Appendix B.4 - Daylight & Sunlight Reports

Barrington and Lamble Infill Sites 2 & 3
London NW5

Daylight & Sunlight Report

March 2014

WATERSLADE

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1.0 Introduction and Methodology

1.1 Generally

We have examined the impact on the daylight and sunlight amenity enjoyed by the neighbouring residential properties, as well as the daylight and sunlight levels within the proposed development itself.

It is usual to assess Daylight and Sunlight in relation to the guidelines set out in the 2011 Building Research Establishment (BRE) report 'Site layout planning for daylight and sunlight - A guide to good practice, second edition' by P. J. Littlefair. We shall refer to this report throughout as the 'BRE'. One of the primary sources for the BRE document is the more detailed guidance contained within 'British Standard 8206 Part 2' which has been superseded by 'British Standard 8206 Part 2:2008'. We shall also refer to this document. The BRE 2011 guidance differs from the previous version, dating from 1991, in a number of respects, particularly in relation to the way in which Average Daylight Factors and Sunlight figures are calculated. There are also a number of subtle changes to the various criteria.

In an urban location, frequently site constraints and the proximity of neighbouring buildings mean that some windows or rooms will fall short of the guideline figures. However, daylight and sunlight is one of a number of factors to be considered in designing a building. Often it needs to be balanced with energy efficiency considerations, the provision of external balcony space and other factors. In its introduction, the BRE guide itself urges that the guidelines be interpreted flexibly:

" *The advice given here is not mandatory……Although it gives numerical guidelines these should be interpreted flexibly…...For example in an historic city centre a higher degree of obstruction may be unavoidable….*".

We examine three measures of diffuse daylight in this study – namely Vertical Sky Component (VSC), Average Daylight Factor (ADF) and No-Sky Line (NSL). In terms of Sunlight, we examine the BRE Annual Probable Sunlight Hours (APSH). These measures of Daylight and Sunlight are discussed in the following paragraphs.

1.2 Diffuse Daylight

1.2.1 Vertical Sky Component (VSC)

VSC is a measure of the skylight reaching a point from an overcast sky. For Existing buildings, the BRE guideline is based on the loss of VSC at a point at the centre of a window, on the outer plane of the wall. The BRE guidelines state that if the VSC at the centre of a window is more than 27%, or if not, then it is more than 0.8 times its former value, then the diffuse daylighting of the existing building will not be adversely affected. We refer to the Appendix for more detail.

1.2.2 No-Sky Line (NSL)

NSL is a measure of the distribution of diffuse daylight within a room. The No-Sky Line simply follows the division between those parts of a room that can receive some direct skylight from those that cannot. If from a point in a room on the working plane (a plane 850mm above the floor) it is possible to see some sky then that point will lie inside the No-Sky Line contour. Conversely, if no sky is visible from that point then it would lie outside the contour.

The BRE state the following for the criterion to be used in comparing the No-Sky Line for the existing buildings with that for proposed development:

'If, following construction of a new development, the no-sky line moves so that the area of the existing room which does receive direct skylight is reduced to less than 0.8 times its former value, then this will be noticeable to the occupants, and more of the room will appear poorly lit.'

1.2.3 Average Daylight Factor (ADF)

ADF is a measure of the adequacy of diffuse daylight within a room and accounts for factors such as the size of window in relation to the size of the room, the reflectance of the walls, the nature of the glazing and number of windows. Clearly a small room with a large window will be better illuminated by daylight than a large room with a small window, and the ADF measure accounts for this. The ADF method is described in both the BRE document and British Standard BS8206 part 2, "Lighting for Buildings". The acceptable minimum depends on the room use. This is 1% for a bedroom, 1.5% for a living room and 2% for a kitchen. In cases where one room serves more than one purpose, the minimum ADF should be that for the room type with the higher value. We refer to the Appendix for more detail.

1.3 Sunlight

1.3.1 Annual Probable Sunlight Hours (APSH)

In relation to sunlight, the BRE recommends that the Annual Probable Sunlight Hours (APSH) received at a given window in the proposed case should be at least 25% of the total available including at least 5% in winter. Where the proposed values fall short of these, and the loss is greater than 4%, then the proposed values should not be less than 0.8 times their previous value in each period. For new build, the guidelines are based on achieving a target value of 25% of the total available, and 5% in winter. We also note that the BRE guidelines state that *'..all main living rooms of dwellings .. should be checked if they have a window facing within 90 degrees of due south. Kitchens and bedrooms are less important, although care should be taken not to block out too much sun'*. We refer to Appendix B for more detail.

2.0 Sources of information

LASER SURVEYS
Site Survey and Elevations; L5216-T, L5216-E

BURD HAWARD ARCHITECTS LTD
Proposed Plans, Elevations + Sections and 3D Model;
1381_P20 to P21...pdf, 3D.dwg, S2_Plan_00 to 02...dwg

3.0 Calculations and assumptions

In order to calculate the various measures of daylight and sunlight it is necessary to construct a 3D computer model. The model was analysed using proprietary software to calculate the various measures of daylight and sunlight.

The majority of the windows in, and massing of the surrounding properties, including existing buildings on the site, were modelled according to the 3D measured survey data. The Ordnance Survey data was used for the building addresses. The internal arrangements of the properties around the site were assumed. We have made reasonable assumptions as to internal floor to ceiling heights. The proposed development was modelled from the architect's 3D drawing.

The 3D model was created so as to reproduce the massing of the buildings both on and surrounding the site at a level of detail appropriate to the calculations performed. All heights in the model are in mm Above Ordnance Datum (AOD).

In assessing the impact of a new development on neighbouring properties it is usual to only consider main habitable spaces (i.e. living rooms, bedrooms and kitchens) within residential properties. For the new build, in relation to ADF we have assumed the use of double glazed units with Transmittance of 0.68, white ceilings with a Reflectance of 0.85, cream walls with a Reflectance of 0.81, light veneer wood or cream carpet floors with a Reflectance of 0.4, and a glazing bar reduction factor of 10%.

In accordance with the BRE and British Standard guidance, VSC values have been calculated at the window centre on the outside wall face. APSH values have been calculated at the window centre on the outside wall face for neighbouring properties and the inside face within the proposed development. The inside wall face has been used as the calculation position for ADF. For windows with a cill below working plane level, the window area above and below the working plane has been considered separately and weighted in accordance with the latest BRE guidance.

Where there are balconies or recessed windows, the BRE advise that the figures should be calculated with the balcony effect removed. This provides an indication of the daylight levels available on the façade of the building, and therefore on the balcony.

4.0 Results and Discussion

4.1 Generally

We refer to the attached drawings 755/P/01-03, which illustrate the site in plan and 3d prior to development. Drawings 755/P/04-06 illustrate the proposed development. For the purpose of analysis each window and room is given a unique reference. This is necessary to track the windows through the

various calculations, and these labels appear in the tables of results. Drawings 755/P/07-09 show the window locations and their labels for each neighbouring residential property. The attached tables of results titled 'DAYLIGHT ANALYSIS' summarise the daylight and sunlight results.

The major difference between VSC and ADF is that VSC is a measure of the diffuse daylight incident on the outside face of a window centre and is therefore not dependent on the size of the window or the size of the room it serves. ADF on the other hand is a measure of the adequacy of daylight within the room and accounts for factors such as the size of window in relation to the size of the room. Clearly a small room with a large window will be better illuminated by daylight than a large room with a small window. Although the 2011 BRE guidelines recommend that ADF is used primarily for the assessment of the light within proposed developments, it also says that there are some situations where its use would be appropriate for neighbouring properties. These include the sequential development of an area to form a larger group of buildings.

The BRE target daylight value as measured by a VSC of 27% corresponds to a development angle of 25 degrees, which frequently is inappropriate in an urban context. In an urban location typical development angles are often significantly higher.

4.2 1-12 Barrington Close

Whilst we do not have internal layout drawings for this property it is highly likely that the small windows in the flank wall of this property which directly face the site serve either non habitable space such as a bathroom or circulation space, or are secondary windows. Therefore the impact to these windows would have little effect on the property. The results show that the impact to all other windows is minimal and the property will retain very good daylight and sunlight levels.

Therefore the impact fully complies with the BRE criteria.

4.3 1-16 Lamble Street

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4.4 13-62 Barrington Close

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6.0 Overshadowing

Section 3.3 of the BRE guidelines describes the method of assessment of the availability of sunlight within garden/amenity spaces. This relates to the proportion of shading on March 21st.

The BRE criterion for garden or amenity areas is as follows:

'It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity space should receive at least two hours of sunlight on 21 March. If as a result of a new development an existing garden or amenity space does not meet the above, and the area which can receive two hours of sunlight on 21 march is less than 0.8 times its former value, then the loss of amenity is likely to be noticeable.'

There is no garden space sufficiently close to either site 2 or site 3 to warrant a detailed study and therefore it is clear that the overshadowing impact will be negligible.

6.0 Conclusions

We have considered the BRE measures of Daylight and of Sunlight in relation to the surrounding residential properties. These were analysed in detail.

The impact to all properties accords with the BRE guidelines on VSC, NSL and sunlight.

Overall we conclude that the impact of the proposed development on the neighbouring properties will be small and will fully comply with the BRE guidelines, and in this regard, the level of development is not excessive.

Waterslade Ltd

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Sources:

LASER SURVEYS
Site Survey and Elevations; L5216-T, L5216-E

KARAKUSEVIC CARSON
Proposed scheme information

BURD HAWARD ARCHITECTS LTD
Proposed Plans, Elevations + Sections and 3D Model;
1381_P20 to P21...pdf, 3D.dwg, S2_Plan_00 to 02...dwg

Key:

Existing

Proposed

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Drawing Title: Plan view
Existing Buildings

Site Plan

Drawn by:	Date:	Scale:	Drawing No.	Rel.:
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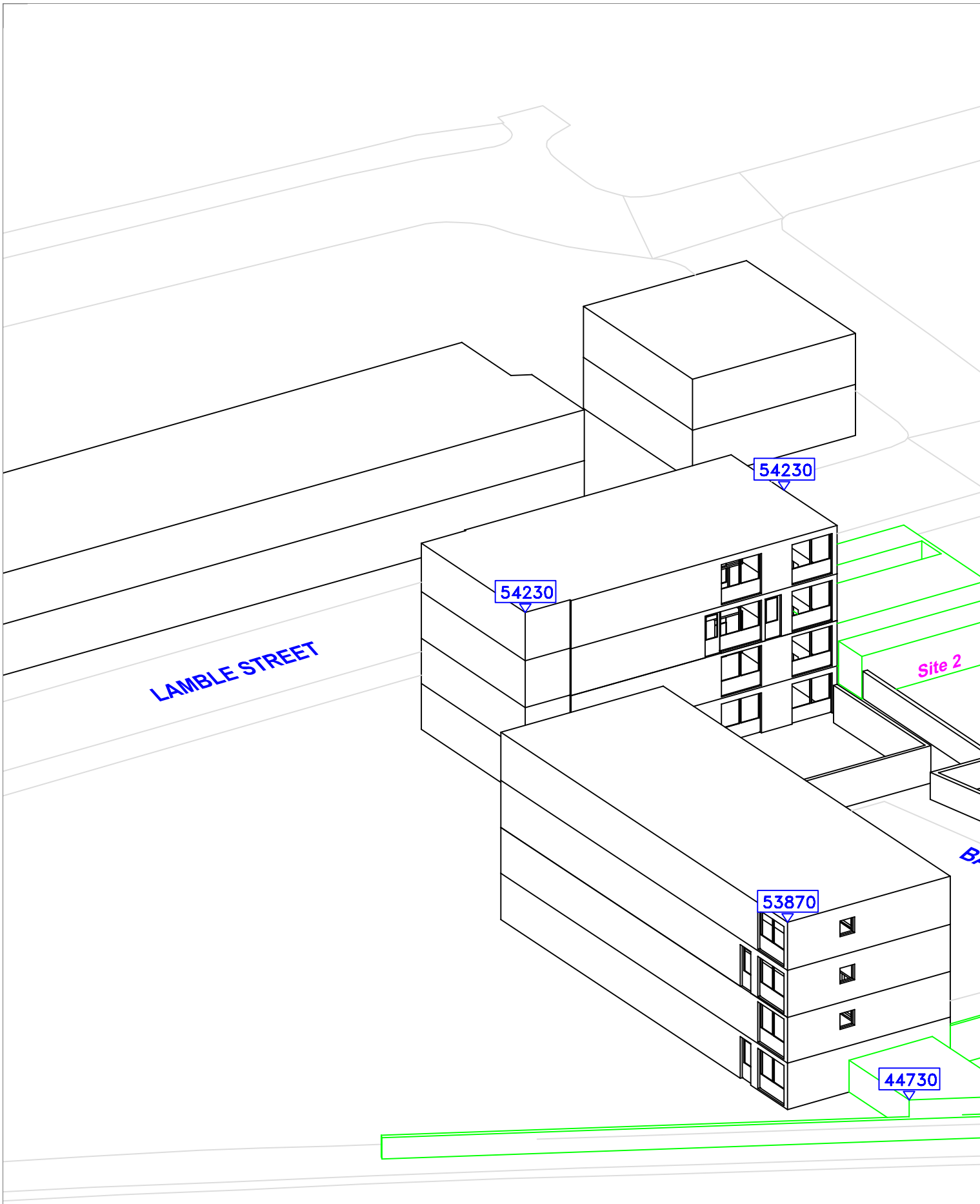

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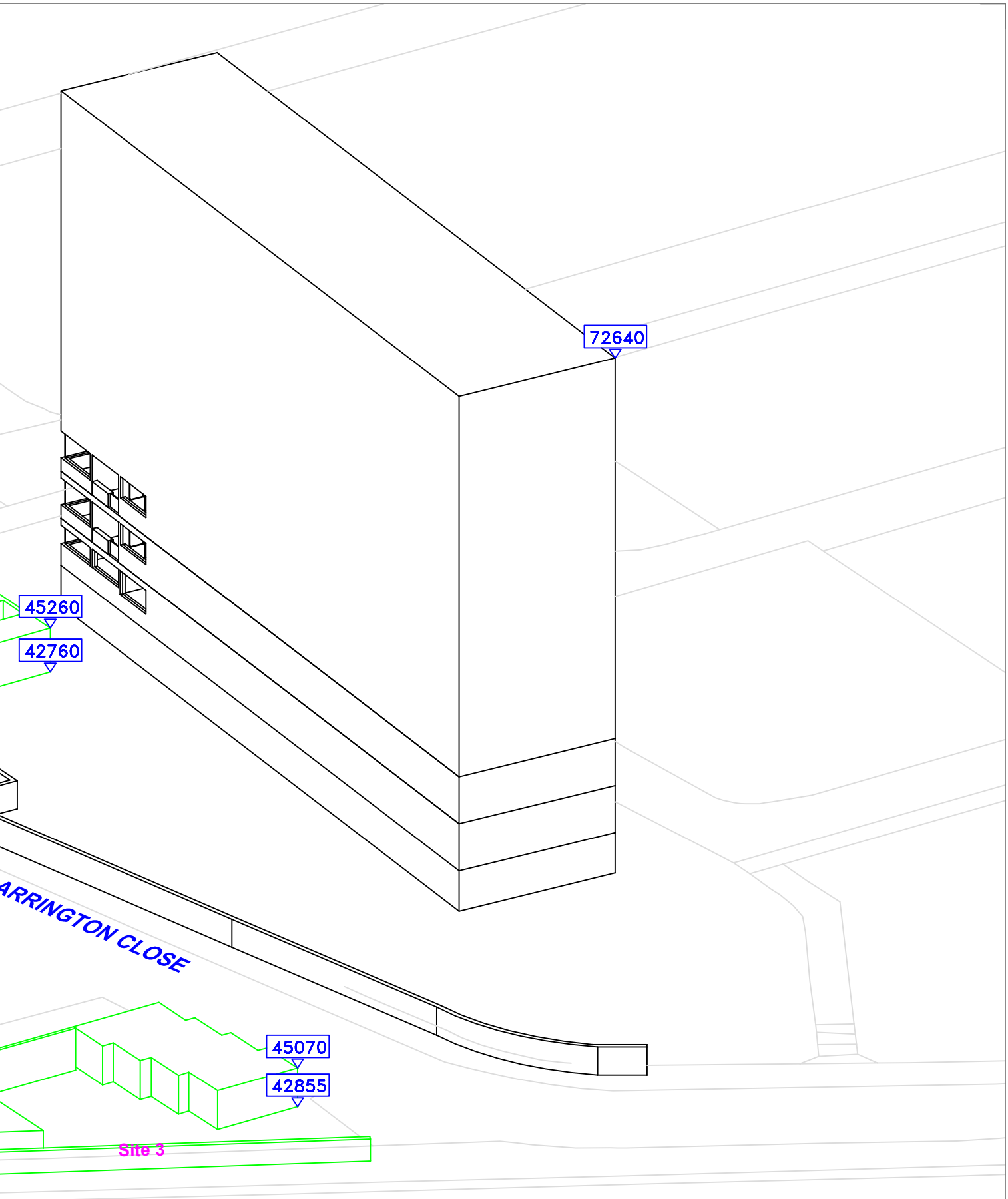

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Drawing Title: 3D view
Existing Buildings

3D Massing Model

Drawn by:	Date:	Scale:	Drawing No.	Rel.:
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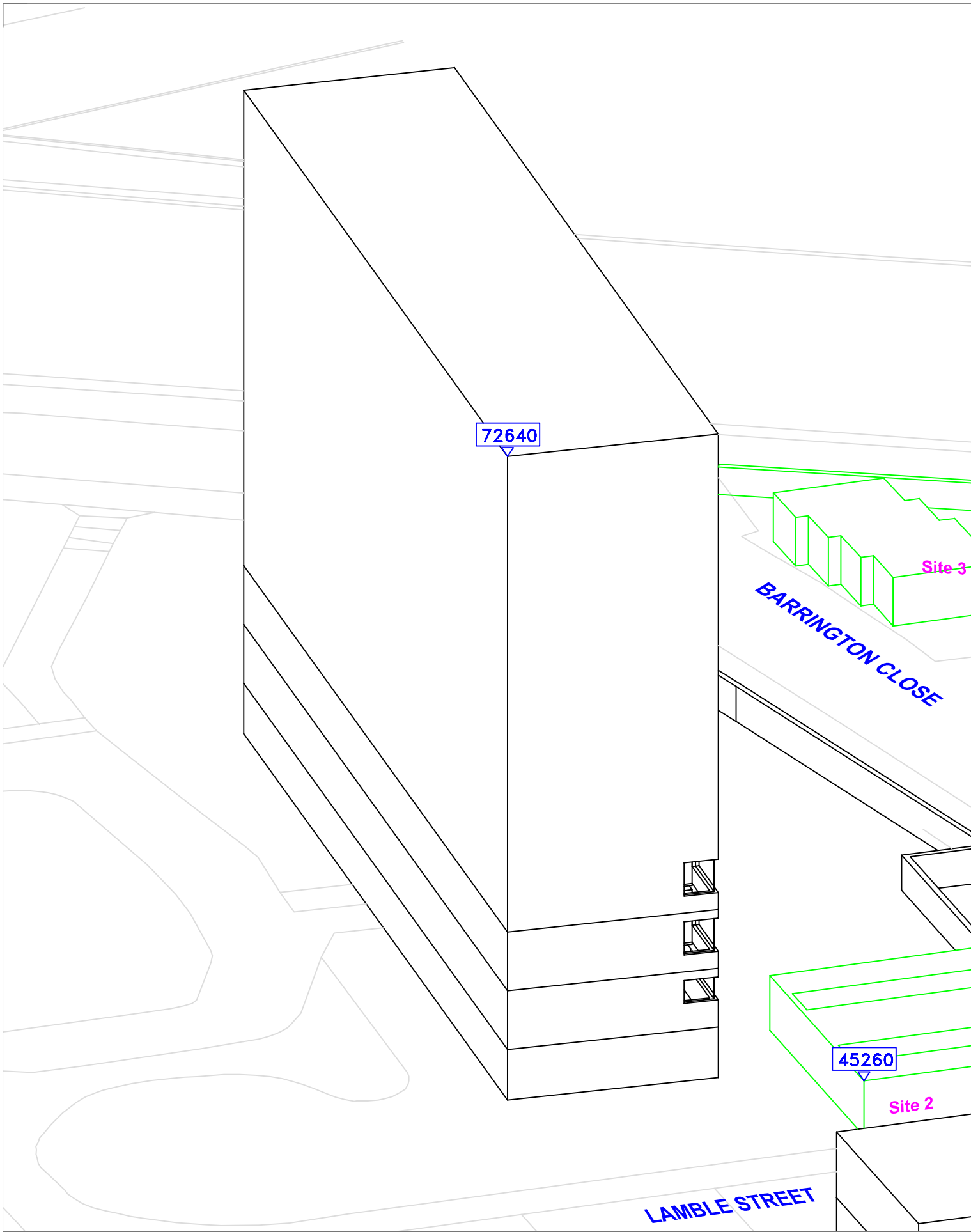

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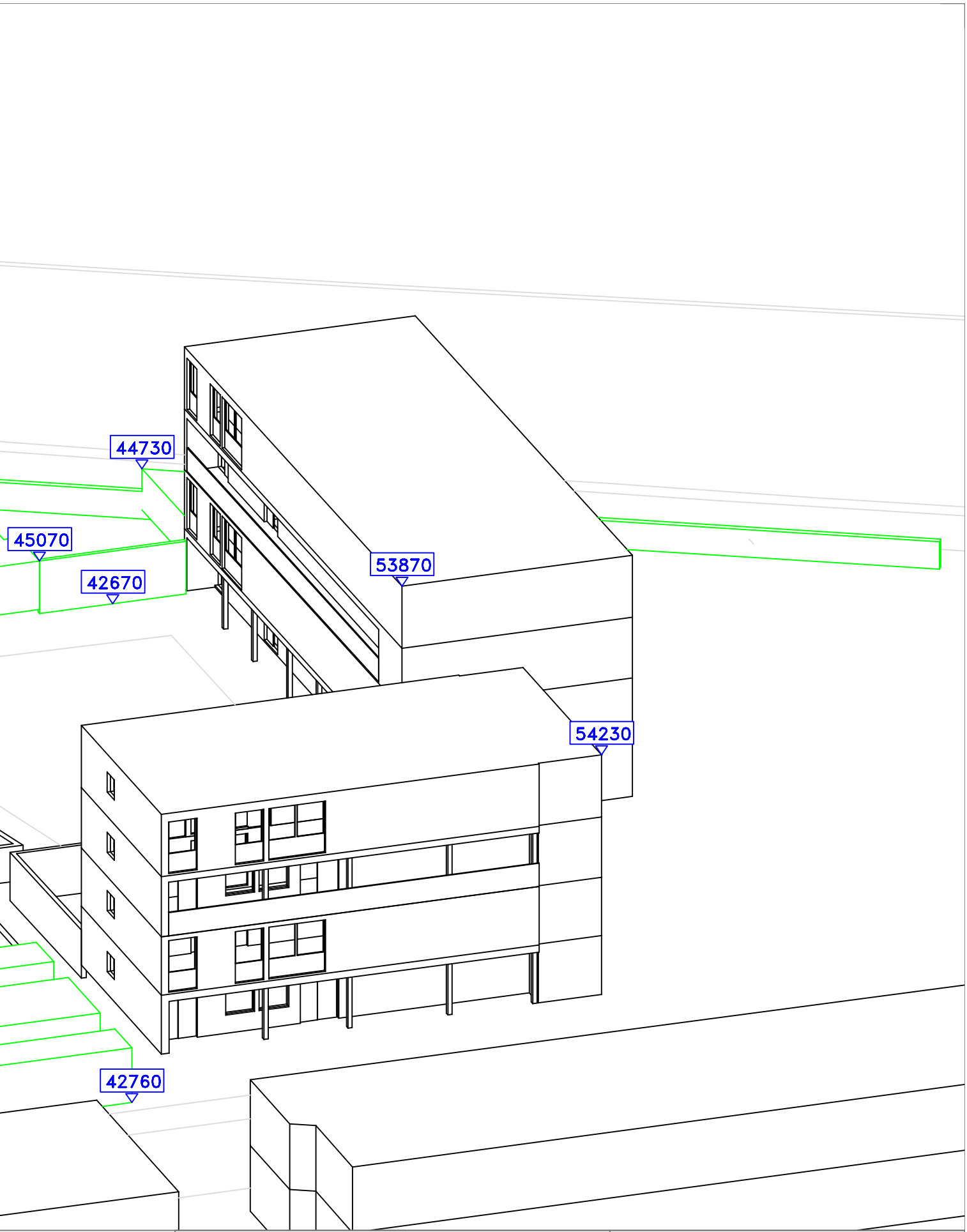

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Drawing Title: Plan view
Proposed schemes dated 28/11/13;
Site 2 and Site 3

Site Plan

Drawn by:	Date:	Scale:	Drawing No.	Rel.:
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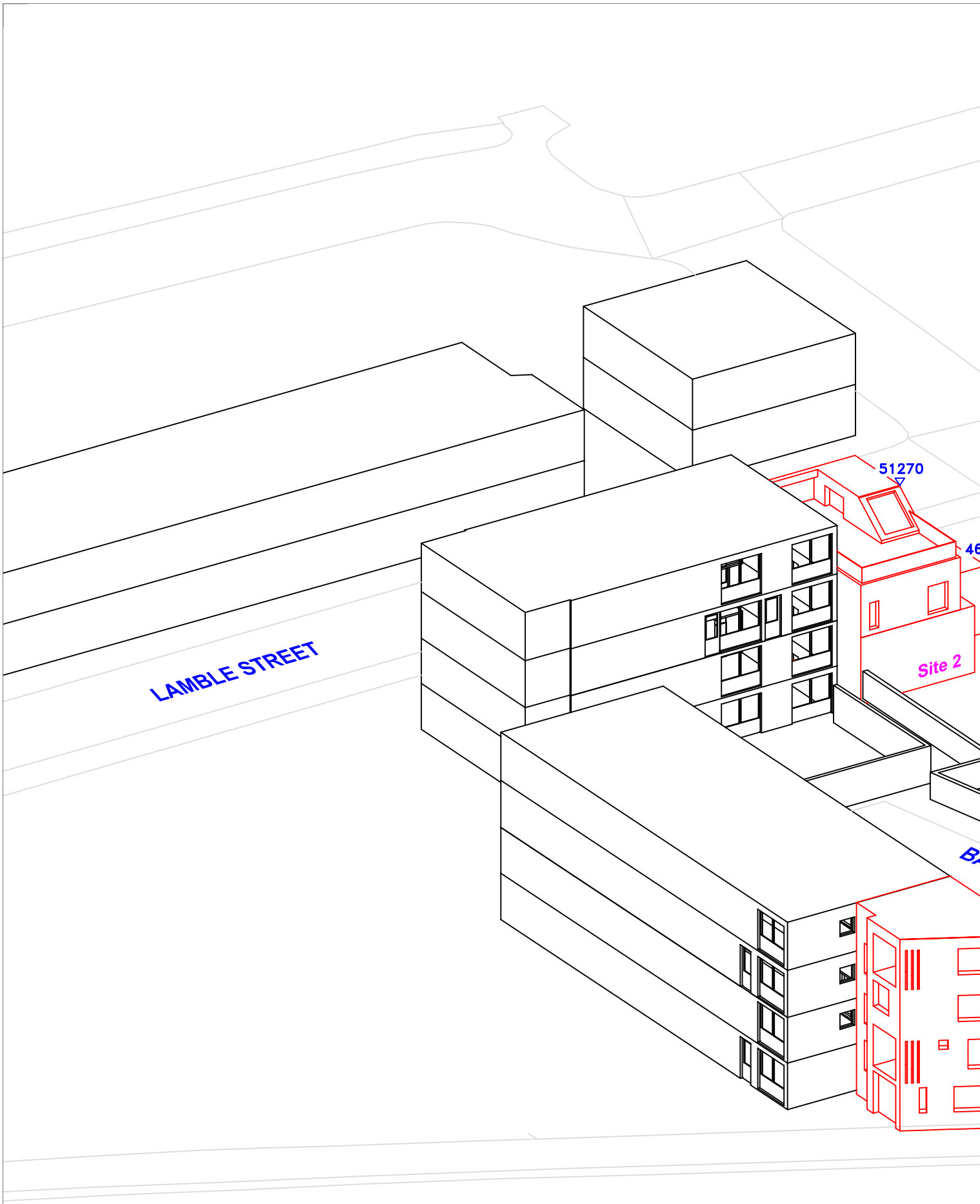

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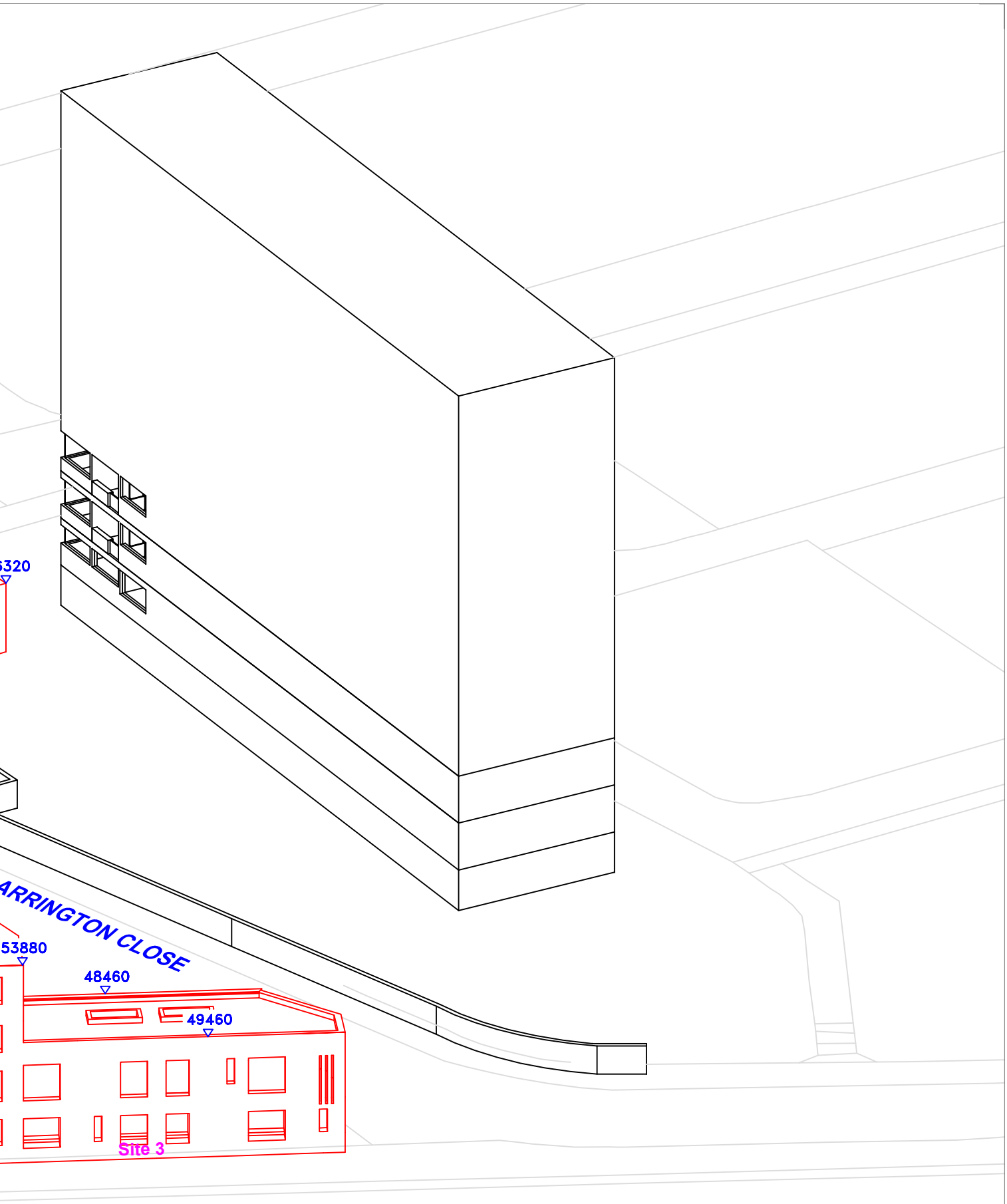

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Drawing Title: 3D view
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Site 2 and Site 3

3D Massing Model

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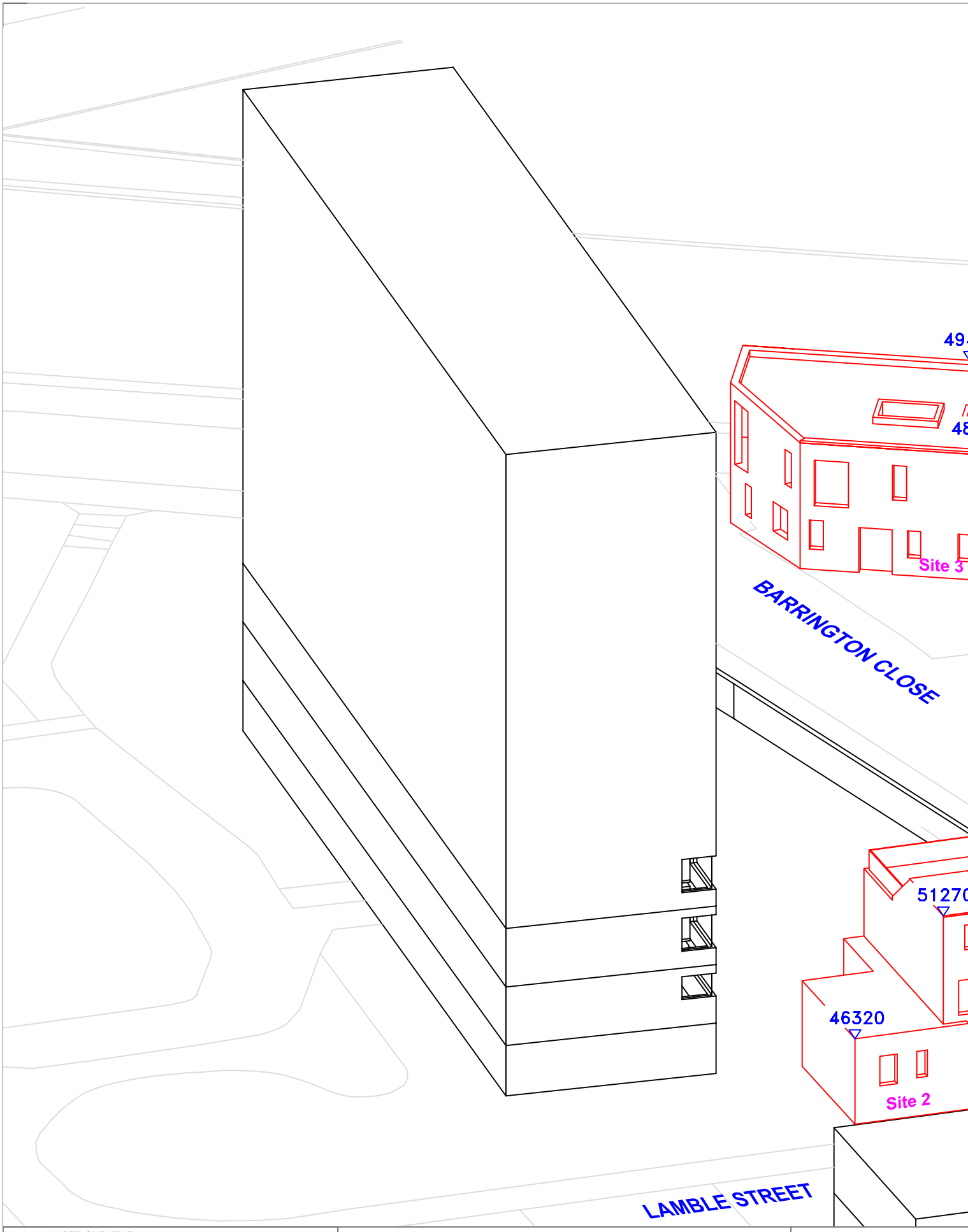

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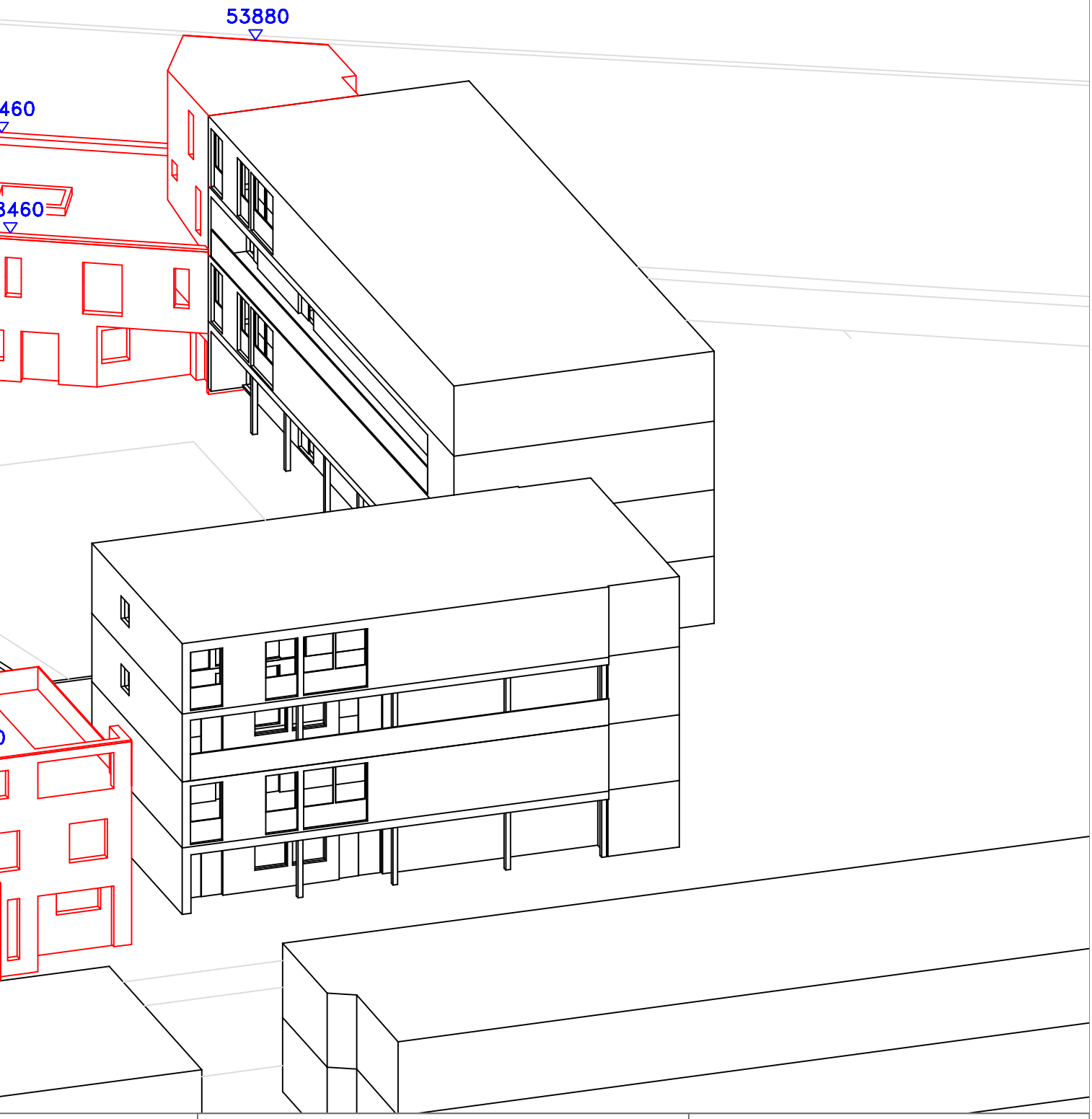

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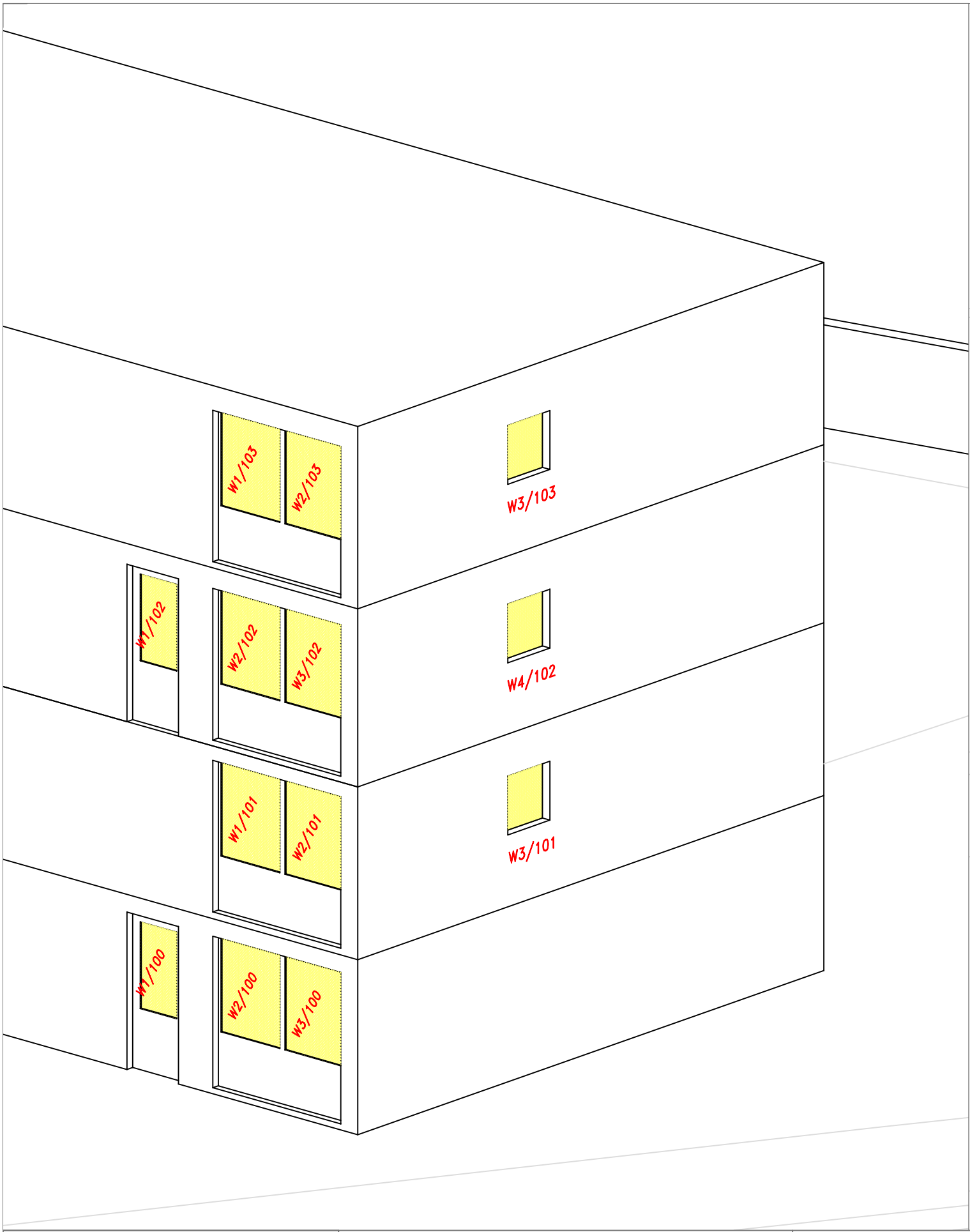

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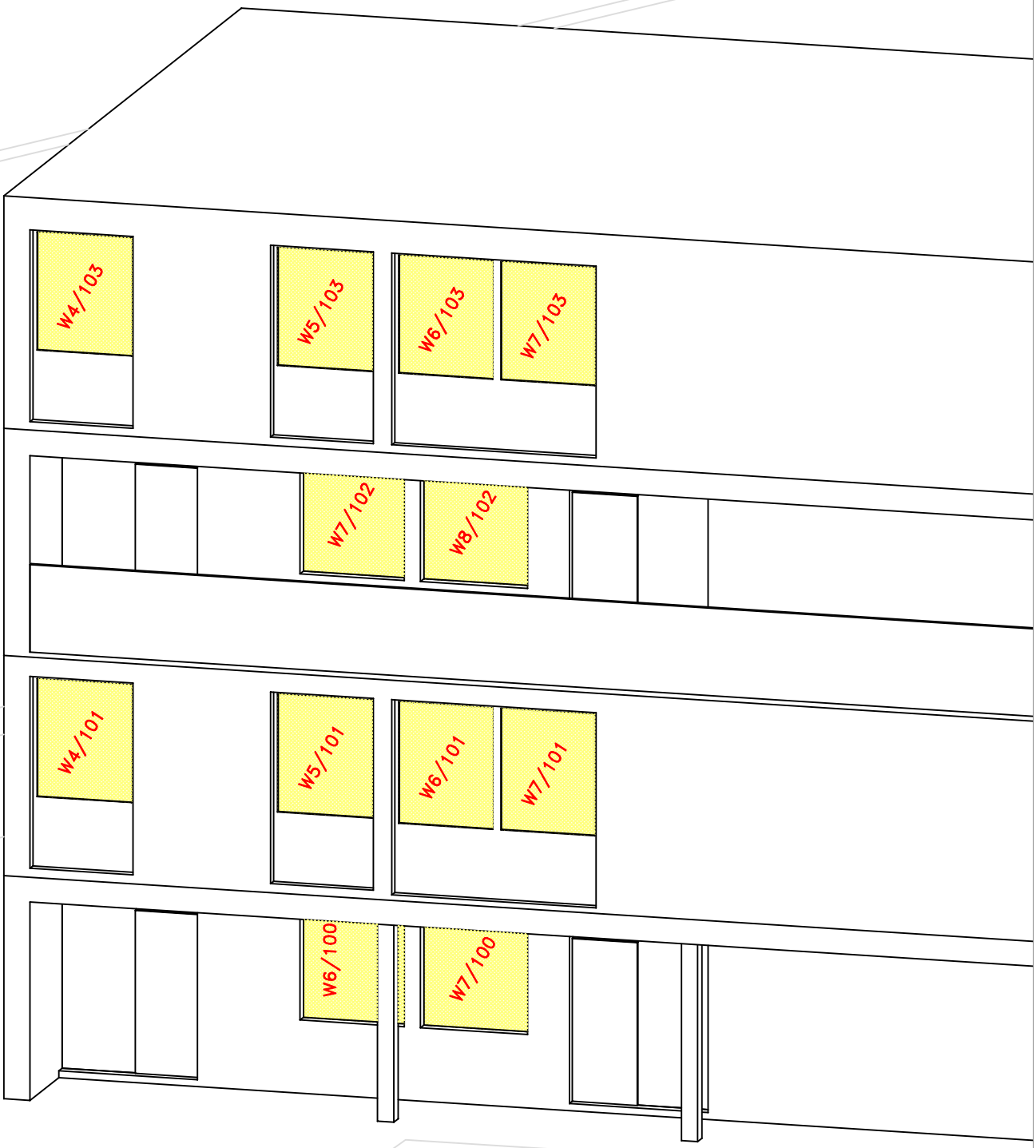

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Project: BARRINGTON AND LAMBLE
CAMDEN, LONDON

Drawing Title: Window Locations
1-12 Barrington Close

Daylight & Sunlight

Drawn by: DR | Date: MAR 14 | Scale:- @A3 | Drawing No. WS755/P/07 | Rel.: 2

Sources:

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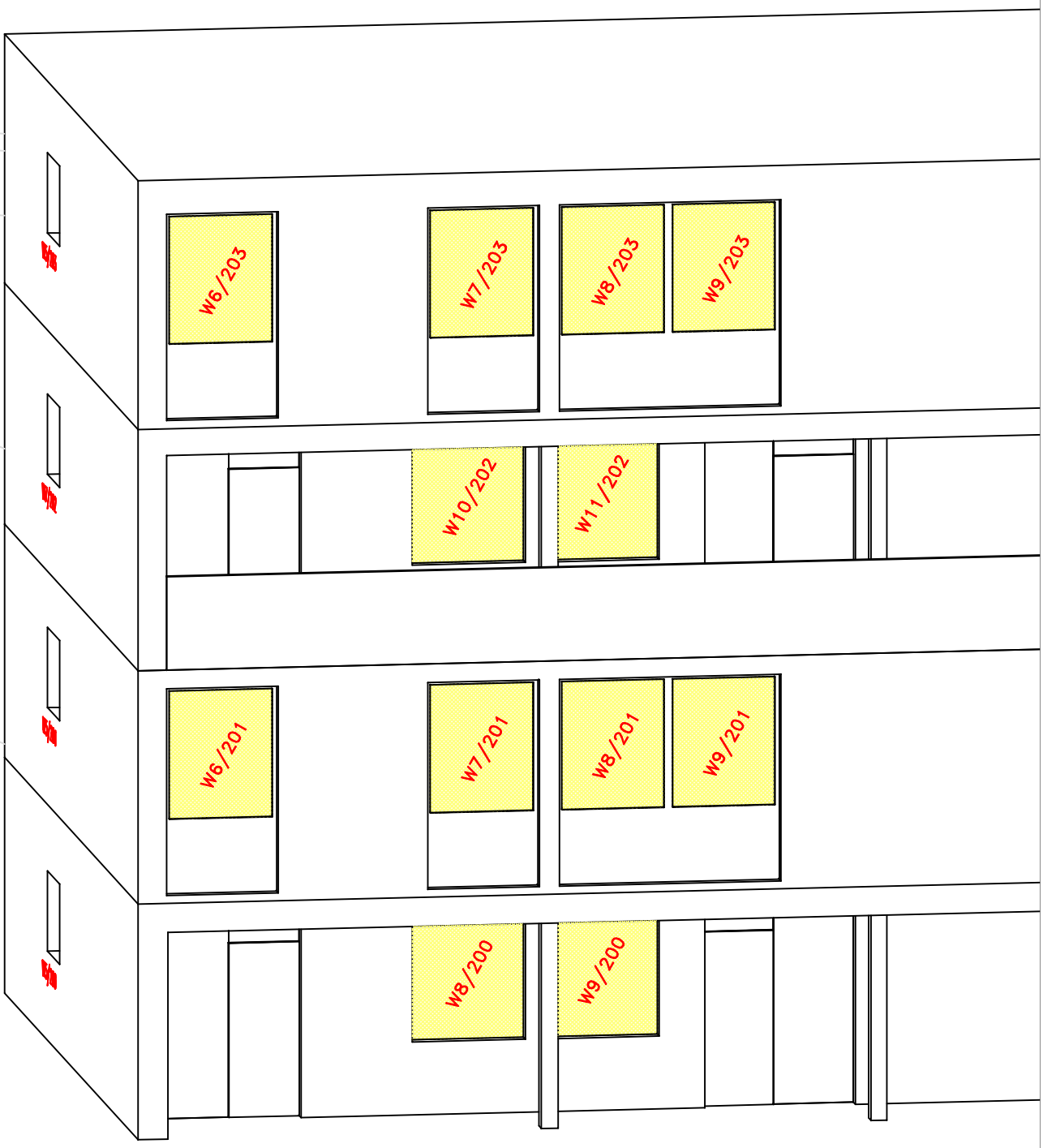

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Project: BARRINGTON AND LAMBLE
CAMDEN, LONDON

Drawing Title: Window Locations
1-16 Lamble Street

Daylight & Sunlight

Drawn by: DR | Date: MAR 14 | Scale:- @A3 | Drawing No. WS755/P/08 | Rel.: 2

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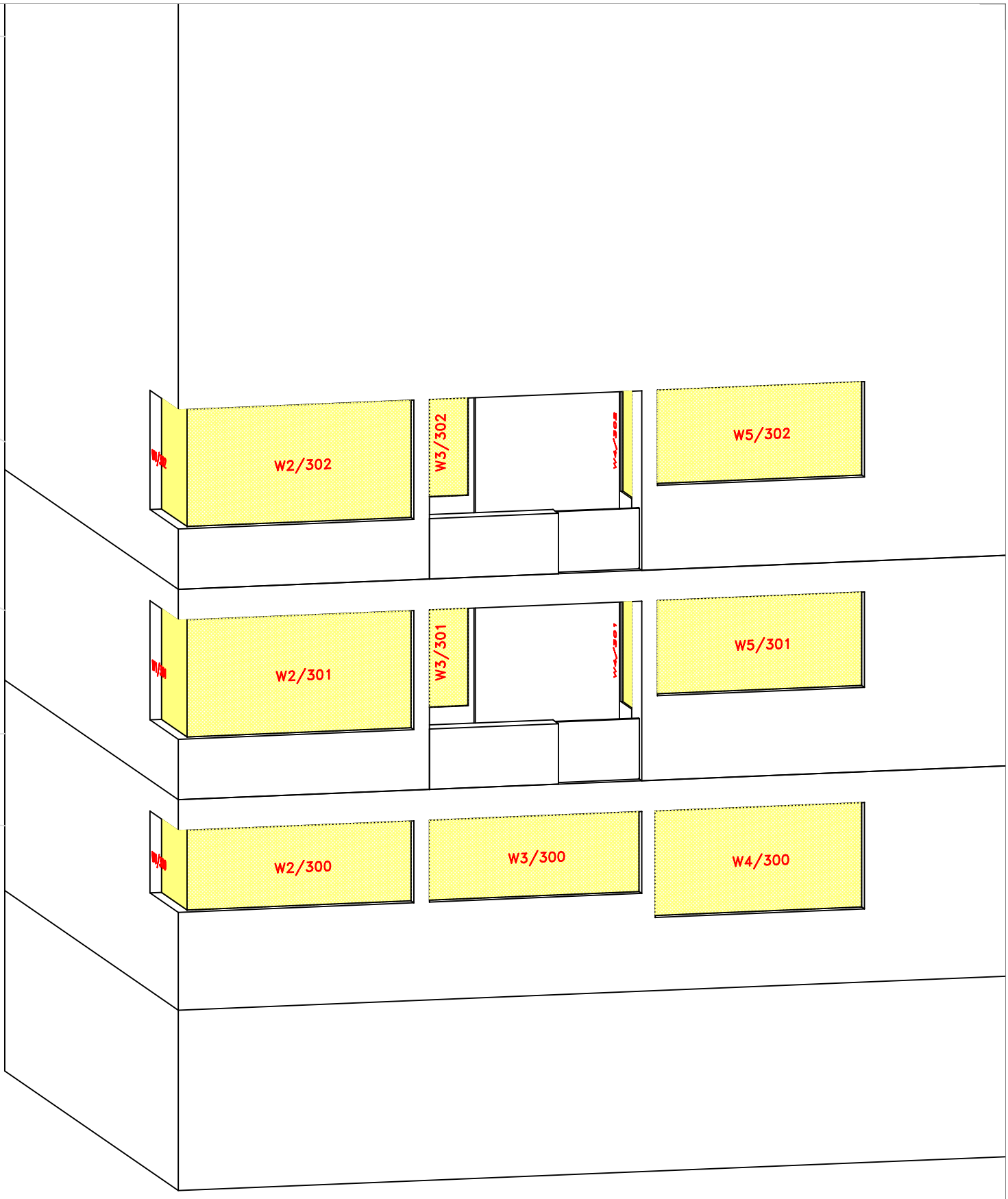

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Drawing Title: Window Locations
13-62 Barrington Close

Daylight & Sunlight

Drawn by: DR | Date: MAR 14 | Scale:- @A3 | Drawing No. WS755/P/09 | Rel.: 2

Appendix A

Location			Vertical Sky Component (VSC)			Average Daylight Factor (ADF)				No-Sky Line (NSL)				Window		Annual Probable Sunlight Hours (APSH) (window)					Annual Probable Sunlight Hours (APSH) (room)				
			EXISTING	PROPOSED	Reduction	EXISTING		PROPOSED		Whole	EXISTING	PROPOSED	Reduction	Angle from	Aspect	EXISTING		PROPOSED		Reduction	Existing		Proposed		Reduction
Room	Room Use	Window	VSC	VSC	Factor	ADF	TOTAL	ADF	TOTAL	Room	sq ft	sq ft	Factor	South		Winter %	Annual %	Winter %	Annual %	Factor	Winter %	Annual %	Winter %	Annual %	Factor
1-12 BARRINGTON CLOSE																									
R1/100		W1/100	39.5	39.5	**1.00**	0.89		0.89		127.4	127.2	127.2	**1.00**	58.1°W	Southerly	24	66	24	66	**1.00**					
R1/100		W2/100	39.5	39.5	**1.00**	1.63		1.63						58.1°W	Southerly	24	66	24	66	**1.00**					
R1/100		W3/100	39.5	39.5	**1.00**	1.63	4.15	1.63	4.15					58.1°W	Southerly	24	66	24	66	**1.00**	24	66	24	66	**1.00**
R3/100		W6/100	7.7	6.7	**0.87**	0.75	0.75	0.70	0.70	103.5	68.0	68.0	**1.00**												
R4/100		W7/100	6.5	5.3	**0.83**	0.86	0.86	0.77	0.77	73.4	67.0	66.7	**1.00**												
R1/101		W1/101	39.6	39.6	**1.00**	1.63		1.63		127.4	125.1	125.1	**1.00**	58.1°W	Southerly	24	66	24	66	**1.00**					
R1/101		W2/101	39.6	39.6	**1.00**	1.63	3.27	1.63	3.27					58.1°W	Southerly	24	66	24	66	**1.00**	24	66	24	66	**1.00**
R2/101	bathroom	W3/101	39.6	20.1	**0.51**	0.95	0.95	0.62	0.62	72.5	70.5	69.1	**0.98**	31.9°E	Southerly	28	82	22	48	**0.59**	28	82	22	48	**0.59**
R3/101		W4/101	31.5	27.4	**0.87**	0.83		0.76		238.6	236.8	236.8	**1.00**												
R3/101		W5/101	30.8	29.8	**0.97**	0.81	1.64	0.80	1.55																
R4/101		W6/101	30.4	29.7	**0.98**	0.96		0.95		197.6	190.2	190.2	**1.00**												
R4/101		W7/101	30.0	29.5	**0.98**	0.95	1.91	0.94	1.89																
R1/102		W1/102	39.6	39.6	**1.00**	0.89		0.89		127.4	127.2	127.2	**1.00**	58.1°W	Southerly	24	66	24	66	**1.00**					
R1/102		W2/102	39.6	39.6	**1.00**	1.63		1.63						58.1°W	Southerly	24	66	24	66	**1.00**					
R1/102		W3/102	39.6	39.6	**1.00**	1.63	4.15	1.63	4.15					58.1°W	Southerly	24	66	24	66	**1.00**	24	66	24	66	**1.00**
R2/102	bathroom	W4/102	39.6	20.5	**0.52**	0.95	0.95	0.62	0.62	72.5	70.5	69.5	**0.99**	31.9°E	Southerly	28	82	22	48	**0.59**	28	82	22	48	**0.59**
R4/102		W7/102	8.9	8.8	**1.00**	0.81	0.81	0.81	0.81	103.5	68.9	68.9	**1.00**												
R5/102		W8/102	8.6	8.6	**1.00**	0.99	0.99	0.99	0.99	73.4	69.4	69.4	**1.00**												
R1/103		W1/103	39.6	39.6	**1.00**	1.63		1.63		127.4	125.1	125.1	**1.00**	58.1°W	Southerly	24	66	24	66	**1.00**					
R1/103		W2/103	39.6	39.6	**1.00**	1.63	3.26	1.63	3.26					58.1°W	Southerly	24	66	24	66	**1.00**	24	66	24	66	**1.00**
R2/103	bathroom	W3/103	39.6	25.0	**0.63**	0.95	0.95	0.69	0.69	72.5	70.5	70.5	**1.00**	31.9°E	Southerly	28	82	22	56	**0.68**	28	82	22	56	**0.68**
R3/103		W4/103	33.3	33.3	**1.00**	0.86		0.86		238.6	236.8	236.8	**1.00**												
R3/103		W5/103	32.7	32.7	**1.00**	0.85	1.71	0.85	1.71																
R4/103		W6/103	32.4	32.4	**1.00**	0.97		0.97		197.6	190.9	190.9	**1.00**												
R4/103		W7/103	32.1	32.1	**1.00**	0.97	1.94	0.97	1.94																
1-16 LAMBLE STREET																									
R2/200		W3/200	27.9	27.4	**0.98**	1.22		1.20		128.2	100.7	100.7	**1.00**	31.7°E	Southerly	22	59	22	59	**1.00**					
R2/200		W4/200	27.5	27.0	**0.98**	1.24	2.46	1.22	2.42					31.7°E	Southerly	22	58	22	58	**1.00**	22	59	22	59	**1.00**
R3/200	non hab	W5/200	19.3	6.7	**0.35**	0.50	0.50	0.00	0.00	72.5	33.6	3.1	**0.09**												
R5/200		W8/200	9.8	9.8	**1.00**	0.81	0.81	0.81	0.81	103.0	100.7	100.7	**1.00**												
R6/200		W9/200	9.7	9.7	**1.00**	0.99	0.99	0.99	0.99	73.1	72.8	72.8	**1.00**												
R2/201		W3/201	29.5	29.2	**0.99**	1.27		1.26		128.2	103.4	103.4	**1.00**	31.7°E	Southerly	24	62	24	62	**1.00**					
R2/201		W4/201	29.0	28.8	**0.99**	1.29	2.56	1.28	2.54					31.7°E	Southerly	25	61	25	61	**1.00**	25	63	25	63	**1.00**
R3/201	non hab	W5/201	21.4	11.9	**0.56**	0.54	0.54	0.26	0.26	72.5	33.5	12.2	**0.36**												
R4/201		W6/201	37.9	36.7	**0.97**	0.98		0.98		238.7	237.0	237.0	**1.00**												
R4/201		W7/201	37.7	37.5	**0.99**	0.98	1.97	0.98	1.96																
R5/201		W8/201	37.7	37.6	**1.00**	1.13		1.13		197.7	196.7	196.7	**1.00**												
R5/201		W9/201	37.7	37.6	**1.00**	1.13	2.26	1.13	2.26																
R2/202		W4/202	31.5	31.5	**1.00**	0.76		0.76		128.2	128.0	128.0	**1.00**	31.7°E	Southerly	26	65	26	65	**1.00**					
R2/202		W5/202	31.0	30.9	**1.00**	1.32		1.32						31.7°E	Southerly	26	64	26	64	**1.00**					
R2/202		W6/202	30.4	30.4	**1.00**	1.34	3.41	1.33	3.41					31.7°E	Southerly	26	63	26	63	**1.00**	26	65	26	65	**1.00**
R3/202	non hab	W7/202	22.4	21.2	**0.95**	0.56	0.56	0.53	0.53	72.5	34.3	34.3	**1.00**												
R5/202		W10/202	14.4	14.3	**1.00**	1.07	1.07	1.07	1.07	103.0	100.1	100.1	**1.00**												

Barrington and Lamble Site 2 and Site 3
Camden
London

DAYLIGHT ANALYSIS
Existing buildings vs Proposed buildings on Site 2 and 3 dated 28/11/13

Location			Vertical Sky Component (VSC)			Average Daylight Factor (ADF)				No-Sky Line (NSL)				Window		Annual Probable Sunlight		
			EXISTING	PROPOSED	Reduction	EXISTING		PROPOSED		Whole	EXISTING	PROPOSED	Reduction	Angle from	Aspect	EXISTING		PR
Room	Room Use	Window	VSC	VSC	Factor	ADF	TOTAL	ADF	TOTAL	Room	sq ft	sq ft	Factor	South		Winter %	Annual %	Winter
R6/202		W11/202	14.4	14.4	**1.00**	1.33	1.33	1.33	1.33	73.1	72.2	72.2	**1.00**					
R2/203		W3/203	32.6	32.6	**1.00**	1.37		1.37		128.2	109.2	109.2	**1.00**	31.7°E	Southerly	26	66	26
R2/203		W4/203	32.0	32.0	**1.00**	1.38	2.75	1.38	2.75					31.7°E	Southerly	26	64	26
R3/203	non hab	W5/203	23.4	23.4	**1.00**	0.58	0.58	0.58	0.58	72.5	34.2	34.2	**1.00**					
R4/203		W6/203	39.6	39.6	**1.00**	1.02		1.02		238.7	237.0	237.0	**1.00**					
R4/203		W7/203	39.6	39.6	**1.00**	1.02	2.05	1.02	2.05									
R5/203		W8/203	39.6	39.6	**1.00**	1.18		1.18		197.7	196.7	196.7	**1.00**					
R5/203		W9/203	39.6	39.6	**1.00**	1.18	2.37	1.18	2.37									
13-62 BARRINGTON CLOSE																		
R1/300		W1/300	38.6	38.1	**0.99**	1.27		1.25		126.1	126.1	126.1	**1.00**	151.9°W	Northerly	1	17	0
R1/300		W2/300	34.3	31.4	**0.92**	2.47	3.74	2.30	3.55					61.9°W	Southerly	19	59	17
R2/300		W3/300	34.3	32.3	**0.94**	2.34	2.34	2.22	2.22	126.3	122.9	121.1	**0.99**	61.9°W	Southerly	20	60	20
R3/300		W4/300	34.4	32.8	**0.95**	3.25	3.25	3.11	3.11	124.3	123.2	123.2	**1.00**	61.9°W	Southerly	20	60	20
R1/301		W1/301	39.6	39.4	**1.00**	1.98		1.97		126.1	126.1	126.1	**1.00**	151.9°W	Northerly	1	17	0
R1/301		W2/301	36.7	35.8	**0.97**	4.03	6.01	3.95	5.92					61.9°W	Southerly	20	61	20
R2/301		W3/301	6.6	6.6	**1.00**	0.47	0.47	0.47	0.47	84.8	52.0	52.0	**1.00**	61.9°W	Southerly	7	10	7
R3/301		W4/301	5.4	5.0	**0.92**	0.34		0.33		123.1	122.0	122.0	**1.00**	151.9°W	Northerly	0	13	0
R3/301		W5/301	36.8	36.3	**0.99**	3.00	3.34	2.96	3.29					61.9°W	Southerly	21	62	21
R1/302		W1/302	39.6	39.6	**1.00**	1.98		1.98		126.1	126.1	126.1	**1.00**	151.9°W	Northerly	2	18	2
R1/302		W2/302	38.6	38.6	**1.00**	4.23	6.21	4.23	6.21					61.9°W	Southerly	22	63	22
R2/302		W3/302	8.3	8.3	**1.00**	0.54	0.54	0.54	0.54	84.8	52.0	52.0	**1.00**	61.9°W	Southerly	10	13	10
R3/302		W4/302	5.7	5.7	**1.00**	0.35		0.35		123.1	122.0	122.0	**1.00**	151.9°W	Northerly	2	15	2
R3/302		W5/302	38.7	38.7	**1.00**	3.14	3.48	3.14	3.48					61.9°W	Southerly	23	64	23

Appendix B

Vertical Sky Component (1)

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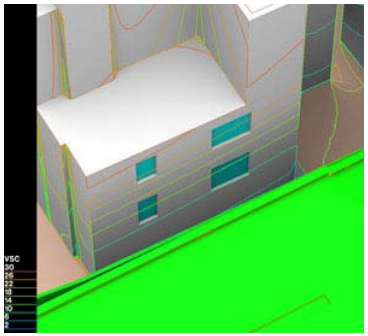
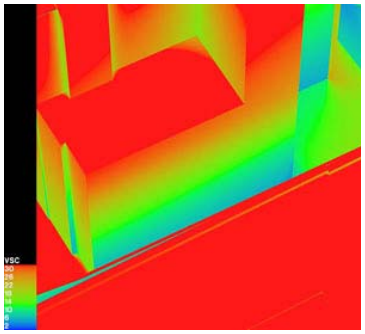
The Vertical Sky Component is a measure of the amount of skylight incident on a vertical plane (i.e. the sky factor on a Vertical Plane). It is most commonly applied to the light incident at the centre of a window and in this sense is a measure of the potential for good daylighting. The VSC is calculated by taking the ratio of the skylight incident at a point to the unobstructed skylight available on a horizontal plane. For a uniform sky, the maximum value is 50% (since the point is on a vertical plane, clearly only the half of the hemisphere which is in front of the plane can contribute). For a CIE sky, the maximum value is 39.6%.





Clearly in this case, the further down the windows are, the less light they receive, and therefore the lower the value of the VSC.

BRE Criterion

The guidelines state that if the VSC at the centre of a window is less than 27% and less than 0.8 times its former value, the diffuse daylighting of the existing building will be adversely affected. A value of 27% corresponds to an obstruction angle of 25 degrees over an infinite extent in plan.

This guideline (as with all the BRE guidelines) can be interpreted flexibly. The above criterion was developed in the case of suburban development where existing development was 2 storeys across an average street width. In city centre locations, the target VSC can be reduced to allow proposed buildings to match the height of other buildings in the neighbourhood.

Average Daylight Factor (1)

WATERSLADE
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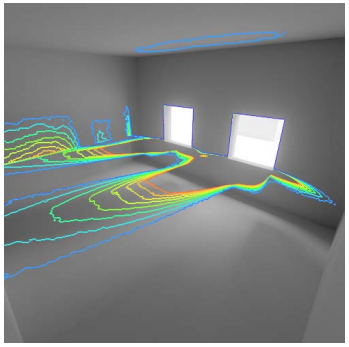
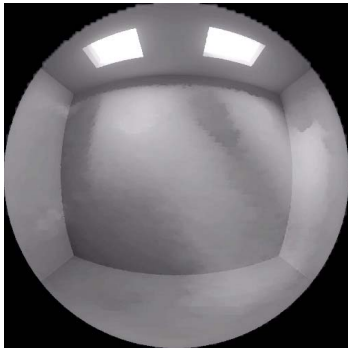
The Average Daylight Factor (ADF) is a measure of interior daylight. It can be used to establish whether a room will have a predominantly daylit appearance and if not, it can provide levels below which a room should not fall even if supplementary electric lighting is provided.





ADF values can be calculated for rooms within a proposed development, and checked against the recommended value. Existing and Proposed ADF values can also be calculated for properties which overlook a site.

Factors on which the ADF depend are: VSC at the face of each window, the Total Window Area, Total Wall Area, Wall Reflectivity and Window Transmission.

There are no specific BRE criteria for reduction in ADF if a proposed development were to be implemented, but since the ADF is related to the VSC via the obstruction angle, a reduction in VSC leads to a reduction in ADF.

BRE Criterion

The BRE states that for a predominantly daylit appearance the ADF should be 5% or more if there is no supplementary electric lighting, or 2% or more if there is supplementary electric lighting. There are additional recommendations for dwellings. These are

- 2.0% - Kitchens
- 1.5% - Living Rooms
- 1.0% - Bedrooms

These figures are also recommended in BS 8206 Part 2 1992 entitled 'Code of Practice for Daylighting'.

Sunlight Availability

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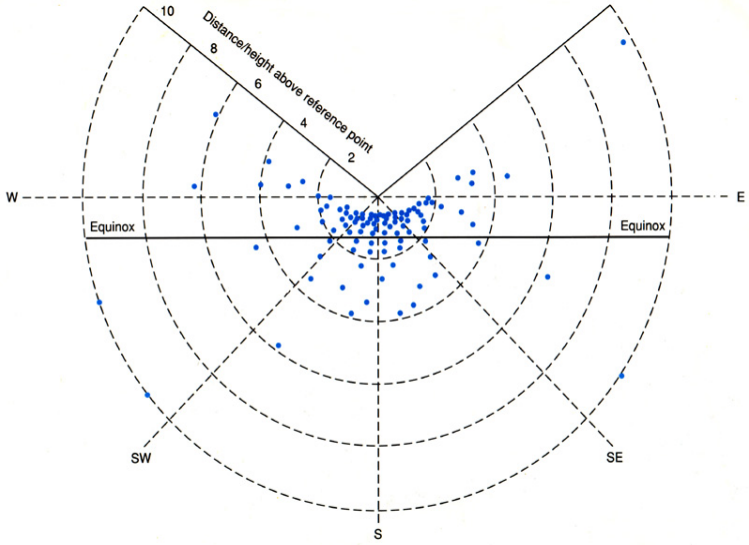
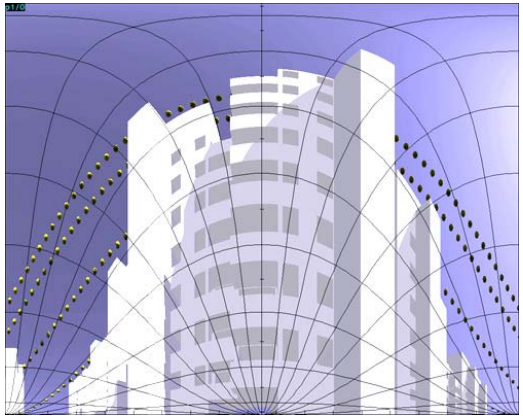
Sunlight Availability is a measure of the average number of hours of sunlight one would expect to receive at a given position, as a fraction of the unobstructed total number of hours at the same location. The BRE have compiled data sets consisting of a statistical sample of solar positions convolved with local meteorological data. Using these to calculate Sunlight Availability, one would simply calculate the number of solar positions visible from a point, compared to the total number, expressed as a percentage. The diagram below, taken from the BRE report, shows the solar positions, relative to a reference point, used to calculate Sunlight Availability for London (51.5°N).



The BRE report states that for windows within a new development, if a point at the centre of a window on the plane of the inside surface of the wall "*...can receive more than one quarter of annual probable sunlight hours, including at least 5% of annual probable hours during the winter months between 21st September and 21st March, then the room should still receive enough sunlight."*

For windows in surrounding properties which experience a change in sulight availability, it goes on to say that, "*Any reduction in sunlight access below this level should be kept to a minimum. If the available sunlight hours are both less than the amount given and less than 0.8 times their former value, either over the whole year or just during the winter months, then the occupants will notice the loss of sunlight."*

Subjective Assessment



It is often useful to visualise solar paths as viewed from a particular position. The above example shows solar paths plotted onto a Waldram Diagram. This provides a snapshot of times and dates showing when a window will receive direct sunlight. It also shows which part of a building is responsible for causing a shadow. Another method of subjective assessment involves producing shadow animations to compare the existing and proposed scenarios.

No-Sky Line (1)

The No-Sky Line is a measure of the impact of development on the daylight distribution in a room. The No-Sky Line can be determined by examining a grid of points on the working plane of the room. Those from which the sky is visible lie within the No-Sky Line, and those from which it is not, lie outside. For a fine enough grid, the boundary between the two is the No-Sky Line. The BRE state that for residential properties, the working plane is to be taken at 850mm above floor level, and for commercial properties, 700mm above floor level.

The BRE state the following for the criterion to be used in comparing the No-Sky Line for the existing buildings with that for proposed development:

'*If, following construction of a new development, the no-sky line moves so that the area of the existing room which does receive direct skylight is reduced to less than 0.8 times its former value, then this will be noticeable to the occupants, and more of the room will appear poorly lit. This is also true if the no-sky line encroaches on key areas like kitchen sinks and worktops.*'

The BRE guide goes on to state that the guidelines need to be applied sensibly and flexibly. For instance, there is no point designing a proposed scheme with tiny gaps in it in order to safeguard the No-Sky line.

The above highlights a potential weakness in the method—in principle a point lies within the No-Sky Line no matter how small a patch of sky it can see—even if for instance there is only a keyhole allowing light in to the room. Clearly the method is intended to map out areas within a room which receive a significant amount of direct daylight from the sky, so that it would be better if a small but finite amount of direct daylight were used to divide the two regions. This would also reduce the tendency for the No-Sky Line position to vary wildly at the rear of a room, rather like when small variations in tidal height cause the tide line to move by large distances on a virtually level beach.

That said, the No-Sky line takes into account multiple windows serving the same room, which the VSC criterion does not. It also takes account of the size of the windows, and the size and layout of the room being served by the window(s). These two factors are also not accounted for in a VSC analysis.

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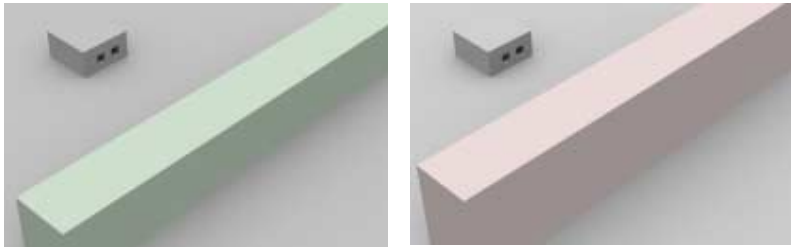
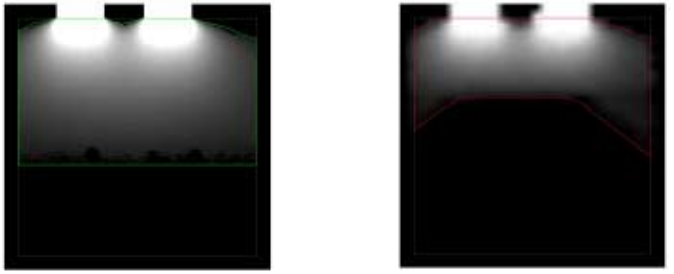
VSC and No-Sky Line are in a sense complementary. VSC is a measure of the potential for good daylighting—does the front face of a window receive adequate daylight and by how much is it reduced? No-Sky Line on the other hand, by examining what happens to daylight when it enters a room through the windows serving it, attempts to answer the question, how is the daylight and its distribution impacted within a room?

Simple Example





EXISTING PROPOSED

In the example above, we show a room served by 2 windows, in front of which a two storey building is having an additional storey added. The area of the room is 25 sq m, the area enclosed by the existing No-Sky Line is 15 sq m, and that enclosed by the proposed No-Sky Line is 9.4 sq m. The proposed area is 0.63 times its former value (37% reduction), and therefore this room would fail the BRE No-Sky Line test.