

10 CLIMATE (SUNLIGHT & DAYLIGHT)

10.1 Introduction

IN2 Engineering Design Partnership (IN2) has been commissioned by the Applicant to carry out an analysis of the impact of the Proposed Development on lands at Portmarnock, Co. Dublin on sunlight and daylight access in the surrounding area.

To date, it is understood that no standards or guidance documents (statutory or otherwise) on the subject of sunlight access to buildings or open spaces have been prepared or published in Ireland.

In the absence of guidance on the matter of sunlight access tailored to Irish climatic conditions, Irish practitioners tend to refer to the relevant 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 (the BRE Guide). The standards for sunlight access in buildings (and the methodologies for assessment of same) suggested in the British Standard and the BRE Guide have been referenced in this Sunlight Access Analysis.

Neither the British Standard nor the BRE Guide set out rigid standards or limits. The BRE Guide is preceded by the following very clear warning 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).

Given that the British Standard and the BRE Guide were drafted in the UK in the context of UK strategic planning policy, recommendations or advices provided in either document that have the potential to conflict with Irish statutory planning policy have been disregarded for the purposes of this analysis.

A scoping exercise was conducted to identify the neighbouring dwellings which would require a detailed study of impact on daylight and sunlight availability. In terms of daylight, appropriate separation distances are achieved and building heights are not excessive. Therefore, no significant adverse impacts are expected in relation to daylight. As the Proposed Development lies within 90° due south of existing neighbouring buildings to the north of the Application Site, further analysis of overshadowing and impact on sunlight availability to these dwellings will be addressed through shadow analysis.

This Chapter and assessment have been completed having regard to the guidance outlined in the EPA documents Guidelines on information to be contained in EIAR (Draft, August 2017) and Advice note for Preparing Environmental Impact Statements (Draft, September 2015) as outlined under Chapter 1: Introduction of this EIAR.

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10.2 Assessment Methodology

10.2.1 Scoping

The BRE Guide provides guidance on site layout and planning to maintain adequate daylight and sunlight access to new and existing dwellings.

The BRE Guide states:

"2.2.4 Loss of light need not be analysed if the distance of each part of the new development from the existing window is three or more times its height above the centre of the existing window..."

2.2.5 ...Measure the angle to the horizontal subtended by the new development at the level of the centre of the lowest window. If this angle is less than 25° for the whole development then it is unlikely to have a substantial effect on the diffuse skylight enjoyed by the existing building."

Through design development and analysis of the final architectural design, we confirm these criteria have been incorporated into the design of the Proposed Development. Appropriate separation distances are achieved which would be expected for developments consisting predominantly of houses. Building heights are not excessive, the Proposed Development ranges in height from 1.5 – 3 storeys. Therefore, no significant adverse impacts are expected in relation to daylight.

As the Proposed Development lies within 90° due south of existing neighbouring buildings to the north of the Application Site, further analysis of overshadowing and impact on sunlight availability to these dwellings will be addressed through shadow analysis.

10.2.2 Context under Technical Guidance Documents

The relevant British Standard, BS 8206-2:2008: Lighting for buildings – Part 2: Code of practice for daylighting, recommends, at Section 5.3: Sunlight Duration, the following test for the assessment of sunlight access to residential accommodation: *"Interiors in which the occupants have a reasonable expectation of direct sunlight should receive at least 25% of probable sunlight hours... At least 5% of probable sunlight hours should be received during the winter months, between 21 September and 21 March. Sunlight is taken to enter an interior when it reaches one or more window reference points."* 'Probable sunlight hours' is described by the British Standard as meaning the *"long-term average of the total number of hours during the year in which direct sunlight reaches the unobstructed ground."*

The BRE Guide states that *"Any reduction in sunlight access below this level should be kept to a minimum. If the available sunlight hours are both less than the amount above and less than 0.8 times their former value, either over the whole year or just in the winter months (21 September to 21 March), then the occupants of the existing building will notice the loss of sunlight...The room may appear colder and less cheerful and less pleasant"*.

Shadow plots illustrate potential overshadowing on neighbouring developments. Section 3.3 of the BRE Guide states that *"...the equinox (21 March) is the best date for which to prepare shadow plots as it gives an average level of shadowing. Lengths of shadows at the Autumn equinox (21 September) will be the same as those for 21 March, so a separate set of plots for September is not required."*

Section 3.3 of the Building Research Establishment's Site layout planning for daylight and sunlight: a guide to good practice sets out design advice and recommendations for site layout planning to ensure good sunlight access to amenity spaces and to minimise the impact of new development on existing amenity spaces. The Guide suggests 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 sunlight at the equinox. The BRE Guide recommends that, as a rule of thumb, the centre of the space should receive at least two hours of sunlight on the 21st March in order to appear adequately sunlit throughout the year.

10.2.3 Assessment Methodology

A three-dimensional digital model of the Proposed Development, and of existing buildings in the area was constructed by IN2 based on drawings and three-dimensional models supplied by the Design Team; and with reference to satellite and aerial photography. Trees and boundary planting were not included in this model. In assessing the impact of the Proposed Development on existing buildings, where relevant, assumptions were made as to the materials and reflectances of external surfaces.

Site shading diagrams were prepared to illustrate potential overshadowing on neighbouring developments. These were compiled on an hourly basis for the Equinox and Summer / Winter Solstices. From these, the number hours of sunlight availability to the surrounding area on the equinox (21st March) can be determined.

10.2.4 Definition of Effects on Sunlight Access

The assessment of the impact of the Proposed Development on sunlight access had regard to the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports prepared by the Environmental Protection Agency (Draft of 2017), and to Directive 2011/92/EU (as amended by Directive 2014/52/EU) on the assessment of the likely effects of certain public and private projects on the environment.

The list of definitions given below is taken from Table 3.3: Descriptions of Effects contained in the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports prepared by the Environmental Protection Agency (EPA). Some comment is also given below on what these definitions might imply in the case of sunlight access. The definitions from the EPA document are in italics.

- **Imperceptible:** *An effect capable of measurement but without significant consequences. The definition implies that the development would cause a change in the sunlight received at a location, capable of measurement, but not noticeable to the casual observer. If the development caused no change in sunlight access, there could be no effect.*
- **Not Significant:** *An effect which causes noticeable² changes in the character of the environment but without significant consequences (the footnote “2” to the word “noticeable” is: “for the purposes of planning consent procedures”). The definition implies that the development would cause a change in the sunlight received at a location, which is capable of measurement and capable of being noticed by an observer who is taking an active interest in the extent to which the proposal might affect sunlight access.*
- **Slight:** *An effect which causes noticeable changes in the character of the environment without affecting its sensitivities. For this definition to apply, the amount of sunlight received at a location would be changed by the construction of the development to an extent that is both capable of measurement and is noticeable to a minor degree. However, the sunlight environment within an existing building should remain largely unchanged.*
- **Moderate:** *An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends. In this case, a development must bring about a change in the sunlight environment within an existing building; and this change must be consistent with a pattern of change that is already occurring, is likely to occur, or is envisaged by policy. A moderate effect would occur where other developments were bringing about changes in sunlight access of similar extent in the area.*
- **Significant:** *An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment. The definition implies that the existence of the development would change the extent of sunlight access in a manner that is not “consistent with existing and emerging baseline trends”. For example, a development resulting in a “significant” diminution of sunlight access would reduce sunlight to the extent that minimum standards for sunlighting are not met and artificial lighting is required for part of the day.*

- **Very Significant:** An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment. The definition implies that the existence of the development would change the extent of sunlight access to a considerable degree and in a manner that is not “consistent with existing and emerging baseline trends”. For example, a “very significant” effect would occur where a development would result in sunlight received in a room falling well below the minimum standards for sunlighting and where artificial lighting would be required in that room as the principal source of lighting all the time.
- **Profound:** An effect which obliterates sensitive characteristics. Examples of development resulting in a “profound” effect on sunlight access would include facilitating sunlight access to a room in an existing building where the existing room has none (e.g. as a result of the demolition of a building) or by removal of all access to sunlight within an existing building.

In relation to sunlight access, it is conceivable that a development could result in positive effects, but this implies that a development would involve a reduction of the size or scale of built form (e.g. such as the demolition of a building, which might result in an increase in sunlight access). Though that is possible, it is usually unlikely as most development involves the construction of new obstructions to sunlight access.

10.3 Receiving Environment

The subject site Application Site is that illustrated on Dwg. No. 6158B-P-001 ‘Site Location Map – OS Map’, prepared by Burke Kennedy Doyle Architects.

10.4 Characteristics of the Proposed Development

The Proposed Development (Phase 1D) comprises in summary of the following components: -

- 172no. residential units consisting of 22no. duplex / apartments and 150no. houses ranging in heights between 1.5 and 3 storeys.
- Provision of public open space including Skylark Park, extension to Railway Linear Park and extension of Townland Boundary Linear Parks,
- Vehicular access to serve the development is proposed off the existing / under construction access points on roads serving the St. Marnock’s Bay development.
- A new vehicular road is proposed to serve the Proposed Development which will connect with Mayne Road. The permanent road includes the provision of a new junction with Mayne Road and SuDs features to control surface water run-off.
- Upgrade of existing temporary foul water pumping station and storage tank to increase capacity.
- All associated and ancillary site development, infrastructural, landscaping and boundary treatment works.

A full project description is provided in Chapter 3: Description of Proposed Development.

10.5 Potential Impact of the Proposed Development

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 out 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 midwinter, the shadow environment in all urban and suburban areas is generally dense throughout winter.

In assessing the impact of a development on sunlight access, the comments of PJ Little fair in *Site layout planning for daylight and sunlight: a guide to good practice* (the BRE Guide) should be taken into consideration. The BRE Guide states that *“it must be borne in mind that nearly all structures will create areas of new shadow, and some degree of transient overshadowing of a space is to be expected.”*

10.5.1 Proposed Development

10.5.1.1 Construction Phase

The potential impact of the Construction Phase of the Proposed Development on sunlight access is likely to be, initially, lesser than the potential impact of the completed development. As the Proposed Development nears completion, the potential impact of the emerging development is likely to be similar in all material respects to that of the completed development. It is noted that temporary structures and machinery (e.g. hoarding, scaffolding, cranes, etc.) have the potential to result in changes in sunlight access in buildings, although any additional impacts arising from temporary structures or machinery are likely to be temporary and minor.

10.5.1.2 Operational Phase

All impacts described in this section will be permanent. Impacts described as “imperceptible” and “not significant” are considered to be neutral in character. Any reduction in sunlight access resulting in a “slight”, “moderate”, “significant”, “very significant” or “profound” impact would usually be considered to be negative in character, unless otherwise indicated. Any increase in sunlight access resulting in a “slight”, “moderate”, “significant”, “very significant” or “profound” impact would usually be considered to be positive in character, unless otherwise indicated.

Overview of the Potential Impact of the Proposed Development on Sunlight Access to Existing Buildings Outside the Application Site

IN2’s analysis indicates that the construction of the Proposed Development will result in no change in sunlight access within neighbouring existing buildings. The potential impact of the Proposed Development on sunlight access within neighbouring existing buildings surrounding the application site is, therefore, likely to be imperceptible.

Given that the potential for development to result in impacts on sunlight access diminishes with distance, it is the finding of IN2’s analysis the Proposed Development will have no undue adverse impact on sunlight access within buildings in the wider area surrounding the application site.

Detailed Analysis of the Potential Impact of the Proposed Development on Sunlight Access to Existing Buildings Outside the Application Site

The potential impact of the Proposed Development was assessed using Site Shading Diagrams, as presented in Section 4 of IN2 Document Portmarnock South Phase 1D Sunlight Analysis.

The equinox (21st March) is the most representative date to produce shadow plots, as it gives a median level of shadowing across the year.

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 out 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.

These Site Shading diagrams illustrate that the Proposed Development is not predicted to cause overshadowing existing buildings outside the Application Site, and therefore the potential impact of the Proposed Development on these buildings is determined to be imperceptible.

10.5.1.3 Do-Nothing Impact

In a “do nothing” scenario, the existing sunlight environment within neighbouring buildings will remain unchanged.

10.5.2 Cumulative

As illustrated by the Site Shading Diagrams presented in Section 4.0 of IN2 Document Portmarnock South Phase 1D Sunlight Analysis, it is the finding of IN2’s analysis the Proposed Development will have no undue adverse impact on sunlight access within buildings in the Cumulative Development. The potential impact of the Proposed Development on sunlight access within the Cumulative Development surrounding the application site is, therefore, likely to be imperceptible.

10.6 Mitigation Measures (Ameliorative, Remedial or Reductive Measures)

The subject application proposes the development of a greenfield site zoned for development, within the Portmarnock South LAP. In these circumstances, during the Construction or Operational Phases scope for mitigation measures, which would preserve a sustainable level of density, is limited.

10.7 Residual Impact of the Proposed Development

10.7.1 Proposed Development

10.7.1.1 Construction Phase

As no ameliorative, remedial, or reductive development is proposed, the residual impact of the Proposed Development on sunlight access is predicted to be as described under Section 10.5.1.1 above.

10.7.1.2 Operational Phase

As no ameliorative, remedial, or reductive development is proposed, the residual impact of the Proposed Development on sunlight access is predicted to be as described under Section 10.5.1.2 above.

10.7.1.3 Worst Case Impact

As no ameliorative, remedial, or reductive development is proposed, the residual impact of the Proposed Development on sunlight access is predicted to be as described under Section 10.5.1.3 above.

10.8 Monitoring

Monitoring of avoidance, remedial and mitigation measures is not relevant to the assessment of impacts on sunlight access in the case of the subject application.

10.9 Reinstatement

Reinstatement is not relevant to the assessment of impacts on sunlight access in the case of the subject application. It is intended that the Proposed Development will be permanent.

10.10 Difficulties Encountered

It was neither possible nor practical for the Design Team to gain unfettered access to every parcel of private property within the study area surrounding the application site in order to carry out measured building survey. Therefore, while IN2 have confidence that the three dimensional model used in the assessment of the impact of the proposal on sunlight access achieves a high degree of accuracy, it should be noted that some level of assumption was necessary in completing the model.