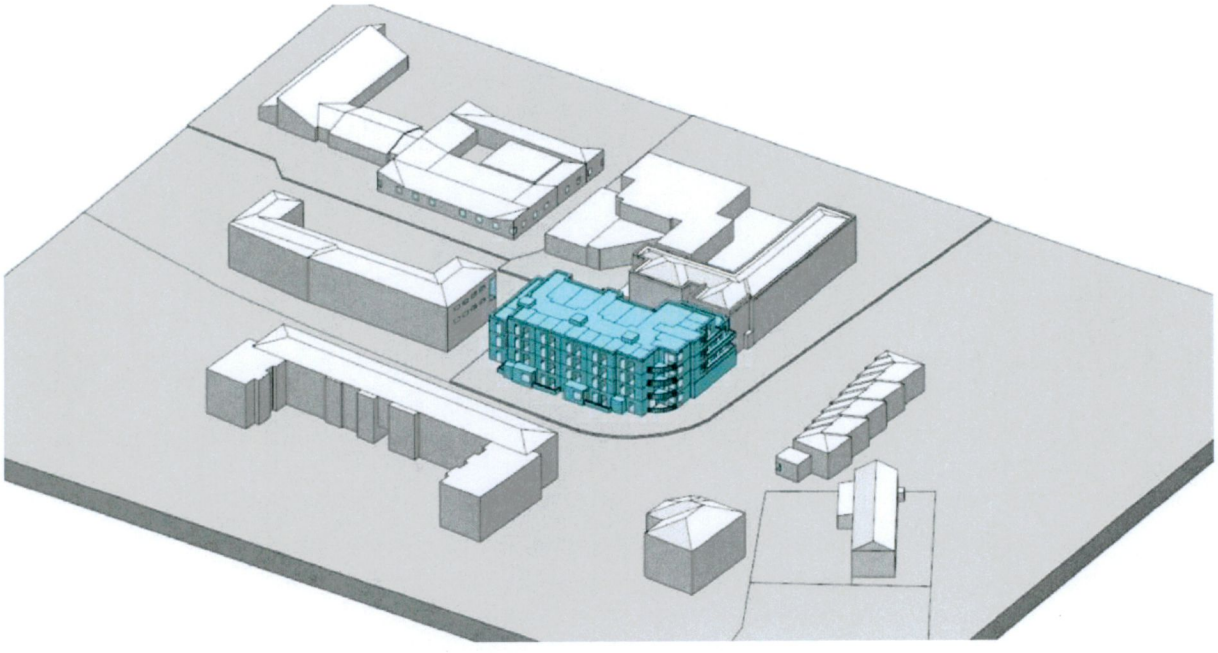
The Finches Development, Rowlagh.

Daylight, Sunlight and Overshadowing Study



Report For: Old Nangor Road Limited

Project No: 15870

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Issued For:	**Prepared by:**	**Checked by:**	
Final Report	Sergio Malpica Lighting Consultant	Dónal O'Connor / Associate Director Douglas Bell / Consultancy Manager – BIM & Lighting	
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1 Executive Summary

This report outlines the analysis undertaken to quantify the Sunlight and Daylight performance of the proposed residential development at The Finches Development, Nielstown Road, Rowlagh, Dublin 22. The report focuses on measuring the daylight and sunlight impact of the proposed development when compared to the existing situation. The report also focuses on the proposed design. The following can be concluded based on the studies undertaken:

1.1 Shadow Analysis

The following observations are observed with regards to the shadow analysis carried out on the proposed Finches Development when comparing it to the existing situation.

Nielstown Road – Chaplains Row

No additional shading visible from the proposed development on these existing residential properties during the months of June and December with minor additional shading noted early morning in March.

Colinstown Road – Chaplains Terrace

No additional shading visible from the proposed development on these existing residential properties during the months of March and June. Minor additional shading noted mid morning and early afternoon in December.

Colinstown Road – Chaplains Place

No additional shading visible from the proposed development on these existing residential properties during the months of March and December. Minor additional shading noted late evening in June.

Rowlagh Health Centre

No additional shading visible from the proposed development on this existing building during the months of March, June and December.

The comments above can be further quantified by the analysis carried out within the Sunlight to Existing Amenity Areas, Sunlight to Existing Buildings and Daylight to Existing Buildings sections of this report.

1.2 Sunlight to Amenity Areas

Section 3.3.17 of BRE's Site Layout Planning for Daylight and Sunlight states that for a space to appear adequately sunlit throughout the year, at least half (50%) of the garden or amenity area should receive at least 2 hours of sunlight on the 21st of March.

Existing Private Amenity Areas

The results demonstrate the existing neighbouring amenity areas will not be affected by the proposed development and will continue to receive the same level of sunlight even with the proposed development in place. 5 out of 5 of the Existing Private Amenity areas on Nielstown Road – Chaplains Row are achieving the recommended 2 hours of sunlight on the 21st of March.

Proposed Communal Amenity Areas

For the Proposed Communal Amenity areas, 65% of the combined areas are achieving more than 2 hours of sunlight on the 21st of March across 50% of their area. The individual areas themselves are also above the 50% minimum recommendation, thus the Proposed Communal Amenity provisions are meeting the recommended targets and are high quality spaces in terms of sunlight.

1.3 Sunlight to Existing Buildings

This study considers the proposed scheme and tests if the APSH results for the windows of the adjacent existing buildings are greater than 25% annual and 5% winter sunlight and are greater than 0.8 times their former value with the proposed development in place and less there is less than a 4% reduction of the annual probable sunlight hours.

Of the 53 points tested, 100% meet the BRE guidelines in both instances (annual & winter).

1.4 Sunlight to Proposed Development

Within the BS 8206-2:2008 standard, when discussing annual probable sunlight hours regarding proposed developments, it is noted that:

"The degree of satisfaction is related to the expectation of sunlight. If a room is necessarily North facing or if the building is in a densely-built urban area, the absence of sunlight is more acceptable than when its exclusion seems arbitrary".

This is also reflected in the correlating BRE guidance which notes:

"The BS 8206-2 criterion applies to rooms of all orientations, although if a room faces significantly north of due east or west it is unlikely to be met."

Of the 29 no. points tested, 20 no. points (69%) meet the BRE recommended values. The windows that do not meet this recommendation are predominantly as a result of their orientation, i.e. north facing windows (View 3) and the provision of a balcony. When the north facing spaces are excluded the overall percentage rises to 91%. This percentage increases again to 100% for the winter period in isolation which is when sunlight is most valued because of the limited availability at this time of year.

1.5 Daylight to Existing Buildings

The Vertical Sky Component for 97% (93 of 96) of the points tested have a value greater than 27% or not less than 0.8 times their former value (that of the Existing Situation). The three values which fall below the criteria are in the range 25.85 – 26.79 and as such are only just below the required 27% and would be classed as a minor adverse impact.

1.6 Daylight to Proposed Development

Across the proposed development, 96% of the tested rooms are achieving Average Daylight Factors (ADF) in accordance with the BRE Guide / BS 8206-2:2008 when Living/Kitchen/Dining spaces are assessed as whole rooms against a 2% ADF target and Bedrooms against a 1% ADF target. The rooms that do not achieve this target are as a result of their location at corners and the provision of balconies. However, overall the quality of daylight provision across the development can be considered high.

For combined Living/Kitchen/Dining areas, the living area is typically treated as the main area of activity, with the kitchen being placed at the back of the space. This design decision is understandable as the kitchen area is typically a transient space as its primary functional purpose is to serve as a food preparation area. Additionally, not every space within a commercially viable apartment development can be in direct connection with an exterior elevation, making the kitchen the obvious choice for this position given that it is a transient space that will require supplementary electric lighting.

Compensatory Measures

With regards to internal daylighting, Section 6.7 of the Sustainable Urban Housing: Design Standards for New Apartments December 2020, states the following:

"Where an applicant cannot fully meet all of the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, which planning authorities should apply their discretion in accepting taking account of its assessment of specific (sic). This may arise due to design constraints associated with the site or location and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution."

Furthermore, Section 3.2 of the Urban Development and Building Heights: Guidelines for Planning Authorities December 2018, states the following:

Where a proposal may not be able to fully meet all the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, in respect of which the planning authority or An Bord Pleanála

should apply their discretion, having regard to local factors including specific site constraints and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution.

Based on the above statements, compensatory measures have been incorporated into the design of the proposed development where rooms do not achieve the daylight provision targets in accordance with the standards they were assessed against. The compensatory measures are summarised as follows:

- 70% of the apartment units have a floor area 10% greater than the minimum floor area requirements as required by the Design Standards (Dec 2020). Note that larger floor areas make it more difficult to achieve the recommended daylight levels. However, larger windows have been incorporated into the design which also improves the view out for the building occupants.
- 80% of the apartment units are dual aspect which is above the 33% minimum requirement as required by the Design Standards (Dec 2020). As a result, more apartment units than the recommended minimum will achieve quality daylight from dual-aspect orientations.
- More than double the minimum requirement of communal open space has been provided above the areas outlined by the Design Standards (Dec 2020).

There is also a need to create a high-quality urban streetscape along the main street, requiring increased height along this road to create an appropriate presence. The daylight results achieved are to a high standard having regard to the fact that the above referenced factors (increased height and larger apartment sizes) render it more difficult to achieve target values for daylight performance.

The overall compliance rate across the development based on an alternative ADF value of 1.5% for combined Living, Kitchen and Dining areas is 100% across all tested rooms within the apartment blocks.

1.7 Discussion

It is important to note that the recommendations within the BRE Guide are not mandatory and the guide itself states *"although it gives numerical guidelines these should be interpreted flexibly because natural lighting is only one of many factors in site layout design".*

Whilst the results shown relate to the criteria as laid out in the BRE Guide, it is important to note that the BRE targets are guidance only and should therefore be used with flexibility and caution when dealing with different types of sites.

In addition, the foreword of BS 8206-2:2008 also states *"The aim of the standard is to give guidance to architects, builders and others who carry out lighting design. It is recognised that lighting is only one of many matters that influence fenestration. These include other aspects of environmental performance (such as noise, thermal equilibrium and the control of energy use), fire hazards, constructional requirements, the external appearance and the surroundings of the site. The best design for a building does not necessarily incorporate the ideal solution for any individual function. For this reason, careful judgement needs to be exercised when using the criteria given in the standard for other purposes, particularly town planning control."*

Taking all of the above information into account and based on the results from each of the assessments undertaken, the proposed development performs well when compared to the recommendations in the BRE Guide 2nd Edition and BS 8206-2:2008.

2 Introduction

This report outlines the analysis undertaken to quantify the Sunlight and Daylight performance of the proposed residential development at Lakeview, Claregalway. The report focuses on measuring the daylight and sunlight impact of the proposed development when compared to the existing situation. The report also focuses on the proposed design.

2.1 Analysis Performed

The various daylight and sunlight assessments that were undertaken using the IES VE software are based on recommendations outlined in the BRE *'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice'* guide (BRE Guidelines), which is also referred to as BRE 209, and the "BS 8206-2:2008: Lighting for Buildings - Part 2: Code of Practice for Daylighting". For clarity, the assessments that were undertaken are summarised below as well as the reference standards that were used for each (where applicable):

- **Shadow Analysis**
  - Assessed using shadow images cast at key times throughout the year, i.e. March 21st, June 21st and December 21st
- **Sunlight to Amenity Spaces**
  - Assessed using annual Solar Exposure calculations
- **Sunlight to Existing Buildings**
  - Assessed using the Annual Probable Sunlight Hours (APSH) method in accordance with the BRE Guide / BS 8206-2:2008
- **Sunlight to Proposed Buildings**
  - Assessed using the Annual Probable Sunlight Hours (APSH) method in accordance with the BRE Guide / BS 8206-2:2008
  - Assessed using Solar Exposure calculations in accordance with IS EN 17037:2018
- **Daylight to Existing Buildings**
  - Assessed using the Vertical Sky Component (VSC) method in accordance with the BRE Guide / BS 8206-2:2008
- **Daylight to Proposed Development**
  - Assessed using the Average Daylight Factor (ADF) method in accordance with the BRE Guide / BS 8206-2:2008.

2.2 Development Description

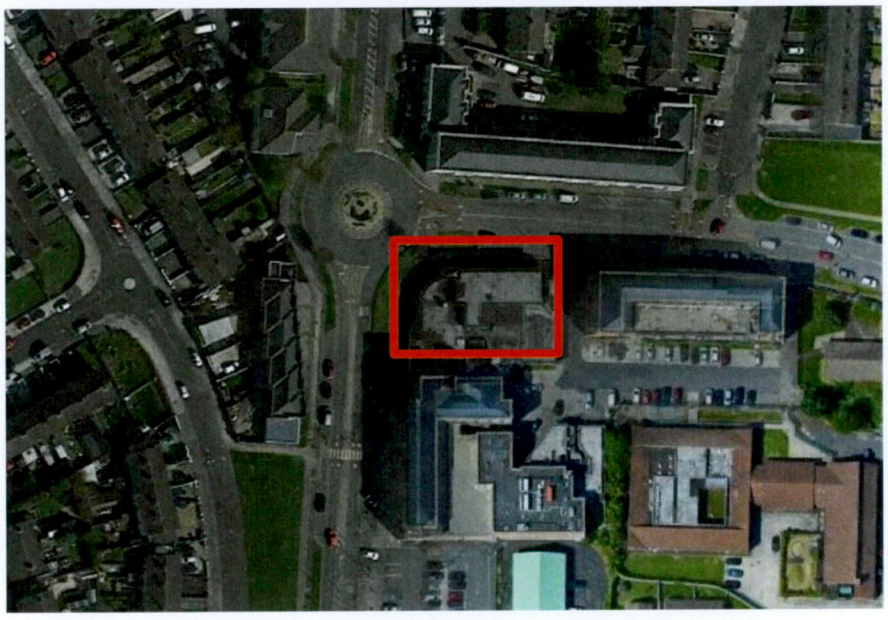
Mixed development consisting of 1 public house and 26 apartments comprising of: the demolition of the existing single storey public house (area 910sq.m); construction of a 4 storey apartment block within the footprint of the site (site area 1267sq.m), comprising a total of 26 apartments (4 one bedroom units, 22 two bedroom units) and smaller Public House at ground level (area 156sq.m), (total area 2717sqm); all apartments have balconies/terraces; carpark for 12 cars (including 1 disabled space), bin store and bicycle stands at ground level; communal areas include 1st floor courtyard above carpark and 3rd floor roof terraces for apartments; streetscape proposals within site boundaries to facilitate and enhance the public realm.

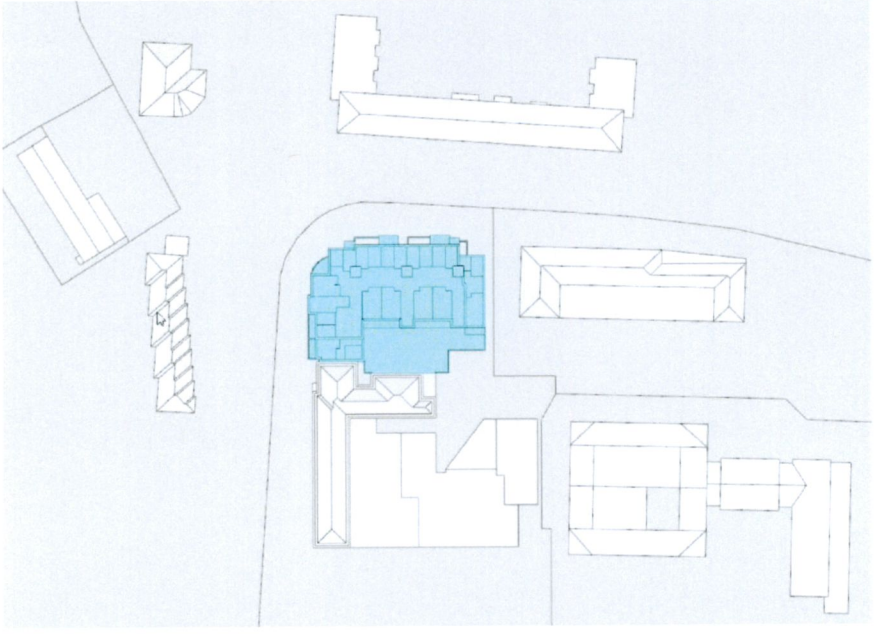
3 Methodology

3.1 Orientation

The model orientation has been taken from drawings provided by the Architect and the resulting angle shown below used in the analysis.

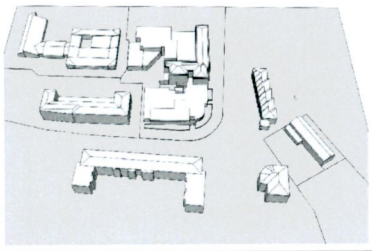
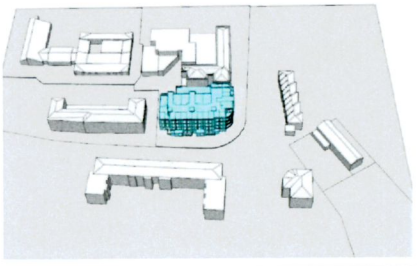
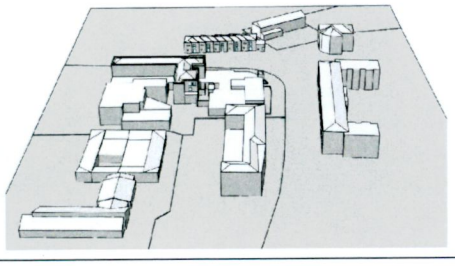
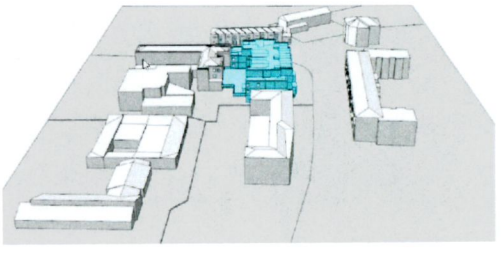
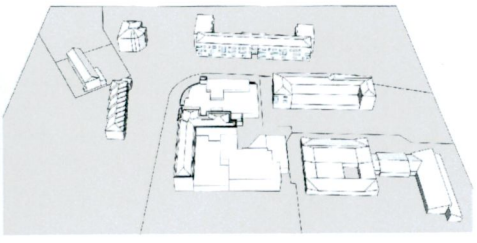
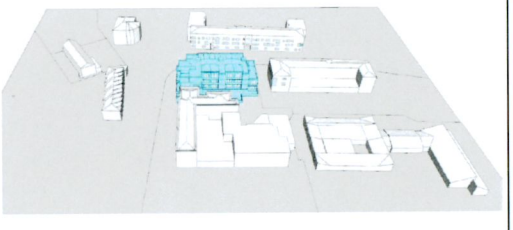
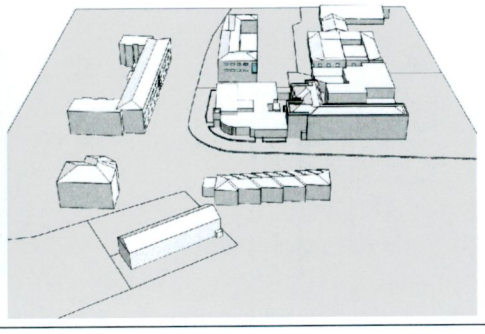
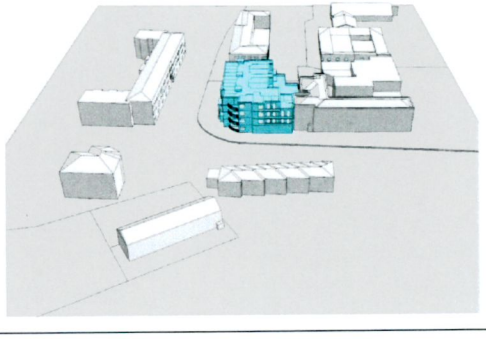
Orientation





3.2 Model Geometry

The following images show the model created from the architectural information provided and the use of Google/Bing maps where information was absent.

	Existing Situation	Proposed Scheme
View looking from North of Site		
View looking from East of Site		
View looking from South of Site		
View looking from West of Site		

4 BRE – Site Layout Planning for Daylight and Sunlight (2nd Edition)

Access to daylight and sunlight is a vital part of a healthy environment. Sensitive design should provide sufficient daylight and sunlight to new residential developments while not obstructing light to existing homes nearby.

The BRE Guide advises on planning developments for good access to daylight and sunlight and is widely used by local authorities to help determine the performance of new developments.

4.1 Impact Classification Discussion

BRE guidance in Appendix I – Environmental Impact Assessment suggests impact classifications as minor, moderate and major adverse. It provides further classifications of these impacts with respect to criteria summarised in the table below.

Where the loss of skylight or sunlight fully meets the guidance in the BRE Guide, the impact is assessed as negligible or minor adverse. Where the loss of skylight or sunlight does not meet the BRE Guide, the impact is assessed as minor, moderate or major adverse.

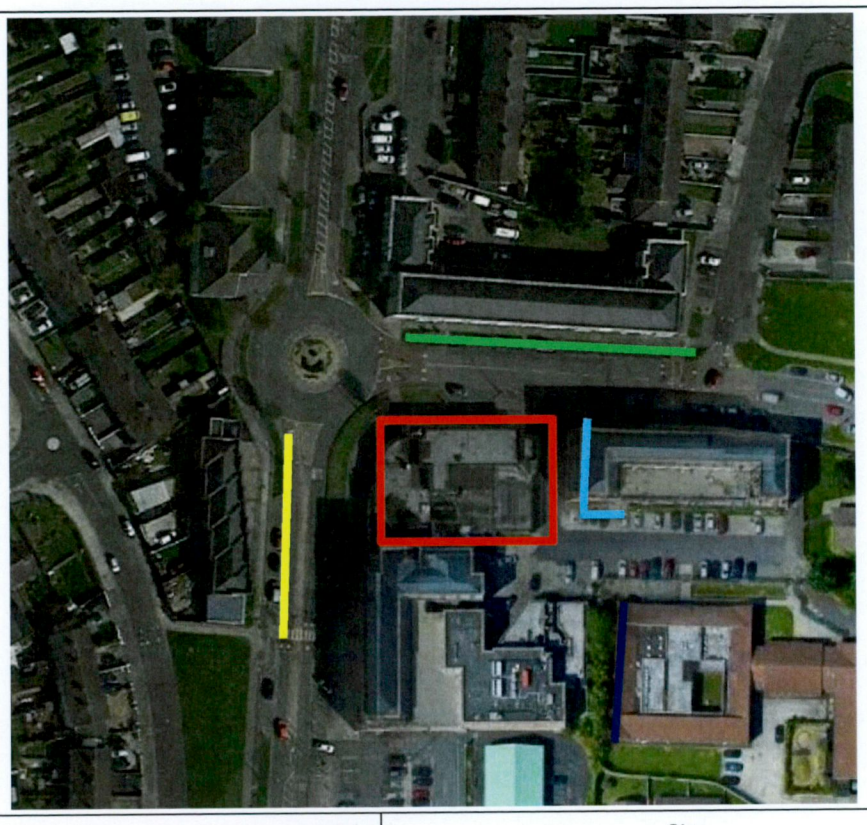
Impact	Description
Negligible adverse impact	• *Loss of light well within guidelines,* ***or*** • *only a small number of windows losing light (within the guidelines)* ***or*** *limited area of open space losing light (within the guidelines)*

Minor adverse impact (a)	• *Loss of light only just within guidelines* ***and***
	  ○ *a larger number of windows are affected* ***or***
	  ○ *larger area of open space is affected (within the guidelines)*

Minor adverse impact (b)	• *only a small number of windows or limited open space areas 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*
Major adverse impact	• *large number of windows or large open space areas 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 (living rooms / playground)*

4.2 Potential Sensitive Receptors

To help understand the potential impact to surrounding buildings, potential sensitive receptors were identified as illustrated below.



	Site
	Nielstown Road – Chaplains Row
	Colinstown Road – Chaplains Terrace
	Collinstown Road - Chaplains Place
	Rowlagh Health Centre

5 Shadow Analysis

The statistics of Met Eireann, the Irish Meteorological Service, show that the sunniest months in Ireland are May and June, based on 1981-2010 averages or latest: https://www.met.ie/climate/30-year-averages.

The following can also be shown from the climate data from Shannon Airport, the closest weather data to the proposed site:

- During December a mean daily duration of 1.4 hours of sunlight out of a potential 7.1 hours sunlight each day is received (i.e. only 20% of potential sunlight hours).
- During June a mean daily duration of 5.2 hours of sunlight out of a potential 15.8 hours sunlight each day is received (i.e. only 33% of potential sunlight hours).

Therefore, the impacts caused by overshadowing are generally most noticeable during the summer months and least noticeable during the winter months.

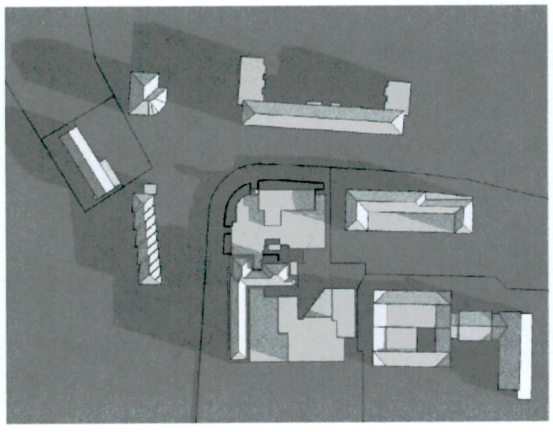
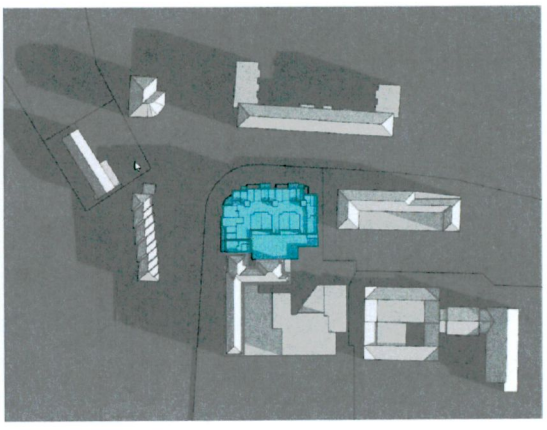
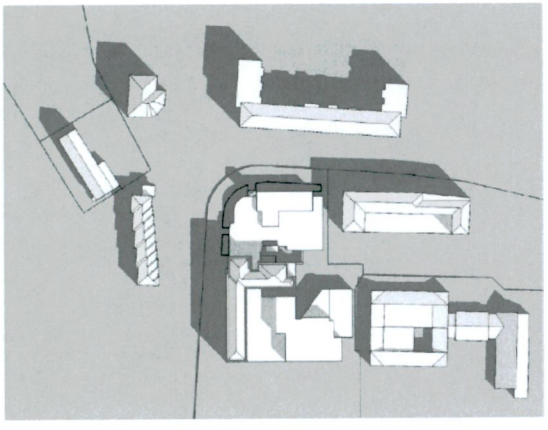
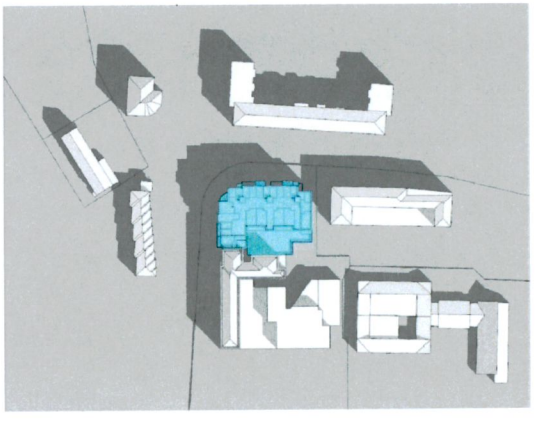
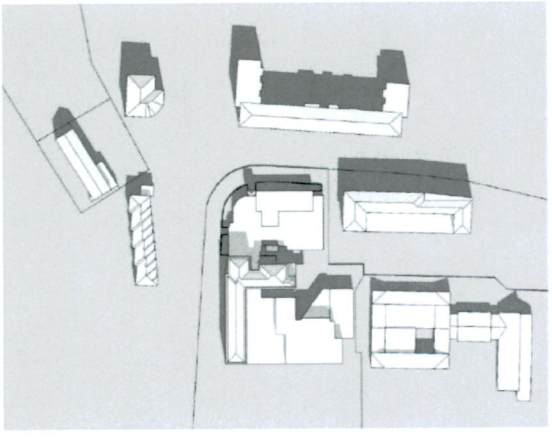
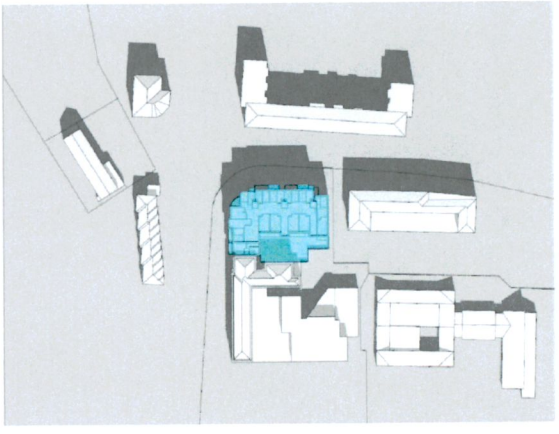
This section will consider the shadows cast by the proposed development on the following dates:

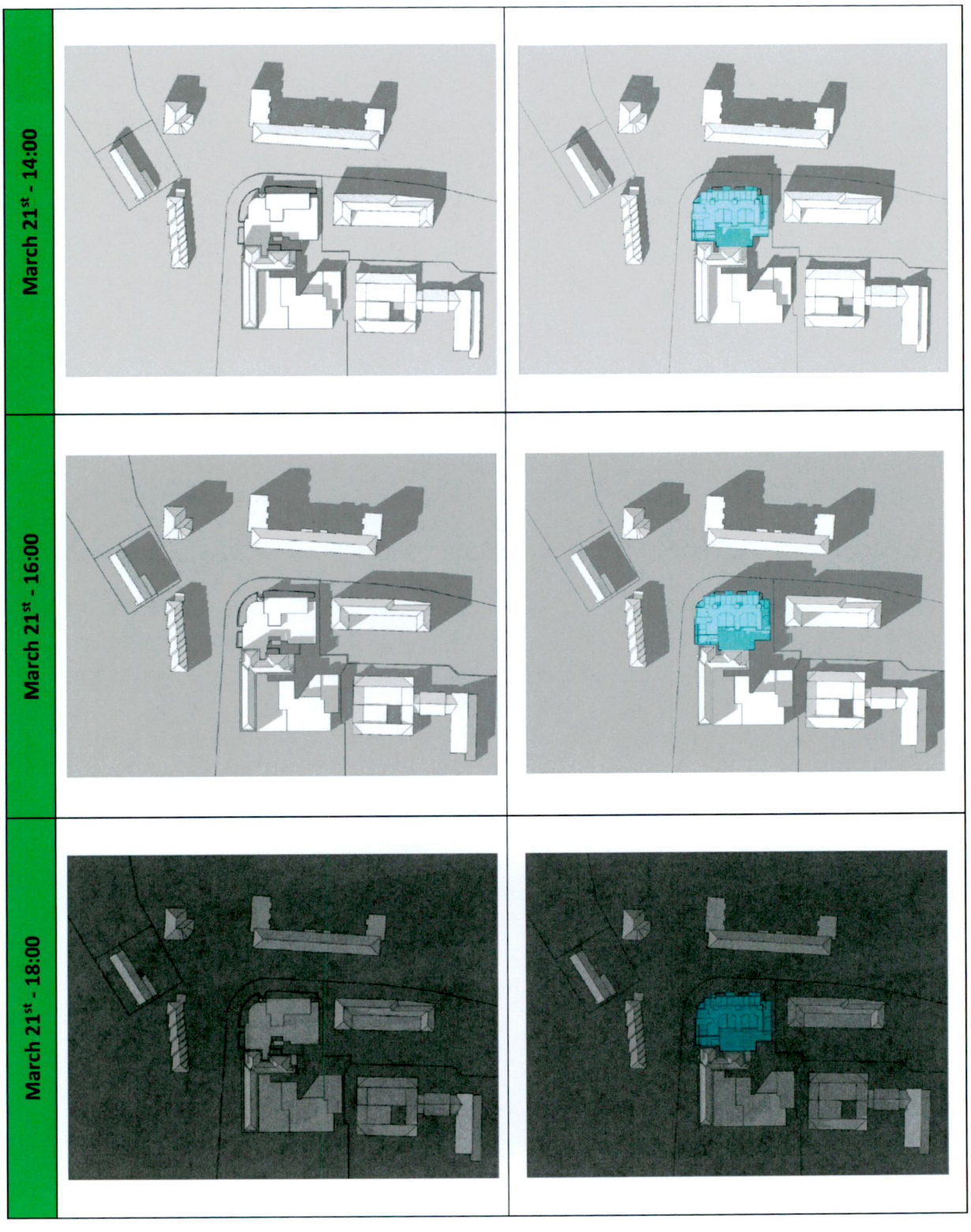
- March 21st / September 21st (Equinox)
- June 21st (Summer Solstice)
- December 21st (Winter Solstice)

These images illustrate shadows cast for 'perfect sunny' conditions with no clouds and assumed that the sun is shining for every hour shown. Based on the information above, it is important to remember that this is not always going to be the case.

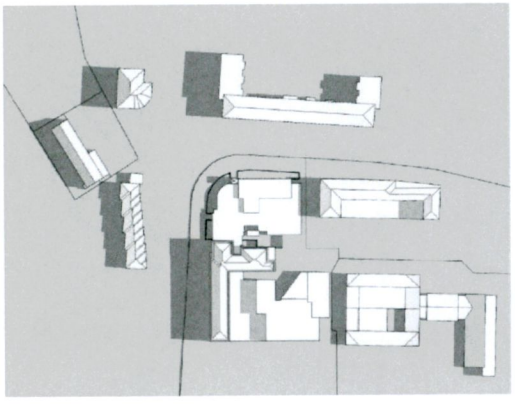
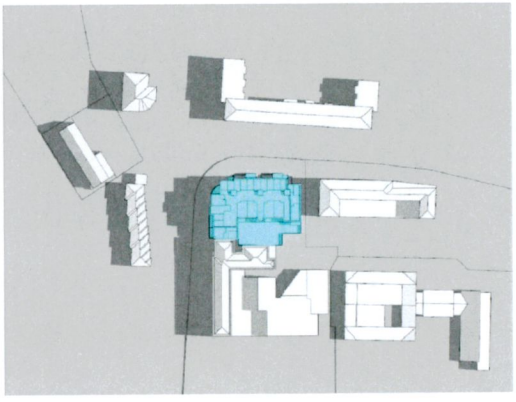
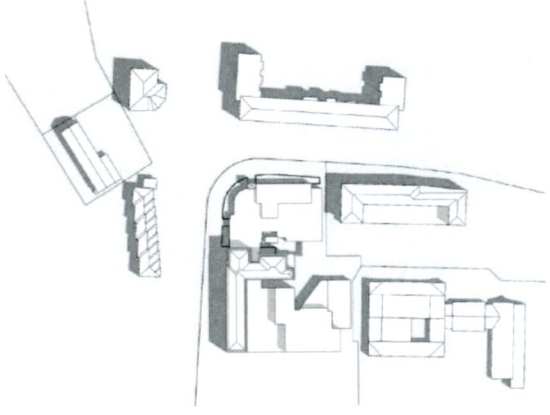
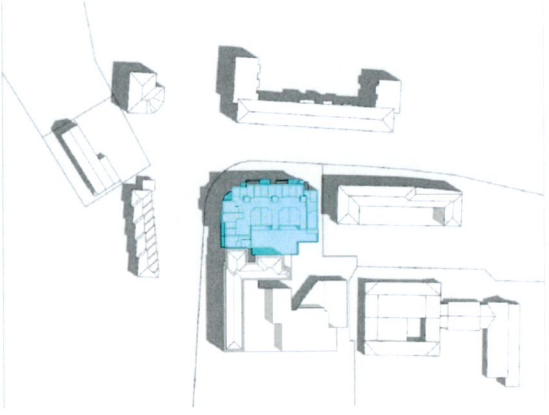
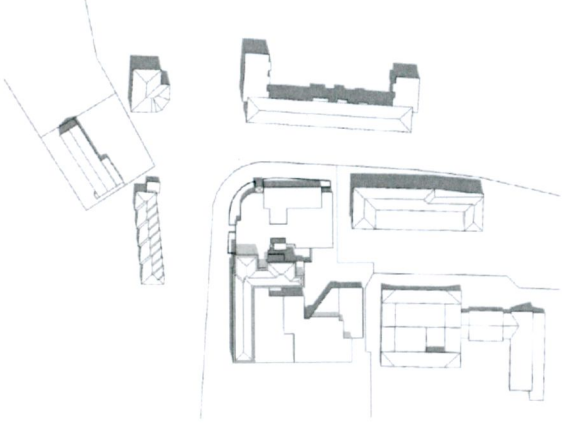
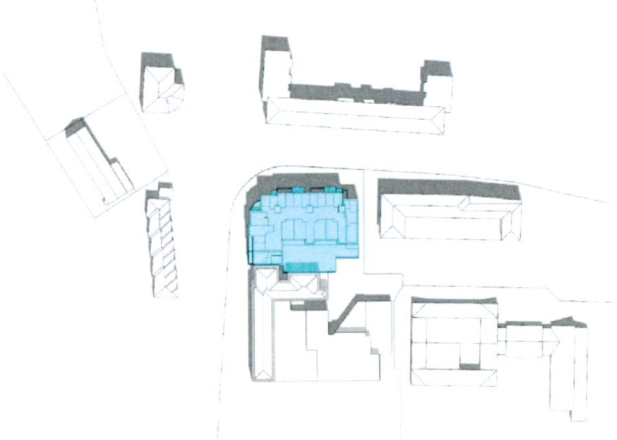
5.1 Plan View

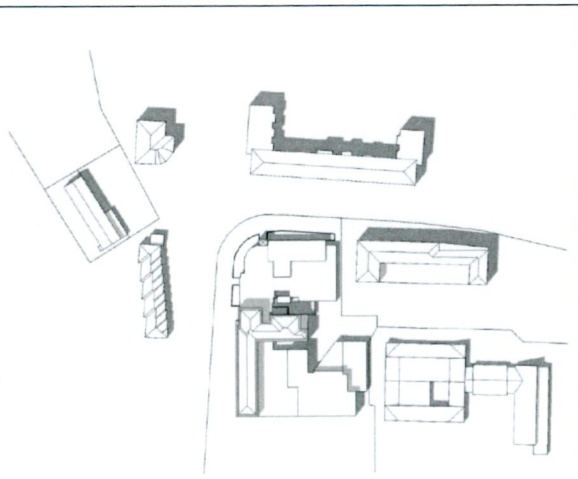
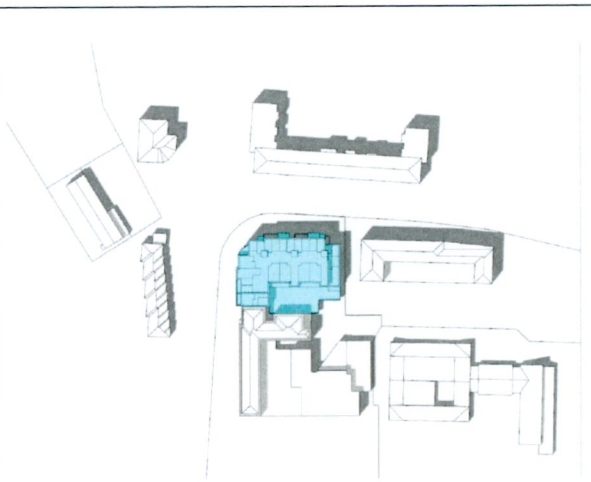
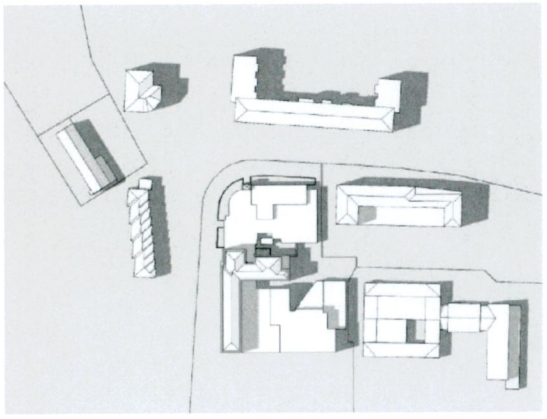
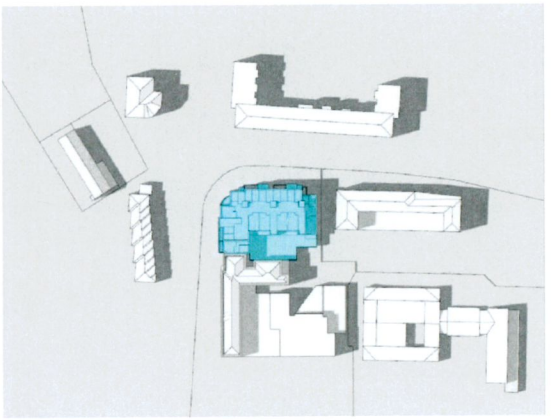
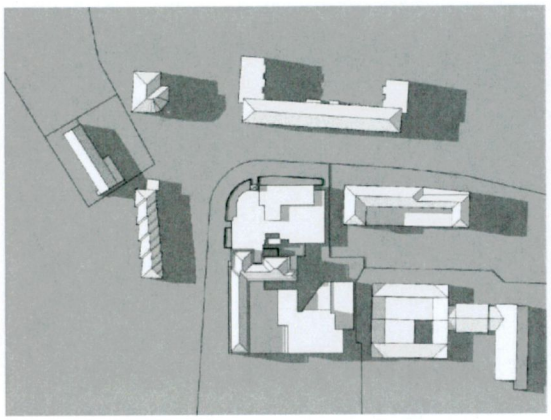
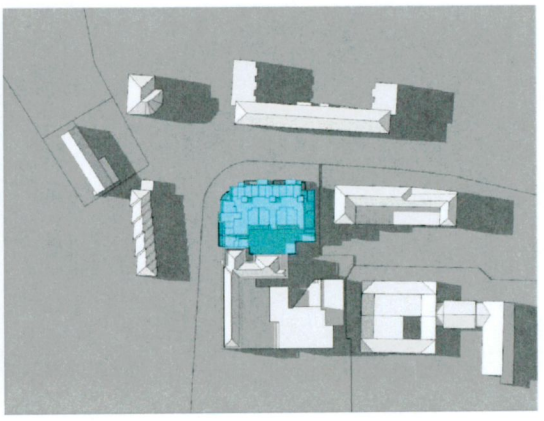
5.1.1 March 21st

	Existing	Proposed
March 21st - 8:00		
March 21st - 10:00		
March 21st - 12:00		

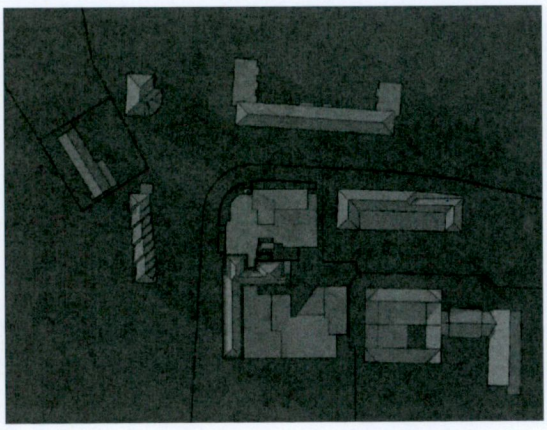

March 21st - 14:00
March 21st - 16:00
March 21st - 18:00

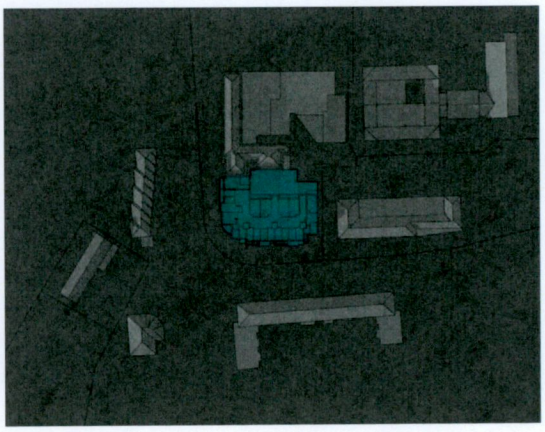
5.1.2 June 21st

	Existing	Proposed
June 21st - 8:00		
June 21st - 10:00		
June 21st - 12:00		

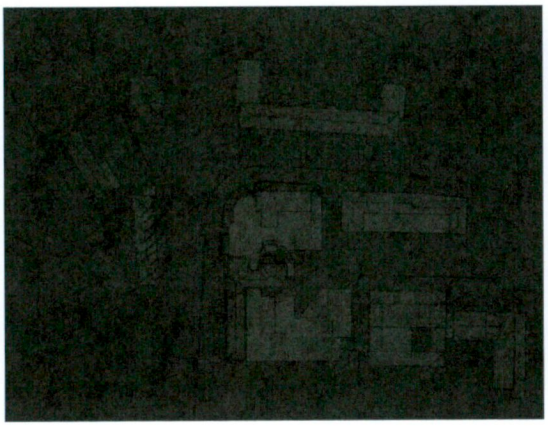
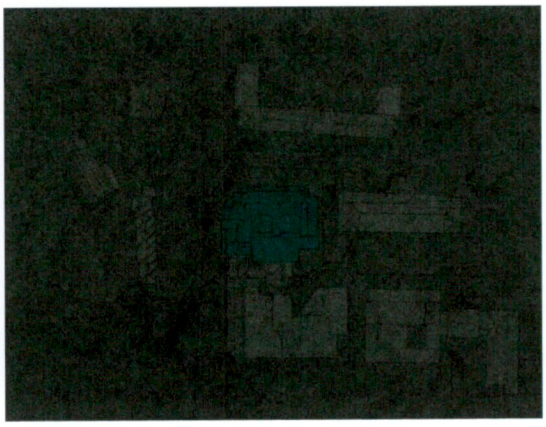
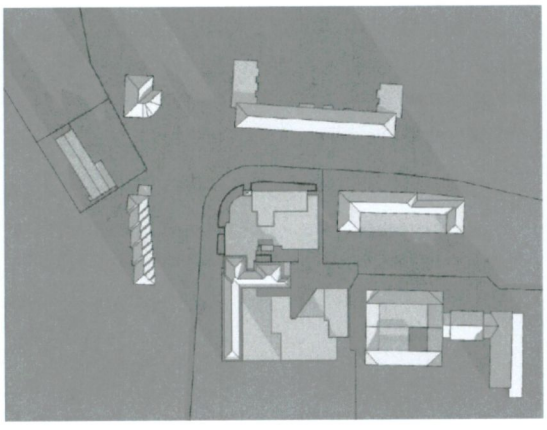
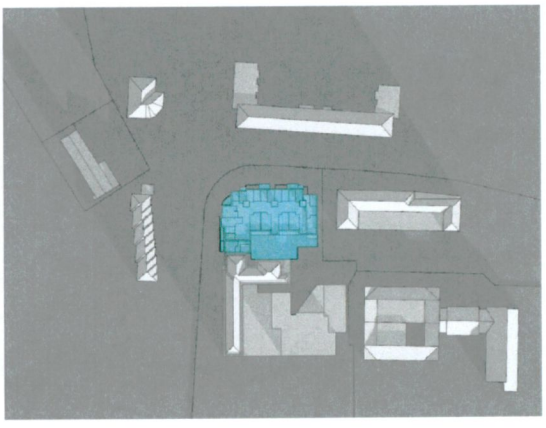
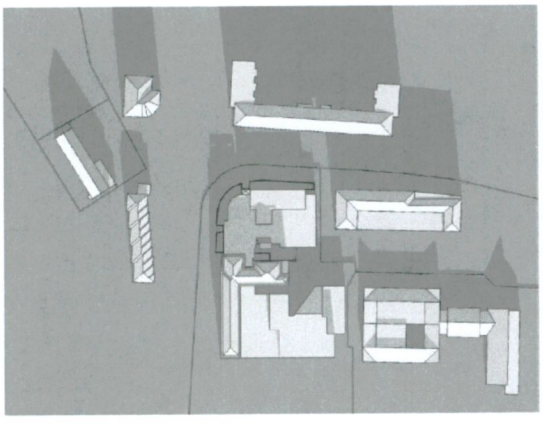
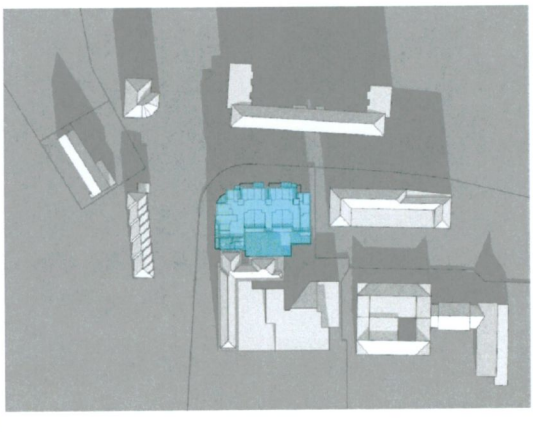
June 21st - 14:00		
June 21st - 16:00		
June 21st - 18:00		

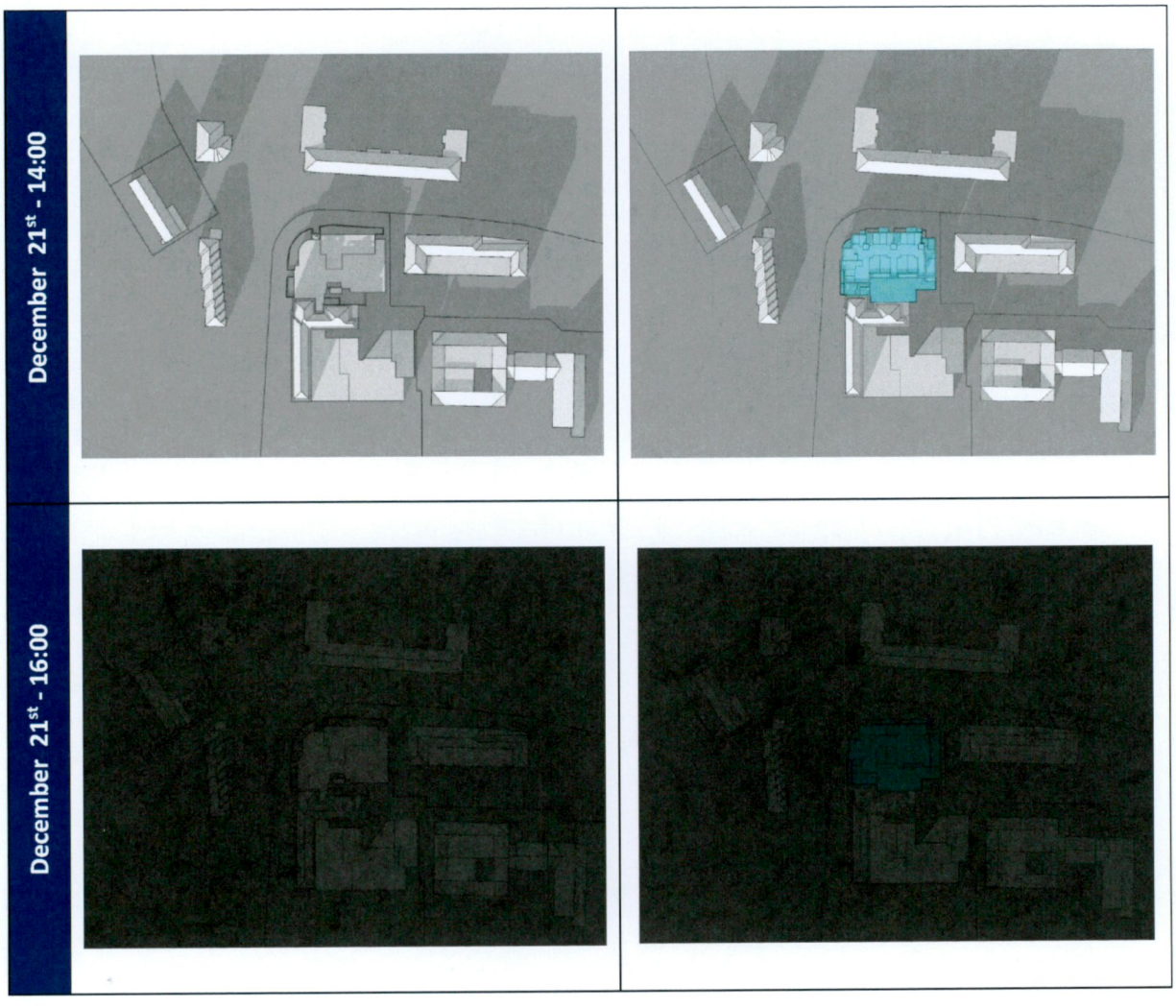
June 21st - 20:00





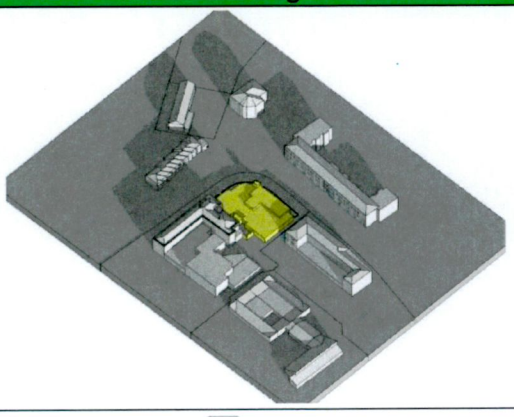
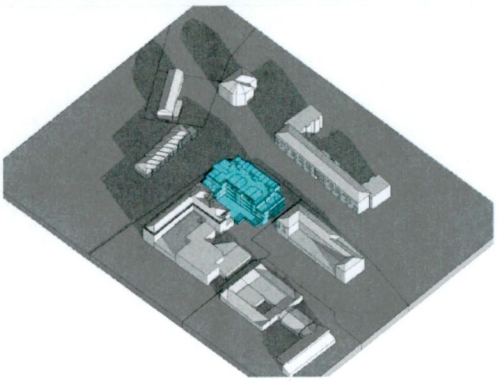
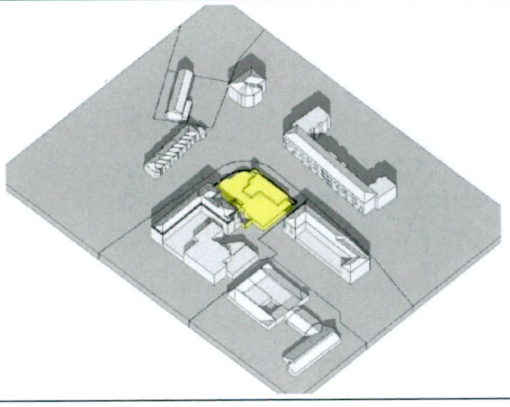
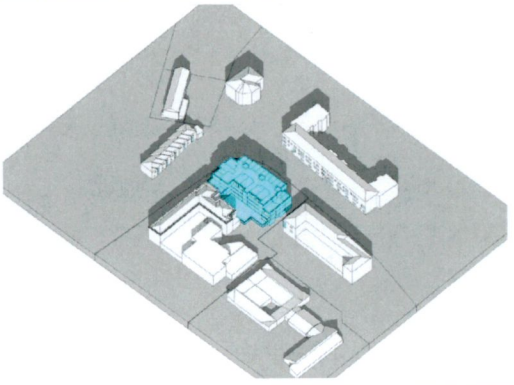
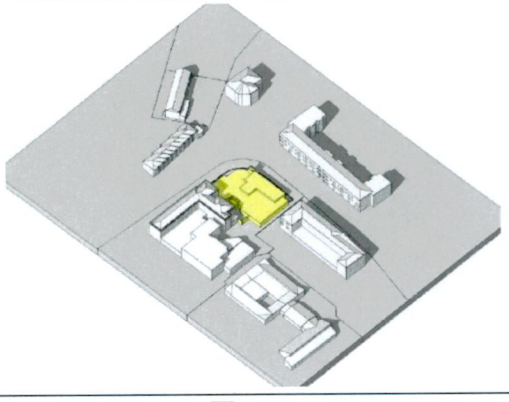
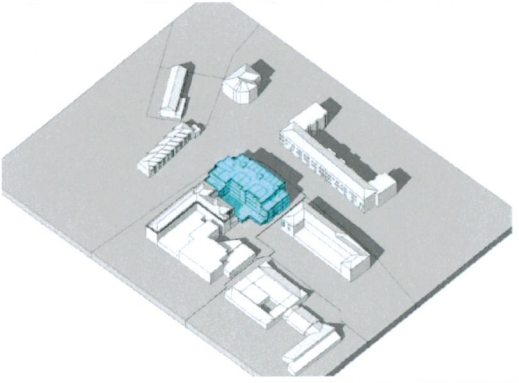
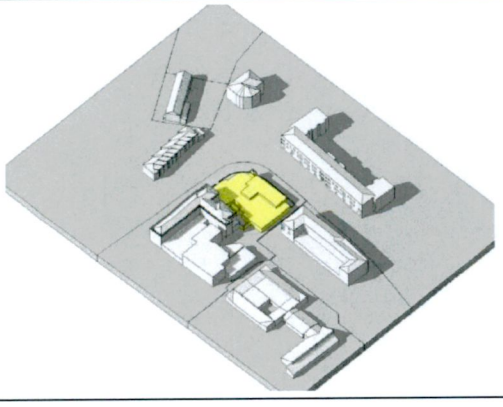
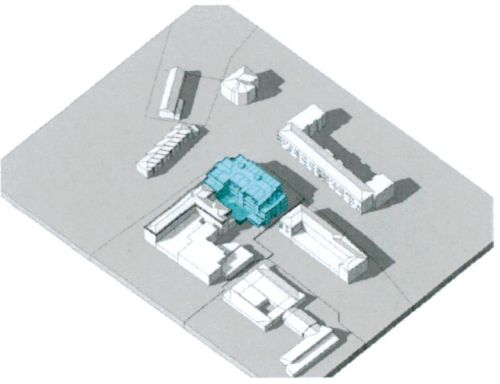
5.1.3 December 21st

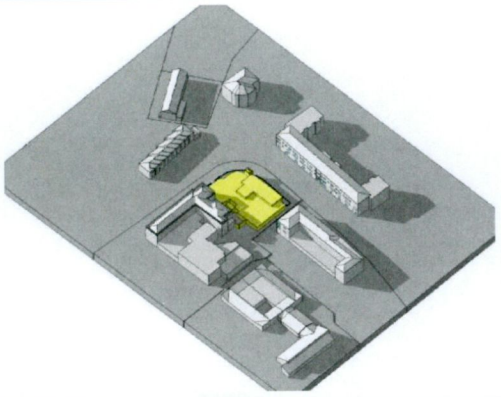
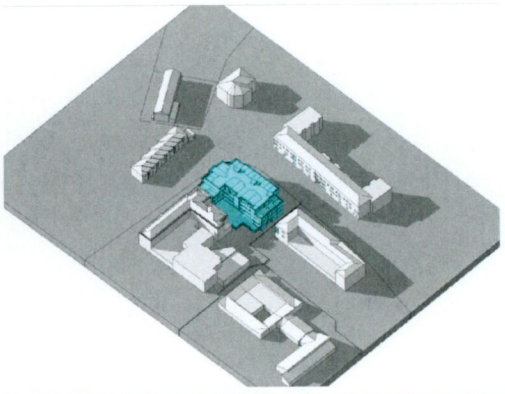
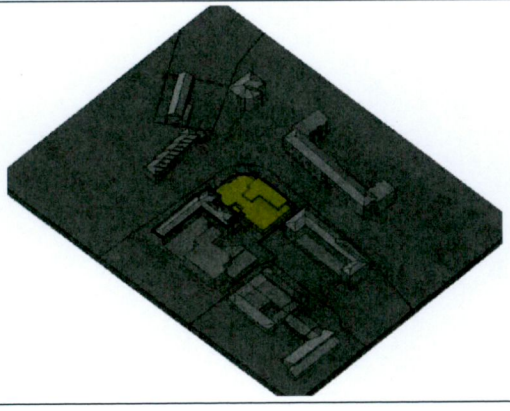
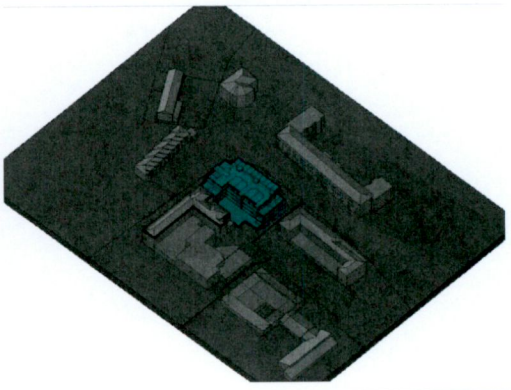
	Existing	Proposed
December 21st - 8:00		
December 21st - 10:00		
December 21st - 12:00		


December 21st - 14:00
December 21st - 16:00

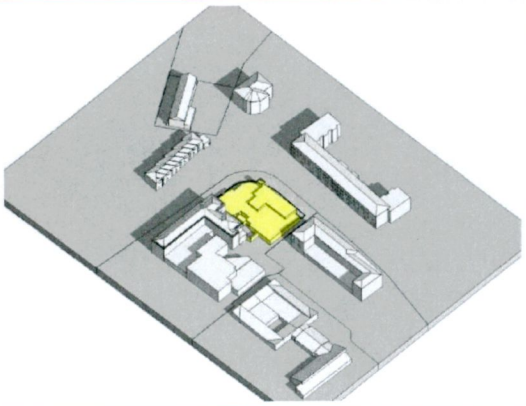
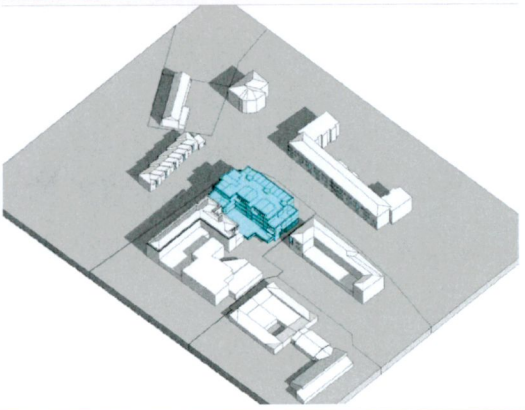
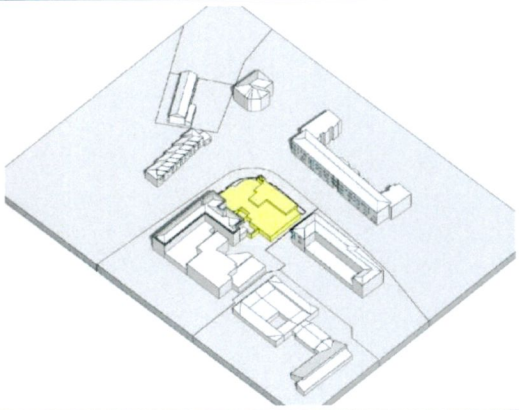
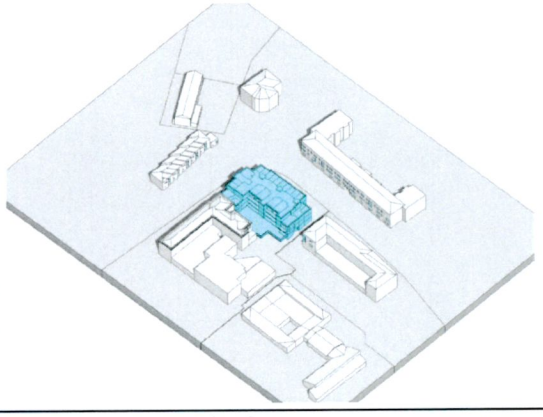
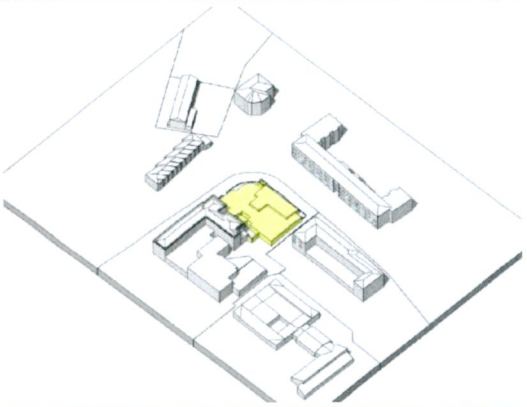
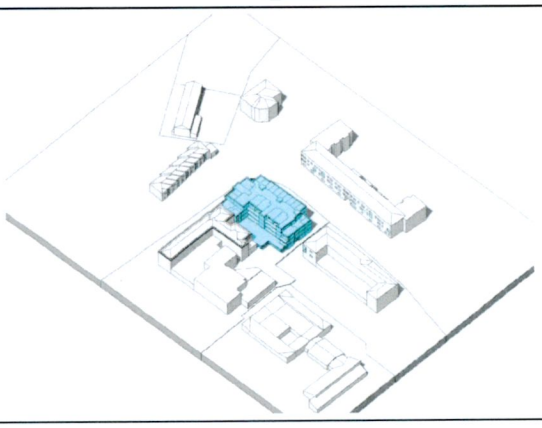
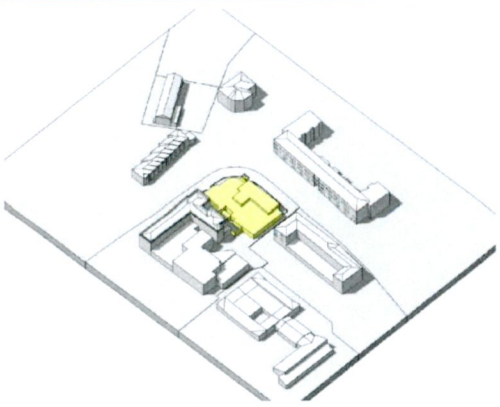
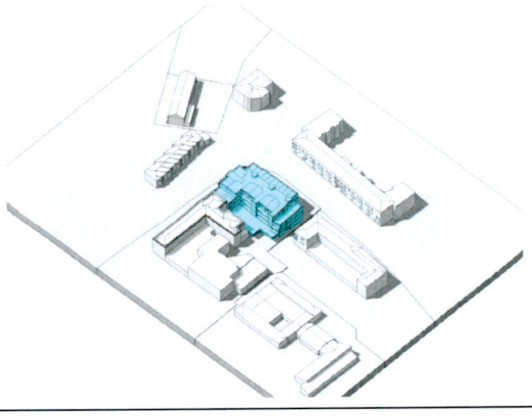
5.2 3D View South East

5.2.1 March 21st

	Existing	Proposed
March 21st - 8:00		
March 21st - 10:00		
March 21st - 12:00		
March 21st - 14:00		

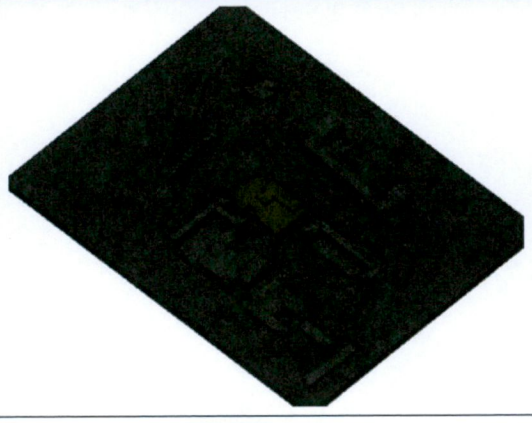
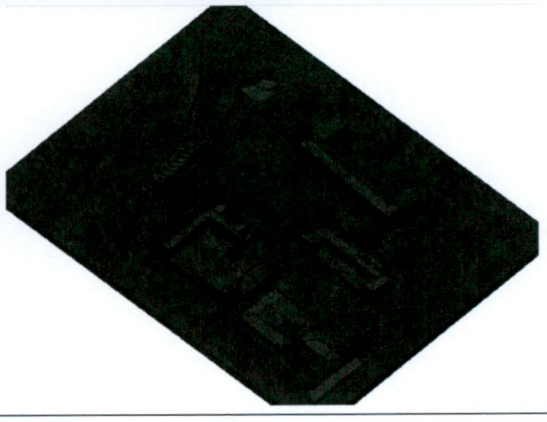
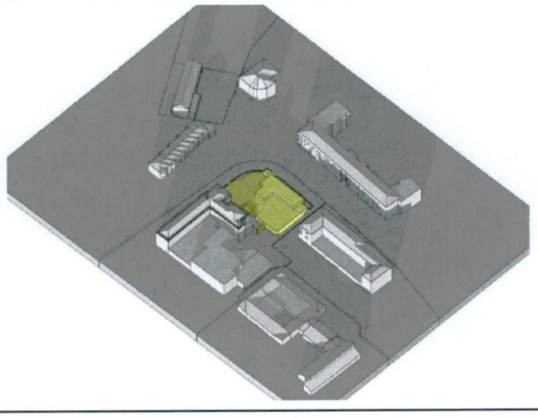
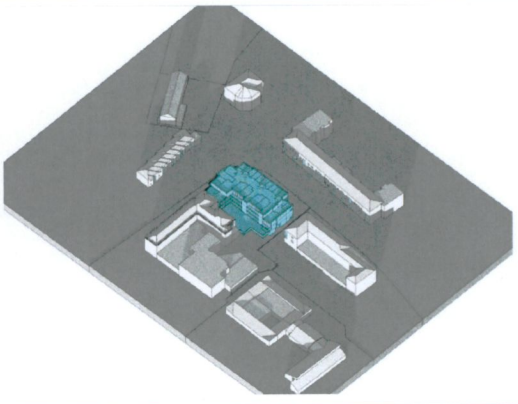
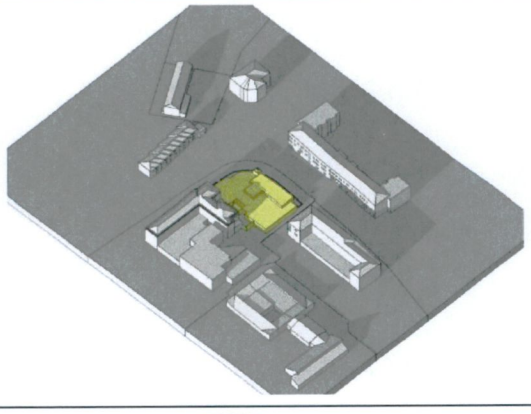
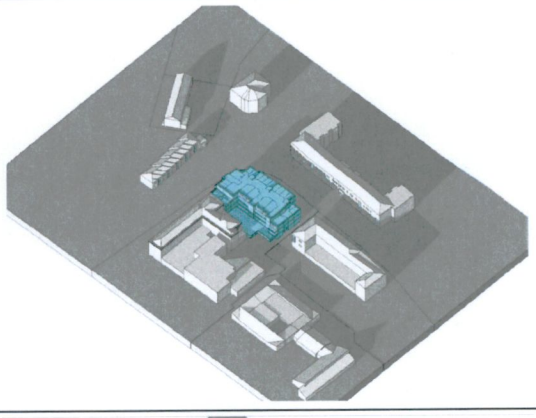
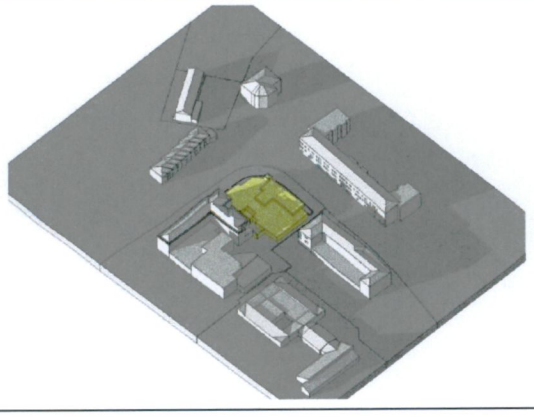
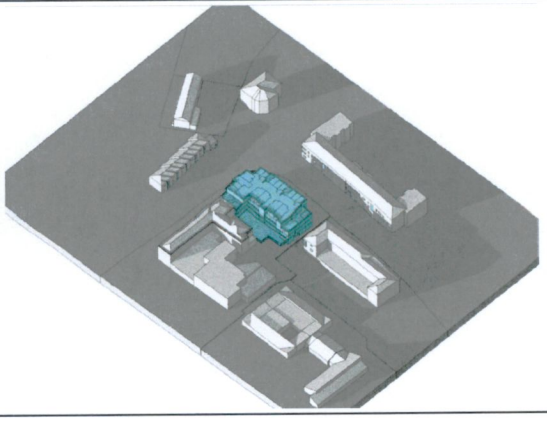
March 21st - 16:00		
March 21st - 18:00		

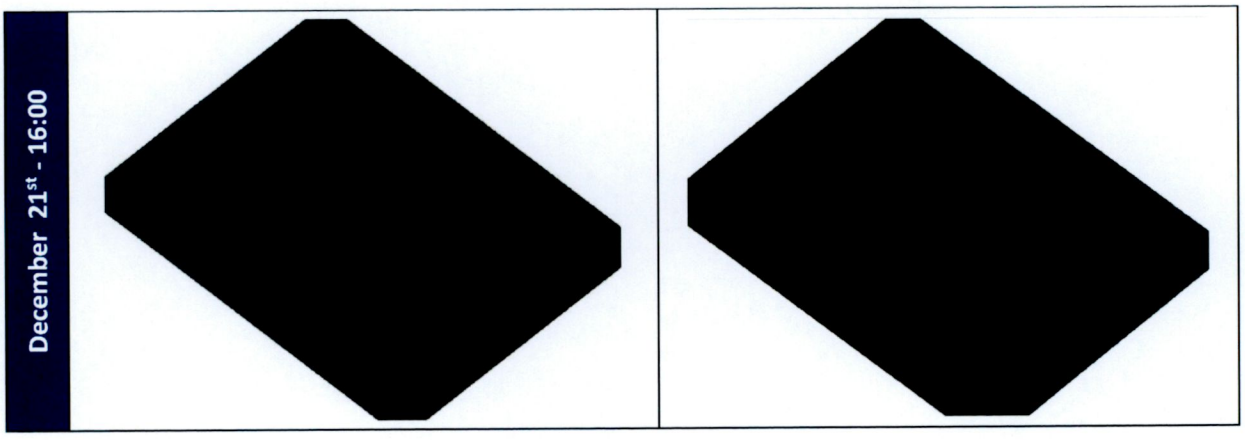
5.2.2 June 21st

	Existing	Proposed
June 21st - 8:00		
June 21st - 10:00		
June 21st - 12:00		
June 21st - 14:00		

June 21st - 16:00
June 21st - 18:00
June 21st - 20:00

5.2.3 December 21st

	Existing	Proposed
December 21st - 8:00		
December 21st - 10:00		
December 21st - 12:00		
December 21st - 14:00		


December 21st - 16:00

5.3 Discussion

The following observations are observed with regards to the shadow analysis carried out on the proposed Finches Development when comparing it to the existing situation.

Nielstown Road – Chaplains Row

No additional shading visible from the proposed development on these existing residential properties during the months of June and December with minor additional shading noted early morning in March.

Colinstown Road – Chaplains Terrace

No additional shading visible from the proposed development on these existing residential properties during the months of March and June. Minor additional shading noted mid morning and early afternoon in December.

Colinstown Road – Chaplains Place

No additional shading visible from the proposed development on these existing residential properties during the months of March and December. Minor additional shading noted late evening in June.

Rowlagh Health Centre

No additional shading visible from the proposed development on this existing building during the months of March, June and December.

The comments above can be further quantified by the analysis carried out within the Sunlight to Existing Amenity Areas, Sunlight to Existing Buildings and Daylight to Existing Buildings sections of this report.

6 Sunlight to Amenity Spaces

6.1 Guidance

The impact of the proposed development on the sunlight availability to the amenity areas will be considered to determine how the amenities perform when assessed against the BRE Guide which states the following in Section 3.3.17:

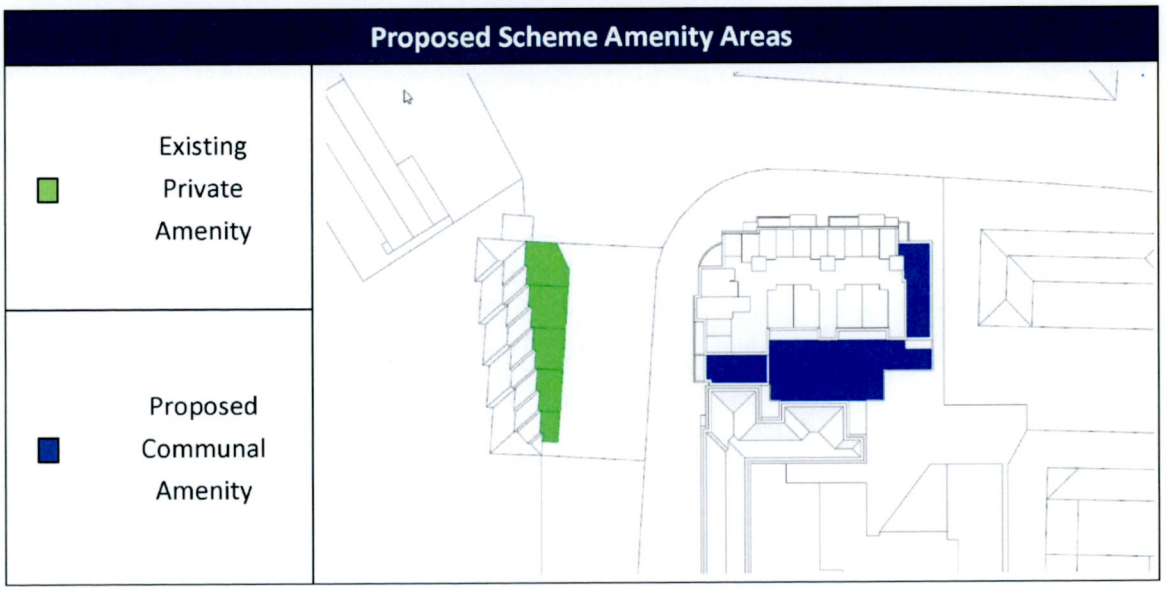
Summary

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 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March.

The BRE Guide states that for a space to, appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least 2 hours of sunlight on 21st March.

6.2 Methodology

This analysis has been completed on the proposed amenity spaces illustrated in the image below:

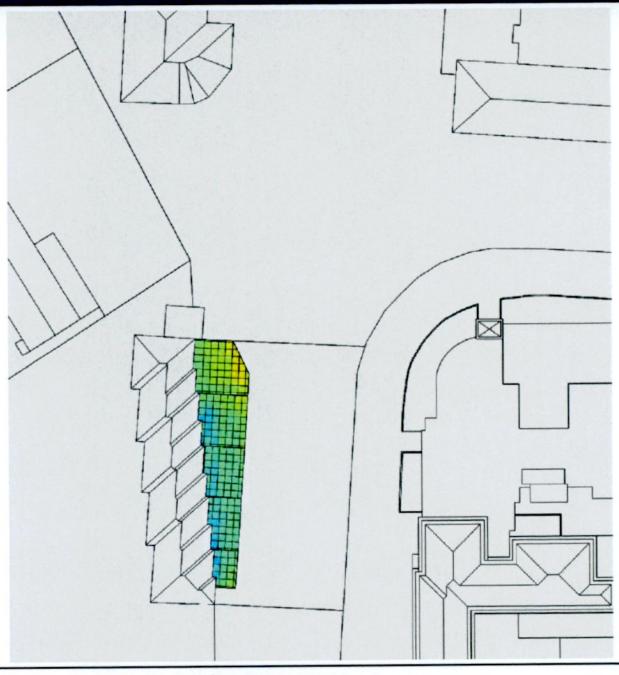
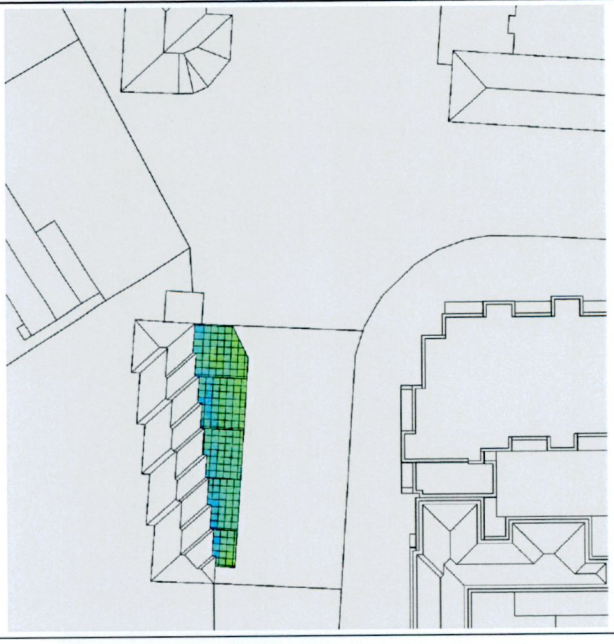


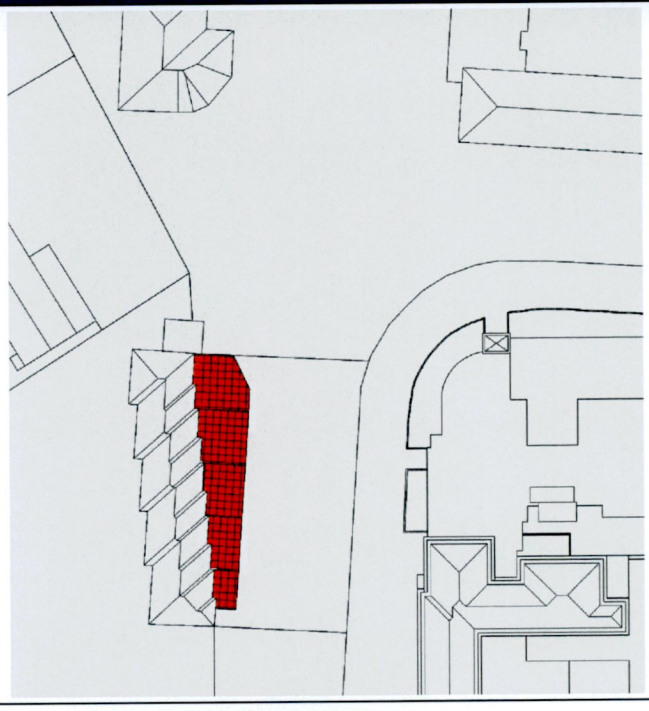
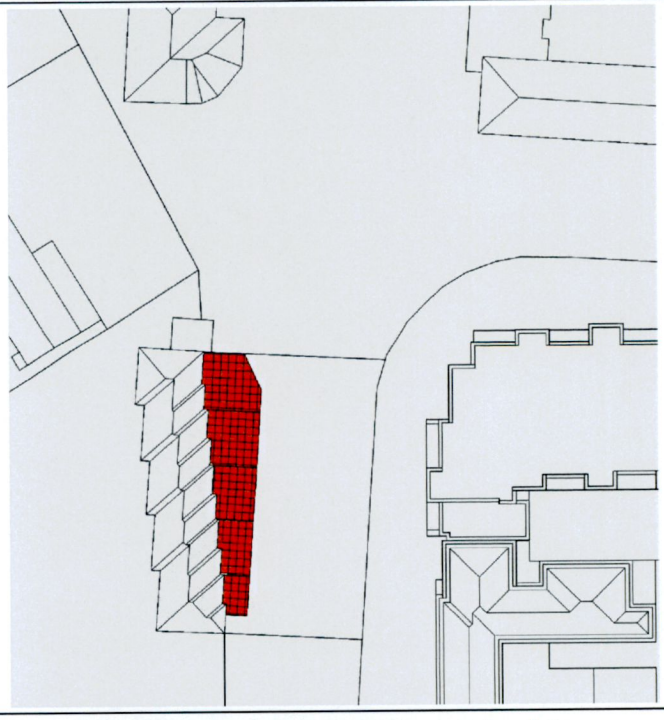
6.3 Results

The following images illustrate the predicted results with respect to the exiting amenity areas neighbouring as well as the amenity spaces within the proposed development itself.

The following images illustrate the predicted results with respect to this space receiving at least 2 hours of sunlight on 21st March. Any areas that receive less than 2 hours of sunlight are colour-coded in grey.

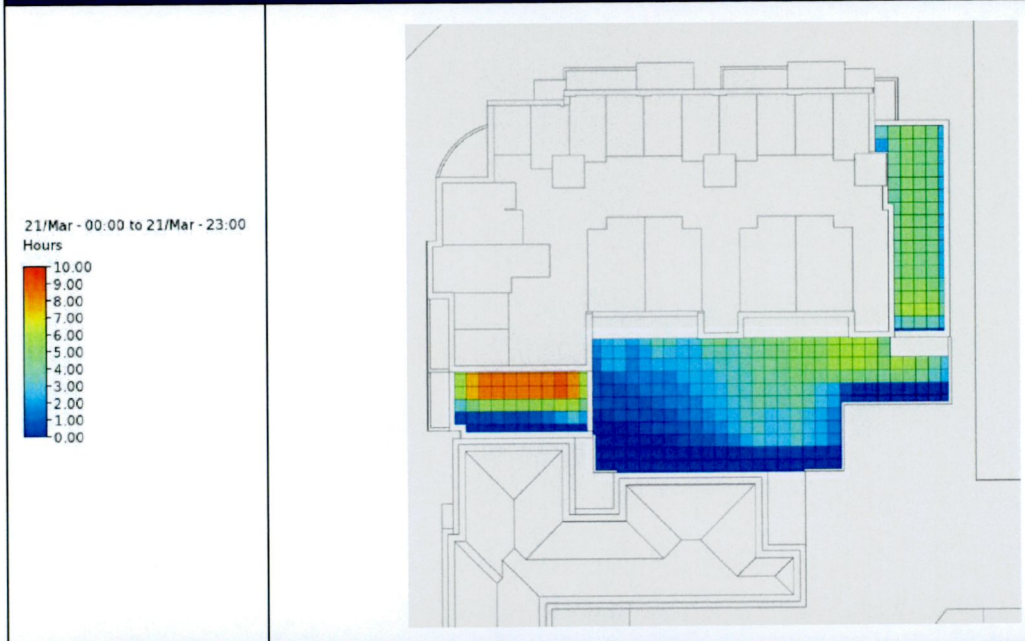
6.3.1 Existing Private Amenity

Private Amenities - Absolute Scale showing all hours	
21/Mar - 00:00 to 21/Mar - 23:00 Hours 10.00 9.00 8.00 7.00 6.00 5.00 4.00 3.00 2.00 1.00 0.00	
	Existing Situation
21/Mar - 00:00 to 21/Mar - 23:00 Hours 10.00 9.00 8.00 7.00 6.00 5.00 4.00 3.00 2.00 1.00 0.00	
	With the Proposed Development in place

Private Amenities – Hours of Sunlight >2 Illustrated in Red	
■ Receives more than 2 hours of sunlight □ Receives less than 2 hours of sunlight	
	Existing Situation
■ Receives more than 2 hours of sunlight □ Receives less than 2 hours of sunlight	
	With the Proposed Development in place

6.3.2 Proposed Communal Amenities

Communal Amenities - Absolute Scale showing all hours



Communal Amenities – Hours of Sunlight >2 Illustrated in Red

6.4 Discussion

Section 3.3.17 of BRE's Site Layout Planning for Daylight and Sunlight states that for a space to appear adequately sunlit throughout the year, at least half (50%) of the garden or amenity area should receive at least 2 hours of sunlight on the 21st of March.

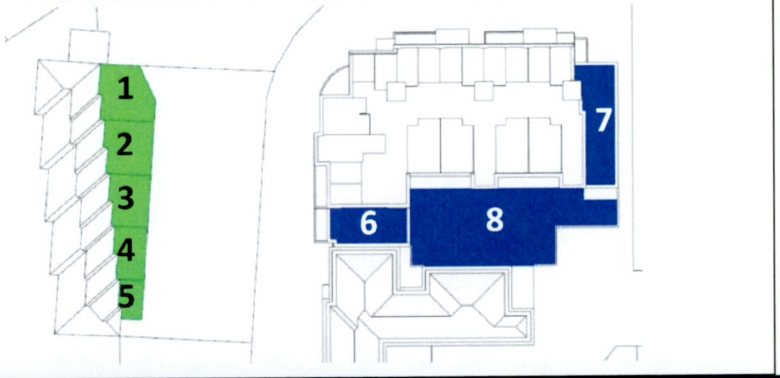
Existing Private Amenity Areas

The results demonstrate the existing neighbouring amenity areas will not be affected by the proposed development and will continue to receive the same level of sunlight even with the proposed development in place.

Existing Private Amenity Areas

Existing Private Amenity

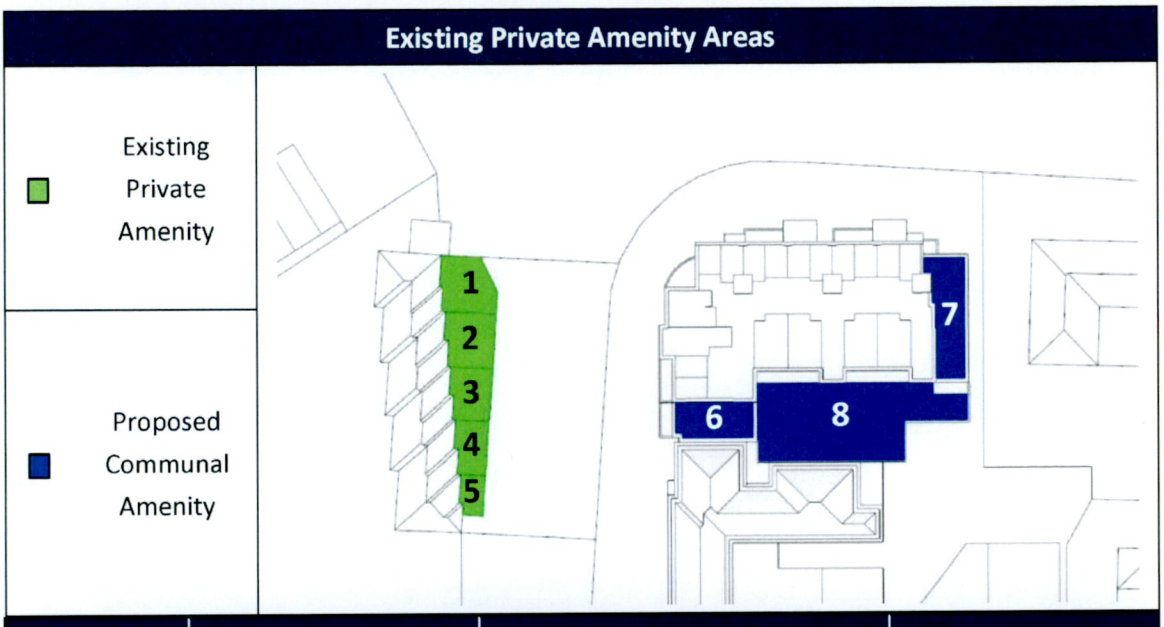
Proposed Communal Amenity



Existing Amenities	Area (m^2)	Existing Area >2 hrs		Proposed Area >2 hrs		Proposed vs Existing (%)	Comment
		(m^2)	(%)	(m^2)	(%)		
1	52	52	100%	52	100%	100%	✓
2	48	48	100%	48	100%	100%	✓
3	38	38	100%	38	100%	100%	✓
4	31	31	100%	31	100%	100%	✓
5	17	17	100%	17	100%	100%	✓

The results demonstrate the existing neighbouring amenity areas will not be affected by the proposed development and will continue to receive the same level of sunlight even with the proposed development in place. 5 out of 5 of the Existing Private Amenity areas are achieving the recommended 2 hours of sunlight on the 21st of March across 100% of their area which is above the 50% minimum recommendation.

Proposed Communal Amenity Areas



Proposed Communal Amenity	Total Area (m^2)	Area (m^2) >2 hours on 21st March	Total % >2 hours on 21st March
6	49	36	73%
7	69	68	98%
8	240	130	54%
Total	**358**	**234**	**65%**

For the Proposed Communal Amenity areas, 65% of the combined areas are achieving more than 2 hours of sunlight on the 21st of March across 50% of their area. The individual areas themselves are also above the 50% minimum recommendation, thus the Proposed Communal Amenity provisions are meeting the recommended targets and are high quality spaces in terms of sunlight.

7 Sunlight to Existing Buildings

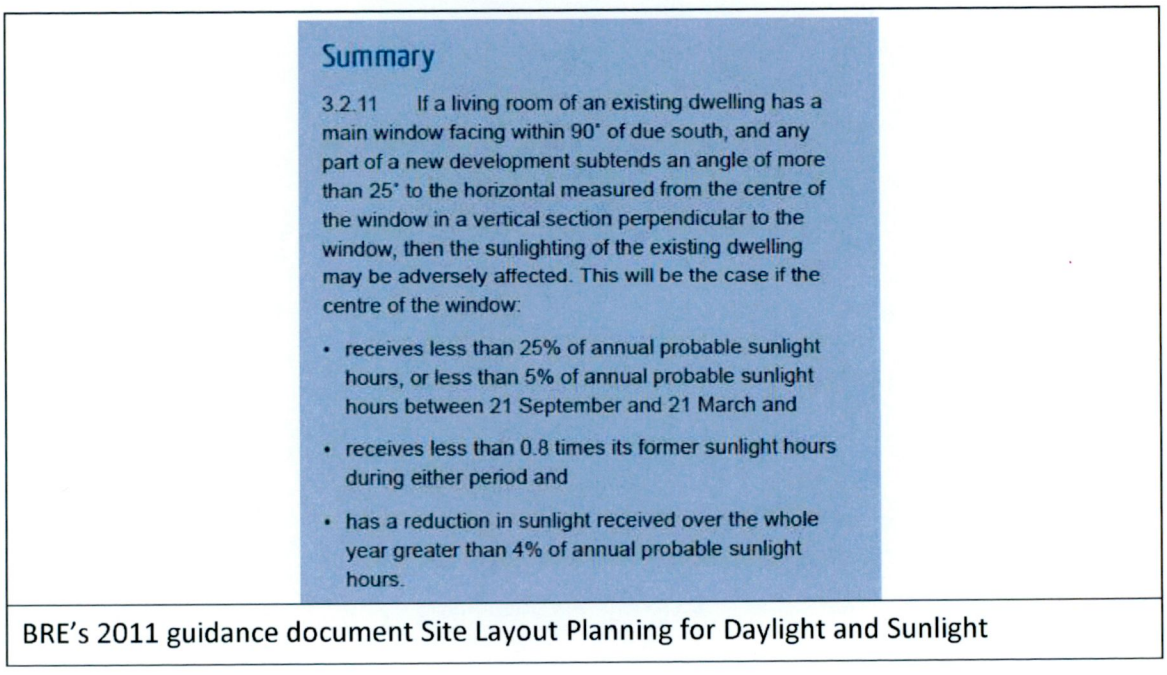
7.1 Guidance

The British Standard BS 8206-2:2008 recommends that interiors where the occupants expect sunlight should receive at least one quarter (25%) of annual probable sunlight hours, including at least 5% of annual probable sunlight hours during the winter months, between 21st September and 21st March.

Here 'probable sunlight hours' means the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness for the location in question.

If a window reference point can receive more than 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours during the winter months between 21 September and 21 March, then the room should still receive enough sunlight. Any reduction in sunlight access below this level should be kept to a minimum.

If the available sunlight hours are both less than the amount given and less than 0.8 times their former value, either over the whole year or just during the winter months (21st September to 21st March) and reduction in sunlight across the year has a greater reduction than 4%, then the occupants of the existing building will notice the loss of sunlight.



Summary

3.2.11 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 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 sunlighting of the existing dwelling 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 21 September and 21 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.

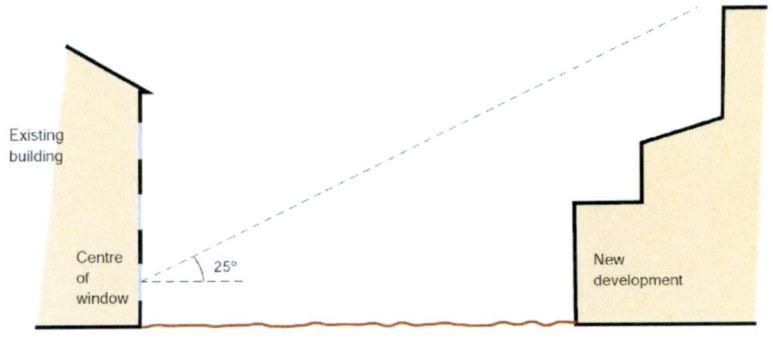
BRE's 2011 guidance document Site Layout Planning for Daylight and Sunlight

7.2 APSH Exclusions

The BRE recommendations note that if a new development sits within 90° due south of any main living room window of an existing dwelling, then these should be assessed for APSH. However, there are several exceptional cases in which APSH does not require calculation, as indicated below:

3.2.7 It is not always necessary to do a full calculation to check sunlight potential. The guideline above is met provided either of the following is true:

- If the distance of each part of the new development from the existing window is three or more times its height above the centre of the existing window (NB obstructions within 90° of due north of the existing window need not count here).
- The window wall faces within 90° of due south and no obstruction, measured in the section perpendicular to the window wall, subtends an angle of more than 25° to the horizontal (Figure 14 in Section 2.2). Again, obstructions within 90° of due north of the existing window need not be counted.
- The window wall faces within 20° of due south and the reference point has a VSC (section 2.1) of 27% or more.



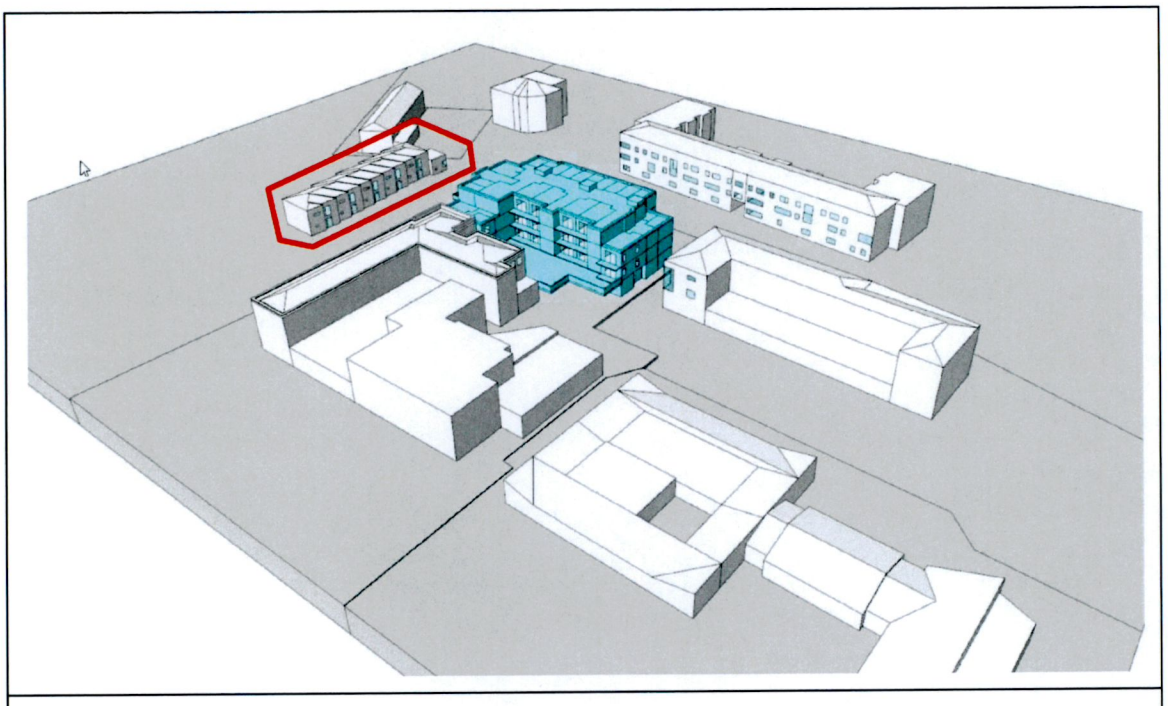
BRE's 2011 guidance document Site Layout Planning for Daylight and Sunlight

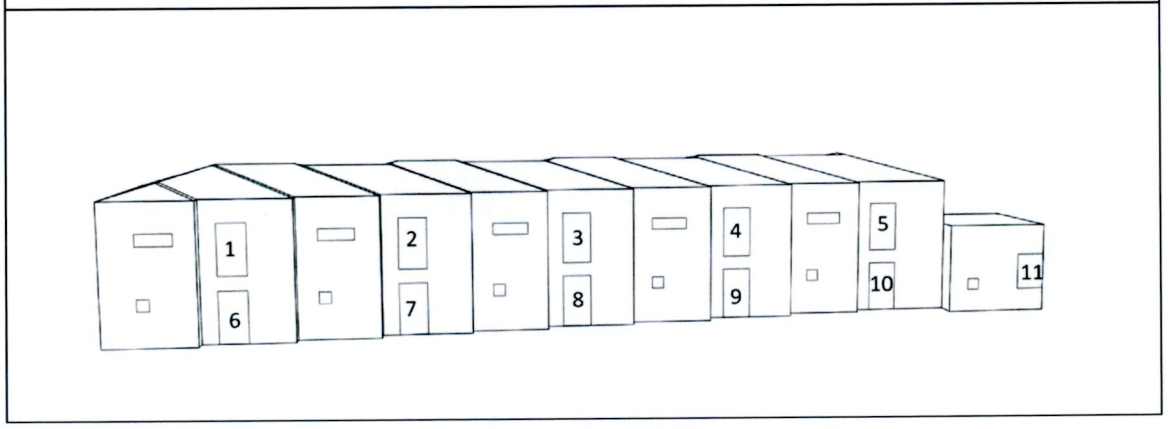
Consequently, APSH will only be calculated for adjacent windows which meet the following conditions:

1. The existing building has living room with a main window which faces within 90 degrees of due south.
2. Existing building is located to the North, East, or West of the Proposed Development.
3. The VSC of the existing window is less than 27%.

7.3 APSH Results

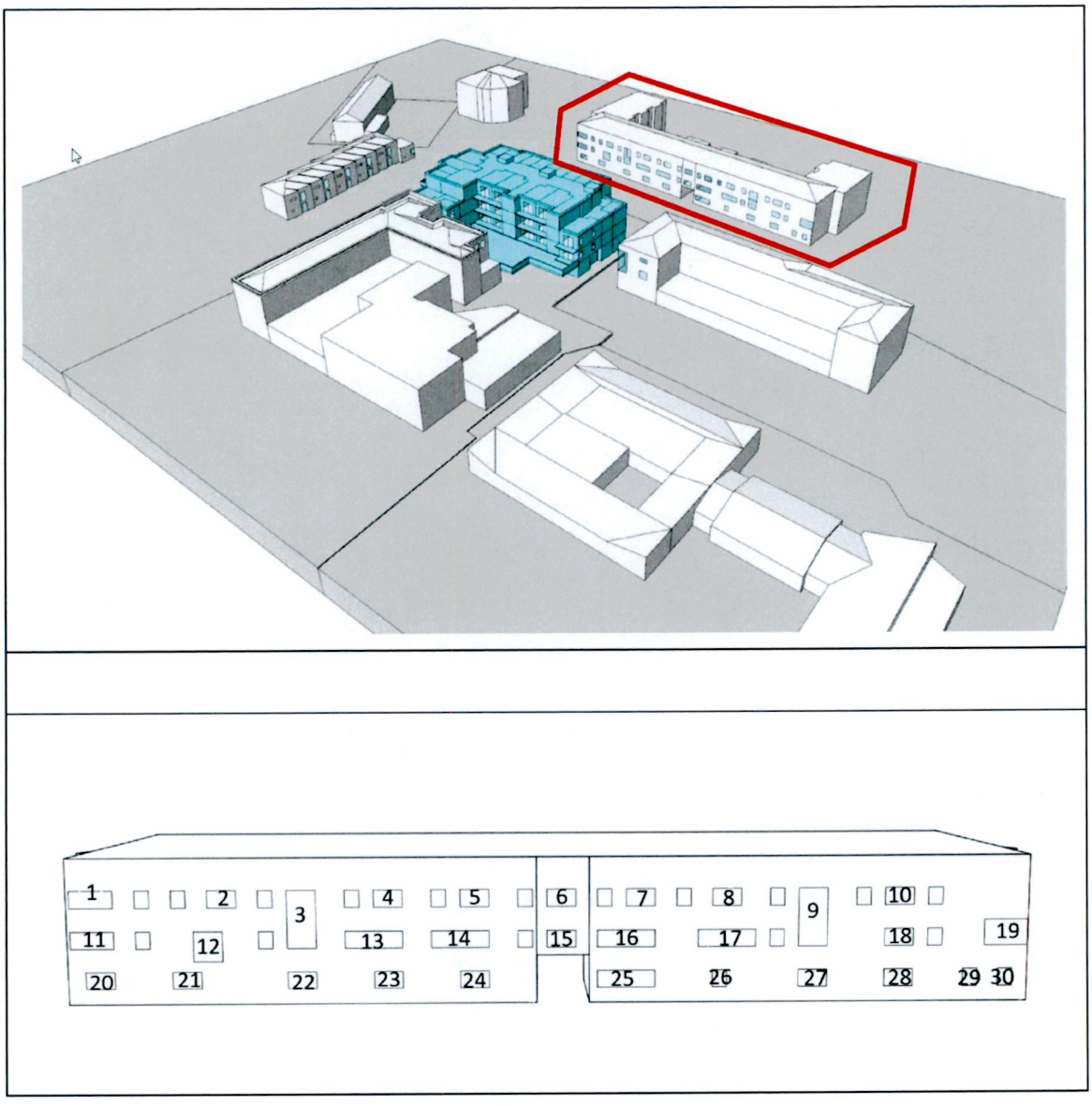
7.4 APSH View 01 – Nielstown Road – Chaplains Row





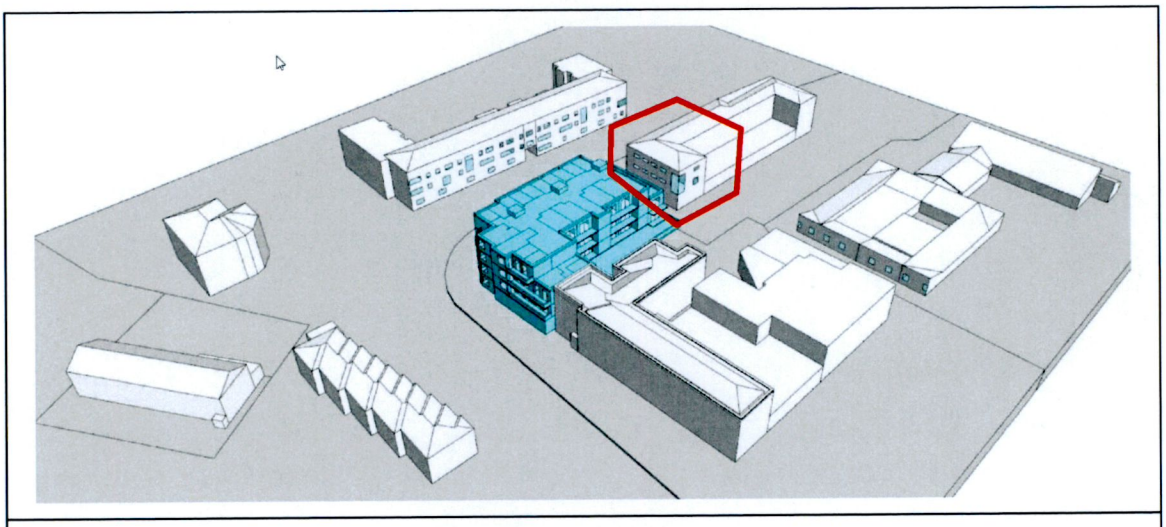
Points	Existing Scheme APSH		Proposed Scheme APSH		Proposed Scheme APSH as a % of the Existing Scheme		Comment
	Annual	Winter	Annual	Winter	Annual	Winter	
1	33.52	8.18	29.19	8.18	87%	100%	✓/✓
2	31.94	6.93	27.44	6.93	86%	100%	✓/✓
3	32.74	7.22	27.22	6.67	83%	92%	✓/✓
4	33.88	7.95	28.24	6.76	83%	85%	✓/✓
5	35.56	9.28	32.39	8.16	91%	88%	✓/✓
6	28.81	7.94	25.64	7.94	89%	100%	✓/✓
7	27.51	6.39	23.67	6.39	86%	100%	✓/✓
8	28.66	5.82	22.52	5.82	79%	100%	✓/✓
9	28.70	6.24	22.75	5.88	79%	94%	✓/✓
10	32.43	7.80	28.65	7.10	88%	91%	✓/✓
11	42.66	13.99	38.34	12.11	90%	87%	✓/✓

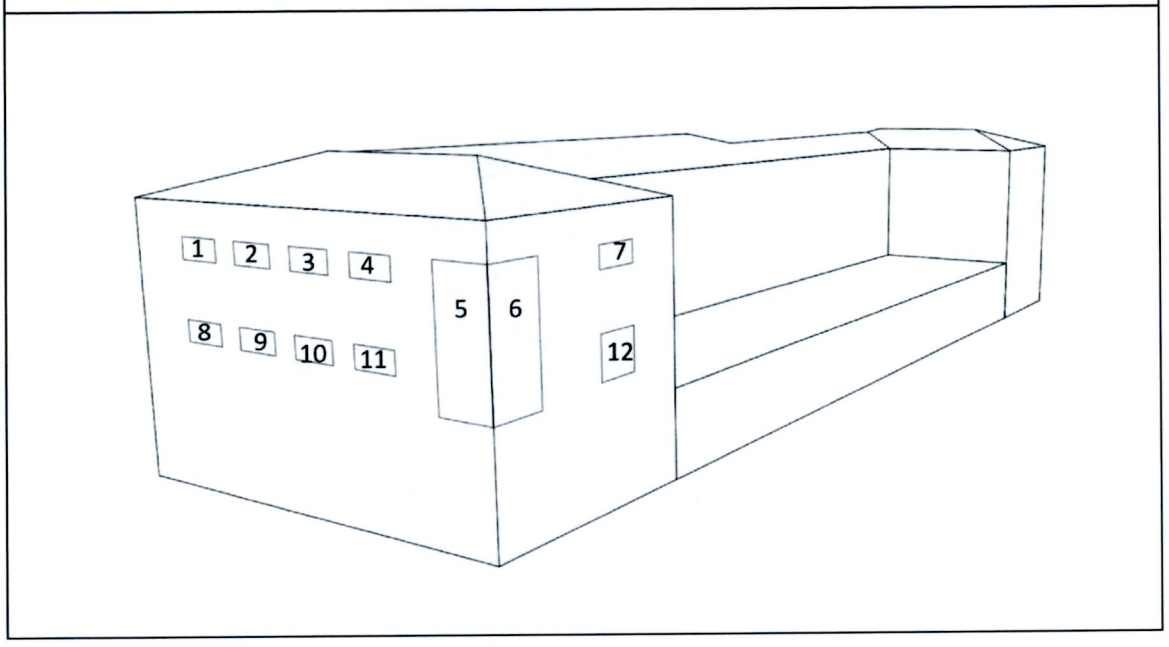
7.5 APSH View 02 – Colinstown Road – Chaplains Terrace



Points	Existing Scheme APSH		Proposed Scheme APSH		Proposed Scheme APSH as a % of the Existing Scheme		Comment
	Annual	Winter	Annual	Winter	Annual	Winter	
1	81.12	36.36	77.20	32.44	95%	89%	✓/✓
2	81.12	36.36	76.48	31.72	94%	87%	✓/✓
3	80.32	35.57	72.96	28.20	91%	79%	✓/✓
4	81.12	36.36	76.17	31.41	94%	86%	✓/✓
5	80.96	36.21	75.28	30.52	93%	84%	✓/✓
6	81.35	36.60	76.26	31.50	94%	86%	✓/✓
7	81.51	36.75	76.69	31.93	94%	87%	✓/✓
8	81.53	36.78	77.15	32.40	95%	88%	✓/✓
9	78.44	33.68	74.13	29.38	95%	87%	✓/✓
10	81.14	36.38	78.91	34.15	97%	94%	✓/✓
11	79.21	34.46	70.50	25.74	89%	75%	✓/✓
12	78.28	33.52	68.38	23.62	87%	70%	✓/✓
13	78.87	34.11	69.68	24.92	88%	73%	✓/✓
14	78.87	34.11	70.62	25.87	90%	76%	✓/✓
15	76.86	32.11	69.73	24.97	91%	78%	✓/✓
16	76.87	32.11	70.98	26.22	92%	82%	✓/✓
17	77.00	32.24	70.26	25.50	91%	79%	✓/✓
18	73.70	28.94	69.46	24.70	94%	85%	✓/✓
19	72.31	27.56	70.23	25.48	97%	92%	✓/✓
20	75.13	31.08	64.97	20.92	86%	67%	✓/✓
21	74.57	30.33	61.98	17.74	83%	58%	✓/✓
22	73.46	28.87	60.75	16.16	83%	56%	✓/✓
23	72.76	28.00	59.66	14.91	82%	53%	✓/✓
24	71.74	26.99	60.91	16.16	85%	60%	✓/✓
25	70.08	25.33	61.76	17.00	88%	67%	✓/✓
26	69.28	24.52	62.87	18.12	91%	74%	✓/✓
27	66.99	22.24	62.65	17.89	94%	80%	✓/✓
28	65.26	20.51	62.53	17.78	96%	87%	✓/✓
29	62.27	19.52	62.45	17.70	100%	91%	✓/✓
30	64.33	19.58	62.54	17.78	97%	91%	✓/✓

7.6 APSH View 03 – Colinstown Road – Chaplains Place





Points	Existing Scheme APSH		Proposed Scheme APSH		Proposed Scheme APSH as a % of the Existing Scheme		Comment
	Annual	Winter	Annual	Winter	Annual	Winter	
1	45.84	17.07	34.72	11.99	76%	70%	✓/✓
2	45.98	16.80	35.24	12.88	77%	77%	✓/✓
3	46.17	16.72	35.40	13.75	77%	82%	✓/✓
4	45.58	16.14	35.55	14.34	78%	89%	✓/✓
5	45.24	15.22	32.83	14.45	73%	95%	✓/✓
6	79.07	35.02	75.29	34.32	95%	98%	✓/✓
7	80.32	36.26	78.22	35.56	97%	98%	✓/✓
8	45.97	15.90	28.92	9.15	63%	58%	✓/✓
9	45.95	15.88	28.40	10.27	62%	65%	✓/✓
10	45.11	15.63	27.90	11.23	62%	72%	✓/✓
11	44.85	14.78	28.24	12.49	63%	85%	✓/✓
12	79.51	35.45	77.41	34.75	97%	98%	✓/✓

7.7 Discussion

This study considers the proposed scheme and tests if the APSH results for the windows of the adjacent existing buildings are greater than 25% annual and 5% winter sunlight and are greater than 0.8 times their former value with the proposed development in place and less there is less than a 4% reduction of the annual probable sunlight hours.

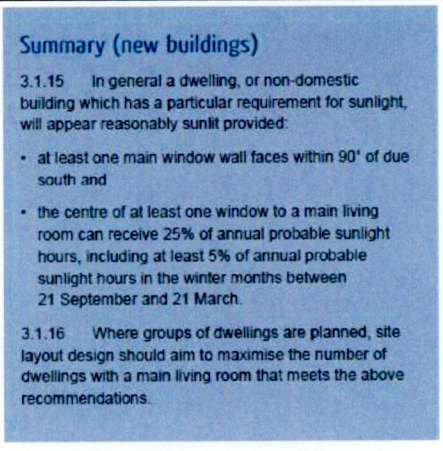
Of the 53 points tested, 100% meet the BRE guidelines in both instances (annual & winter).

8 Sunlight to Proposed Development

The British Standard BS 8206-2:2008 recommends that interiors where the occupants expect sunlight should receive at least one quarter (25%) of annual probable sunlight hours (APSH), including at least 5% of annual probable sunlight hours during the winter months, between 21st September and 21st March. Here 'probable sunlight hours' means the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness for the location in question.

If a window reference point can receive more than one quarter of annual probable sunlight hours, including at least 5% of annual probable sunlight hours during the winter months between 21st September and 21st March, then the room should still receive enough sunlight. Any reduction in sunlight access below this level should be kept to a minimum.

The BRE guide also notes in section 3.1.11, "The BS 8206-2:2008 criterion applies to rooms of all orientations, although if a room faces significantly north of due east or west it is unlikely to be met".



Summary (new buildings)

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

- at least one main window wall faces within 90° of due south and
- 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 21 September and 21 March.

3.1.16 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.

Extract from the BRE 'Site Layout Planning for Daylight and Sunlight' guide

8.1 APSH Assessment

Based on the above criteria for the BRE Guide/BS8206-2:2008, all main living room windows within the proposed development have been assessed with the results included in the following sections.

Please note, the "Comment" symbol in each of the tables represents the following:

BRE Guide / BS 8206-2:2008

✓/✓ For these locations, both the annual and winter APSH results are greater than 25% and 5% respectively.

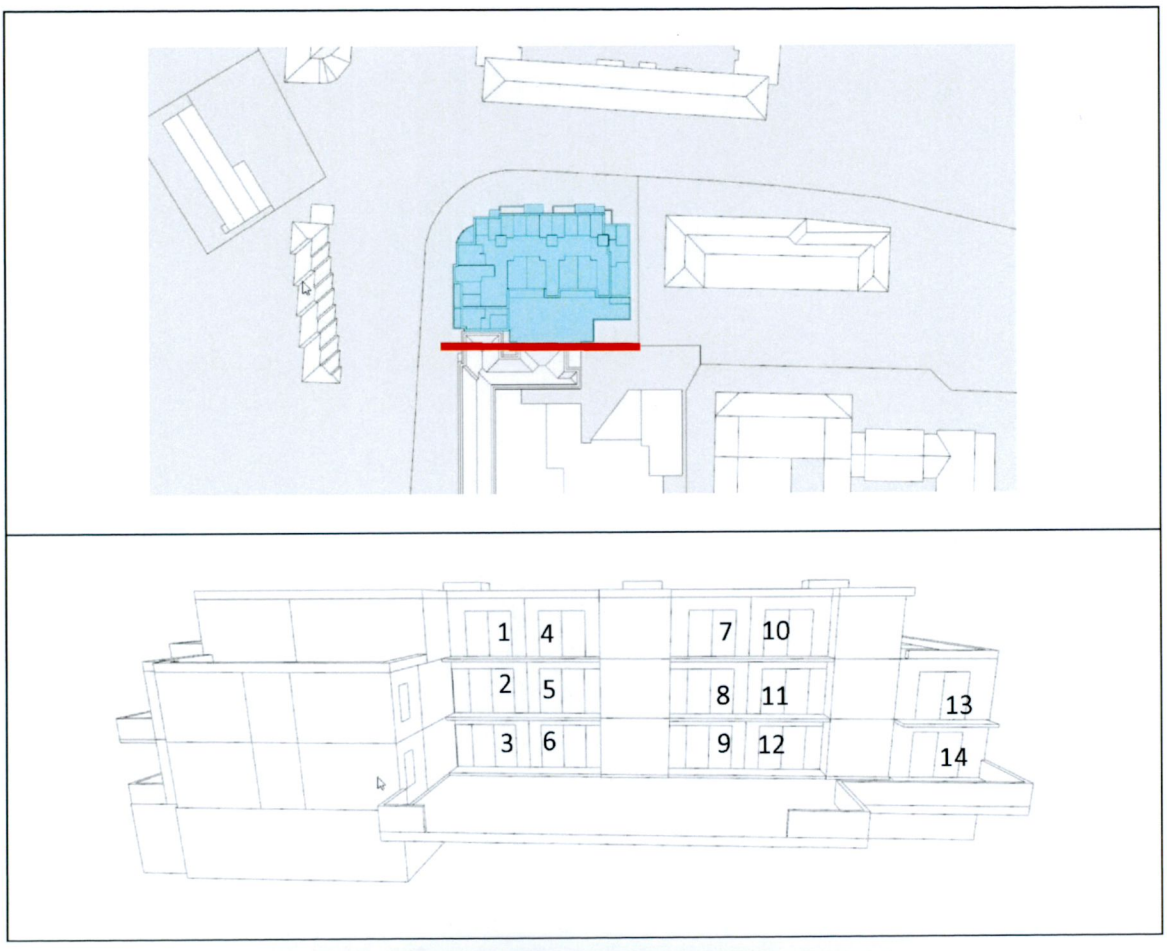
✓/ x For these locations, the annual APSH results are greater than 25%, however, the winter APSH results are less than the recommended values.

x / ✓ For these locations, the annual APSH results are less than the recommended values, however, the winter APSH results are greater than 5%.

x / x For these locations, both the winter and annual APSH results are less than the recommended values.

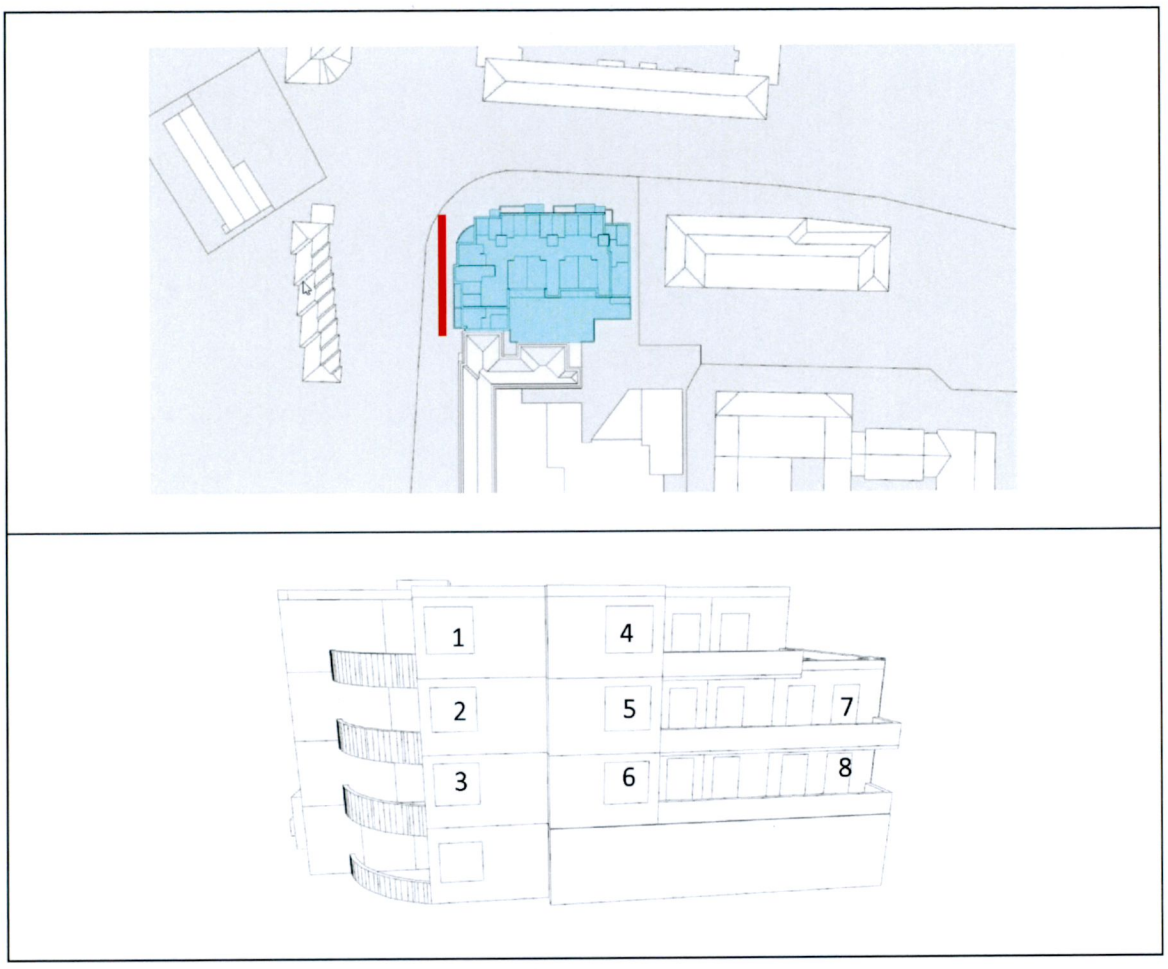
8.2 Proposed APSH Assessment Results

8.2.1 View 1



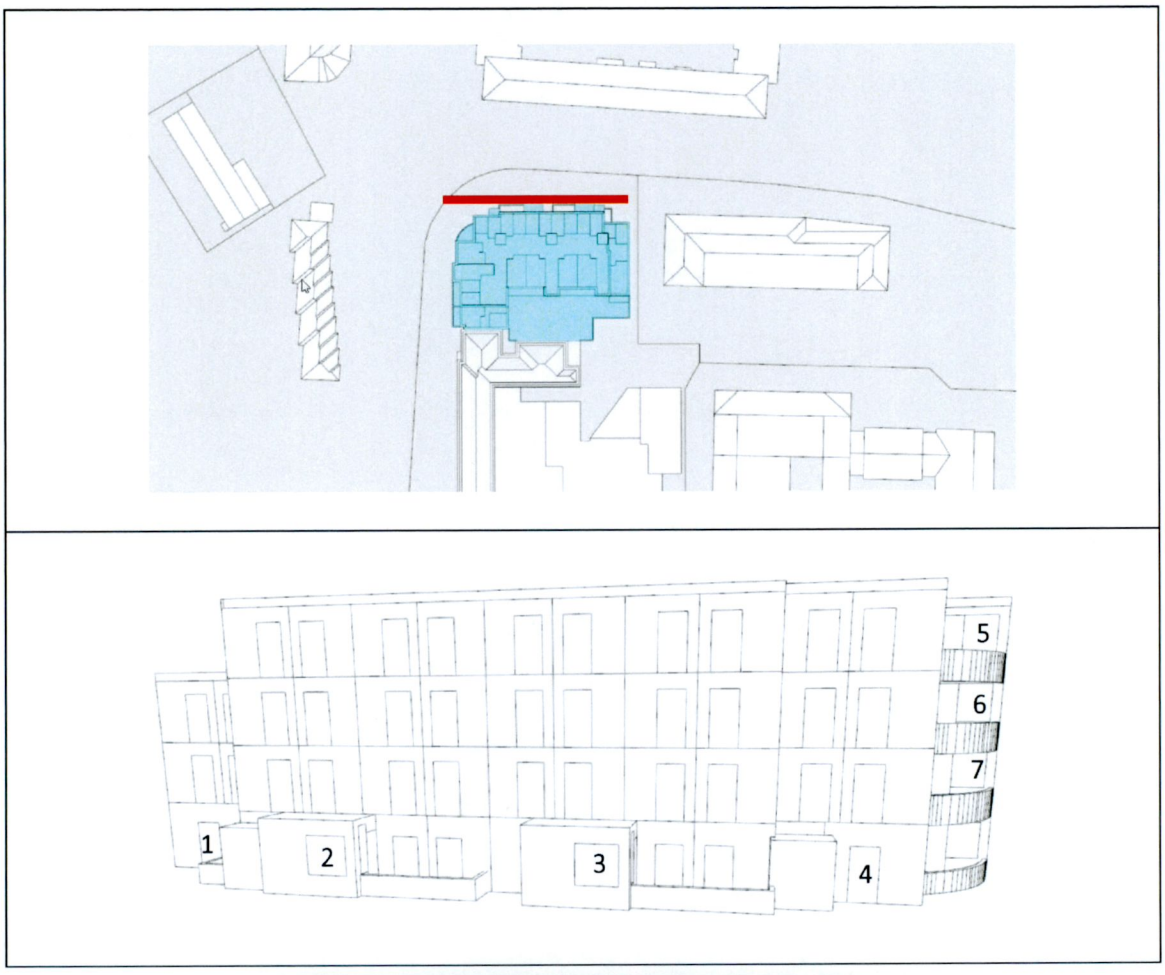
Points	Proposed Scheme APSH		Comment
	Annual	Winter	
1	62.34	28.24	✓/✓
2	26.00	19.91	✓/✓
3	14.86	9.34	x /✓
4	65.12	30.65	✓/✓
5	27.43	20.91	✓ /✓
6	15.76	9.96	x / ✓
7	68.10	33.91	✓/✓
8	34.42	26.96	✓/✓
9	25.92	18.54	✓/✓
10	67.61	33.92	✓/✓
11	33.69	26.46	✓/✓
12	26.36	19.13	✓ /✓
13	76.98	33.63	✓/✓
14	44.81	25.04	✓/✓

8.2.2 View 2



Points	Proposed Scheme APSH		Comment
	Annual	Winter	
1	47.69	16.98	✓/✓
2	45.71	15.73	✓/✓
3	44.23	14.88	✓/✓
4	49.65	18.88	✓/✓
5	49.65	18.88	✓/✓
6	47.86	18.09	✓/✓
7	42.16	14.63	✓/✓
8	30.26	13.29	✓/✓

8.2.3 View 3



Points	Proposed Scheme APSH		Comment
	Annual	Winter	
1	5.59	0.00	x / x
2	12.59	0.00	x / x
3	12.59	0.00	x / x
4	8.39	0.00	x / x
5	9.71	0.00	x / x
6	7.89	0.00	x / x
7	7.43	0.00	x / x

8.3 Discussion

Within the BS 8206-2:2008 standard, when discussing annual probable sunlight hours regarding proposed developments, it is noted that:

"The degree of satisfaction is related to the expectation of sunlight. If a room is necessarily North facing or if the building is in a densely-built urban area, the absence of sunlight is more acceptable than when its exclusion seems arbitrary".

This is also reflected in the correlating BRE guidance which notes:

"The BS 8206-2 criterion applies to rooms of all orientations, although if a room faces significantly north of due east or west it is unlikely to be met."

Of the 29 no. points tested, 20 no. points (69%) meet the BRE recommended values. The windows that do not meet this recommendation are predominantly as a result of their orientation, i.e. north facing windows (View 3) and the provision of a balcony. When the north facing spaces are excluded the overall percentage rises to 91%. This percentage increases again to 100% for the winter period in isolation which is when sunlight is most valued because of the limited availability at this time of year.

9 Daylight to Existing Buildings

9.1 Guidance

When designing a new development, it is important to safeguard the daylight to nearby buildings. The BRE's 2011 guidance provides numerical values that are purely advisory. Different criteria may be used based on the requirements for daylighting in an area viewed against other site layout constraints. Another issue is whether the existing building is itself a good neighbour, standing a reasonable distance from the boundary and taking no more than its fair share of light. Any reduction in the total amount of skylight can be calculated by determining the vertical sky component at the centre of key reference points. The vertical sky component definition from the BRE guide is described below:

Vertical sky component (VSC)	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.

The maximum possible VSC value for an opening in a vertical wall, assuming no obstructions, is 40%. This VSC at any given point can be tested in RadianceIES, a module of IES VE.

For typical residential schemes the BRE guide states the following in Section 2.2.7:

> 2.2.7 If this VSC is greater than 27% then enough skylight should still be reaching the window of the existing building. Any reduction below this level should be kept to a minimum. If the VSC, with the new development in place, is both less than 27% and less than 0.8 times its former value, occupants of the existing building will notice the reduction in the amount of skylight. The area lit by the window is likely to appear more gloomy, and electric lighting will be needed more of the time.

As such this study will compare the Existing scheme and Proposed scheme and consider if the values on the existing buildings are above 27% or not less than 0.8 times their former value (that of the Existing scheme).

9.2 VSC Value Targets

Section 2.1.6 of the BRE Guide states that the amount of daylight a room requires depends on what it is being used for, but roughly speaking if the VSC is:

- ≥ 27%, conventional window design will usually give reasonable results
- between 15 % and 27 % special measures (larger windows, changes to room layout) are usually needed to provide adequate daylight

As such these values will be referred to as part of the analysis of the adjacent properties.

It should be taken into consideration that for the purposes of this report, window positions in some cases have been estimated but are considered representative and sufficient to undertake the assessment.

9.3 Assessment

Based on the methodology outlined above, the following locations have been modelled and analysed:

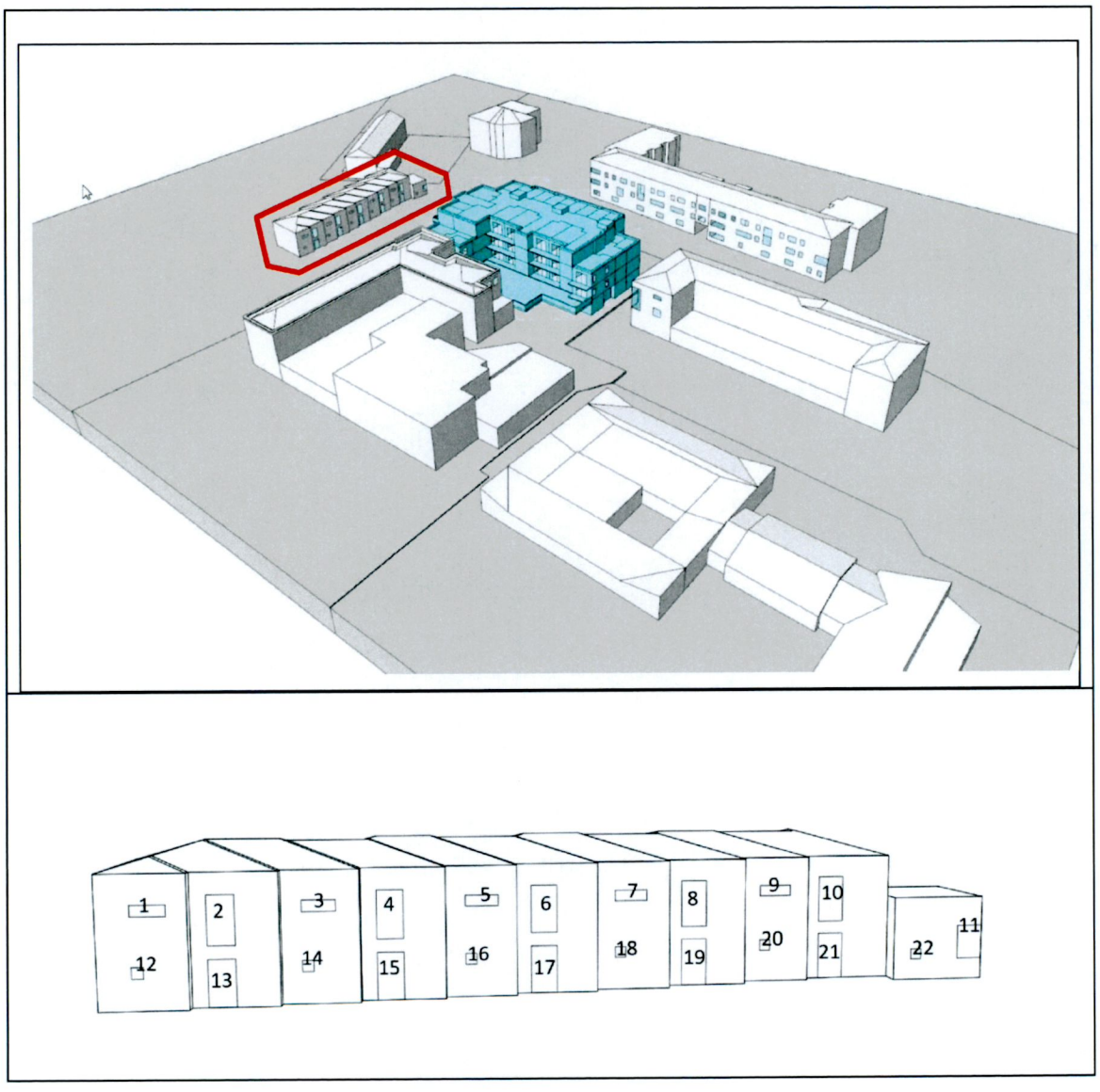
Please note, the "Comment" symbol in each of the tables represents the following:

BRE Guide / BS 8206-2:2008

✓ These points have a proposed vertical sky component greater than 27% or not less than 0.8 times their former value. Therefore, these points exceed BRE recommendations.

✓*1* These points have a proposed vertical sky component between 15% and 27%. The BRE recommends that windows in this VSC range will still receive adequate internal daylighting if they have larger than average windows.

9.3.1 VSC View 01 – Nielstown Road – Chaplains Row



Ref:	Existing VSC	Proposed VSC	Proposed VSC% of Existing	Comment
1	34.93	33.59	96%	✓
2	33.38	31.99	96%	✓
3	35.00	33.13	95%	✓
4	33.74	31.65	94%	✓
5	35.38	33.11	94%	✓
6	34.37	31.59	92%	✓
7	36.21	33.06	91%	✓
8	34.62	32.08	93%	✓
9	36.24	33.02	91%	✓
10	35.62	33.14	93%	✓
11	36.04	33.15	92%	✓
12	33.01	31.40	95%	✓
13	31.28	29.91	96%	✓
14	32.05	29.70	93%	✓
15	31.31	29.02	93%	✓
16	33.32	29.93	90%	✓
17	32.61	28.96	89%	✓
18	33.44	29.70	89%	✓
19	33.02	29.98	91%	✓
20	33.18	30.23	91%	✓
21	33.66	30.49	91%	✓
22	35.66	32.64	92%	✓