

Daylight and Sunlight Assessment

Student Accommodation, Dominic St.,
Limerick

09/07/2026



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1. Executive Summary

H3D were engaged to provide a report on the impact of the proposed student accommodation at Dominic St., Limerick. H3D were instructed to conduct the following:

- To create a 3D computer analysis model of the scheme based upon planning drawings.
- Analyse the access to daylight in respect of the proposed units against the latest standards; BS EN 17037:2018.
- Conduct an analysis to investigate the Sunlight provision to the proposed units.
- Conduct a study to investigate if the proposed communal open space achieves 2 hours of sunlight on March 21st.
- Conduct an analysis to investigate if the adjacent properties will have sufficient access to daylight.
- Prepare a report setting out the analysis and the findings.

Methodology

The assessment of the proposed development was prepared using the methodology's set out in 'BS EN 17037:2018 Daylight in Buildings,' and BRE 209, 'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice', Third Edition 2022, by P. J. Littlefair. The software used in this analysis was a combination of Trimble Sketchup 2024 and Integrated Environmental Solutions Virtual Environment.

BRE Guide and Advisory Note

The numerical guidelines given in these documents are purely advisory. The BRE Guide states that:

"The advice given here is not mandatory and the guide should not be an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design."

"It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location" (Section 1.6, p1).

Results Summary

Daylight to Proposed Development

As the BR 209 document (Third Edition) has been updated to reference the latest standard BS EN 17037:2018 the Daylight analysis was considered against this standard:

- BS EN 17037:2018

For the BS EN 17037:2018 standards 100% of rooms analysed met the target lux levels which were 100 lux for bedrooms, 150 lux for living rooms, and 200 lux for combined Kitchen/Living/Dining.

All 402 no. spaces assessed (bedrooms, living rooms and kitchen/living/dining) exceed the target levels in the BS EN 17037:2018 standard, so the proposed development can be considered to provide an excellent standard of amenity from a daylight perspective.

Sunlight to Proposed Development

A window (predominantly living room windows) was assessed for each unit in the development. As the sunlight exposure assessment in accordance with BS EN 17037:2018 considers the orientation of the rooms similar to the BRE Guide (Third Edition) it can also be concluded that the criteria for rooms facing significantly north of due east or west is unlikely to be met.

Of the 51 no. living rooms windows assessed, 51 no. (100%) meet the EN 17037:2018 sunlight exposure recommendations of greater than 1.5 hours on March 21st. Overall, the sunlight provision results to the proposed development in accordance with BS EN 17037:2018 are considered excellent.

Amenity Overshadowing – Proposed Communal Amenity Area

An amenity overshadowing analysis also confirmed that the communal space within the site would exceed the required overshadowing requirement thus providing good sunlight amenity.

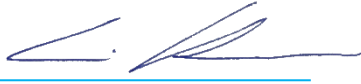
Daylight to Windows – Adjacent Properties -Vertical Sky Component

A check was completed to ascertain which properties had the proposed development subtend a 25-degree angle from the horizontal. A VSC analysis was conducted on the windows of the properties identified (2 Dominic St) and of the 3 no. points assessed, none achieve a VSC of above 27%. 3 no. windows failed the VSC analysis.

The room that these windows service was analysed for No Sky Line to find if a sufficient area of the work plane received sunlight. The room passed this check therefore according to the BRE Guidelines, the daylighting of the adjacent properties would not be adversely affected.

Overall Conclusion.

After conducting a comprehensive daylight and sunlight assessment of the proposed development using simulation modelling and comparing results achieved against the BRE Guide and BS recommended guidelines, the proposed development would provide an excellent level of daylight and sunlight provision.



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2. Daylight to Proposed Development

The purpose of this section is to investigate if the proposed habitable spaces achieve the recommended levels of daylight provision.

The daylight provision to the proposed development was assessed against the following standard.

- BS EN 17037:2018

Prior to 2018, Ireland had no standard for daylight. In 2018, the National Standards Authority of Ireland adopted EN 17037 to directly become IS EN 17037. It does not contain a national annex. It offers only a single target for new buildings (there are no space-by-space targets – e.g., a kitchen would have the same target as a warehouse or office). It does not offer guidance on how new developments will impact on surrounding environments. Most Development Plans do not reference the new BS EN 17037:2018 standard however Appendix 16 of Dublin City Development Plan 2022-2028 recommends that:

“These limitations make it unsuitable for use in planning policy or during planning applications. BR 209 must still be used for this purpose.”

It continues by stating that:

“The planning authority understand that, at present there is some ambiguity in what may be considered the appropriate standard to apply for daylight and sunlight assessments. There is a period of transition at present during which BS8206-2 has been superseded, but the relevant guidance within BR 209 has not yet been updated. This both BS 8206-2 and BS EN 17037 have relevance. As such, both for clarity and as an interim measure during this transition period, the planning authority will look to receive relevant metrics from BR 209, BS 8206-2, and BS 17037. If over the coming years, a revised version of BR 209 is to be issued, the guidance within this new version will take precedence.”

The third edition of BRE 209 has been issued since the above development plan was released. This updated guidance now references BS EN 17037.

The following section summarises the various requirement of this standard.

BS EN 17037:2018 National Annex

In the UK, EN17037:2018 was adopted to form “BS EN 17037:2018”. However, a “National Annex NA” was included which states:

“The UK committee supports the recommendations for daylight in buildings given in BS EN 17037:2018; however, it is the opinion of the UK committee that the recommendations for daylight provision in a space (see Clause A.2) may not be achievable for some buildings, particularly dwellings. The UK committee believes

this could be the case for dwellings with basement rooms or those with significant external obstructions (for example, dwellings situated in a dense urban area or with tall trees outside), or for existing buildings being refurbished or converted into dwellings. This National Annex therefore provides the UK committee's guidance on minimum daylight provision in all UK dwellings."

Whereas IS EN 17037:2018 does not provide different illuminance targets for different space types, the BS EN 17037:2018 National Annex provides target illuminance values for bedrooms, living rooms and kitchens within residential developments as per Table NA.1 below. It is also important to note that as the climate in Ireland is similar to the UK, the targets outlined in the BS EN National Annex could also be applied to dwellings in Ireland.

Room type	Target illuminance E_T (lx)
Bedroom	100
Living room	150
Kitchen	200

Figure 1: Table NA.1 — Values of target illuminance for room types in dwellings

The BS National Annex also states:

"Where one room in a UK dwelling serves more than a single purpose, the UK committee recommends that the target illuminance is that for the room type with the highest value – for example, in a space that combines a living room and a kitchen the target illuminance is recommended to be 200 lx."

Therefore, combined Kitchen/Living/Dining's are to be assessed using a 200-lux target illuminance (E_T).

Finally, the BS National Annex also states that:

"It is the opinion of the UK committee that the recommendation in Clause A.2 – that a target illuminance level should be achieved across the entire (i.e., 95 %) fraction of the reference plane within a space – need not be applied to rooms in dwellings."

Therefore, when assessing the daylight provisions in residential dwellings in accordance with BS EN 17037:2018, only the target illuminance (E_T) or target daylight factor (DT) will be assessed for Bedrooms, Living Rooms, Kitchens (or combined LKDs) on over 50% of the floor area over 50% of the available daylight hours. The minimum target illuminance (E_{TM}) or minimum target daylight factor (DTM) will not be assessed.

Based on the above criteria, the daylight provision to the proposed development has been assessed using an adequate software (i.e., IES VE), using the climate-based approach, and targeting the minimum recommended values outlined in Table C4 of BRE 209, 'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice'.

The following inputs were used in the study:

BS EN 17037:2018

Sky Conditions: Standard CIE overcast sky.
 Time (24hr): 12:00
 Date: 21 September
 Weather File: Dublin.epw (15-year average)

Element	Value	Source/Description
Sky Conditions	CIE Overcast Sky	Software Climate File

Light Reflectance Values (LRV)		
Ceiling	0.7	BR BRE209 2022 Edition
Internal Walls	0.5	BR BRE209 2022 Edition
Floors	0.2	BR BRE209 2022 Edition
External Ground	0.2	BR BRE209 2022 Edition
External Wall	0.2	BR BRE209 2022 Edition

Window Properties:		
Visible Light transmission	68%	BR BRE209 2022 Edition
Average frame thickness	10%	-

Other Properties:		
Working plane height	0.85m	BR BRE209 2022 Edition
Area of interest (perimeter border depth)	0.3m	BR BRE209 2022 Edition
Window surface maintenance factor for cleaning	0.92	BR BRE209 2022 Edition
Grid size for assessment area	0.25m	BR BRE209 2022 Edition

Table 1: Analysis Input Data

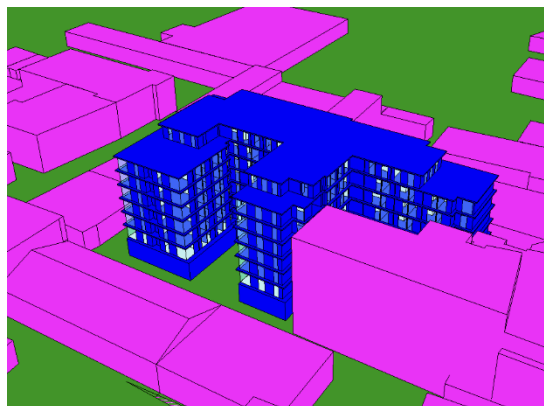


Figure 2: IES VE Analysis Model

Daylight Results

The following tables summarise the daylight provision results for the proposed development assessed against the BS EN 17037:2018 standard. Individual room results can be viewed in Tables 4-10 below. The purpose of the calculations is to quantify an overall percentage of rooms which exceed the recommendations of the various standards that were assessed. The objective of the design team is to maximise the number of units which exceed the recommendations.

Where there are combined Living/Kitchen/Dining areas (LKDs) areas within the development, these have been assessed as whole spaces against an initial 200 lx target. The results are summarised in the following table.

Total for The Development

The overall daylight provision results for the tested spaces in the development are summarised below. Under BR BRE209 2022 Third Edition, a compliance rate of 100% is achieved. Overall, the quality of daylight provision across the development is excellent.

Rooms Tested	No. Rooms
Bedrooms	350
Kitchen/Living/Dining	51
Amenity Space	1
Total Spaces Tested	402

Table 2: Room Breakdown – Summary

BS EN 17037:2018 Method 2 Assessment – National Annex				
Rooms	Pass (No.)	Pass (%)	Fail (No.)	Fail (%)
Bedrooms	350	100	0	0
Kitchen/Living/Dining	51	100	0	0
Amenity Space	1	100	0	0
Total Spaces Tested	402	100	0	0

Table 3: BS EN 17037:2018 Daylight Results – Summary

Unit	Room	BS EN 17037:2018			
		Minimum Lux recommended in BS EN 17037:2018+A1-2021	Minimum Required Floor Area > ET (%)	Floor Area > ET (%)	Pass/Fail
1.01	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
1.02	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
1.03	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
1.04	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	80.33	Pass
	Bedroom 7	100	50	80.33	Pass
	Bedroom 8	100	50	82.26	Pass
	Bedroom 9	100	50	96.77	Pass
	Bedroom 10	100	50	83.61	Pass
	Bedroom 11	100	50	69.77	Pass
	Kitchen Living Dining	200	50	100	Pass
1.05	Bedroom 1	100	50	90.63	Pass
	Bedroom 2	100	50	98.46	Pass
	Bedroom 3	100	50	95.38	Pass
	Bedroom 4	100	50	82.81	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Bedroom 8	100	50	100	Pass

	Bedroom 9	100	50	100	Pass
	Bedroom 10	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
1.06	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Kitchen Living Dining	200	50	83.79	Pass
1.07	Bedroom 1	100	50	88.33	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
1.08	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass

Table 4: Illuminance Results – First Floor

Unit	Room	BS EN 17037:2018			
		Minimum Lux recommended in BS EN 17037:2018+A1-2021	Minimum Required Floor Area > ET (%)	Floor Area > ET (%)	Pass/Fail
2.01	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
2.02	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
2.03	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
2.04	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	77.05	Pass
	Bedroom 7	100	50	91.80	Pass
	Bedroom 8	100	50	96.77	Pass
	Bedroom 9	100	50	100	Pass
	Bedroom 10	100	50	98.36	Pass
	Bedroom 11	100	50	94.19	Pass
	Kitchen Living Dining	200	50	100	Pass
2.05	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	93.85	Pass
	Bedroom 4	100	50	89.39	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Bedroom 8	100	50	100	Pass

	Bedroom 9	100	50	100	Pass
	Bedroom 10	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
2.06	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Kitchen Living Dining	200	50	69.57	Pass
2.07	Bedroom 1	100	50	68.33	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
2.08	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass

Table 5: Illuminance Results – Second Floor

Unit	Room	BS EN 17037:2018			
		Minimum Lux recommended in BS EN 17037:2018+A1-2021	Minimum Required Floor Area > ET (%)	Floor Area > ET (%)	Pass/Fail
3.01	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
3.02	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
3.03	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
3.04	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	70.49	Pass
	Bedroom 7	100	50	100	Pass
	Bedroom 8	100	50	100	Pass
	Bedroom 9	100	50	88.71	Pass
	Bedroom 10	100	50	72.13	Pass
	Bedroom 11	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
3.05	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	78.46	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Bedroom 8	100	50	100	Pass

	Bedroom 9	100	50	100	Pass
	Bedroom 10	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
3.06	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Kitchen Living Dining	200	50	85.77	Pass
3.07	Bedroom 1	100	50	80.00	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
3.08	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass

Table 6: Illuminance Results – Third Floor

Unit	Room	BS EN 17037:2018			
		Minimum Lux recommended in BS EN 17037:2018+A1-2021	Minimum Required Floor Area > ET (%)	Floor Area > ET (%)	Pass/Fail
4.01	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
4.02	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
4.03	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
4.04	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Bedroom 8	100	50	100	Pass
	Bedroom 9	100	50	100	Pass
	Bedroom 10	100	50	100	Pass
	Bedroom 11	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
4.05	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Bedroom 8	100	50	100	Pass

	Bedroom 9	100	50	100	Pass
	Bedroom 10	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
4.06	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Kitchen Living Dining	200	50	91.30	Pass
4.07	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
4.08	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass

Table 7: Illuminance Results – Fourth Floor

Unit	Room	BS EN 17037:2018			
		Minimum Lux recommended in BS EN 17037:2018+A1-2021	Minimum Required Floor Area > ET (%)	Floor Area > ET (%)	Pass/Fail
5.01	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
5.02	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
5.03	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
5.04	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Bedroom 8	100	50	100	Pass
	Bedroom 9	100	50	100	Pass
	Bedroom 10	100	50	100	Pass
	Bedroom 11	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
5.05	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Bedroom 8	100	50	100	Pass

	Bedroom 9	100	50	100	Pass
	Bedroom 10	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
5.06	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Kitchen Living Dining	200	50	98.02	Pass
5.07	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
5.08	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass

Table 8: Illuminance Results – Fifth Floor

Unit	Room	BS EN 17037:2018			
		Minimum Lux recommended in BS EN 17037:2018+A1-2021	Minimum Required Floor Area > ET (%)	Floor Area > ET (%)	Pass/Fail
6.01	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Bedroom 8	100	50	100	Pass
	Bedroom 9	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
6.02	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
6.03	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Bedroom 8	100	50	100	Pass
	Bedroom 9	100	50	100	Pass
	Bedroom 10	100	50	100	Pass
	Bedroom 11	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
6.04	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Bedroom 8	100	50	100	Pass
	Bedroom 9	100	50	100	Pass
	Bedroom 10	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
6.05	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass

	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
6.06	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
6.07	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass

Table 9: Illuminance Results – Sixth Floor

Unit	Room	BS EN 17037:2018			
		Minimum Lux recommended in BS EN 17037:2018+A1-2021	Minimum Required Floor Area > ET (%)	Floor Area > ET (%)	Pass/Fail
7.02	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
7.03	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Bedroom 8	100	50	100	Pass
	Bedroom 9	100	50	100	Pass
	Bedroom 10	100	50	100	Pass
	Bedroom 11	100	50	100	Pass
	Bedroom 12	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
7.04	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Bedroom 5	100	50	100	Pass
	Bedroom 6	100	50	100	Pass
	Bedroom 7	100	50	100	Pass
	Bedroom 8	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
7.05	Bedroom 1	100	50	100	Pass
	Bedroom 2	100	50	100	Pass
	Bedroom 3	100	50	100	Pass
	Bedroom 4	100	50	100	Pass
	Kitchen Living Dining	200	50	100	Pass
7.06	Amenity Space	200	50	100	Pass

Table 10: Illuminance Results – Sixth Floor

Discussion

All 402 no. spaces assessed (bedrooms and kitchen/living/dining) exceed the target levels in the BS EN 17037:2018 standard, so the proposed development can be considered to provide an excellent standard of amenity from a daylight perspective.

3. Sunlight to Proposed Development

Guidance in BR BRE 209:

In general, a dwelling, or non-domestic building that has a particular requirement for sunlight, will appear reasonably sunlit provided:

- at least one main window wall faces within 90° of due south and
- a habitable room, preferably a main living room, can receive a total of at least 1.5 hours of sunlight on 21 March. This is assessed at the inside centre of the window(s); sunlight received by different windows can be added provided they occur at different times and sunlight hours are not double counted.

In large developments it is difficult to avoid having a main living room window facing north. In this development 100% have main living room windows that achieve the 1.5 hours. As the guidelines specify a main room as a kitchen, living room or bedroom an analysis was completed for one room in each unit. The dual aspect nature of the units in this development means that a living room in each unit can achieve the required level of sunlight.

Level of recommendation for exposure to sunlight	Sunlight exposure
Minimum	1,5 h
Medium	3,0 h
High	4,0 h

Figure 3: Table A.6 BS EN 17037 – Recommendation for daily sunlight exposure

Unit	Room Type	Hours (1.5 hours required)	BRE Guide (Third Edition) /BS EN 17037:2018
			Pass/Fail
1	KLD	4.1	Pass
2	KLD	1.6	Pass
3	KLD	1.6	Pass
4	KLD	1.5	Pass
5	KLD	8.0	Pass
6	KLD	2.5	Pass
7	KLD	7.9	Pass
8	KLD	6.8	Pass

Table 11: Sunlight Results – First Floor

Unit	Room Type	Hours (1.5 hours required)	BRE Guide (Third Edition) /BS EN 17037:2018
			Pass/Fail
1	KLD	4.1	Pass
2	KLD	1.8	Pass
3	KLD	1.8	Pass
4	KLD	2.3	Pass
5	KLD	8.6	Pass
6	KLD	2.5	Pass
7	KLD	8.5	Pass
8	KLD	7.6	Pass

Table 12: Sunlight Results – Second Floor

Unit	Room Type	Hours (1.5 hours required)	BRE Guide (Third Edition) /BS EN 17037:2018
			Pass/Fail
1	KLD	4.2	Pass
2	KLD	2.0	Pass
3	KLD	2.0	Pass
4	KLD	2.5	Pass
5	KLD	8.9	Pass
6	KLD	2.5	Pass
7	KLD	9.4	Pass
8	KLD	9.0	Pass

Table 13: Sunlight Results – Third Floor

Unit	Room Type	Hours (1.5 hours required)	BRE Guide (Third Edition) /BS EN 17037:2018
			Pass/Fail
1	KLD	4.6	Pass
2	KLD	2.0	Pass
3	KLD	2.0	Pass
4	KLD	2.5	Pass
5	KLD	9.0	Pass
6	KLD	2.6	Pass
7	KLD	9.4	Pass
8	KLD	9.0	Pass

Table 14: Sunlight Results – Fourth Floor

Unit	Room Type	Hours (1.5 hours required)	BRE Guide (Third Edition) /BS EN 17037:2018
			Pass/Fail
1	KLD	5.4	Pass
2	KLD	2.0	Pass
3	KLD	2.0	Pass
4	KLD	2.5	Pass
5	KLD	9.0	Pass
6	KLD	2.7	Pass
7	KLD	9.5	Pass
8	KLD	9.0	Pass

Table 15: Sunlight Results – Fifth Floor

Unit	Room Type	Hours (1.5 hours required)	BRE Guide (Third Edition) /BS EN 17037:2018
			Pass/Fail
1	KLD	3.5	Pass
2	KLD	2.0	Pass
3	KLD	2.5	Pass
4	KLD	9.0	Pass
5	KLD	3.8	Pass
6	KLD	9.5	Pass
7	KLD	9.0	Pass

Table 16: Sunlight Results – Sixth Floor

Unit	Room Type	Hours (1.5 hours required)	BRE Guide (Third Edition) /BS EN 17037:2018
			Pass/Fail
1	KLD	2.0	Pass
2	KLD	6.9	Pass
3	KLD	9.0	Pass
4	KLD	5.7	Pass
5	Amenity Space	9.1	Pass

Table 17: Sunlight Results – Seventh Floor

Discussion

EN 17037:2018

As the sunlight exposure assessment in accordance with BS EN 17037:2018 considers the orientation of the rooms similar to the BRE Guide (Third Edition) it can also be concluded that the criteria for rooms facing significantly north of due east or west is unlikely to be met.

Of the 52 no. living spaces assessed, 52 no. (100%) meet the EN 17037:2018 sunlight exposure recommendations of greater than 1.5 hours on March 21st. Overall, the sunlight provision results to the proposed development in accordance with BS EN 17037:2018 are considered excellent.

4. Daylight to Windows – Adjacent Properties

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 the lowest window, subtends an angle of more than 25° to the horizontal, then the diffuse daylighting of the existing building may be adversely affected. This will be the case if either:

- the VSC measured at the centre of an existing main window is less than 27%, and less than 0.80 times its former value.
- the area of the working plane in a room which can receive direct skylight is reduced to less than 0.80 times its former value.

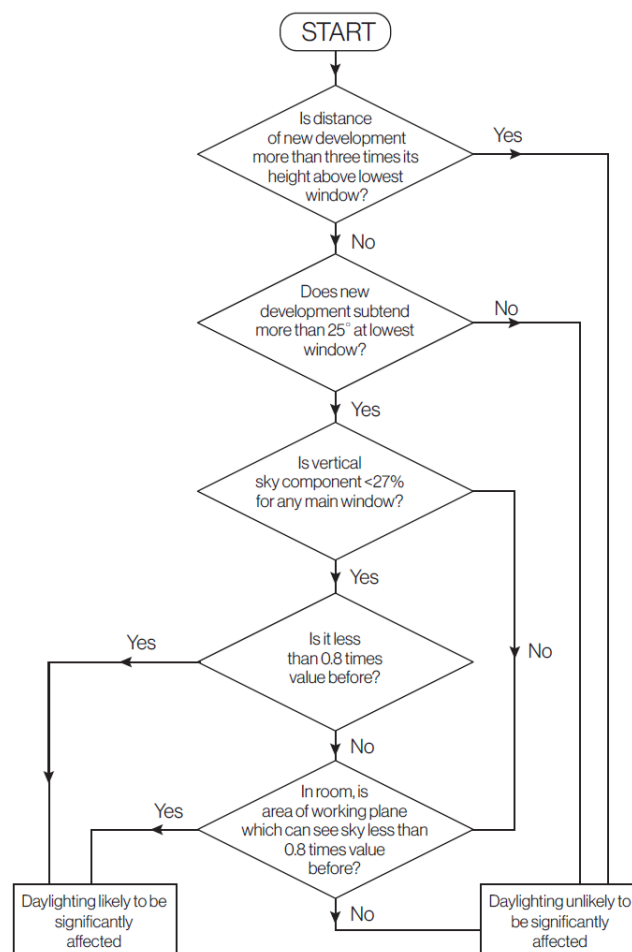


Figure 4: Decision Chart: diffuse daylight in existing buildings (BRE 209)

First, a check was completed on all the properties that are adjacent to the proposed development to identify which need to be analysed.



Figure 5: 3D representation of the 25-degree angle

No windows in the vicinity of the proposed development subtends an angle more than 25° to the horizontal, meaning a VSC analysis is not required, and daylighting is unlikely to be significantly affected.

A VSC analysis was conducted on the following properties:

- 2 Dominic St

A VSC Analysis was conducted on these properties. The guidelines are intended for windows of living rooms, kitchens, and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas, and garages need not be analysed. As the floor layouts of these buildings was not available all windows were analysed for completeness.

The analysis outputs were acquired using a combination of software, namely:

- Trimble Sketchup
- IES VE (Radiance)

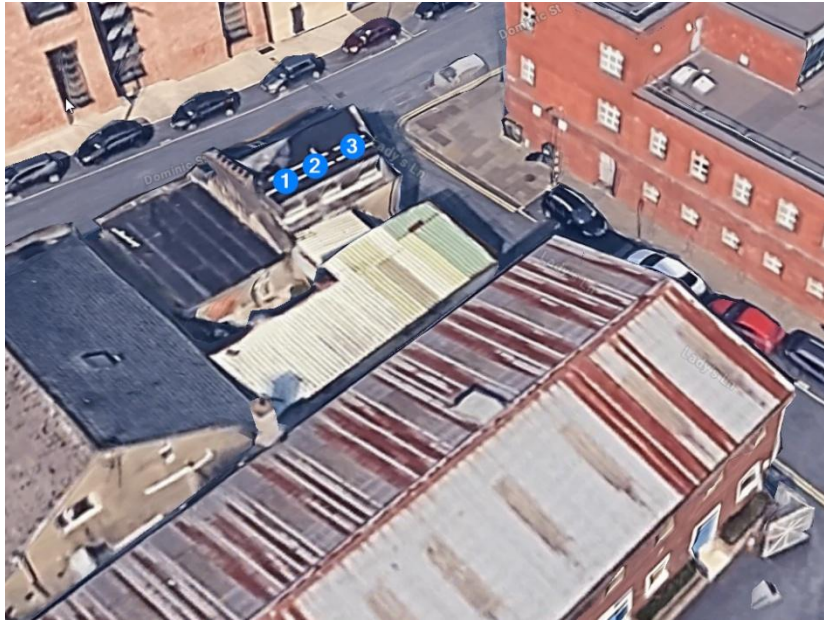


Figure 6: 3D Aerial View – 2 Dominic St

House	Window	Proposed	>27% Yes/No	Existing	Difference	>0.8 Existing	Compliance Demonstrated
2 Dominic St	1	14.69	Yes	35.72	0.41	No	No
	2	15.76	Yes	35.71	0.44	No	No
	3	17.76	Yes	35.76	0.50	No	No

Table 18: VSC Results

The analysed windows failed the first check. The second check was conducted to assess the area of working plane which can receive direct sunlight.

Section 2.2.10 of the BRE Guidelines states:

“that where room layouts are known (for example if they are available on the local authority’s planning portal), the impact on the daylighting in the existing building should be found by plotting the no sky line in each of the main rooms.”

For the top floor of 2 Dominic St, a room of 7m x 3m was used for the second check.

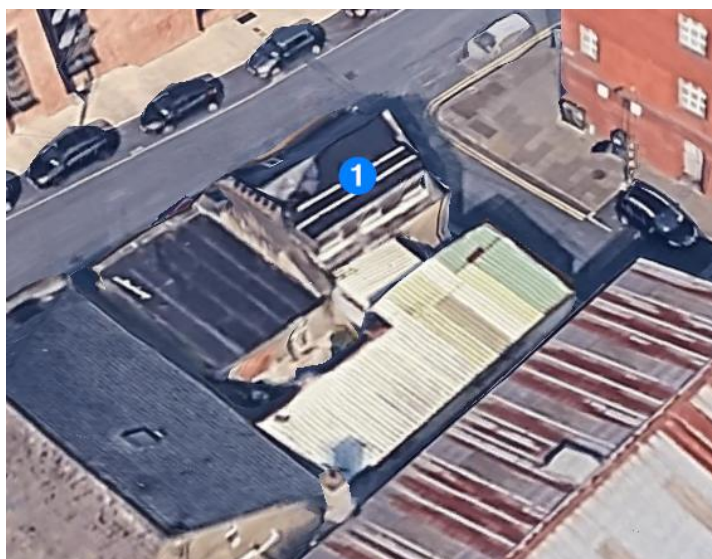


Figure 7: 3D Aerial View

House	Room Ref.	Level	Room	Proposed	Existing	Difference	>0.8 Existing	Compliance Demonstrated
2 Dominic St	1	Second Floor	Unknown	100.00	100.00	1.00	No	Yes

Table 19: No Sky Line Results

Discussion

3 no. windows failed the VSC analysis. The room that these windows service was analysed for No Sky Line to find if a sufficient area of the work plane received sunlight. The room passed this check therefore according to the BRE Guidelines, the daylighting of the adjacent properties would not be adversely affected.

5. Amenity Overshadowing – Within Site

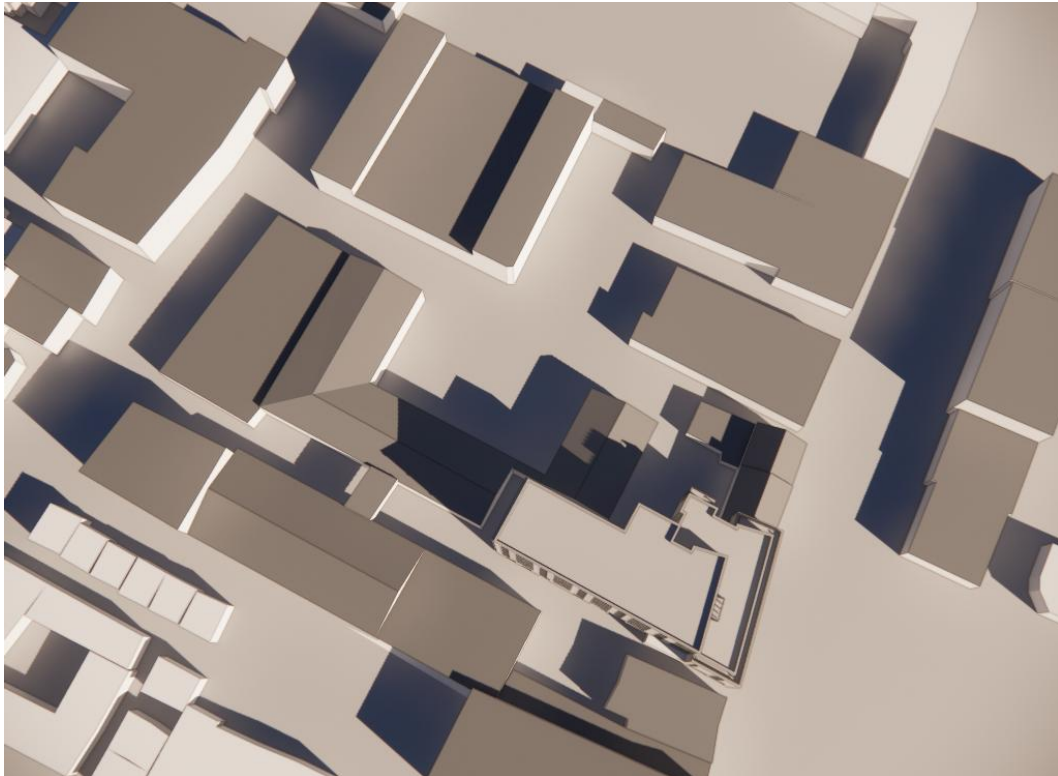
An analysis of the communal amenity spaces within the proposed site was also conducted by calculating the area of sunlight that received a minimum of two hours of sunlight on March 21st. Below are results in numerical and graphical form.

Amenity Overshadowing – Within Site				
Communal Space Analysed (m ²)	Area receiving 2 hours of sunlight on March 21 st (m ²)	Area receiving 2 hours of sunlight on March 21 st (%)	Minimum area receiving 2 hours of sunlight on March 21 st (%)	Compliance Demonstrated
165	153.91	93.28	50%	Yes

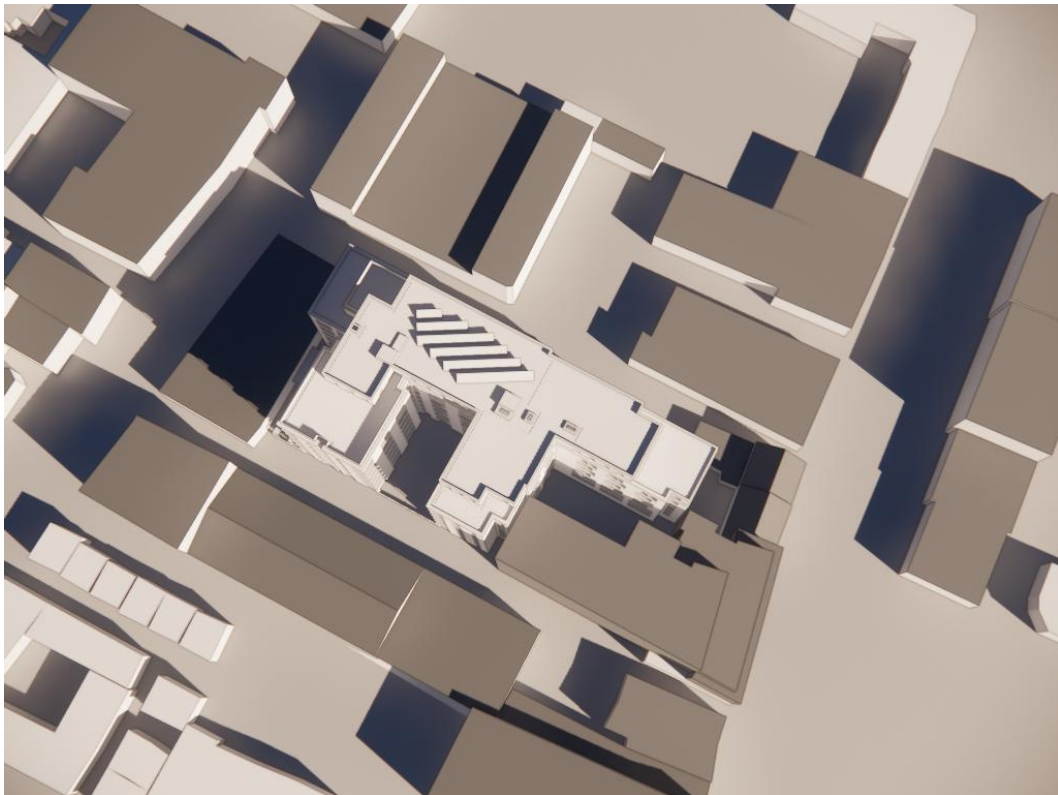
Table 20: Amenity Overshadowing Results – Within Site



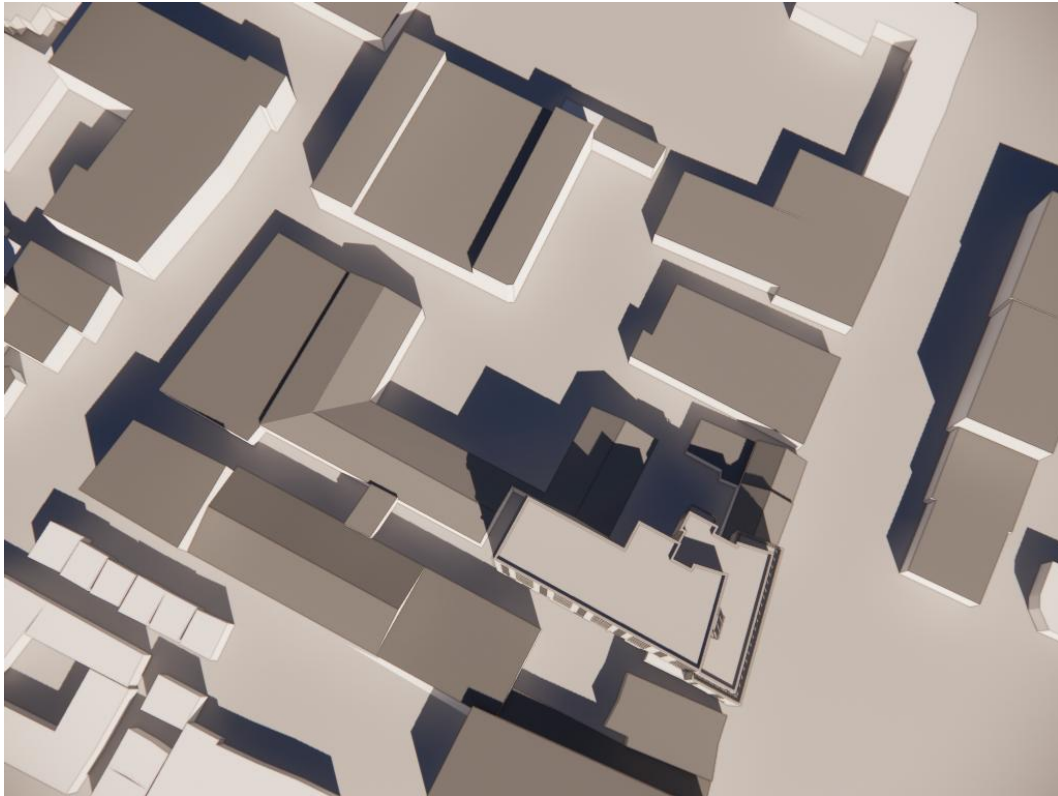
Figure 8: Amenity Overshadowing: Green > 2 hours



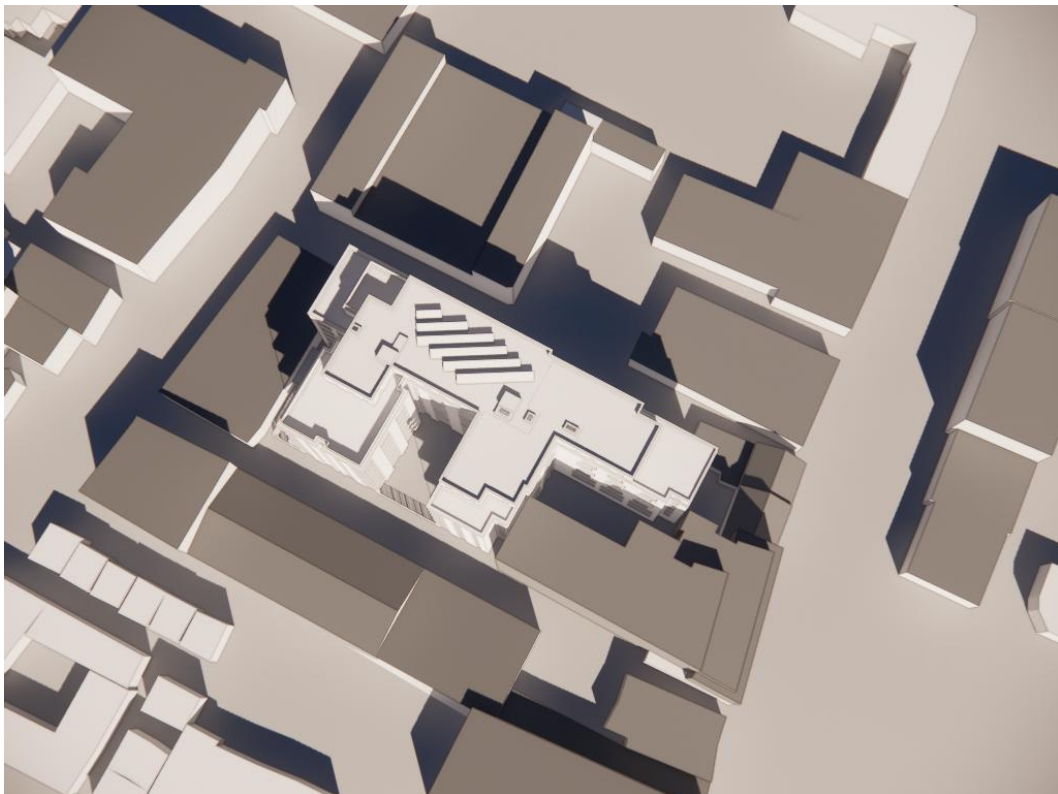
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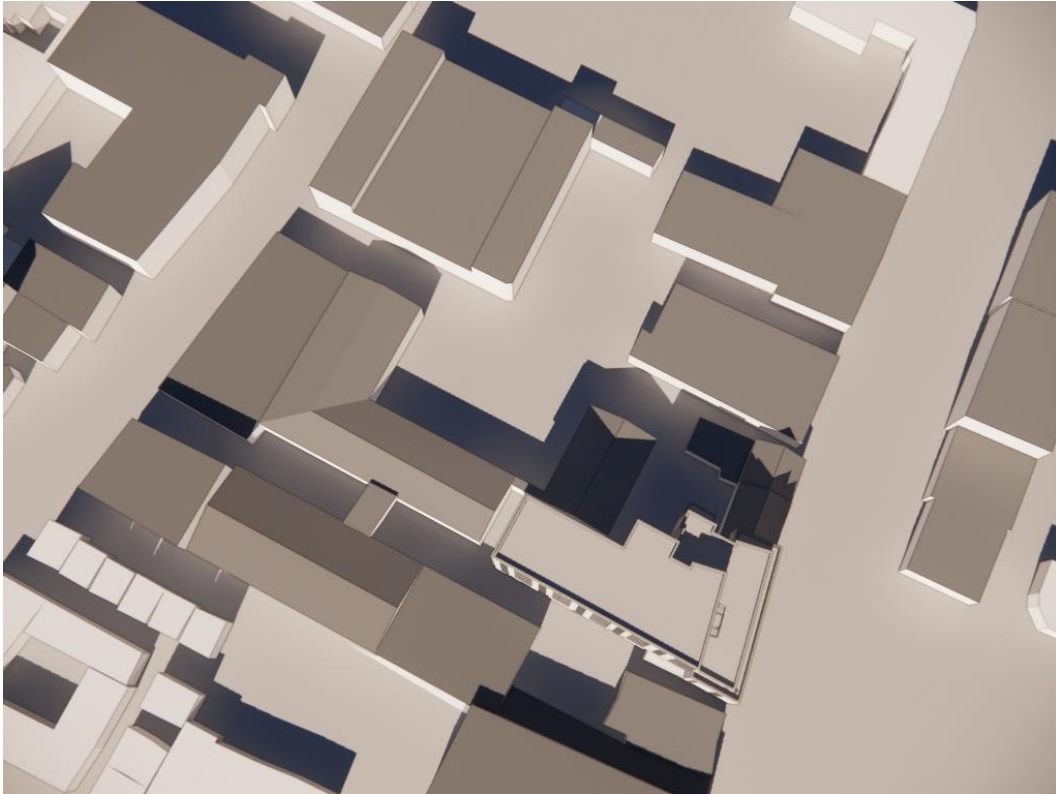
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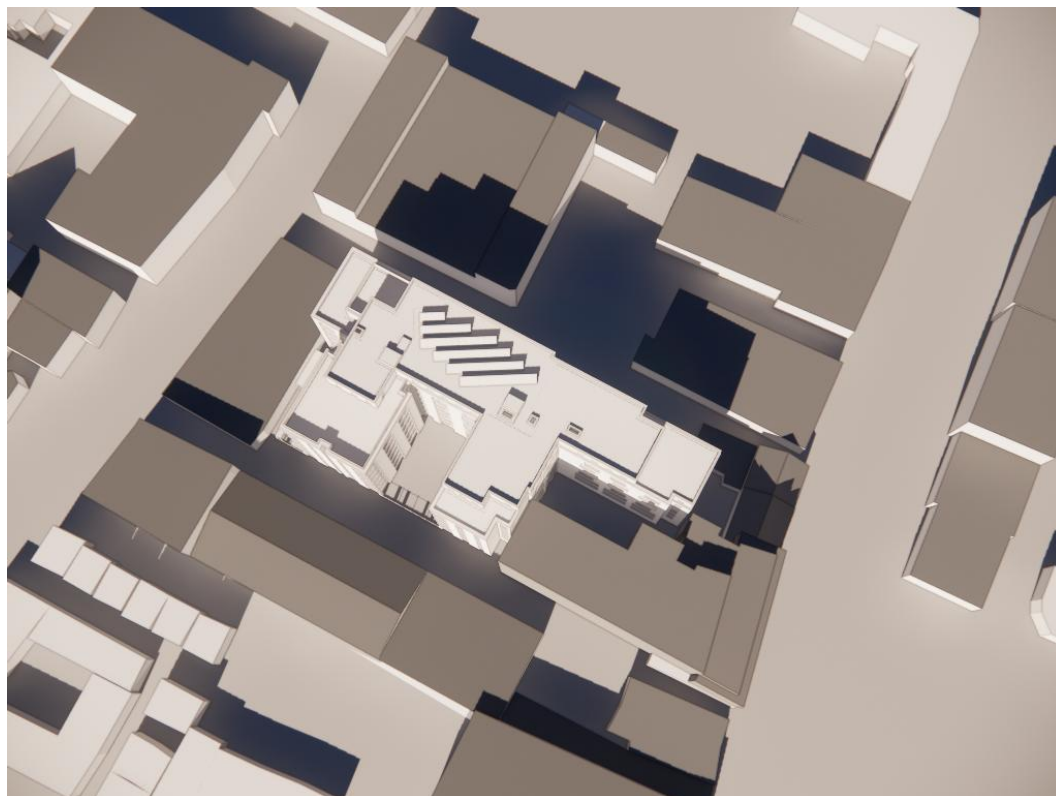
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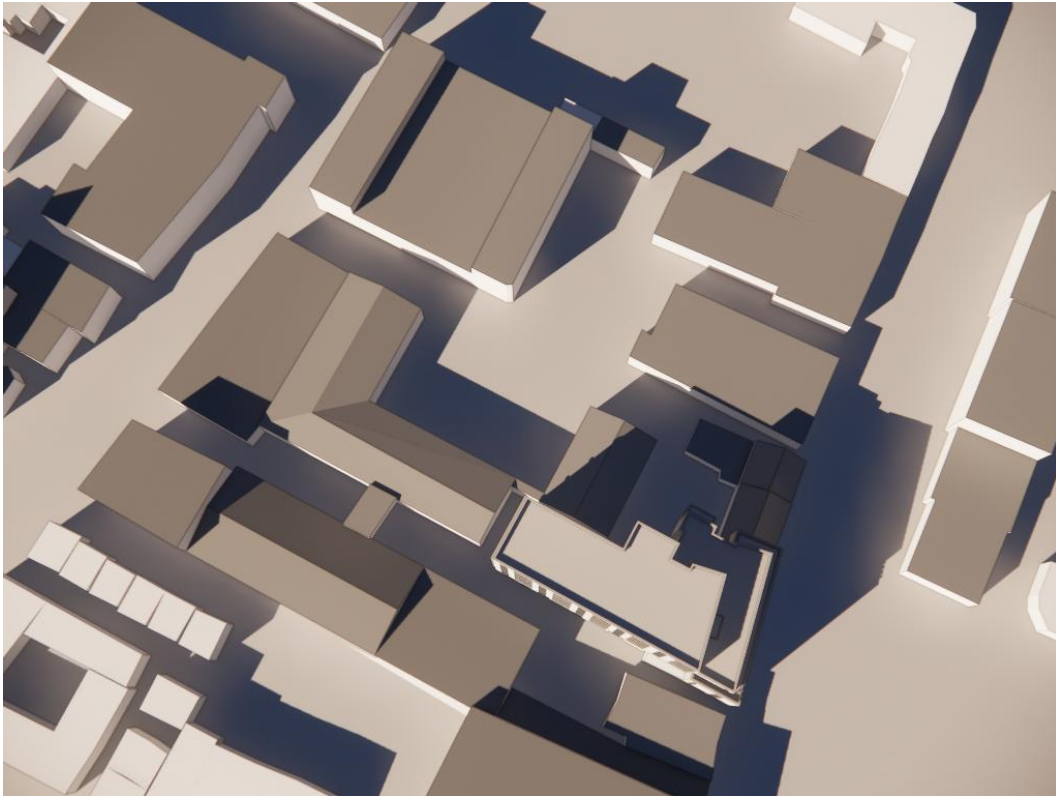
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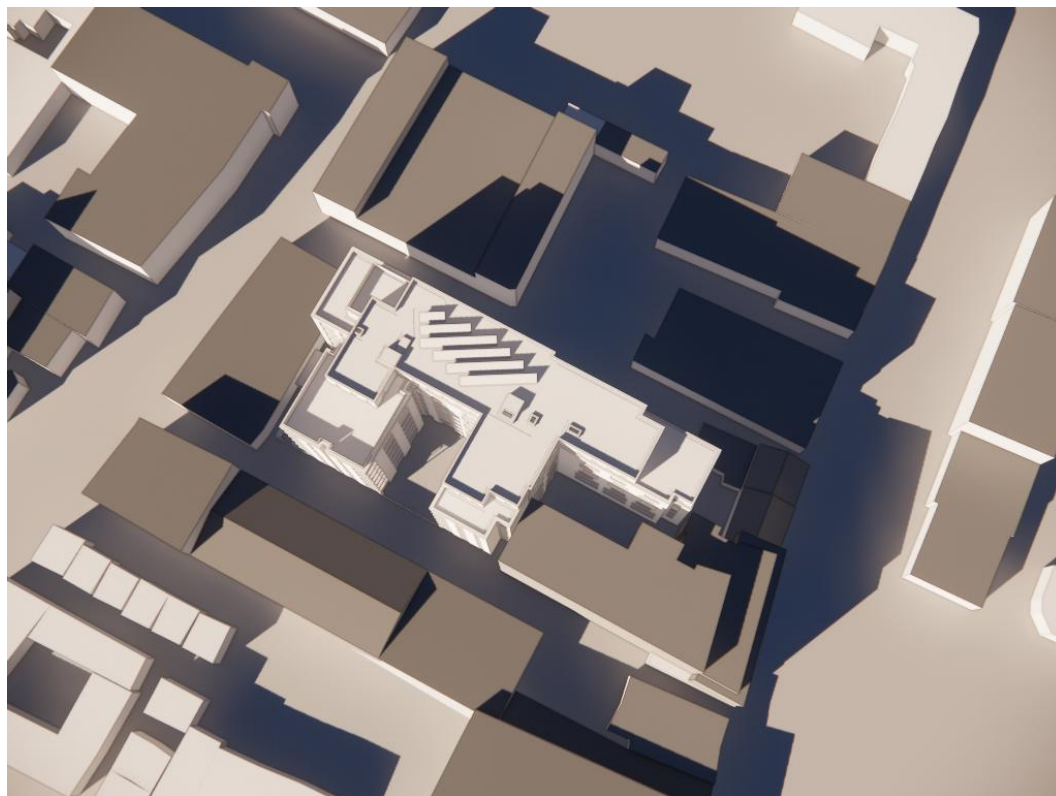
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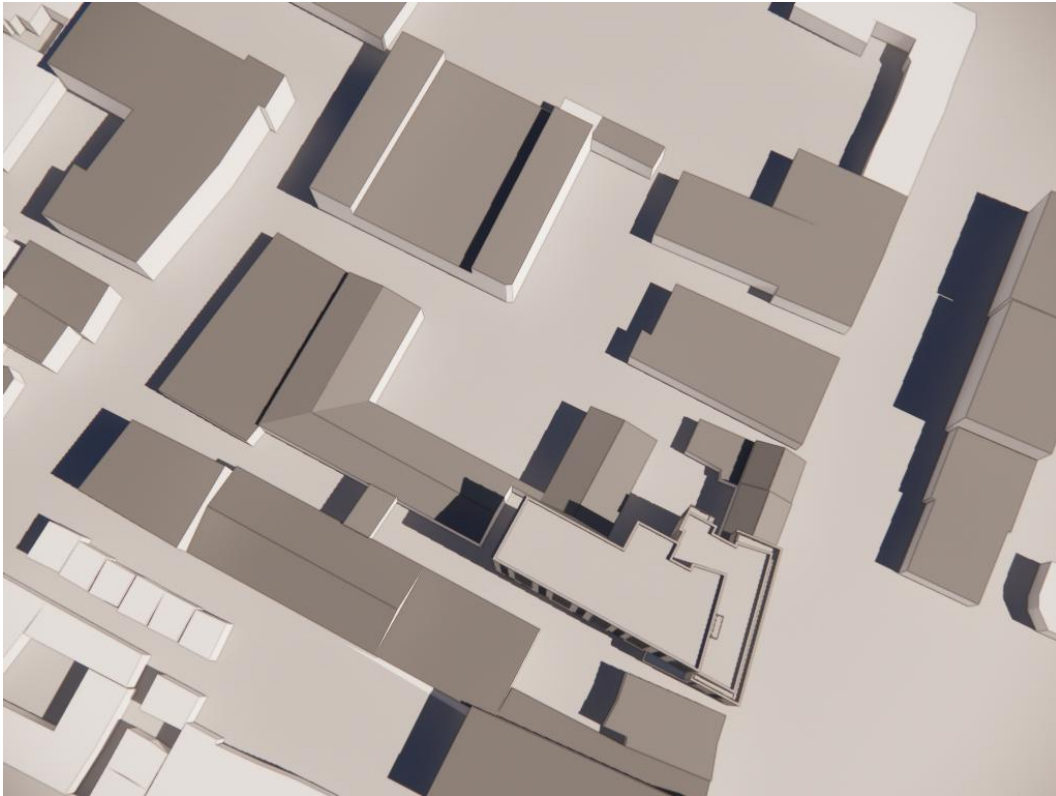
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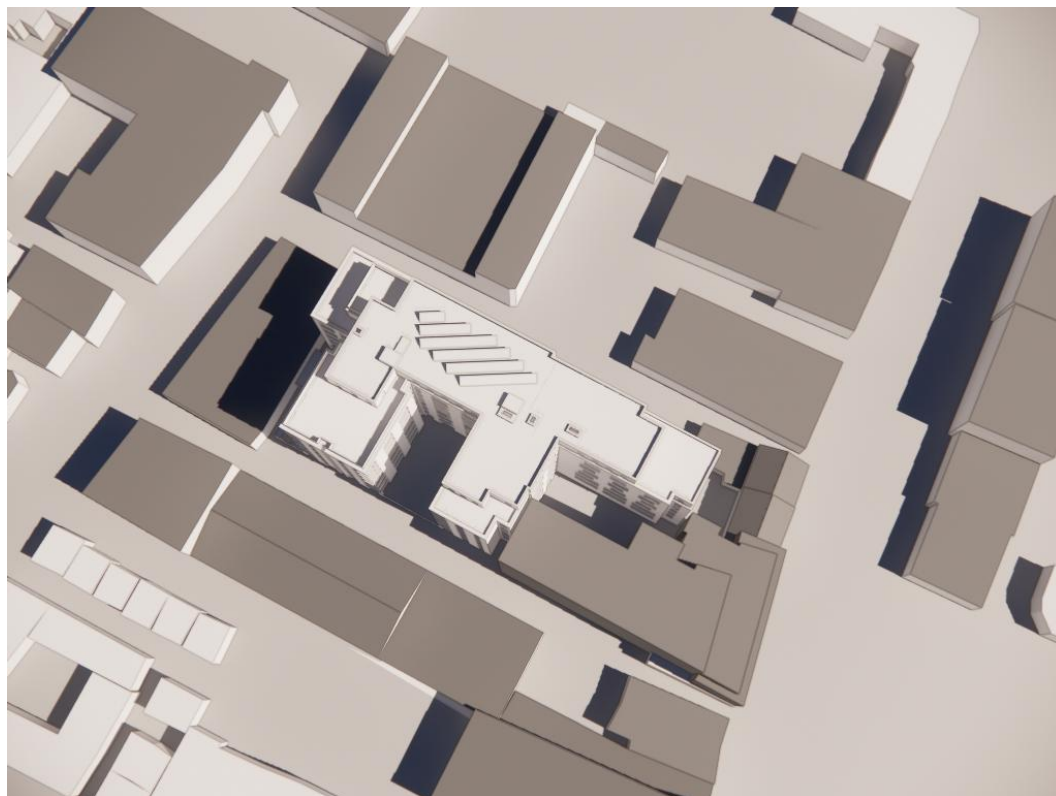
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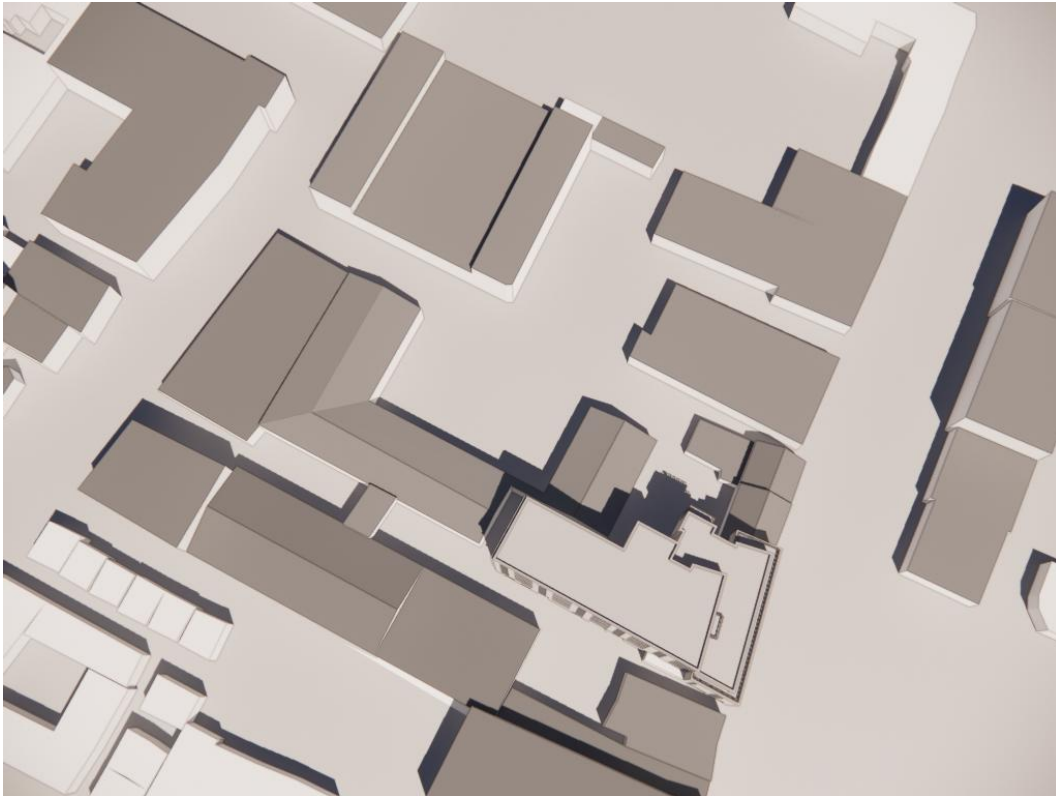
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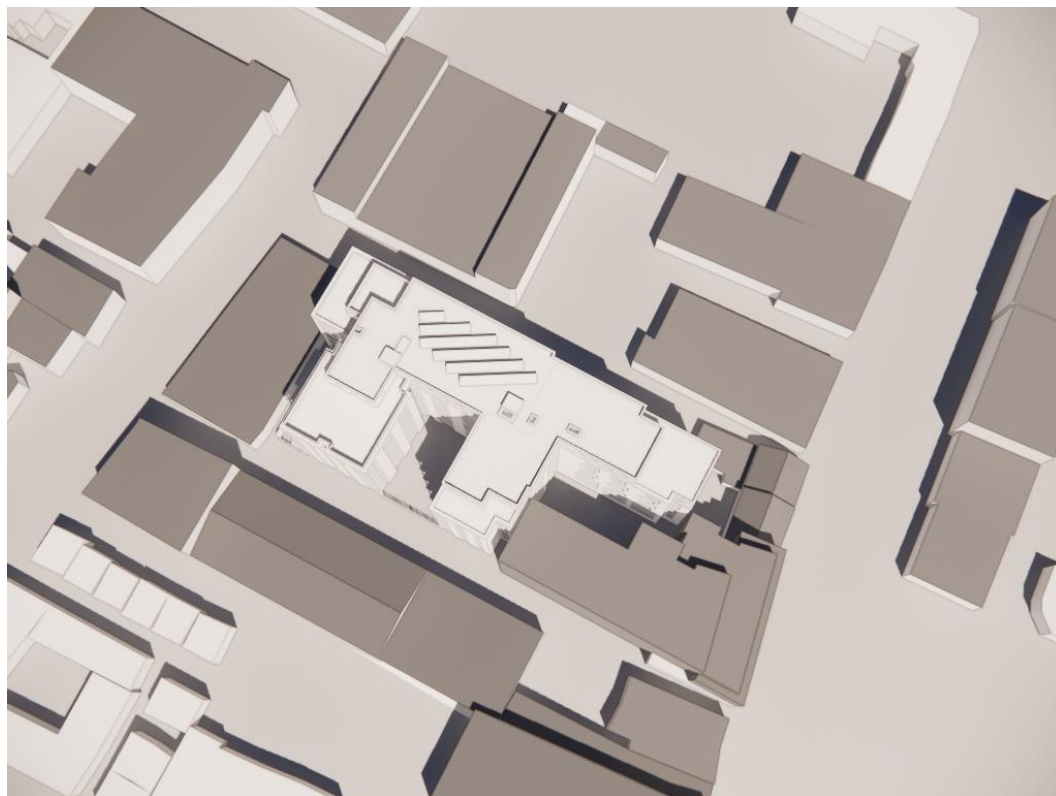
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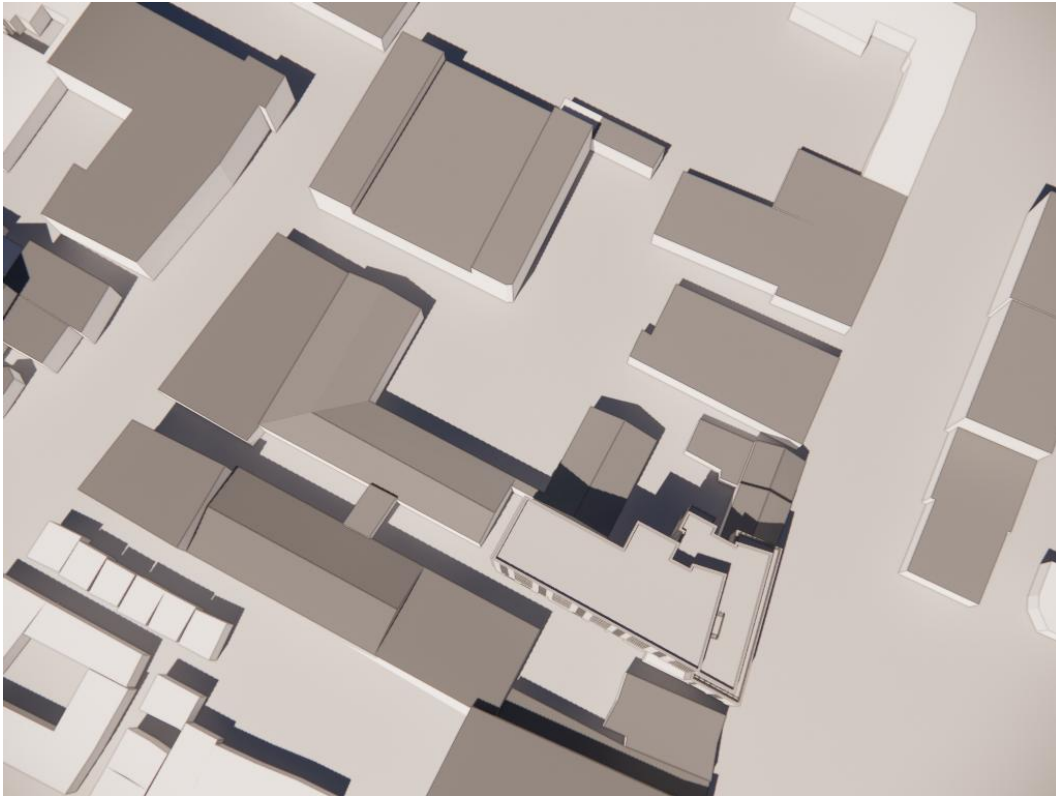
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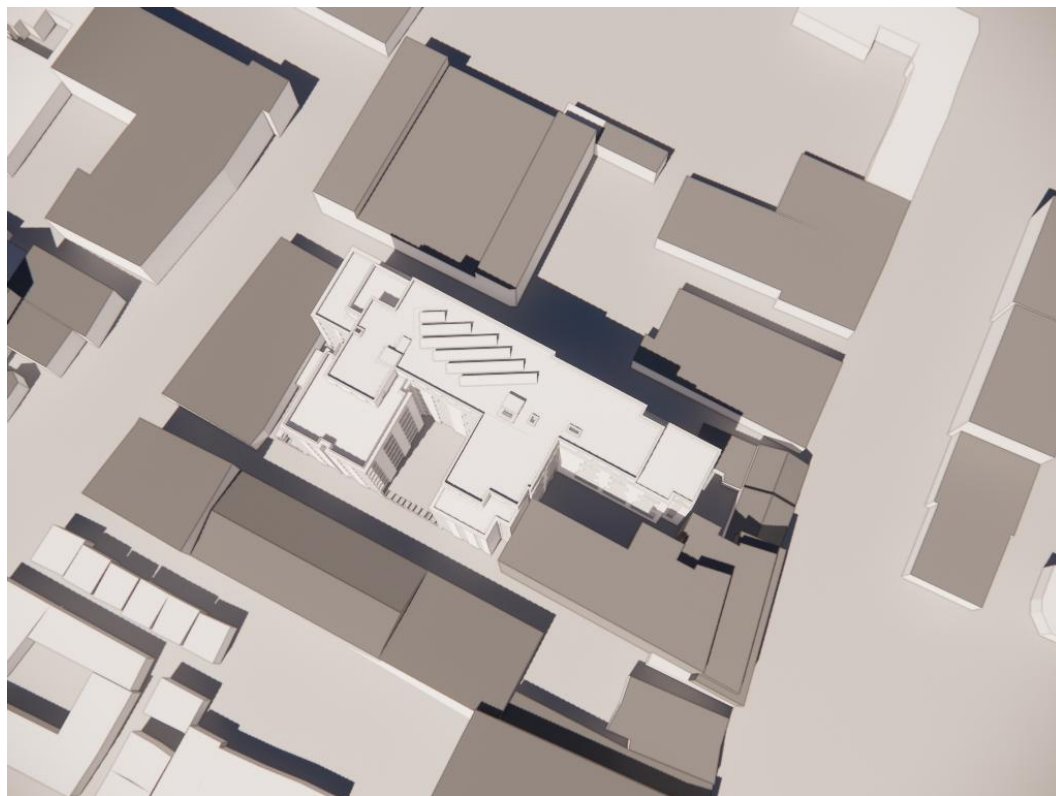
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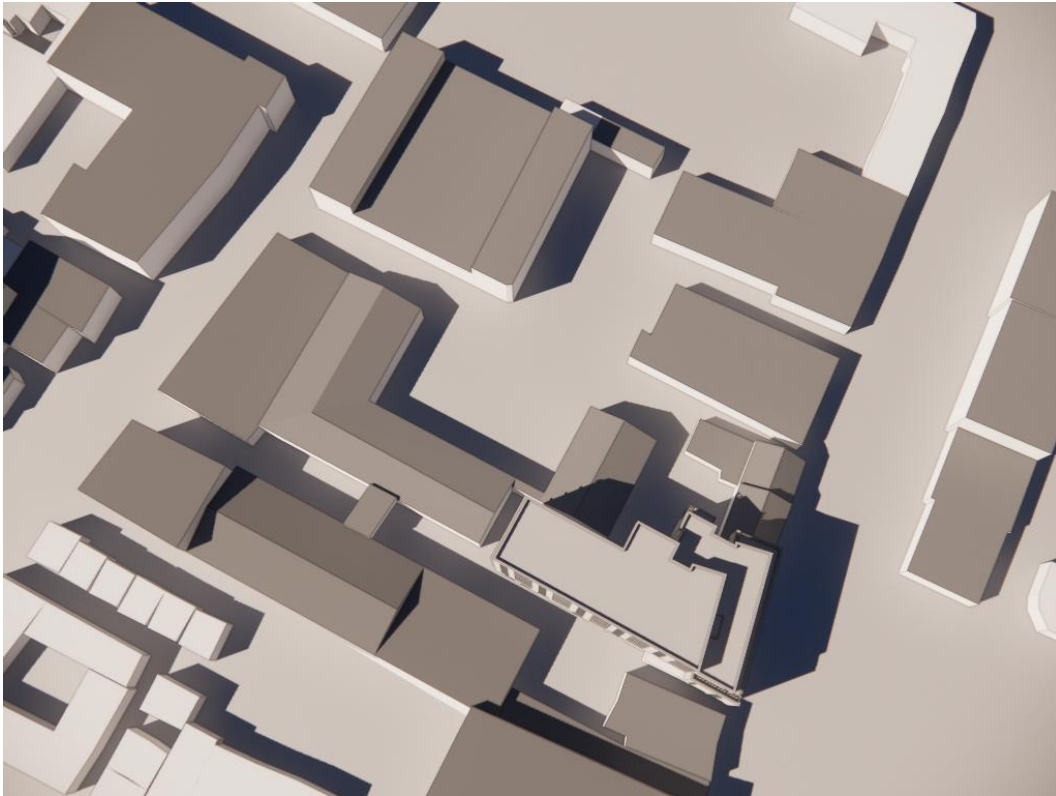
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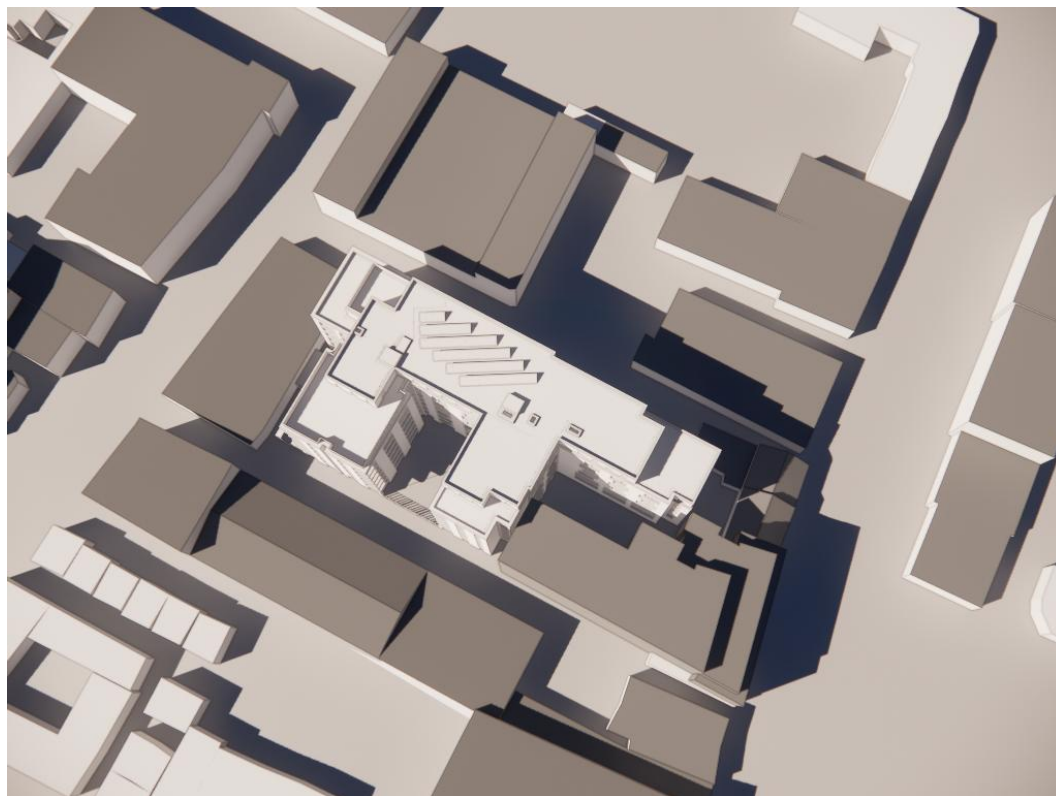
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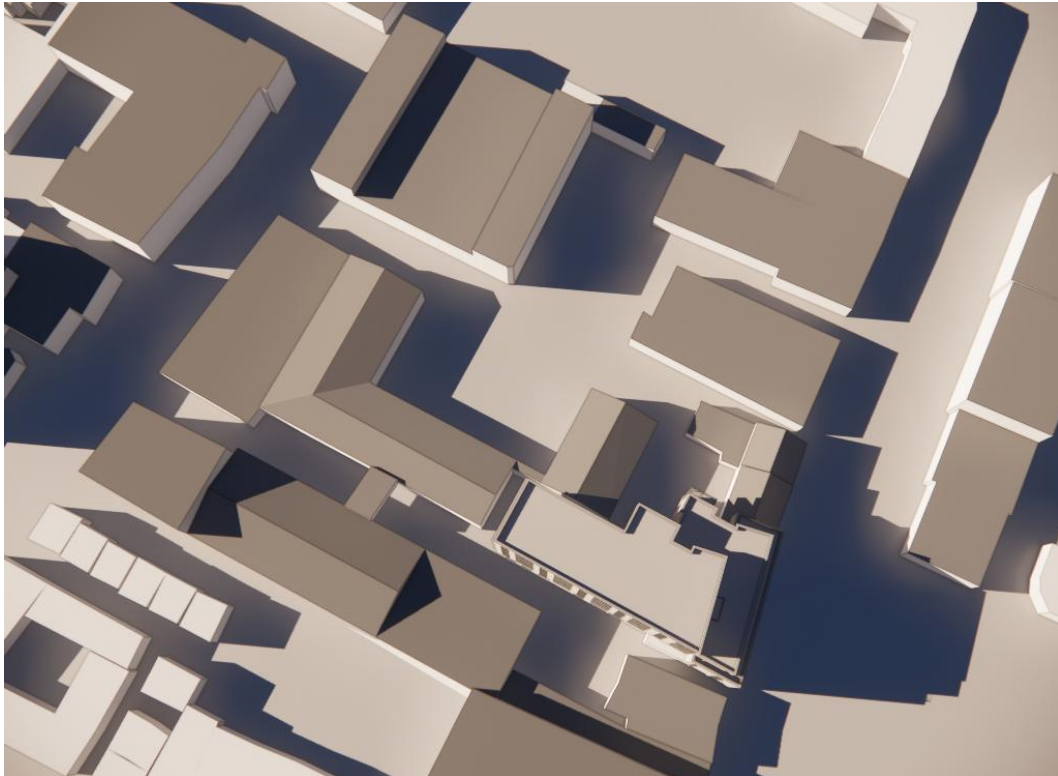
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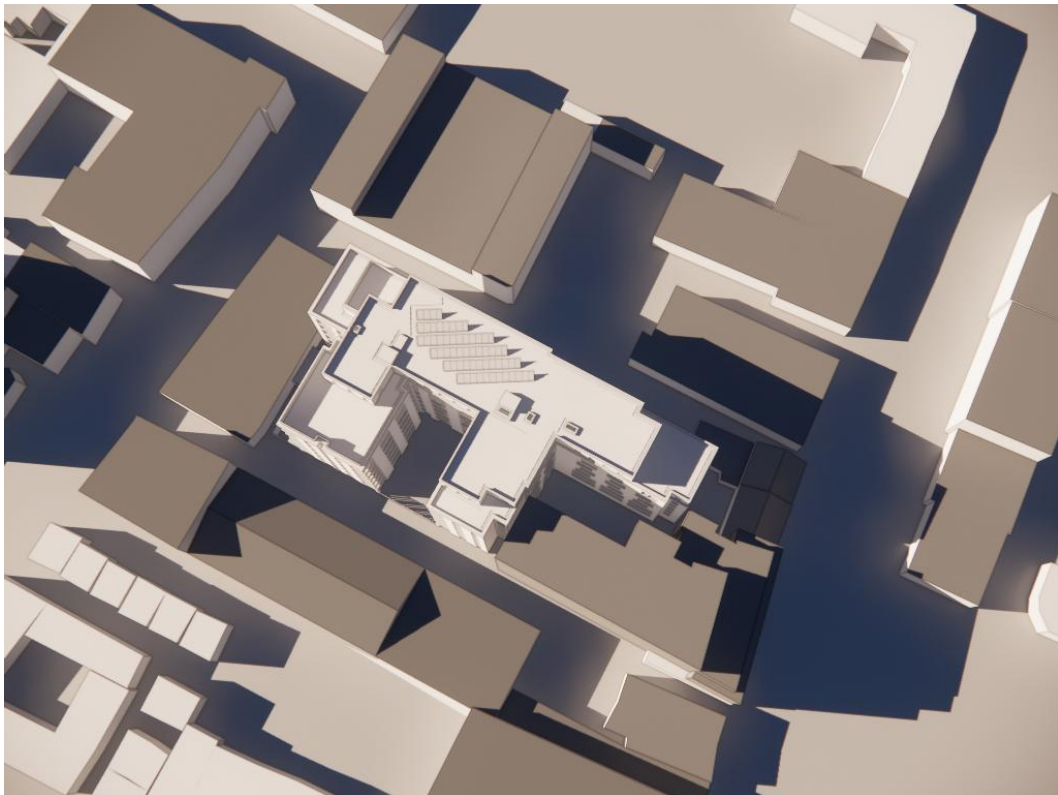
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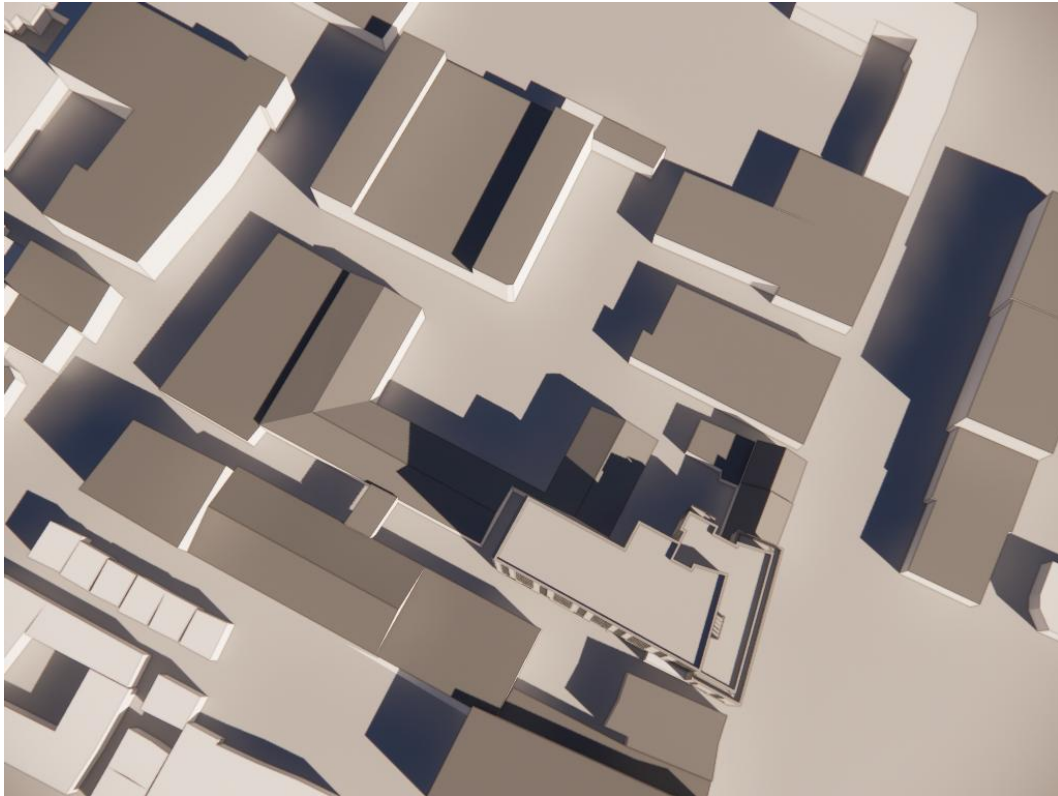
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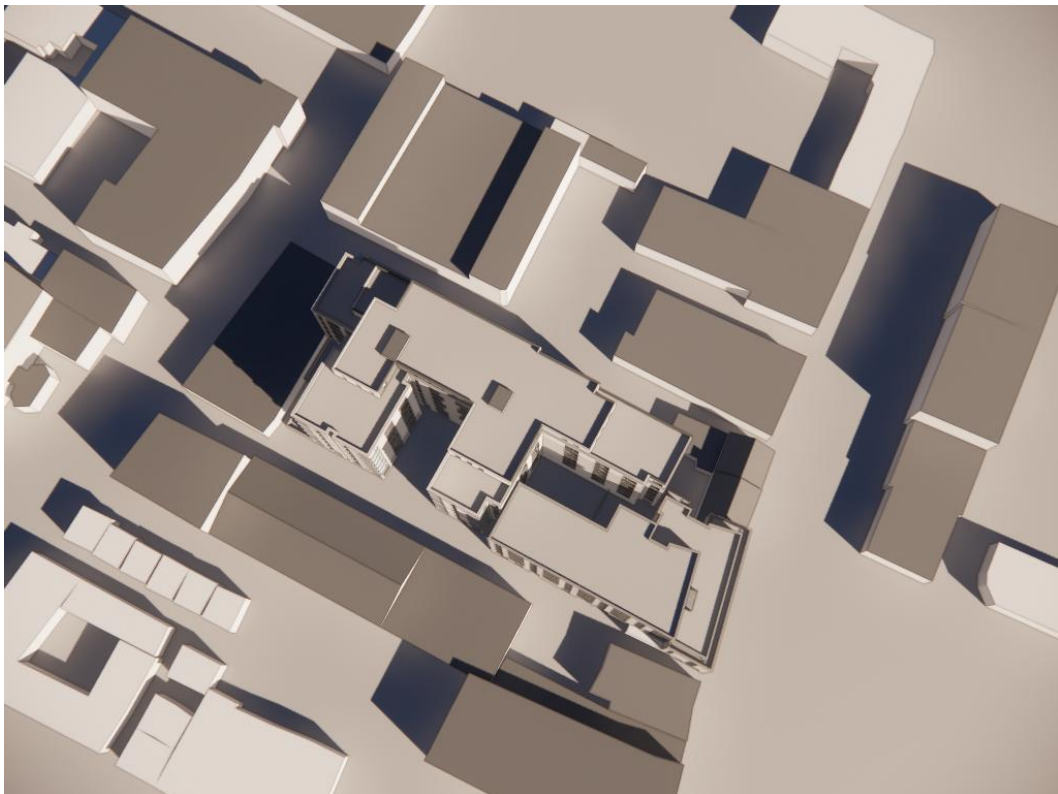
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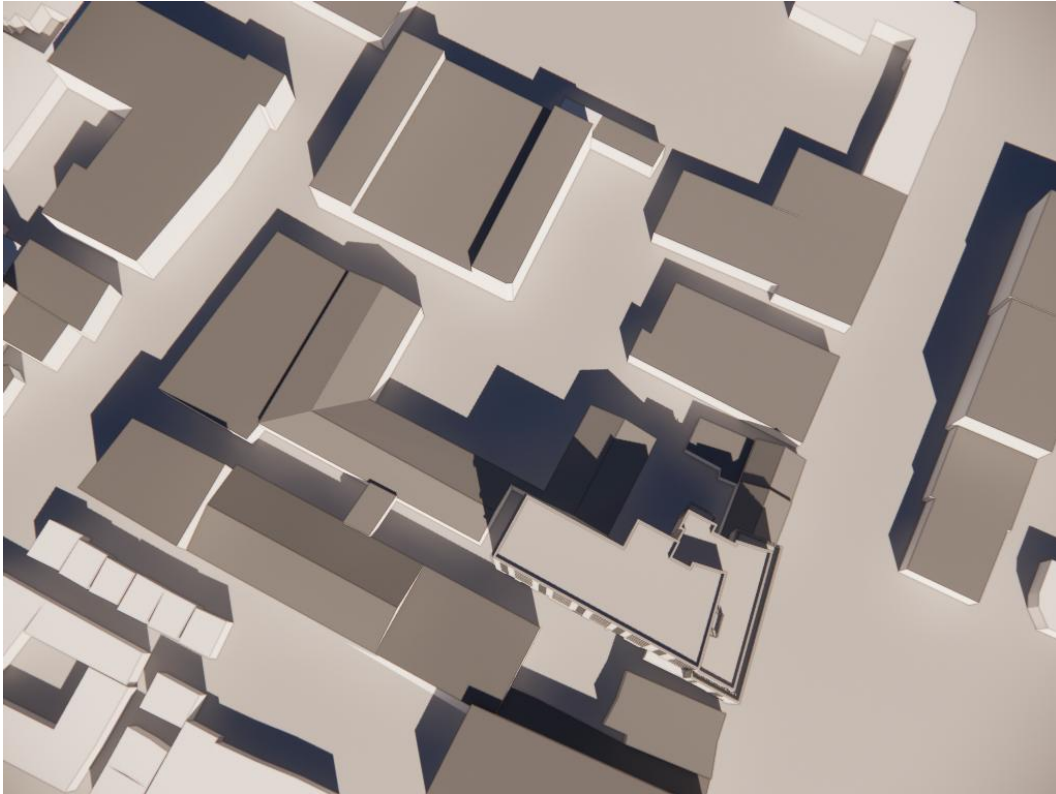
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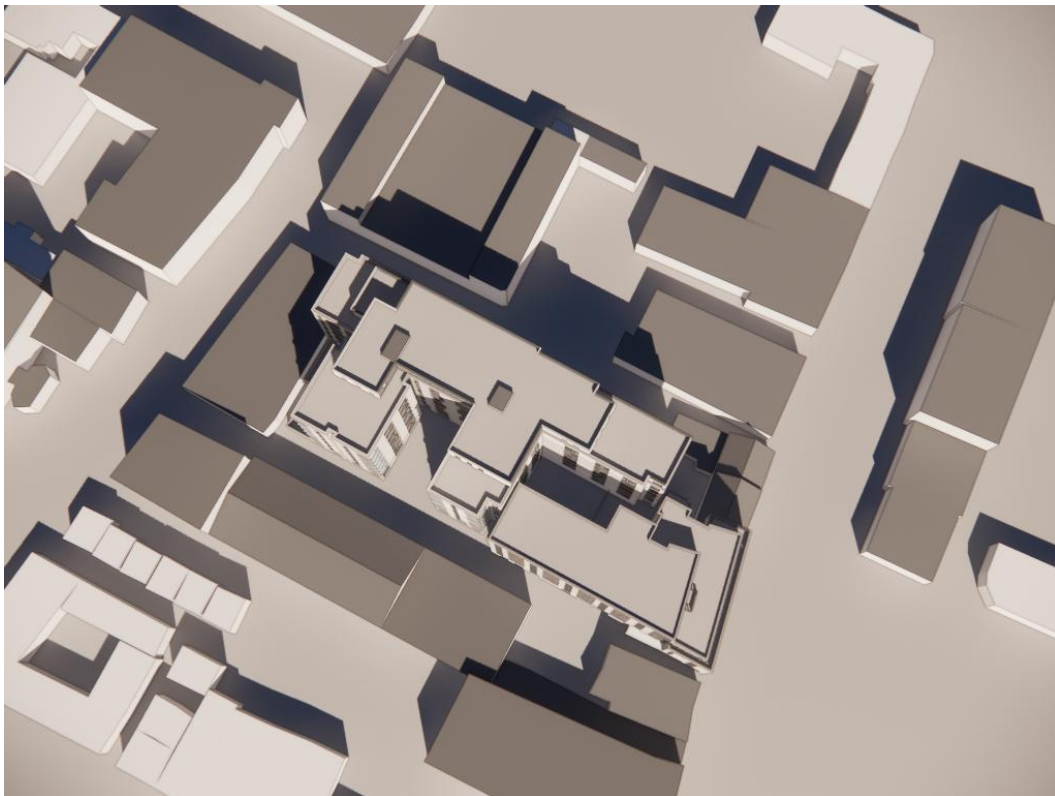
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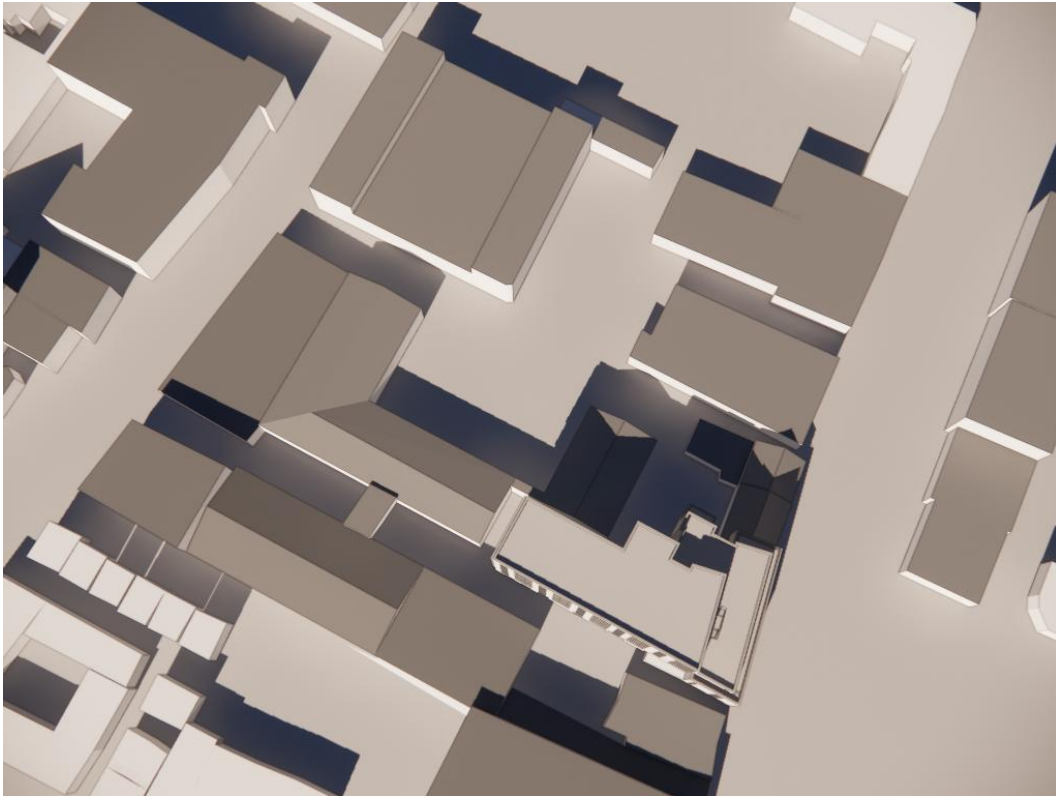
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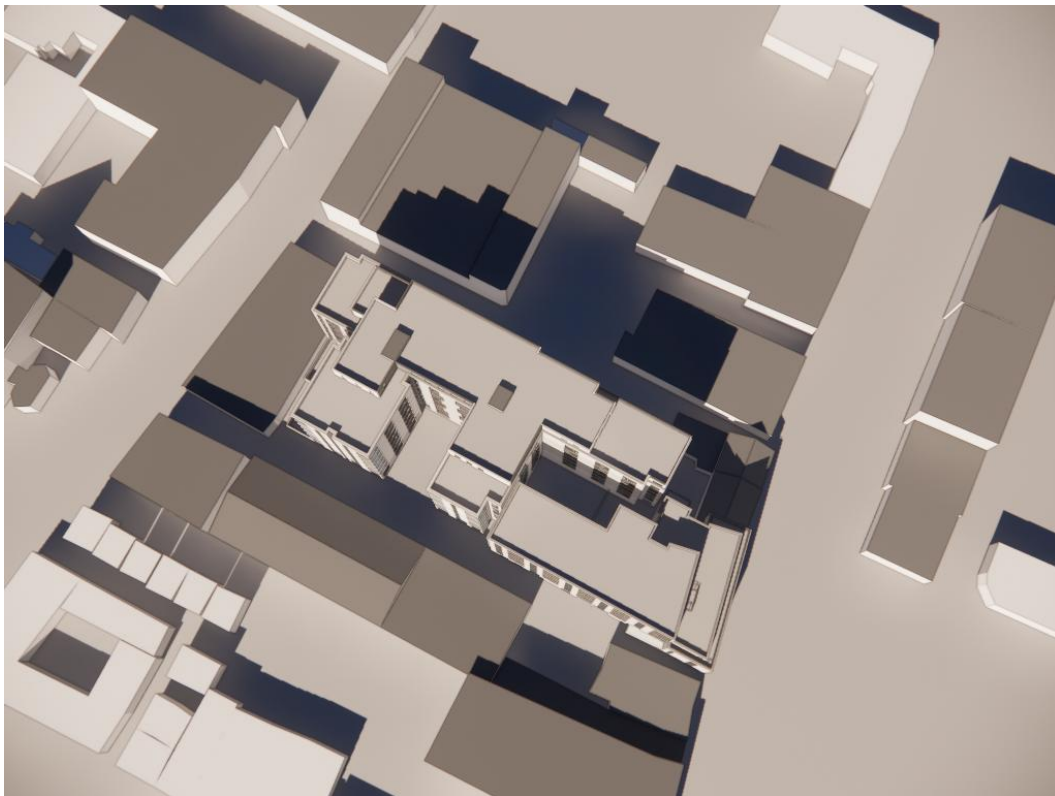
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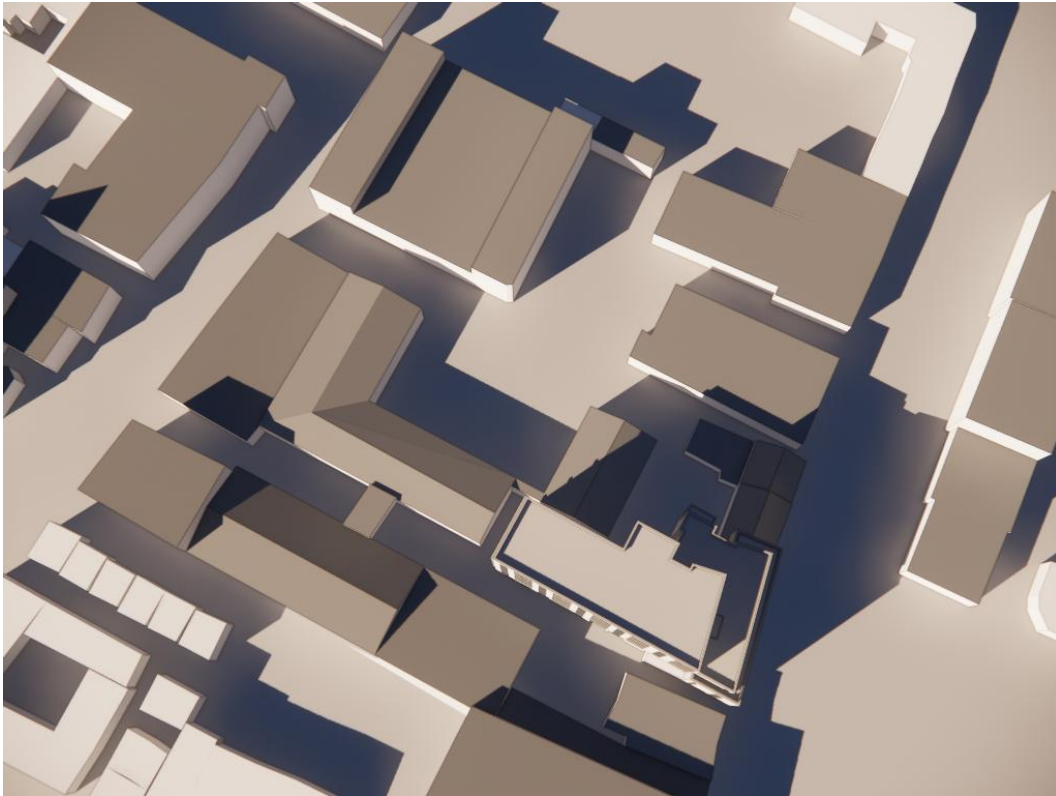
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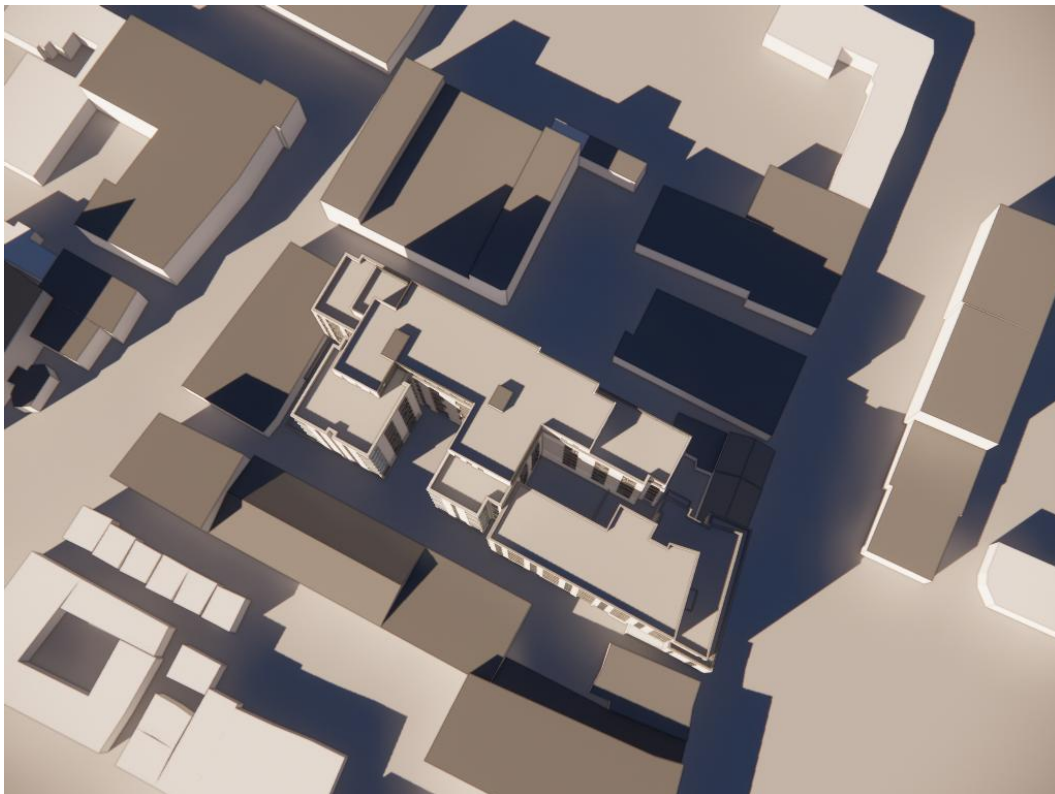
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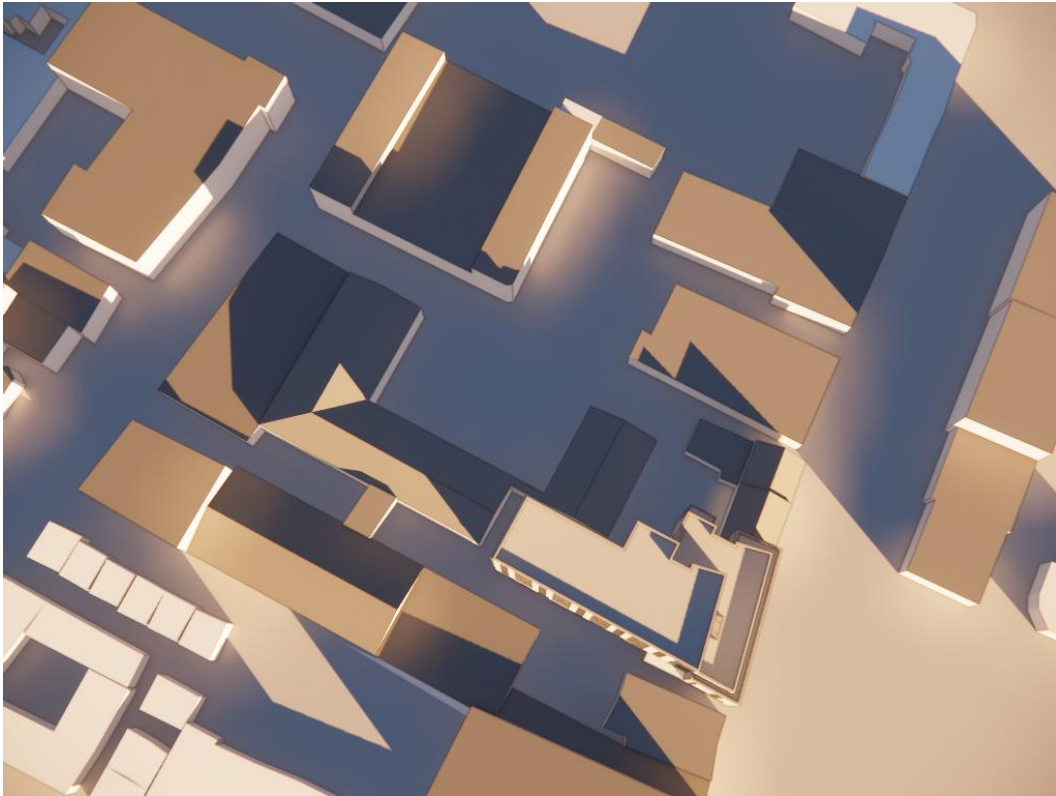
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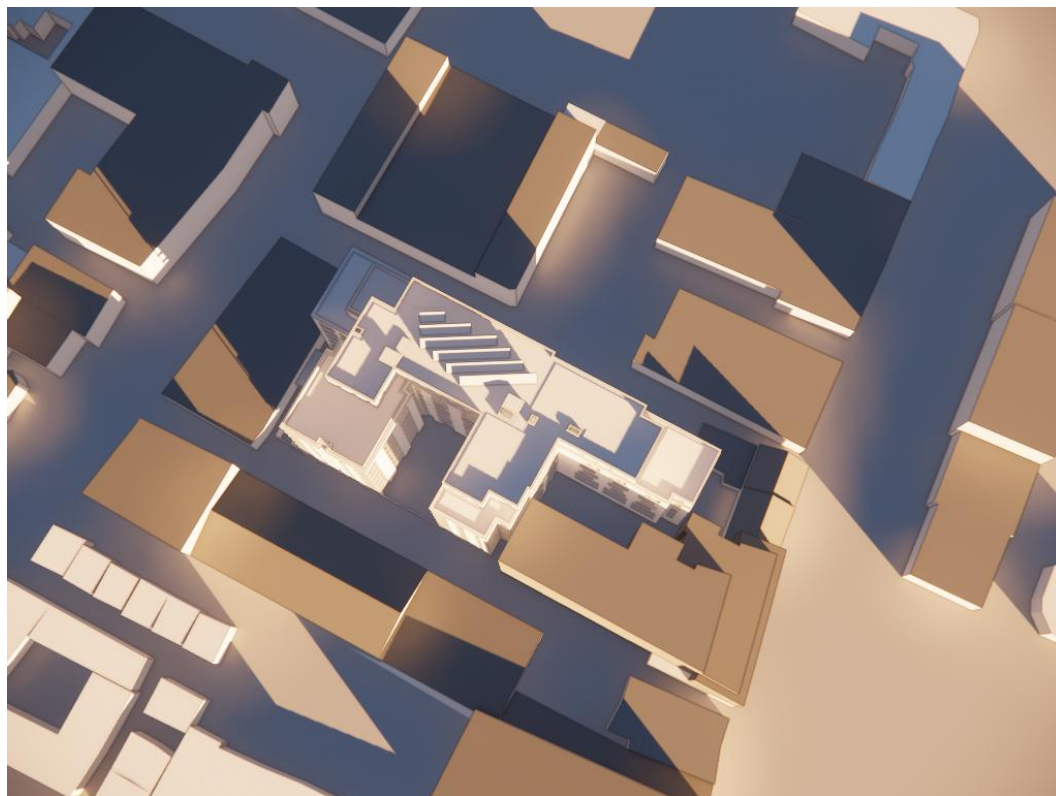
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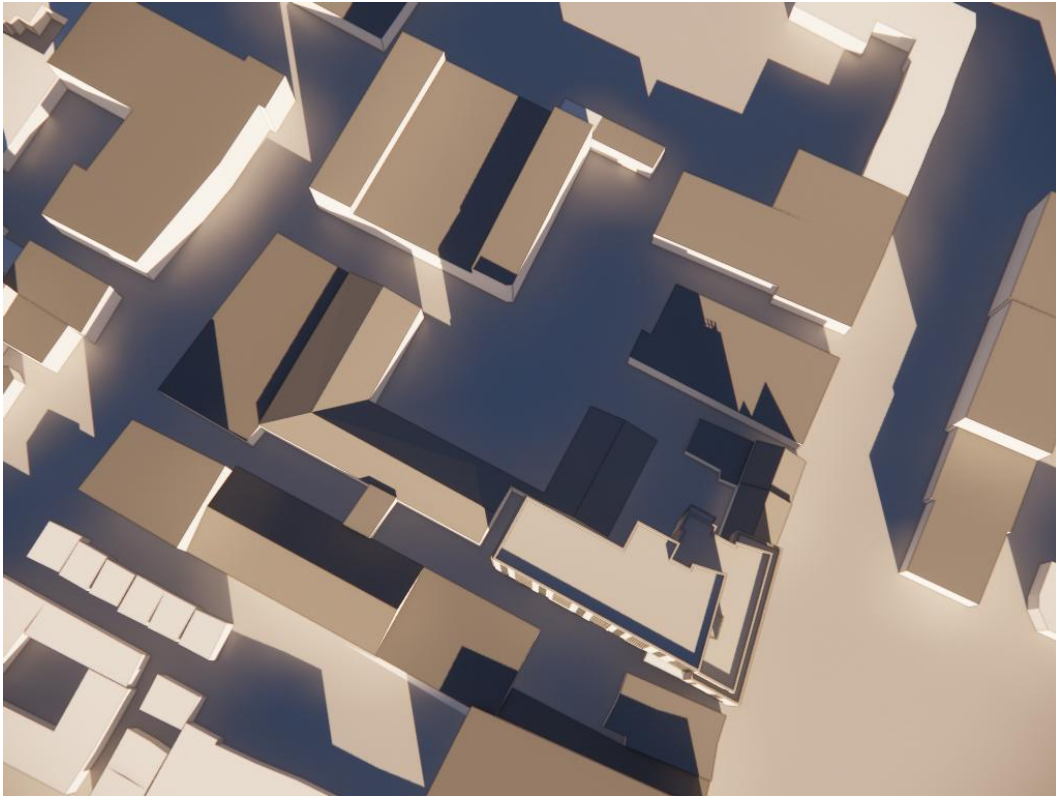
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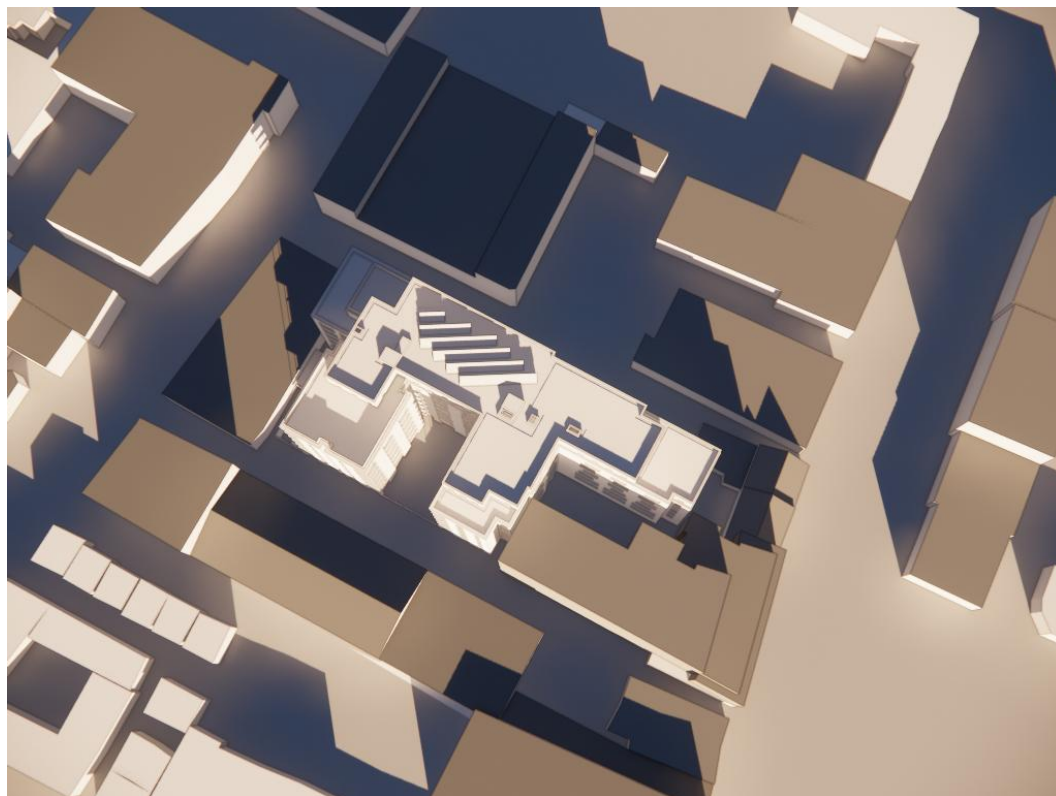
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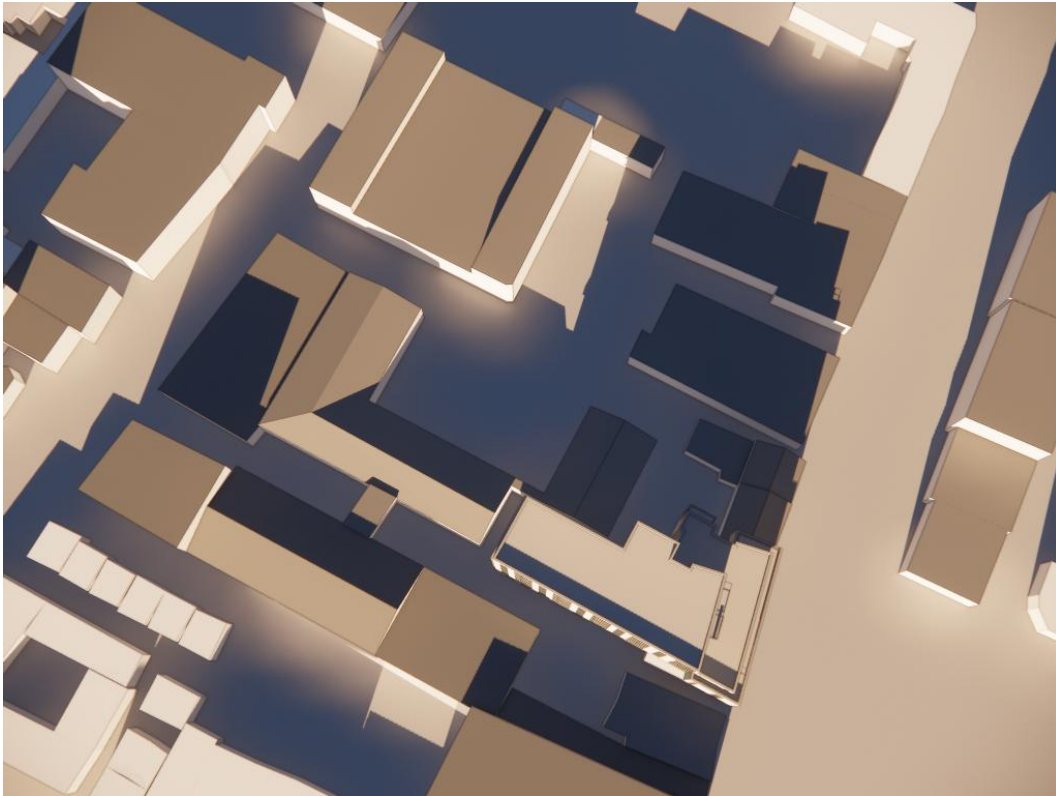
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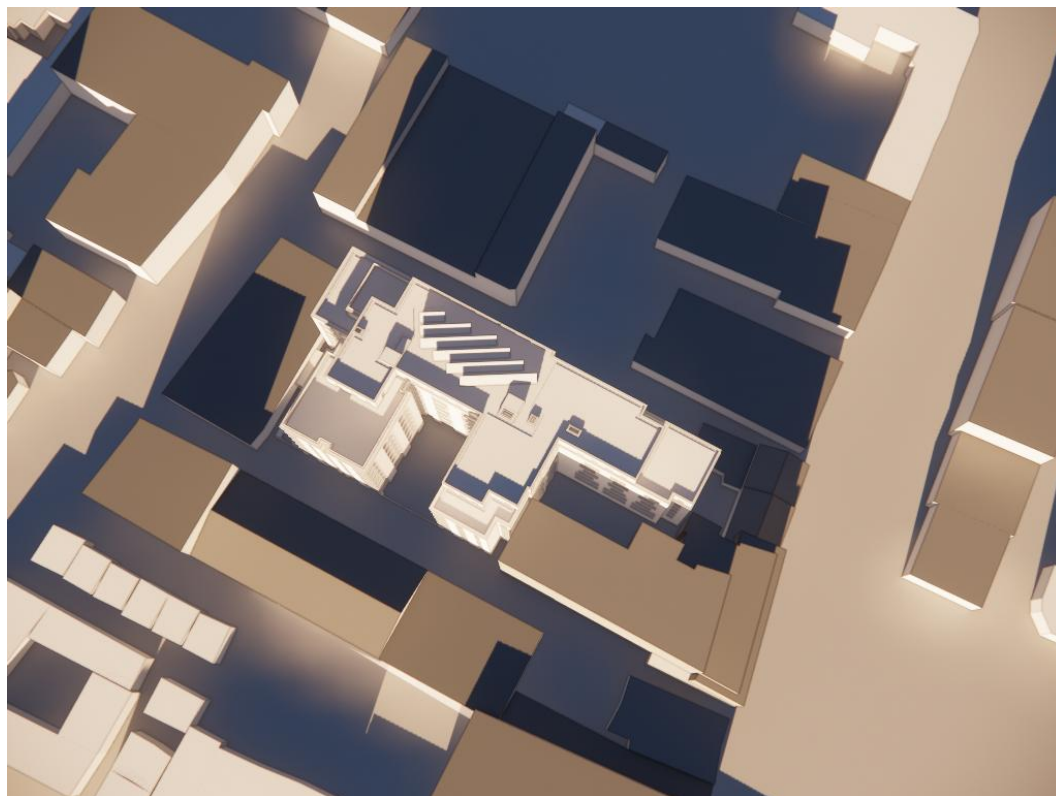
Existing: December 21st, 12:00



Proposed: December 21st, 12:00



Existing: December 21st, 14:00



Proposed: December 21st, 14:00

6. Daylight to Windows – Adjacent Properties

Obstruction Angle Check:

The BRE Guide states that:

Loss of light to existing windows need not be analysed if the distance of each part of the proposed development from the existing window is three or more times its height above the centre of the existing window. In these cases, the loss of light will be small. (BRE Building Technology Group, 2022).

If the development is taller or closer than this then the obstruction angle of the new development can be checked, where the obstruction angle is the angle subtended by the new development at the level of the centre of the lowest window in the existing building.

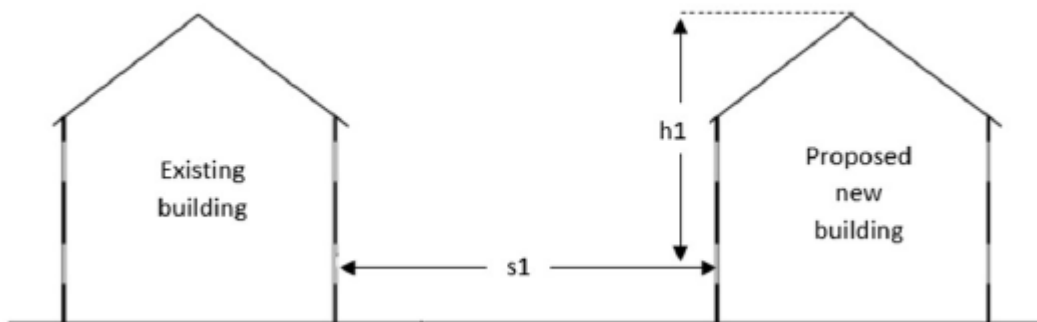


Figure 4: Spacing-to-height Ratio

“If this angle is less than 25 degrees for the whole of the development then it is unlikely to have a substantial effect on the diffuse skylight enjoyed by the existing building” (BRE Building Technology Group, 2022)

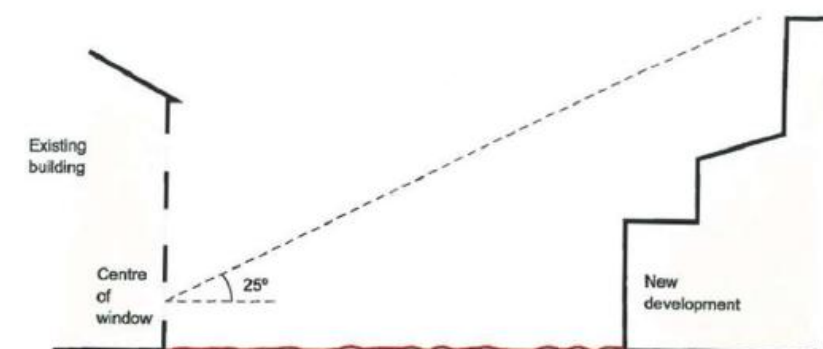


Figure 5: Obstruction Angle Check (25-degree Line Test)

The obstruction angle is measured from the 3D CAD model. This check is suitable for existing windows where the proposed development is directly opposite an existing window, i.e. proposed development is cut by a vertical section drawn perpendicular to the window.

If, for any part of the new development, this angle is more than 25°, a more detailed check is needed to find the loss of skylight to the existing building. This may also be required in cases where the existing windows are not opposite the proposed development.

Any reduction in the total amount of skylight for the existing properties can be calculated by finding the VSC at the centre of each main window. The Vertical Sky Component (VSC) is the ratio of the direct sky illuminance at the vertical reference point, to the simultaneous illuminance on an unobstructed horizontal plane. Reflected light is not included.

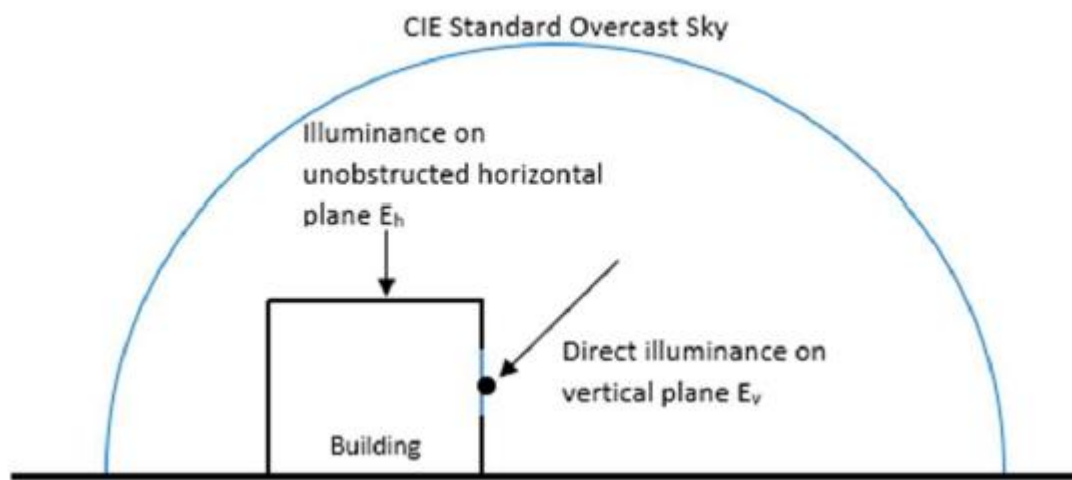


Figure 6: Vertical Sky Component

In the case of a floor-to-ceiling window such as a patio door, a point 1.6 m above ground (or balcony level for an upper storey) on the centre line of the window is used. The reference point is in the external plane of the window wall. Windows to bathrooms, toilets, storerooms, circulation areas, and garages are not analysed.

Note that because the CIE standard overcast sky model is used, VSC is independent of orientation and location. (It is a skylight metric.)

The diffuse daylighting of any existing building may be adversely affected if: “the VSC measured at the centre of an existing main window [or 1.6m above bottom of glazed door] is less than 27%, and less than 0.8 times its former value.” (BRE Building Technology Group, 2022)

Discussion

As there were no living spaces in close proximity to the proposed development except for the granted development to the south-east, which have all living spaces on the opposite side of the building out of view of the proposed development, the daylight analysis was not required.

7. Conclusion

Daylight to Proposed Development

As the BR 209 document (Third Edition) has been updated to reference the latest standard BS EN 17037:2018 the Daylight analysis was considered against this standard:

- BS EN 17037:2018

For the BS EN 17037:2018 standards 100% of rooms analysed met the target lux levels which were 100 lux for bedrooms, 150 lux for living rooms, and 200 lux for combined Kitchen/Living/Dining.

All 402 no. spaces assessed (bedrooms, living rooms and kitchen/living/dining) exceed the target levels in the BS EN 17037:2018 standard, so the proposed development can be considered to provide an excellent standard of amenity from a daylight perspective.

Sunlight to Proposed Development

A window (predominantly living room windows) was assessed for each unit in the development. As the sunlight exposure assessment in accordance with BS EN 17037:2018 considers the orientation of the rooms similar to the BRE Guide (Third Edition) it can also be concluded that the criteria for rooms facing significantly north of due east or west is unlikely to be met.

Of the 52 no. living rooms windows assessed, 52 no. (100%) meet the EN 17037:2018 sunlight exposure recommendations of greater than 1.5 hours on March 21st. Overall, the sunlight provision results to the proposed development in accordance with BS EN 17037:2018 are considered excellent.

Amenity Overshadowing – Proposed Communal Amenity Area

An amenity overshadowing analysis also confirmed that the communal space within the site would exceed the required overshadowing requirement thus providing good sunlight amenity.

Daylight to Windows – Adjacent Properties -Vertical Sky Component

A check was completed to ascertain which properties had the proposed development subtend a 25-degree angle from the horizontal. A VSC analysis was conducted on the windows of the properties identified (2 Dominic St) and of the 3 no. points assessed, none achieve a VSC of above 27%. 3 no. windows failed the VSC analysis.

The room that these windows service was analysed for No Sky Line to find if a sufficient area of the work plane received sunlight. The room passed this check therefore according to the BRE Guidelines, the daylighting of the adjacent properties would not be adversely affected.



Overall Conclusion.

After conducting a comprehensive daylight and sunlight assessment of the proposed development using simulation modelling and comparing results achieved against the BRE Guide and BS recommended guidelines, the proposed development would provide an excellent level of daylight and sunlight provision.



Appendix A

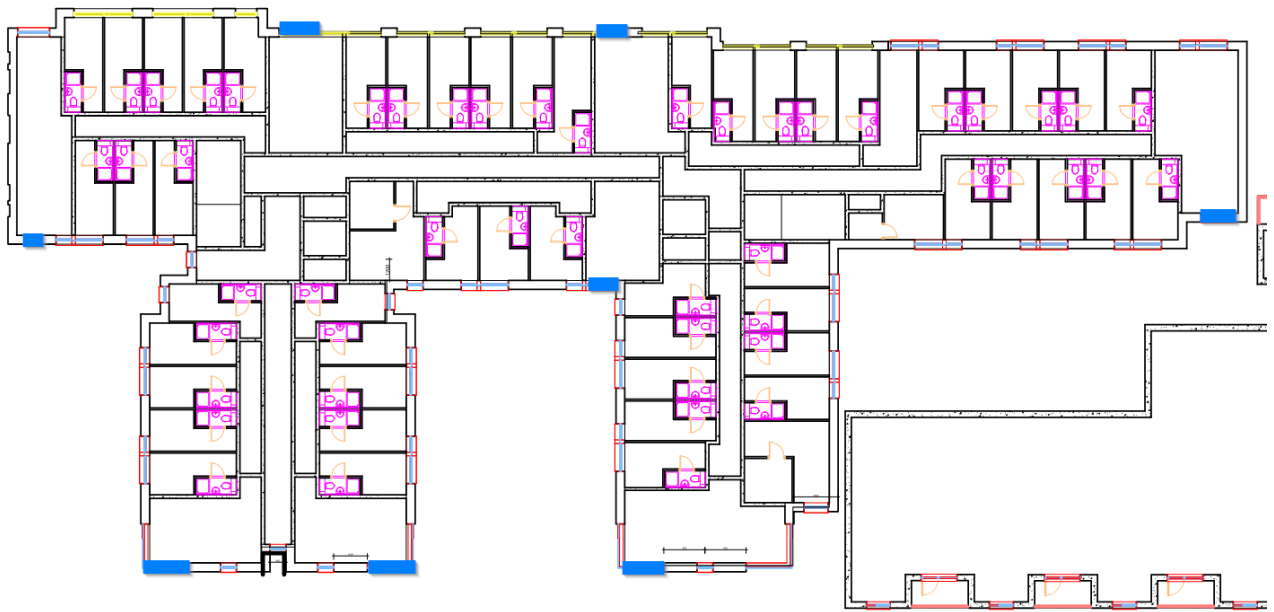


Figure A.1: Sunlight Analysis Window Key – Ground Floor

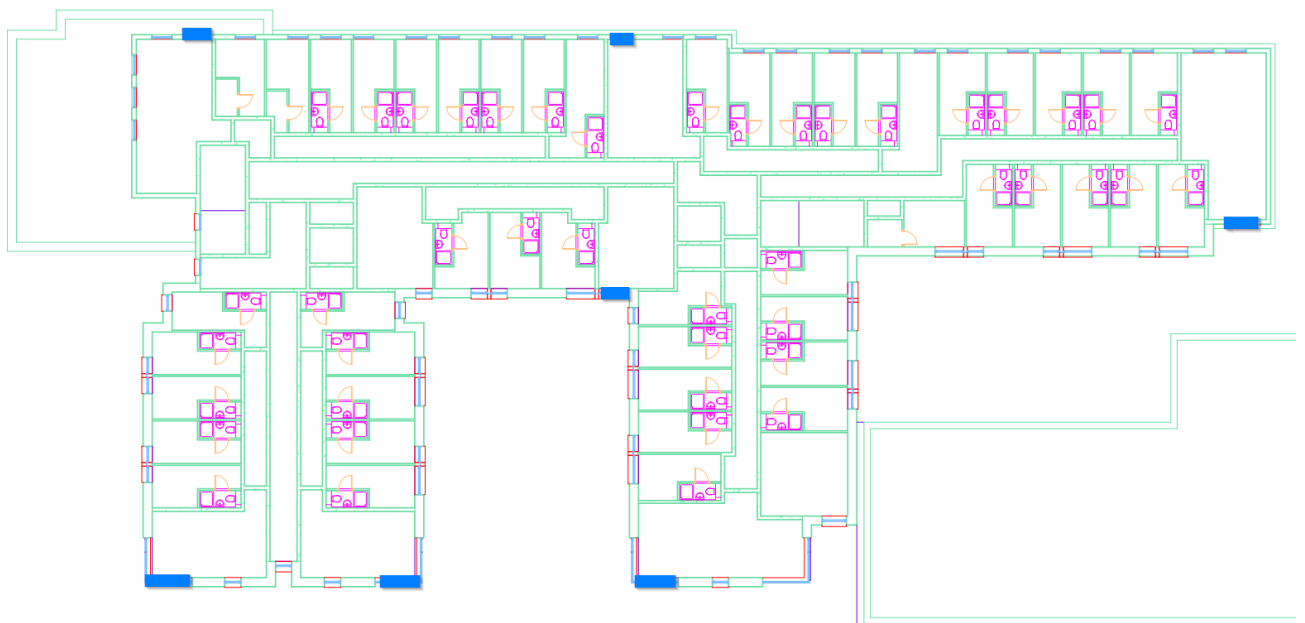


Figure A.2: Sunlight Analysis Window Key – Seventh Floor

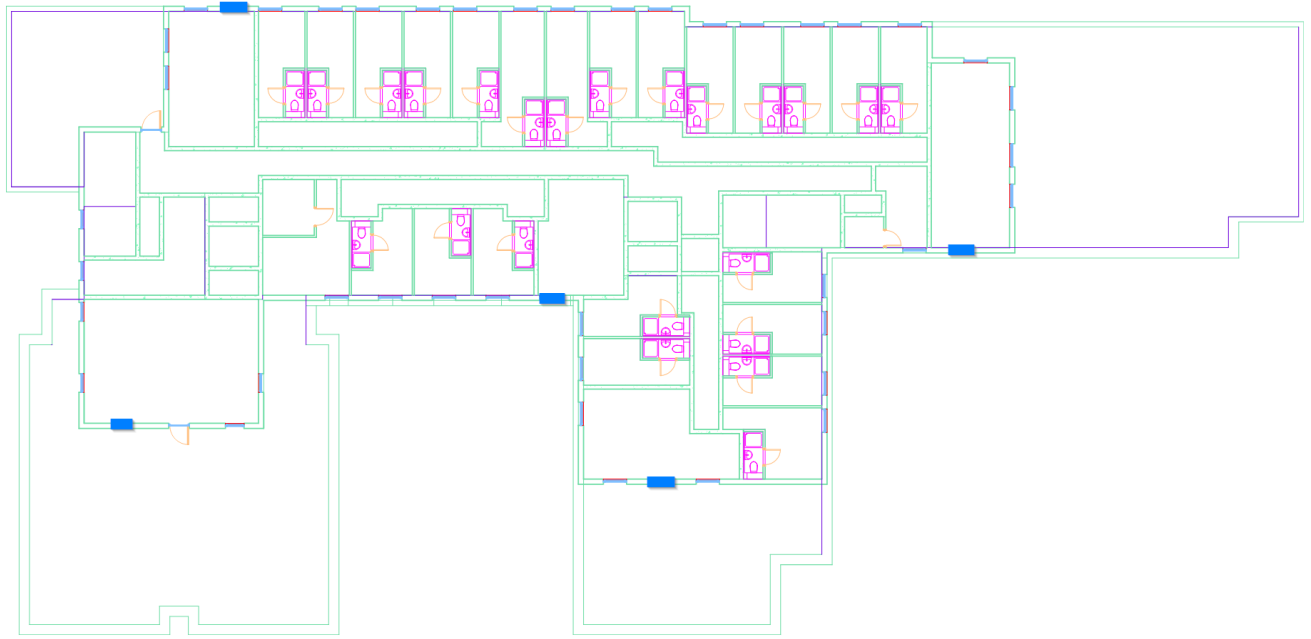


Figure A.3: Sunlight Analysis Window Key – Seventh Floor

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