

KE Hotel, Manchester

Flood Risk Assessment & Drainage Strategy

May 2017

Waterman Infrastructure & Environment Limited
11 Peter Street, Manchester M2 5QR
www.watermangroup.com

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Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2008, BS EN ISO 14001: 2004 and BS OHSAS 18001:2007)

Issue	Date	Prepared by	Checked by	Approved by
First	19.05.17	Richard Baker	Stephen Moorhouse	Stephen Moorhouse

Comments

Comments

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1. Introduction

1.1. Waterman has been commissioned by KE Hotels to undertake a Flood Risk Assessment (FRA) in relation to the proposed development known as KE Hotel, Atkinson Street Manchester (hereafter referred to as the 'Site').

Site Description

1.2. The Site is approximately 0.08 hectares (ha) and is currently known as Invicta House. The Site is located off Deansgate, Manchester. The site is bound by Atkinson Street to the South, the Media Com building to the North (fronting Hardman Street). To the East is the former Magistrates Court and to the West is Little Quay Street, Blocks 202-203 Spinningfields. The site location is highlighted on the image below by the red circle.

Figure 1: Site Location Plan



1.3. A topographic survey of the Site has been undertaken by Survey Operations in December 2015 and is included in Appendix A. The survey shows the Site is impermeable comprising the existing building and car parking area to the rear. The site appears to be positively drained into the adjacent public sewer system.

Development Proposals

1.4. The application seeks planning permission from Manchester City Council (MCC) for: Detailed (Full) submission for Hotel use (Class C1).

1.5. The proposed illustrative Site layout is included in Appendix B.

Planning Policy and Guidance

National Planning Policy Framework

1.6. The National Planning Policy Framework[i] (NPPF) states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk. Where development is necessary in higher risk areas, it must be made safe without increasing flood risk elsewhere.

1.7. The NPPF states that Local Plans should be supported by Strategic Flood Risk Assessments (SFRA) and policies developed to manage flood risk from all sources, considering advice from the Environment Agency and other relevant flood risk management bodies, such as lead local flood authorities and internal drainage boards. It advises that Local Plans should apply a sequential, risk-based approach to the location of development to avoid, where possible, flood risk to people and property and manage any residual risk, taking account of the impacts of climate change, by:

- Applying the Sequential Test and if necessary, the Exception Test;
- Safeguarding land from development that is required for current and future flood management;
- Using opportunities offered by new development to reduce the causes and impacts of flooding; and
- Where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to facilitate the relocation of development, including housing, to more sustainable locations.

1.8. The NPPF clarifies that the aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding and that development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. If, following application of the Sequential Test, it is not possible (consistent with wider sustainability objectives) for the development to be in zones with a lower probability of flooding, the Exception Test can be applied if appropriate. For the Exception Test to be passed:

- It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA where one has been prepared; and
- A site-specific FRA must demonstrate that the development will be safe for its lifetime, taking account of the vulnerability of its users without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

1.9. As the Application Site is located within Flood Zone 1 and is considered to be at a low risk of tidal and fluvial flooding, the Sequential Test would be passed and the Exception Test would not be required.

1.10. The NPPF states that when determining planning applications, Local Planning Authorities should ensure that flood risk is not increased elsewhere and only consider development in areas at risk of flooding where it can be demonstrated that:

- Within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location; and

- Development is appropriately flood resilient and resistant, includes safe access and escape routes where required, any residual risk can be safely managed (including emergency planning), and priority is given to the use of Sustainable Drainage Systems (SuDS).

1.11. Technical Guidance to the NPPF[ii] provides additional guidance to Local Planning Authorities, to ensure effective implementation of the planning policies set out within the NPPF regarding development in areas at risk of flooding. The guidance retains key elements of superseded Planning Policy Statement 25[iii] (PPS25) as an interim measure, pending a wider review of guidance to support planning policy.

1.12. The Technical Guidance states that developers and Local Planning Authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of SuDS. It provides advice on taking climate change into account, setting out recommended contingency allowances for net sea level rise and peak rainfall intensities, which should be increased by between 5% and 40% from now until the year 2115. It also advises on flood resilience and resistance measures when dealing with the residual risks remaining after applying the sequential approach and mitigating actions.

1.13. The Technical Guidance also includes advice on flood risk vulnerability and flood zone compatibility in Table 1. The following flood zones refer to the probability of river and sea flooding, ignoring the presence of defences:

- Zone 1 - low probability: less than 1 in 1,000 annual probability of river or sea flooding (<0.1%) in any year;
- Zone 2 - medium probability: between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% - 0.1%) in any year;
- Zone 3a - high probability: 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability flooding from the sea (>0.5%) in any year; and
- Zone 3b - the functional floodplain: where water has to flow or be stored in times of flood; identification should take account of local circumstances but would typically flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme 1 in 1,000 (0.1%) flood.

1.14. Flood risk vulnerability is split into five classifications in Table 2 of the Technical Guidance, as follows, and the compatibility of these within each flood zone is set out in Table 3.

- Essential utility and transport infrastructure;
- Highly vulnerable, e.g. emergency services (those required to be operational during flooding), basement dwellings;
- More vulnerable, e.g. residential dwellings, hospitals, schools, hotels, drinking establishments;
- Less vulnerable, e.g. retail, offices, storage and distribution, leisure, restaurants; and
- Water compatible development, e.g. docks, marinas, wharves.

Flood and Water Management Act

1.15. The Flood and Water Management Act[iv] (FWMA, 2010) removes the automatic right of connection into public sewers.

Manchester, Salford, Trafford, Strategic Flood Risk Assessment

1.16. A Strategic Flood Risk Assessment (SFRA)[v] was published in December 2011.

1.17. The report "*is a technical piece of work which presents an independent analysis of the risk posed by flooding from all sources in the study area, and the version completed in 2011 is the most up to date SFRA for Manchester. One of the primary purposes of the SFRA is to provide evidence to inform future sustainable development within Manchester, Salford and Trafford, particularly in the Local Authorities' Core Strategies. This collaboration was based upon hydraulic linkages for watercourses and infrastructure across the three authorities, together with a shared policy focus at the heart of Greater Manchester.* "

1.18. The main content of the SFRA includes:

- An overview of flood risk issues;
- Recommended policies to aid the councils in managing the flood risk;
- An outline of requirements for detailed Flood Risk Assessments; and
- Advice on SuDS and mitigation measures to consider as part of a development proposal.

1.19. Information from the SFRA regarding fluvial, tidal, pluvial and groundwater flooding is included within Chapter 2 of this report, Supplemented by The Environment Agency's updated Flood Mapping information.

Scope of Report

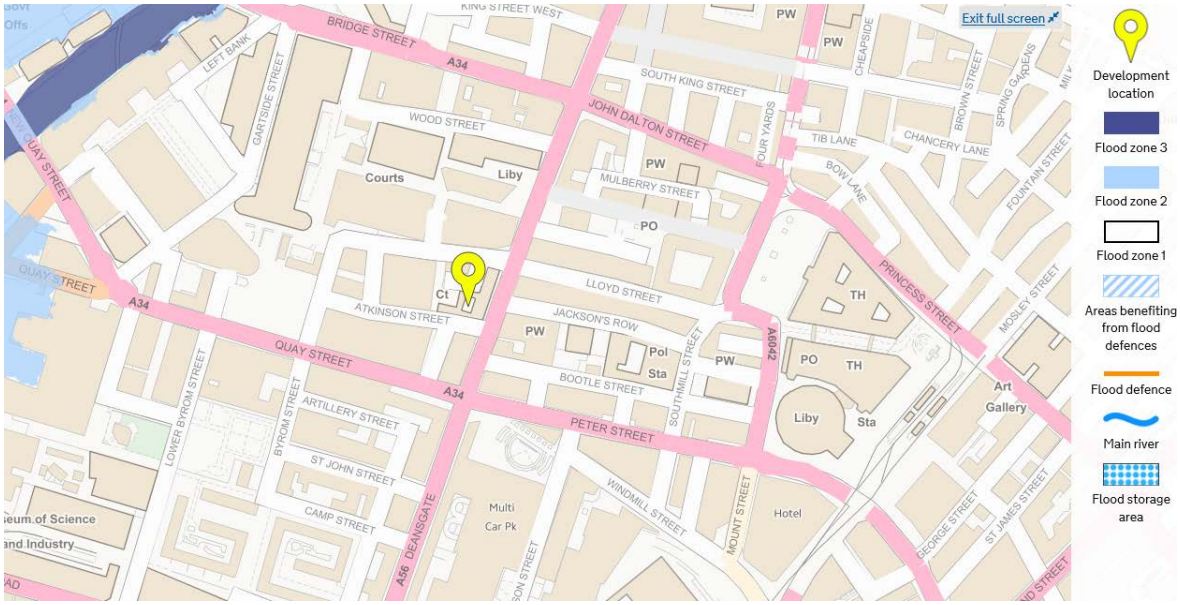
1.20. This report assesses the potential effects of tidal, fluvial, groundwater, pluvial and artificial sources of flooding upon the Proposed Development. In line with current policy, the management of surface water is also assessed, and a strategy to effectively manage runoff whilst working within Site specific constraints is proposed, so as not to increase flood risk elsewhere.

2. Sources of Potential Flooding

Tidal and Fluvial

2.1. The Environment Agency's Flood Map (refer to Figure 2) shows the site being located within Flood Zone 1, indicating a low risk of flooding, less than 0.1% (1 in 1000) from rivers and tidal sources in any given year.

Figure 2: Environment Agency Flood Map



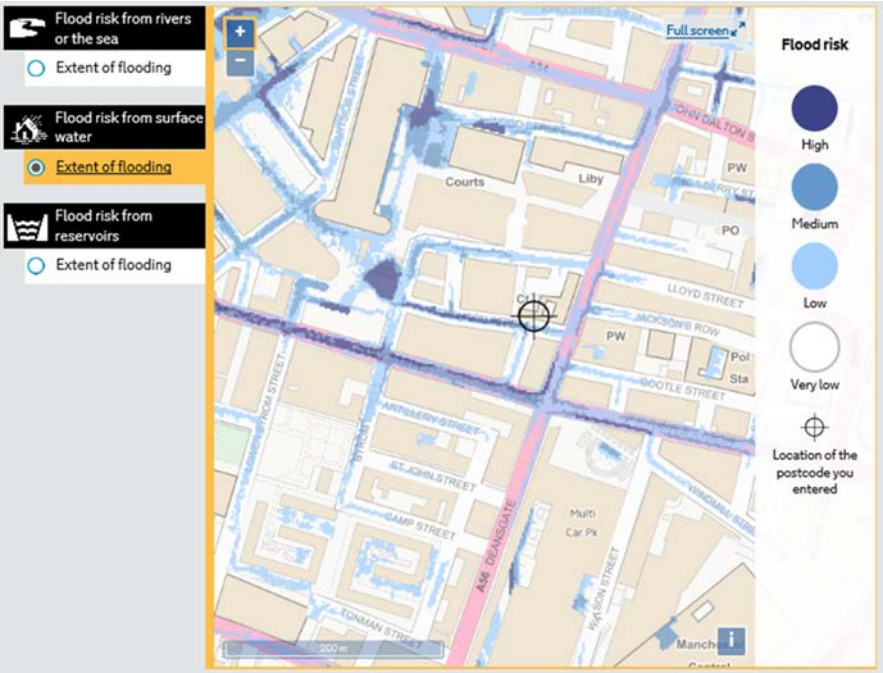
2.2. As such, the risk to the Site from Tidal and Fluvial flooding is considered to be very low.

Pluvial

2.3. Pluvial flooding occurs when natural and engineered drainage systems have insufficient capacity to deal with the volume of rainfall. Pluvial flooding can sometimes occur in urban areas during an extreme, high intensity, short duration summer rainfall event which overwhelms the local surface water drainage systems, or in rural areas during medium intensity, long duration events where saturated ground conditions prevent infiltration into the subsoil. This flood water would then be conveyed via overland flow routes dictated by the local topography.

2.4. The Environment Agency's Flooding from Surface Water map is presented in Figure 3 which indicates tthe Site is at 'Very Low' risk of surface water flooding.

Figure 3: Environment Agency Surface Water Flood Maps



2.5. The mapping in Figure 3 suggests that surface water flow paths would be from East to West along Atkinson Street with the site elevated above the local topography. Any basement proposals should consider the impact of openings on to Atkinson Street/Little Quay Street and the likelihood of opening up flood paths towards/into the building. This risk may be mitigated by maintaining existing FFL and threshold levels.

Groundwater

Groundwater flooding occurs when groundwater levels increase sufficiently for the water table to intersect the ground surface. Groundwater flooding can occur in a variety of geological settings including valleys, in areas underlain by chalk, and in river valleys with thick deposits of alluvium and river gravels. Information available from the British Geological Society suggests the Site sits above made ground overlying Dense Sand/Sandstone at a fairly shallow depth. Given the findings of the boreholes it is anticipated that the risk of flooding associated with groundwater is low.

Artificial Sources of Flooding

2.6. There are no artificial water sources (canals, reservoirs, etc.) within close vicinity of the site that could potentially be the source of flood risk to the site. Flood risk from artificial sources is therefore considered low.

Summary

2.7. The Site is considered at low to very low risk of flooding from tidal, fluvial, pluvial, groundwater and artificial sources.

3. Historical Flooding

3.1. We are not aware of any recorded flooding events to the site.

4. Surface Water Management

4.1. Guidance for the disposal of surface water from a development Site indicate infiltration systems are to be considered as the primary solution. If this is not practical, discharge to a watercourse is to be considered as the next available alternative. Only if these options are unavailable, and other sustainable drainage methods not possible, should the use of the public sewerage system be considered.

4.2. Given the proximity (within 5m) to adjacent properties the use of infiltration drainage techniques would not be considered appropriate under Building Regulations.

4.3. The site is currently connected to the public sewer network.

4.4. The wider Spinningfields project delivered improvements to the existing United Utilities combined sewer system. The strategy relieved the existing combined network by providing an independent surface water system including the provision of a new outfalls into the River Irwell.

4.5. As part of this strategy new surface water drainage was installed within Little Quay Street to facilitate the redevelopment of the area including stub-connections for future phases of redevelopment.

4.6. Please see appendix C for supporting information from the Spinningfields Development Strategy this includes:

- Drawing 8530-405 Overall Drainage Strategy for Spinningfields Area
- Drawing 8530-446 Masterplan for Spinningfields Area with drainage
- Drawing 8530-449 Drainage Plan Indicating Catchment from Area 201 to be connected into new surface water sewer.
- Drainage 8530-444 Drainage for Plots including 201 (including the redeveloped building and associated car park).

Existing Catchments

4.7. The site is comprising the existing building and associated parking area, the site is 100% impermeable and positively drained into the adjacent public sewer system.

Proposed Catchments Discharge Restrictions & Attenuation Estimates

4.8. The site is currently drains into the existing United Utilities combined sewer. The new surface water sewer within Little Quay Street has been installed to allow for the future redevelopment of the site and incorporates lateral connections to allow the new building to be connected directly to the surface water system.

4.9. The 225mm diameter stub-connections constructed under the earlier phase of development were intended for use by this site. The removal of existing surface water connections from the combined sewer system will reduce the risk of flooding from this system.

Adoption & Maintenance

4.10. The drainage connections will be directly into the adjacent sewer system which is adopted by United Utilities. Private connections and associated lateral drainage will be maintained by the building owner.

5. Foul Water Drainage

5.1. It is anticipated that the site will re-use existing foul water connections into United Utilities public sewer system.

5.2. The indicative foul drainage layout can be seen in Appendix D.

6. Conclusions

6.1. The Site is located within Flood Zone 1 and is therefore considered by the Environment Agency to be at a low risk of tidal and fluvial flooding.

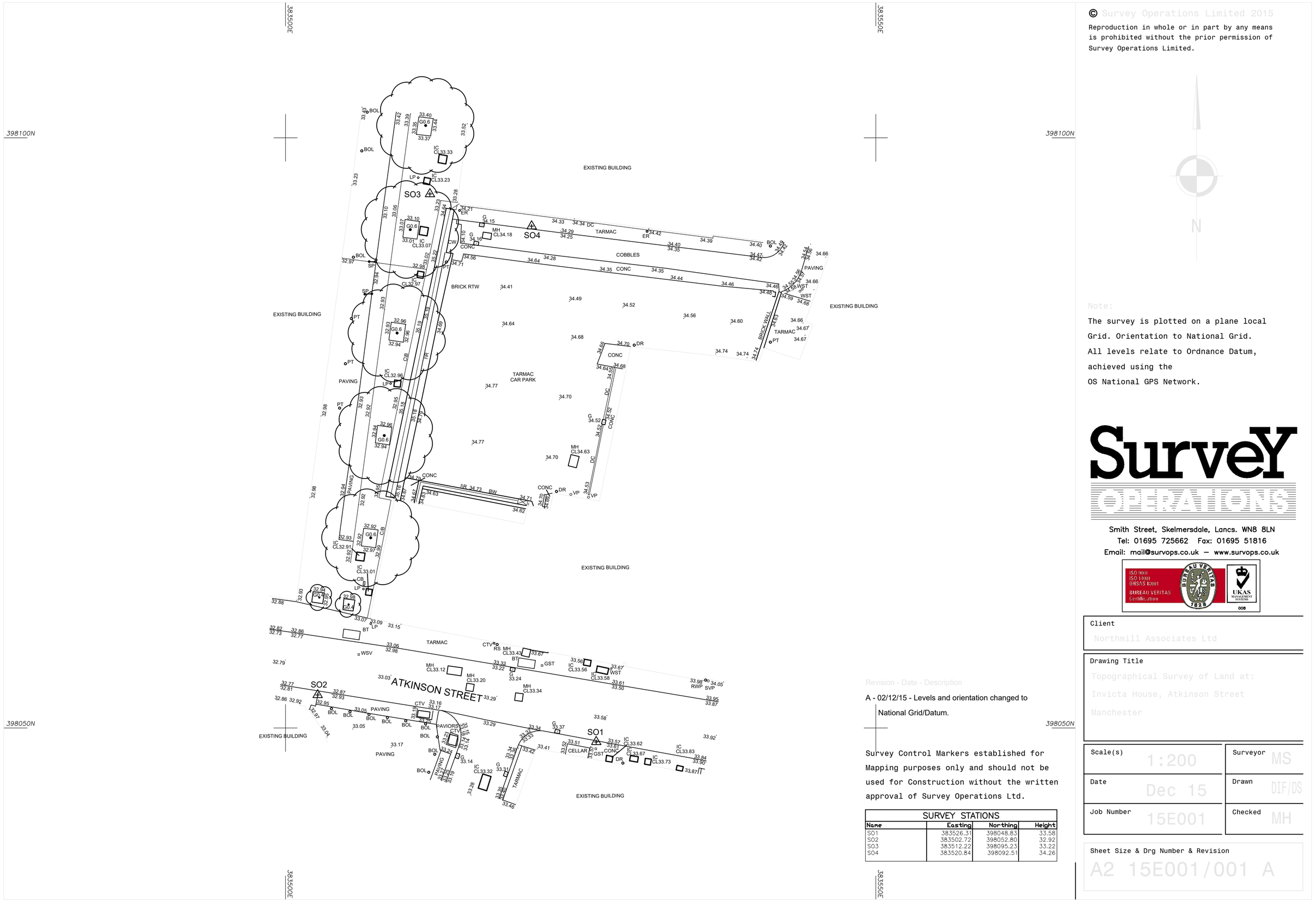
6.2. Pluvial or Surface Water Flood Risk is generally considered to be 'Very Low' and the flood risk from artificial sources has also been assessed as very low.

6.3. It is important to note that the surface water management/drainage provision included in this Flood Risk Assessment demonstrates technical feasibility and further detailed drainage design works will be undertaken. It is simply a demonstration of a suitable and technically feasible design for the proposed development, based on the information available at present.

6.4. This report demonstrates that the proposed Development would be at a low risk of flooding. It also confirms that surface water run-off from the development could be drained sustainably, ensuring that flood risk is not increased elsewhere. It is anticipated that the information provided within this report would satisfy the requirements of the NPPF.

APPENDICES

A. Topographic Survey


383500E
383550E
398100N
398050N
SO1
SO2
SO3
SO4
EXISTING BUILDING
ATKINSON STREET
TARMAC
CAR PARK
BRICK RTW
COBBLES
PAVING
CONC
TARMAC
CELLAR
BRICK WALL
PAVIORS
EXISTING BUILDING
EXISTING BUILDING
EXISTING BUILDING

B. Indicative Masterplan



Basement Plan

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HOTEL GUESTROOMS:

8th:	12 no. guestrooms
7th:	18 no. guestrooms
6th	18 no. guestrooms
5th:	19 no. guestrooms
4th:	19 no. guestrooms
3rd:	19 no. guestrooms
2nd:	20 no. guestrooms
1st:	20 no. guestrooms
Mezzanine:	FOH/BOH
Ground:	FOH
Basement:	FOH/BOH
Total:	145 no. guestrooms

inc. 9 deluxe rooms (6%)
inc. 8 acc. guestrooms (5%)

General Notes:
Scheme subject to survey, planning, boundary confirmation and brand approval. All dimensions and areas are approximate.

Key

- Front Of House
- Back Of House
- Bedroom Accommodation
- Change in level @ GF

0m 2m 8m

Merchant Exchange
20 Bell Street
Glasgow
G1 1LG

+44(0)141 552 2194
weareica.com

project title //
Invicta House
Manchester
Moxy Hotel

drawing title //
Basement Plan

issue stage //
PLANNING

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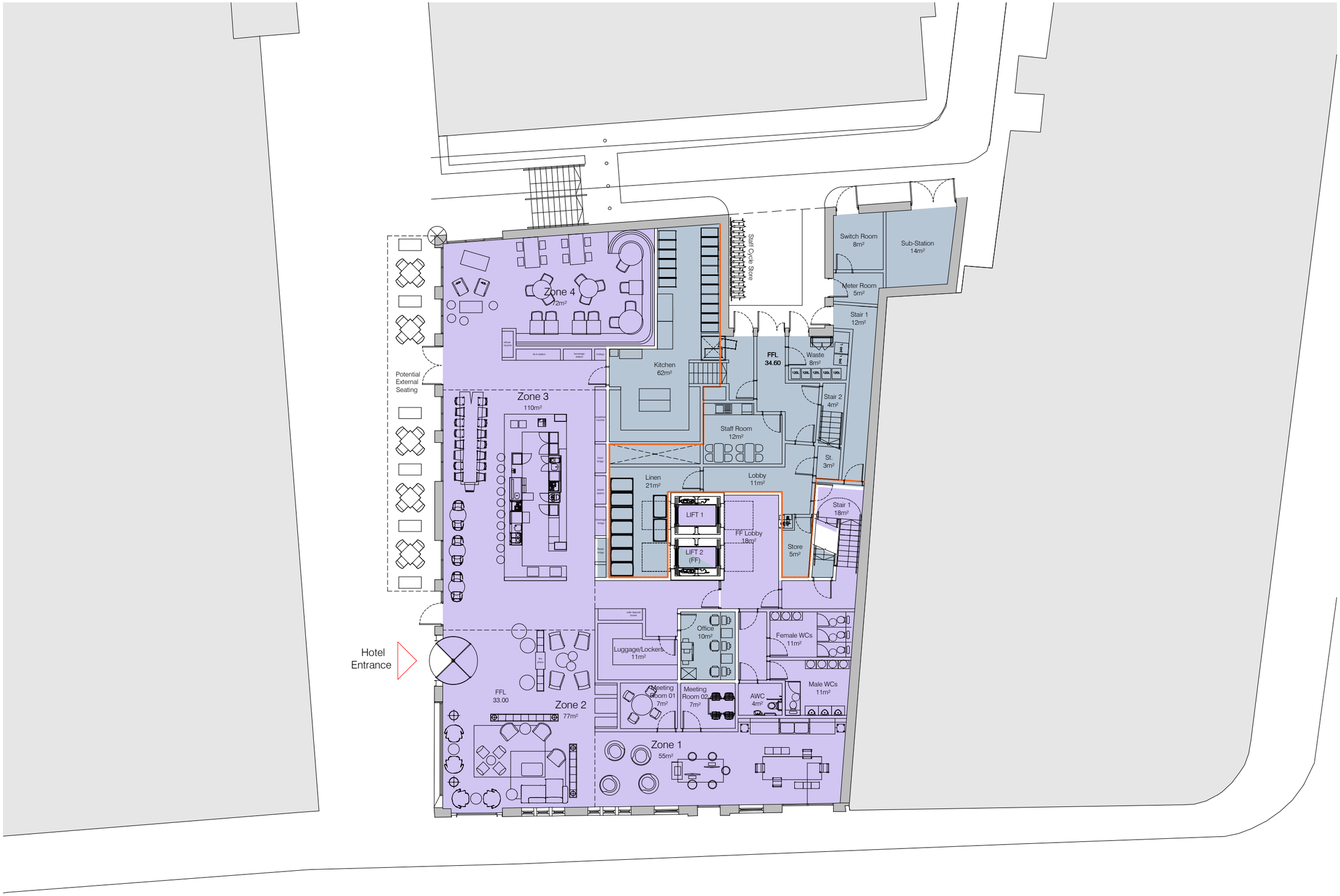

Ground Floor Plan

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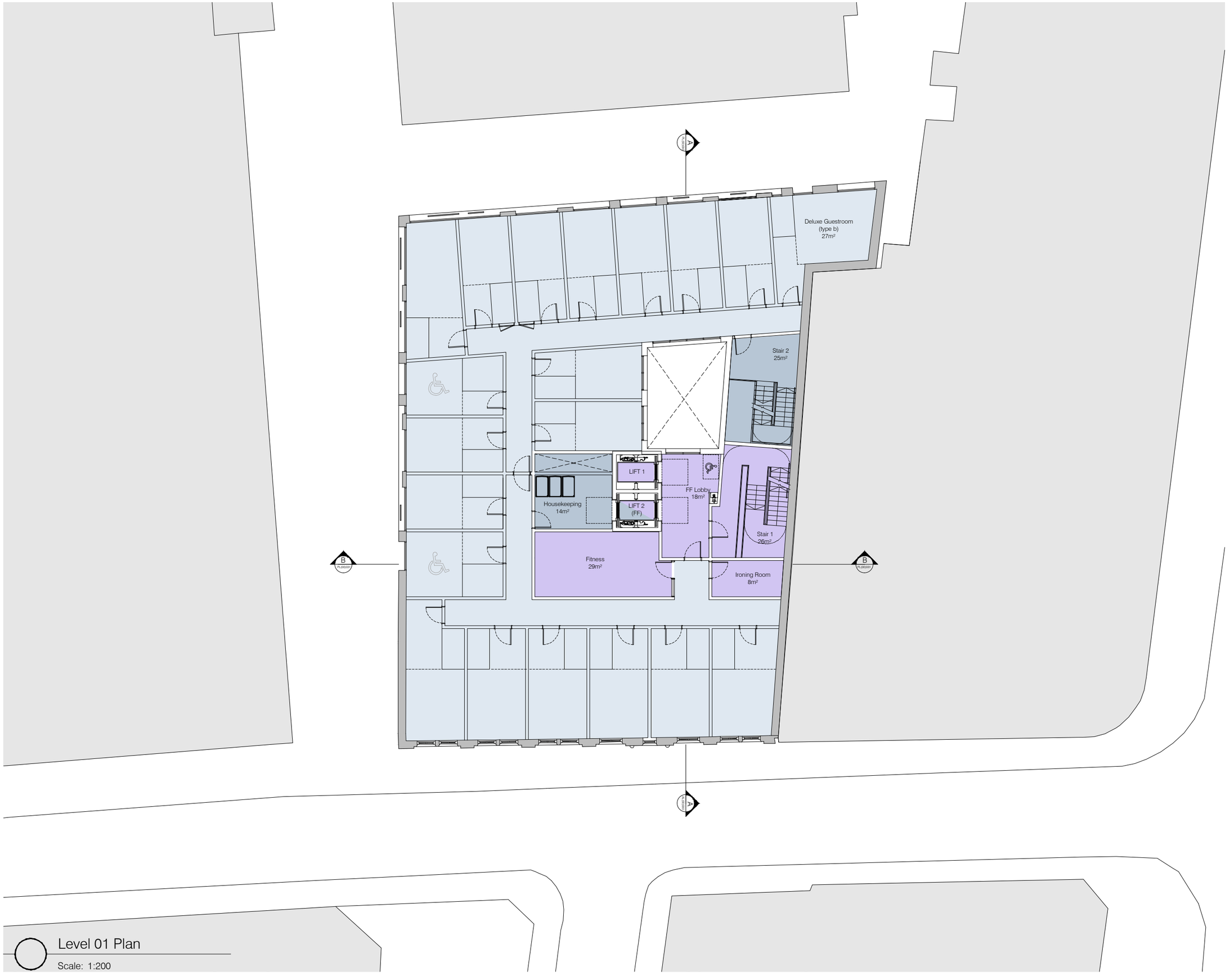

Level 01 Plan

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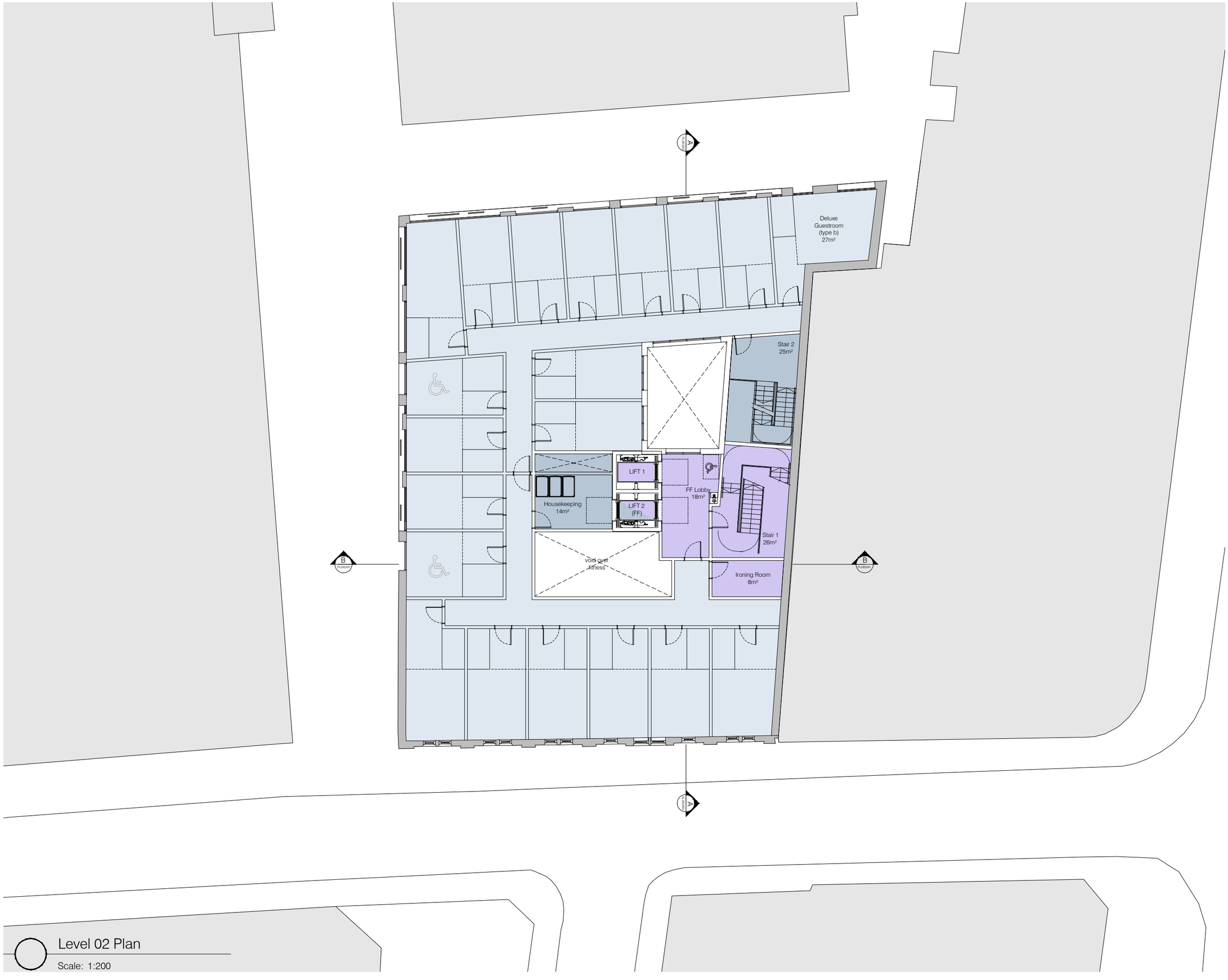

Level 02 Plan

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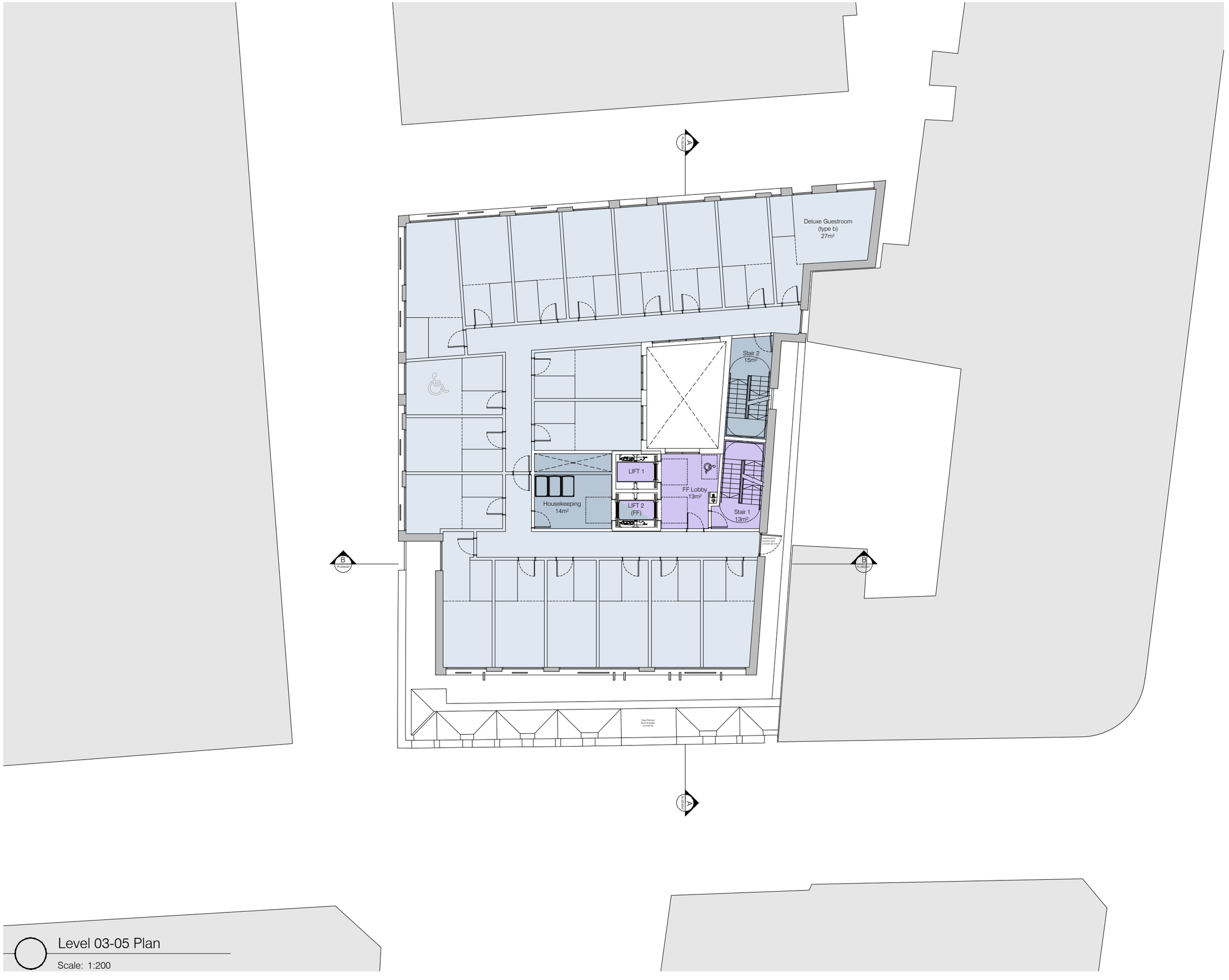

Level 03-05 Plan

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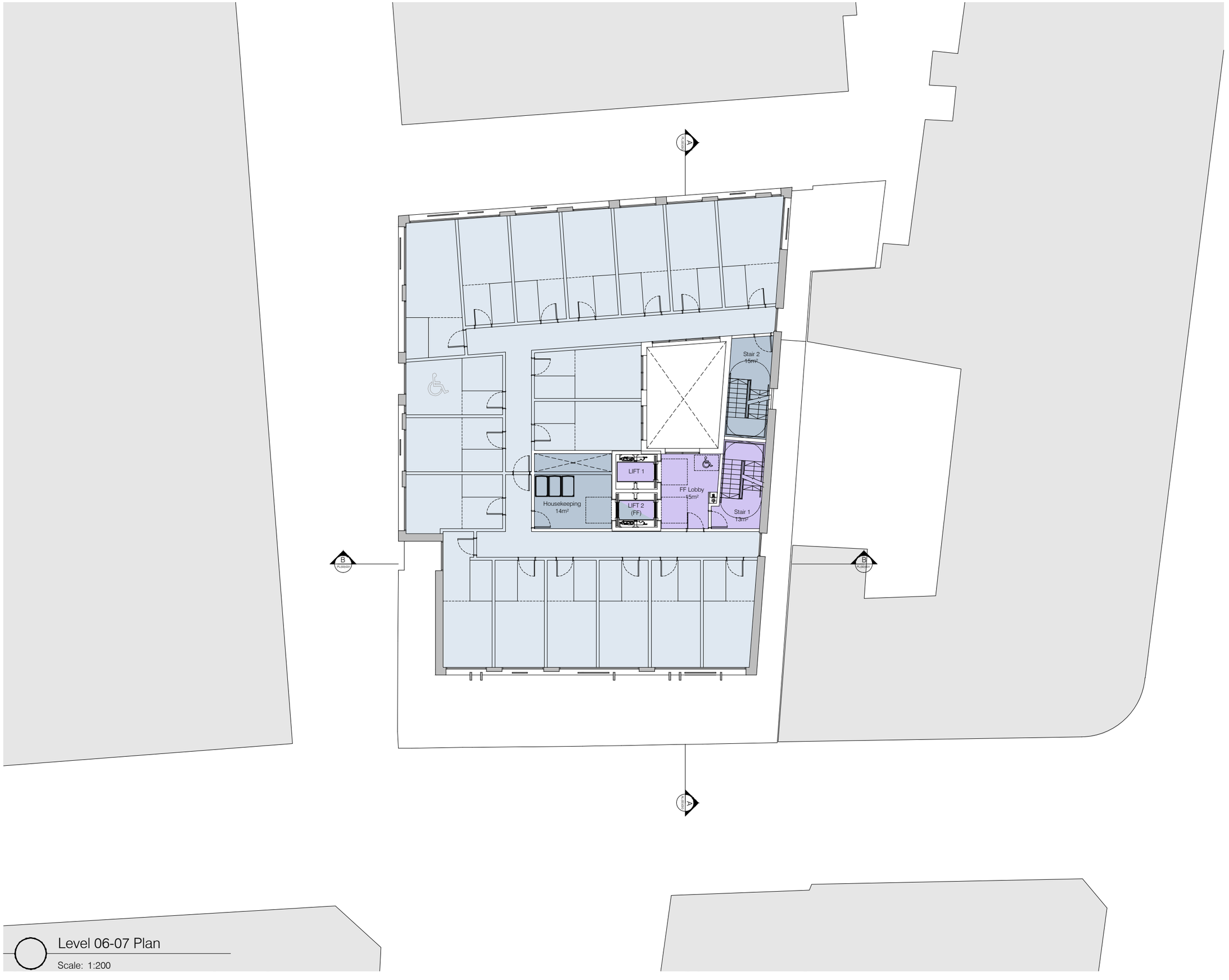

Level 06-07 Plan

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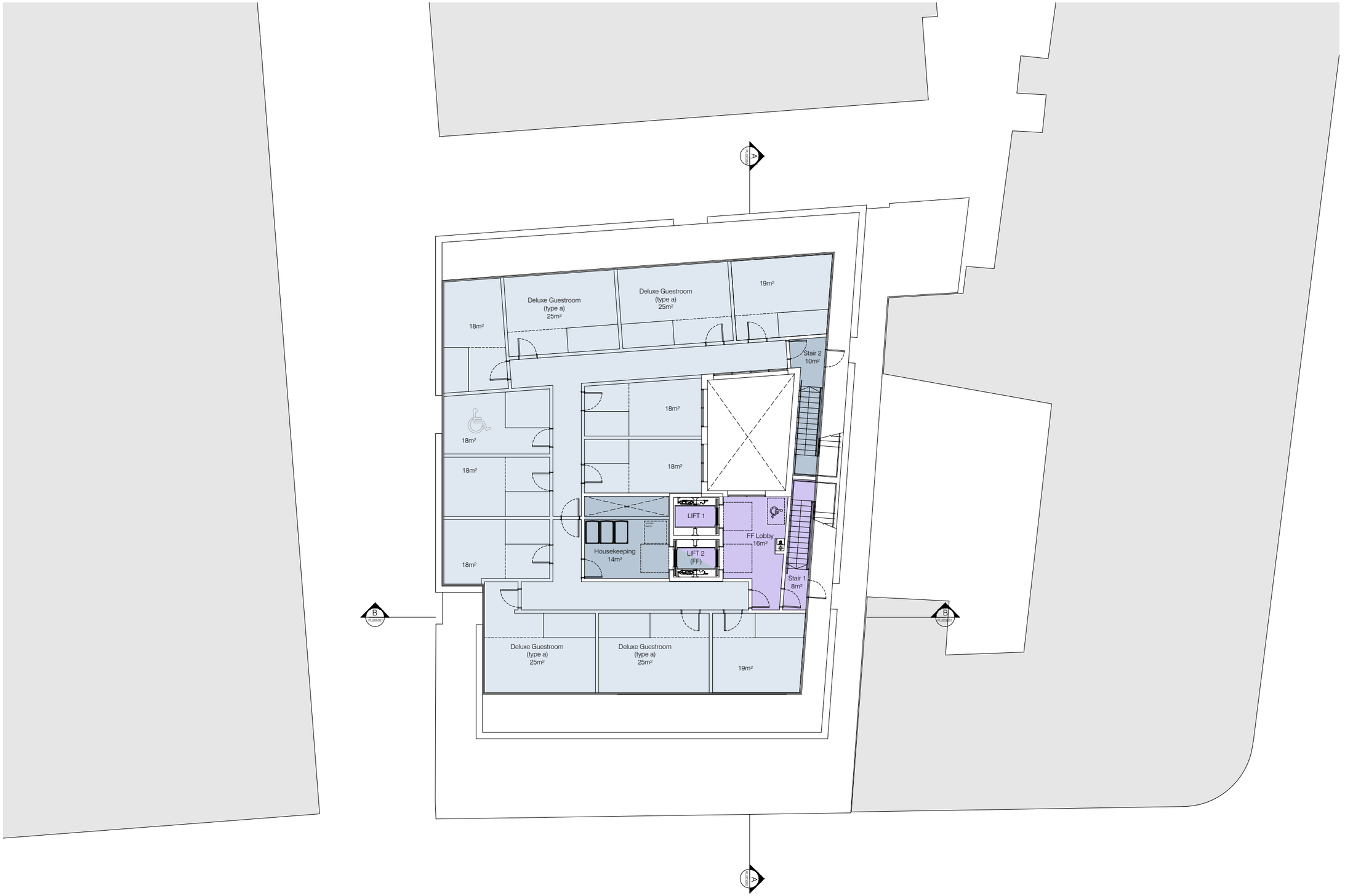

Level 08 Plan

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inc. 8 acc. guestrooms (5%)

General Notes:
Scheme subject to survey, planning, boundary confirmation and brand approval. All dimensions and areas are approximate.

Key

- Front Of House
- Back Of House
- Bedroom Accommodation

0m 2m 8m

Merchant Exchange
20 Bell Street
Glasgow
G1 1LG

+44(0)141 552 2194
weareica.com

project title //
Invicta House
Manchester
Moxy Hotel

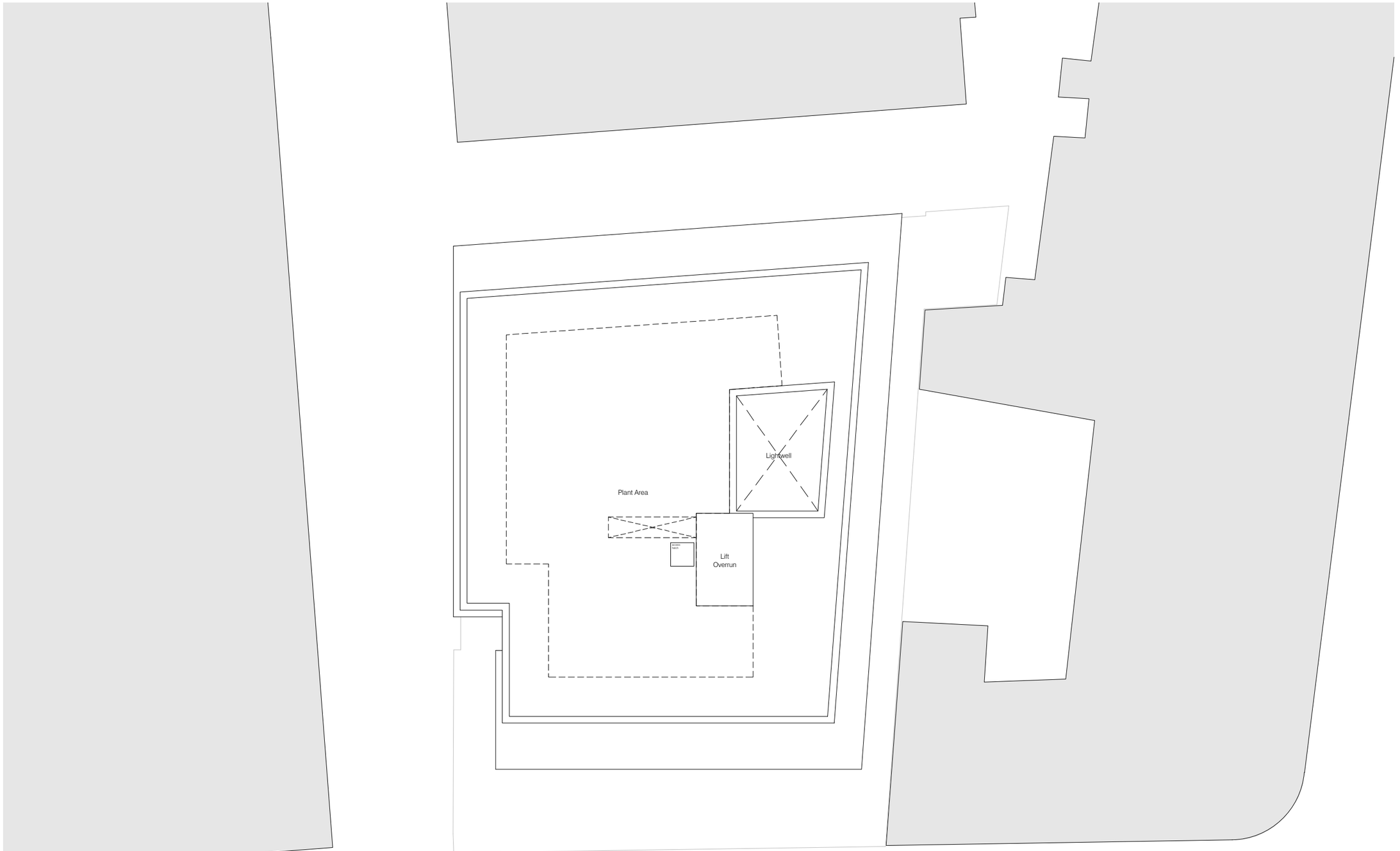
drawing title //
Level 08 Plan

issue stage //
PLANNING

date //	drawn //	scale @ A3 //
JAN17	NVR	1:200

project //	dwg number //	revision //
781	PL(00)019	-

DRAFT 24.02.17



Roof Plan

Scale: 1:200

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revisions //	by //	date //
-	-	-
-		

0m 2m 8m

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Glasgow
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project title //
Invicta House
Manchester
Moxy Hotel

drawing title //
Roof Plan

issue stage //
PLANNING

date //	drawn //	scale @ A3 //
JAN17	NVR	1:200

project //	dwg number //	revision //
781	PL(00)020	-

DRAFT 21.02.17

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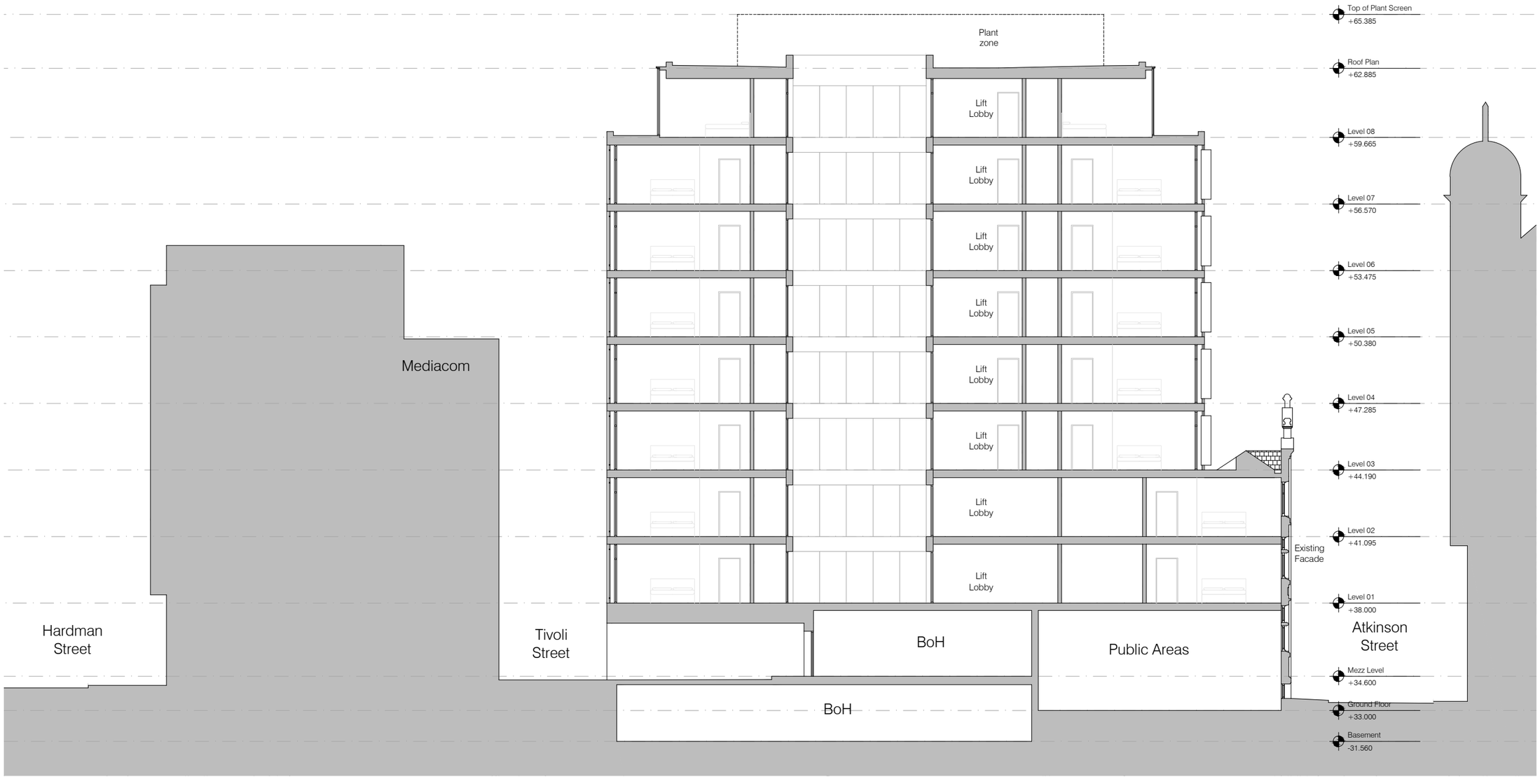

Section A-A

Scale: 1:200

0m 2m 8m

Merchant Exchange
20 Bell Street
Glasgow
G1 1LG

+44(0)141 552 2194
weareica.com

project title //
Invicta House
Manchester
Moxy Hotel

drawing title //
Proposed Section AA

issue stage //
PLANNING

date //	drawn //	scale @ A3 //
JAN17	NVR	1:300

project //	dwg number //	revision //
781	PL(00)030	-

DRAFT 22.02.17

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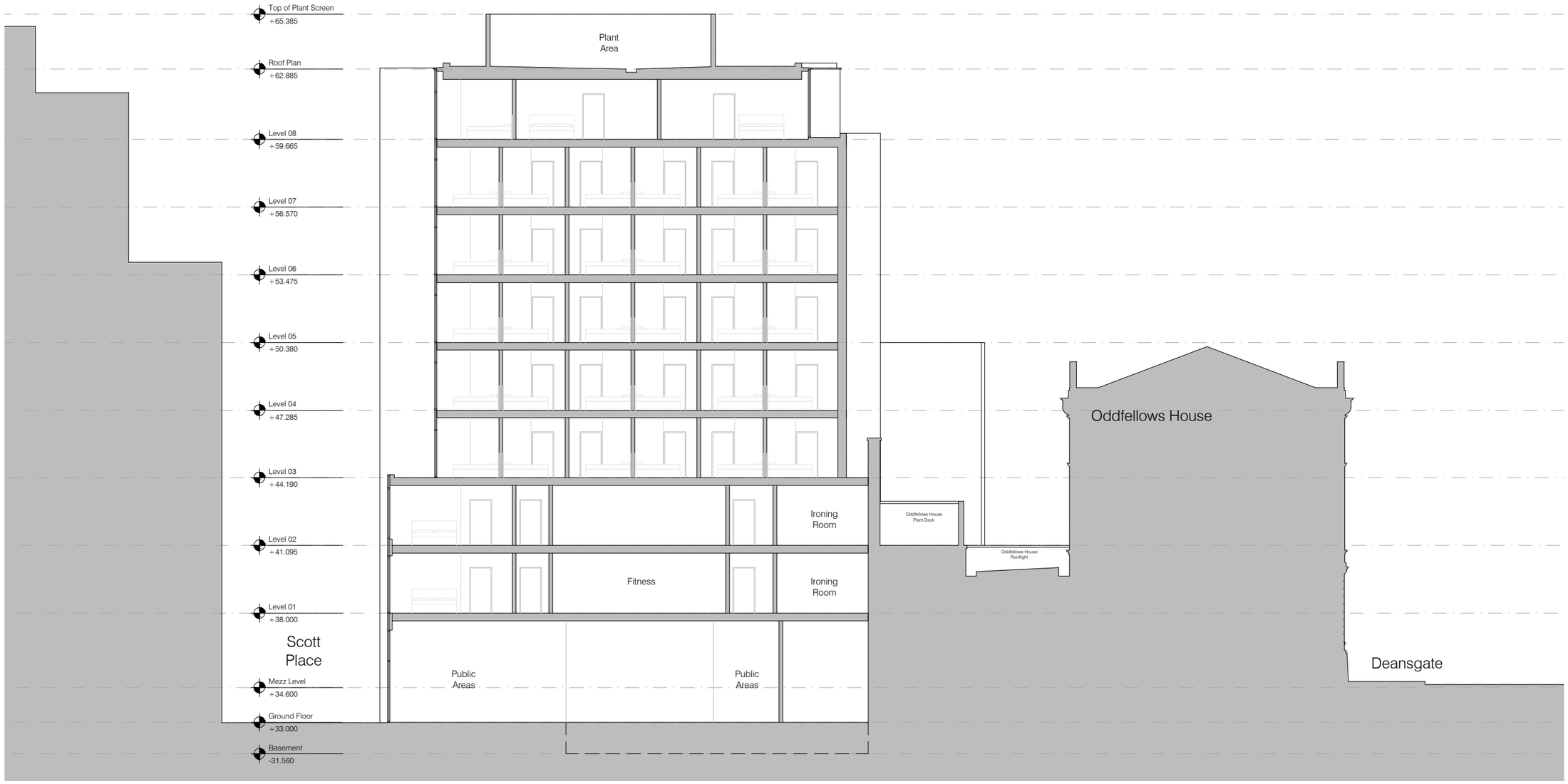

Section BB

Scale: 1:200

0m 2m 8m

Merchant Exchange
20 Bell Street
Glasgow
G1 1LG

+44(0)141 552 2194
weareica.com

project title //
Invicta House
Manchester
Moxy Hotel

drawing title //
Proposed Section BB

issue stage //
PLANNING

date //	drawn //	scale @ A3 //
JAN17	NVR	1:200

project //	dwg number //	revision //
781	PL(00)031	-

DRAFT 22.02.17

C. Spinningfields Development Information

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NEW FOUL
EX COMBINED
DIVERTED COMBINED
PROPOSED SURFACE WATER
ABANDONED COMBINED

REF	DATE	DRN	DESCRIPTION	CHK
P7	21/08/03	RJB	New building arrangements added plus latest amendments to drainage layout	
P6	08/08/02	RJB	Connections added.	BW.
P5	16/5/02	RJB	DRAINAGE UPDATED TO SUIT LATEST DETAIL DRAWINGS.	BW
P4	18/3/02	AJH	LAYOUT AMENDED TO SUIT PROPOSED BASEMENTS	BW
P3	21/2/02	RJB	Latest site overlay & drainage mods added DRAINAGE ADJACENT TO PLOT 401 EXTENDED. DRAINAGE IN CROWN SQUARE AMENDED DRAINAGE ADJACENT OT RYLANDS BUILDING ADDED	BW
P2	08/08/01	AJH	ISSUED FOR INFORMATION	BW
P1	23/7/01	BW	ISSUED FOR INFORMATION	RIB

AMENDMENTS

PROJECT:–
SPINNINGFIELDS

TITLE:–
OVERALL DRAINAGE STRATEGY

CLIENT:–
ALLIED LONDON PROPERTIES

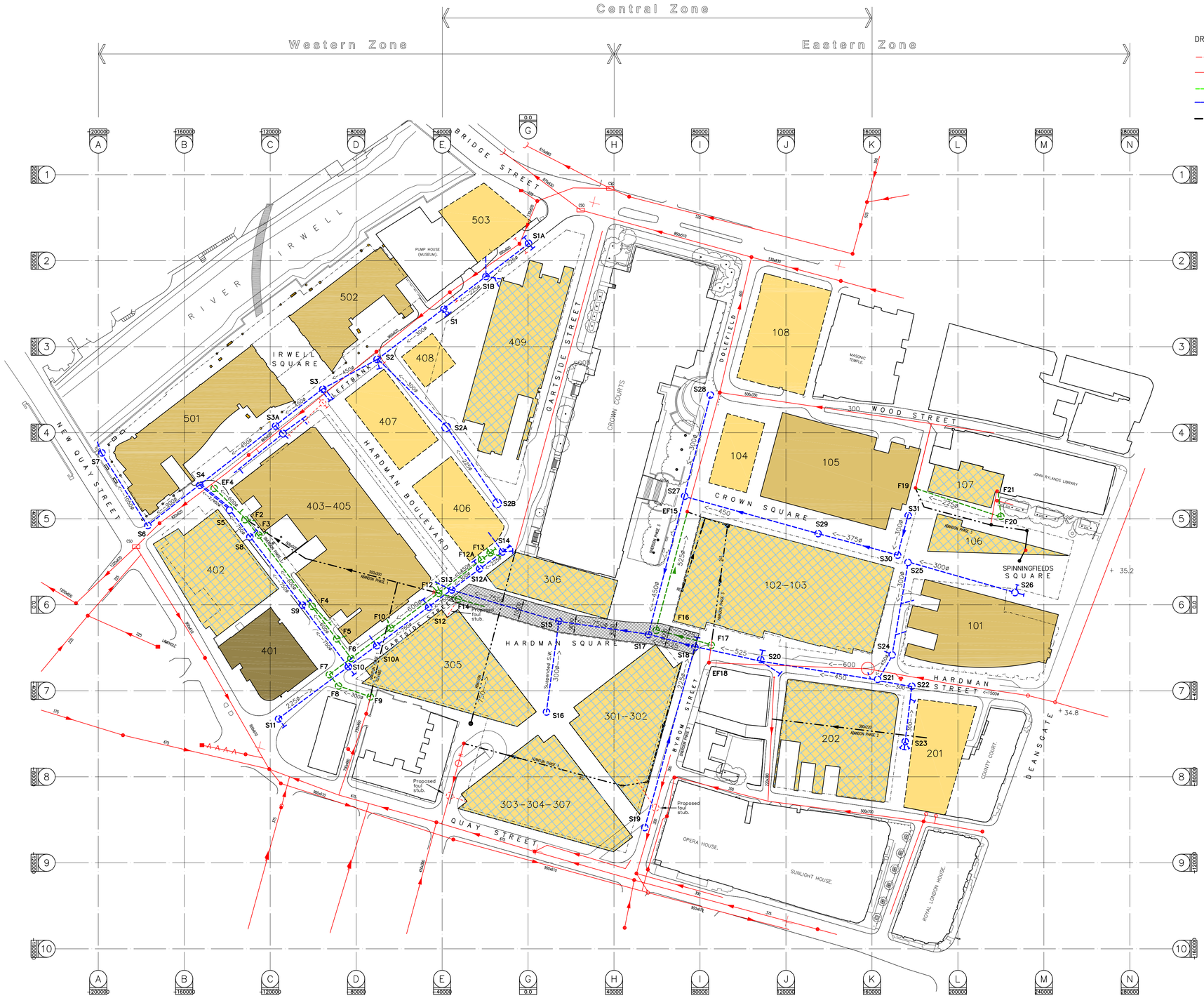
ARCHITECT:–
BDP

Waterman BBT
Consulting Engineers
DELPHIAN HOUSE, RIVERSIDE, MANCHESTER M3 5AP
Tel: 0161 839 8392 wbbtmcr@waterman-group.co.uk Fax: 0161 839 8394
Also at:–
BRADSHAW HOUSE, 31 WATERLOO LANE, LEEDS LS13 2JB
Tel: 0113 256 3322 leeds@waterman-group.co.uk Fax: 0113 257 5871

Drawing Status:–
PRELIMINARY

Designed by:–	Checked by:–	Project No:– 8530
Drawn by:– OT	Date:– 19/7/01	
Scales:– work to figured dimensions only 1:1000		Computer File No:– 8530-405P7

DRAWING No:– 8530–405 Revision P7



DRAINAGE LEGEND.

- NEW FOUL
- EX COMBINED
- DIVERTED COMBINED
- PROPOSED SURFACE WATER
- ABANDONED COMBINED

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Building Legend

- Existing Building
- Completed Building
- Under Construction
- Under Development
- To be Developed
- Extent of Basement Envelope

REF	DATE	DRN	DESCRIPTION	CHK
P3	23/02/04	AJH	EASEMENT UPDATED & ISSUED FOR INFORMATION	
P2	16/01/04	RJB	UPDATED & ISSUED FOR INFORMATION	AH
P1	14/10/03	RJB	ISSUED FOR INFORMATION	RIB

AMENDMENTS

PROJECT:–
SPINNINGFIELDS

TITLE:–
MASTERPLAN AT OCTOBER 2003

CLIENT:–
ALLIED LONDON PROPERTIES

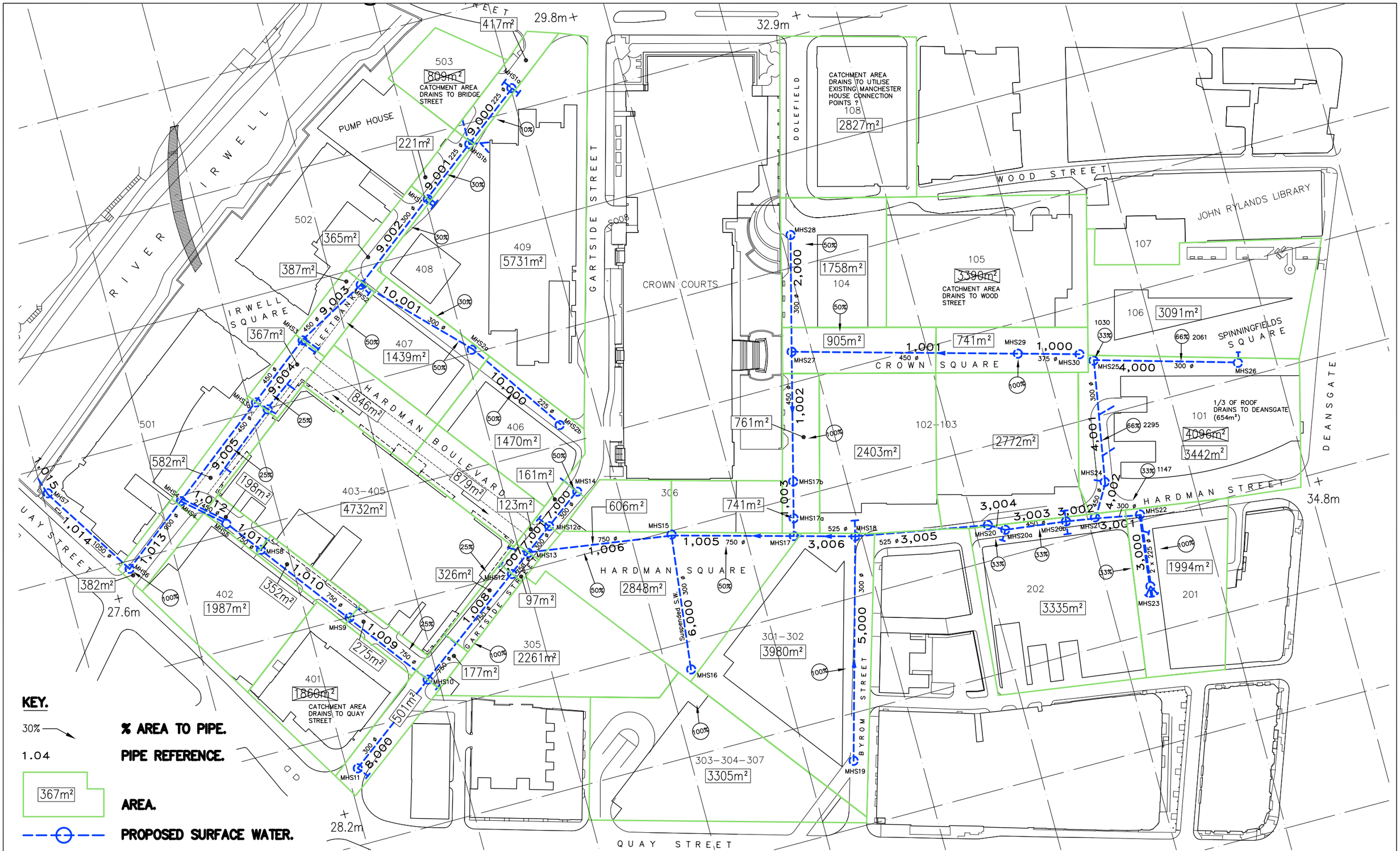
ARCHITECT:–
BDP

Waterman BBT
Consulting Engineers
DELPHIAN HOUSE, RIVERSIDE, MANCHESTER M3 5AP
Tel: 0161 839 8392 wbbtmcr@waterman-group.co.uk Fax: 0161 839 8394
Also at:–
BRADSHAW HOUSE, 31 WATERLOO LANE, LEEDS LS13 2JB
Tel: 0113 256 3322 leeds@waterman-group.co.uk Fax: 0113 257 5871

Drawing Status:–
PRELIMINARY

Designed by:–		Checked by:–	Project No:– 8530
Drawn by:– RJB		Date:– 14/10/03	
Scales:– work to figured dimensions only	1:1000		Computer File No:– 8530–446

DRAWING No:– 8530–446 Revision P3



Waterman BBT
Consulting Engineers

DELPHIAN HOUSE, RIVERSIDE, MANCHESTER M3 5AP
Telephone: 0161 839 8392 Fax: 0161 839 8394
wbbtmcr@waterman-group.co.uk

Also at:-
BRADSHAW HOUSE 31 WATERLOO LANE LEEDS LS13 2JB
Telephone: 0113 256 3322 Fax: 0113 257 5871
leeds@waterman-group.co.uk

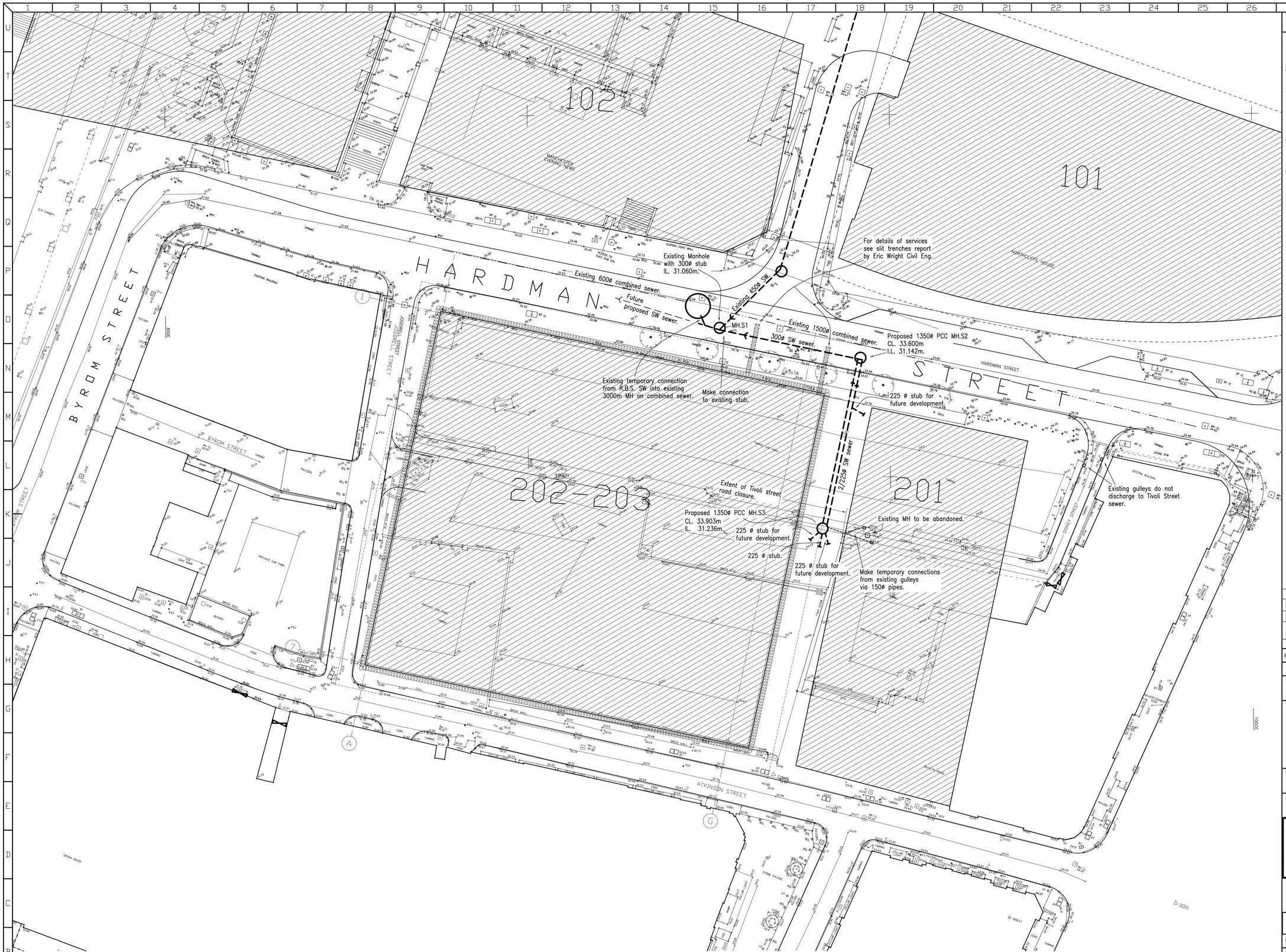
PROJECT:-
SPINNINGFIELDS DRAINAGE MASTERPLAN 2006.

Designed by:-
Checked by:- CS.
Drawn by:- CS.
Date:- 04.04.06.
Scales:- 1:1250
work to figured dimensions only

TITLE:-
DRAINAGE AREA PLAN.

DRAWING No:- 8530/449

Revision P3



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REF	DATE	DRN	DESCRIPTION	CHK
B	MAY 04	RJB	Twin 225 ø between manholes S2 & S3 to get under live electric cables.	CT
A	28/04/04	RJB	ISSUED FOR CONSTRUCTION.	RIB
P4	26/08/03	RJB	Manholes S2 & S3 resized to suit United Utilities	RIB
P3	11/08/03	RJB	Manhole S3 relocated.	EW
P2	23/07/03	RJB	Drainage route re-aligned. TENDER ISSUE.	EW
P1	07/07/03	RJB	Preliminary Issue.	EW

AMENDMENTS

PROJECT:–
SPINNINGFIELDS

TITLE:–
DRAINAGE ENABLING WORKS FOR PLOTS 201, 202 & 203.

CLIENT:–
ALLIED LONDON PROPERTIES

ARCHITECT:–

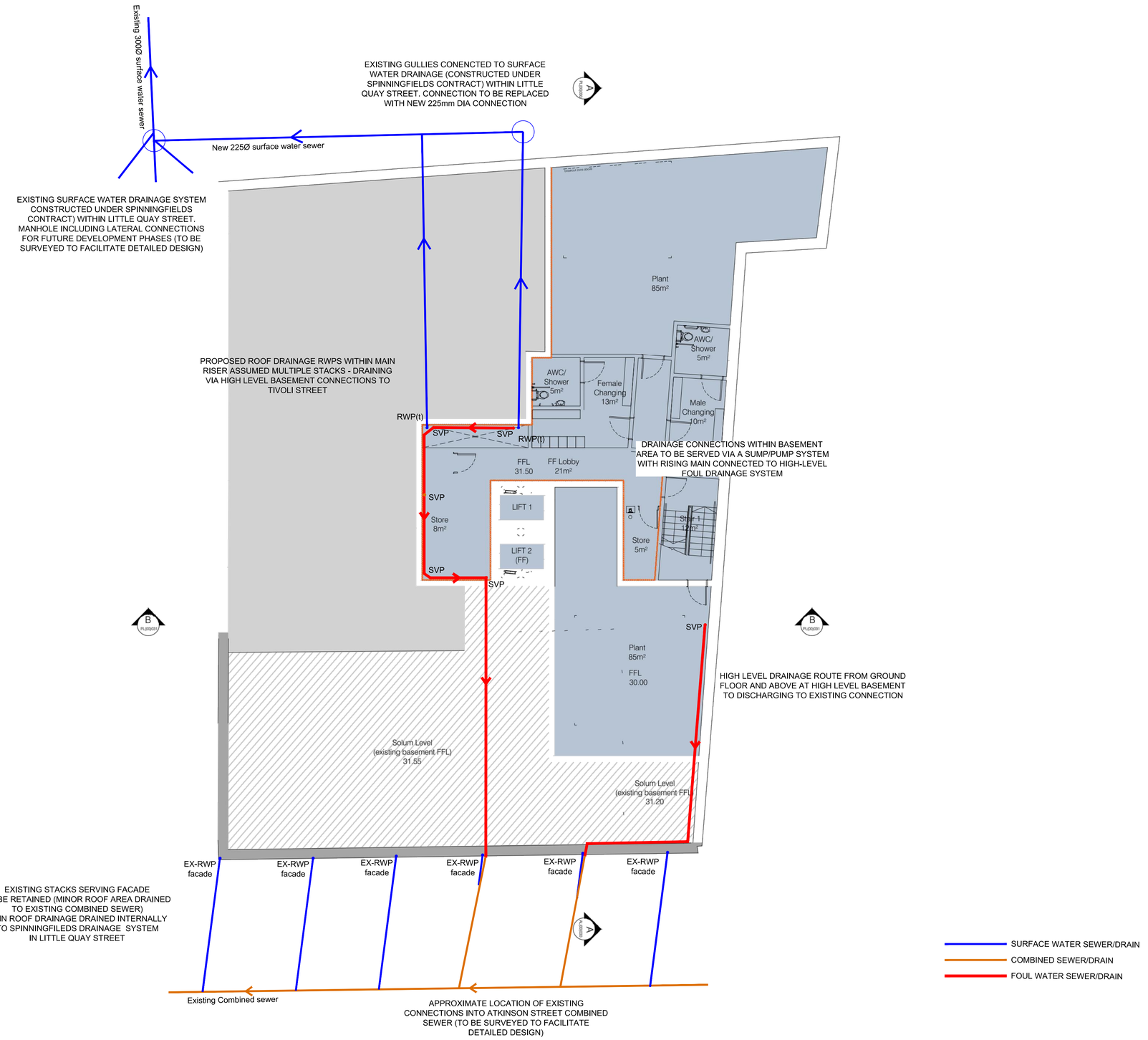
Waterman BBT
Consulting Engineers
DELPHIAN HOUSE, RIVERSIDE, MANCHESTER M3 5AP
Tel: 0161 839 8392 wbbtmcr@waterman-group.co.uk Fax: 0161 839 8394
Also at:–
BRADSHAW HOUSE, 31 WATERLOO LANE, LEEDS LS13 2JB
Tel: 0113 256 3322 leeds@waterman-group.co.uk Fax: 0113 257 5871

Drawing Status:–
CONSTRUCTION

Designed by:– BW	Checked by:–		Project No:– 8530
Drawn by:– RJB	Date:– 1/07/03		
Scales:– work to figured dimension only 1:250			Computer File No:– 8530-444

DRAWING No:– 8530/444 Revision B

D. Indicative Surface Water Layout



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Rev	Date	Description	By
A	19.5.17	First issue.	AS

Amendments

Project
KE HOTEL MANCHESTER

Title
INDICATIVE DRAINAGE LAYOUT

Client
KE HOTELS

Waterman
Infrastructure & Environment
2nd Floor South Central 11 Peter Street Manchester M2 5QR
t 0161 839 8392 f 0333 344 4501
mail@watermangroup.com www.watermangroup.com

Drawing Status
PRELIMINARY

Designed by	RB	Checked by	RB
Drawn by	AS	Date	May 2017
Scales @ A1 work to figured dimensions only	1:100		

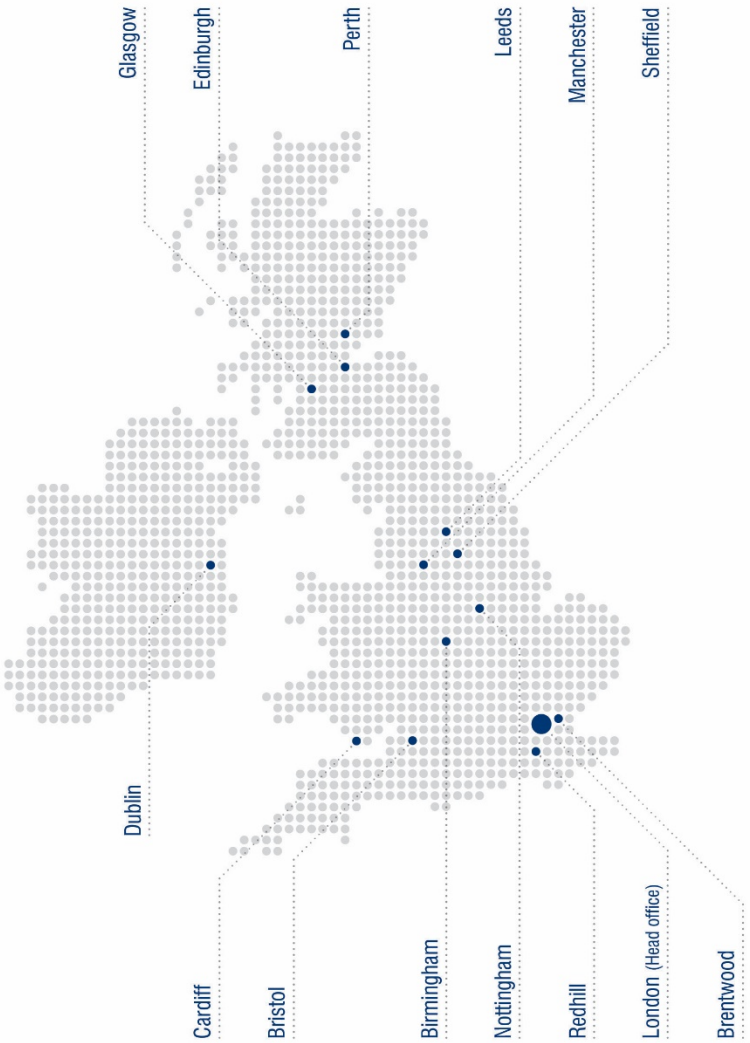
Project No
STR 13901

Computer File No

Publisher	Zone	Category	Number	Revision
WIE	KE	92	001	A

File Path

UK and Ireland Office Locations



[i] Department for Communities and Local Government, March 2012. *National Planning Policy Framework*

[ii] Department for Communities and Local Government, March 2012. *Technical Guidance to the National Planning Policy Framework*

[iii] Communities and Local Government, 2009. *Planning Policy Statement 25: Development and Flood Risk*

[iv] HMSO, 2010. *Flood and Water Management Act*