GROUND INVESTIGATION AND BASEMENT IMPACT REVIEW REPORT

29 & 30 Lyndhurst Road
London NW3

Client: Design and Build Contractors
MY Construction
Carpentry Limited

J10240A

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GEA Geotechnical & Environmental Associates

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CONTENTS

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

The development of a new basement extension at Nos 29 & 30 Lyndhurst Road is nearly complete and planning consent was granted on the basis of the findings of a ground investigation carried out by GEA in 2010, with a basement Impact Assessment (BIA) not required at that time. Subsequently, the proposed development has been constructed and included a small scheme change where the basement extended further into the rear garden than originally proposed. Two planning conditions were outstanding for the original proposed development and GEA has now been commissioned by MY Construction and Carpentry Ltd to assist in the discharge of these conditions.

This report presents the findings of a basement impact review and is based on the findings of the previous ground investigation, which for the purpose of completeness is repeated to a large extent within this report, and has been supplemented by some limited additional ground investigation. The Basement Impact Review has been based on the format of a Basement Impact Assessment, according to the guidance provided by the London Borough of Camden (LBC) Planning Guidance CPG4 in order to provide the relevant review structure.

SITE HISTORY

The earliest Ordnance Survey (OS) map, dated 1879, shows the site to be partially developed in the southern half by a small outbuilding, which was within the grounds of Rosslyn House. This map also shows what appears to have been some form of pond feature encroaching into the northwestern corner of the site at this time. Further study into the history of the area using online information, indicated that two tunnels had been constructed, one approximately 80 m north of the site and the other approximately 150 m south of the site, by 1879. These were used by the then London and Birmingham Railway. By 1896 Lyndhurst Road had been extended along the northern boundary of the site, which still remained part of Rosslyn House, although the pond had apparently been infilled and built over with greenhouses. The site was first developed with what appears to be the existing houses by 1915, by which time Rosslyn House to the east had been demolished and replaced with semi-detached properties. Apart from the increased residential development of the area, the site and surrounding area have remained essentially unchanged from the layout on the 1915 map until the present day.

GROUND CONDITIONS

Beneath a significant thickness of made ground, the Claygate Member of the London Clay Formation was encountered and proved to the maximum depth investigated. The made ground was encountered to depths of between 2.00 m (86.48 m OD) and 3.70 m (87.69 m OD). The underlying Claygate Member initially comprised soft and firm orange-brown mottled pale grey silty sandy clay with occasional gravel and layers of sandy silt which extended during the previous investigation to a level of 83.10 m OD. The Claygate Member was noted to be desiccated to a depth of 4.2 m in Borehole No 102. The Claygate Member comprised silty slightly clayey fine sand from 4.30 m (87.09 m OD) to the full depth of Borehole No 101, of 5.00 m within the front garden area. Below the initial horizon firm becoming stiff grey silty fissured clay extends to a depth of 13.30 m (78.40 m OD), whereupon stiff grey very silty sandy fissured clay is encountered to the maximum depth investigated of 17.55 m (74.15 m OD). During the previous investigation, a slow inflow of groundwater was encountered within the made ground at depth of 3.40 m (88.30 m OD). Subsequent monitoring of the standpipe installed into Borehole No 1 following the previous investigation, after a period of approximately two weeks, showed groundwater to be present at a depth of 5.00 m (86.70 m OD). Groundwater was noted during the recent investigation at a depth of 4.00 m (83.20 m OD) in Borehole No 102 and groundwater has subsequently been measured at a shallowest depth of 3.43 m (83.47 m OD) in the rear garden area.

BASEMENT IMPACT REVIEW

The Basement Impact Review has not indicated any concerns with regard to the effects of the proposed basement on the site and surrounding area, although the design should consider the effect of the removal of trees and the presence of desiccation. It has been concluded that the impacts identified can be mitigated by appropriate design and standard construction practice.

Part 1: INVESTIGATION REPORT

This section of the report details the objectives of the investigation, the work that has been carried out to meet these objectives and the results of the investigation. Interpretation of the findings is presented in Part 2.

1.0 INTRODUCTION

Geotechnical and Environmental Associates (GEA) has been commissioned by the Design and Build Contractors, MY Construction and Carpentry Ltd, to prepare a Basement Impact Review for the new basement extension beneath Nos 29 & 30 Lyndhurst Road.

The development is nearly complete and comprised, in part, the extension of the existing basement beneath the house and into the rear garden. GEA was commissioned in 2010 to carry out a desk study and ground investigation (ref J10240, dated 21 January 2011) and it is understood that the proposed development was approved by the London Borough of Camden (LBC) on 9 March 2011 (ref 2011/0174/P, dated 12 January 2011). At the time of the approval, no Basement Impact Assessment (BIA) was requested, although the impact of the development on the local hydrogeology was addressed in the Structural Engineers Report for Planning Application by Price & Myers (ref 19500, dated August 2010) and there was limited planning guidance in 2011 relating to the requirement for an assessment of the impact of the development on the local hydrogeology and hydrology.

Subsequently, the basement has been constructed with a larger footprint than was originally planned, extending into the rear garden, and this was addressed within a second Planning Application (ref 2014/7048/P, dated 24 November 2014) and includes '… and retaining wall at rear garden level'. Permission was granted on 16 January 2015, with no planning conditions that related to the retaining wall element of the works.

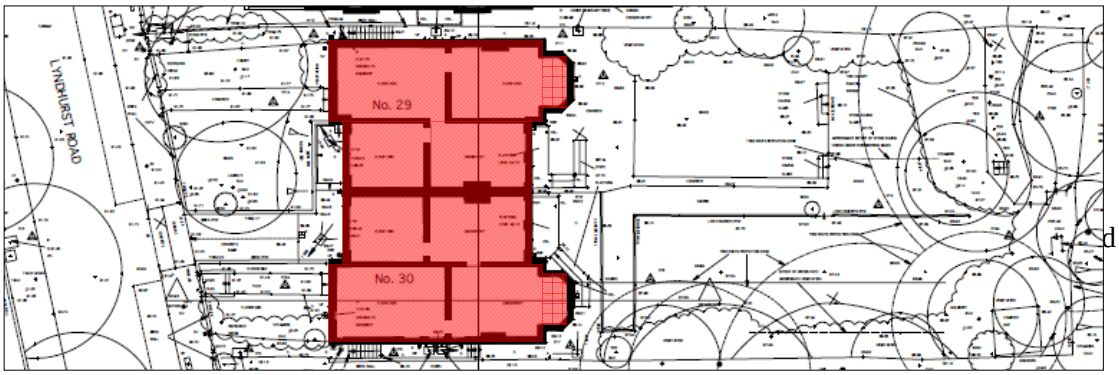
Two planning conditions from the original 2011 Planning Application do however remain outstanding and GEA has been commissioned to assist in the discharge of Conditions 7 and 8, which relate to mitigation measures relating to the build up of water and to assess the that development would not have unreasonable impact on groundwater conditions, hydrology or flood risk.

This report presents the findings of a basement impact review and is based on the findings of the previous ground investigation, which for the sake of completeness and clarity is reproduced to a large extent within this report. The Basement Impact Review has been based on the format of a Basement Impact Assessment, according to the guidance provided by the London Borough of Camden (LBC) Planning Guidance CPG4 in order to provide the relevant review structure, but does not cover all of the BIA requirements.

1.1 Proposed Development

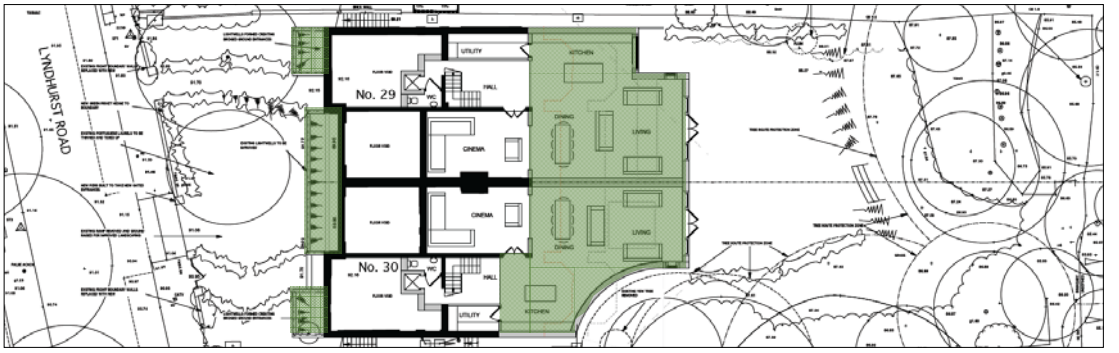
At the time of the original investigation in 2010, it was understood that it was proposed to carry out extensive refurbishment of the existing four-storey semi-detached townhouses, including the construction of an additional basement below existing lower ground floor and beyond the extent of the existing southern elevation. The new basement has been constructed roughly 2.1 m below existing lower ground floor level, to a level of 85.4 m OD.

The footprint of the former lower ground floor is shown below.



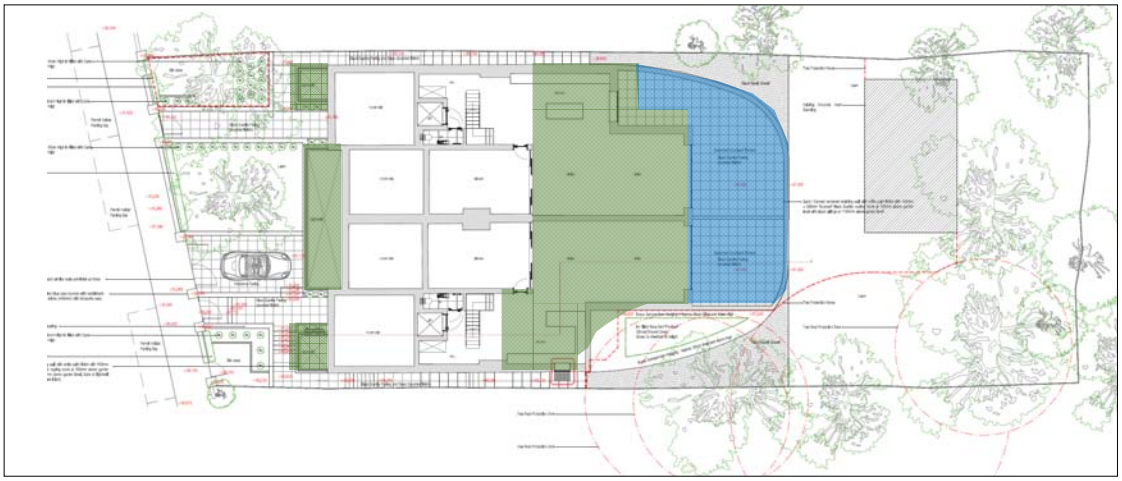
Plan showing footprint of former lower ground floor (drawing ref 1112/AP-00, dated 6 August 2010)

The footprint of the proposed basement extension is shown below, including lightwells at the front of the building. The drawing below comprised part of the planning consent that was granted in 2011.



Plan showing footprint of proposed basement extension (ref 1112/AP-20, dated 6 August 2010)

The basement was subsequently constructed and an extension was incorporated at the rear of the house which formed part of the new planning application in 2014. Although the drawing from which the following extract is cited was submitted as part of the application, it is listed as superseded on the planning portal and it is unclear if the following as-built plan has been approved as part of the application. The proposed development of the 2014 application details '…retaining wall at rear garden level' and for the purpose of this report it is assumed that this refers to the new area of basement outlined in blue, below.



Plan showing as-built basement extension (ref 1799, dated July 2013)

1.2 Purpose of Work

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

- to review the previous GEA Desk Study and Ground Investigation (ref J10240, dated 21 January 2011);
- to install new standpipes in order to carry out additional groundwater monitoring at the site; and
- to review the possible impact of the proposed development on the local hydrogeology.

1.3 Scope of Work

In order to meet the above objectives, additional intrusive ground investigation was carried out to determine the groundwater conditions, which comprised, in summary, the following activities:

- three window sampler boreholes advanced to depths of 5.0 m and 5.7 m;
- installation of standpipes to depths of 4.2 m, 5.0 m and 5.2 m to facilitate future monitoring of groundwater levels;
- two subsequent groundwater monitoring visits; and
- provision of a Basement Impact Review report presenting and interpreting the above data and the findings of the 2011 Desk Study and Ground Investigation Report (ref J10240, dated 21 January 2011), together with our advice and recommendations with respect to the impact of the constructed basement on the local hydrogeology.

1.3.1 Basement Impact Review

The work carried out also includes a Hydrogeological and Hydrological Assessment, which forms part of the BIA procedure specified in the London Borough of Camden (LBC) Planning Guidance CPG4[1] and their Guidance for Subterranean Development[2] prepared by Arup. The aim of the work is to provide information on surface water and groundwater 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 subterranean (groundwater) flow assessment has been carried out by John Evans, 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.

1 London Borough of Camden Planning Guidance CPG4 *Basements and lightwells*
2 Ove Arup & Partners (2010) *Camden geological, hydrogeological and hydrological study. Guidance for Subterranean Development.* For London Borough of Camden November 2010

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 over 25 years' experience in geotechnical engineering and engineering geology.

All assessors meet the qualification requirements of the Council guidance.

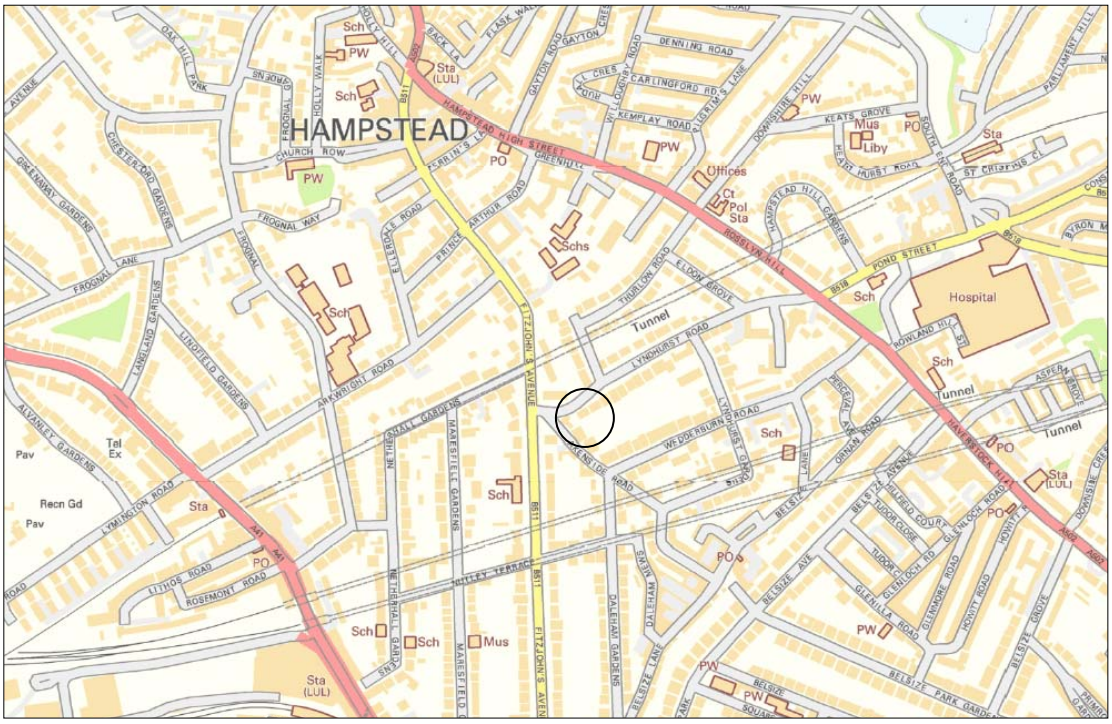
1.4 Limitations

The conclusions and recommendations made in this report are limited to those that can be made on the basis of the investigation. The results of the work should be viewed in the context of the range of data sources consulted and the number of locations where the ground was sampled. No liability can be accepted for information in other data sources or conditions not revealed by the sampling or testing. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate; no independent validation of such information has been made by GEA.

2.0 THE SITE

2.1 Site Description

The site is located in Hampstead, northwest London, approximately 600 m to the south of Hampstead London Underground station and approximately 620 m east of Finchley Road and Frognal railway station. The site may be additionally located by National Grid Reference 526672, 185227, as shown by the map below.

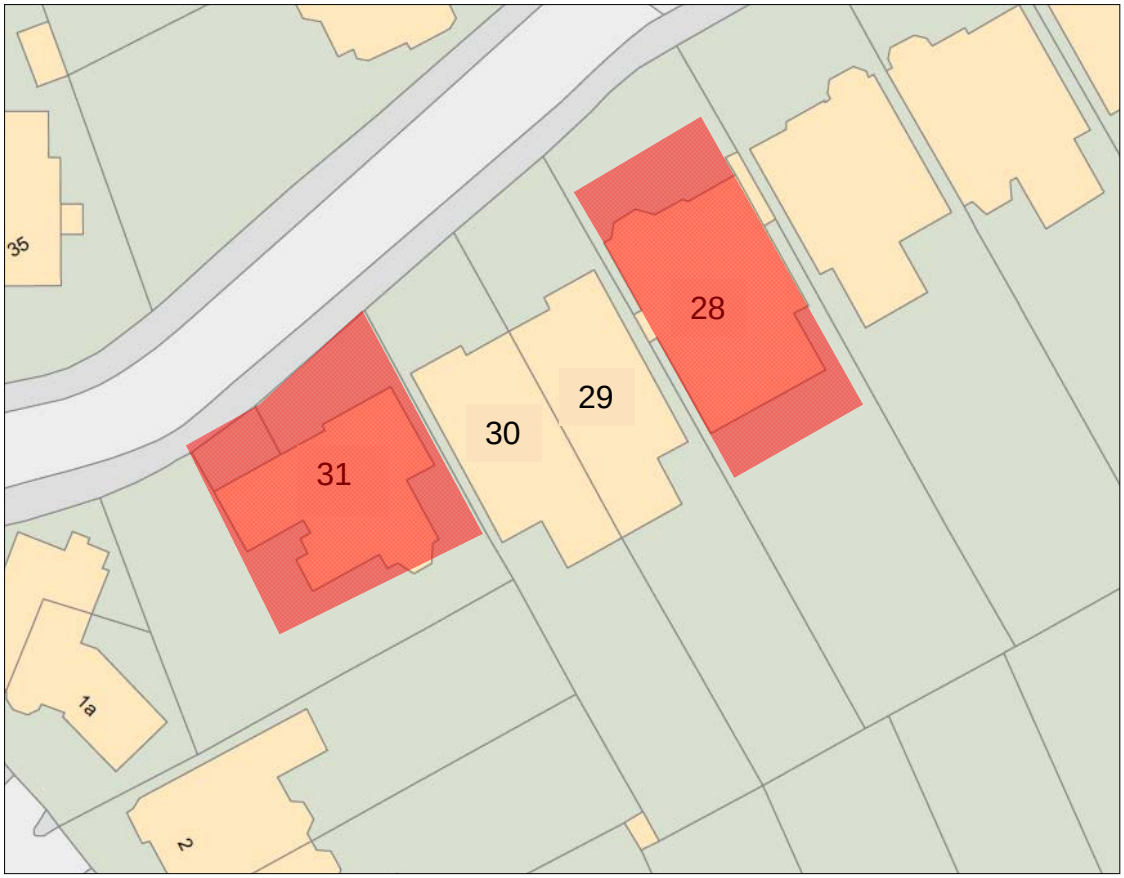


The site forms a roughly rectangular area with maximum dimensions of about 60 m by 20 m and is occupied by Nos 29 and 30 Lyndhurst Road, four-storey semi-detached properties that

are currently divided into flats. The houses front onto Lyndhurst Road to the north and are bordered to the east and west by Nos 28 and 31 Lyndhurst Road respectively and to the south by private gardens associated with houses fronting onto Wedderburn Road. The houses include a semi-basement which extends to about 2.5 m below road level, with the private rear garden also at semi-basement level. No 30 Lyndhurst Road includes a garage at semi-basement level which is accessed via a sloping driveway that exits onto Lyndhurst Road. Both the rear and front gardens are laid to lawn and include planted borders comprising shrubs, bushes and semi-mature and mature deciduous trees. Species typically include oak, laurel, lime and apple. The site generally slopes down to the south from a level of about 91.5 m OD in the north to about 85.5 m OD in the south, giving a slope angle of approximately 6°.

2.1.1 Nearby Structures

The results of a search of the Camden Planning Portal has been carried out for planning applications relating to the properties surrounding the site to determine those with basements are highlighted on the map below.



At No 28 Lyndhurst Road there is a basement, roughly 3.5 m deep, documented in Planning Application reference 2013/7377/P, specifically drawing ref 889/03, dated November 2013.

At No 31 Lyndhurst Road, there is no record of a basement on the Camden planning portal, although observation of the front of the building suggests there is a lower ground floor level.

2.2 Site History

The site history was researched by reference to historical Ordnance Survey (OS) maps sourced from the Envirocheck database.

The earliest Ordnance Survey (OS) map, dated 1879, shows the site to be partially developed in the southern half by a small outbuilding, which was within the grounds of Rosslyn House. This map also shows what appears to have been some form of pond feature encroaching into the northwestern corner of the site at this time. Further study into the history of the area using online information, indicated that two tunnels had been constructed, one approximately 80 m north of the site and the other approximately 150 m south of the site, by 1879. These were used by the then London and Birmingham Railway.

By 1896 Lyndhurst Road had been extended along the northern boundary of the site, which still remained part of Rosslyn House, although the pond had apparently been infilled and built over with greenhouses. The site was first developed with what appears to be the existing houses by 1915, by which time Rosslyn House to the east had been demolished and replaced with semi-detached properties. Apart from the increased residential development of the area, the site and surrounding area have remained essentially unchanged from the layout on the 1915 map until the present day.

2.3 Other Information

A search of public registers and databases was made via the Envirocheck database and relevant extracts from the search are appended. Full results of the search can be provided if required. The search has revealed that there are no landfills, waste management, transfer, treatment or disposal sites within 500 m of the site.

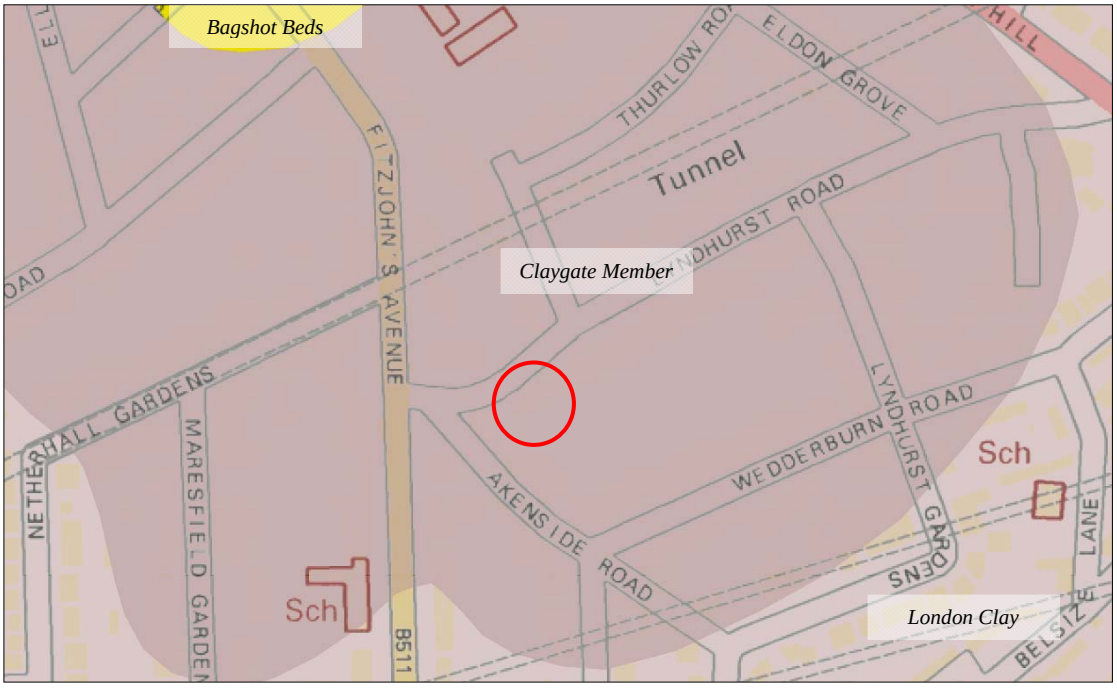
The site is not indicated as being at risk from flooding, nor is it located within a Groundwater Source Protection Zone as defined by the Environment Agency.

The search indicated that the site is located in an area where less than 1% of homes are affected by radon emissions; which is the lowest classification given by the Health Protection Agency (HPA) and therefore no radon protective measures will be necessary.

2.4 Geology

The Geological Survey map of the area (BGS sheet 256: North London) indicates that the site should be underlain by the Claygate Member, which in turn is underlain by the London Clay. The site is not shown to be located in an area as having a ‘Head Propensity’, although there is an area located roughly 70 m to the southeast.

The Claygate Member forms the youngest part of the London Clay Formation. The London Clay Formation is homogenous, slightly calcareous silty clay to very silty clay, with some beds of clayey silt grading to silty fine grained sand. According to the BGS map, dated 2006, the Head propensity is based on the geotechnical properties of the London Clay and head may occur close to the Claygate Member / London Clay boundary. Head propensity is shown on the BGS map as areas denoted as most likely to be covered by Quaternary Head.



The geology in this area is generally horizontally bedded such that the boundary between the geological formations roughly follows the ground surface contour lines. The Bagshot Formation is expected to extend to a level of approximately 115 m OD to 110 m OD and the Claygate Member to levels of roughly between 90 m OD to 85 m OD in this area.

The Claygate Member "*comprises dark grey clays with sand laminae, passing up into thin alternations of clays, silts and fine-grained sand, with beds of bioturbated silt*". The London Clay Formation is described as "*bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay. It commonly contains thin courses of carbonate concretions ('cementstone nodules') and disseminated pyrite. It also includes a few thin beds of shells and fine sand partings or pockets of sand, which commonly increase towards the base and towards the top of the formation.*

2.5 Hydrology and Hydrogeology

The Claygate Member is classified as a Secondary 'A' Aquifer, which refers to 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, as defined by the Environment Agency (EA).

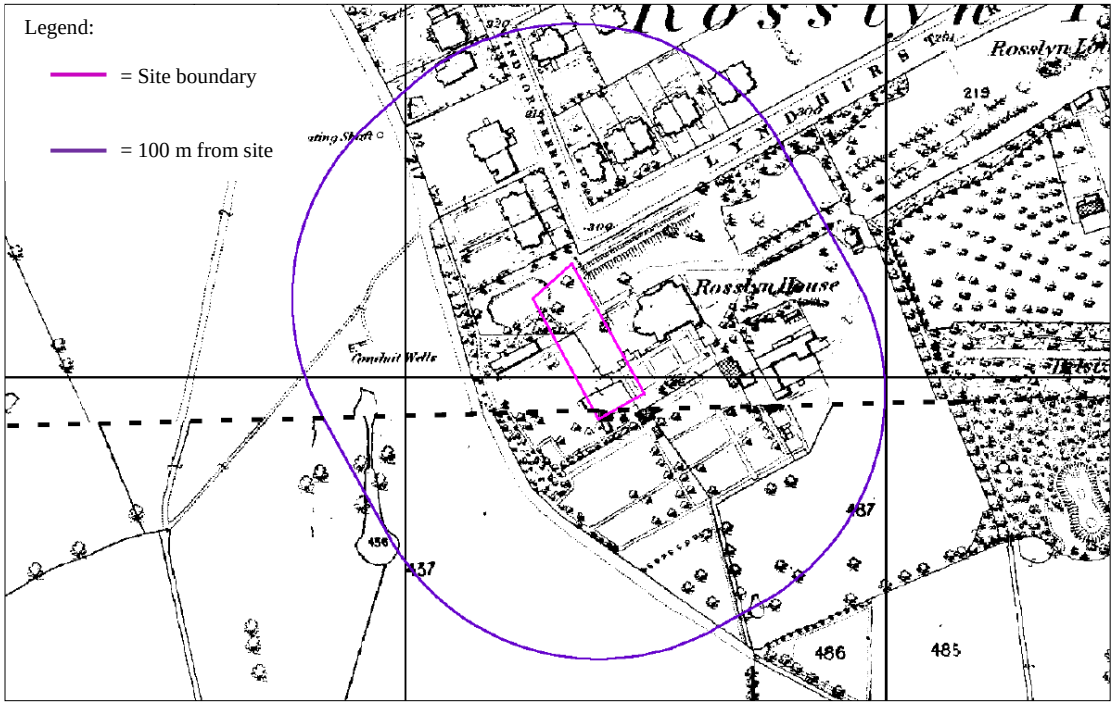
The London Clay is classified as an Unproductive Stratum, which refers to rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

Groundwater is likely to be present within the Claygate Member, and other investigations carried out around the area of Hampstead Heath indicate that spring lines are present at the interface of the Bagshot Beds and the Claygate Member, and to a much lesser extent near the boundary between the Claygate Member and the underlying essentially impermeable London

Clay. These springs have been the source of a number of London's "lost" rivers, notably the Fleet, Westbourne and Tyburn, which generally rose on Hampstead Heath, to the west, northwest and northeast of the current site, mostly at the base of the Bagshot Beds.

The nearest surface water feature is the Hampstead Ponds located 769 m to the northeast of the site on the southern part of Hampstead Heath.

Historically the Tyburn River[3] appeared to rise approximately 100 m west of the site, under what is now No 15 Akenside Road. It is shown on the map dated 1871 rising from a small pond, 'Conduit Wells' near to what is annotated as Shepherd's Well, although it is no longer shown on maps dated after 1874, after the construction of Fitzjohn's Avenue. As shown by the adjacent map, the stream flowed in a southerly direction, where it merged with another tributary of the River Tyburn close to Primrose Hill, issuing to the southeast of site, just north of Regent's Park where it flowed into a large lake that is still present today. From there the river then flowed through central London and into the Thames, although due to the fact that the Tyburn was only a small stream, the exact course of the lower part of the river is relatively unknown.



Extract of historical map published 1871 - 1879

Although the Tyburn appears to rise roughly 100 m to the west of the site, it is understood that the pond named 'Conduit Wells' was fed by adits in the sands of the Bagshot Beds to the north and piped to the ponds made in the Claygate Member for storage and water supply.

Due to the predominantly cohesive nature of the soils, the groundwater flow rate is unlikely to be particularly high. Information provided in the Envirocheck report indicates that the permeability of the Claygate Member may range from "very low" to "high". Published data for the permeability of the London Clay indicates the horizontal permeability to generally range between 1 x 10^{-10} m/s and 1 x 10^{-8} m/s, with an even lower vertical permeability.

3 Nicholas Barton (2000) *London's Lost Rivers.* Historical Publications Ltd

3.0 SCREENING

An assessment has been made of the effects of the basement on surface water and groundwater, using the screening and scoping tools that form part of the Basement Impact Assessment (BIA) requirements.

3.1 Screening Assessment

A number of screening tools are included in the Arup report and for the purposes of this report reference has been made to Appendix E which includes a series of questions within a screening flowchart including the categories groundwater flow and surface water flow. Responses to the questions are tabulated on the following pages.

3.1.1 Subterranean (groundwater) Screening Assessment

Question	Response for 29-30 Lyndhurst Road
1a. Is the site located directly above an aquifer?	*Yes. The Site is underlain by the Claygate Member of the London Clay Formation which is designated as a Secondary Aquifer by the Environment Agency, capable of supplying local water supplies and supporting small watercourses.*
1b. Will the proposed basement extend beneath the water table surface?	*Potentially. The proposed basement formation level would extend to a depth of approximately 3.2m below existing ground level, which potentially could extend below the water table if the Claygate Member is capable of transmitting groundwater flow beneath the site but not if it comprises predominantly clay.*
2. Is the site within 100 m of a watercourse, well (used/ disused) or potential spring line?	*Yes, the site is around 85 m east of the historic Conduit Wells, where the River Tyburn is known to have originated, although the path of the Tyburn is thought to have been in a southern direction away from the site.*
3. Is the site within the catchment of the pond chains on Hampstead Heath?	No. Figure 14 of the Camden geological, hydrogeological and hydrological study – Guidance for subterranean development dated 2010, confirms that the site is not located within this catchment area.
4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	*Yes. The proposals will result in an increase in the proportion of hard surfaced areas on site.*
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. The development is likely to lead an increase in hardstanding, which is likely to reduce the amount of surface water that is discharged to the ground.
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 with which the mean water level could be compared.

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

Q1a. The site is located directly above an aquifer.
Q1b. The proposed basement may extend beneath the water table surface.
Q2. The site is located close to a historical well, roughly 85 m to the west of the site.
Q4. The proposal will increase the proportion of hard surfaced areas on site.

The potential issues that need to be assessed, along with the possible effects of the basement construction on the local hydrology and hydrogeology, are discussed further in Part 2 of this report.

3.1.3 Surface Flow and Flooding Screening Assessment

Question	Response for 29-30 Lyndhurst Road
1. Is the site within the catchment of the pond chains on Hampstead Heath?	No. Figure 14 of the Camden geological, hydrogeological and hydrological study – Guidance for subterranean development dated 2010, 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. It is assumed that any additional surface water from the increased hardstanding area has been attenuated and discharged into the Thames Water sewers to ensure the surface water flow regime will be unchanged. The basement will largely be beneath the building footprint/existing hardstanding area and therefore the 1m distance between the roof of the basement and ground surface as recommended by the Arup report and para 2.16 of the CPG4 does not apply across these areas. It is considered that the use of SUDS attenuation will mitigate any impact by not meeting the 1m requirement.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	Yes. The amount of hardstanding has increased slightly at the rear of the property and at the rear of the property. SUDS attenuation prior to discharge into the sewers will reduce the impact to acceptable levels. Infiltration SUDS systems will not work due to low permeability soils.
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. It is assumed that and allowance has been made for new SUDS attenuation to control how water is stored from additional hardstanding areas. The attenuation size will be based upon peak surface water flows and discharge rates into existing sewers will be agreed with Thames Water.
5. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No. The new basement is very unlikely to result in any changes to the quality of surface water being received by adjacent properties or downstream watercourses as 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?	The findings of this Basement Impact Review together with the Camden Flood Risk Management Strategy dated 2013 and Figures 3iii, 4e, 5a and 5b of the SFRA dated 2014, in addition to the Environment Agency online flood maps show that the site has a low flooding risk from surface water, sewers, reservoirs (and other artificial sources), and fluvial/tidal watercourses. It is possible that the basement has be constructed within a perched water table and the recommendations outlined in the Basement Impact Review with regards to water-proofing and tanking of the basement will have reduced the risk to acceptable levels. In accordance with paragraph 5.11 of the CPG it is assumed that a positive pumped device has been installed in the basement in order to further protect the site from sewer flooding.

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

Q3. the proposed development will slightly increase the proportion of impermeable surfaces on the site.

4.0 SCOPING AND SITE INVESTIGATION

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.

Potential Impact	Consequence
The site is located directly above an aquifer. The basement structure may extend beneath water table surface. The site is located close to a historic well.	The proposed basement level may be below the water table and this could increase flow paths and/or raise groundwater levels locally.
The hard surfaced area will be increased in the form of building footprint and hard standing areas.	The proportional increase in hardstanding could potentially reduce rates of recharge reducing groundwater flow to a nearby watercourse.
The proposed development will increase the proportion of impermeable surfaces on the site.	The quantity of surface water discharging into the ground will be materially altered.

These potential impacts have been investigated through the site investigation, as detailed in Section 9.0.

4.2 Exploratory Work

In order to meet the objectives described in Section 1.2, whilst supplementing the findings of the original ground investigation carried out in 2010 and to address the potential impacts identified by the scoping, three window sampler boreholes were advanced to depths of 5.0 m and 5.7 m, in order to facilitate further groundwater monitoring.

The borehole records are appended together with a site plan indicating the exploratory positions. The Ordnance Datum (OD) levels shown on the borehole records have been interpolated from spot heights shown on two site survey drawings (ref 1112/AP-00, dated 6 August 2010 and ref T001, dated 23 March 2016) provided by the consulting engineers.

4.3 Sampling Strategy

The borehole locations were specified by the consulting engineers and positioned on site by GEA to provide optimum coverage of the site whilst avoiding the areas of known services.

Standpipes were installed in the window sampler boreholes to depths of 4.2 m, 5.0 m and 5.2 m and have been monitored on two occasions roughly five and six weeks following completion of the fieldwork.

5.0 GROUND CONDITIONS

The previous and recent investigations have broadly confirmed the expected ground conditions in that, beneath a significant thickness of made ground, the Claygate Member of the London Clay was encountered and proved to the full depth of the investigation.

5.1 Made Ground

The previous investigation encountered a surface covering of topsoil, which extended to depths of 0.2 m and 0.5 m in Borehole Nos 2 and 3 respectively, the made ground extended to depths of between 2.00 m (86.48 m OD) and 3.40 m (88.30 m OD) and generally comprised dark brown and orange-brown clayey sandy silt with gravel, roots, brick, concrete, coal and charcoal fragments.

The recent investigation encountered made ground to extend to a depth of 3.7 m to the north of the house, possibly due to the proximity of the newly constructed lightwell in that area. The made ground was found to comprise pale brown and dark brown mottled silty sandy gravelly clay with ash, brick, concrete, tile fragments and roots to a depth of 2.00 m, over brown silty very sandy gravelly clay with fine brick and concrete fragments to a depth of 3.70 m. In the rear garden, the made ground was found to extend to depths of 2.0 m and 2.8 m and generally comprised dark greyish brown, pale brown mottled silty very sandy gravelly clay with pockets of pale greyish brown silt, occasional decomposed wood, flint, crushed concrete and occasional ash.

5.2 Claygate Member

During the previous investigation, the Claygate Beds were found to initially comprise an upper weathered horizon of soft and firm orange-brown mottled pale grey silty sandy clay with occasional gravel and layers of sandy silt. The base of this horizon was only proved in Borehole No 1, at a depth of 8.60 m (83.10 m OD) and extended to 5.00 m, the full depth of Borehole Nos 2 and 3. In Borehole No 2 this corresponds to a level of 82.64 m OD, lower than the level at which the base of the initial horizon was encountered in Borehole No 1. This would suggest that the boundary between the initial weathered horizon and the underlying unweathered Claygate Beds dips towards the south along with the local topography.

Below 8.60 m in Borehole No 1 only, this stratum comprised firm becoming stiff dark grey silty fissured clay with traces of selenite, which extended to a depth of 13.30 m (78.40 m OD), whereupon stiff dark grey very silty sandy fissured clay with partings of brownish grey sand was encountered and extended to the maximum depth investigated of 17.55 m (74.15 m OD). The contours and spot heights shown on the OS and geological maps would suggest that the Claygate Member extends to a depth of approximately 77.00 m OD and therefore the clay soils in the lower horizon may form the upper part of the London Clay. However it has not been possible to accurately establish the boundary between the Claygate Member and the upper facies of the London Clay Formation from the borehole findings.

Plasticity index tests have indicated the clay to be of moderate to high shrinkability. The results of laboratory triaxial compression tests show a reduction in shear strength with depth, which is considered to be due to sampling disturbance as a result of the sandy and very silty zones within the clay. Greater reliance should therefore be placed on the results of the SPTs.

During the recent investigation, the Claygate Member was encountered to the full depth of the investigation, of 5.2 m. At the front of the building to the north, the Claygate Member was found to comprise firm pale yellow-brown, dark orange-brown, greenish grey and brown mottled very sandy silty clay with frequent partings of dark orange-brown fine to coarse sand to a depth of 4.3 m. Below this was pale greyish brown and dark orange-brown mottled silty slightly clayey fine sand to the full depth of the borehole, of 5.00 m.

In the rear garden, the Claygate Member generally comprised firm pale brown and pale orange-brown silty sandy clay with rootlets and partings of orange-brown silt,

In Borehole No 102, this stratum was noted to be stiff with rootlets and potentially desiccated to 4.2 m depth.

5.3 Groundwater

A slow inflow of groundwater was encountered towards the base of the made ground in Borehole No 1 only, at a depth of 3.40 m (88.30 m OD), which was sealed at a depth of 9.00 m. Subsequent monitoring of the standpipe installed in Borehole No 1, after a period of approximately two weeks, showed groundwater to be present at a depth of 5.00 m (86.70 m OD).

During the recent investigation, groundwater was encountered during drilling in Borehole No 102 only, at a depth of 4.0 m (83.20 m OD). The original standpipes were destroyed during the extension of the basement. Three new standpipes were installed in 2016 to facilitate further groundwater monitoring following completion of the basement extension.

The results of the subsequent groundwater monitoring are summarised in the following table.

Date	Borehole No	Depth to water m (Level m OD)
19/08/11	101	DRY [-]
	102	3.53 [83.67]
	103	3.43 [83.47]
03/05/16	101	DRY [-]
	102	3.66 [83.54]
	103	3.56 [83.34]

5.4 Existing Foundations

The trial pits showed that the existing building was supported on brick and concrete footings that were generally bearing within the made ground at depths of between 0.7 m (89.2 m OD) and 1.3 m (88.6 m OD). However Trial Pit No 5, excavated adjacent to the northern elevation within what was formerly the coal chute and boiler room, encountered a brick footing bearing on the firm clay of the Claygate Beds at a depth of 1.6 m (88.3 m OD).

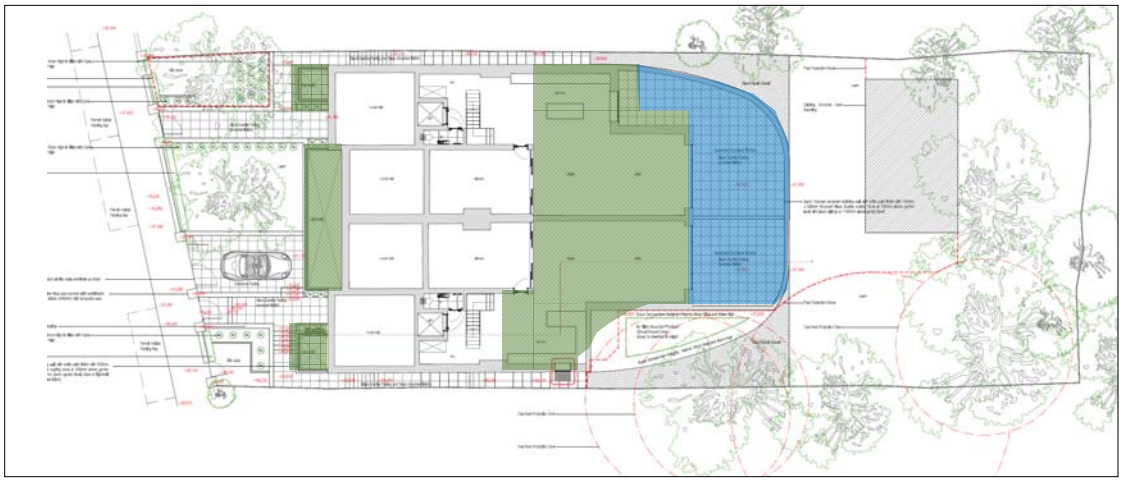
Where the brick corbels were found to be supported by a concrete footing, the concrete itself generally comprised weak concrete mix that include crushed brick fragments. Groundwater was not encountered in any of the trial pits.

Part 2: DESIGN BASIS REPORT

This section of the report provides an interpretation of the findings detailed in Part 1, in the form of a ground model, and completion of the Basement Impact Review.

6.0 INTRODUCTION

The new basement extension has been constructed roughly 2.1 m below existing lower ground floor level, to a level of 85.4 m OD and extends into the rear garden.



Plan showing as-built basement extension (ref 1799, dated July 2013)

7.0 GROUND MODEL

The desk study has revealed that the site has not had a potentially contaminative history, having apparently been occupied by residential properties for the entirety of its developed history and on the basis of the fieldwork, the ground conditions at this site can be characterised as follows.

- Beneath a significant thickness of made ground, the Claygate Member of the London Clay Formation was encountered and proved to the maximum depth investigated;
- the made ground was encountered to depths of between 2.00 m (86.48 m OD) and 3.70 m (87.69 m OD);
- the underlying Claygate Member initially comprises soft and firm orange-brown mottled pale grey silty sandy clay with occasional gravel and layers of sandy silt which extended during the previous investigation to a level of 83.10 m OD;
- the Claygate Member was noted to be desiccated to a depth of 4.2 m in Borehole No 102;
- the Claygate Member comprised silty slightly clayey fine sand from 4.30 m (87.09 m OD) to the full depth of Borehole No 101, of 5.00 m within the front garden area;
- below the initial horizon firm becoming stiff grey silty fissured clay extends to a depth of 13.30 m (78.40 m OD), whereupon stiff grey very silty sandy fissured clay is encountered to the maximum depth investigated of 17.55 m (74.15 m OD);

- during the previous investigation, a slow inflow of groundwater was encountered within the made ground at depth of 3.40 m (88.30 m OD);
- subsequent monitoring of the standpipe installed into Borehole No 1 following the previous investigation, after a period of approximately two weeks, showed groundwater to be present at a depth of 5.00 m (86.70 m OD); and
- groundwater was noted during the recent investigation at a depth of 4.00 m (83.20 m OD) in Borehole No 102 and groundwater has subsequently been measured at a shallowest depth of 3.43 m (83.47 m OD) in the rear garden area.

8.0 BASEMENT IMPACT REVIEW

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

The table below summarises the previously identified potential impacts and the additional information that is now available from the site investigation in consideration of each impact.

Potential Impact	Site Investigation Conclusions
The site is located directly above an aquifer.	The Claygate Member has been established to comprise predominantly silty sandy clay beneath the site with the characteristics of Unproductive Strata. As such it is not capable of supporting groundwater flow or a water table. Therefore a basement development on this site could not impact on an active hydrogeological flow regime. Monitored water levels within the standpipes do not represent a continuous water table and have intercepted isolated pockets of groundwater.
The proposed basement is likely to extend beneath the water table surface and dewatering may be required during construction.	
The site is located close to a historic well.	
The basement extension has increased the proportion of hard surfaced areas on site.	Some areas of flowerbed and decking have been replaced with hardstanding, resulting in an increase in the proportion of hard surfaced areas on site,, although this is unlikely to have reduced the amount of surface water discharging to the ground due to the clay dominated Claygate Member, which would result in very slow infiltration rates and unlikely to be important for groundwater resources.
The basement extension has increased the proportion of impermeable surfaces on the site.	The sealing of the ground surface to rainfall, by increasing the building area, is likely to have resulted in a decreased recharge to the underlying ground.

The results of the site investigation have been used below to review the remaining potential impacts, to assess the likelihood of them occurring or having occurred and the scope for reasonable engineering mitigation.

Impact of Development
The basement extension has been constructed such that it is not connected to any neighbouring adjacent basements and any groundwater within the underlying Claygate Member is unlikely to have been restricted. However, this material is considered to be impermeable and unlikely to be capable of supporting a groundwater regime. The construction of the basement has affectively slightly increased the proportion of hardstanding, particularly in the rear garden area, although a

large proportion of this area is laid to lawn and unlikely to have a significant impact on the amount of water discharging to the underlying shallow soils.

Groundwater is expected to be flowing roughly southwards and groundwater was previously encountered at a depth of 3.40 m (88.30 m OD) during drilling at the front (north) of the house only and long term monitoring was not carried out at the rear of the house. Following the construction of the basement, groundwater has not been measured within the borehole at the front of the house and subsequent groundwater monitoring in the rear garden to the south of the house has indicated the groundwater depth to vary between 3.43 m (83.47 m OD) and 3.66 m (83.54 m OD), which is at a lower level than measured previously on the northern side of the house. There is therefore no evidence that a barrier to groundwater flow has been created with the construction of the basement extension.

8.1 Basement Impact Review Conclusion

A Basement Impact Review has been carried out generally following the information and guidance published by the London Borough of Camden. Information from a previous ground investigation by GEA has been used to assess potential impacts identified by the screening process.

It is concluded that the proposed development is unlikely to result in any specific groundwater or surface water issues.

9.0 OUTSTANDING RISKS AND 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 is considered to be required.

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 ground conditions based on the discrete points at which the ground was sampled, but the ground conditions should be subject to review as the work proceeds to ensure that any variations from the Ground Model are properly assessed by a suitably qualified person.

If during ground works any visual or olfactory evidence of contamination is identified, it is recommended that further investigation be carried out and that the risk assessment is reviewed. 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

Borehole Records

Trial Pit Records

Laboratory Geotechnical Test Results

Revised SPT (N60) v Cohesion Plot

Envirocheck Extracts

Historical Maps

Site Plan

GEA Geotechnical & Environmental Associates	Widbury Barn Widbury Hill Ware,Herts SG12 7QE	**Site** 29 & 30 Lyndhurst Road, Hampstead, London NW3	**Borehole Number** **BH1**
Boring Method Cable Percussion	**Casing Diameter** 200mm cased to 9.80m	**Ground Level (mOD)** 91.70	**Client** Shakib Properties Ltd	**Job Number** J10240
	Location	**Dates** 25/11/2010- 26/11/2010	**Engineer** Price and Myers	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1						Made Ground (dark brown clayey sandy silt with gravel, roots and brick fragments)		
1.20-1.65 1.20 1.50	SPT(C) N=14 D2 D3	1.00	DRY	1,3/7,2,3,2		(3.40)			
2.00-2.45 2.00	SPT(C) N=16 D4	2.00	DRY	4,7/3,3,3,7					
2.50	D5								
3.00-3.45 3.00	SPT(C) N=7 D6	3.00	DRY	1,2/1,2,1,3					▼1
3.50	D7			Slow(1) at 3.40m, rose to 3.07m in 20 mins, sealed at 9.00m.	88.30	3.40	Firm orange-brown silty sandy CLAY with layers of clayey sandy silt and occasional gravel		▽1
4.00-4.45 4.00	SPT N=23 D8	4.00	3.00	3,4/5,6,6,6					
4.50	D9								
5.00-5.45 5.00	SPT N=20 D10	5.00	4.50	4,4/5,5,5,5					
5.50	D11								
6.00-6.45 6.00	SPT N=17 D12	6.00	5.20	2,3/3,4,5,5		(5.20)			
6.50	D13								
7.00-7.45	SPT N=15	7.00	6.40	2,3/3,3,4,5					
7.50	D14								
8.60	D15				83.10	8.60	Firm becoming stiff dark grey silty fissured CLAY with traces of selenite		
9.00-9.45	U1			60 blows					
9.45	D16								

Remarks
Move and erect rig at borehole position - 1 hr 30 mins.
Excavating services inspection pit from GL to 1.2 m for 30 mins.
Borehole terminared due to groundwater inflows.
Dismantling rig and equipment - 1 hr 30 mins.
Groundwater monitoring standpipe installed in borehole to a depth of 5.5 m.
Groundwater monitoring visit carried out on 10/03/10 recorded a groundwater level of 5.0 m.

Scale (approx)	**Logged By**
1:50	ML

Figure No.
J10240.BH1

Geotechnical & Environmental Associates	Widbury Barn Widbury Hill Ware,Herts SG12 7QE	**Site** 29 & 30 Lyndhurst Road, Hampstead, London NW3	**Borehole Number** **BH1**

Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion	200mm cased to 9.80m	91.70	Shakib Properties Ltd	J10240
	Location	**Dates** 25/11/2010- 26/11/2010	**Engineer** Price and Myers	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.50-10.95 10.50	SPT N=20 D17	9.80	DRY	3,4/4,5,5,6		(4.70)			
11.50	D19								
				25/11/2010:DRY					
				26/11/2010:6.80m					
12.00-12.45 12.45	U2 D20			70 blows					
13.00	D21								
					78.40	13.30	Stiff dark grey very silty sandy fissured CLAY with partings of brownish grey sand		
13.45-13.90	SPT N=21	9.80	DRY	3,4/5,5,5,6					
14.00	D22								
15.00-15.45	U3			100 blows		(4.25)			
16.50-17.40 16.50	SPT N=24 D23	9.80	16.00	3,4/5,6,6,7					
17.00	D24								
17.10-17.55 17.10	SPT N=27 D25	9.80	16.00	5,5/6,7,7,7					
				26/11/2010:7.00m	74.15	17.55	Complete at 17.55m		

Remarks

Scale (approx)	**Logged By**
1:50	ML

Figure No.
J10240.BH1

Geotechnical & Environmental Associates	Widbury Barn Widbury Hill Ware,Herts SG12 7QE	**Site** 29 & 30 Lyndhurst Road, Hampstead, London NW3	**Number** **BH101**

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Window Sampler		91.39	Shakib Properties Ltd	J10240
	Location	**Dates** 21/03/2016	**Engineer** Price and Myers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(2.00)	MADE GROUND (pale brown and dark brown mottled silty sandy gravelly clay with ash, brick, concrete, tile fragments and roots) becoming greenish grey and orange-brown silty very sandy clay between 1.6 m and 1.9 m		
				89.39	2.00	MADE GROUND (brown silty very sandy gravelly clay with fine brick and concrete fragments)		
					(1.70)			
				87.69	3.70	Firm pale yellow-brown, dark orange-brown, greenish grey and brown mottled very sandy silty CLAY with frequent partings of dark orange-brown fine to coarse sand		
					(0.60)			
				87.09	4.30	Pale greyish brown and dark orange-brown mottled silty slightly clayey fine SAND		
					(0.70)			
				86.39	5.00	Complete at 5.00m		

Remarks
Groundwater not encountered
Groundwater monitoring standpipe installed to 5.0 m depth

Scale (approx)	**Logged By**
1:50	CA

Figure No.
J10240.BH101

Geotechnical & Environmental Associates	Widbury Barn Widbury Hill Ware,Herts SG12 7QE	**Site** 29 & 30 Lyndhurst Road, Hampstead, London NW3	**Number** **BH102**

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Window Sampler		87.20	Shakib Properties Ltd	J10240
	Location	**Dates** 21/03/2016	**Engineer** Price and Myers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.50)	TOPSOIL (dark brown silty sandy clay with occasional fine gravel and rootlets)		
				86.70	0.50	MADE GROUND (pale brown silty sandy gravelly clay with concrete, brick and rootlets, becoming greyish brown from 2.2 m depth)		
					(2.30)			
				84.40	2.80	Stiff pale brown and pale orange-brown silty sandy CLAY with rootlets and partings of orange-brown silt, becoming firm from 4.2 m depth, rootlets noted to 4.2 m depth		
					(1.80)			
				82.60	4.60	Firm pale bluish grey and pale orange-brown mottled silty sandy CLAY with pockets of pale bluish grey and pale orange-brown very clayey silty fine sand		
					(0.40)			
				82.20	5.00	Complete at 5.00m		

Remarks
Natural soils noted to appear desiccated to a depth of approximately 3.0 m
Groundwater measured at a depth of 4.0 m immediately following drilling
Groundwater monitoring standpipe installed to 4.2 m depth

Scale (approx)	**Logged By**
1:50	CA

Figure No.
J10240.BH102

Geotechnical & Environmental Associates	Widbury Barn Widbury Hill Ware,Herts SG12 7QE	**Site** 29 & 30 Lyndhurst Road, Hampstead, London NW3	**Number** **BH103**

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Window Sampler		86.90	Shakib Properties Ltd	J10240
	Location	**Dates** 21/03/2016	**Engineer** Price and Myers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(2.00)	MADE GROUND (dark greyish brown, brown and pale brown mottled silty very sandy gravelly clay with pockets of pale greyish brown silt, occasional decomposed wood, occasional cobble of flint, crushed concrete between 0.8 m and 0.9 m depth, occasional ash, and a band of pale grey, pale orange0brown and brown silty sandy clay between 1.0 m and 1.2 m)		
				84.90	2.00	Firm dark orange-brown and pale grey mottled fissured silty sandy slightly gravelly CLAY becoming blusish grey and greenish brown from 4.7 m, becoming sandy clay with pockets of bluish grey and greenish brown silty clayey fine sand from 5.2 m depth		
					(3.70)			
				81.20	5.70	Complete at 5.70m		

Remarks
Groundwater not encoutnered during drilling
Groundwater monitoring standpipe installed to 5.7 m depth

Scale (approx)	**Logged By**
1:50	CA

Figure No.
J10240.BH103

Geotechnical & Environmental Associates	Widbury Barn Widbury Hill Ware,Herts SG12 7QE	**Site** 29 & 30 Lyndhurst Road, Hampstead, London NW3	**Number** **BH2**

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Window Sampler		87.64	Shakib Properties Ltd	J10240
	Location	**Dates** 25/11/2010	**Engineer** Price and Myers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				87.44	(0.20) 0.20	Topsoil (dark brown clayey silt with rootlets and gravel)		
0.30	D1					Made Ground (brown silty sandy clay with brick and charcoal fragments)		
					(1.30)			
				86.14	1.50	Made Ground (orange-brown clayey silty sand with gravel, brick and charcoal fragments)		
					(0.50)			
2.00	D2			85.64	2.00	Made Ground (dark brown clayey sandy silt with gravel and fine charcoal fragments)		
					(1.00)			
				84.64	3.00	Firm orange-brown mottled pale grey silty sandy CLAY with occasional fine claystones		
3.10	D3							
4.00	D4				(2.00)			
4.80	D5							
				82.64	5.00	Complete at 5.00m		

Remarks
Groundwater not encountered.

Scale (approx)	**Logged By**
1:50	ML

Figure No.
J10240.BH2

GEA Geotechnical & Environmental Associates	Widbury Barn Widbury Hill Ware,Herts SG12 7QE	**Site** 29 & 30 Lyndhurst Road, Hampstead, London NW3	**Number** **BH3**
Excavation Method Drive-in Window Sampler	**Dimensions**	**Ground Level (mOD)** 88.48	**Client** Shakib Properties Ltd	**Job Number** J10240
	Location	**Dates** 25/11/2010	**Engineer** Price and Myers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.50)	Topsoil (dark brown clayey silt with rootlets and gravel)		
0.20	D1			87.98	0.50	Made Ground (brown mottled orange-brown silty sandy clay with gravel, brick and occasional charcoal fragments)		
					(1.50)			
1.50	D2			86.48	2.00	Soft becoming firm brown mottled bluish grey silty sandy CLAY with occasional gravel		
					(3.00)			
4.00	D3			83.48	5.00	Complete at 5.00m		

Remarks
Groundwater not encountered.

Scale (approx)	Logged By
1:50	ML

Figure No.
J10240.BH3

ABBREVIATIONS

AB	Air Brick	DH	Duct Height	PRF	Post & Rail Fence
	Bollard or Bottom Heights	DP	Down Pipe	PWF	Post & Wire Fence
BB	Bellsha Beacon	ECB	Electricity Control Box	R	Render
BD	Back Drop	ELEC	Electricity	RAD	Radiator
BH	Borehole or Beam Height	EP	Electricity Pole	RE	Rodding Eye
BL	Bed Level	FB	Flower Bed	RG	Rough Ground
BP	Brick Pavlors	FH	Fire Hydrant	RS	Road Sign
BRW	Brick Retaining Wall	FL	Floor Level	RSJ	Rolled Steel Joist
BS	Bus Stop	GU	Gully	RWP	Rain Water Pipe
BT	British Telecom	GV	Gas Valve	S	Spread or Stone
BTCB	BT Control Box	H	Height in Metres	SC	Stop Cock
BW	Brick Wall	H	Window Head Height	SL	Soffit Level or Skylight
BWF	Barbed Wire Fence	HT	Height	SP	Arch Springer Height
	Window Cill Height	IC	Inspection Cover	SPS	Stone Paving Slabs
CB	Control Box	IL	Invert Level	SW	Stone Wall
CBF	Close Boarded Fence	IRF	Iron Railing Fence	TCSU	Traffic Control
CBW	Concrete Block Wall	IWF	Interwoven Fence	T	Top Heights
CCB	Cable TV Control Box	KO	Kerb Outlet	TL	Traffic Light
CIF	Corrugated Iron Fence	L	Light	TP	Telephone Pole
CL	Cover Level	LP	Lamp Post	TPS	Tactile Paving Slabs
CLF	Chain Link Fence	MH	Manhole	UTL	Unable To Lift
CLSF	Chain Link Security Fence	MKR	Marker	V	Vent
CPF	Concrete Panell Fence	OV	Over Flow Pipe	VP	Vent Pipe
CPS	Concrete Paving Slabs	O/H	Overhead	W	Window
CR	Arch Crown Height	P	Post	WL	Water Level
CRW	Concrete Retaining Wall	PALF	Palisade Fence	WM	Water Meter
CSU	Ceiling Slopes Up	PF	Picket Fence	WMF	Wire Mesh Fence
CTV	Cable Television	PIT	Trial Pit	WPF	Wooden Panel Fence
CW	Concrete Wall	PL	Pavement Light	WV	Water Valve
D	Diameter or Doors	PM	Parking Meter	Ø	Diameter

Top
Banks
Bottom
Drop Kerbs
Overhead Detail
Change in Elevation
Fences
Overhead Cables
Change in Surface
Edge of Vegetation
Foul Water Sewer
Surface Water Sewer
Combined Sewer

3.28 Floor to Ceiling Height
3.28 Fallse Ceiling Height
Gate
SLOPING CEILING ARROWS POINT UP
VAULTED CEILING
Survey Station

DATUM NOTES

THE SURVEY GRID SHOWN ON THIS DRAWING IS ARBITRARY AND LIGNED WITH EXISITING STRUCTURE.

ALL LEVELS ARE IN METRES AND RELATE TO THE ORIGINAL SURVEY

DRAWING UNITS ARE METRES

REVISIONS

DATE	23 MAR 2016	DRAWN	AP/JJH
SCALE	1:100 @ A2	CHECKED	AP
DWG NO.	T001	JOB No.	

CLIENT

MY CONSTRUCTION

TITLE

TOPOGRAPHIC, AS-BUILT SURVEY

PROJECT

29-30 LYNDHURST ROAD NW3

ASES
ADVANCED SITE ENGINEERING SERVICES LTD
Garden Flat
5 St Andrews Square
Surbiton
KT6 4EA
t:0203 7000654
www.asesltd.com
contact@asesltd.com

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING ANY WORK OR MAKING SHOP DRAWINGS
NO DIMENSIONS ARE TO BE SCALED FROM THIS DRAWING

No. 28

No. 29

No. 30

No. 31

LYNDHURST ROAD

SECTION A-A

SECTION B-B

SECTION 8-8

Garden Level / Site Plan

0m 1m 2m 3m 4m 5m
SCALE BAR

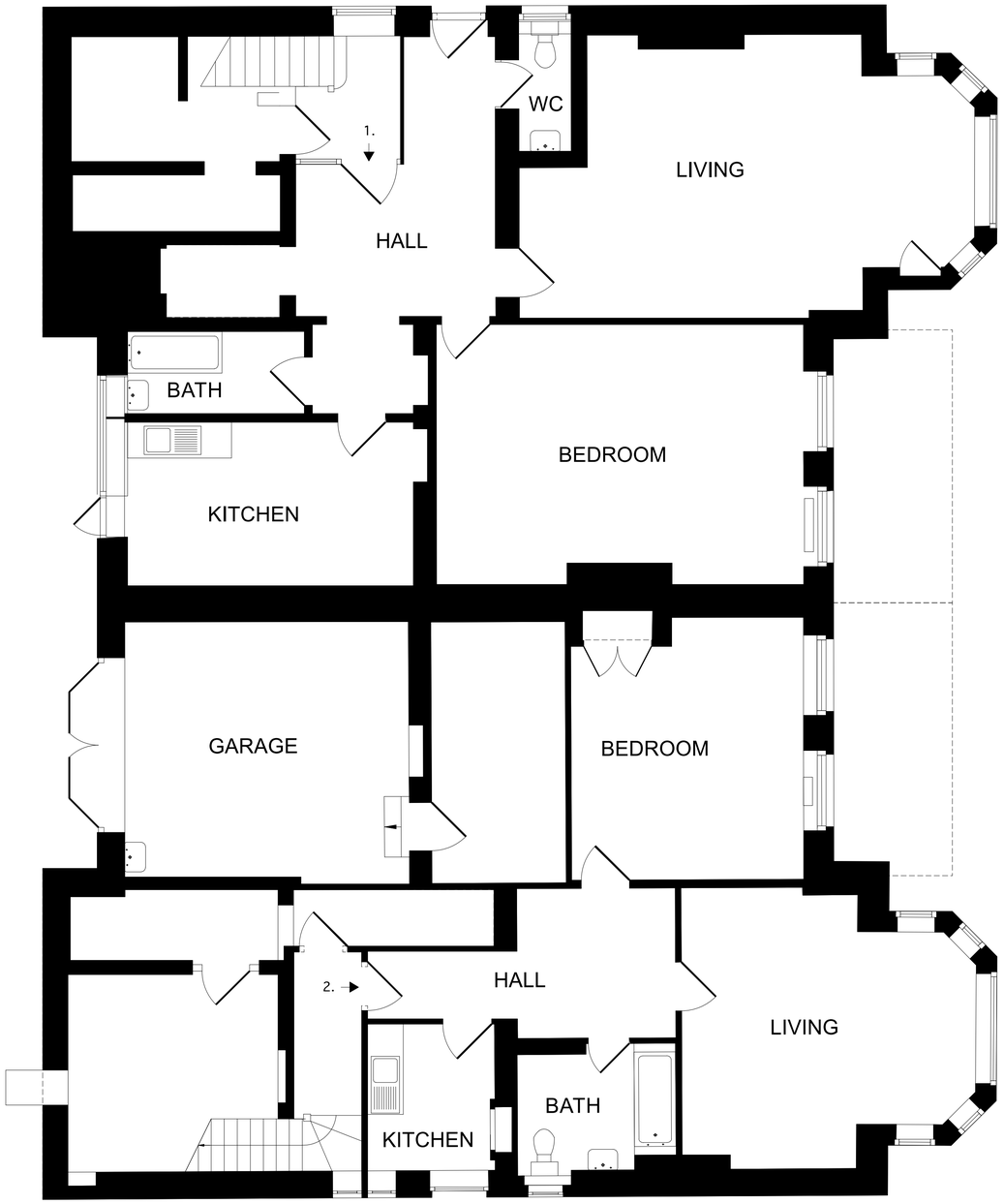
NORTH

THE CHARLTON BROWN PARTNERSHIP
ARCHITECTS
The Old Chapel Shepherds Walk Hampstead London NW3 5UE T 020 7794 1234 F 020 7435 5085 E office@charltonbrown.com

29 & 30 Lyndhurst Road, Hampstead
EXISTING
SITE / GARDEN LEVEL PLAN 1112/AP-00

Date 06/08/10 Scale 1:100 @ A1 Revisions

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING ANY WORK OR MAKING SHOP DRAWINGS
NO DIMENSIONS ARE TO BE SCALED FROM THIS DRAWING



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

SCALE BAR

Lower Ground Floor

THE CHARLTON BROWN PARTNERSHIP

ARCHITECTS

The Old Chapel Shepherds Walk Hampstead London NW3 5UE T 020 7794 1234 F 020 7435 5085 E office@charltonbrown.com

29 & 30 Lyndhurst Road, Hampstead

EXISTING

LOWER GROUND FLOOR PLAN 1112/AP-01

Date 06/08/10 Scale 1:50 @ A1 Revisions

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING ANY WORK OR MAKING SHOP DRAWINGS
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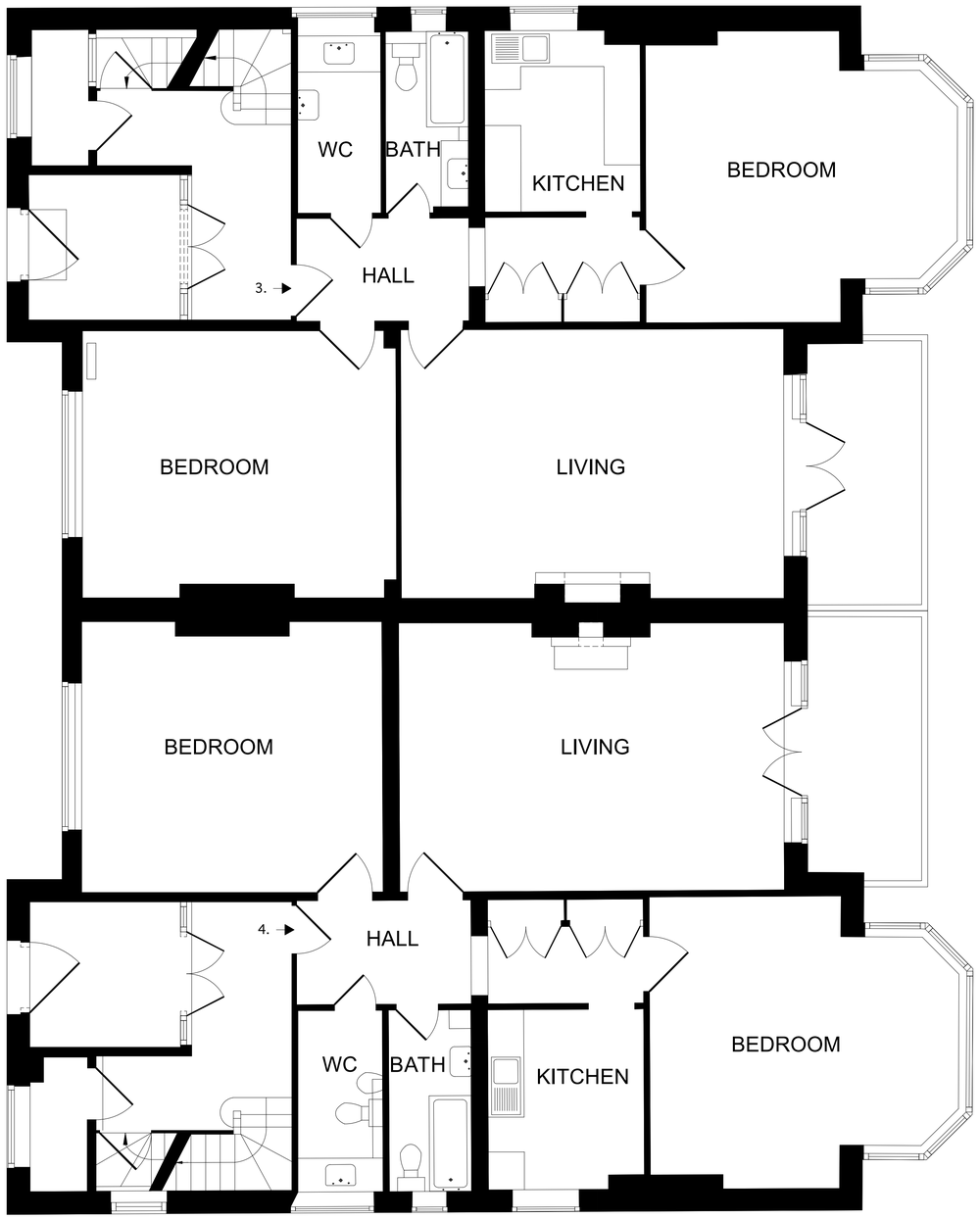

0m 1m 2m 3m 4m 5m

SCALE BAR

Upper Ground Floor

NORTH
GRID

THE CHARLTON BROWN PARTNERSHIP
ARCHITECTS
The Old Chapel Shepherds Walk Hampstead London NW3 5UE T 020 7794 1234 F 020 7435 5085 E office@charltonbrown.com

29 & 30 Lyndhurst Road, Hampstead
EXISTING
UPPER GROUND FLOOR PLAN 1112/AP-02

Date 06/08/10 Scale 1:50 @ A1 Revisions

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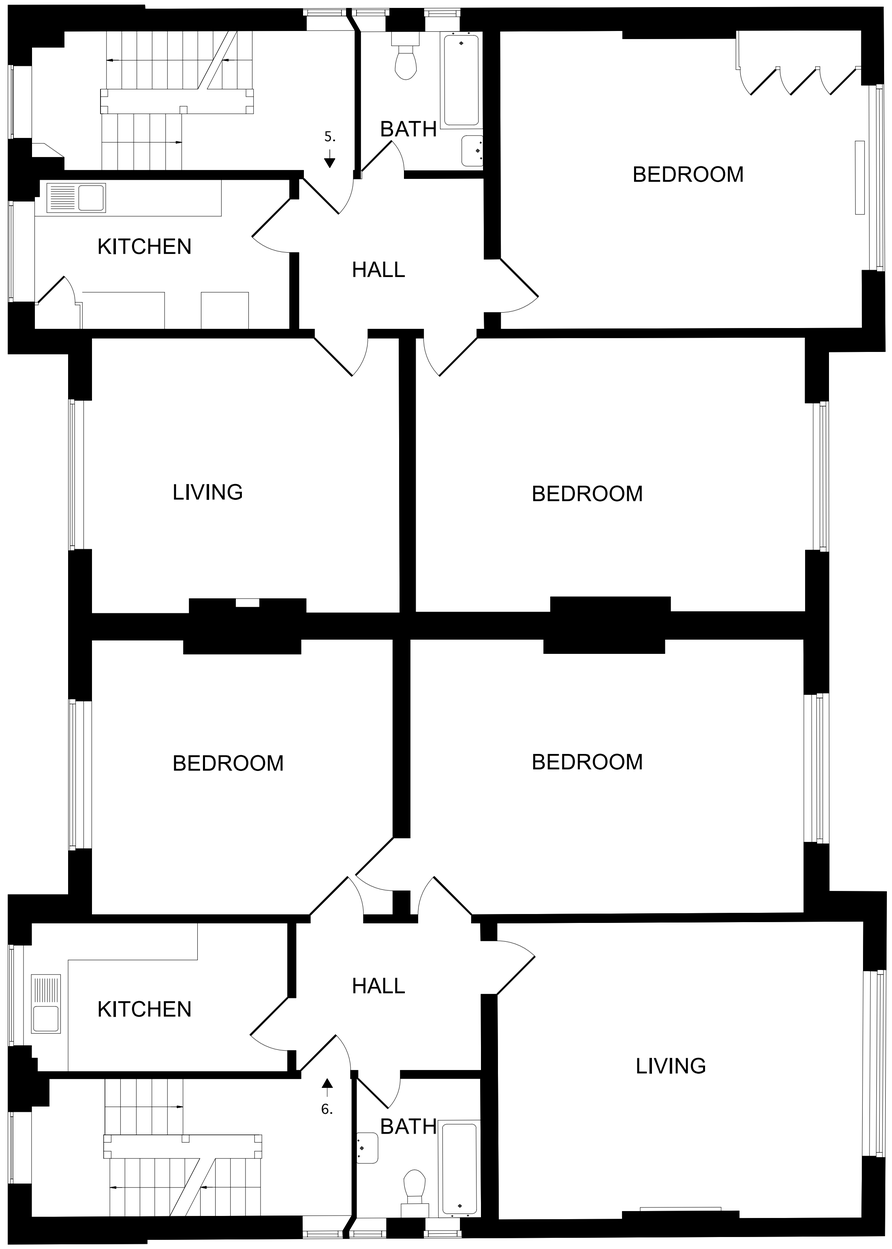

0m 1m 2m 3m 4m 5m
SCALE BAR

First Floor

NORTH
GRID

THE CHARLTON BROWN PARTNERSHIP
ARCHITECTS
The Old Chapel Shepherds Walk Hampstead London NW3 5UE T 020 7794 1234 F 020 7435 5085 E office@charltonbrown.com

29 & 30 Lyndhurst Road, Hampstead
EXISTING
FIRST FLOOR PLAN 1112/AP-03

Date 06/08/10 Scale 1:50 @ A1 Revisions

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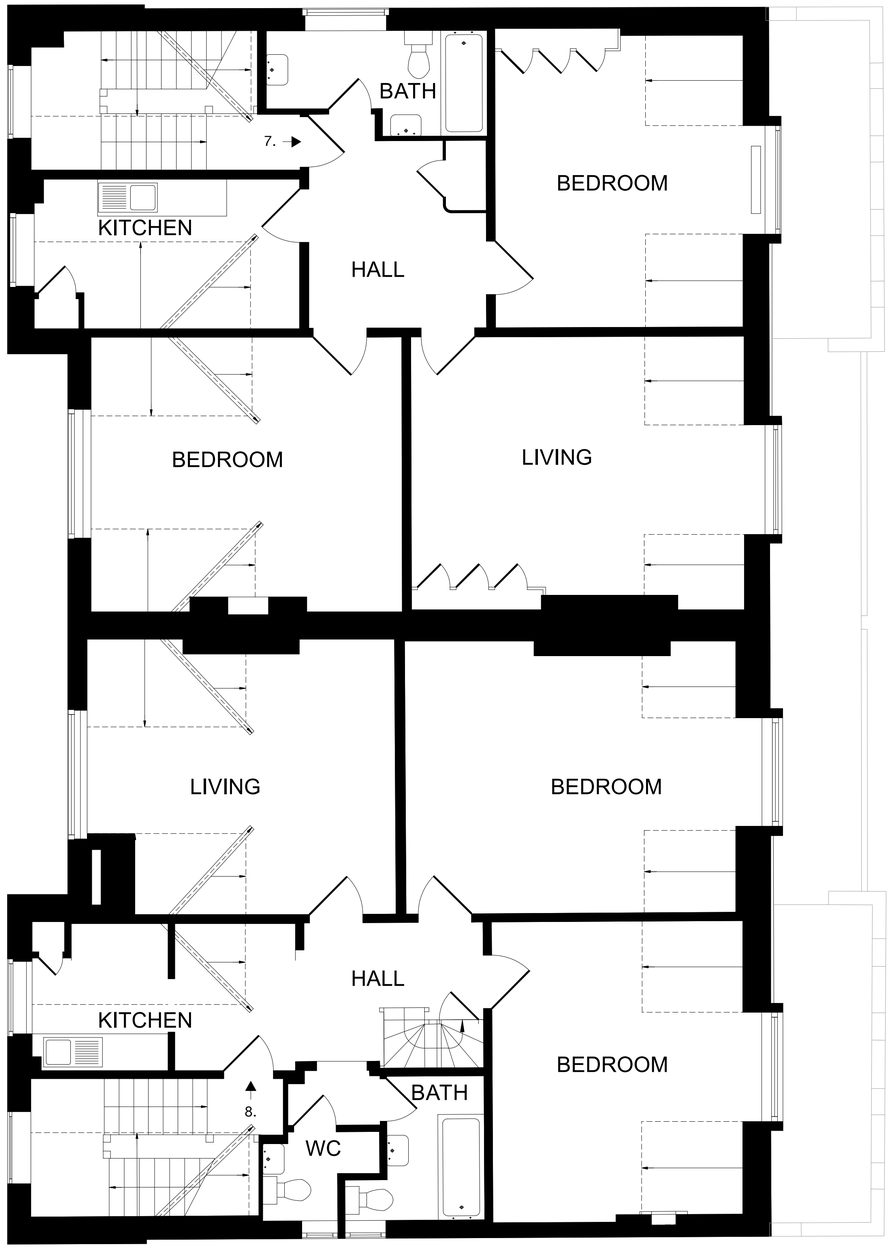
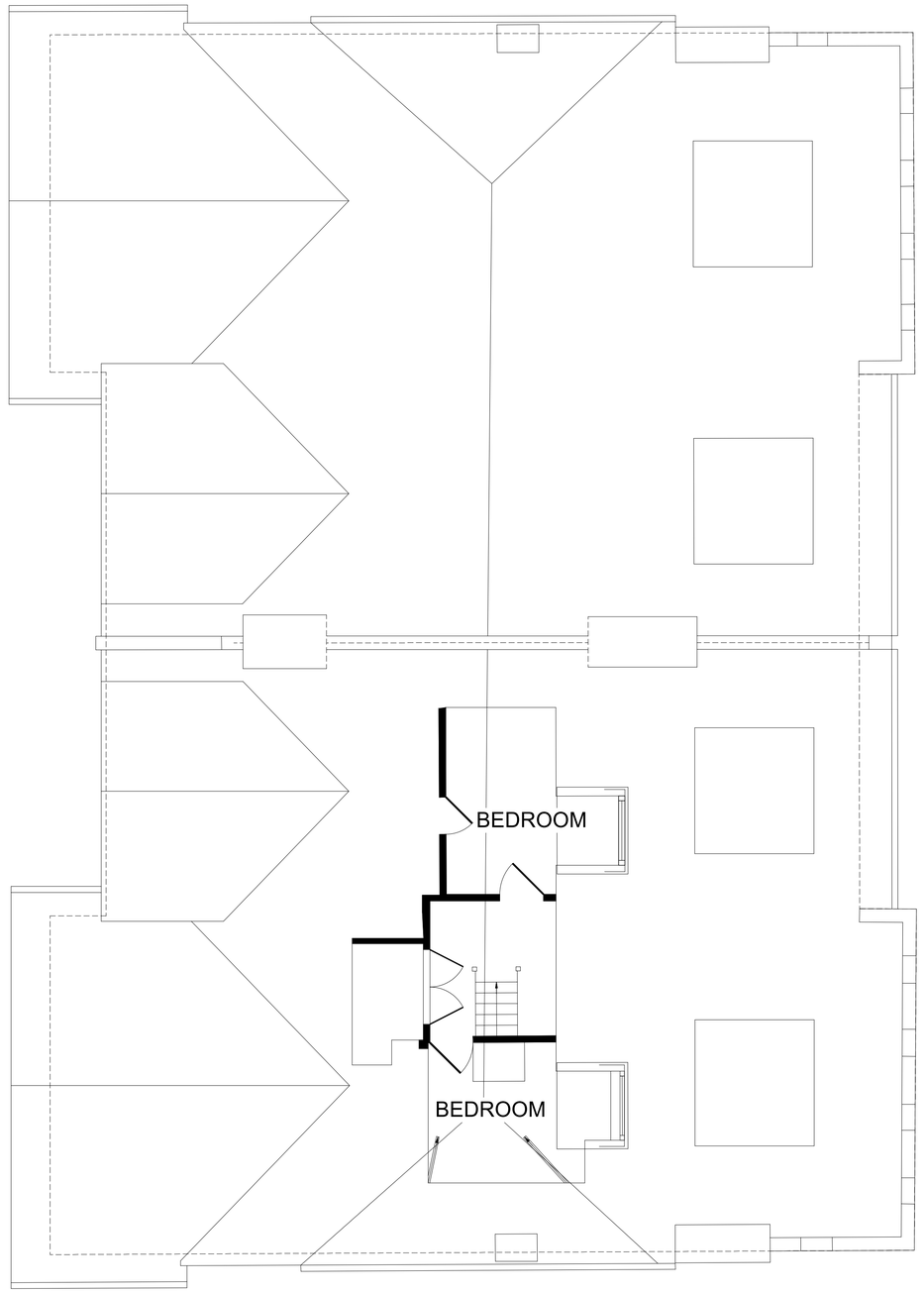


0m 1m 2m 3m 4m 5m
SCALE BAR

Second Floor



0m 1m 2m 3m 4m 5m
SCALE BAR

Attic Floor

NORTH

THE CHARLTON BROWN PARTNERSHIP
ARCHITECTS
The Old Chapel Shepherds Walk Hampstead London NW3 5UE T 020 7794 1234 F 020 7435 5085 E office@charltonbrown.com

29 & 30 Lyndhurst Road, Hampstead
EXISTING
SECOND / ATTIC FLOOR PLANS 1112/AP-04

Date 06/08/10 Scale 1:50 @ A1 Revisions

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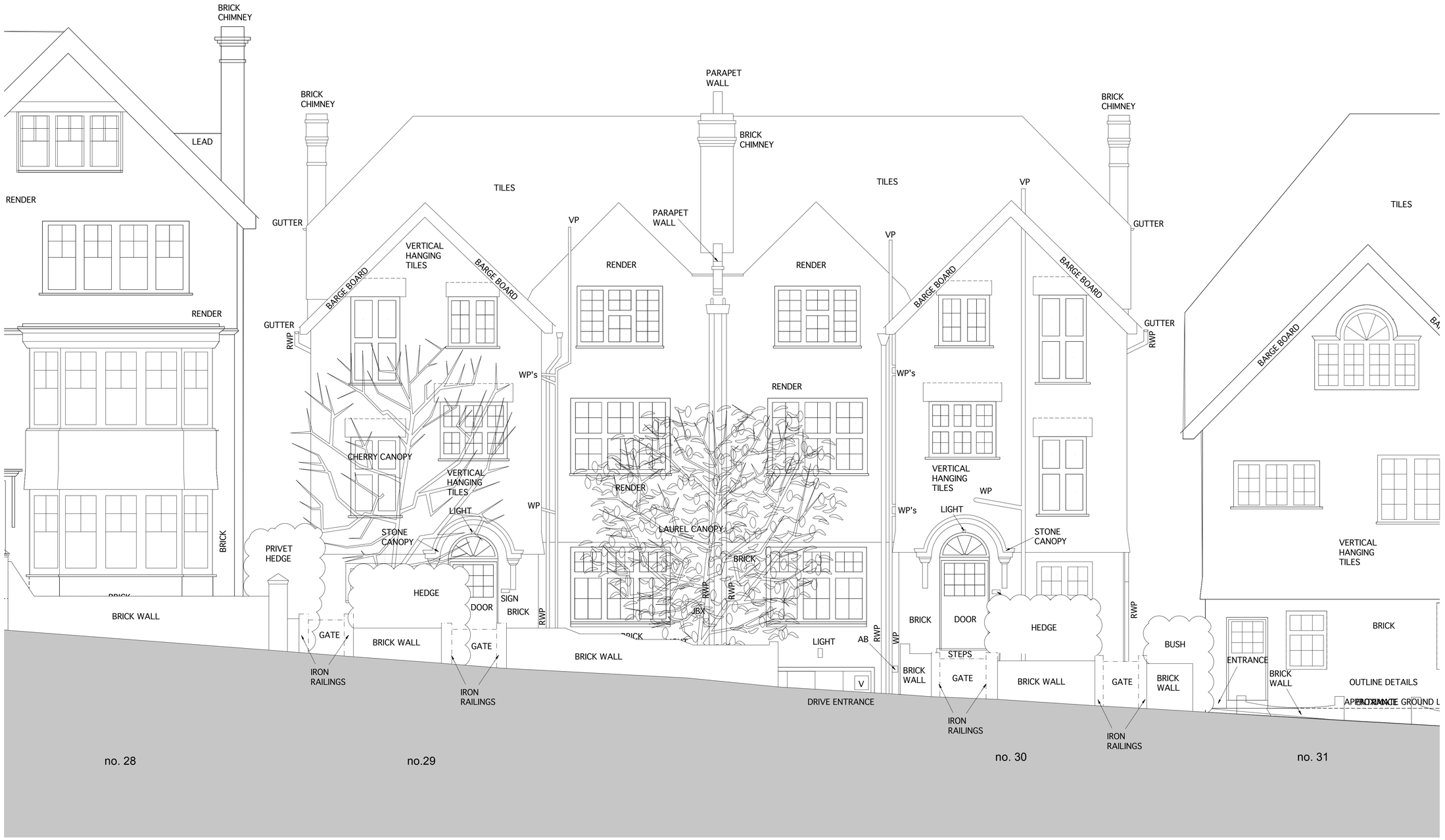

Existing Front Elevation A (Street Scene)

THE CHARLTON BROWN PARTNERSHIP
ARCHITECTS
The Old Chapel Shepherds Walk Hampstead London NW3 5UE T 020 7794 1234 F 020 7435 5085 E office@charltonbrown.com

29 & 30 Lyndhurst Road, Hampstead
EXISTING
FRONT ELEVATION 1112/AP-05

Date 06/08/10 Scale 1:50 @ A1 Revisions

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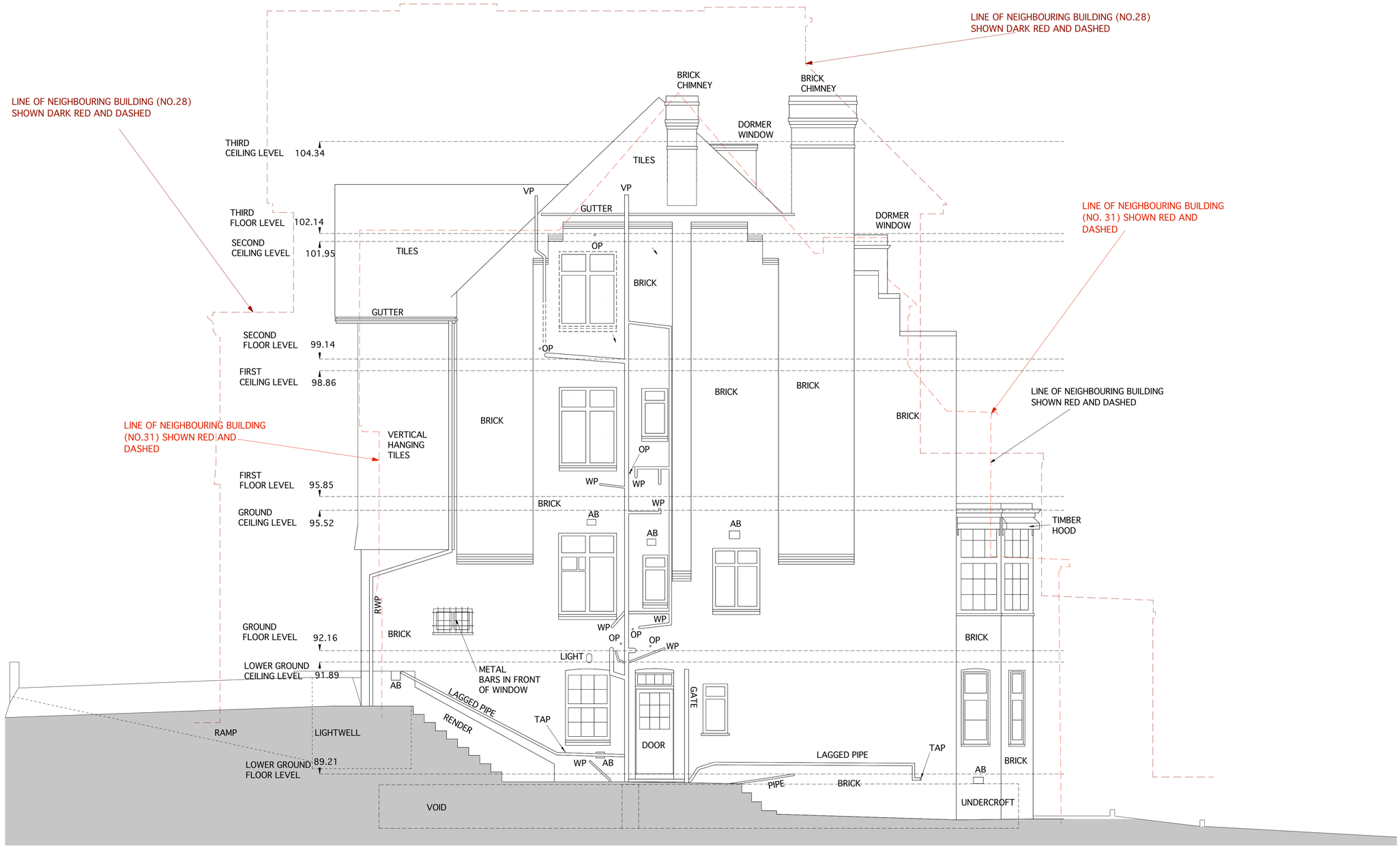

Existing Side Elevation B

THE CHARLTON BROWN PARTNERSHIP
ARCHITECTS
The Old Chapel Shepherds Walk Hampstead London NW3 5UE T 020 7794 1234 F 020 7435 5085 E office@charltonbrown.com

29 & 30 Lyndhurst Road, Hampstead
EXISTING
SIDE ELEVATION 1112/AP-06

Date 06/08/10 Scale 1:50 @ A1 Revisions

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING ANY WORK OR MAKING SHOP DRAWINGS
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Existing Rear Elevation C

THE CHARLTON BROWN PARTNERSHIP
ARCHITECTS
The Old Chapel Shepherds Walk Hampstead London NW3 5UE T 020 7794 1234 F 020 7435 5085 E office@charltonbrown.com

29 & 30 Lyndhurst Road, Hampstead
EXISTING
REAR ELEVATION 1112/AP-07

Date 06/08/10 Scale 1:50 @ A1 Revisions

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING ANY WORK OR MAKING SHOP DRAWINGS
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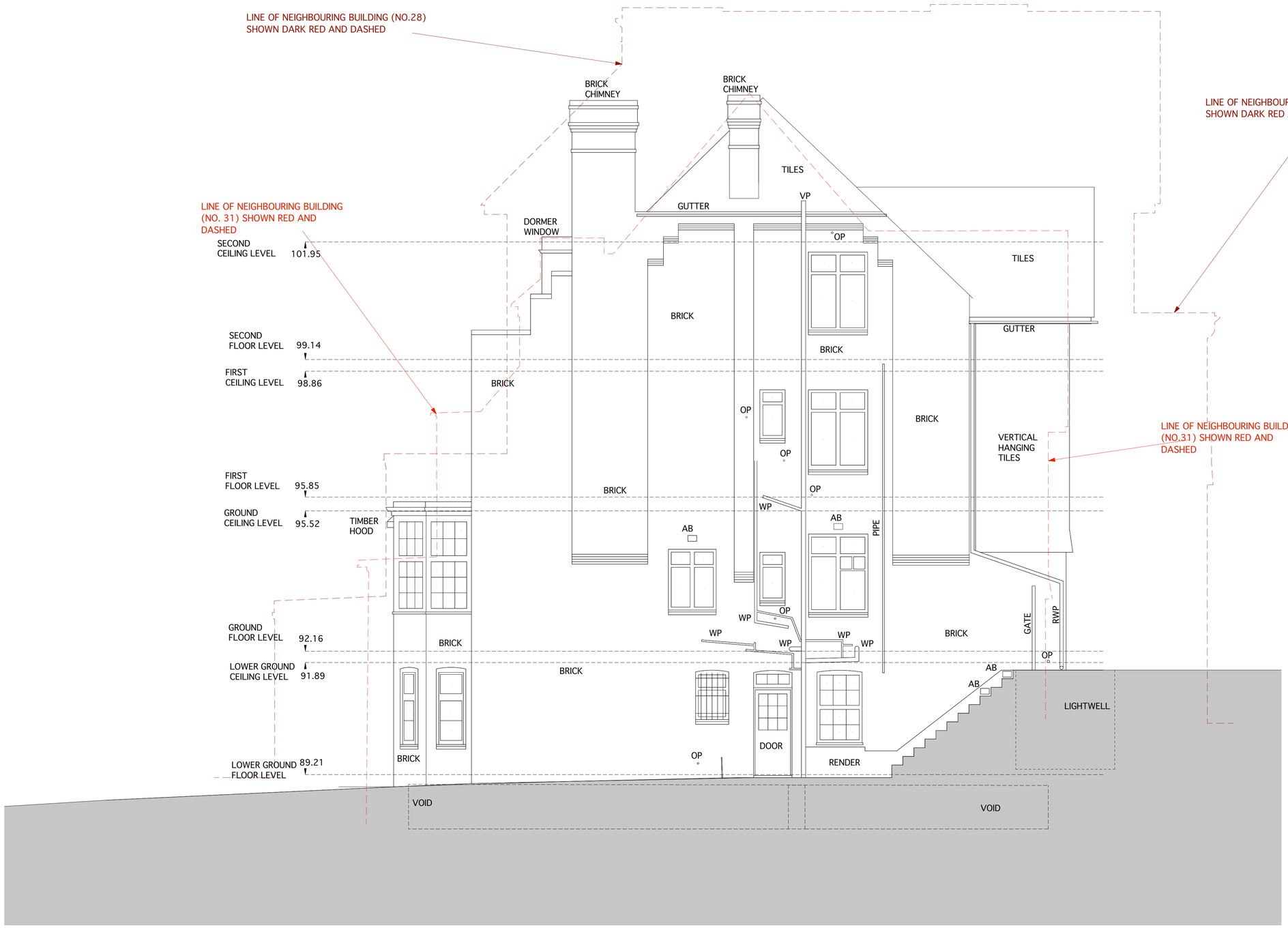

Existing Side Elevation D

THE CHARLTON BROWN PARTNERSHIP
ARCHITECTS
The Old Chapel Shepherds Walk Hampstead London NW3 5UE T 020 7794 1234 F 020 7435 5085 E office@charltonbrown.com

29 & 30 Lyndhurst Road, Hampstead
EXISTING
SIDE ELEVATION 1112/AP-08

Date 06/08/10 Scale 1:50 @ A1 Revisions

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING ANY WORK OR MAKING SHOP DRAWINGS
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DATUM 84.00m A.O.D.

SECTION A-A

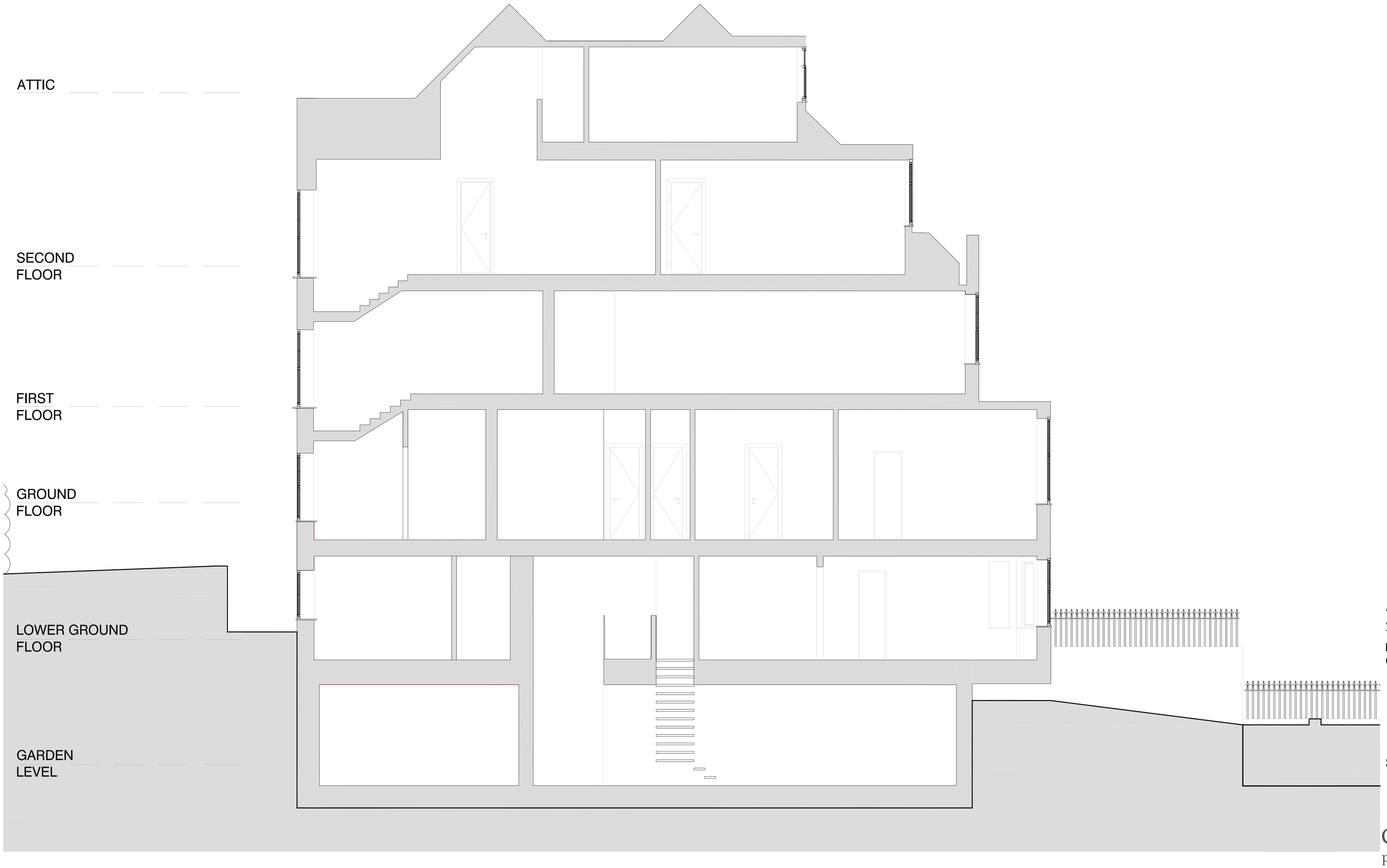
THE CHARLTON BROWN PARTNERSHIP
ARCHITECTS
The Old Chapel Shepherds Walk Hampstead London NW3 5UE T 020 7794 1234 F 020 7435 5085 E office@charltonbrown.com

29 & 30 Lyndhurst Road, Hampstead
EXISTING
SECTION A-A 1112/AP-09

Date 06/08/10 Scale 1:50 @ A1 Revisions

NOTES

"As built' drawings are based on:
(a) CAD files by KYSON, supplied by the client;
(b) images of the existing / 'as built'.



client: SHAKIB & Co
project
2082 29-30 LYNDHURST ROAD
ALTERATIONS TO: FENESTRATION OF FRONT AND REAR FACADES, UPPER LEVEL DORMERS TO REAR; RETENTION OF ROOF TERRACE, RETAINING WALL AND OPENINGS AT LG AND GARDEN LEVELS AS BUILT

D1130 - AS BUILT
rev:00
scale: 1:50 at A1
date: 13/01/2015

SECTION AA

CONSERVATION PD
planning + design

a Phoenix Yard
65-69 Kings Cross Road
London WC1X 9LW
t 020 7096 1504
f 020 7504 1701
e elenimakri@conservationpd.com
w www.conservationpd.co.uk

NOTES

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(b) images of the existing / 'as built'.

client: SHAKIB & Co
project
2082 29-30 LYNDHURST ROAD
ALTERATIONS TO: FENESTRATION OF FRONT AND REAR FACADES, UPPER LEVEL DORMERS TO REAR; RETENTION OF ROOF TERRACE, RETAINING WALL AND OPENINGS AT LG AND GARDEN LEVELS AS BUILT

D1110 - AS BUILT
rev:00
scale: 1:50 at A1
date: 13/01/2015

REAR ELEVATION

CONSERVATION PD
planning + design

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t 020 7096 1504
f 020 7504 1701
e elenimakri@conservationpd.com
w www.conservationpd.co.uk

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client: SHAKIB & Co
project
2082 29-30 LYNDHURST ROAD
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D1111 - AS BUILT
rev:00
scale: 1:50 at A1
date: 13/01/2015

REAR ELEVATION

CONSERVATION PD
planning + design

a Phoenix Yard
65-69 Kings Cross Road
London WC1X 9LW
t 020 7096 1504
f 020 7504 1701
e elenimakri@conservationpd.com
w www.conservationpd.co.uk

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client: SHAKIB & Co
project
2082 29-30 LYNDHURST ROAD
ALTERATIONS TO: FENESTRATION OF FRONT AND REAR FACADES, UPPER LEVEL DORMERS TO REAR; RETENTION OF ROOF TERRACE, RETAINING WALL AND OPENINGS AT LG AND GARDEN LEVELS AS BUILT

D1100 - AS BUILT
rev:00
scale: 1:50 at A1
date: 13/01/2015

FRONT ELEVATION

CONSERVATION PD
planning + design

a Phoenix Yard
65-69 Kings Cross Road
London WC1X 9LW
t 020 7096 1504
f 020 7504 1701
e elenimakri@conservationpd.com
w www.conservationpd.co.uk

Lower Ground Floor

SCALE - 1:50

0 1 2 3 m

Rev:	Comments:	By:	Date:
-	-	-	-

CONDITION VARIATION

Client:
Shakib Properties Ltd
-

Project Title:
Refurbishment and Extension of
29 & 30 Lyndhurst Road, Hampstead

Drawing Title:
Proposed
Lower Ground Floor Plan

Scale:	Date:	Drawn:	Checked:
1:50@A1	Jan 13		

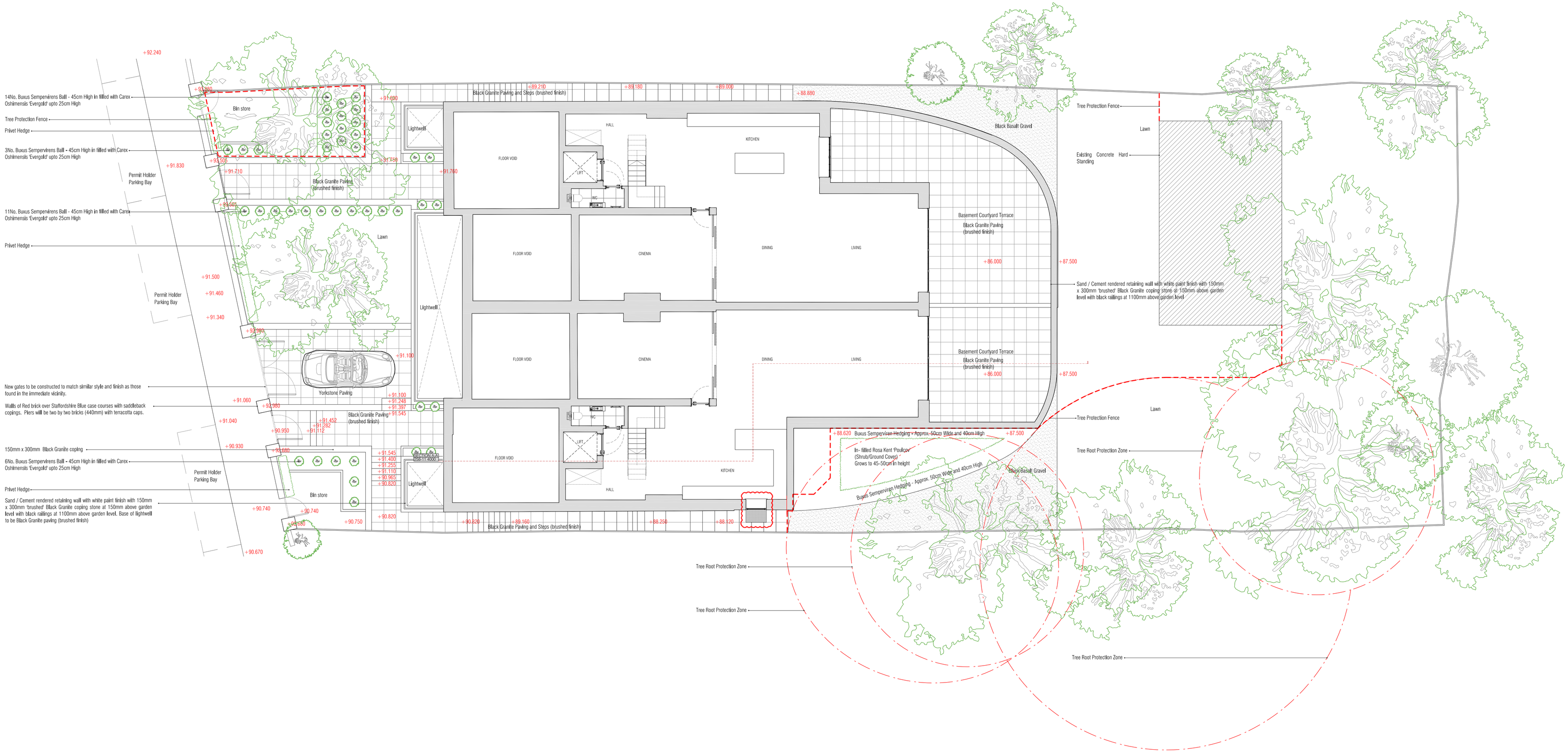
kyson

Studio

28 Scrutton Street
London
UK
EC2A 4RP

T: +44(0) 20 7247 2462
E: enquiries@kyson.co.uk
W: www.kyson.co.uk

Project No.:	Drawing No.:	Revision:
258-11	2001	-



SCALE - 1:100

0 1 2 3 4 5 m

Rev:	Comments:	By:	Date:
A	Basement side window added.	AH	Jul 13

CONDITION VARIATION

Client:
Shakib Properties Ltd

Project Title:
Refurbishment and Extension of
29 & 30 Lyndhurst Road, Hampstead

Drawing Title:
Proposed
Site Plan Showing Basement Layout

Scale:	Date:	Drawn:	Checked:
1:100@A1	Dec 12		

kyson

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EC2A 4RP

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Project No.:	Drawing No.:	Revision:
258-11	1799	A

GEA Geotechnical & Environmental Associates

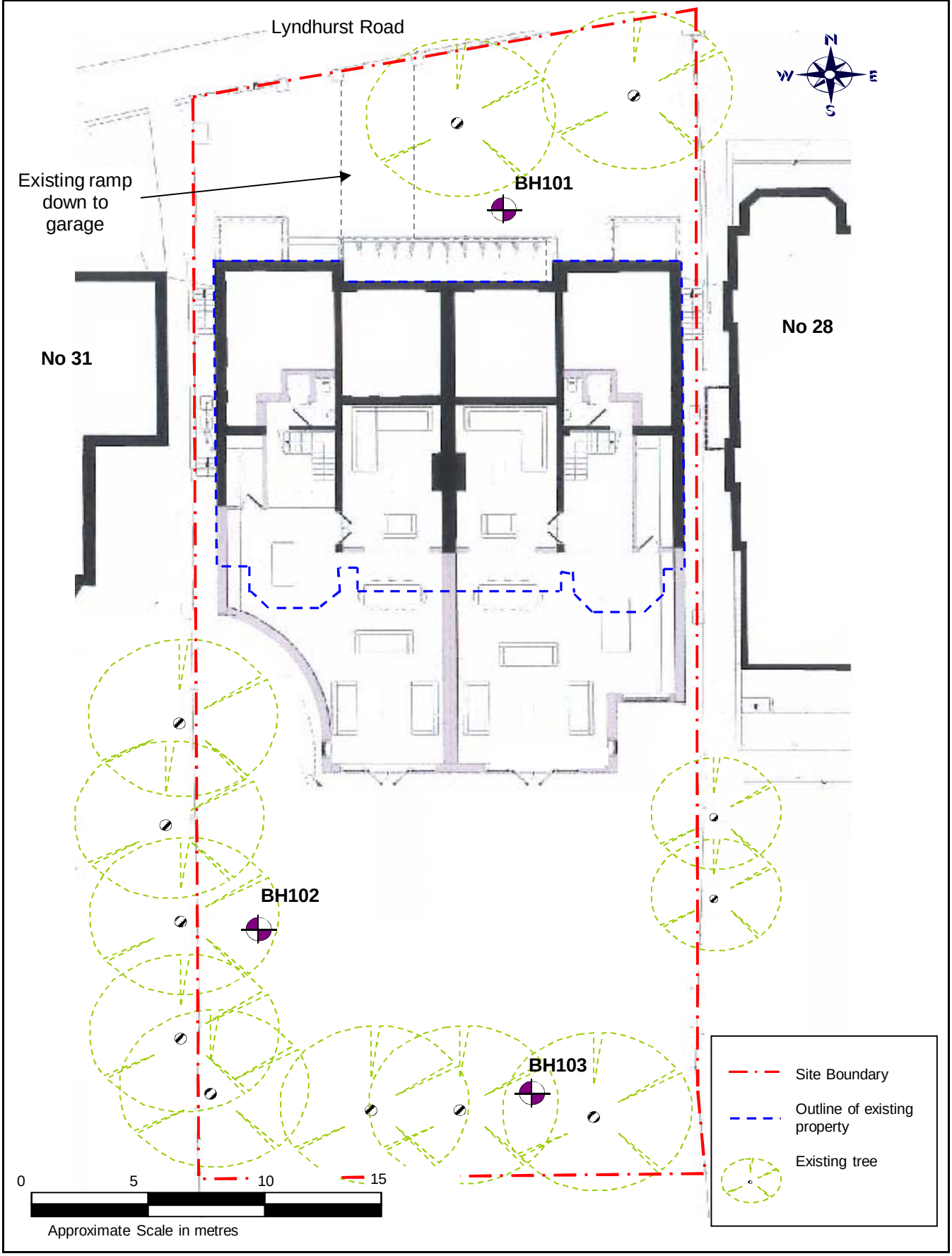
Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Site Plan

Site	29 & 30 Lyndhurst Road, Hampstead, London NW3
Client	Shakib Properties Ltd
Engineer	Price and Myers

Job Number J10240

Sheet 1 / 1



GEA Geotechnical & Environmental Associates

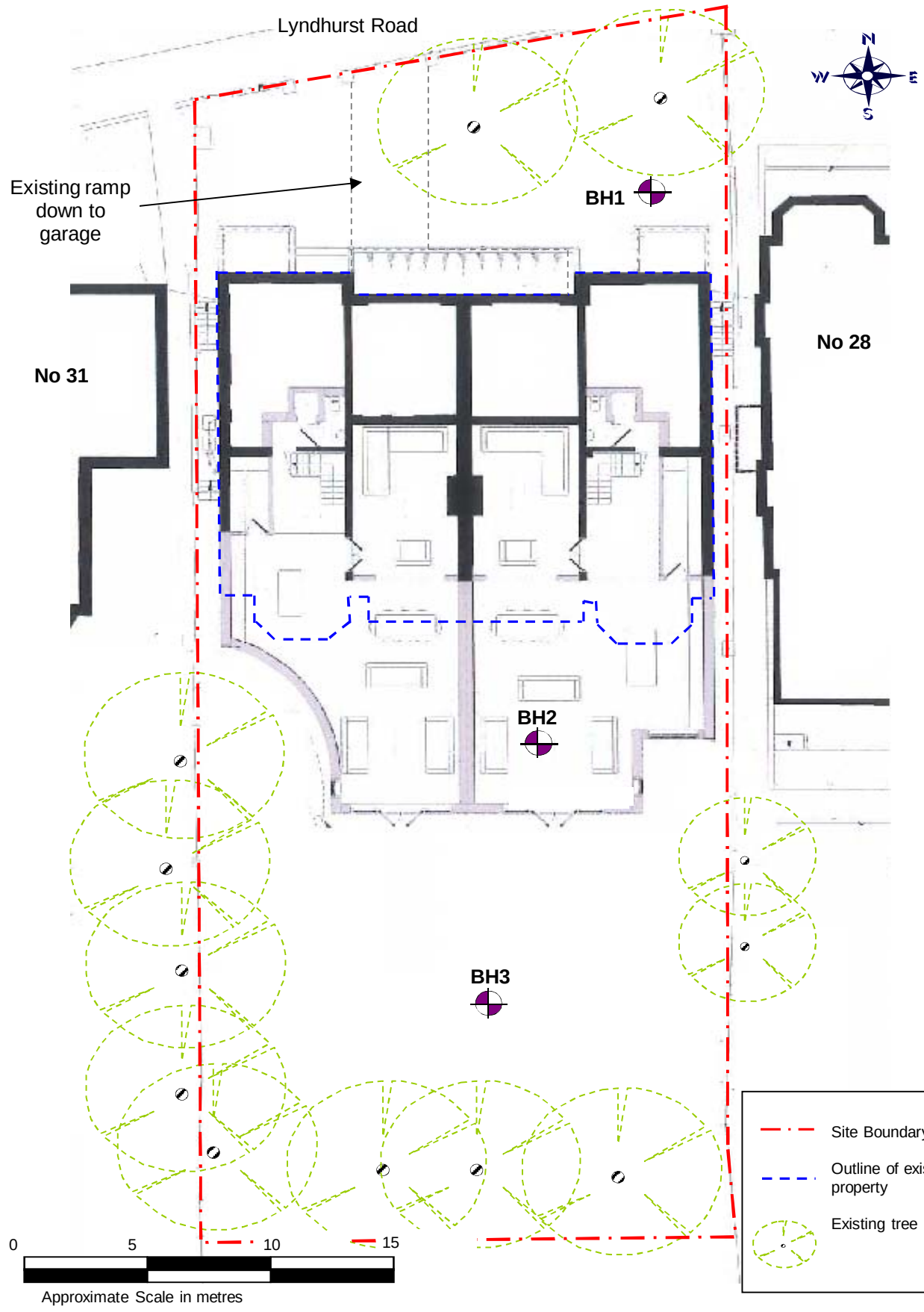
Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Site Plan

Site	29 & 30 Lyndhurst Road, Hampstead, London NW3
Client	Shakib Properties Ltd
Engineer	Price and Myers

Job Number J10240

Sheet 1 / 1



Geotechnical & Environmental Associates (GEA)
is an engineer-led and client-focused independent specialist providing a complete range of geotechnical and contaminated land investigation, analytical and consultancy services to the property and construction industries.

We have offices at

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tel 01727 824666
mail@gea-ltd.co.uk

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Gotham Road
Kingston on Soar
Notts
NG11 0DE
tel 01509 674888
midlands@gea-ltd.co.uk

Enquiries can also be made on-line at

www.gea-ltd.co.uk

where information can be found on all of the services that we offer.

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