11 CLIMATE (SUNLIGHT AND DAYLIGHT)

11.1 Introduction

This chapter assess the potential impact in terms of daylight and sunlight access to the neighbouring environment resulting from the proposed development in the townlands of Kellystown and Porterstown in the administrative area of Fingal County Council.

Model Works was commissioned to carry out a Daylight, Sunlight and Overshadowing assessment on the proposed scheme. This chapter has been compiled by Barry Murphy, Managing Director of Model Works, he holds a B Eng (hons) in Mechanical Engineering, is a member of Institute of Engineers Ireland and has 20 years' experience in the industry.

Specialist 3D software (Waldram Tools for Revit, Version 7) was used to analyse the proposal and receiving environment based on the 3D models, survey information and design details provided to Model Works by the project architects and other qualified professionals on the design team.

11.2 Assessment Methodology

Understanding Direct and Diffuse Daylight

Daylight is generally taken to be the totality of visible radiation originating from the sky, and when visible, the sun, during the hours of daytime. The source of all daylight is in fact the sun. Scattering of sunlight in the atmosphere by air, water vapour, dust, and so on gives the sky the appearance of a self-luminous hemispherical source of light. Sunlight is commonly referred to as direct light since it appears to originate from a small source and can be highly luminous, casting sharp shadows. The sky, however, is an extended source of illumination that casts only soft shadows, and so skylight is commonly referred to as diffuse light.

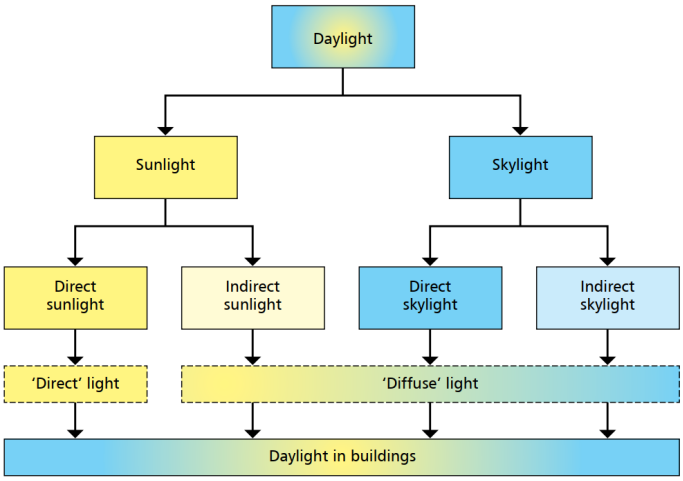

Figure 11-1 Contributions to Daylight in Buildings

11.2.1 Relevant Planning Policies and Guides Used in the Assessment

BRE Guide 2022

The BRE (Building Research Establishment) Guide to Daylight and Sunlight was first published in 1991 and has become the primary reference document for local authorities in Ireland and the UK for the assessment of Daylight and Sunlight. The 2022 edition is the third and most recent edition of the guide.

The BRE Guide's summary states:

"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 for new buildings in the British Standard Daylight in buildings, BS EN 17037. 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." (Summary)

It also notes that it should be interpreted with a degree of flexibility, depending on the specifics of the development being assessed.

"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. In special circumstances the developer or planning authority may wish to use different target values." (1.6)

The introduction also states that:

"The guidance here is intended for use in the United Kingdom and in the Republic of Ireland, though recommendations in the Irish Standard IS EN 17037 may vary from those in BS EN 17037." (1.7)

The BRE Guide will be the primary reference document used in this report.

Sustainable Urban Housing: Design Standards for New Apartments July 2023

This document was prepared by the Department of Housing, Local Government and Heritage, and provides guidance to planners in relation to the built environment including Daylight and Sunlight.

"Planning authorities should avail of appropriate expert advice where necessary and have regard to quantitative performance approaches to daylight provision outlined in guides like A New European Standard for Daylighting in Buildings IS EN17037:2018, UK National Annex BS EN17037:2019 and the associated BRE Guide 209 2022 Edition (June 2022), or any relevant future standards or guidance specific to the Irish context, when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision." (6.6)

And

"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 specifics. This may arise due to 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." (6.7)

Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities (2024)

These guidelines set national planning policy and guidance in relation to the planning and development of urban and rural settlements, with a focus on sustainable residential development and the creation of compact settlements.

In relation to daylight provision, it states:

"In cases where a technical assessment of daylight performance is considered by the planning authority to be necessary regard should be had to quantitative performance approaches to daylight provision outlined in guides like A New European Standard for Daylighting in Buildings IS EN17037:2018, UK National Annex BS EN17037:2019 and the associated BRE Guide 209 2022 Edition (June 2022), or any relevant future standards or guidance specific to the Irish context." (5.3.7)

and

"In drawing conclusions in relation to daylight performance, planning authorities must weigh up the overall quality of the design and layout of the scheme and the measures proposed to maximise daylight provision, against the location of the site and the general presumption in favour of increased scales of urban residential development. Poor performance may arise due to design constraints associated with the site or location and there is a need to balance 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." (5.3.7)

Fingal Development Plan 2023-2029

In relation to Daylight and Sunlight, it states:

"All applications for residential development must ensure that the layout and design of individual units and accompanying public realms are designed in a manner which maximises daylight and sunlight. A Daylight and Sunlight Assessment may be necessary to assess the impacts of the proposed development on surrounding properties and amenity areas outside the site boundaries of an application and in order to assess the likely daylight and sunlight reaching proposed units and associated private, communal and public open spaces."

It also states that:

"Development shall be guided by the principles of Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice – (Building Research Establishment Report) 2011 and/or any updated guidance."

As the 2011 BRE guide has now been withdrawn, the current 2022 guide will be used for this report.

11.2.2 Methodology

There are three assessments that must be made to determine if a proposal adversely affects the daylight and sunlight to existing buildings.

1. Daylight access to existing buildings
2. Sunlight access to existing buildings
3. Sunlight access to neighbouring amenity areas

A 3D model of the entire scheme, plots 1 and 2, and of the receiving environment was created. This model was then analysed using specialist 3D software (Waldram Tools for Revit, Version 7) to determine the potential impacts of the scheme on the receiving environment.

Identifying Sensitive Receptors

The primary purpose of a daylight, sunlight and overshadowing assessment is to determine the likely loss of light to adjacent buildings and amenity spaces resulting from the construction of the proposed development.

Therefore, in this case, the proposed development is identified as the potential source of impact. The sensitive receptors identified for this study, as per the BRE Guidelines are:

- Windows to habitable rooms facing the site where the occupants have a reasonable expectation of daylight; and
- Gardens and open spaces on adjacent properties to the proposed development, excluding public footpaths, front gardens and car parks.

11.2.2.1 Loss of Daylight to Existing Buildings

Assessment Method

The amount of skylight falling on a vertical wall or window can be quantified as the **Vertical Sky Component** (VSC). The VSC for existing buildings is the illuminance on the outside of a window, divided by the illuminance falling on an unobstructed horizontal plane, under overcast sky conditions. The standard Commission Internationale d'Eclairage (CIE) overcast sky is used, and the ratio is usually expressed as a percentage. The maximum value is almost 40% for a completely unobstructed vertical wall and the reference point is in the external plane of the window wall.

"Loss of light to existing windows 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. In these cases the loss of light will be small." (BRE Guide: 2.2.4) Refer to Figure 11-3 below.

"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 of the development then it is unlikely to have a substantial effect on the diffuse skylight enjoyed by the existing building. If, for any part of the new development, this angle is more than 25°, a more detailed check is needed to find the loss of skylight to the existing building." (BRE Guide: 2.2.5) Refer to Figure 11-4 *below.*

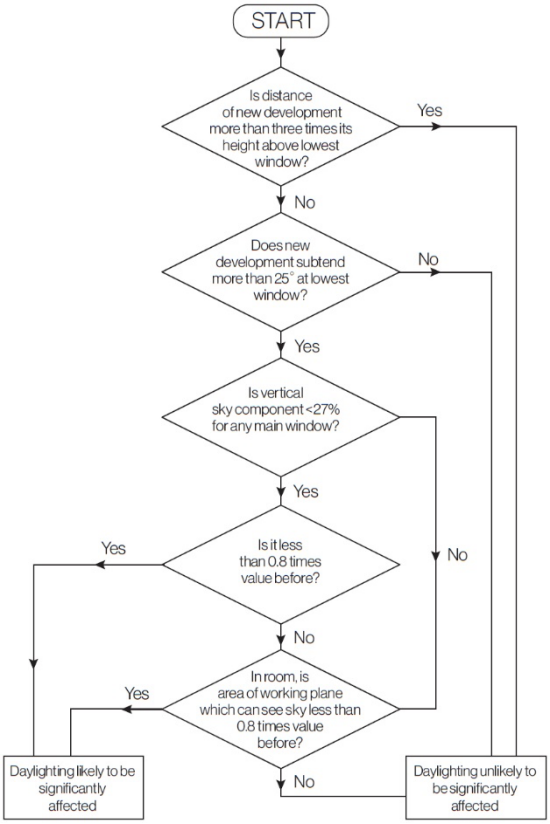

Figure 11-2 Decision chart: diffuse daylight in existing buildings

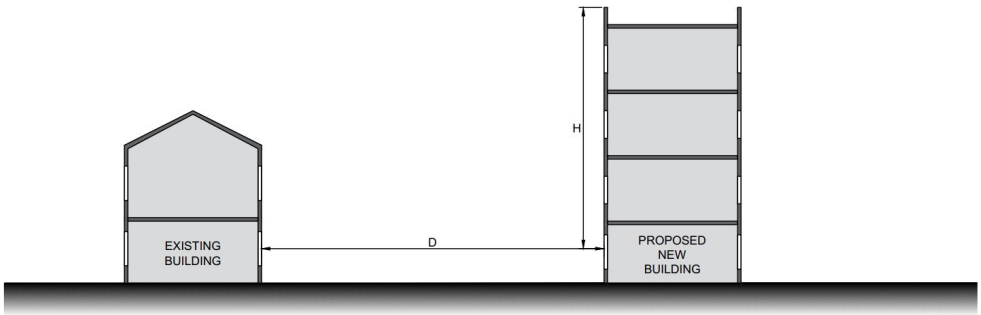

Figure 11-3 Distance test for Daylight Impact to Existing Buildings (Is D > 3xH)

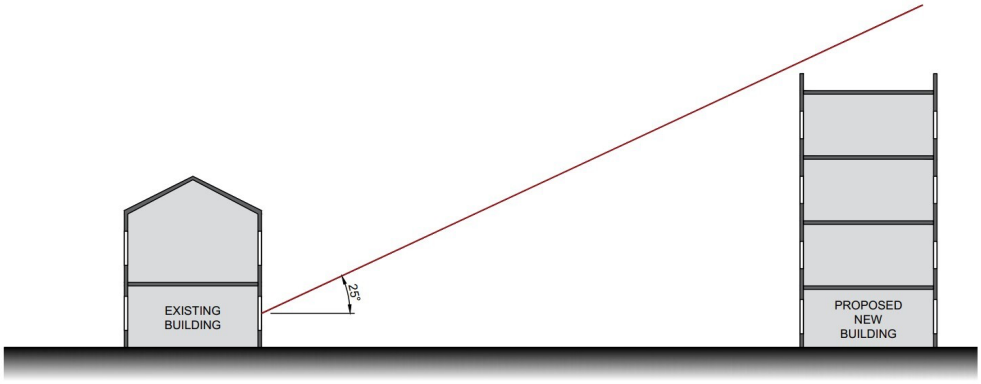

Figure 11-4 25° Angle test for Daylight Impact to Existing Buildings

Weighted Average VSC

"If there would be a significant loss of light to the main window but the room also has one or more smaller windows, an overall VSC may be derived by weighting each VSC element in accordance with the proportion of the total glazing area represented by its window. For example, a room has a main window of area 2 m2 whose VSC would drop from 24% to 18%, 0.75 times the value before. However, it also has a smaller window, area 1 m2, for which the VSC would be unchanged at 30%. The area weighted VSC 'before' would be (24x2+30)/3 = 26%. 'After' it would be (18x2+30)/3 = 22%, 0.85 times the value 'before'. Thus, loss of VSC to the room as a whole would meet the guideline." (BRE Guide: 2.2.8)

Trees

While the potential impact of existing trees must be considered when assessing the daylight to proposed dwellings, trees do not need to be considered for existing buildings, unless a dense belt or group of evergreens is specifically planned as a windbreaker or for privacy purposes.

"It is generally more difficult to calculate the effects of trees on daylight because of their irregular shapes and because some light will generally penetrate through the tree crown. ***Where the effect of a new building on existing buildings nearby is being analysed, it is usual to ignore the effect of existing trees.*** *This is because daylight is at its scarcest and most valuable in winter when most trees will not be in leaf." (BRE Guide: G1.2)* [Emphasis added.]

Assessment Criteria

The daylight to an existing building may be adversely affected if:

- the VSC measured at the centre of an existing main window is less than 27%, and less than 0.80 times its former value.
- the area of the working plane, 0.85m high, in a room which can receive direct skylight is reduced to less than 0.80 times its former value.

The line that divides the points on the working plane which can and cannot see the sky is known as the No Sky Line (NSL). The NSL test can only be carried out when the internal room layout is known, which is seldom the case when assessing existing buildings.

11.2.2.2 Loss of Sunlight to Existing Buildings

Assessment Method

To determine the possible loss of sunlight to existing buildings the **Annual Probable Sunlight Hours** (APSH) is calculated. *"Here 'probable sunlight hours' means the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness for the location in question (based on sunshine probability data). The sunlight reaching a window is quantified as a percentage of this unobstructed annual total." (BRE Guide: 3.2.4)*

It is recommended that all living rooms and conservatory windows of existing dwellings be assessed if the new development is positioned within 90° of due south and it subtends an angle greater than 25° to the horizontal, measured from the centre of the window. The reference point is the centre of the window, or 1.6m above the floor for floor to ceiling windows or patio doors, on the plane of the outside surface of the wall.

Trees

Similar to the VSC assessment above, trees are not included, unless a dense belt or group of evergreens is specifically planned as a windbreaker or for privacy purposes.

Assessment Criteria

The sun lighting of an existing dwelling may be adversely affected, if the centre of the window:

- receives less than 25% of annual probable sunlight hours and less than 0.8 times its former annual value; or less than 5% of annual probable sunlight hours between 21 September and 21 March and less than 0.80 times its former value during that period;
- and also has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

"It is not always necessary to do a full calculation to check sunlight potential. The guideline above is met provided either of the following is true:

- *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 (note: obstructions within 90° of due north of the existing window need not count here).*
- *The window wall faces within 90° of due south and no obstruction, measured in the section perpendicular to the window wall, subtends an angle of more than 25° to the horizontal. Again, obstructions within 90° of due north of the existing window need not be counted.*
- *The window wall faces within 20° of due south and the reference point has a VSC of 27% or more." (BRE Guide: 3.2.9)*

11.2.2.3 Loss of Sunlight to Existing Gardens and Amenity Areas

Assessment Method

BRE Guidelines recommend that for an existing garden or amenity area to appear adequately sunlit throughout the year, at least half of the space should receive at least 2 hours of sunlight on 21 March, the equinox.

Trees

In general, trees do not need to be considered when assessing potential loss of light to existing gardens and amenity spaces.

"In assessing the impact of buildings on sunlight in gardens …, ***trees and shrubs are not normally included in the calculation*** *unless a dense belt or group of evergreens is specifically planned as a windbreak or for privacy purposes. This is partly because the dappled shade of a tree is more pleasant than the deep shadow of a building (this applies especially to deciduous trees)." (BRE Guide 2022: G4.1)* [Emphasis added.]

Assessment Criteria

"If as a result of a new development an existing garden or amenity area does not meet the above, and the area that can receive two hours of sun on 21 March is less than 0.80 times its former value, then the loss of sunlight is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March." (BRE Guide 2022: 3.3.17)

11.2.2.4 Definition of Impacts

Definition of Impacts - Daylight

The assessment of impacts 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 (2022) 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 3.4 Description 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 impact on daylight 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 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 consequence.* 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. Examples of "Not Significant" impacts on daylight access would include: (A) a scenario where the proposed development is predicted to reduce the Vertical Sky Component received by a sample window, but the window will continue to receive the relevant recommended level of Vertical Sky Component of 27% after the construction of the proposed development (the BRE Guide threshold for an adverse impact); and (B) a scenario where the proposed development is predicted to reduce the Vertical Sky Component to not less than 0.8 times its former value (i.e. the BRE Guide threshold).
- ***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. An example of a "slight" impact would be a scenario where, although the impact of the proposed development is not predicted to reduce the amount of daylight received by a sample window to less than 0.8 times its former value, the amount of light received by the sample window

is predicted to fall below a key recommended level, whether that is the BRE Guide recommended target value or an alternative target value. A further example of a "slight" impact would be where, although the construction of the proposed development is predicted to reduce the amount of light received to a level below the BRE Guide threshold for an adverse impact, the predicted reduction is just outside that BRE Guide threshold (e.g. the amount of daylight received by a sample window falls to not less than 0.7 times its existing value). A "slight" impact could also occur where there is a more considerable reduction in daylight by a sample window within an existing building, but only a small number of windows within that property are affected to that extent.

- ***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 or is likely to occur. A moderate effect would occur where other developments were bringing about changes in daylight access of similar extent in the area. A "moderate" impact might also be considered to occur where the level of daylight received by a sample window falls below the BRE Guide recommended level and to between 0.5 and 0.7 times its existing value, subject to consideration of other factors.

- ***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. A "significant" impact could occur where the predicted reduction in daylight access is greater than what is envisaged to occur if the application site were developed in line with existing and emerging baseline trends. Subject to consideration of other factors, a "significant" impact could occur where daylight access to the sample window falls to between 0.25 and 0.5 times its former value.

- ***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 trends".* 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. A "very significant" impact could occur where the predicted reduction in daylight access is considerably greater than what is envisaged to occur if the application site were developed in line with existing and emerging baseline trends. Subject to consideration of other factors, a "very significant" impact could occur where daylight access to the sample window falls to between 0.01 and 0.25 times its former value.

- ***Profound****: An effect which obliterates sensitive characteristics.* Examples of development resulting in a "*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.

Definition of Impacts - Sunlight

The assessment of impacts 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 (2022) 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 3.4 Description 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 impact on 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 *noticeable changes in* the *character of the environment but without significant consequences.* 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. Examples of "Not Significant" impacts on sunlight access would include: (a) a scenario where the proposed development is predicted to reduce the amount of sunlight received by a sample window, but the sample window will continue to receive the relevant recommended level of Annual Probable Sunlight Hours after the construction of the proposed development; and (b) a scenario where the proposed development is predicted to reduce the Annual Probable Sunlight Hours received by a sample window to not less than 0.8 times its existing value (i.e. the BRE Guide threshold for an adverse impact). Similarly, where sunlight access to a sample garden is reduced, the impact of proposed development could be considered to be "not significant" where the sample garden continues to receive at least two hours of sunlight over half its area on 21st March, and, where the area of the garden capable of receiving sunlight on 21st March does not drop to less than 0.8 times its existing level after the construction of the proposed development.

- ***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 shadows cast by the development to an extent that is both capable of measurement and is noticeable to a minor degree. However, the shadow environment of the surrounding environment should remain largely unchanged. An example of a "slight" impact would be a scenario where, although the impact of the proposed development is not predicted to reduce the amount of sunlight received by a sample window or garden to less than 0.8 times its former value, the amount of light received by the sample window or garden is predicted to fall below a key recommended level, whether that is the BRE Guide recommended target value or an alternative target value. A further example of a "slight" impact would be where, although the construction of the proposed development is predicted to reduce the amount of light received to a level below the BRE Guide threshold for an adverse impact, the predicted reduction is just outside that BRE Guide threshold (e.g. the amount of sunlight received by a sample window or garden falls to not less than 0.7 times its existing value). A "slight" impact could also occur where there is a more considerable reduction in sunlight by a sample window within an existing building, but only a small number of windows within that property are affected to that extent.

- ***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 shadow environment of the area; and this change must be consistent with a pattern of change that is already occurring, or is likely to occur. A moderate effect would occur where other developments were bringing about changes in sunlight access of similar extent in the area. A "moderate" impact might also be considered to occur where the level of sunlight access to a sample window or garden falls below the BRE Guide recommended level and to between 0.5 and 0.7 times its existing value, subject to consideration of other factors.

- ***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 overshadow a location to the extent that there is a significant change in the amount of direct sunlight received at that location. A "significant" impact could occur where the predicted reduction in sunlight access is greater than what is envisaged to occur if the application site were developed in line with existing and emerging baseline trends. Subject to consideration of other factors, a "significant" impact could occur where sunlight access to the sample window or garden falls to between 0.25 and 0.5 times its former value.

- ***Very Significant****:* An *effect which, by its character, magnitude, duration or intensity significantly alters* most *of a sensitive aspect of the environment.* For example, a *"very significant"* reduction in sunlight access would occur where the development overshadows a location for most of the time that the location would have been in sunlight prior to the construction of the development and where overshadowing of that magnitude is not *"consistent with existing and emerging baseline trends".* A "very significant" impact could occur where the predicted reduction in sunlight access is considerably greater than what is envisaged to occur if the application site were developed in line with existing and emerging baseline trends. Subject to consideration of other factors, a "very significant" impact could occur where sunlight access to the sample window or garden falls to between 0.01 and 0.25 times its former value.
- ***Profound****: An effect which obliterates sensitive characteristics.* Examples of development resulting in a *"profound"* effect on sunlight access would include facilitating sunlight access at a location where that location has previously had none (e.g. facilitating sunlight access as a result of the demolition of a building) or by removal of all access to sunlight at a location.

11.3 Receiving Environment

11.3.1 Proposed Development – Plot 1 (Luttrellstown Gate Phase 2)

The proposed site is green field land in the townland of Kellystown within the Fingal County Council administrative area. The main Dublin-Maynooth-Sligo rail line and Royal Canal bound the site to the north and the area to the west is existing farmland. The area to the east and south has received planning permission under Reg. Ref. ABP-312318-21, as amended by Reg. Ref. LRD0034-S3, and is currently under construction.

11.3.2 Proposed Development - Plot 2 (St. Mochta's LRD).

The proposed site is located predominantly on the former sports ground of St. Mochta's FC in the townland of Porterstown within the Fingal County Council administrative area. The main Dublin-Maynooth-Sligo rail line and Royal Canal bound the site to the north. Diswellstown Road and Porterstown Road form the boundaries of the site to the east and west respectively. The area to the west and south has received planning permission under Reg. Ref. ABP-312318-21, as amended by Reg. Ref. LRD0034-S3, and is currently under construction.

The cumulative effect of plots 1 and 2, and the site currently under construction, with planning permission under Reg. Ref. ABP-312318-21, as amended by Reg. Ref. LRD0034-S3, have been considered in the assessment for impact on the neighbouring properties.

11.4 Characteristics of the Proposed Development

11.4.1 Proposed Development– Plot 1 (Luttrellstown Gate Phase 2)

Castlethorn Developments Luttrellstown Limited intends to apply for Permission for a development at a site (c. 3.72ha) at lands in the Townland of Kellystown.

The proposed development comprises 99no. residential units in a mix of houses and duplex units consisting of 71no. 2 storey houses (66no. 3-bedroom and 5no. 4-bedroom), 16no. 3 storey houses (16no. 4-bedroom), 8no. 1-bedroom duplex units and 4no. 2-bedroom duplex units and all associated and ancillary site development and infrastructural works, hard and soft landscaping and boundary treatment works, including public open space; public lighting; surface car parking spaces; bicycle parking spaces/stores for mid-terrace units; bin stores. The proposed development includes a minor amendment to development permitted under Reg. Ref. ABP-312318- 21, as amended by Reg. Ref. LRD0034-S3, with minor adjustment proposed to the permitted surface water attenuation pond. Vehicular access to the proposed development is provided by the road network permitted under Reg. Ref. ABP-312318-21, as amended by Reg. Ref. LRD0034-S3.

11.4.1.1 Construction Stage

There is no particular methodology for assessing the construction effects on daylight and sunlight as these are variable and constantly change as construction progresses. The potential impact during the construction stage is likely to be less than that of the completed development. As construction progresses the impact on the receiving environment will increase until it reaches that of the completed development (Operational Stage). Temporary structures and machinery (cranes, hoarding, scaffolding, etc.) would have an impact, but this is expected to be minor and temporary.

Therefore, no technical assessment of the potential impact during construction has been carried out and this chapter will focus on the potential impacts of the completed development on the receiving environment.

11.4.1.2 Operational Stage

When completed and occupied the proposed development will comprise 99no. residential units in a mix of houses and duplex units consisting of 71no. 2 storey houses (66no. 3-bedroom and 5no. 4-bedroom), 16no. 3 storey houses (16no. 4-bedroom), 8no. 1-bedroom duplex units and 4no. 2-bedroom duplex units.

11.4.2 Proposed Development- Plot 2 (St. Mochta's LRD).

Castlethorn Developments Luttrellstown Limited intends to apply for Permission for a development at a site (c. 4.38ha) at lands in the Townland of Porterstown.

The proposed development comprises 302no. residential units in a mix of houses, duplex and apartment units consisting of 62no. 2 storey, 3-bedroom houses and 35no. 3 storey, 4-bedroom houses; 205no. Duplex / Apartment Units (98no. 1-bed, 88no. 2-bed and 19no. 3-bed) across 4no. blocks comprising: Block D ranging in height from 5-7 storeys accommodating 57no. apartment units; Block E ranging in height from 5-7 storeys accommodating 77no. apartment units; Block F ranging in height from 4-5 storeys accommodating 39no. apartment and duplex units; Duplex Blocks G1, G2, G3 & G4 3 storeys in height accommodating 32no. apartment units; and all associated and ancillary site development and infrastructural works, hard and soft landscaping and boundary treatment works, including public open space; public lighting; surface car parking spaces; bicycle parking spaces/stores for mid-terrace units; bin stores. Vehicular access to the proposed development is provided by the road network permi2ed under Reg. Ref. ABP-312318-21, as amended by Reg. Ref. LRD0034-S3.

11.4.2.1 Construction Stage

The impacts will be similar to those detailed above for Plot 1, see 11.4.1.1.

11.4.2.2 Operational Stage

When completed and occupied the proposed development will comprise 302no. residential units in a mix of houses, duplex and apartment units consisting of 62no. 2 storey, 3-bedroom houses and 35no. 3 storey, 4-bedroom houses; 205no. Duplex / Apartment Units (98no. 1-bed, 88no. 2-bed and 19no. 3-bed) across 4no. blocks.

11.4.3 Cumulative

11.4.3.1 Construction Stage

The impacts will be similar to those detailed above for Plot 1, see 11.4.1.1.

11.4.3.2 Operational Stage

When completed and occupied the Plot 1 proposed development will comprise 99no. residential units in a mix of houses and duplex units consisting of 71no. 2 storey houses (66no. 3-bedroom and 5no. 4-bedroom), 16no. 3 storey houses (16no. 4-bedroom), 8no. 1-bedroom duplex units and 4no. 2-bedroom duplex units. Plot 2 will comprise 302no. residential units in a mix of houses, duplex and apartment units consisting of 62no. 2 storey, 3-bedroom houses and 35no. 3 storey, 4-bedroom houses; 205no. Duplex / Apartment Units (98no. 1-bed, 88no. 2-bed and 19no. 3-bed) across 4no. blocks.

11.5 Potential Impact of the Proposed Development

11.5.1 Proposed Development - Plot 1 (Luttrellstown Gate Phase 2)

11.5.1.1 Construction Stage

The potential impact to both daylight and sunlight during the construction stage is likely to be less than that of the completed development. As construction progresses the impact on the receiving environment will increase until it reaches that of the completed development (Operational Stage). Temporary structures and machinery (cranes, hoarding, scaffolding, etc.) would have an impact, but this is expected to be minor and temporary.

Note: the impacts during the construction stage will be similar for both applications.

11.5.1.2 Operational Stage

11.5.1.2.1 Daylight Impact Analysis

The main Dublin-Maynooth-Sligo rail line and Royal Canal bound the site to the north and the area to the west is existing farmland. The area to the east and south has received planning permission under Reg. Ref. ABP-312318-21, as amended by Reg. Ref. LRD0034-S3, and is currently under construction. There is a green band of open space and retained hedgerow between this scheme and the proposed development which provides a distance of circa 30m-40m between the dwellings of the schemes.

Figure 11-5 Plot 1 Siteplan

Using the decision chart detailed in section 11.2.2.1 above, existing and proposed dwellings in the vicinity of the proposal site were assessed for potential impact to daylight. Given the rural nature of the site and the distance the proposed buildings are from existing dwelling, or the scheme currently

under construction to the east and south, no dwellings fell within the criteria requiring a detailed assessment. Therefore, the impact would be **imperceptible**.

11.5.1.2.2 Sunlight Impact Analysis

Similar to the Daylight impact assessment above, no dwellings fell within the criteria requiring a detailed assessment. Therefore, the impact would be **imperceptible**.

11.5.1.2.3 Sunlight to Amenity areas

The neighbouring environment was reviewed for potential impact to sunlight on gardens or amenity spaces, however there were none close enough to the development site to be impacted by overshadowing.

11.5.1.3 Do-Nothing Impact

In a Do-Nothing scenario, no construction would occur on the site and therefore the impact on neighbouring properties would be neutral as the existing daylight and sunlight levels would remain unchanged.

11.5.2 Proposed Development- Plot 2 (St. Mochta's LRD).

11.5.2.1 Construction Stage

See Sections 11.5.1.1 above. The impacts during the construction stage will be similar for both applications.

11.5.2.2 Operational Stage

11.5.2.2.1 Daylight Impact Analysis

Using the decision chart detailed in section 11.2.2.1 above, all existing dwellings and those that have received planning permission in the vicinity of the site have been assessed for potential impact to daylight and sunlight. However, given the rural nature of the site and its distance from existing buildings, the number of dwellings impacted will be limited to:

1. Block A of the scheme to the south of the proposed which has received planning permission under Reg. Ref. ABP-312318-21, as amended by Reg. Ref. LRD0034-S3.
2. Two dwellings in the Traveller Accommodation site to the west.

Figure 11-6 Plot 2 Siteplan

Table 11.1 Daylight Exposure Results Summary

Surrounding	Floors Assessed	No. of Units	No. of Rooms	% Meets BRE Criteria	Impact Assessment
Block A	Gnd, 01, 02, 03, 04, 05	17	51	86%	Slight
Traveller Accommodation	Gnd	2	2	100%	Not Significant

Block A

Seventy-three windows serving 51 rooms were assessed and 86% of these meet the BRE criteria. Of the 10 windows which failed compliance, three had a VSC of 26%, just below the compliance value of 27%, and a further four had a ratio of proposed to existing VSC of 0.70-0.79, just below the compliance value of 0.8. The impact on this block is assessed as **Slight**.

Traveller Accommodation

Two units required assessment as they both had a main window facing east, directly towards the proposal site. The window of units 1 (TA 001) achieved BRE compliance with a VSC of 27%. The main window of unit 2 failed to achieve BRE compliance when assess individually. However, as recommended by the BRE Guide (Section: 2.2.8), as there are four windows serving the main living space, a weighted average VSC was calculated, and this resulted in the room achieving compliance. Therefore, the impact on both units is assessed as **Not Significant.**

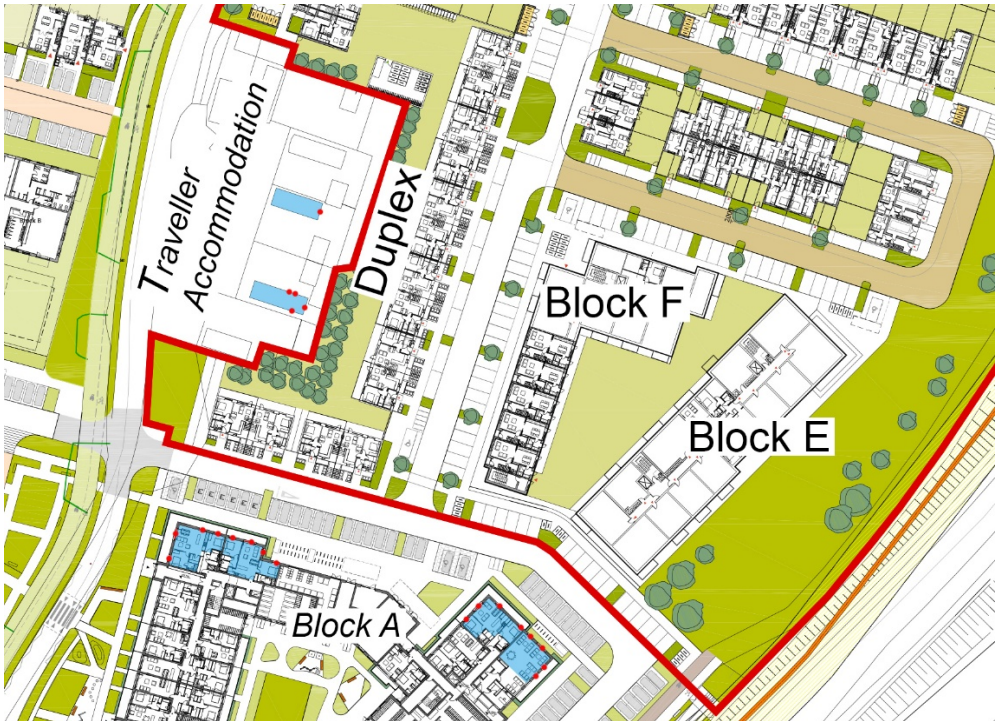

Figure 11-7 Neighbouring Buildings Assessed

Figure 11-8 Neighbouring Buildings – Block A Window Reference Numbers

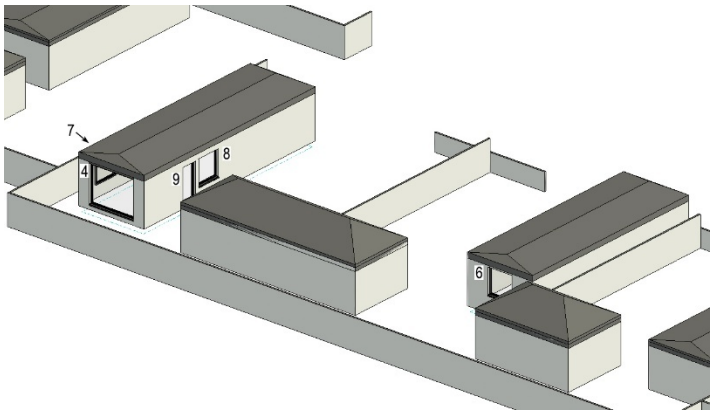

Figure 11-9 Neighbouring Buildings – Traveller Accommodation Window Reference Numbers

Table 11.2 Daylight Exposure Detailed Results

Building Reference	Window Ref	VSC Existing	VSC Proposed	Ratio of VSC Proposed to VSC Existing	Meets BRE Criteria
BA 001	388	28%	28%	1.00	Yes
BA 001	746	39%	30%	0.78	Yes
BA 001	392	28%	28%	1.00	Yes
BA 001	742	38%	29%	0.75	Yes
BA 002	723	21%	16%	0.80	Yes
BA 002	744	28%	17%	0.61	No
BA 002	745	37%	27%	0.72	Yes
BA 002	675	32%	22%	0.70	No
BA 003	506	39%	26%	0.66	No
BA 003	563	21%	17%	0.79	No
BA 003	656	39%	26%	0.66	No
BA 003	508	28%	24%	0.86	Yes
BA 004	348	26%	26%	1.00	Yes
BA 004	526	38%	32%	0.85	Yes
BA 004	352	34%	34%	1.00	Yes
BA 004	517	38%	32%	0.83	Yes
BA 005	524	25%	18%	0.72	No
BA 005	1650	21%	18%	0.85	Yes
BA 005	525	37%	30%	0.81	Yes
BA 005	24	32%	26%	0.80	Yes
BA 006	558	38%	27%	0.71	Yes
BA 006	564	21%	18%	0.85	Yes
BA 006	5	39%	28%	0.71	Yes
BA 006	686	29%	27%	0.91	Yes
BA 007	554	26%	15%	0.60	No
BA 007	598	38%	37%	1.00	Yes
BA 007	633	38%	26%	0.71	No
BA 007	597	38%	38%	1.00	Yes
BA 007	596	38%	38%	1.00	Yes
BA 008	3995	39%	39%	1.00	Yes
BA 008	4986	27%	24%	0.89	Yes
BA 008	4002	37%	37%	1.00	Yes
BA 008	4210	37%	34%	0.91	Yes
BA 009	2238	22%	20%	0.91	Yes
BA 009	4142	25%	22%	0.86	Yes
BA 009	4143	37%	34%	0.91	Yes
BA 009	3108	33%	29%	0.89	Yes
BA 010	559	25%	16%	0.65	No
BA 010	565	36%	34%	0.95	Yes
BA 010	634	39%	30%	0.76	Yes
BA 010	690	32%	31%	0.95	Yes
BA 011	601	25%	25%	1.00	Yes
BA 011	659	39%	30%	0.77	Yes
BA 011	683	39%	31%	0.78	Yes
BA 011	600	37%	37%	1.00	Yes
BA 011	599	34%	34%	1.00	Yes
BA 012	560	25%	18%	0.74	No
BA 012	566	37%	37%	0.99	Yes
BA 012	637	39%	32%	0.82	Yes
BA 012	694	34%	34%	0.99	Yes
BA 013	604	25%	25%	1.00	Yes
BA 013	661	39%	33%	0.83	Yes
BA 013	662	39%	32%	0.82	Yes

Building Reference	Window Ref	VSC Existing	VSC Proposed	Ratio of VSC Proposed to VSC Existing	Meets BRE Criteria
BA 013	603	38%	38%	1.00	Yes
BA 013	602	34%	34%	1.00	Yes
BA 014	561	25%	21%	0.83	Yes
BA 014	567	38%	38%	1.00	Yes
BA 014	640	39%	34%	0.87	Yes
BA 014	698	36%	36%	1.00	Yes
BA 015	549	25%	25%	1.00	Yes
BA 015	664	39%	35%	0.88	Yes
BA 015	665	39%	35%	0.88	Yes
BA 015	442	38%	38%	1.00	Yes
BA 015	441	35%	35%	1.00	Yes
BA 016	562	39%	37%	0.94	Yes
BA 016	568	39%	39%	1.00	Yes
BA 016	643	39%	36%	0.92	Yes
BA 016	427	39%	39%	1.00	Yes
BA 017	607	39%	39%	1.00	Yes
BA 017	667	39%	36%	0.93	Yes
BA 017	668	39%	36%	0.92	Yes
BA 017	606	39%	39%	1.00	Yes
BA 017	605	39%	39%	1.00	Yes
TA 001	6	35%	27%	0.77	Yes
TA 002	4	36%	25%	0.70	No
TA 002	9	32%	31%	0.96	Yes
TA 002	8	36%	35%	0.97	Yes
TA 002	7	33%	30%	0.89	Yes
Total meets criteria			Yes	67	86%
			No	11	14%
Total Windows Analysed				78	

11.5.2.2.2 Sunlight Impact Analysis

The neighbouring buildings requiring a detailed assessment for sunlight were the same as those assessed for daylight, see 11.5.2.2.1 above.

1. Block A of the scheme to the south of the proposed which has received planning permission under Reg. Ref. ABP-312318-21, as amended by Reg. Ref. LRD0034-S3.
2. Two dwellings in the Traveller Accommodation site to the west.

Table 11.3 Sunlight Exposure Results Summary

Building Ref	Rooms Assessed	APSH Meets BRE Criteria	WPSH Meets BRE Criteria	Meets APSH & WPSH Criteria	Building Use	Impact Assessment
Block A	51	99%	100%	99%	Residential	Not Significant
Traveller Accommodation	2	Yes	Yes	Yes	Residential	Not Significant

Block A

Fifty-one rooms were assessed and 99% achieved compliance with the BRE criteria for Annual Probable Sunlight Hours, 100% were compliant for Winter Probable Sunlight Hours, and 99% for both. While some windows recorded a measurable reduction in sunlight, this reduction was small and relative few windows were impacted. The impact on this block is assessed as **Not Significant**.

Traveller Accommodation

Two units required assessment as they both had a main window facing east, directly towards the proposal site. Both windows assessed recorded a reduction in sunlight however both the APSH and WPSH were both well within the BRE guide thresholds. Therefore, the impact on both units is assessed as **Not Significant**.

Table 11.4 Sunlight Exposure Detailed Results

Building Ref	Window Ref	APSH Existing	APSH Proposed	APSH Existing/ Proposed	APSH Meets BRE Criteria	WPSH Existing	WPSH Proposed	WPSH Existing/ Proposed	WPSH Meets BRE Criteria	Meets APSH & WPSH Criteria
BA 001	388	20%	20%	1.00	Yes	5%	5%	1.00	Yes	Yes
BA 001	746	1%	0%	0.00	Yes	0%	0%	1.00	Yes	Yes
BA 001	392	11%	11%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 001	742	1%	0%	0.00	Yes	0%	0%	1.00	Yes	Yes
BA 002	723	12%	7%	0.58	No	0%	0%	1.00	Yes	No
BA 002	744	2%	0%	0.00	Yes	0%	0%	1.00	Yes	Yes
BA 002	745	1%	0%	0.00	Yes	0%	0%	1.00	Yes	Yes
BA 002	675	1%	0%	0.00	Yes	0%	0%	1.00	Yes	Yes
BA 003	506	9%	7%	0.78	Yes	0%	0%	1.00	Yes	Yes
BA 003	563	2%	2%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 003	656	9%	8%	0.89	Yes	0%	0%	1.00	Yes	Yes
BA 003	508	1%	1%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 004	348	20%	20%	1.00	Yes	5%	5%	1.00	Yes	Yes
BA 004	526	1%	0%	0.00	Yes	0%	0%	1.00	Yes	Yes
BA 004	352	20%	20%	1.00	Yes	2%	2%	1.00	Yes	Yes
BA 004	517	1%	0%	0.00	Yes	0%	0%	1.00	Yes	Yes
BA 005	524	2%	1%	0.50	Yes	0%	0%	1.00	Yes	Yes
BA 005	1650	13%	10%	0.77	Yes	0%	0%	1.00	Yes	Yes
BA 005	525	1%	0%	0.00	Yes	0%	0%	1.00	Yes	Yes
BA 005	24	1%	0%	0.00	Yes	0%	0%	1.00	Yes	Yes
BA 006	558	9%	7%	0.78	Yes	0%	0%	1.00	Yes	Yes
BA 006	564	5%	5%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 006	5	9%	8%	0.89	Yes	0%	0%	1.00	Yes	Yes
BA 006	686	1%	1%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 007	554	7%	7%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 007	598	52%	52%	1.00	Yes	18%	18%	1.00	Yes	Yes
BA 007	633	7%	6%	0.86	Yes	0%	0%	1.00	Yes	Yes
BA 007	597	52%	52%	1.00	Yes	18%	18%	1.00	Yes	Yes
BA 007	596	52%	52%	1.00	Yes	18%	18%	1.00	Yes	Yes
BA 008	3995	28%	28%	1.00	Yes	5%	5%	1.00	Yes	Yes
BA 008	4986	1%	1%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 008	4002	20%	20%	1.00	Yes	2%	2%	1.00	Yes	Yes
BA 008	4210	1%	1%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 009	2238	13%	11%	0.85	Yes	0%	0%	1.00	Yes	Yes
BA 009	4142	2%	2%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 009	4143	1%	1%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 009	3108	1%	1%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 010	559	9%	7%	0.78	Yes	0%	0%	1.00	Yes	Yes
BA 010	565	11%	11%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 010	634	9%	8%	0.89	Yes	0%	0%	1.00	Yes	Yes
BA 010	690	1%	1%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 011	601	27%	27%	1.00	Yes	17%	17%	1.00	Yes	Yes
BA 011	659	9%	8%	0.89	Yes	0%	0%	1.00	Yes	Yes
BA 011	683	12%	12%	1.00	Yes	0%	0%	1.00	Yes	Yes

Building Ref	Window Ref	APSH Existing	APSH Proposed	APSH Existing/ Proposed	APSH Meets BRE Criteria	WPSH Existing	WPSH Proposed	WPSH Existing/ Proposed	WPSH Meets BRE Criteria	Meets APSH & WPSH Criteria
BA 011	600	52%	52%	1.00	Yes	18%	18%	1.00	Yes	Yes
BA 011	599	48%	48%	1.00	Yes	18%	18%	1.00	Yes	Yes
BA 012	560	9%	7%	0.78	Yes	0%	0%	1.00	Yes	Yes
BA 012	566	10%	10%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 012	637	9%	8%	0.89	Yes	0%	0%	1.00	Yes	Yes
BA 012	694	8%	8%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 013	604	30%	30%	1.00	Yes	18%	18%	1.00	Yes	Yes
BA 013	661	9%	8%	0.89	Yes	0%	0%	1.00	Yes	Yes
BA 013	662	9%	8%	0.89	Yes	0%	0%	1.00	Yes	Yes
BA 013	603	52%	52%	1.00	Yes	18%	18%	1.00	Yes	Yes
BA 013	602	48%	48%	1.00	Yes	18%	18%	1.00	Yes	Yes
BA 014	561	9%	7%	0.78	Yes	0%	0%	1.00	Yes	Yes
BA 014	567	10%	10%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 014	640	9%	8%	0.89	Yes	0%	0%	1.00	Yes	Yes
BA 014	698	8%	8%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 015	549	30%	30%	1.00	Yes	18%	18%	1.00	Yes	Yes
BA 015	664	9%	8%	0.89	Yes	0%	0%	1.00	Yes	Yes
BA 015	665	9%	8%	0.89	Yes	0%	0%	1.00	Yes	Yes
BA 015	442	52%	52%	1.00	Yes	18%	18%	1.00	Yes	Yes
BA 015	441	48%	48%	1.00	Yes	18%	18%	1.00	Yes	Yes
BA 016	562	12%	11%	0.92	Yes	0%	0%	1.00	Yes	Yes
BA 016	568	11%	11%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 016	643	9%	8%	0.89	Yes	0%	0%	1.00	Yes	Yes
BA 016	427	11%	11%	1.00	Yes	0%	0%	1.00	Yes	Yes
BA 017	607	58%	58%	1.00	Yes	21%	21%	1.00	Yes	Yes
BA 017	667	9%	8%	0.89	Yes	0%	0%	1.00	Yes	Yes
BA 017	668	9%	8%	0.89	Yes	0%	0%	1.00	Yes	Yes
BA 017	606	52%	52%	1.00	Yes	18%	18%	1.00	Yes	Yes
BA 017	605	52%	52%	1.00	Yes	18%	18%	1.00	Yes	Yes
TA 001	6	56%	44%	0.79	Yes	19%	12%	0.63	Yes	Yes
TA 002	4	54%	38%	0.70	Yes	15%	9%	0.60	Yes	Yes
Total Meeting Annual Criteria								Yes	74	99%
Total Meeting Winter Criteria								Yes	75	100%
Total Meeting Both Criteria								Yes	74	99%
Total Windows Analysed									75	

Sunlight to Amenity areas

The neighbouring environment was reviewed for potential impact to sunlight on gardens or amenity spaces, however there were none close enough to the development site to be impacted by overshadowing.

11.5.2.3 Do-Nothing Impact

See Sections 11.5.1.3 above. The Do-Nothing impacts during the construction stage will be similar for both applications.

11.5.3 Cumulative

11.5.3.1 Construction Stage

See Sections 11.5.1.1 above. The impacts during the construction stage will be similar for both applications.

11.5.3.2 Operational Stage

The impact to the receiving environment will be similar to that detailed above for the individual plots in sections 11.5.1.2 and 11.5.2.2. There will be no additional cumulative impact.

11.5.3.3 Do-Nothing Impact

See Section 11.5.1.3 above. The Do-Nothing impacts during the construction stage will be similar for both applications.

11.6 Mitigation Measures (Ameliorative, Remedial or Reductive Measures)

11.6.1 Proposed Development - Plot 1 (Luttrellstown Gate Phase 2)

11.6.1.1 Construction Stage

The potential impact to both daylight and sunlight during the construction stage is likely to be less than that of the completed development. As construction progresses the impact on the receiving environment will increase until it reaches that of the completed development (Operational Stage). Temporary structures and machinery (cranes, hoarding, scaffolding, etc.) would have an impact, but this is expected to be minor and temporary. Thus, no mitigations measures will be required.

Note: the mitigation measures during the construction stage will be similar for both applications.

11.6.1.2 Operational Stage

Given the rural nature of the site and the distance the proposed buildings are from existing dwelling, or the scheme currently under construction to the east and south, the impact to daylight and sunlight on any neighbouring dwellings would be imperceptible. Therefore, no mitigation measures are required.

11.6.2 Proposed Development- Plot 2 (St. Mochta's LRD)

11.6.2.1 Construction Stage

The mitigation measures will be similar to Plot 1, see 11.6.1.1 above.

11.6.2.2 Operational Stage

There is a very limited impact by the proposed scheme on existing or planned scheme in the receiving environment. The dwellings that were assessed for potential effects to daylight and sunlight were predicted to experience only Slight or Not Significant impacts and therefore, no mitigation measures are required.

11.6.3 Cumulative

11.6.3.1 Construction Stage

The mitigation measures will be similar to Plot 1, see 11.6.1.1 above.

11.6.3.2 Operational Stage

There is no additional cumulative impact when both Plot 1 and 2 are completed, therefore no mitigation measures are required.

11.7 Residual Impact of the Proposed Development

11.7.1 Proposed Development - Plot 1 (Luttrellstown Gate Phase 2)

11.7.1.1 Construction Stage

The potential impact to both daylight and sunlight during the construction stage will gradually increase until it reaches that of the completed development (Operational Stage).

11.7.1.2 Operational Stage

The residual impact on daylight and sunlight will be the same as that predicted in 11.5.1.2.1 and 11.5.1.2.2 above.

11.7.1.3 Worst Case Impact

This assessment is based on the proposed scheme being completed in its entirety and therefore, with respect to potential effects to daylight and sunlight, represents the worst case impact.

11.7.2 Proposed Development- Plot 2 (St. Mochta's LRD)

11.7.2.1 Construction Stage

The residual impacts will be similar to that described for Plot 1 above.

11.7.2.2 Operational Stage

The residual impact on daylight and sunlight will be the same as that predicted in 11.5.2.2.1 and 11.5.2.2.2 above.

11.7.2.3 Worst Case Impact

The residual impact will be similar to that detailed above for Plot 1.

11.7.3 Cumulative

11.7.3.1 Construction Stage

The residual impacts will be similar to that described for Plot 1 above.

11.7.3.2 Operational Stage

There is no additional cumulative impact when both Plot 1 and 2 are completed, therefore the residual impacts will be similar to those detailed in Plot 1 and 2 above.

11.7.3.3 Worst Case Impact

The residual impact will be similar to that detailed above for Plot 1.

11.8 Monitoring

No monitoring is required in relation to daylight and sunlight during the construction or operational stages.

11.9 Reinstatement

Reinstatement is not relevant to the assessment of impacts on daylight and sunlight for this application. It is intended that the proposed development will be permanent.

11.10 Difficulties Encountered

Detailed 3D models were created for the proposed developments, these were either received from the design team or created by Model Works. However, detailed modelling of the receiving environment is more difficult, as it is not possible or practical to gain access to neighbouring private property in order to carry out a detailed survey, and therefore 3D models are created from the available information, such as from planning portals, Google earth, limited survey information, etc. While Model Works has confidence in the accuracy of the models used, some level of assumption was necessary to complete these models.