

## 11 CLIMATE (DAYLIGHT)

### 11.1 Introduction

IN2 Engineering Design Partnership has been commissioned by the Applicant to carry out an analysis of the impact of the proposed development on lands at Dunshaughlin Link Road, Dunshaughlin, Co. Meath on daylight access in the surrounding area.

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

In the absence of guidance on the matter of daylight 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 daylight access in buildings (and the methodologies for assessment of same) suggested in the British Standard and the BRE Guide have been referenced in this Daylight 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.

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.

### 11.2 Assessment Methodology

#### 11.2.1 Context under Technical Guidance Documents

BS 8206-2:2008: Lighting for buildings - Part 2: Code of practice for daylighting states as follows at Section 8.2.1: Loss of Daylight to Existing Buildings: -

*"The BRE Report sets out two guidelines regarding the vertical sky component.*

*a) If the vertical sky component at the centre of the existing window would exceed 27% with the new development in place, then enough skylight would still be reaching the existing window.*

*b) If the vertical sky component with the new development in place would be both less than 27% and less than 0.8 times its former value, then the area lit by the window would be likely to appear more gloomy, and electric lighting would be needed for more of the time. "*

### 11.2.2 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.

Allowing that a detailed survey of the existing dwelling was unavailable at the time of analysis, and thus in order to ensure a “worst case” conservative assessment be undertaken, a continuous series of notional “windows” was modelled to each of its elevations, enabling VSC values to be calculated for points at 2m separation (with height of 1.6m above ground in accordance with BRE guidance). This approach ensured a comprehensive analysis of daylight impact across each façade, as all potential around floor window locations were essentially tested, with detailed VSC results included within Daylight and Sunlight Analysis Report, prepared by IN2.

From these detailed point calculations, the worst-case values determined for each elevation.

### 11.2.3 Definition of Effects on Daylight Access

The assessment of the impact of the proposed development on daylight 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. Some comment is also given below on what these definitions might imply in the case of daylight access. The definitions from the EP 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 daylight received at a location, capable of measurement, but not noticeable to the casual observer. If the development caused no change in daylight access, there could be no effect.*

***Not Significant:** An effect which causes noticeable 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 daylight 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 daylight 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 daylight 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 daylight 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 daylight 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 daylight 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 daylight access in a manner that is not “consistent with existing and emerging baseline trends”. For example, a development resulting in a “significant” diminution of daylight access would reduce daylight to the extent that minimum standards for daylighting 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 daylight access to a considerable degree and in a manner that is not “consistent with existing and emerging baseline trend”. For example, a “very significant” effect would occur where a development would result in daylight received in a room falling well below the minimum standards for daylighting 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 “profound” effect on daylight access would include facilitating daylight 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 daylight within an existing building.

In relation to daylight 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 daylight access). Though that is possible, it is usually unlikely as most development involves the construction of new obstructions to daylight access.

### 11.3 Receiving Environment

The subject site forms part of the Applicant’s wider landholding of c. 18.8 Ha extending north and beyond the Drumree Road. These lands are irregularly shaped and largely comprise two distinct sites within the western part of the Dunshaughlin Local Area Plan and are bisected by Drumree Road and Dunshaughlin Link Road and comprise a total area of c. 14.8 Ha (which includes the lands zoned F1 – Open Space). A single private dwelling adjoins the subject site along the south eastern boundary.

### 11.4 Characteristics of the Proposed Development

The proposed development is set out in three character areas. Character Area 6 (c. 3.75 Ha) comprises a greenfield site which lies north of Drumree Road and to the west of the Dunshaughlin Link Road. A single private dwelling adjoins the subject site along the south eastern boundary.

Character Areas 3 & 4 (c. 8.47 Ha) are generally bounded to the west by the existing Dunshaughlin Link Road, to the south and east by lands zoned for open space, to the north by Phase 1 lands (currently under construction by the Applicant) and lands identified for neighbourhood centre use.

In summary, the proposed Strategic Housing Development broadly comprises: -

- 415no. residential units (254no. houses, 55no. duplex and 106no. apartments) in buildings ranging in height from 2 to 5-storeys.
- 1no. childcare facility (c. 409 sq. m gross floor area).
- Provision of access from Drumree Road (Character Area 6) and Dunshaughlin Link Road – R125 (Character Areas 3 & 4) and provision of internal road network including pedestrian and cycle links.
- Provision of public open space including facilitation of planned pedestrian and cyclist connection along River Skane Greenway toward Dunshaughlin Town Centre.
- Provision of wastewater infrastructure including connections to main sewers on Drumree Road and to foul networks in permitted Phase 1 development and provision of SuDS infrastructure.

- All associated and ancillary site development and infrastructural works, hard and soft landscaping and boundary treatment works.

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

## 11.5 Potential Impact of the Proposed Development

The BRE Guide provides that *“The quantity and quality of daylight inside a room will be impaired if obstructing buildings are large in relation to their distance away”*. Generally speaking, new development is most likely to affect daylight access in existing buildings in close proximity to the application site.

### 11.5.1 Proposed Development

#### 11.5.1.1 Construction Stage

The potential impact of the construction phase of the proposed development on daylight 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 daylight access in buildings, although any additional impacts arising from temporary structures or machinery are likely to be temporary and minor.

#### 11.5.1.2 Operational Stage

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 daylight 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 daylight 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 Daylight Access to Existing Buildings Outside the Application Site**

IN2’s analysis indicates that the construction of the proposed development will result in little or no change in daylight access within neighbouring existing buildings. The potential impact of the proposed development on daylight access within neighbouring existing buildings surrounding the application site is, therefore, likely to range from none to “imperceptible”.

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

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

The DHPLG advocates the use of the industry best practice guideline for daylight and sunlight is the BRE publication *“Site Layout Planning for Daylight and Sunlight – A guide to good Practice (Second Edition): BRE209”*. Whilst it may be noted that it is a guidance document and not a legislative requirement or standard, it has been utilised as a robust means of assessing the impact of the proposed development with regards to the existing dwelling.

With respect to Daylight, BRE Guidelines state: -

Light from the Sky

*“If any part of a new building or extension, measured in a vertical section perpendicular to a main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal, then the diffuse daylighting of the existing building may be adversely affected. This will be the case if either: -*

- *The VSC (Vertical Sky Component) measured at the centre of an existing main window is less than 27%, and less than 0.8 times its former value.”*

Allowing that a detailed survey of the existing dwelling was unavailable at the time of analysis, and thus in order to ensure a “worst case” conservative assessment be undertaken, a continuous series of notional “windows” was modelled to each of its elevations, enabling VSC values to be calculated for points at 2m separation (with height of 1.6m above ground in accordance with BRE guidance). This approach ensured a comprehensive analysis of daylight impact across each façade, as all potential around floor window locations were essentially tested, with detailed VSC results included within Appendix A of Daylight and Sunlight Analysis Report, prepared by IN2.

From these detailed point calculations, the worst-case values determined for each elevation are illustrated in Table 11.1.

Façade	VSC Existing (%)	VSC Proposed (%)	Proposed/Existing (%)
NW	38.9	36.3	93
NE	30.3	28.3	93
SE	38.9	38.9	100
SW	38.9	38.3	98

**Table 11.1:** Vertical Sky Component (VSC) Results.

It can be seen that for the existing dwelling with the exception of the NE façade (which has some sky view restriction due to building return protrusion), all elevations were determined to be currently receiving full natural light availability (VSC = 39%) – It may be noted that all existing trees and foliage were excluded from the analysis to allow conservative estimate of impact.

The proposed development was then determined to result in the following VSC values determined to each elevation of the existing dwelling:

- SE – Zero impact.
- SW – Imperceptible (98%).
- NW/NE – Not Significant (93%).

In conclusion, the VSC analysis determined the proposed development would have a Zero to Not Significant impact on natural light availability to the existing dwelling with VSC results (proposed/existing) comfortably higher than BRE Best Practice Guideline recommendations of 80%+.

An alternative layout is proposed which includes the omission of a road link between Character Area 3 and 4. Should this road link be omitted it will have no impact on daylight access within neighbouring existing buildings.

#### 11.5.1.3 Do-Nothing Impact

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

### 11.5.2 Cumulative

Phase 1 Dunshaughlin (currently under construction) is located directly north of the proposed development. The developments are located a distance apart such that there is anticipated to be no impacts on daylight access in the case of the subject application.

### 11.6 Mitigation Measures (Ameliorative, Remedial or Reductive Measures)

The subject application proposes the development of a greenfield site zoned as: “A2” which is “to provide for new residential communities with ancillary community facilities, neighbourhood facilities and employment uses as considered appropriate.” under statutory planning policy (i.e. the Meath County Council Development Plan 2013 – 2019). In these circumstances, during the construction or operational phases scope for mitigation measures, which would preserve a sustainable level of density, is limited.

### 11.7 Residual Impact of the Proposed Development

#### 11.7.1 Proposed Development

##### 11.7.1.1 Construction Stage

As no ameliorative, remedial, or reductive development is proposed, the residual impact of the proposed development on daylight access is predicted to be as described under Section 11.5.1.1 above.

##### 11.7.1.2 Operational Stage

As no ameliorative, remedial, or reductive development is proposed, the residual impact of the proposed development on daylight access is predicted to be as described under Section 11.5.1.2 above.

##### 11.7.1.3 Worst Case Impact

As no ameliorative, remedial, or reductive development is proposed, the residual impact of the proposed development on daylight access is predicted to be as described under Section 11.5.1.3 above.

### 11.8 Monitoring

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

### 11.9 Reinstatement

Reinstatement is not relevant to the assessment of impacts on daylight access in the case of the subject application. It is intended that the proposed development will be permanent.

### 11.10 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 daylight access achieves a high degree of accuracy, it should be noted that some level of assumption was necessary in completing the model.