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Phase 2a Site Investigation and GQRA

at

277a Gray's Inn Road
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WC1X 8QF

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LIST OF ABBREVIATIONS

ACM	Asbestos Containing Material
Agency	Environment Agency
Al	Aluminium
AONB	Area of Outstanding Natural Beauty
AoPC	Area(s) of Potential Concern
BaA	Benzo(a)anthracene
BaP	Benzo(a)pyrene
BbF	Benzo(b)fluoranthene
BGS	British Geological Survey
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene & Xylene
CAT	Cable Avoidance Tool
C4SL	Category 4 Screening Levels
Chy	Chrysene
CLEA	Contaminated Lane Exposure Assessment
CSM	Conceptual Site Model
CWG	California Working Group
DEFRA	Dept for Environment, Food & Rural Affairs
DQRA	Detailed Quantitative Risk Assessment
E	East
FRA	Flood Risk Assessment
Ha	Hectare(s)
IcdP	Indeno(123-cd)pyrene
GAC	Generic Assessment Criteria
GQA	General Quality Assessment
GQRA	Generic Quantitative Risk Assessment
LLTC	Low level of toxicological concern'
LNR	Local Nature Reserve
m	Metre(s)
mAOD	Metres Above Ordnance Datum
mbgl	Metres Below Ground Level
MTBE	Methyl Tert-Butyl Ether
MCERTS	The Agency's Monitoring Certification Scheme
N	North
NGR	National Grid Reference
NNR	National Nature Reserve
NP	National Park
NVZ	Nitrate Vulnerable Zone
PAH	Polyaromatic Hydrocarbon(s)
PCB	Polychlorinated Biphenyl(s)
PCoC	Potential Contaminants of Concern
PE	Polyethylene
PID	Photo Ionisation Detector
POS	Parks and Open Spaces
PPE	Personal Protective Equipment
PRA	Preliminary Risk Assessment
PVC	Polyvinyl Chloride
QTSE	QTS Environmental Limited
RBMP	River Basin Management Plan
RMS	Risk Management Strategy
RWL	Resting Water Level
S	South
S4UL	Suitable 4 Use Levels
SAC	Special Area of Conservation
SGV	Soil Guideline Value
SPA	Special Protection Area
SPL	Significant Pollutant Linkage
SPR	Source-Pathway-Receptor
SPZ	Source Protection Zone
SSAC	Site Specific Assessment Criteria
SSSI	Site of Special Scientific Interest
SVOC	Semi Volatile Organic Compounds
TGEN	Terragen Environmental Consultants Ltd
TP	Trial Pit
TPH	Total Petroleum Hydrocarbon(s)
UCL_{95}	95% Upper Confidence Limit
UK	United Kingdom
UKAS	UK Accreditation Service
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds
W	West
WAC	Waste Assessment Criteria
WFD	Water Framework Directive
WS	Window Sampler

1.0 INTRODUCTION

TGEN was commissioned by Soil Consultants Limited (SCL) on behalf of Regal Homes Limited (the client), via a written instruction to proceed (email dated 27/11/2014), to carry out a Phase 2a site investigation to inform a GQRA at 277a Gray's Inn Road, London, WC1X 8QF (the site). A site location plan is presented in Figure 1.

2.0 BACKGROUND, REMIT AND APPROACH

2.1 Existing Site

The site comprises a roughly rectangular plot covering circa 0.285ha located in a mixed residential and commercial area of NW London, circa 150m to the SE of Kings Cross station. A steel framed warehouse building occupies the entire footprint of the site, which has been most recently in use as a car park. The site has been raised relative to an average level of 19.1mAOD compared to a level of 17.5mAOD at the St.Chad's Street exit and 18.1mAOD at the Gray's Inn Road exit.

The existing building comprises a steel column and roof truss structure, which runs down onto concrete pad footings. The boundary walls between the steel columns are formed in typical London brickwork and rise to a level of 6.0m along the full perimeter of the trussed roof.

Below part of the N section of the site there is a basement approximately 10m wide. The basement floor is circa 4.25m below the ground level across the site at 14.90mAOD. The basement is constructed from a series of brickwork walls supporting brickwork arches and appeared to have been used for storage, toilets, changing rooms and showers.

The site is bounded by St Chad's Street to the N, Gray's Inn Road to the E, Birkenhead Street to the W and Argyle Street to the S.

The E boundary of the site is directly adjacent to residential and commercial properties facing out onto Gray's Inn Road. These generally consist of four storey terraced brickwork buildings, a large proportion of which have a rear annex, which extends back to the E boundary of the proposed site. Further S along the E boundary, the proposed site is adjacent to number 275 Gray's Inn Road.

Along the S boundary, an existing building exists identified as No. 55 Argyle Street. This property, which runs along the length of the S boundary of the site contains an existing lower ground floor level and rises up two stories to the original roof level. A relatively recent extension to the building was undertaken, which comprised an additional high level storey on top of the original building. As part of the works undertaken the boundary wall was raised to suit the proportion of the new building. The boundary wall now extends to a level approximately 10.5m above existing ground level. To the W boundary, the site is bounded by the Birkenhead Street Estate, which contains four individual multi residential buildings each of which contain a single storey basement. The buildings are located approximately 5.0m from the existing site boundary wall. Surrounding the Birkenhead Street Estate is a communal green area, which has an average level of 18.75mAOD along the boundary with the site. To the N boundary, the site is accessed directly from St. Chad's street with properties each side of the site access. These have been identified as No.11 St. Chad's Street and No.13 St. Chad's Street. At present, No.11 St. Chad's Street is under development with construction of a new lower ground floor level through a series of underpins to the shared boundary walls.

2.2 Proposed Development

Planning permission (ref 2014/4267/P dated 10/10/2014) was granted by the London Borough of Camden (the local authority) for the demolition of the existing building and a comprehensive mixed use redevelopment of the site to provide sixty residential units (including fourteen affordable flats) comprising fifty six units arranged around the new open space (seven two-storey houses plus lower ground floor, forty nine flats in three, seven and eight storey blocks plus lower ground floor) and four flats in a four storey plus lower ground floor building on St Chads street with ancillary basement gym, offices at ground and lower ground floor, a café/gallery (Class A1/Class A3) at ground floor together with cycle parking, access, landscaping, boundary treatments and associated works. A copy of the

planning permission is presented in Appendix A, which is subject to a number of conditions, one of which (condition 9) relates to the investigation and remediation of potential contamination.

The proposed development will involve the demolition of the existing building and removal of all the existing hardstanding areas and underground services found within the confines of the site. The redeveloped site will provide three readily identifiable structural blocks, which rise up from an upper ground floor level of 18.95m AOD. The three blocks will include the low level residential "Eastern Block", the high level residential "Western Block" and the high level multi-purpose "Southern Block". A central courtyard is proposed between the three proposed blocks, which when considered together will form a continuous structural floor plate across upper ground floor level. The central communal areas between the eastern and western blocks will be dropped by 1.35m to a level of 17.60mAOD to form a split level upper ground floor.

Below the upper ground floor level, the site will maintain the split level characteristic of the proposed development with a split level lower ground floor to be identified separately as lower ground floor (to the raised levels below each of the residential blocks along the east and west boundaries) and basement level (to the central courtyard area and the full footprint of the southern block). The lower ground floor will be formed at a level of 16.1mAOD (i.e. circa 3m below the existing ground floor level) with the lower basement levels adopting a level of 14.3mAOD (i.e. circa 4.8m existing ground floor level).

As such, the redeveloped site will contain a single storey basement (typically 3.50m deep) across 60% of the site with a storey-and-a-half basement (typically 5.50m deep) over the remaining 40% of the site. When complete the site will be fully lined with RC facing walls in front of a combination of concrete underpins and contiguous piled walls.

The plans presented in Figure 2 show the extent of the upper ground floor, lower ground floor and the basement. A reduced level excavation of circa 3m across the entire site will be required with a deeper section, predominantly in the middle, circa 4.8m deep.

As the proposed development will result in the entire site being under permanent hardstanding, the landscape scheme is primarily hard materials. The soft landscaping will comprise a series of raised planters with grasses and herbaceous perennials and multistem trees helping 'green' the volume between the buildings. The raised planters will also provide seating opportunities as well as areas for visitor cycle parking, etc.

2.3 Previous Investigations

Several investigations have been undertaken across the site by Herts & Essex Site Investigations (HESI), which include the following:-

- Site Investigation Report (ref. MRS/12138 dated 02/06/2014).
- Additional Site Investigation (ref. 12138 dated August 2014).
- Phase 1 Desk Study Report (ref. 12138 dated September 2014)

2.3.1 Site Investigations

Two visits were made to the site by HESI. During the initial site investigation works undertaken in May 2014 four window sample holes were excavated. One of the window sampler holes (BH3) located in the SW corner of the site reached a depth of 6mbgl and encountered the following strata succession:-

Stratum	Maximum Thickness	Minimum Thickness	Average Thickness	Typical Description	Encountered
Hardstanding	0.30m	n/a	n/a	Concrete.	BH3
Made Ground	2.60m	n/a	n/a	Brick rubble and concrete fill.	BH3
London Clay	>3.10m	n/a	n/a	Stiff, brown, slightly silty clay.	BH3

The other three exploratory holes were abandoned at shallow depth due to concrete obstructions in the made ground. Subsequently, HESI returned to the site in August 2014 to excavate four deeper boreholes. Two of these were abandoned (BHA at 0.9mbgl and BHB at 1.2mbgl) due to concrete obstructions in the shallow made ground. Two (BHD in the N courtyard area and BHE along the S perimeter) were progressed to a depth of 15mbgl and encountered the following strata succession:-

Stratum	Maximum Thickness	Minimum Thickness	Average Thickness	Typical Description	Encountered
Hardstanding	0.20m	0.20m	0.20m	Reinforced concrete.	BHD and BHE
Made Ground	3.00m	1.10m	2.05m	Sandy, brick rubble fill.	BHD and BHE
Clay	3.10m	n/a	n/a	Soft, brown, silty, slightly peaty clay.	BHD
London Clay	>11.80m	n/a	n/a	Firm, becoming stiff, brown, slightly silty clay.	BHD and BHE

Groundwater monitoring standpipes were installed in each borehole. Geotechnical laboratory testing was carried out to establish the characteristics of the subsurface soils.

As such, the limited site investigations have demonstrated that the thickness of made ground beneath the site is likely to be up to circa 3m thick and comprises predominantly brick and concrete rubble. Superficial drift is absent with the made ground being directly underlain by a significant thickness of predominantly stiff, impermeable London Clay.

2.3.2 Desk Study

The main findings of the Phase 1 PRA compiled by HESI are summarised below:-

- In 1874, the London General Depository was located at the site and then later in 1892 it was used by Robert Baker (Whitbread Co Ltd) as a bottling warehouse, which included cold stores, a compressor and coke and generation stores located within the footprint of the building. Surrounding land uses to the N, S, E and W are predominantly residential. A chemical works is located circa 30m to the E, although is not shown after 1896.
- From 1967 to 1991, Goad mapping records the site as being vacant. In 1967, the land to the S of the site is also listed as being a beers and empties warehouse and later as a garage.
- In 1991, the site is recorded as a depot, which it remained until recently when it was once again vacated.
- The site is currently used as a warehouse/parking area.
- Land uses to the N of the site remain predominantly residential to the present day. From 1892 onwards, commercial and retail units have been located along the E boundary of the site, which front onto Gray's Inn Road. A commercial unit was located along the S boundary of the site. To the W of the site, the

previous residential land was redeveloped to form residential flats in 1953, which remain in place to the present day.
- The published geology indicates that superficial drift is absent and the site and the bedrock comprises London Clay.
- The underlying bedrock is classified as unproductive and the site is not located within an agency designated SPZ.
- The nearest groundwater abstraction (other/industrial/commercial/public services - heat pump) is located circa 395m to the W. The nearest potable abstraction is located circa 750m to the E.
- The nearest surface water feature, a basin off the Grand Union Canal, is located circa 445m to the N.
- Potential onsite sources of contamination include a former depot/works and the former coke and generator store in the NE corner of the site.
- Potential offsite sources of contamination include the former beers and empties warehouse and garage to the S.

HESI suggested that the nature of the sources of contamination at the site constituted a potential vapour risk. HESI also considered that due to the presence of unproductive strata below the site that there was limited risk to groundwater. Based on the findings of the Phase 1 PRA, which identified potential sources of contamination, sensitive receptors and pathways between the two, HESI recommended that an intrusive site investigation be undertaken in order to assess the presence and significance of any contamination in the context of the proposed development, the scope of which can be summarised as follows:-

- Intrusive shallow based excavation using a window sampler to assess the geological conditions and recover samples for laboratory analysis.
- Install standpipes for the monitoring of vapour risks.
- Vapour risk assessment, should contamination that promotes a vapour risk be in place.
- Targeted sampling to assess onsite source risk.
- Spatial sampling for use in statistical analysis.
- Consideration through the site assessment as to the presence of asbestos product within the fabric of the building prior to demolition and the subsoil within the site.
- Visual observations of the subsoil encountered to make an initial assessment of the potential risk from contamination.
- Watching brief to record, assess and report on unexpected contamination.

These reports should be read in full in conjunction with this Phase 2a site investigation and GQRA.

2.4 Remit and Approach

Our remit included for a review of all of the available information contained in the previous reports, together with the implementation of a preliminary Phase 2a site investigation to gather additional information regarding the nature and presence of potential contamination within the subsurface strata at the site in order to compile a GQRA and inform the production of a RMS (separate document).

Environmental assessors use a SPR conceptual site model when determining the risk posed by a potentially contaminated site. For potential risk to arise each stage of the SPR linkage must be present, plausible and significant. Our approach to site investigation, environmental risk assessment and the generation of GAC and SSAC used to assess potential land contamination and the success of remediation works, if required, is detailed in Appendix B.

3.0 SITE WORK

Due to the presence of potential sources of contamination (made ground onsite and offsite potentially impacted by contemporary and historic activities), sensitive receptors (e.g. end users, buildings and construction materials etc.) and plausible pathways between the two, an intrusive investigation was recommended by HESI. The data gathered during the investigation was required to inform a GQRA in order to confirm the qualitative assessment and where necessary refine the preliminary CSM and determine the requirement for and scope of additional investigative works, and/or remedial measures to be incorporated into the development.

During previous intrusive investigations undertaken across the site, five out of eight exploratory holes (window sampler boreholes and cable percussive boreholes) were abandoned due to obstructions encountered at shallow depths in the made ground. In addition, a supplementary geotechnical investigation by Soil Consultants Limited (SCL) in November 2014 was also abandoned due to obstructions in the shallow made ground.

3.1 Scope Of Works

Previous investigations across the site involving the progression of boreholes by window sampler rig or cable percussion have been compromised due to consistent obstructions causing in excess of 60% of exploratory holes to be abandoned within the top 1m.

As such, a Phase 2a (preliminary) site investigation was proposed, to be undertaken using a mechanical excavator to break out the surface concrete and progress trial pits through the underlying made ground. This was considered to provide the most effective means of obtaining data from a range of locations across the site. The Phase 2a site investigation and GQRA included for an inspection of the site and near surface soils in order to:-

- Assess the presence, extent and significance of potential contaminants in the subsurface strata associated with former activities at or adjacent to the site identified in the Phase 1 PRA.
- Assess the significance of potential impacts on sensitive receptors at or adjacent to the site.
- Assess the requirement for remedial measures to be implemented at the site as part of the development.
- Assess the potential environmental liabilities and consequences associated with the development of the site.
- Identify requirements for further works, including the design of any additional investigation (i.e. Phase 2b), a DQRA and remedial measures, if deemed necessary.

The proposed scope of works was agreed by the client prior to the commencement of the investigations. To achieve this, the following works were undertaken:-

- The excavation of eleven TP across the site to depths of up to 3.0mbgl. TP13 was located in the basement, the floor of which was 3.6mbgl. TP13 was excavated to a depth of 1.5m, which was effectively 5.1m below the ground level across the site.
- Geo-environmental assessment of the strata encountered, including an assessment of visual and olfactory evidence of contamination. Copies of the exploratory hole logs are presented in Appendix C.
- The assessment of soils for volatile organic compounds by visual and olfactory means was supplemented with the use of a PID. The results are shown in the respective exploratory hole log(s).
- The recovery of representative samples of the underlying strata (made ground and underlying natural strata) to be submitted for laboratory analysis.

The locations for the investigation were scanned with a CAT in order to minimise the risk of damage to underground services. Where necessary, the final positions of the exploratory holes were moved in order to avoid buried services. The intrusive investigation was subsequently carried out in accordance with BSI (2013b) on 09/12/2104. An annotated exploratory hole location plan is presented in Figure 3.

3.2 Exploratory Investigation

3.2.1 Exploratory Hole Locations

A total of eleven exploratory holes were excavated across the site providing a density equivalent to a circa 16m grid. Two exploratory holes (TP11 and TP12) were abandoned due to the presence of rebar

within the reinforced concrete. The holes were positioned in order to provide site wide coverage and to target the AoPC identified in the Phase 1 PRA:-

- Former coke and generator store in the NE corner of the site — TP1, TP2, TP3 and TP13.
- Former beers and empties warehouse and garage to the S — TP8, TP9 and TP10.

All of the exploratory locations also coincided with the footprint of the proposed lower ground floor and/or basement.

3.2.2 Ground Conditions

During the intrusive investigation the exploratory holes were logged in accordance with BSI (2010). The strata generally comprised hardstanding over made ground, over weathered London Clay. The profile of strata at the site is summarised in the table below:-

Stratum	Maximum Thickness	Minimum Thickness	Average Thickness	Typical Description	Encountered
Hardstanding	0.70m	0.00m	0.43m	Reinforced concrete.	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP10m TP11.
Made Ground (MG1)	0.30m	n/a	n/a	Dry, compact, crushed concrete sub-base.	TP1.
Made Ground (MG2)	1.90m	0.40m	1.81m	Brown to reddish brown, compact brick rubble with a silty, sandy matrix and containing frequent fragments of concrete and occasional fragments of slate, ceramic, metal and ACM.	TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10.
Made Ground (MG3)	>0.80	>0.40m	>0.30m	Very dark greyish brown, dry, compact, sandy, gravelly silt with frequent fragments of brick and concrete and occasional fragments of wood and ceramic and occasional partially decomposed organic remains.	TP1, TP2, TP5, TP6, TP7.
London Clay	>0.60m	n/a	n/a	Yellow brown to orange brown, soft to firm silty clay.	TP10, TP11.

There was a thick layer of reinforced concrete across the entire site. The only exceptions to this were at TP8 and TP9 where the ground surface had been previously disturbed and broken out, presumably in connection with a previous investigation. Below the hardstanding was a circa 2.1m thick layer of made ground. In general, the made ground comprised a layer dominated by rubble (MG2) with a deeper layer of sandy, gravelly silt (MG3).

There was no visual or olfactory evidence of significant hydrocarbon contamination, which was corroborated by in-situ VOC headspace readings using a PID. At several locations fragments of cement bonded tile, pieces of insulation board or lagging (suspected ACM) was noted within the layer of rubble dominated made ground (MG2).

Where proven, the London Clay was encountered at 2.4mbgl in the S part of the site at TP10. Made ground was absent in the N part of the site, where weathered London Clay was encountered directly below the hardstanding at 4.6mbgl (i.e. below the existing basement).

On the basis that the redeveloped site will contain a single storey basement (typically 3.50m deep) across 60% of the site with a storey-and-a-half basement (typically 5.50m deep) over the remaining 40% of the site, it is likely that all of the made ground will be excavated out to accommodate the new basement structure.

Water ingress was recorded at TP5 @ 2.2mbgl, TP10 @ 2.4mbgl and TP13 @ 4.6mbgl. In each case, the ingress was slow and likely to be water perched in the granular made ground above the impermeable clay rather than a body of groundwater.

3.2.3 Sampling Strategy

Representative samples of the soils encountered at each exploratory hole location were recovered from across the site to provide an even spread of samples and target AoPC.

3.2.4 Collection, Preservation and Transport of Samples

The protocol for the collection, preservation and transportation of the samples to an approved UKAS/MCERTS accredited laboratory is presented in Appendix B.

3.2.5 Scheduled Testing of Soil Samples

Sixteen soil samples recovered from representative depths throughout the subsurface profiles during the site investigation were submitted to a UKAS/MCERTS accredited laboratory for analysis. All of the samples (fourteen made ground and two underlying clay) were selected for a broad screen of total potential contaminants including an ACM screen, as detailed in the table below:-

Metals/Semi Metals		Hydrocarbons	Non Metals
• Arsenic • Boron • Cadmium • Chromium (Cr^{III}) • Chromium (Cr^{VI})	• Copper • Lead • Mercury • Nickel • Selenium • Zinc	• Speciated PAH • Speciated TPH • Phenol (monohydric)	• Cyanide (Total) • Sulphate (Total & Water Soluble) • Sulphide • pH • Organic Matter • ACM Screen

In addition, samples returning positive ACM results were submitted for quantification. Five samples of made ground and one sample of underlying clay from the NE (TP2) and S (TP10) of the site were submitted for TPH CWG (inc BTEX).

Due to the potential for the generation of arisings excess to requirements onsite three samples of made ground and one sample of clay were also submitted for WAC testing.

The results of the laboratory testing carried out on the samples of soil recovered during the Phase 2a investigation are given in the QTSE reports listed below, copies of which are presented in Appendix D:-

- Report 14-27306 dated 23/12/2014
- Report 15-28264 dated 03/02/2015

3.2.6 Environmental Monitoring

During the Phase 2a investigation a borehole was encountered in the S part of the site, which was found to be operational. The borehole was referenced BH1 for the purposes of the Phase 2a investigation, but was previously referenced as BHE during the August 2014 HESI investigation. The profile in the borehole was recorded as encountering 0.2m hardstanding over 0.6m of sub-base, over 2.4m of brick rubble fill, over 11.8m of London Clay. The borehole was recorded as being dry during its excavation in 2014. A 15m deep standpipe was installed, the top 1m being solid and the remainder slotted. During the Phase 2a investigation water was recorded at 11.1mbgl. The borehole was developed and a representative sample of groundwater was recovered.

The recharge rate appeared to be slow, which would appear to corroborate the evidence from the trial pits that the water encountered was perched water accumulating in the borehole rather than a body of groundwater.

3.2.7 Scheduled Testing of Water Samples

One sample of groundwater was recovered from BH1 and was submitted for a broad suite of potential contaminants including metals, TPH and speciated PAH. As the borehole was located in the S part of the site, the suite was supplemented with VOC and Semi-VOC to account for the AoPC. The results of the laboratory testing are given in QTSE report 14-27324 dated 18/12/2014, a copy of which are presented in Appendix E.

4.0 TIER 2 GQRA

This section comprises a generic assessment of the analytical results (for PCoC) and other data gathered during the Phase 2a site investigation, through comparison of the measured contaminant concentrations against appropriate GAC, in relation to the proposed residential development, which will be entirely under permanent hardstanding (basement and building footprints) with soft landscaping limited to containerised planting above the permanent hardstanding in areas of communal gardens and areas of amenity open space.

For the purposes of the Tier 2 GQRA, the laboratory test results have been split into three datasets:-

- Made Ground.
- Natural Clay.
- Groundwater.

For each of the datasets a statistical analysis has been undertaken, a summary of which is presented in Appendix F.

4.1 Human Health

For the Tier 2 GQRA for human health, where appropriate, we have selected the generic residential GAC based on the measured pH and/or total organic carbon converted to organic matter content, where required, for comparison against the results as an initial conservative screen. Based on the scope of the proposed development (i.e. commercial at ground floor with residential apartments above and only communal areas of garden and amenity open space) the selection of a generic residential GAC can be considered as overly conservative. Therefore, further discussion is provided in instances where these stringent GAC are exceeded in respect of the use of more realistic screening values.

Where the maximum concentration exceeded the respective GAC, as described in Appendix B, a statistical assessment was undertaken in accordance with CL:AIRE (2008). USEPA ProUCL Version 5.0 (2013) was used to determine the presence of statistical outliers within the dataset, the normality of the distribution and the UCL_{95} concentration using an appropriate statistical tool.

For each dataset, the UCL_{95} concentration of the whole was calculated with outliers included. Where outliers were removed, the distribution of the resultant dataset was then determined in accordance with the Shapiro-Wilk normality test and the UCL_{95} recalculated.

4.1.1 Made Ground Dataset

In general, the samples of made ground tested returned concentrations across the dataset that were below their respective conservative Tier 2 GAC for risks to human health in a residential end use scenario. The only exception is detailed in the table below:-

Made Ground	Unit	No.	>GAC	Max	Outliers*	UCL_{95}	Residential GAC	C4SL POS_{resi}	C4SL POS_{park}	C4SL Commercial
Lead	mg/kg	14	12	***1940***	0	***1549***	290	630	1300	2330

* Indicates the number of results that are considered as statistical outliers.

The most elevated concentration of lead was found to be part of the made ground dataset and could therefore occur anywhere within the averaging area (i.e. anywhere within the made ground across the site). The distribution of lead was lognormal and the UCL_{95} concentration was determined using an appropriate statistical tool (e.g. Chebyshev, Students t-test etc.) at a 95% confidence interval. As can be seen from the table above the UCL_{95} concentration of lead in the made ground dataset exceeded the conservative residential GAC. Therefore the concentration of lead in the made ground above the residential GAC would be considered as being ubiquitous across the site and as such, would be considered as a potential risk to end users in the context of a residential end use in areas of the site where the SPL (ingestion, inhalation, direct contact etc.) remain active.

As noted, the GAC for a residential scenario (i.e. house with a private garden etc.) is clearly more sensitive than the proposed development. The recently released DEFRA (2014) C4SL provide a range of thresholds for residential and commercial scenarios where changes are made to the way that

exposure is dealt with by the CLEA model, where exposure is modelled as per the Environment Agency (2009b) report but a LLTC is adopted and where changes are made to exposure and a LLTC is adopted. In addition, the C4SL include thresholds for POS, which may be considered a more realistic measure based on the scope of the proposed development. In the context of Part 2A, Category 4 describes land that is clearly not contaminated land and where there is no risk or where the level of risk posed is low. As such, C4SLs are:-

- Intended as generic screening values to help show when land is within Category 4.
- They describe a level of risk that whilst above minimal is still low.
- Provide a higher simple test for deciding that land is suitable for use and definitely not contaminated.

As such, as can be seen from the table above, the UCL_{95} concentration of lead in the made ground exceeded a residential GAC threshold of minimal risk and also POS thresholds of low risk in both a residential and park based scenario, but was below a commercial threshold of low risk. On the assumption that the entire site will be under permanent hardstanding (e.g. building/basement footprint, access roads, parking, hard landscaping etc.), which will provide a break in the exposure pathway rendering the SPL inactive. All of made ground (i.e. the source of elevated concentrations of lead) will also be removed in order to accommodate the basement structure and thus the SPL would in any case be inactive.

4.1.2 Clay Dataset

The samples of clay returned concentrations across the dataset that were below their respective conservative Tier 2 GAC for risks to human health and therefore the underlying natural ground would not be considered as a potential risk.

4.1.3 Asbestos Containing Materials

Suspected ACM (fragments of cement bonded tile, pieces of insulation board or lagging) was observed in the made ground at several locations. Of the fourteen samples of made ground screened for ACM, eight (i.e. 60%) were positive. Seven of the eight samples returning positive results were derived from the rubble dominated made ground (MG2) and included cement, loose fibres, insulation board and lagging matrices containing chrysotile, amosite and crocidolite fibres. In five of the samples returning positive results, the concentration of fibres was below detection (i.e. <0.001%). The remaining three samples however returned fibre quantification of 0.178%, 0.243% and 0.763%. At the majority of locations, the ACM was not discernible to the naked eye.

If the made ground were to be retained in-situ, then the ACM would be capped under permanent hardstanding and would not represent a long term risk to end users of the development. Although the presence of ACM in the made ground is unlikely to be a risk to end users as all of the made ground is being excavated out to accommodate the basement structure, it would be considered as a potential risk to operatives and offsite human health during the groundwork phase of the development. As such, it will be necessary to employ an asbestos specialist during the groundwork phase to ensure that the works are undertaken in accordance with good practice.

4.2 Landscape Planting

4.2.1 Made Ground Dataset

In general, the samples of made ground tested returned concentrations across the dataset that were below their respective conservative Tier 2 GAC for risks to landscape planting. The only exception is detailed in the table below:-

Made Ground Dataset	Unit	No.	>GAC	Max	Outliers*	UCL_{95}*	Landscape GAC
Zinc	mg/kg	14	6	***2300***	1	883 (445)	300

* Indicates the number of results that are considered as statistical outliers.
**UCL_{95} results in brackets returned after any statistical outliers had been removed.

The most elevated concentration of zinc was found to be a statistical outlier (i.e. hotspot) not part of the made ground dataset. The zinc dataset was found to have a lognormal distribution and therefore the UCL_{95} concentration was determined using the Chebyshev theorem at a 95% confidence interval.

As can be seen from the table above, the UCL_{95} concentration of zinc, both with the outliers and with them removed, exceeded the respective landscape GAC. All of the made ground however is to be removed in order to accommodate the basement structure and all of the site will be under permanent hardstanding with any landscaping being restricted to containerised planting. As such, the landscape planting SPL from the made ground returning elevated concentrations of zinc would be considered as inactive.

4.2.2 Clay Dataset

The samples of clay returned concentrations across the dataset that were below their respective conservative Tier 2 GAC for risks to landscape planting and therefore the underlying natural ground across the site would not be considered as a potential risk to landscape planting.

4.3 Controlled Water

The Phase 1 PRA considered the groundwater SPL to be a very low risk based on the following:-

- Superficial deposits are absent and the underlying bedrock (London Clay) is unproductive.
- The site is not within 500m of a SPZ boundary. The nearest boundary is circa 600m to the E.
- The nearest groundwater abstraction is circa 395m to the W for a heat pump.
- The nearest potable abstraction is circa 750m to the E.
- There are no surface water features on or within 250m of the site boundary, the nearest is circa 445m to the N.

As such, the controlled water SPL are considered to be inactive.

4.3.1 Groundwater Testing

The sample of water recovered from the standpipe is considered to be representative of perched water above the impermeable bedrock as opposed to groundwater per se. The sample returned concentrations of a wide range of potential contaminants including TPH, PAH, VOC and semi VOC, and those that returned elevated total concentrations in the made ground dataset (i.e. lead and zinc) that were below their respective Tier 2 GAC for a secondary aquifer and in the vast majority of cases were below the respective laboratory limit of detection. This would corroborate the qualitative assessment that the controlled water SPL is inactive.

4.4 Buildings and Construction Materials

4.4.1 Concrete Cast In-Situ

The majority of samples (made ground and underlying clay) returned concentrations of water soluble sulphate that were within BRE (2005) Design Class DS-2 for concrete cast in-situ. The only exceptions to this were samples of made ground from TP8 and TP9, which returned concentrations of sulphate that would be Design Class DS-3. This should be taken into account should any concrete structures be installed within the soils represented by these samples. Further guidance should be provided by a geotechnical engineer in respect to this issue.

4.4.2 Potable Water Supply Pipes

Should it be intended to install water supply pipes within the near surface soil then additional targeted investigation and testing may be required along the proposed route(s) (once finalised) in accordance with UKWIR (2010) to allow an assessment to be made into the suitability of standard materials at the site. However, the concentrations of TPH returned by the samples of made ground recovered during the Phase 2a investigation would not preclude the use of standard PE pipe materials, should the soil represented by these samples remain in-situ and also coincide with the route of a proposed water supply pipe.

All of the made ground is however to be removed in order to accommodate the basement structure and it is therefore unlikely that water supply pipes will come into contact with made ground on the site. We would recommend that the local water supply company be consulted to determine the suitability of standard pipe materials or the need for some form of PVC of PE-Al-PE barrier pipe (e.g. Protectaline or similar).

4.4.3 Volatile Organic Compounds

The made ground and underlying natural ground encountered during the Phase 2a site investigation was found to be free from significant visual and/or olfactory indicators of volatile organic contamination, which was corroborated by in-situ VOC monitoring at each location and the organic hydrocarbon analysis undertaken. Furthermore, the sample of water recovered from the standpipe in the S of the site returned concentrations of TPH, PAH, VOC and semi VOC that were all below detection limits. As such, together with the fact that all of the made ground is to be removed to accommodate the basement structure the VOC SPL would be considered inactive.

4.5 Refined CSM

The table below presents a revised Tier 2 CSM for the site based upon the SPL identified within the Phase 1 PRA, accounting for the results of the Tier 2 GQRA and summarises the relevant sources, pathways and receptors at the site based on the proposed development.

Source(s)	Potential Contaminant(s)	Potential Migration Pathway(s)	Potential Receptor(s)	Probability of Occurrence	Severity of Occurrence	Overall Risk Rating*	Active/Inactive
Made ground across the site.	Lead	Ingestion of contaminated soils. Inhalation of dust. Dermal contact with soils.	Future site users.	Unlikely	Mild	Very Low (o)	The SPL to human health from elevated concentrations of lead in the made ground across the site would only be potentially active should it remain in-situ and coincide with areas of soft landscaping. In this case the pathway will be broken by the development, which includes for the removal of all of the made ground to accommodate the basement structure and on the basis that the entire development will be under permanent hardstanding (e.g. building footprint, roads etc.). As such, the SPL to human health from lead will be rendered **INACTIVE**.
	ACM	Inhalation of fibres/dust.	Groundwork operatives and offsite humans during the works.	Likely	Severe	High (b)	ACM was observed in the made ground at several locations and was detected in 60% of the made ground samples. The made ground will however, be removed as part of the development. This will render the SPL to future site users as inactive. However, the SPL to groundwork operatives and offsite humans will be **ACTIVE** during the development. Therefore an asbestos specialist should be employed to devise a suitable method statement and standard operating procedure, which should be adhered to whilst excavating the made ground across the site.
	Zinc	Plant uptake by roots.	Landscape planting.	Unlikely	Mild	Very Low (o)	The SPL to landscape planting from elevated concentrations of zinc in the made ground will only be potentially active in areas of sensitive end use within the development (e.g. gardens and soft landscaping etc.). In this case the pathway will be broken by the development, which includes for the removal of all of the made ground to accommodate the basement structure and on the basis that the entire development will be under permanent hardstanding (e.g. building footprint, roads etc.). As such, the SPL to landscape planting from zinc will be rendered **INACTIVE**.

* See Appendix B for overall risk rating.

5.0 CONCLUSIONS AND RISK MANAGEMENT STRATEGY

The refined CSM based on the findings of the Phase 2 site investigation and Tier 2 GQRA has concluded that the human health and landscape planting SPL will be rendered inactive as a result of the development. However, due to the widespread presence of ACM within the made ground and the proposal to remove the made ground to accommodate the basement structure, the SPL to groundwork operatives and offsite humans will remain active with a high risk ranking. As such, a RMS should be compiled and employed at the site during the development to ensure that risks to groundwork operatives and offsite humans are suitably mitigated and the SPL broken.

Due to the nature of the site (i.e. thick reinforced concrete surface underlain by rubble filled made ground) the scope of this investigation has been restricted to a Phase 2a preliminary site investigation. We would therefore anticipate that any RMS would include for additional assessment of the below surface strata and the identification of any unexpected contamination through the implementation of a suitable discovery strategy and watching brief, backed where necessary by a programme of additional investigation and testing once the surface hardstanding and any obstructions have been removed prior to the basement excavation commencing.

5.1 Regulatory Approval

Formal approval should be sought from the regulatory authorities with regards to the recommendations contained within this report prior to commencing significant development of the site.

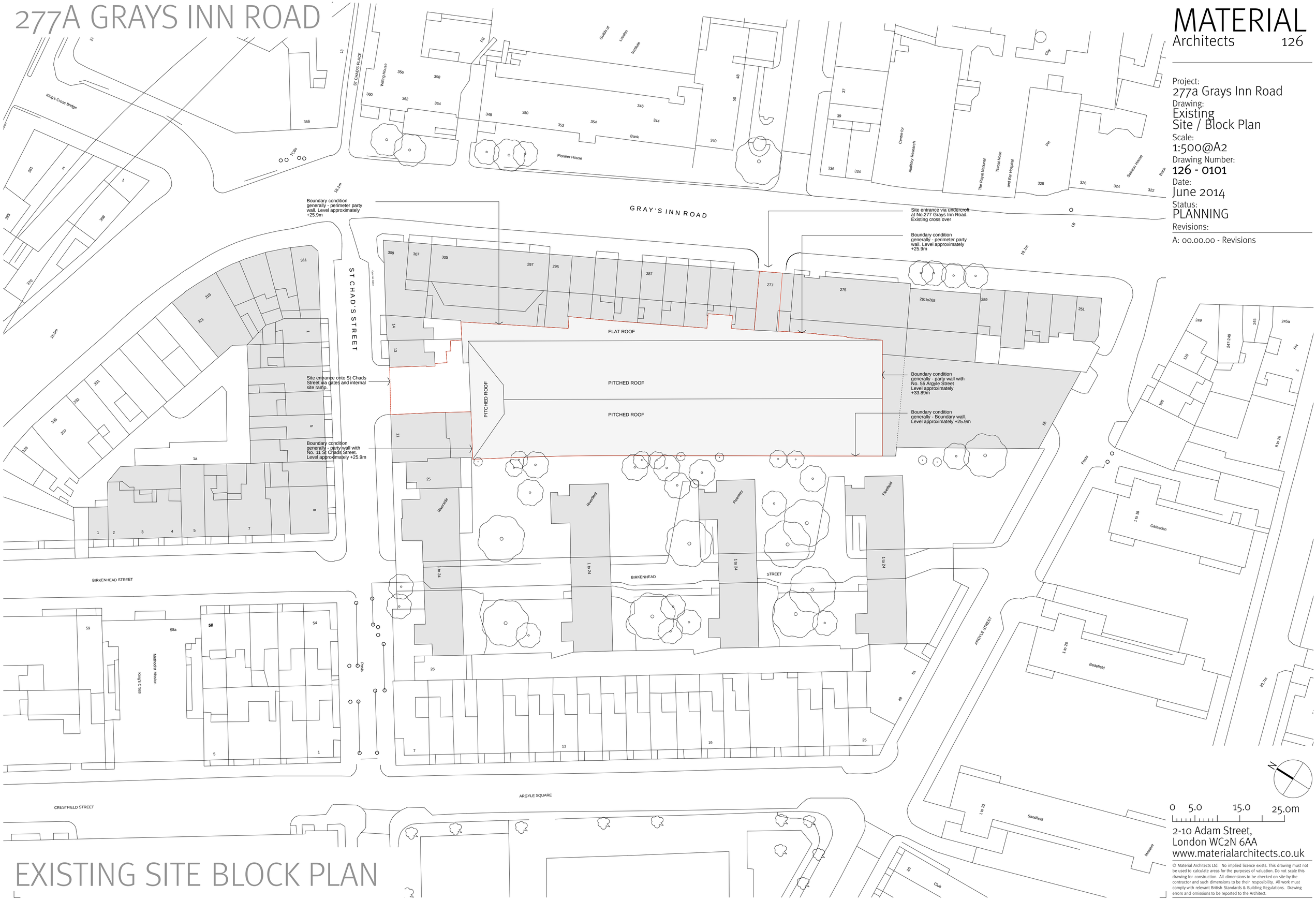
6.0 LIMITATIONS AND USE OF THIS REPORT

IMPORTANT: This section should be read before reliance is placed on any of the opinions, advice, recommendations or conclusions set out in this report.

a) This report has been prepared for the purpose of providing advice to the client pursuant to its appointment of TGEN to act as a consultant.
b) Save for the client no duty is undertaken or warranty or representation made to any party in respect of the opinions, advice, recommendations or conclusions herein set out.
c) All work carried out in preparing this report has used, and is based upon, our professional knowledge and understanding of the current relevant English and European Community standards, approved codes of practice, technology and legislation.
d) Changes in the above may cause the opinion, advice, recommendations or conclusions set out in this report to become inappropriate or incorrect. However, in giving its opinions, advice, recommendations and conclusions, TGEN has considered pending changes to environmental legislation and regulations of which it is currently aware. Following delivery of this report, we will have no obligation to advise the client of any such changes, or of their repercussions.
e) TGEN acknowledges that it is being retained, in part, because of its knowledge and experience with respect to environmental matters. TGEN will consider and analyse all information provided to it in the context of our knowledge and experience and all other relevant information known to us. To the extent that the information provided to us is not inconsistent or incompatible therewith, TGEN shall be entitled to rely upon and assume, without independent verification, the accuracy and completeness of such information.
f) The content of this report represents the professional opinion of experienced environmental consultants. TGEN does not provide specialist legal advice and the advice of lawyers may be required.
g) In the summary and recommendations sections of this report, TGEN has set out our key findings and provided a summary and overview of our advice, opinions and recommendations. However, other parts of this report will often indicate the limitations of the information obtained by TGEN and therefore any advice, opinions or recommendations set out in the executive summary, summary and recommendations sections ought not to be relied upon unless they are considered in the context of the whole report.
h) The assessments made in this report are based on the ground conditions as revealed by walkover survey and/or intrusive investigations, together with the results of any field or laboratory testing or chemical analysis undertaken and other relevant data which may have been obtained including previous site investigations. In any event, ground contamination often exists as small discrete areas of contamination (hot spots) and there can be no certainty that any or all such areas have been located and/or sampled.
i) There may be special conditions appertaining to the site which have not been taken into account in the report. The assessment may be subject to amendment in light of additional information becoming available.
j) Where any data supplied by the client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by TGEN for inaccuracies within the data supplied by other parties.
k) Whilst the report may express an opinion on possible ground conditions between or beyond trial pit or borehole locations, 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 the accuracy thereof.
l) Comments on groundwater conditions are based on observations made at the time of the investigation unless otherwise stated. Groundwater conditions may vary due to seasonal or other effects.
m) This report is prepared and written in the context of the agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a reinterpretation of the report in whole or part after its original submission.
n) The copyright in the written materials shall remain the property of the TGEN but with a royalty-free perpetual license to the client deemed to be granted on payment in full to TGEN by the client of the outstanding amounts.
o) These terms apply in addition to the TGEN standard terms of engagement (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing (In the event of a conflict between these terms and the said standard terms of engagement the said standard terms of engagement shall prevail). In the absence of such a written contract the standard terms of engagement will apply.
p) TGEN maintains adequate insurance cover for public liability and professional indemnity. However, we are unable to accept liability for asbestos related matters. Our work must not be taken as sufficient to identify the presence or absence of asbestos in or on the ground. In placing a contract with us the client accepts the restriction on asbestos. If we find or strongly suspect asbestos is or may be present in or on the ground we will inform the client and advise specialist investigation. The client agrees that they shall not bring any claim personally against any director / employee or consultant to us in respect of loss or damage suffered by the client arising out of this contract.

Figure 1 Site Location Plan.

277A GRAYS INN ROAD



EXISTING SITE BLOCK PLAN

MATERIAL
Architects 126

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277a Grays Inn Road
Drawing:
Existing
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Scale:
1:500@A2
Drawing Number:
126 - 0101
Date:
June 2014
Status:
PLANNING
Revisions:

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277A GRAYS INN ROAD


Aerial View


Interior of the existing building

Gray's Inn Road entrance


Argyle Square Gardens


St Chad's Street entrance


View from Birkenhead Estate


West Elevation - from Birkenhead Estate


West Elevation - from Birkenhead Estate


West Elevation - from Birkenhead Estate

EXISTING SITE PHOTOS

MATERIAL
Architects 126

Project:
277a Grays Inn Road
Drawing:
Existing
Site Photos
Scale:
NS@A2
Drawing Number:
126 - 0102
Date:
June 2014
Status:
PLANNING
Revisions:
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277A GRAYS INN ROAD

EXISTING BASEMENT FLOOR PLAN

MATERIAL
Architects 126

Project:
277a Grays Inn Road
Drawing:
Existing Plan
Basement Floor
Scale:
1:200@A2
Drawing Number:
126 - 0200
Date:
June 2014
Status:
PLANNING
Revisions:

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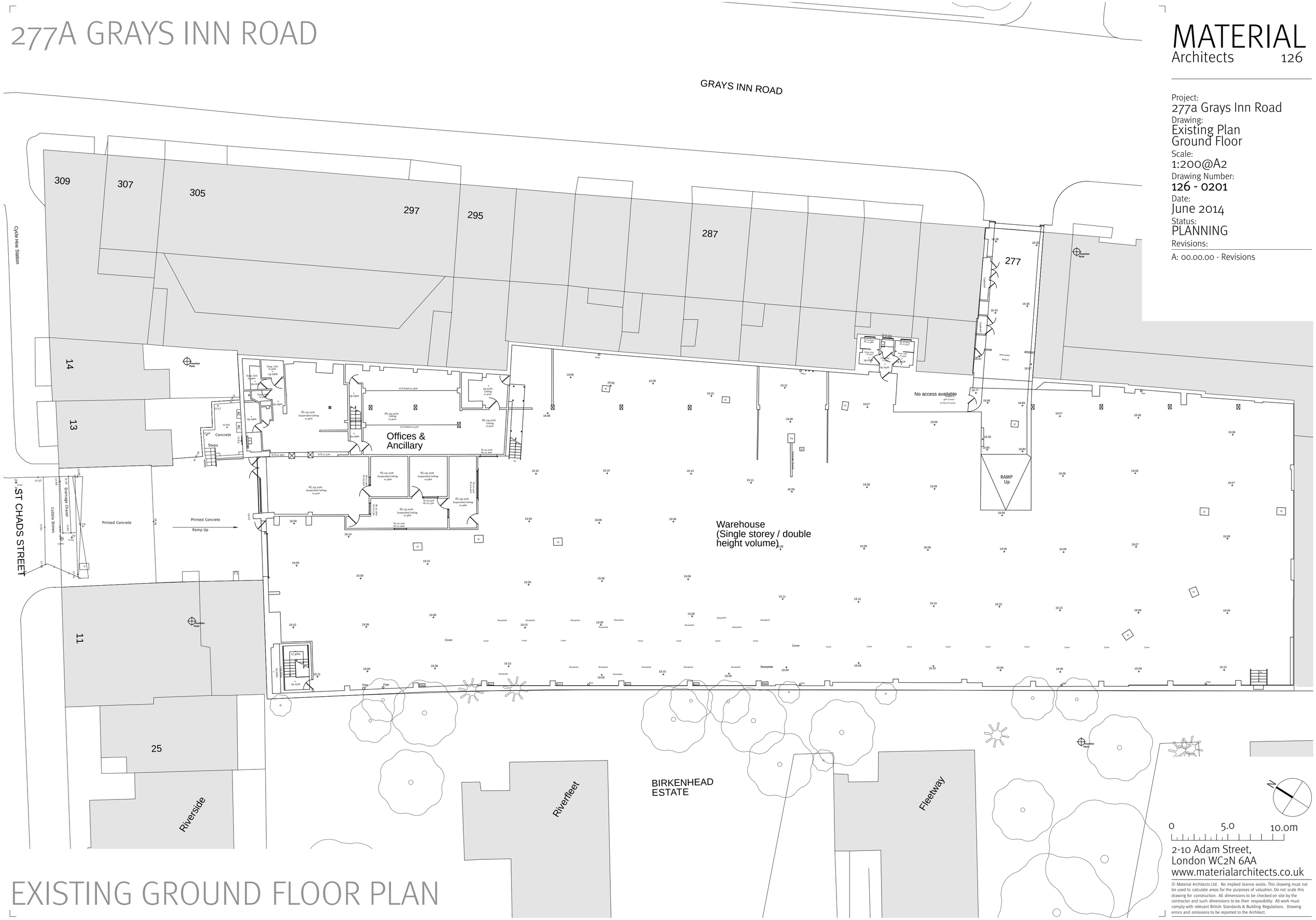

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Drawing Number:
126 - 0201
Date:
June 2014
Status:
PLANNING
Revisions:

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EXISTING GROUND FLOOR PLAN

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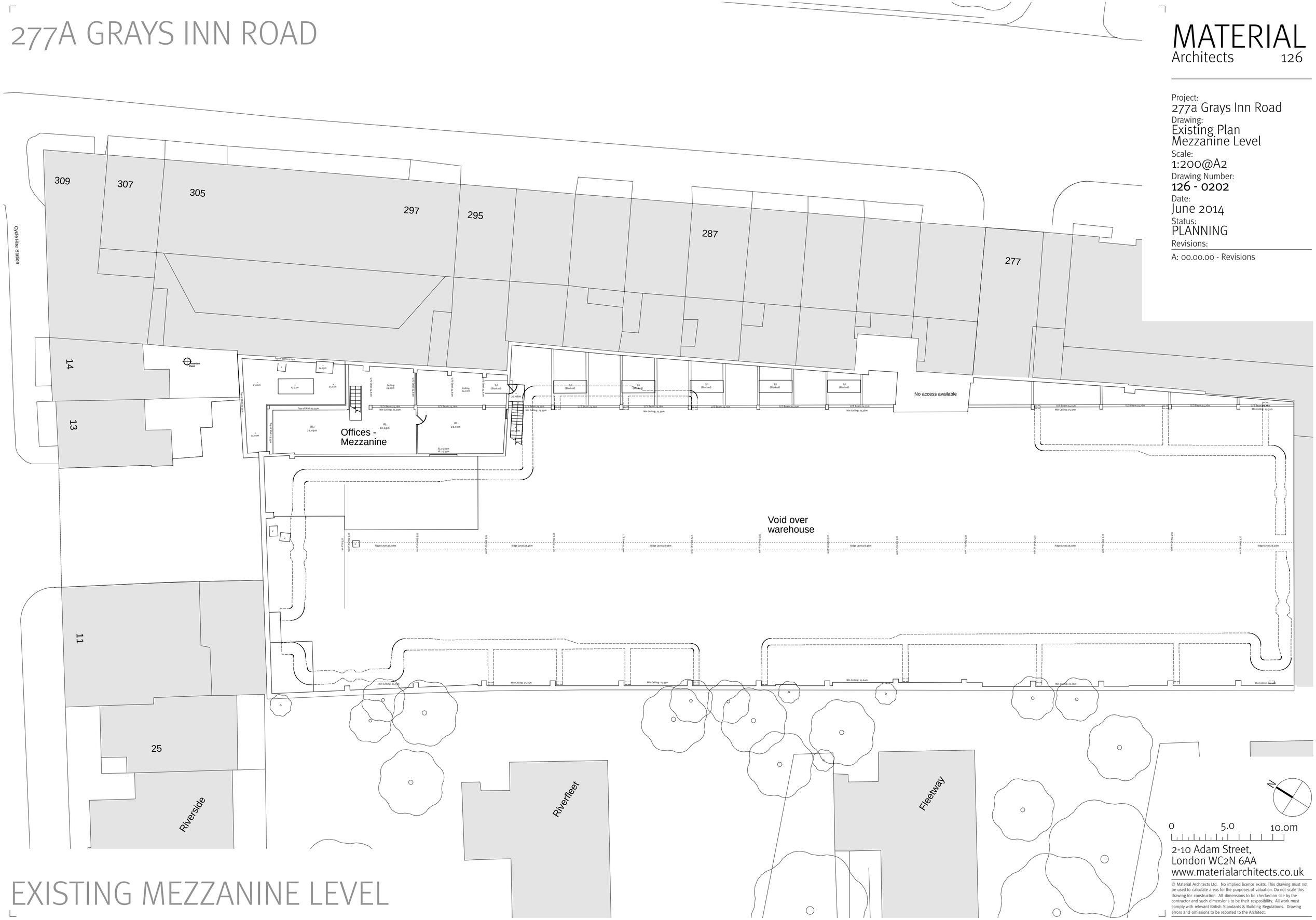

EXISTING MEZZANINE LEVEL

MATERIAL
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Drawing Number:
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Date:
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Status:
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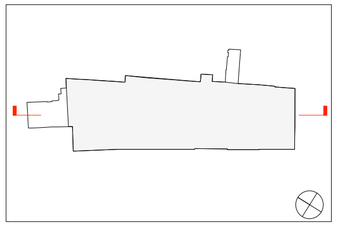

MATERIAL
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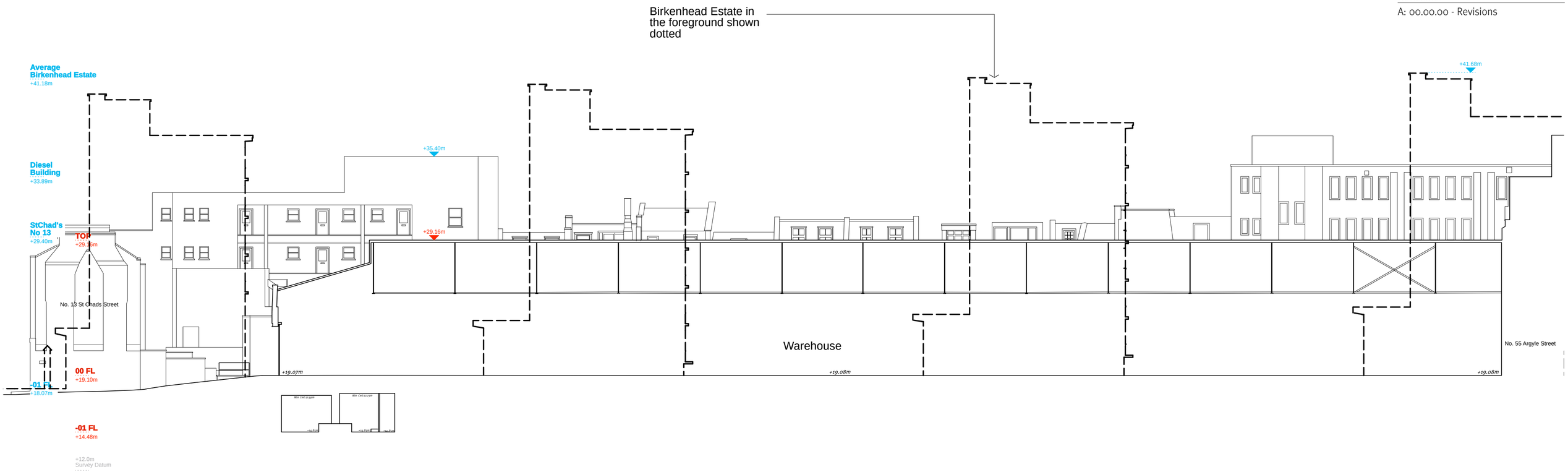

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EXISTING LONGITUDINAL SECTION (Looking East)

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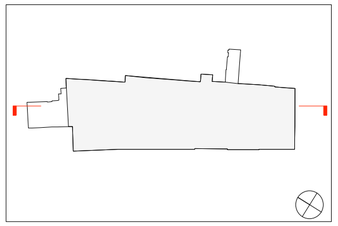

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Date:
June 2014
Status:
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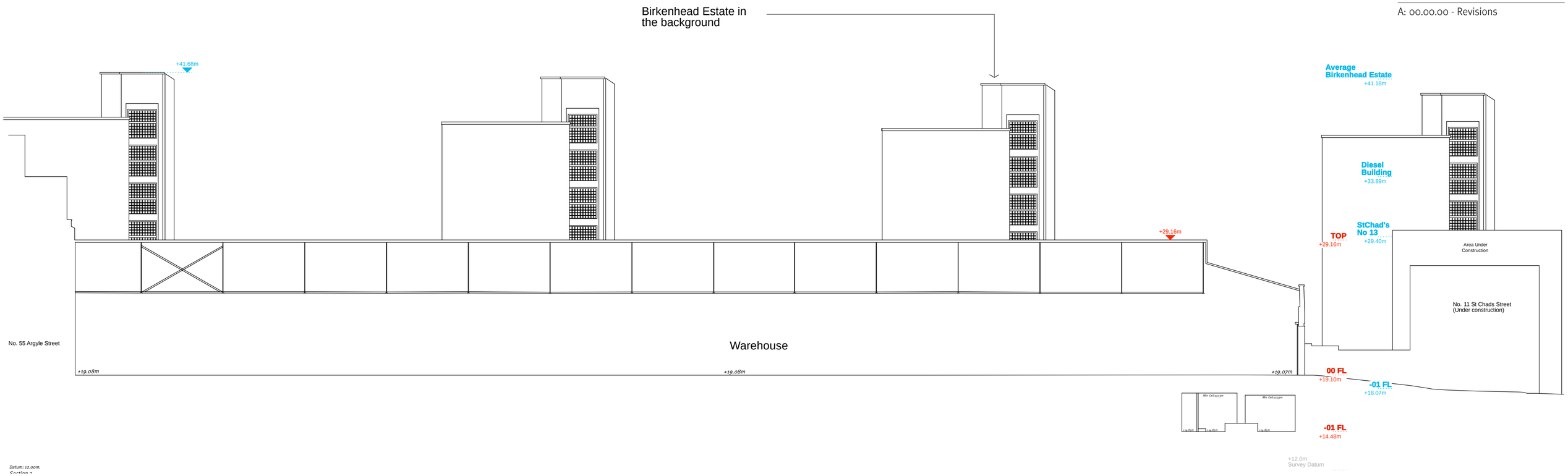

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EXISTING LONGITUDINAL SECTION (Looking West)

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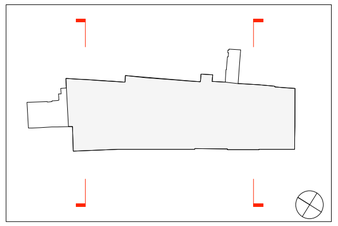

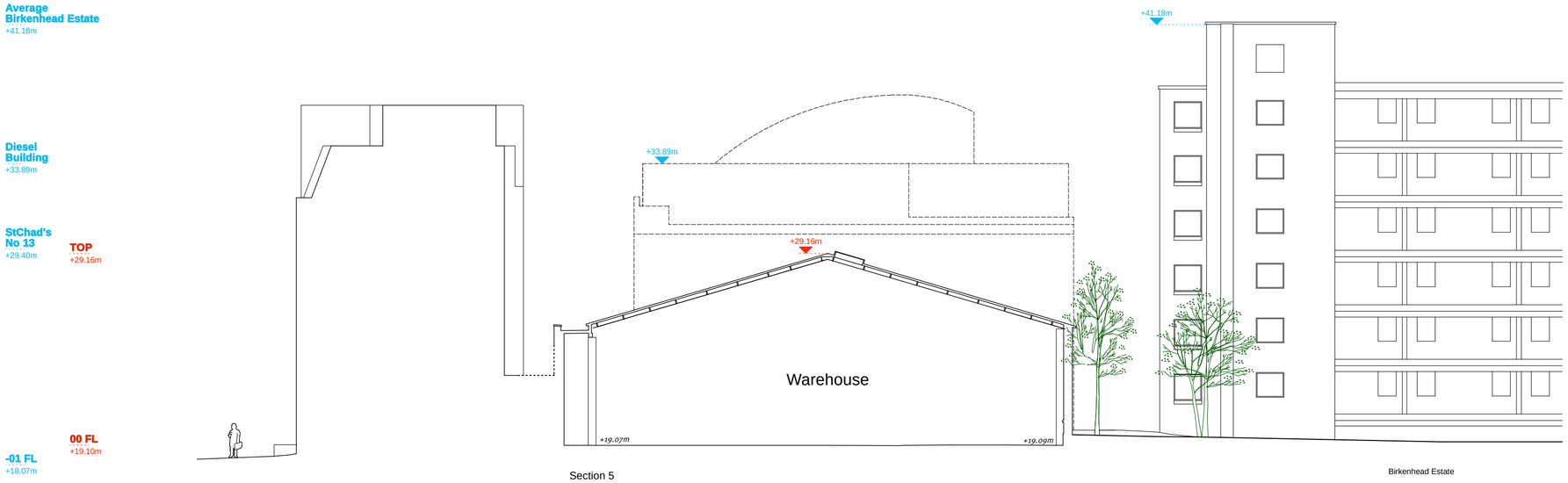

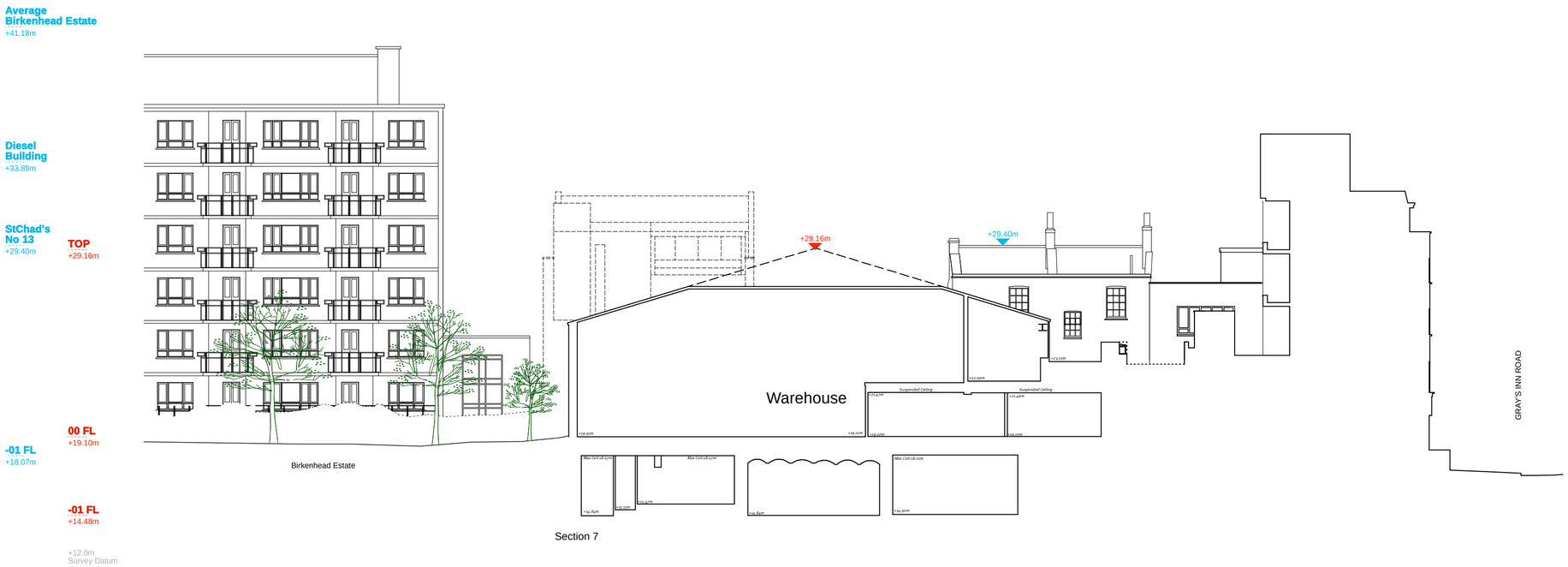

EXISTING CROSS SECTIONS

MATERIAL
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Drawing Number:
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Date:
June 2014
Status:
PLANNING
Revisions:

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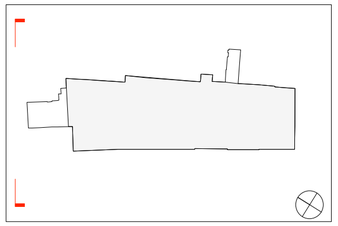

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Status:
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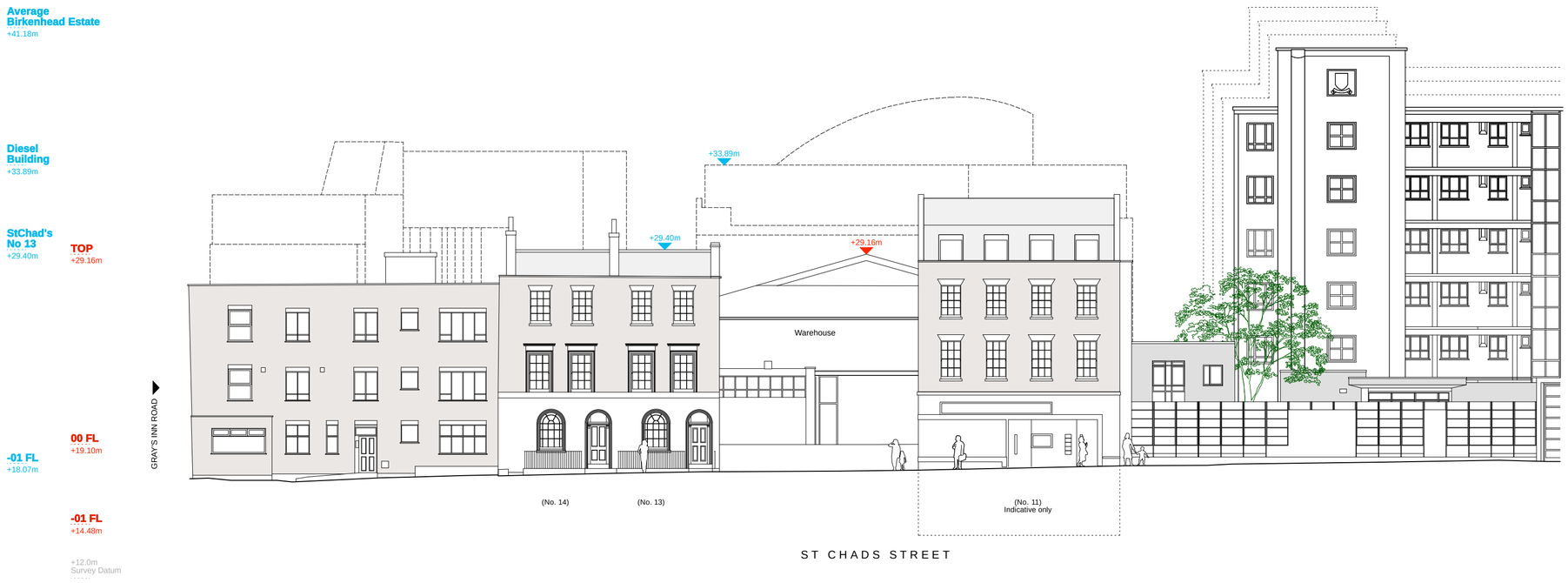

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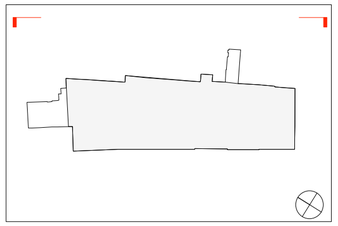
EXISTING NORTH ELEVATION - (St Chad's Street)

277A GRAYS INN ROAD



MATERIAL
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Existing
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Drawing Number:
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Date:
June 2014
Status:
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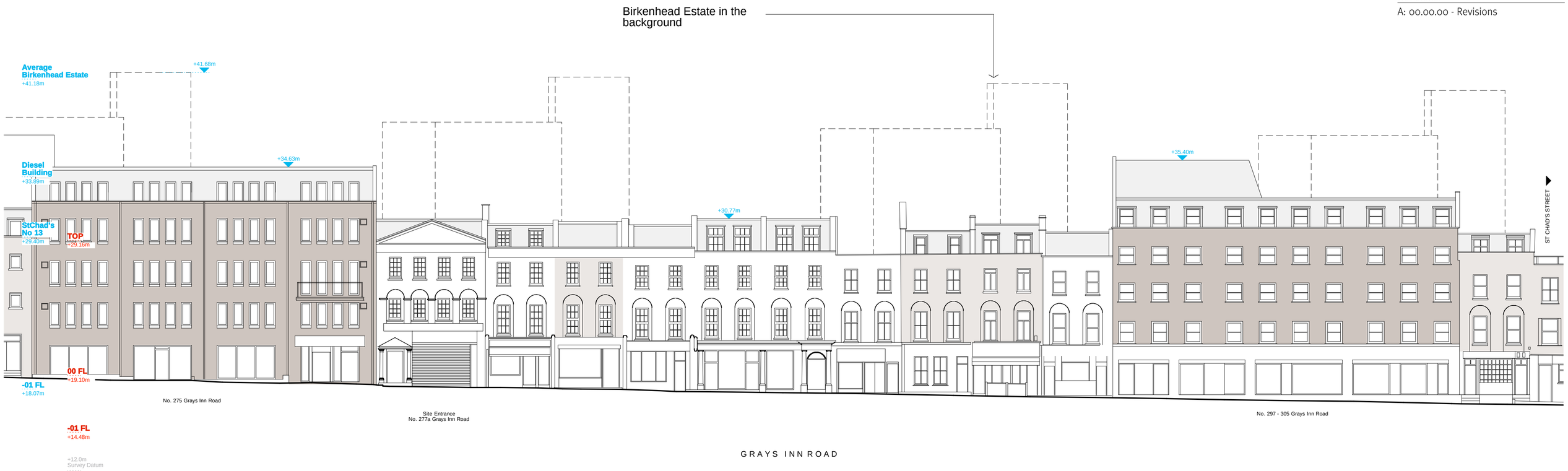

0 5.0 10.0m

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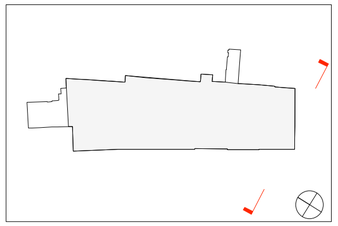
EXISTING EAST ELEVATION - (Gray's Inn Road)

277A GRAYS INN ROAD



MATERIAL
Architects 126

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Drawing Number:
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Date:
June 2014
Status:
PLANNING
Revisions:

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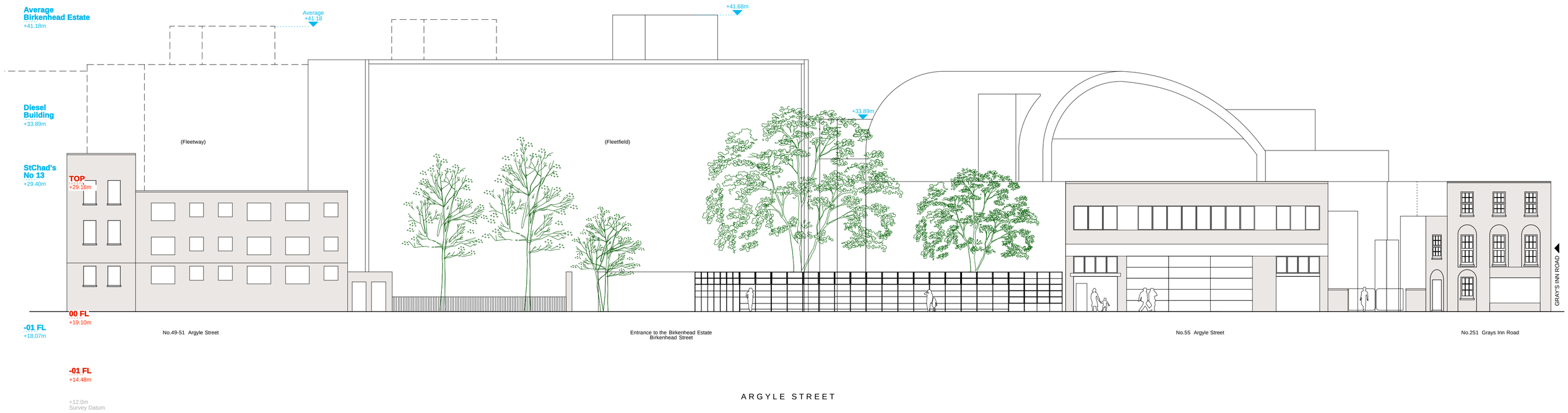

0 5.0 10.0m

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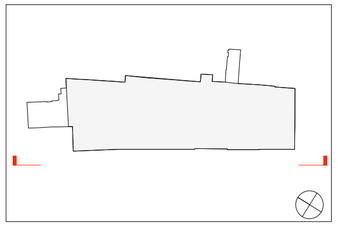
EXISTING SOUTH ELEVATION - (Argyle Street)

277A GRAYS INN ROAD



MATERIAL
Architects 126

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Drawing:
Existing
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Drawing Number:
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Date:
June 2014
Status:
PLANNING
Revisions:
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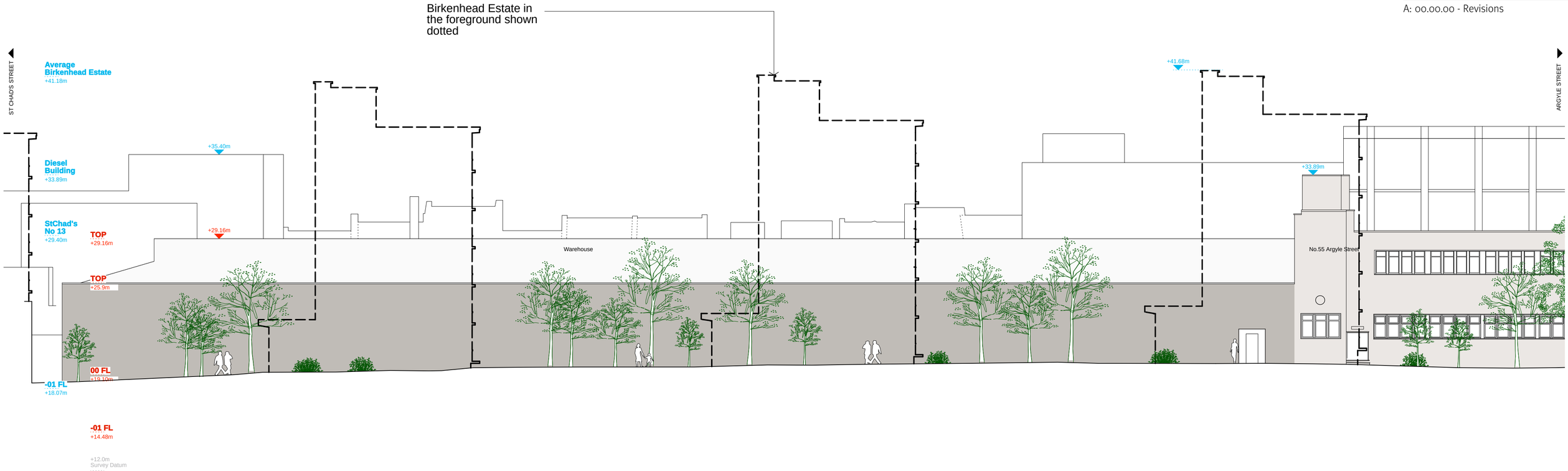

0 5.0 10.0m

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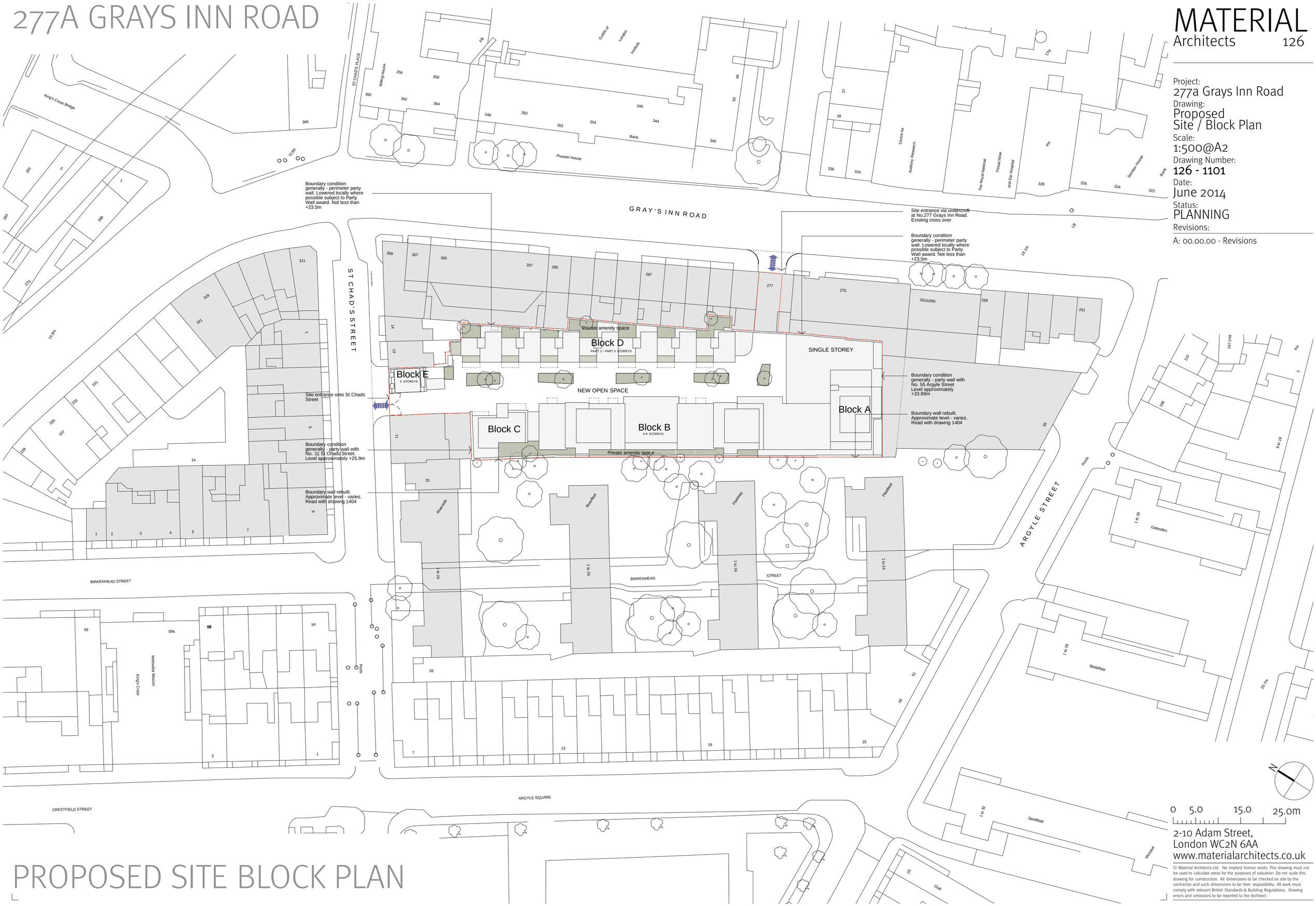
EXISTING WEST ELEVATION - (to Birkenhead Estate)

Figure 2 Proposed Development Plans.

277A GRAYS INN ROAD



MATERIAL
Architects 126

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Drawing:
Proposed
Site / Block Plan
Scale:
1:500@A2
Drawing Number:
126 - 1101
Date:
June 2014
Status:
PLANNING
Revisions:

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PROPOSED SITE BLOCK PLAN

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277A GRAYS INN ROAD

LOWER GROUND FLOOR

MATERIAL
Architects 126

Project:
277a Grays Inn Road
Drawing:
Proposed Plan
Lower Ground Floor
Scale:
1:200@A2
Drawing Number:
126 - 1200
Date:
June 2014
Status:
PLANNING
Revisions:

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NOTES:

1. Lower ground floor private amenity space.
2. Front light well. Private amenity space.
3. Raised garden. Visual amenity.
4. Raised planting bed with integrated seating.
5. Paving Type 1 - Individual residential entrances.
6. Paving Type 2 - Shared residential entrances.
7. Paving Type 3 - Open space.
8. Paving Type 4 - Commercial entrances.
9. New boundary wall to BH Estate. Re-claimed brick. Height varies.
10. Existing boundary wall retained. Lowered locally where possible subject to party wall awards. Not less than 1.7m above proposed first floor level in the courtyard homes.

0 5.0 10.0m

2-10 Adam Street,
London WC2N 6AA
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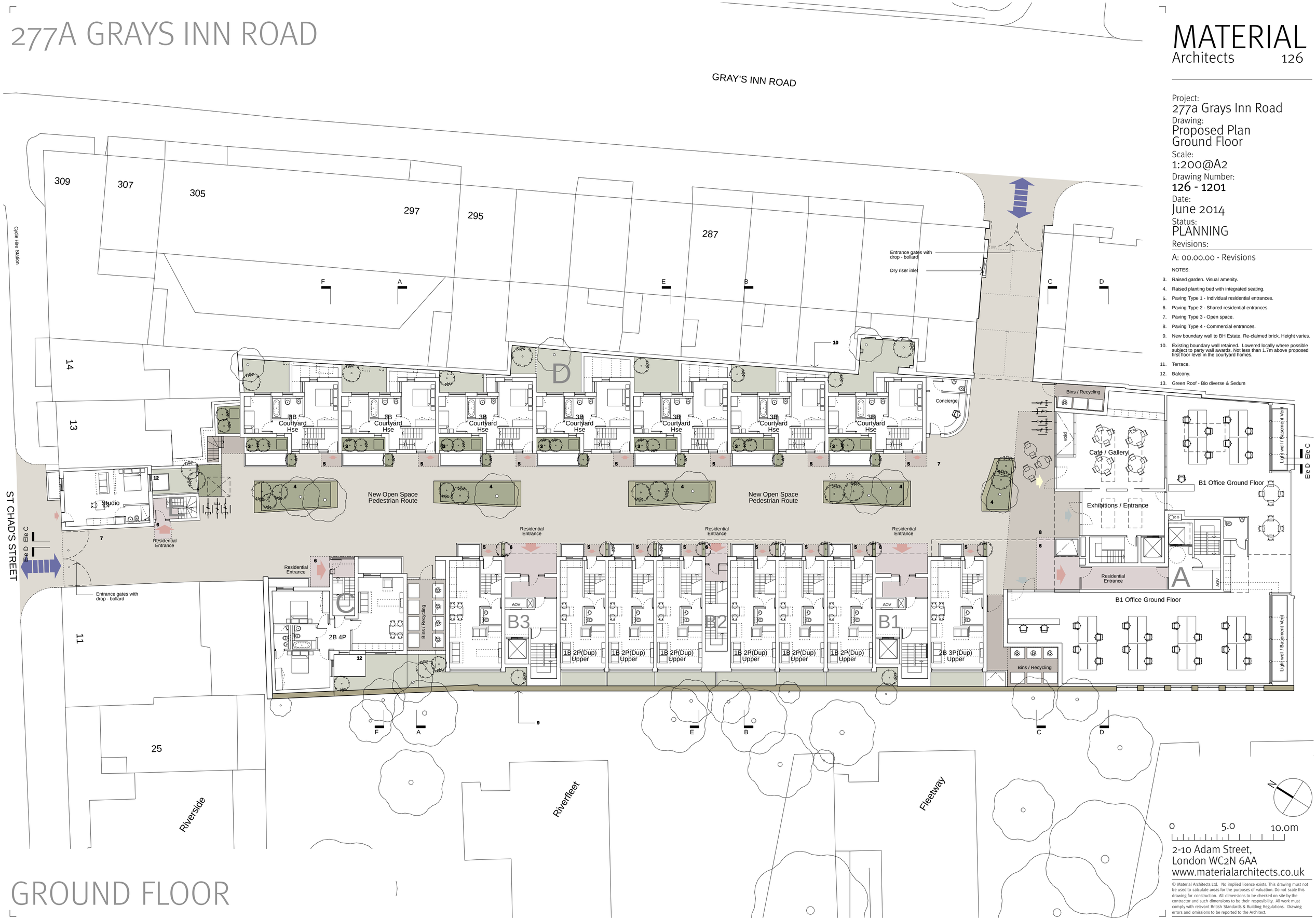
277A GRAYS INN ROAD



GROUND FLOOR

MATERIAL
Architects 126

Project:
277a Grays Inn Road
Drawing:
Proposed Plan
Ground Floor
Scale:
1:200@A2
Drawing Number:
126 - 1201
Date:
June 2014
Status:
PLANNING
Revisions:

A: 00.00.00 - Revisions

NOTES:

3. Raised garden. Visual amenity.
4. Raised planting bed with integrated seating.
5. Paving Type 1 - Individual residential entrances.
6. Paving Type 2 - Shared residential entrances.
7. Paving Type 3 - Open space.
8. Paving Type 4 - Commercial entrances.
9. New boundary wall to BH Estate. Re-claimed brick. Height varies.
10. Existing boundary wall retained. Lowered locally where possible subject to party wall awards. Not less than 1.7m above proposed first floor level in the courtyard homes.
11. Terrace.
12. Balcony.
13. Green Roof - Bio diverse & Sedum

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277A GRAYS INN ROAD

FIRST FLOOR

MATERIAL
Architects 126

Project:
277a Grays Inn Road
Drawing:
Proposed Plan
First Floor
Scale:
1:200@A2
Drawing Number:
126 - 1202
Date:
June 2014
Status:
PLANNING
Revisions:

A: 00.00.00 - Revisions

NOTES:

3. Raised garden. Visual amenity.
4. Raised planting bed with integrated seating.
5. Paving Type 1 - Individual residential entrances.
6. Paving Type 2 - Shared residential entrances.
7. Paving Type 3 - Open space.
8. Paving Type 4 - Commercial entrances.
9. New boundary wall to BH Estate. Re-claimed brick. Height varies.
10. Existing boundary wall retained. Lowered locally where possible subject to party wall awards. Not less than 1.7m above proposed first floor level in the courtyard homes.
11. Terrace.
12. Balcony.
13. Green Roof - Bio diverse & Sedum

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277A GRAYS INN ROAD

SECOND FLOOR

MATERIAL
Architects 126

Project:
277a Grays Inn Road
Drawing:
Proposed Plan
Second Floor
Scale:
1:200@A2
Drawing Number:
126 - 1203
Date:
June 2014
Status:
PLANNING
Revisions:

A: 00.00.00 - Revisions

NOTES:

3. Raised garden. Visual amenity.
4. Raised planting bed with integrated seating.
5. Paving Type 1 - Individual residential entrances.
6. Paving Type 2 - Shared residential entrances.
7. Paving Type 3 - Open space.
8. Paving Type 4 - Commercial entrances.
9. New boundary wall to BH Estate. Re-claimed brick. Height varies.
10. Existing boundary wall retained. Lowered locally where possible subject to party wall awards. Not less than 1.7m above proposed first floor level in the courtyard homes.
11. Terrace.
12. Balcony.
13. Green Roof - Bio diverse & Sedum

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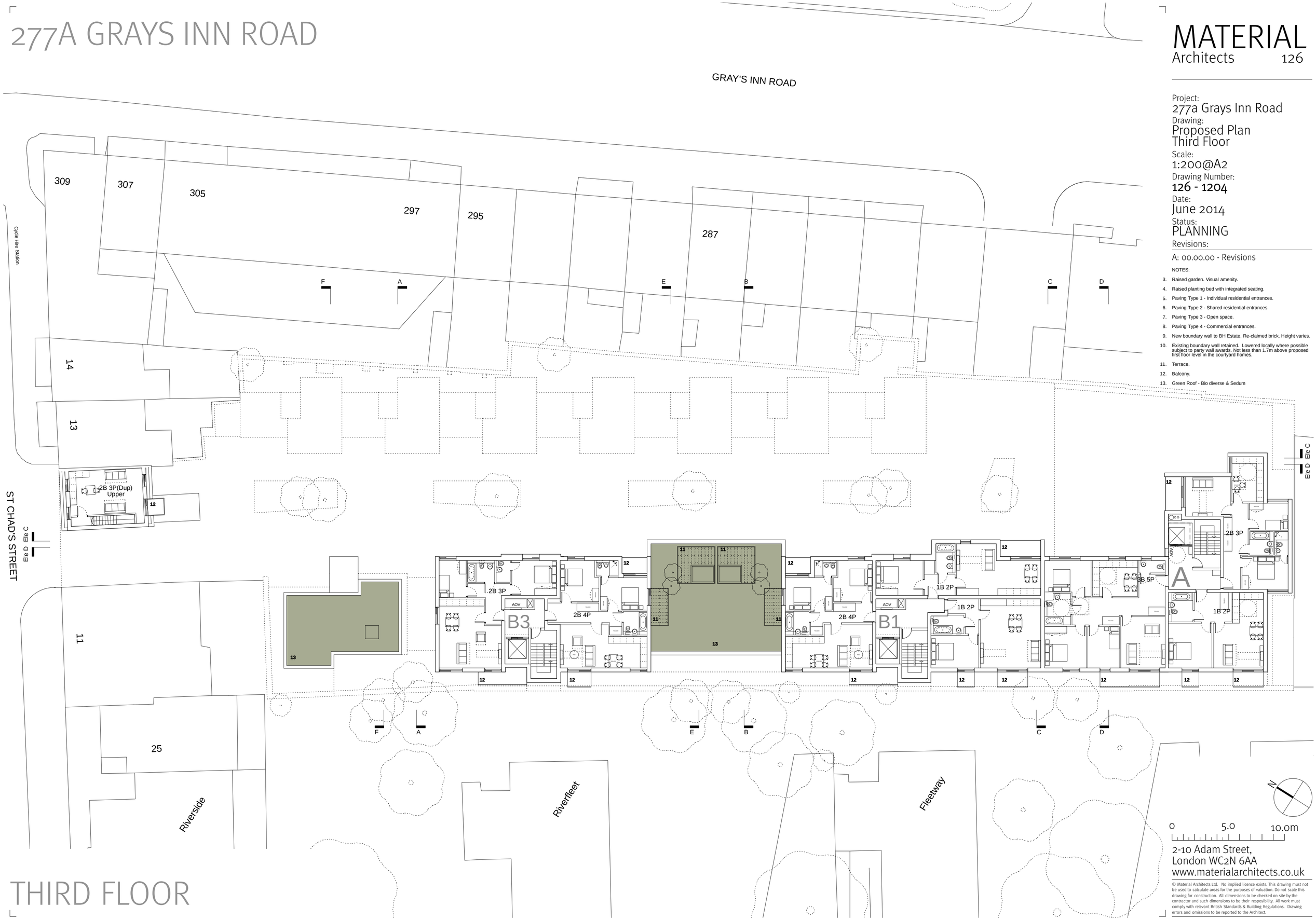
277A GRAYS INN ROAD



MATERIAL
Architects 126

Project:
277a Grays Inn Road
Drawing:
Proposed Plan
Third Floor
Scale:
1:200@A2
Drawing Number:
126 - 1204
Date:
June 2014
Status:
PLANNING
Revisions:

A: 00.00.00 - Revisions

NOTES:

3. Raised garden. Visual amenity.
4. Raised planting bed with integrated seating.
5. Paving Type 1 - Individual residential entrances.
6. Paving Type 2 - Shared residential entrances.
7. Paving Type 3 - Open space.
8. Paving Type 4 - Commercial entrances.
9. New boundary wall to BH Estate. Re-claimed brick. Height varies.
10. Existing boundary wall retained. Lowered locally where possible subject to party wall awards. Not less than 1.7m above proposed first floor level in the courtyard homes.
11. Terrace.
12. Balcony.
13. Green Roof - Bio diverse & Sedum

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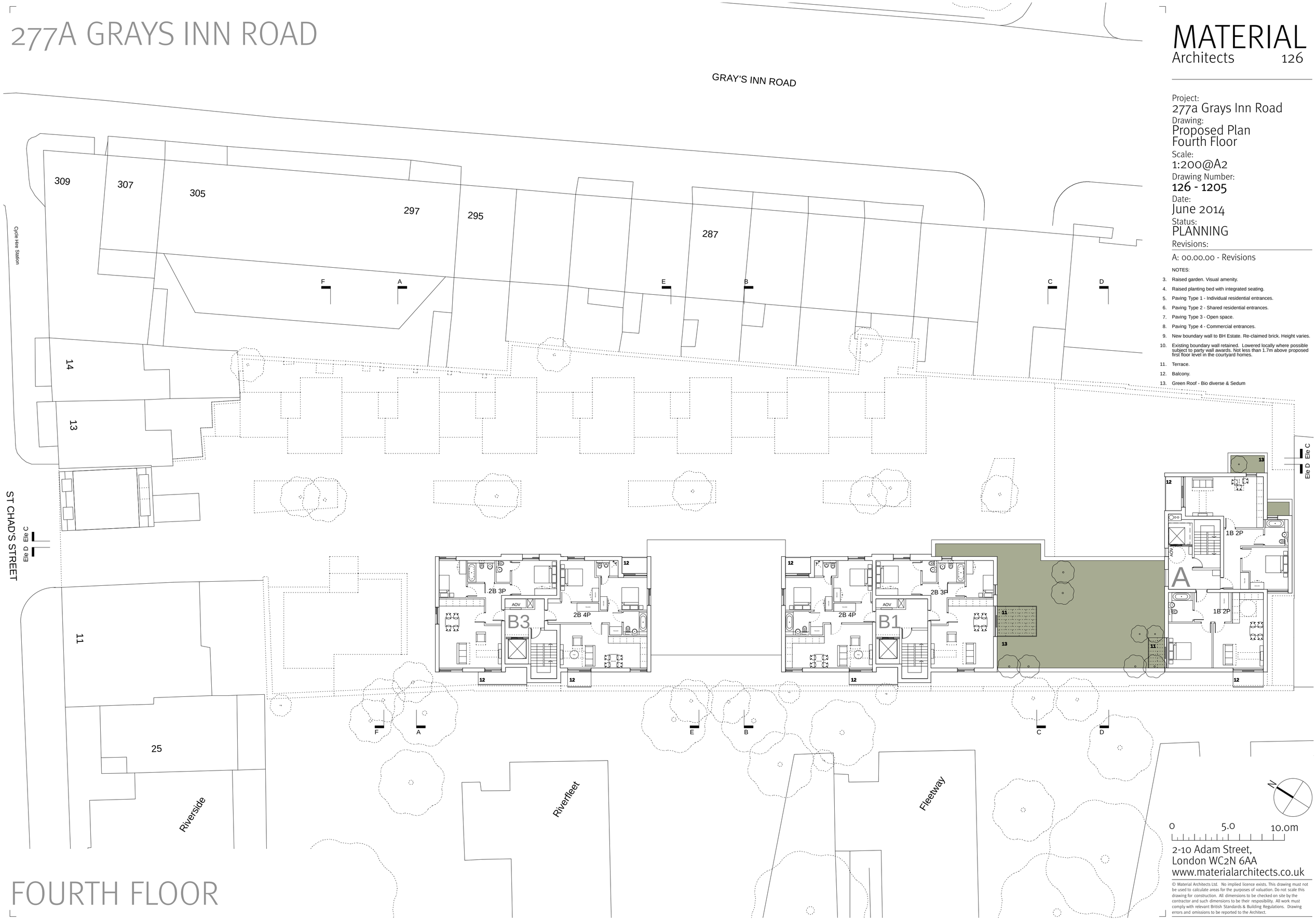
THIRD FLOOR

277A GRAYS INN ROAD



FOURTH FLOOR

MATERIAL
Architects 126

Project:
277a Grays Inn Road
Drawing:
Proposed Plan
Fourth Floor
Scale:
1:200@A2
Drawing Number:
126 - 1205
Date:
June 2014
Status:
PLANNING
Revisions:

A: 00.00.00 - Revisions

NOTES:

3. Raised garden. Visual amenity.
4. Raised planting bed with integrated seating.
5. Paving Type 1 - Individual residential entrances.
6. Paving Type 2 - Shared residential entrances.
7. Paving Type 3 - Open space.
8. Paving Type 4 - Commercial entrances.
9. New boundary wall to BH Estate. Re-claimed brick. Height varies.
10. Existing boundary wall retained. Lowered locally where possible subject to party wall awards. Not less than 1.7m above proposed first floor level in the courtyard homes.
11. Terrace.
12. Balcony.
13. Green Roof - Bio diverse & Sedum

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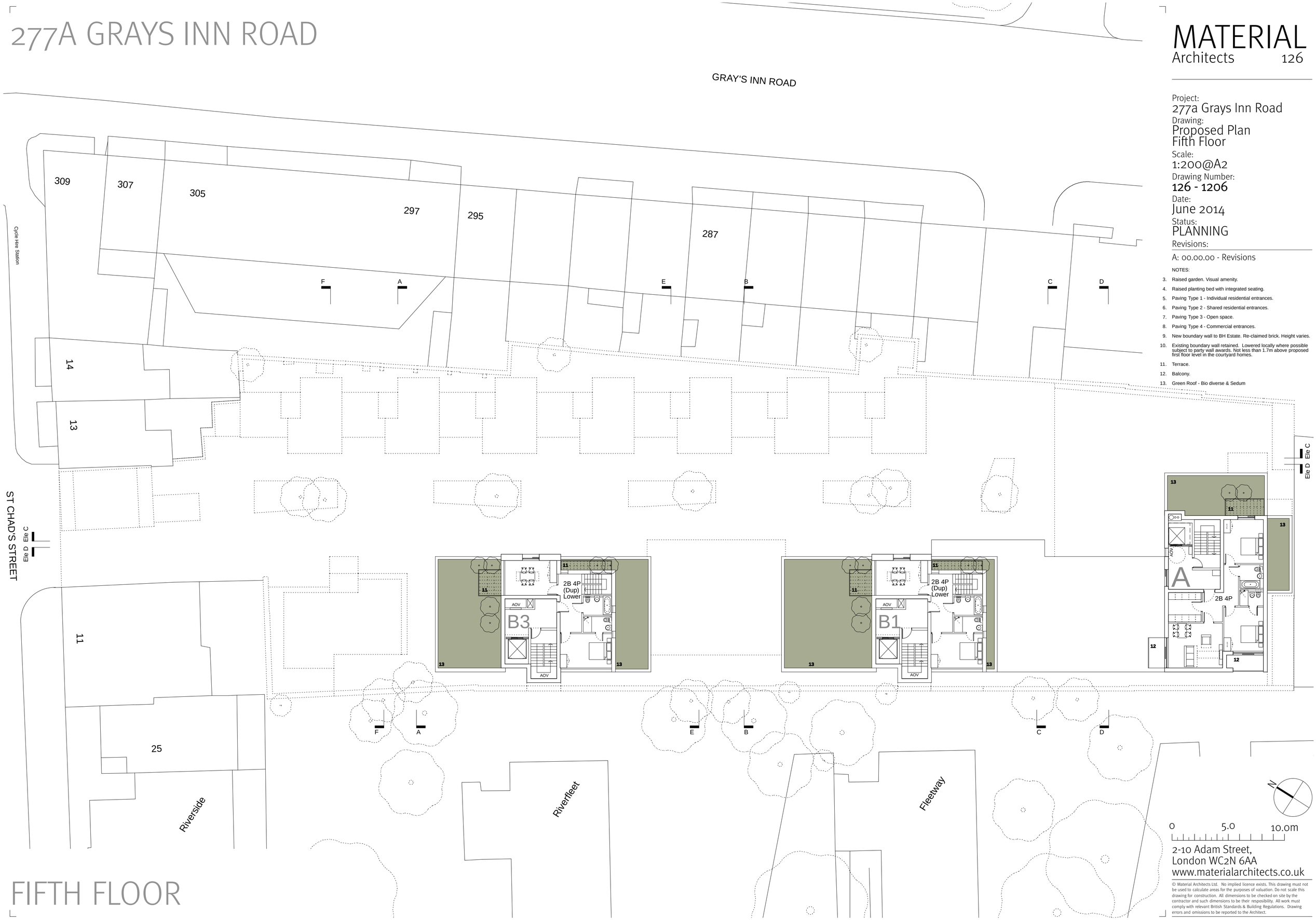
277A GRAYS INN ROAD



MATERIAL
Architects 126

Project:
277a Grays Inn Road
Drawing:
Proposed Plan
Fifth Floor
Scale:
1:200@A2
Drawing Number:
126 - 1206
Date:
June 2014
Status:
PLANNING
Revisions:

A: 00.00.00 - Revisions

NOTES:

3. Raised garden. Visual amenity.
4. Raised planting bed with integrated seating.
5. Paving Type 1 - Individual residential entrances.
6. Paving Type 2 - Shared residential entrances.
7. Paving Type 3 - Open space.
8. Paving Type 4 - Commercial entrances.
9. New boundary wall to BH Estate. Re-claimed brick. Height varies.
10. Existing boundary wall retained. Lowered locally where possible subject to party wall awards. Not less than 1.7m above proposed first floor level in the courtyard homes.
11. Terrace.
12. Balcony.
13. Green Roof - Bio diverse & Sedum

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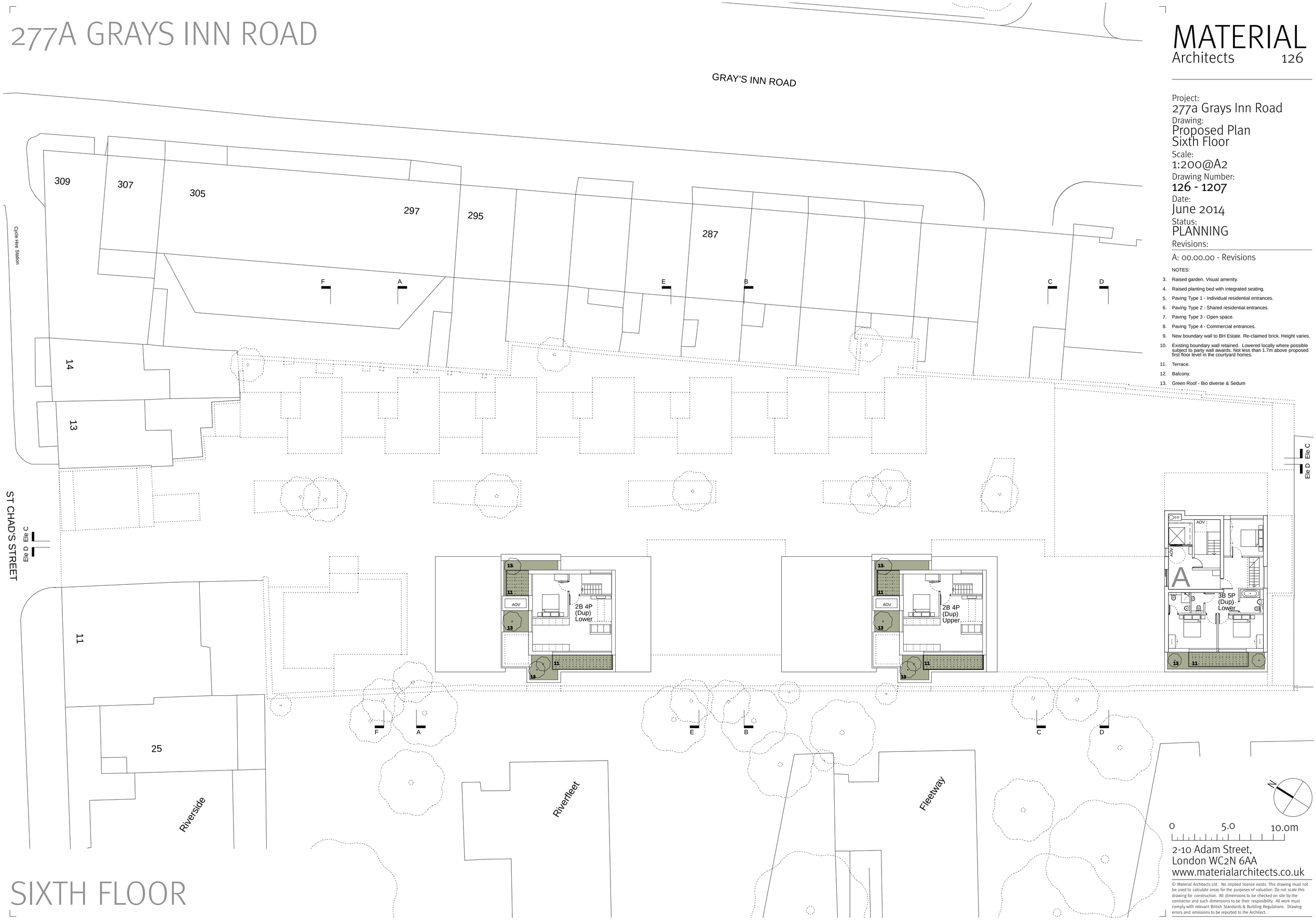
FIFTH FLOOR

277A GRAYS INN ROAD



SIXTH FLOOR

MATERIAL
Architects 126

Project:
277a Grays Inn Road
Drawing:
Proposed Plan
Sixth Floor
Scale:
1:200@A2
Drawing Number:
126 - 1207
Date:
June 2014
Status:
PLANNING
Revisions:

A: 00.00.00 - Revisions

NOTES:

3. Raised garden. Visual amenity.
4. Raised planting bed with integrated seating.
5. Paving Type 1 - Individual residential entrances.
6. Paving Type 2 - Shared residential entrances.
7. Paving Type 3 - Open space.
8. Paving Type 4 - Commercial entrances.
9. New boundary wall to BH Estate. Re-claimed brick. Height varies.
10. Existing boundary wall retained. Lowered locally where possible subject to party wall awards. Not less than 1.7m above proposed first floor level in the courtyard homes.
11. Terrace.
12. Balcony.
13. Green Roof - Bio diverse & Sedum

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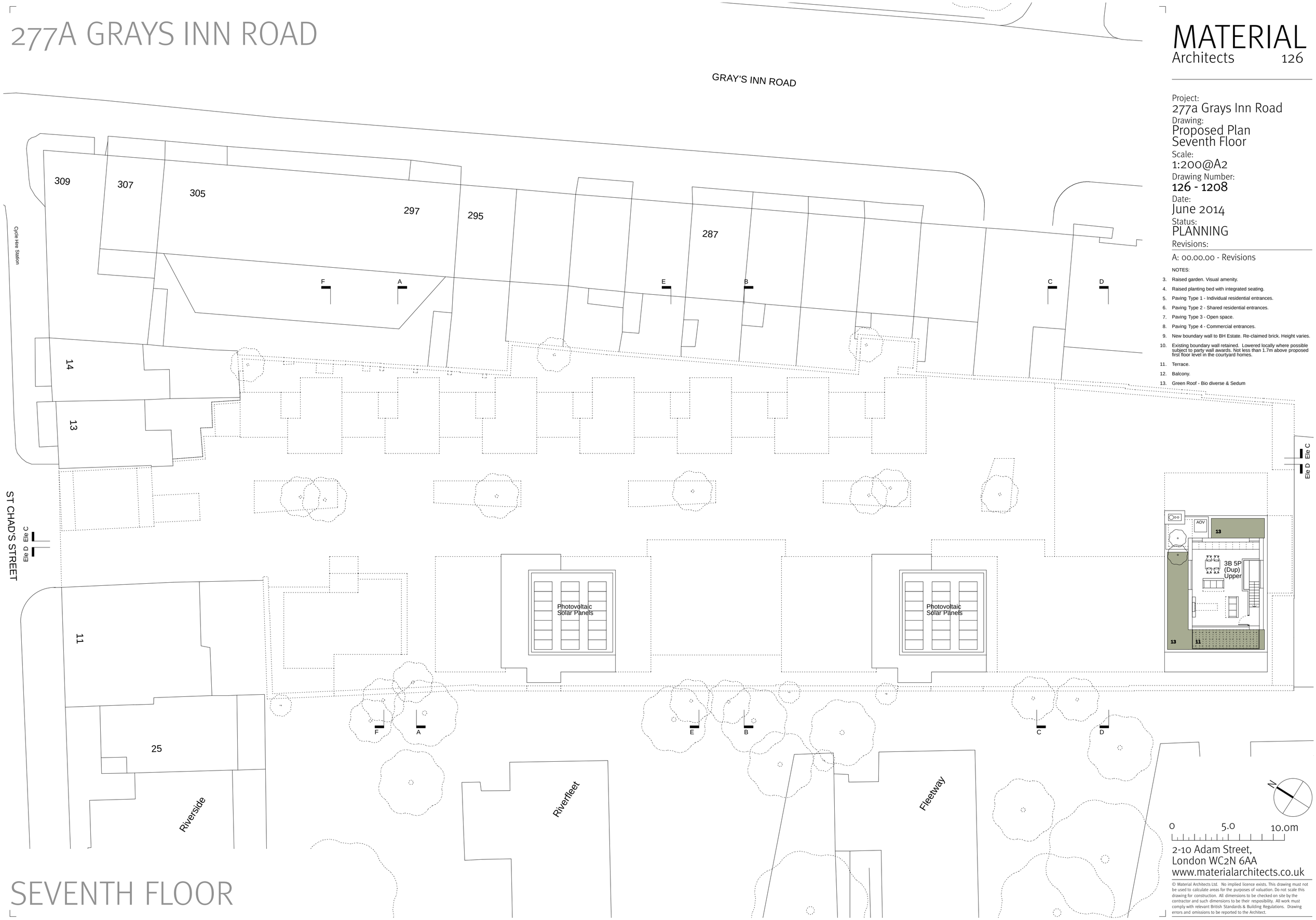
277A GRAYS INN ROAD



SEVENTH FLOOR

MATERIAL
Architects 126

Project:
277a Grays Inn Road
Drawing:
Proposed Plan
Seventh Floor
Scale:
1:200@A2
Drawing Number:
126 - 1208
Date:
June 2014
Status:
PLANNING
Revisions:

A: 00.00.00 - Revisions

NOTES:

3. Raised garden. Visual amenity.
4. Raised planting bed with integrated seating.
5. Paving Type 1 - Individual residential entrances.
6. Paving Type 2 - Shared residential entrances.
7. Paving Type 3 - Open space.
8. Paving Type 4 - Commercial entrances.
9. New boundary wall to BH Estate. Re-claimed brick. Height varies.
10. Existing boundary wall retained. Lowered locally where possible subject to party wall awards. Not less than 1.7m above proposed first floor level in the courtyard homes.
11. Terrace.
12. Balcony.
13. Green Roof - Bio diverse & Sedum

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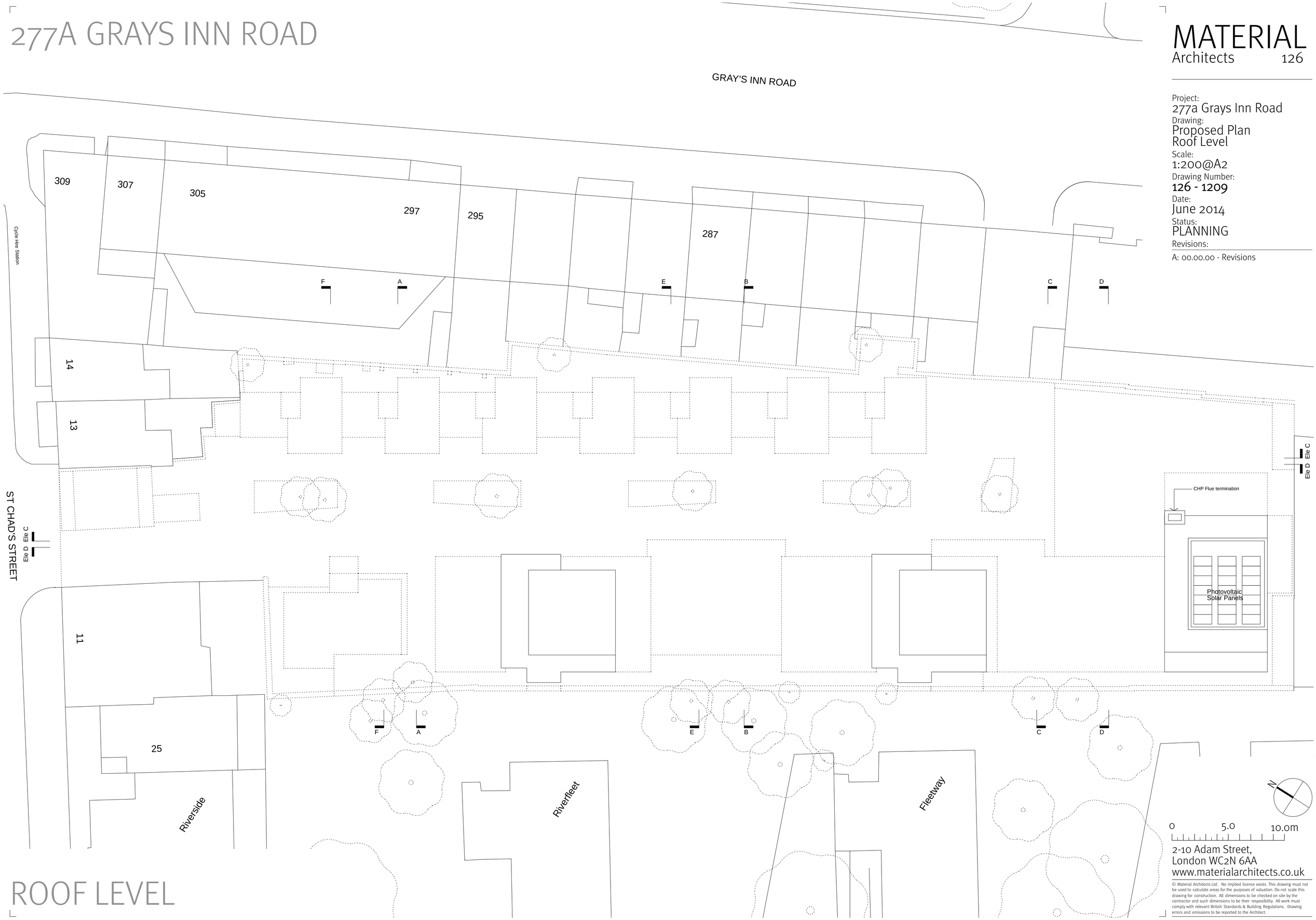
277A GRAYS INN ROAD



ROOF LEVEL

MATERIAL
Architects 126

Project:
277a Grays Inn Road
Drawing:
Proposed Plan
Roof Level
Scale:
1:200@A2
Drawing Number:
126 - 1209
Date:
June 2014
Status:
PLANNING
Revisions:

A: 00.00.00 - Revisions

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London WC2N 6AA
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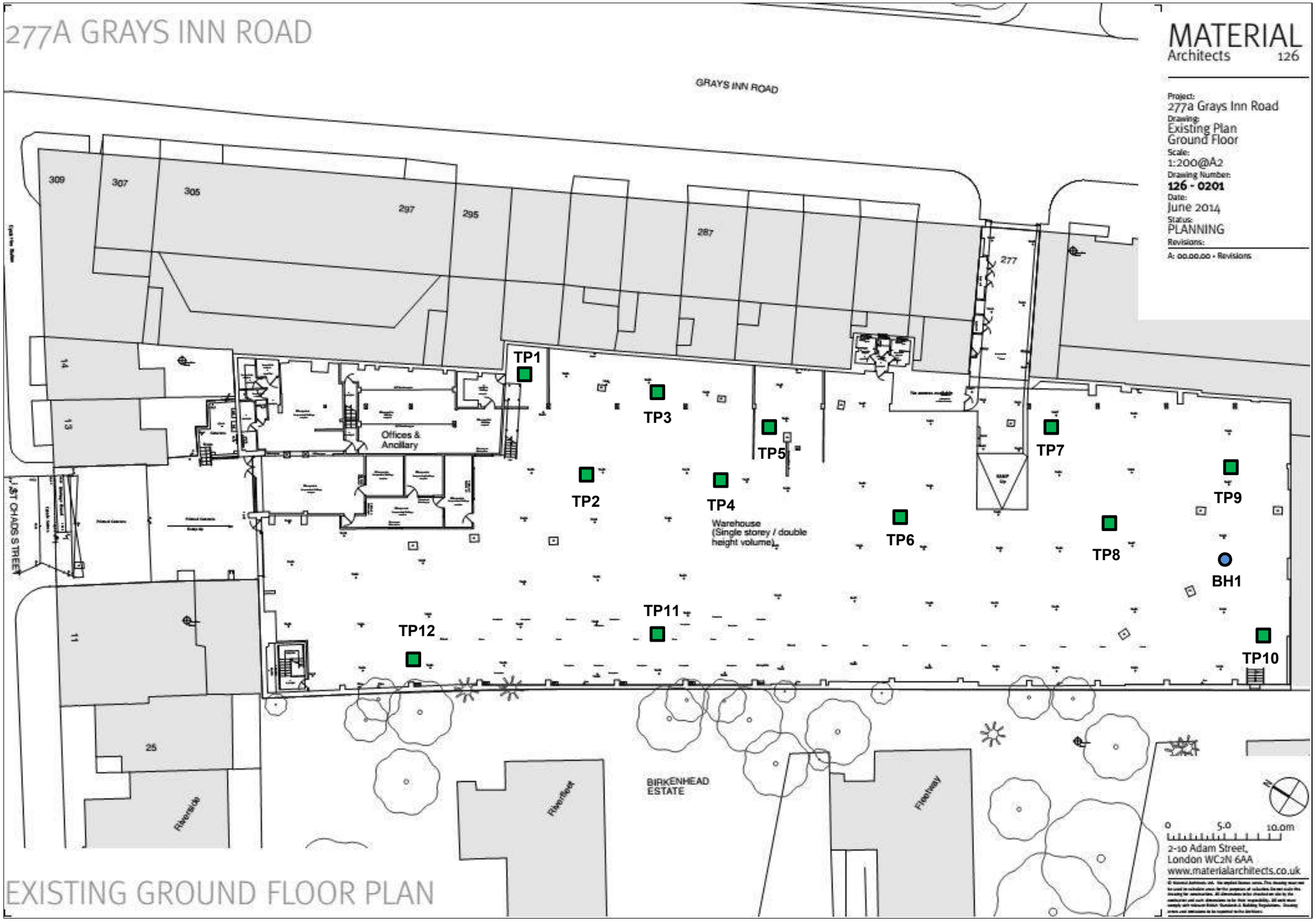
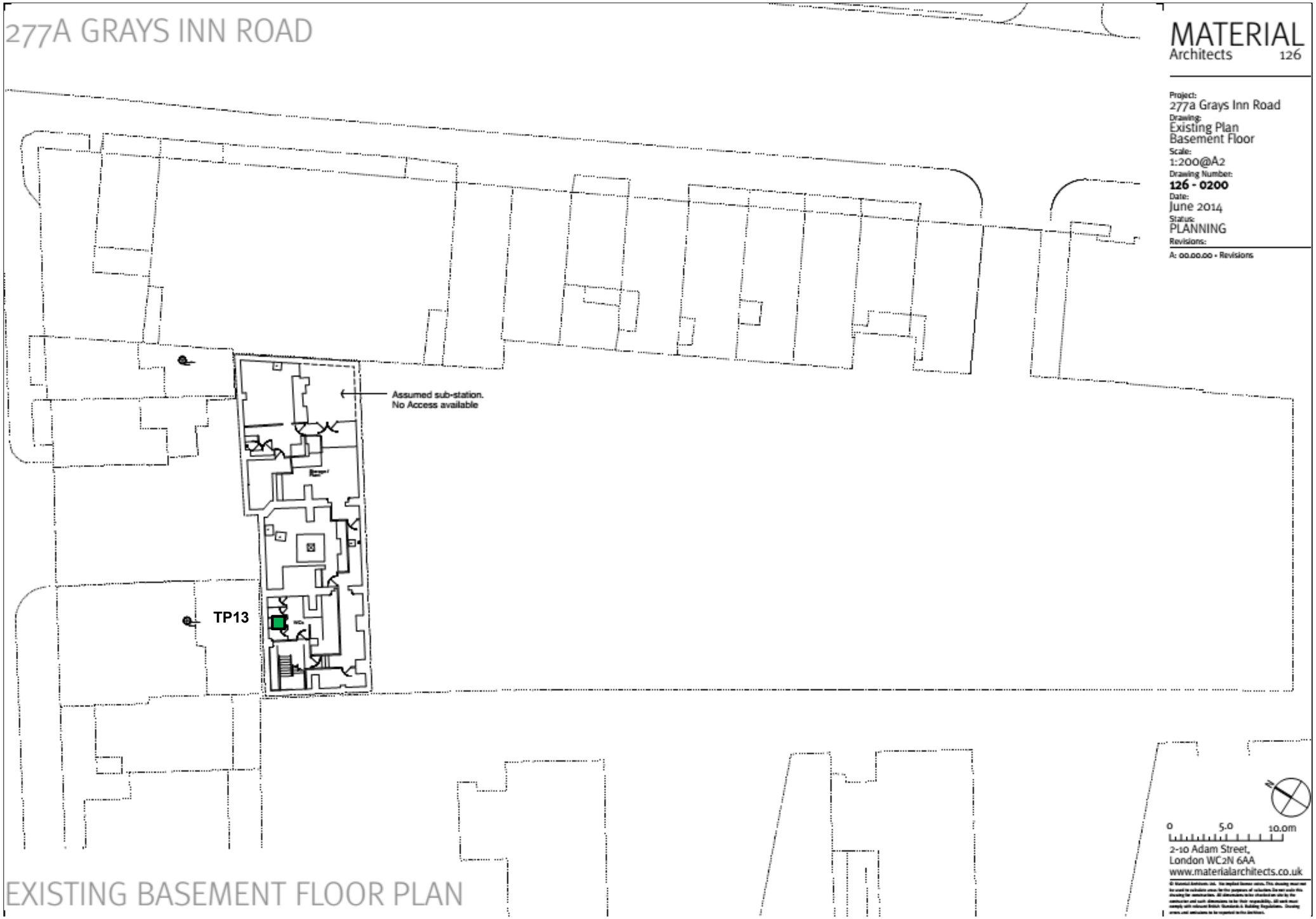
Figure 3 Exploratory Hole Location Plan.

Exploratory Hole Location Plan





Appendix A Planning Permission.

Camden

Regeneration and Planning
Development Management
London Borough of Camden
Town Hall
Judd Street
London
WC1H 8ND

Tel 020 7974 4444
Textlink 020 7974 6866

planning@camden.gov.uk
www.camden.gov.uk/planning

Kieron Hodgson /
Rebecca Dewey
Iceni Projects
Flitcroft House
114-116 Charing Cross Road
London
WC2H 0JR

Application Ref: **2014/4267/P**
Please ask for: **Gavin Sexton**
Telephone: 020 7974 **3231**

10 October 2014

Dear Sir/Madam

DECISION

Town and Country Planning Act 1990 (as amended)

Full Planning Permission Granted Subject to a Section 106 Legal Agreement

Address:
277A Gray's Inn Road
London
WC1X 8QF

Proposal:
Demolition of existing building and comprehensive mixed-use redevelopment of the site to provide 60 residential units (including 14 affordable flats) comprising: 56 units arranged around the new open space (seven x 2 storey houses plus lower-ground floor, 49 x flats in 3, 7 and 8 storey blocks plus lower-ground floor) and 4 flats in a 4 storey plus lower-ground building on St Chads street, with ancillary basement gym; with offices at ground and lower-ground floor, café/gallery (Class A1/Class A3) at ground floor, together with cycle parking, access, landscaping, boundary treatments and associated works.
Drawing Nos: Supporting documents:
Daylight/Sunlight Assessment, by GVA Schatunowski Brooks June 2014; Letter from Ian Absolon (GVA Schatunowski Brooks) dated 18th August 2014 re Sunlight/Daylight with accompanying sheet 'Job 13 - Amenity results new wall height'; Design and Access Statement, prepared by Material Architects; Letter from Andy Robertson (Peter Brett Associates) 26th June 2014 re Flood risk assessment with associated appendices. Letter from J W S Mayes (Spencer Mayes) dated 27th August 2014 re SUDs proposal; Heritage Statement June 2014 by KM Heritage; Landscape Design Statement Revision A 15th August 2014 by Tyrens-Mesh Partnerships; Marketing Report by Gerald Eve LLP ref

Shay/AD/G6215; Transport Statement June 2014 by Iceni Projects; Energy Statement by Environ June 2014 refUK11-19893; Sustainability Statement by Environ June 2014 refUK11-19893; Code for Sustainable Homes and BREEAM Pre-assessment by Environ June 2014 refUK11-19893; Ecological Assessment by Environ June 2014 UK1119893; Air Quality Assessment by Environ June 2014 refUK11-19893; Noise Assessment by Sharps Redmore, No 1414511 (dated 26th June 2014); Basement Impact Assessment Rev 02 by Pringeur James; Phase 1 Desk stop study report (ref. 12138) by Herts & Essex Site investigations; Mechanical and Electrical Services Report Planning Issue Rev01 by Spencer Mayes.

Drawings:
Prefix 126- 0100, 0200, 0201, 0202, 0301, 0302, 0303, 0401, 0402, 0403, 0404, 0900, 0901, 0902, 0903, 0904, 1101, 1200A, 1201A, 1202B, 1203B, 1204B, 1205B, 1206A, 1207B, 1208B, 1209, 1301, 1302A, 1303A, 1304A, 1305A, 1306A, 1401B, 1402, 1403, 1404A, 1405A, 1406A, 1501, 1502, 1503, 1504, 1505, 1506A, 1507, 1508A, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1621, 1622. Landscape hardworks 055-055_300A, Landscape softworks 055-055_300A

The Council has considered your application and decided to grant permission subject to the following condition(s):

Condition(s) and Reason(s):

1 The development hereby permitted must be begun not later than the end of three years from the date of this permission.

Reason: In order to comply with the provisions of Section 91 of the Town and Country Planning Act 1990 (as amended).

2 The development hereby permitted shall be carried out in accordance with the following approved plans and drawings approved subsequently by the local planning authority pursuant to conditions on this decision notice:

Drawings:
Prefix 126- 0100, 0200, 0201, 0202, 0301, 0302, 0303, 0401, 0402, 0403, 0404, 0900, 0901, 0902, 0903, 0904, 1101, 1200A, 1201A, 1202B, 1203B, 1204B, 1205B, 1206A, 1207B, 1208B, 1209, 1301, 1302A, 1303A, 1304A, 1305A, 1306A, 1401B, 1402, 1403, 1404A, 1405A, 1406A, 1501, 1502, 1503, 1504, 1505, 1506A, 1507, 1508A, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1621, 1622. Landscape hardworks 055-055_300A, Landscape softworks 055-055_300A,

Supporting documents:
Daylight/Sunlight Assessment, by GVA Schatunowski Brooks June 2014; Letter from Ian Absolon (GVA Schatunowski Brooks) dated 18th August 2014 re Sunlight/Daylight with accompanying sheet 'Job 13 - Amenity results new wall height'; Design and Access Statement, prepared by Material Architects; Letter from Andy Robertson (Peter Brett Associates) 26th June 2014 re Flood risk assessment with associated appendices. Letter from J W S Mayes (Spencer Mayes) dated 27th

August 2014 re SUDs proposal; Heritage Statement June 2014 by KM Heritage; Landscape Design Statement Revision A 15th August 2014 by Tyrens-Mesh Partnerships; Marketing Report by Gerald Eve LLP ref Shay/AD/G6215; Transport Statement June 2014 by Iceni Projects; Energy Statement by Environ June 2014 refUK11-19893; Sustainability Statement by Environ June 2014 refUK11-19893; Code for Sustainable Homes and BREEAM Pre-assessment by Environ June 2014 refUK11-19893; Ecological Assessment by Environ June 2014 UK1119893; Air Quality Assessment by Environ June 2014 refUK11-19893; Noise Assessment by Sharps Redmore, No 1414511 (dated 26th June 2014); Basement Impact Assessment Rev 02 by Pringeur James; Phase 1 Desk stop study report (ref. 12138) by Herts & Essex Site investigations; Mechanical and Electrical Services Report Planning Issue Rev01 by Spencer Mayes.

Reason: For the avoidance of doubt and in the interest of proper planning.

3 Detailed drawings, or samples of materials as appropriate, in respect of the following, shall be submitted to and approved in writing by the local planning authority before the relevant part of the work is begun:

a) Details including sections at 1:10 of all windows (including jambs, head and cill), ventilation grills, external doors and gates;

b) Plan, elevation and section drawings, including fascia, pilasters and glazing panels of the new shop fronts at a scale of 1:10;

c) Typical plan, elevation and section drawings of balustrading to terraces and balconies;

d) Manufacturer's specification details of all facing materials (to be submitted to the Local Planning Authority) and samples of those materials (to be provided on site).

The relevant part of the works shall be carried out in accordance with the details thus approved and all approved samples shall be retained on site during the course of the works.

Reason: To safeguard the appearance of the premises and the character of the immediate area in accordance with the requirements of policy CS14 of the London Borough of Camden Local Development Framework Core Strategy and policies DP24 and DP25 of the London Borough of Camden Local Development Framework Development Policies.

4 No lights, meter boxes, flues, vents or pipes, and no telecommunications equipment, alarm boxes, television aerials or satellite dishes shall be fixed or installed on the external face of the buildings, without the prior approval in writing of the local planning authority.

Reason: To safeguard the appearance of the premises and the character of the immediate area in accordance with the requirements of policy CS14 of the London Borough of Camden Local Development Framework Core Strategy and policies DP24 and DP25 of the London Borough of Camden Local Development