

Scholarstown House

Daylight and Sunlight Assessment Report
Applicant: Emmaville Ltd.

"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." - BRE 209

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The full set of results for each assessment and shadow study can be found in the appendix.

1.0 Executive Summary

1.1 Summary of Assessment

3D Design Bureau were commissioned to carry out a comprehensive daylight and sunlight assessment, along with an accompanying shadow study for the proposed residential development at Scholarstown Road, Dublin 16.

The assessment has been broken down into the following two main categories, Impact Assessment and Scheme Performance, of which there are subcategories as summarised further below:

- Impact assessment: Effect on the surrounding environment and properties, which includes Vertical Sky Component (VSC), Annual and Winter Probable Sunlight Hours (APSH/WPSH) and Sun On Ground (SOG) analysis. The effects were assessed in the baseline state versus the proposed state; For definition of model states please refer to the 'Methodology' section on Page 15. A visual representation of the model states can be seen in the renderings of the shadow study in the appendix section on Page 47.
- Scheme Performance: Daylight and sunlight assessment of the proposed development, which includes Sunlight Exposure (SE) and Spatial Daylight Autonomy (SDA) to all the habitable rooms across the entire scheme, and Sun On Ground (SOG) in the proposed amenity spaces.

Impact Assessment

The impact assessment that was carried out for the purpose of this report has studied the potential levels of effect the surrounding existing environment and/or properties would sustain should the proposed development be built as proposed.

This impact assessment covers the following categories:

- Effect on daylight (VSC) to surrounding properties. The effect to the VSC of the windows of the following neighbouring properties was assessed:

- **17, 19 Orlagh Green, Scholarstown Road**
- **20,22 Orlagh Crescent, Scholarstown Road**
- **Orlagh Local Services, Orlagh Grove**
- **Rossmore Lodge, Scholarstown Road**
- **Ros Mor View, Scholarstown Road**
- **Saint Colmcilles Community School, Scholarstown Road**

- Effect on sunlight to surrounding properties. The effect to the annual and winter probable sunlight hours (APSH/WPSH) of the windows of the following neighbouring properties was assessed:

- **20,22 Orlagh Crescent, Scholarstown Road**
- **Orlagh Local Services, Orlagh Grove**
- **Rossmore Lodge, Scholarstown Road**
- **Ros Mor View, Scholarstown Road**

- Effect on sun on ground (SOG) to surrounding external amenity spaces such as gardens:

- **17, 19 Orlagh Green, Scholarstown Road**
- **20,22 Orlagh Crescent, Scholarstown Road**
- **Rossmore Lodge, Scholarstown Road**
- **Ros Mor View, Scholarstown Road**

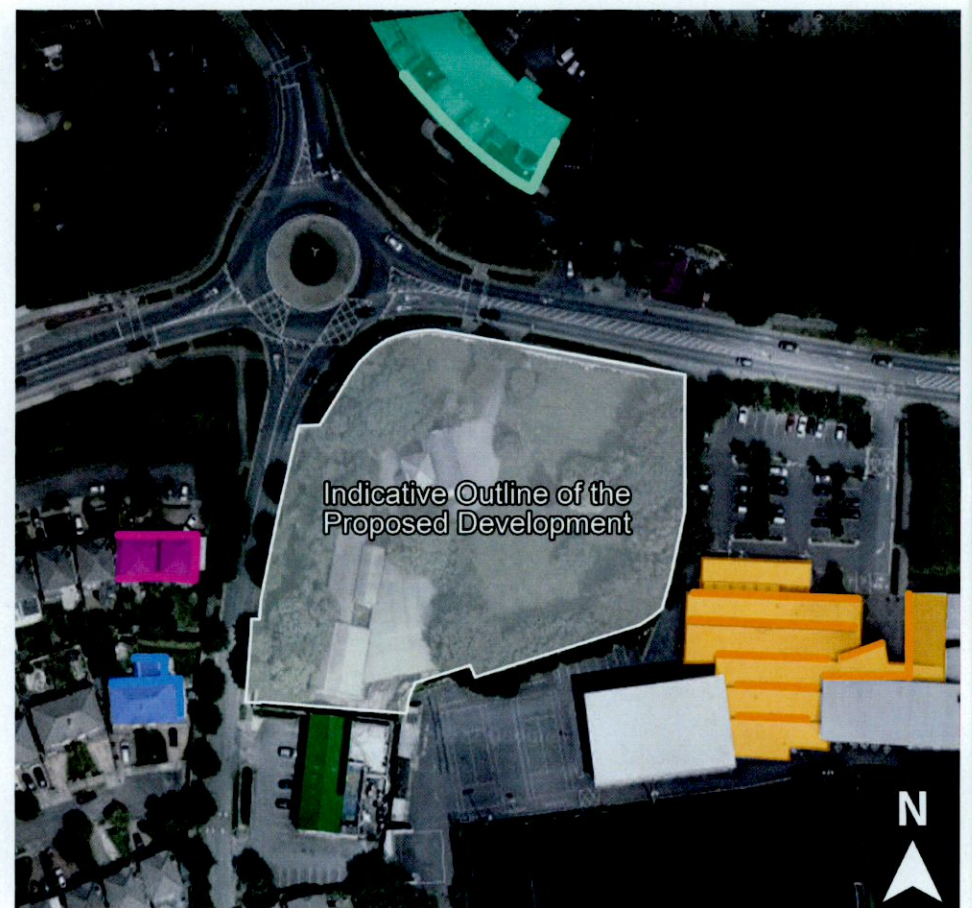


Figure 1.1: Scope of surrounding properties and environment assessed.

The surrounding context was carefully considered under the 25 degree rule, as per BRE Guidelines to ensure all properties and amenity spaces that may potentially experience a level of effect were included in the study. A more detailed explanation of this criteria can be found in "5.3 Generating Results" on page 16. In addition to the windows that the proposed development would subtend an angle of 25°, the extent of the assessed windows has been expanded to include other windows in relatively close proximity to the proposed development as highlighted above.

The tables in section "A.0 Impact Assessment Results" on page 27 show that the proposed scheme would have no noticeable level of impact to any of the neighbouring properties assessed, resulting in a 100% compliance rate for all the impact studies carried out for this report.

Scheme Performance

The scheme performance assessment of the proposed development included an analysis of the levels of sun on ground (SOG) to the proposed amenity spaces, as well as sunlight exposure (SE) and spatial daylight autonomy (SDA) in the habitable rooms of the proposed units within the development. These include the units within the new proposed 4-storey apartment block and the units in the existing protected structure of Scholarstown House, for which renovation works and re-arrangement of the interior layout have been proposed. The compliance rates for SE and SDA have been presented separately for the two buildings. The external public amenity space as identified by the architect was assessed for SOG as well as the private gardens of the existing Scholarstown House.

Please see Page 4 for a detailed breakdown of results.

1.2 Impact Assessment Results Overview:

Effect to Vertical Sky Component (VSC) on neighbouring properties:

- Windows/Rooms Assessed: 104
 - Negligible: 104

Effect to Annual Probable Sunlight Hours (APSH):

- Windows/Rooms Assessed: 50
 - Negligible: 50

Effect to Winter Probable Sunlight Hours (WPSH):

- Windows/Rooms Assessed: 50
 - Negligible: 50

Effect to Sun On Ground (SOG) in existing neighbouring gardens / amenity areas:

- Gardens Assessed: 6
 - Negligible: 6

Table No. 1.2.0 - Summary of Impact Assessment Results

Assessment Name	Guiding Document	Compliance Rate*
Effect to Vertical Sky Component (VSC)	BRE 209 (2022)	100%
Effect to Annual Probable Sunlight Hours (APSH)	BRE 209 (2022)	100%
Effect to Winter Probable Sunlight Hours (WPSH)	BRE 209 (2022)	100%
Effect to Sun On Ground (SOG)	BRE 209 (2022)	100%

*Compliance rates stated are calculated from all assessments carried out. Where windows/gardens/amenity areas are considered non-applicable, these instances are not included in the calculation.

The results presented above show that the proposed development would have no noticeable level of impact to any of the neighbouring properties. This can be considered excellent results and can be attributed to the design and layout of the proposed scheme allowing sufficient separation of it from all the neighbouring properties which could be affected.

1.3 Scheme Performance Results Overview - proposed apartment block:

Sun On Ground (SOG) in proposed amenity areas:

- Areas Assessed: 1
 - Areas meeting the guidelines: 1

Sunlight Exposure (SE):

- Units Assessed: 74
- Deciduous trees as opaque objects:
 - High: 42
 - Medium: 9
 - Minimum: 7
 - Non-compliant: 16
- Without deciduous trees:
 - High: 44
 - Medium: 13
 - Minimum: 5
 - Non-compliant: 12

Spatial Daylight Autonomy (SDA):

- Rooms assessed: 199

Assessed under BRE 209:

- Deciduous trees in winter state:
 - Rooms meeting the guideline: 188
 - Rooms not meeting the guideline: 11
- Deciduous trees in summer state:
 - Rooms meeting the guideline: 184
 - Rooms not meeting the guideline: 15

Assessed under I.S. EN 17037:

- Rooms meeting the guideline: 108
- Rooms not meeting the guideline: 91

Table No. 1.3.0 - Summary of Scheme Performance Results		
Assessment Name	Guiding Document	Compliance Rate
Sun on Ground (SOG)	BRE 209 (2022)	100%
Sunlight Exposure (SE)	BRE 209 (2022)	~(78% - 84%)
Spatial Daylight Autonomy (SDA)	BRE 209 (2022)	~(92% - 94%)
Spatial Daylight Autonomy (SDA)	I.S. EN 17037	~54%

It is the opinion of 3D Design Bureau the proposed apartment block is performing very favourably in terms of daylight and sunlight. The SDA has yielded very good levels of compliance under the BRE 209. It should be noted that 3 no. LKDs do not reach the required target value because of the retention of large existing trees on the subject site and a number located outside the site boundary. This was tested in an additional supplementary assessment, without these large existing trees in place. The result can be seen in further detail in section 6.2 on page 20. The SE study shows an high level of compliance due to the inclusion of a good number of dual and triple aspect units. The proposed public amenity space would also receive good levels of sunlight.

1.4 Scheme Performance Results Overview - existing Scholarstown House:

Sun On Ground (SOG) in proposed gardens:

- Areas Assessed: 2
 - Areas meeting the guidelines: 0

Sunlight Exposure (SE):

- Units Assessed: 2
- Deciduous trees as opaque objects:
 - High: 2
 - Non-compliant: 0
- Without deciduous trees:
 - High: 2
 - Non-compliant: 0

Spatial Daylight Autonomy (SDA):

- Rooms assessed: 9

Assessed under BRE 209:

- Deciduous trees in winter state:
 - Rooms meeting the guideline: 1
 - Rooms not meeting the guideline: 8
- Deciduous trees in summer state:
 - Rooms meeting the guideline: 1
 - Rooms not meeting the guideline: 8

Assessed under I.S. EN 17037:

- Rooms meeting the guideline: 0
- Rooms not meeting the guideline: 9

Table No. 1.4.0 - Summary of Scheme Performance Results*

Assessment Name	Guiding Document	Compliance Rate
Sun on Ground (SOG)	BRE 209 (2022)	0%
Sunlight Exposure (SE)	BRE 209 (2022)	100%
Spatial Daylight Autonomy (SDA)	BRE 209 (2022)	~11%
Spatial Daylight Autonomy (SDA)	I.S. EN 17037	0%

*Please note that compliance rates for the existing Scholarstown House may appear excessively high or excessively low due to the small number of rooms, units and gardens assessed.

The existing Scholarstown House has been re-arranged internally for use as two separate units as opposed to the current one unit. The SDA study which was carried out has shown that levels of daylight would not be sufficient to comply with BRE Guidelines in most cases. However, as the building is a protected structure there will be no alterations to the external facades, hence no increase of the glazing area would be possible. Still, proposed layout relocates the staircore to the north, arranging the habitable spaces to the south and giving access to natural light. Therefore, it is the opinion of 3D Design Bureau that proposed internal layout has taken into consideration a daylight-conscious design as much as possible, and interventions should be seen positive as they improve the house condition and make it fit for purposes for today's living requirements.

2.0 Guidelines / Standards

Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities. (2020)

In December of 2020, the Department of Housing, Planning and Local Government published a guidance document for new apartments, *Sustainable Urban Housing: Design Standards for New Apartments*. This document makes reference to the British Standard, *BS 8206-2:2008: Lighting for Buildings - Part 2: Code of Practice for Daylighting* (the British Standard) and to the Building Research Establishment's *Site Layout Planning for Daylight and Sunlight: a Guide to Good Practice* (BRE 209).

Paragraph 6.7 of the 2020 apartment guidelines states:

"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 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."

As such, this report identifies where daylight and sunlight recommendations have and have not been achieved. Rationale and compensatory design solutions are the remits of the planning consultant and project architect, these will also be included in this report when possible.

Note: Section 3.2 of the Urban Development and Building Height Guides 2018, provides similar guidance as above.

At the time of publication of *Design Standards for New Apartments* and the *Urban Development and Building Height Guides*, BRE 209 was in the 2nd edition, first published in 2011. Since then, a 3rd edition of BRE 209 has been published (June 2022) and the 2nd edition has been withdrawn. BRE 209 no longer references *BS 8206-2:2008*, which has also been withdrawn. The primary standard used as reference in BRE 209 edition 3 is *BS EN 17037*.

BRE - Site Layout Planning for Daylight and Sunlight: a Guide to Good Practice (2022)

This document will be referred to as *the BRE Guidelines* in this report.

At the time of writing this report, the BRE Guidelines are in the third edition (BRE 209). The BRE Guidelines sets out recommendations for appropriate levels of daylight and sunlight within a proposed development, as well as providing guidance on impacts arising from a proposed development to surrounding properties and amenity areas.

The BRE Guidelines will be used as the primary guiding document in the assessments that are carried out for the purpose of this report, as they are referenced in Irish guidance documents:

- *Sustainable Urban Housing: Design Standards for New Apartments*, as published in December of 2020 by the Department of Housing, Planning and Local Government and Heritage.
- *Urban Development and Building Heights*, as published in December of 2018 by the Government of Ireland.

Whilst the primary reference document for the BRE Guidelines is *BS EN 17037*, there are some subtle differences between BRE 209 and *BS EN 17037*. For the purposes of this report, the BRE Guidelines (BRE 209) is considered the primary reference.

A detailed description of the various recommendations for impact assessment and scheme performance is contained in section "4.0 Assessment Overview" on page 12 of this report.

EN 17037:2018: Daylight in Buildings (2018)

EN 17037 is a European Standard that provides recommendations for daylight within spaces. (Emphasis added)

EN 17037:2018 recommends that 300 lux should be received across 50% of a hypothetical reference plane of any room for half of the daylight hours of the year, with no less than 100 lux received across 95% of the reference plane. No distinction is made for the function of the room for target lux levels within this standard.

The target values given within EN 17037 are difficult to achieve, especially where increased density is desired.

Recommendations made in EN 17037 regarding Sunlight Exposure have been incorporated into the BRE Guidelines and are expanded on in section "4.0 Assessment Overview" on page 12 of this report.

EN 17037 also makes recommendations related to glare and quality of view out. These aspects are not addressed in this report as these assessments have less relevance in a residential context where occupants have the freedom to move about in order to improve level of glare or alter the view out.

I.S. EN 17037:2018 Daylight in Buildings (2018)

I.S. EN 17037 is a direct adoption of the European Standard *EN 17037:2018* that provides recommendations for daylight within spaces.

The target values given within *I.S. EN 17037* are difficult to achieve, especially where increased density is desired. Whilst it could be deemed appropriate to apply *I.S. EN 17037* instead of *BRE 209* in the Republic of Ireland, it should be noted that *BRE 209* is referenced in both the *Sustainable Urban Housing: Design Standards for New Apartments (2020)* and *Urban Development and Building Heights (2018)*. To the best of our knowledge, (at the time of writing), the only reference that is made to *I.S. EN 17037* in a planning guidance document issued by an Irish planning authority is in the draft *Dublin City Development Plan (2022-2028)*, in which *I.S. EN 17037* is deemed unsuitable for use during planning applications.

Regardless, a supplementary SDA study has been carried out using the same rooms as assessed under the primary study (*BRE 209*) using the criteria of *I.S. EN 17037*, with compliance rates stated. However, this can be considered a supplementary study. Compensatory design measures may not be put forward for non-compliant rooms under this standard as the rationale for non-compliance may be that the standard is too difficult to achieve in a well-balanced proposal.

Until official guidance or instruction is published by a relevant authority on this matter, 3DDB will continue to reference the *BRE Guidelines* in our daylight and sunlight assessments.

BS EN 17037:2018: Daylight in Buildings (2018)

BS EN 17037 is the British Annex to the European Standard (see above). The British Annex acknowledges that a rigid application of the European Standard could prove to be a difficult task. It states “... *it is the opinion of the UK committee that the recommendations for daylight provision in a space [...] may not be achievable for some buildings, particularly dwellings.*”

In *BS EN 17037*, daylight recommendations differ depending on the function of a room. Target lux levels are applied across 50% of the reference plane of a room for half of the daylight hours. The target lux levels are:

- 200 lux for kitchens.
- 150 lux for living rooms
- 100 lux for bedrooms.

No minimum is stated to be achieved across 95% of the working plane. If a space has dual purposes it is advised that the higher target value should be applied.

Summary

The *BRE Guidelines (BRE 209)*, will be the primary reference document for this report as it is referenced in both *Sustainable Urban Housing: Design Standards for New Apartments (2020)* and *Urban Development and Building Heights (2018)*. For daylight within proposed developments, a supplementary study will be carried out under the criteria of *I.S. EN 17037*.

Neither the British Standard, European Standard, British Annex to the European Standard nor the *BRE Guide* set out rigid standards or limits. They are all considered advisory documents. The *BRE Guide* is preceded by the following very clear statement as to how the design advice contained therein should be used:

“The advice given here 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.”

That the recommendations of the *BRE Guide* are not suitable for rigid application to all developments in all contexts, is of particular importance in the context of national and local policies for the consolidation and densification of urban areas or when assessing applications for highly constrained sites (e.g. lands in close proximity or immediately to the south of residential lands).