metec
CONSULTING ENGINEERS

DAYLIGHT, SUNLIGHT AND SHADOW ASSESSMENT

for the

FRANKFORT CASTLE SITE DEVELOPMENT

at

OLD FRANKFORT
DUNDRUM
DUBLIN 14

for

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EXECUTIVE SUMMARY

METEC Consulting Engineers have been instructed by our client, Pembroke Partnership Limited, to carry out an assessment of the Daylight, Sunlight and shadowing for the proposed Frankfort Castle Site development. The scope of the assessment was to determine:

1. The impact, if any, that the proposed development would have on the existing surrounding properties in terms of Daylight, Sunlight and shadowing;
2. The Daylight and Sunlight levels that would be achieved by the proposed development.

Overall Methodology

"The assessment of the proposed extension was prepared using the methodology's set out in the BRE BR209, 'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice', Second Edition 2011, by P. J. Littlefair (the BRE Guidelines), the Urban Development and Building Heights: Guidelines for Planning Authorities 2018 (the Building Height Guidelines) and the Design Standards for New Apartments - Guidelines for Planning Authorities (March 2018) (the Apartment Guidelines)"

BRE Guidelines and Advisory Note

The numerical guidelines given in these documents are purely advisory. BRE BR209 states that:

"The advice given here are recommended guidelines and the guide should not be seen as 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".

However, both the Building Height Guidelines and Apartment Guidelines require appropriate and reasonable regard to be taken of quantitative performance approaches to daylight provision outlined in guides like the Building Research Establishment's 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or any other similar and broadly compatible guides or updated versions of these guides.

Overall Conclusion

In our opinion, after carrying out a comprehensive daylight, sunlight and overshadowing assessment of the proposed development using simulation modelling and comparing results achieved against the BRE guidelines and where recommended BRE Guidance levels have not been reached, this has been identified and considered, the results presented within this report demonstrate that overall, the proposed development achieves the guidance given in BRE BR209 'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice'.

Executive Summary Results Table

Design Parameters which have been reviewed as part of this study	Methodology	Recommended Guidelines	Compliance achieved in line with BRE Guide & BS 8206-2
Daylight Assessment on <u>Neighbouring Buildings</u> – Vertical Sky Component (VSC) and Average Daylight Factor (ADF) Calculations **(Referring to nearby 3rd Party Residential)**	IES VE Radiance Daylight Simulation	**BRE Guide [2.2]** **1.** VSC ≥ 27% (Or where that is not achieved) **2.** ≤ 20% reduction in VSC compared to its previous value before the proposed development (as simulated)	The VSC and daylight results demonstrate that the proposed development will not result impact assessment demonstrated that the proposed development would not result in any loss of light received by neighbouring properties beyond Minor adverse impacts as identified in Appendix I of the BRE Guidelines. Refer to Section 8.0 of this Report for a more in-depth commentary.
Average Daylight Factor (ADF) (Referring to the Proposed Development)	IES VE Radiance Daylight Simulation	**BRE Guide [2.1.8]** **3.** 2% for Kitchens **4.** 1.5% for Living Rooms **5.** 1% for Bedrooms	Of the **309** rooms that were assessed for daylight, **305** Assessed rooms achieved the BRE daylight guidelines. Refer to Section 10.0 of this Report for a more in-depth commentary.
Sunlight Assessment <u>Neighbouring Buildings</u> – Annual Probable Sunlight Hours (APSH) **(Referring to nearby 3rd Party Residential)**	IES VE SunCast Simulation	**BRE Guide [3.2.11]** **6.** Receives more than 25% of annual probable sunlight hours, and more than 5% of annual probable sunlight hours between 21st September and 21st March; (Or where that is not achieved) **7.** ≤ 20% reduction in APSH compared to its previous value before the proposed development (as simulated) **8.** Has a reduction in sunlight received over the whole year less than 4% of annual probable sunlight hours.	32 of the 32 windows assessed for Annual Probable sunlight hours (APSH) achieved the BRE Guideline recommended values for safeguarding access to sunlight in existing dwellings. 31 of the 32 windows assessed for Winter Probable sunlight hours (WPSH) in the winter months achieved the BRE Guideline recommended values for safeguarding access to sunlight in existing dwellings. W1 of assessment dwelling 10 which did not meet the APSH in the winter month was marginally outside of the guidelines. A classification of minor adverse impact is appropriate. Refer to Section 10.0 of this Report for a more in-depth commentary.

Design Parameters which have been reviewed as part of this study	Methodology	Recommended Guidelines	Compliance achieved in line with BRE Guide & BS 8206-2
Sunlight Assessment on <u>Proposed Buildings</u> – Annual Probable Sunlight Hours (APSH) **(Referring to Proposed Development)**	IES VE SunCast Simulation	**BRE Guide [3.1.15]** The centre of at least one window to a main living room can receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21st of September and 21st March.	The results demonstrate that dwellings of the proposed development achieve good APSH on the applicable main living room windows. The majority of dwellings achieve the BRE Guide recommend metric for Sunlight availability. Those that have not fully achieved the BRE metrics, these cases were, in our opinion professional opinion only marginally short of the threshold values or are North/North-East facing where there is a low expectation for sunlight. Refer to Section 11.0 of this Report for a more in-depth commentary.
Sunlight Assessment on <u>Amenity Space</u> – Sunlight Hours **(Referring to nearby 3rd Party Residential)**	IES VE SunCast Simulation	**BRE Guide [3.3.17]** It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21st March. If as a result of a new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on March 21st is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable.	27 of the 29 assessed neighbouring amenity areas achieve the BRE Guideline recommended values for safeguarding access to sunlight. The two amenity areas that did not achieve the guideline were, in our professional opinion only marginally outside of the guideline target. A classification of minor adverse impact is appropriate. Refer to Section 12.0 of this Report for a more in-depth commentary.
Sunlight Assessment on <u>Amenity Space on</u> – Sunlight Hours	IES VE SunCast Simulation	**BRE Guide [3.3.17]** It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least	The BRE recommended criteria for sunlight in amenity spaces is achieved for the proposed development. Refer to Section 13.0 of this Report for a more in-depth commentary.

Design Parameters which have been reviewed as part of this study	Methodology	Recommended Guidelines	Compliance achieved in line with BRE Guide & BS 8206-2
(Referring to Proposed Development)		two hours of sunlight on 21st March.	
Solar Shading **(Referring to nearby 3rd Party Residential)**	IES VE SunCast Simulation	**BRE Guide [3.3.17]** Where a large building is proposed which may affect a number of gardens or open spaces it is often illustrative to plot a shadow plan showing the location of shadows at different times of the day and year.	Existing and proposed solar shading images have been presented to illustrate the shadows that will occur on March 21st, June 21st and December 21st; however, it should be noted that in December, even low buildings will cast long shadows. It should be borne in mind when interpreting the shadowing images that nearly all structures will create areas of new shadows, and some degree of shadow a space is to be expected Refer to Section 14.0 of this Report for a more in-depth commentary and Appendix E for images.

1. INTRODUCTION

METEC Consulting Engineers have been instructed by our client, Pembroke Partnership Limited, to carry out an assessment of the Daylight, Sunlight and shadowing for the proposed Frankfort Castle Site development. The scope of the assessment was to determine:

1. The impact, if any, that the proposed development would have on the existing surrounding properties in terms of Daylight, Sunlight and shadowing;
2.The Daylight and Sunlight levels that would be achieved by the proposed development.

Daylight and Sunlight calculations have been carried out in accordance with BRE's 'Site Layout Planning for Sunlight and Daylight: A Guide to Good Practice' (2011) (herein referred to as the "BRE Guide") by P J Littlefair and BS 8206-2:2008 Lighting for Buildings – Part 2 Code of Practice for Daylighting, which are accepted as good practice guidelines by Planning Authorities. The Design Standards for New Apartments - Guidelines for Planning Authorities (March 2018) were also considered as part of this study.

The BRE Guide gives advice on site layout to achieve provision of daylight and sunlight both within buildings, and in the open spaces between them. In general, it aims to aid designers in considering the relationship between new and existing buildings to ensure that each retains the potential to achieve good daylighting and sunlight levels.

The BRE Guide states in the introduction that: *"The guide is intended for building designers and their clients, consultants and planning officials.* ***The advice given here are recommended guidelines and the guide should not be seen as 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. In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings."*

Where a proposal may not be able to fully meet all the requirements of the daylight provisions above, this has been clearly identified and a rationale for any alternative, compensatory design solutions has been set out, in order to assist An Bord Pleanála applying its discretion, having regard to local factors including specific site constraints and the balancing of that assessment against the desirability of achieving wider planning objectives.

It is therefore important that the guidelines that exist in relation to daylight and sunlight are read in the correct context and are not viewed as mandatory requirements for all dwellings.

2. SITE DESCRIPTION AND DEVELOPMENT OVERVIEW

The proposed development will consist of 115 no. residential units comprising 45 no. one-bed units and 70 no. two-bed units. The proposed units will be accommodated in the partially retained Frankfort Castle building and in 3no. proposed blocks which have a maximum height of 5 storeys. Additional works proposed include the provision of a childcare facility (80sqm), car parking at surface and basement levels, cycle parking, hard and soft landscaping, surface water drainage infrastructure and attenuation tank, and all associated site development and infrastructure works.

Figure 2.0.1 – Proposed Development Site Layout Plan

3. DEFINITIONS

The technical definitions that are referred to in this report are explained below.

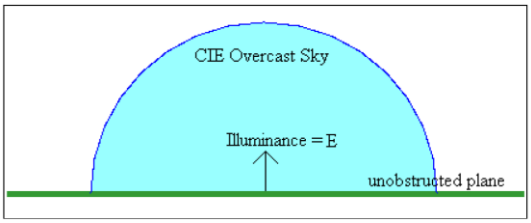
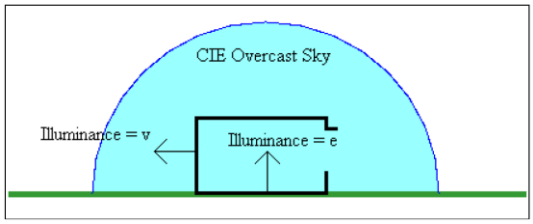
BRE	Building Research Establishment.
Average Daylight Factor (ADF)	The ratio of total daylight flux incident on a reference area to total area of reference area, expressed as a percentage of outdoor illuminance on a horizontal plane due to an unobstructed hemisphere of sky of assumed or known luminance distribution.
Vertical Sky Component (VSC)	The Vertical Sky Component (VSC) is the "Ratio of that part of illuminance, at a point on a given vertical plane that is received directly from a CIE standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. Usually the "given vertical plane" is the outside of a window wall. The VSC does not include reflected light, either from the ground or from other buildings.  E= illuminance on an unobstructed plane.  e= illuminance at point in interior Sky Component =e/E (often expressed as a percentage) Vertical Sky Component = v/E
CIE Standard Overcast Sky	A completely overcast sky for which the ratio of its luminance Ly at an angle of elevation y above the horizontal to the luminance Lz at the zenith is given by; $L_y = L_z \frac{(1 + 2\sin y)}{3}$ The CIE standard overcast sky is darkest at the horizon and brightest at the zenith (vertically overhead).
Annual Probable Sunlight Hours	The long-term average of the total number of hours during a year in which direct sunlight reaches the unobstructed ground (when clouds are taken into account).

Table 3.0.1 – Definitions of key terms referenced in this study

4. GUIDANCE DOCUMENTS REFERENCED DURING THIS STUDY

This Daylight, Sunlight and shadowing Assessment, has been carried out in accordance with the methodology outlined in the BRE Guide and BS 8206-2:2008.

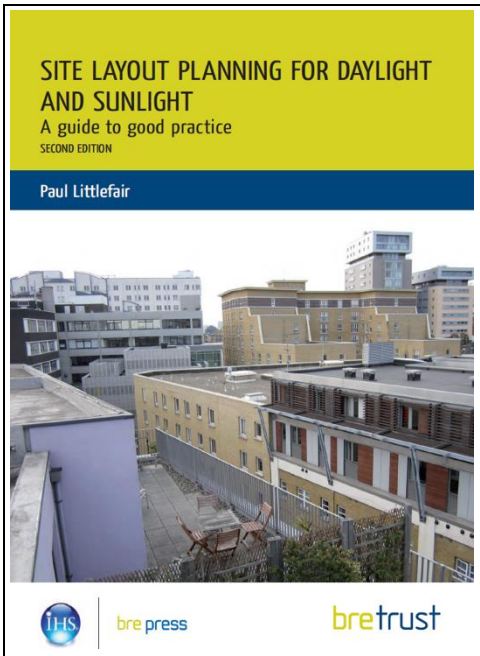
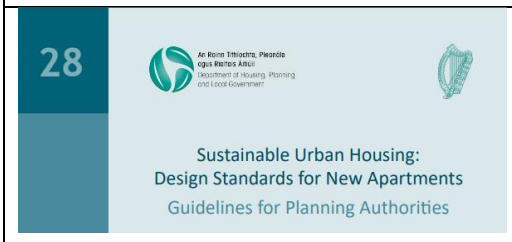
	This document gives advice on site layout planning to achieve good sun lighting and daylighting, both within buildings and in the open spaces between them. This authoritative document is widely used to provide advice during the planning and design stages of building development in the UK and Ireland. Guidance is given on site layout for good sun lighting and daylighting; safeguarding of daylight and sunlight within existing buildings nearby; and the protection of daylighting of adjoining land for future development.
	Design Standards for New Apartments - Guidelines for Planning Authorities (March 2018).

Table 4.0.1 – Guidance Documents Referenced for this Study

5. ASSESSMENT METHODOLOGY

This Daylight, Sunlight and shadowing Assessment was carried out using the simulation software IES VE. The simulation results were then compared against metrics referenced in the BRE Guide and BS 8206-2:2008. It is important to note that the BRE Guide does not contain mandatory requirements and the guide should not be seen as an instrument of planning policy. Section 1.6 of the BRE Guide states that: "*Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design. In special circumstances the developer or planning authority may wish to use different target values"*

Where a proposal may not be able to fully meet all the requirements of the daylight provisions above, this has been clearly identified and a rationale for any alternative, compensatory design solutions has been set out, in order to assist An Bord Pleanála applying its discretion, having regard to local factors including specific site constraints and the balancing of that assessment against the desirability of achieving wider planning objectives

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 a window in relation to the size of the room; the reflectance of the walls; and, the nature of the glazing and number of windows.

BRE guidelines confirm that the recommended minimum ADF target value depends on the room uses. That is 1% for a bedroom, 1.5% for a living room and 2% for a kitchen. As stated in BS 8206-2:2008 - "Where one room serves more than one purpose, the minimum average daylight factor should be that for the room type with the highest value. For example, in a space which combines a living room and a kitchen the minimum average daylight factor should be 2%". Where applicable within this assessment, kitchen spaces that measure less than 6.5m^2 (and therefore not deemed to be a habitable space) are omitted from the scope of the daylight calculation. The BRE Guide also states – "If the layout means that a small internal galley-type kitchen is inevitable, it should be directly linked to a well daylight living room"

Annual Probable Sunlight Hours (APSH)

Paragraph 3.1.11 of the BRE Guide states that if a room faces significantly north of due east or west it is unlikely to meet the recommended sunlight levels. Therefore, these orientations were not analysed for APSH because the BRE Guide recognises that good sun light availability is unachievable for these orientations.

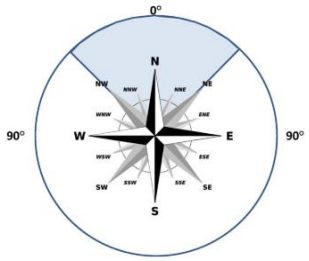


Figure 5.0.1 – Orientations analysed for APSH.

Surrounding Landscaping

As per Appendix H of the BRE guide section H1.2: "*It is generally more difficult to calculate the effects of trees on daylight because of their irregular shapes and because some light will generally penetrate through the tree crown. Where the effect of a new building on existing buildings nearby is being analysed, it is usual to ignore the effect of existing trees. This is because daylight is at its scarcest and most valuable in winter months when most trees will not be in leaf*"

6. SIMULATION SOFTWARE DESCRIPTION

IES VIRTUAL ENVIRONMENT

IES Virtual Environment is the world's leading building performance analysis tool. The software provides an in-depth suite of integrated analysis tools which allow an integrated design approach and highly detailed results.

IES VIRTUAL ENVIRONMENT - RADIANCE

Radiance is a software package developed by the Lighting Systems Research group at the Lawrence Berkeley Laboratory in California, USA. Radiance was developed as a research tool for predicting the distribution of visible radiation in illuminated spaces.

IES VIRTUAL ENVIRONMENT - SUNCAST

SunCast enables engineers to perform shading and solar insolation analysis studies and can generate images and animations. SunCast generates shadows and internal solar insolation from any sun position defined by date, time, orientation, site latitude and longitude. SunCast can be used at any stage of the design process from a model created by the IES Model Builder.

7. SIMULATION MODEL IMAGES

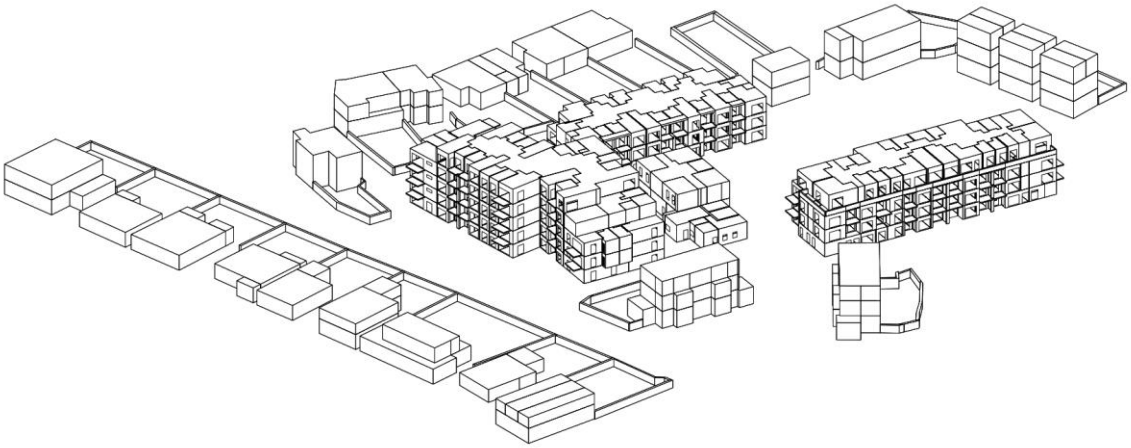


Figure 7.0.1 View from the South West.

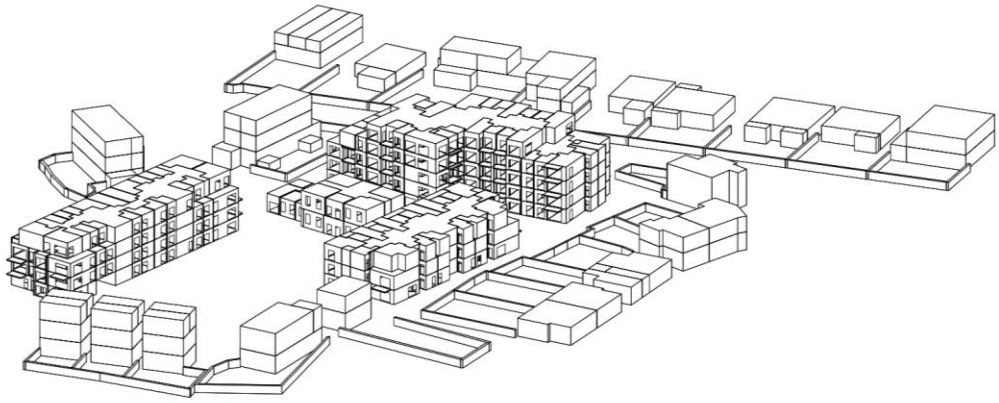


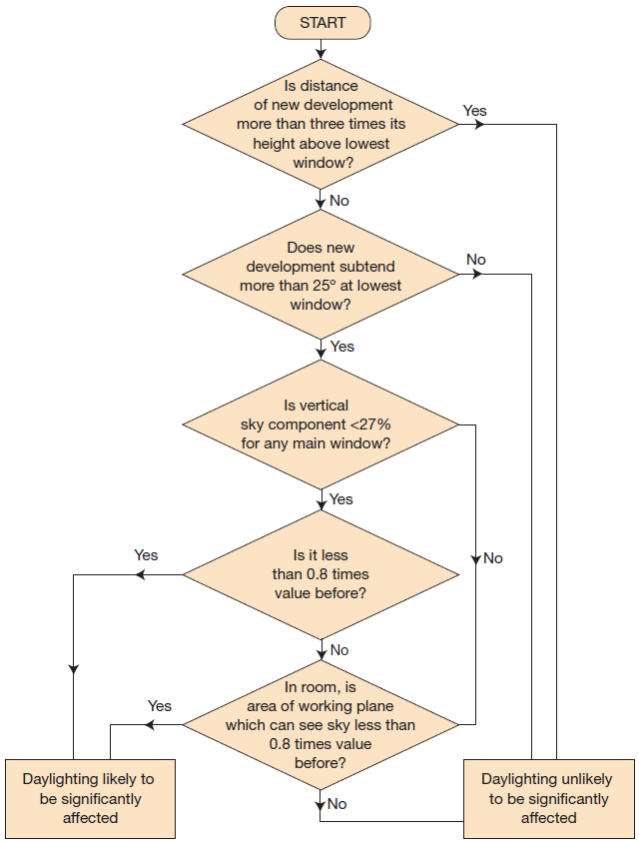
Figure 7.0.2 View from the North.

8. DAYLIGHT ASSESSMENT – NEIGHBOURING PROPERTIES

The guidelines given within the BRE Guide are intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed.

To analyse the effects of the proposed development on the adjacent dwellings in the immediate surrounding area of the Frankfort Castle Site, a Vertical Sky Component (VSC) simulation was carried out using the IES Radiance software package. For the VSC definition refer to Section 3.0 of this report (page 10). The VSC was calculated with the proposed development in place using a simulation model. In accordance with Section 2.2 of the BRE Guide, where a VSC of 27% or greater is achieved, "enough skylight should still be reaching the existing building" and therefore daylighting will not be significantly affected. The BRE Methodology is summarised below.

Methodology (as referenced in Section 2.2 of the BRE Guide)



Decision chart / methodology used to quantify the impact of a new development on daylight levels of nearby buildings / dwellings.

Figure 8.0.1 – BRE Guide VSC Decision Chart

The VSC has been calculated for all main windows of surrounding dwellings which face the proposed development. Figure 8.0.2 below identifies the dwellings that were analysed as part of this assessment. The results of this VSC analysis are presented overleaf.

Figure 8.0.2 – Assessed Surrounding Dwellings

Simulation Results – Assessment Dwellings No. 1 & 2

Window Reference	VSC with Proposed Development (%)	Compliant with BRE Guideline for Safeguarding Daylight
W1	32.88	Yes
W2	35.89	Yes
W3	36.81	Yes
W4	36.02	Yes
W5	35.30	Yes
W6	37.90	Yes

Table 8.0.1 – VSC Results for Assessment Dwellings No. 1 & 2

The results confirm that the access to daylight for residents of assessment dwellings No. 1 & 2, will not be compromised as a result of the proposed development because the VSC in all cases is ≥ 27%.

Simulation Results – Assessment Dwelling No.3

Window Reference	VSC with Proposed Development (%)	Compliant with BRE Guideline for Safeguarding Daylight
W1	35.30	Yes
W2	34.41	Yes
W3	34.25	Yes
W4	32.76	Yes
W5	36.46	Yes
W6	36.16	Yes

Table 8.0.2 – VSC Results for Assessment Dwelling No.3

The results confirm that the access to daylight for residents of assessment dwelling No. 3, will not be compromised as a result of the proposed development because the VSC in all cases is ≥ 27%.

Simulation Results – Assessment Dwelling No.4

Window Reference	VSC with Proposed Development (%)	Compliant with BRE Guideline for Safeguarding Daylight
W1	33.36	Yes
W2	33.36	Yes
W3	28.85	Yes

Table 8.0.3 – VSC Results for Assessment Dwelling No.4

The results confirm that the access to daylight for residents of assessment dwelling No. 4, will not be compromised as a result of the proposed development because the VSC in all cases is ≥ 27%.

Simulation Results – Assessment Dwellings No. 5 & 6

Window Reference	VSC with Proposed Development (%)	Compliant with BRE Guideline for Safeguarding Daylight
W1	33.59	Yes
W2	33.89	Yes
W3	30.88	Yes
W4	34.71	Yes

Table 8.0.4 – VSC Results for Assessment Dwellings No. 5 & 6

The results confirm that the access to daylight for residents of assessment dwellings No. 5 & 6, will not be compromised as a result of the proposed development because the VSC in all cases is ≥ 27%.

Simulation Results – Assessment Dwellings No. 7 & 8

Window Reference	VSC with Proposed Development (%)	Compliant with BRE Guideline for Safeguarding Daylight
W1	36.06	Yes
W2	36.42	Yes
W3	35.89	Yes
W4	36.03	Yes
W5	35.97	Yes
W6	37.60	Yes

Table 8.0.5 – VSC Results for Dwellings No. 7 & 8

The results confirm that the access to daylight for residents of Dwellings No. 7 & 8, will not be compromised as a result of the proposed development because the VSC in all cases is ≥ 27%.

Simulation Results – Assessment Dwelling No. 9

Window Reference	VSC with Proposed Development (%)	Compliant with BRE Guideline for Safeguarding Daylight
W1	38.02	Yes
W2	37.54	Yes
W3	37.52	Yes
W4	37.28	Yes
W5	35.97	Yes

Table 8.0.6 – VSC Results for Assessment Dwelling No. 9

The results confirm that the access to daylight for residents of assessment dwelling No. 9, will not be compromised as a result of the proposed development because the VSC in all cases is ≥ 27%.

Simulation Results – Assessment Dwellings No. 10, 11 & 12

Window Reference	VSC with Proposed Development (%)	Compliant with BRE Guideline for Safeguarding Daylight
W1	29.37	Yes
W2	30.29	Yes
W3	30.34	Yes
W4	31.15	Yes
W5	28.71	Yes
W6	34.94	Yes
W7	34.73	Yes
W8	33.90	Yes
W9	35.09	Yes

Table 8.0.7 – VSC Results for Assessment Dwellings No. 10, 11 & 12

The results confirm that the access to daylight for residents of assessment dwellings No. 10, 11 & 12, will not be compromised as a result of the proposed development because the VSC in all cases is ≥ 27%.

Simulation Results – Assessment Dwellings No. 13, 14, 15 & 16

Window Reference	VSC with Proposed Development (%)	Compliant with BRE Guideline for Safeguarding Daylight
W1	32.01	Yes
W2	33.11	Yes
W3	33.12	Yes
W4	33.87	Yes
W5	34.44	Yes
W6	33.41	Yes
W7	35.34	Yes

Table 8.0.8 – VSC Results for Assessment Dwellings No. 13, 14, 15 & 16

The results confirm that the access to daylight for residents of assessment dwellings No. 13, 14, 15 & 16, will not be compromised as a result of the proposed development because the VSC in all cases is ≥ 27%.

Simulation Results – Assessment Dwellings No. 17 & 18

Window Reference	VSC with Proposed Development (%)	Compliant with BRE Guideline for Safeguarding Daylight
W1	32.99	Yes
W2	34.30	Yes
W3	34.19	Yes
W4	31.38	Yes
W5	36.22	Yes
W6	37.54	Yes
W7	36.46	Yes

Table 8.0.9 – VSC Results for Assessment Dwellings No.17 & 18

The results confirm that the access to daylight for residents of assessment dwelling No. 17 & 18, will not be compromised as a result of the proposed development because the VSC in all cases is ≥ 27%.

Simulation Results – Assessment Dwellings No. 19, 20 & 21

Window Reference	VSC with Proposed Development (%)	Compliant with BRE Guideline for Safeguarding Daylight
W1	34.40	Yes
W2	35.08	Yes
W3	35.44	Yes
W4	35.04	Yes
W5	34.72	Yes
W6	34.68	Yes
W7	37.04	Yes
W8	37.21	Yes
W9	37.37	Yes
W10	37.65	Yes
W11	37.53	Yes
W12	37.32	Yes
W13	37.77	Yes
W14	37.63	Yes
W15	37.44	Yes

Table 8.0.10 – VSC Results for Assessment Dwellings No. 19, 20, & 21

The results confirm that the access to daylight for residents of assessment dwelling No. 19, 20 & 21, will not be compromised as a result of the proposed development because the VSC in all cases is ≥ 27%.

Simulation Results – Assessment Dwellings No. 22, 23, 24 & 25

Window Reference	VSC with Proposed Development (%)	Compliant with BRE Guideline for Safeguarding Daylight
W1	28.55	Yes
W2	29.77	Yes
W3	28.41	Yes
W4	27.82	Yes
W5	32.52	Yes
W6	33.47	Yes
W7	32.65	Yes
W8	33.62	Yes
W9	38.60	Yes
W10	38.68	Yes
W11	38.89	Yes
W12	38.11	Yes

Table 8.0.11 – VSC Results for Assessment Dwellings No. 22, 23, 24 & 25

The results confirm that the access to daylight for residents of assessment dwelling No. 22, 23, 24 & 25, will not be compromised as a result of the proposed development because the VSC in all cases is ≥ 27%.

Simulation Results – Assessment Dwellings No. 26, 27, 28 & 29

Window Reference	VSC with Proposed Development (%)	Compliant with BRE Guideline for Safeguarding Daylight
W1	25.63	As VSC is below 27%, further analysis is required, see overleaf.
W2	26.28	As VSC is below 27%, further analysis is required, see overleaf.
W3	25.37	As VSC is below 27%, further analysis is required, see overleaf.
W4	23.06	As VSC is below 27%, further analysis is required, see overleaf.
W5	32.11	Yes
W6	31.64	Yes
W7	31.92	Yes
W8	33.23	Yes

Table 8.0.12 – VSC Results for Assessment Dwellings No. 26, 27, 28 & 29

The results confirm that the access to daylight of the windows referenced W5, W6, W7 and W8 will not be compromised as a result of the proposed development because the VSC in all cases is ≥ 27%.

The windows referenced W1, W2, W3 and W4 achieve a VSC below the guideline value of 27%, therefore further analysis is required, see overleaf.

For the windows identified as having a VSC below 27% with the proposed development in place an Average Daylight Factor (ADF) Calculation was undertaken to determine the level of daylight that would be achieved in the rooms these windows serve, and whether the BRE guideline ADF would are achieved with the proposed development in place. The rooms have been assumed to be kitchen spaces, and therefore have a target ADF of 2%, which represents a high level of daylight. Default surface properties were applied to these rooms, the model inputs applicable to these spaces are outlined in table 8.0.13 below. Table 8.0.14 below presents the calculated ADF values with the proposed development in place.

Parameter	Value
Surface Reflectance's	
1. Internal ceilings	70% - default value
2. Internal walls	50% - default value
3. Internal floors	20% - default value
Glazing Transmittance	70%
Frame	0.1m frame width
Working Plane	0.85m

Table 8.0.13 – Daylight Model Inputs

Room no.	Room Type	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
1	Kitchen Living Dining	2	2.70	Yes
2	Kitchen Living Dining	2	2.17	Yes
3	Kitchen Living Dining	2	2.06	Yes
4	Kitchen Living Dining	2	2.64	Yes

Table 8.0.14 – Average Daylight Factor Results

The ADF results demonstrate that with the proposed development in place the BRE Guideline ADF values are achieved for the assessment rooms 1, 2, 3 and 4. This further assessment has been undertake as a result of some windows having a VSC below 27%, to ensure good daylight access will be safeguarded to these dwellings with the proposed development in place.

Presented in Appendix A of this report are the daylight distribution images for these assessment rooms.

9. DAYLIGHT ASSESSMENT – PROPOSED DEVELOPMENT

Daylight Assessment

All Bedrooms and Kitchen/Dining/living rooms of the Apartment blocks were selected for a detailed daylight assessment to ensure adequate daylight levels throughout the development.

Of the **309** rooms that were assessed for daylight, **305** assessed rooms achieve the BRE daylight guidelines. The remaining rooms are marginally below the BRE guidelines.

Appendix B presents the daylight results for the dwellings within the proposed development.

Appendix C presents daylight distribution images.

Appendix D presents the software inputs that were specified within the daylight modelling software for the calculation of average daylight factors.

10. SUNLIGHT ASSESSMENT – NEIGHBOURING PROPERTIES

In designing a new development or extension to a building, it is important to safeguard the access to sunlight where there is a particular requirement for sunlight. To assess the sunlight impact to existing buildings the BRE Guide has been followed. A summary of the BRE Guide for safeguarding sunlight is provided in the table below.

Methodology (as referenced in Section 3.2 of the BRE Guide)

Design Issue	BRE Recommended Criteria – Section 3.2
Safeguarding Sunlight to Neighbouring Properties	If a living room of an existing dwelling has a main window facing within 90° of due south, and any part of a new development subtends at 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 sun lighting of the window may be adversely affected. This will be the case if the centre of the window:
	Receives less than 25% of annual probable sunlight hours, or less than 5% of annual probable sunlight hours between 21st September and 21st March; and
	Receives less than 0.8 times its former sunlight hours during either period; and
	Has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

Table 10.0.1 – BRE Guide methodology for safeguarding sunlight

The previously identified surrounding assessment dwellings have been assessed for sunlight impact. In accordance with the BRE Guidelines main living room windows which face the proposed development have been assessed, as identified in the methodology section of this report windows which face significantly north of due east or west have not been analysed for APSH because the BRE Guide recognises that good sun light availability is unachievable for these orientations. Results are presented overleaf.

Simulation Results – Assessment Dwellings No. 1 & 2

Window Reference	APSH with Proposed Development (%) (Recommended Value ≥25%)	APSH Between 21st September and 21st March with Proposed Development (%) (Recommended Value ≥5%)	Compliant with BRE Guide for Safeguarding Access to Sunlight
W1	29.83	7.28	Yes
W2	39.25	14.65	Yes

Table 10.0.2 – APSH Results for Assessment Dwellings No. 1 & 2

These results confirm that the access to Sunlight for residents of Assessment Dwellings No. 1 and 2, when compared with their existing baseline experience, will not be compromised as a result of the proposed development because the Annual Probable Sunlight Hours calculated achieve the BRE Guide recommended values for safeguarding access to sunlight in existing dwellings.

Simulation Results – Assessment Dwelling No. 3

Window Reference	APSH with Proposed Development (%) (Recommended Value ≥25%)	APSH Between 21st September and 21st March with Proposed Development (%) (Recommended Value ≥5%)	Compliant with BRE Guide for Safeguarding Access to Sunlight
W1	29.03	5.99	Yes
W2	27.49	6.56	Yes

Table 10.0.3 – APSH Results for Assessment Dwelling No. 3

These results confirm that the access to Sunlight for residents of Assessment Dwelling No. 3, when compared with their existing baseline experience, will not be compromised as a result of the proposed development because the Annual Probable Sunlight Hours calculated achieve the BRE Guide recommended values for safeguarding access to sunlight in existing dwellings.

Simulation Results – Assessment Dwelling No. 4

Window Reference	APSH with Proposed Development (%) (Recommended Value ≥25%)	APSH Between 21st September and 21st March with Proposed Development (%) (Recommended Value ≥5%)	Compliant with BRE Guide for Safeguarding Access to Sunlight
W1	30.14	11.49	Yes
W2	44.70	14.83	Yes

Table 10.0.4 – APSH Results for Assessment Dwelling No. 4

These results confirm that the access to Sunlight for residents of Assessment Dwelling No. 4, when compared with their existing baseline experience, will not be compromised as a result of the proposed development because the Annual Probable Sunlight Hours calculated achieve the BRE Guide recommended values for safeguarding access to sunlight in existing dwellings.

Simulation Results – Assessment Dwellings No. 5 & 6

Window Reference	APSH with Proposed Development (%) (Recommended Value ≥25%)	APSH Between 21st September and 21st March with Proposed Development (%) (Recommended Value ≥5%)	Compliant with BRE Guide for Safeguarding Access to Sunlight
W1	27.55	9.68	Yes
W2	26.93	7.36	Yes

Table 10.0.5 – APSH Results for Assessment Dwellings No. 5 and 6

These results confirm that the access to Sunlight for residents of Assessment Dwellings No. 5 and 6, when compared with their existing baseline experience, will not be compromised as a result of the proposed development because the Annual Probable Sunlight Hours calculated achieve the BRE Guide recommended values for safeguarding access to sunlight in existing dwellings.

Simulation Results – Assessment Dwellings No. 7 & 8

Window Reference	APSH with Proposed Development (%) (Recommended Value ≥25%)	APSH Between 21st September and 21st March with Proposed Development (%) (Recommended Value ≥5%)	Compliant with BRE Guide for Safeguarding Access to Sunlight
W1	31.27	8.39	Yes
W2	32.87	7.69	Yes

Table 10.0.6 – APSH Results for Assessment Dwellings No. 7 and 8

These results confirm that the access to Sunlight for residents of Assessment Dwellings No. 7 and 8, when compared with their existing baseline experience, will not be compromised as a result of the proposed development because the Annual Probable Sunlight Hours calculated achieve the BRE Guide recommended values for safeguarding access to sunlight in existing dwellings.

Simulation Results – Assessment Dwelling No. 9

Window Reference	APSH with Proposed Development (%) (Recommended Value ≥25%)	APSH Between 21st September and 21st March with Proposed Development (%) (Recommended Value ≥5%)	Compliant with BRE Guide for Safeguarding Access to Sunlight
W1	32.15	6.95	Yes
W2	33.18	7.92	Yes
W3	33.55	8.30	Yes
W4	33.59	8.41	Yes

Table 10.0.7 – APSH Results for Assessment Dwelling No. 9

These results confirm that the access to Sunlight for residents of Assessment Dwelling No. 9, when compared with their existing baseline experience, will not be compromised as a result of the proposed development because the Annual Probable Sunlight Hours calculated achieve the BRE Guide recommended values for safeguarding access to sunlight in existing dwellings.

Simulation Results – Assessment Dwellings No. 10, 11 & 12

Window Reference	APSH with Proposed Development (%) (Recommended Value ≥25%)	APSH Between 21st September and 21st March with Proposed Development (%) (Recommended Value ≥5%)	Compliant with BRE Guide for Safeguarding Access to Sunlight
W1	30.25	3.47	Summer – Yes Winter - No
W2	57.46	17.45	Yes
W3	70.73	26.67	Yes
W4	59.40	16.62	Yes

Table 10.0.8 – APSH Results for Assessment Dwelling No. 10, 11 and 12

These results confirm that the annual access to Sunlight for residents of Assessment Dwellings No. 10, 11 and 12, when compared with their existing baseline experience, will not be compromised as a result of the proposed development because the Annual Probable Sunlight Hours calculated achieve the BRE Guide recommended values for safeguarding access to sunlight in existing dwellings. W2, W3 and W4 also achieve the BRE Guide recommended winter sunlight hours. W1 does not achieve the winter recommended sunlight hours with the proposed development in place.

Simulation Results – Assessment Dwellings No. 13, 14, 15 & 16

Window Reference	APSH with Proposed Development (%) (Recommended Value ≥25%)	APSH Between 21st September and 21st March with Proposed Development (%) (Recommended Value ≥5%)	Compliant with BRE Guide for Safeguarding Access to Sunlight
W1	57.48	17.21	Yes
W2	58.44	16.85	Yes
W3	68.68	24.94	Yes
W4	62.10	19.82	Yes

Table 10.0.9 – APSH Results for Assessment Dwellings No. 13, 14, 15 and 16

These results confirm that the access to Sunlight for residents of Assessment Dwellings No. 13, 14, 15 and 16 when compared with their existing baseline experience, will not be compromised as a result of the proposed development because the Annual Probable Sunlight Hours calculated achieve the BRE Guide recommended values for safeguarding access to sunlight in existing dwellings.

Simulation Results – Assessment Dwellings No. 17 & 18

Window Reference	APSH with Proposed Development (%) (Recommended Value ≥25%)	APSH Between 21st September and 21st March with Proposed Development (%) (Recommended Value ≥5%)	Compliant with BRE Guide for Safeguarding Access to Sunlight
W1	61.81	23.63	Yes
W2	68.26	27.71	Yes
W3	67.36	25.95	Yes

Table 10.0.10 – APSH Results for Assessment Dwellings No. 17 and 18

These results confirm that the access to Sunlight for residents of Assessment Dwellings No. 17 and 18 when compared with their existing baseline experience, will not be compromised as a result of the proposed development because the Annual Probable Sunlight Hours calculated achieve the BRE Guide recommended values for safeguarding access to sunlight in existing dwellings.

Simulation Results – Assessment Dwellings No. 19, 20 & 21

Window Reference	APSH with Proposed Development (%) (Recommended Value ≥25%)	APSH Between 21st September and 21st March with Proposed Development (%) (Recommended Value ≥5%)	Compliant with BRE Guide for Safeguarding Access to Sunlight
W1	48.97	17.95	Yes
W2	47.72	16.65	Yes
W3	48.41	16.24	Yes

Table 10.0.11 – APSH Results for Assessment Dwellings No. 19, 20 and 21

These results confirm that the access to Sunlight for residents of Assessment Dwellings No. 19, 20 and 21 when compared with their existing baseline experience, will not be compromised as a result of the proposed development because the Annual Probable Sunlight Hours calculated achieve the BRE Guide recommended values for safeguarding access to sunlight in existing dwellings.

Simulation Results – Assessment Dwellings No. 22, 23, 24 & 25

Window Reference	APSH with Proposed Development (%) (Recommended Value ≥25%)	APSH Between 21st September and 21st March with Proposed Development (%) (Recommended Value ≥5%)	Compliant with BRE Guide for Safeguarding Access to Sunlight
W1	10.81 (Current value – 11.91)	1.13 (Current value – 1.13)	Yes
W2	26.01 (Current value – 26.01)	6.56 (Current value – 6.56)	Yes
W3	11.47 (Current value – 11.47)	0.88 (Current value – 0.88)	Yes
W4	23.16 (Current value – 23.16)	3.36 (Current value – 3.36)	Yes

Table 10.0.12 – APSH Results for Assessment Dwellings No. 22, 23, 24 and 25

These results confirm that the access to Sunlight for residents of Assessment Dwellings No. 22, 23, 24 and 25 when compared with their existing baseline experience, will not be compromised as a result of the proposed development because the Annual Probable Sunlight Hours calculated achieve the BRE Guide recommended values for safeguarding access to sunlight in existing dwellings.

Assessment Dwellings No. 26, 27, 28 & 29

As the main windows assessment dwellings No. 26, 27, 28 and 29 which face the proposed development face significantly north they have not been analysed for APSH because as outlined in the BRE Guide good sunlight availability is unachievable for these orientations, and therefore they are not required to analysed in this respect.

Results Summary

32 of the 32 windows assessed for Annual Probable sunlight hours (APSH) achieved the BRE Guideline recommended values for safeguarding access to sunlight in existing dwellings. 31 of the 32 windows assessed for Annual Probable sunlight hours (WPSH) in the winter months achieved the BRE Guideline recommended values for safeguarding access to sunlight in existing dwellings. W1 of assessment dwelling 10 which did not meet the APSH in the winter month was, in our professional opinion marginally outside of the guidelines.

Appendix I of the BRE Guidelines suggests that daylight/sunlight impacts can be assessed as minor, moderate or major adverse. Where the loss of sunlight affects only a small number of windows and the loss of light is only marginally outside the guidelines, as is the case here with the proposed development in place, a classification of minor adverse impact is appropriate.

11. SUNLIGHT ASSESSMENT – PROPOSED DEVELOPMENT

In general, a dwelling, or non-domestic building which has a particular requirement for sunlight, will appear reasonably sunlit provided the following recommended BRE Guide metrics are achieved.

Methodology (as referenced in Section 3.1 of the BRE Guide)

Design Issue	BRE Recommended Criteria – Section 3.1
Sunlight	In general, a dwelling, of non-domestic building which has a particular requirement for sunlight will appear reasonably sunlit provided;
	(1) At least one main window wall faces within 90º of due south; and
	(2) The centre of at least one window to a main living room can receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21st September and 21st March.

BRE Guidelines and Advisory Notes

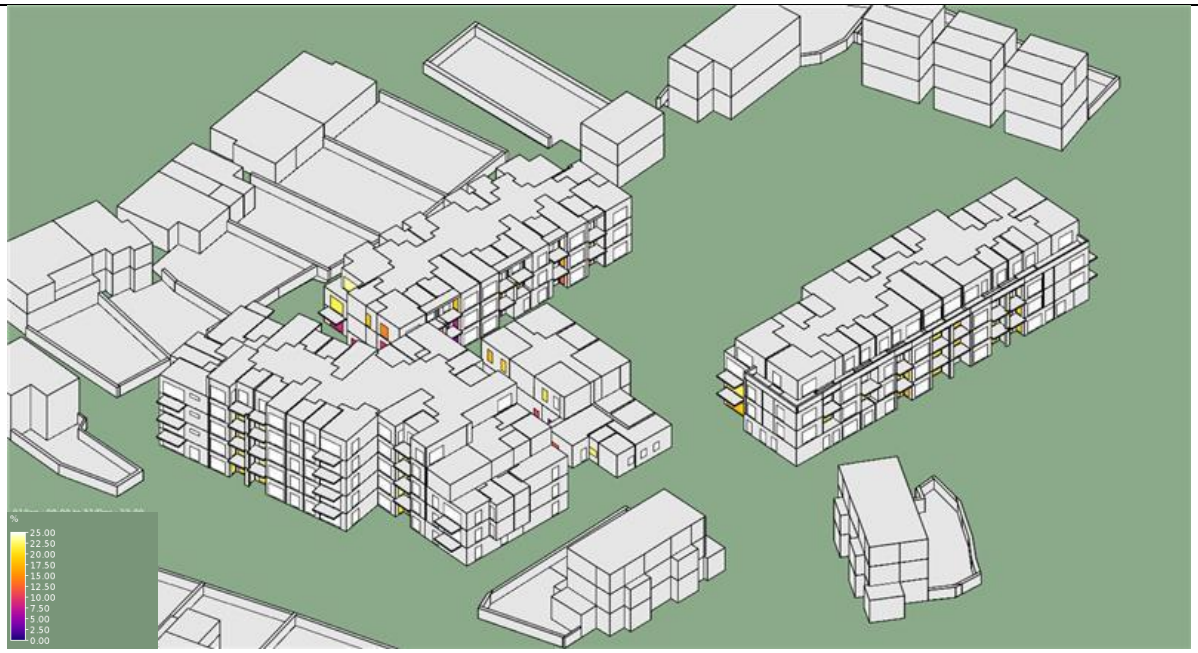
It is important that the guidelines that exist in relation to sunlight are read in the correct context and are not viewed as mandatory requirements for all dwellings.

1. The BRE Guide states "Where groups of dwellings are planned, site layout design should aim to maximise the number of dwellings with a main living room that meets the above recommendations" (Section 3.1.16). In our opinion this outlines that there is not an expectation that all dwellings will achieve the guidelines for Sunlight, particularly in high density developments.

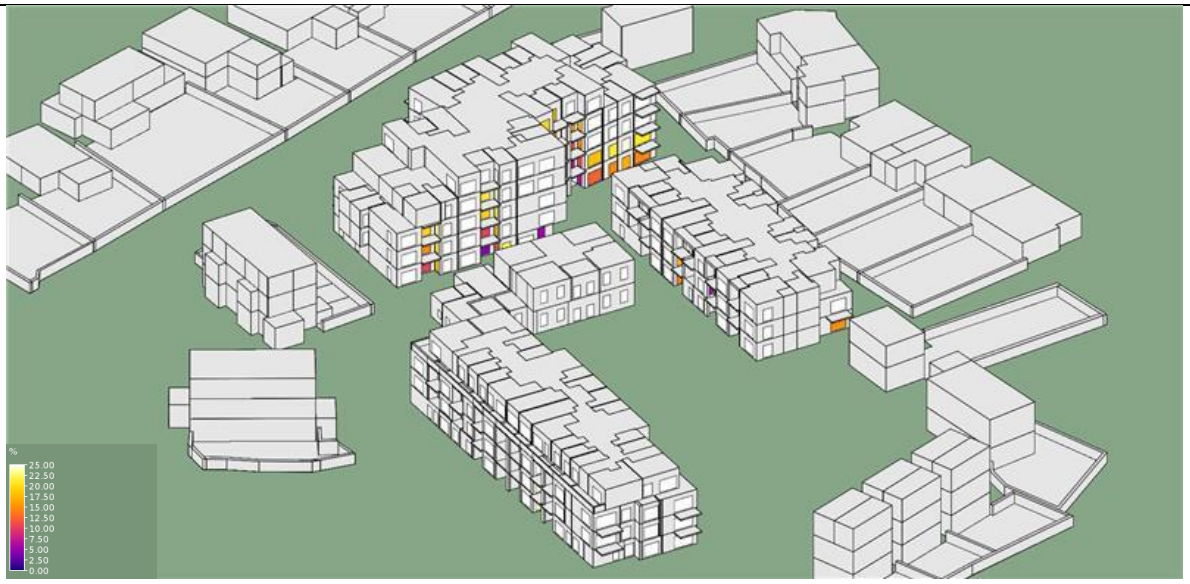
2. Paragraph 3.1.11 of the BRE Guide states that if a room faces significantly north of due east or west it is unlikely to meet the recommended levels. Therefore, taking this BRE statement into account, only windows that face significantly south of due east and west were assessed as part of this study.

3. Where a proposal may not be able to fully meet all the requirements of the daylight provisions above, this has been clearly identified and a rationale for any alternative, compensatory design solutions has been set out, in order to assist An Bord Pleanála applying its discretion, having regard to local factors including specific site constraints and the balancing of that assessment against the desirability of achieving wider planning objectives.

Simulation Results – Full Year



South West View of Proposed Development

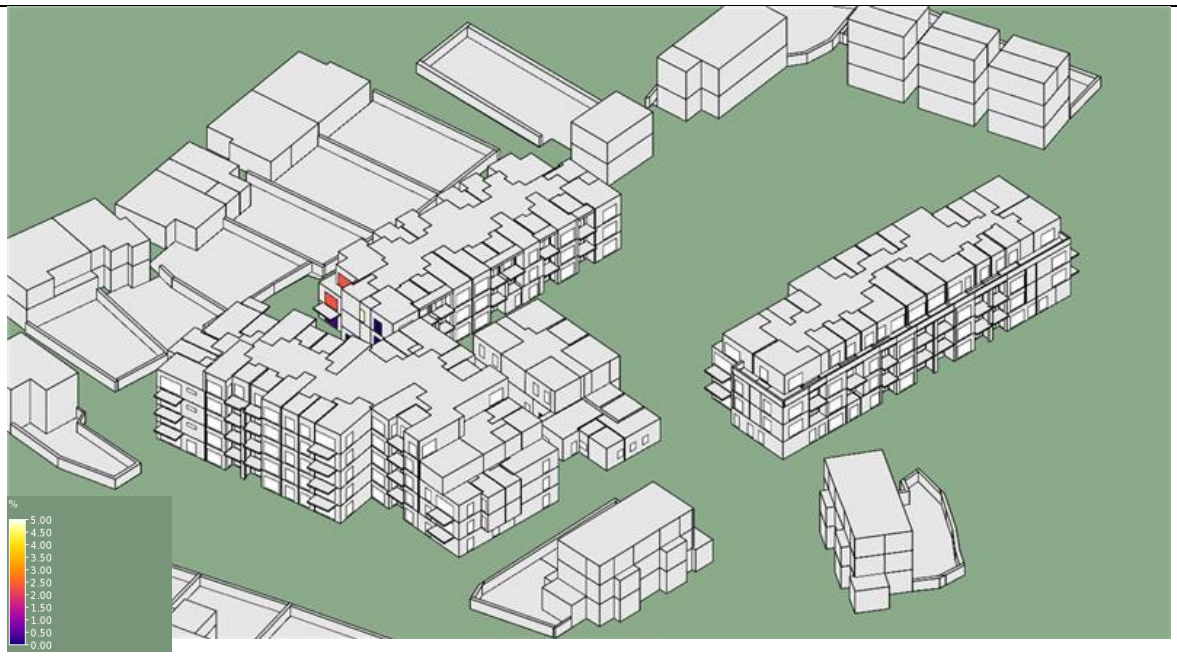


South East View of Proposed Development

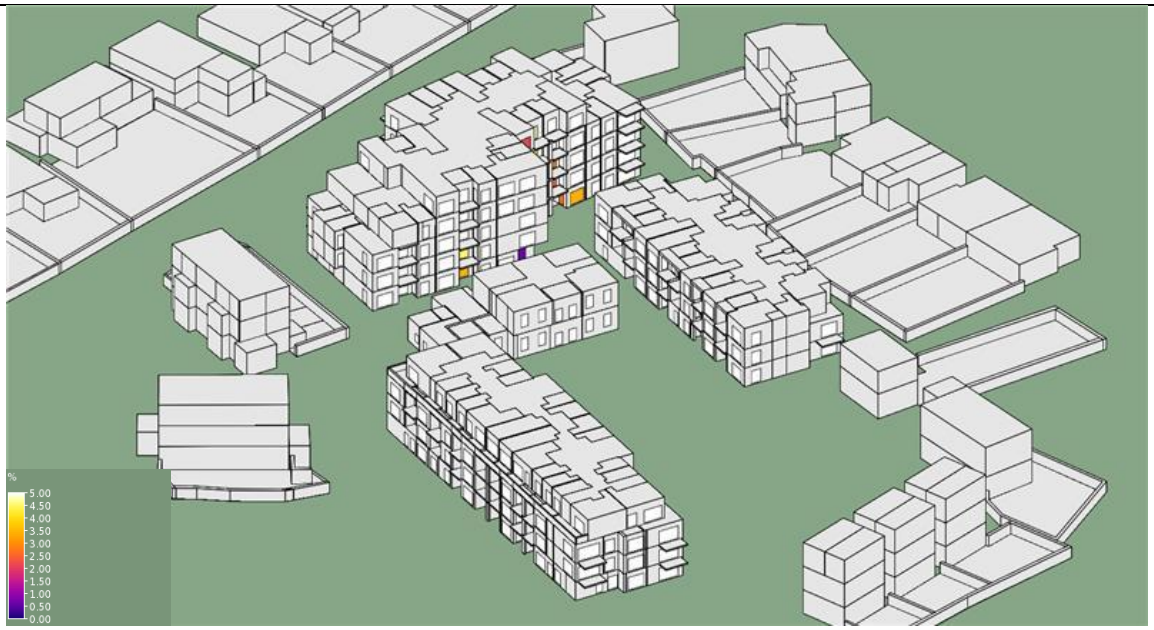
The Sunlight target is 25% APSH (refer to legend). Windows shown in white achieve the BRE targets as the APSH is greater than 25%. Using the legend, the specific APSH can be determined for windows that do not exceed the target value.

Note: The APSH achieved is shown for all windows on the images above, however the BRE Guide APSH target is only applicable to main living room windows. The results demonstrate that the majority of windows achieve the target sunlight values. Generally, where the sunlight targets are not achieved it is at the lower levels where typically there is a lower expectation of sunlight.

Simulation Results – Winter Months



South West View of Proposed Development



South East View of Proposed Development

The Sunlight target is 5% APSH (refer to legend). Windows shown in white achieve the BRE targets as the APSH is greater than 5%. Using the legend, the specific APSH can be determined for windows that do not exceed the target value.

Note: The APSH achieved is shown for all windows on the images above, however the BRE Guide APSH target is only applicable to main living room windows.

Results Summary

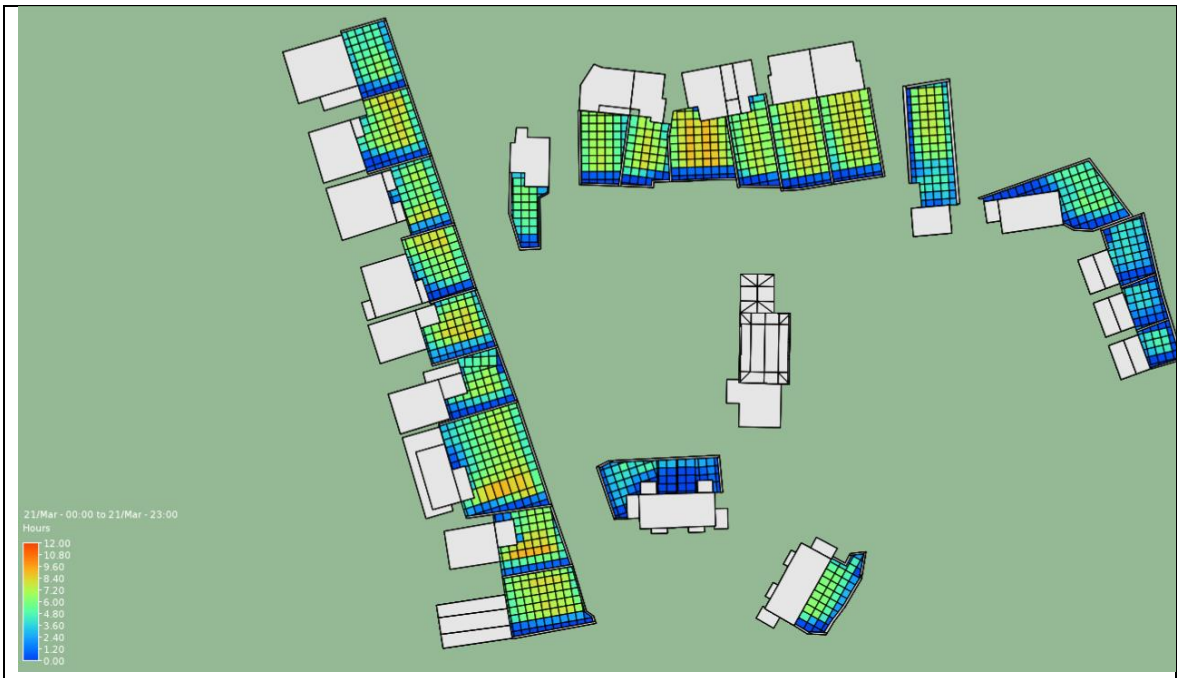
The results demonstrate that dwellings of the proposed development achieve good APSH on main windows. The majority of living rooms achieve the BRE Guides criteria for Sunlight availability and those that have not fully achieved the BRE metrics, in the majority of cases were only marginally short of the threshold values. Generally, where the sunlight targets are not achieved it is at the lower levels where typically there is a lower expectation of sunlight. Also, the provision of private amenity spaces via balconies provides a level of shade to the windows below them.

7. SUNLIGHT ASSESSMENT – NEIGHBOURING AMENITY SPACE

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

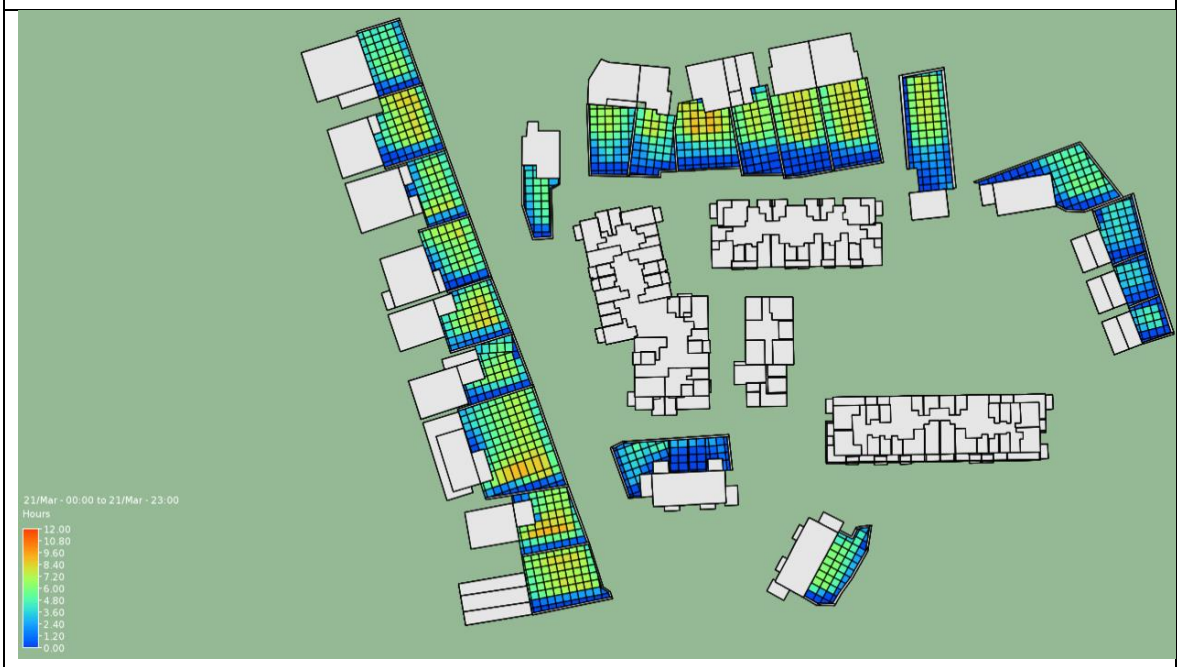
Presented overleaf are the current and proposed scenario sunlight exposure images for the rear gardens of the assessment dwellings.

Simulation Results



Current Scenario – March 21st

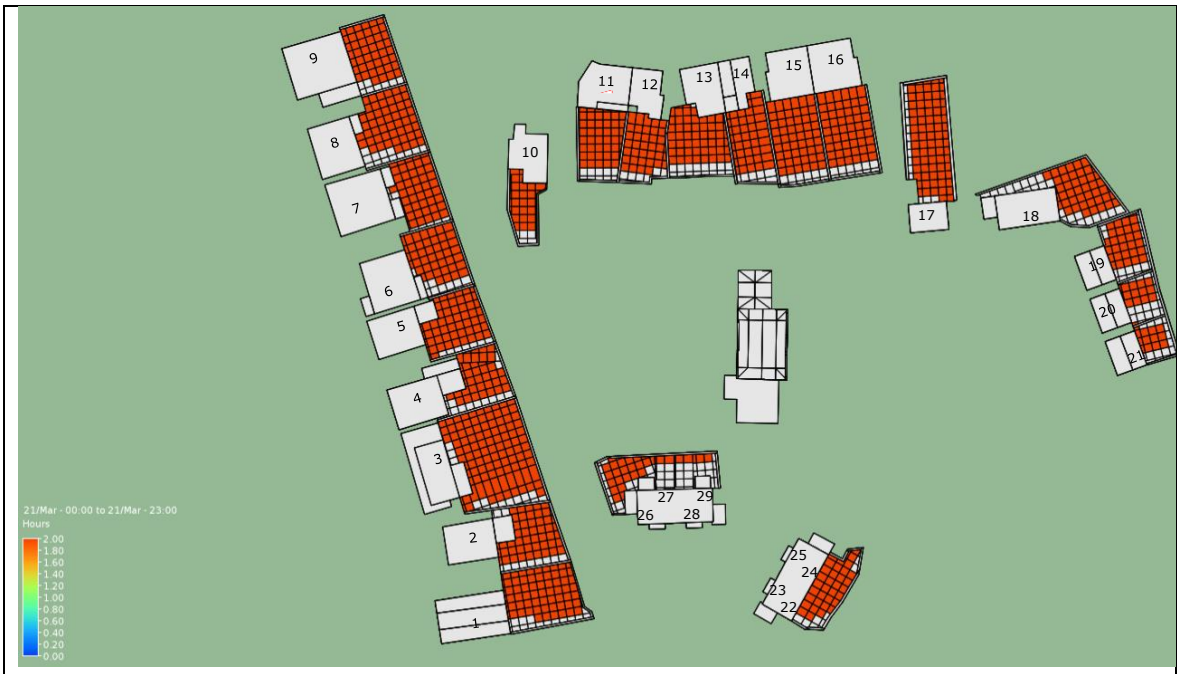
Sunlight exposure (hours)



Proposed Scenario – March 21st

Sunlight exposure (hours)

Simulation Results



Current Scenario – March 21st

Cells coloured red if they receive ≥2 hours of sunlight

Proposed Scenario – March 21st

Cells coloured red if they receive ≥2 hours of sunlight

Simulation Results Table

Garden No.	Current Scenario % of Garden receiving ≥2 hours of sunlight on March 21	Proposed Scenario % of Garden receiving ≥2 hours of sunlight on March 21	% of Former Value (target value ≥80%)	Compliant with BRE Guideline for safeguarding access to sunlight	Comments
1	79	79	100%	Yes	
2	89	89	100%	Yes	
3	92	92	100%	Yes	
4	75	75	100%	Yes	
5	86	86	100%	Yes	
6	84	84	100%	Yes	
7	96	96	100%	Yes	
8	85	85	100%	Yes	
9	87	87	100%	Yes	
10	86	77	89%	Yes	
11	85	76	90%	Yes	
12	87	77	90%	Yes	
13	86	79	92%	Yes	
14	88	65	74%	No	Proposed scenario is marginally outside the BRE guideline
15	89	70	78%	No	Proposed scenario is marginally outside the BRE guideline
16	94	87	93%	Yes	
17	89	75	84%	Yes	
18	63	63	100%	Yes	
19	78	78	100%	Yes	
20	59	59	100%	Yes	
21	56	56	100%	Yes	
22	50	50	100%	Yes	
23	100	100	100%	Yes	
24	100	100	100%	Yes	
25	100	100	100%	Yes	
26	83	83	100%	Yes	
27	25	25	100%	Yes	
28	25	25	100%	Yes	
29	43	43	100%	Yes	

Results Summary

27 of the 29 assessed neighbouring amenity areas achieve the BRE Guideline recommended values for safeguarding access to sunlight. The two amenity areas that did not achieve the guideline were only marginally outside of the guideline target.

Appendix I of the BRE Guidelines suggests that sunlight impacts can be assessed as minor, moderate or major adverse. Where the loss of sunlight affects only a small number of spaces and the loss of light is only marginally outside the guidelines, as is the case here with the proposed development in place, a classification of minor adverse impact is appropriate.

8. SUNLIGHT ASSESSMENT – PROPOSED DEVELOPMENT AMENITY SPACE

The BRE Guide recommends that for an amenity space to appear adequately sunlit throughout the year, at least half of the amenity space should receive at least two hours of sunlight on the design day, March 21st.

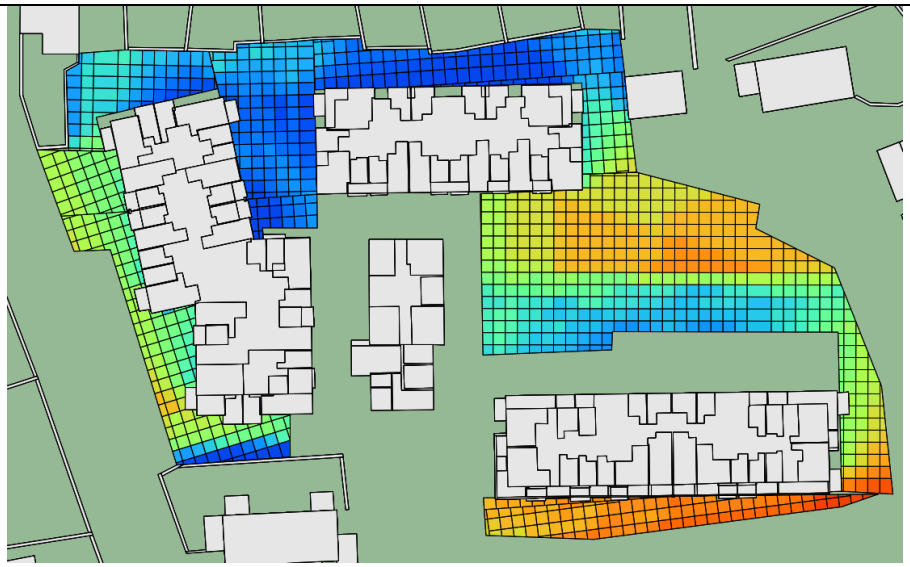
Methodology (as referenced in Section 3.3 of the BRE Guide)

Design Issue	BRE Recommended Criteria – Section 3.3.7
Sunlight in Gardens, Communal Open Spaces, Play Areas etc.	It is recommended that at least half (≥50%) of the amenity areas should receive at least two hours of sunlight on 21st March.

Table 13.0.1 – BRE methodology for safeguarding sunlight in amenity spaces

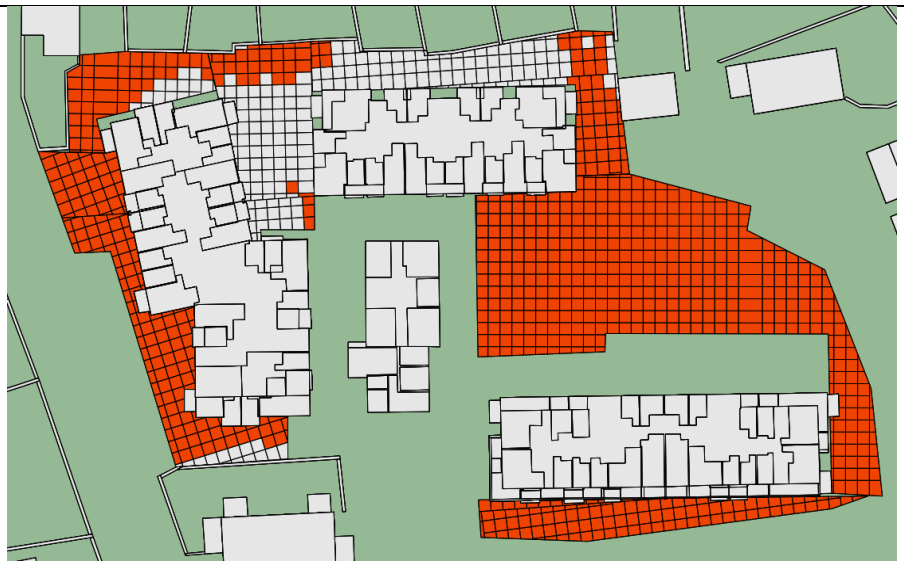
The massing of the proposed development has been designed so that the amenity areas exceed the BRE Guides recommended criteria for sunlight. This will ensure that a positive appearance and ambiance will be achieved by development. This is demonstrated by the images overleaf where the amenity areas exceed the BRE Guides recommended criteria.

Simulation Results



Proposed Development Amenity Areas – March 21st

Sunlight exposure (hours)



Proposed Development Amenity Areas – March 21st

Cells coloured red if they receive ≥2 hours of sunlight

78% of Amenity garden area receives ≥2 hours of sunlight, therefore the BRE Guideline is Achieved

Results Summary

The BRE recommended criteria for sunlight in amenity spaces is achieved for the proposed development.

9. SHADOW ASSESSMENT

Shadow images are presented in Appendix E for both the current scenario and with the proposed development in place. Images are presented for the design days of March 21st and June 21st as recommended by the BRE Guide. Also presented are images for December 21st, however it should be noted that in December, even low buildings will cast long shadows. It should be borne in mind when interpreting the shadowing images that nearly all structures will create areas of new shadows, and some degree of shadow a space is to be expected.
It should be borne in mind when interpreting the shadowing images that nearly all structures will create areas of new shadows, and some degree of shadow of a space is to be expected.

While additional shadows are identified, it is important to note that the results of the daylight and sunlight impact assessment demonstrated that the proposed development would not result in any loss of light received by neighbouring properties beyond Minor adverse impacts as identified in Appendix I of the BRE Guidelines.

10. CONCLUSION

The Daylight, Sunlight and shadow assessment of the proposed development was prepared using the methodology's set out in the British Standard: Lighting for Buildings – Part 2: Code for Practice for Daylighting, BRE 209, 'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice', Second Edition 2011, by P. J. Littlefair and the Design Standards for New Apartments - Guidelines for Planning Authorities (March 2018).

Neither the British Standard nor the BRE Guide set out rigid standards or limits. The BRE Guide is preceded by the following very clear statement as to how the design advice contained therein should be used.

"*The advice given here are recommended guidelines and the guide should not be seen as 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.*"

However, both the Building Height Guidelines and Apartment Guidelines require appropriate and reasonable regard to be taken of quantitative performance approaches to daylight provision outlined in guides like the Building Research Establishment's 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or or any other similar and broadly compatible guides or updated versions of these guides."

Our conclusions with respect to daylight & sunlight are summarised as follows;

Existing 3rd Party Neighbouring Properties
Daylight/Sunlight

A comprehensive study on the neighbouring properties was carried out based on the BRE Guide methodology. The daylight and sunlight assessment results demonstrate that the proposed development would not result in any loss of light received by neighbouring properties beyond Minor adverse impacts as identified in Appendix I of the BRE Guidelines. As only a small number of windows and limited area of open space are affected with the proposed development in place, a classification of minor adverse impact is appropriate.

Proposed Development

Daylight

All Bedrooms and Kitchen/Dining/living rooms of the apartment blocks were selected for a detailed daylight assessment, 305 of the 309 assessed rooms achieved the BRE daylight guidelines. The remaining rooms are marginally below the BRE guidelines.

Sunlight to Main Living Room Windows

The sunlight assessment demonstrated that the main living rooms windows achieve good APSH on the applicable main living rooms windows.

Sunlight to Amenity Areas

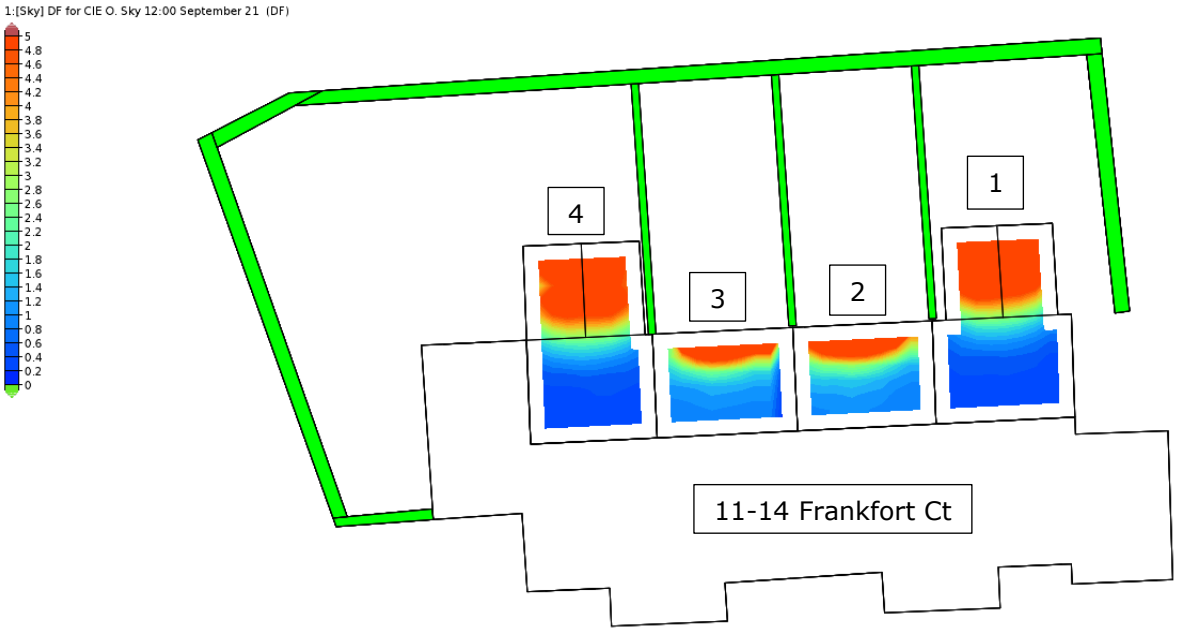
The proposed development achieves the BRE criteria for sunlight in amenity spaces.

Shadow Images

Shadow images are presented in Appendix E for both the current scenario and with the proposed development in place. Images are presented for the design days of March 21st and June 21st as recommended by the BRE Guide. Also presented are images for December 21st, however it should be noted that in December, even low buildings will cast long shadows. It should be borne in mind when interpreting the shadowing images that nearly all structures will create areas of new shadows, and some degree of shadow a space is to be expected.
It should be borne in mind when interpreting the shadowing images that nearly all structures will create areas of new shadows, and some degree of shadow of a space is to be expected.

While additional shadows are identified, it is important to note that the results of the daylight and sunlight impact assessment demonstrated that the proposed development would not result in any loss of light received by neighbouring properties beyond Minor adverse impacts as identified in Appendix I of the BRE Guidelines.

APPENDIX A – DAYLIGHT DISTRIBUTION IMAGES - ASSESSMENT DWELLINGS NO. 1, 2, 3 AND 4



APPENDIX B – DAYLIGHT RESULTS – PROPOSED DEVELOPMENT

BLOCK A

Ground Floor

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
Apt 1	Kitchen Living Dining	2	7.93	Yes
	Bedroom 1	1	4.35	Yes
	Bedroom 2	1	4.74	Yes
Creche	Wobbler Room	1.5	2.97	Yes
	Toddler Room	1.5	5.26	Yes
	Baby Room	1.5	6.67	Yes
Apt 3	Kitchen Living Dining	2	2.31	Yes
	Bedroom 1	1	5.49	Yes
	Bedroom 2	1	4.48	Yes
Apt 4	Kitchen Living Dining	2	4.51	Yes
	Bedroom 1	1	2.66	Yes
Apt 5	Kitchen Living Dining	2	4.3	Yes
	Bedroom 1	1	4.31	Yes
	Bedroom 2	1	5.64	Yes
Apt 6	Kitchen Living Dining	2	4.74	Yes
	Bedroom 1	1	2.93	Yes
Apt 7	Kitchen Living Dining	2	6.44	Yes
	Bedroom 1	1	5.43	Yes
Apt 8	Kitchen Living Dining	2	6.55	Yes
	Bedroom 1	1	9.70	Yes
	Bedroom 2	1	4.66	Yes

First Floor

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
Apt 1	Kitchen Living Dining	2	6.3	Yes
	Bedroom 1	1	4.28	Yes
	Bedroom 2	1	3.88	Yes
Apt 2	Kitchen Living Dining	2	4.75	Yes
	Bedroom 1	1	3.99	Yes
	Bedroom 2	1	2.63	Yes
Apt 3	Kitchen Living Dining	2	2.88	Yes
	Bedroom 1	1	4.5	Yes
	Bedroom 2	1	2.69	Yes
Apt 4	Kitchen Living Dining	2	3.58	Yes
	Bedroom 1	1	2.04	Yes
Apt 5	Kitchen Living Dining	2	1.57	No
	Bedroom 1	1	4.86	Yes
	Bedroom 2	1	3.78	Yes
Apt 6	Kitchen Living Dining	1.5	3.78	Yes
	Bedroom 1	1	2.15	Yes
Apt 7	Kitchen Living Dining	2	1.85	No
	Bedroom 1	1	4.81	Yes
	Bedroom 2	1	3.62	Yes
Apt 8	Kitchen Living Dining	2	3.93	Yes
	Bedroom 1	1	2.24	Yes
Apt 9	Kitchen Living Dining	2	6.56	Yes
	Bedroom 1	1	4.73	Yes
	Bedroom 2	1	4.61	Yes
Apt 10	Kitchen Living Dining	2	5.6	Yes
	Bedroom 1	1	4.05	Yes
	Bedroom 2	1	3.93	Yes

Second Floor

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
Apt 1	Kitchen Living Dining	2	7.16	Yes
	Bedroom 1	1	4.28	Yes
	Bedroom 2	1	3.89	Yes
Apt 2	Kitchen Living Dining	2	4.75	Yes
	Bedroom 1	1	4.01	Yes
	Bedroom 2	1	2.91	Yes
Apt 3	Kitchen Living Dining	2	2.91	Yes
	Bedroom 1	1	4.54	Yes
	Bedroom 2	1	3.23	Yes
Apt 4	Kitchen Living Dining	2	3.62	Yes
	Bedroom 1	1	2.34	Yes
Apt 5	Kitchen Living Dining	2	1.57	No
	Bedroom 1	1	4.86	Yes
	Bedroom 2	1	3.78	Yes
Apt 6	Kitchen Living Dining	2	3.88	Yes
	Bedroom 1	1	2.49	Yes
Apt 7	Kitchen Living Dining	2	1.85	No
	Bedroom 1	1	4.83	Yes
	Bedroom 2	1	3.6	Yes
Apt 8	Kitchen Living Dining	2	3.93	Yes
	Bedroom 1	1	2.5	Yes
Apt 9	Kitchen Living Dining	2	7.46	Yes
	Bedroom 1	1	4.73	Yes
	Bedroom 2	1	4.61	Yes
Apt 10	Kitchen Living Dining	2	6.56	Yes
	Bedroom 1	1	6.5	Yes
	Bedroom 2	1	4.20	Yes

Third Floor

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
Apt 1	Kitchen Living Dining	2	5.85	Yes
	Bedroom 1	1	4.00	Yes
	Bedroom 2	1	3.78	Yes
Apt 2	Kitchen Living Dining	2	4.11	Yes
	Bedroom 1	1	4.3	Yes
	Bedroom 2	1	3.14	Yes
Apt 3	Kitchen Living Dining	2	2.83	Yes
	Bedroom 1	1	4.68	Yes
	Bedroom 2	1	3.66	Yes
Apt 4	Kitchen Living Dining	2	4.60	Yes
	Bedroom 1	1	24.42	Yes
Apt 5	Kitchen Living Dining	2	2.88	Yes
	Bedroom 1	1	4.63	Yes
	Bedroom 2	1	3.49	Yes
Apt 6	Kitchen Living Dining	2	4.26	Yes
	Bedroom 1	1	3.82	Yes
Apt 7	Kitchen Living Dining	2	6.33	Yes
	Bedroom 1	1	3.88	Yes
	Bedroom 2	1	3.84	Yes
Apt 8	Kitchen Living Dining	2	3.24	Yes
	Bedroom 1	1	4.38	Yes
	Bedroom 2	1	3.77	Yes

BLOCK B

Ground Floor

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
Apt 1	Kitchen Living Dining	2	6.11	Yes
	Bedroom 1	1	1.44	Yes
	Bedroom 2	1	1.31	Yes
Apt 2	Kitchen Living Dining	2	4.81	Yes
	Bedroom 1	1	4.91	Yes
	Bedroom 2	1	4.38	Yes
Apt 3	Kitchen Living Dining	2	4.05	Yes
	Bedroom 1	1	2.95	Yes
Apt 4	Kitchen Living Dining	2	4.52	Yes
	Bedroom 1	1	6.93	Yes
Apt 5	Kitchen Living Dining	2	4.29	Yes
	Bedroom 1	1	3.13	Yes
Apt 6	Kitchen Living Dining	2	3.65	Yes
	Bedroom 1	1	3.02	Yes
Apt 7	Kitchen Living Dining	2	4.46	Yes
	Bedroom 1	1	4.84	Yes
	Bedroom 2	1	3.73	Yes
Apt 8	Kitchen Living Dining	2	4.88	Yes
	Bedroom 1	1	4.33	Yes
Apt 9	Kitchen Living Dining	2	2.81	Yes
	Bedroom 1	1	4.08	Yes
	Bedroom 2	1	2.86	Yes
Apt 10	Kitchen Living Dining	2	4.88	Yes
	Bedroom 1	1	5.74	Yes
	Bedroom 2	1	4.88	Yes
Apt 11	Kitchen Living Dining	2	5.88	Yes

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
	Bedroom 1	1	6.41	Yes
	Bedroom 2	1	3.55	Yes

First Floor

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
Apt 1	Kitchen Living Dining	2	4.15	Yes
	Bedroom 1	1	1.19	Yes
	Bedroom 2	1	1.09	Yes
Apt 2	Kitchen Living Dining	2	3.74	Yes
	Bedroom 1	1	4.17	Yes
	Bedroom 2	1	3.85	Yes
Apt 3	Kitchen Living Dining	2	3.40	Yes
	Bedroom 1	1	2.17	Yes
Apt 4	Kitchen Living Dining	2	3.76	Yes
	Bedroom 1	1	2.34	Yes
Apt 5	Kitchen Living Dining	2	3.43	Yes
	Bedroom 1	1	4.23	Yes
Apt 6	Kitchen Living Dining	2	2.97	Yes
	Bedroom 1	1	2.21	Yes
Apt 7	Kitchen Living Dining	2	5.88	Yes
	Bedroom 1	1	6.41	Yes
	Bedroom 2	1	3.55	Yes
Apt 8	Kitchen Living Dining	2	5.85	Yes
	Bedroom 1	1	4.27	Yes
	Bedroom 2	1	2.36	Yes
Apt 9	Kitchen Living Dining	2	3.70	Yes
	Bedroom 1	1	2.21	Yes
	Bedroom 2	1	2.14	Yes

Apt 10	Kitchen Living Dining	2	3.66	Yes
	Bedroom 1	1	4.56	Yes
	Bedroom 2	1	2.69	Yes
Apt 11	Kitchen Living Dining	2	5.11	Yes
	Bedroom 1	1	2.14	Yes
	Bedroom 2	1	1.75	Yes
Apt 12	Kitchen Living Dining	2	4.88	Yes
	Bedroom 1	1	4.31	Yes
	Bedroom 2	1	2.68	Yes

Second Floor

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
Apt 1	Kitchen Living Dining	2	4.15	Yes
	Bedroom 1	1	1.2	Yes
	Bedroom 2	1	1.09	Yes
Apt 2	Kitchen Living Dining	2	3.74	Yes
	Bedroom 1	1	4.17	Yes
	Bedroom 2	1	3.85	Yes
Apt 3	Kitchen Living Dining	2	3.40	Yes
	Bedroom 1	1	2.17	Yes
Apt 4	Kitchen Living Dining	2	3.76	Yes
	Bedroom 1	1	2.34	Yes
Apt 5	Kitchen Living Dining	2	3.43	Yes
	Bedroom 1	1	2.36	Yes
Apt 6	Kitchen Living Dining	2	2.97	Yes
	Bedroom 1	1	2.22	Yes
Apt 7	Kitchen Living Dining	2	5.88	Yes
	Bedroom 1	1	6.41	Yes
	Bedroom 2	1	3.55	Yes
Apt 8	Kitchen Living Dining	2	5.85	Yes

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
	Bedroom 1	1	4.29	Yes
	Bedroom 2	1	2.39	Yes
Apt 9	Kitchen Living Dining	2	3.70	Yes
	Bedroom 1	1	2.21	Yes
	Bedroom 2	1	2.14	Yes
Apt 10	Kitchen Living Dining	2	3.66	Yes
	Bedroom 1	1	4.57	Yes
	Bedroom 2	1	2.80	Yes
Apt 11	Kitchen Living Dining	2	6.02	Yes
	Bedroom 1	1	2.14	Yes
	Bedroom 2	1	1.75	Yes
Apt 12	Kitchen Living Dining	2	4.89	Yes
	Bedroom 1	1	4.31	Yes
	Bedroom 2	1	2.71	Yes

Third Floor

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
Apt 1	Kitchen Living Dining	2	4.53	Yes
	Bedroom 1	1	1.26	Yes
	Bedroom 2	1	1.11	Yes
Apt 2	Kitchen Living Dining	2	3.74	Yes
	Bedroom 1	1	4.22	Yes
	Bedroom 2	1	3.85	Yes
Apt 3	Kitchen Living Dining	2	3.41	Yes
	Bedroom 1	1	2.17	Yes
Apt 4	Kitchen Living Dining	2	3.76	Yes
	Bedroom 1	1	2.36	Yes
Apt 5	Kitchen Living Dining	2	3.44	Yes
	Bedroom 1	1	2.37	Yes
Apt 6	Kitchen Living Dining	2	3.10	Yes

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
	Bedroom 1	1	2.25	Yes
Apt 7	Kitchen Living Dining	2	5.88	Yes
	Bedroom 1	1	6.41	Yes
	Bedroom 2	1	3.55	Yes
Apt 8	Kitchen Living Dining	2	8.11	Yes
	Bedroom 1	1	5.88	Yes
	Bedroom 2	1	3.55	Yes
Apt 9	Kitchen Living Dining	2	3.70	Yes
	Bedroom 1	1	3.49	Yes
	Bedroom 2	1	2.23	Yes
Apt 10	Kitchen Living Dining	2	3.66	Yes
	Bedroom 1	1	4.57	Yes
	Bedroom 2	1	2.80	Yes
Apt 11	Kitchen Living Dining	2	6.02	Yes
	Bedroom 1	1	3.49	Yes
	Bedroom 2	1	2.23	Yes
Apt 12	Kitchen Living Dining	2	7.89	Yes
	Bedroom 1	1	4.43	Yes
	Bedroom 2	1	2.71	Yes

Fourth Floor

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
Apt 1	Kitchen Living Dining	2	5.50	Yes
	Bedroom 1	1	4.12	Yes
Apt 2	Kitchen Living Dining	2	6.95	Yes
	Bedroom 1	1	3.74	Yes
Apt 3	Kitchen Living Dining	2	3.38	Yes
	Bedroom 1	1	4.07	Yes
Apt 4	Kitchen Living Dining	2	3.37	Yes

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
	Bedroom 1	1	4.52	Yes
Apt 5	Kitchen Living Dining	2	7.95	Yes
	Bedroom 1	1	5.32	Yes
	Bedroom 2	1	4.20	Yes
Apt 6	Kitchen Living Dining	2	4.33	Yes
	Bedroom 1	1	3.72	Yes
	Bedroom 2	1	2.79	Yes
Apt 7	Kitchen Living Dining	2	2.59	Yes
	Bedroom 1	1	4.20	Yes

BLOCK C

Ground Floor

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
Apt 1	Kitchen Living Dining	2	4.81	Yes
	Bedroom 1	1	4.0.9	Yes
	Bedroom 2	1	3.95	Yes
Apt 2	Kitchen Living Dining	2	2.97	Yes
	Bedroom 1	1	5.26	Yes
	Bedroom 2	1	6.67	Yes
Apt 3	Kitchen Living Dining	2	4.64	Yes
	Bedroom 1	1	2.86	Yes
Apt 4	Kitchen Living Dining	2	4.35	Yes
	Bedroom 1	1	4.30	Yes
	Bedroom 2	1	3.03	Yes
Apt 5	Kitchen Living Dining	2	6.28	Yes
	Bedroom 1	1	3.17	Yes
	Bedroom 2	1	1.92	Yes
Apt 6	Kitchen Living Dining	2	4.60	Yes
	Bedroom 1	1	3.90	Yes

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
	Bedroom 2	1	2.68	Yes

First Floor

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
Apt 1	Kitchen Living Dining	2	2.93	Yes
	Bedroom 1	1	1.15	Yes
	Bedroom 2	1	1.07	Yes
Apt 2	Kitchen Living Dining	2	4.81	Yes
	Bedroom 1	1	2.34	Yes
	Bedroom 2	1	1.89	Yes
Apt 3	Kitchen Living Dining	2	3.69	Yes
	Bedroom 1	1	1.89	Yes
Apt 4	Kitchen Living Dining	2	3.66	Yes
	Bedroom 1	1	1.99	Yes
Apt 5	Kitchen Living Dining	2	2.29	Yes
	Bedroom 1	1	2.21	Yes
	Bedroom 2	1	1.55	Yes
Apt 6	Kitchen Living Dining	2	5.12	Yes
	Bedroom 1	1	2.40	Yes
	Bedroom 2	1	2.05	Yes
Apt 7	Kitchen Living Dining	2	3.10	Yes
	Bedroom 1	1	1.33	Yes
	Bedroom 2	1	1.11	Yes

Second Floor

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
Apt 1	Kitchen Living Dining	2	4.11	Yes
	Bedroom 1	1	1.37	Yes
	Bedroom 2	1	1.01	Yes
Apt 2	Kitchen Living Dining	2	4.68	Yes

Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
	Bedroom 1	1	3.28	Yes
	Bedroom 2	1	2.42	Yes
Apt 3	Kitchen Living Dining	2	3.71	Yes
	Bedroom 1	1	2.42	Yes
Apt 4	Kitchen Living Dining	2	3.37	Yes
	Bedroom 1	1	2.58	Yes
Apt 5	Kitchen Living Dining	2	2.33	Yes
	Bedroom 1	1	3.64	Yes
	Bedroom 2	1	2.20	Yes
Apt 6	Kitchen Living Dining	2	5.01	Yes
	Bedroom 1	1	2.82	Yes
	Bedroom 2	1	2.28	Yes
Apt 7	Kitchen Living Dining	2	3.46	Yes
	Bedroom 1	1	1.15	Yes
	Bedroom 2	1	1.02	Yes

BLOCK D

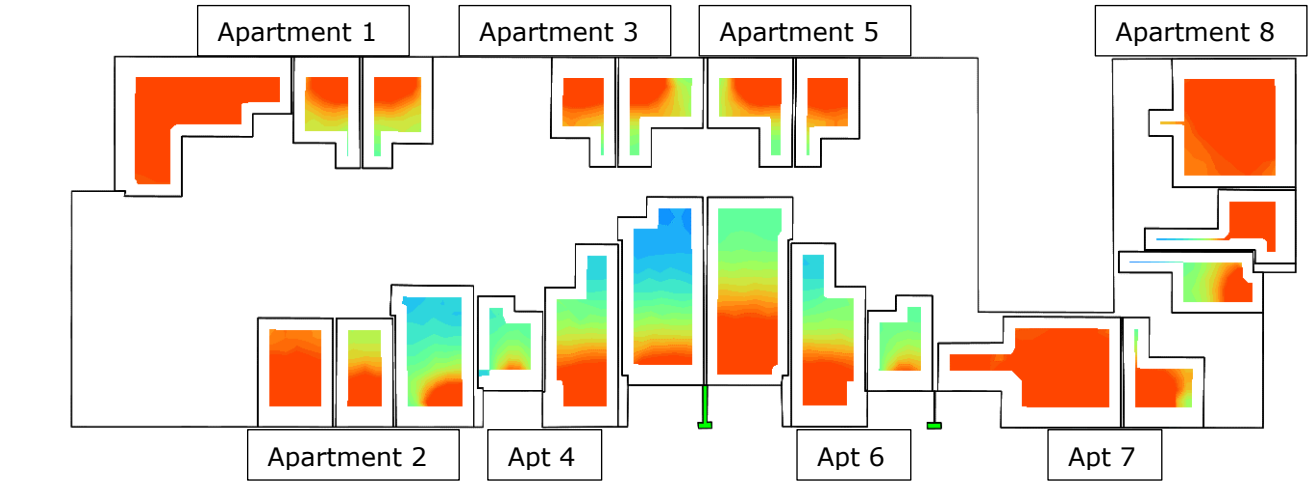
Ground/ First Floor Floor

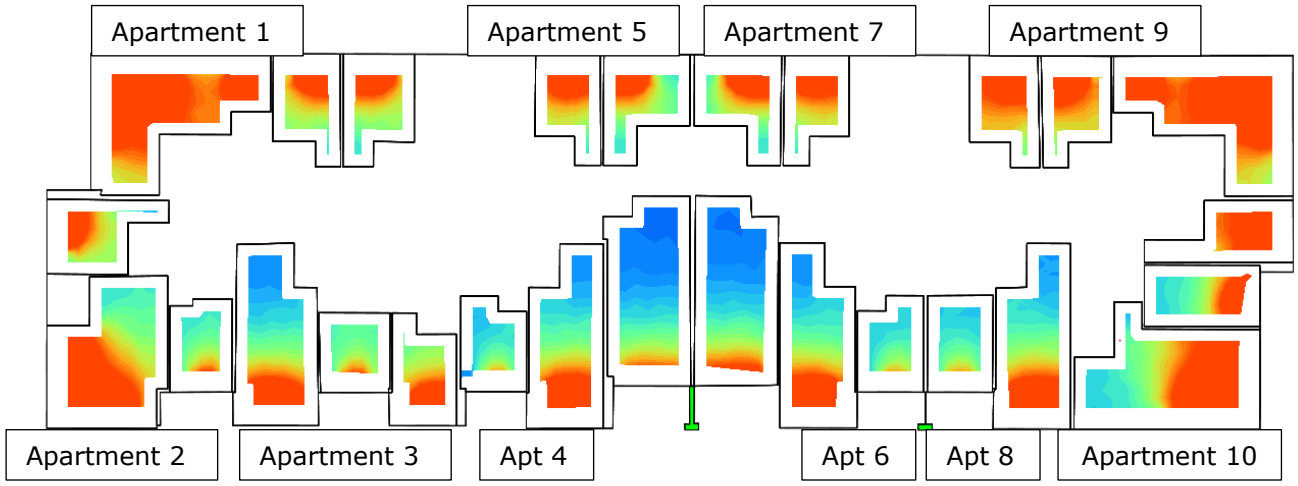
Ref	Room	Target ADF (%)	ADF Achieved (%)	Target ADF Achieved
Apt 1	Kitchen Living Dining	2	4.08	Yes
	Bedroom 1	1	2.35	Yes
Apt 2	Kitchen Living Dining	2	3.21	Yes
	Bedroom 1	1	2.37	Yes
Apt 1	Kitchen Living Dining	2	3.73	Yes
	Bedroom 1	1	4.40	Yes
	Bedroom 2	1	3.77	Yes
Apt 2	Kitchen Living Dining	2	3.70	Yes
	Bedroom 1	1	3.03	Yes

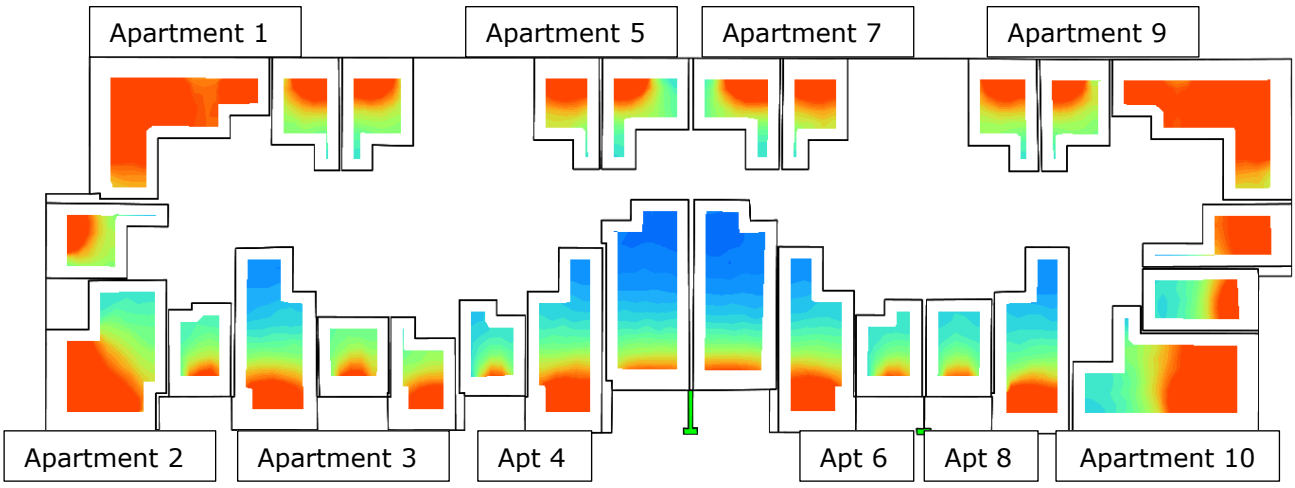
Note: For information ADF achieved in all other rooms of Block D are included below.

Ref	ADF Achieved (%)
Study	**11.72**
Lounge	**2.02**
Office	**2.28**
Resi Amenity	**5.99**
Gym	**6.11**
Meeting Room	**3.73**

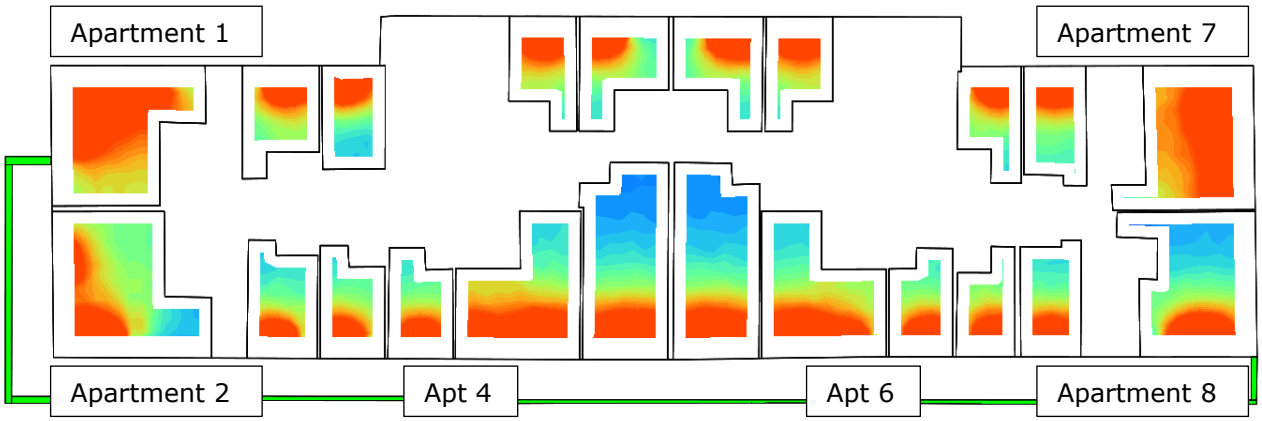
BLOCK A



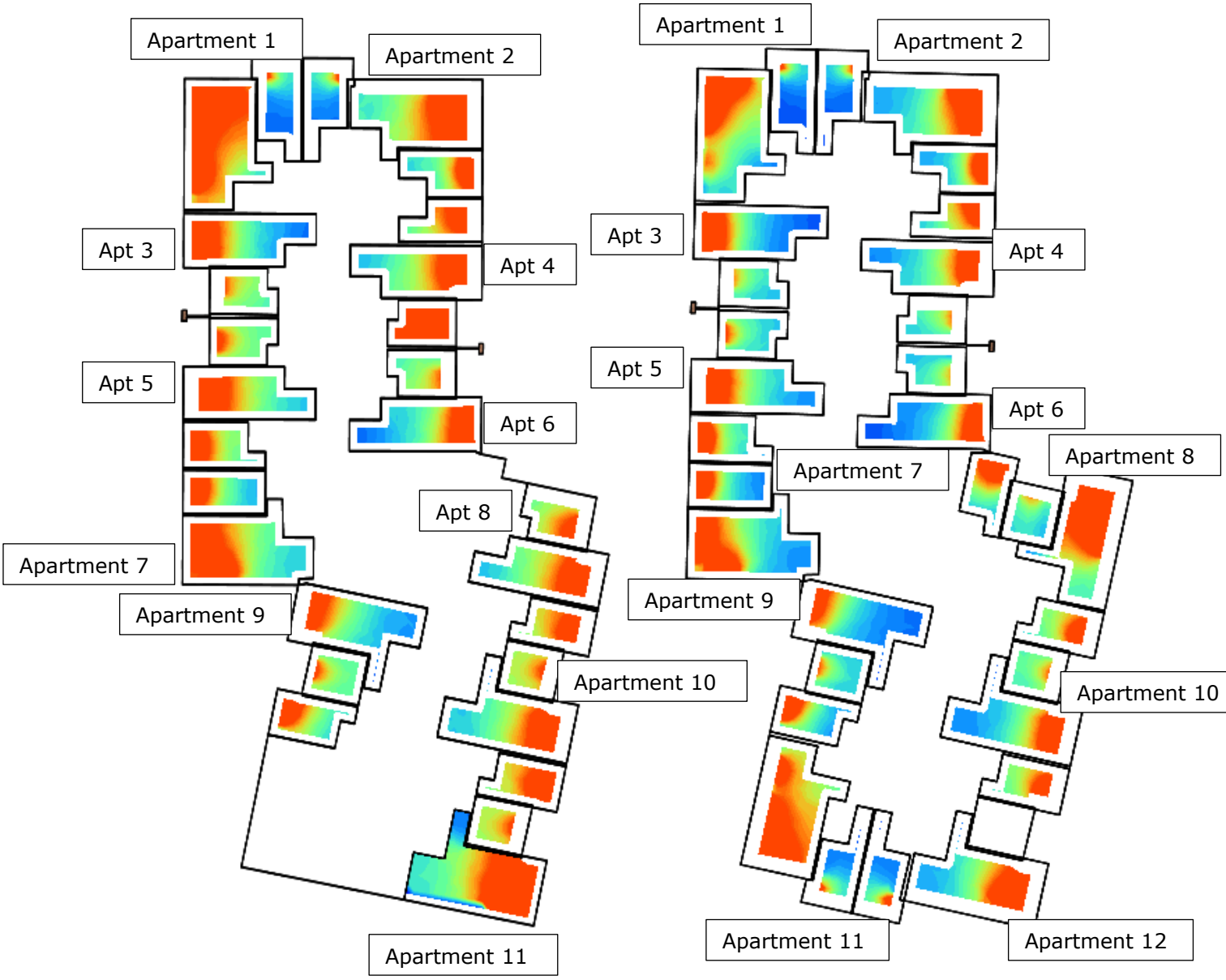


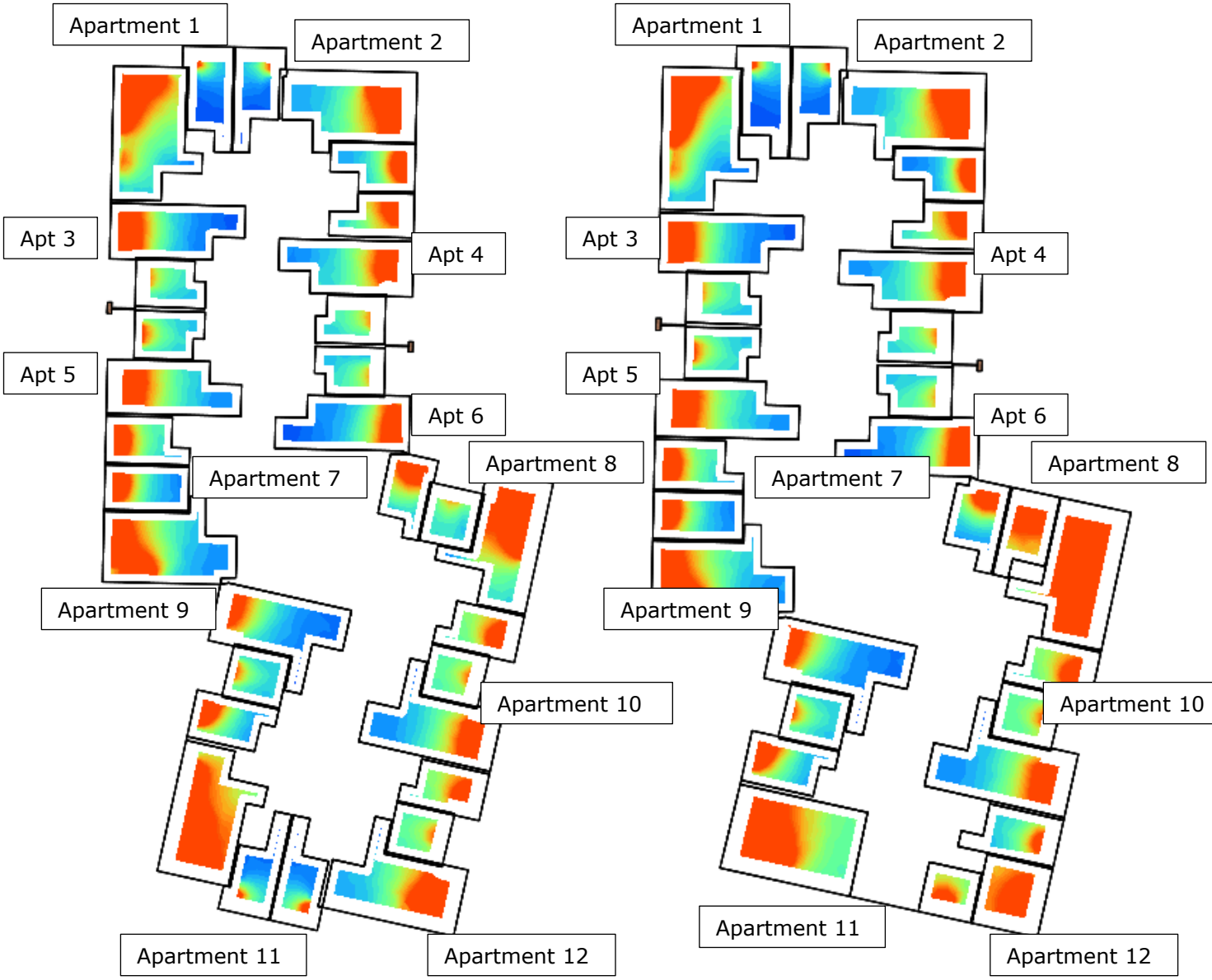


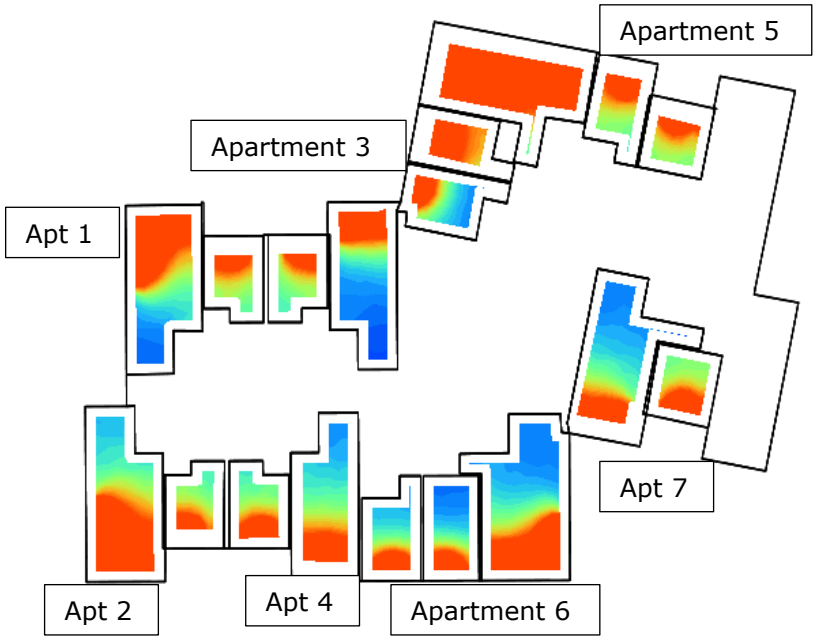
Apartment 3 Apartment 5


Apartment 1
Apartment 7
Apartment 2
Apt 4
Apt 6
Apartment 8

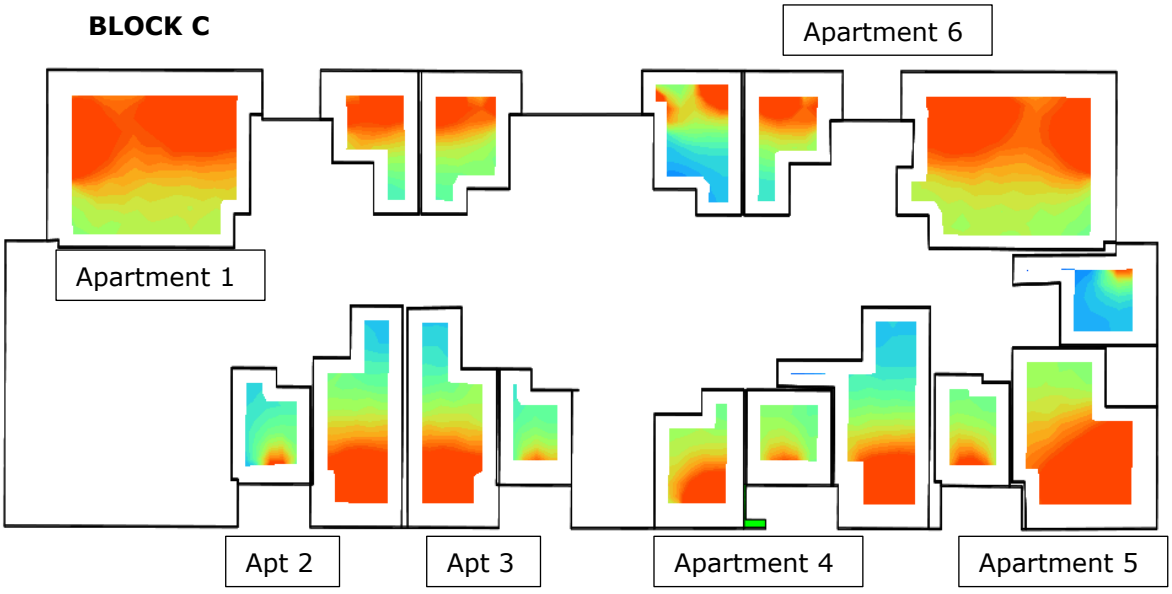
BLOCK B

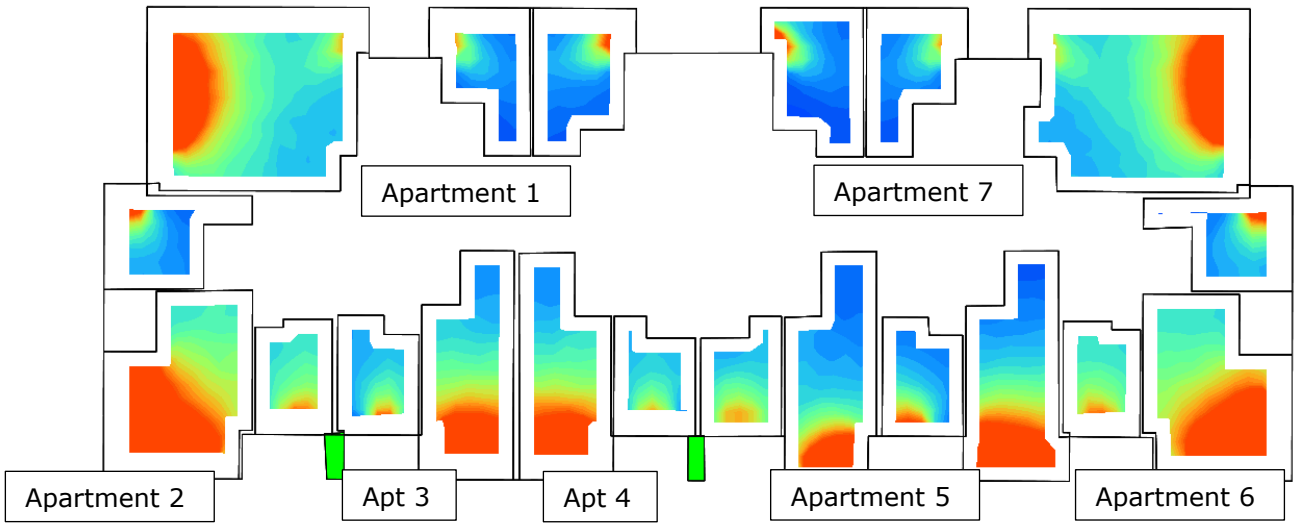

Apartment 1
Apartment 2
Apt 3
Apt 4
Apt 5
Apt 6
Apt 8
Apartment 7
Apartment 9
Apartment 10
Apartment 11
Apartment 1
Apartment 2
Apt 3
Apt 4
Apt 5
Apt 6
Apartment 8
Apartment 7
Apartment 9
Apartment 10
Apartment 11
Apartment 12

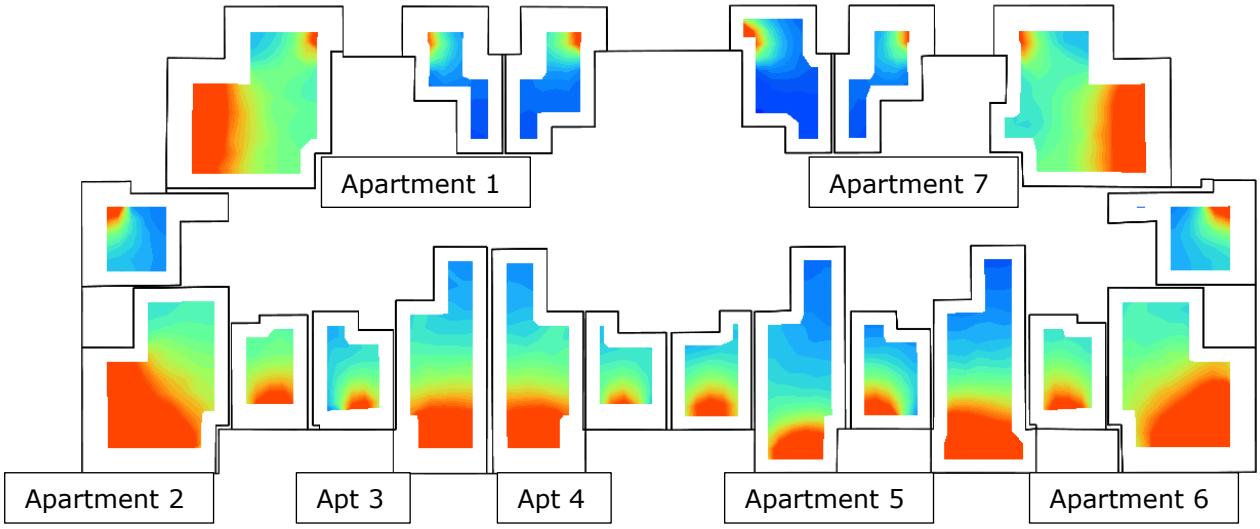

Apartment 1
Apartment 2
Apt 3
Apt 4
Apt 5
Apt 6
Apartment 7
Apartment 8
Apartment 9
Apartment 10
Apartment 11
Apartment 12
Apartment 1
Apartment 2
Apt 3
Apt 4
Apt 5
Apt 6
Apartment 7
Apartment 8
Apartment 9
Apartment 10
Apartment 11
Apartment 12


Apartment 5
Apartment 3
Apt 1
Apt 7
Apt 2
Apt 4
Apartment 6

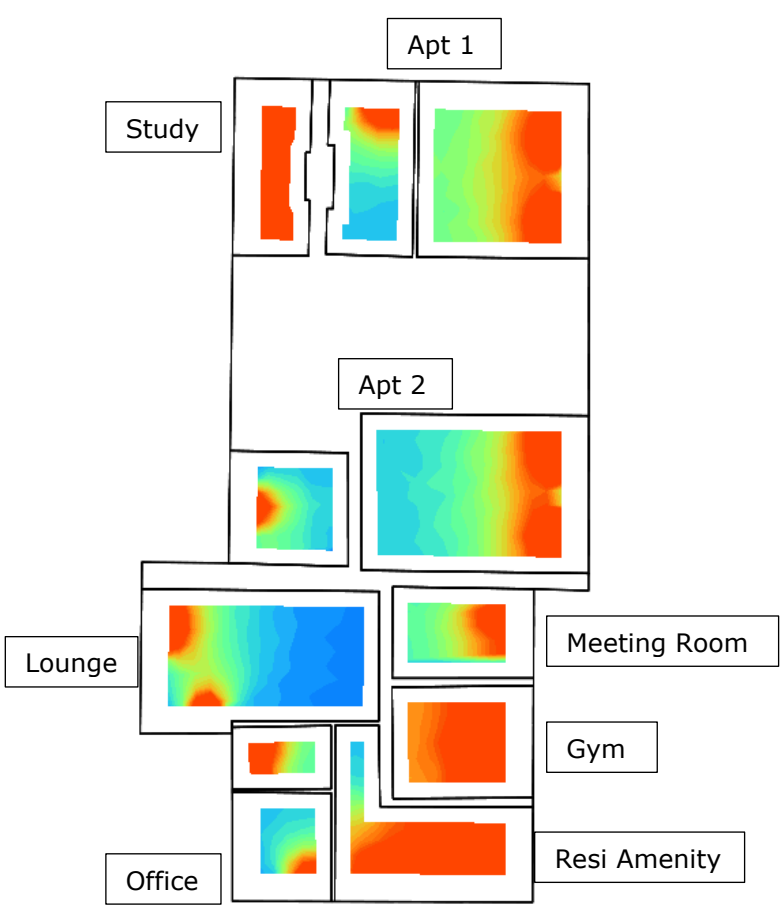
BLOCK C

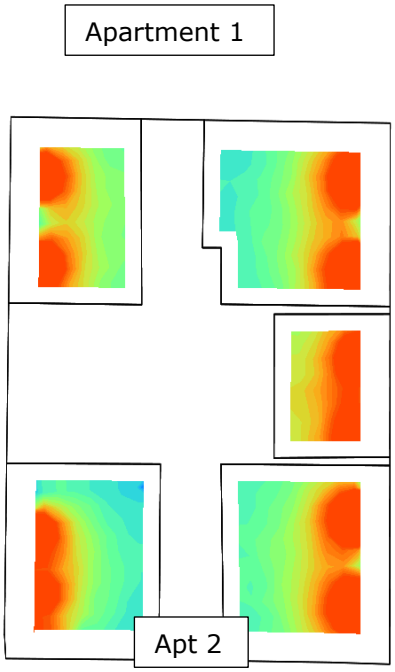

Apartment 6
Apartment 1
Apt 2
Apt 3
Apartment 4
Apartment 5


Apartment 1
Apartment 7
Apartment 2
Apt 3
Apt 4
Apartment 5
Apartment 6


Apartment 1
Apartment 7
Apartment 2
Apt 3
Apt 4
Apartment 5
Apartment 6

BLOCK D


Apt 1
Study
Apt 2
Lounge
Meeting Room
Gym
Office
Resi Amenity


Apartment 1
Apt 2

APPENDIX D – DAYLIGHT MODEL IMPUTS – PROPOSED DEVELOPMENT

Parameter	Value
Surface Reflectance's	
1. Internal ceilings	85% e.g. light coloured ceiling
2. Internal walls	85% e.g. light coloured walls
3. Internal floors	50% e.g. light coloured timber floor
Surface Maintenance Factor	95%
Glazing Maintenance Factor	95%
Glazing Transmittance	80%
Frame	0.05m frame width
Working Plane	0.85m
Area of Interest (AOI)	0.5m inset from perimeter
Simulation Settings	Radiance custom settings: Ambient bounces – 8 Ambient accuracy – 0.18 Ambient resolution – 2048 Ambient divisions – 4096 Ambient super samples – 1024 Limit reflection – 8

APPENDIX E – SHADOW IMAGES

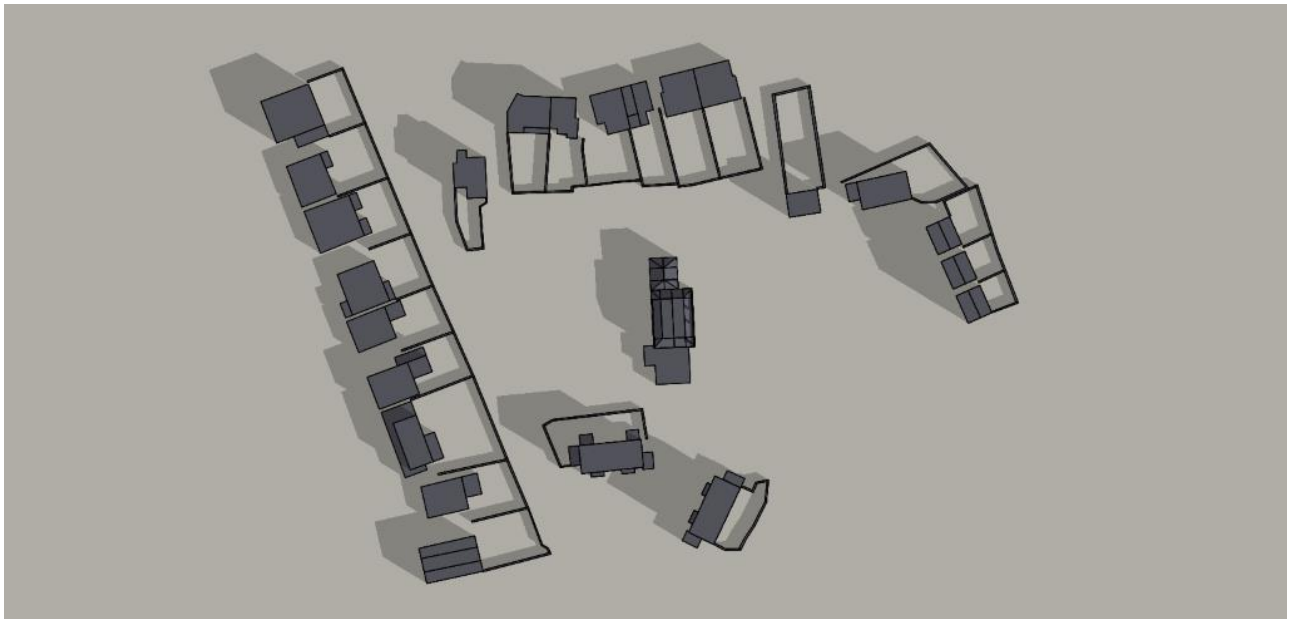
21st March
6am – Current Scenario

21st March
6am – With Proposed Development

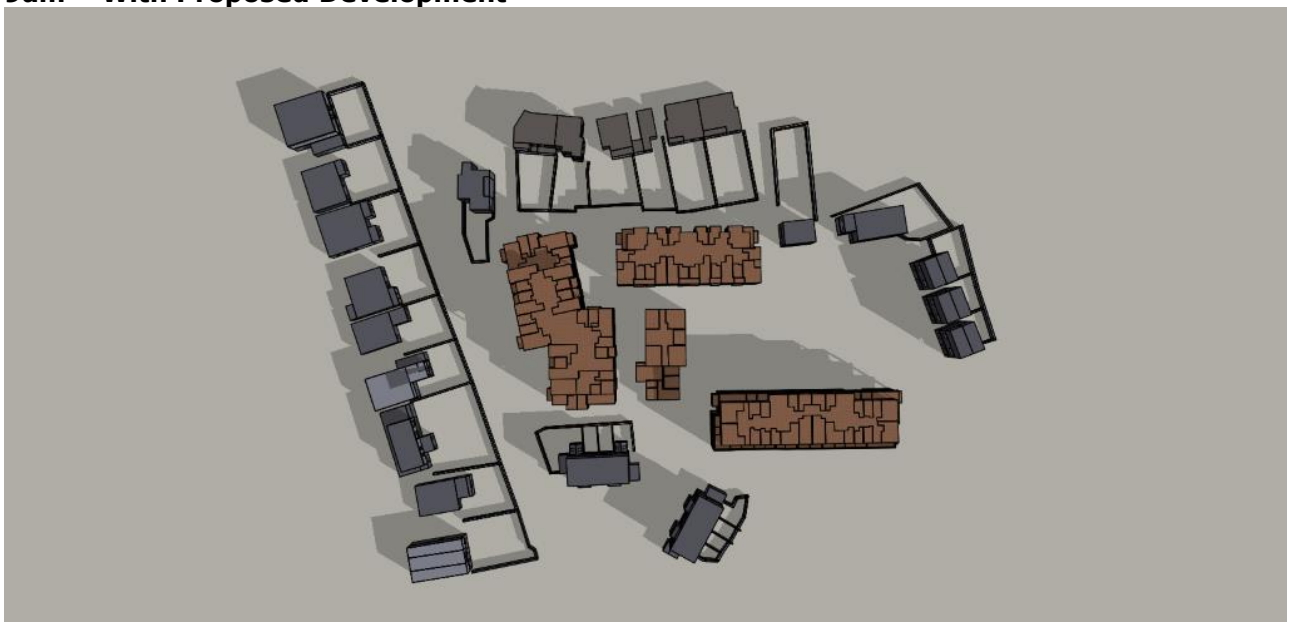
21st March
7am – Current Scenario

21st March
7am – With Proposed Development

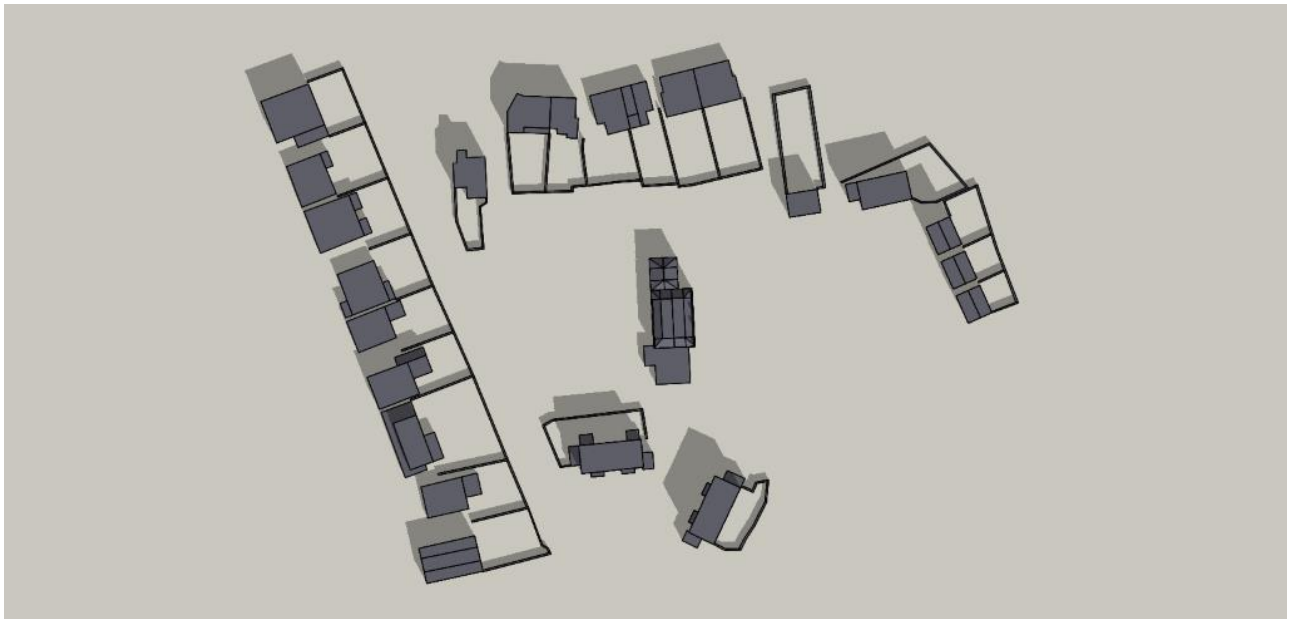
21st March
9am – Current Scenario



21st March
9am – With Proposed Development



21st March
11am – Current Scenario



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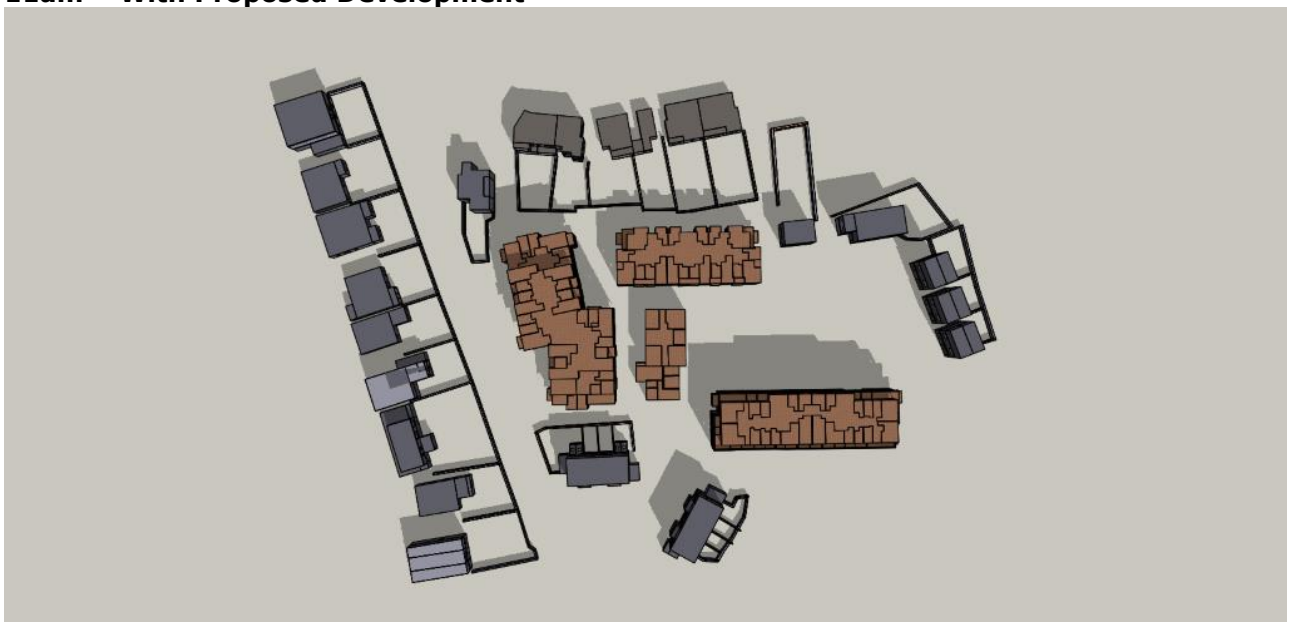
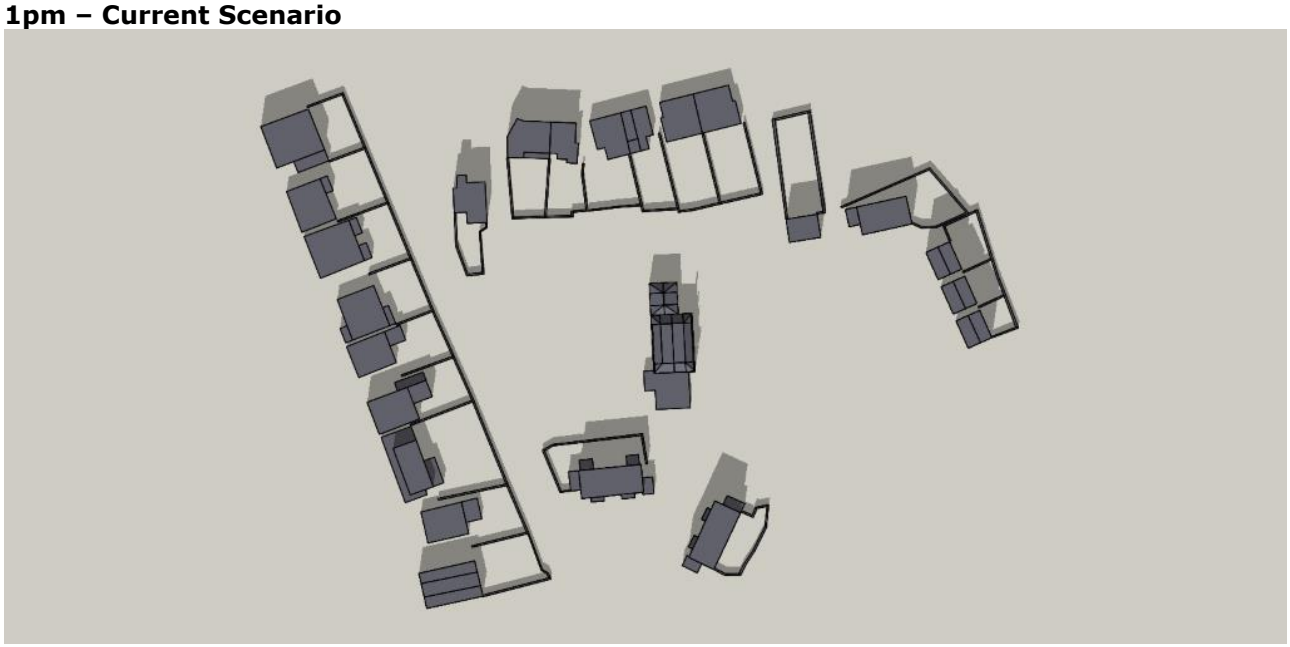
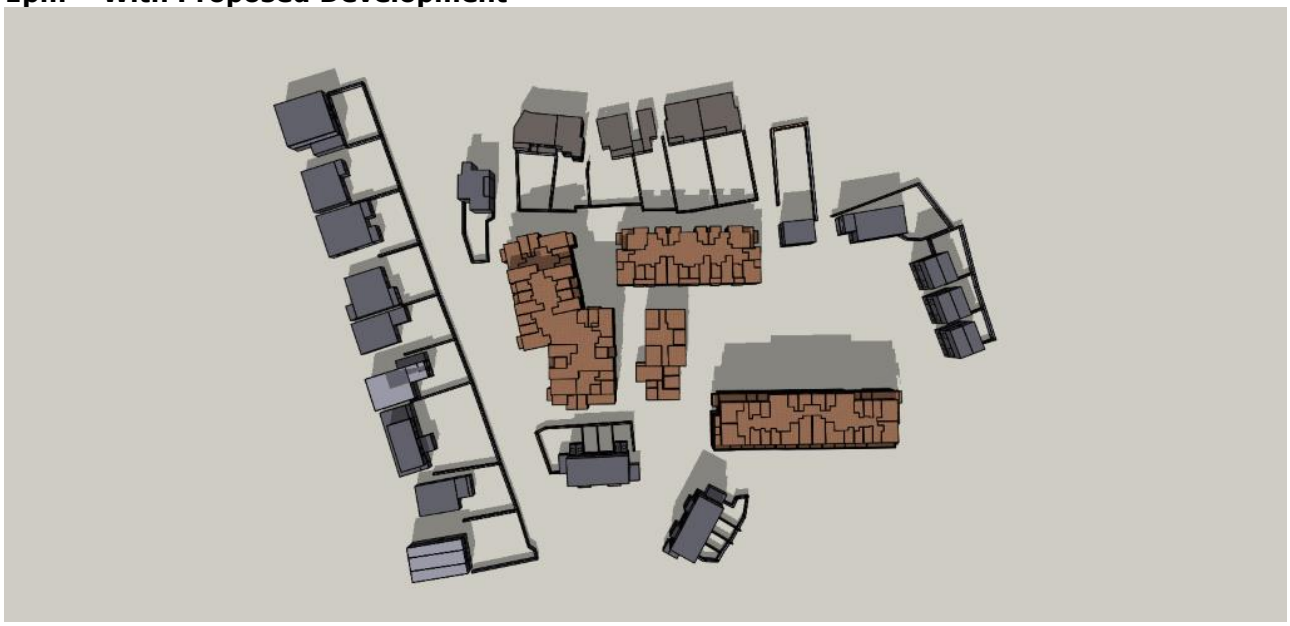
11am – With Proposed Development



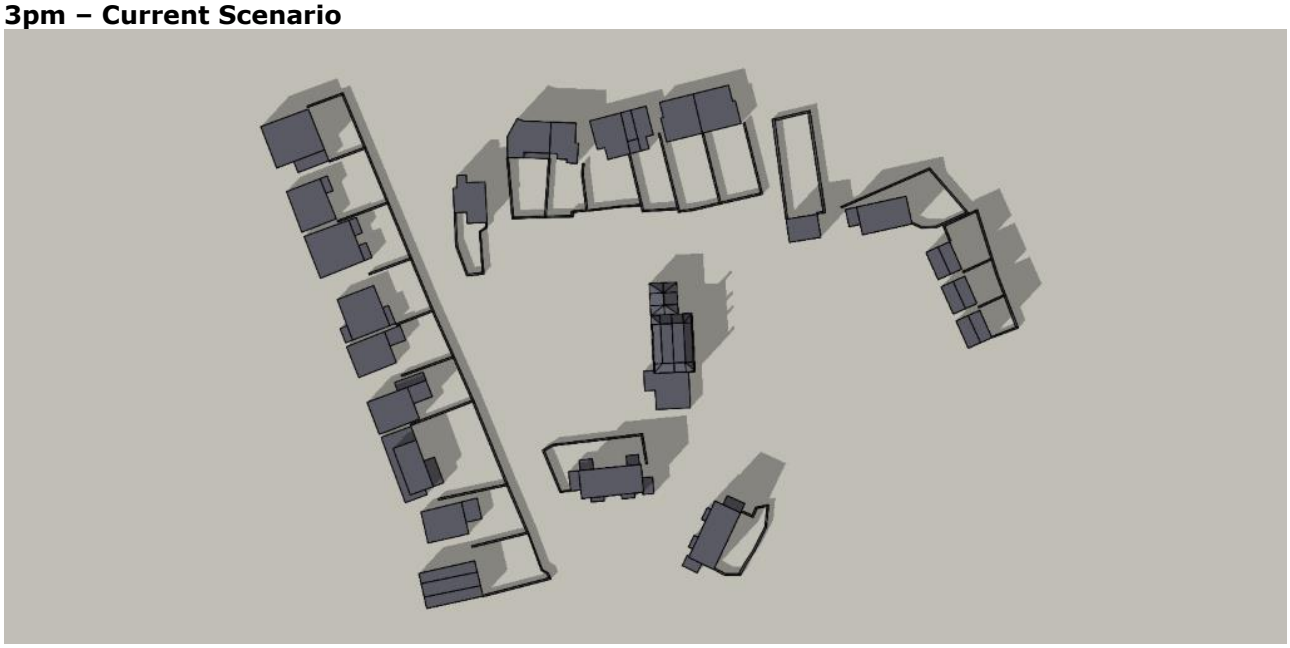
21st March
1pm – Current Scenario



21st March
1pm – With Proposed Development



21st March
3pm – Current Scenario



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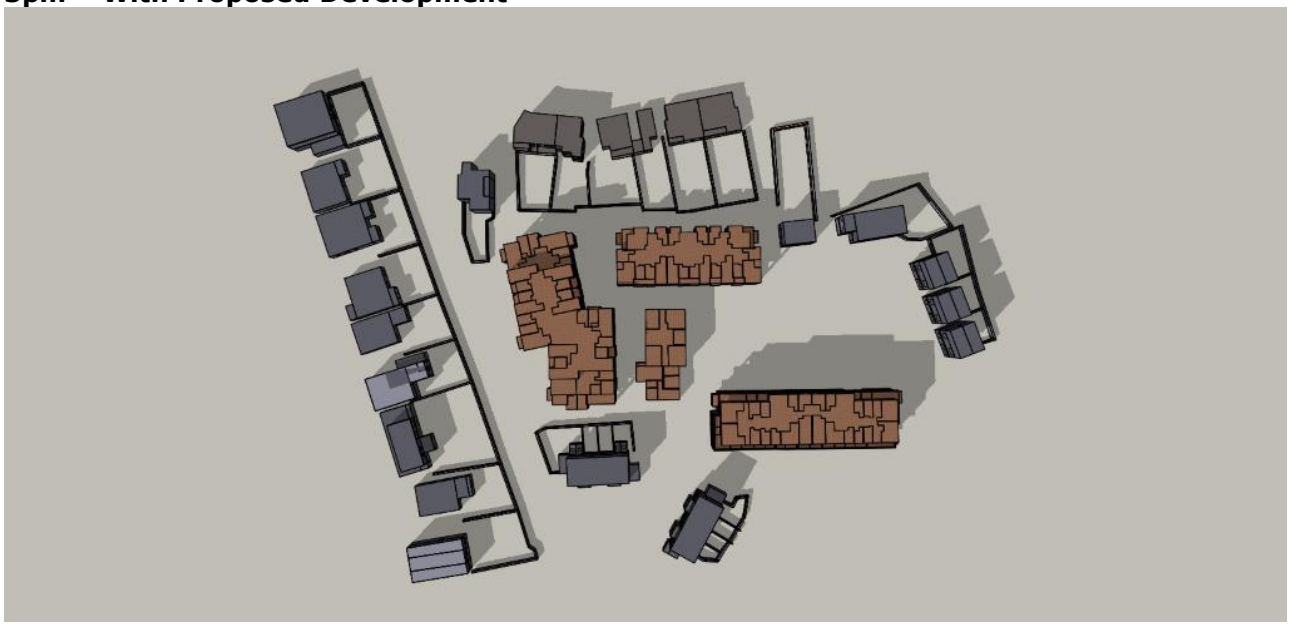
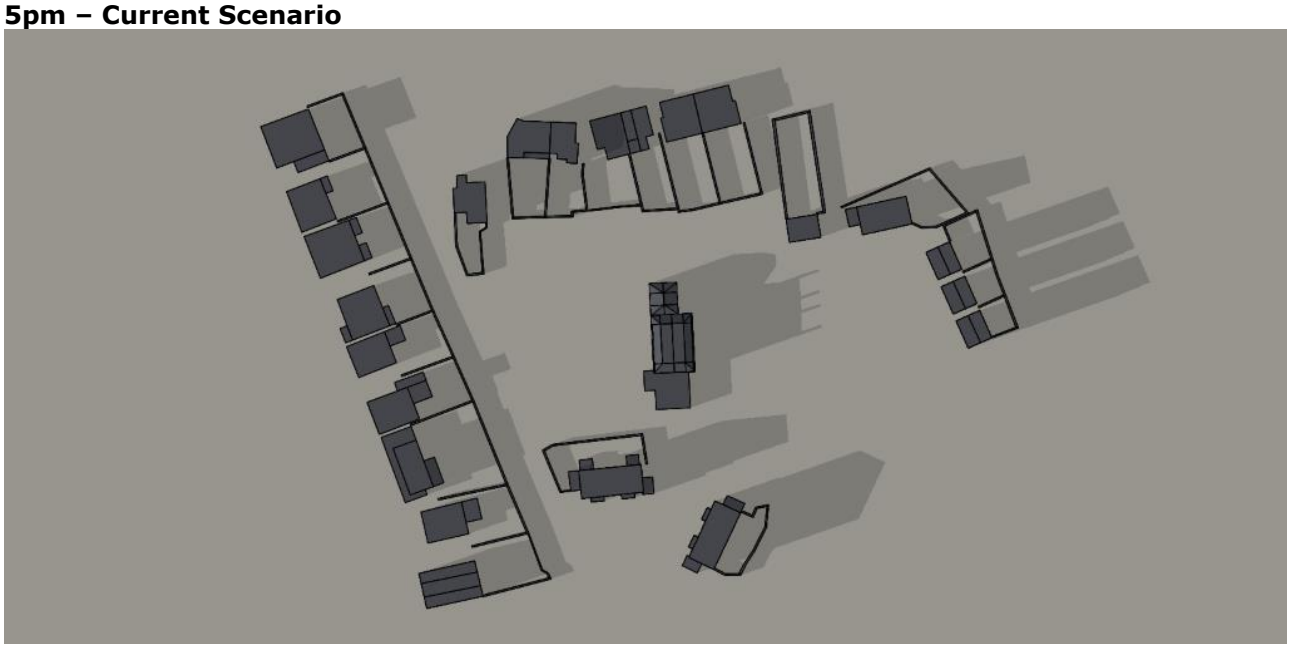
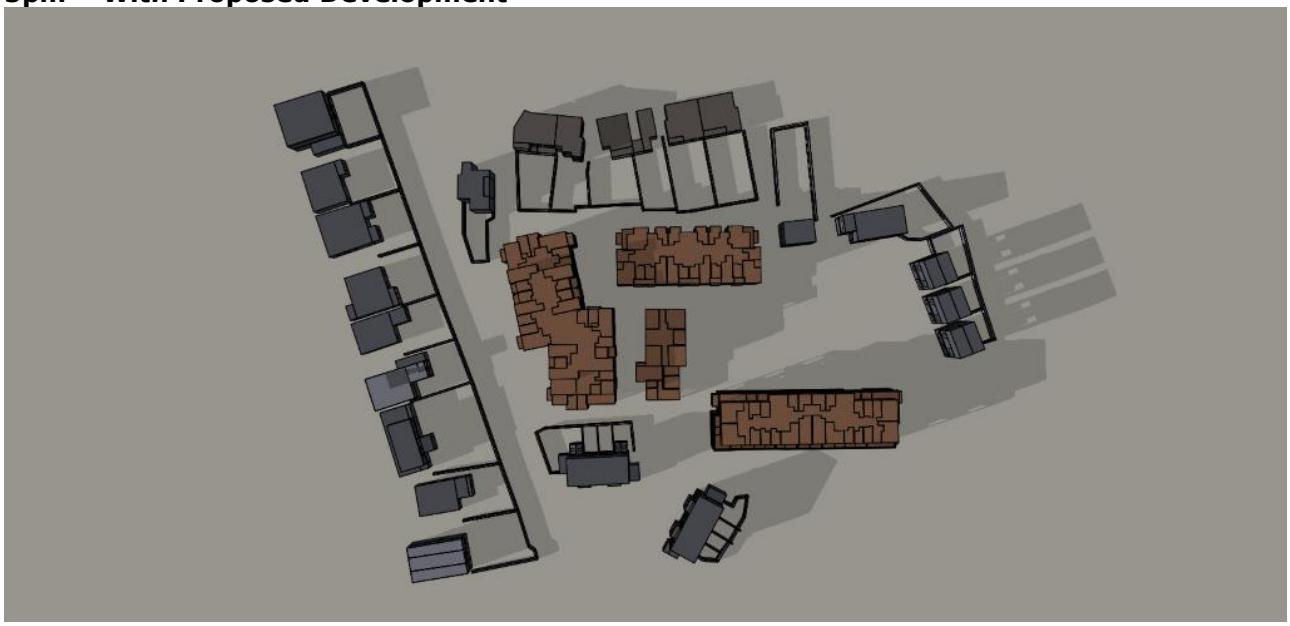
3pm – With Proposed Development



21st March
5pm – Current Scenario



21st March
5pm – With Proposed Development



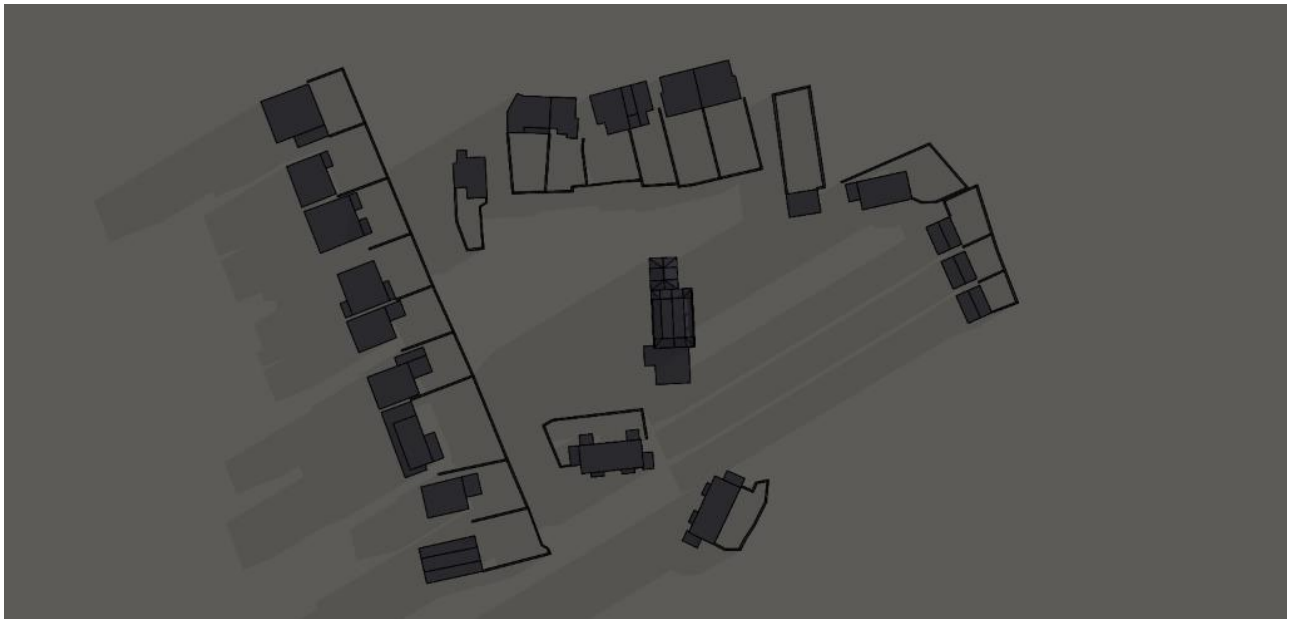
21st March
7pm – Current Scenario

21st March
7pm – With Proposed Development

21st June
4am – Current Scenario

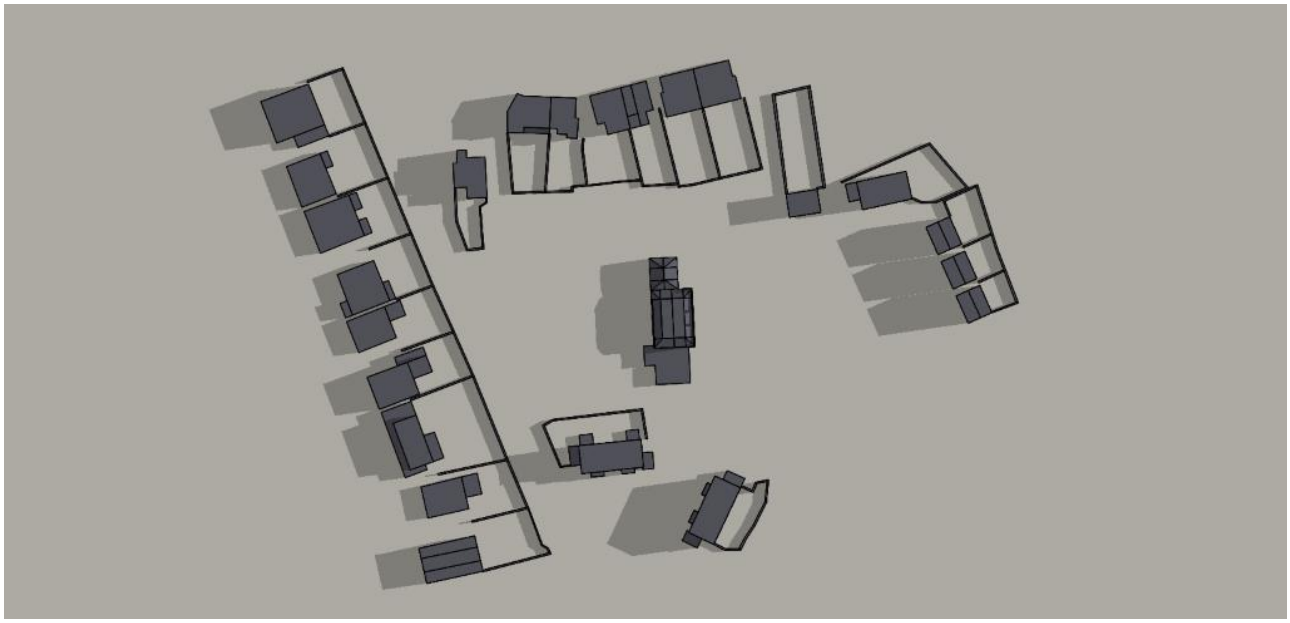
21st June
4am – With Proposed Development

21st June
5am – Current Scenario



21st June
5am – With Proposed Development

21st June
7am – Current Scenario



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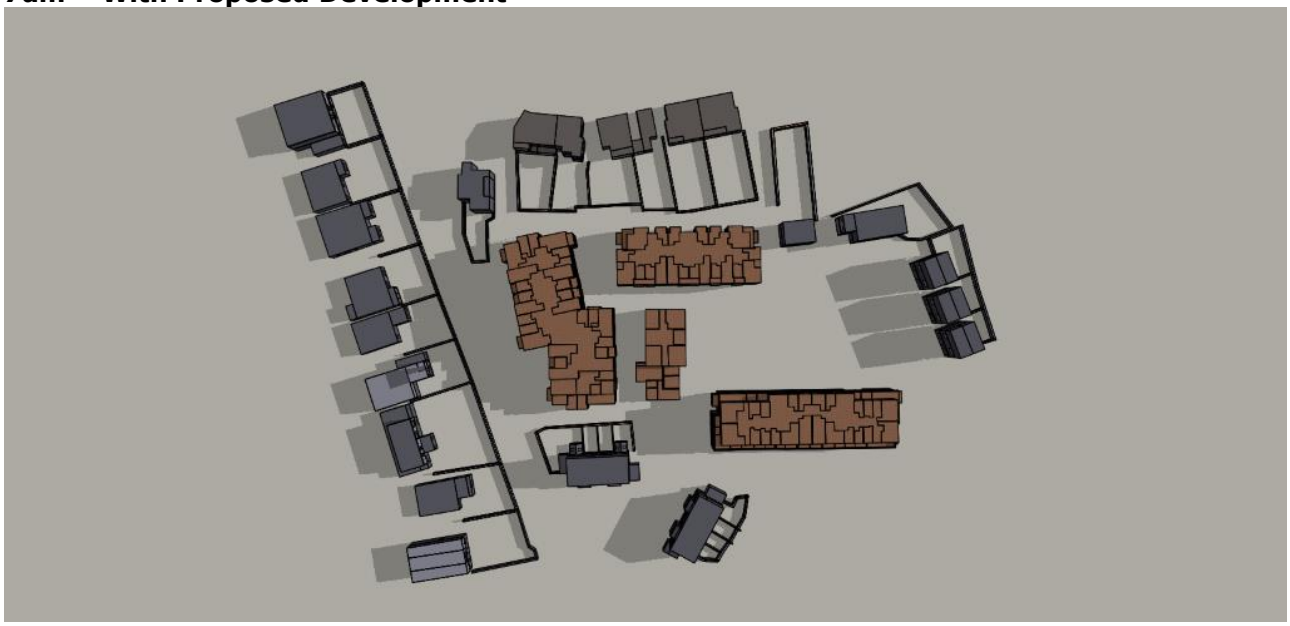
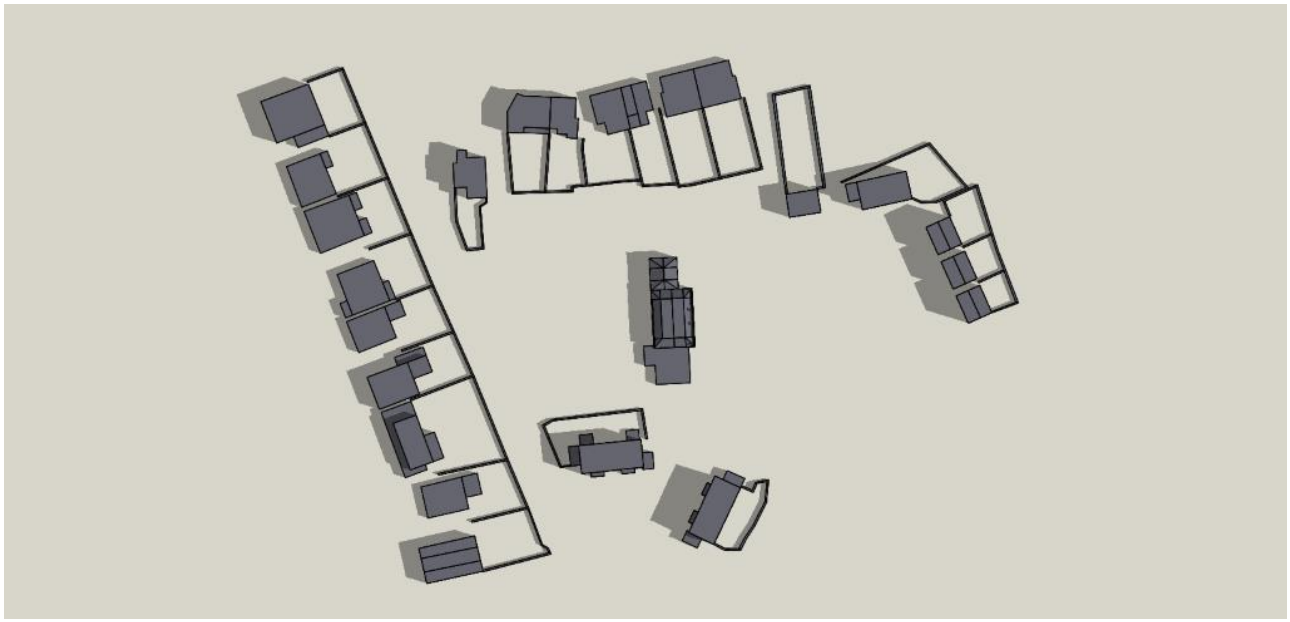
7am – With Proposed Development



21st June
9am – Current Scenario



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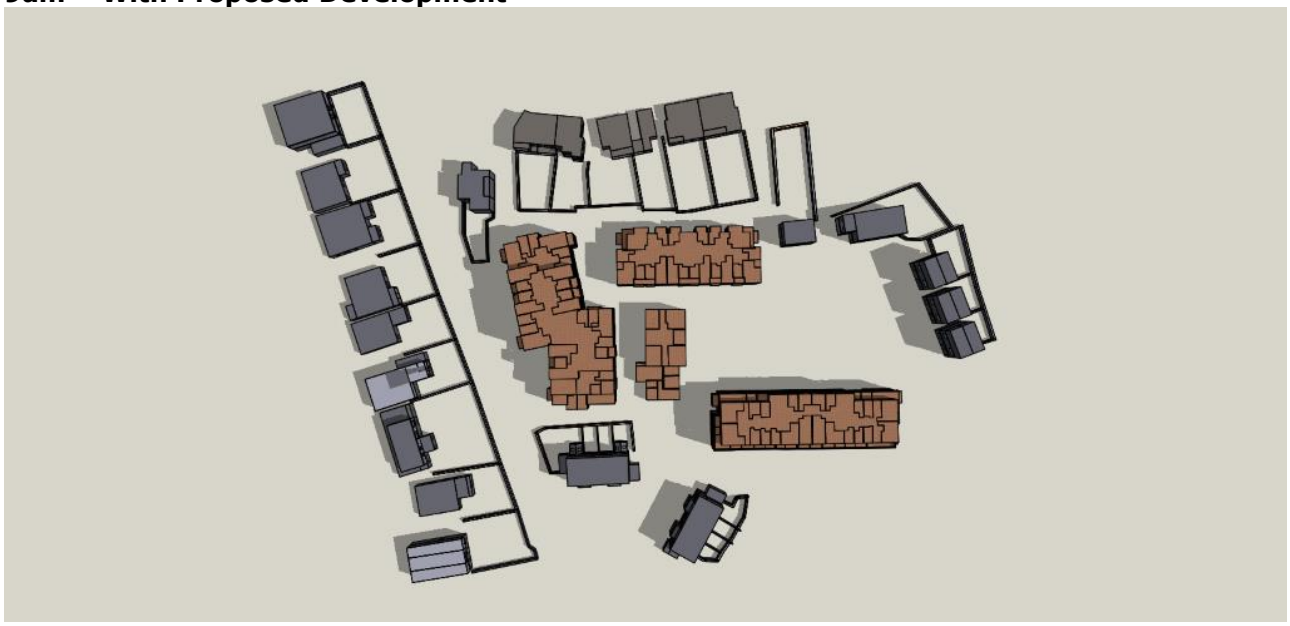
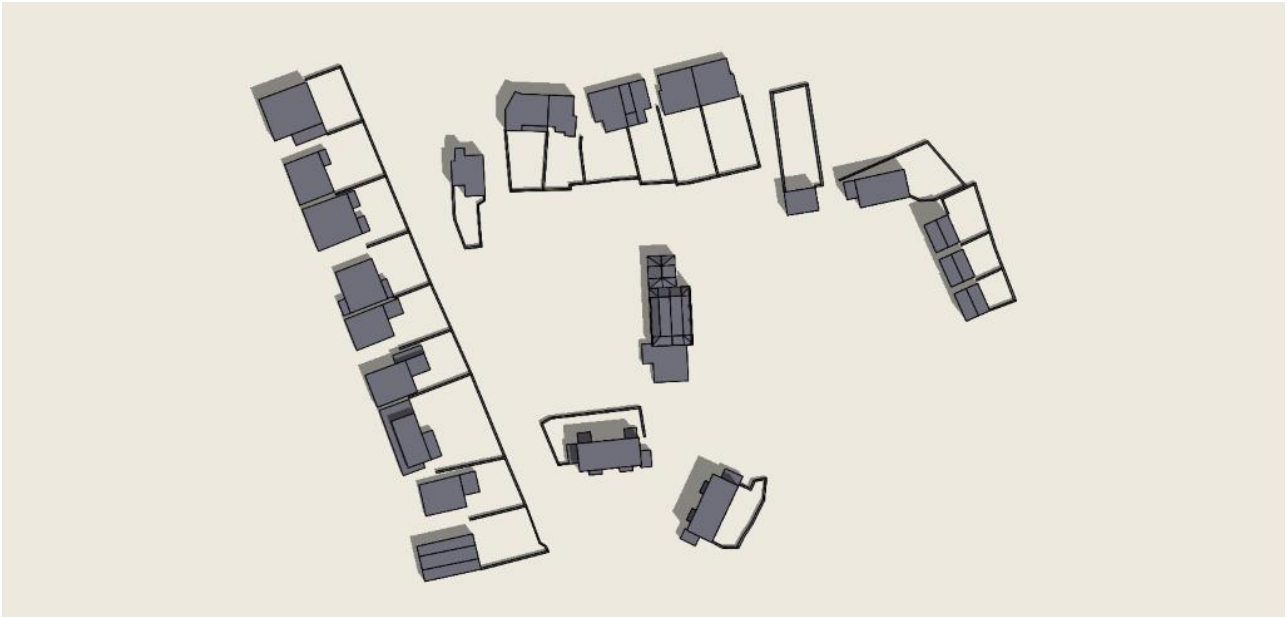
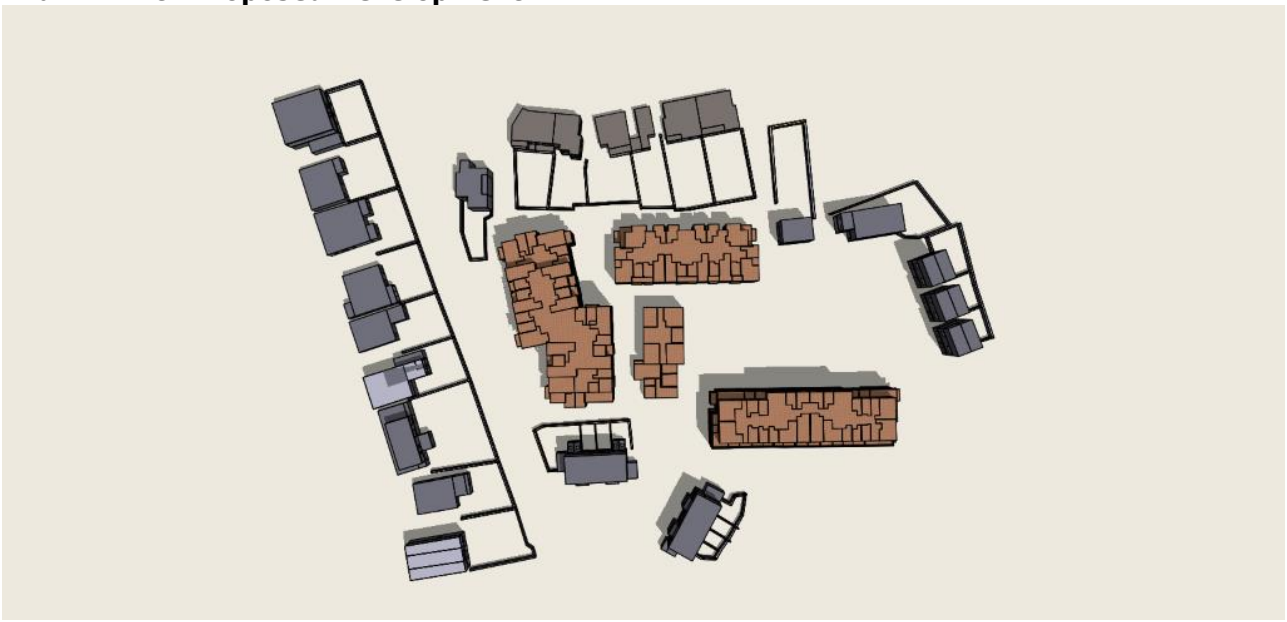
9am – With Proposed Development



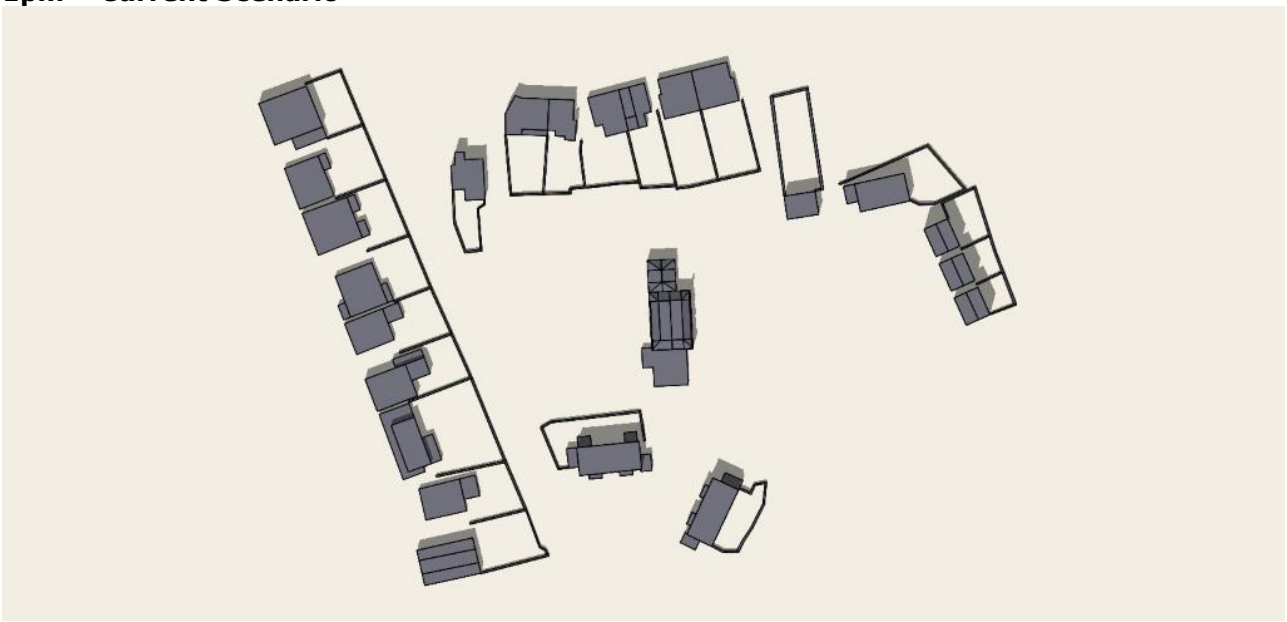
21st June
11am – Current Scenario



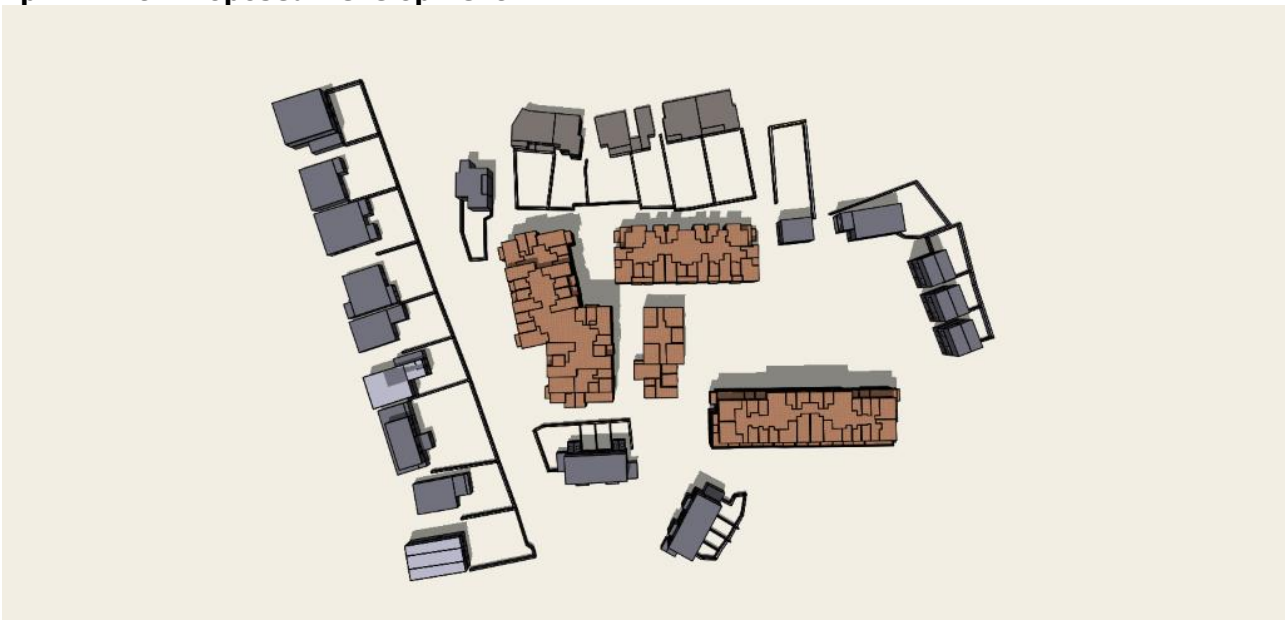
21st June
11am – With Proposed Development



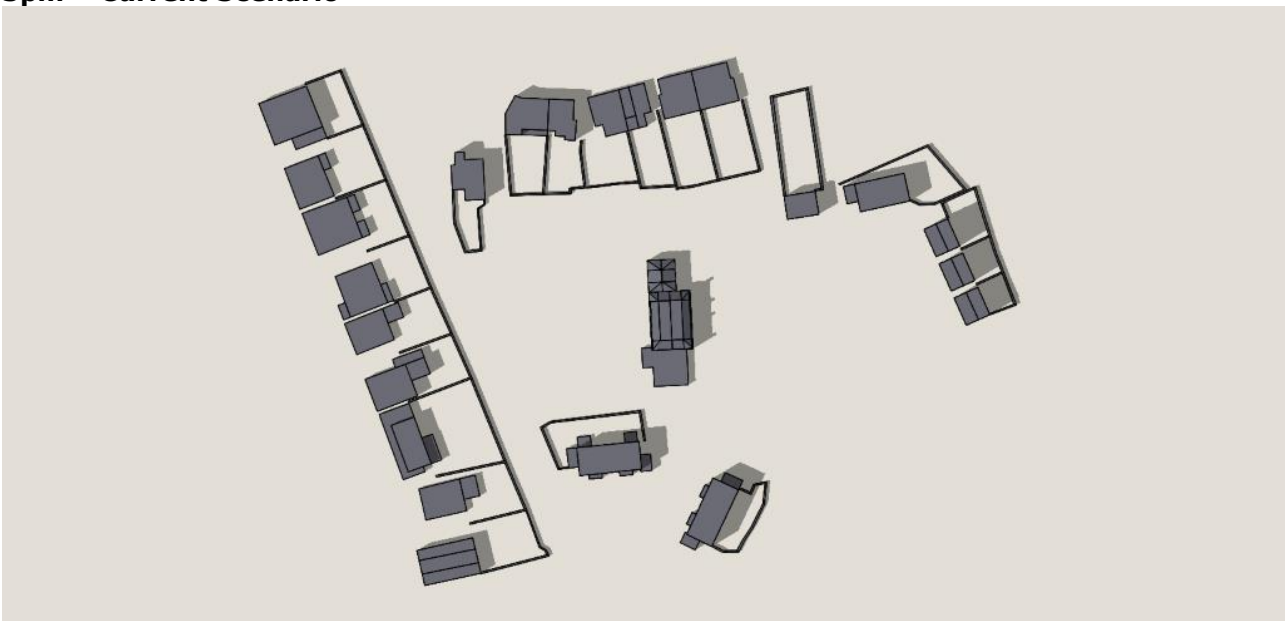
21st June
1pm – Current Scenario



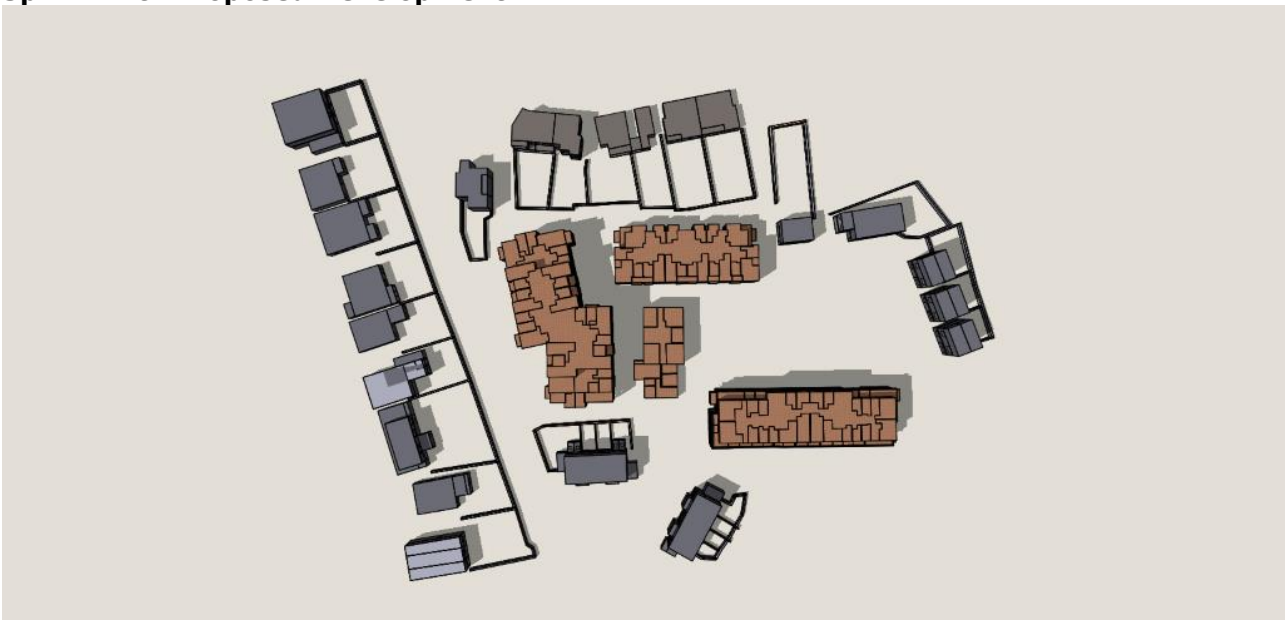
21st June
1pm – With Proposed Development



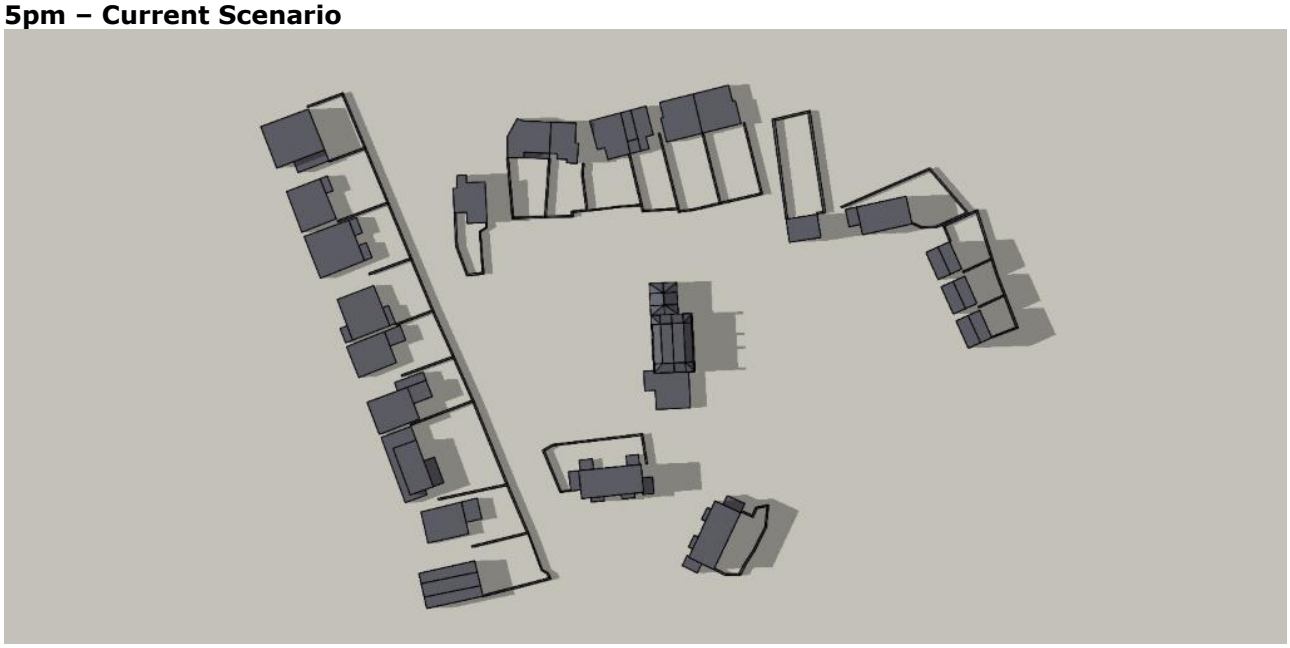
21st June
3pm – Current Scenario



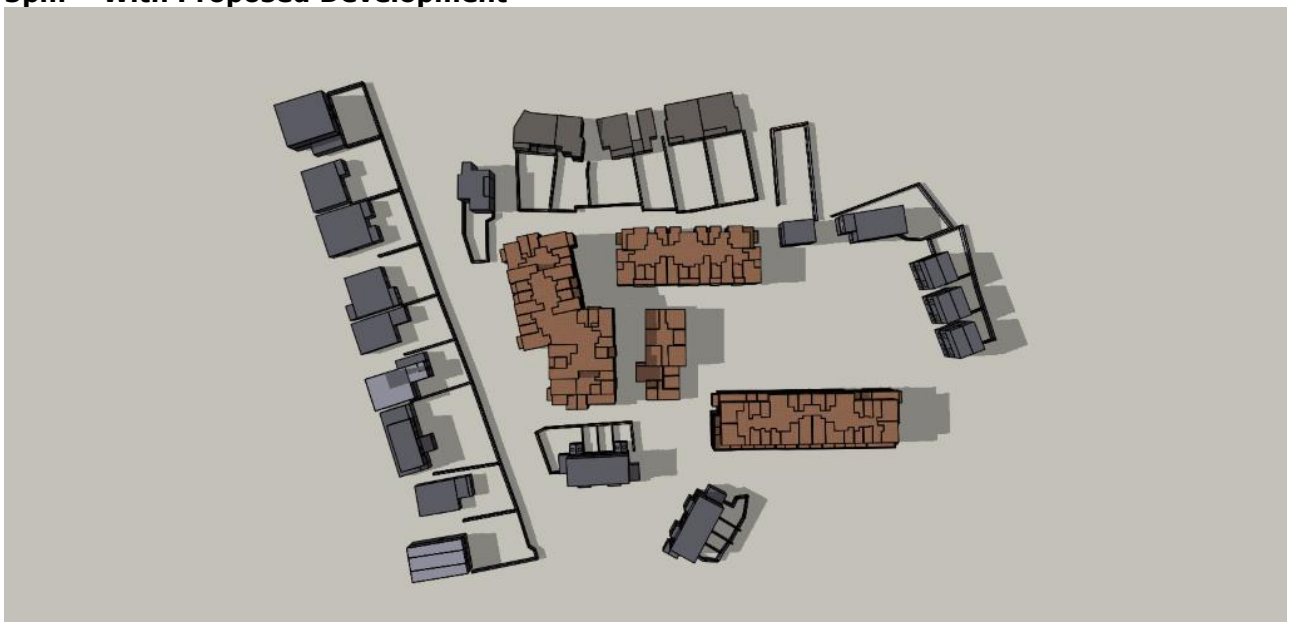
21st June
3pm – With Proposed Development



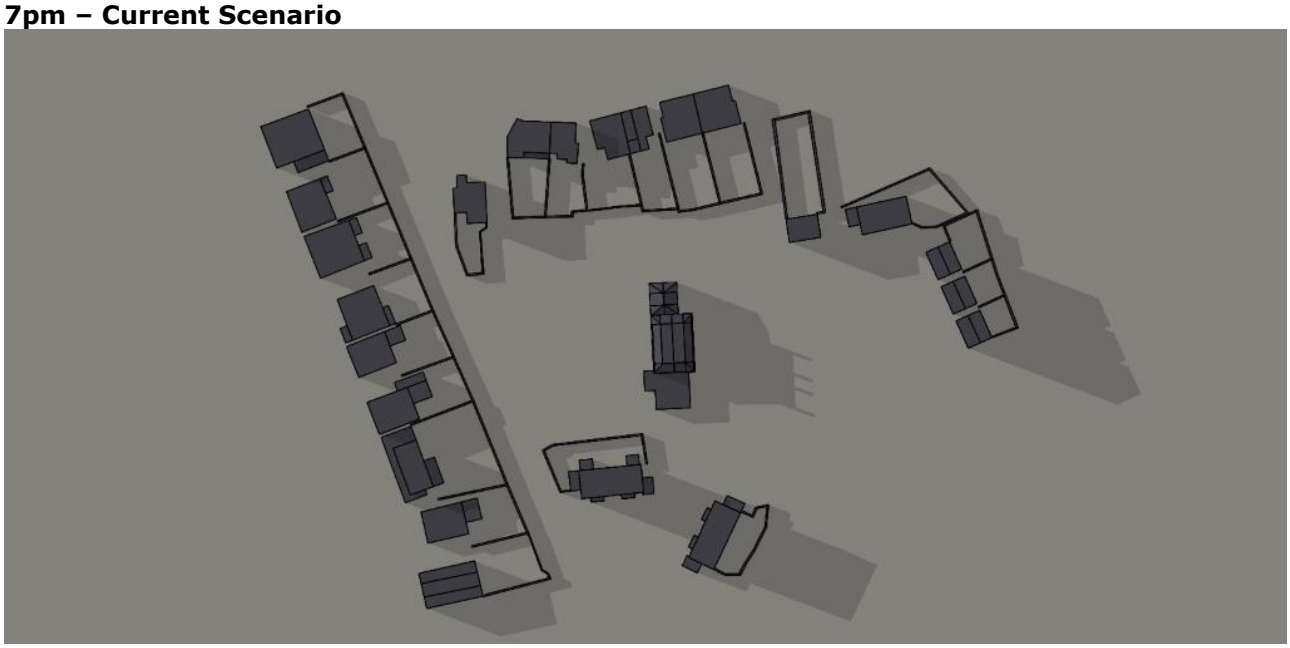
21st June
5pm – Current Scenario



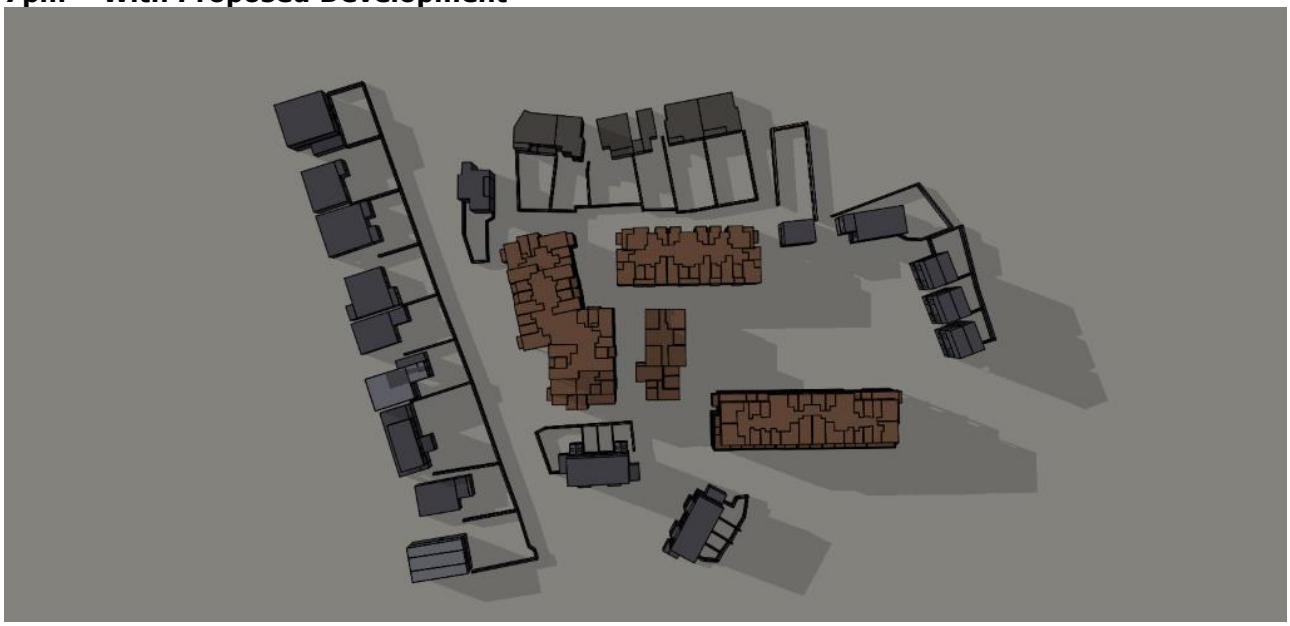
21st June
5pm – With Proposed Development



21st June
7pm – Current Scenario



21st June
7pm – With Proposed Development



21st June
9pm – Current Scenario

21st June
9pm – With Proposed Development

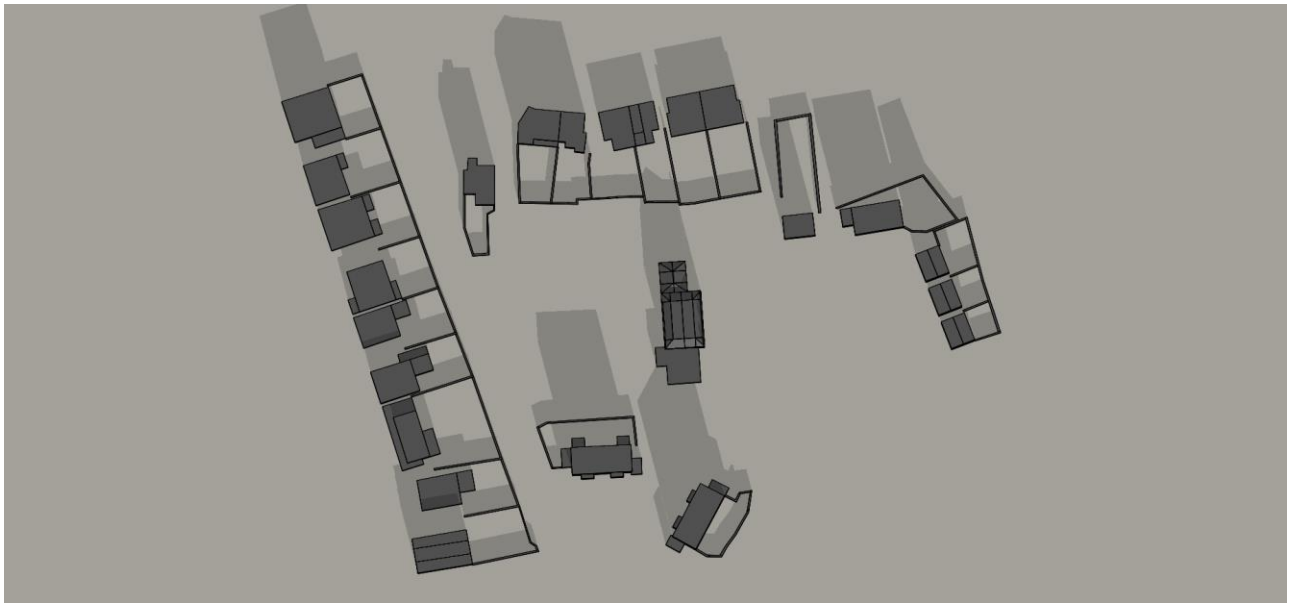
21st December
7am – Current Scenario

21st December
7am – With Proposed Development

21st December
9am – Current Scenario

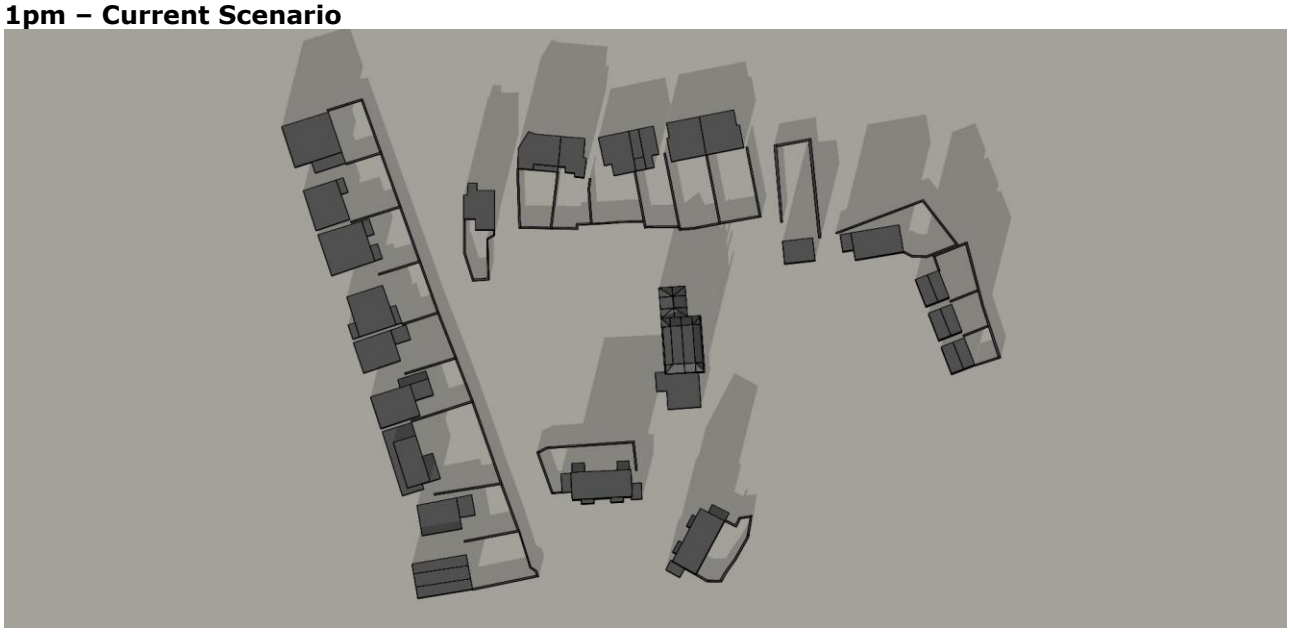
21st December
9am – With Proposed Development

21st December
11am – Current Scenario

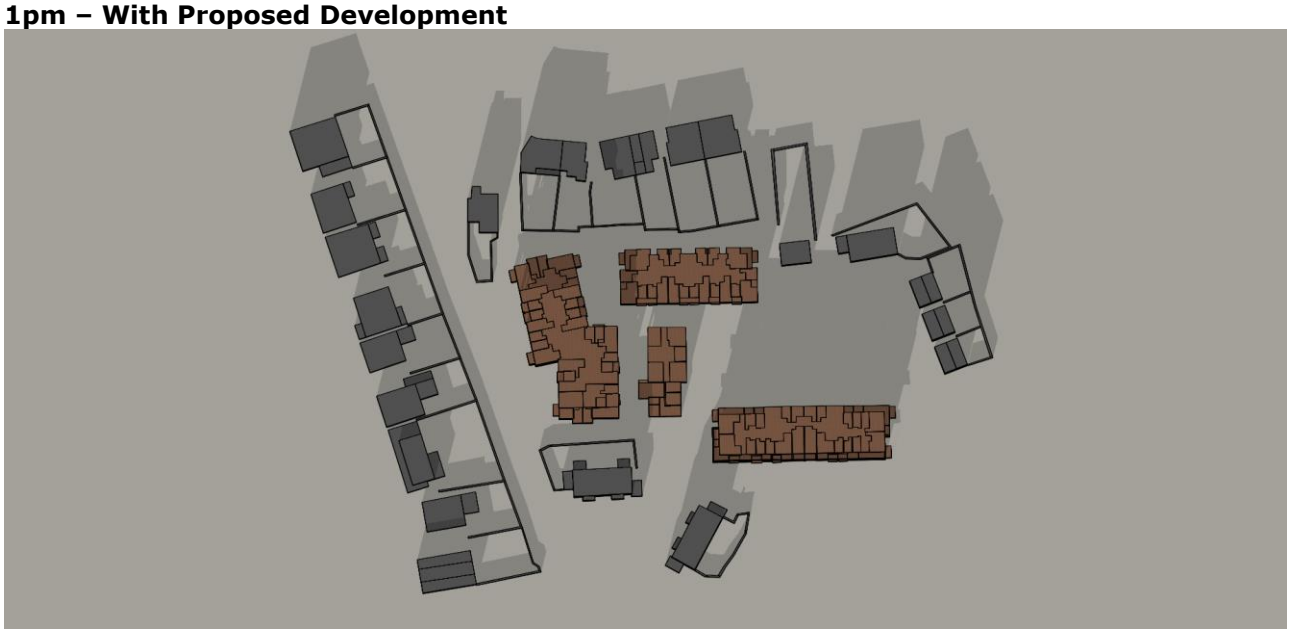


21st December
11am – With Proposed Development

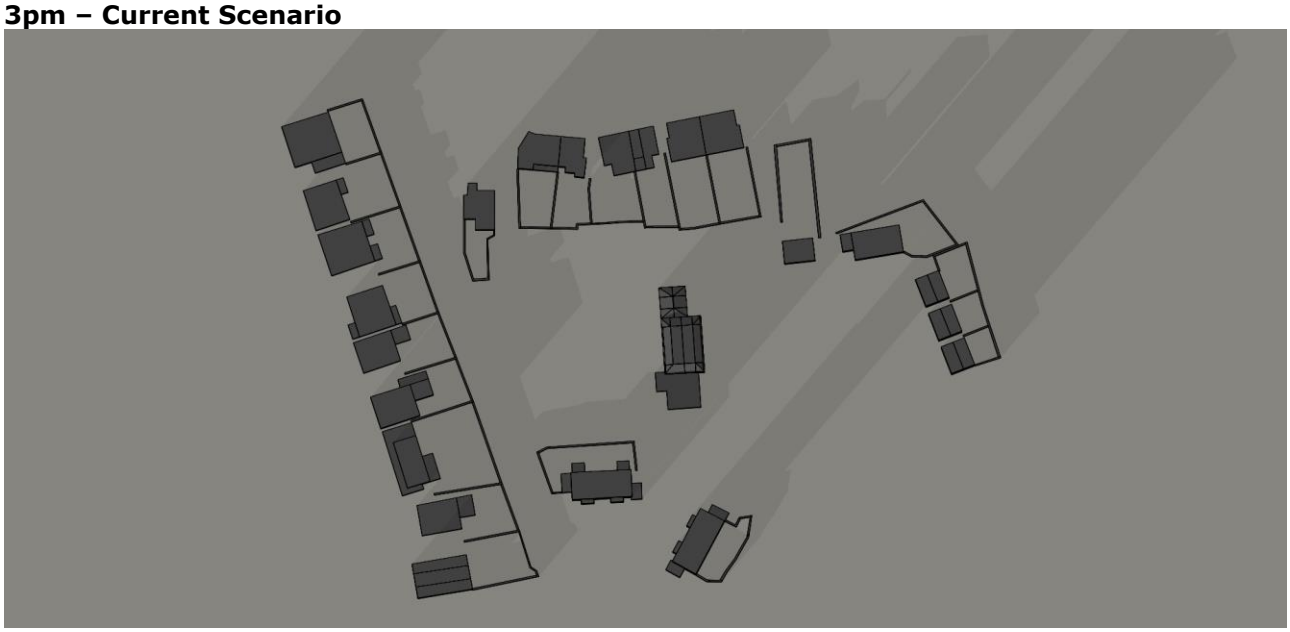
21st December
1pm – Current Scenario



21st December
1pm – With Proposed Development



21st December
3pm – Current Scenario



21st December
3pm – With Proposed Development

21st December
5pm – Current Scenario

21st December
5pm – With Proposed Development

APPENDIX F – BRE GUIDE APPENDIX I ENVIROMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT

I1 The guidelines in this book may be used as the basis for environmental impact assessment, where the skylight and sunlight impact of a new development on its surroundings are taken into account.

I2 Where a new development affects a number of existing buildings or open spaces, the clearest approach is usually to assess the impact on each one separately. It is also clearer to assess skylight and sunlight impacts separately.

I3 Adverse impacts occur when there is a significant decrease in the amount of skylight and sunlight reaching an existing building where it is required, or in the amount of sunlight reaching an open space.

I4 The assessment of impact will depend on a combination of factors, and there is no simple rule of thumb that can be applied.

I5 Where the loss of skylight or sunlight fully meets the guidelines in this book, the impact is assessed as negligible or minor adverse. Where the loss of light is well within the guidelines, or only a small number of windows or limited area of open space lose light (within the guidelines), a classification of negligible impact is more appropriate. Where the loss of light is only just within the guidelines, and a larger number of windows or open space area are affected, a minor adverse impact would be more appropriate, especially if there is a particularly strong requirement for daylight and sunlight in the affected building or open space.

I6 Where the loss of skylight or sunlight does not meet the guidelines in this book, the impact is assessed as minor, moderate or major adverse. Factors tending towards a minor adverse impact include:

- only a small number of windows or limited area of open space are affected
- the loss of light is only marginally outside the guidelines
- an affected room has other sources of skylight or sunlight
- the affected building or open space only has a low level requirement for skylight or sunlight
- there are particular reasons why an alternative, less stringent, guideline should be applied (see Appendix F).

I7 Factors tending towards a major adverse impact include:

- a large number of windows or large area of open space are affected
- the loss of light is substantially outside the guidelines
- all the windows in a particular property are affected
- the affected indoor or outdoor spaces have a particularly strong requirement for skylight or sunlight, eg a living room in a dwelling or a children's playground.

I8 Beneficial impacts occur when there is a significant increase in the amount of skylight and sunlight reaching an existing building where it is required, or in the amount of sunlight reaching an open space. Beneficial impacts should be worked out using the same principles as adverse impacts. Thus a tiny increase in light would be classified as a negligible impact, not a minor beneficial impact.

I9 An adverse impact on one property cannot be balanced against negligible or beneficial impacts on other properties. In these situations it is more appropriate to quote a range of impacts.

I10 The provision of new dwellings, or commercial or industrial buildings, or private gardens that meet the skylight or sunlight guidance in this book should not be classified as a beneficial daylight or sunlight impact on the local environment. However, the provision of community buildings or public open spaces with good skylight and/or sunlight could be classed as a beneficial impact.