The Geo-Environmental Service Provider

SITE INVESTIGATION
205 ALBANY STREET
LONDON

Prepared for: Afrijanus Property UK 1 Limited

ASL Report No. 253-20-651-09Rev1

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ASL
Holly Farm Business Park
Honiley
Warwickshire
CV8 1NP

T: +44(0)1926485508
F: +44(0)1926485507
E: info@aslenvironmental.co.uk
W: www.aslenvironmental.co.uk

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1 INTRODUCTION

In August 2019, ASL were instructed by QED Structures on behalf of the client, Afrijanus Property UK 1 Limited to undertake the necessary site investigation and consultancy services associated with the site known as 205 Albany Street, London.

A site investigation is required in order to determine the ground conditions at the site ahead of its proposed development. It is understood that the proposed development comprises alterations and extensions to the existing property including extensions to the existing lower ground floor. In addition, as part of the proposed development, it is understood that floor levels within the existing lower ground floor are to be lowered by approximately 0.4m to 0.75m, with the floor level within the existing vaults in the east of the site lowered by approximately 0.75m. A proposed development layout is presented as Appendix I.

The scope of works for this project was set out in ASL's proposal references 253-20-651 205.elo.3384 dated 26th August 2020. The proposal was formerly accepted by Afrijanus Property UK 1 Limited in their completed Project Award Form dated 17th November 2020.

This report presents a desk study and conceptual site model, the factual results from an intrusive investigation and subsequent laboratory analyses and interpretative comment in terms of the geotechnical properties of the ground conditions encountered at the site in relation to the proposed development together with an assessment of the contaminative status of the site.

This report has been prepared for the sole benefit of the Client, Afrijanus Property UK 1 Limited, and their representatives and agents. The report has been written based on the results of data searches and ground conditions encountered at the time of the investigation and the results of subsequent analyses. Future changes in legislation and advances in current best practises or provision of more detailed design proposals will result in this report requiring review and possible further assessment after the date of issue. The general notes section within this report should be noted in relation to the limitations of this investigation and assessment.

2 THE SITE

The site is located to the immediate west of Albany Street approximately 0.6km to the south-west of Camden Town Centre and can be located approximately by National Grid Reference TQ 286 833 as shown on Figure 1.

The site comprises a roughly rectangular shaped piece of land with maximum dimensions of approximately 10m by 10m. The site is generally flat lying with no significant changes in elevation across the site.

The site is currently occupied by a terraced residential property (205 Albany Street). The existing structure comprises a brick built four-storey residential property with sloping tiled roof. An existing lower ground floor is present beneath the main house structure, the level of which is approximately 2m to 3m below the general site level.

The remainder of the site comprises an area measuring approximately 5m by 1.5m which forms a small area of courtyard located directly to the west of the existing structure.

The western boundary of the site is formed by a brick built wall approximately 2m in height. The site is bound to the east by Albany Street and to the north and south by residential properties.

It is understood that the proposed development comprises alterations and extensions to the existing property including extensions to the existing lower ground floor. In addition, as part of the proposed development, it is understood that floor levels within the existing lower ground floor are to be lowered by approximately 0.4m to 0.75m, with the floor level within the existing vaults in the east of the site lowered by approximately 0.75m. A proposed development layout is presented as Appendix I.

3 GEOLOGY

The British Geological Survey (BGS) Sheet No. 256 – 'North London' (Solid and Drift) and the Geology of Britain viewer indicates the site to be devoid of drift geology and directly underlain by solid geology the London Clay Formation generally 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' by the BGS. The thickness of the London Clay Formation is not defined by the BGS in the vicinity of the site, however it is anticipated to extend to significant depth.

A large area of mapped Worked Ground is indicated to be present approximately 250m to the east of the site. The Worked Ground is generically described as 'an area where the land surface (natural or artificial) has been lowered as a result of man-made excavations. The purpose of the excavation is unspecified' by the BGS.

The site is located in an area that may not be affected by coal mining and an area at no hazard from non coal mining activities. There are no BGS recorded mineral sites located within 0.5km of the site.

The environmental database search indicates the site to be in a lower probability radon area and that no radon protective measures are necessary in the construction of new dwellings or extensions.

Further details are presented in Appendix II.

4 HYDROGEOLOGY

The London Clay Formation is classified by the EA as an 'Unproductive Strata' described as 'These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow'.

The site is not located in a Source Protection Zone (SPZ). A Boundary with a SPZ II (Outer Protection Zone) and a SPZ I (Inner Protection Zone) are present approximately 810m and 870m to the west, respectively.

There is one abstraction from groundwater located within 1km of the site. This listing relates to the abstraction of water for 'Zoos/Kennels/Stables: Animal Watering & General Use (Non Agricultural)' use located approximately 630m to the west.

There are no discharge consents to groundwater located within 1km of the site.

The site is not located in an area with the potential for groundwater flooding to occur.

The site is not located in a groundwater nitrate vulnerable zone.

Further details are presented in Appendix II.

5 HYDROLOGY

The nearest identified surface water features are a number of unnamed ponds associated with London Zoo located approximately 380m to the west. None of these surface water features are classified chemically or biologically by the EA in the vicinity of the site.

The Grand Union Canal is located approximately 400m to the north-west of the site. The Grand Union Canal was classified as a category E – Poor by the EA in the vicinity of the site in 2000.

There are no abstractions from or discharges to surface water within 0.5km of the site.

The site is not indicated to be in an area at risk of flooding from rivers or seas without defences.

The site is not indicated to be in an area at risk from surface water flooding.

The site is not indicated to be in a surface water nitrate vulnerable zone.

Further details are presented in Appendix II.

6 SITE HISTORY

The site history has been derived from historical OS maps dating back to 1872. The map extracts are presented in Appendix III. Table 1 below presents a summary of the key developments in and around the site shown on the historical maps.

Table 1 Summary of Site History

Date of Map Extract	On site and surrounding Land-use
1872 - 82 (1:1056, 1:2500 & 1:10560)	The site is occupied by an assumed residential property, the layout of which is broadly consistent with that seen today. Albany Street is present directly to the east with Gloucester Mews present directly to the west. Regents Canal (Collateral Cut) is present approximately 60m to the north-east, with an assumed wharf present approximately 375m to the south-east. Railway lines are present approximately 175m to the north-east. Regents Park Barracks are present approximately 100m to the south-east. Regents Park is present approximately 80m to the west. A large railway goods depot is present approximately 700m to the north, with Euston Station present approximately 750m to the south-east. The remainder of the surrounding area generally comprises areas of residential properties, public buildings and associated road infrastructure.
1895 - 96 (1:10560, 1:2500 & 1:10560)	The site appears to remain unchanged. Limited residential development has taken place approximately 40m to the north-east. The buildings approximately 50m to the south are now labelled as St Katherines Royal Hospital. Zoological gardens are present approximately 350m to the west.
1916 - 20 (1:2500 & 1:10560)	The site area remains generally unchanged. A significant area of railway infrastructure and sidings together with two carriage sheds is present approximately 125m to the east. A hospital is present within the north of the barracks to the south-east.
1938 (1:10560)	The site and surrounding area remain generally unchanged.
1946 (Aerial Photo)	The site remains generally unchanged. The canal to the north-east appears to have been infilled. Assumed allotment gardens are present approximately 150m to the west. A number of further structures are present within the barracks to the south-east.
1951 - 53 (1:1250 & 1:10000)	The site remains unchanged. Further structures are present within the barracks to the south-east. A garage is present approximately 150m to the north-east. A number of works together with a warehouse and garage are present in excess of approximately 250m to the north and north-east. Allotment gardens are present on the route of the former canal approximately 250m to the south-east. Ruins are present approximately 125m to the south-west. In addition, the residential property approximately 20m to the south-east has been removed together with a limited number of properties in the wider surrounding area. It is considered that the ruins and removed property may be associated with bomb damaged sustained during World War II.
1954 - 57 (1:2500 & 1:10000)	The site and surrounding area remain generally unchanged.
1962 - 69 (1:1250 & 1:10000)	The site remains generally unchanged. Assumed lock-up garage structures are present approximately 50m to the south. A large tank feature is present approximately 25m to the east.
1971 (1:2500)	The site remains generally unchanged. The tank feature to the east has been removed and redeveloped with two assumed residential properties.
1973 -75 (1:1250 & 1:10000)	The site and surrounding area remain generally unchanged.
1976 (1:1250)	The site remains generally unchanged. The residential properties present approximately 10m to the south-west appeared to have undergone redevelopment with their layout now broadly consistent with that seen today.
1977 (1:1250)	The site and surrounding area remain generally unchanged.

Date of Map Extract	On site and surrounding Land-use
1990 (1:1250)	The site remains generally unchanged. Limited assumed residential development has taken place approximately 40m to the north-east. The carriage shed approximately 200m to the north-east has been removed.
1991 (1:1250 & 1:10000)	The site remains unchanged. The goods depot and associated railway infrastructure to the north has been removed and replaced with a distribution centre.
1999 (Aerial Photo & 1:10000)	The site and surrounding area remain generally unchanged. The zoological gardens to the west are now labelled as London Zoo, with a number of ponds present within its grounds
2006 (1:10000)	The site and surrounding area remain generally unchanged. The barracks to the south-east has undergone limited alteration.
2020 (1:10000)	The site and surrounding area remain generally unchanged. The carriage shed approximately 250m to the south-east has been removed.

The site's history dating back to 1872 indicates the site to have been occupied by an assumed residential property, the layout of which is consistent with the property currently present onsite.

Regents Canal (Collateral Cut) is indicated to have been present approximately 60m to the north-east of the site until approximately 1946 after which this feature appears to have been infilled.

A significant area of railway infrastructure and sidings including two carriage sheds is indicated to have been present approximately 125m to the east of the site since approximately 1916. The carriage sheds are indicated to have been removed by 1990 and 2020, however the railway infrastructure remains.

A number of garages, works and warehouses have been identified in the vicinity of the site, the closest of which is located approximately 150m to the north-east.

The remainder of the surrounding area has generally comprised residential properties, public buildings, recreational land and local road infrastructure.

7 STATUTORY DATABASE SEARCH

7.1 General

This section details any relevant information from registers maintained by the EA. Information provided by the BGS, The Coal Authority, Health Protection Agency and the National Environment Research Council (NERC) is also considered. The information held by the various bodies is summarised below and presented in detail in Appendix II.

It should be noted that the information provided in the desk study is obtained from independent third party sources. It is provided in good faith, but no guarantee can be provided as to its accuracy. Independent enquiries should be made relating to information provided in the desk study information that may impact on the proposed development. The desk study information is not necessarily exhaustive and further information relevant to the site may be available from other sources.

7.2 Database Search Results

There are no registrations listed within 0.5km of the site under the following:

- Contaminated Land Register Entries and Notices;
- Prosecutions Relating to Controlled Waters
- Enforcement and Prohibition Notices;
- Integrated Pollution Controls;
- Integrated Pollution Prevention and Control;
- Local Authority Integrated Pollution Prevention and Control;
- Local Authority Pollution Prevention and Control Enforcements;
- Prosecutions Relating to Authorised Processes;
- Registered Radioactive Substance Sites;
- Substantiated Pollution Incident Register;
- Water Industry Act Referrals;
- Any landfill sites;
- Integrated Pollution Control Registered Waste Sites;
- Any Licensed Waste Management Facilities;
- Any waste transfer, treatment or disposal sites;
- Any areas of potentially infilled land (non-water);
- Any Hazardous Substance Sites.

The following sections discuss the database search results which identified registrations listed within 0.5km of the site.

7.3 Environment Agency Search Results

There are three Local Authority pollution prevention and controls located within 0.5km of the site. The closest listing relates to a petrol filling station located approximately 260m to the north. The status of this listing is detailed as ‘authorised’. The remaining two listings relate to ‘dry cleaning’ located approximately 300m and 400m to the north. The status of these listings is detailed as ‘permitted’.

There is one pollution incidents to controlled waters located within 0.5km of the site. This listing relates to the release of an unknown pollutant to an undefined water feature located approximately 465m to the north. This incident was classified as a Category 3 – minor incident by the EA.

There are three areas of potentially infilled land (water) located within 0.5km of the site. The closest listing relates to an area of unknown filled land (pond, marsh, river, stream, dock etc.) located approximately 80m to the north-east. The remaining listings relate to areas of unknown filled land (pond, marsh, river, stream, dock etc.) located at distances greater than approximately 380m from the site. The mapping date of all of these features is detailed as 1951.

Further details are presented in Appendix II.

7.4 Geological Hazards

There is either a very low risk or no hazard from collapsible ground stability hazards, compressible ground stability hazards, landslide ground stability hazards or running sand ground stability hazards at the site.

The site is indicated to be in an area at moderate risk from shrinking or swelling clay ground stability hazards.

The site is located in an area that may not be affected by coal mining and an area at no hazard from non coal mining activities. There are no BGS recorded mineral sites located within 0.5km of the site.

The environmental database search indicates the site to be in a lower probability radon area and that no radon protective measures are necessary in the construction of new dwellings or extensions.

Further details are presented in Appendix II.

7.5 Contemporary Trade References

There are thirty-nine contemporary trade references located within 0.5km of the site. The closest listing relates to commercial cleaning services located approximately 190m to the north. The status of this listing is detailed as 'inactive'. The remaining listings relate to various industrial and commercial services completed at distances greater than approximately 230m from the site.

There is one fuel station entry located within 0.5km of the site. The listing relates to an obsolete facility located approximately 455m to the east.

There are seven commercial services points of interest located within 0.5km of the site. The closest listing relates to 'vehicle repair, testing and servicing' located approximately 250m to the north. The remaining listings relate to 'scrap metal merchants', 'vehicle repair, testing and servicing' and 'distribution and haulage' located at distances greater than approximately 305m from the site.

There is one education and health point of interest located within 0.5km of the site. this listing relates to a hospital located approximately 470m to the north-east.

There are ten manufacturing and production points of interest located within 0.5km of the site. The listings relate to 'unspecified works or factories', 'business parks and industrial estates' and' unspecified quarries or mines' located at distances greater than approximately 275m from the site.

There are five recreational and environmental points of interest located within 0.5km of the site. These listings relate to 'playgrounds' and 'municipal parks and gardens' located approximately at distances greater than approximately 130m from the site.

Further details are presented in Appendix II.

8 ASSESSMENT OF POTENTIAL CONTAMINATION RISKS

8.1 General

The following sections identify potential sources of contamination at the site and the surrounding area. The receptors to any contamination are also identified together with the pathways by which the contamination may make contact with the receptors. This section of the report uses the guidance presented in CLR 11 'Model Procedures for the Management of Land Contamination' produced by DEFRA and the EA to develop a conceptual site model as a 'source-pathway-receptor' model in accordance with current best practise.

8.2 On-Site Sources of Contamination

The potential sources of on-site contamination are associated with the site's former land uses. The site's history dating back to 1872 indicates the site to have been occupied by an assumed residential property, the layout of which is consistent with the property currently present onsite.

The former and current use of the site as a residential property is not classified by the Department for Environment, Food and Rural Affairs and the Environment Agency's document CLR8 as being potential sources of contamination.

There is the potential for vehicles and machinery use or stored at the site to contaminate the site from incidental leaks or spills of fuels and oils. This would give rise to the presence of oil and fuel based hydrocarbons within the near surface soils. No visual or olfactory evidence of contamination was noted at the site during the site walkover.

There is the potential for Made Ground to be present at the site associated with the existing development. Should Made Ground be identified, a general suite of determinants including asbestos should be considered.

The environmental database search indicates the site to be in an area where lead concentrations of between 300mg/kg and 600mg/kg may be present, with lead concentrations in excess 900mg/kg likely to be present within the vicinity of the site to the north. The elevated concentrations of lead are associated with historical industrial activity completed in the vicinity of the site.

There is the potential for asbestos to be present within the building fabric of the existing onsite structure. It is recommended that an asbestos survey is completed prior to the commencement of any development or refurbishment works.

8.3 Off-Site Sources of Contamination

The site has generally been surrounded by residential dwellings, recreational land, public buildings and local infrastructure. These land uses are not classified in the Department for Environment, Food and Rural Affairs and the Environment Agency's document CLR8 and the Department of the Environment Industry Profiles as being a potential source of contamination.

The railway infrastructure to the north-east is considered to be a potential source of contamination in the form of wind-blown metal and polycyclic aromatic hydrocarbon contamination.

A limited number of commercial and industrial land uses, including railway infrastructure, have been identified in the vicinity of the site, the closest of which is located approximately 125m to the east. In addition, areas of infilled land have been identified in the vicinity of the site, the closest of which is located approximately 80m to the north-east. These features and land uses are considered to be potential off-site sources of contamination and hazardous ground gases. However, due to the distance to these features and the likely cohesive nature of the underlying ground conditions the potential risk posed at the site from these off-site sources is considered to be very low.

8.4 Receptors

The receptors to any potential contamination and therefore the element actually at risk from the potential sources of contamination have been identified as the following:

- Construction and maintenance workers (R1);
- Current and future site users (R2);
- Service Lines, constructed as part of any new development (R3);
- Groundwater hydraulically down gradient of the site – Unproductive Strata (R4);
- Surface watercourses - Unnamed ponds located approximately 380m to the west and Grand Union Canal located approximately 400m to the north-west (R5);
- Neighbouring properties and residents (R6).

8.5 Pathways

A pathway is the means by which a contamination source makes contact with the receptor creating a pollutant linkage. The three elements of an identified pollutant linkage (source-pathway-receptor) need to be present for there to be a perceived risk from any identified contamination present in soils and/or groundwater.

The pathways considered in this assessment are as follows:

- Direct Physical Contact – Dermal contact, ingestion, inhalation (PL1);
- Migration from soils to groundwater via leaching (PL2);
- Migration within groundwater (PL3);
- Migration via service lines (PL4);
- Volatilisation of contaminants from soils and groundwater (PL5);
- Migration of hazardous ground gases (PL6)
- Vegetable intake (PL7).

8.6 Conceptual Site Model

The conceptual site model has been produced in accordance with the guidance presented in DEFRA R&D Publication CLR11 to produce this source-pathway-receptor model.

The desk study assessment of the site's environmental setting has identified potential pollutant linkages that may pose a risk to human health and controlled waters. The potential pollutant linkages are detailed in the conceptual site model, Figure 3.

The conceptual site model assumes the presence of contamination on the site in the Made Ground and/or the near surface soils and should be refined in relation to the results of the investigation as necessary. Refinement should also be made should the nature of the development result in pollutant linkages being broken. Refinements as necessary will be discussed in the qualitative risk assessment section of this report.

Table 2 presents a summary of the identified pollutant linkages.

Table 2 Summary of Pollutant Linkages

Potential Source of Contamination	Potential Pathway	Description / Comment	Potential Receptors
Potential Made Ground at the site.	PL1, PL2, PL3, PL4, PL5, PL6, PL7	Potential for contamination and hazardous ground gases. Presence not yet proven but expected.	R1, R2, R3, R4, R5, R6
Incidental leaks and spills from vehicles and machinery used and stored at the site.		Presence not yet proven. No visual or olfactory evidence of contamination noted during the site walkover.	
Elevated background concentrations of lead associated with historical industrial activity.		Presence not yet proven but expected.	
Areas of infilled land and limited industrial and commercial land uses identified in the vicinity of the site.		Potential for the migration of contamination and hazardous ground gases. Presence not yet proven.	
Asbestos within the existing building fabric.	PL1	Presence not yet proven.	R1, R2

8.7 Summary

The potential pollutant linkages noted in Table 2 will be discussed in light of the findings of the intrusive investigation from which an assessment of the actual risks posed by any contamination to the identified receptors will be determined.

From the assessment of the potential pollutant linkages the critical receptors are considered to be site end users (female child for a residential development) and groundwater hydraulically down gradient of the site in the Unproductive Strata. Maintenance and construction workers, service lines and neighbouring properties may also require consideration.

Due to the potential for asbestos to be present within the existing building fabric, it is recommended that an asbestos survey is completed prior to the completion of any development or refurbishment works.

9 GROUND INVESTIGATION AND TESTING

9.1 Ground Investigation

The scope of works was defined for the project by ASL in conjunction with QED Structures and comprised one windowless sample borehole. The intrusive investigation was designed to target the location of the proposed development. This investigation was completed to obtain information relating to the contaminative status and geotechnical properties of the underlying ground conditions.

The position of exploratory hole has been surveyed and plotted approximately on Figure 2.

The ground investigation was carried out in general accordance with BS5930 (2015) 'Code of Practice for Site Investigations' and BS10175+A2:2017 "Investigation of Potentially Contaminated Sites - Code of Practice" and in accordance with current best practice.

The scope of works for the ground investigation was as follows:

- 1 No. windowless sampler borehole (WS) to a depth of 10.45m bgl;
- Insitu standard penetration tests (SPT) at regular intervals within WS;
- Installation of a combined gas and groundwater monitoring standpipe within WS;
- Chemical laboratory testing of selected soil samples
- Chemical and geotechnical laboratory testing;
- Gas and groundwater monitoring programme.

The ground investigation was undertaken on the 14th January 2021. The intrusive investigation was supervised by a suitably experienced geo-environmental engineer from ASL. The exploratory holes were logged by the supervising engineer and the logs are presented in Appendix IV.

9.2 Gas and Groundwater Monitoring Programme

A single monitoring event was conducted on the 4th February 2021 and comprised level measurements of methane, oxygen, carbon dioxide, carbon monoxide, hydrogen sulphide, relative and atmospheric pressure, gas flow rate and groundwater level. The results of the gas and groundwater level monitoring are presented in Table IVa of Appendix IV.

9.3 Falling Head Permeability Testing

A falling head permeability test was completed within the monitoring installation on the 4th February 2021. The falling head permeability test was completed by filling the installation with clean water and monitoring the rate at which the water fell. The results of the falling head permeability test are presented in Appendix IV.

9.4 Laboratory Testing

Selected soil samples were scheduled for chemical testing for a general suite of contaminants to determine the general contaminative status of the ground conditions on the site. The samples were scheduled for chemical laboratory testing for the following determinants:

> Arsenic, Boron (water soluble), Beryllium, Cadmium, Chromium, Copper, Cyanide (free and total) Lead, Mercury, Nickel, Selenium, Vanadium, Zinc, Poly-cyclic Aromatic Hydrocarbons (PAH) (16 No. speciated), Total Petroleum Hydrocarbons (TPH), pH, Phenols, Sulphate (soluble), Sulphide, Total Sulphur, Total Sulphate, fraction of organic carbon, asbestos (Made Ground only)

Selected samples were scheduled for inert waste acceptance criteria (WAC) testing.

Selected soil samples were scheduled for the following determinants in leachate:

> Arsenic, Boron, Beryllium, Cadmium, Chromium, Copper, Cyanide (free and total), Lead, Mercury, Nickel, Selenium, Zinc, pH

The chemical testing is being undertaken by a UKAS accredited laboratory in accordance with the MCERTS accreditation where available.

The results of the chemical laboratory testing are presented in Appendix V.

9.5 Geotechnical Laboratory Testing

Geotechnical laboratory testing was completed on selected soil samples. The samples have been scheduled for Atterberg Limit testing to assess shrinkage potential and for pH and sulphate testing to assess the concrete classification for the proposed development.

The results of the geotechnical laboratory testing are presented in Appendix V and VI.

10 GROUND, GROUNDWATER AND GAS CONDITIONS

10.1 Materials Encountered

The BGS indicates the site to be devoid of drift geology and directly underlain by solid geology comprising the London Clay Formation.

The intrusive investigation proved the published solid geology.

In addition to the published geology the intrusive investigation Made Ground at the site present overflying the London Clay Formation materials to a depth of 2.2m bgl.

Table 3 presents a summary of the ground conditions encountered during the intrusive investigation. Full details of the conditions encountered are presented on the exploratory hole logs in Appendix IV.

Table 3 Summary of Strata Encountered

Description	Top of Unit (m bgl)		Thickness of Unit (m)		SPT 'N' Value
	Min	Max	Min	Max	
Made Ground Yellow brown gravelly SAND with frequent cobbles of paving slab, brick and concrete. Gravel is subangular to subrounded fine to coarse slate, brick, concrete, sandstone and plastic; Soft to firm, locally very soft, brown sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse brick, flint, charcoal and limestone; Soft to firm brown locally grey CLAY with occasional angular to subrounded gravel of slate, brick and limestone.	0.15	0.15	2.05	2.05	0 - 1
London Clay Formation Stiff becoming very stiff with depth light brown becoming brown and brown grey with depth CLAY locally with rare selenite crystals.	2.20	2.20	8.25*	8.25*	10 - 23

Notes: * Denotes base not proven

In addition to the strata summarised in Table 3, concrete paved hardstandings were encountered at the surface at WS1 to a depth of 0.15m bgl.

Two SPT's were completed within Made Ground materials encountered which recorded SPT 'N' values of 0 and 1, indicating extremely low strength cohesive materials.

Eight SPTs were completed within materials interpreted as the London Clay Formation that recorded SPT 'N' values between 10 and 23, with SPT 'N' values typically increasing with depth, indicating typically medium strength becoming high strength with depth cohesive materials.

Two samples of the London Clay Formation materials recovered from depths of 3.6m and 5.6 bgl were scheduled for Atterberg Limit determinations. The results indicate the London Clay Formation materials tested to comprise silts of very high plasticity with liquid limits of 72% and 81%, plastic limits of 40% and 41%% and plasticity indices of 32% and 40% indicating the materials to be of medium and high volume change potential.

Natural moisture contents of 33% were recorded for the two samples tested.

The results of the geotechnical laboratory testing are presented in Appendix IV.

10.2 Falling Head Permeability Testing

A falling head permeability test was completed at WS1 on 4th February 2021. The falling head permeability test recorded a positive infiltration rate of 7.01×10^{-9}m/s. The results of the permeability testing are presented in full in Appendix IV.

10.3 Groundwater

Groundwater was not encountered within the exploratory borehole during the intrusive investigation or subsequent monitoring event.

Full details are presented in Appendix IV.

10.4 Gas

As part of the monitoring programme below ground gas levels within the monitoring standpipe were measured during a single monitoring event completed on the 4th February 2021. The results are presented in full in Table IVa of Appendix IV.

Methane, carbon monoxide, carbon dioxide and hydrogen sulphide were not recorded in excess of their relevant analytical detection limits of the apparatus used during the monitoring events.

Oxygen was recorded in excess of the analytical detection limit of the apparatus used at the monitoring installation during the monitoring event at a concentration of 20.9% v/v.

Average downhole pressures and average flow rates were recorded as being zero during the monitoring event.

The monitoring event was completed during a period of lower atmospheric pressure of 1005 to 1006mb.

11 GEOTECHNICAL ASSESSMENT

11.1 General

It is understood that the proposed development comprises alterations and extensions to the existing property including extensions to the existing lower ground floor. In addition, as part of the proposed development, it is understood that floor levels within the existing lower ground floor are to be lowered by approximately 0.4m to 0.75m, with the floor level within the existing vaults in the east of the site lowered by approximately 0.75m. A proposed development layout is presented as Appendix I.

At this stage it is assumed that a formation level of approximately 3m to 4m below existing ground level is to be adopted for the proposed basement construction.

As it is proposed to reduce the floor level within the existing lower ground floor, it is considered that underpinning of the existing foundations within these areas will be required.

The ground conditions at the site have been found to comprise Made Ground materials to a depth of approximately 2.2m bgl overlying firm to very stiff cohesive materials considered to represent solid geology of the London Clay Formation.

11.2 Foundation Assessment

Due to their inconsistency and variability the Made Ground materials are not considered a suitable founding stratum in their current condition.

It is considered that conventional foundations could be adopted for the proposed basement construction and any associated underpinning works, with foundations placed within the London Clay Formation materials at depths between approximately 3m and 4m bgl and designed to a net allowable bearing pressure of 125kN/m^2 to limit total settlements to 25mm and differential settlements to acceptable levels. Foundations will need to be locally deepened through any deeper Made Ground materials or any otherwise unsuitable materials and placed a minimum of 200mm into the underlying founding strata.

Plasticity index results indicate the London Clay Formation materials to be of medium and high volume change potential. However, given the nature of the site and the absence of any trees or planting within the vicinity of the proposed development it is considered that the deepening of foundation due to tree influence is unlikely to be required.

However, if foundations lie within the influencing distance of existing, proposed or recently removed trees and planting, foundations may need to be locally deepened in accordance with NHBC guidelines.

11.3 Basement Construction

It has been assumed that a formation level of approximately 3m to 4m below existing ground level will be adopted for the proposed basement construction.

It is considered that the most suitable option for forming the basement is by sequenced excavation to formation level, with suitable temporary support to the excavations and adjacent structures, together with the construction of mass concrete or reinforced retaining walls.

It is considered that conventional foundations could be adopted for retaining walls forming the basement as detailed in Section 11.2.

The sequencing of excavation and the design of temporary and permanent support to the ground and existing structures should be determined by a suitably qualified structural engineer.

The soil parameters detailed in Table 4 below are considered appropriate in relation to retaining wall design and ground movements.

Table 4 Retaining Wall Design Parameters

Material	Effective Cohesion (kN/m^2)	Effective Friction Angle (°)	Undrained Stiffness (E) (MN/m^2)	Bulk Density (Mg/m^3)
Made Ground	c' = 0*	ǿ = 25*	5*	γ′ = 1.80*
London Clay Formation	c' = 0 - 5*	ǿ = 21 - 23*	15 - 20*	γ′ = 2.10*

Groundwater was not encountered within the exploratory borehole during the intrusive investigation or subsequent monitoring event.

Based on the results of the groundwater monitoring it is considered that groundwater issues are unlikely to be encountered in relation to basement construction. However, the potential for higher groundwater levels cannot be discounted, particularly if the construction works are undertaken during the winter or periods of wet weather.

It is therefore considered that the basement structure should be waterproofed and appropriate measures included to manage groundwater during construction. The basement structure should be designed to safeguard against flotation.

11.4 Floor Slabs

Due to the limited depth and extent of the proposed basement excavation, it is considered that any heave of the materials at basement formation level due to the removal of the overlying soils is likely to be limited.

It is therefore considered that the use of ground bearing floor slabs could be adopted within the proposed development, placed within the London Clay Formation materials, however as a precautionary measure it is recommended that heave precautions are included beneath any proposed ground bearing slabs.

Alternatively, it is considered that suspended floor slabs with suitable subfloor voids could be adopted.

11.5 Excavations

Excavation of the materials encountered on site is likely to be achieved using conventional plant however, should any obstructions remain in the ground, such as former foundations and basement structures, at shallow depths the use of pneumatic/hydraulic breakout equipment may be required, particularly within confined excavations.

Given the nature of the Made Ground materials excavations may be prone to collapse, particularly in association with inflows of water. Consequently, temporary support should be considered for all excavations where collapse is to be avoided. Heavier duty closed

shoring should be provided for any excavations where man entry is necessary, in compliance with statutory requirements, to ensure safe working conditions.

11.6 Dewatering

Groundwater was not encountered within the exploratory borehole during the intrusive investigation or subsequent monitoring event.

It is therefore considered that groundwater is unlikely to encountered in excavations forming part of the proposed development. However, in the event of groundwater inflows within excavations it is considered that these should be suitably controlled with the use of conventional sump pumping techniques in conjunction with construction techniques to limit inflows into the excavation.

If dewatering is to be undertaken, consideration should be given to obtaining any relevant discharge consents that may be required for the disposal of water to existing drainage systems.

11.7 Buried Concrete Classification

Based on the results of chemical laboratory testing undertaken on samples recovered from the Made Ground and London Clay Formation materials it is considered that a Design Sulphate Class “DS-4” and an Aggressive Chemical Environment for Concrete (ACEC) site classification “AC-4” should be adopted for all concrete placed within these materials such as foundations and services.

11.8 Gas Protection Measures

The gas monitoring results indicate gas conditions corresponding to a Hazardous Gas Flow (HGF) of <0.07l/hr indicating Characteristic Situation 1 (CS1 – characterised as very low potential hazard). For CS1, the guidance provided in BS 8485 indicates that incorporation of gas protection measures is not required for a development of this type.

This conclusion should be agreed with the relevant regulatory authorities prior to the commencement of development works to confirm that the assessment completed meets with their requirements.

11.9 Drainage Design and Surface Water Management

As part of the investigation a falling head permeability test was completed within the monitoring installation at WS1. The falling head permeability test recorded a positive infiltration rate 7.01×10^{-9}m/s. The result of the permeability test is presented in full in Appendix IV.

Based on the results of the falling head permeability test undertaken and the cohesive nature of the underlying ground conditions, it is considered that the use of soakaways or other infiltration systems will not be feasible at the site.

It is recommended that the advice of a specialist drainage engineer is sought with regards to the design and installation of any drainage systems which may form part of the proposed development.

12 GROUND MOVEMENT ASSESSMENT

12.1 General

This assessment has been based on the findings of the intrusive investigation, the current design proposals and assumes a construction sequence including installation of the temporary retaining structures, excavation and temporary propping of retaining structures and construction of permanent retaining structures.

The ground conditions at the site have been found to comprise Made Ground materials to a depth of approximately 2.2m bgl overlying cohesive natural materials of the London Clay Formation which has been proven to the termination depth of investigation at 10.45m bgl.

During the intrusive investigation groundwater was not encountered and during the subsequent monitoring event the monitoring standpipe, installed to a depth of approximately 5m bgl, was recorded as dry.

A ground model has been derived for the site based on the findings of the intrusive investigation and comprises a layer of Made Ground over cohesive materials. The ground model together with the proposed development proposals are shown on the CSM as Figure 3.

The geotechnical parameters used within the assessment have been established from the SPT results together with Figure 31 and Section 8.2 of CIRIA Report 143 'The Standard Penetration Test (SPT): Methods and Use'.

The interpretation of the SPT results is included as Figure 4; Plot of SPT 'N' versus Depth.

It is assumed that the construction sequence comprises the sequenced excavation of soil to formation level and installation of any temporary support or propping as required prior to construction of permanent works. The final scheme will provide permanent support consisting of reinforced concrete walls and floors/slabs. The temporary supports/props will be removed following completion of the permanent construction works.

To undertake the detailed ground movement assessment, the various components of the development have been considered, not only individually, but also in terms of the overall CSM. The assessment and analytical methods represent all of the considered scenarios, including the temporary and permanent conditions (where appropriate).

12.2 Slope Stability Assessment

A slope stability assessment is not considered necessary for this site as the site is currently flat lying and any excavations associated with the formation of the basement will be supported in both the temporary and permanent conditions.

12.3 Ground Movement

The Made Ground encountered from surface to a depth of 2.2m bgl comprised a thin layer of more granular materials overlying soft cohesive materials. The Made Ground recovered was very loose granular materials or very soft to firm low strength cohesive materials. Due to the depth of the more granular materials these are likely to be fully stripped from around the excavation. Given the low strength of the Made Ground these will need to be fully supported during construction to prevent collapse. Any collapse or loss of ground will need to be remediated as part of placing the support to the excavation. The collapse of

the Made Ground will be minimised by carrying the work out in a controlled sequenced manner.

The level of support provided during the excavation through the Made Ground will be sufficient to minimise any ground movements in these materials.

The ground movements within the more competent materials at depth have been estimated based on CIRIA C760 Guidance on Embedded Retaining Walls using Section 6.2.1 Empirical Methods for soft and firm clays (Made Ground) and stiff clays (London Clay). This is considered appropriate based on the depth and location of the basement and the ground conditions present at the site.

Given the nature of the proposed basement construction the potential ground movements will be due to excavation in front of the existing basement wall. The proposed construction scheme does not include installation of a temporary or permanent piled wall.

The proposed construction comprises sequenced top-down excavation and support to a depth of approximately 3m to 4m bgl, together with temporary props as necessary resulting in a 'High Support Stiffness' construction methodology.

The assessment has been completed based on the proximity of the existing building and adjacent buildings, numbers 203 and 207 Albany Street, which are the closest structures to the proposed basement excavation. The proposed basement extension will join the lower ground floor of the existing property.

In terms of ground movement due to excavation in front of the basement wall, a relationship between the depth of the basement wall, distance from the basement wall and settlement, for cohesive soils is given in Figure 6.14 (a) and (b) and Figure 6.15 of CIRIA C760.

The relationship indicates that the settlement (ground movement) is likely to be of the order of 3mm to 6mm at the wall and reducing with distance from the wall.

It is assumed that the horizontal movement will be equal to the vertical movement due to settlement of the ground surface as a result of excavation in front of the wall.

12.4 Building Damage Assessment

The ground movements resulting from excavation of the basement will need to be controlled and given the nature of the ground conditions and the proposed construction methodology these will need to be a high standard, in accordance with Section 6.3 of CIRIA C760 to minimise any resulting movement. The measures required will include all supports being tight to the wall, minimising the first stage of excavation and any excavation beyond supports and minimising any delays during the construction works.

The ground movements estimated based on the ground model and the proposed works have been used to estimate typical expected damage to the existing building. The damage assessment has been completed based on the methodology presented in CIRIA C760 Section 6.4.

The estimated damage category (CIRIA C760, Table 6.4), relevant to masonry structures, indicates expected damage based on tensile strain. The tensile strain calculated indicates the existing building falls within 'very slight' damage, as shown on Figure 5, generally described as 'cracks filled as normal decoration'.

The existing structure includes a lower ground floor, the level of which is approximately 2.5m below existing ground level, it is therefore considered that the ground movements associated with the construction of the proposed basement are likely to be less than those detailed above as the depth of excavation below the existing lower ground floor and associated foundations will be limited (less than 1m). The estimated damage category detail above is therefore considered to be a 'worst case' scenario, with the actual settlements and associated damage category expected to be less than those estimated corresponding to 'negligible' damage.

12.5 Recommendations

The proposed development comprises the construction of a new basement extension adjacent to an existing building.

The site ground level is currently flat lying and any excavations will be supported both in the temporary and permanent conditions and therefore slope stability does not pose a risk at the site and a detailed slope stability assessment is not considered necessary.

Horizontal ground movements due to excavation of typically around 3mm to 6mm at the existing building have been estimated. The ground movements will be controlled by use of appropriate temporary support within a controlled sequenced excavation.

Potential 'very slight' damage is predicted to the existing building due to excavation in front of the existing basement. However, to minimise the extent of damage it is considered that the wall should be propped at the top and middle of the wall where it is immediately adjacent to the existing building, in the temporary condition, to minimise any ground movement in the temporary condition due to the basement excavation.

The final structure will provide sufficient support to the basement walls to prevent movement in the permanent condition.

Given the depth to groundwater and the relatively limited size of the proposed basement, it is considered that the construction of the basement will have negligible impact on groundwater.

13 HYDROGEOLOGICAL AND HYDROLOGICAL ASSESSMENT

13.1 General

Based on the findings of the site investigation, the ground conditions at the site have been found to generally comprise a relatively limited thickness of Made Ground materials overlying cohesive materials of the London Clay Formation which were present to the termination depth of the investigation at 10.45m bgl.

The London Clay Formation is classified by the EA as an Unproductive Strata defined as 'these are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow'.

Groundwater monitoring undertaken at the site indicates the groundwater level is in excess of approximately 5m bgl, with groundwater not encountered within the monitoring installation or within the borehole during its formation to the completed depth of 10.45m bgl. Therefore, it is not possible to accurately determine the depth of groundwater or the direction of groundwater flow at the site.

13.2 Groundwater Flow

The proposed development comprises the demolition of the existing structure and the construction of a new building which includes a new basement level extending to approximately 3m to 4m bgl. The proposed extension basement will extend across the width of the site, although it should be noted that the site already includes a full width basement. The extension will only increase the length of the basement by around 2m.

The proposed basement will not extend below groundwater level and will be located within the low permeability London Clay Formation materials.

Therefore, a qualitative assessment has been undertaken to determine the potential impact the basement may have on the local hydrogeological regime and whether this could impact adjacent properties.

Given the anticipated groundwater depth and the nature of the development proposals, the proposed basement structure is expected to have negligible impact on groundwater flow beneath the site.

The proposed development is therefore not anticipated to have a significant impact on surrounding properties or soils.

13.3 Flooding

Information provided in Environmental Database, including the BGS Flood GFS data, indicates the site to be located in an area with a no risk from groundwater, Fluvial or Surface Water Flooding.

13.4 Discussion

The hydrological and hydrogeological assessment indicates there are negligible risks associated with the development and impact on groundwater flow or flooding.

14 CONTAMINATION ASSESSMENT – HUMAN HEALTH

14.1 Introduction

The results of the chemical laboratory testing undertaken on selected soil samples (see Section 9.4), have been compared where possible to the relevant industry guidance as detailed in the following section.

Defra have published Development of Category 4 Screening Levels (C4SL) for Assessment of Land Affected by Contamination (document reference SP1010, dated 20th December 2013). This document includes proposed C4SL for six contaminants of concern. In March 2014 it was agreed that the C4SL could be used as part of the planning process. The chemical laboratory test results have therefore been compared where relevant to the C4SL. The C4SL have been derived based on the proposed end use of the site. In this instance an end use of 'residential with plant uptake' has been considered the most appropriate. Should the proposed development at the site change the potential risk posed by the identified contamination should be reviewed.

C4SLs have not been provided for the full range of determinants assessed as part of this contamination assessment. Further Generic Assessment Criteria (GAC) in accordance with this guidance are currently in production. Contaminated Land Exposure Assessment (CLEA) guidance to assess the risk to human health (Document References SC050021/SR2, SC050021/SR3, SC050021/SR4 and SC050021/SR7) is available. As a result, GAC for the relevant contaminants of concern included in this report have been derived in accordance with this CLEA guidance and spreadsheet Version 1.06. These criteria are considered to remain appropriate as C4SL are proposed to be more pragmatic whilst still highly precautionary when compared to the previously published guidance and associated SGVs. The GAC in this report are therefore considered to be conservative and define a lower level of risk in consideration of the potential risk to human health when compared to the current guidance and C4SL. The derived GAC are presented in Appendix VII.

Laboratory data at the site recorded a result of approximately 0.34% for soil organic matter calculated using fraction or organic carbon results. The GAC for the site are therefore calculated assuming 0.34% SOM.

14.2 Chemical Test Results - Soils

The results of the chemical laboratory testing undertaken on the selected soil samples are summarised in Table 5. Only those determinants recorded in excess of their relevant laboratory detection limits are assessed here.

The chemical test results on soil are presented in full in Appendix V.

Table 5 Summary of Soils Data with Respect to Human Health (Tier 1)

Contaminants	Max Conc. (mg/kg)	C4SL mg/kg (Residential with Plant Uptake)	CLEA Derived GAC mg/kg (Residential with Plant Uptake)	No. of Tests
Arsenic	14	37 (0)	-	2
Beryllium	1.4	-	87.8 (0)	2
Boron	1.6	-	117 (0)	2
Chromium	52	-	1110 (0)	2
Copper	41	-	2380 (0)	2
Lead	36	200 (0)	-	2
Nickel	52	-	127 (0)	2
Vanadium	100	-	282 (0)	2
Zinc	96	-	3250 (0)	2

Note:
1. Number in brackets represents the number of results above guideline values.

In addition to the determinants summarised in Table 5, asbestos was analysed for in three samples of Made Ground. Asbestos was not identified in any of the soil samples analysed. No further assessment of the potential risk to human health from asbestos present in soils is considered necessary.

None of the contaminants of concern summarised in Table 5 are identified in excess of their relevant screening criteria. No further assessment of the potential risk to human health from the recorded concentrations of contaminants of concern is considered necessary. No remediation to be protective of human health is considered necessary.

However, it is recommended that the chemical laboratory test results within this report should be forwarded to the mains water service provider to ensure that their requirements for service line construction are satisfied.

15 CONTAMINATION ASSESSMENT – CONTROLLED WATERS

15.1 Introduction

To assess the potential risk to controlled waters from the recorded concentrations in soils the use of leachability is generally used to determine contaminant mobility within the ground with the results of these tests compared to the determinants respective environmental quality standards (EQS) or other applicable standards such as UK drinking water standards (DWS). The critical receptor is considered to be groundwater beneath the site, therefore the relevant DWS have been used where available.

15.2 Summary of Results - Soils

Table 6 presents a summary of the screening criteria compared with the maximum recorded concentrations of determinants at the site. Only those determinants recorded in excess of their relevant laboratory detection limits are assessed here. The chemical test results are presented in full in Appendix V.

Table 6 Summary of Soils Data with Respect to Controlled Waters (Tier 1)

Determinant	Max Conc. (mg/l)	Tier 1 Value (mg/l)	No. of Exceedances
Arsenic	0.0041	0.01	0 (1)
Boron	0.042	1	0 (1)
Chromium	0.0043	0.05	0 (1)
Copper	0.004	2	0 (1)
Lead	0.0057	0.01	0 (1)
Nickel	0.0029	0.02	0 (1)
Vanadium	0.0034	0.06	0 (1)
Zinc	0.0076	5	0 (1)

Notes
1. Numbers in brackets denote the number of tests undertaken.

None of the contaminants of concern are recorded in excess of their relevant screening criteria. No further assessment of the potential risk to controlled waters from contamination present in soil is considered necessary. No remediation of soils to be protective of controlled waters is considered necessary.

16 WASTE DISPOSAL

Based on the results of the chemical laboratory analysis including Waste Acceptance (WAC) testing it is considered that the cohesive the Made Ground and natural strata may be classified as inert waste in terms of disposal and should be considered as such until further testing is completed to prove otherwise.

Laboratory testing has not been undertaken on the shallow Made Ground materials, with the exception of testing for the presence of asbestos. However, based on the nature of these materials and the absence of asbestos, it is considered likely that these materials may also be classified as inert.

Prior to disposal, the characteristics of any excavated soils will need final classification in consultation with the relevant waste disposal facility and further testing and analysis may be required on the actual materials requiring off-site disposal.

17 DISCOVERY STRATEGY

This investigation has not identified significant contamination that may pose a potential risk to the identified receptors. However, there is the potential for more significantly contaminated materials, differing ground conditions and buried structures to be present at the site between exploratory hole locations. Should any of these conditions be identified during the development works, ASL should be contacted immediately to allow further assessment to be completed to ensure the identified critical receptors are not at risk.

This assessment may take the form of additional intrusive investigation, sampling and laboratory analyses subject to the nature of the conditions encountered.

18 CONCLUSIONS AND RECOMMENDATIONS

A ground investigation has been completed at the site to characterise the ground and groundwater conditions. A geotechnical and contamination assessment has been completed based on the results of these investigations. The conclusions of this assessment are summarised as follows:

It is recommended that an asbestos survey is completed prior to the commencement of any development or refurbishment works.

It is considered that conventional foundations could be adopted for the proposed basement construction and underpinning works, with foundations placed within the London Clay Formation materials at depths between approximately 3m and 4m bgl, designed to a net allowable bearing pressure of 125kN/m^2 to limit total settlements to 25mm and differential settlements to acceptable levels. Foundations will need to be locally deepened through any Made Ground materials or any otherwise unsuitable materials and placed a minimum of 200mm into the underlying founding strata.

Plasticity index results indicate the London Clay Formation materials to be of medium and high volume change potential.

It is considered that the most suitable option for forming the basement is by sequenced excavation to formation level, with suitable temporary support to the excavations and adjacent structures, together with mass concrete or reinforced retaining walls.

The sequencing of excavation and the design of temporary and permanent support to the ground and existing structures should be determined by a suitably qualified structural engineer.

The basement structure should be waterproofed and appropriate measures included to manage groundwater during construction. The basement structure should be designed to safeguard against flotation.

It is considered that the use of a ground bearing floor slab could be adopted within the proposed development placed within the London Clay Formation materials, however as a precautionary measure it is recommended that heave precautions are included beneath any proposed ground bearing slabs. Alternatively, it is considered that suspended floor slabs with suitable subfloor voids could be adopted.

Based on the results of chemical laboratory testing undertaken on samples recovered from the Made Ground and London Clay Formation materials it is considered that a Design Sulphate Class “DS-4” and an Aggressive Chemical Environment for Concrete (ACEC) site classification “AC-4” should be adopted for all concrete placed within these materials such as foundations and services.

The results of ground gas monitoring indicate that the gas protection measures are not required for the proposed development. This conclusion should be agreed with the relevant regulatory authorities prior to the commencement of development works.

Based on the results of the falling head permeability tests undertaken and the ground conditions encountered at the site, it is considered that the use of soakaways or other infiltration systems will not be feasible at the site.

The contamination assessment has not identified a potential risk to the identified critical human health or controlled waters receptors. No further assessment of the potential risk to human health or controlled waters is considered necessary. No remediation to be protective of human health or controlled waters is considered necessary.

It is recommended that the chemical laboratory test results within this report are forwarded to the mains water service provider to ensure that their requirements for service line construction are satisfied.

Based on the results of the chemical laboratory analysis it is considered that the Made Ground and natural strata may be classified as inert waste in terms of disposal.

Prior to disposal, the characteristics of any excavated soils will need final classification in consultation with the relevant waste disposal facility and further testing and analysis may be required on the actual materials requiring off-site disposal.

REFERENCES

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Environment Agency's Publication 'Methodology for the Derivation of Remedial Targets for Soil and Groundwater to Protect Water Resources' R&D Publication 20

Environment Agency's 'Remedial Targets Worksheet, Release 3.1' (October 2007)

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WHO, Concise International Chemical Assessment Document 32, "Beryllium and Beryllium Compounds" 2001

Total Petroleum Hydrocarbon Criteria Working Group Series Volume 3 and 4, 1997

Human health toxicological assessment of contaminants in soil (Report Reference SC050021/SR2, dated January 2009);

Updated technical background to the CLEA model (Report Reference SC050021/SR3, dated January 2009);

CLEA Software (Version 1.04) Handbook (Report Reference SC050021/SR4, dated January 2009);

Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values (Report Reference SC050021/SR7, dated November 2008).

BS8485 'Code of practice for the characterisation and remediation from ground gas in affected developments', 2007

NHBC standards 2016

CIRIA C760 "Guidance on Embedded Retaining Wall Design" 2017

CIRIA Report 143 "The Standard Penetration Test (SPT): Methods and Use" 1995.

Environmental Database Search report reference: 273837874_1_1

GENERAL NOTES

The interpretation made in this report is based on the information obtained during the course of the desk study and ground investigation. It should be appreciated that any desk study information is not necessarily exhaustive and that further information relevant to the site and its proposed usage may be available. There may be conditions present on the site that have not been revealed by the ground investigation which as a result have not been addressed within this report.

The accuracy of any map extracts cannot be guaranteed and it should be recognised that different conditions on site may have existed between and subsequent to the various map surveys.

The qualitative assessment of risk presented in this report presents an assessment of potential pollutant linkages between sources, pathways and receptors. A level of risk is attributed to these linkages. However, a low or insignificant risk does not imply that elevated concentrations of various determinants are not present on the site when compared to background or 'greenfield' conditions.

The level of risk attributed is based on a number of factors and the interpretation of this risk may be applied in a different manner for a different end use or environmental setting. The presence of contaminants may be assessed in alternative ways by institutional bodies regardless of whether an apparent risk is present based on the identified pollutant linkages in this assessment.

This report may express an opinion on possible configurations of strata underlying the site between or beyond the exploratory holes or on the possible presence of features based on either visual, verbal or published evidence, this is for guidance only and no liability can be accepted for its accuracy.

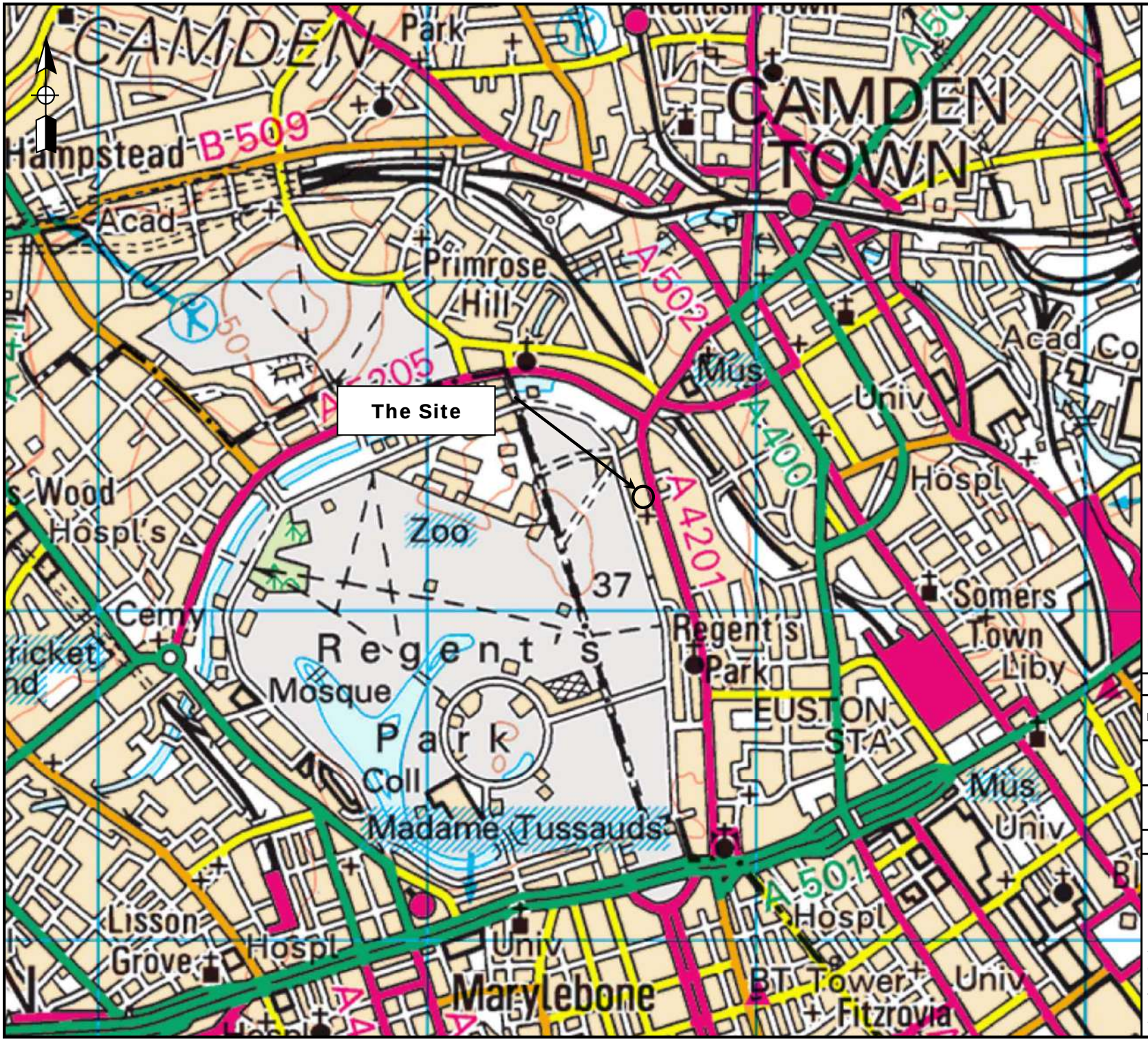
Comments made on ground conditions are based on the observations made at the time of the investigation works. It should be noted that groundwater levels may vary due to seasonal fluctuation or other factors. Observations made with respect to below ground gas concentrations may also vary due to seasonal factors and atmospheric conditions.

This report has been prepared in relation to the proposed development as detailed herein. Should the nature of the development change following the submission of this report a re-assessment of the conditions recorded on the site may be necessary.

This report may not be used in the assessment of the conditions at any site other than the site described herein

This report has been prepared for the sole use of the client and the client's agents and advisors in relation to the proposed development as detailed herein. The issue of this report to third parties not involved in the proposed development as described herein is not permitted without the prior permission being received in writing by ASL. Reproduction of this report to include all figures, drawings and appendices is prohibited without the prior written consent of ASL.

FIGURES



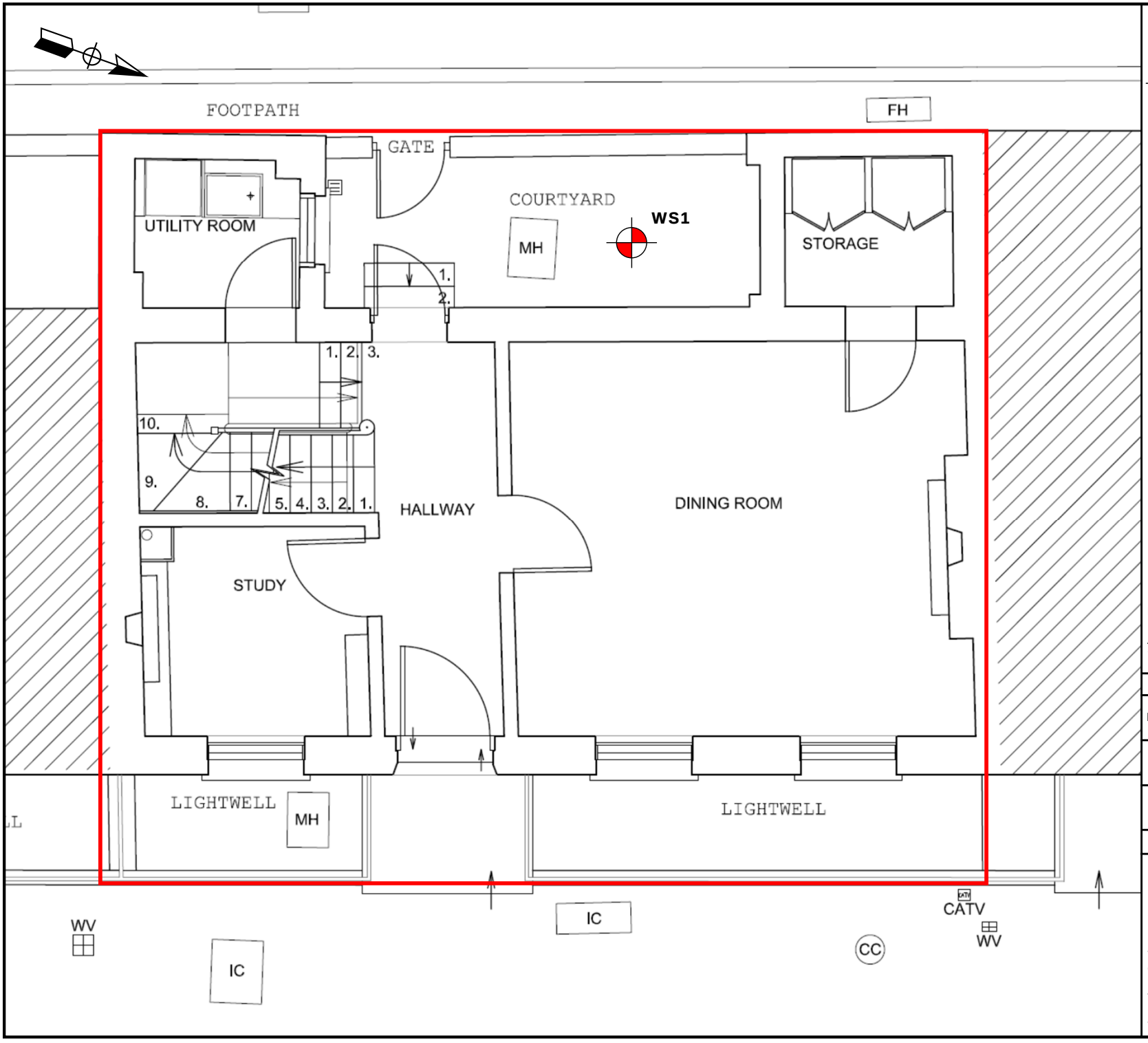
OS Landranger Map Sheet No. 176 West London, 1:50,000 Scale

Notes:
Not to Scale

Drawing No.	**Figure 1**
Drawing Name	**Site Location**
Project	**205 Albany Street, London**
Client Name	**Afrijanus Property UK 1 Limited**
Project No.	**253-20-651**

ASL
Holly Farm Business Park
Honiley
Warwickshire
CV8 1NP

T: +44 (0)1926 485 508
E: info@aslenvironmental.co.uk
W: www.aslenvironmental.co.uk



Key

Windowless Sampler Borehole Location

Approximate Site Boundary

Notes:

Not to Scale

All dimensions to be checked on site and not scaled on this drawing.

Drawing No.	**Figure 2**
Drawing Name	**Site Layout Plan**
Project	**205 Albany Street, London**
Client Name	**Afrijanus Property UK 1 Limited**
Project No.	**253-20-651**

ASL
Holly Farm Business Park
Honiley
Warwickshire
CV8 1NP

T: +44 (0)1926 485 508
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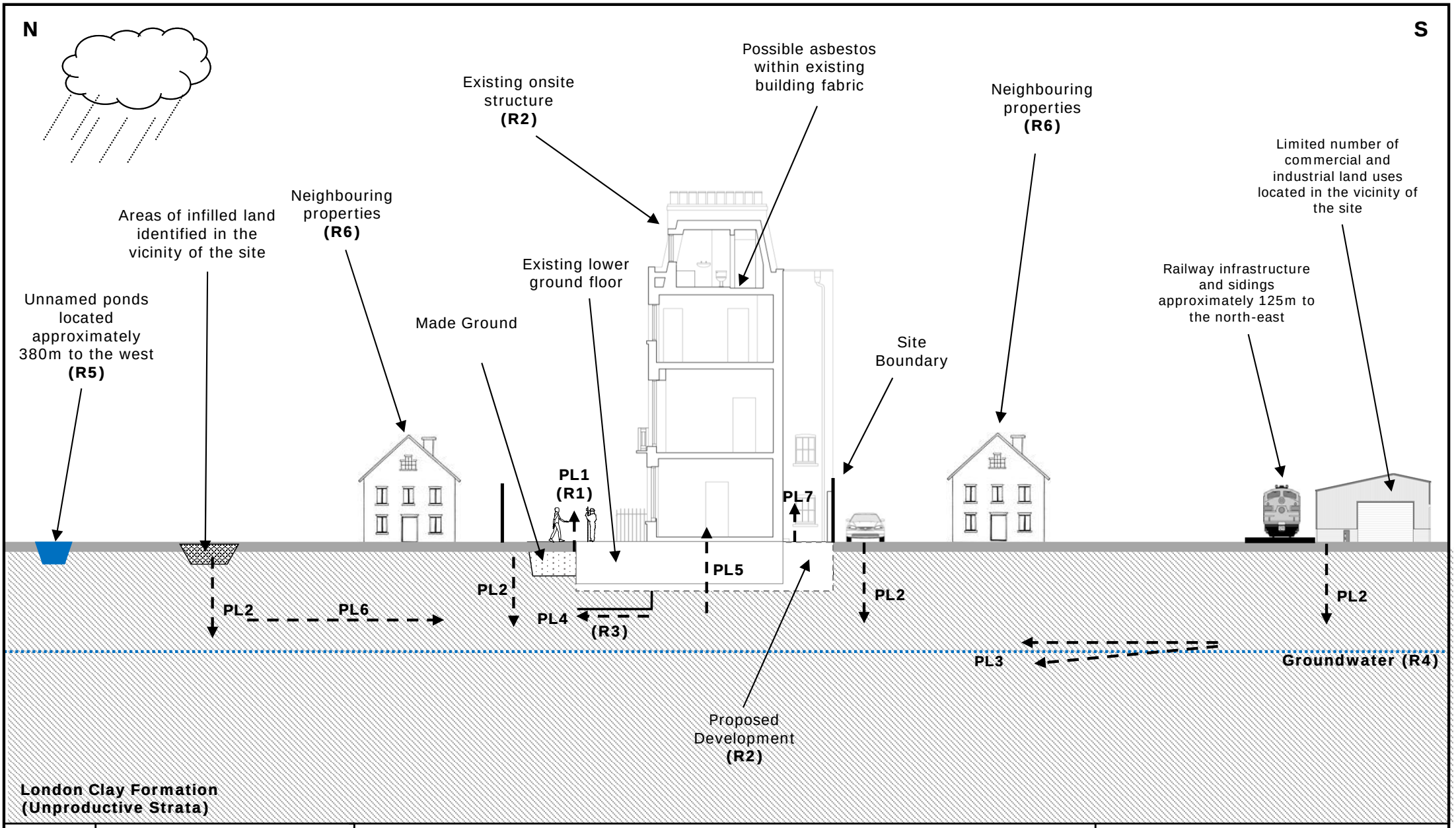
W: www.aslenvironmental.co.uk



Drawing No.	**Figure 3**
Drawing Name	**Conceptual Site Model**
Project Name	**205 Albany Street, London**
Client Name	**Afrijanus Property UK 1 Limited**
Project No.	**253-20-651**

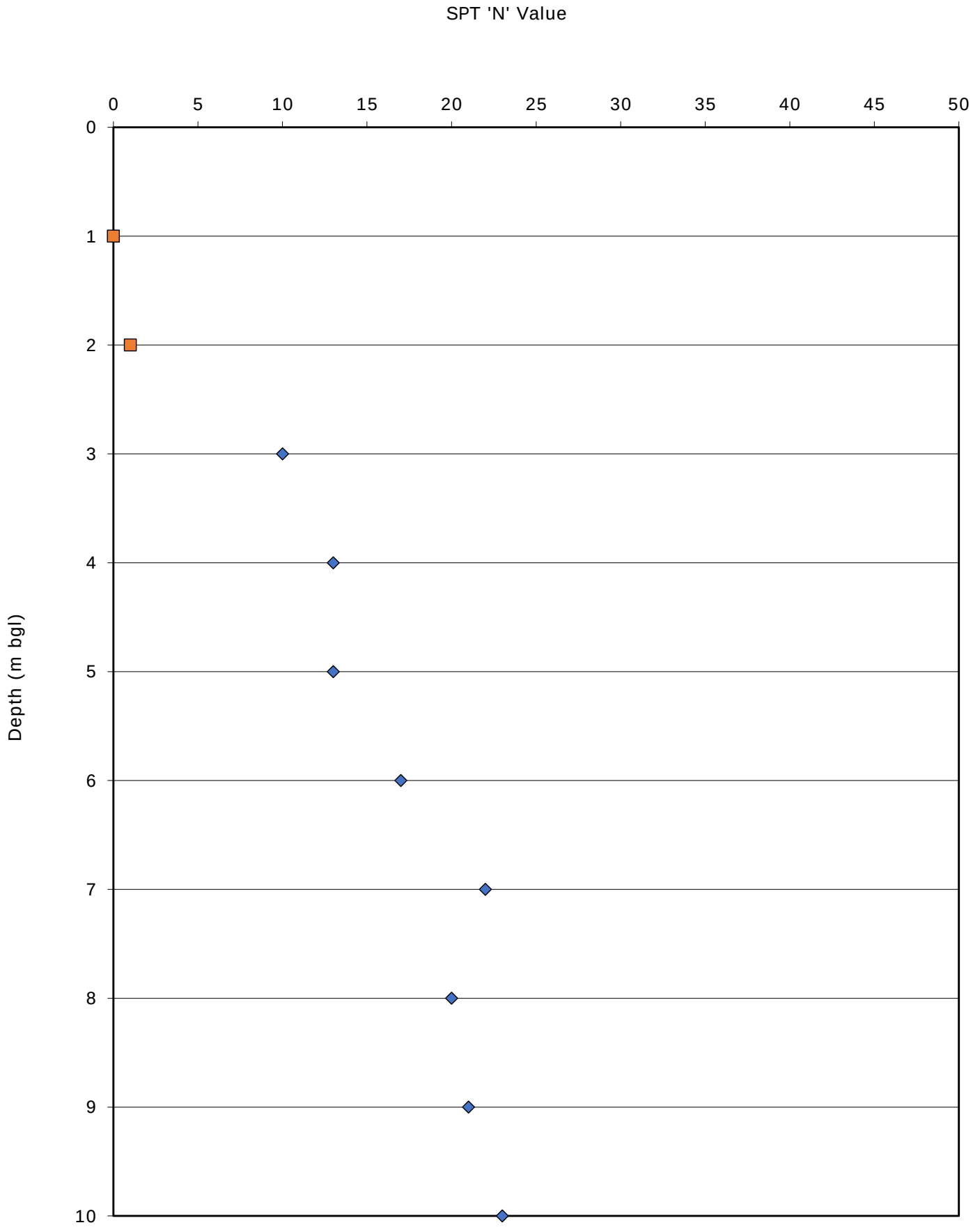
Summary of Pollutant Linkages (for full details see contamination associated report)

Receptors:
R1 - Construction and maintenance workers;
R2 - Current and future site users;
R3 - Service Lines;
R4 - Groundwater;
R5 - Surface watercourses;
R6 - Neighbouring properties and residents.

Pathways:
PL1 - Direct Physical Contact;
PL2 - Migration from soils to groundwater via leaching;
PL3 - Migration within groundwater;
PL4 - Migration via service lines;
PL5 - Volatilisation of contaminants from soils and groundwater;
PL6 - Migration of hazardous ground gases;
PL7 - Vegetable intake.

ASL
Holly Farm Business Park
Honiley
Warwickshire
CV8 1NP

T: +44 (0)1926 485 508
E: info@aslenvironmental.co.uk
W: www.aslenvironmental.co.uk



Drawing No.	**Figure 4**
Drawing Name	**SPT 'N' Value Versus Depth Below Ground Level**
Project Name	**205 Albany Street, London**
Client Name	**Afrijanus Property UK 1 Limited**
Project No.	**253-20-651**

Legend

- Made Ground
- London Clay Formation

ASL
Holly Farm Business Park
Honiley
Warwickshire
CV8 1NP

T: +44 (0)1926 485 508
E: info@aslenvironmental.co.uk
W: www.aslenvironmental.co.uk

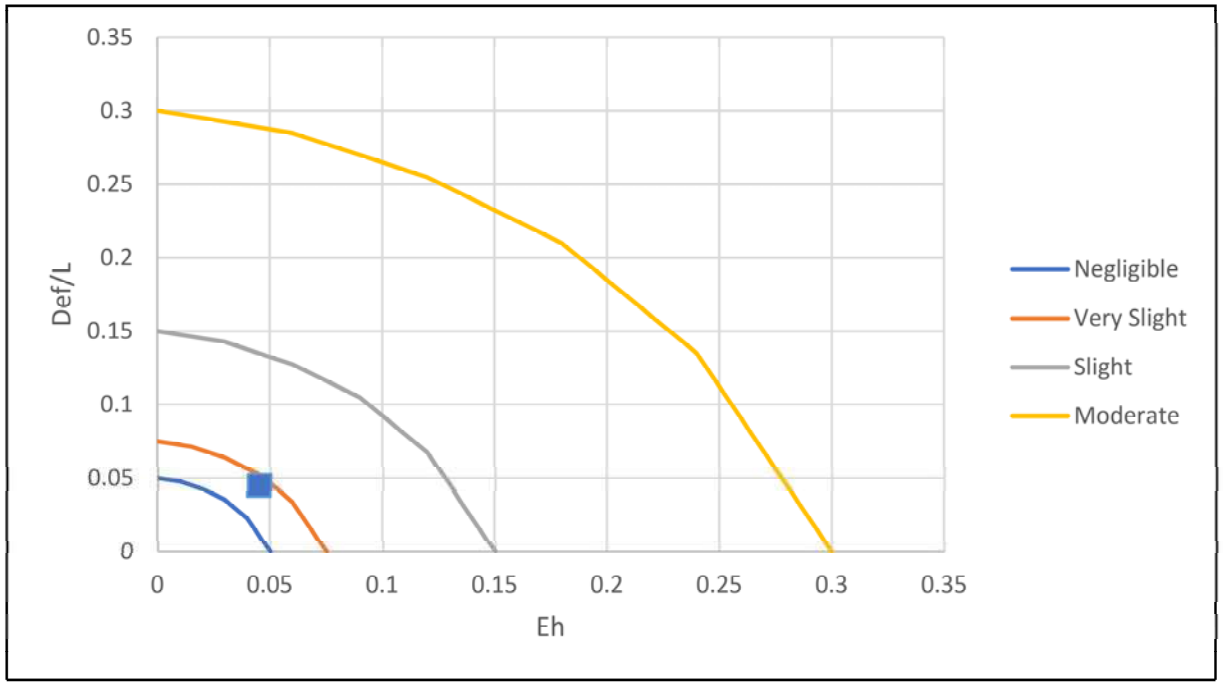
Strain & Damage Catergory Relationships (L/H = 0.5)	
Eh/Elim	Def/L/Elim
0	1
0.2	0.95
0.4	0.85
0.6	0.7
0.8	0.45
1	0

Negligible	
Elim	0.05
Eh	Def/L
0	0.05
0.01	0.0475
0.02	0.0425
0.03	0.035
0.04	0.0225
0.05	0

Very Slight	
Elim	0.075
Eh	Def/L
0	0.075
0.015	0.07125
0.03	0.06375
0.045	0.0525
0.06	0.03375
0.075	0

Slight	
Elim	0.15
Eh	Def/L
0	0.15
0.03	0.1425
0.06	0.1275
0.09	0.105
0.12	0.0675
0.15	0

Moderate	
Elim	0.3
Eh	Def/L
0	0.3
0.06	0.285
0.12	0.255
0.18	0.21
0.24	0.135
0.3	0



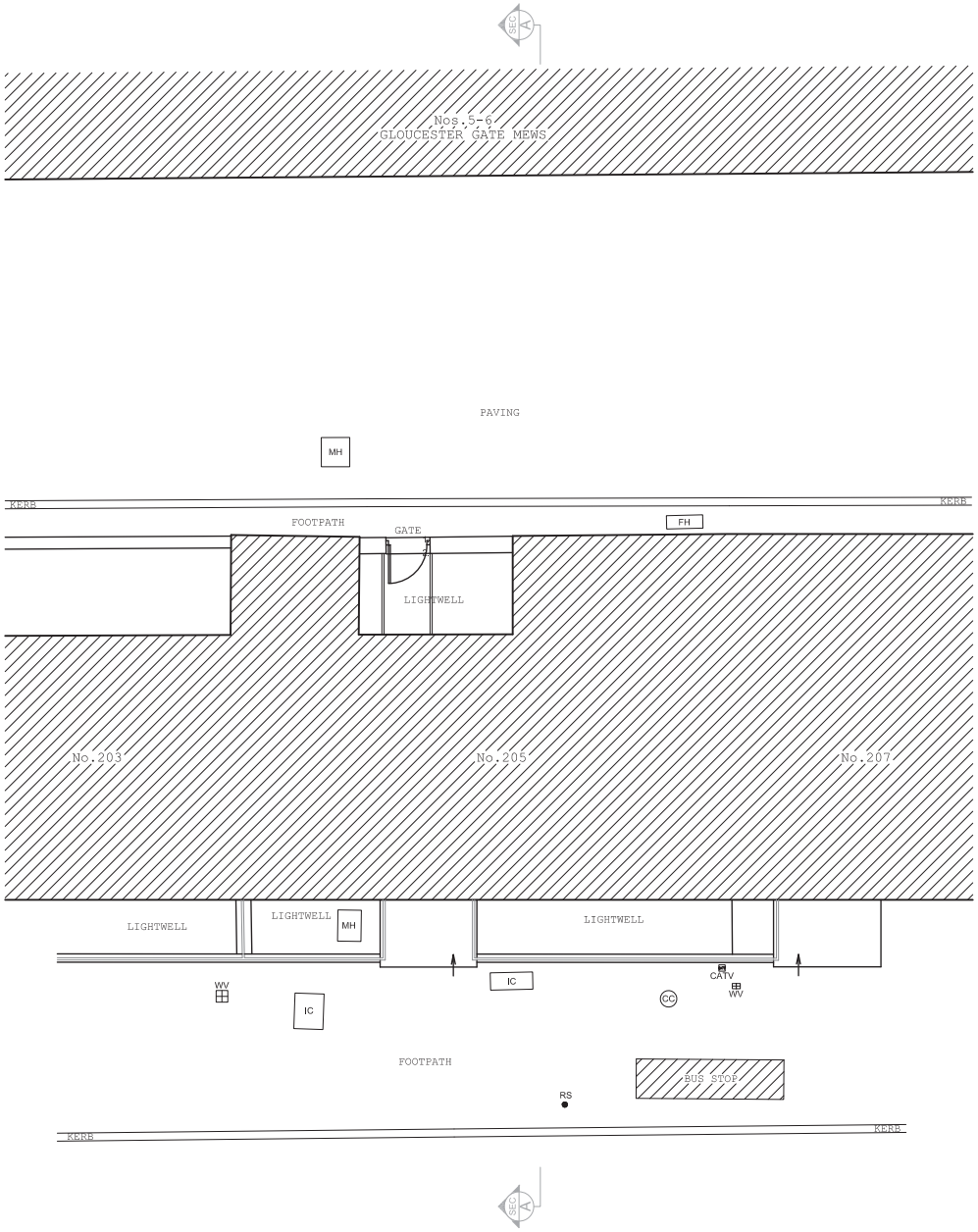
Drawing No.	**Figure 5**
Drawing Name	**Damage Assessment – Existing Building**
Project Name	**205 Albany Street, London**
Client Name	**Afrijanus Property UK 1 Limited**
Project No.	**253-20-651**

ASL
Holly Farm Business Park
Honiley
Warwickshire
CV8 1NP

T: +44 (0)1926 485 508
E: info@aslenvironmental.co.uk
W: www.aslenvironmental.co.uk

APPENDIX I

PROPOSED DEVELOPMENT PLAN



1 **Proposed Site Plan**
1:100 @ A3

Existing walls
New walls / partitions / floors
Partition omitted
Infilled walls
New openings

0 1m 2m 5m

PLANNING

REVISIONS

NOTES

205 ALBANY STREET
LONDON, NW1 4AB

PROPOSED SITE PLAN

DWG No: 205AS/P100

SCALE: 1:100 @A3

DATE: JUNE 2020

BELSIZE ARCHITECTS

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T: 020 7482 4420
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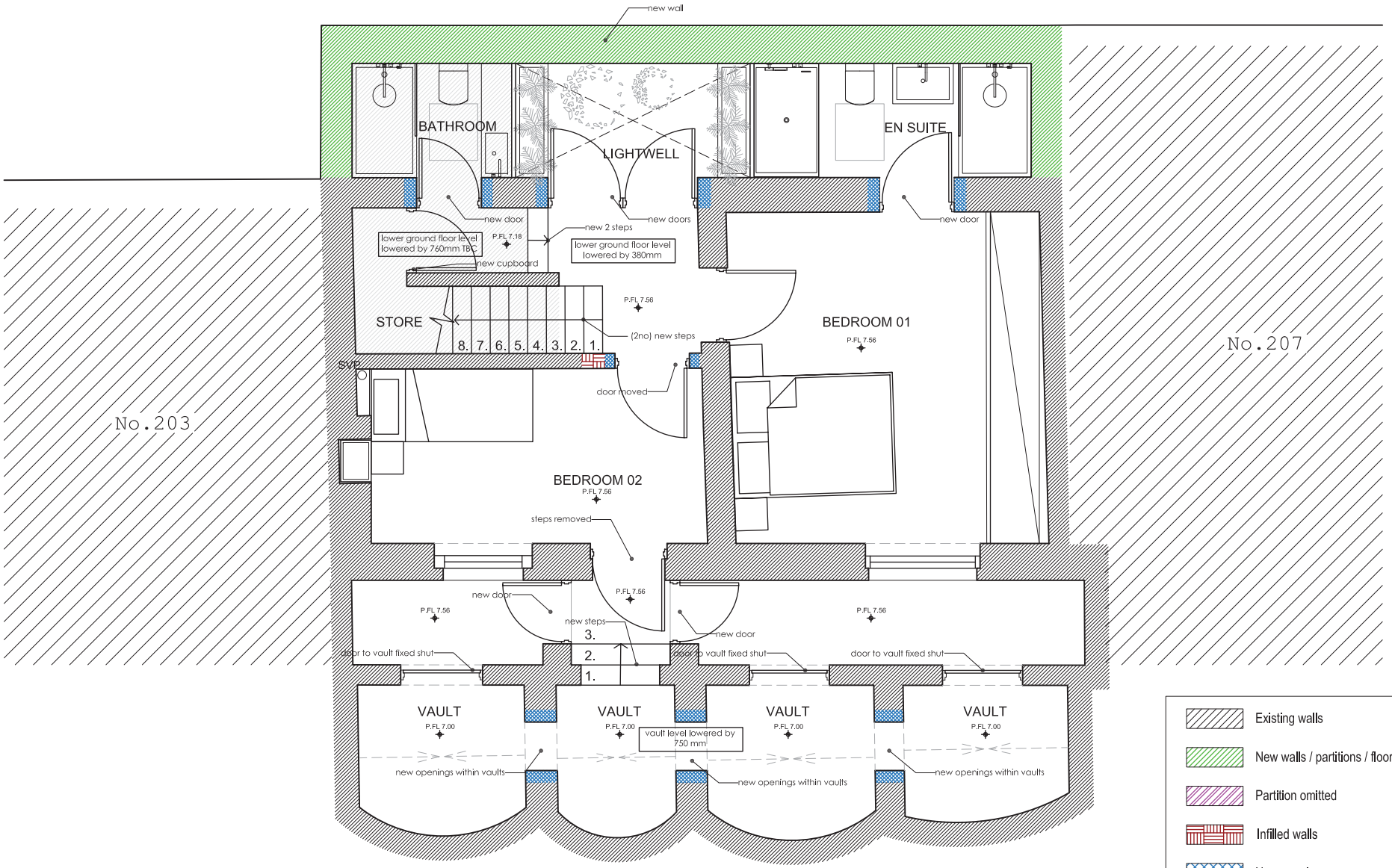


Existing walls

New walls / partitions / floors

Partition omitted

Infilled walls

New openings

0 1m 2m 5m

1 Proposed Lower Ground Floor Plan
1:50 @ A3

PLANNING

REVISIONS
01.11.2020_REV A
Bathroom area lowered 380 mm
12.03.2021_REV B
Vault doors info added.

NOTES

205 ALBANY STREET
LONDON, NW1 4AB

PROPOSED LOWER GROUND FLOOR PLAN

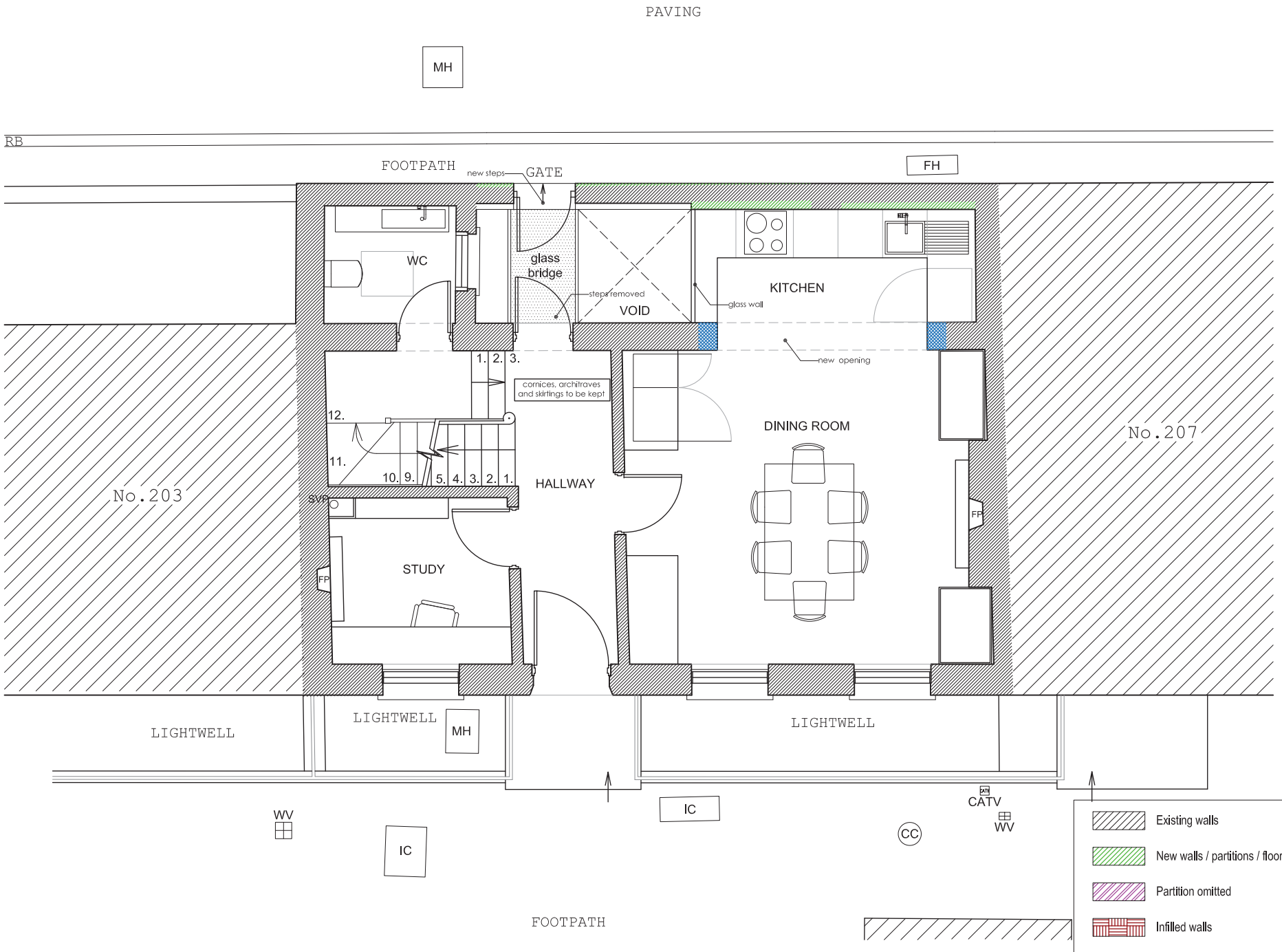
DWG No: 205AS/P101B

SCALE: 1:50 @A3

DATE: JUNE 2020

BELSIZE ARCHITECTS

48 PARKHILL ROAD, LONDON, NW3 2YP
T: 020 7482 4420
E: MAIL@BELSIZEACHITECTS.COM



1 **Proposed Ground Floor Plan**
1:50 @ A3

Existing walls
New walls / partitions / floors
Partition omitted
Infilled walls
New openings

0 1m 2m 5m

PLANNING

REVISIONS

NOTES

205 ALBANY STREET
LONDON, NW1 4AB

PROPOSED GROUND FLOOR PLAN

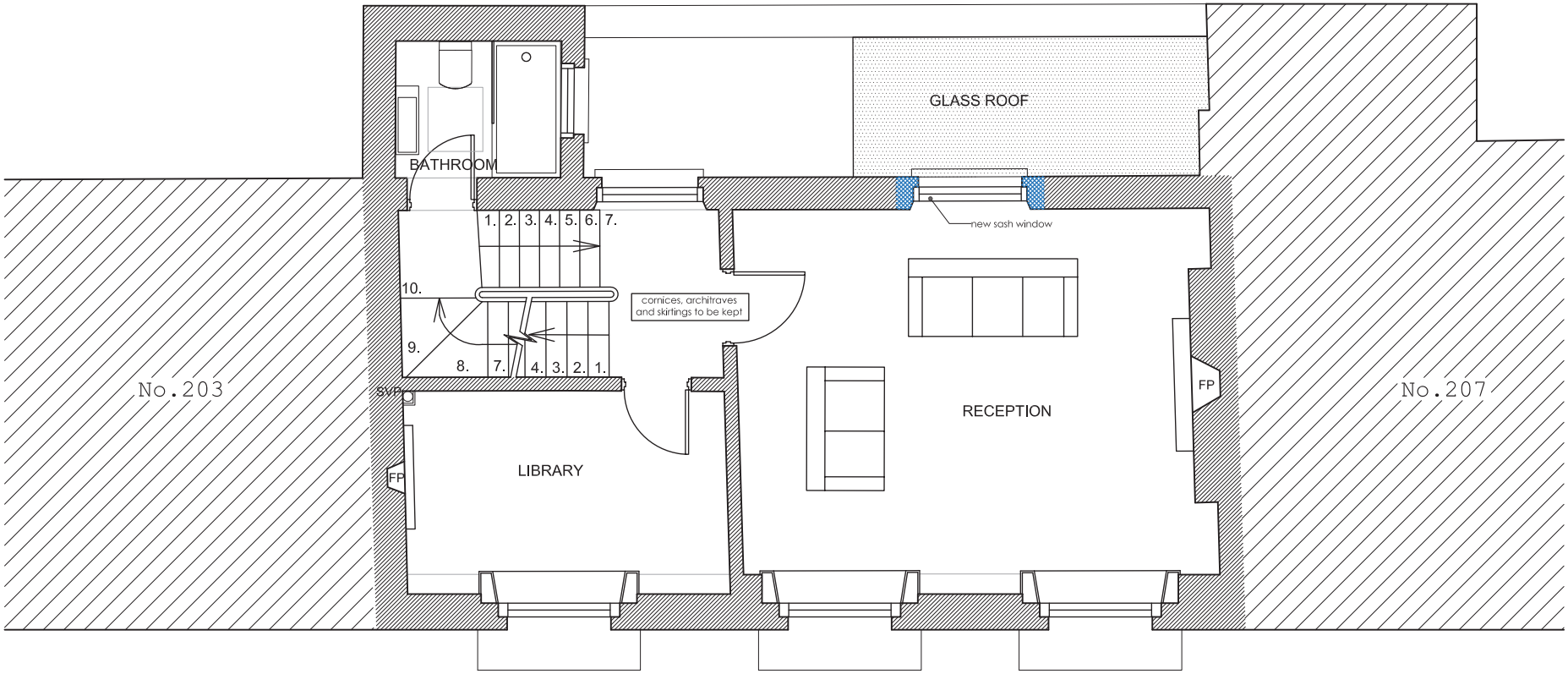
DWG No: 205AS/P102

SCALE: 1:50 @A3

DATE: JUNE 2020

BELSIZE ARCHITECTS

48 PARKHILL ROAD, LONDON, NW3 2YP
T: 020 7482 4420
E: MAIL@BELSIZEACHITECTS.COM



PLANNING

REVISIONS

NOTES

205 ALBANY STREET
LONDON, NW1 4AB

PROPOSED FIRST FLOOR PLAN

DWG No: 205AS/P103

SCALE: 1:50 @A3

DATE: JUNE 2020

Existing walls

New walls / partitions / floors

Partition omitted

Infilled walls

New openings

0 1m 2m 5m

BELSIZE ARCHITECTS

48 PARKHILL ROAD, LONDON, NW3 2YP
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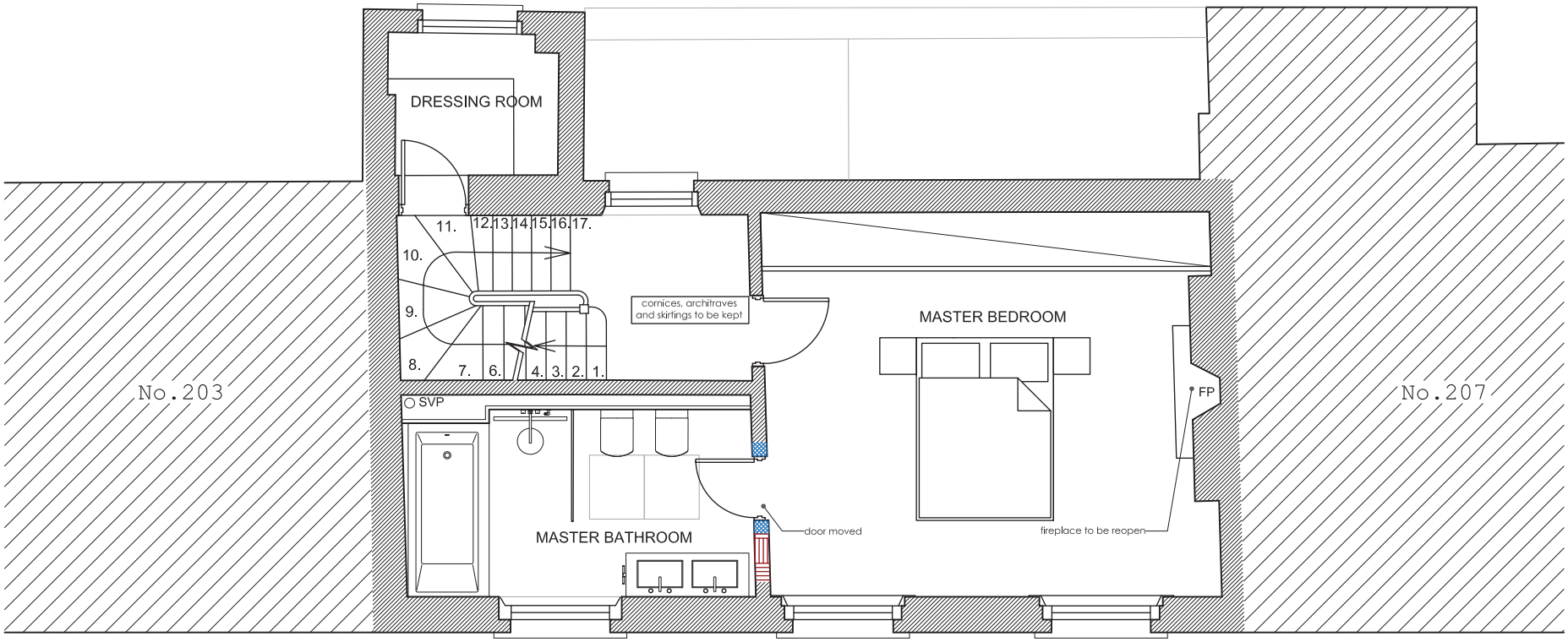
E: MAIL@BELSIZEACHITECTS.COM

1 **Proposed First Floor Plan**
1:50 @ A3



1 **Proposed Second Floor Plan**
1:50 @ A3

Existing walls
New walls / partitions / floors
Partition omitted
Infilled walls
New openings

0 1m 2m 5m

PLANNING

REVISIONS

NOTES

205 ALBANY STREET
LONDON, NW1 4AB

PROPOSED SECOND FLOOR PLAN

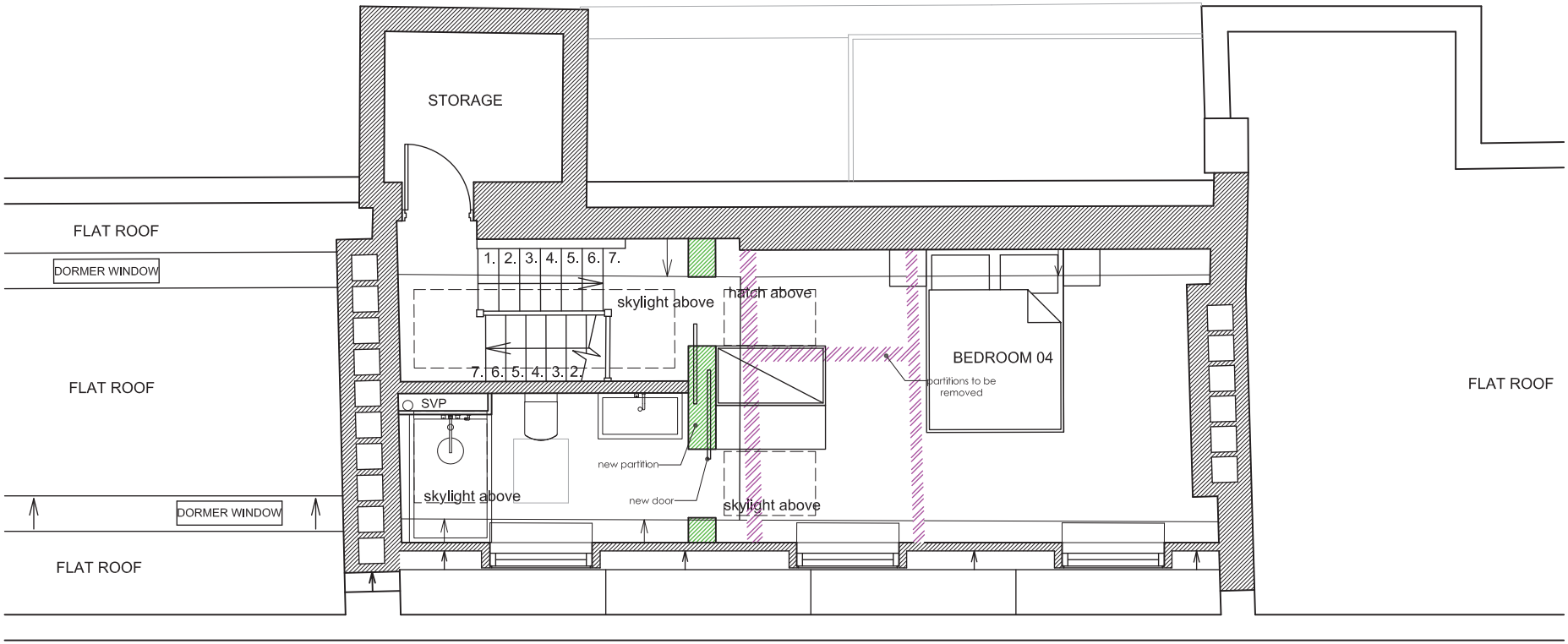
DWG No: 205AS/P104

SCALE: 1:50 @A3

DATE: JUNE 2020

BELSIZE ARCHITECTS

48 PARKHILL ROAD, LONDON, NW3 2YP
T: 020 7482 4420
E: MAIL@BELSIZEACHITECTS.COM



PLANNING

REVISIONS

01.11.2020_REV A
Partition amended.
Skylights amended.

NOTES

205 ALBANY STREET
LONDON, NW1 4AB

PROPOSED THIRD FLOOR PLAN

DWG No: 205AS/P105A

SCALE: 1:50 @A3

DATE: JUNE 2020

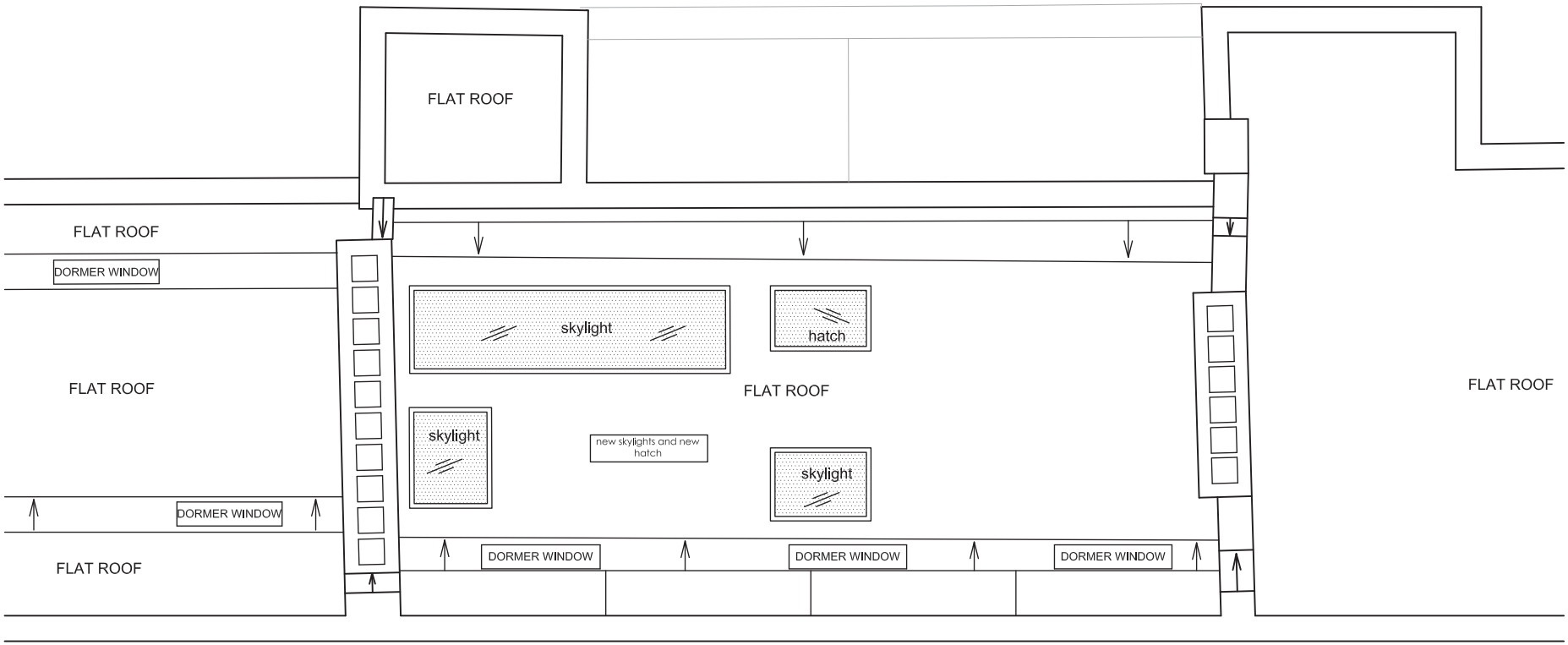
Existing walls
New walls / partitions / floors
Partition omitted
Infilled walls
New openings

0 1m 2m 5m

1 **Proposed Third Floor Plan**
1:50 @ A3

BELSIZE ARCHITECTS

48 PARKHILL ROAD, LONDON, NW3 2YP
T: 020 7482 4420
E: MAIL@BELSIZEACHITECTS.COM



PLANNING

REVISIONS

01.11.2020_REV A
Skylights amended.

NOTES

205 ALBANY STREET
LONDON, NW1 4AB

PROPOSED ROOF PLAN

DWG No: 205AS/P106A

SCALE: 1:50 @A3

DATE: JUNE 2020

Existing walls

New walls / partitions / floors

Partition omitted

Infilled walls

New openings

0 1m 2m 5m

BELSIZE ARCHITECTS

48 PARKHILL ROAD, LONDON, NW3 2YP
T: 020 7482 4420
E: MAIL@BELSIZEACHITECTS.COM

1 **Proposed Roof Plan**
1:50 @ A3

1 **Proposed Front Elevation**
1:50 @ A3

0 1m 2m 5m

PLANNING

REVISIONS

NOTES

205 ALBANY STREET
LONDON, NW1 4AB

PROPOSED FRONT ELEVATION

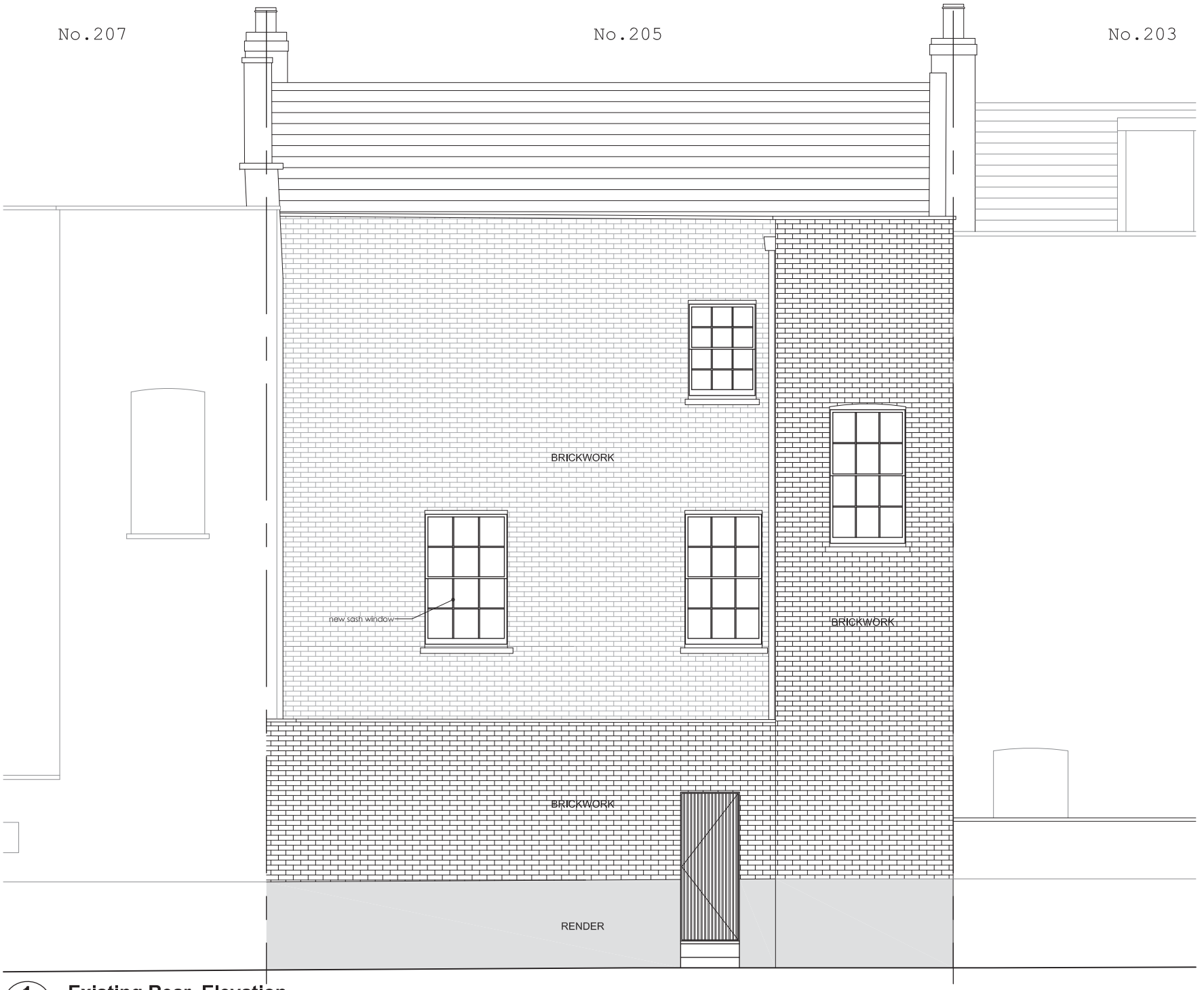
DWG No: 205AS/P200

SCALE: 1:50 @A3

DATE: JUNE 2020

BELSIZE ARCHITECTS

48 PARKHILL ROAD, LONDON, NW3 2YP
T: 020 7482 4420
E: MAIL@BELSIZEACHITECTS.COM



1 **Existing Rear Elevation**
1:50 @ A3

0 1m 2m 5m

PLANNING

REVISIONS

NOTES

205 ALBANY STREET
LONDON, NW1 4AB

PROPOSED REAR ELEVATION

DWG No: 205AS/P201

SCALE: 1:50 @A3

DATE: JUNE 2020

BELSIZE ARCHITECTS

48 PARKHILL ROAD, LONDON, NW3 2YP
T: 020 7482 4420
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PLANNING

REVISIONS
01.11.2020_REV A
Bathroom area lowered 380 mm

NOTES

205 ALBANY STREET
LONDON, NW1 4AB

PROPOSED SECTION BB

DWG No: 205AS/P301A

SCALE: 1:50 @A3

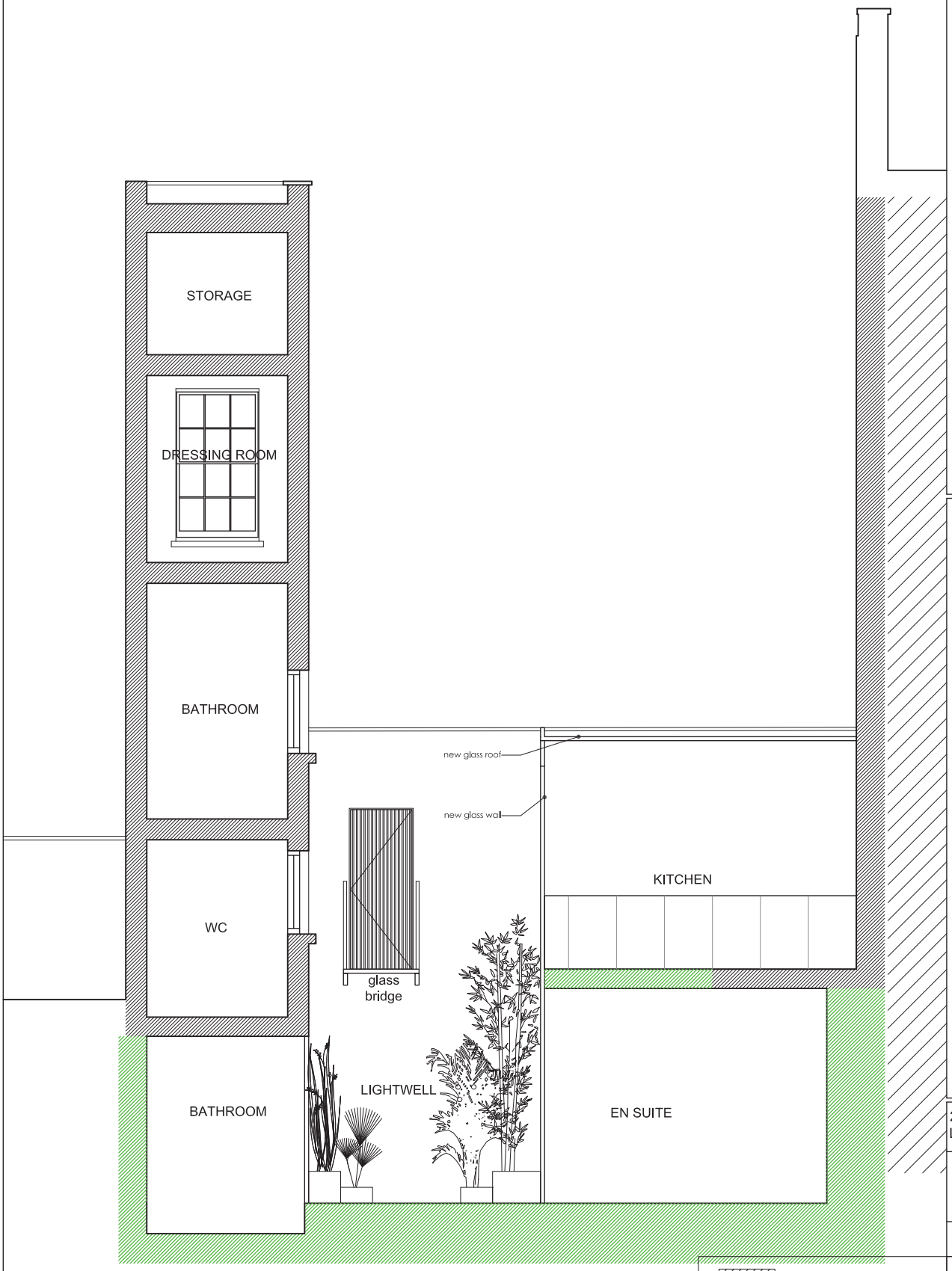
DATE: JUNE 2020

Existing walls
New walls / partitions / floors
Partition omitted
Infilled walls
New openings

BELSIZE ARCHITECTS
48 PARKHILL ROAD, LONDON, NW3 2YP
T: 020 7482 4420
E: MAIL@BELSIZEACHITECTS.COM

1 **Proposed Section BB**
1:50 @ A3

0 1m 2m 5m



PLANNING

REVISIONS
01.11.2020_REV A
Bathroom area lowered 380 mm

NOTES

205 ALBANY STREET
LONDON, NW1 4AB

PROPOSED SECTION CC

DWG No: 205AS/P302A

SCALE: 1:50 @A3

DATE: JUNE 2020

Existing walls
New walls / partitions / floors
Partition omitted
Infilled walls
New openings

0 1m 2m 5m

1 **Proposed Section CC**
1:50 @ A3

BELSIZE ARCHITECTS
48 PARKHILL ROAD, LONDON, NW3 2YP
T: 020 7482 4420
E: MAIL@BELSIZEACHITECTS.COM