Basement Impact Assessment,

Groundwater Screening Assessment

Westminster House - Richmond

LUSTRE CONSULTING

Non-Technical Summary

What is Proposed?	It is understood that proposals involve the lowering of the existing basement by 0.62m to facilitate the use of the basement as a gym, combined with refurbishment of the existing property.
What is the Problem?	The following issues have been identified: ► The Lynch Hill Gravel Member (a Secondary A aquifer) as the underlying geology.
What is the Result?	The method of construction used will need to ensure the stability of existing building in addition to being suitable for excavation of the Kempton Park Gravel.
What are the Next Steps?	This report should be submitted to the local planning authority to support the planning application.

Report Record

Project Name	Westminster House, Richmond
Client	Baden Prop Ltd
Report Type	Basement Impact Assessment, Screening & Scoping
Report Ref	BIA-01.0_4874
Issue Date	November 2023
Author	Morwenna Corry - BSc (Hons) MSc CGeol FGS
Reviewer	Matt Dean - BEng (Hons) CEng CEnv C.WEM MCIWEM

Report Revisions

Revision Ref	Date	Author	Details

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To keep our reports as concise and simple as possible, we have put background information in a dedicated location. Click the magnifying glass icon seen throughout the report to navigate straight to relevant information in Appendix A.

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1.0 Introduction

1.1 This report presents the findings of the **Screening and Scoping Stages** of a Basement Impact Assessment - a technical review of the impact that a proposed basement may have on groundwater, surface water and ground and structural stability, and has been prepared in line with best practice guidance and planning policy.

What is a Basement Impact Assessment?

1.2 A Basement Impact Assessment is a technical assessment, which starts at the pre-planning stage and can continue until after planning is granted. It has the primary aim of ensuring that any proposed basement does not have an unacceptable impact on its environment. The BIA is a staged process rather than a single report / assessment, with five stages as follows:

Table 1 BIA Stages

Stage	Work Required	Planning Stage
One	Desk Study & Screening	Pre-Planning
Two	Scoping	Pre-Planning
Three	Site Investigation & Monitoring	Post Planning Award
Four	Basement Impact Assessment	Post Planning Award
Five	Review & Decision Making	Undertaken by the Local Authority

1.3 This report considers stages 1 and 2 of the BIA process, which is a Screening and Scoping BIA, and will **determine the suitability for a basement at the subject site** from a high-level perspective. The assessment will then set out if stages 3 to 5 are required (typically conditioned on award of planning). In stages 3 to 5, a greater level detail and information is also required from other disciplines (such as structural engineers). Find out more about Basement Impact Assessments here.

The Subject Site

Table 2 Site Details

Address	Westminster House, Kew Road, Richmond, TW9 2ND
Eastings, Northings	518079, 175226
Area	0.042ha

1.4 The site currently comprises a four storey mixed use property with a basement. The site area is shown in Figure 1.

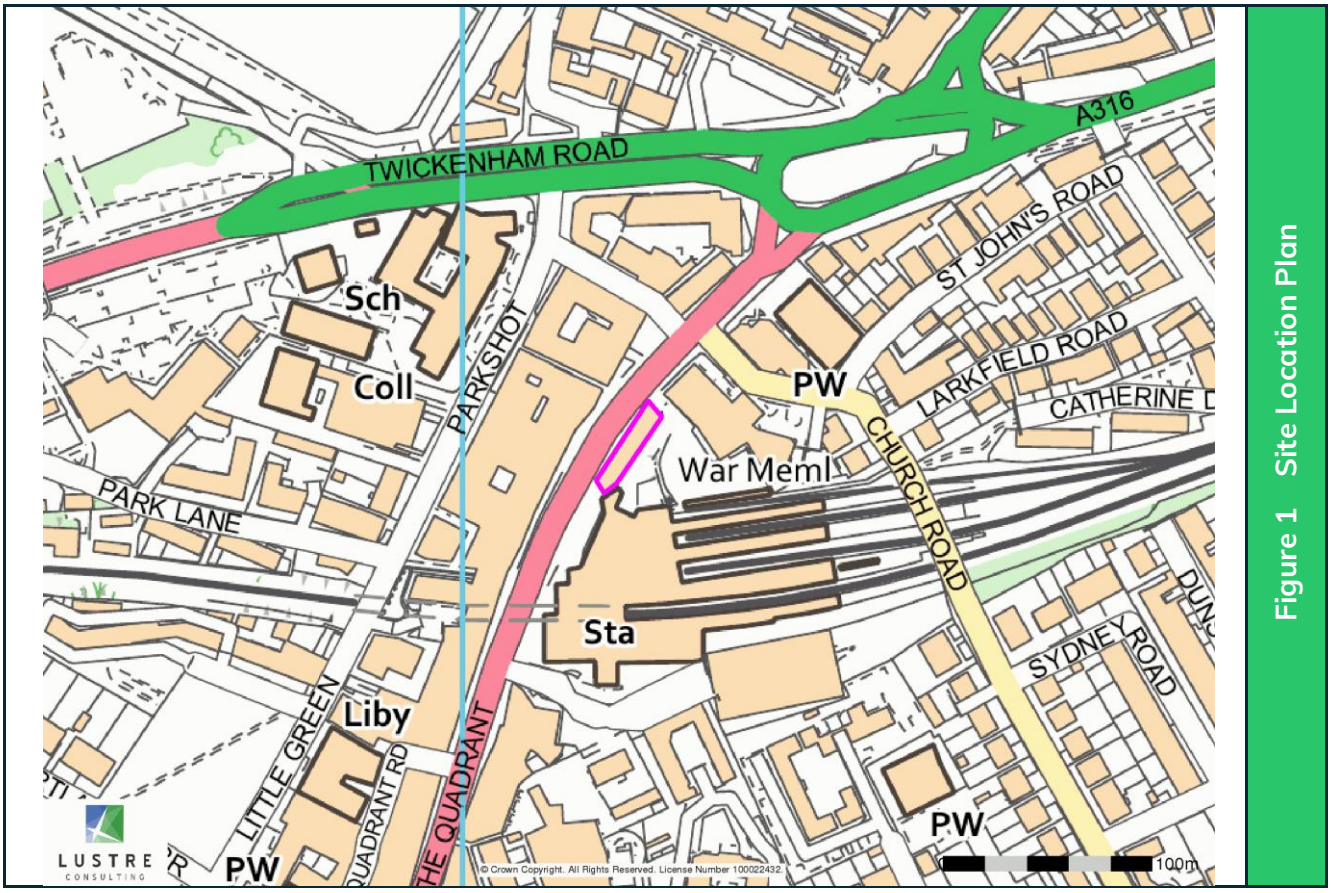

Figure 1 Site Location Plan

The Proposed Development

1.5 It is understood that it is proposed to create two additional levels of Class C3 accommodation comprising 7no.units, conversion and excavation of the existing Class E basement and part conversion of existing floorspace at basement, ground, first, second, and third floor levels to provide internal access and ancillary residential floorspace with external alterations and associated development.

1.6 The basement is to be utilised as a gym, electricity substation, bin store, bike store and a plant room including a containerised generator and a new BCWS Tank & Pumps. The existing basement will be lowered by 620mm in order to facilitate the conversion.

1.7 Figure 2 illustrates the plan view of the proposed development scheme at basement level.

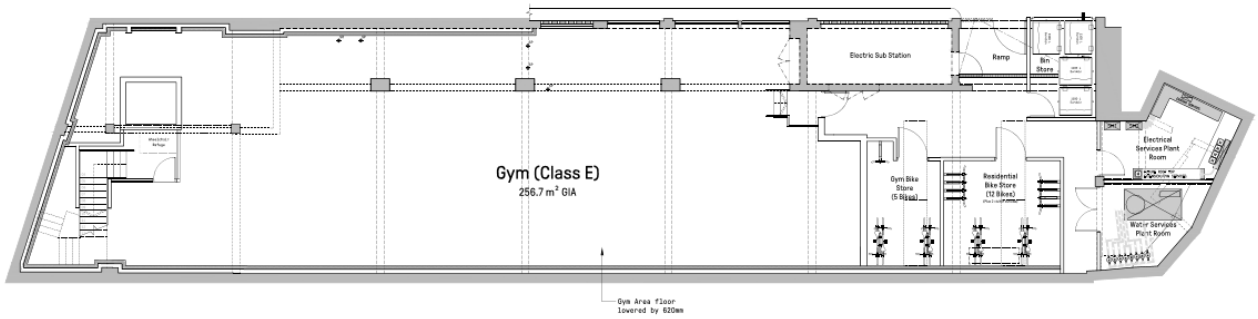

Figure 2 Proposed Development Plan

The Stakes & Objectives

1.8 This assessment has been prepared in line with the London Borough of Richmond Upon Thames (LBRUT) supplementary planning guidance released in 2020, including guidance on Strategic Flood Risk Assessment (Level 1)[1] and Further Groundwater Investigations[2], the Good Practice Guide on Basement Developments and the Basement Assessment User Guide (2021)[3].

1.9 The guidance requires all applications for new or extended basements in areas that are either more susceptible to groundwater flooding (>=25%), and/or within one of the four defined throughflow catchment areas, to have a Screening Assessment. The location of a site and whether it falls within one of the two catchment areas can be viewed on LBRUT interactive mapping tool[4]. Review of the site location relative to the catchment areas shown on the LBRUT interactive mapping tool indicates the following:

- The site **is** located within an 'Area Susceptible to Groundwater Flood' 1 km grid cell (Environment Agency), with an estimated risk over 75%.

[1] Strategic Flood Risk Assessment – Level 1. Prepared for the London Borough of Richmond Upon Thames. September 2020.
[2] Further Groundwater Investigations. Prepared for the London Borough of Richmond Upon Thames. October 2020.
[3] https://www.richmond.gov.uk/services/planning/basement_developments
[4] https://mapping.richmond.gov.uk/map/Aurora.svc/run?script=%5CAurora%5Cpublic_SFRA_Groundwater_Etc_LBRUT.AuroraScript%24&resize=always

- The site **is** located within one of the four defined throughflow catchment areas.

1.10 A Screening Assessment is used to identify any potential matters that may have an adverse impact and determine if a Basement Impact Assessment is required. If the answer to any of the screening questions is "yes", or is currently unknown, matters relating to that question need to be addressed as part of a Basement Impact Assessment. Accompanying information should be provided to justify the responses included within the Screening Assessment and signed off by the chartered professional who carried out the assessment.

1.11 The completed 'Site and Assessment Verification Form' from the Basement Assessment User Guide is contained in Appendix A.

Report Structure, Limitations & Changes

1.12 Chapter 2 of the report provides the site setting and Chapter 3 provides the Screening Stage of the Basement Impact Assessment. The conclusions of the assessment and recommendations are set out in Chapter 4.

1.13 This assessment has been undertaken in accordance with our Terms & Conditions. Full details on limitations and reliance are provided in those Terms. Third party information which has been reviewed and used to inform the assessments presented herein, including public records held by various regulatory authorities and environmental database data has been assumed to be true and accurate.

1.14 This assessment has been carried out to determine the potential risks posed to future end users, along with other key receptors, based on the current development. Should revisions in the development proposals result in a change any assessment parameters detailed in this report, a re-assessment of the risk should be carried out.

2.0 Site Setting

Site Layout

2.1 The site comprises a 1960's mixed use development with commercial units present on the ground floor. There is a basement present across the whole building; at the eastern end of the building, the basement is present as a lower ground floor due to the natural topography of the site.

Existing Plans

2.2 The property is laid out as a mixed use development with commercial units present at ground floor level and office suites present on the first, second and third floors.

2.3 Within the basement there is an electric substation present on the eastern elevation at the southern end of the property which is accessible from the street due to topography. There is a plant room and store present adjacent to the southern elevation and two rooms divided off from the remainder of the basement at the northern end. The central portion of the basement is open and is in use as car parking. Along the eastern elevation there is currently an inaccessible area.

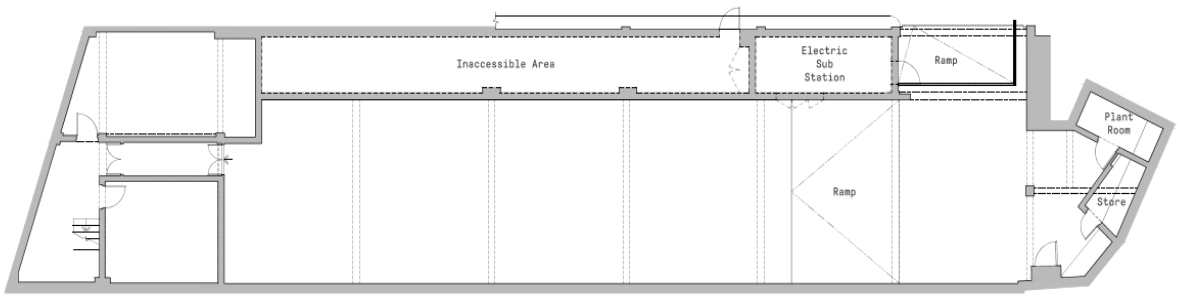

Figure 3 Existing Basement Plan

Site Topography

2.4 Spot heights across the existing property have been provided and these show that the ground floor of the property slopes downwards from 14.60m AOD at the southern end of the eastern elevation (front) to 13.65m AOD at the northern end of the eastern elevation. This is a slope of <1° across the eastern elevation.

2.5 Along the western elevation (rear) the property slopes upwards from 11.16m AOD at the southern end to 13.65m AOD at the northern end, this is a slope of approx. 3°.

2.6 These changes in height across the property footprint are reflected in the surrounding topography of the wider local area.

Aerial Imagery

2.7 Historical aerial imagery dating from 2001 show the site to be in its current layout and there are no significant changes shown on the aerial imagery to the present day.

Review of Planning Information

2.8 A review of the available online planning records held by London Borough of Richmond has been undertaken for the subject site and surrounding area.

2.9 There appear to be no on-site planning records that relate to the subterranean portion of the building.

2.10 There appear to be no nearby relevant off site planning records that relate to subterranean developments.

Geology

2.11 The 1:50,000 British Geological Survey (BGS) map (Sheet 270)[5] and the BGS website (National Geoscience Information Service)[6] show the site to be directly underlain by superficial deposits of the Kempton Park Gravel Formation comprising sand and gravel,

[5] BGS Solid and Drift Map Sheet MAP
[6] Information from BGS website: www.bgs.ac.uk consulted in month of report issue

locally with lenses of silt, clay or peat. Bedrock geology is listed as the London Clay Formation comprising poorly laminated, blue-grey or grey-brown, silty to very silty clay.

2.12 A Ground Investigation was carried out in April 2018 by Soil Consultants and recorded the following ground conditions:

Basement slab/made ground

- *The existing concrete basement slab varied in thickness between 450mm (TP1-2016) and 250mm (TP3-2018). A thin layer of brick hardcore with sandy gravel was present beneath the slab in TP1, extending to about 0.70m depth. In WS1, TP2 and TP, the slab rested directly upon natural strata.*

Kempton Park Gravel

- *This natural stratum was met at depths of between 0.25m and 0.70m below basement slab level, comprising brown/orange slightly silty sand and gravel/very sandy gravel. Standard Penetration Test (SPT) N-values of 48 and 28 were measured, indicating a dense becoming medium dense state of compaction. The dynamic probe measured N100 values (ie blows/100mm) of between 6 and 10 and this again would suggest medium dense to dense conditions. The gravel extended to the full 2.70m depth of WS1.*

London Clay

- *The London Clay was not encountered in the trial pits or the borehole. The dynamic probe (DP1) which continued from the base of the borehole exhibited a significant drop in N100 values at about 3.50m depth (+1.4mOD). Two scenarios which could be inferred from the DP1 profile are as follows:*

    i. *The lower blowcounts at about 3.50m depth could represent the level of the gravel/London Clay interface. The picture is, however, confused by the rapid increase in N100 value below about 4.30m, with refusal (N100>50) at 4.50m. The only realistic explanation if this is the London Clay would be the presence of a cemented claystone causing refusal.*

ii. The alternative is that the Kempton Park Gravel contains localised loose granular or softer cohesive zones and extended beyond the base of the probing

2.13 *We have examined published information, and a BGS borehole immediately to west of the site identifies the level of the gravel/London Clay interface at approximately +1.2mOD. This would therefore tend to support the first scenario above, with the lower N100 values reflecting the presence of London Clay.*

Groundwater

- *In the previous phase of investigation, groundwater was measured at between 1.35m and 1.38m below the basement slab level (23rd November 2015), corresponding to about +3.55mOD to +3.62mOD. In the current 2018 investigation, a standing water level was measured in WS1 at 1.28m depth, corresponding to about +3.61mOD.*

2.14 The groundwater level at the site is therefore considered to resting between +3.55mOD to +3.62mOD; this equates to approximately 1m below the finished floor level of the proposed basement.

Hydrogeology

2.15 DEFRA's online 'MAGIC' map application[7] shows the area around the site to have 'low' groundwater vulnerability. The sand and gravel deposit is classified as a 'Secondary A' aquifer, which is defined as permeable layers capable of supporting water supplies at a local scale, and in some cases forming an important source of base flow to rivers. The London Clay Formation is designated as an unproductive stratum which is defined by the Environment Agency as "rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow."

[7] https://magic.defra.gov.uk/MagicMap.aspx

2.16 The LBRUT interactive mapping tool shows that the Environment Agency has classified the 1 km grid square that contains the site as having a groundwater flooding susceptibility risk above 75%.

2.17 The LBRUT online mapping tool also shows a 'susceptibility to groundwater flooding' map developed by the BGS. As shown below, this indicates the site is in an area of potential groundwater flooding at surface. However, it is noted that the map was developed as part of 'strategic scale' exercise and should not be interpreted as identifying precise areas where groundwater flooding is likely to occur.

2.18 The tool also provides the Increased potential for Elevated Groundwater layer from GLA Drain London. This high-level mapping indicates an increased risk through permeable superficial across the whole site.

Figure 4 Susceptibility to Groundwater Flooding

2.19 The Environment Agency has defined Source Protection Zones (SPZs) for groundwater sources used for public drinking water supply.[8] These are shown on DEFRA's 'MAGiC' map. The site does not lie within or close to any defined SPZs.

[8] These zones show the risk of contamination from any activities that might cause pollution in the area. The maps show three main zones (inner, outer and total catchment) and a fourth zone of special interest.

Hydrology

2.20 The predominant water feature within the vicinity of the site is the River Thames, situated approximately 740m to the south west of the site.

3.0 Screening Assessment

3.1 A screening process has been undertaken and the findings are described below:

Table 3 GWSA Screening

	Screening Question		Response	Details
Subterranean Characteristics (SC)	SC1	Does the recorded water table extend above the base of the proposed subsurface structure?	No	The depth of groundwater on site has been recorded during the phases of site investigation and shown to sit at approximately 1m below the finished floor level of the proposed basement slab.
	SC2	Is the proposed subsurface development structure within 100m of a watercourse or spring line?	No	The River Thames is 740m away from the site towards the south west
	SC3	Are infiltration methods proposed as part of the site's drainage strategy?	**Yes**	SuDs measures are proposed which will connect to the existing drainage.
	SC4	Does the proposed excavation during the construction phase extend below the local water table level or spring line (if applicable)?	No	The depth of groundwater on site has been recorded during the phases of site investigation and shown to sit at approximately 1m below the finished floor level of the proposed basement slab.
	SC5	Is the most shallow geological strata at the site London Clay?	No	The Kempton Park Gravels are the most shallow strata.
	SC6	Is the site underlain by an aquifer and/or permeable geology?	**Yes**	The Kempton Park Gravels are a Secondary Aquifer.
Land Stability (LS)	LS1	Does the site, or neighbouring area, topography include slopes that are greater than 7°?	No	No. The site and surrounding land has only a slight fall towards the north on the eastern elevation and a slope of 3° is present on the western elevation.
	LS2	Will changes to the site's topography result in slopes that are greater than 7°?	No	The proposed basement will be constructed at a single level and no slopes are proposed.
	LS3	Will the proposed subsurface structure extend significantly deeper underground compared to the foundations of the neighbouring properties?	No	Richmond Station adjacent to the south is constructed at the same level as the existing basement.
	LS4	Will the implementation of the proposed subsurface structure require any trees to be felled or uprooted?	No	No trees are proposed to be felled at the site.
	LS5	Has the ground at the site been previously worked?	No	There is no evidence that the ground has previously been worked.
	LS6	Is the site within the vicinity of any tunnels or railway lines?	No	There are no known tunnels or other underground structures in the vicinity of the site.
Flood	FR1	Will the proposed subsurface development result in a change	No	There are no material changes planned at ground floor level.

Table 3 GWSA Screening

Screening Question		Response	Details
	in impermeable area coverage on the site?		
FR2	Will the proposed subsurface development impact the flow profile of throughflow, surface water or groundwater to downstream areas?	No	An extension is proposed to the existing basement, which is minimal in comparison to the existing basement.
FR3	Will the proposed subsurface development increase throughflow or groundwater flood risk to neighbouring properties?	No	As there is an existing basement, it is not considered that there will be changes to the groundwater flow.

Non-Technical Summary of Screening Process

3.2 The screening process identifies the following issues to be carried forward to scoping for further assessment:

- SC3 – SuDs measured are proposed at the site which will connect to the existing drainage.
- SC6 – The site is underlain by the Kempton Park Gravels a Secondary A Aquifer.

3.3 The other potential concerns considered within the screening process have been demonstrated to be not applicable or not significant when applied to the proposed development.

4.0 Summary and Conclusion

4.1 The property is laid out as a mixed use four storey property with commercial premises at ground floor level, offices on floors one to three and a basement present under the existing property. The existing basement is at 11.16m AOD at the deepest part at the southern end of the site.

4.2 It is understood that it is proposed to create two additional levels of Class C3 accommodation comprising 7no.units, conversion and excavation of the existing Class E basement and part conversion of existing floorspace at basement, ground, first, second, and third floor levels to provide internal access and ancillary residential floorspace with external alterations and associated development.

4.3 The basement is to be utilised as a gym, electricity substation, bin store, bike store and a plant room including a containerised generator and a new BCWS Tank & Pumps. The existing basement will be lowered by 620mm in order to facilitate the conversion.

4.4 Review of the site location relative to the catchment areas shown on the Richmond interactive mapping tool indicates that the property is within an 'Area Susceptible to Groundwater Flood' (1 km grid cell), with an estimated risk over 75%. The site is located within one of the four defined throughflow catchment areas.

4.5 In accordance with planning guidance, the fact that the property is within an Area Susceptible to Groundwater Flood with a risk above 25% means that a Screening Assessment is required for the proposed development. The screening assessment involves answering a total of 15 questions relating to subterranean characteristics, land stability, flood risk and drainage.

4.6 SuDs measured are proposed at the site which will connect to the existing drainage; however, these are not proposed within the basement area of the site.

4.7 The answer is 'yes' to "Is the site underlain by an aquifer and/or permeable geology?", (as it would be for most of the council area). The available geological information indicates that beneath any surficial Made Ground, the soils underlying the property are likely to be sand

and gravel (classified as a Secondary A aquifer) to approximately 6 to 8 m depth, overlying London Clay (classified as unproductive strata).

4.8 Given that the proposal is to increase the head height of the basement by 0.62m bgl and that the existing basement is in a good condition with no history of water ingress, it is considered that based on the information available at this time it is unlikely that the proposed development will be at significant risk of flooding or affect local groundwater conditions.

APPENDIX A: Site Assessment Verification Form

Site Details

Site details	Applicant information
Site name	Westminster House
Planning application reference (if applicable)	
Address & postcode	Westminster House, TW9 2ND
Brief description of the proposed works	Excavation of existing basement to create larger useable space with a deepening of the existing basement by 0.62m
Geology type	Kempton Park Gravel
Presence of aquifer?	Secondary A Aquifer
Total site area (Ha)	0.042
Is the site currently known to be at risk of flooding from any sources?	No

Chartered Professional Verification

Professional details	Applicant information
Name	Morwenna Corry
Profession / area of expertise	Geologist
Chartered institution and membership level	Chartered Geologist, Fellow of the Geological Society (Member No. 1019042)
Brief description of assessment involvement	Author of screening assessment report
Brief summary of the assessment results	The development will not be at significant risk of flooding and will not affect local groundwater conditions. No further assessment of groundwater risk is considered necessary.
Declaration of assessment results	I have applied all reasonable skill, care and diligence in performing this assessment and to the best of my knowledge the results are a true reflection of the site conditions based on the information available to me at the time of writing.
Signature	

Chartered Professional Verification

Professional details	Applicant information
Name	Matt Dean
Profession / area of expertise	Engineering and Environmental Services
Chartered institution and membership level	CEng CEnv C.WEM MCIWEM
Brief description of assessment involvement	Reviewer of screening assessment report
Brief summary of the assessment results	The basement will not be at significant risk of flooding and will not affect local groundwater conditions. No further assessment of groundwater risk is considered necessary.
Declaration of assessment results	I have applied all reasonable skill, care and diligence in performing this assessment and to the best of my knowledge the results are a true reflection of the site conditions based on the information available to me at the time of writing.
Signature	

Format of form as per Richmond Basement Assessment User Guide

APPENDIX B: Plans

N

0 10 20 30 50 100m

Scale 1:1250

- Do not scale from this drawing, except for planning purposes.
- Check all dimensions on site.
- Subject to survey.
- Subject to site inspection.
- Site boundary lines are indicative only.

Rev	Date	By	Description
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Revision Schedule

project
WESTMINSTER HOUSE
RICHMOND

title
SITE LOCATION PLAN

sheet number
PLOXX1

drawing status
PRELIMINARY

contract no. | client ref.

scale	date	drawn by	checked by
1 : 1250 @ A3	06/08/22	JK	JK

project no.	drawing number	revision
P22-058	CGL-Z1-00-GA-A-PLOXX1	A

drawing number: originator-zone-level -type -role - sheet number

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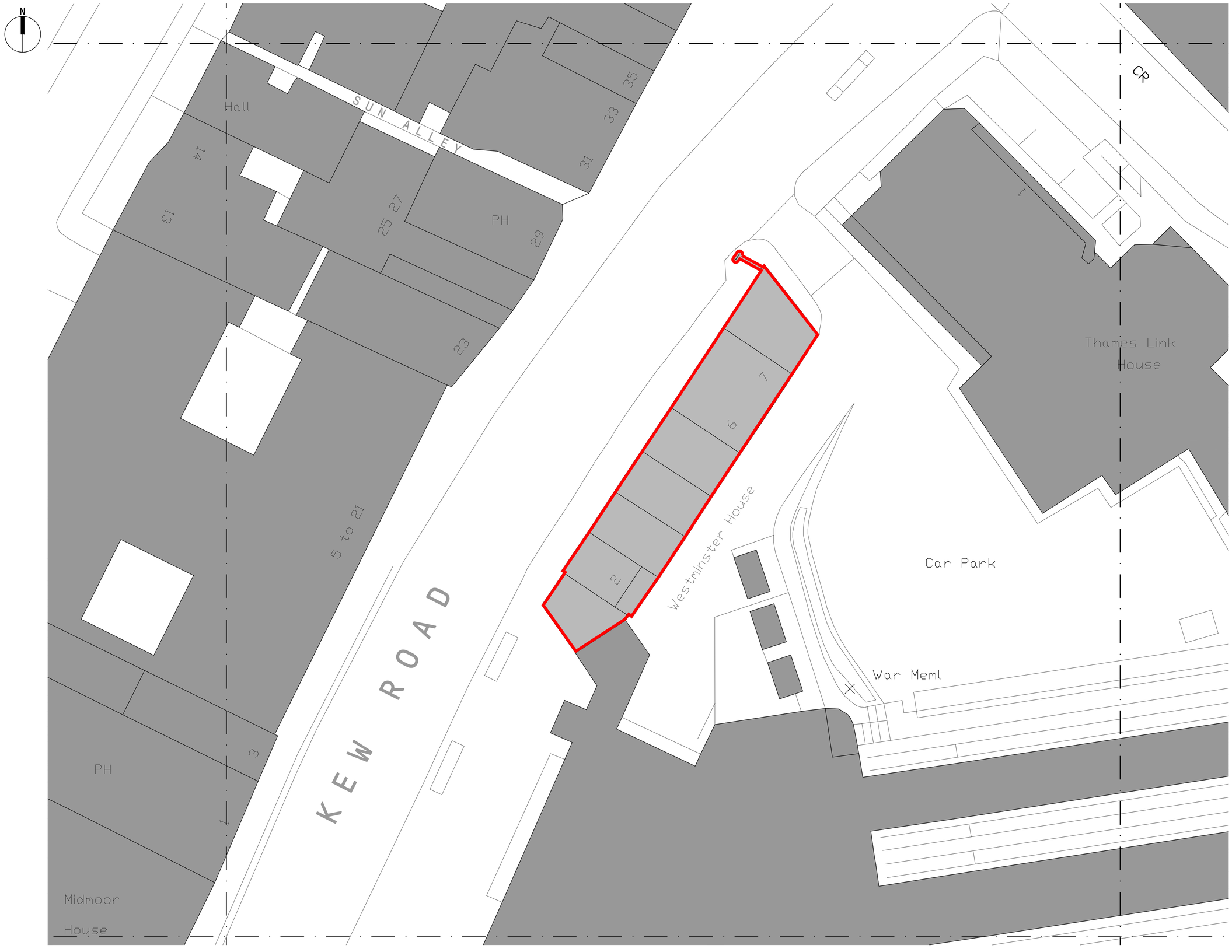

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Rev	Date	By	Description
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Revision Schedule

project
WESTMINSTER HOUSE
RICHMOND

title
BLOCK PLAN

sheet number
PLOXX2

drawing status
PRELIMINARY

contract no. | client ref.

scale	date	drawn by	checked by
1 : 200	06/08/22	JK	JK

project no.	drawing number (originator-zone-level-type-role-sheet number)	revision
P22-058	CGL-Z1-00-GA-A-PLOXX2	A

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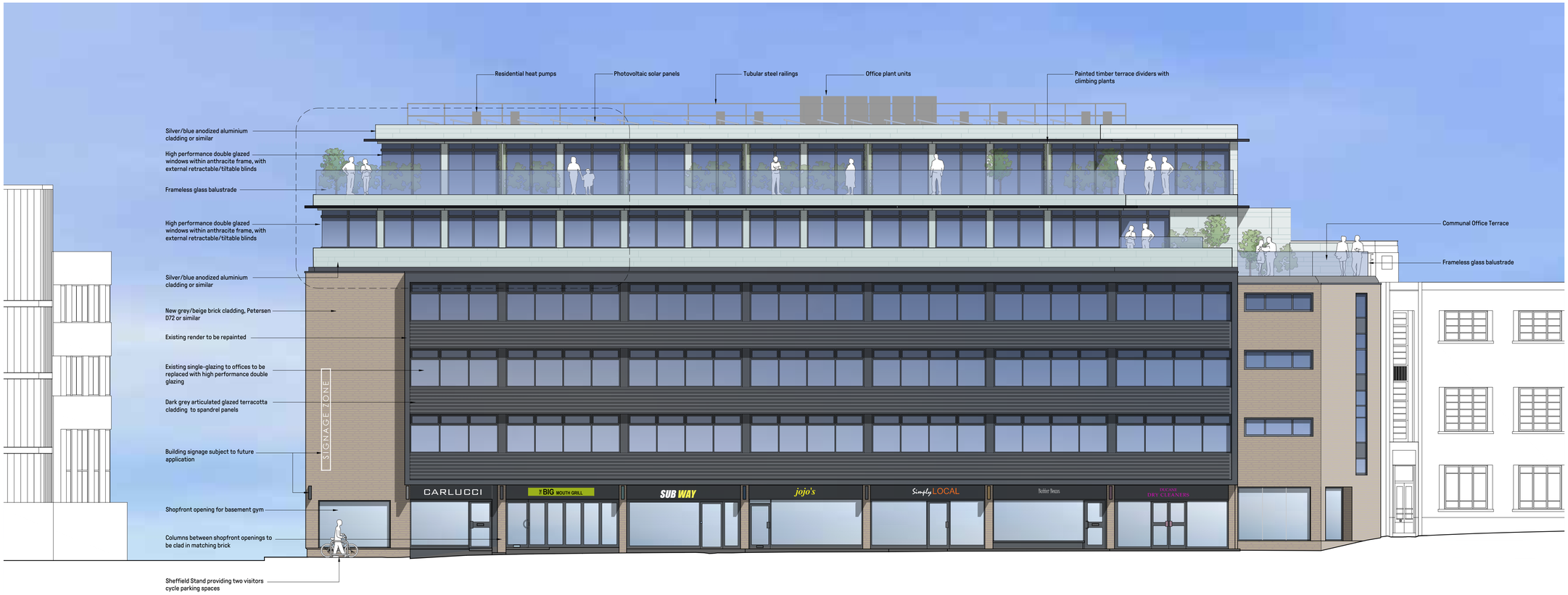
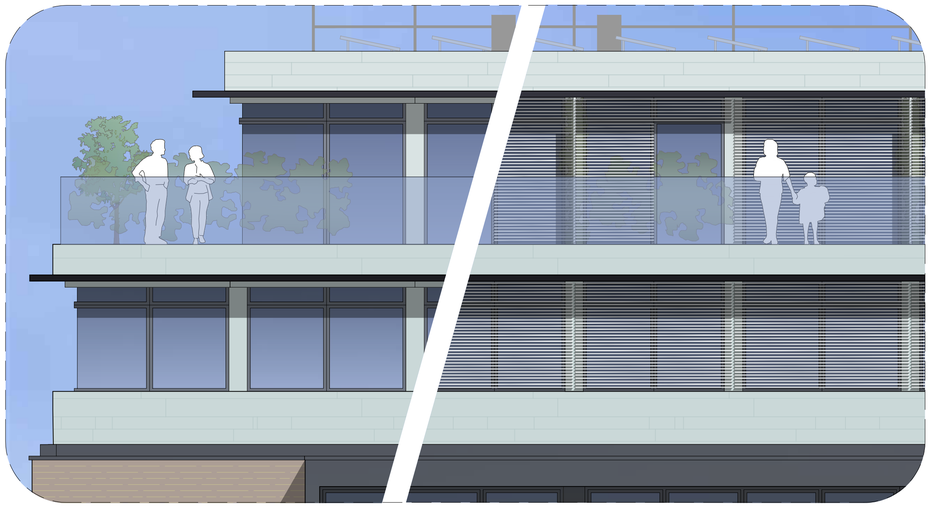
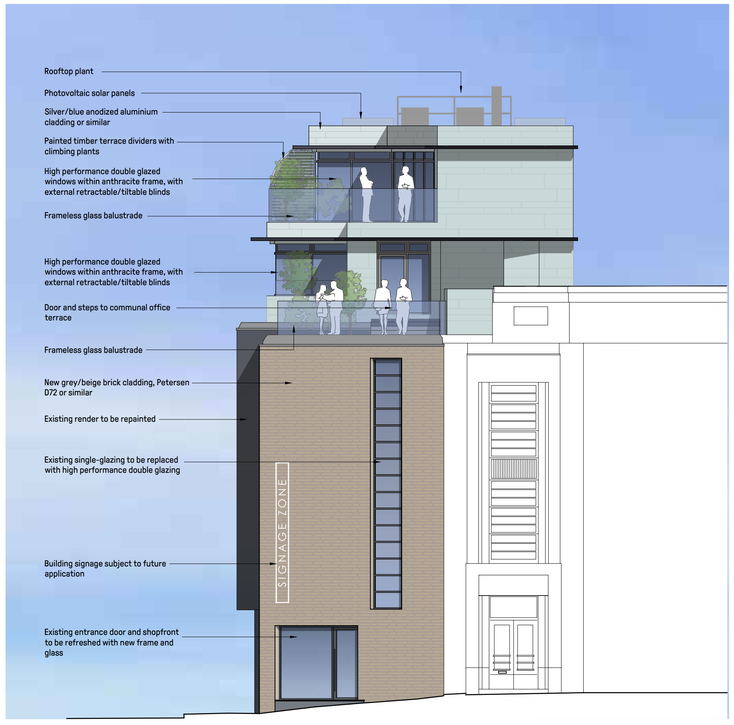


1 PROPOSED FRONT (WEST) ELEVATION
1 : 100



3 EXTRACT SHOWING BLINDS UP Vs DOWN
1 : 50



2 PROPOSED SIDE (SOUTH) ELEVATION
1 : 100

0 1 2 3 5 10m
Scale 1:100

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Note:
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Rev	Date	By	Description
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Revision Schedule

project
WESTMINSTER HOUSE
RICHMOND

title
PROPOSED
WEST & SOUTH ELEVATIONS

sheet number
PL0004

drawing status
PRELIMINARY

contract no. | client ref.

scale	date	drawn by	checked by
1 : 100 @ A1	06/06/22	JT	JK

project no.	drawing number (originator-zone-level-type-role-sheet number)	revision
P22-058	CGL-Z1-00-GA-A-PL0004	G

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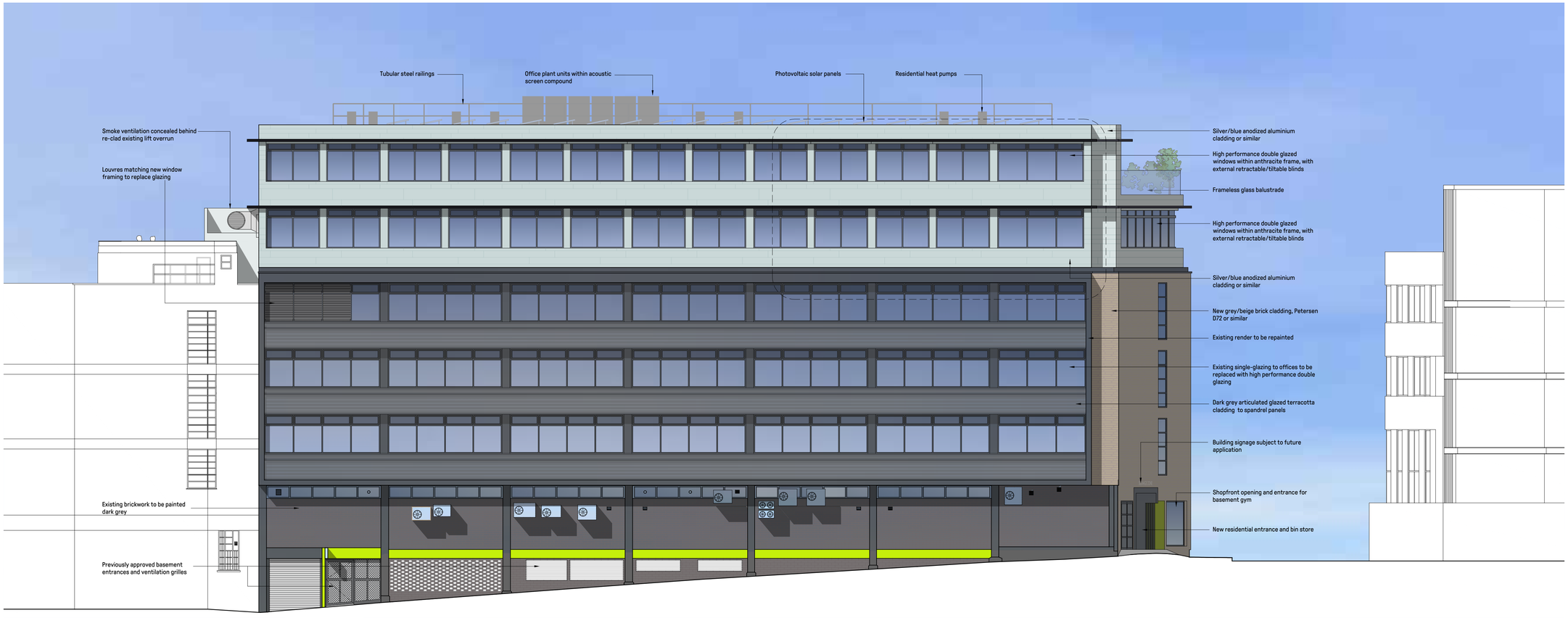

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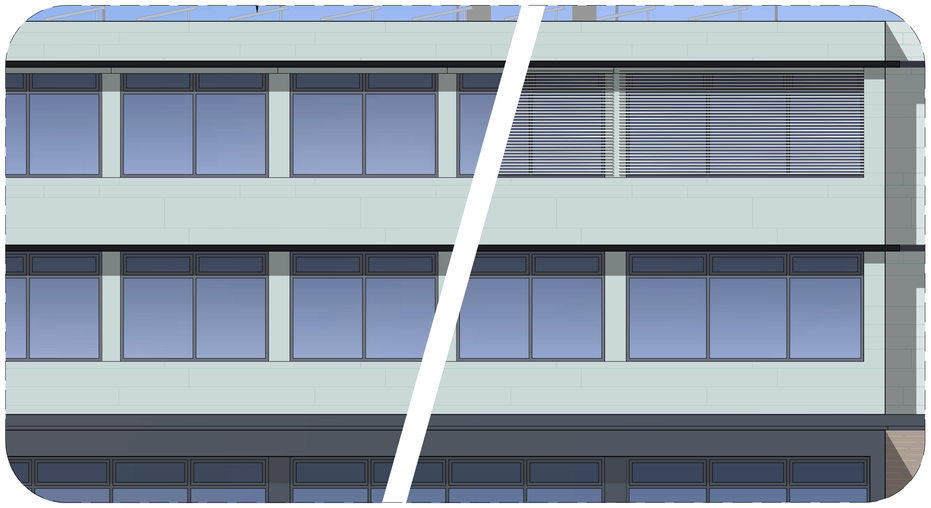

3 EXTRACT SHOWING BLINDS UP Vs DOWN
1 : 50

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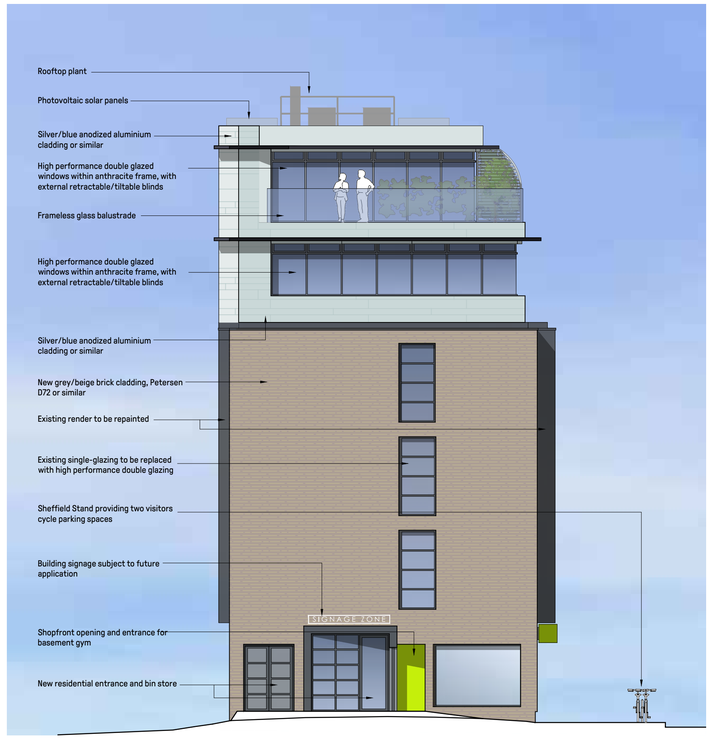
Scale 1:100



2 PROPOSED SIDE (NORTH) ELEVATION
1 : 100

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- Subject to site inspection.
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Note:
Planting shown indicatively for illustrative purposes.

Rev	Date	By	Description
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Revision Schedule

project
WESTMINSTER HOUSE
RICHMOND

title
PROPOSED
EAST & NORTH ELEVATIONS

sheet number
PL0005

drawing status
PRELIMINARY

contract no. | client ref.

scale	date	drawn by	checked by
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project no.	drawing number (originator-zone-level-type-role-sheet number)	revision
P22-058	CGL-Z1-00-GA-A-PL0005	C

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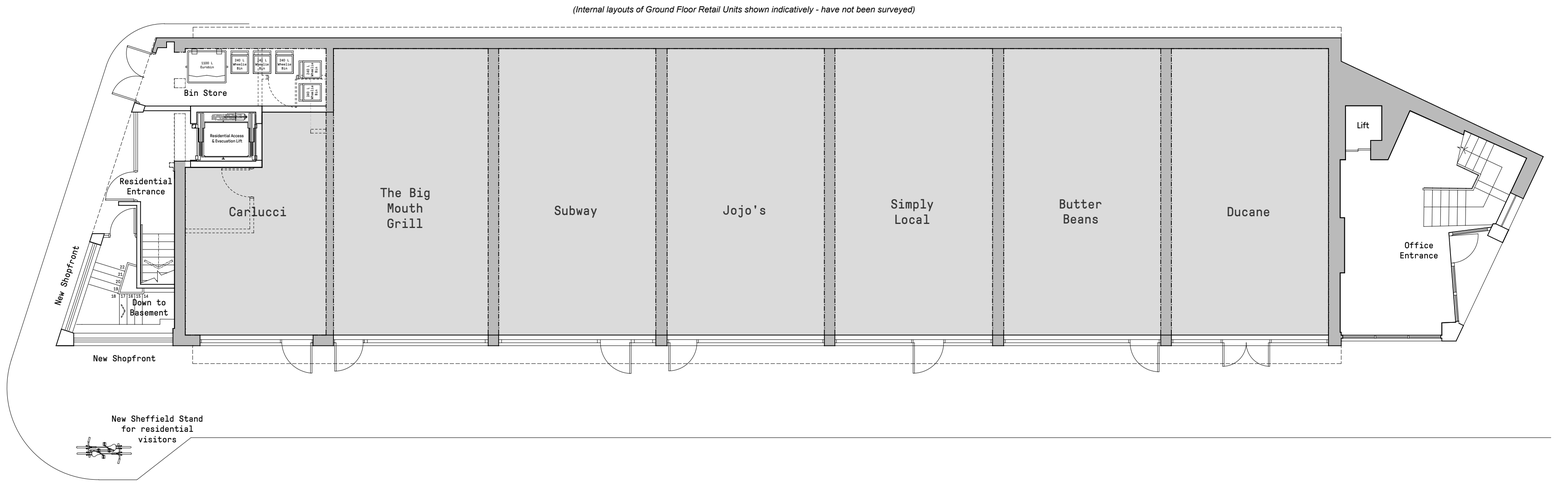
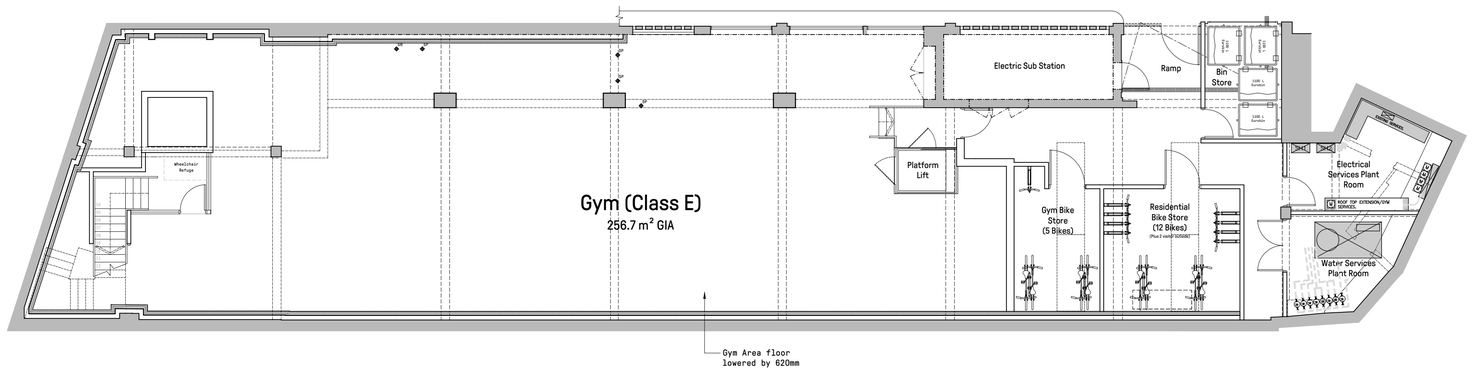


2 PROPOSED GROUND FLOOR PLAN
1 : 100



1 PROPOSED BASEMENT PLAN
1 : 100

0 1 2 3 5 10m
Scale 1:100

- Do not scale from this drawing, except for planning purposes.
- Check all dimensions on site.
- Subject to survey.
- Subject to site inspection.
- Site boundary lines are indicative only.

Rev	Date	By	Description
-	--/--/--	-	-

Revision Schedule

project
WESTMINSTER HOUSE
RICHMOND

title
PROPOSED BASEMENT AND GROUND FLOOR PLANS

sheet number
PL0001

drawing status
PRELIMINARY

contract no. | client ref.

scale	date	drawn by	checked by
1 : 100 @ A1	06/06/22	JT	JK

project no.	drawing number (originator-zone-level -type -role - sheet number)	revision
P22-058	CGL-Z1-00-GA-A-PL0001	I

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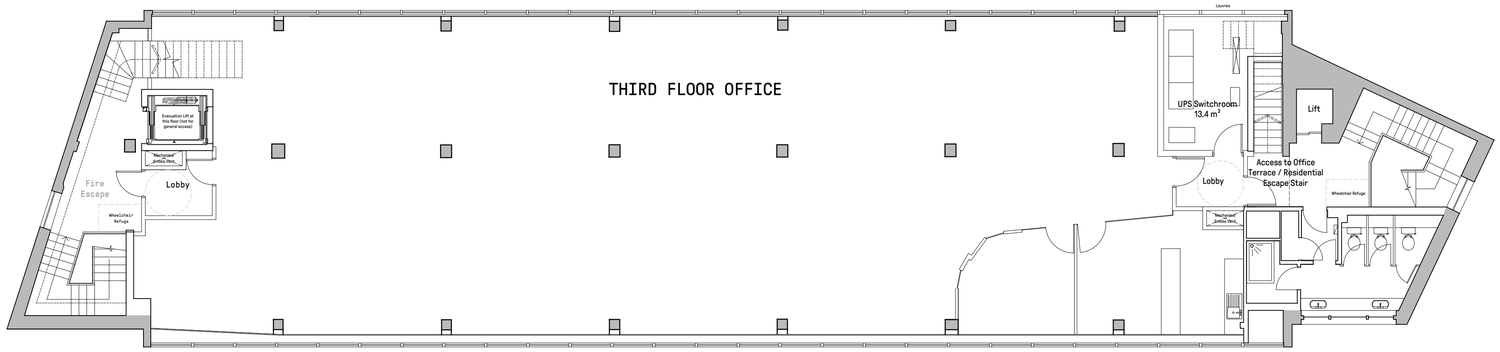
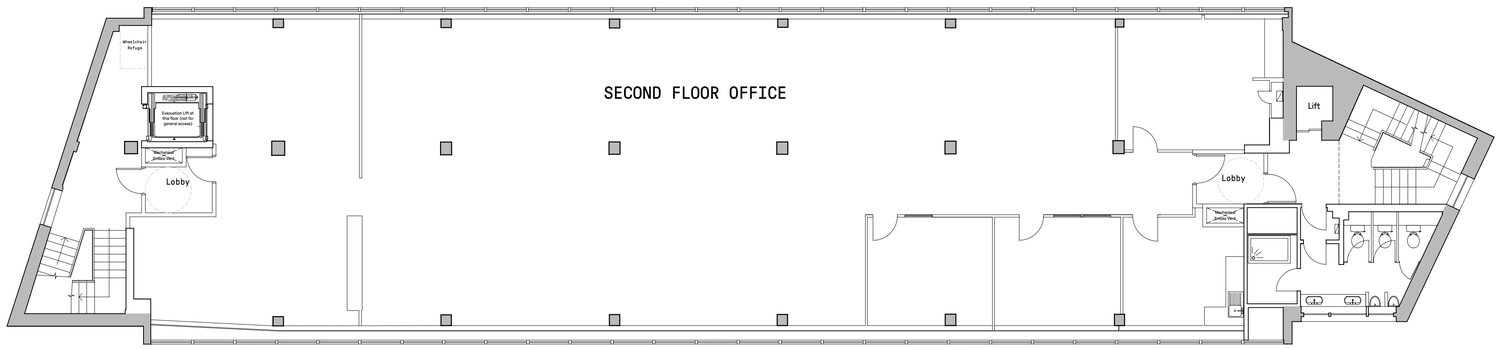
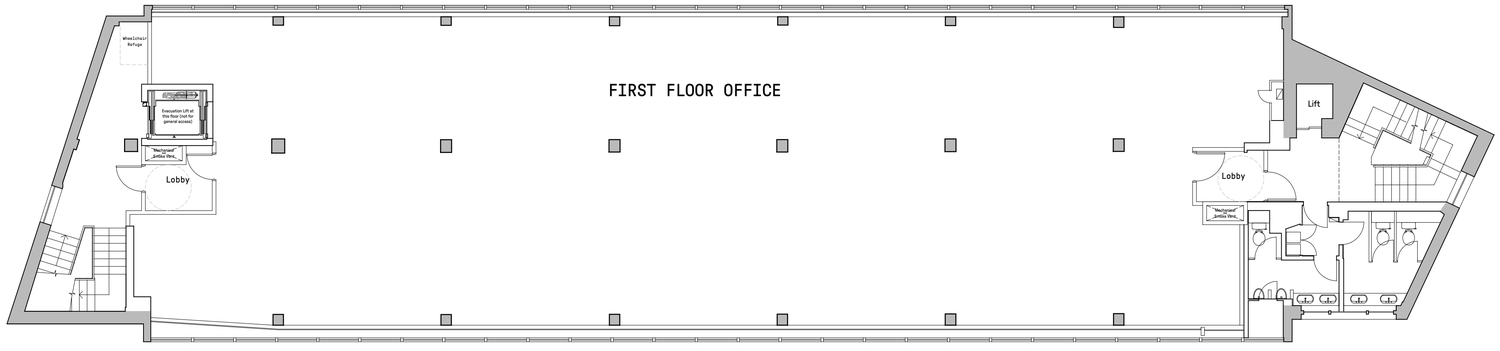


3 PROPOSED THIRD FLOOR PLAN
1 : 100



2 PROPOSED SECOND FLOOR PLAN
1 : 100



1 PROPOSED FIRST FLOOR PLAN
1 : 100

0 1 2 3 5 10m
Scale 1:100

- Do not scale from this drawing, except for planning purposes.
- Check all dimensions on site.
- Subject to survey.
- Subject to site inspection.
- Site boundary lines are indicative only.

Rev	Date	By	Description
-	-/-/--	-	-

Revision Schedule

project
WESTMINSTER HOUSE
RICHMOND

title
PROPOSED FIRST, SECOND AND THIRD FLOOR PLANS

sheet number
PL0002

drawing status
PRELIMINARY

contract no. client ref.

scale	date	drawn by	checked by
1 : 100 @ A1	06/06/22	JT	JK

project no.	drawing number originator-zone-level -type -role - sheet number	revision
P22-058	CGL-Z1-00-GA-A-PL0002	E

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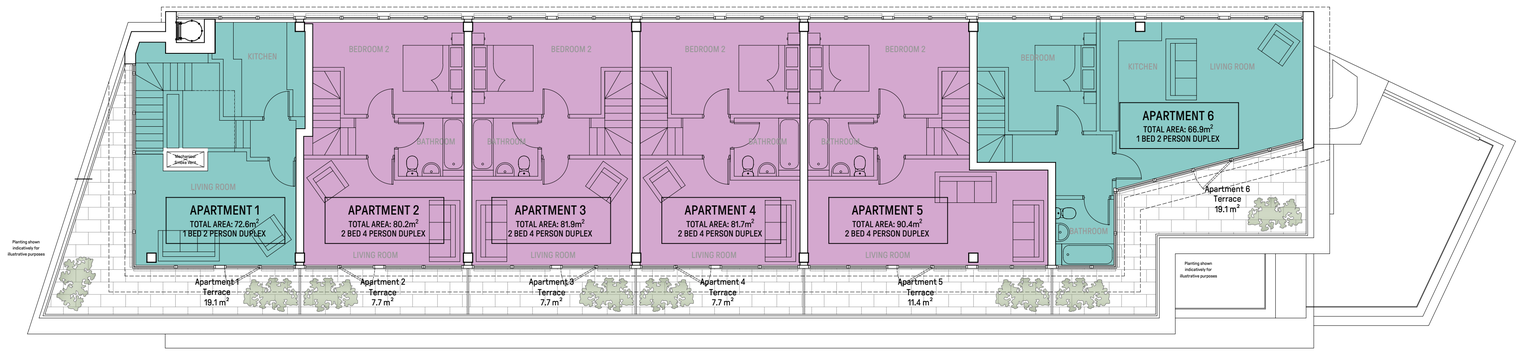
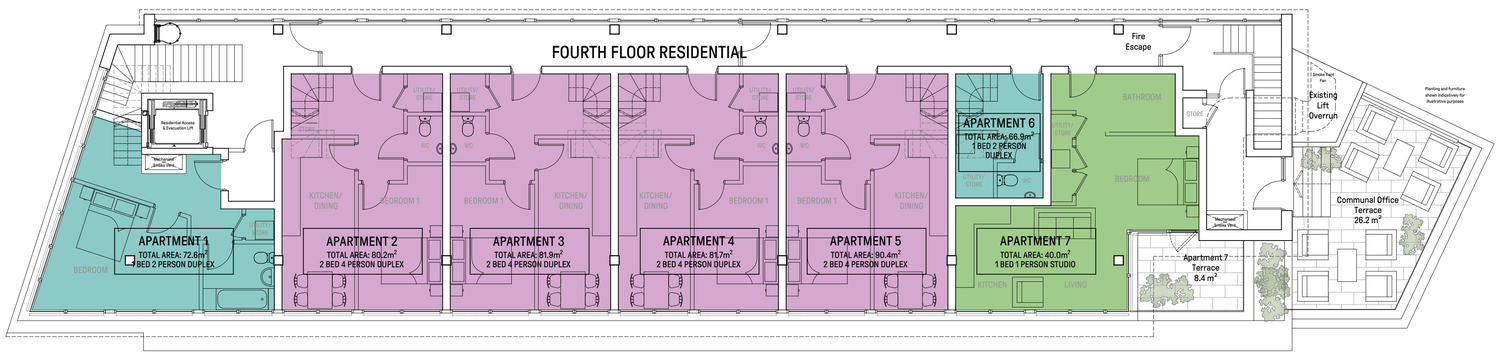
- 1 BED 1 PERSON
- 1 BED 2 PERSON
- 2 BED 3 PERSON
- 2 BED 4 PERSON

3 PROPOSED ROOF PLAN
1 : 100



2 PROPOSED FIFTH FLOOR PLAN
1 : 100



1 PROPOSED FOURTH FLOOR PLAN
1 : 100

0 1 2 3 5 10m
Scale 1:100

- Do not scale from this drawing, except for planning purposes.
- Check all dimensions on site.
- Subject to survey.
- Subject to site inspection.
- Site boundary lines are indicative only.

Rev	Date	By	Description
-	--/--/--	-	-

Revision Schedule

project
WESTMINSTER HOUSE
RICHMOND

title
PROPOSED FOURTH, FIFTH AND ROOF PLANS

sheet number
PL0003

drawing status
PRELIMINARY

contract no. | client ref.

scale	date	drawn by	checked by
1 : 100 @ A1	06/06/22	JT	JK

project no.	drawing number (originator-zone-level -type -role - sheet number)	revision
P22-058	CGL-Z1-00-GA-A-PL0003	K

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