FLOOD RISK ASSESSMENTS & DRAINAGE STRATEGIES

FLOOD RISK ASSESSMENT

95 Avenue Road, London, NW8 6HY - Semi-Detached Houses

Reference: 478 FRA- 002

Jun-23

www.rida-reports.co.uk

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Report Limitations

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The study provides no guarantee against flooding of the study site or elsewhere, nor of the absolute accuracy of water levels, flow rates and associated probabilities.

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Introduction 1

Purpose of this report

1.1 RIDA Reports Ltd has been appointed to undertake a Level 1 – Screening Study Flood Risk Assessment for a development located at NW8 6HY.

Objectives

1.2 The objectives of this FRA are to demonstrate the following:

* Whether the proposed development is likely to be affected by current or future flooding.
* Whether the proposed development will increase flood risk elsewhere.
* Whether the flood risks associated with the proposed development can be satisfactorily managed.
* Whether the measures proposed to deal with the flood risk are sustainable.

Documents Consulted

1.3 To achieve these objectives the following documents have been consulted and/or referenced:

The National Planning Policy Framework (NPPF)
CIRIA C753 document The SuDS Manual, 2015
Local Flood Risk Management Strategy (LFRMS)
Level 1 Strategic Flood Risk Assessment (SFRA)
Aerial photographs and topographical survey of the site
British Geological Society Records
Local Council flood Maps
Environment Agency flood maps
The CIRIA publication 'C635 Designing for exceedance in urban drainage— Good practice'

Development Site and Location

2.1 The site is located at Avenue Road, London. The nearest post code is NW8 6HY. Refer to appendix A for site location plan.

2.2 The current use of the site is a garage. The current use vulnerability clasification of the site is More vulnerable . The site is located in the River Flood Zone 1. Refer to Appendix B for more details.

Development Proposals

2.3 The proposed development includes the internal modifications of the existing garage and conversion into two dwellings. The total development area (shown in within the red line) is approximately 2200 sqm. Refer to Appendix B for layout of the proposed development.

2.4 The vulnerability classification of the proposed development is More vulnerable with an estimated lifetime between 50 and 100 years.

Site Hydrology and Hydrogeology

Hydrology 2.5 The Regent`s Canal is located approximately 960 m away from the development.

Aquifer 2.6 The development is located within an unproductive strata. These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

Source Protection Zone 2.7 The site is located within the source protection zone 2. This zone is defined by a 400 day travel time from a point below the water table. This zone has a minimum radius of 250 or 500 metres around the source.

Groundwater Levels 2.8 The ground water levels for this site are unknown.

Site Geology

Bedrock 2.9 The British Geological Society records of the site show that it is located within the London Clay Formation - Clay, Silt and Sand.

Superficial Deposits 2.10 The British Geological Society records show that the superficial deposits are No results found.

National and Local Planning Policy 3

National Planning Policy Framework (NPPF)

3.1 The NPPF and its technical guidance is a set of planning policies with the key objective to contribute to the achievement of sustainable development. As part of it, they ensure that flood risk and sustainability are taken into account during the planning process. This ensures that developments are not located in flood risk areas and directs developments to lower risk areas. The NPPF applies a sequential risk-based approach to determining the suitability of land for development in flood risk areas. The NPPF also encourages developers to seek opportunities to reduce the overall level of flood risk through the layout of the development and the application of Sustainable Drainage Systems (SuDS).

The Flood and Water Management Act (2010)

3.2 The Flood and Water Management Act aims to reduce the flood risk associated with extreme weather events. It provides a robust management of flood risk for people, homes and businesses and also encourages the use of SuDS for developments. A robust SuDS strategy should take into account the recommendations given in this Flood Risk Assessment.

Strategic Flood Risk Assessment (SFRA)

3.3 Planning policy with regard to development and flood risk in the area is detailed in the Strategic Flood Risk Assessment (SFRM) which was published in 2014. The proposed development site is located within the administrative boundary of the London Borough of Camden.

3.4 The SFRA commits to direct new development to locations at lowest flood risk. The SFRA provides information on the levels and flood hazards that could result from flooding. The Environment Agency flood zone maps and the SFRA ignore the presence of existing flood defences when defining the potential extent of flooding.

3.5 This report follows the guidance given in the Strategic Flood Risk Assessment by evaluating the flood risk and providing relevant flood mitigation.

The Sequential and Exception Test 4

4.1 The flood risks were determined by identifying the sources of flooding and assessing their possible impact and likelihood to the development.

Fluvial Flood Risk Assessment

4.2 Fluvial flood risk was assessed using the Environment Agency Flood Zone Maps and the sequential risk-based approach recommended in the NPPF. The sequential test takes into account the flood risk vulnerability of land uses in relation to the flood zone categorisation. These parameters are assessed in order to determine whether the development is appropriate. Under certain circumstances the exception test is applicable.

Sequential Approach

Step 1
Flood Zone categorisation

4.3 The proposed development is less than 1Ha and falls within the Environment Agency Flood Zone 1.Therefore, this Flood Risk Assessment Level 1- Screening report should be sufficient under the NPPF. The Flood Zone 1 is considered to have a low probability of flooding with an annual probability of flooding of <0.1%. The chance of flooding is 1 in 1000 years or greater.

Step 2
Flood risk vulnerability

4.4 Within Table 2 (Flood Risk Vulnerability Classification) of the NPPF Planning Practice Guide, the proposed development is classified as 'More vulnerable '.

Step 3
Sequential Test Results

4.5 The Flood Risk vulnerability and Flood Zone Compatibility table of the NPPF Planning Practice Guide states that More vulnerable developments are appropriate in this area.

4.6 The exception test is not required.

Flood hazard assessment 5

5.1 The development has been assessed for all potential flood risks such as river and tidal flood risk, surface water flooding, flooding from groundwater, reservoir flood risk and drainage systems.

Historic Flooding

5.2 The site does not benefit from flood defences. The Environment Agency records show that the area around the site has not been flooded in the past.

Flooding from river and sea

5.3 The proposed development is less than 1Ha and falls within the Environment Agency Flood Zone 1.Therefore, this Flood Risk Assessment Level 1- Screening report should be sufficient under the NPPF. The Flood Zone 1 is considered to have a low probability of flooding with an annual probability of flooding of <0.1%. The chance of flooding is 1 in 1000 years or greater.

5.4 The climate change allowance is not applicable for this site as it is not affected by fluvial flood risk.

Surface water (overland flows) flood risk

5.5 The Environment Agency maps show that the flood risk from surface water is very low. A residual risk of localised ponding remains unlikely. The Environment Agency surface water flood risk maps are defined through application of a specific procedure based on digital terrain models and assumptions regarding losses to infiltration and/or urban drainage. The surface water flood maps is defined by the Environment Agency as follows.

5.6 *"The nationally produced surface water flood mapping only indicates where surface water flooding could occur as a result of local rainfall. It does not fully represent flooding that occurs from:*

- Ordinary watercourses
- Drainage systems or public sewers caused by catchment-wide rainfall events
- Rivers
- Groundwater

Due to the modelling techniques used, the mapping picks out depressions in the ground surface and simulates some flow along natural drainage channels, rivers, low areas in floodplains, and flow paths between buildings. Although the maps appear to show flooding from ordinary watercourses, they should not be taken as definitive mapping of flood risk from these as the conveyance effect of ordinary watercourses or drainage channels is not explicitly modelled. Also, structures (such as bridges, culverts and weirs) and flood risk management infrastructure (such as defences) are not represented.

The nationally produced surface water flood mapping does not take account of the effect of pumping stations in catchments with pumped drainage. No allowance is made for tide locking, high tidal or fluvial levels where sewers cannot discharge in to rivers or the sea."

5.7 The strategic flood risk for the London Borough of Camden confirms that the flood risk for the site is Very Low.

5.8 On the basis of Environment Agency and the Strategic flood risk assessment's surface water mapping, together with the presence of surface water drainage systems at the site and surrounding area it is concluded that the site is at Very Low risk of flooding from surface water sources.

Flooding from drainage systems in adjacent areas

5.9 The council's database confirms that are no records of sewer flooding within the site. The site is located outside of the sewer flooding incidents area. See appendix C for details.

Reservoirs Risks

5.10 The Reservoir Flood Map (RFM) produced by the Environment Agency do not show the risk to individual properties of dam breach flooding. The maps do not indicate or relate to any particular probability of dam breach flooding. The maps were prepared for emergency planning purposes and can be used to help reservoir owners produce on-site plans and the Local Resilience Forum produce off-site plans, and to prioritise areas for evacuation/early warning in the event of a potential dam failure. The RFM shows that the development could be outside of the possible dam breach flooding path. See Appendix C.

Groundwater flood risk

5.11 The British Geological Survey's flood risk susceptibility maps show that the development has limited susceptibility to ground water flooding. The risk from groundwater flood to the site is considered very low. Refer to appendix C for record drawings.

Critical Drainage Areas

5.12 The development falls within a Critical Drainage Area. The risks of critical problems and increase of downstream flooding is high. Critical Drainage Area (CDA) is an area that has critical drainage problems and which has been notified to the local planning authority by the Environment Agency.

6.1 The Flood hazard assessment has demonstrated that the site is:

- In Flood Zone 1
- At Very Low risk of surface flooding
- At very low risk of groundwater flooding
- Within a critical drainage area
- Outside of an area with sewer flooding

6.2 Under the NPPF it is necessary to demonstrate that, for any new development on the site, it is possible to provide an adequate level of flood protection for personnel working or living at the development.

Flood Protection

6.3 The development is within a Critical Drainage Area, the local authority expects new developments to reduce the flood risks downstream, rather than having just a neutral impact. It also expects that Sustainable Drainage Systems (SuDS) are used for managing surface water. Refer to section 7 of this report. All connections to have NRVs.

7.1 The NPPF specifically stipulates that consideration should be given to potential off-site flood impacts of any proposed development. These off-site impacts are in relation to:

- Surface water management

- Flood flow conveyance, storage and climate change

Surface Water Management

7.2 The surface water run-off will be disposed using SuDS techniques. The aim is to provide a sustainable design that accommodates the proposed attenuation volume and replicated the existing drainage regime using the SuDS hierarchy is shown in the figure below.

7.3 The SuDS techniques highlighted in red below could be used on site. This assessment is based on the ground conditions and the potential discharge points available.

The SuDS Hierarchy (Source:EA Thames region, SuDS a practical guide)

	SUDS technique	Flood Reduction	Pollution Reduction	Landscape & Wildlife Benefit
Most Sustainable	**Living roofs**	✓	✓	✓
	Basins and ponds - Constructed wetlands - Balancing ponds - Detention basins - Retention ponds	✓	✓	✓
	Filter strips and swales	✓	✓	✓
	Infiltration devices - soakaways - infiltration trenches and basins	✓	✓	✓
	Permeable surfaces and filter drains - gravelled areas - solid paving blocks - porous paviors	✓	✓	
Least Sustainable	**Tanked systems** - over-sized pipes/tanks - storms cells	✓		

7.4 With no increase in the rate of surface water discharge from the site, compared to the site in its current configuration, the proposed development would have no adverse impact on surface water flood risk at the site or surrounding area. The SuDS should be designed at detailed project stage.

Conclusions 8

8.1 It is concluded that subject to the proposed mitigation measures, the site can be developed in accordance with the provisions of the NPPF and the requirements of the Environment Agency and the local planning authority.

8.2 This report demonstrates that the proposal will be safe, in terms of flood risk, for its design life and will not increase the flood risk elsewhere.

Appendix A

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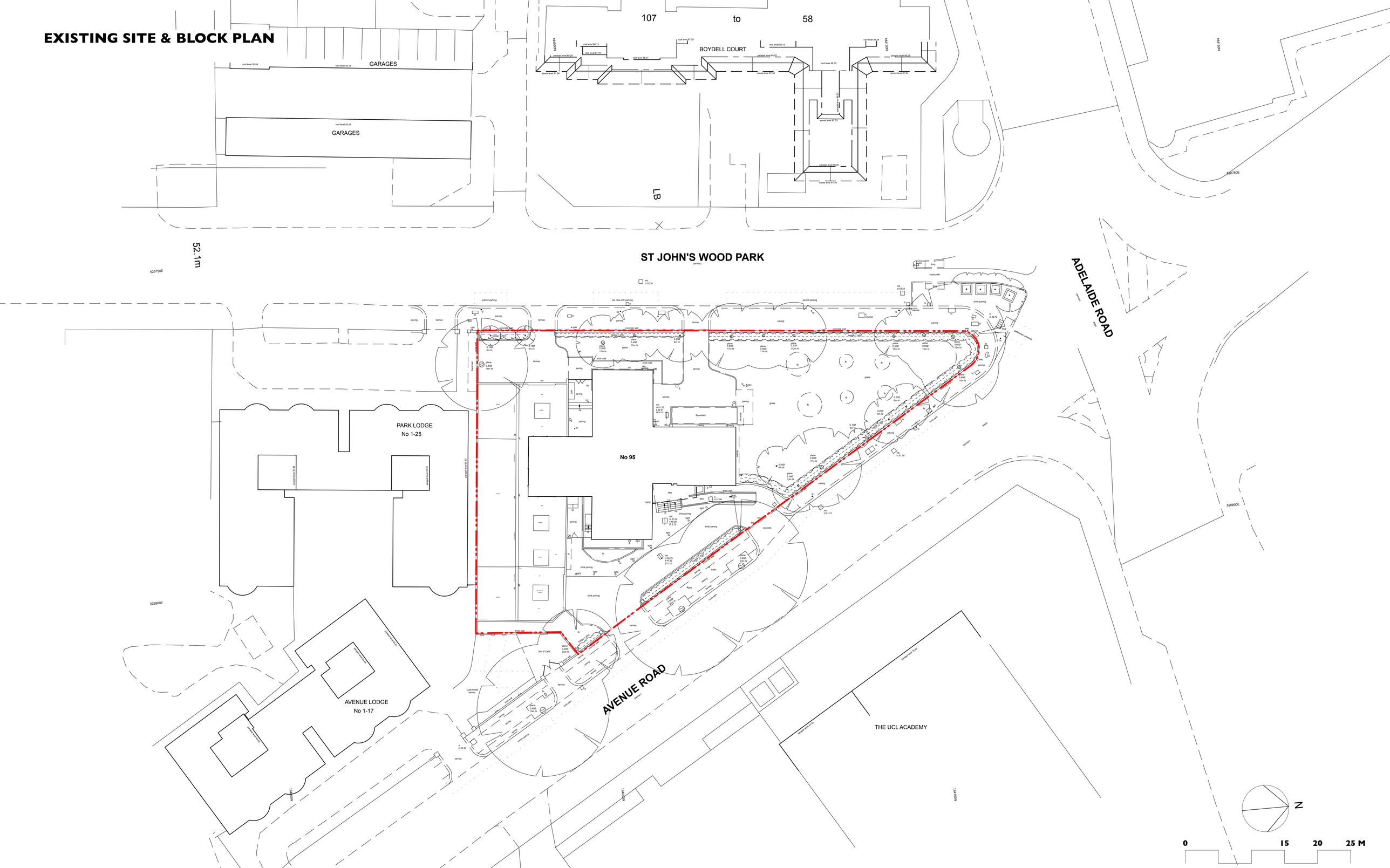
Rev.	Date.	Description.	Initial.

EXISTING

Project:	95 Avenue Road, London, NW8 6HY	Drawing:	Location Plan
Scale:	1:1250 @ A3	DWG:	1289 - EX - 000
Date:	Feb 2022	Revision:	/

Appendix B

EXISTING SITE & BLOCK PLAN



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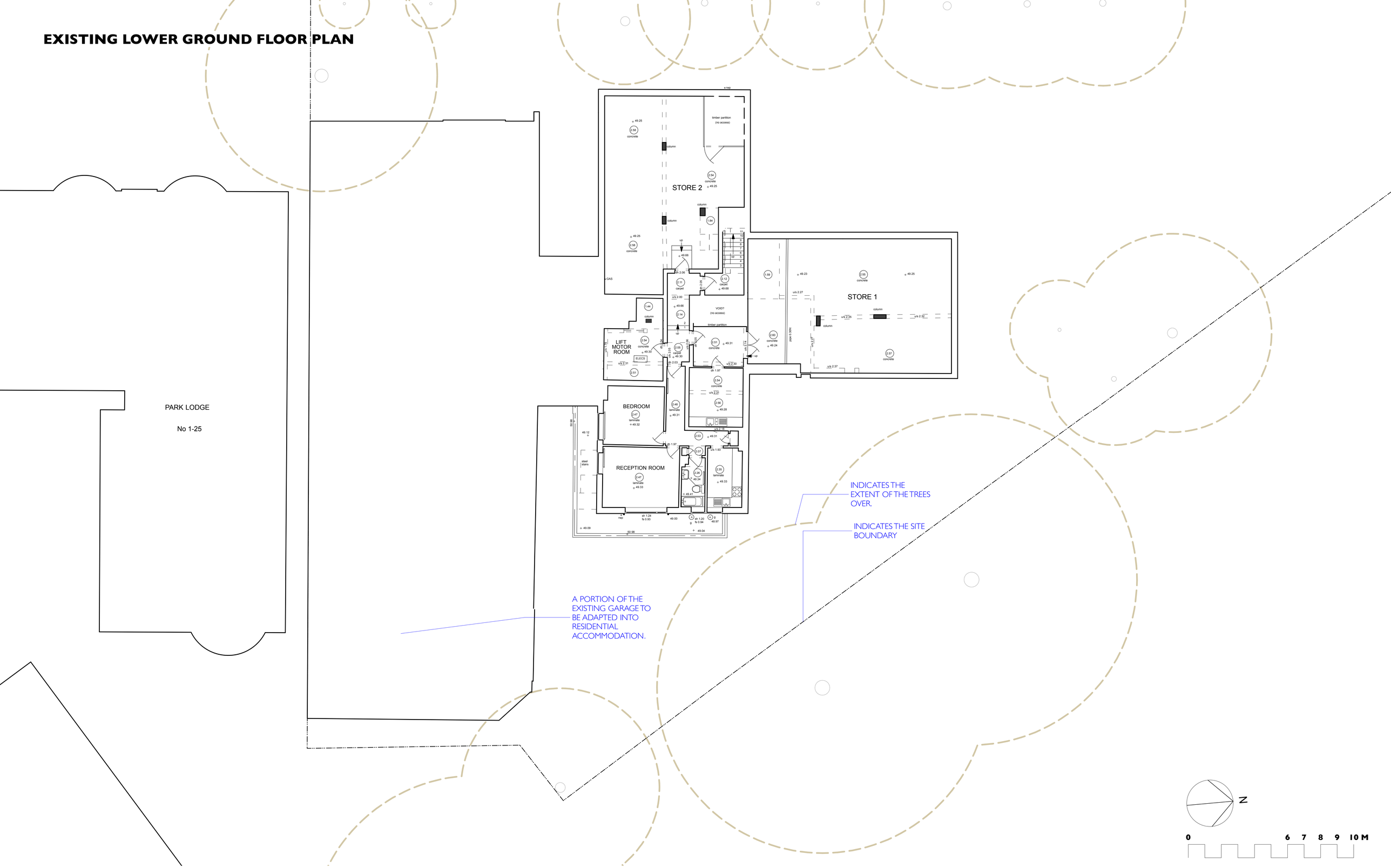
EXISTING

Project:	95 Avenue Road, London, NW8 6HY	Drawing:	Existing Site Plan & Block Plan
Scale:	1:250 @ A1 & 1:500 @ A3	DWG:	1289 - EX - PP3 - 002
Date:	Jan 2021	Revision:	/

EXISTING LOWER GROUND FLOOR PLAN



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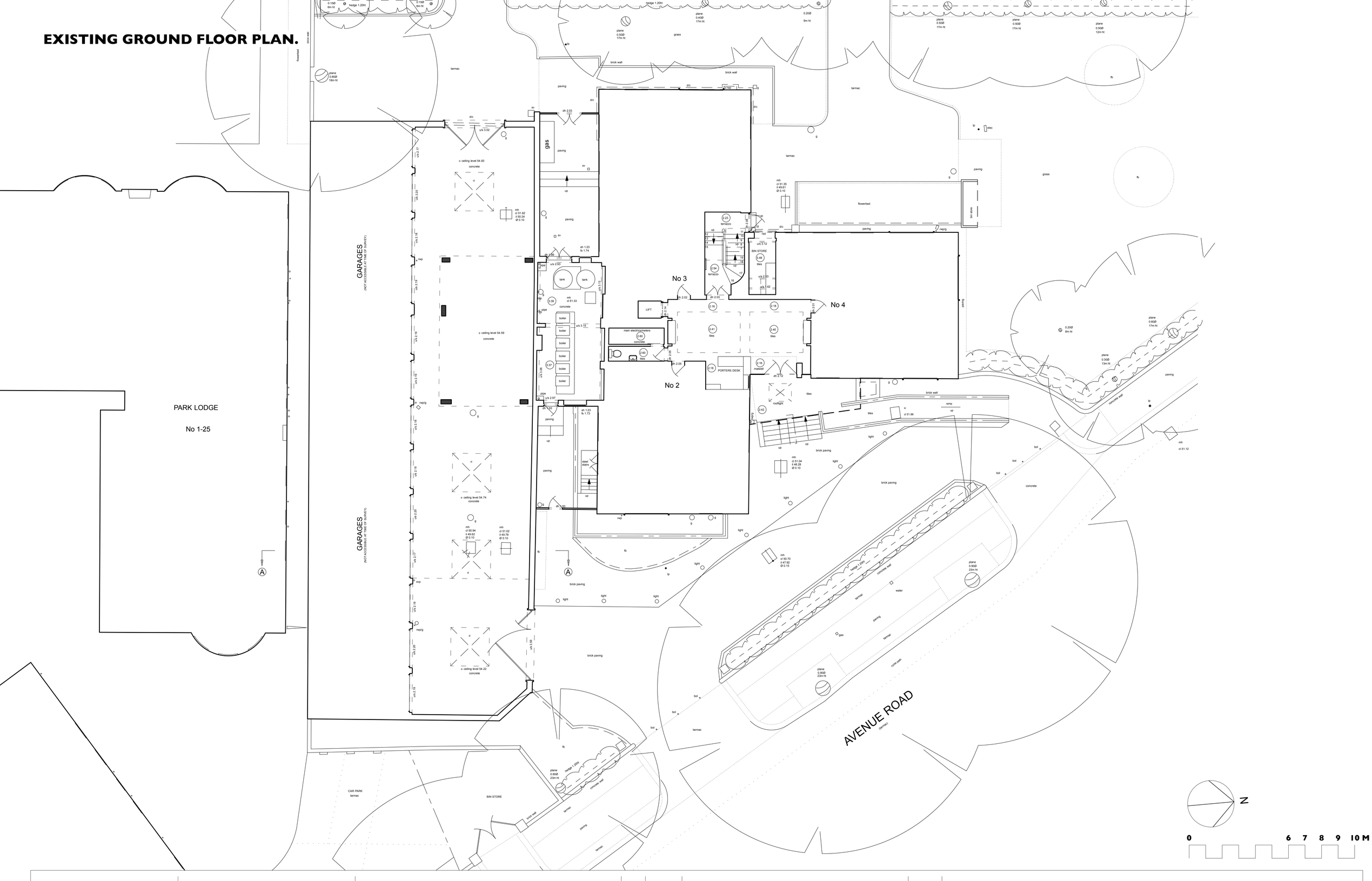
EXISTING

Project:	95 Avenue Road, London, NW8 6HY	Drawing:	Existing Lower Ground Floor Plan
Scale:	1:100 @ A3 & 1:200 @ A3	DWG:	1289 - EX - PP3 - 003
Date:	Jan 2021	Revision:	/

EXISTING GROUND FLOOR PLAN.



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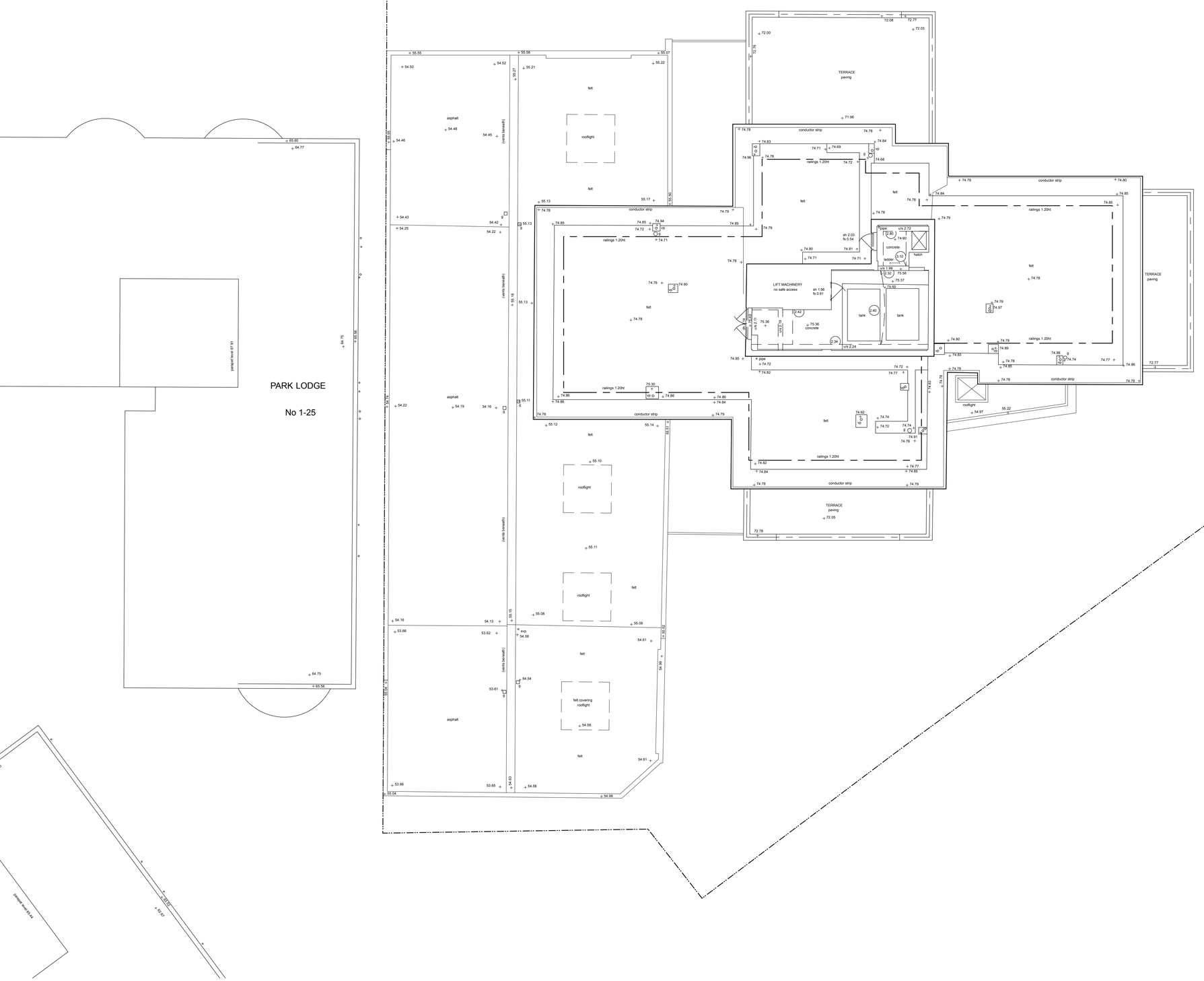
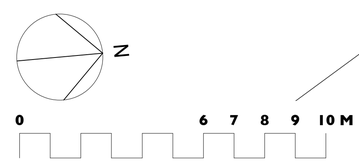
Project:	95 Avenue Road, London, NW8 6HY	Drawing:	Existing Ground Floor Plan
Scale:	1:100 @ A1 & 1:200 @ A3	DWG:	1289 - EX - PP3 - 004
Date:	Jan 2021	Revision:	/

EXISTING ROOF PLAN





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EXISTING

Project:	95 Avenue Road, London, NW8 6HY	Drawing:	Existing Roof Plan
Scale:	1:100 @ A1 & 1:200 @ A3	DWG:	1289 - EX - PP3 - 005
Date:	Jan 2021	Revision:	/

EXISTING ELEVATIONS
Sheet 1

SOUTH ELEVATION (Side)
50.00m A.O.D.

EAST ELEVATION (Avenue Road)
48.00m A.O.D.

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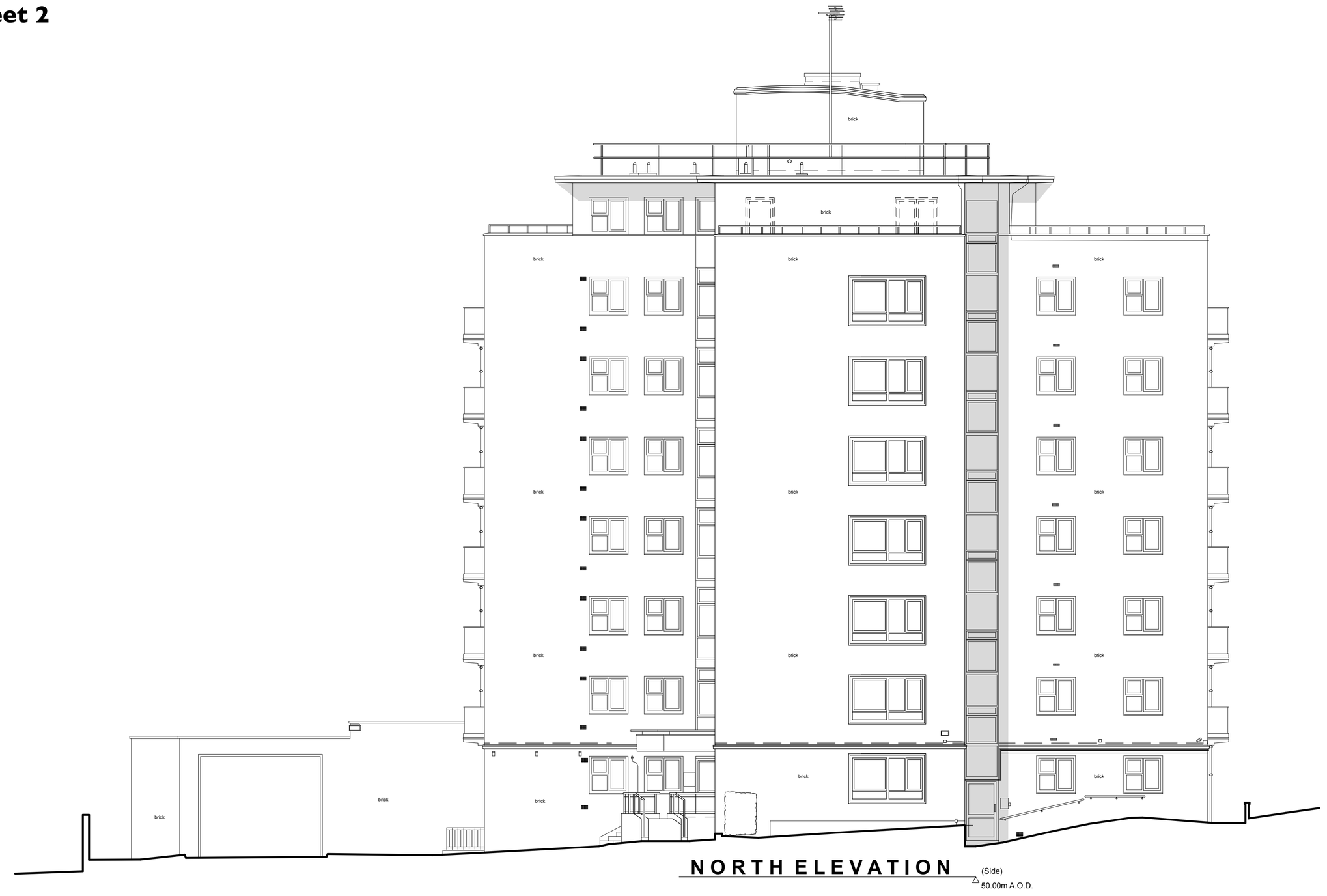
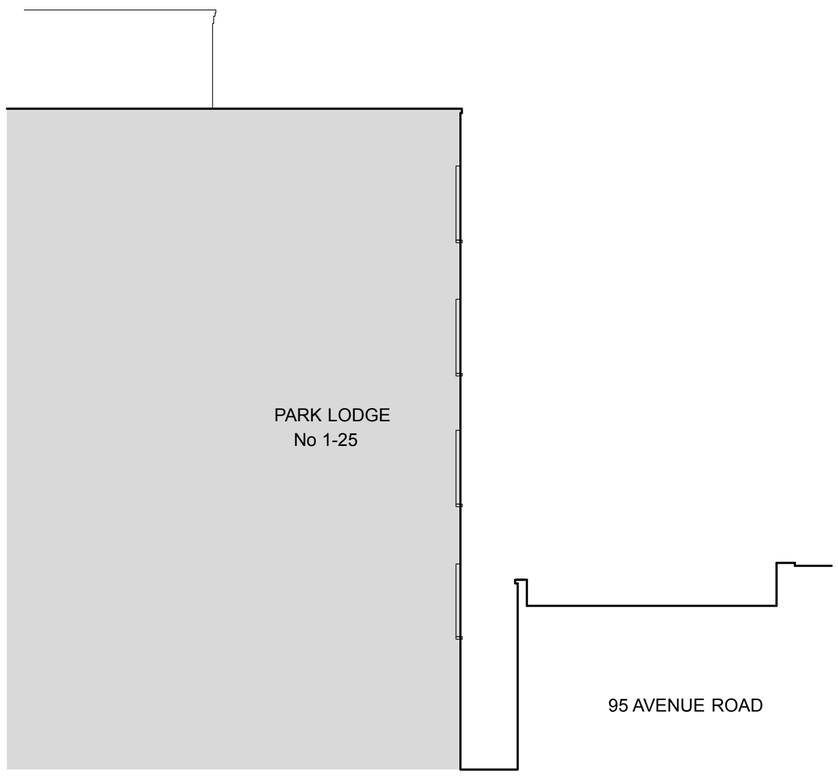
EXISTING

Project: 95 Avenue Road, London, NW8 6HY
Drawing: Existing Elevations Sheet 1
Scale: 1:100 @ A1 & 1:200 @ A3
DWG: 1289 - EX - PP3 - 020
Date: Jan 2021
Revision: /

EXISTING ELEVATIONS
Sheet 2



NORTH ELEVATION (Side)
50.00m A.O.D.



OUTLINE SECTION A (Avenue Road)
48.00m A.O.D.

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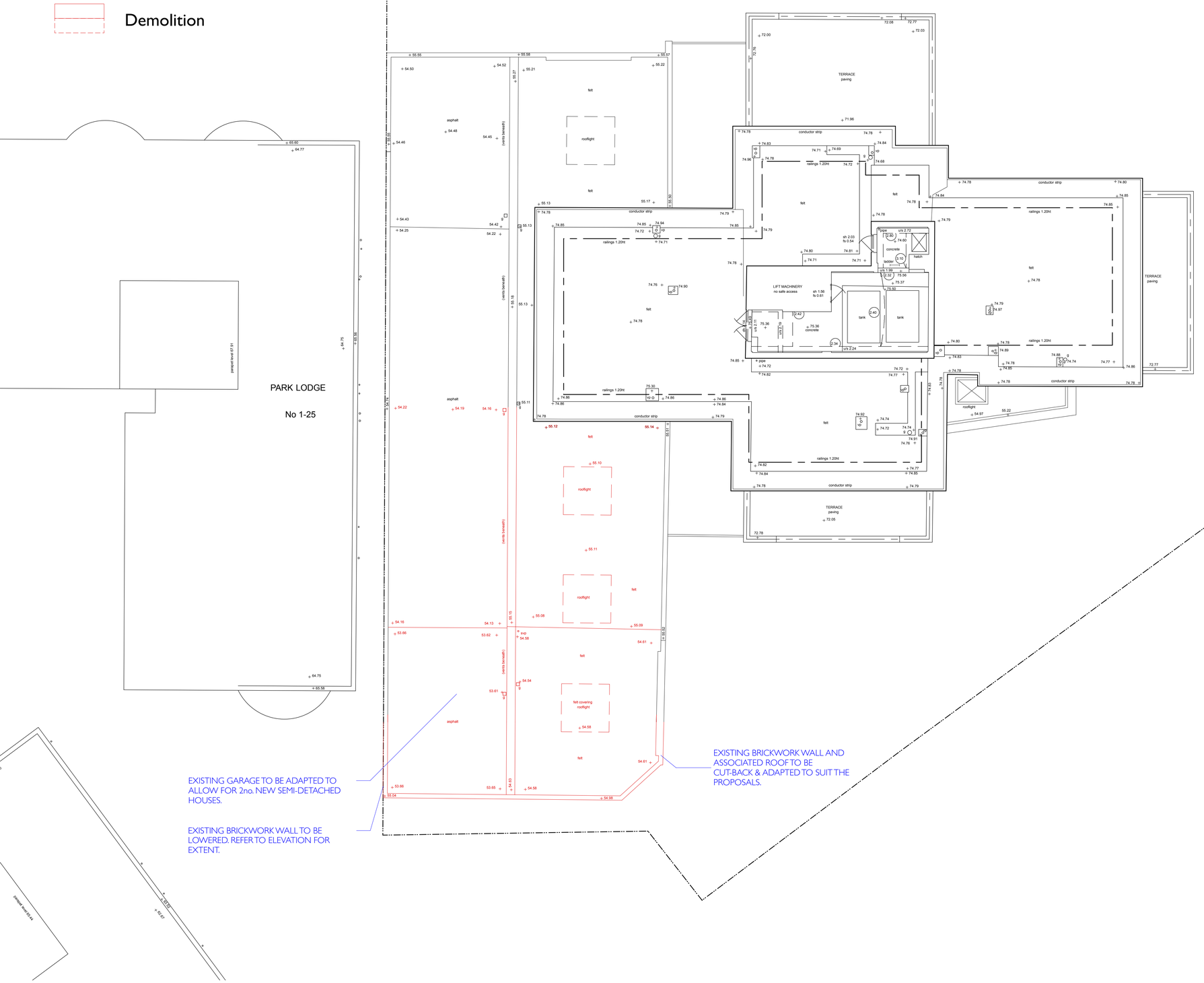
EXISTING

Project:	95 Avenue Road, London, NW8 6HY	Drawing:	Existing Elevations Sheet 2
Scale:	1:100 @ A1 & 1:200 @ A3	DWG:	1289 - EX - PP3 - 021
Date:	Jan 2021	Revision:	/

DEMOLITION PLAN

Demolition



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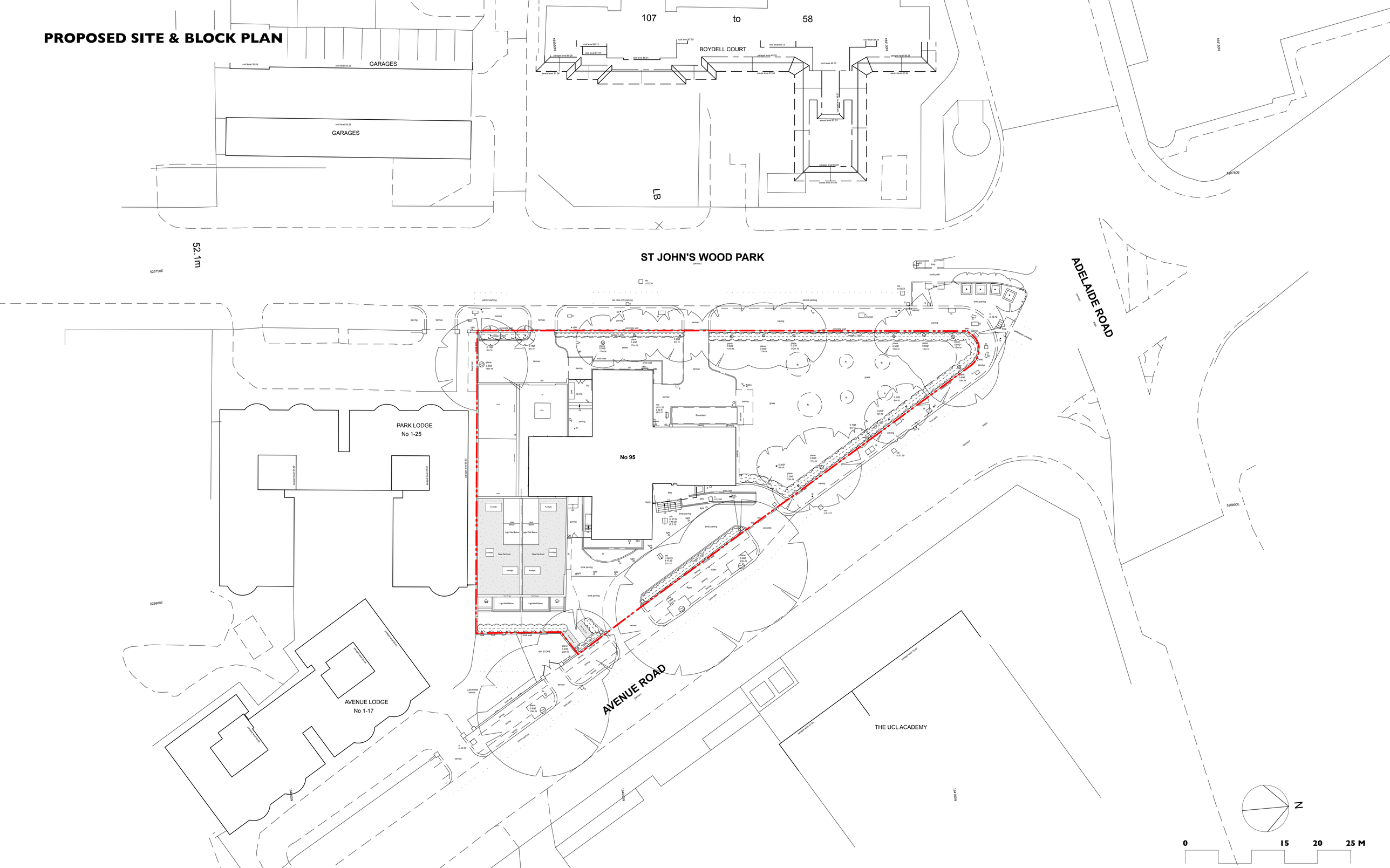
DEMOLITION

Project:	95 Avenue Road, London, NW8 6HY	Drawing:	Demolition Plan
Scale:	1:100 @ A1 & 1:200 @ A3	DWG:	1289 - EXD - PP3 - 105
Date:	Jan 2023	Revision:	/

PROPOSED SITE & BLOCK PLAN



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PLANNING

Project:	95 Avenue Road, London, NW8 6HY	Drawing:	Proposed Site Plan & Block Plan
Scale:	1:250 @ A1 & 1:500 @ A3	DWG:	1289 - PP3 - 202
Date:	Jan 2021	Revision:	/

PROPOSED LOWER GROUND FLOOR PLAN

House 1

House 2

New Walls

PARK LODGE

No 1-25

A-A

B-B

REFER TO STRUCTURAL ENGINEER'S INFO FOR STRUCTURAL REQUIREMENTS.

EXISTING GARAGE TO BE ADAPTED TO ALLOW FOR 2no. NEW SEMI-DETACHED HOUSES. A NEW BASEMENT LEVEL TO BE CONSTRUCTED BELOW THE EXISTING GARAGE.

INDICATES THE EXTENT OF THE TREES OVER.

N

0 6 7 8 9 10M

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Rev.	Date.	Description.	Initial.
A	2201-28	General drawing update.	JC
B	2202-08	Update to bed 2 to incorporate roof light & adjust windows. Bed 3 doorway & light well glazing edited.	JC
C	2206-16	General drawing update, H1 updated.	JC
D	2208-09	General drawing update, Landmark Trees RPA info added.	JC
E	2301-05	General drawing update following receipt of structural info.	JC

PLANNING

Project:	95 Avenue Road, London, NW8 6HY	Drawing:	Proposed Lower Ground Floor Plan
Scale:	1:100 @ A3 & 1:200 @ A3	DWG:	1289 - PP3 - 203
Date:	Jan 2021	Revision:	E

PROPOSED GROUND FLOOR PLAN

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Rev.	Date.	Description.	Initial.
A	2201-28	General drawing update.	JC
B	2202-08	Walk-on roof lights added to rear terrace.	JC
C	2202-11	General drawing update.	JC
D	2206-16	General drawing update.	JC
E	2208-09	General drawing update, Landmark Trees RPA info added.	JC
F	2301-05	General drawing update following receipt of structural info.	JC

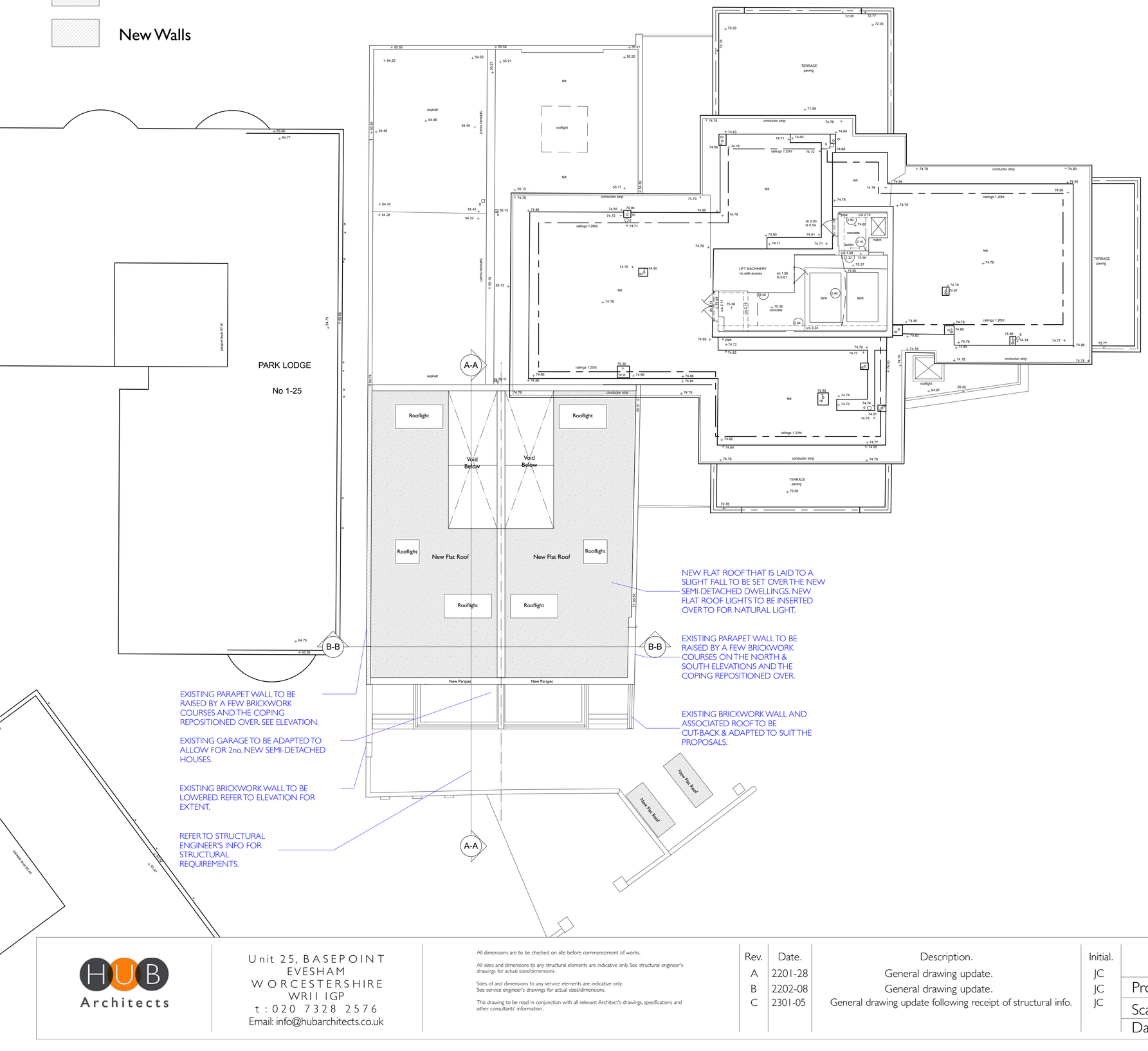
PLANNING

Project: 95 Avenue Road, London, NW8 6HY
Drawing: Proposed Ground Floor Plan
Scale: 1:100 @ A3 & 1:200 @ A3
DWG: 1289 - PP3 - 204
Date: Jan 2021
Revision: F

PROPOSED ROOF PLAN

New Roof

New Walls



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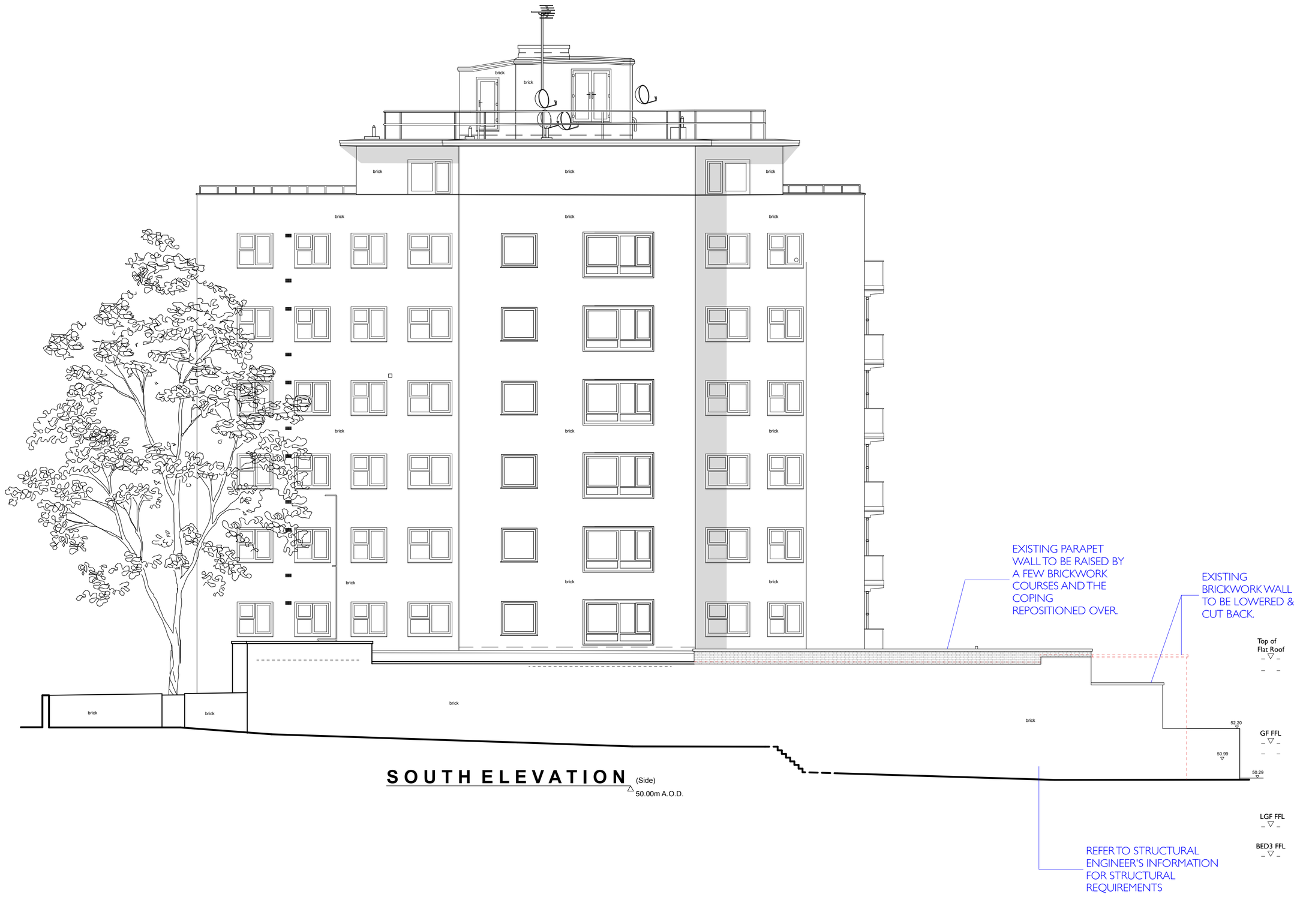
A	2201-28	General drawing update.	JC
B	2202-08	General drawing update.	JC
C	2301-05	General drawing update following receipt of structural info.	JC

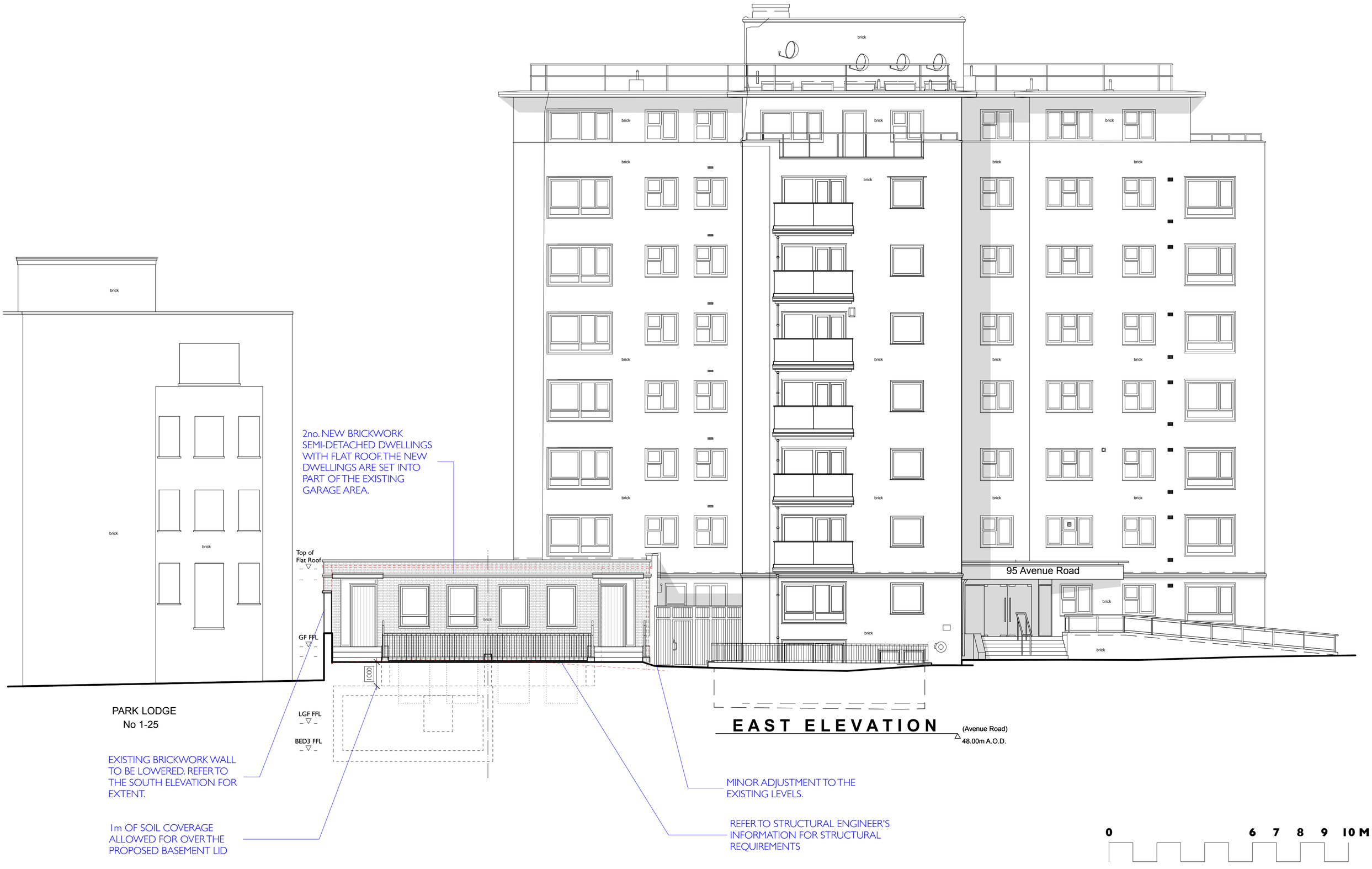
PLANNING

Project:	95 Avenue Road, London, NW8 6HY	Drawing:	Proposed Roof Plan
Scale:	1:100 @ A3 & 1:200 @ A3	DWG:	1289 - PP3 - 205
Date:	Jan 2021	Revision:	C

PROPOSED ELEVATIONS
Sheet 1



SOUTH ELEVATION (Side)
50.00m A.O.D.



EAST ELEVATION (Avenue Road)
48.00m A.O.D.

0 6 7 8 9 10M

HUB Architects

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EVESHAM
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Email: info@hubarchitects.co.uk

All dimensions are to be checked on site before commencement of works.

All sizes and dimensions to any structural elements are indicative only. See structural engineer's drawings for actual sizes/dimensions.

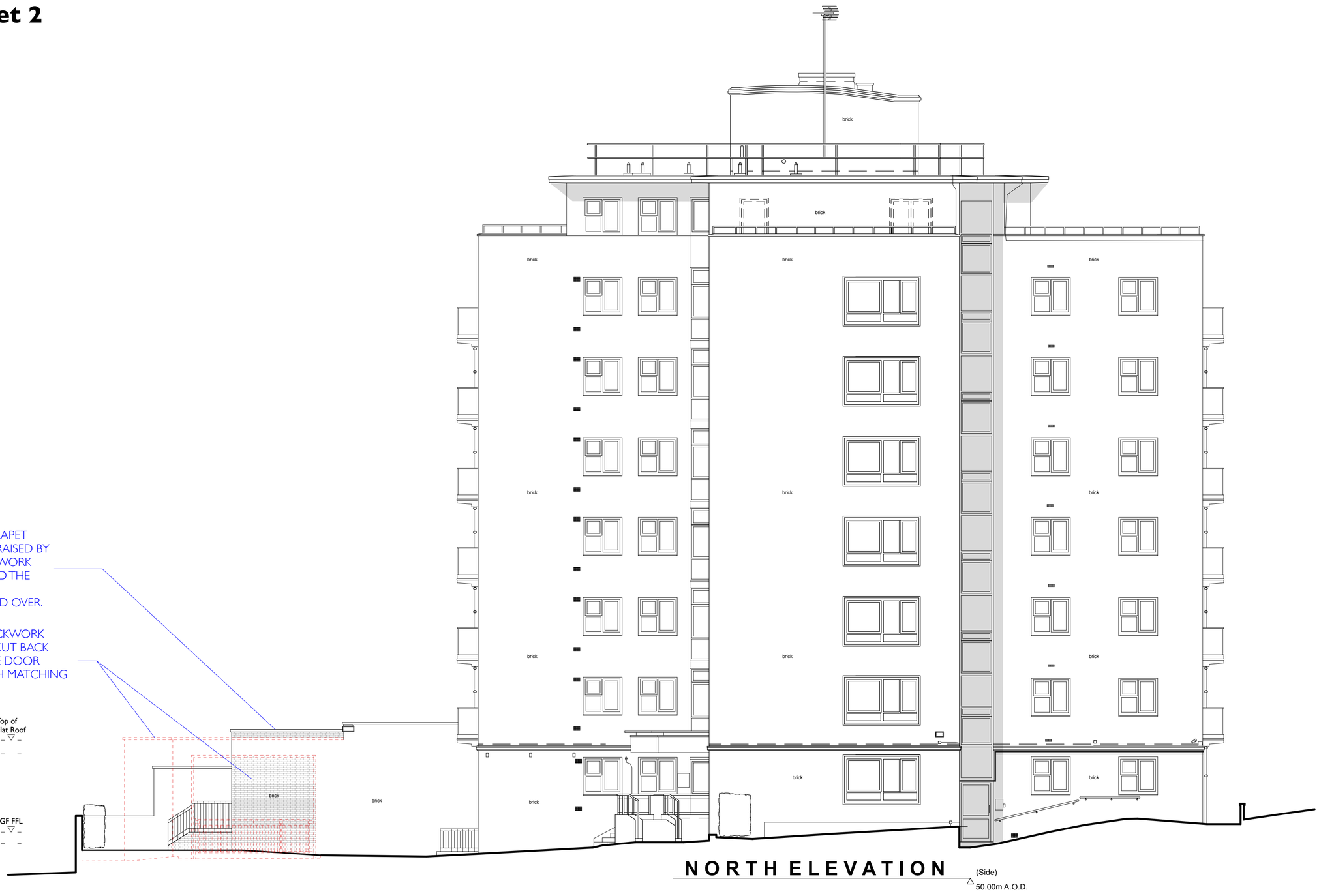
Sizes of and dimensions to any service elements are indicative only. See service engineer's drawings for actual sizes/dimensions.

This drawing to be read in conjunction with all relevant Architect's drawings, specifications and other consultants' information.

Rev.	Date.	Description.	Initial.
A	2201-28	General drawing update. Ceiling height.	JC
B	2206-16	General drawing update.	JC
C	2301-05	General drawing update.	JC

PLANNING

Project:	95 Avenue Road, London, NW8 6HY	Drawing:	Proposed Elevations Sht1
Scale:	1:100 @ A1 & 1:200 @ A3	DWG:	1289 - PP3 - 220
Date:	Jan 2021	Revision:	C



PROPOSED ELEVATIONS
Sheet 2

EXISTING PARAPET WALL TO BE RAISED BY A FEW BRICKWORK COURSES AND THE COPING REPOSITIONED OVER.

EXISTING BRICKWORK WALL TO BE CUT BACK AND GARAGE DOOR INFILLED WITH MATCHING BRICKWORK.

NORTH ELEVATION

(Side)
50.00m A.O.D.

EXISTING PARAPET WALL TO BE RAISED BY A FEW BRICKWORK COURSES AND THE COPING REPOSITIONED OVER.

OUTLINE SECTION B

(Avenue Road)
48.00m A.O.D.

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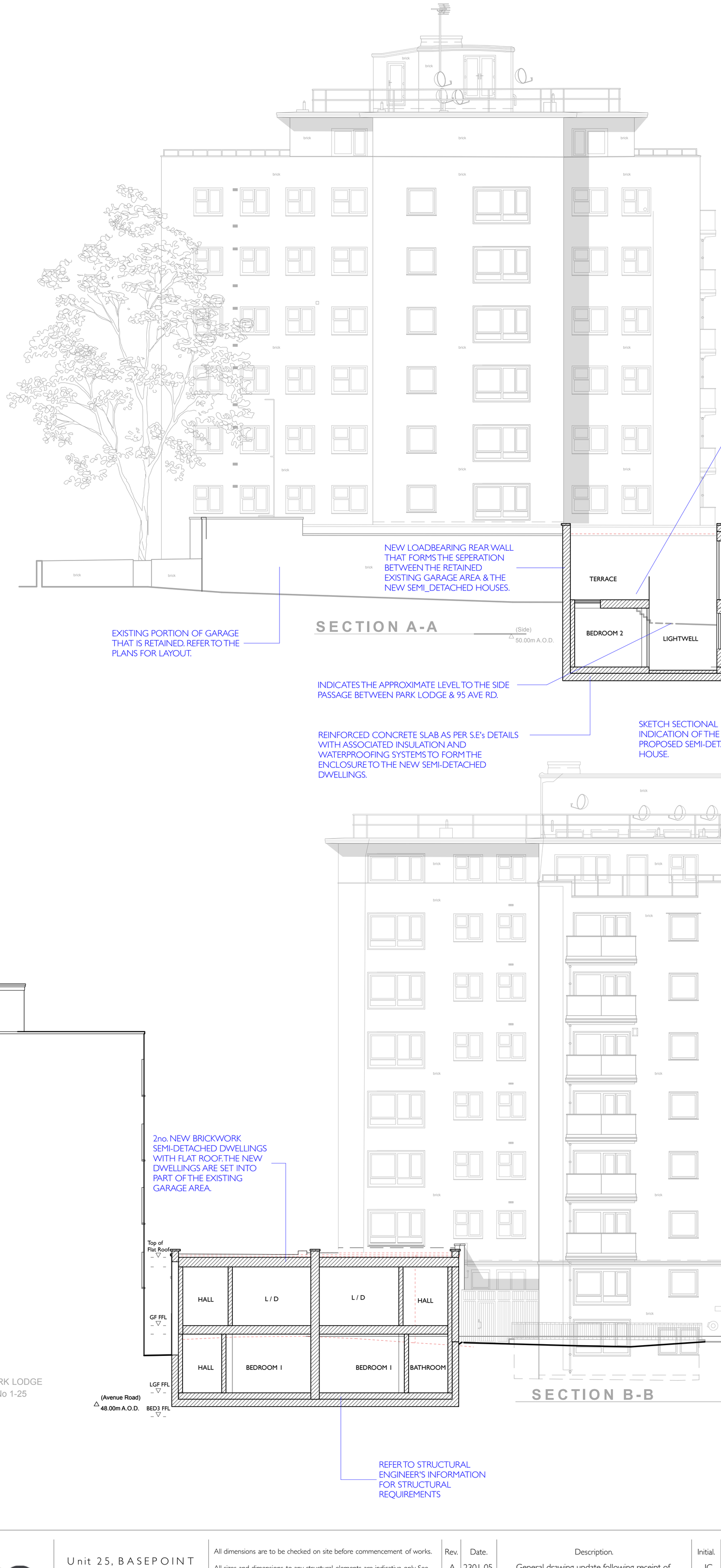
Rev.	Date.	Description.	Initial.
A	2201-28	General drawing update. Ceiling height.	JC
B	2202-10	Outline section & Park Lodge elevation shown.	JC
C	2202-14	General drawing update.	JC
D	2206-16	General drawing update.	JC
E	2301-05	General drawing update.	JC

PLANNING

Project: 95 Avenue Road, London, NW8 6HY
Drawing: Proposed Elevations Sht 2
Scale: 1:100 @ A1 & 1:200 @ A3
DWG: 1289 - PP3 - 221
Date: Jan 2021
Revision: **E**

PROPOSED SECTIONS
Sheet 1



SECTION A-A

SECTION B-B

ALLOW FOR THE CAREFUL REMOVAL OF THE EXISTING GARAGE SLAB TO ENABLE THE CONSTRUCTION OF THE SEMI-DETACHED DWELLINGS.

NEW FLAT ROOF OVER THE NEW SEMI-DETACHED HOUSES WITH STRUCTURAL SLAB SET OVER METAL DECKING WHICH IS SUPPORTED ON STEEL BEAMS. REFER TO THE S.E's DETAILS FOR STRUCTURAL DESIGN.

A PORTION OF THE EXISTING BRICKWORK WALL FOR EXISTING GARAGE TO BE REMOVED.

NEW LOADBEARING REAR WALL THAT FORMS THE SEPERATION BETWEEN THE RETAINED EXISTING GARAGE AREA & THE NEW SEMI_DETACHED HOUSES.

EXISTING PORTION OF GARAGE THAT IS RETAINED. REFER TO THE PLANS FOR LAYOUT.

INDICATES THE APPROXIMATE LEVEL TO THE SIDE PASSAGE BETWEEN PARK LODGE & 95 AVE RD.

REINFORCED CONCRETE SLAB AS PER S.E's DETAILS WITH ASSOCIATED INSULATION AND WATERPROOFING SYSTEMS TO FORM THE ENCLOSURE TO THE NEW SEMI-DETACHED DWELLINGS.

SKETCH SECTIONAL INDICATION OF THE PROPOSED SEMI-DETACHED HOUSE.

EXISTING BRICKWORK BOUNDARY WALL TO BE UNDERPINNED IN STAGES WITH RC RETAINING WALL AS PER THE S.E's DETAILS AND REQUIREMENTS.

2no. NEW BRICKWORK SEMI-DETACHED DWELLINGS WITH FLAT ROOF. THE NEW DWELLINGS ARE SET INTO PART OF THE EXISTING GARAGE AREA.

REFER TO STRUCTURAL ENGINEER'S INFORMATION FOR STRUCTURAL REQUIREMENTS

PARK LODGE
No 1-25

0 6 7 8 9 10 M

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This drawing to be read in conjunction with all relevant Architect's drawings, specifications and other consultants' information.

Rev.	Date.	Description.	Initial.
A	2301-05	General drawing update following receipt of structural info.	JC

PLANNING

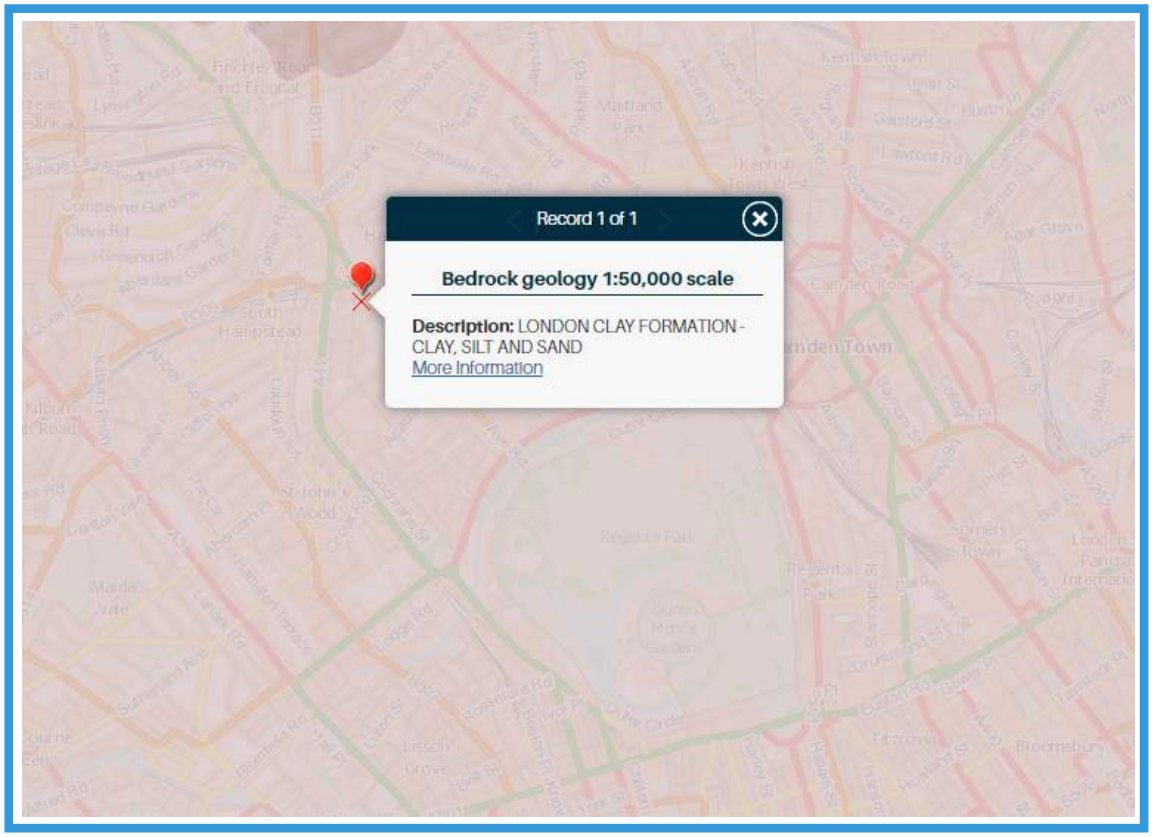
Project:	95 Avenue Road, London, NW8 6HY	Drawing:	Proposed Sections
Scale:	1:100 @ A1 & 1:200 @ A3	DWG:	1289 - PP3 - 230
Date:	Nov 2022	Revision:	A

Appendix C

SITE GEOLOGY

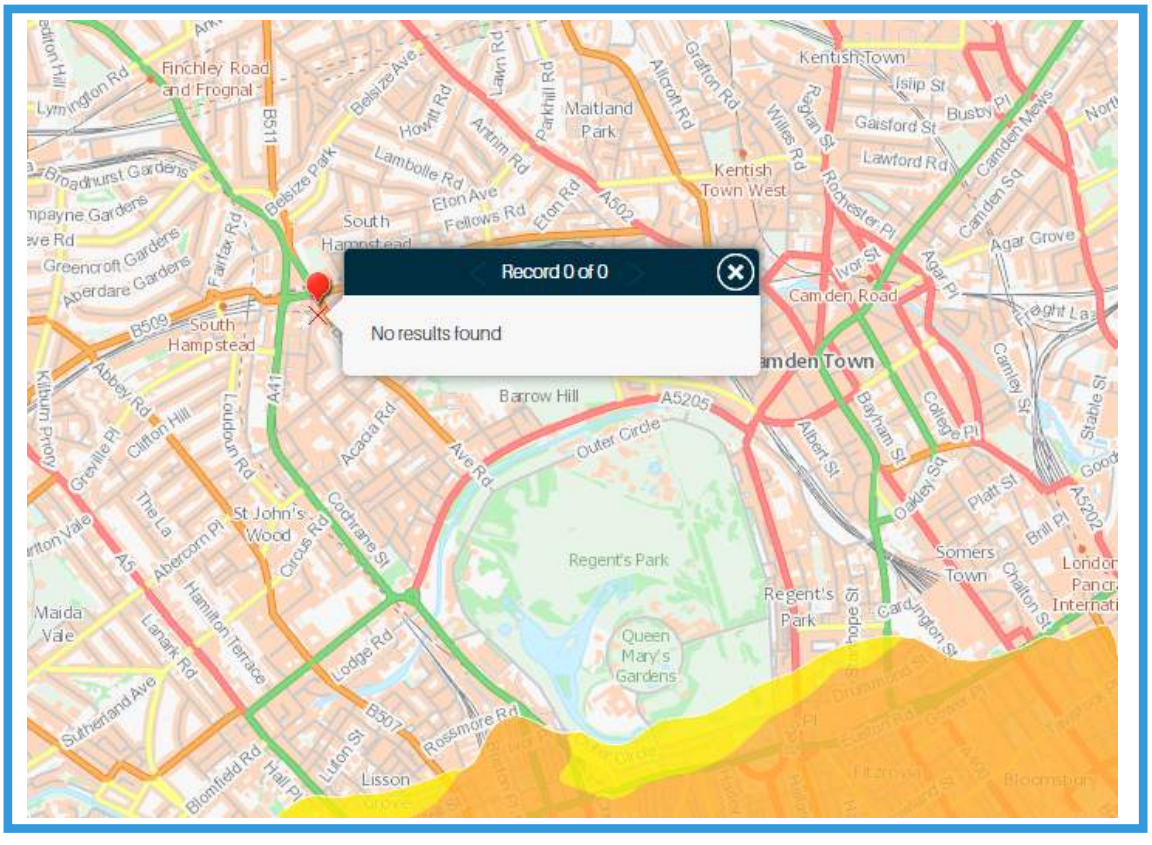
GEOINDEX ONSHORE

GEOLOGY - BEDROCK - LONDON CLAY FORMATION - CLAY, SILT AND SAND



GEOINDEX ONSHORE

GEOLOGY - SUPERFICIAL DEPOSITS - No results found



SITE HYDROGEOLOGY

Environment Agency

Main River Map

Flood risk from reservoirs

Extent of flooding

when river levels are normal

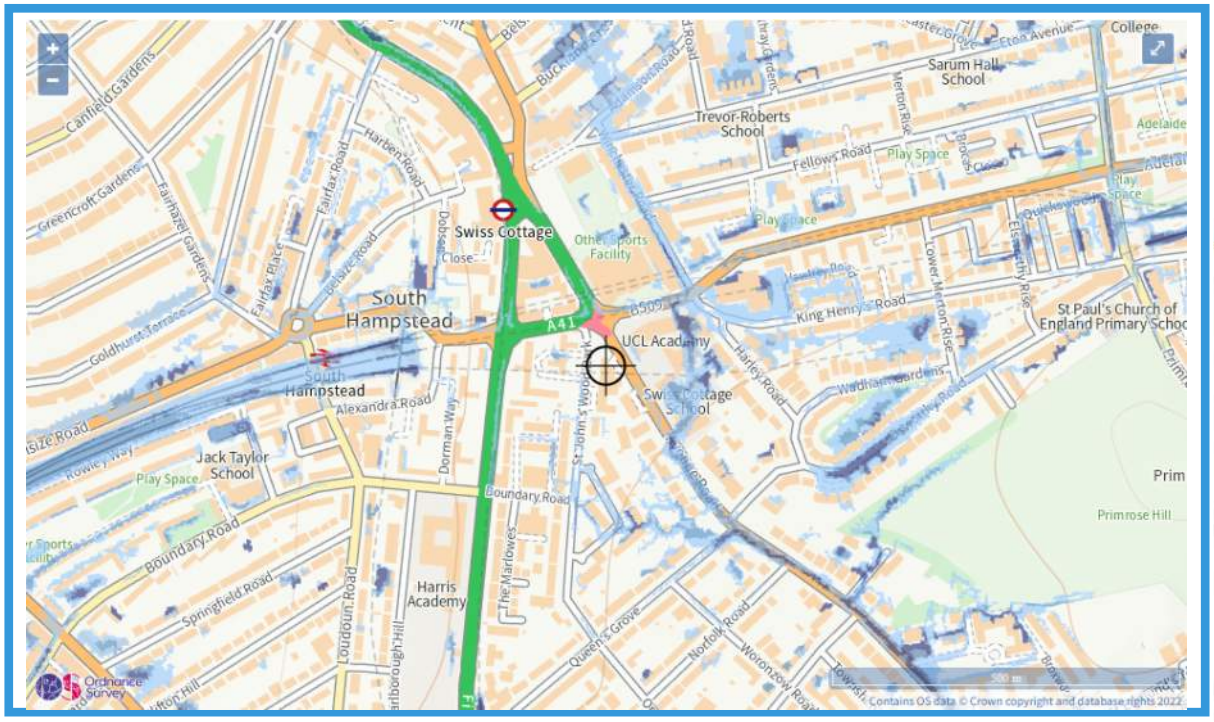
when there is also flooding from rivers

SITE SURFACE WATER FLOOD RISK

Flood risk from surface water

Extent of flooding

Low risk means that each year this area has a chance of flooding of between 0.1% and 1%. Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.



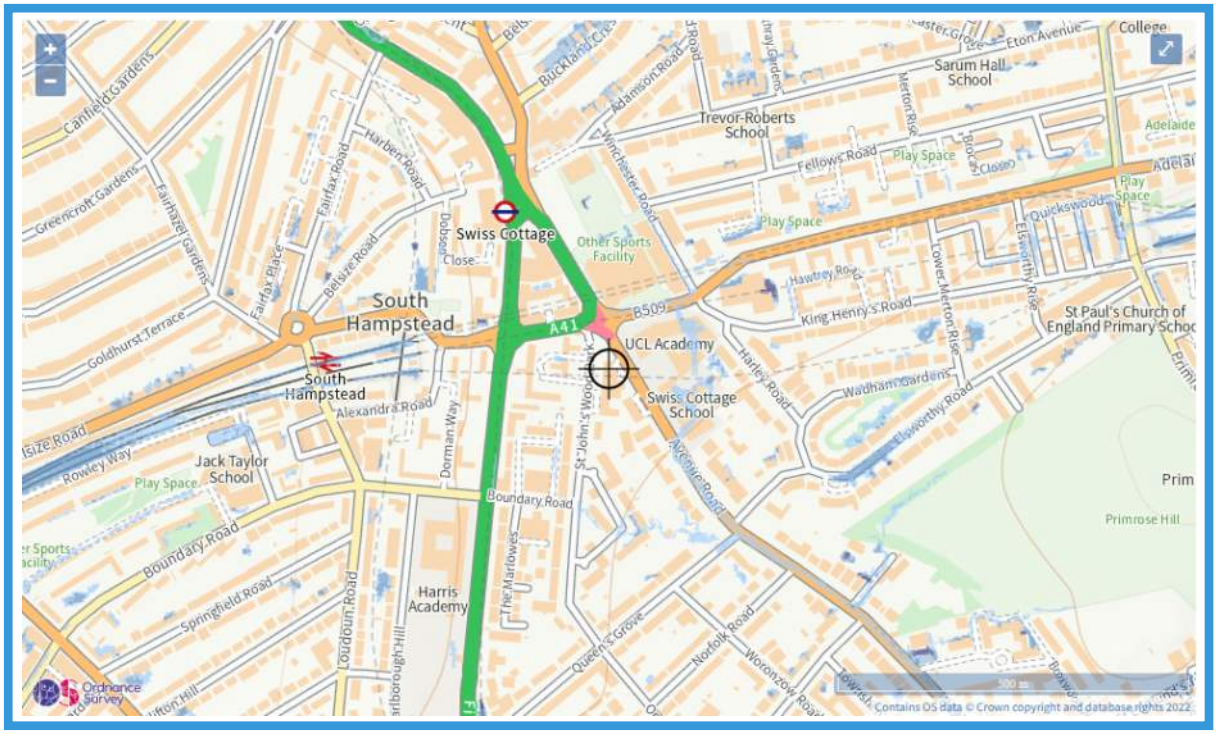
Flood risk

High

Medium

Low

Very low



Over 900mm

300 to 900mm

Below 300mm

MAGIC RESULTS

Site Check Results

Site Check Report Report generated on Fri Apr 22 2022
You selected the location: Centroid Grid Ref: TQ26788405
The following features have been found in your search area:

Source Protection Zones merged (England)

Zone	2

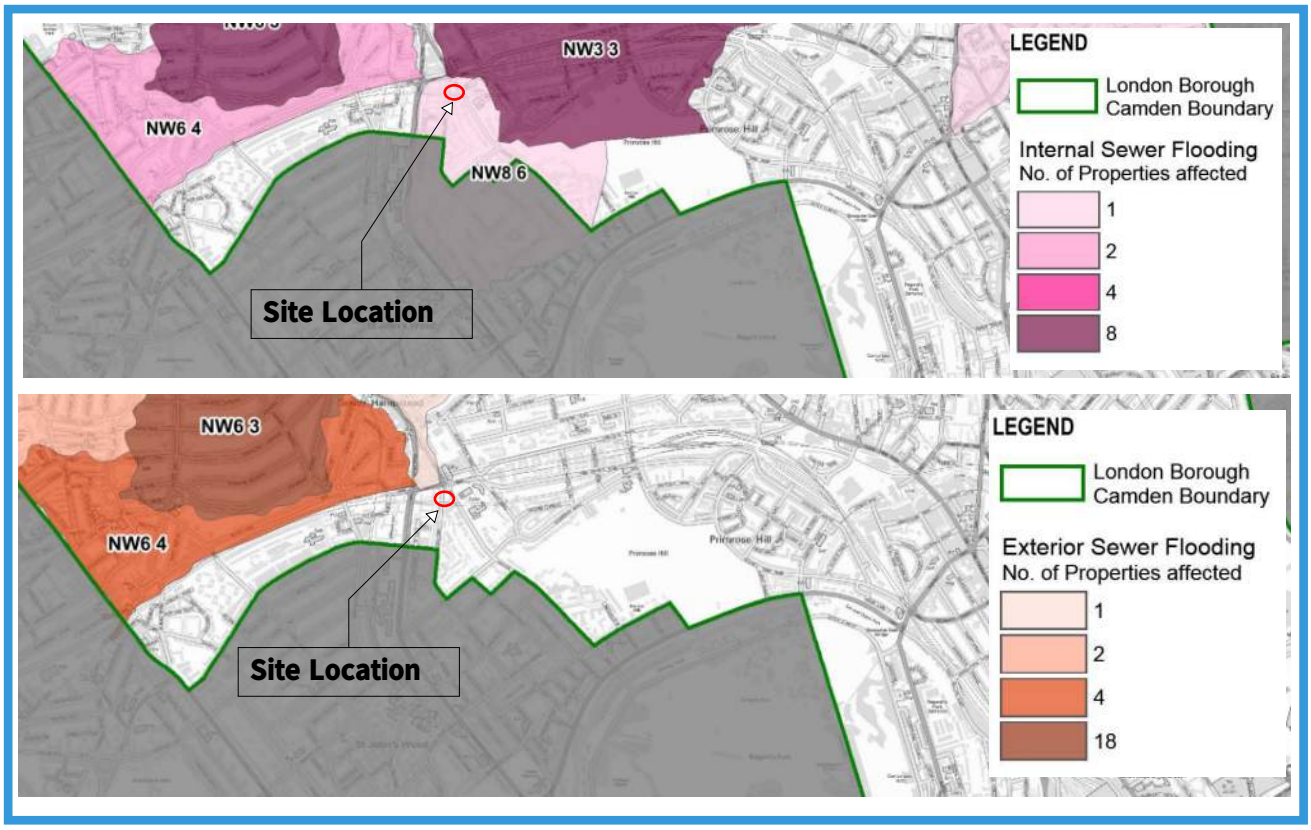
Aquifer Designation Map (Bedrock) (England)

Typology	Unproductive

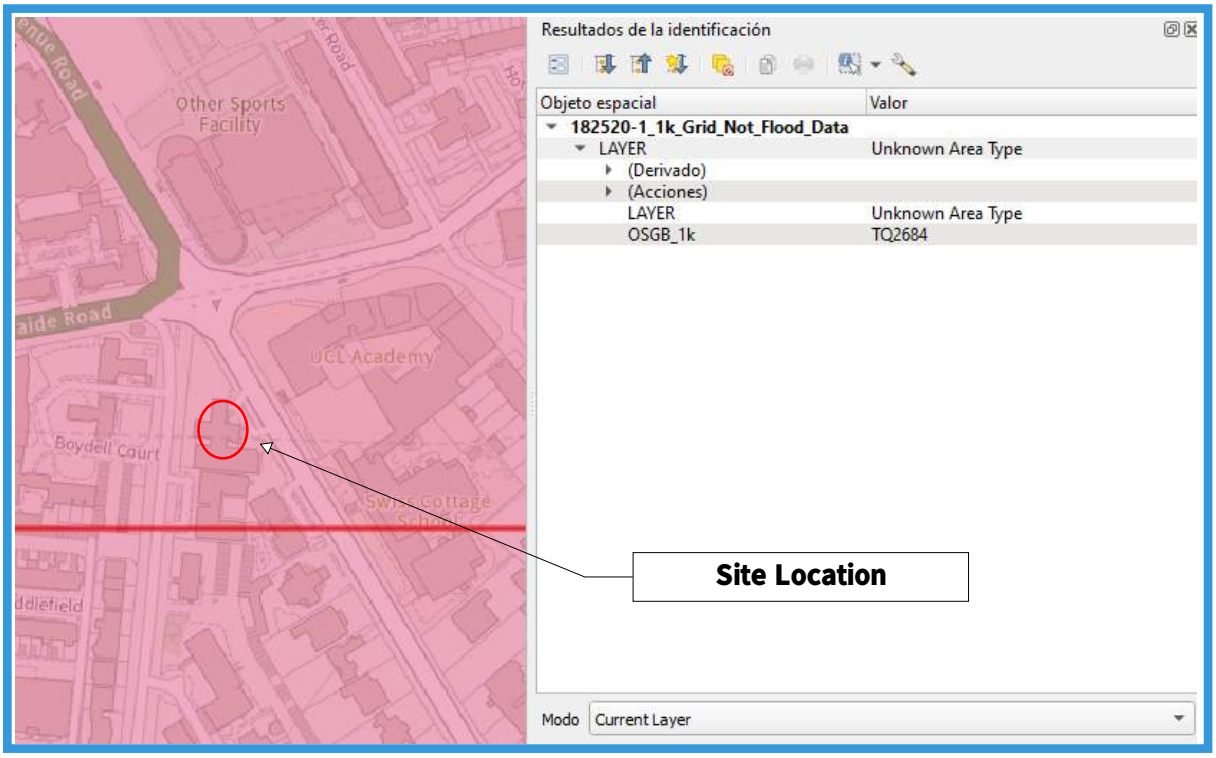
Aquifer Designation Map (Superficial Drift) (England)
No Features found

OK | Cancel | Export to CSV | Print

SITE SEWER FLOODING



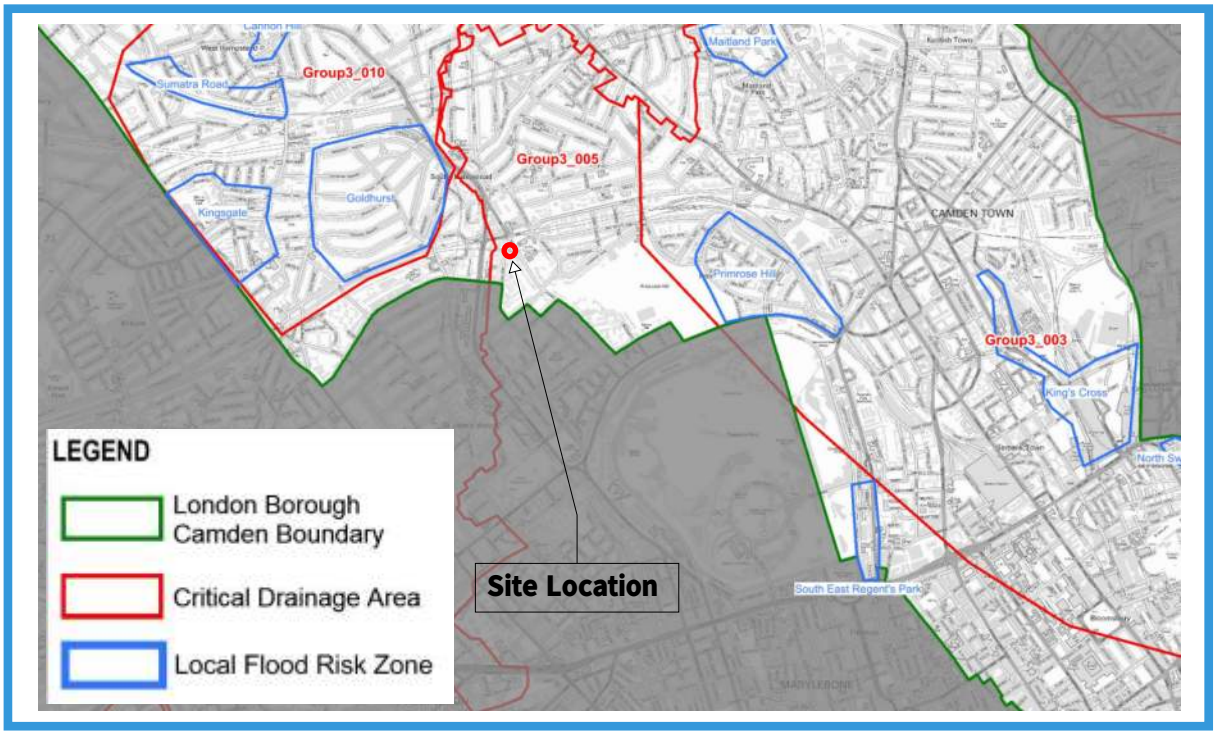
GROUND WATER FLOOD RISK



FLOOD WARNING AREA

Flood Warning areas

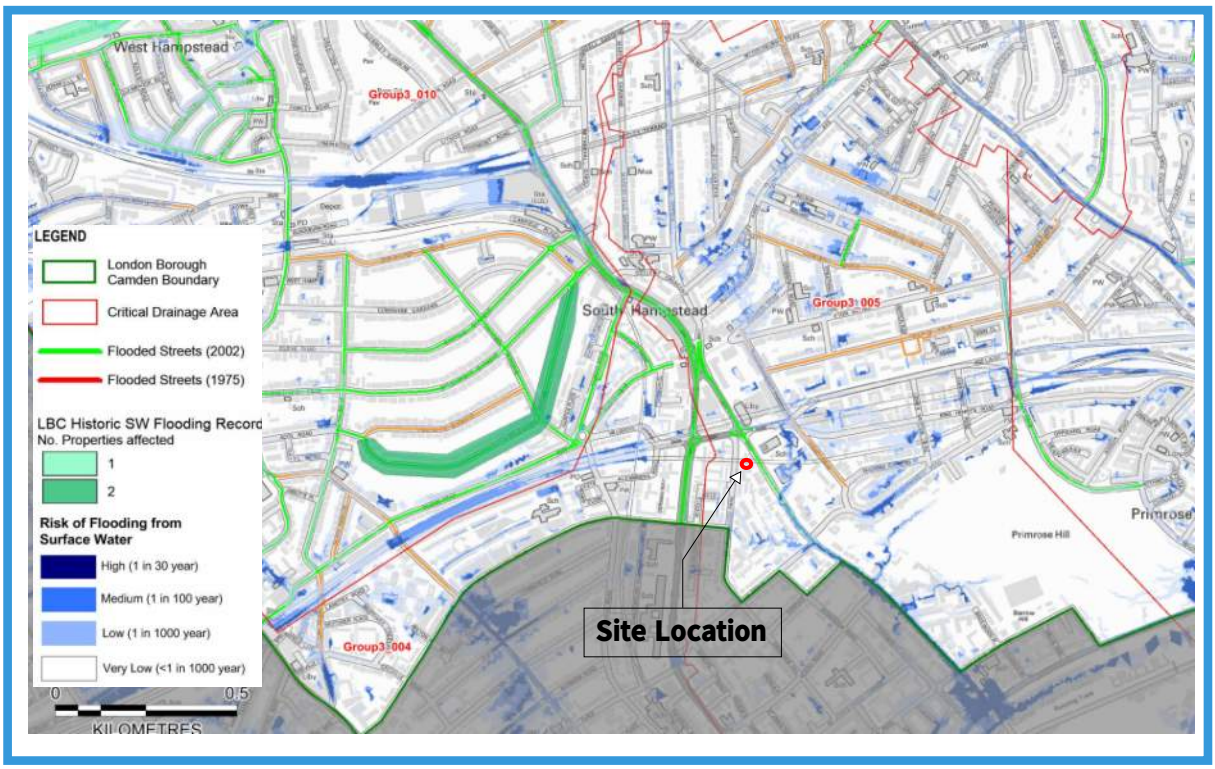
CRITICAL DRAINAGE AREA



HISTORIC FLOOD MAP

Historic Flood Outline

SURFACE WATER FLOODING



Flood map for planning

Your reference	Location (easting/northing)	Created
NW8 6HY	**526781/184061**	**22 Apr 2022 12:21**

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following:**

- bigger that 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence **which** sets out the terms and conditions for using government data. https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2021 OS 100024198. https://flood-map-for-planning.service.gov.uk/os-terms

Environment Agency

Flood map for planning

Your reference
NW8 6HY

Location (easting/northing)
526781/184061

Scale
1:2500

Created
22 Apr 2022 12:21

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 20 40 60m

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