



**112 King Henry's Road,  
London, NW3 3SL**

## **Daylight and Sunlight Report**

**13<sup>th</sup> September, 2021**



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# Daylight and Sunlight Report

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London,  
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Prepared for:

**THE LONDON RESOLUTION  
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## **1.0 Introduction**

**1.1** CHP Surveyors Limited have been instructed by The London Resolution to consider the impact the proposal of an additional floor to the property will have on the daylight and sunlight enjoyed by the neighbouring residential properties.

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**1.2** This report accompanies a planning application submitted by The London Resolution for the proposed scheme.

## **2.0 Executive Summary**

**2.1** CHP Surveyors Limited's instructions are to consider the implications of the proposed scheme on the neighbouring residential properties daylight and sunlight.

**2.2** From our online research, the neighbouring residential properties that need to be considered as part of this assessment are: -

- 1 Lyttelton Close
- 2 Lyttelton Close
- 5 Lyttelton Close
- 110 King Henry's Road

**2.3** To ensure that this assessment has correctly considered the daylight and sunlight enjoyed by the neighbouring residential properties, it has been undertaken in accordance with the Building Research Establishment's publication "*Site Layout Planning for Daylight and Sunlight. A Guide to Good Practice*." (2011) (the "BRE guidelines").

**2.4** The technical analysis has been undertaken using the standards and tests contained in the BRE guidelines. A summary of the recommendations set out in the Principles of Daylight and Sunlight attached at Appendix A.



- 2.5** The analysis demonstrates that the proposed additional floor will not have a significant effect on the daylight and sunlight enjoyed by the neighbouring residential properties, with the numerical values set out in the BRE guidelines achieved in all instances.

### **3.0 Assessment**

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- 3.1** Under paragraph 123 © of the National Planning Policy Framework, it states with regard to daylight and sunlight when consider whether efficient use of the land is being made with the land;

*"....when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide adequate living standards)."*

It also states under the National Planning Practice guidance under Design (March 2014);

*"....with regard to scale and relates to both the overall size and mass of individual buildings and spaces in relation to their surroundings, and to the scale of their parts. As part of this account should be taken of local climatic conditions, including daylight and sunlight..."*

- 3.2** The site is located within the London Borough of Camden. Within the borough's Local Plan, it states; *"the Council will seek to protect the quality of life of occupiers and neighbours. We will grant permission for the development unless this causes unacceptable harm to amenity."* It states *"Loss of daylight and sunlight can be caused if spaces are overshadowed by development. To assess whether acceptable levels of daylight and sunlight are available to habitable, outdoor amenity and open spaces, the Council will take into account the most recent guidance published by the Building Research Establishment (currently the Building Research Establishment's Site Layout Planning for Daylight and Sunlight- A Guide to Good Practice 2011). Further detail can be found within our supplementary planning document Camden Planning Guidance on amenity."*



**3.3** To ensure that the assessment has been considered appropriately, daylight and sunlight assessments have been undertaken referencing the criteria contained in the Building Research Establishment's publication "*Site Layout Planning for Daylight and Sunlight. A Guide to Good Practice*." (2011) (BRE guidelines) but taking into account the specific site constraints.

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**3.4** The introduction to the BRE guidelines state that: -

*"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the developer. Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design."*

**3.5** It is suggested within the BRE guidelines that residential properties should have the greatest need for good daylight and sunlight and that key habitable rooms should be considered, these being Bedrooms, Living Rooms and Kitchens.

**3.6** Within the BRE guidelines, there are different methodologies for calculating daylight. The first method calculates the Vertical Sky Component (VSC). This analysis establishes the amount of available daylight received directly from the sky for each individual window. The reference point for this analysis is the centre point of the window.

**3.7** The second method is the No Sky Line (NSL) or Daylight Distribution analysis. This assesses the change in position of the No Sky Line between the existing and proposed situations. It does not take into account the number and size of windows to a room.

**3.8** To calculate the level of sunlight received, the BRE guidelines state that an analysis is required to windows which are within 90° of due south. An Annual Probable Sunlight Hours (APSH) test is undertaken which establishes the level of sunlight achieved during the winter and summer months.



- 3.9** An extended account of the BRE guidelines is attached at Appendix A, entitled 'Principles of Daylight and Sunlight'.

#### **4.0 Information**

- 4.1** During the process of producing our report, we have made reference to the following information: -

Drawing numbers; 210818-001, 002, 003, 004, 005, 006, 102, 103, 104, 105, 106, 107

#### **CHP Surveyors Limited**

Online research

#### **5.0 Proposals**

- 5.1** The site is located within the London Borough of Camden. The existing structure on the site comprises of a two-storey residential property as indicated on drawing numbers 2582-100 and 102 attached at Appendix B.

- 5.2** The proposals for the site are to construct an additional floor as illustrated on drawing numbers 2582-101 and 103 attached at Appendix B.

#### **6.0 Limitations**

- 6.1** Our 3D computer model and resultant analyses the proposed development has been based on the drawings set out in Clause 4.1.

- 6.2** During the design process, to assist in understanding the implications proposed massing would have on the neighbouring residential properties a site was undertaken to endeavour to understand the internal configuration of the neighbouring properties. In addition, research has been undertaken of the neighbouring properties using planning portals and other sources to try and establish the internal configuration within these properties. Where information was



unable to be sourced, reasonable assumptions have been made as to the internal room sizes, layouts and uses based on onsite observations.

## 7.0 Methodology

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- 7.1** Based on online research and onsite observations, we have produced a 3D computer model of the neighbouring residential buildings to the site. This includes the window locations and internal configuration (either actual or assumed). We have not had access to the neighbouring properties and therefore the internal configuration and which windows serve habitable rooms has been based on onsite observations and other information we have been able to obtain. We have then produced a 3D computer model of the existing structures on the site and the proposals.
- 7.2** Using a specialist computer programme, we have undertaken an analysis in accordance with the criteria contained in the BRE guidelines. We have run an analysis in the existing situation to provide a baseline and then a further analysis following the implementation of the proposals. There is no requirement to consider the implications during the development process as these will only be short term.
- 7.3** As clearly stated within the BRE guidelines; *"Its aims are to help designers not constrain them and that therefore the numerical values contained within the document should be interpreted flexibly since natural light is only one of many factors in site layout design."* It also states that different target levels may be used in such an urban location, as we are considering.
- 7.4** The BRE guidelines goes on to state; *In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or an area with modern high rise buildings, a higher degree of obstruction may be unavoidable if new development are to match the height and proportions of existing buildings.* It also under paragraph 2.2.3 *Note that the numerical values given here are purely advisory. Different criteria may be used based on requirements for daylighting in an area viewed against other site layout constraints. Another important issue is whether the existing building is itself a good neighbour,*





*standing a reasonable distance from the boundary and taking no more than its fair share of light.*

- 7.5** The numerical values contained in the BRE guidelines are to establish whether the proposals will have a significant effect on the daylight enjoyed by the neighbouring properties and are based initially on a Vertical Sky Component (VSC) analysis. This analysis advises that each window should achieve a VSC of 27% or 0.8 times the existing value. These values are for a suburban location whereas the site is located within an urban location. In such a location, with reference to previous planning appeal decisions, an alternative target VSC in the mid-teens is considered more appropriate.
- 7.6** In relation to daylight, the BRE guidelines set out the numerical values for daylight distribution. The criteria specify that a significant portion of each habitable room (>80%), at least 0.8 times the existing area, should lie in front of the No Sky Line (NSL).
- 7.7** Concerning sunlight, the BRE guidelines advise that all windows within 90° of due south should achieve 25% of the Annual Probable Sunlight Hours (APSH) with at least 5% during the winter months. Where this is not achieved and the difference between the existing and proposed APSH is more than 4%, the BRE guidelines state that the proposals will not have a noticeable effect on the sunlight, provided the total APSH, as well as during the winter months, are within 0.8 times the existing.
- 7.8** The numerical values set out in the BRE Guidelines, it acknowledges should be applied flexibly as they are national and therefore are more appropriate within a sub-urban rather than urban location. The Mayor of London's Housing SPG acknowledges this and states under paragraph 1.3.46: -

*The degree of harm on adjacent properties and the daylight targets within a proposed scheme should be assessed drawing on broadly comparable residential typologies within the area and of a similar nature across London. Decision makers should recognise that fully optimising housing potential on larger sites may necessitate standards which depart from those presently*



*experienced, but which still achieve satisfactory levels of residential amenity and avoid unacceptable harm.*

- 7.9** The Housing SPG under paragraph 2.3.47 in relation to the necessity for more living and working space and thus greater density: -

*BRE guidelines on assessing daylight and sunlight should be applied sensitively to higher density development in London, particularly in central and urban settings, recognising the London Plan's strategic approach to optimise housing output (Policy 3.4) and the need to accommodate additional housing supply in locations with good accessibility suitable for higher density development (Policy 3.3). Quantitative standards on daylight and sunlight should not be applied rigidly, without carefully considering the location and context and standards experienced in broadly comparable housing typologies in London.*

## **8.0 Surrounding Properties**

- 8.1** Using the information provided and our online research we have applied the criteria contained in the BRE guidelines, to establish the properties that should be considered in the technical analysis. We consider a technical analysis is undertaken of the following properties: -

PROPERTY	ORIENTATION TO SITE	PROPERTY USE
1 Lyttelton Close	West	Residential over two floors
2 Lyttelton Close	Northwest	Residential over two floors
5 Lyttelton Close	North	Residential over two floors
110 King Henry's Road	East	Residential over two floors

## **9.0 Daylight Assessment**

### **9.1 General**

- 9.1.1** With regard to daylight enjoyed by the neighbouring residential properties, we have considered where the proposals will subtend a 25° line drawn from their lowest window. The BRE guidelines



state that where the proposals do not subtend this, they will not have significant implications. Where this is not achieved, in accordance with the BRE guidelines we have calculated the Vertical Sky Component (VSC), both in the existing and proposed situation. This establishes the amount of daylight currently enjoyed on the face of the window and following the implementation of the proposals.

**9.1.2** The guidelines state that if the VSC calculated at the centre of each window is 27% or more, the enough skylight should be reaching the window. If, with the implementation of the proposals the window does not achieve 27% VSC but is more than 0.8 times its former value, then the BRE guidelines state that skylight is unlikely to be seriously affected.

These numerical values are however considered appropriate for a sub-urban, rather than urban location. It is therefore considered that with reference to previous planning appeal decisions throughout London, a VSC mid-teens is appropriate.

**9.1.3** In addition to the above, to ensure that the room will achieve good daylight distribution the No Sky Line (NSL) is plotted. The BRE guidelines state that for a room to enjoy good daylight distribution, a significant area of the room, which is considered to be 80% or at least 0.8 times the existing area should be in front of the NSL.

**9.1.4** Criteria on how to calculate the Average Daylight Factor is set out in Appendix C of the BRE guidelines. The equation used is: -

$$ADF = \frac{TMA_w\theta}{A(1-R^2)} \quad \text{Where: -}$$

- T Is the diffuse visible light transmittance of glazing with 0.74 used for clear double glazing
- M Is the maintenance factor allowing for the effects for dirt where 0.92 is used reflecting a 8% loss
- $A_w$  Is the net glazed area of the window which is calculated from the 3D computer model
- $\theta$  Is the angle of visible sky which can be taken from VSC results
- A Is the total area of all the room surfaces (ceilings, floors, walls and windows) which is calculated from the 3D computer model
- R Is the area-weighted average reflectance for the room surfaces with 0.85 used for ceilings, 0.81 for walls and 0.4 for floors



## 9.2 Daylight Analysis

9.2.1 It would appear that the following neighbouring properties provide residential accommodation:

- 1 Lyttelton Close
- 2 Lyttelton Close
- 5 Lyttelton Close
- 110 King Henry's Road

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9.2.2 Concerning 110 King Henry's Road, this property has been considered as part of our assessment. However, this property has no windows overlooking the proposed additional floor and the courtyard is to the east and on the opposite side of the property. The proposals will therefore have no implication on this property's access to daylight or sunlight.

## 9.3 1 Lyttelton Close

9.3.1 This property is located to the west of the site and provides residential accommodation over two floors.

9.3.2 The results of the VSC analysis are set out in the table attached at Appendix C and demonstrate that in all instances the numerical values set out in the BRE guidelines are achieved.

9.3.3 With regards to daylight distribution, based on our assumptions as to the internal configuration, the results of the analysis are set out in the table attached at Appendix C and demonstrate that in all instances a significant portion of each room will lie in front of the NSL.

9.3.4 The analysis of the daylight enjoyed by this property demonstrates that the BRE guidelines are achieved.

## 9.4 2 Lyttelton Close

9.4.1 This property is located to the northwest of the site and provides residential accommodation over two floors.



**9.4.2** The results of the VSC analysis are set out in the table attached at Appendix C and demonstrate that in all instances the numerical values set out in the BRE guidelines are achieved.

**9.4.3** With regards to daylight distribution, based on our assumptions as to the internal configuration, the results of the analysis are set out in the table attached at Appendix C and demonstrate that in all instances a significant portion of each room will lie in front of the NSL.

**9.4.4** The analysis of the daylight enjoyed by this property demonstrates that the BRE guidelines are achieved.

## **9.5 5 Lyttelton Close**

**9.5.1** This property is located to the north of the site and provides residential accommodation over two floors.

**9.5.2** The results of the VSC analysis are set out in the table attached at Appendix C and demonstrate that in all instances the numerical values set out in the BRE guidelines are achieved.

**9.5.3** With regards to daylight distribution, based on our assumptions as to the internal configuration, the results of the analysis are set out in the table attached at Appendix C and demonstrate that in all instances a significant portion or at least 0.8 times the existing of each room will lie in front of the NSL.

**9.5.4** The analysis of the daylight enjoyed by this property demonstrates that the BRE guidelines are achieved.



## **10.0 Sunlight Assessment**

### **10.1 General**

**10.1.1** The BRE guidelines require that all windows within 90° of due south should be considered. The recommended criteria of the BRE guidelines sets out that a window should achieve an Annual Probable Sunlight Hours (APSH) of 25%, including at least 5% during the winter months. Where the difference in APSH is more than 4% between the existing and proposed, both the total APSH and those enjoyed within the winter months are more than 0.8 times the existing values. The guidelines also state that bedrooms are less important than living rooms.

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### **10.2 Sunlight Analysis**

**10.2.1** Due to the orientation of the neighbouring properties, in accordance with the BRE guidelines, a sunlight analysis has been undertaken of: -

- 1 Lyttelton Close
- 2 Lyttelton Close
- 5 Lyttelton Close

### **10.3 1 Lyttelton Close**

**10.3.1** The analysis has considered the access to sunlight the rooms that have windows facing within 90° of due south, with the results set out in the table attached at Appendix D.

**10.3.2** This indicates that all rooms will achieve the numerical values set out in the BRE guidelines and therefore the proposals will not have a significant effect on sunlight and the BRE guidelines are achieved.



### **10.3 2 Lyttelton Close**

**10.3.1** The analysis has considered the access to sunlight the rooms that have windows facing within 90° of due south, with the results set out in the table attached at Appendix D.

**10.3.2** This indicates that all rooms will achieve the numerical values set out in the BRE guidelines and therefore the proposals will not have a significant effect on sunlight and the BRE guidelines are achieved.

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### **10.5 5 Lyttleton Close**

**10.5.1** The analysis has considered the access to sunlight the two rooms that have windows facing within 90° of due south, with the results set out in the table attached at Appendix D.

**10.5.2** This indicates that all rooms will achieve the numerical values set out in the BRE guidelines and therefore the proposals will not have a significant effect on sunlight and the BRE guidelines are achieved.

## **11.0 Conclusion**

**11.1** An analysis has been undertaken in accordance with the Building Research Establishment's publication "*Site Layout Planning for Daylight and Sunlight. A Guide to Good Practice*". (BRE guidelines) to establish the effect the proposals will have on the daylight and sunlight enjoyed by the neighbouring properties: -

- 1 Lyttelton Close
- 2 Lyttelton Close
- 5 Lyttleton Close
- 110 King Henry's Road



- 11.2** The results of the analysis demonstrate that in all instances the numerical values set out in the BRE guidelines are achieved. The proposals will therefore not have a significant effect on the neighbour's enjoyment of daylight and sunlight.





# Appendix A



## CHP Surveyors Limited

### PRINCIPLES OF DAYLIGHT AND SUNLIGHT

In 2011 the Building Research Establishment (BRE) published a handbook titled "*Site Layout Planning for Daylight and Sunlight. A Guide to Good Practice.*" Its aim was to provide advice to building designers on site layout planning in order to achieve good daylight and sunlight amenity to the proposed development, the open spaces between the proposed blocks and the existing surrounding properties.

The content of this guide is well established and is used by most Local Authorities as the methodology for measuring daylight and sunlight, the guidelines should be applied flexibly to take account of the specific circumstances of each site. The BRE guidelines are suited more to low density suburban development sites where there is greater flexibility for site layout planning. In dense urban development sites, these are usually constrained often by adjacent buildings and the guidelines state that these should be applied more flexibly in these instances. Within the Introduction of the guidelines, it states that: -

*"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the developer. Although it gives numerical guidelines, these should be interpreted flexibly because natural light is only one of many factors in site layout design."*

The Introduction of this document, continues to advise that its purpose is also to; "*To help to ensure good conditions in the local environment, considered broadly, with enough sunlight and daylight on or between buildings for good interior and exterior conditions.*"

It must therefore be appreciated and as can be seen from the above extracts; the handbook is for guidance only.



## Daylight

The guidelines state that daylight assessments should be undertaken to habitable rooms where the occupants can expect to receive a reasonable amount of daylight.

The first assessment that should be undertaken is to establish whether the proposals will subtend an angle of 25° from the centre of the window. If it does not, then it is considered there will be good daylight. The BRE guidelines advise: -

*"If any part of a new building or extension, measured in a vertical section perpendicular to a main window wall of an existing building, from the centre of a lowest window, subtends an angle of more than 25° to the horizontal may be affected."*

This assessment is most appropriate for well-spaced, low density or low rise, uniform proposed developments. It is not an appropriate assessment for dense urban environments where the existing building on the development site already subtends at an angle greater than 25° to the horizontal from the subject window. It is for this reason that this 25° assessment is generally dispensed with and the more detailed analysis outlined below is undertaken.

The BRE guidelines set out two methods for calculating daylight, these being an analysis of the Vertical Sky Component (VSC) and No Sky Line (NSL).

### Vertical Sky Component (VSC)

The Vertical Sky Component (VSC) analysis establishes the amount of available daylight received directly from the sky for each individual window. The reference point for the analysis being the centre of the window, on the plan of the outer window wall.

The VSC is the amount of direct sky a window enjoys, expressed as a percentage of the amount of direct sky a horizontal, unobstructed rooflight would receive.



The maximum percentage of direct skylight a vertical window can receive is 40%. The BRE have determined that where a VSC of 27% is achieved, then daylight should reach the window of an existing building.

Where a VSC of less than 27% is achieved either enjoyed before the implementation of the proposals or it is enjoyed following the implementation, then the BRE guidelines state that provided the new value is greater than 0.8 times the existing value, daylight will not be significantly affected.

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#### No Sky Line (NSL)

The daylight distribution analysis is undertaken at working plane level, with this set at 0.85m above the floor level of a dwelling.

The BRE guidelines state that provided a significant area of the room, which is considered to be 80%, is in front of the No Sky Line (the point behind which at desk top level no sky is visible) or at least 0.8 times the existing area, then the room will enjoy good distribution.

If, in the existing situation this is not the case, the BRE guidelines state that provided the area following the implementation of the proposals is at least 0.8 times the existing area, there will not be a significant affect.

#### Average Daylight Factor (ADF)

This analysis is more detailed and therefore is more precise in its measurement of daylight. Not only does it consider the amount of sky visible but also the window size, room use and room size.

The BRE guidelines provides set criteria for calculating the Average Daylight Factor for specific room uses within a property.

- Kitchen – 2%
- Living Room – 1.5%
- Bedroom – 1%



## Sunlight

This analysis is undertaken in a similar method to calculating VSC. Within residential accommodation the analysis undertaken to establish the levels of sunlight relate to the main windows that are within 90° of due south. It is considered that sunlight to kitchens and bedrooms is less important, although care should be taken not to block out too much.

Within commercial or non-domestic buildings, the use of the building will determine whether a sunlight assessment is required.

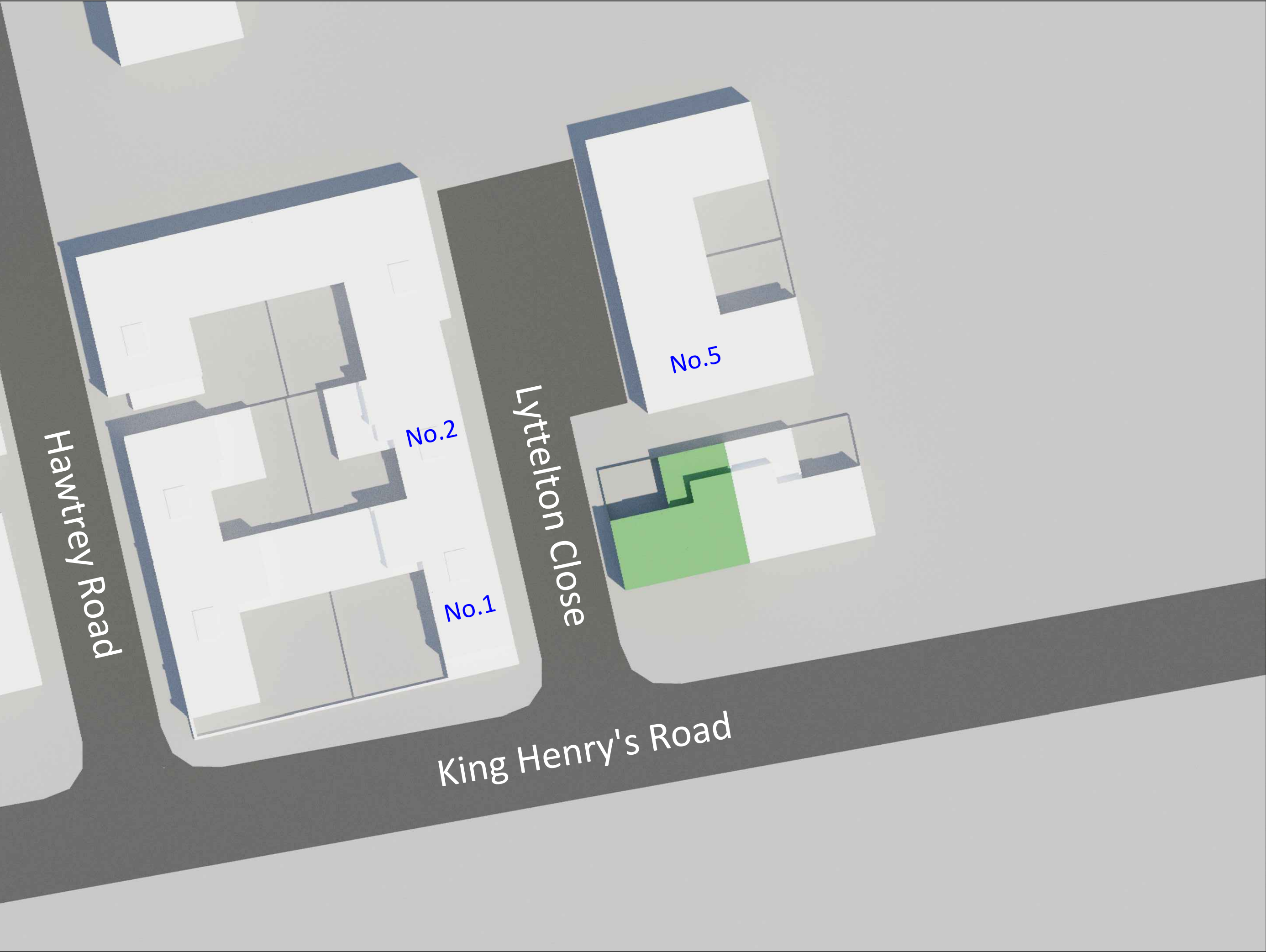
In relation to neighbouring residential buildings, if a window is facing within 90° of due south and overlooking any part of the proposals subtends an angle of more than 25° to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sunlight of the existing dwelling may be affected.

### Annual Probable Sunlight Hours (APSH)

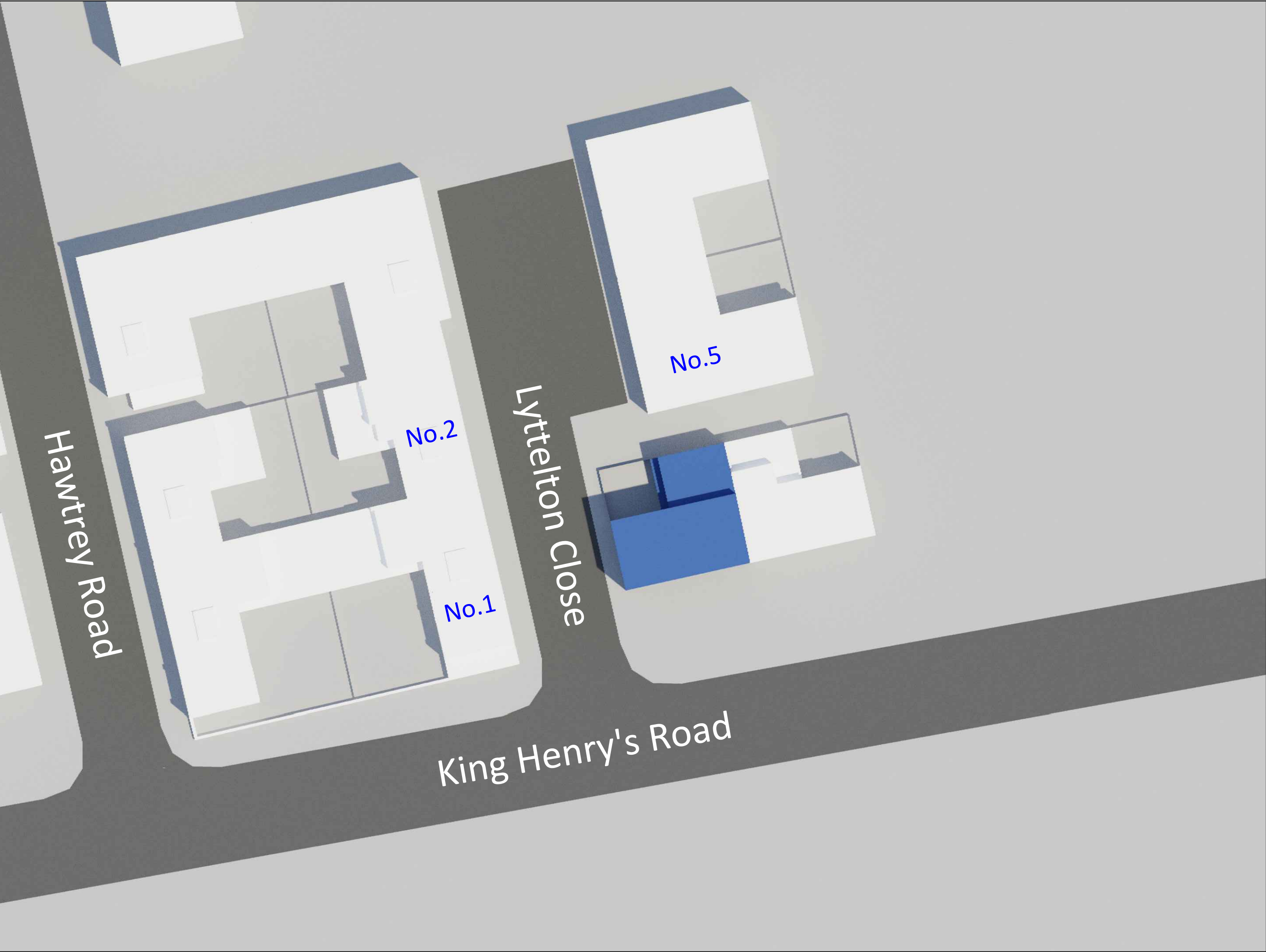
The 'Probable Sunlight Hours' can be defined as the total number of hours in the year that sun is expected to shine.



## Appendix B

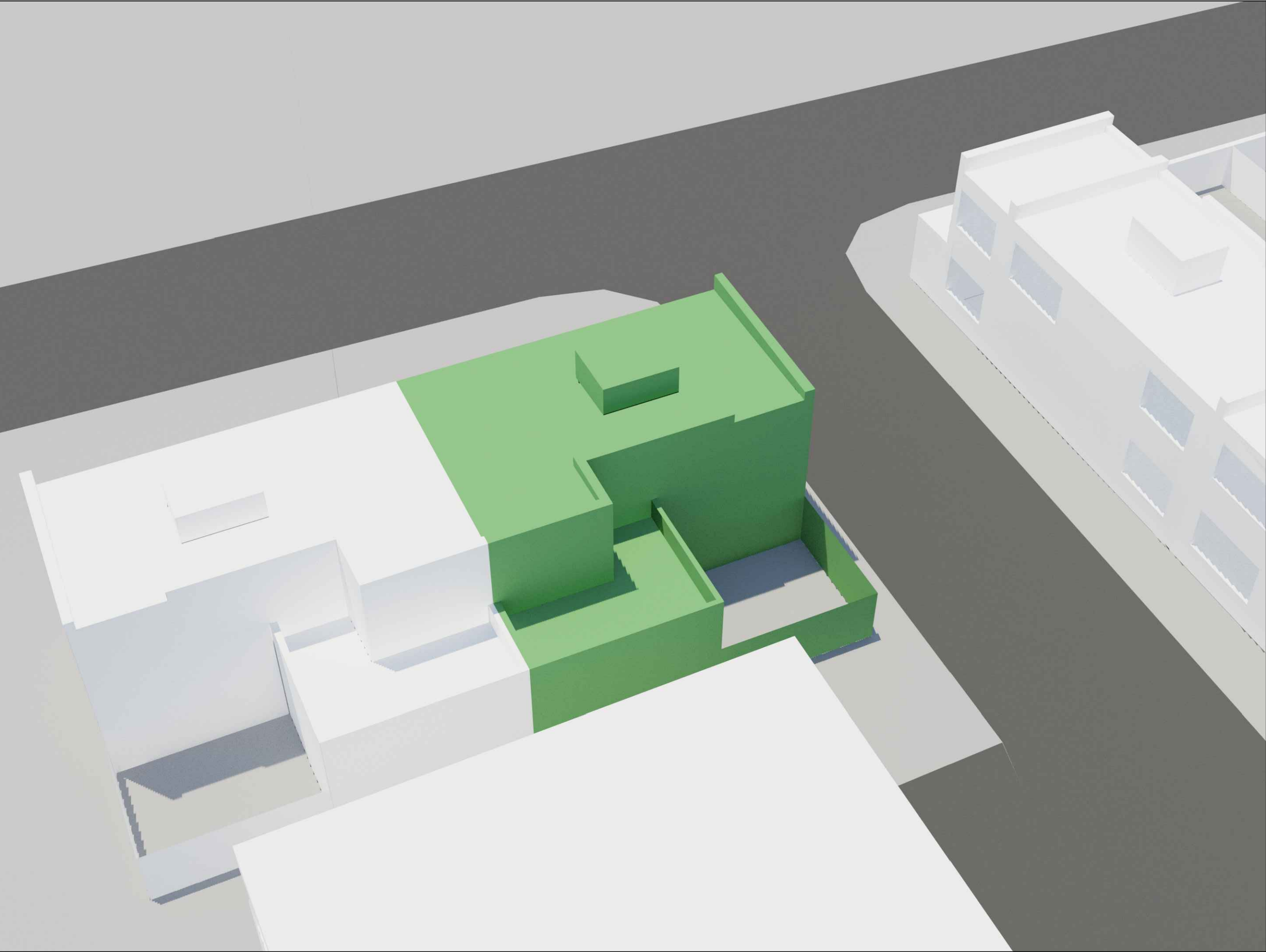


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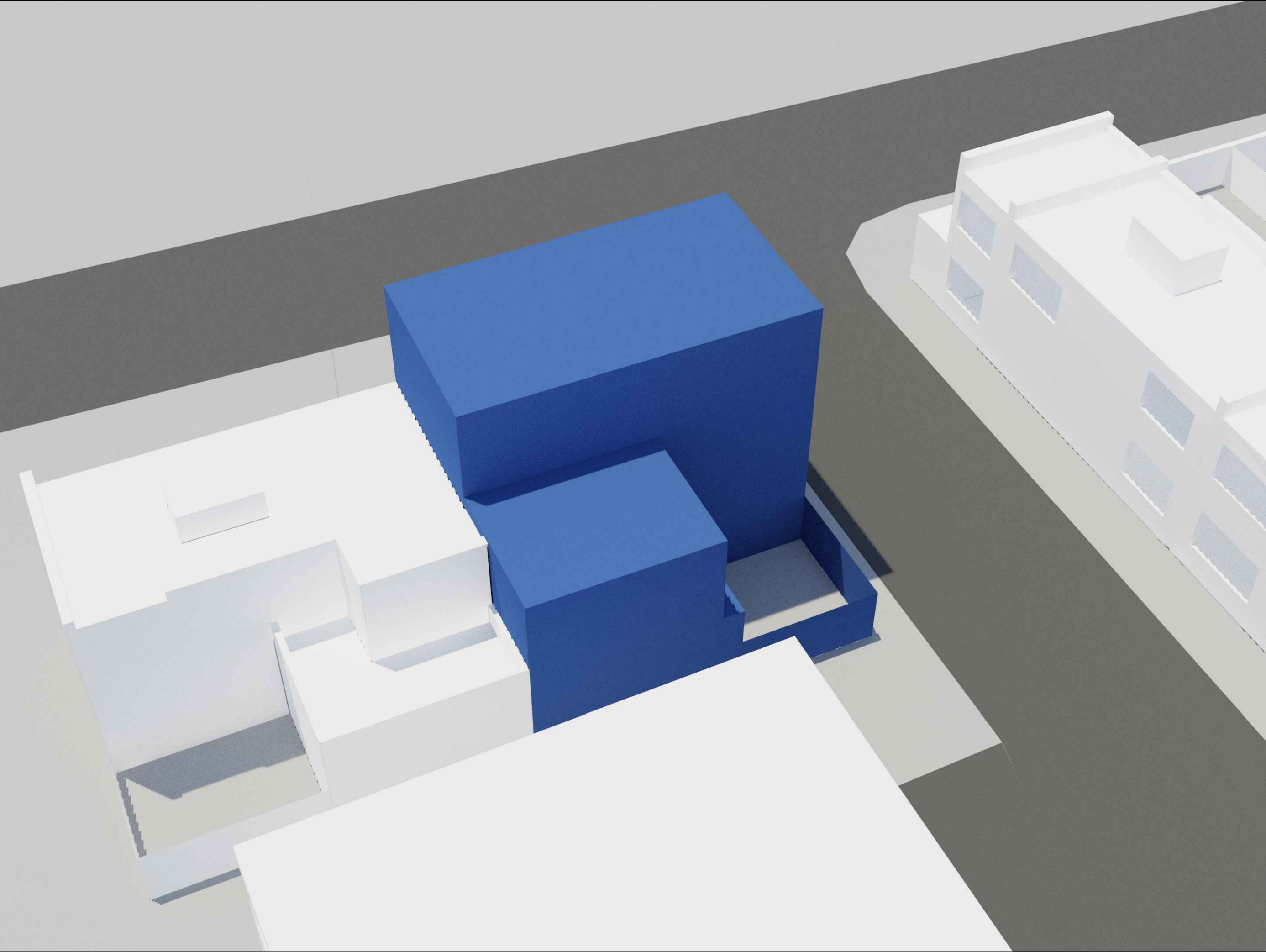


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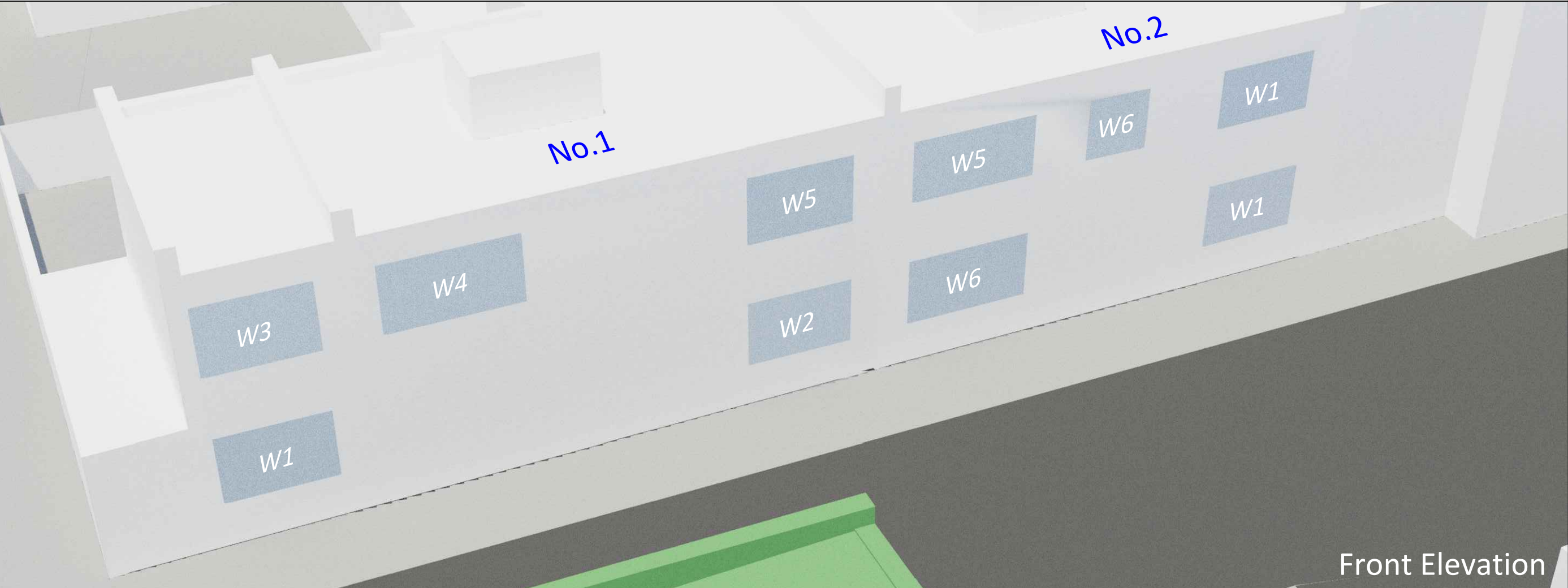


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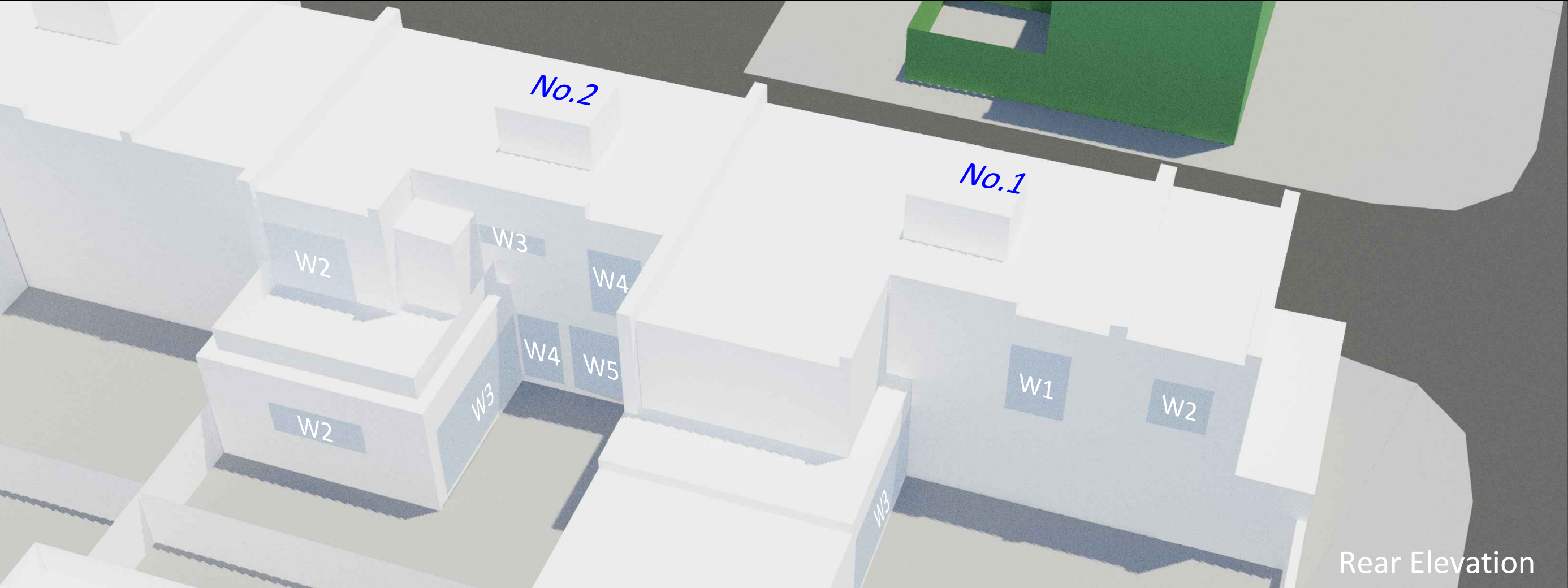


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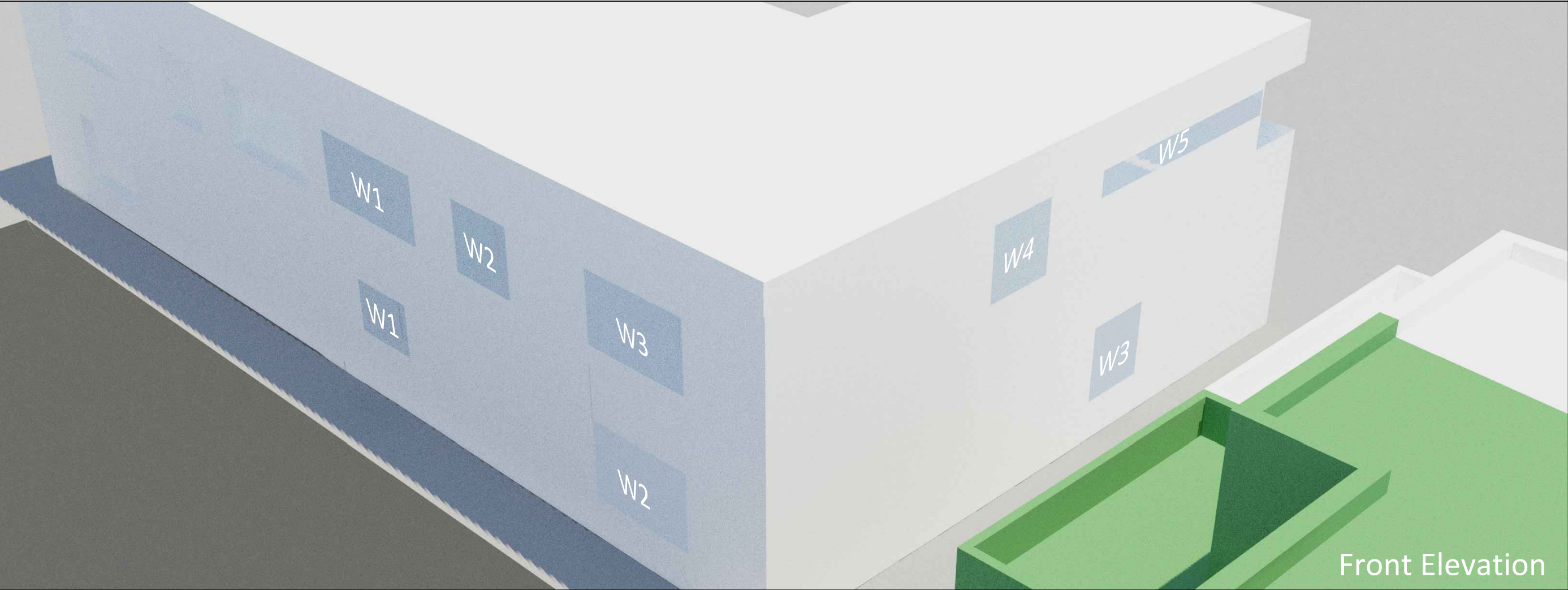
Front Elevation



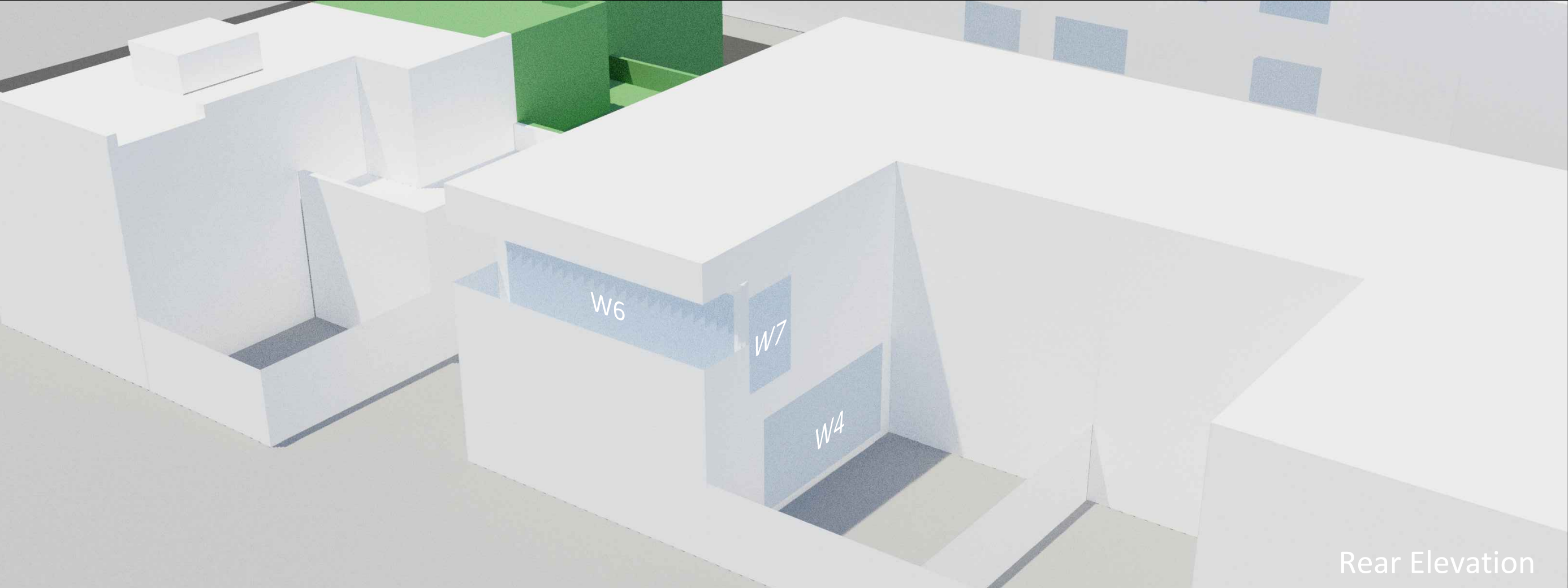
Rear Elevation

KEY





Front Elevation



Rear Elevation

KEY



## Appendix C

## Daylight Results

LEVEL	WINDOW	ROOM	VSC		LOSS	% LOSS	NOSKY	
			EXISTING	PROPOSED			EXISTING	PROPOSED
1 Lyttelton Close								
Ground	W2	R2	32.9	30.4	2.5	7.5	>80%	>80%
	W3		26.3	26.3	0.0	0.0		
First	W2	R1	37.6	37.6	0.0	0.0	>80%	>80%
	W3		37.9	35.3	2.6	6.8		
	W1	R2	35.3	35.3	0.0	0.0	>80%	>80%
	W4		37.4	34.3	3.1	8.3		
	W5	R3	37.3	34.8	2.4	6.6	>80%	>80%
2 Lyttelton Close								
Ground	W1	R1	32.4	31.4	1.0	3.1	>80%	>80%
	W2		27.6	27.6	0.0	0.0		
	W3		14.7	14.7	0.0	0.0		
First	W4	R2	16.1	16.1	0.0	0.0	>80%	>80%
	W5		18.7	18.7	0.0	0.0		
	W6		33.1	31.2	1.9	5.8		
	W1	R1	36.9	36.0	0.9	2.3	>80%	>80%
	W2	R2	35.0	35.0	0.0	0.0	>80%	>80%
	W4	R4	27.7	27.7	0.0	0.0	>80%	>80%
	W5		37.3	35.5	1.8	4.7		
5 Lyttelton Close								
Ground	W1	R1	32.5	32.4	0.1	0.3	>80%	>80%
	W2	R2	31.9	31.5	0.4	1.3	54%	49%
	W3		24.0	21.7	2.3	9.5		
First	W4		21.7	21.7	0.0	0.0		
	W1	R1	36.8	36.7	0.1	0.3	>80%	>80%
	W3	R3	36.8	36.3	0.5	1.3	>80%	>80%
	W4	R4	34.6	30.5	4.1	11.8	>80%	>80%
	W5	R5	36.8	34.5	2.3	6.2	>80%	>80%
	W6		24.4	24.4	0.0	0.0		
	W7		33.8	33.8	0.0	0.0		



## Appendix D

## Sunlight Results

LEVEL	WINDOW	EXISTING			PROPOSED			% LOSS	
		SUMMER	WINTER	TOTAL	SUMMER	WINTER	TOTAL	WINTER	TOTAL
<u>1 Lyttelton Close</u>									
Ground	R2	56%	25%	81%	50%	25%	75%	0.00	7.41
First	R1	69%	30%	99%	69%	30%	99%	0.00	0.00
	R2	69%	29%	98%	64%	29%	93%	0.00	5.10
<u>2 Lyttelton Close</u>									
Ground	R1	61%	23%	84%	61%	22%	83%	4.35	1.19
	R2	59%	11%	70%	58%	11%	69%	0.00	1.43
First	R2	36%	16%	52%	36%	16%	52%	0.00	0.00
	R3	36%	15%	51%	36%	15%	51%	0.00	0.00
	R4	58%	10%	68%	57%	8%	65%	20.00	4.41
<u>5 Lyttelton Close</u>									
Ground	R1	34%	16%	50%	34%	14%	48%	12.50	4.00
	R2	65%	18%	83%	65%	14%	79%	22.22	4.82
First	R1	37%	18%	55%	37%	17%	54%	5.56	1.82
	R3	37%	19%	56%	37%	16%	53%	15.79	5.36
	R4	58%	29%	87%	58%	21%	79%	27.59	9.20
	R5	62%	30%	92%	62%	25%	87%	16.67	5.43