Portmarnock South Phase 1D

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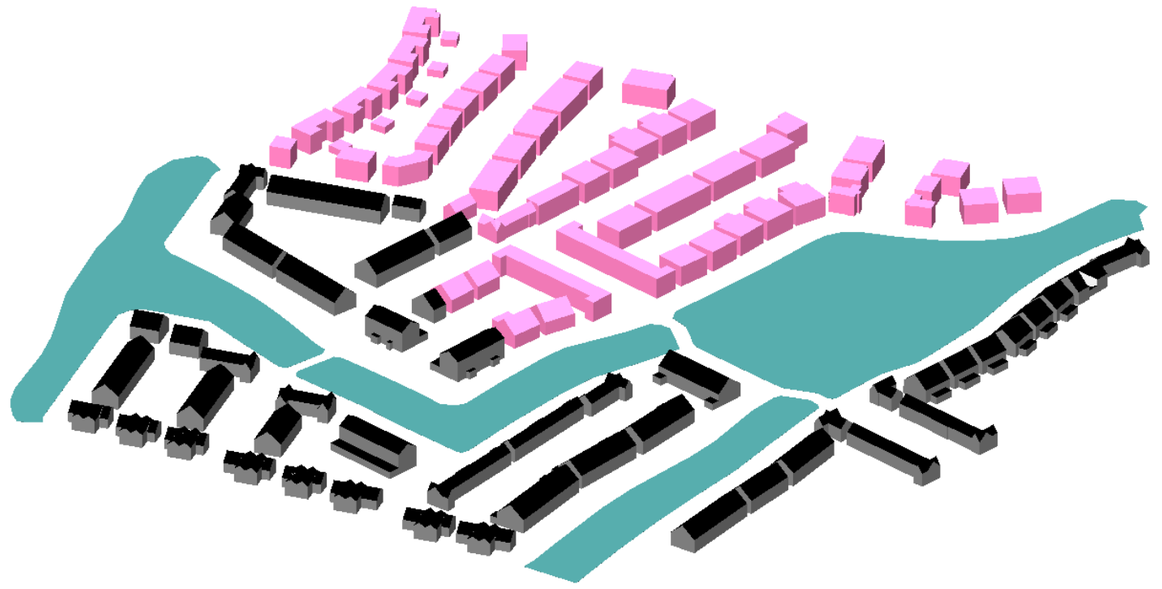

Sunlight and Daylight Analysis

IN2 Project No. D2113

29/11/2021

REV05

Revision History

Date	Revision	Description
17/06/2021	00	Issue for comment
24/06/2021	01	Updated to reflect comments
24/09/2021	02	Revised to include Section 5.0 – Daylight Analysis
15/10/2021	03	Updated to reflect comments
04/11/2021	04	Updated to reflect comments
29/11/2021	05	Issue for Planning Application

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1.0 Non-Technical Summary

This report assesses the predicted sunlight and daylight availability to the Proposed Portmarnock South Phase 1D development and its surroundings. Analysis was based on architectural drawings as received from BKD Architects.

The report has been prepared as a desktop exercise with 3D massing and survey information provided by others. No site visits took place as information provided included all relevant required information and our understanding is that any survey information or 3D models provided were carried out by relevant suitably qualified professionals.

Various software programs were utilised in the analysis of the proposed development. These included:

- Radiance Lighting Software
- TAS by EDSL

Section 2.0 introduces the various Guidelines and Standards utilised throughout the Daylight / Sunlight analysis undertaken. The specific methodology for each topic (as relevant) is detailed in the relevant section in the body of this report as identified.

Analysis Type	**Relevance**	**Assessment Methodology**	**Compliance Guidelines Targets**	**Reference section of this report**
Daylight	Proposed Development	Average Daylight Factors	BRE 209	Section 5.0 – Internal Daylight Analysis
Daylight	Existing Neighbouring Buildings	Vertical Sky Component	BRE 209	VSC assessment not required, as the new development does not subtend more than 25° at the lowest windows of the existing buildings.
Sunlight	Proposed Development	Compliance with dual aspect requirements	2020 Apartment Guidelines	Not covered in this report. Refer to Architectural documentation.
Sunlight	Existing Neighbouring Buildings	Annual Probable Sunlight Hours	BRE 209	Section 4.0 – Site Shading Diagrams
Sunlight	Proposed Development Amenity Spaces	Sunlight Hours	BRE 209	Section 4.0 – Site Shading Diagrams
Sunlight	Existing Neighbouring Buildings Amenity Spaces	Sunlight Hours	BER 209	Section 4.0 – Site Shading Diagrams

Sunlight availability to the Amenity spaces was assessed against the BRE.209 criterion of achieving at least 2 hours potential sunlight on March 21st to the majority of its area. Section 3.0 outlines how compliance was determined for the proposed amenity space with 100% of the proposed amenity spaces achieving compliance (well in excess of the 50% minimum requirement).

Section 4.0 includes illustrative Site Shading Diagrams. These are displayed on an hourly basis for the Equinox and Summer/ Winter Solstices. The Shite Shading diagrams illustrate that the proposed housing development is not predicted to cause overshadowing on neighbouring developments, namely Portmarnock South Phase 1A and Phase 1C. This is due to the relatively low rise and low-density nature of the proposed development.

Therefore, this report confirms that best practice Sunlight and Daylight availability has been ensured for the proposed Portmarnock South Phase 1D development, with no undue impact on existing neighbouring environment.

The internal daylight analysis, as detailed in section 5.0, has been undertaken for all duplex apartment units across the development. The analysis determined that 89% of rooms were in excess of the prescribed BRE/BS guidelines as set out within this report, for average daylight factors (ADF). Where daylight factors were below the target value, compensatory measures have been included in the architectural design, as described in Section 5.0 of this report.

Appendix A has been included in the report for clarity on guidelines and standards implications / comparisons. Within Appendix A: EN Daylight Standards: a comparative assessment between BS.8206-2 and the incoming EN.17037 was undertaken based on a methodology adopted from that included in the UK National Annex to the Standard and is included in Appendix A (see section 2.0 for relevance of standard). This analysis determined generally good correlation between the existing and new standards applied, with those rooms deemed compliant in the former methodology also achieving compliance under the latter.

2.0 Standards and Guidelines

The following standards and guidance documents have been consulted when compiling this report to ensure compliance with the various Daylight and Sunlight requirements as applicable and relevant:

a) Sustainable Urban Housing: Design Standards for New Apartments (December 2020) (the **"2020 Apartment Guidelines").** These are guidelines issued under section 28 of the 2000 Planning and Development Act.

b) Fingal County Development Plan 2017 - 2023, (the "**Development Plan"**).

c) The Building Research Establishment's (BRE) Site Layout Planning for Daylight and Sunlight: A guide to good practice (BRE 209) (2nd edition) (the **"BRE Guide").**

d) British Standard BS 8206-2:2008 – "Lighting for Buildings – Part 2: Code of Practice for Daylighting" (the "**2008 British Standard**").

e) British Standard BS EN 17037:2018 – Daylight in Buildings (the "**2018 British EN Standard**").

f) Irish Standard IS EN 17037:2018 (the "**2018 Irish EN Standard**").

It should be noted at the outset that the 2008 British Standard has been superseded by the 2018 British Standard. This is the UK implementation of EN 17037:2018, which was approved by the CEN on 29 July 2018. In Ireland, EN 17037:2018 has been implemented by the 2018 Irish Standard. The texts of the 2018 British Standard and the 2018 Irish Standard are the same, with one exception. The exception is that the 2018 British Standard contains an additional "National Annex" which specifically sets out requirements within dwellings, to ensure some similarity to the now superseded 2008 British Standard.

The 2020 Apartment Guidelines state:

> *"[6.5] The provision of acceptable levels of natural light in new apartment developments is an important planning consideration as it contributes to the liveability and amenity enjoyed by apartment residents. In assessing development proposals, planning authorities must however weigh up the overall quality of the design and layout of the scheme and the measures proposed to maximise daylight provision with the location of the site and the need to ensure an appropriate scale of urban residential development.*
>
> *[6.6] Planning authorities should have regard to quantitative performance approaches to daylight provision outlined in guides like the BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2:2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting' when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision.*
>
> *[6.7] 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. This may arise due to a 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."*

It can be noted from this section that the 2020 Apartment Guidelines continue to refer to the BRE Guide (published in 2011) and to the 2008 British Standard. They do not take into account the 2018 British Standard and/or the 2018 Irish Standard and as the BRE Guide is still current and applicable, the 2011 edition will therefore provide the basis for the assessments detailed within this report.

The BRE Guide

The BRE Guide describes its purpose in the following terms in the "Summary" section (v):

> *"This guide gives advice on site layout planning to achieve good sunlighting and daylighting both within buildings and in the open spaces between them. It is intended to be used in conjunction with the interior daylight recommendations in the [2008] British Standard… It contains guidance on site layout to provide good natural lighting within a new development; safeguarding of daylight and sunlight within existing buildings nearby; and the protection of daylighting of adjoining land for future development."*

The BRE Guide also notes that:

> *"It (the guide) is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location. Appendix F explains how this can be done in a logical way, while retaining consistency with the British Standard recommendations on interior daylighting."*

> *"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design (see Section 5). In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings."*

Therefore, if the situation arises where the targets identified within the Guide are not achieved, these should be highlighted and either justified in the context of the development / site or where relevant and applicable, compensatory measure will be proposed. In the context of this report, any deviations from the Guides recommendations have therefore been identified, with an approach throughout to ensure that good quality daylight/sunlight in achieved through analysis and design improvements as far as practicable and viable as detailed in the report as relevant.

The main sections in the guide that the assessments within this report will reference (as applicable) are:

1. Light from the Sky (Daylight) – *Based on a theoretical mathematical uniform sky (CIE overcast sky) which does not alter based on orientation.*
    - 1.1. New Development – Within this section the guide sets values for internal Average Daylight Factors (ADF) for various space types and relevant calculation methodologies.
    - 1.2. Existing Buildings – The guide sets a quantitative assessment method for determining the impact of new developments on light from the sky (VSC) on existing neighbouring buildings.
2. Sunlighting – *Based on site location, longitude and latitude, and solar azimuths. i.e. buildings south of a site will not be impacted for sunlight in the northern hemisphere.*
    - 2.1. New Development – This topic is addressed in the 2020 Apartment Guidelines under the issue of dual aspect units and is not covered within this report.
    - 2.2. Existing Buildings – As above, the guide has quantitative assessment for determining the impact of sunlight on existing neighbouring buildings.
    - 2.3. Gardens and open spaces – The amenity criteria set out is used for both proposed new amenity and the impact on existing neighbouring amenities.

The specific methodology for each topic (as relevant) is detailed in the relevant section in the body of this report.

The 2008 British Standard

The BRE guide specifically refers to this standard and most of the quantitative criteria set out have already been mentioned in relation to the BRE Guide above. However the BRE guide provides more detail as to context and implementation. In relation to average daylight factor (ADF), the standard states the following:

> *"The average daylight factor… is used as the measure of general illumination from skylight. It is considered good practice to ensure that rooms in dwellings and in most other buildings have a predominantly daylit appearance. In order to achieve this the average daylight factor should be at least 2%."*

However, the standard then acknowledges that lower lighting levels may be applicable for dwellings, offering minimum ADFs for different room types within dwellings, i.e. 1% for bedrooms; 1.5% for living rooms; and 2% for kitchens (Table 2), and notes that:

> *"Where one room serves more than one purpose, the minimum average daylight factor should be that for the room type with the highest value. For example, in a space which combines a living room and a kitchen the minimum average daylight factor should be 2%."*

Whilst specifically applicable to houses, it should be noted that there is no specific reference within the British Standard to apartment internal galley type kitchens as recognised in the BRE Guide which states:

> *"2.1.14 Non-daylit internal kitchens should be avoided wherever possible, especially if the kitchen is used as a dining area too. If the layout means that a small internal galley-type kitchen is inevitable, it should be directly linked to a well daylit living room."*

The standard's guidance on loss of daylight and sunlight to existing buildings is similar to, but less extensive or detailed than, that contained in the BRE Guide, and in particular Appendix F of the BRE Guide.

The 2018 British and Irish Versions of the EN Standards

The EN 17037:2018 standard—which is the basis of both the 2018 British EN Standard and the 2018 Irish EN Standard—approaches the assessment of daylight provision on a different basis from that utilised in the 2008 British Standard and the BRE Guide. Instead of **average** daylight factors the standard considers a new metric based on **median** daylight, in order to ensure both extent and a degree of uniformity of daylight.

> *"A space is considered to provide adequate daylight if a target illuminance level is achieved across a fraction of the reference plane within a space for at least half of the daylight hours."*

EN 17037:2018 also address other aspects in addition to daylight - including sunlight, glare and quality of view, which are not addressed in the context of this report.

The National Annex

As is noted above, the 2018 British Standard includes a "National Annex", containing "Further recommendations and data for daylight provision in the UK and Channel Islands". This is referenced further in the appendix of this report. As there is no equivalent in the 2018 Irish Standard the 2018 British Standard National Annex will be referenced, which states:

> *"NA.1 Introduction: The UK committee supports the recommendations for daylight in buildings given in BS EN 17037:2018; however, it is the opinion of the UK committee that the recommendations for daylight provision in a space (see Clause A.2) may not be achievable for some buildings, particularly dwellings. The UK committee believes this could be the case for dwellings with basement rooms or those with significant external obstructions (for example, dwellings situated in a dense urban area or with tall trees outside), or for existing buildings being refurbished or converted into dwellings. This National Annex therefore provides the UK committee's guidance on minimum daylight provision in all UK dwellings."*

NA.2 addresses minimum daylight provision in UK dwellings. It contains a table, in which target illuminance, ET (lx), levels are recommended for different room types. These are: bedroom at 100 lx; living room at 150 lx; and kitchen at 200 lx, which may be compared to EN 17037's recommendation of 300 lux (irrespective of room application). The commentary is as follows:

> *"Even if a predominantly daylit appearance is not achievable for a room in a UK dwelling, the UK committee recommends that the target illuminance values given in Table NA.1 are exceeded over at least 50% of the points on a reference plane 0.85 m above the floor, for at least half of the daylight hours."*

3.0 Amenity Area Sunlight Availability

3.1 Methodology

The BRE Site Layout Planning for Daylight and Sunlight Design Guide 209 provides guidance with regards to sunlighting and shading to external Amenity spaces within proposed developments.

The guidance recommends “that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21st March”.

The methodology assesses sunlight performance at the Equinox, as this is the mid solar position throughout the year (as illustrated in Fig. 3.1.1), with compliance indicative of spaces that will receive adequate sunlight and appealing useful spaces, including that the following attributes will be achieved as identified in BRE.209:

- Provide attractive sunlit views (all year)
- Make Outdoor Activities like sitting out and children’s play more pleasant (mainly warmer months).
- Encourage plant growth (mainly spring and summer).
- Dry out the ground, reducing moss and slime (mainly in colder months).

An example analysis of Amenity Spaces is indicated in Figure 3.1.2. In this development, the main amenity space (to right hand side) is located to the North of a building block which provides some degree of overshadowing (dark green contours).

However, as the majority of the Amenity Space was determined to be able to receive at least 2 hours of sunlight at the Equinox (green contours), this would be deemed to be compliant.

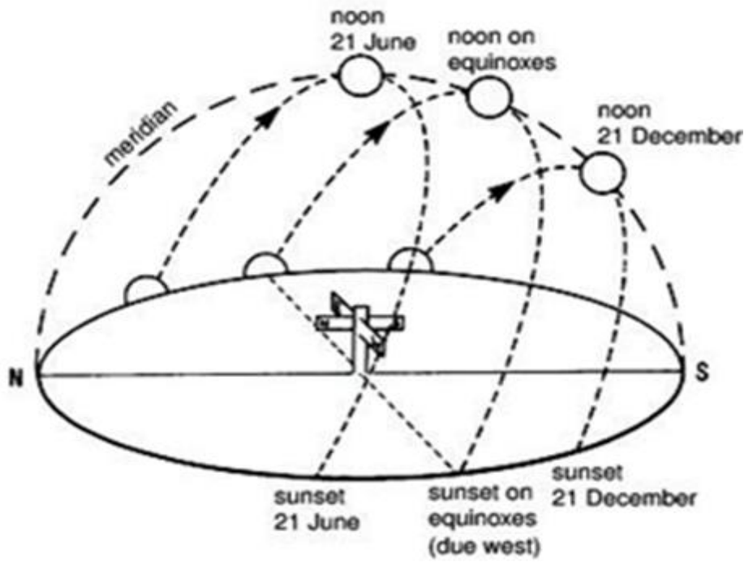


Fig 3.1.1 – Annual Solar Position

Fig 3.1.2 – Example Analysis

3.0 Amenity Area Sunlight Availability

3.2 Analysis Result

Annual sunlight availability was analysed for the proposed development, calculating the extent of each area that can receive at least 2 hours of potential sunlight on 21st March.

Figure 3.2.1 illustrates the results determined for each amenity space, indicating the predicted percentage area that could achieve at least 2 hours sunlight in accordance with the methodology.

The analysis shows that the 21st March is representative of the availability of Sunlight over the course of the entire year. As expected, this then increases in the summer months and reduces in the winter.

All amenity spaces were predicted to be compliant with BRE Best Practice Guidance, receiving good sunlight in 100% of their areas and thus deemed to be appealing useful external spaces in accordance with the methodology.

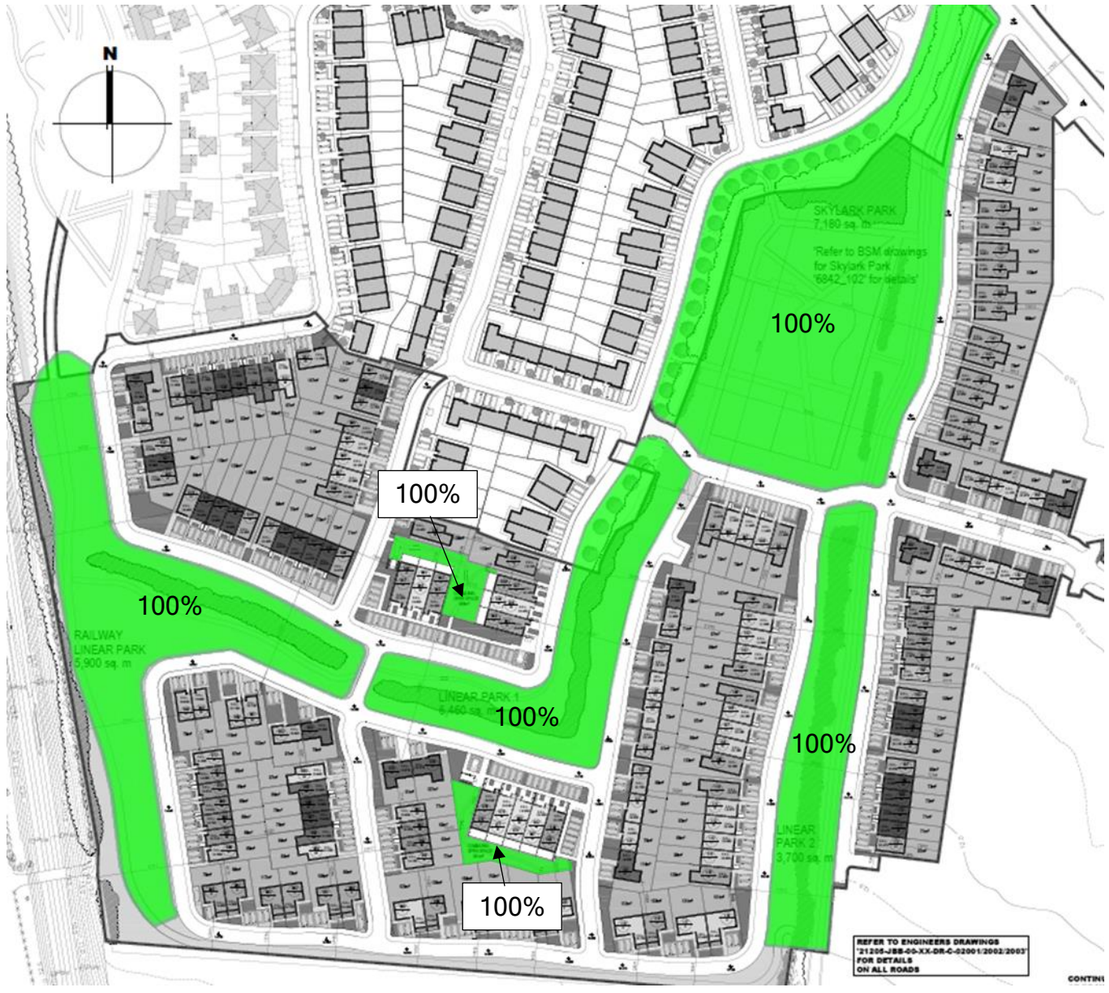


Fig 3.2.1 – Amenity Area Sunlight Availability

4.0 Site Shading Diagrams

Equinox March 21st

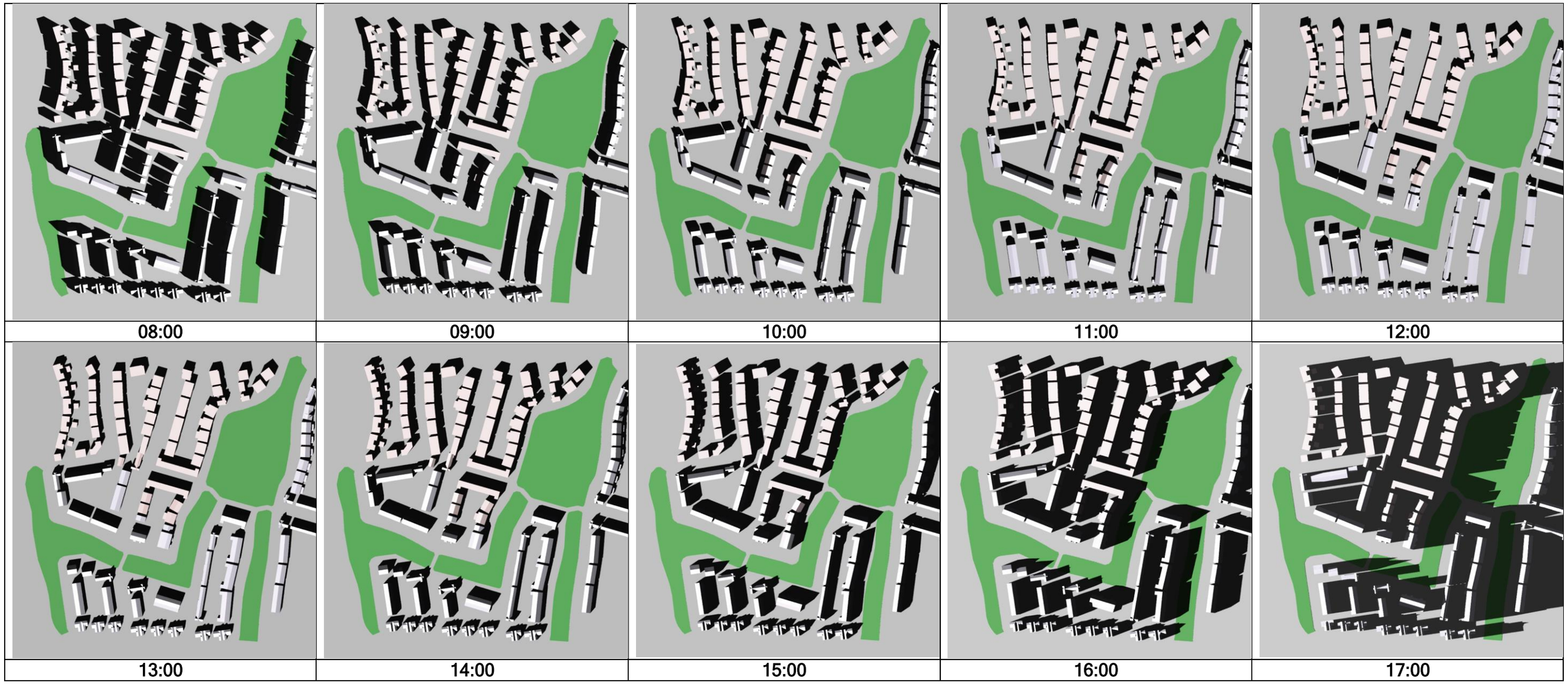


Fig 4.1: Sunlight and Site Shading Diagrams - Equinox (March 21st): 08:00-17:00 hrs

Summer Solstice June 21st

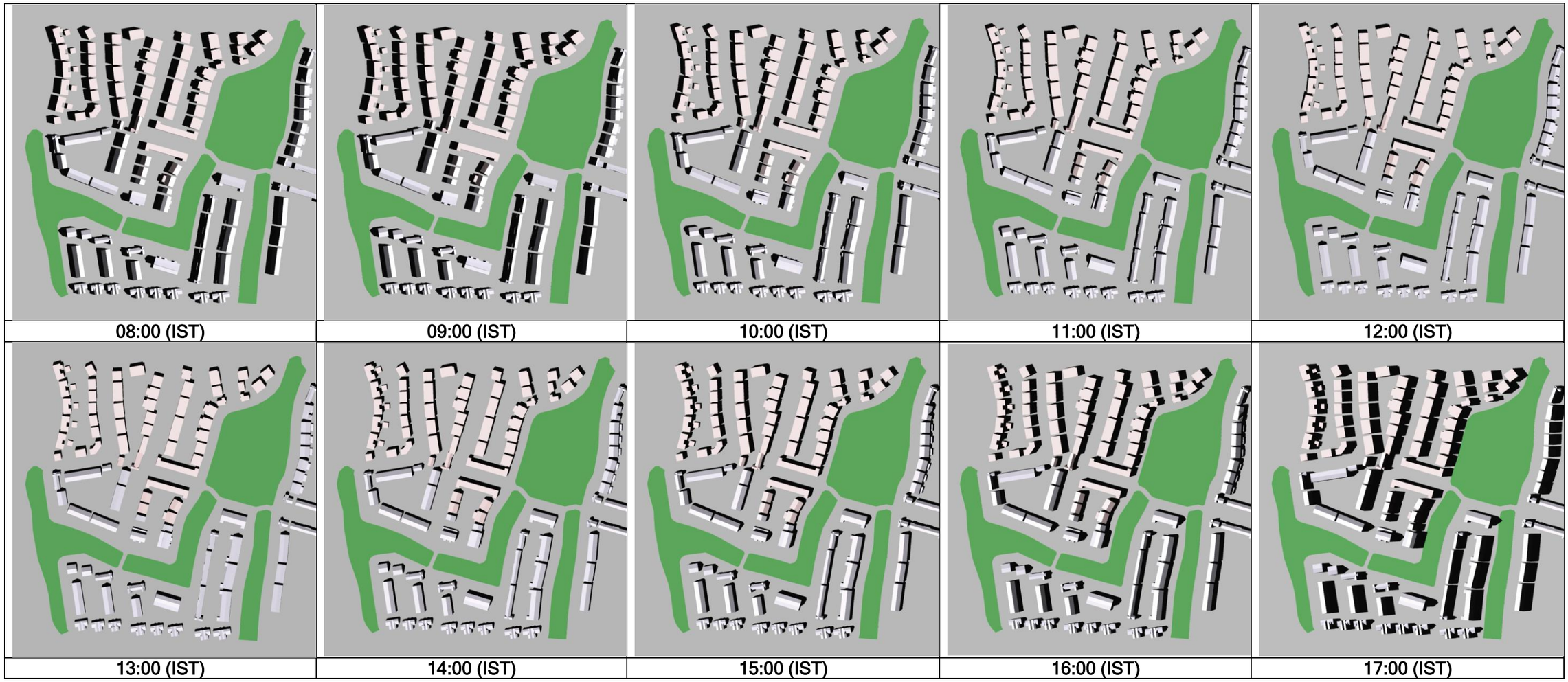


Fig 4.2: Sunlight and Site Shading Diagrams - Summer Solstice (June 21st): 08:00-17:00 hrs

Whilst both winter and summer solstices have been included, it should be noted that the statistics of Met Eireann, the Irish Meteorological Service, indicate that the sunniest months in Ireland are May and June. During December, Dublin receives a mean daily duration of 1.7 hours of sunlight out of a potential 7.4 hours sunlight each day (i.e. only 22% of potential sunlight hours). This can be compared with a mean daily duration of 6.4 hours of sunlight our of a potential 16.7 hours each day received by Dublin during June (i.e. 38% of potential sunlight hours). Therefore, impacts caused by overshadowing are generally most noticeable during the summer months and least noticeable during the winter months. Due to the low angle of the sun in mid-winter, the shadow environment in all urban and suburban areas are generally dense tending to make the images confusing and superfluous.

Winter Solstice December 21st

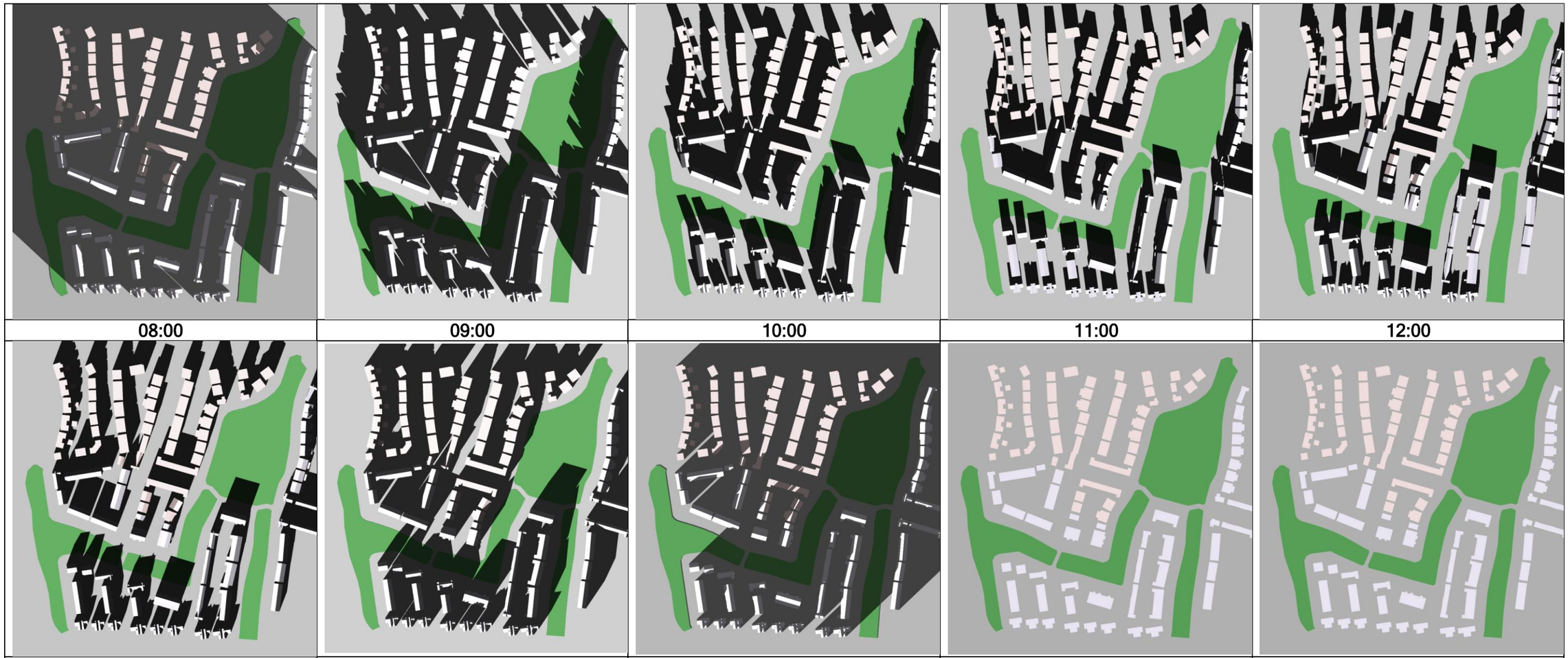


Fig 4.3: Sunlight and Site Shading Diagrams - Winter Solstice (December 21st): 08:00-17:00 hrs

Whilst both winter and summer solstices have been included, it should be noted that the statistics of Met Eireann, the Irish Meteorological Service, indicate that the sunniest months in Ireland are May and June. During December, Dublin receives a mean daily duration of 1.7 hours of sunlight out of a potential 7.4 hours sunlight each day (i.e. only 22% of potential sunlight hours). This can be compared with a mean daily duration of 6.4 hours of sunlight our of a potential 16.7 hours each day received by Dublin during June (i.e. 38% of potential sunlight hours). Therefore, impacts caused by overshadowing are generally most noticeable during the summer months and least noticeable during the winter months. Due to the low angle of the sun in mid-winter, the shadow environment in all urban and suburban areas are generally dense tending to make the images confusing and superfluous.

5.0 Daylight Analysis

5.1 Methodology

Daylighting analysis was undertaken for the proposed residential development using radiance lighting software to determine Average Daylight Factors (ADF's) in accordance with BRE 209 and BS. 8206-2, as referenced in the Sustainable Urban Housing: Design Standards for New Apartments (December 2020), as well as an assessment comparison to BS EN 17037 (National Annex). These guidelines and standards have been outlined in section 2.0.

ADF's were determined for a CIE Overcast Sky equivalent to providing an external, unobstructed ground illumination level of 10,000 Lux. CIE Overcast skies are theoretical sky models, with brightness highest at the zenith and reducing to the horizon, but also unidirectional (as illustrated in Figure 5.1.1); therefore ADF's do not differ for façade orientation, with North facing rooms achieving identical metric performance to South facing, (all else being equal), as results account for diffuse natural light only and exclude any direct sunlight effects.

The daylight analysis accounted for all aspects that can potentially restrict natural light availability including any adjacent / opposing buildings, along with explicitly modelling Building Details as illustrated in Figure 5.1.2 such as balcony structures, window frames, reveal and cill depth etc. in accordance with the architectural design.

The daylighting models were calculated based on the following assumptions regarding transmittance and reflectance (based on measured manufacturer's test data):

- Glazing Transmission = 70%
- Ceilings: 82% reflectance (BS 00E55 White)
- Walls: 62% reflectance (BS 10C31 Ivory)
- Floors: 36% reflectance (BS 00A05 Platinum Grey)

Daylight Factors for each space were then calculated for a working plane height of 0.85m on a 0.25 x 0.25m grid basis to enable a detailed calculation within each room, the average of which was then determined to calculate ADF.

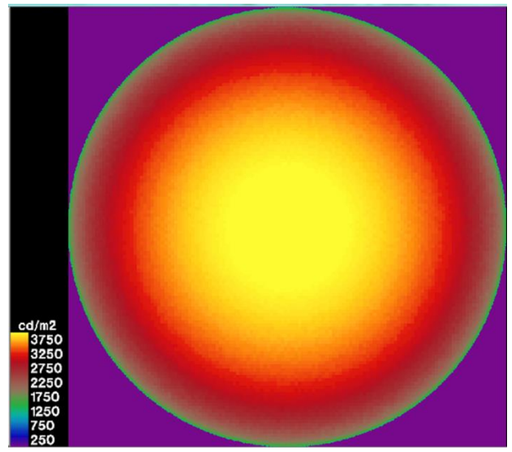


Fig 5.1.1 - CIE Overcast sky as viewed from below.

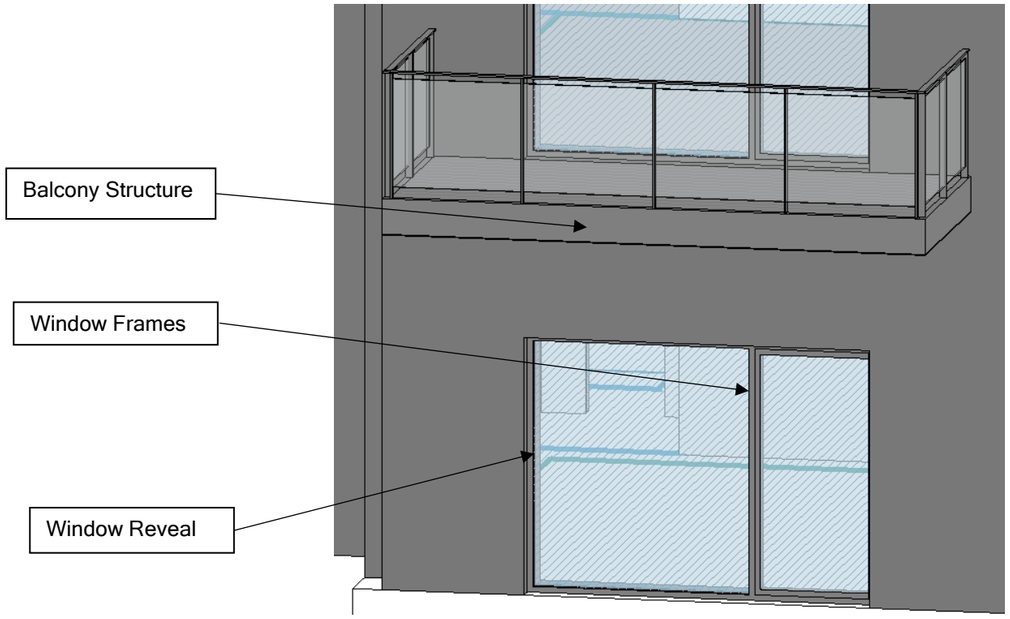


Fig 5.1.2 – Typical Building Details included within Daylight Analysis

5.1 Methodology (Cont'd)

In relation to daylight, the BRE Guide suggest that:

"Daylight provision in new rooms may be checked using the average daylight factor (ADF). The ADF is a measure of the overall amount of daylight in a space… [The 2008 British Standard] recommends an ADF of 5% for a well daylit space and 2% for a partly daylit space. Below 2% the room will look dull and electric lighting is likely to be turned on. In ***housing*** *[the 2008 British Standard] also gives minimum values of ADF of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms." (emphasis added)*

The 2008 British Standard further clarifies the targets by stipulating:

"Where one room serves more than one purpose, the minimum average daylight factor should be that for the room type with the highest value. For example, in a space which combines a living room and a kitchen the minimum average daylight factor should be 2%."

With regard to the above, the minimum values targeted for relevant spaces are:

- > 2.0% for Kitchen/Living/ Dining Areas (KLD)
- >2.0% for Kitchen/ Dining Areas
- >1.5% for Living Rooms
- > 1.0% for Bedrooms

Notwithstanding the above, it may be noted that these are minimum targets, and that the vast majority of spaces were determined to comfortably exceed the values, as summarised in the results section below. In addition, sub-standard daylighting performance has been avoided wherever viable and practical with the following design enhancements applied to maximise natural light availability and therefore internal environments:

- Maximise glazing,
- Minimise / offset porch/ canopy structures,
- Increase glazing / floor heights.

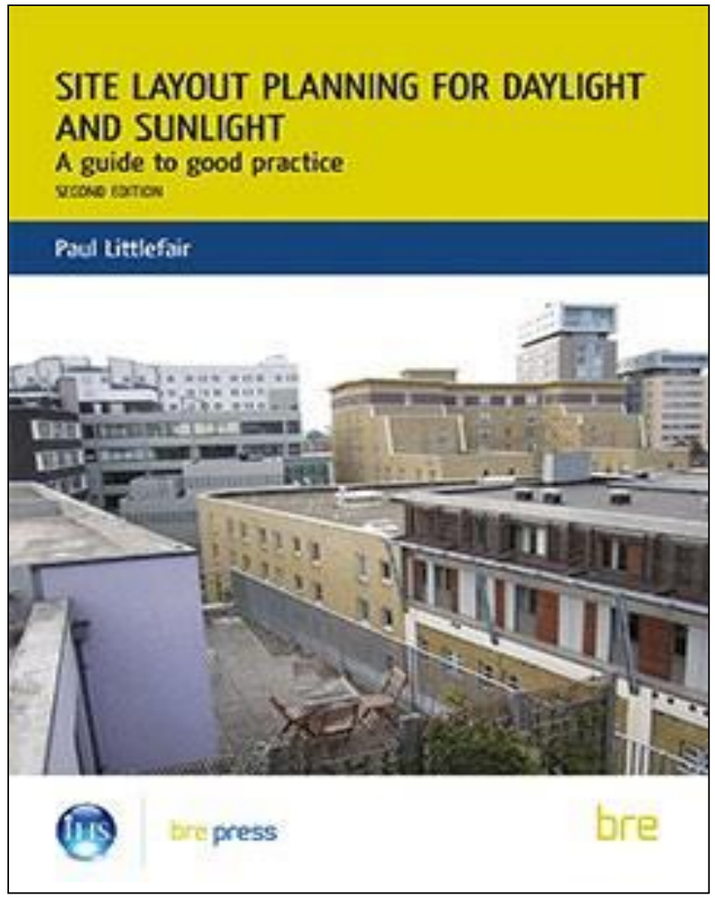


Fig 5.1.3 – The BRE Guide

5.2 Results Summary

Figure 5.2.1 indicates the overall summary of ADF's determined for all duplex apartments (Type J and K) within the Proposed Development, at each floor level. It can be seen that **89%** of Kitchen/Living/ Dining areas, Living Rooms, Kitchen/ Dining areas and Bedrooms assessed (totalling 78 of 88 rooms) were determined to be compliant based on the methodology utilised, in accordance with BS.8206-2: 2008. As detailed in the architectural package, the layouts of Types J and K differ. Type J contains a combined KLD space, whilst Type K consists of separate living room and kitchen/ dining room. The spaces are therefore assessed against the following criteria:

- >2.0% for Kitchen/Living/ Dining Areas (KLD)
- >2.0% for Kitchen/ Dining Areas
- >1.5% for Living Rooms
- > 1.0% for Bedrooms

All spaces at 1st and 2nd floor level assessed were determined to comfortably exceed these minimum requirements. The vast majority of ground floor spaces were determined to be compliant, with the exception of 11 no. KLD's.

KLD's in the ground floor 2 Bed apartments were determined to achieve ADF values in the region of 1.3% to 1.4%, below the minimum 2.0% ADF required for these spaces. However, 2020 Apartment Guidelines advise that "*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".*

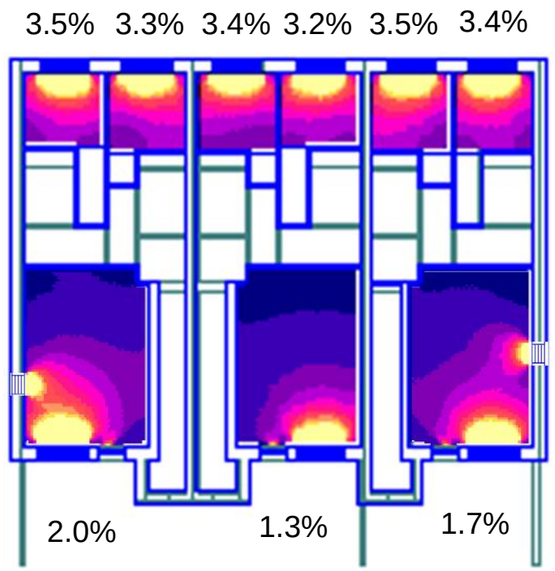
The following compensatory measures have been incorporated into the design of these apartments:

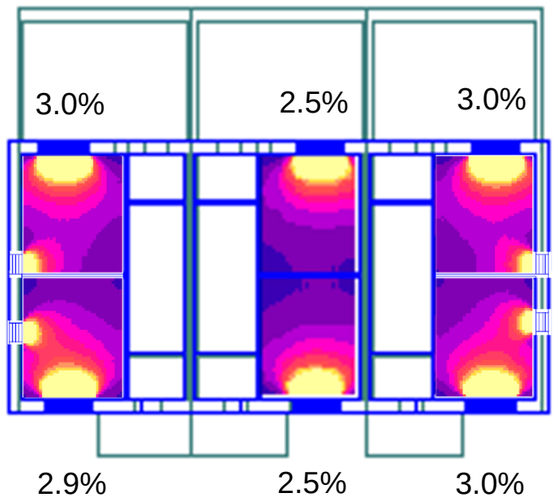
- Ground floor terrace to the rear is 19sqm (7sqm required).
- Communal amenity areas are well in excess of the minimum requirements. Block 01 and 02 requires a minimum of 96sqm and 429sqm is proposed. Block 3 requires a minimum of 80sqm and 330sqm is proposed.
- All duplex apartments have direct aspect onto the Linear Park.

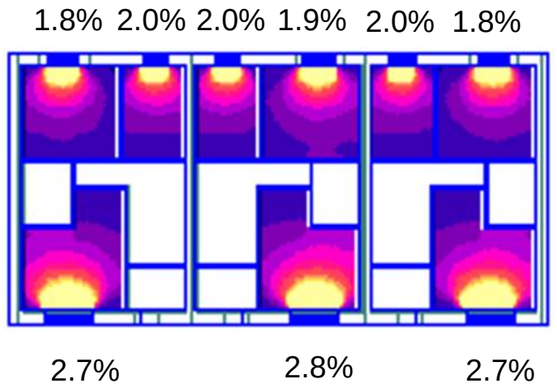
Level	Pass	Fail	Total
Grd	23	10	33
1	22	0	22
2	33	0	33
Total	78	10	88
Percentage	89%	12%	

Fig 5.2.1 – Daylight Summary – Development

5.3 Block 1 Duplexes Type J & K No. 42 - 47







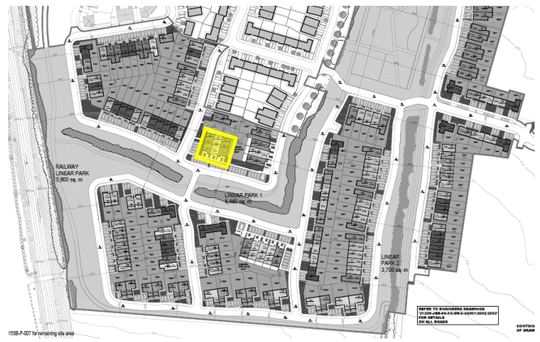


Fig 5.4.1 – Site Plan

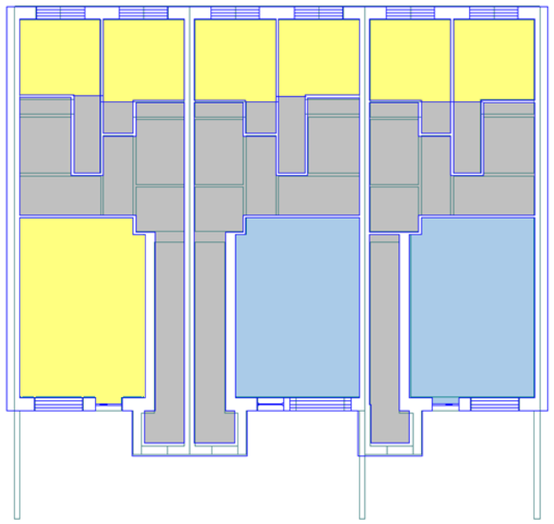


Fig 5.4.2 – Ground Floor

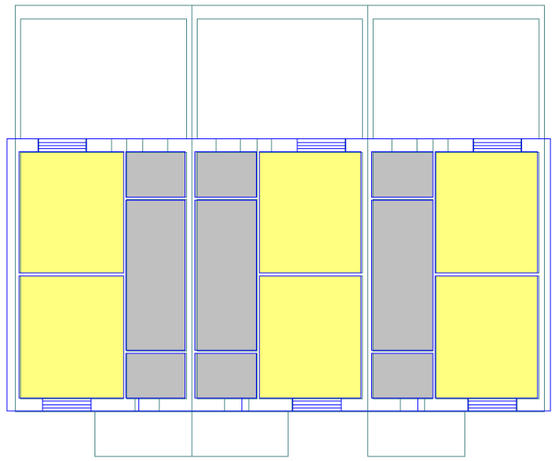


Fig 5.4.3 – 1st Floor

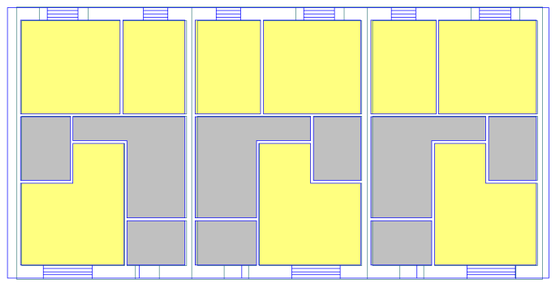
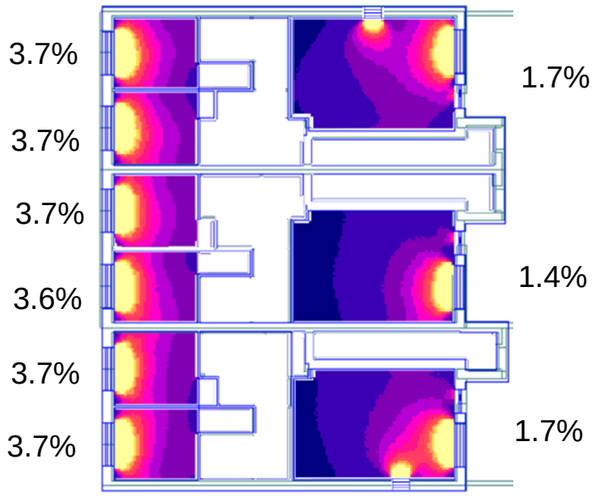


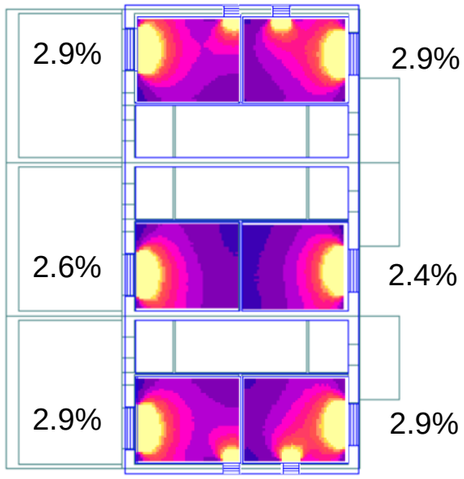
Fig 5.4.4 – 2nd Floor

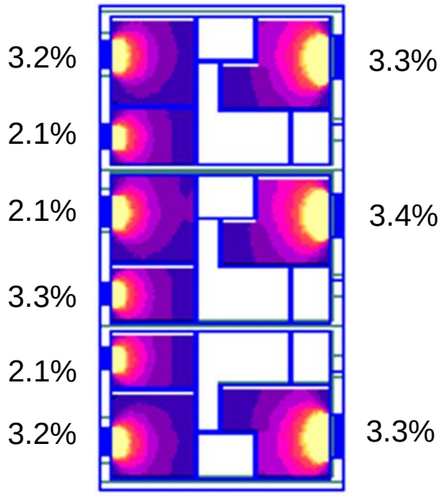
Key	
	Pass
	Fail

Space	ADF Req.
Bedrooms	1.0%
Living/ Dining	1.5%
KLD	2.0%

5.4 Block 2 Duplexes Type J & K No. 35 - 41







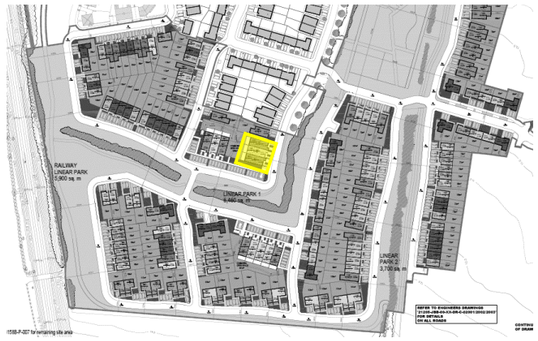


Fig 5.5.1 – Site Plan

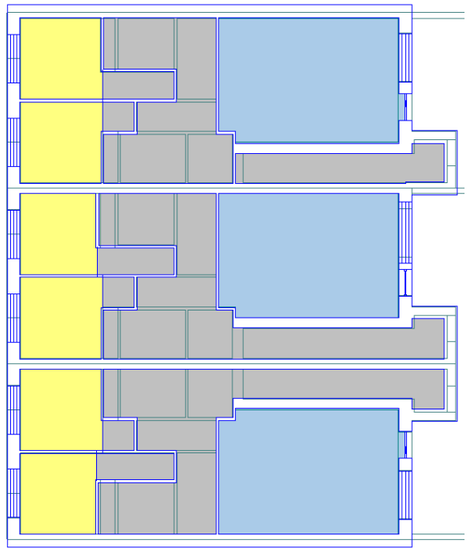


Fig 5.5.2 – Ground Floor

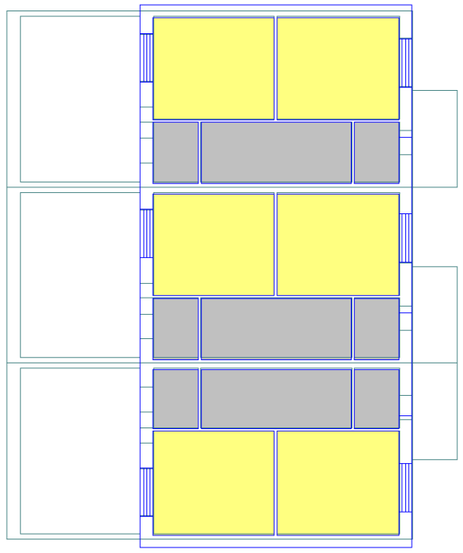


Fig 5.5.3 – 1st Floor

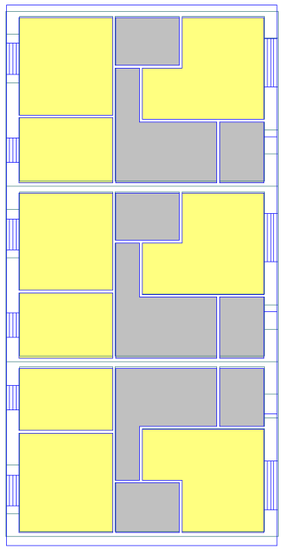
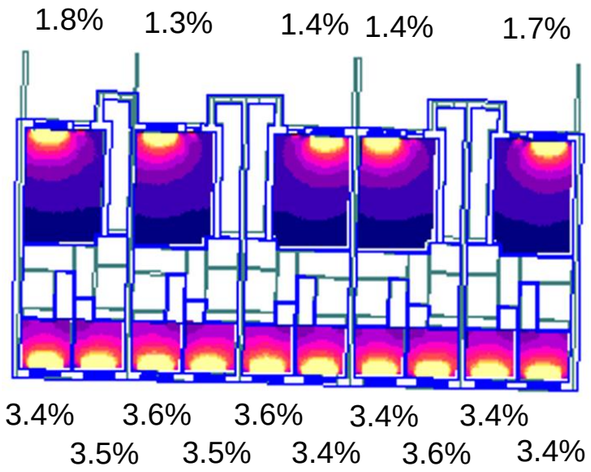


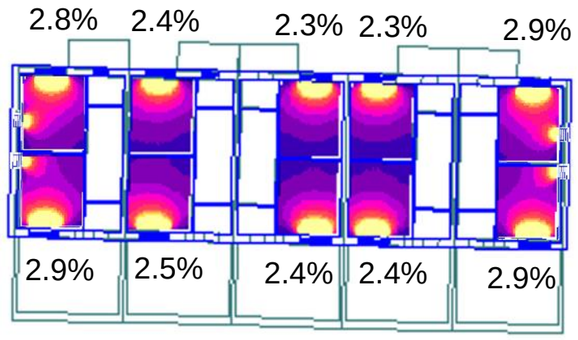
Fig 5.5.4 – 2nd Floor

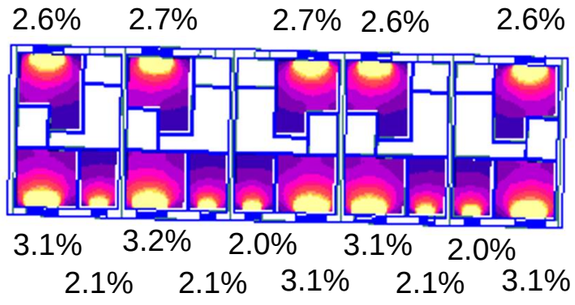
Key	
	Pass
	Fail

Space	ADF Req.
Bedrooms	1.0%
Living/ Dining	1.5%
KLD	2.0%

5.5 Block 3 Duplexes Type J & K No. 75 - 84







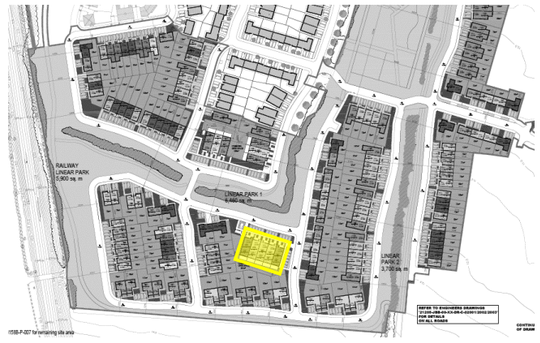


Fig 5.6.1 – Site Plan

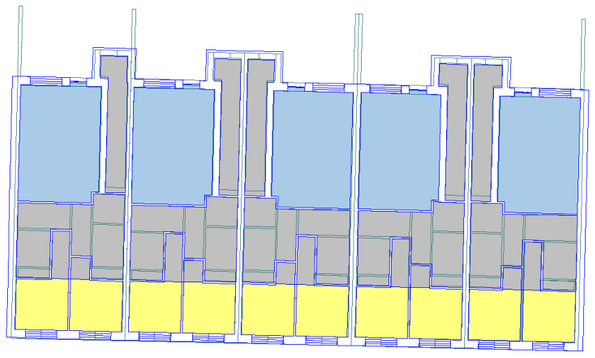


Fig 5.6.2 – Ground Floor

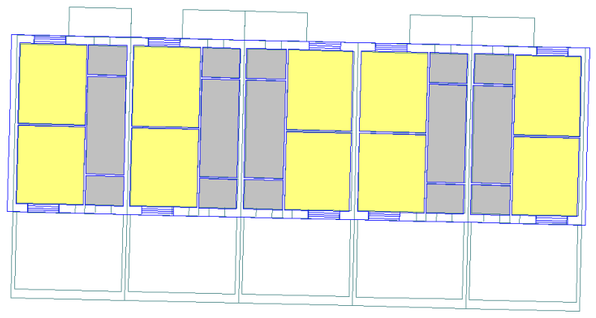


Fig 5.6.3 – 1st Floor

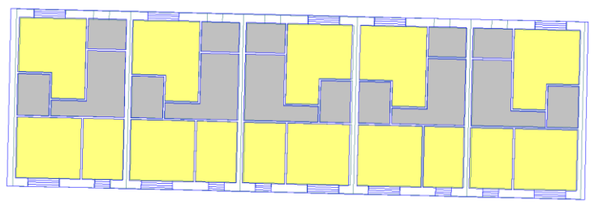


Fig 5.6.4 – 2nd Floor

Key	
	Pass
	Fail

Space	ADF Req.
Bedrooms	1.0%
Living/ Dining	1.5%
KLD	2.0%

APPENDIX A – EN Daylight Standards

The Daylight Analysis section of the report assesses the Average Daylight Factors in accordance with the BRE 209 guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition). This guide is specifically referenced within Section 6.6 of The Department of Housing, Planning and Local Government document – Sustainable Urban Housing: Design Standards for New Apartments (2018) which advises that:

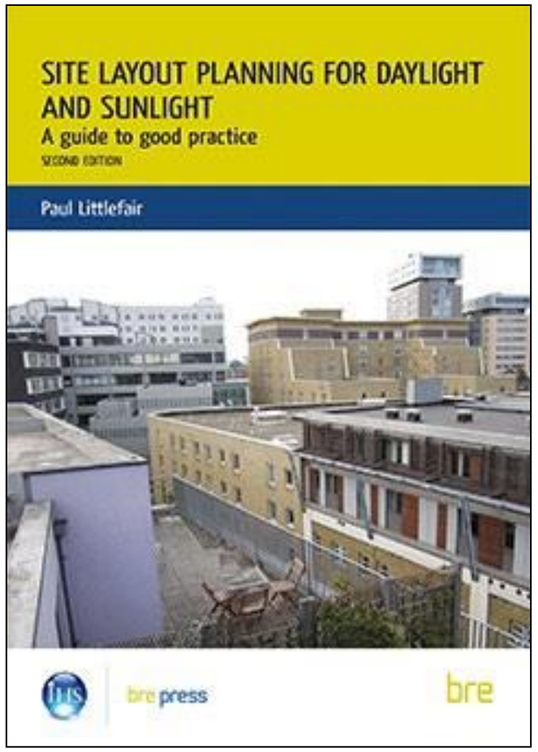
Planning authorities should have regard to quantitative performance approaches to daylight provision outlined in guides like the BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting' when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision.

Subsequent to this guidance, a new European Standard for Daylight in Buildings (EN 17037) was released in 2018 and adopted as IS EN 17037 in January 2019. This standard does not fall under any *mandatory* directive of the EU or any Irish Statutory Instrument and therefore remains *advisory*.

On release of the EN standard within the UK, the BRE confirmed their intention to provide a National Annex, which will subsequently inform an updated and revised BRE 209 document. The rational for this Annex was that the Median Daylight Factor methodology applied within EN 17037 do not differentiate between residential and non- residential applications, with the standard stipulating a minimum target illuminance of 300 lux for all Building Applications. However, it is recognised by BRE that Dwellings have lower natural light requirements compared to non-domestic buildings (i.e. BS. 8602-2 has Average Daylight Factors of 1.0-2.0% for dwellings, as opposed to Average Daylight Factors of 2.0-5.0% for non-residential). Furthermore, providing higher daylight level in residential applications may in some instances be counter-productive in that excessive glazing provision may promote overheating.

This Annex, which was included in the British Standard version of EN 17037 identifies the target illuminances for dwellings that should be exceeded for over at least 50% of a room, and for at least half of annual daylight hours (i.e. Median). Utilising the Median External Illuminance of 14,900 Lux for Dublin (EN 17037 Table A.3) the following Median Daylight Factors may therefore be applied, adopting the methodology used in BS.EN 17037 Annex NA:

Room type	**Target illuminance** E_T (lx)	**Median Daylight Factors**
Bedroom	100	0.7%
Living room	150	1.0%



A compliance comparison for a sample of rooms from Duplexes Type J & K No. 75 – 84 was then made for the KLD's and Living/ Dining Rooms between the existing B.S.8206-2008 (as referenced within BRE.209, DoHPLG Planning Guidelines and used for analysis within this report) and the BS EN.17037:2018 Annex NA (as understood to be introduced in forthcoming BRE.209 Guidelines).

Figure A.2 compares for the KLD spaces for Duplexes Type J & K No. 75 - 84.

Average Daylight Factor (ADF) as per BS.8206-2 (horizontal axis), with rooms deemed compliant where ADF exceeds 2.0%.

Extent of room where Daylight Factor exceeds BS.EN.17037 Annex NA target of 1.0% (vertical axis), with rooms deemed compliant where extent exceeds 50% (i.e. Median Daylight Factor or MDF).

This graph illustrates that the results are generally aligned under both methodologies, with rooms where compliance in accordance with B.S.8206-2 within this report has been confirmed were also generally found to be compliant to BS.EN.17037 Annex NA (green markers) and the converse non-compliances also true (red markers). All were found compliant to BS.8206-2 and to the EN.17037 methodology assessed.

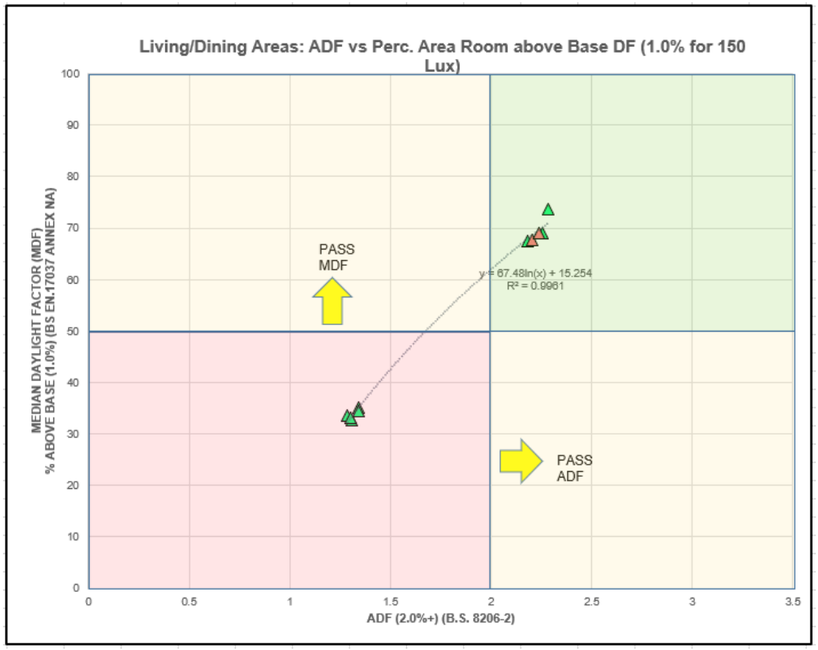


Fig A.2: Compliance Comparison: ADF-v-MDF

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