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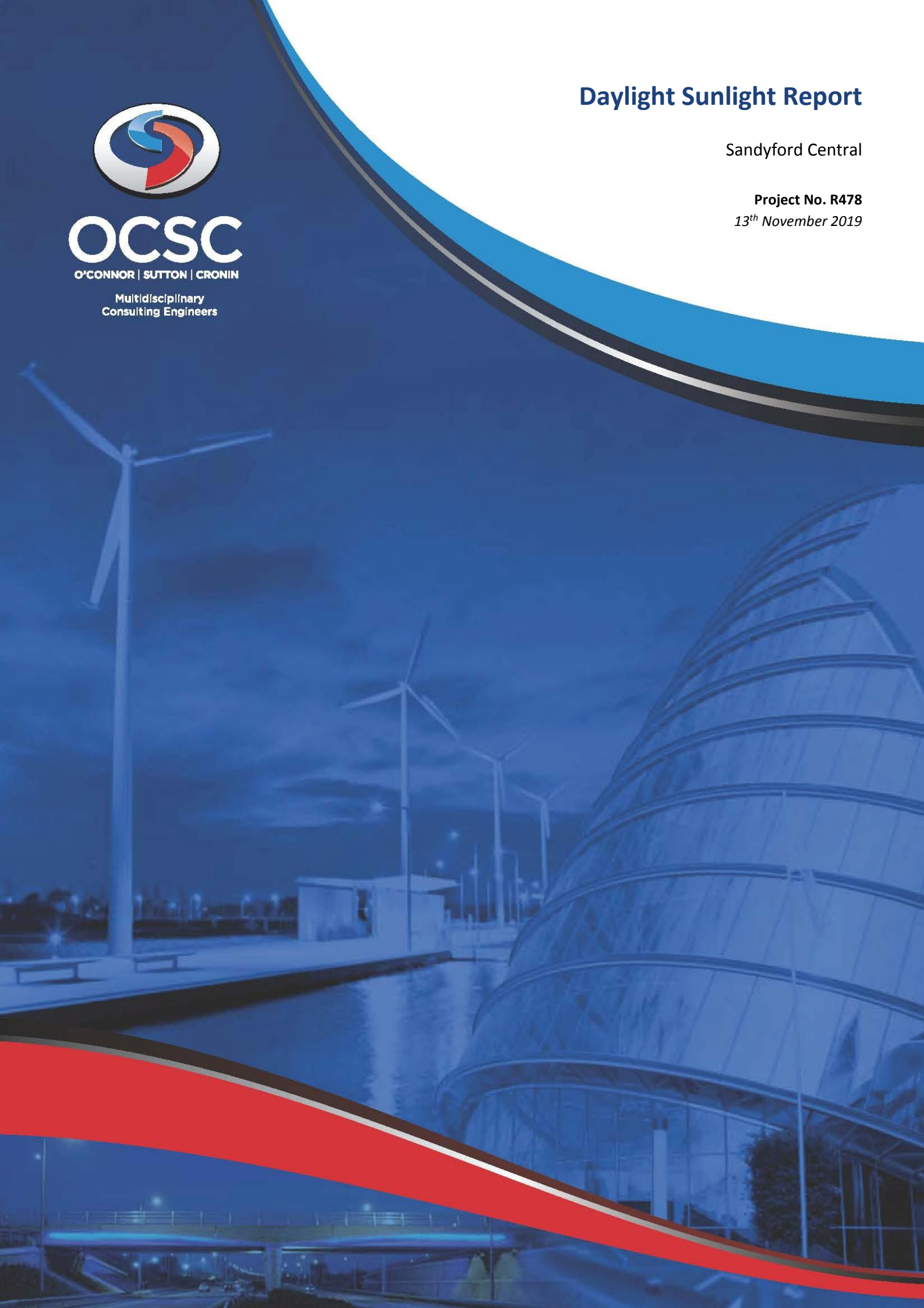
Daylight Sunlight Report

Sandyford Central

Project No. R478

13th November 2019



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NOTICE

DOCUMENT CONTROL & HISTORY

OCSC Job No.: R478	Project Code	Originator Code	Zone Code	Level Code	File Type	Role Type	Number Series	Status/ Suitability Code	Revision
	R478	OCSC	XX	XX	RP	YS	0002	S4	P06

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EXECUTIVE SUMMARY

A Daylight/ Sunlight report has been carried out for the Sandyford Central development.

The analysis confirms that across the entire development excellent levels of internal daylight are achieved. The majority of apartments not only meet but exceed the recommendations outlined within the BRE guidelines on "Site Layout Planning for Daylight and Sunlight" and British Standard BS 8206.

The analysis demonstrates that the proposed building has no further daylight or overshadowing impact to any of the surrounding properties over the currently permitted scheme ABP Ref. PL06D.301428.

In relation to sunlight, the development shows compliance with BRE Guidelines receiving more than 2 hours of sunlight on more than half of the provided amenity spaces on March 21st. Also, excellent levels of sunlight will be achieved during the summer.

DAYLIGHT SUNLIGHT REPORT

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1. INTRODUCTION

OCSC have been appointed to carry out a Daylight/ Sunlight study for the Sandyford Central development located at Sandyford, Dublin 18.

The aim of the study is to record and analyse the results for the following:

- The daylight levels within the living and bedroom areas of selected apartments, to give an indication of the expected daylight levels throughout the proposed development;
- The quality of amenity space, being provided as part of the development, in relation to sunlight;
- Any potential daylight impact the proposed development may have on properties adjacent to the site.

The calculation methodology for daylight and sunlight is based on the British Research Establishments "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2011 Second Edition.

A previous planning application was granted with Reg. Ref. ABP Ref. PL06D.301428. The height and massing changes proposed in the current scheme are outlined in Section 3.6.

2. SITE DESCRIPTION

Sandyford GP Limited (acting in its capacity as general partner for the Sandyford Central Partnership) intend to apply to An Bord Pleanála for permission for a strategic housing development at a 1.54 ha site at the former Aldi Site, Carmanhall Road, Sandyford Business District, Dublin 18.

The development, which will have a Gross Floor Area of 49,342 sq m will principally consist of: the demolition of the existing structures on site and the provision of a Build-to-Rent residential development comprising 564 No. apartments (46 No. studio apartments, 205 No. one bed apartments, 295 No. two bed apartments and 18 No. three bed apartments) in 6 No. blocks as follows: Block A (144 No. apartments) is part 10 to part 11 No. storeys over basement; Block B (68 No. apartments) is 8 No. storeys over basement; Block C (33 No. apartments) is 5 No. storeys over lower ground; Block D (103 No. apartments) is part 16 to part 17 No. storeys over lower ground; Block E (48 No. apartments) is 10 No. storeys over semi-basement; and Block F (168 No. apartments) is 14 No. storeys over semi basement.

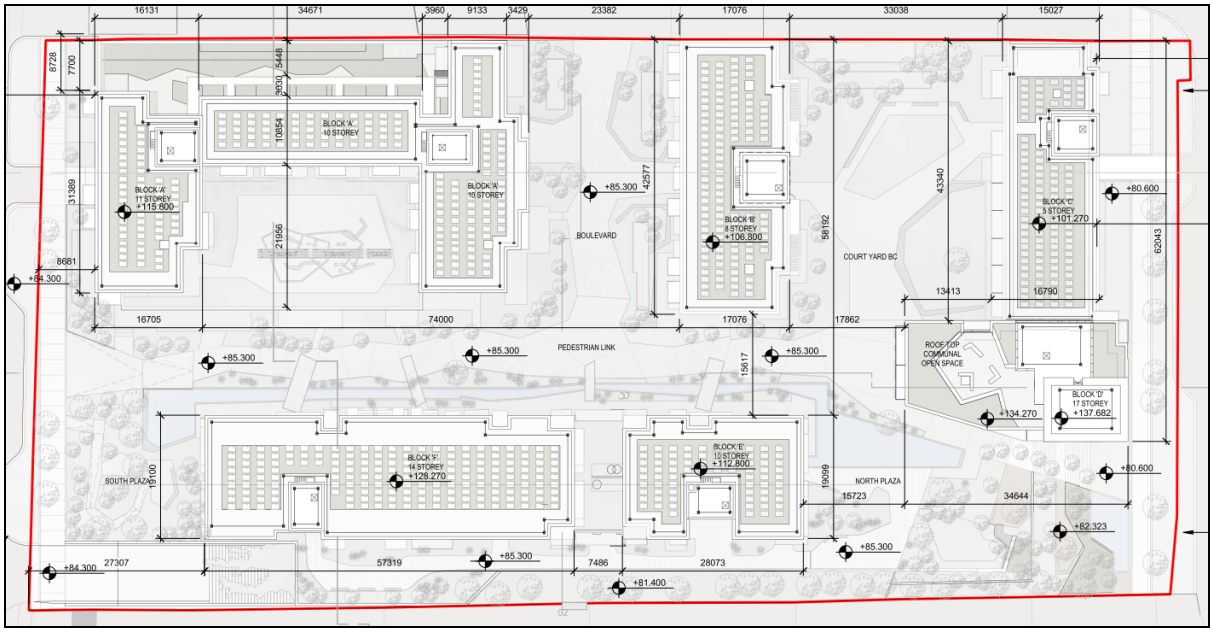


Figure 1 - Proposed Site Plan

(Source: HJL Drawing No. SFC-HJL-ST-00-DR-A-1000)

The development provides resident amenity spaces (1,095 sq m) in Blocks A, C and D including concierge, gymnasium, lounges, games room and a panoramic function room at Roof Level of Block D; a creche (354 sq m); café (141 sq m); a pedestrian thoroughfare from Carmanhall Road to

Blackthorn Drive also connecting into the boulevard at Rockbrook to the west; principal vehicular access off Carmanhall Road with servicing and bicycle access also provided off Blackthorn Drive; 285 No. car parking spaces (254 No. at basement level and 31 No. at ground level); 21 No. motorcycle spaces; set-down areas; bicycle parking; bin storage; boundary treatments; hard and soft landscaping; lighting; plant; ESB substations and switchrooms; sedum roofs; and all other associated site works above and below ground.

3. PROPOSED BUILDING DESIGN

In order to ensure that daylight levels were maximised for the Sandyford Central development, a number of key design strategies were analysed during concept design.

3.1. BUILDING MATERIAL SELECTION

The selection of materials play an important role in ambient daylight levels. The façade of the proposed buildings have been carefully selected to promote a sense of brightness and light. The Sandyford façades are composed of light brick and powder coated metal. This will ensure light is reflected throughout the development. The inclusion of greenery to the courtyard areas and amenity spaces will help to improve the sense of light and brightness within the apartments.

Figure 2 - Façade Views of Proposed Development

(Source: Visual Lab)

3.2. GLAZING TO WALL RATIO

The primary function of the glazing to wall ratio is to maximize daylight within the space while reducing solar gains within the proposed development. The other advantage in conjunction with appropriate materials is that the more light coloured, reflective materials used externally, the more ambient daylight will be reflected to the surrounding areas. In addition, floor to ceiling heights of a minimum of 2.6m for living rooms and minimum of 2.4m for bedrooms further enhance the opportunity for improved daylight levels. Extensive analysis was undertaken on all building facades to ensure glazing widths were maximized to promote access to daylight. The image below illustrates the glazing to wall ratio of the proposed development.

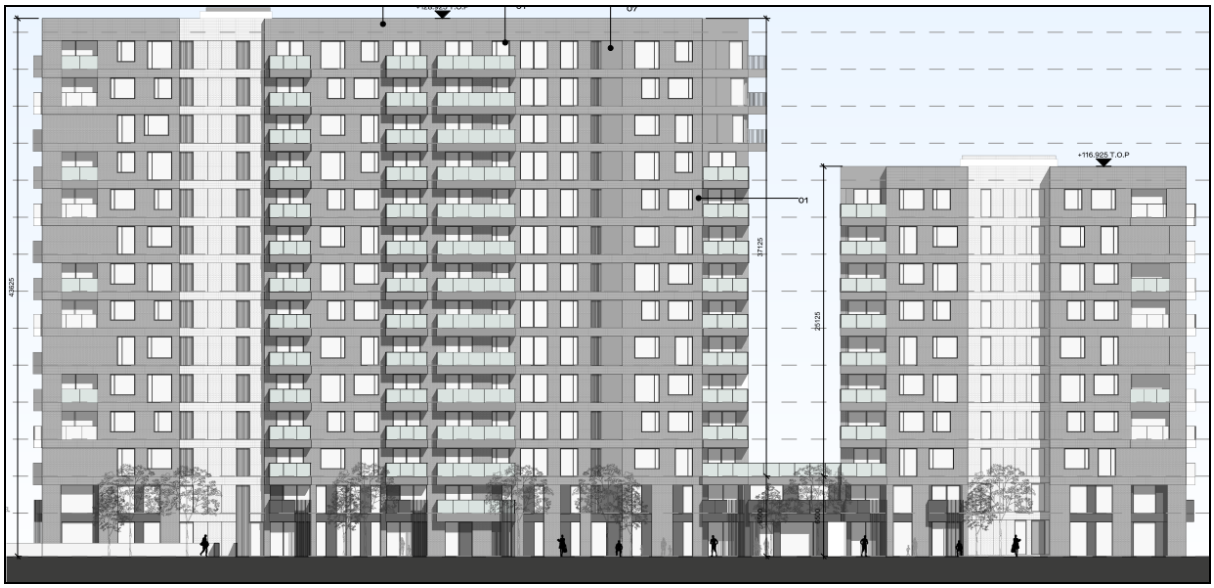


Figure 3 – Block EF South East Elevation

(Source: HJL Drawing No. SFC-HJL-XX-ZZ-DR-A-2015)

3.3. PLAY AREAS

In order to make the development more attractive for the occupants, the development has two play areas that will allow for different activities for children and families.

A south facing park of 400 m^2 along Carmanhall Road will include pocket play areas with seating and grassed areas for diverse activities. Also, a toddler area of 60 m^2 will also be included, located in the planted area next to Blackthorn Avenue.

Both play areas will achieve excellent levels of sunlight on March 21st as illustrated under Section 6 of this report.

3.4. BOULEVARD

Within the development high quality green courtyards have been included to allow occupants to spend quality time outdoors. The two main level 1 boulevard ground floor courtyards have been carefully designed accommodating large areas of planting with raised and modulated edges used as seating. The courtyards will ensure a light, bright and airy amenity space. The open ended courtyard provided at Block D will assist in improving the daylight levels of the apartments in this area. In addition, the occupants will benefit from exceptional views onto diverse and ambient courtyard areas as illustrated in Figure 4.

Figure 4 – Courtyards at Level 1 Boulevard Ground Floor Level

(Source: Landscape & Boundary Treatments Presentation)

3.5. RAISED COURTYARDS & ROOF

A high quality courtyard is provided on the second floor of Block A which will accommodate several activities. There will be a structural canopy for shelter that will allow outdoor activities, as well as a long linear table that could be used for worktop or dining space for occupants. The lawn area will allow space for outdoor picnics and raised planters will frame the terraces of the apartments providing a layer of green screening.

A roof top terrace is also included on Level 17 of Block D. The terrace will be effectively landscaped to provide a mix of greenery and seating areas for occupants and as illustrated in Section 6 of this report, excellent levels of sunlight will be received.

Figure 5 – Raised Courtyard at Block A

(Source: Landscape & Boundary Treatments Presentation)

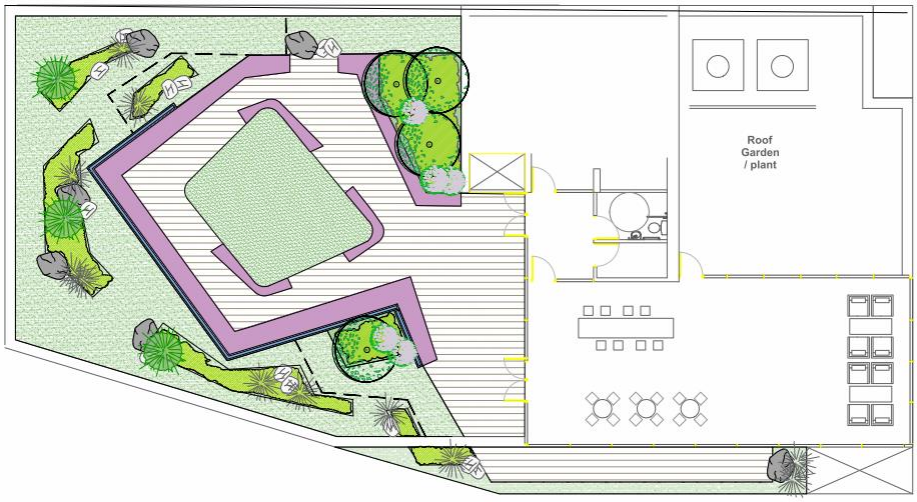


Figure 6 – Roof Top Terrace on Block D

(Source: Landscape & Boundary Treatments Presentation)

3.6. HEIGHT AND MASSING CHANGES

The changes to the permitted building height and massing include the addition of 3 floors to Block D and 2 floors to Block F.

The substitution of a 1100mm deep transfer slab with a 250mm floor slab and the floor to floor height reduction by 75mm have caused the decrease of the total height of every building and promote the least possible impact due to the additional floors. Therefore, although additional floors have been added to Blocks D and E the overall heights of these blocks have increased by only 5425mm (Block F) and 6680mm (Block D).

The massing of Blocks E and F have been redesigned, removing the bridges and changing the position of the gap between buildings in order to allow more sunlight penetration into the amenity spaces within the proposed development.

Figure 7 – 3D Sketchup Model of Currently Permitted Scheme

(Source: HJL Sketchup Model)

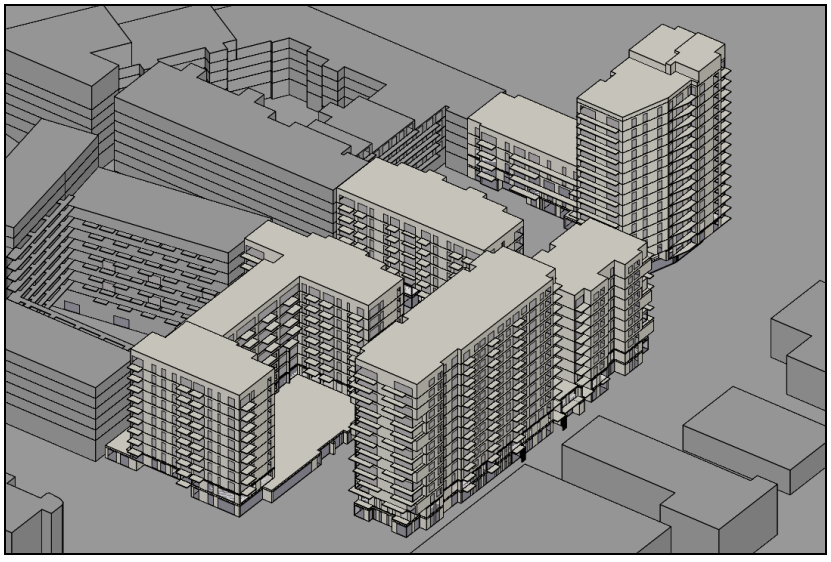


Figure 8 – 3D IES VE Model of Proposed Scheme

(Source: OCSC IES VE Model)

4. BRE GUIDELINES FOR DAYLIGHT AND SUNLIGHT

The analysis of the development potential and the quality of amenity for the new development as well as for the surrounding properties once the scheme has been implemented, has been based on the Building Research Establishment (BRE) guidelines on "Site Layout Planning for Daylight and Sunlight. A Guide to Good Practice (Building Research Establishment Report, 2011)."

These guidelines provide the criteria and methodology for calculations pertaining to daylight and sunlight, and is the primary reference for this matter. The guide gives simple rules for analysing sites where the geometry of the surroundings is straightforward, supplementing them with graphical methods for complex sites.

However, it is important to note that the performance targets which are included should be used with a degree of flexibility as per the extract below from the BRE Guide:

"The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the designer. Although it gives numeral guidelines these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design."

The difficulty in achieving the result set out by the BRE guidance in a city centre location is also recognised within planning guidance which has been published by the Irish Government. On page 43 of the Urban Design Manual 2009 the following advice is provided:

"Where design standards are to be used (such as the UK document Site Layout Planning for Daylight and Sunlight, published by the BRE), it should be acknowledged that for higher density proposals in urban areas it may not be possible to achieve the specified criteria, and standards may need to be adjusted locally to recognise the need for appropriate heights or street widths."

5. DAYLIGHT LEVELS WITHIN THE PROPOSED DEVELOPMENT

5.1. ASSESSMENT CRITERIA – INTERNAL DAYLIGHT

The method of calculation selected for the internal daylight analysis for this development is the Average Daylight Factor (ADF). This is the most detailed and thus most accurate method which considers not only the amount of sky visible from the vertical face of the window, but also the window size, room size and room use.

Architectural plans and elevations provided by Henry J Lyons formed the basis for the internal daylight assessment.

In order to quantify the quality of daylight within a space as per BRE Guidelines, the British standards BS8206 sets out minimum daylight factors to be achieved in new build residential units.

Table 2 **Minimum average daylight factor**

Room type	Minimum average daylight factor %
Bedrooms	1
Living rooms	1.5

Figure 9 - BS 8206 – Table 2

(Source: British Standard (BS 8206-2:2008) Lighting for Buildings – Part 2)

In order to analyse the ADF within the proposed residential development, simulations have been completed within the IES VE Software package. A detailed model of the development has been constructed using the software. The model includes the proposed development as well as the surrounding buildings adjacent to the site. Heights of surrounding buildings have been obtained from survey data.

5.2. DAYLIGHT RESULTS – INTERNAL DAYLIGHT APARTMENTS

This section outlines the apartment units that were selected for assessment of internal daylight levels for the proposed Sandyford Central development. The results of the analysis are outlined in the accompanying tables.

In line with standard industry practice, units presented at the lower levels across all blocks have been selected as 'worst case' for analysis. The theory being that as floor level height increases so too does access to daylight. The units selected for analysis are considered to be representative of the units across the site and therefore results are indicative of daylight levels to be expected across the entire development.

In summary, the vast majority of units not only meet but in the majority of cases exceed the Average Daylight Factor criteria as outlined within the BRE Guidelines. Of the 1413 rooms that comprise the development, only 62 fall slightly under the BRE requirements, therefore a 95.6% compliance ratio is achieved across the development. This percentage is above the 95% compliance ratio outlined within ARUP's daylight report issued as part of the currently permitted scheme at the subject site (ABP Ref. PL06D.301428), therefore it can be stated that overall the quality of the proposed development is as good as or better than the extant permission pertaining to the site.

In all cases generous floor to ceiling heights have been designed into the project with glazing areas being maximised to amplify the quality of daylight received. Careful consideration has been given to room layout design attributing store rooms and circulation areas to the back of rooms and living spaces to the front where the highest level of daylight is experienced.

Figures 10 and 11 illustrate the assessed rooms at Level 1 Boulevard Ground Floor and Level 2 within all blocks. Block E has not been assessed, however, the results of Block F are representative for Block E due to the similar room location and configuration.

Figure 10 – Level 1 Boulevard Ground Floor Assessed Rooms Highlighted in Green

(Source: HJL Drawing No. SFC-HJL-00-01-DR-A-1011)

Figure 11 – Level 2 Assessed Rooms Highlighted in Green

(Source: HJL Drawing No. SFC-HJL-00-02-DR-A-1012)

Figure 12 – Level 1 Boulevard Ground Floor Block A Assessed Rooms

(Source: HJL Drawing No. SFC-HJL-00-01-DR-A-1011)

Table 1 – Average Daylight Factor Results – Level 1 Boulevard Ground Floor Block A

Unit		ADF required (%)	ADF results (%)	Meets minimum ADF criteria
A	Living/Dining	1.5	1.5	Y
B	Bedroom	1.0	1.9	Y
C	Bedroom	1.0	1.3	Y
D	Living/Dining	1.5	2.3	Y
E	Living/Dining	1.5	1.0	N
F	Living/Dining	1.5	1.0	N

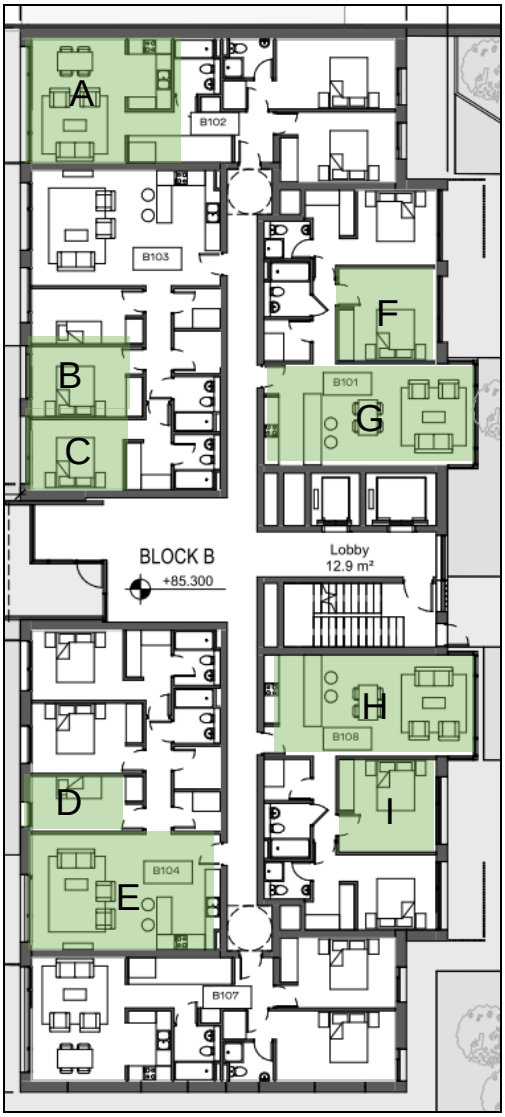


Figure 13 – Level 1 Boulevard Ground Floor Block B Assessed Rooms

(Source: HJL Drawing No. SFC-HJL-00-01-DR-A-1011)

Table 2 – Average Daylight Factor Results – Level 1 Boulevard Ground Floor Block B

Unit		ADF required (%)	ADF results (%)	Meets minimum ADF criteria
A	Living/Dining	1.5	0.8	N
B	Bedroom	1.0	1.4	Y
C	Bedroom	1.0	1.4	Y
D	Bedroom	1.0	1.0	Y
E	Living/Dining	1.5	1.0	N
F	Bedroom	1.0	2.9	Y
G	Living/Dining	1.5	3.2	Y
H	Living/Dining	1.5	3.2	Y
I	Bedroom	1.0	2.9	Y

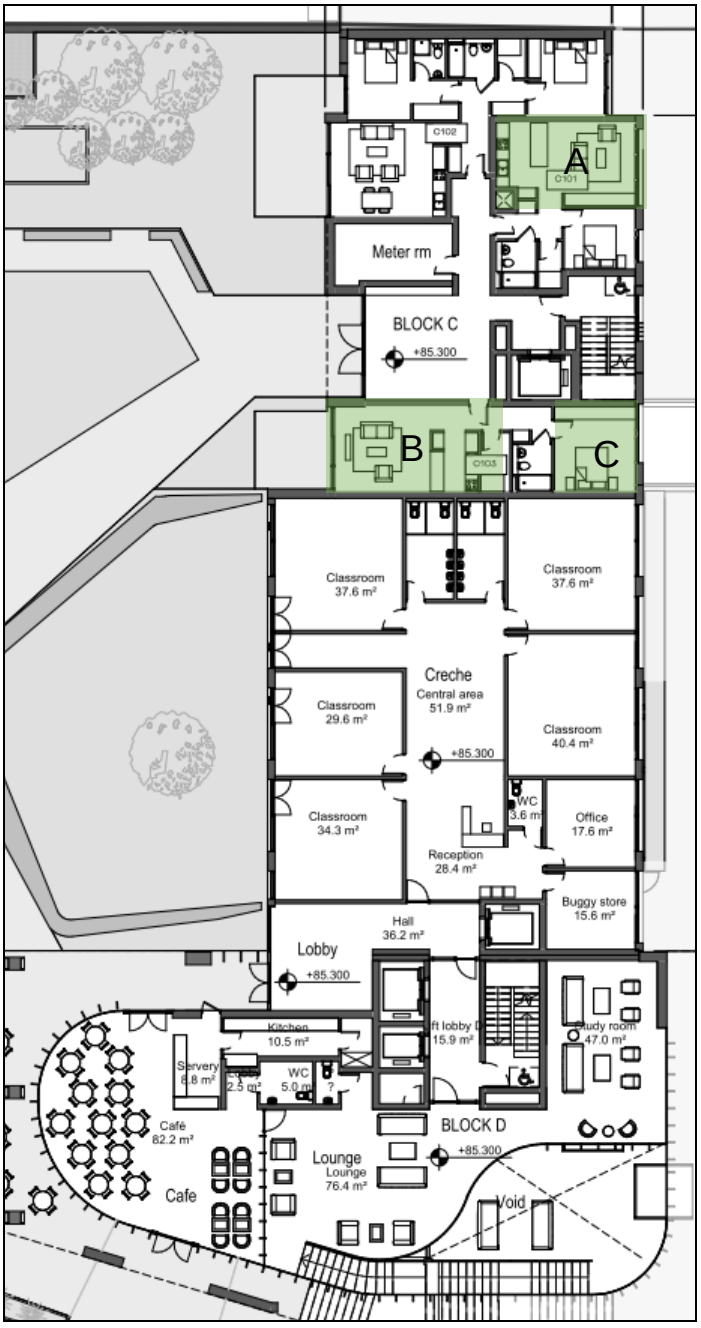


Figure 14 – Level 1 Boulevard Ground Floor Block C and D Assessed Rooms

(Source: HJL Drawing No. SFC-HJL-00-01-DR-A-1011)

Table 3 – Average Daylight Factor Results – Level 1 Boulevard Ground Floor Blocks C and D

Unit		ADF required (%)	ADF results (%)	Meets minimum ADF criteria
A	Living/Dining	1.5	3.7	Y
B	Living/Dining	1.5	1.5	Y
C	Bedroom	1.0	4.7	Y

Figure 15 – Level 1 Boulevard Ground Floor Block F Assessed Rooms (representative of Block E)

(Source: HJL Drawing No. SFC-HJL-00-01-DR-A-1011)

Table 4 – Average Daylight Factor Results – Level 1 Boulevard Ground Floor Block F

Unit		ADF required (%)	ADF results (%)	Meets minimum ADF criteria
A	Bedroom	1.0	1.7	Y
B	Living/Dining	1.5	1.5	Y
C	Bedroom	1.0	1.6	Y
D	Living/Dining	1.5	1.5	Y
E	Living/Dining	1.5	0.6	N
F	Living/Dining	1.5	1.5	Y
G	Bedroom	1.0	2.1	Y
H	Bedroom	1.0	2.1	Y
I	Bedroom	1.0	2.0	Y

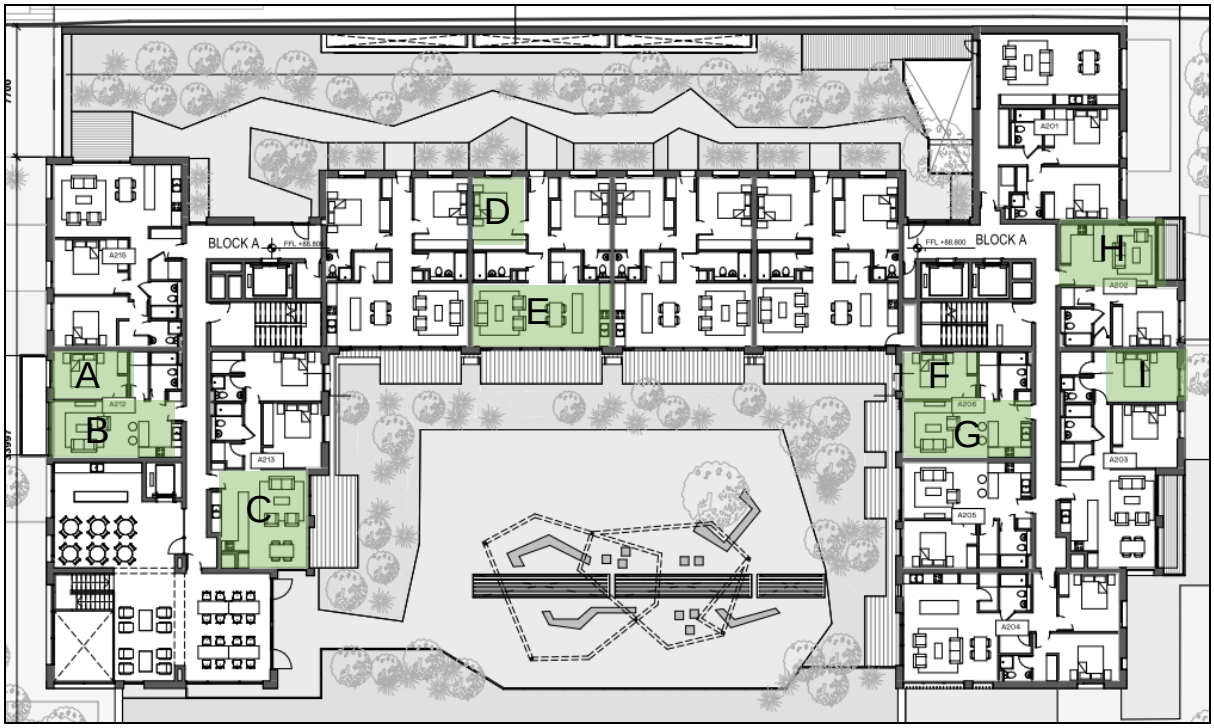


Figure 16 – Level 2 Block A Assessed Rooms

(Source: HJL Drawing No. SFC-HJL-00-02-DR-A-1012)

Table 5 – Average Daylight Factor Results – Level 2 Block A

Unit		ADF required (%)	ADF results (%)	Meets minimum ADF criteria
A	Bedroom	1.0	4.2	Y
B	Living/Dining	1.5	2.7	Y
C	Living/Dining	1.5	1.5	Y
D	Bedroom	1.0	1.0	Y
E	Living/Dining	1.5	2.2	Y
F	Bedroom	1.0	1.3	Y
G	Living/Dining	1.5	0.7	N
H	Living/Dining	1.5	2.3	Y
I	Bedroom	1.0	1.0	Y

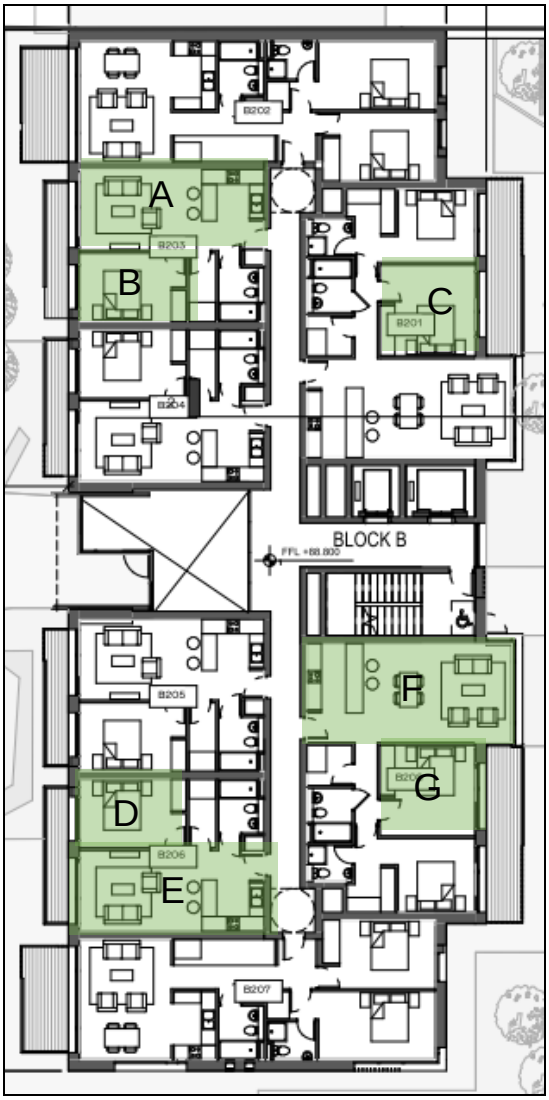


Figure 17 – Level 2 Block B Assessed Rooms

(Source: HJL Drawing No. SFC-HJL-00-02-DR-A-1012)

Table 6 – Average Daylight Factor Results – Level 2 Block B

Unit		ADF required (%)	ADF results (%)	Meets minimum ADF criteria
A	Living/Dining	1.5	0.7	N
B	Bedroom	1.0	1.8	Y
C	Bedroom	1.0	2.8	Y
D	Bedroom	1.0	1.0	Y
E	Living/Dining	1.5	0.9	N
F	Living/Dining	1.5	3.1	Y
G	Bedroom	1.0	3.0	Y

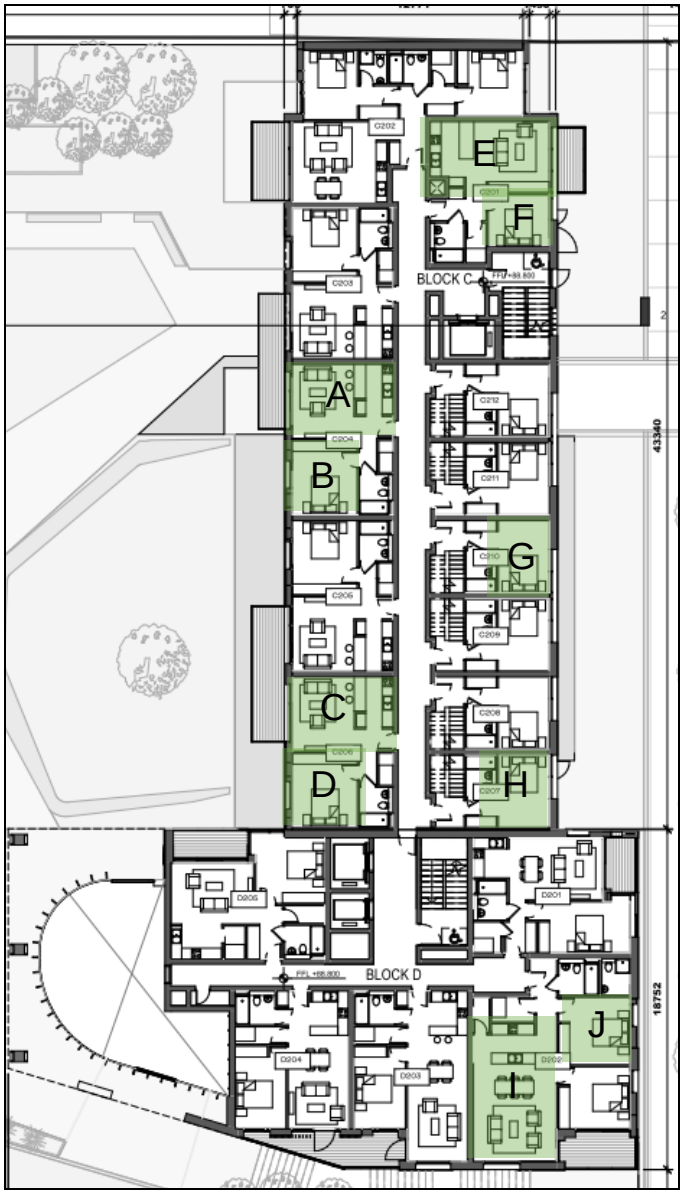


Figure 18 – Level 2 Block C and D Assessed Rooms

(Source: HJL Drawing No. SFC-HJL-00-02-DR-A-1012)

Table 7 – Average Daylight Factor Results – Level 2 Block C and D

Unit		ADF required (%)	ADF results (%)	Meets minimum ADF criteria
A	Living/Dining	1.5	1.5	Y
B	Bedroom	1.0	1.0	Y
C	Living/Dining	1.5	1.5	Y
D	Bedroom	1.0	1.0	Y
E	Living/Dining	1.5	2.4	Y
F	Bedroom	1.0	1.6	Y
G	Bedroom	1.0	1.6	Y
H	Bedroom	1.0	1.6	Y
I	Living/Dining	1.5	1.5	Y
J	Bedroom	1.0	1.6	Y

Figure 19 – Level 2 Block F Assessed Rooms (representative of Block E)

(Source: HJL Drawing No. SFC-HJL-00-02-DR-A-1012)

Table 8 – Average Daylight Factor Results – Level 2 Block F

Unit		ADF required (%)	ADF results (%)	Meets minimum ADF criteria
A	Studio	1.5	1.7	Y
B	Living/Dining	1.5	0.6	N
C	Bedroom	1.0	2.0	Y
D	Living/Dining	1.5	1.9	Y
E	Bedroom	1.0	1.5	Y
F	Bedroom	1.0	1.5	Y

6. SUNLIGHT ASSESSMENT TO AMENITY SPACES WITHIN THE DEVELOPMENT

BRE Guidelines (2011) recommend that for external amenity spaces to appear adequately sunlit throughout the year, at least half of the garden or amenity space should receive at least two hours of sunlight on March 21st.

In order to show that sunlight levels within the development achieve compliance with current BRE Guidelines and are still in line with the previous planning application, a sunlight study has been carried out for the permitted and the proposed developments.

The image below illustrates the open spaces within the development.

Figure 20 – Open Spaces

(Source: Landscape & Boundary Treatments Presentation)

The red squares in Figure 21 highlight the areas that receive a minimum of 2 hours of sunlight on the 21st of March for the proposed development. It is evident at least 50% of the overall communal amenity spaces receive 2 hours or more of sunlight on March 21st, therefore compliance with BRE Guidelines is achieved. Figure 22 illustrates the sunlight received on March 21st for the previously granted planning application at the subject site. Due to the additional floors some areas perceive a slight deterioration in sunlight. However, due to the reconfiguration of the blocks F and E a significant improvement in sunlight access is also shown. Overall, it is evident that there is no significant deterioration in sunlight received between the proposed and permitted schemes.

Figure 21 – Open Spaces - Hours of Sunlight on March 21st – Proposed Development

(Source: OCSC Sunlight Analysis IES VE)

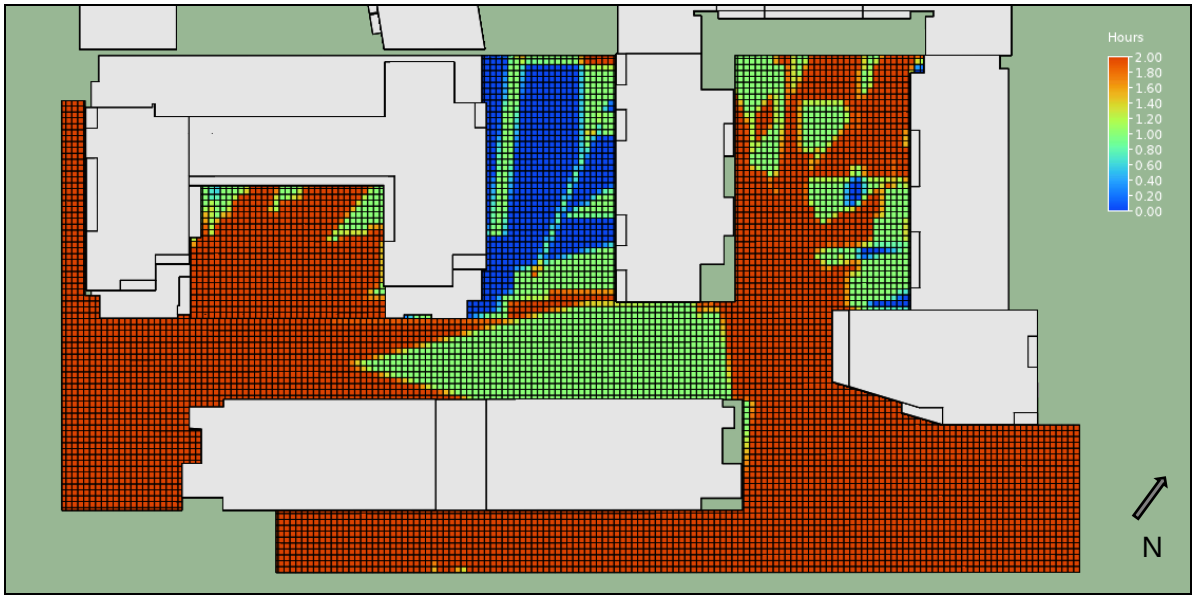


Figure 22 – Open Spaces - Hours of Sunlight on March 21st – Permitted Development

(Source: OCSC Sunlight Analysis IES VE)

The excellent daylight and sunlight access can also be attributed to the sunlight reflection from the building facades that have been carefully designed with light materials, thus creating comfortable and desirable spaces for the residents.

The sunlight access for the proposed development has also been assessed on June 21st, showing that summer sunlight access is excellent, with the majority of all residential amenity spaces achieving more than 2 hours of sunlight.

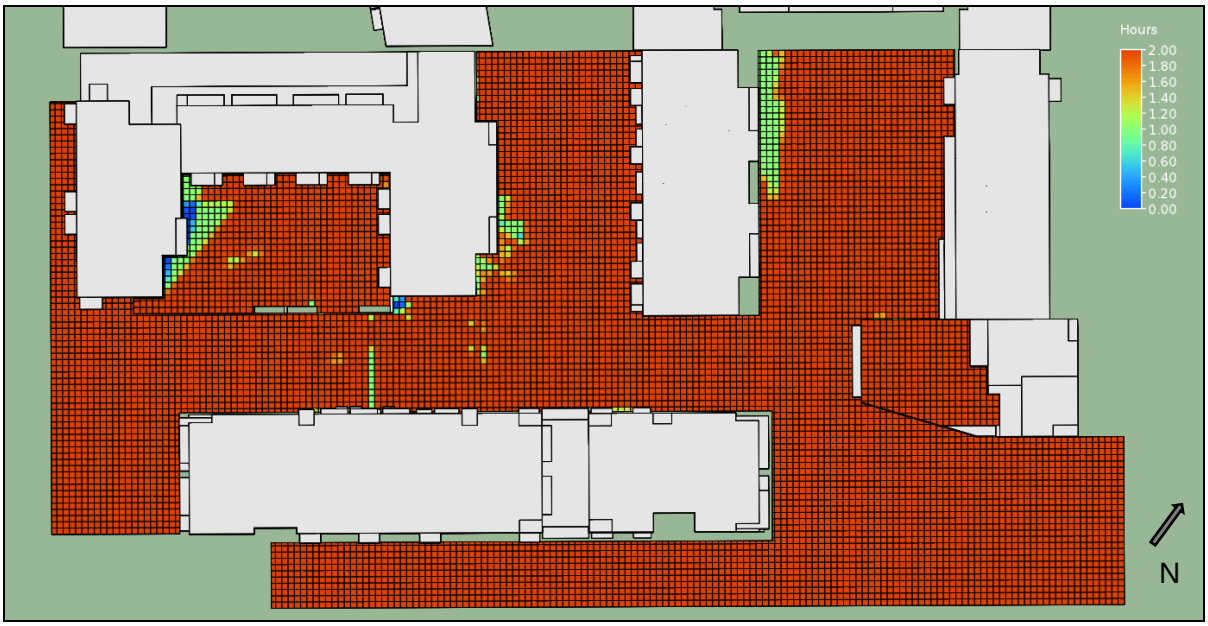


Figure 23 – Open Spaces - Hours of Sunlight on June 21st – Proposed Development

(Source: OCSC Sunlight Analysis IES VE)

7. ASSESSING THE IMPACT ON SURROUNDING PROPERTIES

7.1. DAYLIGHT & SUNLIGHT IMPACT METHODOLOGY

As per the BRE Guidelines it is important to safeguard the daylight to nearby buildings, from a proposed development, where a reasonable expectation of daylight is required. The flow matrix below outlines the criteria to be assessed, as per the BRE Guidelines, in order to ascertain any potential impact to adjacent buildings from the proposed development.

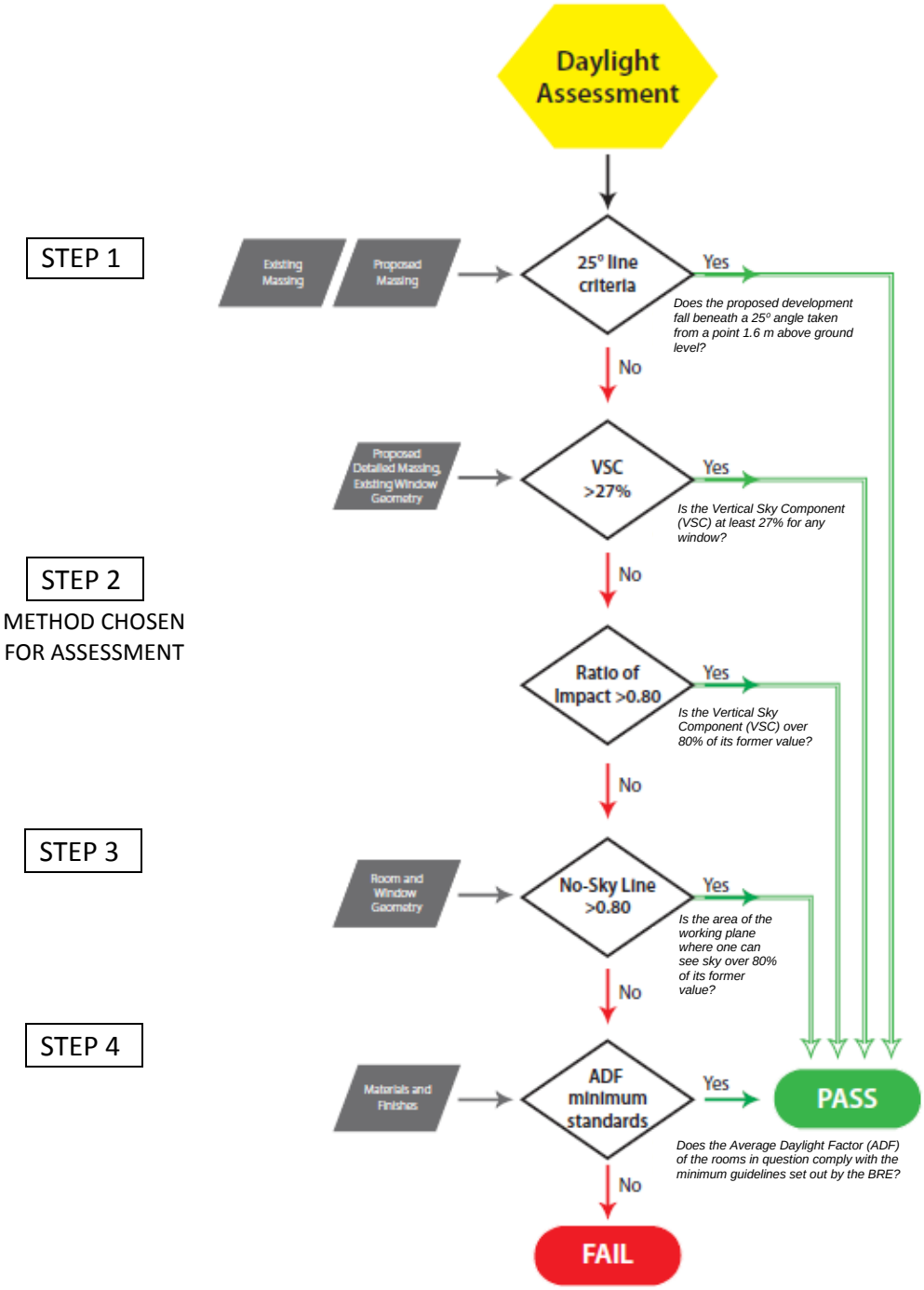


Figure 24 – Daylight Assessment Methodology

As per the flow matrix, the BRE and BS8206 guidelines provide four main methods for assessing daylight availability. In order to assess the impact of the proposed Sandyford Central development to surrounding buildings, the Visible Sky Component was selected as the method of analysis.

7.1.1 25° LINE CRITERIA

In the first instance, if a proposed development falls beneath a 25° angle taken from a point 1.6 metres above ground level from any adjacent properties, then the BRE Guidelines say that no further analysis is required in relation to impact on surrounding properties as adequate skylight will still be available. In the case of the Sandyford Central development, this method was not successful so the analysis proceeded to the next step.

7.1.2 VISIBLE SKY COMPONENT

The second method is known as the Vertical Sky Component (VSC). The VSC calculation is the ratio of the direct sky illuminance falling on the outside of a window, to the simultaneous horizontal illuminance under an unobstructed sky. The BRE Guide sets out two guidelines for the VSC:

- If the VSC at the centre of the existing window exceeds 27% with the new development in place, then enough sky light should still be reaching the existing window.
- If the VSC with the new development in place is both less than 27% and less than 80% its former value, then the reduction in light to the window is likely to be noticeable.
- This means that even if the VSC is less than 27%, as long as the reduction in the VSC value is still greater than 80% of its former value, this would be acceptable and thus the impact would be considered negligible.

It is important to note that the VSC is a simple geometrical calculation which provides an early indication of the potential for daylight entering the space. However, it does not assess or quantify the actual daylight levels inside the rooms. If the VSC standard is not met on any window, a more detailed assessment based on the Average Daylight Factor should be undertaken.

The VSC method was the second step used to assess the potential impact to the surrounding buildings identified in Figure 25, with compliance demonstrated for all surrounding buildings.

7.1.3 NO SKY LINE

The third method is the No Sky Line or Daylight Distribution Method. This method assesses the change in position of the No Sky Line between the existing and proposed situations. It does take into account the number and size of windows to a room, but still does not give any qualitative or quantitative assessment of the light in the room, only where sky can or cannot be seen. Thus, as this method is limited, it was not used as part of the analysis.

7.1.4 AVERAGE DAYLIGHT FACTOR

The final method of calculation is the Average Daylight Factor (ADF). This is a more detailed and thus more accurate method which considers not only the amount of sky visible from the vertical face of the window, but also the window size, room size and room use. Where dimensions for the room to be assessed are available, this is the best method of assessment, but even where they are not, it provides a very informative result. It gives guidance as to the qualitative and quantitative change in daylight and is related to the British Standard BS 8206 Part II.

This step is only utilised for assessing the impact to adjacent properties where compliance is not achieved using the VSC analysis. As VSC method showed compliance, this step was not used as part of the analysis.

Sections 7.2, 7.3 and 7.4 on the following pages outline the details of the analysis undertaken.

7.2. IDENTIFYING SENSITIVE RECEPTORS

Prior to following the flow matrix, first the key sensitive receptors around the site need to be identified. According to the BRE Guide, sensitive receptors are described as:

- Habitable rooms in residential buildings, where the occupants have a reasonable expectation of daylight;
- Other sensitive receptors are gardens and open spaces on adjacent properties to the new scheme, excluding public footpaths, front gardens and car parks. In accordance with the BRE Guide, windows are selected as sensitive receptors on the basis of being a habitable room facing the proposed development.

Similarly, amenities and open spaces are selected on the basis of being in the immediate vicinity of the proposed development. The primary purpose of a daylight, sunlight and overshadowing assessment is to determine the likely loss of light to adjacent buildings resulting from the construction of the proposed development.

Therefore, in this case, the proposed development is identified as the potential source of impact. The sensitive receptors identified for this study are windows of habitable rooms facing the site where the occupants have a reasonable expectation of daylight. Table 9 identifies all sensitive receptors analysed, whilst Figure 25 identifies their location.

Table 9 – Sensitive Receptors surrounding Sandyford Central Development

Development name
Future Development Rockbrook 2
Rockbrook 1
118-124 Lakelands Cl

The image below identifies the location of the sensitive receptors.

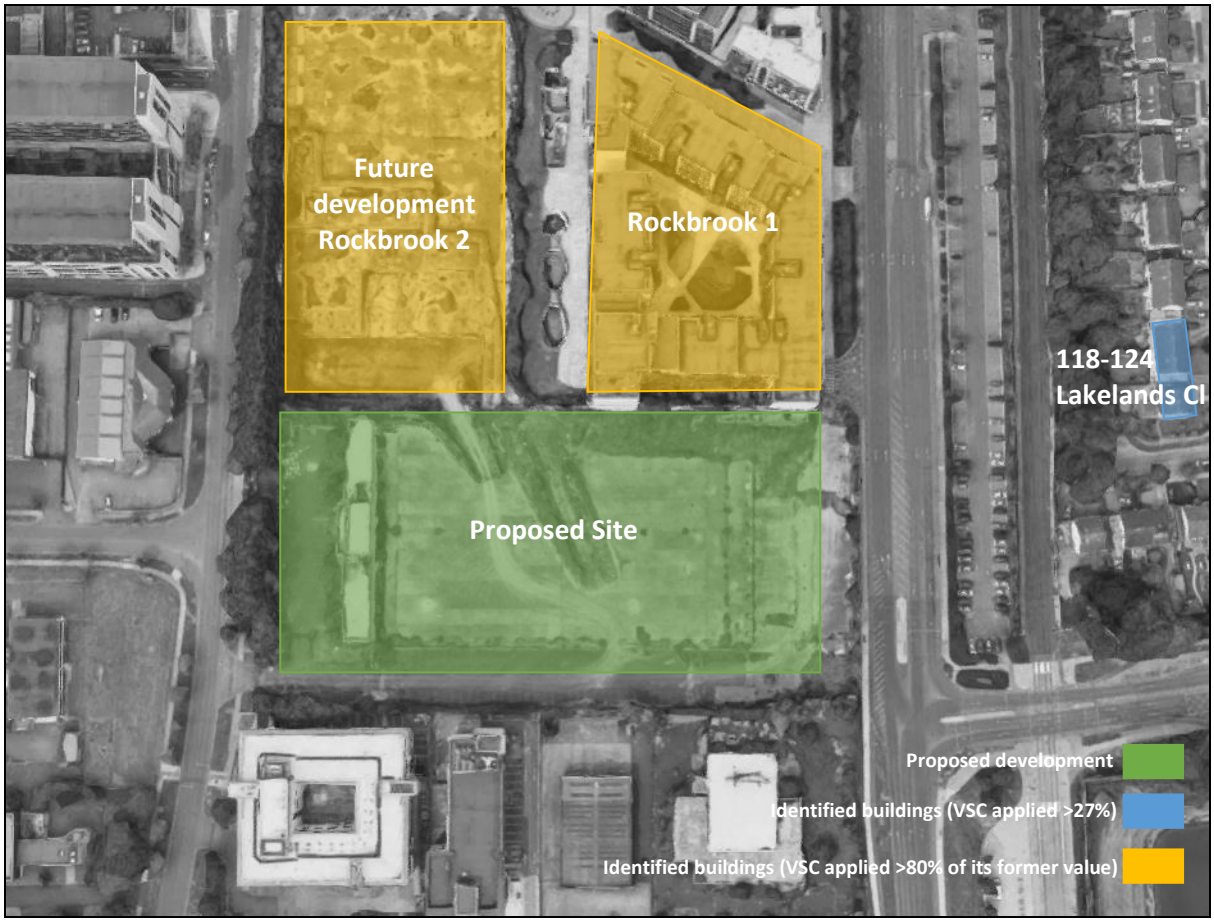


Figure 25 - Location of Sensitive Receptors

(Source: Google Maps)

7.3. SANDYFORD URBAN FRAMEWORK PLAN

In order to establish a baseline case in which to assess any potential impact to adjacent properties, guidance from the Sandyford Urban Framework Plan has been sought. The Sandyford Urban Framework Plan gives guidance on the number of storeys permitted for developments within the Sandyford area. For the Sandyford Central area this ranges between 5-14 storey heights. On this basis the previously granted scheme has been used as a baseline to assess if the proposed scheme poses any additional impact over the permitted scheme.

Figure 26 below shows an excerpt from the Sandyford Urban Framework Plan.

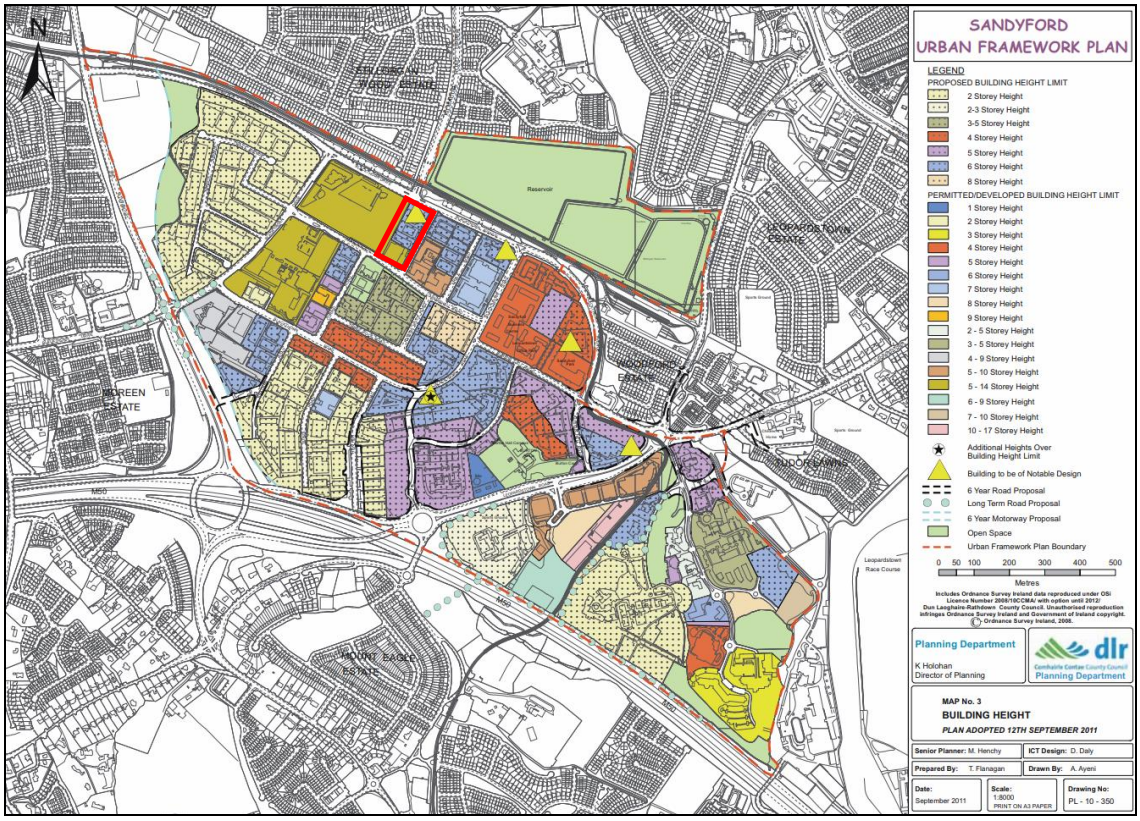


Figure 26 – Sandyford Urban Framework Plan (Sandyford Central development site highlighted with red line)

(Source: DLR County Council)

In order to quantify the potential impact on light levels when the Sandyford Central residential development is constructed, the Vertical Sky Component is used.

The following scenarios are modelled to determine the impact:

- Existing Scenario: existing brownfield;
- Permitted Scenario: permitted scheme as per granted planning application ABP Ref. PL06D.301428.
- Proposed Scenario.

7.4. DAYLIGHT IMPACT ON SURROUNDING PROPERTIES

VSC > 27%

The analysis has shown that all the properties located at Lakelands Cl will achieve a VSC value above 27% once the proposed Sandyford Central development takes place. Therefore, excellent levels of daylight will still be achieved.

Figure 27 – Sensitive receptors at Lakelands Cl

(Source: Google Maps)

Table 10 – Vertical Sky Component Results

Building	VSC received once the proposed building is in place (%)	Meets BRE Guidelines VSC >27%
1	36	Y
2	36	Y
3	36	Y
4	36	Y
5	36	Y
6	36	Y
7	36	Y
8	37	Y
9	37	Y
10	37	Y
11	37	Y
12	36	Y
13	36	Y
14	36	Y
15	36	Y

VSC > 80% of its former value

When comparing the VSC of the permitted or the proposed scenarios to the existing site, a daylight impact to the Rockbrook 1 (constructed) and 2 (granted permission) is perceived. This is normal due to the comparison between an empty brownfield and the construction of any new development. However, when comparing the currently permitted scenario to the proposed scenario, all selected windows at Rockbrook 1 and 2 show compliance with the VSC method by achieving ≥80% of its former value (permitted scenario), therefore no further impact will be perceived over the permitted development.

The following images highlights the windows tested and the tables show the VSC levels achieved.

Figure 28 – Sensitive Receptor Rockbrook 1

(Source: Google Maps)

Table 11 – Vertical Sky Component Results Rockbrook 1

Window Ref.	VSC existing development (%)	VSC permitted development ABP Ref. PL06D.301428 (%)	VSC proposed development (%)	VSC % of its former value (permitted scheme)	Meets BRE Guidelines VSC >80% of its former value
1	21.9	8.5	8.1	95	Y
2	28.9	11.3	10.7	95	Y
3	29.1	12.2	11.9	98	Y
4	21.4	11.4	11.1	97	Y
5	21.7	9.1	8.8	97	Y
6	26.1	10.6	10.6	100	Y
7	26.6	11.8	11.8	100	Y
8	21.9	13.2	12.7	96	Y
9	22.1	10.6	9.9	93	Y
10	26.6	12.5	11.6	93	Y
11	26.7	13.9	13.9	100	Y
12	23.5	16.1	15.6	97	Y

Window Ref.	VSC existing development (%)	VSC permitted development ABP Ref. PL06D.301428 (%)	VSC proposed development (%)	VSC % of its former value (permitted scheme)	Meets BRE Guidelines VSC >80% of its former value
13	22.2	12.1	11.5	95	Y
14	26.4	14.7	14.3	97	Y
15	27.2	16.8	16.3	97	Y
16	31.1	23.5	22.5	96	Y
17	22.8	14.5	13	90	Y
18	37.6	27.9	27.1	97	Y
19	39.5	31	30.1	97	Y
20	24.7	18.1	16.7	92	Y
21	27.6	23.4	22.5	96	Y

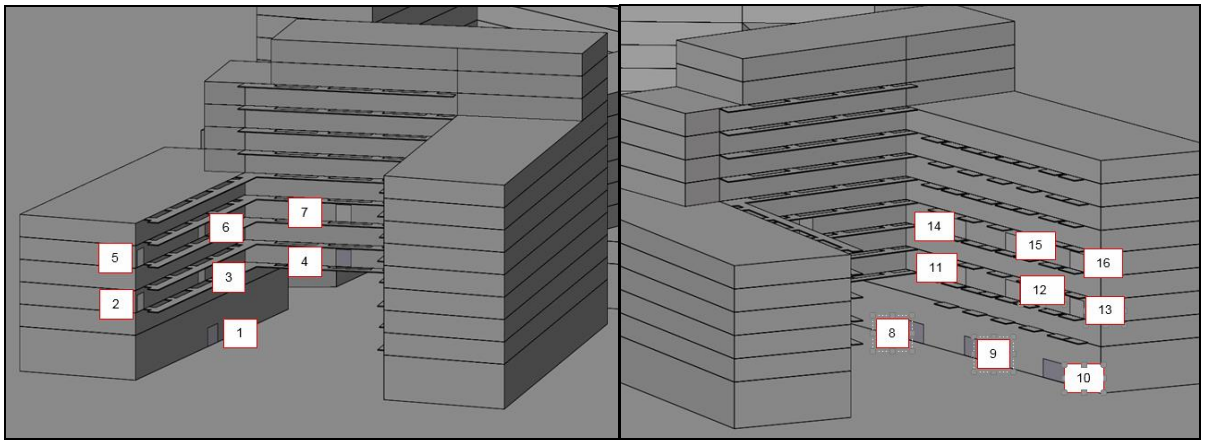


Figure 29 – Sensitive receptor Rockbrook 2

(Source: OCSC IES VE Model)

Table 12 – Vertical Sky Component Results Rockbrook 2

Window Ref.	VSC existing development (%)	VSC permitted development ABP Ref. PL06D.301428 (%)	VSC proposed development (%)	VSC % of its former value (permitted scheme)	Meets BRE Guidelines VSC >80% of its former value
1	13.8	10.1	10.1	100	Y
2	20.3	7.2	6.4	89	Y
3	4.1	1.4	1.4	100	Y
4	11.6	6.2	6.2	100	Y
5	22.5	12	11.6	97	Y
6	7.6	6	6	100	Y
7	14.4	9.6	9.3	97	Y
8	12.2	9.5	9.3	98	Y
9	18	13.9	13.3	96	Y
10	26.2	15.3	14.7	96	Y
11	20	17.2	16.8	98	Y
12	22.5	17	17	100	Y
13	21.1	11.3	11.1	98	Y
14	24.6	21.6	21.3	99	Y
15	25.6	21.6	21.6	100	Y
16	24.2	15.6	15.4	99	Y

As previously outlined, the VSC of all analysed windows is greater than 80% of its former value when compared to the permitted scheme. Therefore, it can be stated that no impact will be perceived for any of the adjacent properties when the proposed design is compared to the permitted scheme.

8. OVERSHADOWING IMPACT TO SURROUNDING PROPERTIES

The overshadowing impact on the surrounding buildings has also been analysed for the proposed and the permitted scheme. The overshadowing images illustrate the overshadowing impact for both schemes on March 21st and June 21st at 10 a.m., 12 p.m., 2 p.m. and 4 p.m. The analysis confirms that no further overshadowing to any of the surrounding properties is perceived when compared to the currently permitted scheme ABP Ref. PL06D.301428.

The images for 21st March at 10 a.m. are included below, with the remaining images included in Appendix A.

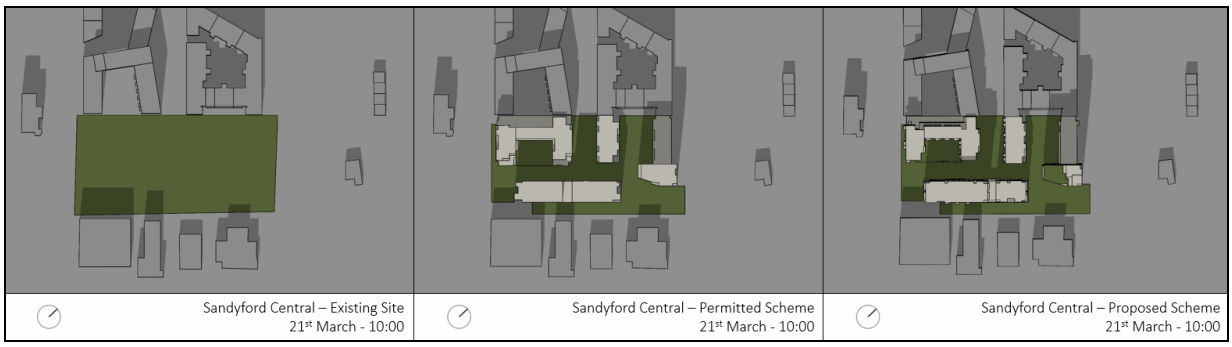


Figure 30 – Overshadowing Image on March 21st at 10 a.m.

(Source: OCSC IES VE Model)

9. CONCLUSION

The proposed Sandyford Central development has been analysed in order to determine the following:

- The daylight levels within the living and bedroom areas of selected apartments, to give an indication of the expected daylight levels throughout the proposed development;
- The quality of amenity spaces, being provided as part of the development, in relation to sunlight;
- Any potential overshadowing impact the proposed development may have on properties adjacent to the site.

Calculations and methodology used are in accordance with BRE Guidelines for daylight and sunlight and based on the British Research Establishments "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2011 Second Edition, however, the following should be reiterated as previously outlined:

"The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather that constrain the designer. Although it gives numeral guidelines these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design"

Internal Daylight

The analysis confirms that across the entire development excellent levels of internal daylight are achieved. A 95.6% compliance rate is achieved across the entire development.

Throughout the full development, comfortable and desirable spaces have been designed with floor to ceiling heights of a minimum of 2.6m for living rooms and minimum of 2.4m for bedrooms and extensive glazing to every room enabling deep daylight penetration and providing enhanced views to a beautiful landscaped courtyard area.

Sunlight

Sunlight analysis has shown that at least 2 hours of sunlight is achieved on March 21st on at least 50% of the amenity spaces, thus complying with BRE Guidelines. An additional study was carried out to analyse the summer sunlight, with excellent sunlight levels being achieved.

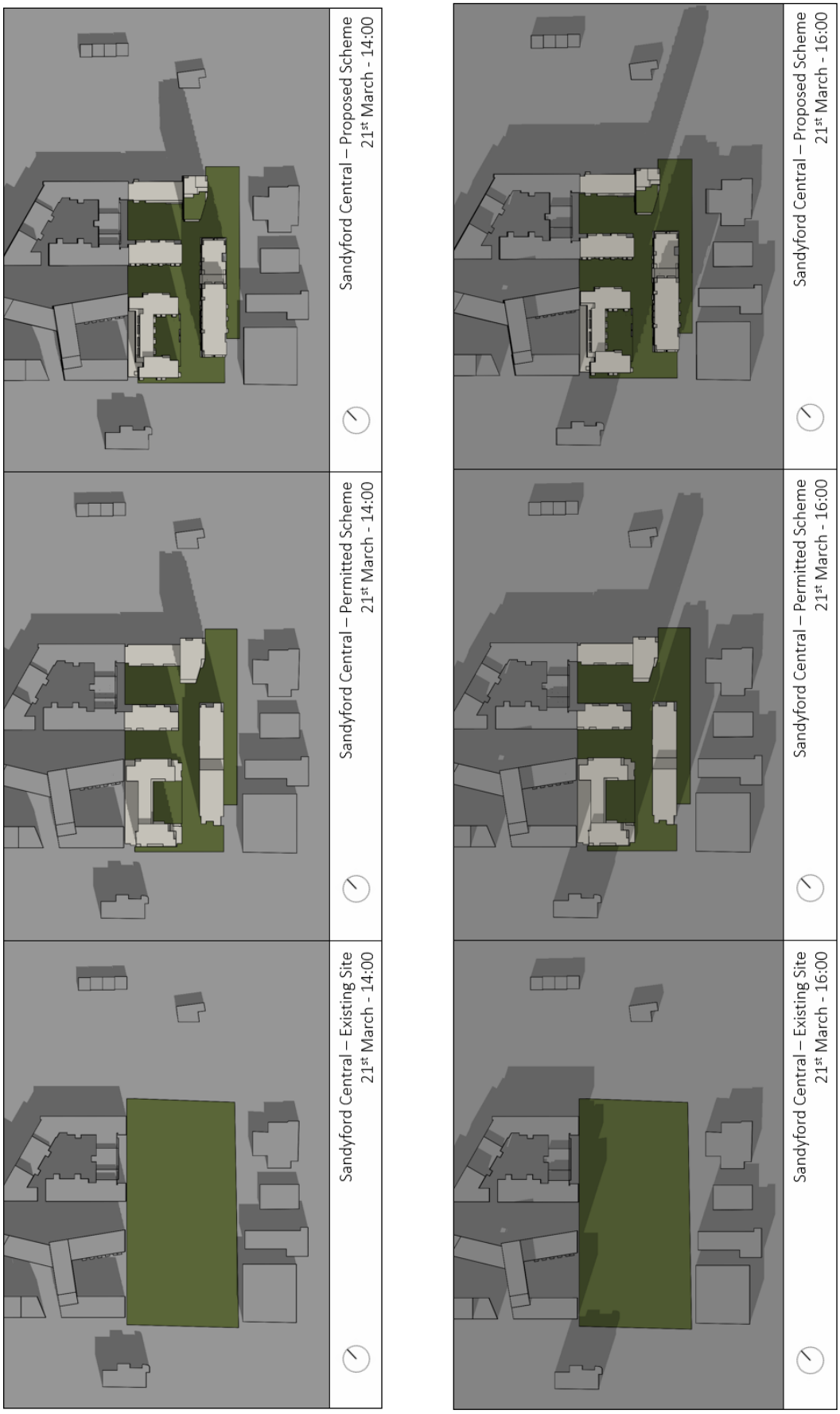
Impact to surrounding properties

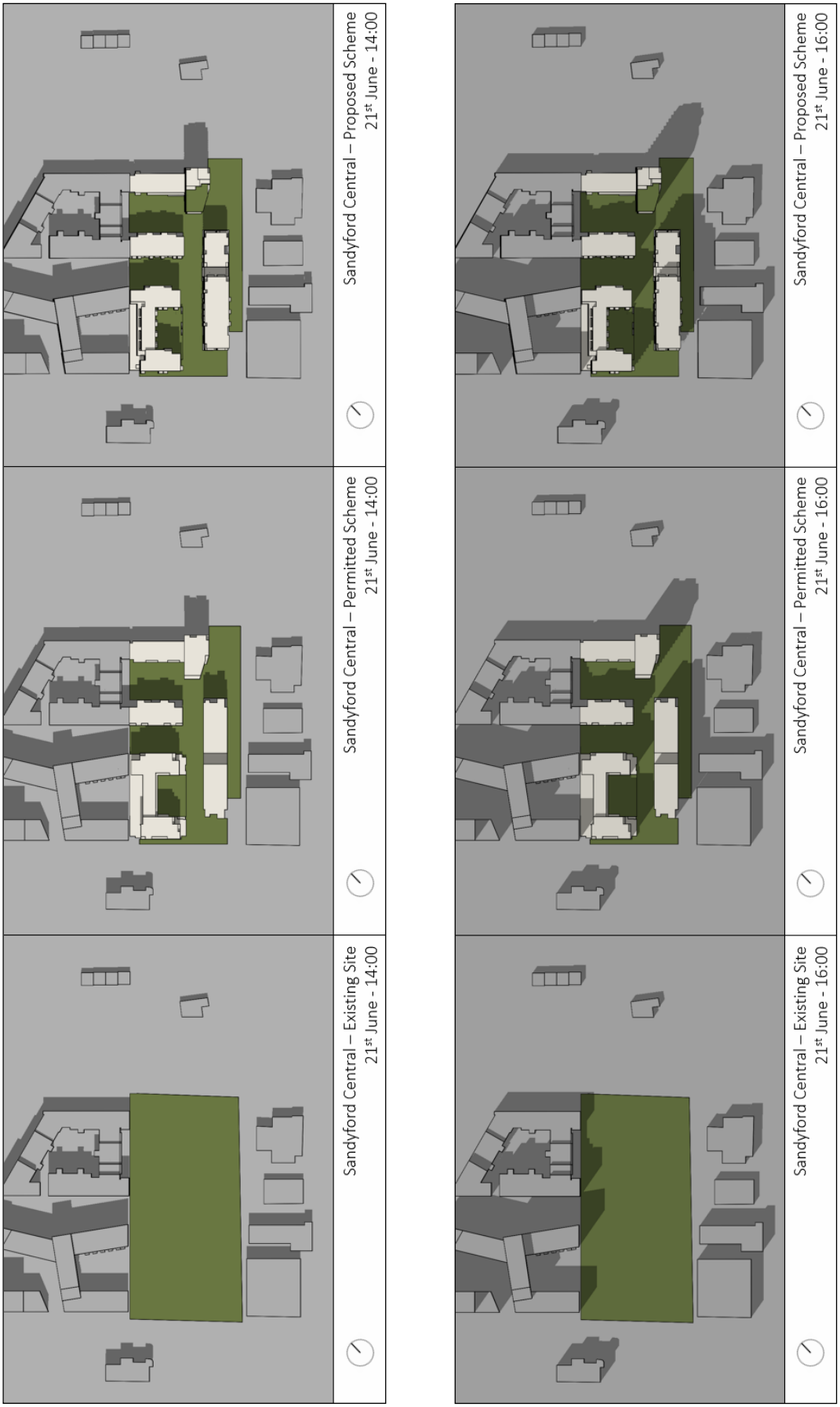
The VSC analysis demonstrates that the proposed building has no daylight impact to adjacent properties when compared to the currently permitted scheme.

The shadow analysis confirms that no further overshadowing is perceived to any of the surrounding properties when compared to the currently permitted scheme ABP Ref. PL06D.301428.

In conclusion, the steps taken by the project team during design have ensured that levels of daylight and sunlight within the development have been safeguarded and the impact to adjacent properties is negligible.

APPENDIX A





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