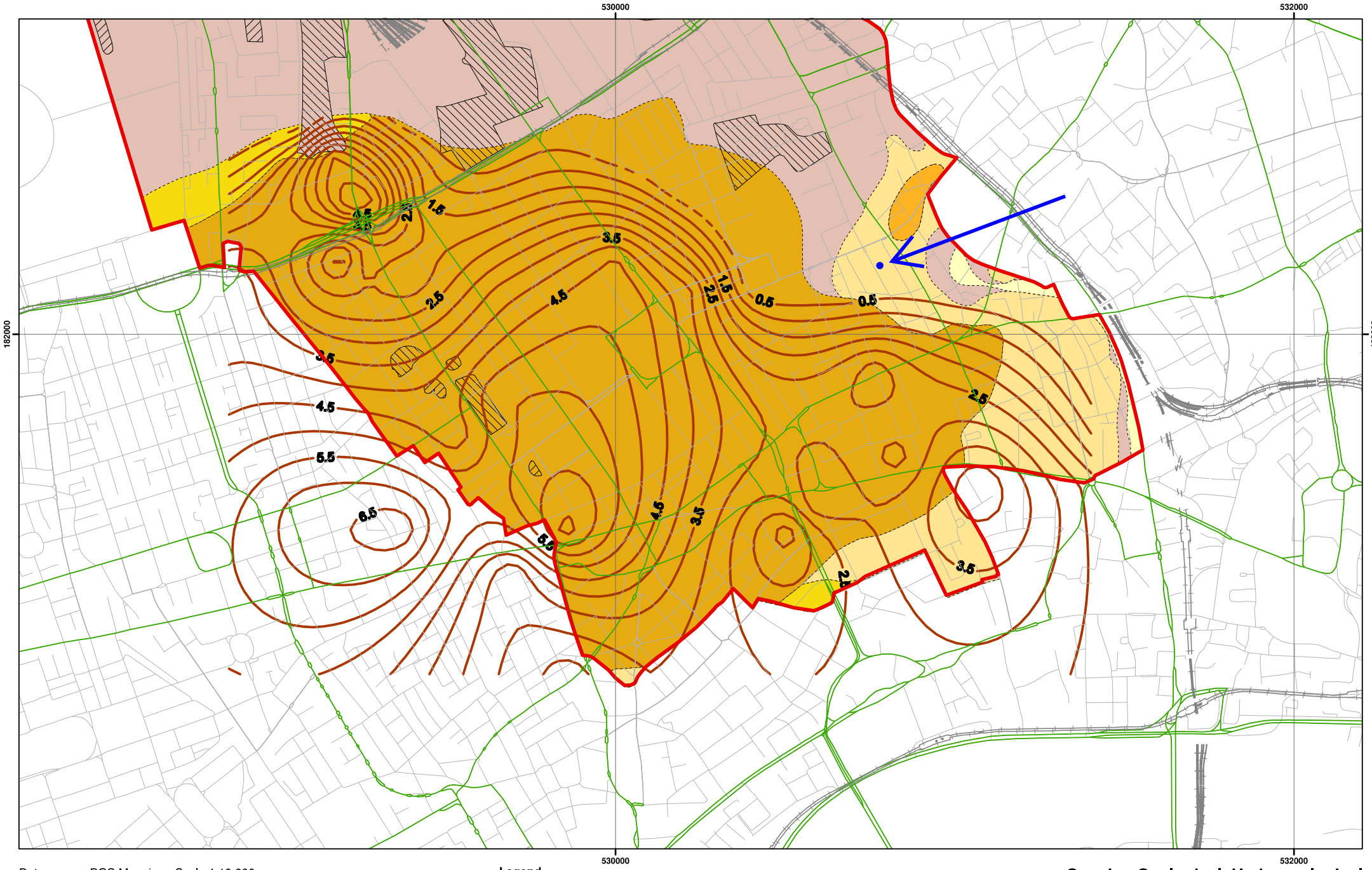
London Borough of Camden

Text at adjacent borehole
(location shown with green dot) :
L + 59
Made ___ 11
Sand ___ 8
L C ___ 48
R B ___ 11

Camden Geological, Hydrogeological and Hydrological Study

Camden 1:10,560 Geological Map (1920)

213923 FIGURE **2**



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

N

Scale at A3: 1:10,000

Coordinate System:
British National Grid
GCS_OSGB_1936

0 0.2 0.4 0.8 1.2
Kilometers

Legend

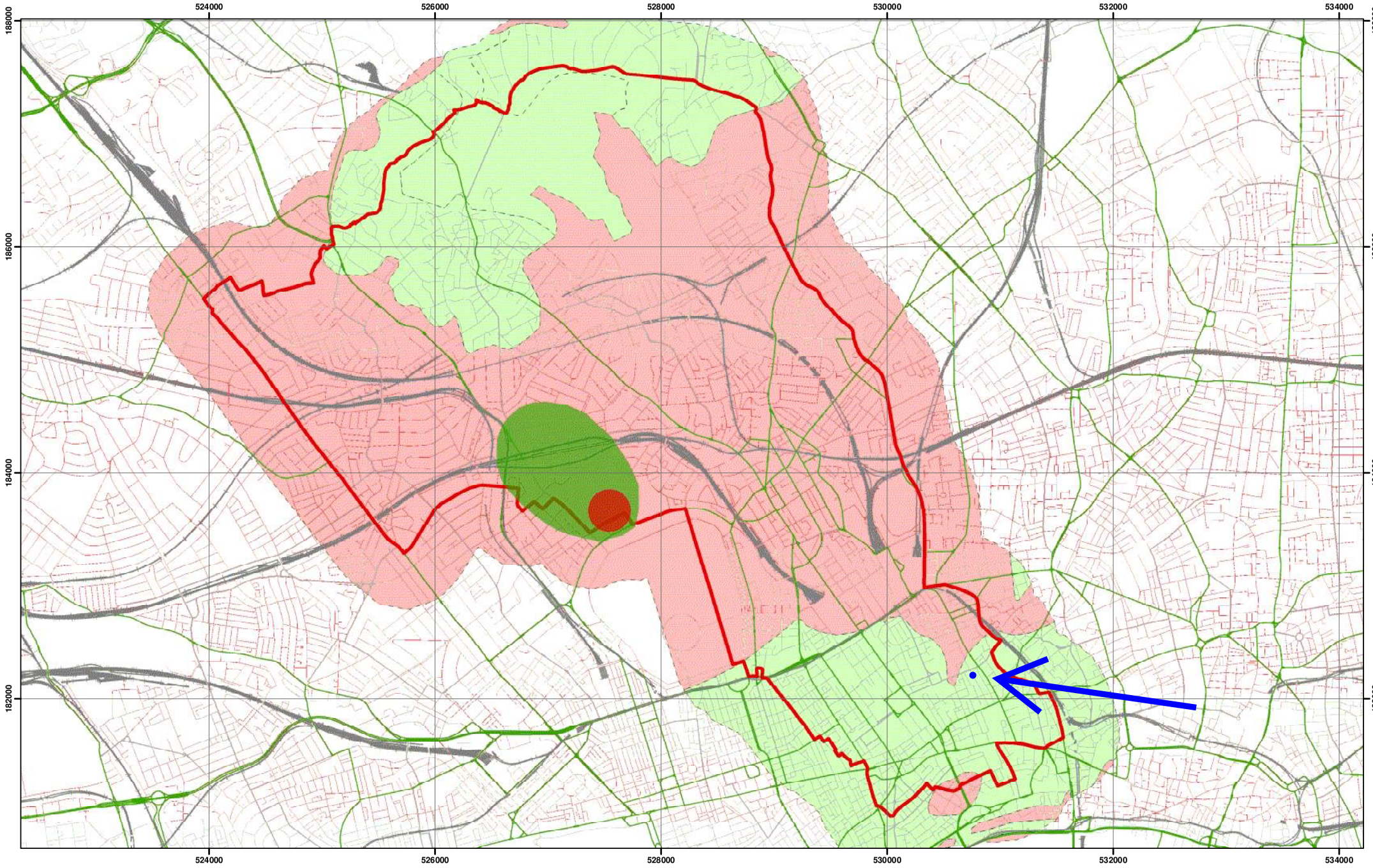
- London Borough of Camden
- Railway Lines
- A Roads
- RTD Thickness Contours
- BGS 1:10K Artificial Ground
  - MADE GROUND
  - WORKED GROUND
- BGS 1:10K Drift Geology
  - ALLUVIUM
  - HACKNEY GRAVEL FORMATION
  - LANGLEY SILT FORMATION
  - LYNCH HILL GRAVEL FORMATION
  - STANMORE GRAVEL FORMATION
- BGS 1:10K Solid Geology
  - BAGSHOT FORMATION
  - CLAYGATE MEMBER
  - LAMBETH GROUP
  - LONDON CLAY FORMATION

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

Camden Geological, Hydrogeological and Hydrological Study

River Terrace Deposit Thickness Contours

213923 **FIGURE** **6**



Environment Agency Aquifer Designation based on BGS Mapping

N

Scale at A3: 1:30,000

Coordinate System:
British National Grid
GCS_OSGB_1936

0 0.5 1 2 3
Kilometers

Legend

- Borough of Camden
- Railway Lines
- A Roads

Aquifer Designation

- Secondary A Aquifer
- Unproductive Strata

Source Protection Zone

- Outer Source Protection Zone
- Inner Source Protection Zone

NB. Aquifer boundaries are indicative based on available geological mapping data

Camden Geological, Hydrogeological and Hydrological Study

Camden Aquifer Designation Map

213923

FIGURE 8

An excerpt from the following figure including an overlay of a modern map highlighting the site location:

Camden Geological, Hydrogeological and Hydrological Study
Watercourses

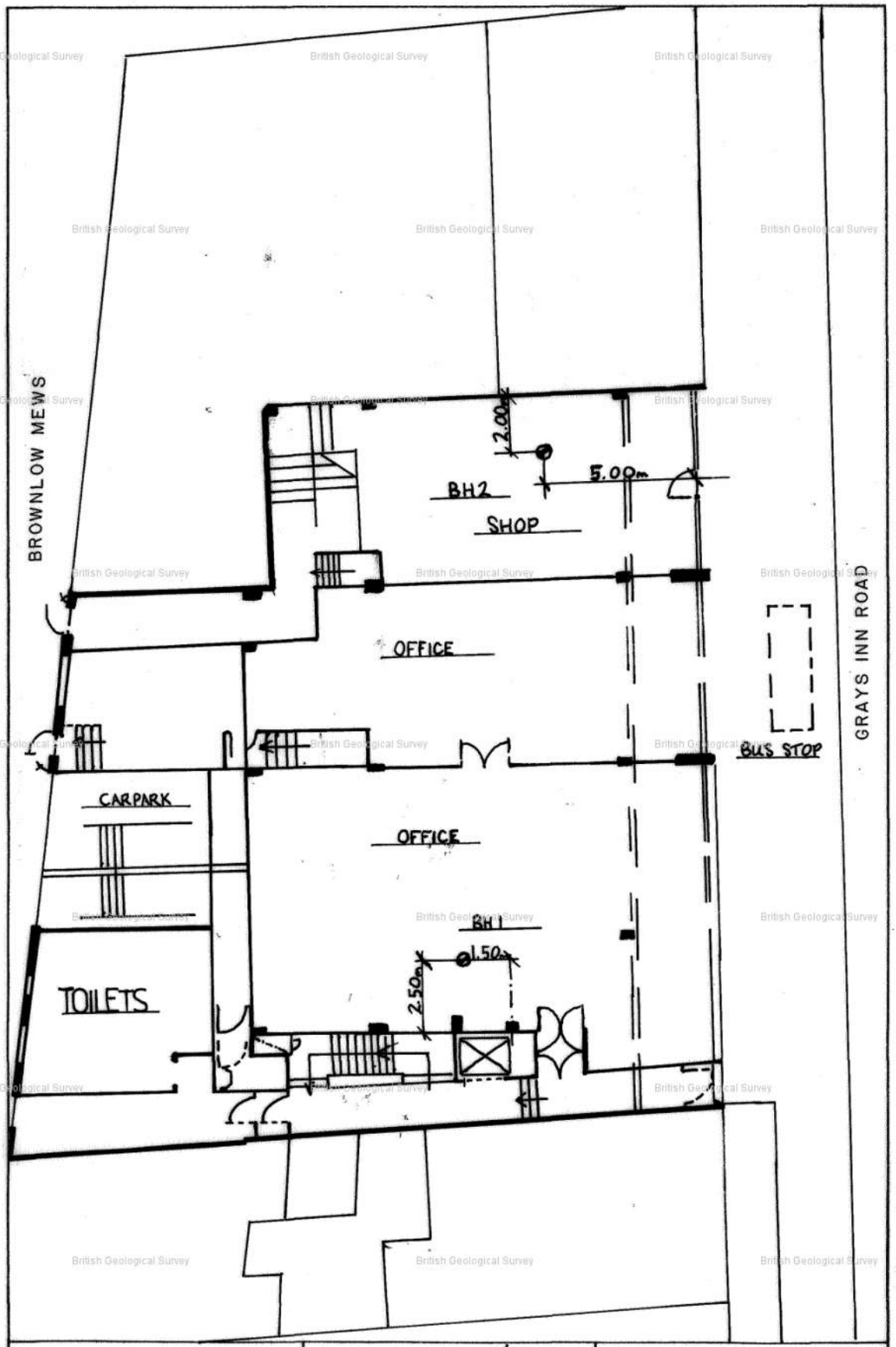
213923

FIGURE 11

Appendix 4 – Results from nearby boreholes

● Site location

Results from boreholes at this location included overleaf



Terresearch Limited	Report No. S90/709	Figure No. 1

A4 Admel P6472

Contract: Grays Inn Road

Client: Gazeley Properties Limited

Borehole No. 1
Sheet No. 1 Of 3.
Depth 0 to 10 metres.

Equipment and Methods
Light Cable Percussion Boring
150mm Diameter

Orientation : Vertical

Ground Level : (m.O.D.)

Coordinates :

Job Number : S39/709

Location :

Dates : 5/12/89
15/12/89

Daily Prog.	Water Levels	Remarks	In Situ Tests	Samples Taken	Depth (Thick)	Reduced Level	Description	Legend
					0.00			
					(0.50)		MADE GROUND (concrete)	
					0.50			
				B 46	(1.00)		MADE GROUND (clay and rubble fill)	
				U 47	1.50			
				J 48			MADE GROUND (Dense very clayey SAND with fine to medium gravel, traces of ash and brick)	
					(1.70)			
				U 49	3.20			
5/12				J 50			Dense fine to coarse SAND with fine to coarse subangular gravel	
5/12								
	▽ 8/12/89		C 45	B 51				
				J 44				
	▽ 15/12/89		C 53	W 45				
				B 52				
				J 46				
					(7.80)			
			C 48	B 53				
				J 48				
			C 49	B 54				
				J 50				
					10.00		Continued	

Operator
WI

General Remarks:
Water added to assist boring from 10.5m to 11.0m. Water level observation tube installed to 12.45m.

Appendix
1

Scale
10m/sheet

Sheet No.
1

Contract: Grays Inn Road

Client: Gazeley Properties Limited

Borehole No. 1

Sheet No. 2 Of 3.
Depth 10 to 20 metres.

Equipment and Methods
Light Cable Percussion Boring
150mm Diameter

Orientation : Vertical

Ground Level : (m.O.D.)

Coordinates :

Job Number : S39/709

Location :

Dates : 5/12/89
15/12/89

Daily Prog.	Water Levels	Remarks	In Situ Tests	Samples Taken	Depth (Thick)	Reduced Level	Description	Legend
			C 54	B 55	10.00			
6/12				J 52	(7.80)		Dense fine to coarse SAND with fine to coarse subangular gravel	
6/12								
	7/12/89			U 56	11.00			
				J 57			Firm to stiff grey very sandy silty CLAY	
					(2.00)			
				U 58				
				J 59	13.00			
							Very stiff fissured grey silty CLAY with lenses of fine sand	
				U 60				
				J 61	(3.00)			
				U 62				
7/12				J 63	16.00			
							Stiff grey brown silty CLAY with lenses of fine sand and occasional plant remains	
				U 64				
				J 65				
					(4.50)			
				J 66				
					20.00			
							Continued	

Operator
WI

General Remarks:
Water added to assist boring from 10.5m to 11.0m. Water level observation tube installed to 12.45m.

Appendix
1

Scale
10m/sheet

Sheet No.
2

Contract: Grays Inn Road

Client: Gazeley Properties Limited

Borehole No. 1

Sheet No. 3 Of 3.
Depth 20 to 30 metres.

Equipment and Methods
Light Cable Percussion Boring
150mm Diameter

Orientation : Vertical

Ground Level : (m.O.D.)

Coordinates :

Job Number : S39/709

Location :

Dates : 5/12/89
15/12/89

Daily Prog.	Water Levels	Remarks	In Situ Tests	Samples Taken	Depth (Thick)	Reduced Level	Description	Legend
				J 67	20.00			
					(4.50)		Stiff grey brown silty CLAY with lenses of fine sand and occasional plant remains	
				J 68	20.50			
				J 69			Stiff brown silty CLAY with pockets of blue grey silty clay	
					(4.00)			
				U 70				
				J 71				
15/12				J 72	24.50		End of Borehole	

Operator
WI

Scale
10m/sheet

General Remarks:
Water added to assist boring from 10.5m to 11.0m. Water level observation tube installed to 12.45m.

Appendix
1

Sheet No.
3

Contract: Grays Inn Road

Client: Gazeley Properties Limited

Borehole No. 2

Sheet No. 1 Of 3.
Depth 0 to 10 metres.

Equipment and Methods
Light Cable Percussion Boring
150mm Diameter

Orientation : Vertical

Ground Level : (m.O.D.)

Coordinates :

Job Number : S39/709

Location :

Dates : 29/11/89
1/12/89

Daily Prog.	Water Levels	Remarks	In Situ Tests	Samples Taken	Depth (Thick)	Reduced Level	Description	Legend
					0.00			
					(0.50)		MADE GROUND (concrete)	
					0.50			
			C 44	B 1			Dense fine to coarse SAND with fine to coarse GRAVEL	
				J 2				
			C 47	B 3	(3.00)			
				J 4				
			C 32	B 5				
29/11				J 6	3.50			
				U 7			Firm brown very sandy silty CLAY with fine to coarse rounded and subangular gravel	
29/11		(Brickearth band)		J 8	(1.00)			
			C 54	B 9	4.50		Dense fine to coarse SAND with fine to coarse rounded and subangular GRAVEL	
				J 10				
			C 52	B 11				
				J 12				
			C 52	B 13	(4.50)			
				J 14				
			C 55	B 15				
				J 16				
29/11			C 62	B 17				
29/11				J 18	9.00			
				U 19	(5.50)		Stiff fissured grey silty CLAY with lenses of fine sand and selenite and occasional pockets of pyritised wood	
					10.00			
							Continued	

Operator
WI

General Remarks:
Water added to assist boring from 9.0 to 9.5m.

Appendix
1

Scale
10m/sheet

Sheet No.
6

Contract: Grays Inn Road

Client: Gazeley Properties Limited

Borehole No. 2

Sheet No. 2 Of 3.
Depth 10 to 20 metres.

Equipment and Methods
Light Cable Percussion Boring
150mm Diameter

Orientation : Vertical

Ground Level : (m.O.D.)

Coordinates :

Job Number : S39/709

Location :

Dates : 29/11/89
1/12/89

Daily Prog.	Water Levels	Remarks	In Situ Tests	Samples Taken	Depth (Thick)	Reduced Level	Description	Legend
30/11				J 20	10.00		Stiff fissured grey silty CLAY with lenses of fine sand and selenite and occasional pockets of pyritised wood	
				U 21				
				J 22				
					(5.50)			
				U 23				
				J 24				
				U 25				
				J 26	14.50			
			S 66	J 27			Very stiff brown silty CLAY with pockets and lenses of red brown and grey silty clay	
30/11					(2.50)			
				U 28				
				J 29				
			S 72	J 30	17.00		Stiff brown silty CLAY with pockets of fine grey sand	
			S 14	B 31	(2.00)			
				U 32	19.00		Stiff brown silty sandy CLAY with pockets of blue grey silty clay	
				J 33	(1.00)			
					20.00		Continued	

Operator
WI

General Remarks:
Water added to assist boring from 9.0 to 9.5m.

Appendix
1

Scale
10m/sheet

Sheet No.
7

Contract: Grays Inn Road

Client: Gazeley Properties Limited

Borehole No. 2

Sheet No. 3 Of 3.
Depth 20 to 30 metres.

Equipment and Methods
Light Cable Percussion Boring
150mm Diameter

Orientation : Vertical

Ground Level : (m.O.D.)

Coordinates :

Job Number : S39/709

Location :

Dates : 29/11/89
1/12/89

Daily Prog.	Water Levels	Remarks	In Situ Tests	Samples Taken	Depth (Thick)	Reduced Level	Description	Legend
					20.00		Very stiff brown silty CLAY with pockets and lenses of red brown and grey silty clay	
			S 64	J 34				
				U 35				
				J 36	(5.00)			
1/12								
			S 70					
1/12					25.00		End of Borehole	

Operator
WI

General Remarks:
Water added to assist boring from 9.0 to 9.5m.

Appendix
1

Scale
10m/sheet

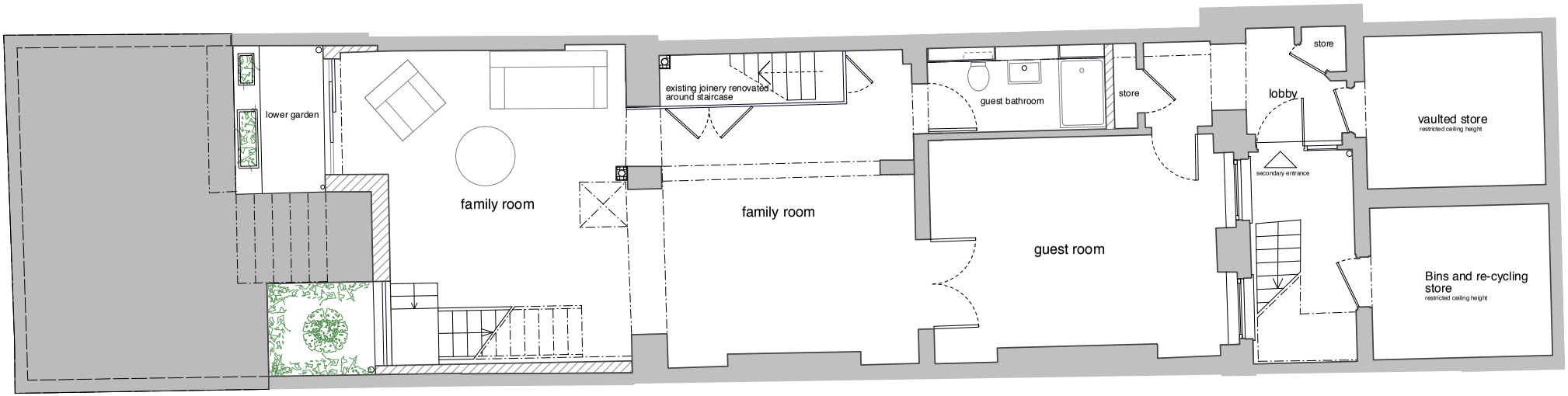
Sheet No.
8

Appendix 5 – Sample of planning drawings for alterations to No.46 Doughty Street

General Notes
Do not scale from this drawing
All dimensions to be verified on site
To be read in conjunction with all relevant documents
In the event of discrepancy notify the Architect immediately

Issue Status
SK Information F Feasibility D Design
P Permissions S Scheme T Tender
C Construction E Existing Condition

existing construction
new construction



B: Withdrawn - revised following comments from Camden and submitted for planning (14.09.10 /CC)

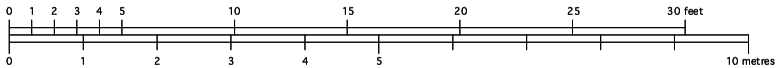
A: Withdrawn and re-submitted for planning (4.03.10/CC)

(_): Submitted for Planning (15.12.09/CC)

Revision: Information (date/drawn by)

Gross area 87 SqM

SCALE BAR



HUGH CULLUM
ARCHITECTS LTD
Bloomsbury Design
51b Judd Street
London WC1H 9QT
t 020 7383 7647
f 020 7387 7645
mail@hughcullum.com

46 Doughty Street

Design
Proposed Basement
1:50 @A2 June 2010

DS046-P-101(B)

Appendix 6 – Thames Water asset location search

Asset Location Search

Eastwood and Partners
Principle House 121 - 123,

FLEET
GU51 3PD

Search address supplied	47 Doughty St 47 Doughty St London WC1N 2LW
Your reference	47 Doughty St
Our reference	ALS/ALS Standard/2015_3213752
Search date	9 December 2015

You are now able to order your Asset Location Search requests online by visiting
www.thameswater-propertysearches.co.uk

searchcode

Asset Location Search

Search address supplied: 47 Doughty St, 47, Doughty St, London, WC1N 2LW

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This searchprovides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0845 070 9148, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

Asset Location Search

Waste Water Services

Please provide a copy extract from the public sewer map.

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an ‘as constructed’ record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arran e [redacted] low and

Asset Location Search

pressure test to be carried out for a fee.

For your guidance:

- [redacted]sets other t[redacted] vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

A charge will be added to your suppliers account.

Asset Location Search

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0845 850 2777
Email: developer.services@thameswater.co.uk

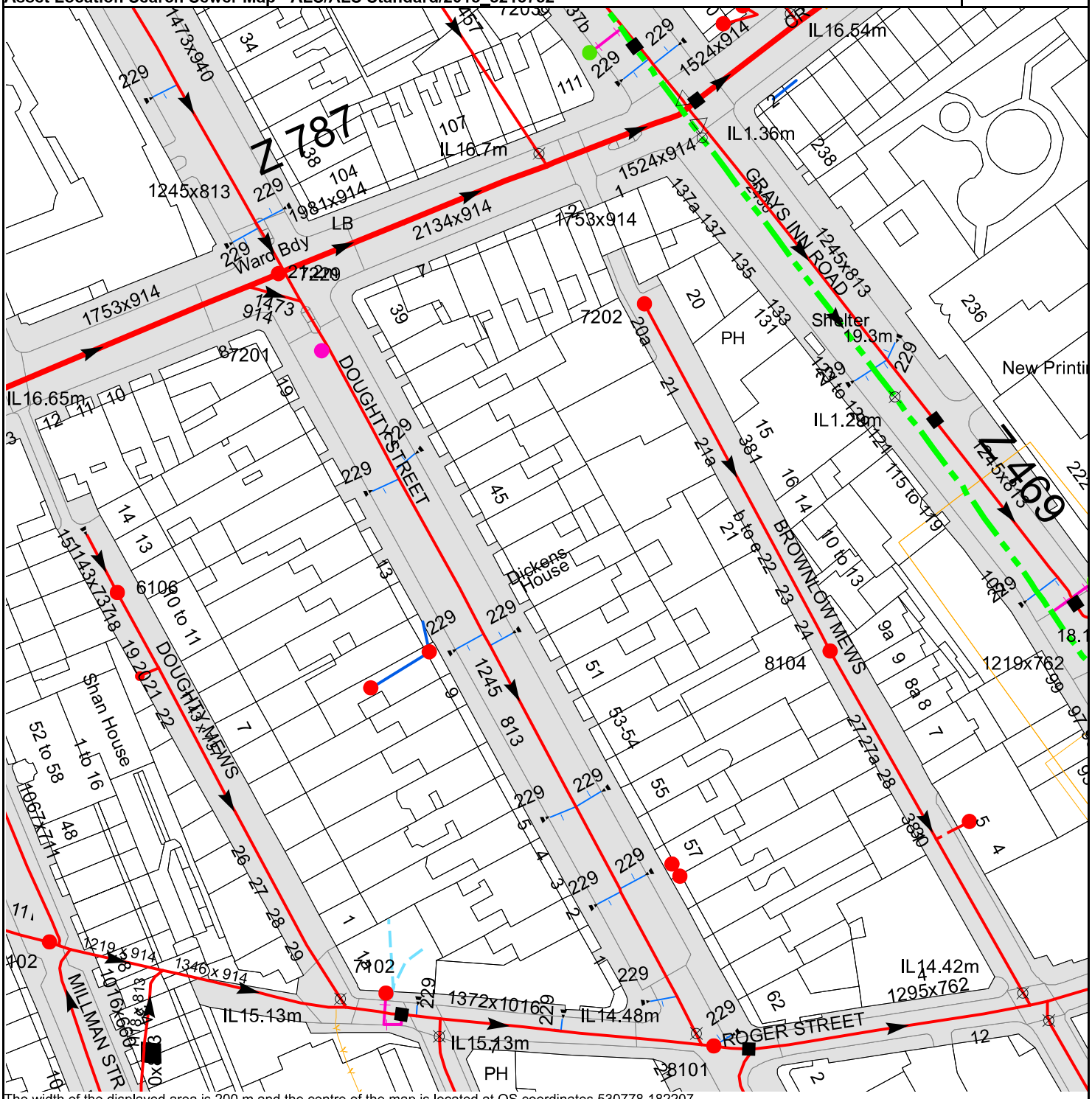
Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0845 850 2777
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2015_3213752



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 530778,182207

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
8101	20.43	14.38
7102	n/a	n/a
81BJ	n/a	n/a
81CA	n/a	n/a
8195	n/a	n/a
71FJ	n/a	n/a
71GA	n/a	n/a
8104	19.12	16.56
7201	21.05	n/a
7202	20.25	19.49
7229	21.17	16.49
7203	20.55	n/a
83IH	n/a	n/a
6102	20.49	15.73
6106	20.63	17.22
711A	n/a	n/a

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

Control Valve

Drop Pipe

Ancillary

Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

Outfall

Undefined End

Inlet

Other Symbols

Symbols used on maps which do not fall under other general categories

Public/Private Pumping Station

Change of characteristic indicator (C.O.C.I.)

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

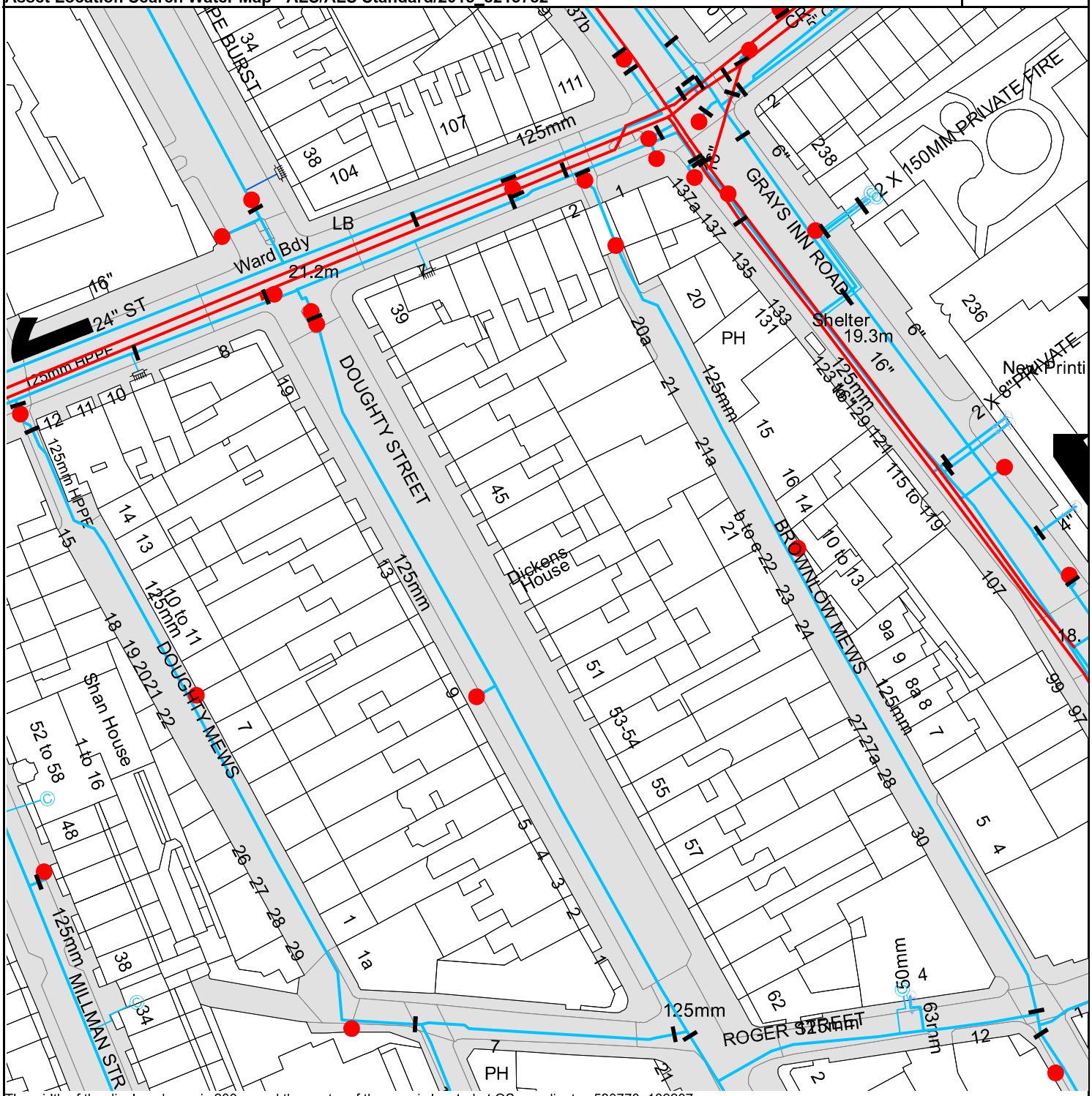
Proposed

Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plans are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole level indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

Asset Location Search Water Map - ALS/ALS Standard/2015_3213752



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 530778, 182207.

ALS Water Map Key

Water Pipes (Operated & Maintained by Thames Water)

4"

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

16"

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

3" SUPPLY

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

3" FIRE

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

3" METERED

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Other Water Pipes (Not Operated or Maintained by Thames Water)

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL`s terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to him at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**	**Cheque**
Call **0845 070 9148** quoting your invoice number starting CBA or ADS.	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number	Made payable to '**Thames Water Utilities Ltd**' Write your Thames Water account number on the back. Send to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW** or by DX to **151280 Slough 13**

Search Code

IMPORTANT CONSUMER PROTECTION INFORMATION

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
- monitor their compliance with the Code

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if he finds that you have suffered actual loss as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

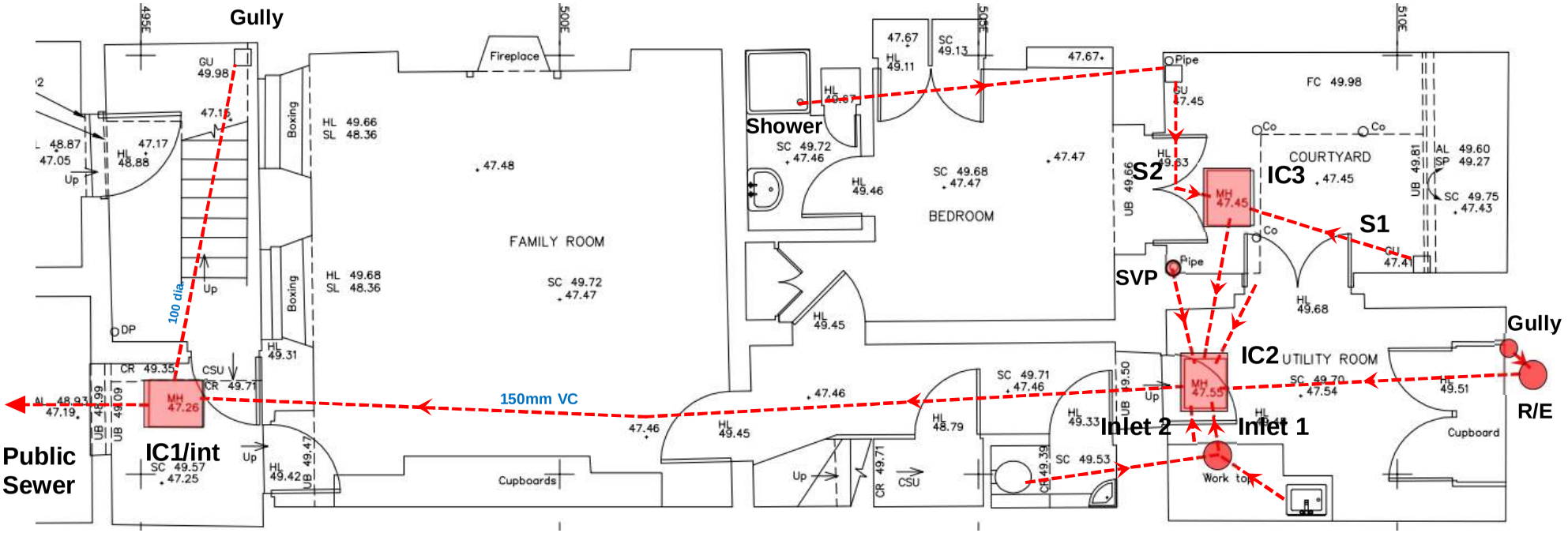
TPOs Contact Details

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE

Appendix 7 – Drainage survey plan drawing



Unable to survey Inlets 1 & 2

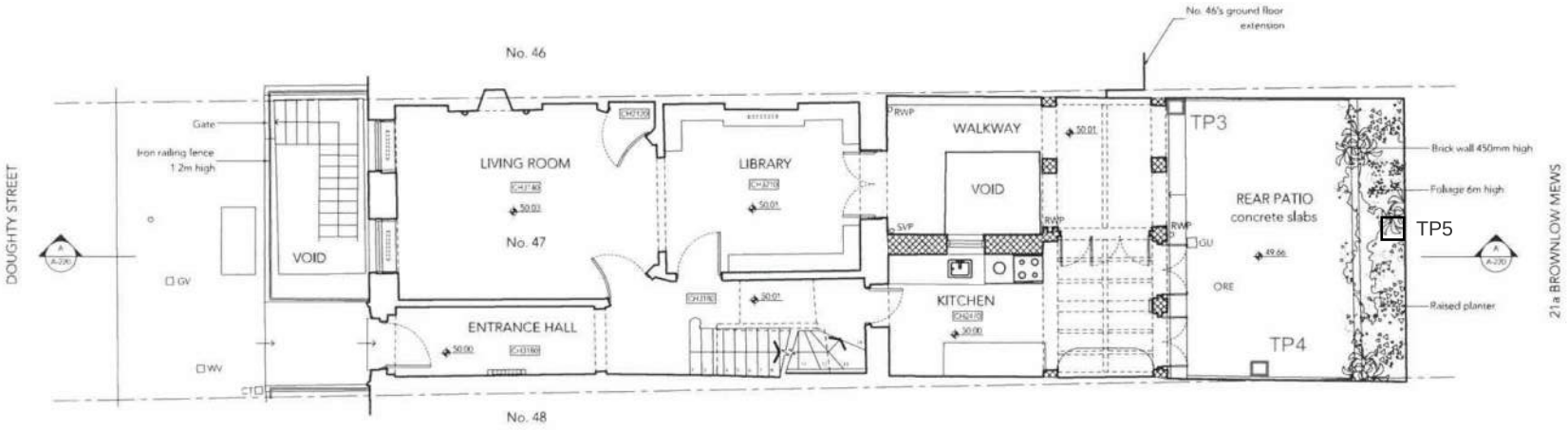
CW Drain | CW Manhole | SVP

Drawing by DRAINCAD

Site:
47 Doughty Street
WC1N 2LW

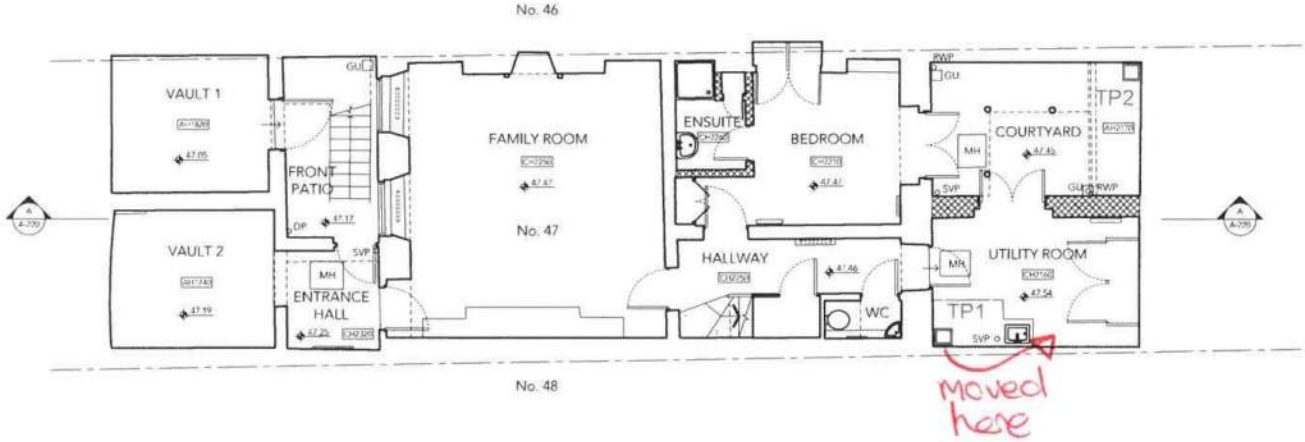
Scale
NTS

Appendix 8 – Results from intrusive ground investigations



1 EXISTING GROUND FLOOR PLAN
scale 1:100

Trial pits in corners to establish foundations for both walls



2 EXISTING BASEMENT PLAN
scale 1:100

0 2m 4m

NOTE
DO NOT SCALE FROM THIS DRAWING, EXCEPT FOR TOWN PLANNING PURPOSES.
THIS DRAWING IS THE PROPERTY OF TG STUDIO AND COPYRIGHT IS RESERVED BY THEM.
THIS DRAWING IS ISSUED ON CONDITION THAT IT IS NOT REPRODUCED, USED OR DISCLOSED BY OR TO ANY UNAUTHORIZED PERSON WITHOUT THE PRIOR CONSENT OF TG STUDIO.
THE AREAS ON THIS DRAWING HAVE BEEN CALCULATED FROM A CAD DRAWING AND HAVE NO TOLERANCES ADDED OR SUBTRACTED.

STATUS: PRE-PLANNING DATE: 18.09.2015

N

LEGEND

	Existing structures
	Structures to be demolished
CH----	Ceiling height
AH----	Arch height

STUDIO
Architecture & Interior Design
13 RATHBONE PLACE LONDON W1T 1HP T 020 7636 3030 F 020 7636 3031 W WWW.TG-STUDIO.CO.UK

PROJECT: 47 DOUGHTY STREET, LONDON WC1N 2LW

DRAWING: EXISTING BASEMENT & GROUND FLOOR PLAN

DATE: 18.09.2015	DRAWN BY: EG	CHECKED BY: TG	
STATUS: PRE-PLANNING	SCALE @ A3: 1:100		
JOB NO: 163	DWG NO: A-200	REV: -	

AP GEOTECHNICS
T 01932 848460
F 01932 851255
E mail@apgeotechnics.co.uk

Site	Trial Pit Number
47 DOUGHTY STREET, WL1N 2LW	TP1

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Excavated by hand			Eastwood & Partners Consulting Engineers	4376
	Location	**Dates**	**Engineer**	**Sheet**
	See site plan	13/10/2015		1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.03)	Brick tiles		
					0.03			
					(0.03)	Screed		
					0.06			
					(0.16)	Concrete		
					0.22			
0.50	D1					MADE GROUND: Light becoming dark brown silty sand with some gravel sized fragments of brick, shell and flint		
					(1.02)			
0.90	D2							
1.00	D3							
					1.24			
						MADE GROUND: Dark brown very sandy clay with some gravel sized fragments of brick, concrete, shell and flint		
1.50	D4							
2.00	D5				(1.76)			
2.50	D6							
					3.00			
3.00	D7					Complete at 3.00m		

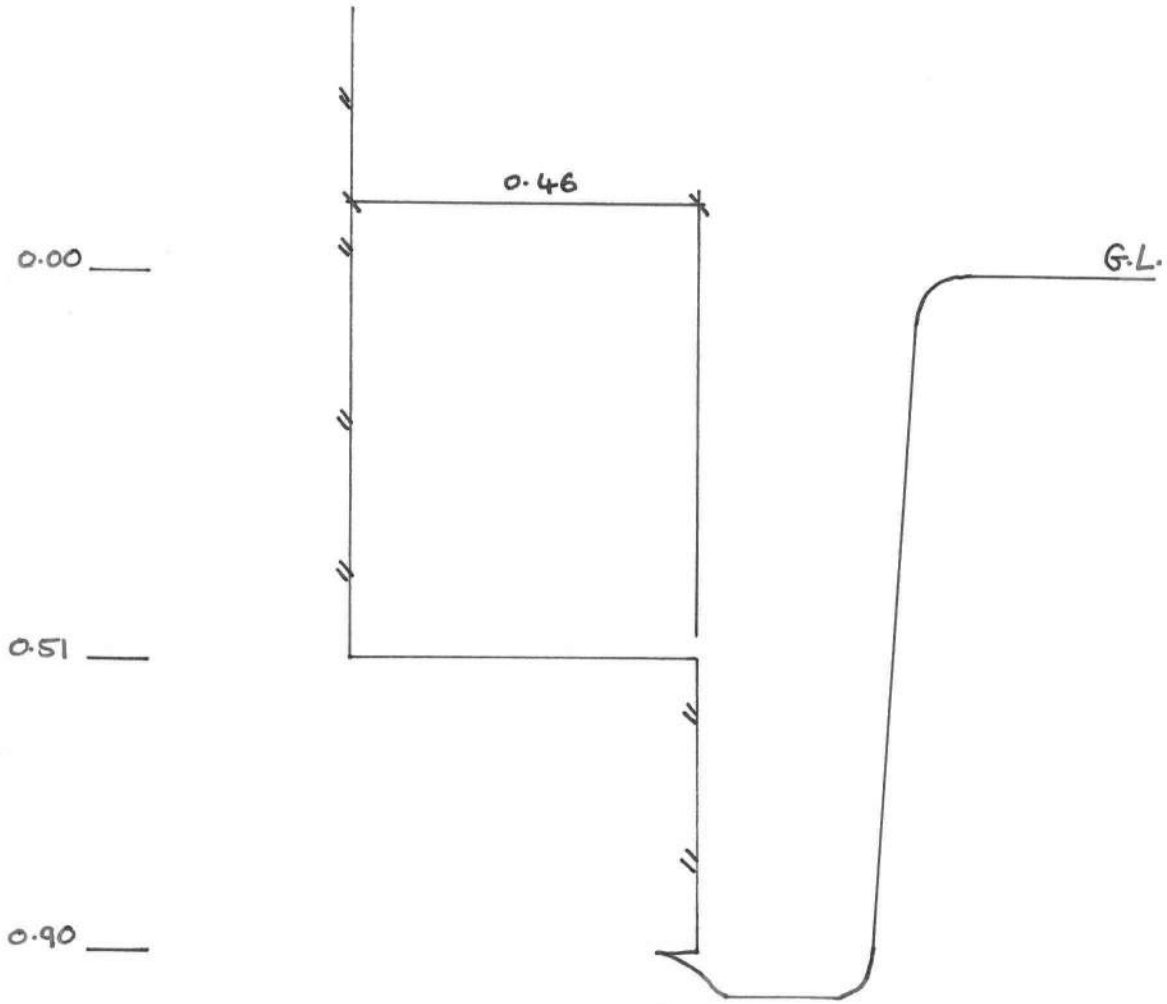
Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	AB	4376.TP1

AP GEOTECHNICS	T 01932 848460 F 01932 851255 E mail@apgeotechnics.co.uk	Site 47 DOUGHTY STREET, WL1N 2LW	Trial Pit Number TP1

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Excavated by hand			Eastwood & Partners Consulting Engineers	4376
	Location See site plan	**Dates** 13/10/2015	**Engineer**	**Sheet** 2/2



	Scale (approx)	Logged By	Figure No.
	1:10	AB	4376.TP1

AP GEOTECHNICS
T 01932 848460
F 01932 851255
E mail@apgeotechnics.co.uk

Site	Trial Pit Number
47 DOUGHTY STREET, WL1N 2LW	TP2

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Excavated by hand			Eastwood & Partners Consulting Engineers	4376
	Location	**Dates**	**Engineer**	**Sheet**
	See site plan	13/10/2015		1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.03)	Brick tiles		
					0.03			
					(0.36)	Concrete ...steel at 0.15m depth ...steel at 0.2m depth		
0.40	D1				0.39	MADE GROUND: Dark brown silty sandy gravelly clay with some gravel sized fragments of brick, concrete and flint		
0.50	D2							
1.00	D3					...layer of clayey silty gravelly sand (~100mm)		
					(1.86)			
1.50	D4							
2.00	D5							
					2.25	MADE GROUND: Dark brown very sandy gravelly clay with some gravel sized fragments of brick and flint		
2.50	D6							
					(0.75)			
3.00	D7				3.00	Complete at 3.00m		

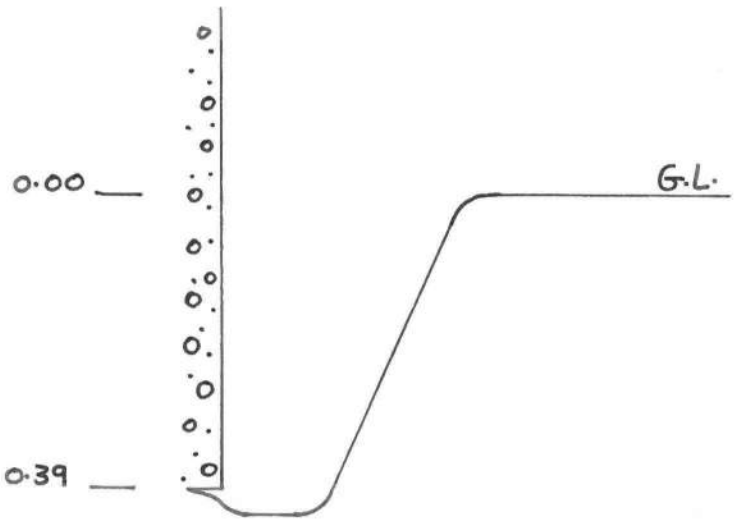
Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	AB	4376.TP2

AP GEOTECHNICS	T 01932 848460 F 01932 851255 E mail@apgeotechnics.co.uk	Site 47 DOUGHTY STREET, WL1N 2LW	Trial Pit Number **TP2**

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Excavated by hand			Eastwood & Partners Consulting Engineers	4376
	Location See site plan	**Dates** 13/10/2015	**Engineer**	**Sheet** 2/2



	Scale (approx)	Logged By	Figure No.
	1:10	AB	4376.TP2

AP GEOTECHNICS
T 01932 848460
F 01932 851255
E mail@apgeotechnics.co.uk

Site	Trial Pit Number
47 DOUGHTY STREET, WL1N 2LW	TP3

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Excavated by hand			Eastwood & Partners Consulting Engineers	4376
	Location	**Dates**	**Engineer**	**Sheet**
	See site plan	13/10/2015		1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.04) 0.04	Concrete		
					(0.66)	MADE GROUND: Dark brown silty sand with some gravel sized fragments of brick, shell and flint		
0.50	D1				0.70			
0.90	D2					MADE GROUND: Dark brown silty sand with abundant gravel sized fragments of brick and flint		
1.00	D3				(1.05)			
1.50	D4				1.75			
						MADE GROUND: Dark brown silty sand with some gravel sized fragments of brick, concrete and shell		
2.00	D5				(1.25)			
2.50	D6							
3.00	D7				3.00			
						Complete at 3.00m		

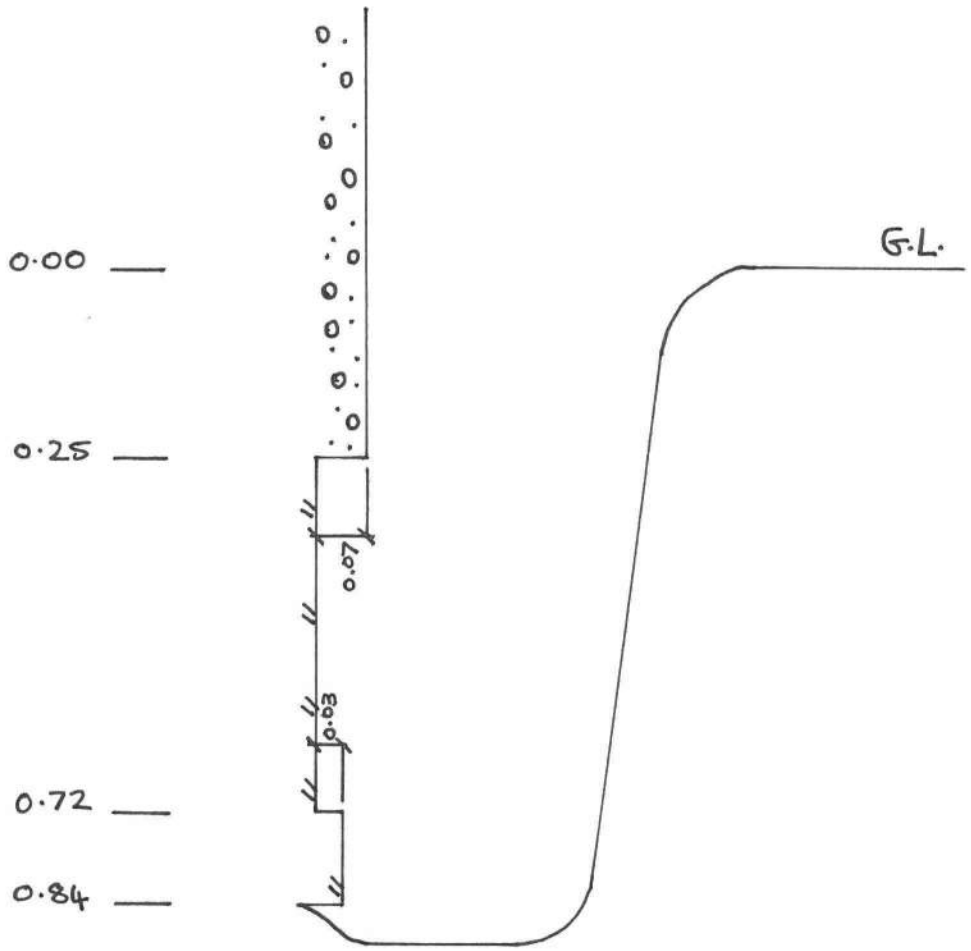
Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	AB	4376.TP3

AP GEOTECHNICS	T 01932 848460 F 01932 851255 E mail@apgeotechnics.co.uk	Site 47 DOUGHTY STREET, WL1N 2LW	Trial Pit Number TP3

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Excavated by hand			Eastwood & Partners Consulting Engineers	4376
	Location See site plan	**Dates** 13/10/2015	**Engineer**	**Sheet** 2/2



	Scale (approx)	Logged By	Figure No.
	1:10	AB	4376.TP3

AP GEOTECHNICS
T 01932 848460
F 01932 851255
E mail@apgeotechnics.co.uk

Site	Trial Pit Number
47 DOUGHTY STREET, WL1N 2LW	TP4

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Excavated by hand			Eastwood & Partners Consulting Engineers	4376

Location	Dates	Engineer	Sheet
See site plan	13/10/2015		1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.04) 0.04	Concrete		
						MADE GROUND: Brown silty sand with abundant gravel sized fragments of brick and flint		
0.30	D1							
0.50	D2				(1.21)			
0.82	D3					...layer of sandy gravel of brick and flint (~100mm)		
1.00	D4							
					1.25	MADE GROUND: Brown very silty sand with some gravel sized fragments of brick, concrete and flint		
1.50	D5							
2.00	D6				(1.75)			
2.50	D7							
					3.00			
3.00	D8					Complete at 3.00m		

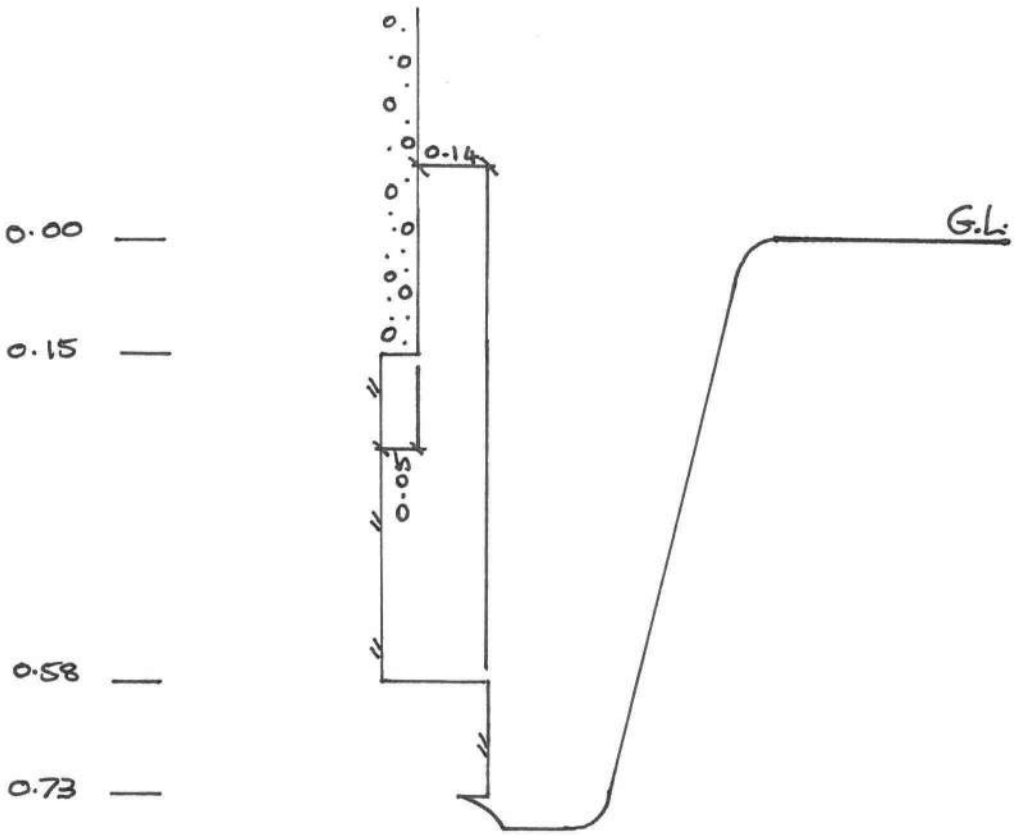
Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	AB	4376.TP4

AP GEOTECHNICS	T 01932 848460 F 01932 851255 E mail@apgeotechnics.co.uk	Site 47 DOUGHTY STREET, WL1N 2LW	Trial Pit Number TP4

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Excavated by hand			Eastwood & Partners Consulting Engineers	4376
	Location See site plan	**Dates** 13/10/2015	**Engineer**	**Sheet** 2/2



	Scale (approx)	Logged By	Figure No.
	1:10	AB	4376.TP4

AP GEOTECHNICS
T 01932 848460
F 01932 851255
E mail@apgeotechnics.co.uk

Site	Trial Pit Number
47 DOUGHTY STREET, WL1N 2LW	TP5

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Excavated by hand			Eastwood & Partners Consulting Engineers	4376
	Location	**Dates**	**Engineer**	**Sheet**
	See site plan	04/02/2016		1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(2.55)	MADE GROUND: Dry dark brown mottled red and cream organic silty gravelly sand with abundant fine to medium and occasionally coarse gravel sized fragments of flint, brick, concrete, plastic and waste		
					2.55	Complete at 2.55m		

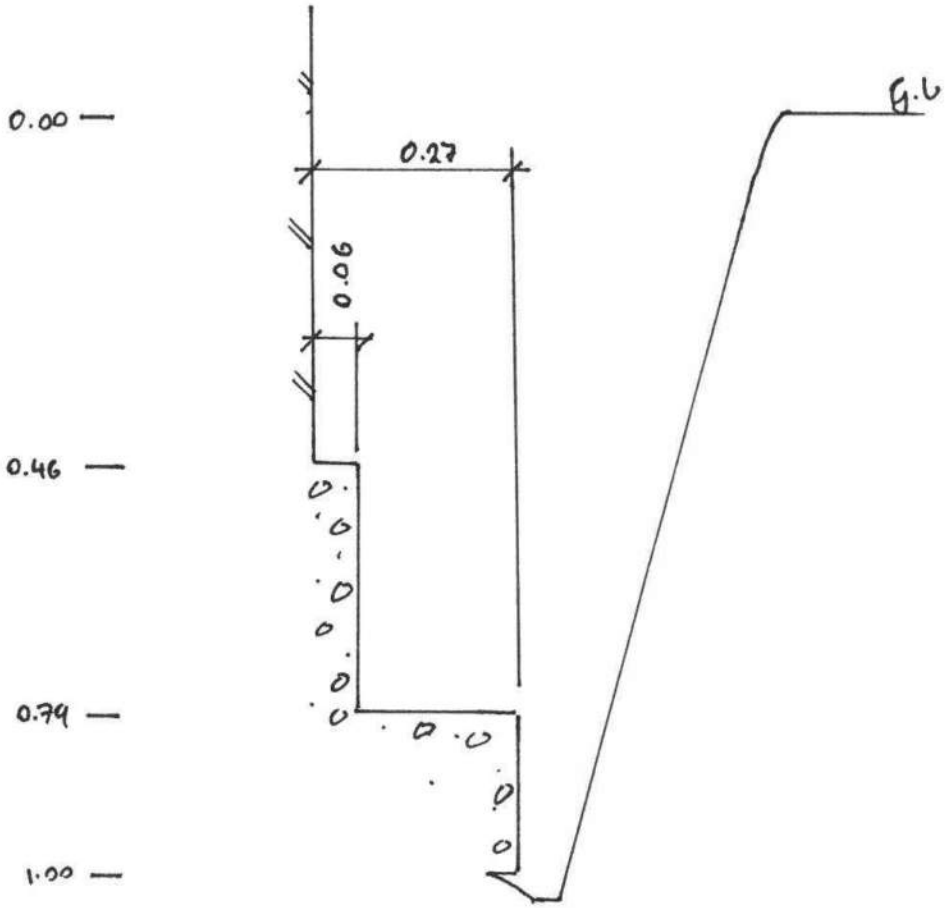
Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	AB	4376.TP5

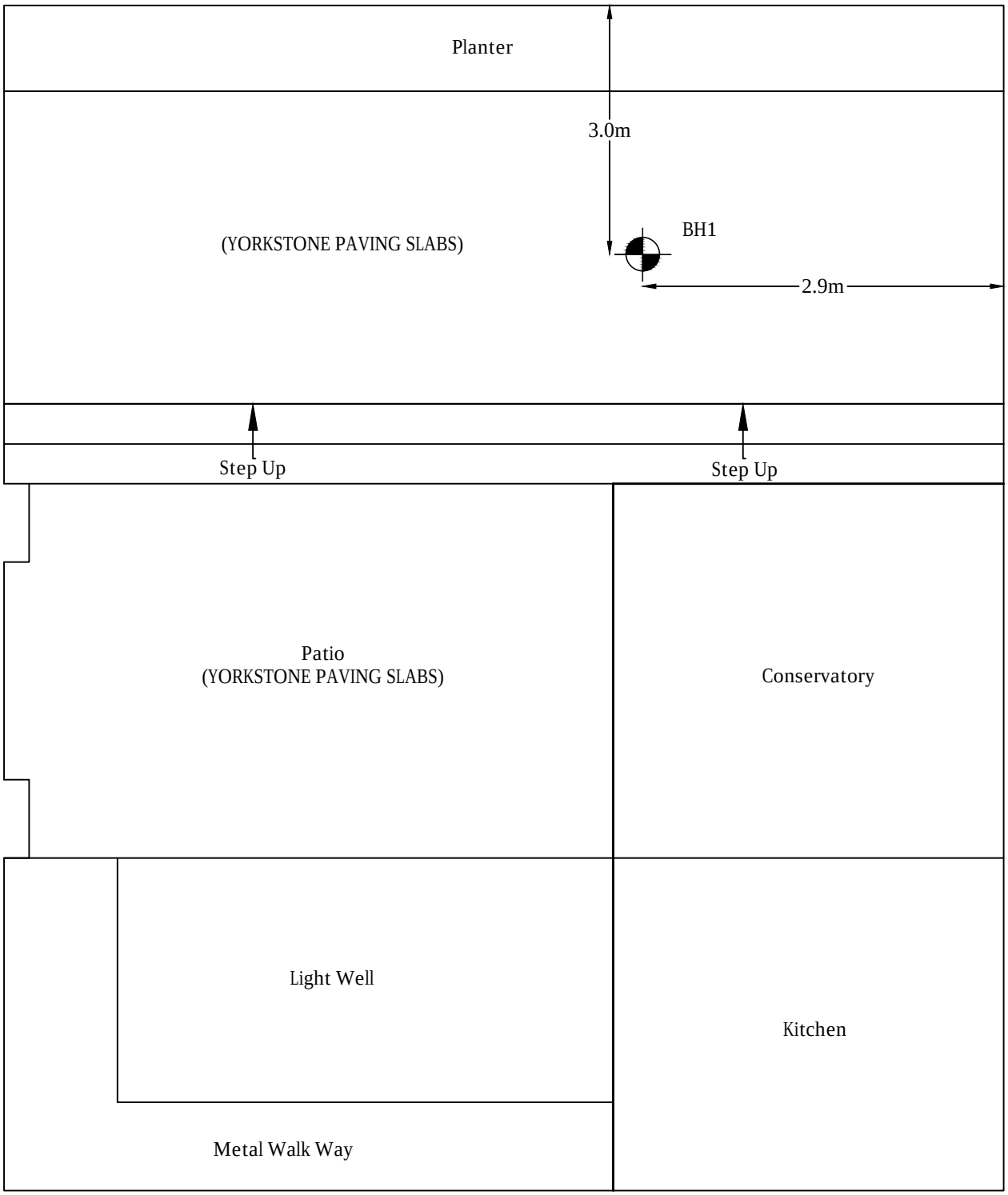
AP GEOTECHNICS	T 01932 848460 F 01932 851255 E mail@apgeotechnics.co.uk	Site 47 DOUGHTY STREET, WL1N 2LW	Trial Pit Number **TP5**

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Excavated by hand			Eastwood & Partners Consulting Engineers	4376
	Location See site plan	**Dates** 01/01/2016	**Engineer**	**Sheet** 2/2



	Scale (approx)	Logged By	Figure No.
	1:10	AB	4376.TP5

Client: TG Studios	Scale: N.T.S	Sheet: 1 of 1	Date: 24.05.16	
Location: 47 Doughty Street, London WC1N 2LW	Job No.: 7004	Weather: Fine	Drawn by: LF	Checked by: JH



Notes:

Key: BH Borehole

Chelmer
Site Investigations
'Groundbreaking Services'

Client: TG Studios	Scale: N.T.S.	Sheet No: 1 of 2	Weather: Fine	Date: 24.05.16
Site: 47 Doughty Street, London WC1N 2LW	Job No: 7004	Borehole No: 1	Boring method: /C! млл ΥΥq {Ŝ0̂2yŘΥŀy	

Depth Mtrs	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
G.L.	YORKSTONE PAVING SLABS	0.03					No roots observed.		
0.03	SAND	0.08							
0.11	MADE GROUND: Dark brown very gravelly silty medium sand with numerous brick, clinker-like, lime mortar and ceramic fragments.	1.39		D					0.5
				D	M	17 18 16 18			1.0
				D					1.5
1.5	MADE GROUND: Moist black sandy silt with numerous oyster shell, brick, lime mortar and ceramic fragments.	1.0		D	M	18 17 16 18			2.0
				D					2.5
2.5	MADE GROUND: Dark grey-brown silty sand with numerous ceramic, oyster shell and clinker-like fragments.	1.5		D	M	18 18 19 19			3.0
				D					3.5
				D					4.0
4.0	MADE GROUND: Dark grey-brown gravelly silty clay with numerous oyster shell, ceramic, lime mortar and brick fragments.	1.5		D					4.5
				D					5.0
				D					5.5
5.5	MADE GROUND: Dark grey-brown slightly gravelly silty clay with numerous lime mortar and brick fragments.	5.3		D					6.0
	...becoming brown mottled dark brown from 8.0m.			D					7.0
	...becoming brown from 8.0m.			D					8.0
	.....with rare clinker-like fragments at 9.0m.			D					9.0
				D					10.0

Drawn by: LF	Approved by: JH

Remarks:

CONTINUED ON SHEET 2 OF 2

Key: CFA Continuous Flight Auger
GL Ground Level
D Small Disturbed Sample
M Mackintosh Probe

Chelmer
Site Investigations
'Groundbreaking Services'

Client: TG Studios	Scale: N.T.S.	Sheet No: 2 of 2	Weather: Fine		Date: 24.05.16
Site: 47 Doughty Street, London WC1N 2LW	Job No: 7004	Borehole No: 1	Boring method: /C! мллƳƳq {Ŝů2yŘƳƚy		

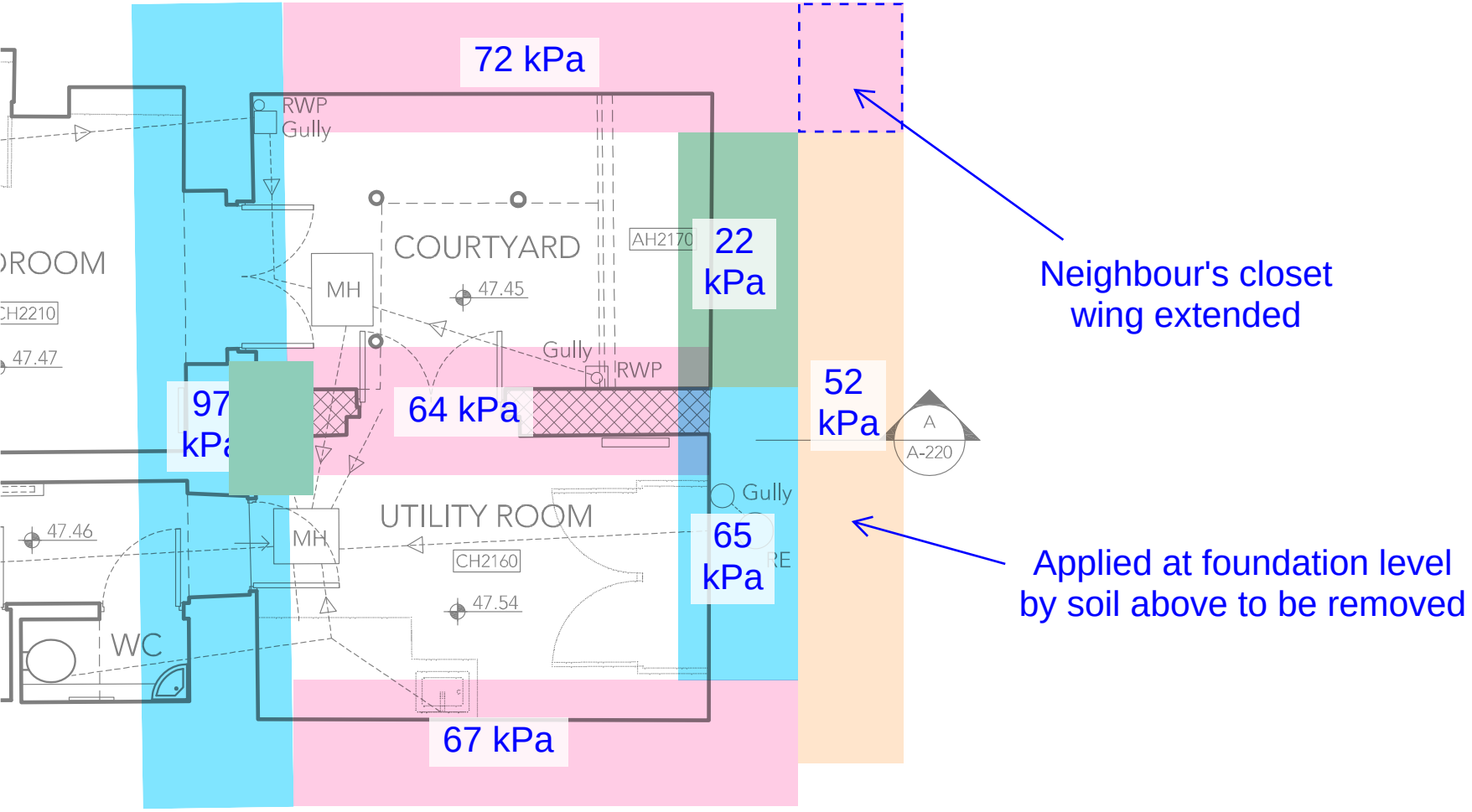
Depth Mtrs	Description of Strata	Thick-ness	Legend	Sample	Test Type Result	Root Information	Depth to Water	Depth Mtrs
10.8	Medium dense wet brown SAND with occasional gravel. (HACKNEY GRAVEL MEMBER)			D				11.0
	...becoming very gravelly from 12.1m.			D				12.0
				D				13.0
		7.3		D				14.0
				D				15.0
				D				16.0
				D				17.0
	...becoming sand and gravel from 18.0m.			D				18.0
18.1	Borehole ends at 18.1m							

Drawn by: LF | Approved by: JH

Remarks: *Unable to carry out insitu tests from 4.0m due to borehole collapsing.*
Borehole wet and collapsed to 10.5m on completion.
мpƳƳq ƚłƚǎůŎ ǎůƚyŘƚƚŜ ƛyǎůƚŜŘ ů2 мл‰pƳ ŏƚƚƚŜ2ÈƛƳƚůŜťè л‰нƳ concrete, 0.8m bentonite seal, 9.5m shingle surround, bung, valve and square plastic cover).

Key: CFA Continuous Flight Auger
D Small Disturbed Sample

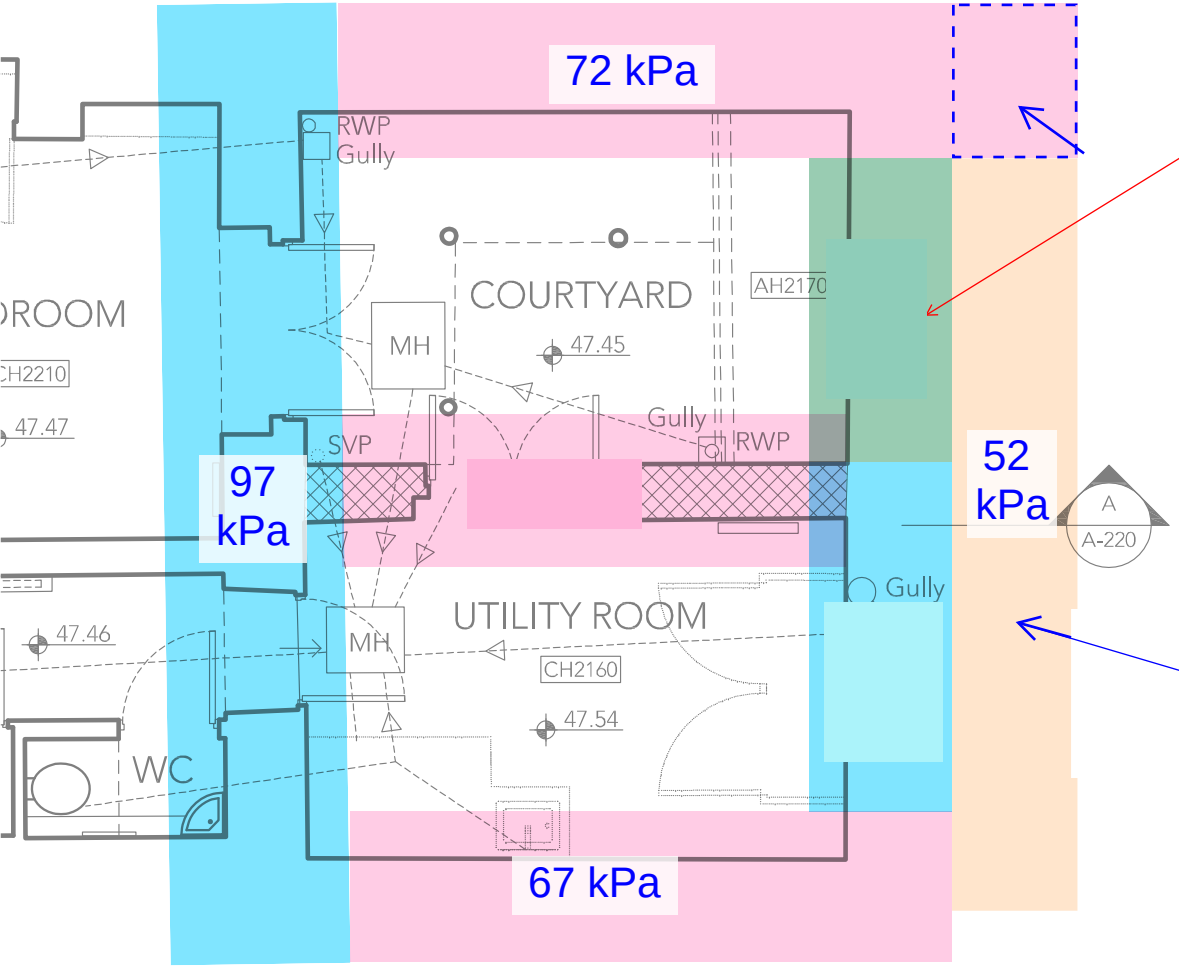
Appendix 9 – Existing and proposed bearing pressures



Existing applied bearing pressures

Pressures currently applied by superstructures, assuming 33% live load

Note: 900mm overbearing between basement FFL and foundation level is ignored. This will add approx. 18kPa to all of the figures on these two pages.



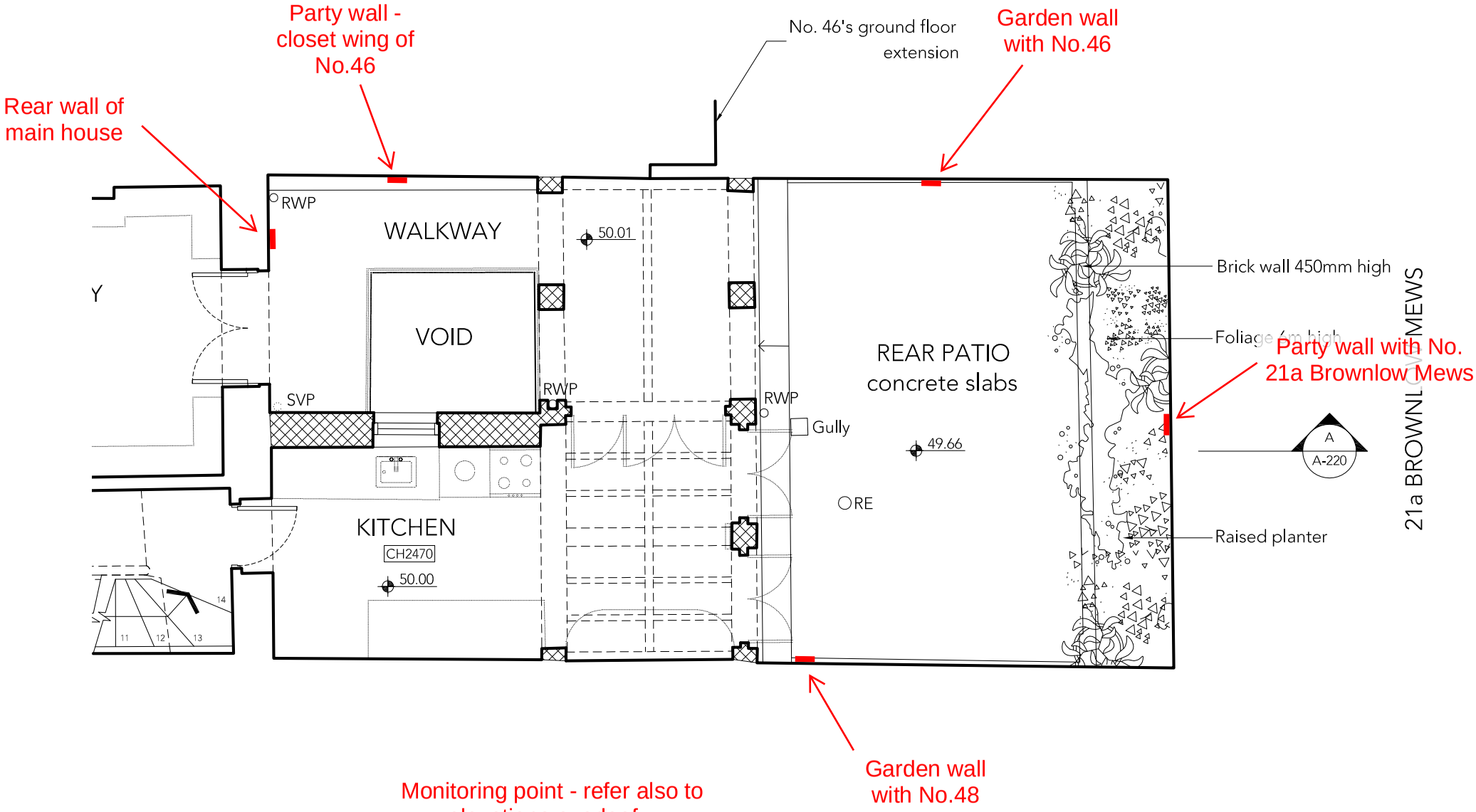
There will be no increase in applied bearing pressure compared to the existing bearing pressure as the new extension and basement will be supported on a piled raft taking the loads below the existing foundation level .

existing applied bearing pressures shown thus.

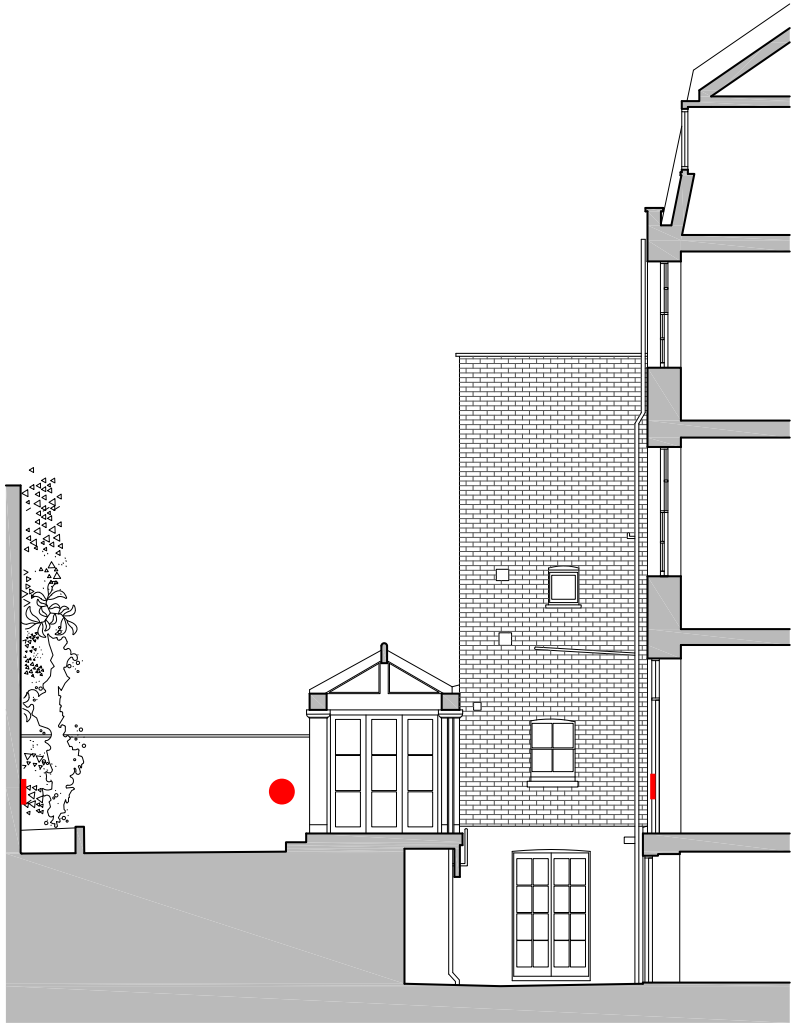
Proposed applied bearing pressures

Pressures currently applied by superstructures, assuming 33% live load

Appendix 10 – Suggested movement monitoring points


Party wall - closet wing of No.46
Rear wall of main house
No. 46's ground floor extension
Garden wall with No.46
RWP
WALKWAY
50.01
VOID
SVP
RWP
RWP
Gully
REAR PATIO
concrete slabs
49.66
RE
KITCHEN
CH2470
50.00
Brick wall 450mm high
Foliage 4m high
Party wall with No. 21a Brownlow Mews
A
A-220
Raised planter
21a BROWNLOW MEWS
Garden wall with No.48
Monitoring point - refer also to elevations overleaf.
All monitoring points to be about 1 metre above ground level.

2 EXISTING REAR ELEVATION
scale 1:100



4 EXISTING SIDE ELEVATION
scale 1:100