# Countess Road, Killarney

## Proposed Residential Development

# Daylight and Sunlight Analysis Report

Countess Road,
Dromhale (townlands),
Killarney,
Co. Kerry

Client
Dipharma Unlimited Company

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# 1 Introduction

## 1.1 Report purpose

This report gives information on daylight and sunlight studies within the proposed new development and assesses the impact on daylight and sunlight to surrounding areas / existing environment. The daylight and sunlight studies are assessed under two categories, these are.

Performance of proposed development:

- Daylight reception analysis of the proposed development
- Sunlight reception analysis of the proposed development

Impact of proposed development on the existing surrounding environment:

- Impact on daylight reception analysis on existing environment
- Impact on sunlight reception analysis on existing environment

## 1.2 Instruction

DKPartnership (DKP) have been commissioned by Dipharma Unlimited Company to carry out the analysis and report for the proposed development at Countess Road, Dromhale (townlands), Killarney, Co. Kerry.

## 1.3 Standards and guidelines overview

For this report we applied the recommendations and guidelines of the following documents.

- The Building Research Establishment report, BR 209 (2022) Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice. (referred to as the BRE Report).
- British European Standard BS EN 17037:2018 +A1:2021 also referred to as the UK Annex
- Irish European Standard IS EN 17037:2018

## 1.4 Brief development description

Dipharma Unlimited Company intend to apply for a 10-Year Planning Permission for a Large-Scale Residential Development (LRD) at Countess Road, Dromhale (townland), Killarney, Co. Kerry. The development will consist of: The construction of a residential development of 259 no. residential units with ancillary single storey creche, landscaping and all associated site development works.

The proposed development includes the demolition of 2 no. existing two-storey semi-detached dwelling houses and an existing ruinous structure on the site and construction of 103 no. two storey houses (3-bed units), comprising of 27 no. terraced units, 62 no. end of terrace units, and 14 no. side entry units, 82 no. courtyard apartment units over 2 no. storeys (42 no. 1-bed units, 40 no. 2-bed units), and 74 no. apartment units (34 no. 1-bed units, 40 no. 2-bed units) in 2 no. part 3 storey and part 4 storey blocks.

Vehicular access to the proposed development will be via one entrance from Countess Road (L3904) to the north, with the entrance design including improvement works on the public road inclusive of a raised crossing point. The design includes pedestrian/cycle infrastructure to/from Countess Road and internally within the development site and to adjoining areas.

Ancillary site works include car parking, provision of bicycle parking and bin storage facilities serving the proposed apartment/courtyard apartment buildings and creche, 2 no. ESB substations, landscaping, water services and drainage infrastructure (including foul and storm network upgrades in Countess Grove), and all associated site development works. The proposed development also provides for the demolition of existing site boundary walls along Countess Road. A Natura Impact Statement (NIS) has been prepared and will be submitted to the Planning Authority with the application.

## 1.5 Geographical overview

Image 1.1 the (google maps) site is an overview of the site area with the proposed development approximately outlined in red.




Image 1.1: Proposed development site boundary. Imagery © Google 2025.

# 2 Executive summary

## 2.1 Analysis conducted

This report details the achieved calculated daylight and sunlight reception within the new development and the impact on neighbouring receptors. The results are compared for compliance with the recommendations of the relevant guidelines and standards. Daylight and sunlight studies are assessed under two categories, these are.
Performance of proposed development:

- Daylight reception analysis of the proposed development,
- Sunlight reception analysis of the proposed development.

Impact of proposed development on the existing surrounding environment:

- Impact on daylight reception analysis on existing environment,
- Impact on sunlight reception analysis on existing environment,

## 2.2 Performance of proposed development - Summary of results

### Daylight reception analysis of the proposed development

For the daylight assessment, results have been analysed within these standards:

- Assessed in accordance with IS EN17037 / BS EN17307, carried out in accordance with Method 1 and Method 2 described in the methodology section.
- Assessed in accordance with BS EN 17037:2018 National Annex.

The results from table 5.1 are reviewed under each standard. The daylight reception assessment has been targeted to habitable rooms within the proposed development. Receptors / rooms within the proposed development are indicated in image 5.1 to 5.11.

- Apartments: Blocks B1 and B2, all habitable rooms within the proposed block on the ground floor have been assessed. Once a (lowest level) room is compliant, rooms at higher levels with similar configuration / parameters are deemed compliant on the basis that the room daylight factor would have improved due to the better vertical sky view angle of higher located rooms.
- Maisonette blocks: all habitable rooms within the proposed blocks on the ground floor have been assessed. Once a (lowest level) room is compliant, rooms at higher levels with similar configuration / parameters are deemed compliant on the basis that the room daylight factor would have improved due to the better vertical sky view angle of higher located rooms.
- Houses: habitable rooms on the ground floor which are observed to be in the most daylight challenging positions or rooms positioned with close by obstacles have been assessed.

IS EN17037 / BS EN17307: To achieve recommendations outlined in IS EN 17037:2018 / BS EN 17307:2018, a given room must achieve: a target daylight factor of 2.0% or in terms of illuminance 300 lux on over 50% of the floor area for over 50% of the available daylight hours. And a minimum target daylight factor of 0.7% or in terms of illuminance 100 lux on over 95% of the floor area for over 50% of the available daylight hours. From the calculation result table 5.1 we note the vast majority of the proposed rooms calculated daylight results achieved the minimum guidelines or achieved well in excess of the guidelines.

- Apartments: Overall, examined residential rooms for Apartment blocks B1 and B2 achieved on average a daylight factor (DF) of 2.8% and an illuminance of 431 lux on over 50% of the floor area for over 50% of the available daylight hours. An average DF of 0.9% and an illuminance of 142 lux on over 95% of the floor area for over 50% of the available daylight hours was achieved. Only 2 no. of bedrooms were below recommendations.
- Maisonette blocks: Overall, examined residential rooms for Maisonette blocks achieved on average a daylight factor (DF) of 2.96% and an illuminance of 447 lux on over 50% of the floor area for over 50% of the available daylight hours. An average DF of 1.0% and an illuminance of 147 lux on over 95% of the floor area for over 50% of the available daylight hours was achieved.
- Houses: Overall, examined residential rooms for Houses achieved on average a daylight factor (DF) of 2.9% and an illuminance of 442 lux on over 50% of the floor area for over 50% of the available daylight hours. An average DF of 1.0% and an illuminance of 146 lux on over 95% of the floor area for over 50% of the available daylight hours was achieved.

In an urban environment it can more often be the case that complete fulfilment with the guidelines is not attainable. Within the BS EN 17037 it acknowledges that a rigid application of the European Standard could prove to be a difficult task as it offers only a single target for new buildings and IS EN17037 currently has no specific National Annex. The

British Annex of BS EN 17037, daylight recommendations differ depending on the function of a room and offers minimum daylight provision targets for kitchens, living rooms and bedrooms.
Therefore, Given the similarity of weather, light and design patterns between Ireland and the UK and the lack of specific localisation Annex details in the Irish version, the alternate minimum daylight provision targets set out in the national annex of BS EN 17037 are reviewed next.

BS EN 17037:2018 National Annex: To achieve the alternate minimum daylight recommendations for Dublin, the room in question must achieve: Kitchen 1.3% target daylight factor or in terms of illuminance 200 lux. Living room 1.0% target daylight factor or in terms of illuminance 150 lux, and bedrooms 0.7% target daylight factor or in terms of illuminance 100 lux all over 50% of the floor area for over half the daylight hours. From the calculation result table 5.1 we note that all of the rooms calculated daylight are well in excess of these minimum guidelines.

- Overall compliance for proposed development = 100%

In summary, the calculation results have achieved a good level of compliance under IS EN17037 / BS EN17307 and full compliance under BS EN 17037:2018 National Annex guidelines. This indicates an overall good level of daylight for the proposed development under the guidelines. We conclude, the proposed development can provide a good level of residential daylight amenity to future occupants.

### Sunlight in amenity areas / Sun on ground reception analysis of the proposed development

Based on the BRE guidelines at least 50% of the amenity space should receive at least two hours of sunlight on the 21st of March. From the calculation results in table 5.3 we note that all selected amenity spaces received in excess of the minimum 2 hours of sunlight on at least 50% of the area on March 21st, see image 5.12 for receptor/amenity space locations. Summary of results are as follows:

- The calculated average sunlight on at least 50% of the area on March 21st for Open space amenity areas is 9.2 hours.
- The calculated average sunlight on at least 50% of the area on March 21st for Communal open space amenity areas is 5.4 hours.

This confirms the amenity areas proposed will be adequately sunlit throughout the year. We conclude that the new amenity spaces receive sunlight on 50% of the area is in line with the recommendations of the BRE Report - Site Layout and Planning for Daylight and Sunlight - and therefore deem these to be compliant to this element.

## 2.3 Impact of proposed development on the existing surrounding environment - Summary of results

### Impact on daylight reception analysis on existing environment

The BRE recommends that the effects of a new development on daylight reception should not impact any existing VSC by more than 20% or have a maximum change factor in excess of 0.80. From the calculation results we note all selected neighbouring habitable receptors are affected to some degree with regards to daylight reception due to the introduction of the proposed development in their respective habitable rooms facing the proposed development. The calculated change in daylight reception in all of the neighbouring receptors/windows achieved a change factor ranging from 0.81 to 0.98. The BRE report outlines VSC guidelines are intended for use for rooms where daylight is required, including living rooms, kitchens and bedrooms. Properties used for habitable purposes have been assessed therefore properties occupied by commercial units have not been applied to the VSC assessment. Summarized result findings are as follows (see image 6.1-6.8 for receptor locations):

- East receptors: Receptor no. 1 to 5: Existing dwellings located in closest proximity with ground floor windows were examined and resulted in a change factor range of 0.88 to 0.98. These receptors are comfortably within the guidelines and the effect is determined as negligible under BRE definitions.
- North receptors: Receptor no. 6 to 31: The private dwelling located on Countess Road with ground floor windows was examined and resulted in a change factor range of 0.87 to 0.94. These receptors are well within the guidelines and the effect is determined as negligible under BRE definitions.
- West receptors: Receptor no. 32 to 64: Existing dwellings located in closest proximity with ground floor windows were examined and resulted in a change factor range of 0.81 to 0.98. These receptors are within the guidelines and the effect is determined as negligible under BRE definitions.
- South receptors: Receptor no. 65 to 70: Existing dwellings located in closest proximity with ground floor windows were examined and resulted in a change factor range of 0.81 to 0.97. These receptors are also within the guidelines and the effect is determined as negligible under BRE definitions.
- Overall, the average change ratio for VSC is 0.90.

We conclude that the new proposed development's effect on daylight reception in the neighbouring rooms is all within the constraints and recommendations of the BRE Report – Site Layout and Planning for Daylight and Sunlight BR209 2022, and we therefore deem the proposed development to be compliant with this element.

### Impact on sunlight in existing amenity areas / Sun on ground reception analysis on existing environment

Based on the BRE guidelines at least 50% of the amenity space should receive at least two hours of sunlight on the 21st of March and that and any loss of sunlight should not be greater than 0.80 (20% reduction) times its former size. From the calculation results we note that all the existing amenity spaces received 2 hours of sunlight or more on at least 50% of the area before and after the introduction of the new development. Summary of results are as follows (see image 6.9-6.11 for receptor locations):

- East receptors: Receptor no. 1 and 2 are private amenity spaces to houses on Countess Road. The receptors resulted in a change factor of 0.93. The change happens in the late afternoon hours of 16.00-19.00. The calculation findings are within the guidelines, and the effect is determined as 'negligible' under BRE definitions.
- North receptors: Receptor no. 3 to 13 are private amenity spaces to houses opposite the development site entrance on Countess Road. Receptor no. 3, 4, 5, 6 and 8 resulted in a change factor of 1.00, meaning the new proposed development will have no sunlight impact on the existing area. Receptor no. 7 and receptor 9 to 13 resulted in a change factor range of 0.94 to 0.99. The change happens in the morning hours of 08.00-11.00. The calculation findings are comfortably within guidelines, and the effect is determined as 'negligible' under BRE definitions.
- West receptors: Receptor no. 14 to 33 are private amenity spaces to individual dwellings. The receptors resulted in a change factor range of 0.85 to 0.99. The calculation findings are also well within the guidelines, and the effect is determined as 'negligible' under BRE definitions. Receptor no. 26 resulted in a change factor of 1.00, meaning the new proposed development will have no sunlight impact on the area.
- South receptors: Receptor no. 34 to 36 are private amenity spaces to dwellings in Deireadh Coille estate. The receptors resulted in a change factor range of 0.97 to 0.99. The calculation findings are comfortably within the guidelines, and the effect is determined as 'negligible' under BRE definitions.
- Overall, the average change ratio is 0.94.

We conclude that the new proposed development's effect on sunlight reception in the neighbouring amenity areas is all within the constraints and minimum recommendations of the BRE Report – Site Layout and Planning for Daylight and Sunlight BR209 2022, and we therefore deem the proposed development to be compliant with this element.

# 3 Standards and guidelines

## 3.1 Standards and guidelines overview

For this report we applied the recommendations and guidelines of the following documents.

- The Building Research Establishment report, BR 209 (2011) Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice. On June 8th, 2022, BR 209 (2011) was replaced with BR 209 (2022) Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice. This report is commonly referenced as the main guide in Ireland/UK in determining the minimum standards of daylight and sunlight and for determining the impact of a development.
- European Standard EN 17037:2018 and British European Standard BS EN 17037:2018 Daylight in buildings, which replaces BS 8206-2:2008. The document contains guidance on interior day lighting and introduces some of the calculation procedures used in the BRE Report.
- IS EN 17037:2018 Daylight in buildings. Irish guidelines.

## 3.2 BR 209 (2022): Site Layout and Planning for Daylight and Sunlight, A Guide to Good Practice

This document is an updated version of BR 209 (2011) and referred to as the BRE Guidelines. The report contains guidance on how to design developments, whilst minimising the impacts on existing buildings from overshadowing and reduced levels of daylight and sunlight. The BRE guidelines recommend the use of BS EN 17037:2018 for assessing the quality of interior spaces in proposed developments. BS EN 17037 sets out assessment methods for daylight provision and access to sunlight The advice provided within the guide is not mandatory and should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the designer and should be interpreted flexibly since natural lighting is one of many factors in site layout design.

## 3.3 EN 17037:2018: Daylight in Buildings

EN 17037 is a daylighting standard published by the European Committee for Standardization (CEN) in 2018. It is applicable across all countries within the EU including Ireland with the Irish edition IS EN17037:2018EN 17037. It provides recommendations for daylight within spaces. Recommendations made in EN 17037 regarding daylight and sunlight exposure have been incorporated into the BRE Guidelines.

## 3.4 IS EN 17037:2018: Daylight in Buildings

Prior to 2018, Ireland had no standard for daylight. In 2018, the National Standards Authority of Ireland adopted EN 17037 to directly become IS EN 17037.

## 3.5 BS EN 17037:2018: Daylight in buildings

BS EN 17037:2018: Daylight in Buildings is the British version to the European Standard and also contains a national annex. The national annex (NA) attempts to align the guidance and expectations of the European standard with the now superseded BS 8206-2. Within the British Annex it acknowledges that a rigid application of the European Standard could prove to be a difficult task. Within BS EN 17037 NA, daylight recommendations differ depending on the function of a room and offers minimum daylight provision targets for kitchens, living rooms and bedrooms.

The assessment methodology in this report is built around the above-mentioned documents. The methods proposed are outlined in section 4.

# 4 Approach and methodology

## 4.1 General approach

This report assesses the daylight and sunlight reception to the proposed development and the impact on daylight and sunlight to surrounding areas. The results are then compared with the relevant guidelines and recommendations. The calculation assessment is split across two distinct parts:

Performance of proposed development

- Daylight reception analysis of the proposed development
- Sunlight reception analysis of the proposed development

Impact of proposed development on the existing surrounding environment:

- Impact on daylight reception analysis on existing environment
- Impact on sunlight reception analysis on existing environment

## 4.2 Note on the nature and effects of daylight and sunlight

When assessing the effects of proposed building projects on the potential to cause issues relating to light, it is important to recognise the distinction between daylight and sunlight. Daylight is the combination of all direct and indirect sunlight during the daytime, whereas sunlight (for the purposes of this report) comprises only the direct elements of sunlight. For example, on a cloudy or overcast day diffused daylight still comes in through windows, even when sunlight is absent. Any development within a built-up area has the potential to alter the amount of daylight received by nearby residential properties.

Care should be taken when designing new buildings in built-up areas, especially when the proposed development is relatively tall or situated to the south of existing buildings, because in the northern hemisphere the majority of the sunlight comes from the south. In Ireland (and other northern hemisphere countries) south-facing facades will in general, receive the most sunlight, while the north facing facades will receive sunlight on only a handful of occasions, specifically early mornings and late evenings during the summer months. It is therefore important to ensure that new buildings to the south of any development do not cause over shadowing to existing dwellings and therefore reduce their capacity to receive sunlight.

## 4.3 Assessment methodology

The analyses and assessments in this report are based on the guidelines recommended in the BRE guide (2022), the guide is intended to be used in conjunction with lighting recommendations in BS EN 17037 Daylight in buildings. It should also be noted that although the BRE guide gives numerical guidelines, these should be interpreted flexibly.

The BRE document sets out in its introduction that "*It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location." " 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* ".

Throughout this report an effort will be made to differentiate between metrics used to assess daylight (skylight) versus sunlight. The following sub-sections namely 'New buildings' and 'Existing buildings / existing amenity areas' outline the methodology and assessment criteria carried out.

## 4.4 New buildings

### Daylight provision:

#### Daylight provision within IS EN 17037 guidelines

The IS EN 17037 explains that "*a space is considered to provide adequate daylight if a target illuminance level is achieved across a fraction of the reference plane within a space for at least half of the daylight hours*". These guidelines do not provide different illuminance targets for different room types. Therefore, all rooms have the same daylight provision targets. To achieve the minimum level of daylight provision as per table 4.2, the following must be achieved, taken from IS EN 17037:2018 (table ref A.1).

- A minimum target illuminance of 300 lux must be achieved on over 50% of the floor area for over 50% of the available daylight hours.
- A minimum target illuminance of 100 lux must be achieved on over 95% of the floor area for over 50% of the available daylight hours.
- Both targets above must be satisfied for a space to be deemed compliant with the requirements.

| Level of recommendation for vertical and inclined daylight opening | Target illuminance ET lx | Fraction of space for target level Fplane,% | Minimum target illuminance ETM lx | Fraction of space for Minimum target level Fplane,% | Fraction of daylight hours Ftime,% |
|---|---|---|---|---|---|
| Minimum | 300 | 50% | 100 | 95% | 50% |
| Medium | 500 | 50% | 300 | 95% | 50% |
| High | 750 | 50% | 500 | 95% | 50% |

Table 4.2: IS EN 17037:2018 target illuminance levels.

These recommendations can also be expressed in terms of a daylight factor. IS EN 17037:2018 (table ref A.3) provides the corresponding daylight factor relative to a recommended target illuminance and target minimum illuminance depending on the location (capital city for individual countries) for daylight. The Dublin daylight factor target recommendations are replicated in table 4.3.

| Nation | Capital | Geographical latitude φ [°] | Median External Diffuse Illuminance *E*v,d,med | *D* to exceed 100 lx | *D* to exceed 300 lx | *D* to exceed 500 lx | *D* to exceed 750 lx |
|---|---|---|---|---|---|---|---|
| Ireland | Dublin | 53,43 | 14 900 | 0.7% | 2.0% | 3.4% | 5.0% |

Table 4.3: IS EN 17037:2018 target daylight factor levels for Dublin.

Therefore, within IS EN 17037:2018, to achieve the minimum level of daylight provision for vertical openings the following must be achieved:

- A minimum target daylight factor of 2.0% must be achieved on over 50% of the floor area for over 50% of the available daylight hours.
- A minimum target daylight factor of 0.7% must be achieved on over 95% of the floor area for over 50% of the available daylight hours.
- Both targets above must be satisfied for a space to be deemed compliant with the requirements.

### Daylight provision within BS EN 17037 National Annex

In the UK, EN 17037 was adopted to form BS EN 17037 and a national annex was also included. The national annex offers additional targets and guidance for daylight provision in residential developments and states " *it is the opinion of the UK committee that the recommendations for daylight provision in a space may not be achievable for some buildings*." The national annex gives specific minimum recommendations for habitable rooms in dwellings in the UK. These are intended for 'hard to light' dwellings. The national annex therefore provides the UK guidance on minimum daylight provision in all UK dwellings, these are 100 lux in bedrooms, 150 lux in living rooms and 200 lux in kitchens, to be exceeded over at least 50% of the assessment points in the room for at least half of the daylight hours.

| Habitable room types | BS EN17037 National Annex Minimum target Illuminance | BS EN17037 Corresponding minimum target daylight factor (Dublin) |
|---|---|---|
| Kitchen | 200 lux | 1.3% |
| Living rooms | 150 lux | 1.0% |
| Bedrooms | 100 lux | 0.7% |
| Living, Kitchen, Dining | 200 lux | 1.3% |

Table 4.4: BS EN 17037 minimum target Illuminances and daylight factor for dwellings.

### Daylight provision within BR 209 (2022) guidelines

The BRE guide is intended to be used in conjunction with recommendations in BS EN 17037. The guide states that "*Daylight provision in new rooms may be checked using either of the methods in BS EN 17037 Daylight in Buildings: direct prediction of illuminance levels using hourly climate data, or the use of the daylight factor*". The two methods to assess daylight provision to the interior which are based on target values.

- Method 1-Daylight factor method: This calculation method uses the daylight factor targets on the reference plane. The Daylight factor is the illuminance at a point on a reference plane in a space, divided by the illuminance on an unobstructed horizontal surface outdoors. The assessment is carried out on a representative day and time during the year, i.e., under standard CIE overcast sky conditions. BS EN 17037 gives the Median External Diffuse Illuminance (Ev,d,med) for the capital cities throughout Europe to account for external local illuminance levels.
- Method 2-Illuminance method: This calculation method uses the illuminance targets on the reference plane. The assessment requires the use of a suitable weather file which accounts for varying sky conditions and sun positions throughout the year and takes into account the orientation of the space

Equivalent daylight factor targets to achieve a target illuminance over at least half of the daylight hours in a year are based on the formula: Target daylight factor (DT)= target illuminance/Ev,d,med x 100 [%].
Where, Ev,d,med is the median diffuse horizontal illuminance from the sky (as recommended for Dublin, Ireland).

The daylight factor (D) addresses daylight provision as a ratio of unobstructed external illuminance under overcast sky conditions. The daylight factor is defined as D =Ei/Eo x 100[%], where,
Ei=illuminance due to daylight at a point on the indoors working plane.
Eo= simultaneous outdoor illuminance on a horizontal plane from an unobstructed hemisphere of overcast sky.

Table 4.5 provides the target illuminances from daylight over at least half of the daylight hours and thus the corresponding calculated daylight factor targets for side lit rooms for Dublin.

| Level of recommendation for vertical and inclined daylight opening | Target illuminance (lx) for half of assessment grid | Target illuminance ETM (lx) for 95% of assessment grid | Target daylight factor D for half of assessment grid (Dublin) | Target daylight factor D for 95% of assessment grid (Dublin) |
|---|---|---|---|---|
| Minimum | 300 | 100 | 2.0% | 0.7% |
| Medium | 500 | 300 | 3.4% | 2.0% |
| High | 750 | 500 | 5.0% | 3.4% |

Table 4.5: Target illuminances and thus the corresponding calculated daylight factor targets for side lit rooms for Dublin.

The recommendations for rooms are met if both target daylight factors are achieved; the median daylight factor over 50% of the reference plane, and the minimum daylight factor over 95% of the reference plane.

### Project calculation parameters

The following values were used in the daylighting calculations.

| Element | DKP metrics | Comments |
|---|---|---|
| Internal and external factors: | | |
| Ceilings | 0.8 | Light |
| Walls | 0.5 | Medium dark |
| Floor | 0.2 | Dark |
| Exterior walls and obstructions | 0.2 | |
| Exterior ground | 0.2 | |
| Maintenance factors: | | |
| Glass light diffuse transmittance | 0.68 | |
| Glazing maintenance factor | 0.92 | |

Table 4.6: Project calculation parameters.

## Sunlight provision:

### Sunlight to proposed amenity spaces / Sun on ground

Acceptable criterion within the BRE guidelines for sunlight reception recommends that at least half of the amenity area should receive at least two hours of sunlight on the 21st of March. The minimum sunlight requirement in this report measured in sunlight time 2 hours (120 minutes) multiplied by 50% area $m^2$ or the minimum requirement = 120 (min) * 0.5a ($m^2$) = [ ] min·$m^2$.

| Analysis | BRE recommendation, criteria on March 21st | Acceptable sunlight reception parameters |
|---|---|---|
| Sunlight reception | Minimum sunlight reception in amenity spaces | At least 50% of the total area to receive at least 2 hours sunshine |

Table 4.7: Sunlight to proposed amenity spaces / Sun on ground assessment

The sunlight assessment is executed using a 3D model of the project with the results illustrated in tabular format showing the hourly status of the shadow / sunlight fraction in the relevant amenity spaces. Appendix A provides the 3D images. The impacts of vegetation: It is important to note that according to the BRE Report, calculations do not normally take into account vegetation. The exception is when evergreen vegetation exists that forms a continuous barrier and would be permanent throughout the seasons.

## 4.5 Existing buildings

## Impact on daylight provision:

### Daylight provision to surrounding existing buildings

The impact of the proposed development on the existing buildings with respect to daylight can assessed using the following methodologies advised in the BRE guide.

- The distance test: loss of light to windows need not be analysed if the distance from the existing window to the development is three or more times its height above the centre of the existing window.
- The 25° rule: loss of light to windows need not be analysed if the angle to the horizontal subtended by the new development from the centre of the existing window is less than 25° (an angle of 25° equates to a VSC of 27%).
- Vertical Sky Component (VSC) assessment: diffuse daylight of an existing building may be adversely affected by a proposed development if either: the 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; or the area of the working plane which can receive direct skylight is reduced to less than 0.8 times its former value.

The impact assessment of daylight is required for windows serving rooms in adjoining dwellings where daylight is required including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas and garages need not be assessed. The guidelines also apply to any room that may have a reasonable expectation of daylight, including schools, hospitals, hotels and some offices. To ensure a neighbouring property is not adversely affected, VSC is calculated and assessed in this report. This report assesses the percentage of direct sky illuminance that falls on the assessment point of neighbouring windows that could be affected by the proposed development, image 4.1 represents this.

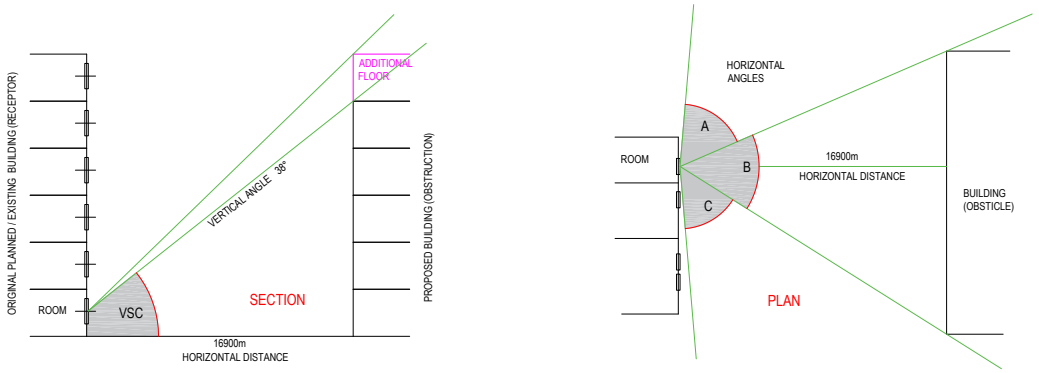



Image 4.1:

VSC gives a measure of daylight received on the outside of a window. Stated within BR 209 (2022) “if the VSC is greater than 27% then enough skylight should still be reaching the window of the existing building. Any reduction

below this level should be kept to a minimum. If the VSC, with the new development in place, is both less than 27% and less than 0.80 times its former value, occupants of the existing building will notice the reduction in the amount of skylight". Table 4.8 details the BRE assessment criteria for daylight reception for existing windows.

| Analysis | Description | Acceptable parameters |
|---|---|---|
| Daylight reception | Existing daylight incoming angle | Existing angles should not be affected more than 0.8 time its former value or a maximum loss of 20%. |

Table 4.8: VSC assessment.

In this report, the VSC of the assessment point on each of the assessed windows will be calculated, both in the baseline state and in the proposed state. The baseline state reflects the current VSC of the window, the proposed state will determine what the VSC of the window would be if the proposed development is built as planned.

## Impact on sunlight provision:

### Neighbouring Properties – Sunlight on the Ground (Shadow) Gardens and Open spaces

Sunlight provision in existing amenity areas: BRE (2022), recommendations are given as to the quantity of sunlight in amenity areas that is required to produce a well sunlit space throughout the year. " It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21st of March. If as a result of new development, an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21st of March is less than 0.80 times its former value, then the loss of sunlight is likely to be noticeable". Calculations were conducted in accordance with the BRE guidelines to determine the extent to which the proposed development could affect the shadow / sunlight reception in the selected existing neighbouring amenity spaces. For existing amenity spaces any loss of sunlight should not be greater than 0.8 times its former size on March 21st.

| Analysis | Criteria on March 21st | Acceptable sunlight reception parameters |
|---|---|---|
| Sunlight reception | Minimum sunlight reception in amenity spaces | At least 80% or 0.8 x its former sunlight reception. |

Table 4.9: Sunlight in existing amenity areas.

Sunlight provision in existing amenity areas is recommended to be checked for all open spaces where it is required. BRE recommends spaces such as, gardens, such as the main back garden of a house or communal gardens including courtyards and roof terraces, parks and playing fields, children's playgrounds, outdoor swimming pools and paddling pools, and other areas of recreational water such as marinas and boating lakes, sitting out areas such as those between non-domestic buildings and in public squares, nature reserves (which may have special requirements for sunlight if rare plants are growing there).

Design Model: A 3D model of the proposed development and the surrounding neighbouring properties was provided by the Architect. SketchUp Pro 2023 design model was used to examine potential impacts. The model was geo-referenced to its correct location and an accurate solar daylight system was introduced. The 3D model of the project with the results illustrated in tabular format showing the hourly status of the shadow/sunlight fraction in the relevant amenity spaces is used to undertake the sun light assessment. Appendix A provides the illustrations in hourly sections.

## 4.6 Summary of analysis

The table below summarises the assessments carried out in this report.

| Element | Guidelines | |
|---|---|---|
| Performance of proposed development | | |
| Daylight | Daylight – IS EN 17037 / BS EN 17307 | To achieve the daylight provision outlined in IS / BS EN 17037:2018 a given room is recommended to achieve:<br>Using method 1:<br>• A target daylight factor of 2.0% must be achieved on over 50% of the floor area for over 50% of the available daylight hours.<br>• A target daylight factor of 0.7% must be achieved on over 95% of the floor area for over 50% of the available daylight hours.<br>Or using method 2:<br>• A target illuminance of 300 lux must be achieved on over 50% of the floor area for over 50% of the available daylight hours.<br>• A target illuminance of 100 lux must be achieved on over 95% of the floor area for over 50% of the available daylight hours. |
| | Daylight - National annex BS EN 17037 | To achieve the alternate minimum daylight provision outlined in the national annex of BS EN 17037:2018, the room is recommended to achieve:<br>• Kitchens, 1.3% target daylight factor or 200 lux over 50% of the floor area for over half the daylight hours.<br>• Living rooms, 1.0% target daylight factor or 150 lux over 50% of the floor area for over half the daylight hours.<br>• Bedrooms, 0.7% target daylight factor or 100 lux over 50% of the floor area for over half the daylight hours. |
| Sunlight | Sunlight in amenity areas / Sun on ground | To meet the minimum recommendations given in BR 209 (2022), a new amenity space should experience two hours sunlight on March 21st for at least 50% of its area. |
| Impact of the proposed development on the existing surrounding environment | | |
| Daylight | Vertical Sky Component (VSC) | To meet the recommendations in BR 209 (2022), the VSC with the new development in place, should be greater than 27% or greater than 0.80 times its former value. |
| Sunlight | Sunlight in existing amenity areas / Sun on ground | To meet the recommendations in BR 209 (2022), an existing amenity space, with the new development in place should experience in excess of two hours sunlight on March 21st for at least 50% of its area and should be greater than 0.80 times the previous value. |

Table 4.10: Summary of assessments.

## 4.7 Note on receptors

The BRE guide states that when assessing the potential effects of a proposed development on existing buildings, only those windows and rooms that have a reasonable expectation of daylight and sunlight need to be considered. Windows and rooms which meet this criterion are considered to be sensitive receptors. the BRE guide clarifies what are considered sensitive receptors with respect to sunlight and daylight as follows: “The guidelines given here are intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed”.
The guidelines may also be applied to any existing non-domestic building where the occupants have a reasonable expectation of daylight; this would normally include schools, hospitals, hotels and hostels, small workshops and some offices. Outdoor amenity spaces which have a reasonable expectation of sunlight, whether they are private gardens, communal open spaces or outdoor public amenity areas, are also considered sensitive receptors. Receptors that may be affected by the proposed development are highlighted in the calculation section of each appropriate analysis.

## 4.8 Note on the definition of effects

Guidelines from Appendix H in the BRE guidelines is used to categorise the varying degrees of compliance when assessing the impact, a proposed development might have on the daylight and sunlight of an existing environment. The table of definitions given below is used in the results section of this report, for the purposes of categorising the impact on sunlight and daylight.

| Effect | Definition of effect |
|---|---|
| Negligible | Where any loss of daylight / sunlight is well within the guidelines, or only a small number of windows or area of space lose daylight / sunlight but still within the guidelines, then the impact is assessed as negligible. |
| Minor Adverse | If the level of effect is marginally outside of the criteria as stated in the relevant guidelines, a minor adverse level of effect will be applied if the level of daylight / sunlight is within 5% of the target guideline. |
| Moderate Adverse | If the level of effect is outside of the criteria as stated in the relevant guidelines, a moderate adverse level of effect will be applied if the level of daylight / sunlight is within 5-10% of the target guideline. |
| Major Adverse | If the level of effect is outside of the criteria as stated in the relevant guidelines, a moderate adverse level of effect will be applied if the level of daylight / sunlight is in excess of 10% of the target value. |
| Beneficial Impact | If the ratio of change is > 1.10 (an improvement of 10%), then the impact is assessed as a beneficial impact. Should less significant improvements occur a negligible level of effect will be stated. |

Table 4.11: Definition of effects used in the impact assessments.

# 5 Performance of proposed development – Calculation results and conclusion

The performance of the proposed development calculations is broken into two sections, daylight reception and sunlight reception.

## Daylight Reception:

5.1 Receptor selection – Rooms within the proposed development

The daylight reception assessment has been targeted to habitable rooms within the proposed development. Receptors / rooms within the proposed development are indicated in image 5.1 to 5.11 below.

- Apartments: Blocks B1 and B2, all habitable rooms within the proposed block on the ground floor have been assessed. Once a (lowest level) room is compliant, rooms at higher levels with similar configuration / parameters are deemed compliant on the basis that the room daylight factor would have improved due to the better vertical sky view angle of higher located rooms.
- Maisonette blocks: all habitable rooms within the proposed blocks on the ground floor have been assessed. Once a (lowest level) room is compliant, rooms at higher levels with similar configuration / parameters are deemed compliant on the basis that the room daylight factor would have improved due to the better vertical sky view angle of higher located rooms.
- Houses: habitable rooms on the ground floor which are observed to be in the most daylight challenging positions or rooms positioned with close by obstacles have been assessed.

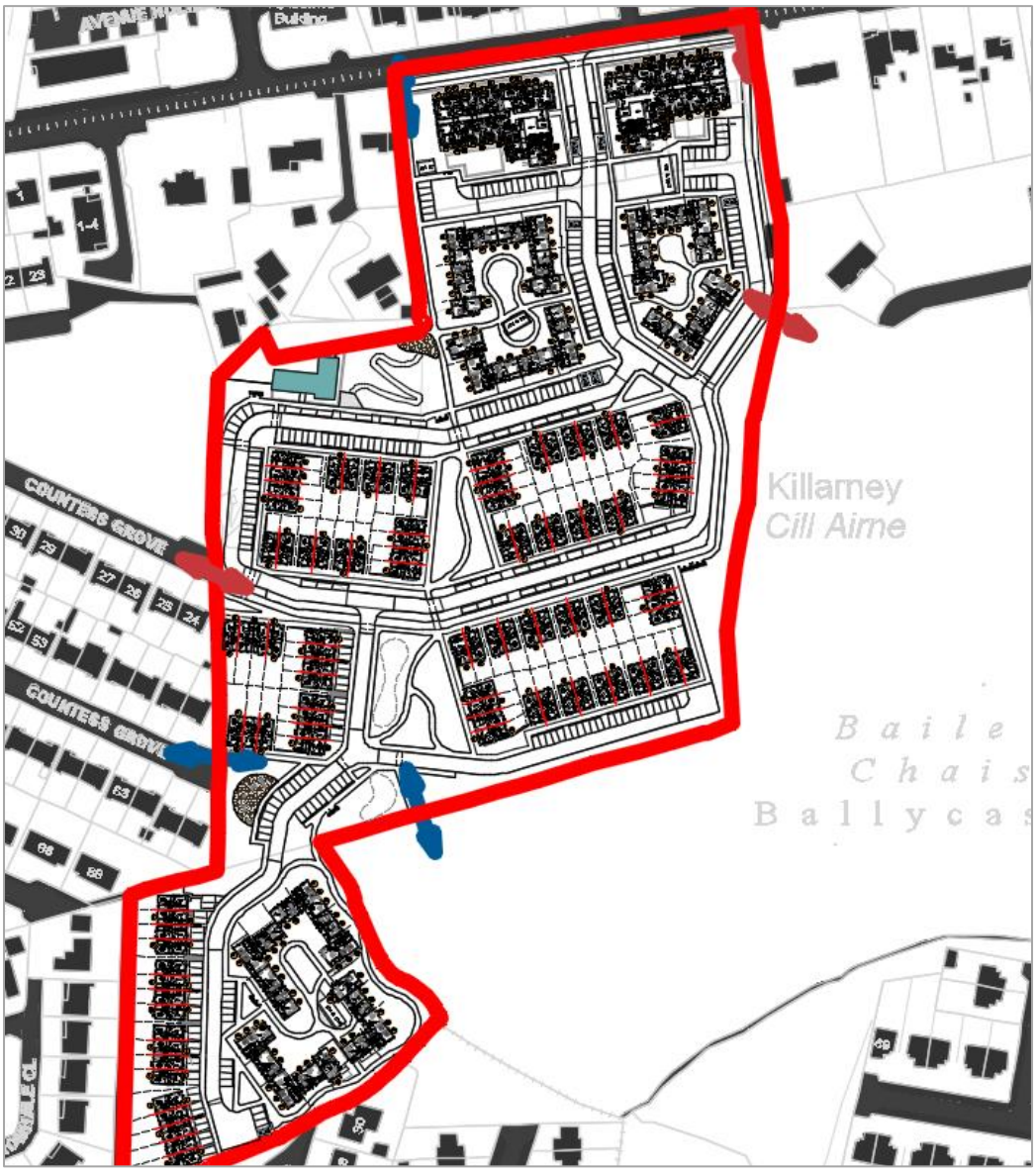



Image 5.1: Overall view.

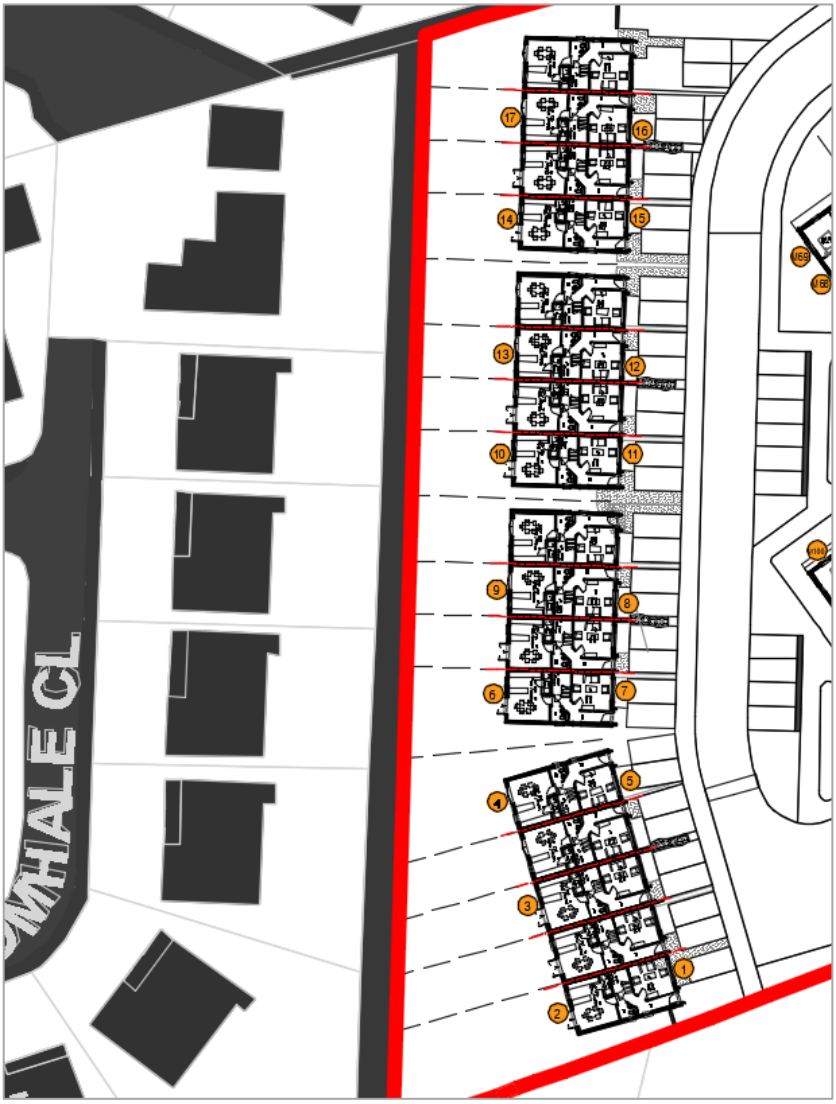



Image 5.2: Level 00 (ground floor). House Blocks. Receptor no. 1-17.




Image 5.3: Level 00 (ground floor). House Blocks. Receptor no. 18-32.




Image 5.4: Level 00 (ground floor). House Blocks. Receptor no. 33-49.

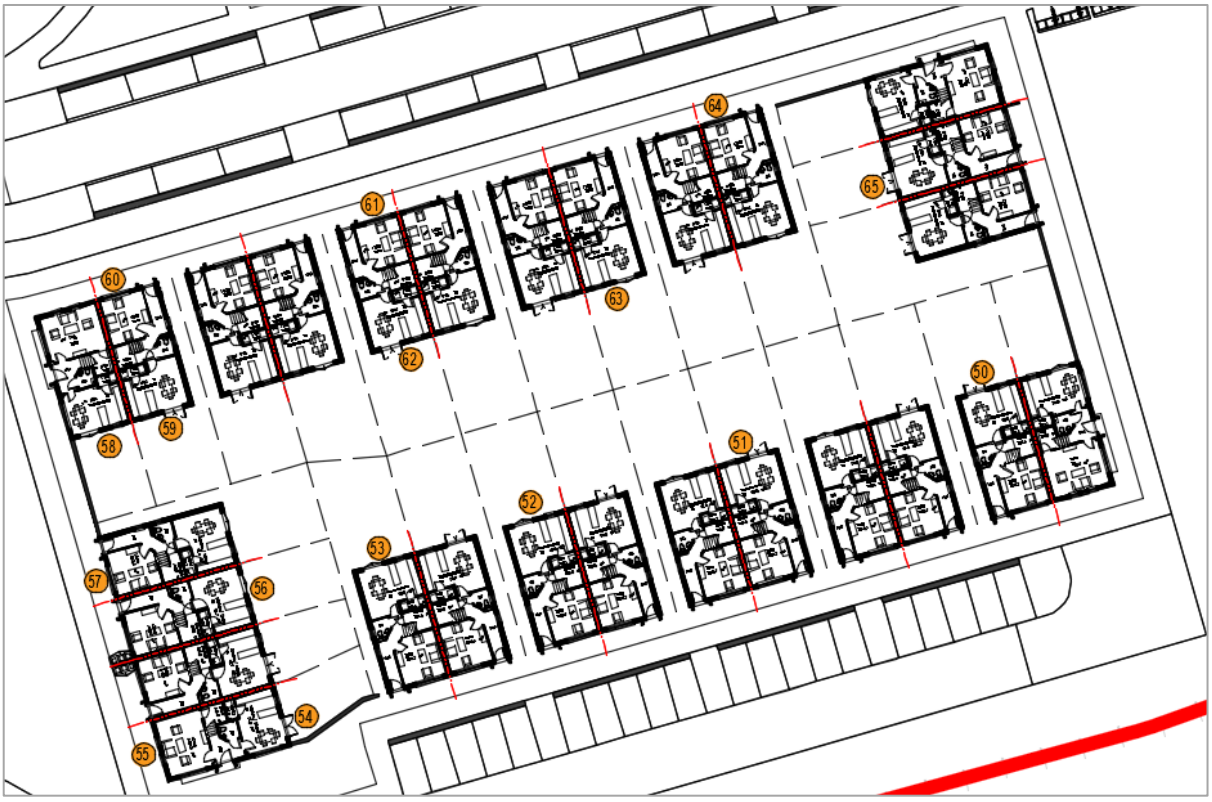



Image 5.5: Level 00 (ground floor). House Blocks. Receptor no. 50-65.




Image 5.6: Level 00 (ground floor). House Blocks. Receptor no. 66-84.

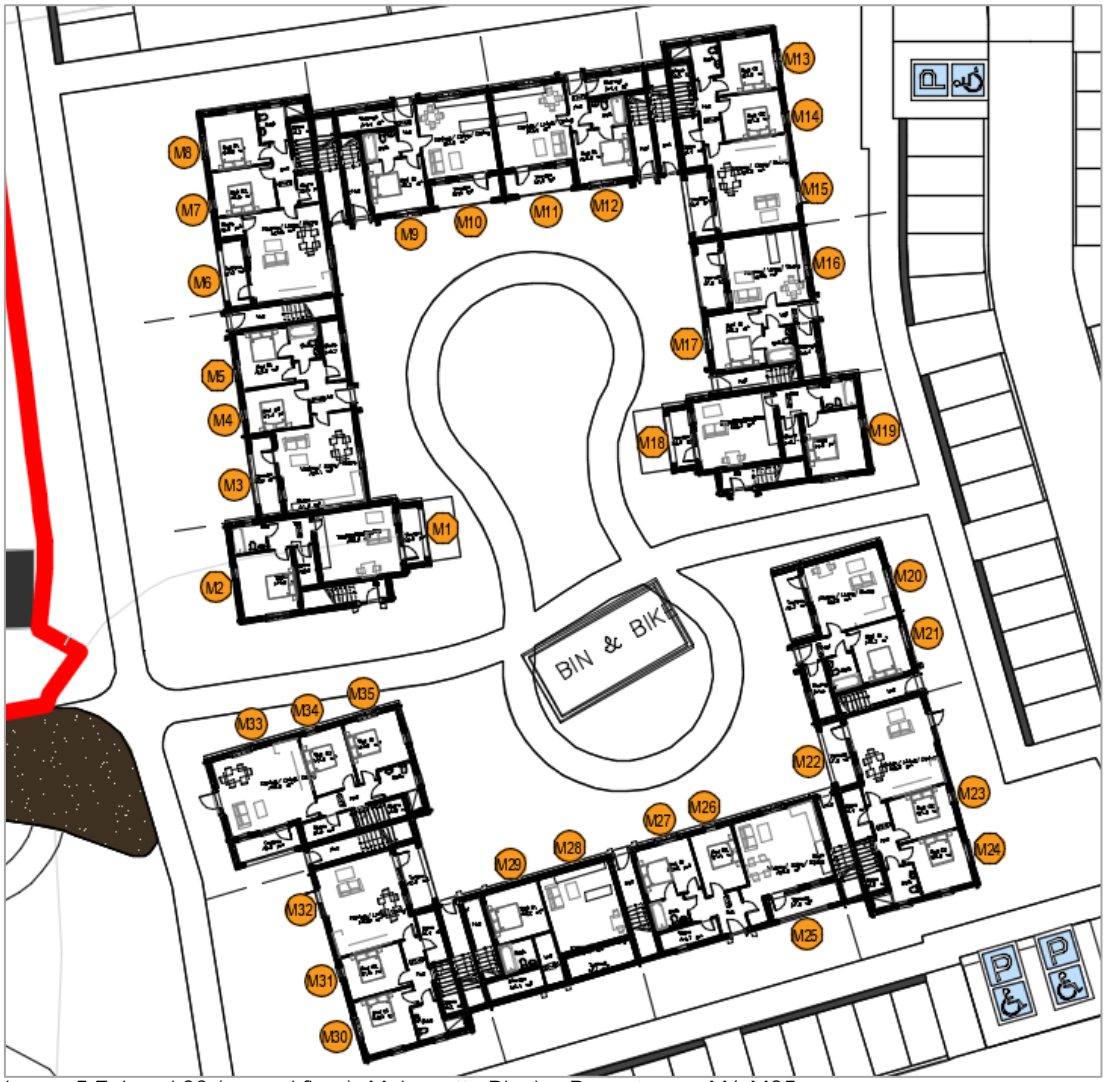



Image 5.7: Level 00 (ground floor). Maisonette Blocks. Receptor no. M1-M35.




Image 5.8: Level 00 (ground floor). Maisonette Blocks. Receptor no. M36-M62.

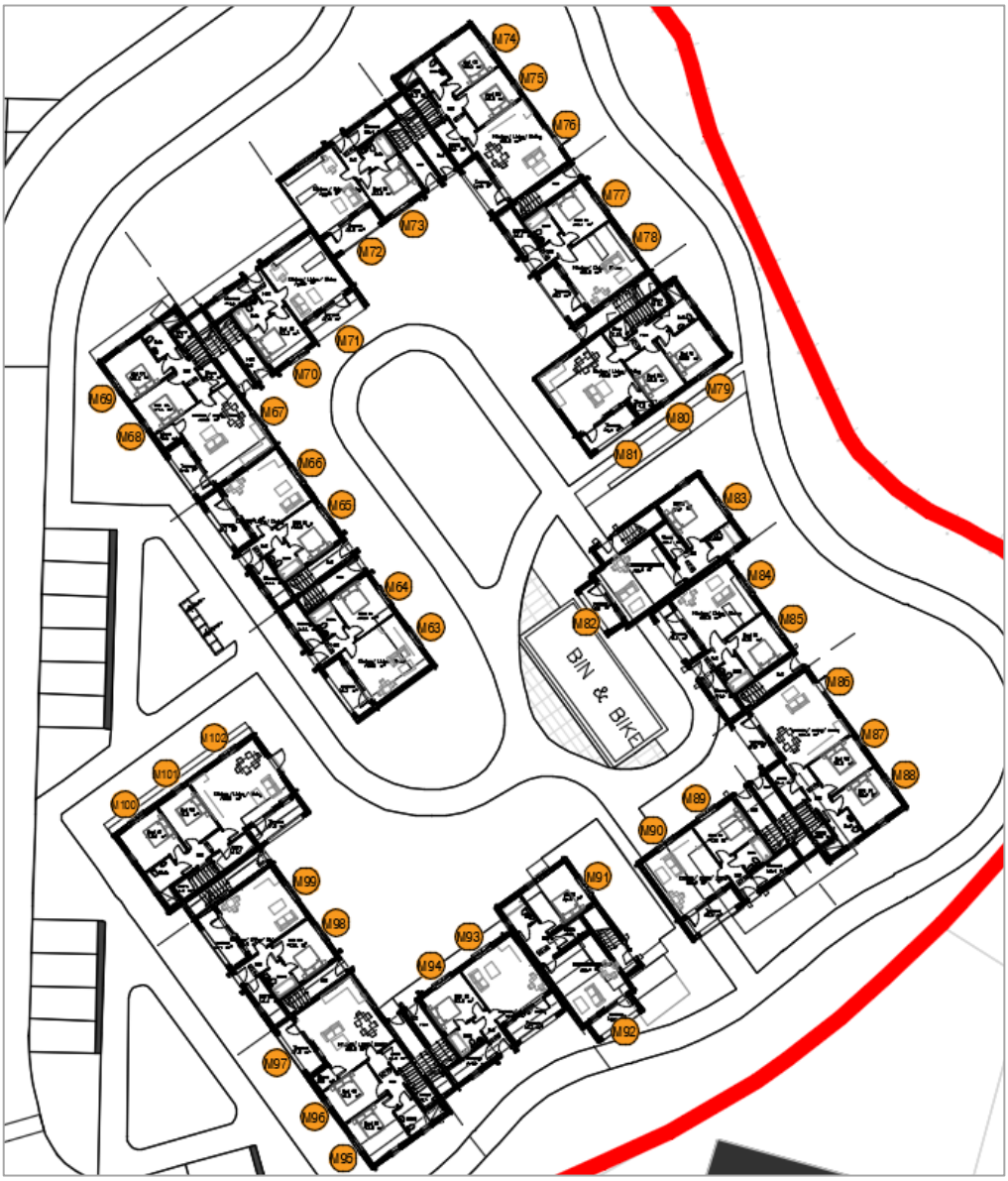



Image 5.9: Level 00 (ground floor). Maisonette Blocks. Receptor no. M63-M102.




Image 5.10: Level 00 (ground floor). Apartment Block B1. Receptor no. A1-A24.




Image 5.11: Level 00 (ground floor). Apartment Block B2. Receptor no. A25-A48.

## 5.2 Calculation result table

The results table below provide the full calculation results of the selected receptors / rooms. IS EN17037 / BS EN17037 daylight factor and illuminance levels are provided and the National Annex (NA) target values in BS EN17037. The calculation results have been given the following colour code guide depending on its level of resulting compliance within each guideline.

**Compliance hierarchy**

| | |
|---|---|
| ☑☑ | >=100% |
| ☑ | <100% , >95% |
| ☑ | <95% , >90% |
| !! | <90% , >80% |
| x | <80% |

| Receptor | Level/Floor | Block /Unit ID | Room / type | glass area | room area | glass ratio | Dept/Width | ∑ VSC ⊥ (total) | ISEN17037 DAY LIGHT FACTOR 50% area 50% sun hrs | | ISEN17037 DAY LIGHT FACTOR 95% area 50% sun hrs | | ISEN17037 ILLUMINANCE 50% area 50% sun hrs | | ISEN17037 ILLUMINANCE 95% area 50% sun hrs | | BSEN17037 ANNEX illuminance | BSEN17037 ANNEX day light factor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | % | min % | % | min % | lx | min lx | lx | min lx | min lx | min % |
| 1 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 34% | 2.95 | 2.00 | 1.03 | 0.70 | 446 | 300 | 147 | 100 | 200 | 1.3 |
| 2 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 34% | 3.02 | 2.00 | 1.05 | 0.70 | 456 | 300 | 150 | 100 | 200 | 1.3 |
| 3 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 33% | 2.95 | 2.00 | 1.03 | 0.70 | 446 | 300 | 147 | 100 | 200 | 1.3 |
| 4 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 32% | 2.81 | 2.00 | 0.98 | 0.70 | 426 | 300 | 140 | 100 | 200 | 1.3 |
| 5 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 31% | 2.75 | 2.00 | 0.96 | 0.70 | 415 | 300 | 137 | 100 | 200 | 1.3 |
| 6 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 31% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| 7 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 33% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| 8 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 33% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| 9 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 31% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| 10 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 31% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| 11 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 33% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| 12 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 33% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| 13 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 31% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| 14 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 31% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| 15 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 32% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| 16 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 32% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| 17 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 30% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| 18 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 33% | 2.95 | 2.00 | 1.03 | 0.70 | 446 | 300 | 147 | 100 | 200 | 1.3 |
| 19 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 31% | 2.75 | 2.00 | 0.96 | 0.70 | 415 | 300 | 137 | 100 | 200 | 1.3 |
| 20 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 30% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| 21 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 33% | 2.95 | 2.00 | 1.03 | 0.70 | 446 | 300 | 147 | 100 | 200 | 1.3 |
| 22 | 00 | House | Living-Kitchen | 7.34 | 17.0 | 43.2 | 2.75 | 29% | 4.96 | 2.00 | 1.73 | 0.70 | 750 | 300 | 247 | 100 | 200 | 1.3 |
| 23 | 00 | House | Living-Kitchen | 5.32 | 20.0 | 26.6 | 2.34 | 35% | 4.02 | 2.00 | 1.41 | 0.70 | 608 | 300 | 201 | 100 | 200 | 1.3 |
| 24 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 25 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 35% | 3.08 | 2.00 | 1.08 | 0.70 | 466 | 300 | 154 | 100 | 200 | 1.3 |
| 26 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 27 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 29% | 2.55 | 2.00 | 0.89 | 0.70 | 385 | 300 | 127 | 100 | 200 | 1.3 |
| 28 | 00 | House | Living-Kitchen | 5.32 | 20.0 | 26.6 | 2.34 | 34% | 3.89 | 2.00 | 1.36 | 0.70 | 588 | 300 | 194 | 100 | 200 | 1.3 |
| 29 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 32% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| 30 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 30% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| 31 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 31% | 2.75 | 2.00 | 0.96 | 0.70 | 415 | 300 | 137 | 100 | 200 | 1.3 |
| 32 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 33% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| 33 | 00 | House | Living-Kitchen | 5.32 | 20.0 | 26.6 | 2.34 | 32% | 3.69 | 2.00 | 1.29 | 0.70 | 557 | 300 | 184 | 100 | 200 | 1.3 |
| 34 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.55 | 2.00 | 0.89 | 0.70 | 385 | 300 | 127 | 100 | 200 | 1.3 |
| 35 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 36 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 31% | 2.75 | 2.00 | 0.96 | 0.70 | 415 | 300 | 137 | 100 | 200 | 1.3 |
| 37 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 38 | 00 | House | Living-Kitchen | 7.34 | 17.0 | 43.2 | 2.75 | 28% | 4.82 | 2.00 | 1.69 | 0.70 | 730 | 300 | 241 | 100 | 200 | 1.3 |
| 39 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 40 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 33% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 35% | 3.15 | 2.00 | 1.10 | 0.70 | 476 | 300 | 157 | 100 | 200 | 1.3 |
| 42 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 26% | 2.35 | 2.00 | 0.82 | 0.70 | 355 | 300 | 117 | 100 | 200 | 1.3 |
| 43 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.55 | 2.00 | 0.89 | 0.70 | 385 | 300 | 127 | 100 | 200 | 1.3 |
| 44 | 00 | House | Living-Kitchen | 7.34 | 17.0 | 43.2 | 2.75 | 28% | 4.96 | 2.00 | 1.73 | 0.70 | 750 | 300 | 247 | 100 | 200 | 1.3 |
| 45 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 32% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| 46 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 47 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 48 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.55 | 2.00 | 0.89 | 0.70 | 385 | 300 | 127 | 100 | 200 | 1.3 |
| 49 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 33% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| 50 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.55 | 2.00 | 0.89 | 0.70 | 385 | 300 | 127 | 100 | 200 | 1.3 |
| 51 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 52 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 53 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 54 | 00 | House | Living-Kitchen | 7.34 | 17.0 | 43.2 | 2.75 | 28% | 4.96 | 2.00 | 1.73 | 0.70 | 750 | 300 | 247 | 100 | 200 | 1.3 |
| 55 | 00 | House | Living-Kitchen | 5.32 | 20.0 | 26.6 | 2.34 | 35% | 3.95 | 2.00 | 1.38 | 0.70 | 598 | 300 | 197 | 100 | 200 | 1.3 |
| 56 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.55 | 2.00 | 0.89 | 0.70 | 385 | 300 | 127 | 100 | 200 | 1.3 |
| 57 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 34% | 3.02 | 2.00 | 1.05 | 0.70 | 456 | 300 | 150 | 100 | 200 | 1.3 |
| 58 | 00 | House | Living-Kitchen | 7.34 | 17.0 | 43.2 | 2.75 | 28% | 4.82 | 2.00 | 1.69 | 0.70 | 730 | 300 | 241 | 100 | 200 | 1.3 |
| 59 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.41 | 2.00 | 0.84 | 0.70 | 365 | 300 | 120 | 100 | 200 | 1.3 |
| 60 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 31% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| 61 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 31% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| 62 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 63 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 64 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 31% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| 65 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.41 | 2.00 | 0.84 | 0.70 | 365 | 300 | 120 | 100 | 200 | 1.3 |
| 66 | 00 | House | Living-Kitchen | 7.34 | 17.0 | 43.2 | 2.75 | 28% | 4.82 | 2.00 | 1.69 | 0.70 | 730 | 300 | 241 | 100 | 200 | 1.3 |
| 67 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.41 | 2.00 | 0.84 | 0.70 | 365 | 300 | 120 | 100 | 200 | 1.3 |
| 68 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 27% | 2.35 | 2.00 | 0.82 | 0.70 | 355 | 300 | 117 | 100 | 200 | 1.3 |
| 69 | 00 | House | Living-Kitchen | 7.34 | 17.0 | 43.2 | 2.75 | 27% | 4.62 | 2.00 | 1.62 | 0.70 | 699 | 300 | 231 | 100 | 200 | 1.3 |
| 70 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 71 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 72 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 73 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.41 | 2.00 | 0.84 | 0.70 | 365 | 300 | 120 | 100 | 200 | 1.3 |
| 74 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 75 | 00 | House | Living-Kitchen | 7.34 | 17.0 | 43.2 | 2.75 | 28% | 4.82 | 2.00 | 1.69 | 0.70 | 730 | 300 | 241 | 100 | 200 | 1.3 |
| 76 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 26% | 2.35 | 2.00 | 0.82 | 0.70 | 355 | 300 | 117 | 100 | 200 | 1.3 |
| 77 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 29% | 2.55 | 2.00 | 0.89 | 0.70 | 385 | 300 | 127 | 100 | 200 | 1.3 |
| 78 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.41 | 2.00 | 0.84 | 0.70 | 365 | 300 | 120 | 100 | 200 | 1.3 |
| 79 | 00 | House | Living-Kitchen | 5.32 | 20.0 | 26.6 | 2.34 | 29% | 3.28 | 2.00 | 1.15 | 0.70 | 496 | 300 | 164 | 100 | 200 | 1.3 |
| 80 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 30% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| 81 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 82 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 28% | 2.48 | 2.00 | 0.87 | 0.70 | 375 | 300 | 124 | 100 | 200 | 1.3 |
| 83 | 00 | House | Living-Kitchen | 3.36 | 15.0 | 22.4 | 2.13 | 30% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| 84 | 00 | House | Living-Kitchen | 3.98 | 19.0 | 20.9 | 2.46 | 27% | 2.35 | 2.00 | 0.82 | 0.70 | 355 | 300 | 117 | 100 | 200 | 1.3 |
| | | | | | | | | | | | | | | | | | | |
| M1 | 00 | Maisonette | Living-Kitchen | 4.66 | 22.4 | 20.8 | 1.76 | 23% | 2.14 | 2.00 | 0.75 | 0.70 | 324 | 300 | 107 | 100 | 200 | 1.3 |
| M2 | 00 | Maisonette | Bed room | 4.09 | 14.4 | 28.4 | 2.38 | 26% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 100 | 0.7 |
| M3 | 00 | Maisonette | Living-Kitchen | 7.51 | 27.0 | 27.8 | 1.94 | 26% | 3.35 | 2.00 | 1.17 | 0.70 | 507 | 300 | 167 | 100 | 200 | 1.3 |
| M4 | 00 | Maisonette | Bed room | 2.00 | 11.2 | 17.8 | 1.81 | 34% | 2.14 | 2.00 | 0.75 | 0.70 | 324 | 300 | 107 | 100 | 100 | 0.7 |
| M5 | 00 | Maisonette | Bed room | 2.85 | 11.9 | 23.9 | 2.37 | 34% | 3.02 | 2.00 | 1.05 | 0.70 | 456 | 300 | 150 | 100 | 100 | 0.7 |
| M6 | 00 | Maisonette | Living-Kitchen | 7.51 | 29.0 | 25.9 | 1.99 | 23% | 2.75 | 2.00 | 0.96 | 0.70 | 415 | 300 | 137 | 100 | 200 | 1.3 |
| M7 | 00 | Maisonette | Bed room | 2.00 | 10.9 | 18.3 | 1.86 | 35% | 2.28 | 2.00 | 0.80 | 0.70 | 344 | 300 | 114 | 100 | 100 | 0.7 |
| M8 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.28 | 35% | 4.42 | 2.00 | 1.55 | 0.70 | 669 | 300 | 221 | 100 | 100 | 0.7 |
| M9 | 00 | Maisonette | Bed room | 2.85 | 11.6 | 24.7 | 2.44 | 30% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 100 | 0.7 |
| M10 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 27% | 3.95 | 2.00 | 1.38 | 0.70 | 598 | 300 | 197 | 100 | 200 | 1.3 |
| M11 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 27% | 3.95 | 2.00 | 1.38 | 0.70 | 598 | 300 | 197 | 100 | 200 | 1.3 |
| M12 | 00 | Maisonette | Bed room | 2.85 | 11.6 | 24.7 | 2.44 | 30% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 100 | 0.7 |
| M13 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.28 | 32% | 4.02 | 2.00 | 1.41 | 0.70 | 608 | 300 | 201 | 100 | 100 | 0.7 |
| M14 | 00 | Maisonette | Bed room | 2.00 | 10.9 | 18.3 | 1.86 | 32% | 2.08 | 2.00 | 0.73 | 0.70 | 314 | 300 | 104 | 100 | 100 | 0.7 |
| M15 | 00 | Maisonette | Living-Kitchen | 8.06 | 29.0 | 27.8 | 1.99 | 23% | 3.02 | 2.00 | 1.05 | 0.70 | 456 | 300 | 150 | 100 | 200 | 1.3 |
| M16 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 23% | 3.28 | 2.00 | 1.15 | 0.70 | 496 | 300 | 164 | 100 | 200 | 1.3 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M17 | 00 | Maisonette | Bed room | 2.85 | 11.6 | 24.7 | 2.44 | 29% | 2.55 | 2.00 | 0.89 | 0.70 | 385 | 300 | 127 | 100 | 100 | 0.7 |
| M18 | 00 | Maisonette | Living-Kitchen | 4.66 | 22.4 | 20.8 | 1.76 | 23% | 2.14 | 2.00 | 0.75 | 0.70 | 324 | 300 | 107 | 100 | 200 | 1.3 |
| M19 | 00 | Maisonette | Bed room | 4.09 | 14.4 | 28.4 | 2.38 | 26% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 100 | 0.7 |
| M20 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 28% | 4.09 | 2.00 | 1.43 | 0.70 | 618 | 300 | 204 | 100 | 200 | 1.3 |
| M21 | 00 | Maisonette | Bed room | 2.85 | 11.6 | 24.7 | 2.44 | 31% | 2.75 | 2.00 | 0.96 | 0.70 | 415 | 300 | 137 | 100 | 100 | 0.7 |
| M22 | 00 | Maisonette | Living-Kitchen | 8.06 | 29.0 | 27.8 | 1.99 | 25% | 3.22 | 2.00 | 1.13 | 0.70 | 486 | 300 | 160 | 100 | 200 | 1.3 |
| M23 | 00 | Maisonette | Bed room | 2.00 | 10.9 | 18.3 | 1.86 | 31% | 2.01 | 2.00 | 0.70 | 0.70 | 304 | 300 | 100 | 100 | 100 | 0.7 |
| M24 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.28 | 31% | 3.89 | 2.00 | 1.36 | 0.70 | 588 | 300 | 194 | 100 | 100 | 0.7 |
| M25 | 00 | Maisonette | Living-Kitchen | 7.51 | 27.0 | 27.8 | 1.94 | 24% | 3.02 | 2.00 | 1.05 | 0.70 | 456 | 300 | 150 | 100 | 200 | 1.3 |
| M26 | 00 | Maisonette | Bed room | 2.00 | 11.2 | 17.8 | 1.81 | 31% | 1.94 | 2.00 | 0.68 | 0.70 | 294 | 300 | 97 | 100 | 100 | 0.7 |
| M27 | 00 | Maisonette | Bed room | 2.85 | 11.9 | 23.9 | 2.37 | 31% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 100 | 0.7 |
| M28 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 25% | 3.69 | 2.00 | 1.29 | 0.70 | 557 | 300 | 184 | 100 | 200 | 1.3 |
| M29 | 00 | Maisonette | Bed room | 2.85 | 11.9 | 23.9 | 2.37 | 30% | 2.61 | 2.00 | 0.91 | 0.70 | 395 | 300 | 130 | 100 | 100 | 0.7 |
| M30 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.28 | 32% | 4.02 | 2.00 | 1.41 | 0.70 | 608 | 300 | 201 | 100 | 100 | 0.7 |
| M31 | 00 | Maisonette | Bed room | 2.00 | 10.9 | 18.3 | 1.86 | 34% | 2.21 | 2.00 | 0.77 | 0.70 | 334 | 300 | 110 | 100 | 100 | 0.7 |
| M32 | 00 | Maisonette | Living-Kitchen | 8.06 | 29.0 | 27.8 | 1.99 | 20% | 2.61 | 2.00 | 0.91 | 0.70 | 395 | 300 | 130 | 100 | 200 | 1.3 |
| M33 | 00 | Maisonette | Living-Kitchen | 8.06 | 29.0 | 27.8 | 1.99 | 22% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| M34 | 00 | Maisonette | Bed room | 2.00 | 10.4 | 19.3 | 1.81 | 27% | 2.01 | 2.00 | 0.70 | 0.70 | 304 | 300 | 100 | 100 | 100 | 0.7 |
| M35 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.37 | 25% | 3.08 | 2.00 | 1.08 | 0.70 | 466 | 300 | 154 | 100 | 100 | 0.7 |
| M36 | 00 | Maisonette | Living-Kitchen | 7.51 | 29.5 | 25.5 | 2.35 | 22% | 2.61 | 2.00 | 0.91 | 0.70 | 395 | 300 | 130 | 100 | 200 | 1.3 |
| M37 | 00 | Maisonette | Bed room | 2.00 | 10.4 | 19.3 | 1.81 | 26% | 1.94 | 2.00 | 0.68 | 0.70 | 294 | 300 | 97 | 100 | 100 | 0.7 |
| M38 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.37 | 26% | 3.22 | 2.00 | 1.13 | 0.70 | 486 | 300 | 160 | 100 | 100 | 0.7 |
| M39 | 00 | Maisonette | Bed room | 2.85 | 11.9 | 23.9 | 2.37 | 27% | 2.41 | 2.00 | 0.84 | 0.70 | 365 | 300 | 120 | 100 | 100 | 0.7 |
| M40 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.5 | 32.0 | 1.85 | 25% | 3.55 | 2.00 | 1.24 | 0.70 | 537 | 300 | 177 | 100 | 200 | 1.3 |
| M41 | 00 | Maisonette | Living-Kitchen | 7.51 | 29.0 | 25.9 | 1.99 | 22% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| M42 | 00 | Maisonette | Bed room | 2.00 | 10.9 | 18.3 | 1.86 | 32% | 2.08 | 2.00 | 0.73 | 0.70 | 314 | 300 | 104 | 100 | 100 | 0.7 |
| M43 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.28 | 32% | 4.02 | 2.00 | 1.41 | 0.70 | 608 | 300 | 201 | 100 | 100 | 0.7 |
| M44 | 00 | Maisonette | Living-Kitchen | 7.51 | 27.0 | 27.8 | 1.94 | 26% | 3.28 | 2.00 | 1.15 | 0.70 | 496 | 300 | 164 | 100 | 200 | 1.3 |
| M45 | 00 | Maisonette | Bed room | 2.00 | 10.4 | 19.3 | 1.81 | 26% | 1.94 | 2.00 | 0.68 | 0.70 | 294 | 300 | 97 | 100 | 100 | 0.7 |
| M46 | 00 | Maisonette | Bed room | 2.85 | 11.9 | 23.9 | 2.37 | 26% | 2.28 | 2.00 | 0.80 | 0.70 | 344 | 300 | 114 | 100 | 100 | 0.7 |
| M47 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.28 | 33% | 4.09 | 2.00 | 1.43 | 0.70 | 618 | 300 | 204 | 100 | 100 | 0.7 |
| M48 | 00 | Maisonette | Bed room | 2.00 | 10.9 | 18.3 | 1.86 | 36% | 2.35 | 2.00 | 0.82 | 0.70 | 355 | 300 | 117 | 100 | 100 | 0.7 |
| M49 | 00 | Maisonette | Living-Kitchen | 8.06 | 29.0 | 27.8 | 1.99 | 23% | 3.08 | 2.00 | 1.08 | 0.70 | 466 | 300 | 154 | 100 | 200 | 1.3 |
| M50 | 00 | Maisonette | Bed room | 2.85 | 11.9 | 23.9 | 2.37 | 27% | 2.41 | 2.00 | 0.84 | 0.70 | 365 | 300 | 120 | 100 | 100 | 0.7 |
| M51 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 26% | 3.82 | 2.00 | 1.34 | 0.70 | 578 | 300 | 191 | 100 | 200 | 1.3 |
| M52 | 00 | Maisonette | Living-Kitchen | 8.06 | 29.0 | 27.8 | 1.99 | 24% | 3.08 | 2.00 | 1.08 | 0.70 | 466 | 300 | 154 | 100 | 200 | 1.3 |
| M53 | 00 | Maisonette | Bed room | 2.00 | 10.9 | 18.3 | 1.86 | 35% | 2.28 | 2.00 | 0.80 | 0.70 | 344 | 300 | 114 | 100 | 100 | 0.7 |
| M54 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.28 | 35% | 4.36 | 2.00 | 1.52 | 0.70 | 659 | 300 | 217 | 100 | 100 | 0.7 |
| M55 | 00 | Maisonette | Living-Kitchen | 7.51 | 27.0 | 27.8 | 1.94 | 28% | 3.55 | 2.00 | 1.24 | 0.70 | 537 | 300 | 177 | 100 | 200 | 1.3 |
| M56 | 00 | Maisonette | Bed room | 2.00 | 10.4 | 19.3 | 1.81 | 26% | 1.94 | 2.00 | 0.68 | 0.70 | 294 | 300 | 97 | 100 | 100 | 0.7 |
| M57 | 00 | Maisonette | Bed room | 2.85 | 11.9 | 23.9 | 2.37 | 25% | 2.21 | 2.00 | 0.77 | 0.70 | 334 | 300 | 110 | 100 | 100 | 0.7 |
| M58 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.37 | 34% | 4.22 | 2.00 | 1.48 | 0.70 | 638 | 300 | 211 | 100 | 100 | 0.7 |
| M59 | 00 | Maisonette | Bed room | 2.00 | 11.2 | 17.8 | 1.81 | 32% | 2.08 | 2.00 | 0.73 | 0.70 | 314 | 300 | 104 | 100 | 100 | 0.7 |
| M60 | 00 | Maisonette | Living-Kitchen | 7.51 | 29.6 | 25.4 | 1.95 | 26% | 3.15 | 2.00 | 1.10 | 0.70 | 476 | 300 | 157 | 100 | 200 | 1.3 |
| M61 | 00 | Maisonette | Bed room | 2.85 | 11.6 | 24.7 | 2.44 | 25% | 2.28 | 2.00 | 0.80 | 0.70 | 344 | 300 | 114 | 100 | 100 | 0.7 |
| M62 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 24% | 3.48 | 2.00 | 1.22 | 0.70 | 527 | 300 | 174 | 100 | 200 | 1.3 |
| M63 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 23% | 3.35 | 2.00 | 1.17 | 0.70 | 507 | 300 | 167 | 100 | 200 | 1.3 |
| M64 | 00 | Maisonette | Bed room | 2.85 | 11.9 | 23.9 | 2.37 | 29% | 2.55 | 2.00 | 0.89 | 0.70 | 385 | 300 | 127 | 100 | 100 | 0.7 |
| M65 | 00 | Maisonette | Bed room | 2.85 | 11.9 | 23.9 | 2.37 | 29% | 2.55 | 2.00 | 0.89 | 0.70 | 385 | 300 | 127 | 100 | 100 | 0.7 |
| M66 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 24% | 3.48 | 2.00 | 1.22 | 0.70 | 527 | 300 | 174 | 100 | 200 | 1.3 |
| M67 | 00 | Maisonette | Living-Kitchen | 7.51 | 29.0 | 25.9 | 1.99 | 22% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 200 | 1.3 |
| M68 | 00 | Maisonette | Bed room | 2.00 | 10.9 | 18.3 | 1.86 | 31% | 2.08 | 2.00 | 0.73 | 0.70 | 314 | 300 | 104 | 100 | 100 | 0.7 |
| M69 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.28 | 33% | 4.09 | 2.00 | 1.43 | 0.70 | 618 | 300 | 204 | 100 | 100 | 0.7 |
| M70 | 00 | Maisonette | Bed room | 2.85 | 11.6 | 24.7 | 2.44 | 24% | 2.14 | 2.00 | 0.75 | 0.70 | 324 | 300 | 107 | 100 | 100 | 0.7 |
| M71 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 26% | 3.82 | 2.00 | 1.34 | 0.70 | 578 | 300 | 191 | 100 | 200 | 1.3 |
| M72 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 27% | 3.89 | 2.00 | 1.36 | 0.70 | 588 | 300 | 194 | 100 | 200 | 1.3 |
| M73 | 00 | Maisonette | Bed room | 2.85 | 11.6 | 24.7 | 2.44 | 24% | 2.08 | 2.00 | 0.73 | 0.70 | 314 | 300 | 104 | 100 | 100 | 0.7 |
| M74 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.28 | 35% | 4.42 | 2.00 | 1.55 | 0.70 | 669 | 300 | 221 | 100 | 100 | 0.7 |
| M75 | 00 | Maisonette | Bed room | 2.00 | 10.9 | 18.3 | 1.86 | 35% | 2.28 | 2.00 | 0.80 | 0.70 | 344 | 300 | 114 | 100 | 100 | 0.7 |
| M76 | 00 | Maisonette | Living-Kitchen | 8.06 | 29.0 | 27.8 | 1.99 | 27% | 3.48 | 2.00 | 1.22 | 0.70 | 527 | 300 | 174 | 100 | 200 | 1.3 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M77 | 00 | Maisonette | Bed room | 2.85 | 11.9 | 23.9 | 2.28 | 35% | 3.08 | 2.00 | 1.08 | 0.70 | 466 | 300 | 154 | 100 | 100 | 0.7 |
| M78 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 28% | 4.02 | 2.00 | 1.41 | 0.70 | 608 | 300 | 201 | 100 | 200 | 1.3 |
| M79 | 00 | Maisonette | Bed room | 4.09 | 12.2 | 33.4 | 2.41 | 32% | 4.02 | 2.00 | 1.41 | 0.70 | 608 | 300 | 201 | 100 | 100 | 0.7 |
| M80 | 00 | Maisonette | Bed room | 2.00 | 10.9 | 18.3 | 1.84 | 30% | 2.01 | 2.00 | 0.70 | 0.70 | 304 | 300 | 100 | 100 | 100 | 0.7 |
| M81 | 00 | Maisonette | Living-Kitchen | 7.51 | 29.6 | 25.4 | 1.95 | 19% | 2.28 | 2.00 | 0.80 | 0.70 | 344 | 300 | 114 | 100 | 200 | 1.3 |
| M82 | 00 | Maisonette | Living-Kitchen | 4.66 | 22.4 | 20.8 | 1.76 | 23% | 2.14 | 2.00 | 0.75 | 0.70 | 324 | 300 | 107 | 100 | 200 | 1.3 |
| M83 | 00 | Maisonette | Bed room | 4.09 | 14.4 | 28.4 | 2.38 | 26% | 2.81 | 2.00 | 0.98 | 0.70 | 426 | 300 | 140 | 100 | 100 | 0.7 |
| M84 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 26% | 3.75 | 2.00 | 1.31 | 0.70 | 567 | 300 | 187 | 100 | 200 | 1.3 |
| M85 | 00 | Maisonette | Bed room | 2.85 | 11.6 | 24.7 | 2.44 | 35% | 3.15 | 2.00 | 1.10 | 0.70 | 476 | 300 | 157 | 100 | 100 | 0.7 |
| M86 | 00 | Maisonette | Living-Kitchen | 8.06 | 29.0 | 27.8 | 1.99 | 27% | 3.55 | 2.00 | 1.24 | 0.70 | 537 | 300 | 177 | 100 | 200 | 1.3 |
| M87 | 00 | Maisonette | Bed room | 2.00 | 10.9 | 18.3 | 1.86 | 36% | 2.35 | 2.00 | 0.82 | 0.70 | 355 | 300 | 117 | 100 | 100 | 0.7 |
| M88 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.28 | 34% | 4.36 | 2.00 | 1.52 | 0.70 | 659 | 300 | 217 | 100 | 100 | 0.7 |
| M89 | 00 | Maisonette | Bed room | 2.85 | 11.6 | 24.7 | 2.44 | 25% | 2.21 | 2.00 | 0.77 | 0.70 | 334 | 300 | 110 | 100 | 100 | 0.7 |
| M90 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 26% | 3.82 | 2.00 | 1.34 | 0.70 | 578 | 300 | 191 | 100 | 200 | 1.3 |
| M91 | 00 | Maisonette | Bed room | 4.09 | 14.4 | 28.4 | 2.38 | 23% | 2.55 | 2.00 | 0.89 | 0.70 | 385 | 300 | 127 | 100 | 100 | 0.7 |
| M92 | 00 | Maisonette | Living-Kitchen | 4.66 | 22.4 | 20.8 | 1.76 | 24% | 2.21 | 2.00 | 0.77 | 0.70 | 334 | 300 | 110 | 100 | 200 | 1.3 |
| M93 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 24% | 3.55 | 2.00 | 1.24 | 0.70 | 537 | 300 | 177 | 100 | 200 | 1.3 |
| M94 | 00 | Maisonette | Bed room | 2.85 | 11.6 | 24.7 | 2.44 | 25% | 2.21 | 2.00 | 0.77 | 0.70 | 334 | 300 | 110 | 100 | 100 | 0.7 |
| M95 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.37 | 34% | 4.22 | 2.00 | 1.48 | 0.70 | 638 | 300 | 211 | 100 | 100 | 0.7 |
| M96 | 00 | Maisonette | Bed room | 2.00 | 11.2 | 17.8 | 1.81 | 33% | 2.14 | 2.00 | 0.75 | 0.70 | 324 | 300 | 107 | 100 | 100 | 0.7 |
| M97 | 00 | Maisonette | Living-Kitchen | 7.51 | 29.6 | 25.4 | 1.95 | 23% | 2.75 | 2.00 | 0.96 | 0.70 | 415 | 300 | 137 | 100 | 200 | 1.3 |
| M98 | 00 | Maisonette | Bed room | 2.85 | 11.6 | 24.7 | 2.44 | 25% | 2.28 | 2.00 | 0.80 | 0.70 | 344 | 300 | 114 | 100 | 100 | 0.7 |
| M99 | 00 | Maisonette | Living-Kitchen | 7.51 | 23.0 | 32.7 | 1.83 | 24% | 3.48 | 2.00 | 1.22 | 0.70 | 527 | 300 | 174 | 100 | 200 | 1.3 |
| M100 | 00 | Maisonette | Bed room | 4.09 | 11.9 | 34.3 | 2.37 | 32% | 4.09 | 2.00 | 1.43 | 0.70 | 618 | 300 | 204 | 100 | 100 | 0.7 |
| M101 | 00 | Maisonette | Bed room | 2.00 | 11.2 | 17.8 | 1.81 | 32% | 2.08 | 2.00 | 0.73 | 0.70 | 314 | 300 | 104 | 100 | 100 | 0.7 |
| M102 | 00 | Maisonette | Living-Kitchen | 7.51 | 29.0 | 25.9 | 1.99 | 24% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| | | | | | | | | | | | | | | | | | | |
| A1 | 00 | Apt. block B1 | Living-Kitchen | 9.87 | 27.4 | 36.0 | 1.17 | 28% | 4.49 | 2.00 | 1.57 | 0.70 | 679 | 300 | 224 | 100 | 200 | 1.3 |
| A2 | 00 | Apt. block B1 | Bed room | 2.94 | 9.6 | 30.6 | 2.39 | 32% | 3.28 | 2.00 | 1.15 | 0.70 | 496 | 300 | 164 | 100 | 100 | 0.7 |
| A3 | 00 | Apt. block B1 | Bed room | 2.94 | 8.4 | 35.0 | 2.46 | 32% | 3.55 | 2.00 | 1.24 | 0.70 | 537 | 300 | 177 | 100 | 100 | 0.7 |
| A4 | 00 | Apt. block B1 | Bed room | 2.94 | 9.2 | 31.8 | 2.16 | 19% | 2.01 | 2.00 | 0.70 | 0.70 | 304 | 300 | 100 | 100 | 100 | 0.7 |
| A5 | 00 | Apt. block B1 | Living-Kitchen | 5.25 | 25.5 | 20.6 | 1.11 | 32% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| A6 | 00 | Apt. block B1 | Bed room | 2.94 | 9.2 | 31.8 | 2.16 | 19% | 2.01 | 2.00 | 0.70 | 0.70 | 304 | 300 | 100 | 100 | 100 | 0.7 |
| A7 | 00 | Apt. block B1 | Living-Kitchen | 5.25 | 25.5 | 20.6 | 1.11 | 32% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| A8 | 00 | Apt. block B1 | Living-Kitchen | 5.25 | 26.1 | 20.1 | 1.26 | 22% | 2.01 | 2.00 | 0.70 | 0.70 | 304 | 300 | 100 | 100 | 200 | 1.3 |
| A9 | 00 | Apt. block B1 | Bed room | 2.52 | 9.6 | 26.3 | 2.39 | 26% | 2.21 | 2.00 | 0.77 | 0.70 | 334 | 300 | 110 | 100 | 100 | 0.7 |
| A10 | 00 | Apt. block B1 | Bed room | 2.94 | 8.4 | 35.0 | 2.46 | 32% | 3.55 | 2.00 | 1.24 | 0.70 | 537 | 300 | 177 | 100 | 100 | 0.7 |
| A11 | 00 | Apt. block B1 | Bed room | 2.94 | 12.0 | 24.4 | 1.73 | 27% | 2.35 | 2.00 | 0.82 | 0.70 | 355 | 300 | 117 | 100 | 100 | 0.7 |
| A12 | 00 | Apt. block B1 | Bed room | 2.94 | 10.7 | 27.4 | 2.04 | 27% | 2.55 | 2.00 | 0.89 | 0.70 | 385 | 300 | 127 | 100 | 100 | 0.7 |
| A13 | 00 | Apt. block B1 | Living-Kitchen | 9.87 | 29.6 | 33.3 | 1.21 | 27% | 4.09 | 2.00 | 1.43 | 0.70 | 618 | 300 | 204 | 100 | 200 | 1.3 |
| A14 | 00 | Apt. block B1 | Bed room | 2.94 | 10.6 | 27.6 | 1.96 | 29% | 2.75 | 2.00 | 0.96 | 0.70 | 415 | 300 | 137 | 100 | 100 | 0.7 |
| A15 | 00 | Apt. block B1 | Living-Kitchen | 9.87 | 24.8 | 39.8 | 1.12 | 23% | 3.82 | 2.00 | 1.34 | 0.70 | 578 | 300 | 191 | 100 | 200 | 1.3 |
| A16 | 00 | Apt. block B1 | Living-Kitchen | 8.19 | 28.0 | 29.3 | 1.74 | 24% | 3.22 | 2.00 | 1.13 | 0.70 | 486 | 300 | 160 | 100 | 200 | 1.3 |
| A17 | 00 | Apt. block B1 | Bed room | 1.68 | 13.5 | 12.4 | 2.56 | 22% | 1.07 | 2.00 | 0.38 | 0.70 | 162 | 300 | 53 | 100 | 100 | 0.7 |
| A18 | 00 | Apt. block B1 | Living-Kitchen | 5.25 | 25.5 | 20.6 | 1.11 | 22% | 2.01 | 2.00 | 0.70 | 0.70 | 304 | 300 | 100 | 100 | 200 | 1.3 |
| A19 | 00 | Apt. block B1 | Bed room | 2.94 | 9.2 | 31.8 | 2.16 | 19% | 2.01 | 2.00 | 0.70 | 0.70 | 304 | 300 | 100 | 100 | 100 | 0.7 |
| A20 | 00 | Apt. block B1 | Living-Kitchen | 5.25 | 24.8 | 21.2 | 1.09 | 29% | 2.61 | 2.00 | 0.91 | 0.70 | 395 | 300 | 130 | 100 | 200 | 1.3 |
| A21 | 00 | Apt. block B1 | Bed room | 2.94 | 9.2 | 31.8 | 2.16 | 19% | 2.01 | 2.00 | 0.70 | 0.70 | 304 | 300 | 100 | 100 | 100 | 0.7 |
| A22 | 00 | Apt. block B1 | Bed room | 2.94 | 8.4 | 35.0 | 2.46 | 30% | 3.28 | 2.00 | 1.15 | 0.70 | 496 | 300 | 164 | 100 | 100 | 0.7 |
| A23 | 00 | Apt. block B1 | Bed room | 2.94 | 9.6 | 30.6 | 2.39 | 30% | 3.02 | 2.00 | 1.05 | 0.70 | 456 | 300 | 150 | 100 | 100 | 0.7 |
| A24 | 00 | Apt. block B1 | Living-Kitchen | 9.87 | 27.4 | 36.0 | 1.17 | 27% | 4.29 | 2.00 | 1.50 | 0.70 | 648 | 300 | 214 | 100 | 200 | 1.3 |
| A25 | 00 | Apt. block B2 | Living-Kitchen | 9.87 | 29.6 | 33.3 | 1.21 | 26% | 3.89 | 2.00 | 1.36 | 0.70 | 588 | 300 | 194 | 100 | 200 | 1.3 |
| A26 | 00 | Apt. block B2 | Bed room | 2.94 | 10.7 | 27.4 | 2.04 | 31% | 2.95 | 2.00 | 1.03 | 0.70 | 446 | 300 | 147 | 100 | 100 | 0.7 |
| A27 | 00 | Apt. block B2 | Bed room | 2.94 | 12.0 | 24.4 | 1.73 | 31% | 2.68 | 2.00 | 0.94 | 0.70 | 405 | 300 | 134 | 100 | 100 | 0.7 |
| A28 | 00 | Apt. block B2 | Living-Kitchen | 5.25 | 28.9 | 18.2 | 1.19 | 26% | 2.08 | 2.00 | 0.73 | 0.70 | 314 | 300 | 104 | 100 | 200 | 1.3 |
| A29 | 00 | Apt. block B2 | Bed room | 2.52 | 9.6 | 26.3 | 2.39 | 26% | 2.21 | 2.00 | 0.77 | 0.70 | 334 | 300 | 110 | 100 | 100 | 0.7 |
| A30 | 00 | Apt. block B2 | Bed room | 2.94 | 8.4 | 35.0 | 2.46 | 32% | 3.55 | 2.00 | 1.24 | 0.70 | 537 | 300 | 177 | 100 | 100 | 0.7 |
| A31 | 00 | Apt. block B2 | Living-Kitchen | 5.25 | 25.5 | 20.6 | 1.11 | 32% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A32 | 00 | Apt. block B2 | Bed room | 2.94 | 9.2 | 31.8 | 2.16 | 19% | 2.01 | 2.00 | 0.70 | 0.70 | 304 | 300 | 100 | 100 | 100 | 0.7 |
| A33 | 00 | Apt. block B2 | Living-Kitchen | 5.25 | 25.5 | 20.6 | 1.11 | 32% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| A34 | 00 | Apt. block B2 | Bed room | 2.94 | 9.2 | 31.8 | 2.16 | 19% | 2.01 | 2.00 | 0.70 | 0.70 | 304 | 300 | 100 | 100 | 100 | 0.7 |
| A35 | 00 | Apt. block B2 | Bed room | 2.94 | 8.4 | 35.0 | 2.46 | 32% | 3.55 | 2.00 | 1.24 | 0.70 | 537 | 300 | 177 | 100 | 100 | 0.7 |
| A36 | 00 | Apt. block B2 | Bed room | 2.94 | 9.6 | 30.6 | 2.39 | 32% | 3.28 | 2.00 | 1.15 | 0.70 | 496 | 300 | 164 | 100 | 100 | 0.7 |
| A37 | 00 | Apt. block B2 | Living-Kitchen | 9.87 | 27.4 | 36.0 | 1.17 | 31% | 4.89 | 2.00 | 1.71 | 0.70 | 740 | 300 | 244 | 100 | 200 | 1.3 |
| A38 | 00 | Apt. block B2 | Living-Kitchen | 9.87 | 27.4 | 36.0 | 1.17 | 28% | 4.42 | 2.00 | 1.55 | 0.70 | 669 | 300 | 221 | 100 | 200 | 1.3 |
| A39 | 00 | Apt. block B2 | Bed room | 2.94 | 9.6 | 30.6 | 2.39 | 31% | 3.08 | 2.00 | 1.08 | 0.70 | 466 | 300 | 154 | 100 | 100 | 0.7 |
| A40 | 00 | Apt. block B2 | Bed room | 2.94 | 8.4 | 35.0 | 2.46 | 31% | 3.42 | 2.00 | 1.20 | 0.70 | 517 | 300 | 171 | 100 | 100 | 0.7 |
| A41 | 00 | Apt. block B2 | Bed room | 2.94 | 9.2 | 31.8 | 2.16 | 20% | 2.14 | 2.00 | 0.75 | 0.70 | 324 | 300 | 107 | 100 | 100 | 0.7 |
| A42 | 00 | Apt. block B2 | Living-Kitchen | 5.25 | 25.5 | 20.6 | 1.11 | 29% | 2.55 | 2.00 | 0.89 | 0.70 | 385 | 300 | 127 | 100 | 200 | 1.3 |
| A43 | 00 | Apt. block B2 | Bed room | 2.94 | 9.2 | 31.8 | 2.16 | 19% | 2.08 | 2.00 | 0.73 | 0.70 | 314 | 300 | 104 | 100 | 100 | 0.7 |
| A44 | 00 | Apt. block B2 | Living-Kitchen | 5.25 | 25.5 | 20.6 | 1.11 | 23% | 2.08 | 2.00 | 0.73 | 0.70 | 314 | 300 | 104 | 100 | 200 | 1.3 |
| A45 | 00 | Apt. block B2 | Bed room | 1.68 | 13.5 | 12.4 | 2.56 | 22% | 1.07 | 2.00 | 0.38 | 0.70 | 162 | 300 | 53 | 100 | 100 | 0.7 |
| A46 | 00 | Apt. block B2 | Living-Kitchen | 8.19 | 28.0 | 29.3 | 1.74 | 21% | 2.88 | 2.00 | 1.01 | 0.70 | 436 | 300 | 144 | 100 | 200 | 1.3 |
| A47 | 00 | Apt. block B2 | Living-Kitchen | 9.87 | 24.8 | 39.8 | 1.12 | 23% | 3.82 | 2.00 | 1.34 | 0.70 | 578 | 300 | 191 | 100 | 200 | 1.3 |
| A48 | 00 | Apt. block B2 | Bed room | 2.94 | 10.6 | 27.6 | 1.96 | 29% | 2.75 | 2.00 | 0.96 | 0.70 | 415 | 300 | 137 | 100 | 100 | 0.7 |

Table 5.1: Calculation results: Daylight performance of proposed development.

### 5.3 Daylight reception of proposed development conclusion

For the daylight assessment, results have been analysed within these standards:

- Assessed in accordance with IS EN17037 / BS EN17307, carried out in accordance with Method 1 and Method 2 described in the methodology section.
- Assessed in accordance with BS EN 17037:2018 National Annex.

The results from table 5.1 are reviewed under each standard. The daylight reception assessment has been targeted to habitable rooms within the proposed development. Receptors / rooms within the proposed development are indicated in image 5.1 to 5.11.

- Apartments: Blocks B1 and B2, all habitable rooms within the proposed block on the ground floor have been assessed. Once a (lowest level) room is compliant, rooms at higher levels with similar configuration / parameters are deemed compliant on the basis that the room daylight factor would have improved due to the better vertical sky view angle of higher located rooms.
- Maisonette blocks: all habitable rooms within the proposed blocks on the ground floor have been assessed. Once a (lowest level) room is compliant, rooms at higher levels with similar configuration / parameters are deemed compliant on the basis that the room daylight factor would have improved due to the better vertical sky view angle of higher located rooms.
- Houses: habitable rooms on the ground floor which are observed to be in the most daylight challenging positions or rooms positioned with close by obstacles have been assessed.

IS EN17037 / BS EN17307: To achieve recommendations outlined in IS EN 17037:2018 / BS EN 17307:2018, a given room must achieve: a target daylight factor of 2.0% or in terms of illuminance 300 lux on over 50% of the floor area for over 50% of the available daylight hours. And a minimum target daylight factor of 0.7% or in terms of illuminance 100 lux on over 95% of the floor area for over 50% of the available daylight hours. From the calculation result table 5.1 we note the vast majority of the proposed rooms calculated daylight results achieved the minimum guidelines or achieved well in excess of the guidelines.

- Apartments: Overall, examined residential rooms for Apartment blocks B1 and B2 achieved on average a daylight factor (DF) of 2.8% and an illuminance of 431 lux on over 50% of the floor area for over 50% of the available daylight hours. An average DF of 0.9% and an illuminance of 142 lux on over 95% of the floor area for over 50% of the available daylight hours was achieved. Only 2 no. of bedrooms were below recommendations.
- Maisonette blocks: Overall, examined residential rooms for Maisonette blocks achieved on average a daylight factor (DF) of 2.96% and an illuminance of 447 lux on over 50% of the floor area for over 50% of the available daylight hours. An average DF of 1.0% and an illuminance of 147 lux on over 95% of the floor area for over 50% of the available daylight hours was achieved.
- Houses: Overall, examined residential rooms for Houses achieved on average a daylight factor (DF) of 2.9% and an illuminance of 442 lux on over 50% of the floor area for over 50% of the available daylight hours. An average DF of 1.0% and an illuminance of 146 lux on over 95% of the floor area for over 50% of the available daylight hours was achieved.

In an urban environment it can more often be the case that complete fulfilment with the guidelines is not attainable. Within the BS EN 17037 it acknowledges that a rigid application of the European Standard could prove to be a difficult task as it offers only a single target for new buildings and IS EN17037 currently has no specific National Annex. The British Annex of BS EN 17037, daylight recommendations differ depending on the function of a room and offers minimum daylight provision targets for kitchens, living rooms and bedrooms.
Therefore, Given the similarity of weather, light and design patterns between Ireland and the UK and the lack of specific localisation Annex details in the Irish version, the alternate minimum daylight provision targets set out in the national annex of BS EN 17037 are reviewed next.

BS EN 17037:2018 National Annex: To achieve the alternate minimum daylight recommendations for Dublin, the room in question must achieve: Kitchen 1.3% target daylight factor or in terms of illuminance 200 lux. Living room 1.0% target daylight factor or in terms of illuminance 150 lux, and bedrooms 0.7% target daylight factor or in terms of illuminance 100 lux all over 50% of the floor area for over half the daylight hours. From the calculation result table 5.1 we note that all of the rooms calculated daylight are well in excess of these minimum guidelines.

- Overall compliance for proposed development = 100%

In summary, the calculation results have achieved a good level of compliance under IS EN17037 / BS EN17307 and full compliance under BS EN 17037:2018 National Annex guidelines. This indicates an overall good level of daylight for the proposed development under the guidelines. We conclude, the proposed development can provide a good level of residential daylight amenity to future occupants.

## Sunlight Reception

### Sunlight in the new proposed amenity areas:

5.4 **Receptor selection - Amenity spaces within the proposed development**

Image 5.12 below indicates the public and communal open space amenity areas that have been selected and analysed on the basis that the shadow casted from the proposed development may affect the amenity areas given its geographical location in relation to the development. These areas are identified below and labelled for reference in the results.




Image 5.12: New proposed amenity spaces within the development.

| Receptor | Amenity Description | Amenity area (m²) |
|---|---|---|
| A | Open space – Zone 1 | 861.4 |
| B | Open space – Zone 2 | 887.5 |
| C | Open space – Zone 3 | 1,300.8 |
| D | Open space – Zone 4 | 1,421.3 |
| E | Open space – Zone 5 | 911.5 |
| F | Open space – Zone 6 | 1,051.5 |
| G | Communal open space – Zone 1 | 757.1 |
| H | Communal open space – Zone 2 | 328.8 |
| I | Communal open space – Zone 3 | 553.4 |
| J | Communal open space – Zone 4 | 255.8 |
| K | Communal open space – Zone 5 | 285.9 |

Table 5.2: List of new proposed amenity spaces.

## 5.5 Calculation result table

The result table below provides a summary of the calculation results of the proposed amenity areas. It shows the overall hours of sunlight on March 21st together with the 'to-be-achieved' BRE minimum sunlight standards. Appendix B provides the full calculation results of the proposed amenity areas. The calculation results have been given the following colour code guide depending on its level of resulting compliance.

Compliance guide

| | | |
|---|---|---|
| ☑ | 0% | Over /equal to |
| ☑ | 5% | Within |
| !! | 10% | Within |
| x | 10% | In excess of |

| Amenity space ID ref | Amenity space area (m²) | Achieved daily sun time * area | Achieved total sun time (hrs) | Required sun hours @ 50% area | Achieved sun hours on @ 50% area |
|---|---|---|---|---|---|
| A | 861.4 | 419674.1 | 8.12 | 2.0 | 9.0 |
| B | 887.5 | 483510.0 | 9.08 | 2.0 | 10.0 |
| C | 1300.8 | 590823.4 | 7.57 | 2.0 | 9.0 |
| D | 1421.3 | 705249.1 | 8.27 | 2.0 | 9.0 |
| E | 911.5 | 356578.8 | 6.52 | 2.0 | 8.0 |
| F | 1051.5 | 504089.1 | 7.99 | 2.0 | 10.0 |
| G | 757.1 | 180341.2 | 3.97 | 2.0 | 5.0 |
| H | 328.8 | 58592.2 | 2.97 | 2.0 | 3.0 |
| I | 553.4 | 109905.2 | 3.31 | 2.0 | 3.0 |
| J | 255.8 | 83646.6 | 5.45 | 2.0 | 6.0 |
| K | 285.9 | 141692.0 | 8.26 | 2.0 | 10.0 |

Table 5.3: Calculation results: Summary table of sunlight analysis of proposed amenity spaces.

## 5.6 Sunlight reception – amenity areas of the proposed development conclusion

Based on the BRE guidelines at least 50% of the amenity space should receive at least two hours of sunlight on the 21st of March. From the calculation results in table 5.3 we note that all selected amenity spaces received in excess of the minimum 2 hours of sunlight on at least 50% of the area on March 21st, see image 5.12 for receptor/amenity space locations. Summary of results are as follows:

- The calculated average sunlight on at least 50% of the area on March 21st for Open space amenity areas is 9.2 hours.
- The calculated average sunlight on at least 50% of the area on March 21st for Communal open space amenity areas is 5.4 hours.

This confirms the amenity areas proposed will be adequately sunlit throughout the year. We conclude that the new amenity spaces receive sunlight on 50% of the area is in line with the recommendations of the BRE Report - Site Layout and Planning for Daylight and Sunlight - and therefore deem these to be compliant to this element.

# 6 Impact of proposed development – Calculation results and conclusion

The impact of the proposed development calculations and assessments is broken into two sections, impact on daylight reception and impact on sunlight reception.

## Impact on Daylight Reception:

### Vertical sky component (VSC):

6.1 **Receptor selection – Buildings / windows neighbouring the proposed development**
The VSC assessment has been targeted to habitable neighbouring windows / rooms / dwellings that are perceived to be in challenging locations i.e., ground floor rooms and dwellings/rooms in the vicinity of the new proposed development on the basis that if these habitable rooms pass the minimum requirements all rooms at higher levels will definitely pass the minimum recommendations as a result of the improving vertical sky view angle. Image 6.1-6.8 below indicates the windows that have been selected and analysed. The windows are identified and labelled for reference in the results.




Image 6.1: Daylight impact: Neighbouring receptors – Overall view (receptor no. 1 - 70).




Image 6.2: Daylight impact: Neighbouring receptors (receptor no. 1 - 5).

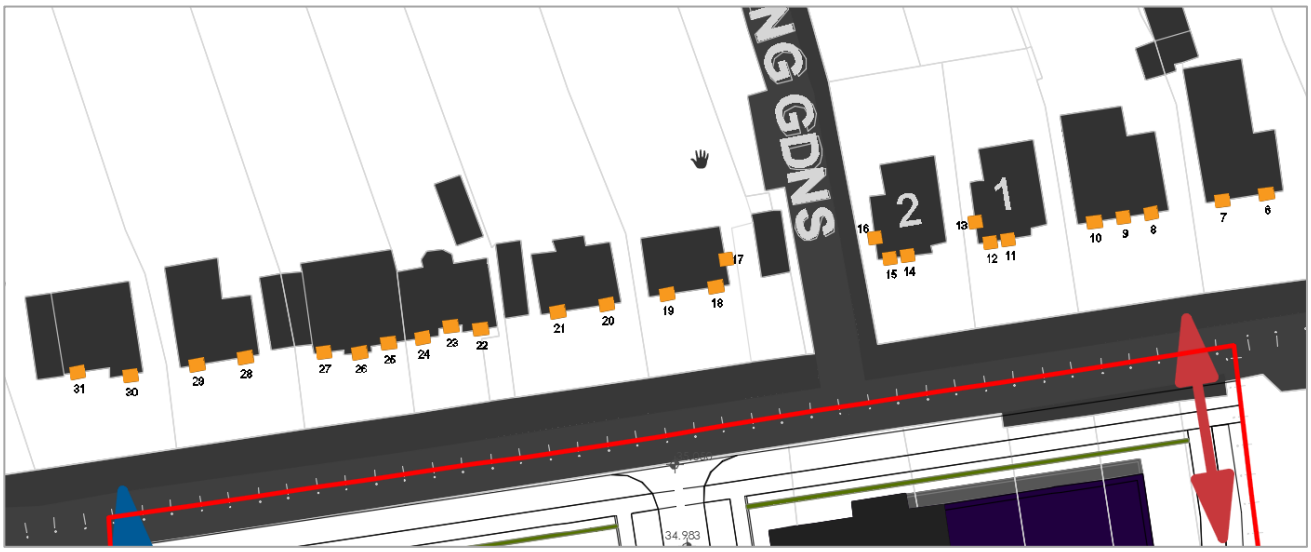



Image 6.3: Daylight impact: Neighbouring receptors (receptor no. 6 - 31).




Image 6.4: Daylight impact: Neighbouring receptors (receptor no. 32 - 42).




Image 6.5: Daylight impact: Neighbouring receptors (receptor no. 43 - 48).




Image 6.6: Daylight impact: Neighbouring receptors (receptor no. 49 - 54).




Image 6.7: Daylight impact: Neighbouring receptors (receptor no. 55 - 64).




Image 6.8: Daylight impact: Neighbouring receptors (receptor no. 65 - 70).

| Receptor/window * | Level | Location / Address | Dwelling description |
|---|---|---|---|
| 1, 2 | 00 | Broom Cottage, Rookery Road, Killarney, Co. Kerry | Residential |
| 3, 4, 5 | 00 | Shephard House, Countess Road, Killarney, Co. Kerry | Residential |
| 6, 7 | 00 | La Salette, Countess Road, Killarney, Co. Kerry | Residential |
| 8, 9, 10 | 00 | Countess Road, Killarney, Co. Kerry | Residential |
| 11, 12, 13 | 00 | 1 Aisling Gardens, Countess Road, Killarney, Co. Kerry | Residential |
| 14, 15, 16 | 00 | 2 Aisling Gardens, Countess Road, Killarney, Co. Kerry | Residential |
| 17, 18, 19 | 00 | Countess Road, Killarney, Co. Kerry | Residential |
| 20, 21 | 00 | Donlara, Countess Road, Killarney, Co. Kerry | Residential |
| 22, 23, 24 | 00 | Sonas, Countess Road, Killarney, Co. Kerry | Residential |
| 25, 26, 27 | 00 | Countess Road, Killarney, Co. Kerry | Residential |
| 28, 29 | 00 | Ailesbury, Countess Road, Killarney, Co. Kerry | Residential |
| 30, 31 | 00 | Lia Fail, Countess Road, Killarney, Co. Kerry | Residential |
| 32, 33, 34 | 00 | Innisfallen, Countess Road, Killarney, Co. Kerry | Residential |
| 35, 36, 37, 38 | 00 | Mountain View, Countess Road, Killarney, Co. Kerry | Residential |
| 39, 40 | 00 | Countess Road, Killarney, Co. Kerry | Residential |
| 41, 42 | 00 | The Bungalow, Countess Grove, Killarney, Co. Kerry | Residential |
| 43, 44, 45 | 00 | 24 Countess Grove, Killarney, Co. Kerry | Residential |
| 46, 47, 48 | 00 | 59 Countess Grove, Killarney, Co. Kerry | Residential |
| 49, 50, 51 | 00 | 60 Countess Grove, Killarney, Co. Kerry | Residential |
| 52 | 00 | 61 Countess Grove, Killarney, Co. Kerry | Residential |
| 53, 54 | 00 | 89 Countess Grove, Killarney, Co. Kerry | Residential |
| 55, 56 | 00 | 11 Dromhale Close, Killarney, Co. Kerry | Residential |
| 57, 58 | 00 | 10 Dromhale Close, Killarney, Co. Kerry | Residential |
| 59, 60 | 00 | 9 Dromhale Close, Killarney, Co. Kerry | Residential |
| 61, 62 | 00 | 8 Dromhale Close, Killarney, Co. Kerry | Residential |
| 63, 64 | 00 | 7 Dromhale Close, Killarney, Co. Kerry | Residential |
| 65, 66 | 00 | 19 Deireadh Coille, Woodlawn, Killarney, Co. Kerry | Residential |
| 67 | 00 | 28 Deireadh Coille, Woodlawn, Killarney, Co. Kerry | Residential |
| 68, 69, 70 | 00 | 30 Deireadh Coille, Woodlawn, Killarney, Co. Kerry | Residential |

Table 6.1: List of receptors selected for analysis.

* The BRE report outlines VSC guidelines are intended for use for rooms where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed or commercial premises.

* The windows have been calculated as ground floor receptors. On the basis that if these habitable rooms pass the minimum requirements all rooms at higher levels will definitely pass the minimum recommendations as a result of the improving vertical sky view angle.

* Some of the windows selected here could potentially be windows to a bathroom, WC, storeroom or circulation area and the room may not need to be examined. However, for the purpose of this report they have all been presumed as potentially habitable.

## 6.2 Calculation result table

The VSC has been calculated for potentially affected windows within the neighbouring/adjacent properties. Locations of receptors are based on guideline recommendations for the closest facades which have windows with potential for impact. The change factor or effect on daylight reception in an existing habitable room should not be affected by more than 20% i.e., a maximum change factor of 0.8. The column named comment/effect describes the level of change an assessed window will experience, based on its compliance with the BRE target. A list of definitions can be found in section 4.8 of this report. To identify the status of the change factor in the tables below we use the following colour code guide depending on its level of resulting compliance status. The summary result table below provides the VSC calculation results. Appendix C provides the full calculation result table.

Compliance guide

| | | |
|---|---|---|
| ☑ | 0% | Over /equal to |
| ☑ | 5% | Within |
| !! | 10% | Within |
| x | 10% | In excess of |

| Receptor ID | Existing baseline VSC value [%] | Proposed VSC value [%] | Change factor | Comment / Effect of proposed development |
|---|---|---|---|---|
| Receptor 1 | 37% | 34% | 0.93 | Negligible |
| Receptor 2 | 35% | 33% | 0.93 | Negligible |
| Receptor 3 | 35% | 34% | 0.95 | Negligible |
| Receptor 4 | 35% | 31% | 0.88 | Negligible |
| Receptor 5 | 34% | 33% | 0.98 | Negligible |
| Receptor 6 | 35% | 33% | 0.94 | Negligible |
| Receptor 7 | 35% | 33% | 0.93 | Negligible |
| Receptor 8 | 35% | 33% | 0.93 | Negligible |
| Receptor 9 | 35% | 32% | 0.92 | Negligible |
| Receptor 10 | 36% | 32% | 0.91 | Negligible |
| Receptor 11 | 36% | 32% | 0.90 | Negligible |
| Receptor 12 | 36% | 31% | 0.89 | Negligible |
| Receptor 13 | 32% | 29% | 0.90 | Negligible |
| Receptor 14 | 36% | 31% | 0.88 | Negligible |
| Receptor 15 | 36% | 31% | 0.88 | Negligible |
| Receptor 16 | 33% | 29% | 0.90 | Negligible |
| Receptor 17 | 32% | 29% | 0.92 | Negligible |
| Receptor 18 | 36% | 32% | 0.88 | Negligible |
| Receptor 19 | 36% | 32% | 0.88 | Negligible |
| Receptor 20 | 36% | 32% | 0.89 | Negligible |
| Receptor 21 | 36% | 32% | 0.89 | Negligible |
| Receptor 22 | 36% | 31% | 0.87 | Negligible |
| Receptor 23 | 36% | 31% | 0.87 | Negligible |
| Receptor 24 | 36% | 31% | 0.88 | Negligible |
| Receptor 25 | 36% | 31% | 0.88 | Negligible |
| Receptor 26 | 36% | 31% | 0.88 | Negligible |
| Receptor 27 | 36% | 31% | 0.88 | Negligible |
| Receptor 28 | 36% | 32% | 0.90 | Negligible |
| Receptor 29 | 36% | 32% | 0.90 | Negligible |
| Receptor 30 | 36% | 33% | 0.92 | Negligible |
| Receptor 31 | 36% | 33% | 0.92 | Negligible |
| Receptor 32 | 34% | 33% | 0.97 | Negligible |
| Receptor 33 | 36% | 30% | 0.84 | Negligible |
| Receptor 34 | 34% | 31% | 0.94 | Negligible |
| Receptor 35 | 36% | 30% | 0.83 | Negligible |
| Receptor 36 | 34% | 30% | 0.88 | Negligible |
| Receptor 37 | 34% | 29% | 0.83 | Negligible |
| Receptor 38 | 34% | 32% | 0.95 | Negligible |
| Receptor 39 | 34% | 31% | 0.92 | Negligible |
| Receptor 40 | 34% | 31% | 0.92 | Negligible |

| | | | | |
|---|---|---|---|---|
| Receptor 41 | 32% | 29% | 0.91 | Negligible |
| Receptor 42 | 36% | 33% | 0.91 | Negligible |
| Receptor 43 | 36% | 31% | 0.87 | Negligible |
| Receptor 44 | 36% | 29% | 0.81 | Negligible |
| Receptor 45 | 32% | 31% | 0.95 | Negligible |
| Receptor 46 | 34% | 31% | 0.91 | Negligible |
| Receptor 47 | 36% | 30% | 0.83 | Negligible |
| Receptor 48 | 33% | 32% | 0.98 | Negligible |
| Receptor 49 | 34% | 33% | 0.95 | Negligible |
| Receptor 50 | 36% | 34% | 0.93 | Negligible |
| Receptor 51 | 33% | 32% | 0.96 | Negligible |
| Receptor 52 | 33% | 31% | 0.96 | Negligible |
| Receptor 53 | 34% | 31% | 0.93 | Negligible |
| Receptor 54 | 33% | 31% | 0.95 | Negligible |
| Receptor 55 | 35% | 32% | 0.91 | Negligible |
| Receptor 56 | 35% | 32% | 0.91 | Negligible |
| Receptor 57 | 36% | 32% | 0.90 | Negligible |
| Receptor 58 | 36% | 32% | 0.90 | Negligible |
| Receptor 59 | 36% | 32% | 0.90 | Negligible |
| Receptor 60 | 36% | 32% | 0.90 | Negligible |
| Receptor 61 | 35% | 32% | 0.92 | Negligible |
| Receptor 62 | 35% | 32% | 0.92 | Negligible |
| Receptor 63 | 35% | 32% | 0.92 | Negligible |
| Receptor 64 | 35% | 32% | 0.92 | Negligible |
| Receptor 65 | 35% | 34% | 0.97 | Negligible |
| Receptor 66 | 34% | 32% | 0.94 | Negligible |
| Receptor 67 | 36% | 33% | 0.92 | Negligible |
| Receptor 68 | 36% | 30% | 0.83 | Negligible |
| Receptor 69 | 35% | 28% | 0.81 | Negligible |
| Receptor 70 | 36% | 30% | 0.83 | Negligible |

Table 6.2: Calculation results: Summary table of VSC results.

### 6.3 Impact on daylight reception conclusion

The BRE recommends that the effects of a new development on daylight reception should not impact any existing VSC by more than 20% or have a maximum change factor in excess of 0.80. From the calculation results we note all selected neighbouring habitable receptors are affected to some degree with regards to daylight reception due to the introduction of the proposed development in their respective habitable rooms facing the proposed development. The calculated change in daylight reception in all of the neighbouring receptors/windows achieved a change factor ranging from 0.81 to 0.98. The BRE report outlines VSC guidelines are intended for use for rooms where daylight is required, including living rooms, kitchens and bedrooms. Properties used for habitable purposes have been assessed therefore properties occupied by commercial units have not been applied to the VSC assessment. Summarized result findings are as follows (see image 6.1-6.8 for receptor locations):

- East receptors: Receptor no. 1 to 5: Existing dwellings located in closest proximity with ground floor windows were examined and resulted in a change factor range of 0.88 to 0.98. These receptors are comfortably within the guidelines and the effect is determined as negligible under BRE definitions.
- North receptors: Receptor no. 6 to 31: The private dwelling located on Countess Road with ground floor windows was examined and resulted in a change factor range of 0.87 to 0.94. These receptors are well within the guidelines and the effect is determined as negligible under BRE definitions.
- West receptors: Receptor no. 32 to 64: Existing dwellings located in closest proximity with ground floor windows were examined and resulted in a change factor range of 0.81 to 0.98. These receptors are within the guidelines and the effect is determined as negligible under BRE definitions.
- South receptors: Receptor no. 65 to 70: Existing dwellings located in closest proximity with ground floor windows were examined and resulted in a change factor range of 0.81 to 0.97. These receptors are also within the guidelines and the effect is determined as negligible under BRE definitions.
- Overall, the average change ratio for VSC is 0.90.

We conclude that the new proposed development's effect on daylight reception in the neighbouring rooms is all within the constraints and recommendations of the BRE Report – Site Layout and Planning for Daylight and Sunlight BR209 2022, and we therefore deem the proposed development to be compliant with this element.

## Impact on Sunlight Reception:

### Sunlight in existing amenity areas:

6.4 **Receptor selection – Existing amenity spaces**

The sunlight reception assessment is targeted to neighbouring amenity spaces that might be affected by the introduction of the new proposed development. BR 209 (2022) outlines sunlight checks should include gardens, parks & playing fields, playgrounds, swimming pools, areas of recreational water, moorings, sitting out areas and nature reserves. Image 6.9 – 6.11 below indicates the neighbouring amenity areas selected and analysed on the basis that the shadow casted from the new development may impact these amenity areas given its geographical location in relation to the proposed development. These areas are identified below and labelled for reference in the results.

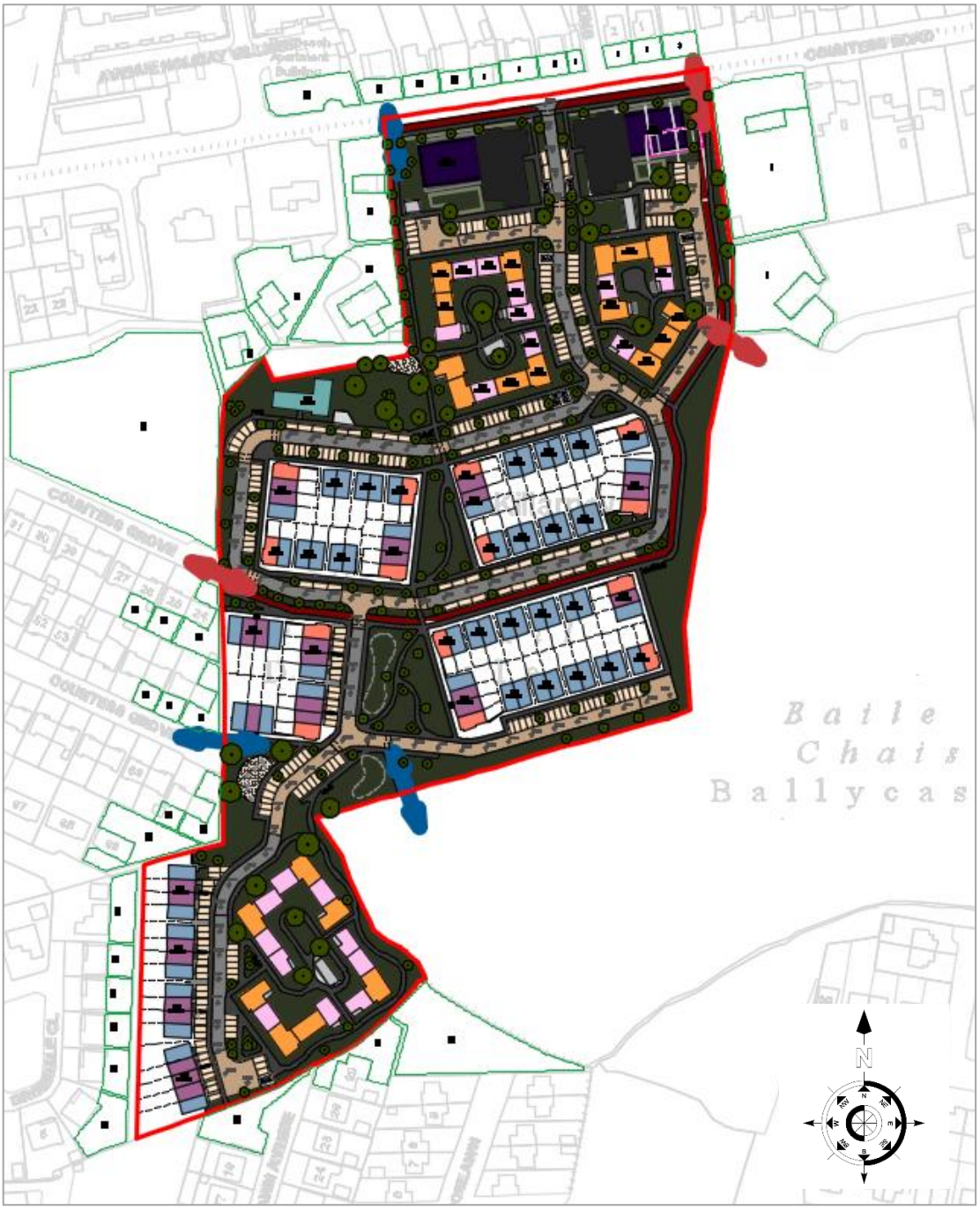



Image 6.9: Sunlight impact: Existing neighbouring amenity spaces. Overall view.




Image 6.10: Sunlight impact: Existing neighbouring amenity spaces. Receptor no.1-18.




Image 6.11: Sunlight impact: Existing neighbouring amenity spaces. Receptor no.19-36.

| Receptor | Location / Address | Amenity description | Approx. area ($m^2$) |
|---|---|---|---|
| 1 | Broom Cottage, Rookery Road, Killarney, Co. Kerry | Private garden space | 1,250 |
| 2 | Shephard House, Countess Road, Killarney, Co. Kerry | Private garden space | 2,300 |
| 3 | Countess Road, Killarney, Co. Kerry | Private garden space | 140 |
| 4 | 1 Aisling Gardens, Countess Road, Killarney, Co. Kerry | Private garden space | 110 |
| 5 | 2 Aisling Gardens, Countess Road, Killarney, Co. Kerry | Private garden space | 110 |
| 6 | Countess Road, Killarney, Co. Kerry | Private garden space | 55 |
| 7 | Countess Road, Killarney, Co. Kerry | Private garden space | 105 |
| 8 | Donlara, Countess Road, Killarney, Co. Kerry | Private garden space | 140 |
| 9 | Sonas, Countess Road, Killarney, Co. Kerry | Private garden space | 95 |
| 10 | Countess Road, Killarney, Co. Kerry | Private garden space | 100 |
| 11 | Ailesbury, Countess Road, Killarney, Co. Kerry | Private garden space | 135 |
| 12 | Lia Fail, Countess Road, Killarney, Co. Kerry | Communal open space | 160 |
| 13 | The Beech, Countess Rd, Killarney, Co. Kerry | Private garden space | 500 |
| 14 | Innisfallen, Countess Road, Killarney, Co. Kerry | Private garden space | 770 |
| 15 | Mountain View, Countess Road, Killarney, Co. Kerry | Private garden space | 1,100 |
| 16 | Countess Road, Killarney, Co. Kerry | Private garden space | 950 |
| 17 | The Bungalow, Countess Grove, Killarney, Co. Kerry | Private garden space | 400 |
| 18 | Countess Grove, Killarney, Co. Kerry | Communal open space | 5,500 |
| 19 | 24 Countess Grove, Killarney, Co. Kerry | Private garden space | 300 |
| 20 | 25 Countess Grove, Killarney, Co. Kerry | Private garden space | 125 |
| 21 | 26 Countess Grove, Killarney, Co. Kerry | Private garden space | 125 |
| 22 | 57 Countess Grove, Killarney, Co. Kerry | Private garden space | 240 |
| 23 | 58 Countess Grove, Killarney, Co. Kerry | Private garden space | 100 |
| 24 | 59 Countess Grove, Killarney, Co. Kerry | Private garden space | 100 |
| 25 | 60 Countess Grove, Killarney, Co. Kerry | Private garden space | 250 |
| 26 | 61 Countess Grove, Killarney, Co. Kerry | Private garden space | 85 |
| 27 | 89 Countess Grove, Killarney, Co. Kerry | Private garden space | 540 |
| 28 | 11 Dromhale Close, Killarney, Co. Kerry | Private garden space | 290 |
| 29 | 10 Dromhale Close, Killarney, Co. Kerry | Private garden space | 140 |
| 30 | 9 Dromhale Close, Killarney, Co. Kerry | Private garden space | 140 |
| 31 | 8 Dromhale Close, Killarney, Co. Kerry | Private garden space | 140 |
| 32 | 7 Dromhale Close, Killarney, Co. Kerry | Private garden space | 190 |
| 33 | 6 Dromhale Close, Killarney, Co. Kerry | Private garden space | 350 |
| 34 | Deireadh Coille, Woodlawn, Killarney, Co. Kerry | Communal open space | 500 |
| 35 | 30 Deireadh Coille, Woodlawn, Killarney, Co. Kerry | Private garden space | 400 |
| 36 | Deireadh Coille, Woodlawn, Killarney, Co. Kerry | Communal open space | 1,500 |

Table 6.3: Sunlight impact: List of existing neighbouring amenity spaces.

## 6.5 Calculation result table

The table below provides a summary of the calculation results of the selected amenity space before and after the introduction of the new proposed development. Under the BRE guidelines any loss of sunlight in existing neighbouring amenity spaces as a result of the new development should not be greater than 0.8 times (maximum 20% reduction) its former size. The column named comment/effect describes the level of effect an assessed window will experience, based on its compliance with the BRE target. A list of definitions can be found in the section 4.8 of this report. Appendix D provides the full calculation results of the amenity areas. To identify the status of the change factor the following colour code guide is used depending on its level of resulting compliance status.

Compliance guide

| | | |
|---|---|---|
| ☑ | 0% | Over /equal to |
| ☑ | 5% | Within |
| !! | 10% | Within |
| x | 10% | In excess of |

| Amenity space ID | Amenity space area (m²) | EXISTING STATUS | | | NEW STATUS | | | Change factor | Comment / effect of proposed development |
|---|---|---|---|---|---|---|---|---|---|
| | | sun hours * amenity space area (Sun Hr*m²) | total sun hours (Sun Hr) | sun hours on 50% of the area | sun hours * amenity space area (Sun Hr*m²) | total sun hours (Sun Hr) | sun hours on 50% of the area | | |
| 1 | 1,250 | 579750 | 7.73 | 10.0 | 537750 | 7.17 | 9.0 | 0.93 | Negligible |
| 2 | 2,300 | 1224060 | 8.87 | 11.0 | 1132980 | 8.21 | 10.0 | 0.93 | Negligible |
| 3 | 140 | 77364 | 9.21 | 11.0 | 77364 | 9.21 | 11.0 | 1.00 | Negligible |
| 4 | 110 | 60786 | 9.21 | 11.0 | 60786 | 9.21 | 11.0 | 1.00 | Negligible |
| 5 | 110 | 60786 | 9.21 | 11.0 | 60786 | 9.21 | 11.0 | 1.00 | Negligible |
| 6 | 55 | 30393 | 9.21 | 11.0 | 30162 | 9.14 | 11.0 | 1.00 | Negligible |
| 7 | 105 | 58023 | 9.21 | 11.0 | 57393 | 9.11 | 11.0 | 0.99 | Negligible |
| 8 | 140 | 77364 | 9.21 | 11.0 | 76608 | 9.12 | 11.0 | 1.00 | Negligible |
| 9 | 95 | 52497 | 9.21 | 11.0 | 50160 | 8.80 | 10.0 | 0.96 | Negligible |
| 10 | 100 | 55260 | 9.21 | 11.0 | 51900 | 8.65 | 10.0 | 0.94 | Negligible |
| 11 | 135 | 74601 | 9.21 | 11.0 | 70308 | 8.68 | 10.0 | 0.95 | Negligible |
| 12 | 160 | 88416 | 9.21 | 11.0 | 83328 | 8.68 | 10.0 | 0.95 | Negligible |
| 13 | 500 | 276300 | 9.21 | 11.0 | 263700 | 8.79 | 11.0 | 0.96 | Negligible |
| 14 | 770 | 397320 | 8.60 | 11.0 | 350196 | 7.58 | 9.0 | 0.89 | Negligible |
| 15 | 1,100 | 510180 | 7.73 | 10.0 | 454740 | 6.89 | 9.0 | 0.90 | Negligible |
| 16 | 950 | 416670 | 7.31 | 8.0 | 399570 | 7.01 | 8.0 | 0.96 | Negligible |
| 17 | 400 | 177840 | 7.41 | 9.0 | 170160 | 7.09 | 9.0 | 0.96 | Negligible |
| 18 | 5,500 | 3187800 | 9.66 | 12.0 | 3012900 | 9.13 | 11.0 | 0.95 | Negligible |
| 19 | 300 | 128340 | 7.13 | 9.0 | 111600 | 6.20 | 7.0 | 0.87 | Negligible |
| 20 | 125 | 65025 | 8.67 | 10.0 | 62325 | 8.31 | 10.0 | 0.96 | Negligible |
| 21 | 125 | 65025 | 8.67 | 10.0 | 62325 | 8.31 | 10.0 | 0.96 | Negligible |
| 22 | 240 | 102672 | 7.13 | 9.0 | 88992 | 6.18 | 7.0 | 0.87 | Negligible |
| 23 | 100 | 52020 | 8.67 | 10.0 | 49020 | 8.17 | 10.0 | 0.95 | Negligible |
| 24 | 100 | 52020 | 8.67 | 10.0 | 49020 | 8.17 | 10.0 | 0.95 | Negligible |
| 25 | 250 | 106950 | 7.13 | 9.0 | 105450 | 7.03 | 9.0 | 0.99 | Negligible |
| 26 | 85 | 44217 | 8.67 | 10.0 | 44217 | 8.67 | 10.0 | 1.00 | Negligible |
| 27 | 540 | 231012 | 7.13 | 9.0 | 210276 | 6.49 | 8.0 | 0.92 | Negligible |
| 28 | 290 | 139374 | 8.01 | 10.0 | 117276 | 6.74 | 8.0 | 0.85 | Negligible |
| 29 | 140 | 67284 | 8.01 | 10.0 | 56616 | 6.74 | 8.0 | 0.85 | Negligible |
| 30 | 140 | 67284 | 8.01 | 10.0 | 56616 | 6.74 | 8.0 | 0.85 | Negligible |
| 31 | 140 | 67284 | 8.01 | 10.0 | 56616 | 6.74 | 8.0 | 0.85 | Negligible |
| 32 | 190 | 91314 | 8.01 | 10.0 | 77064 | 6.76 | 8.0 | 0.85 | Negligible |
| 33 | 350 | 168210 | 8.01 | 10.0 | 164010 | 7.81 | 9.0 | 0.98 | Negligible |
| 34 | 500 | 246900 | 8.23 | 10.0 | 243900 | 8.13 | 10.0 | 0.99 | Negligible |
| 35 | 400 | 185520 | 7.73 | 10.0 | 178560 | 7.44 | 9.0 | 0.97 | Negligible |
| 36 | 1,500 | 828900 | 9.21 | 12.0 | 801900 | 8.91 | 11.0 | 0.97 | Negligible |

Table 6.4: Calculation results: summary table of sunlight impact of existing neighbouring amenity spaces.

### 6.6 Impact on sunlight reception conclusion

Based on the BRE guidelines at least 50% of the amenity space should receive at least two hours of sunlight on the 21st of March and that and any loss of sunlight should not be greater than 0.80 (20% reduction) times its former size. From the calculation results we note that all the existing amenity spaces received 2 hours of sunlight or more on at least 50% of the area before and after the introduction of the new development. Summary of results are as follows (see image 6.9-6.11 for receptor locations):

- East receptors: Receptor no. 1 and 2 are private amenity spaces to houses on Countess Road. The receptors resulted in a change factor of 0.93. The change happens in the late afternoon hours of 16.00-19.00. The calculation findings are within the guidelines, and the effect is determined as 'negligible' under BRE definitions.
- North receptors: Receptor no. 3 to 13 are private amenity spaces to houses opposite the development site entrance on Countess Road. Receptor no. 3, 4, 5, 6 and 8 resulted in a change factor of 1.00, meaning the new proposed development will have no sunlight impact on the existing area. Receptor no. 7 and receptor 9 to 13 resulted in a change factor range of 0.94 to 0.99. The change happens in the morning hours of 08.00-11.00. The calculation findings are comfortably within guidelines, and the effect is determined as 'negligible' under BRE definitions.
- West receptors: Receptor no. 14 to 33 are private amenity spaces to individual dwellings. The receptors resulted in a change factor range of 0.85 to 0.99. The calculation findings are also well within the guidelines, and the effect is determined as 'negligible' under BRE definitions. Receptor no. 26 resulted in a change factor of 1.00, meaning the new proposed development will have no sunlight impact on the area.
- South receptors: Receptor no. 34 to 36 are private amenity spaces to dwellings in Deireadh Coille estate. The receptors resulted in a change factor range of 0.97 to 0.99. The calculation findings are comfortably within the guidelines, and the effect is determined as 'negligible' under BRE definitions.
- Overall, the average change ratio is 0.94.

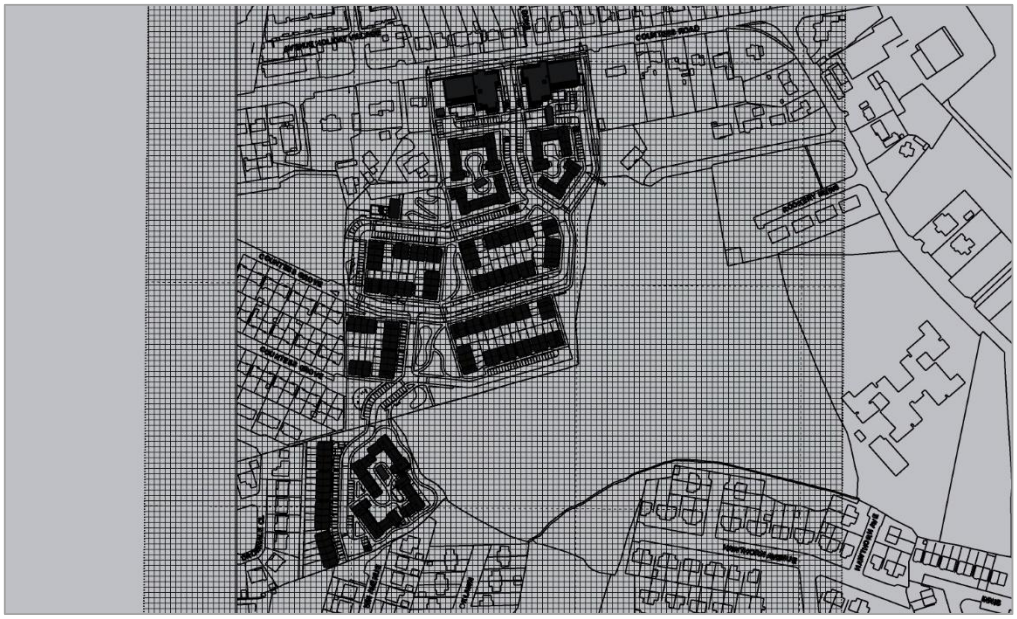
We conclude that the new proposed development's effect on sunlight reception in the neighbouring amenity areas is all within the constraints and minimum recommendations of the BRE Report – Site Layout and Planning for Daylight and Sunlight BR209 2022, and we therefore deem the proposed development to be compliant with this element.

# Appendix A

Sunlight analysis illustrations: plotted in one hourly illustration time frames for March 21st (Spring equinox).

Proposed status: 06:00 to 19:00 hours.

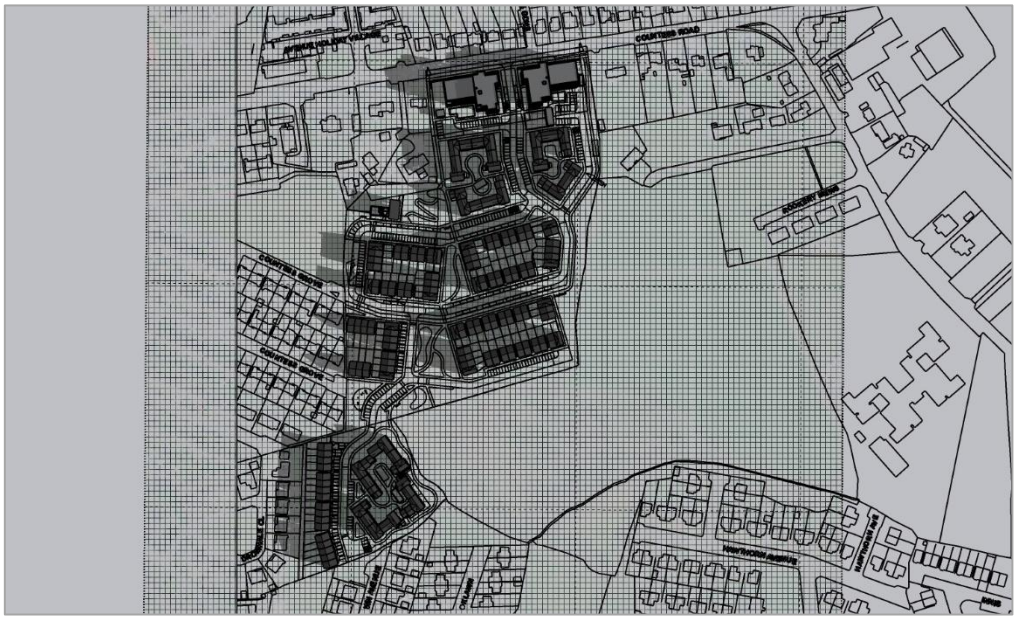
06.00 March 21st



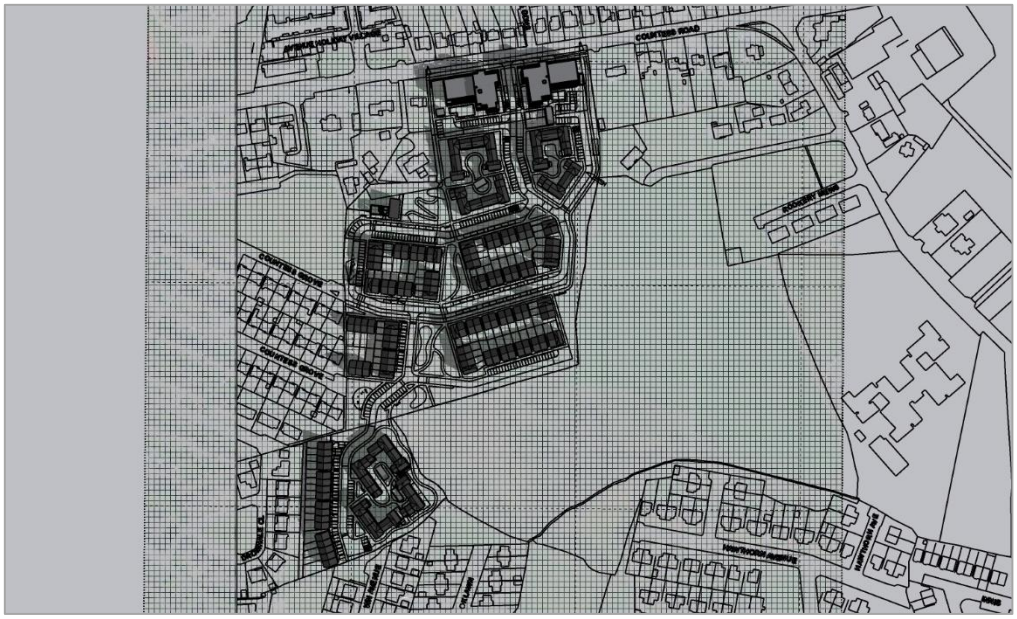
07.00 March 21st



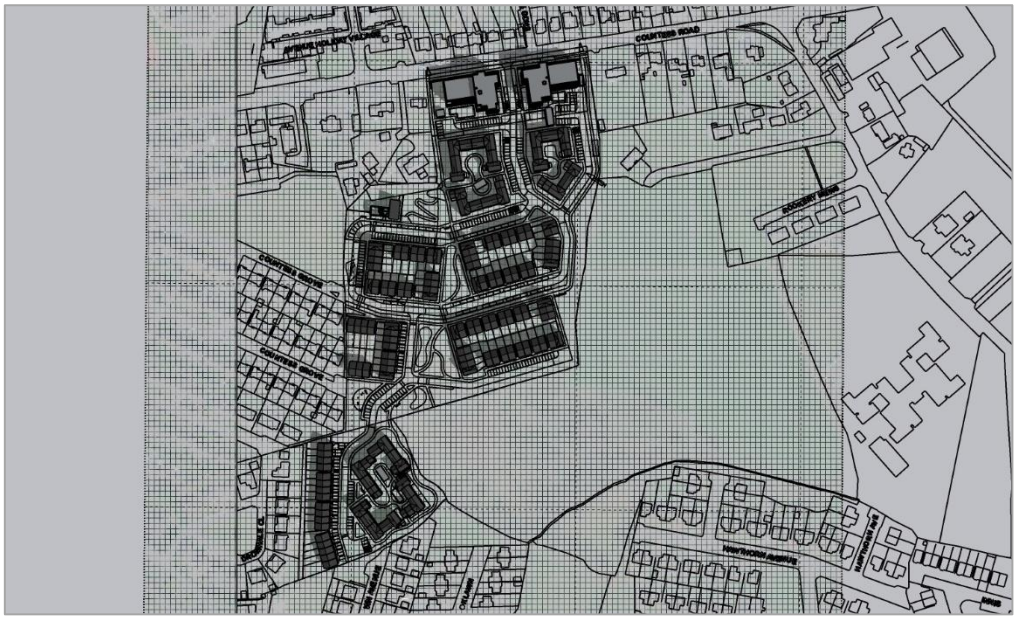
08.00 March 21st



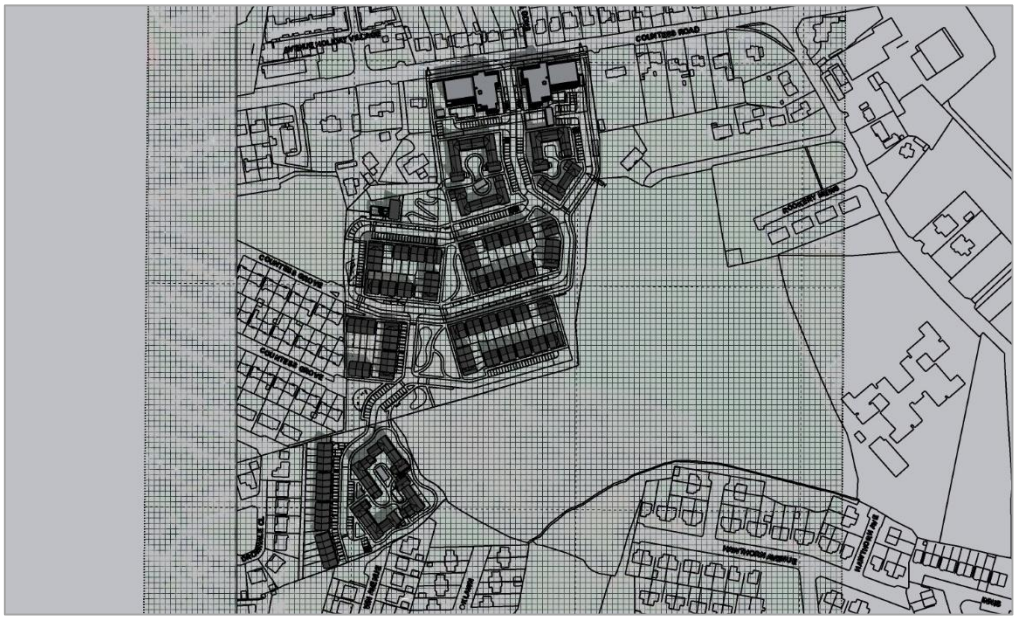
09.00 March 21st



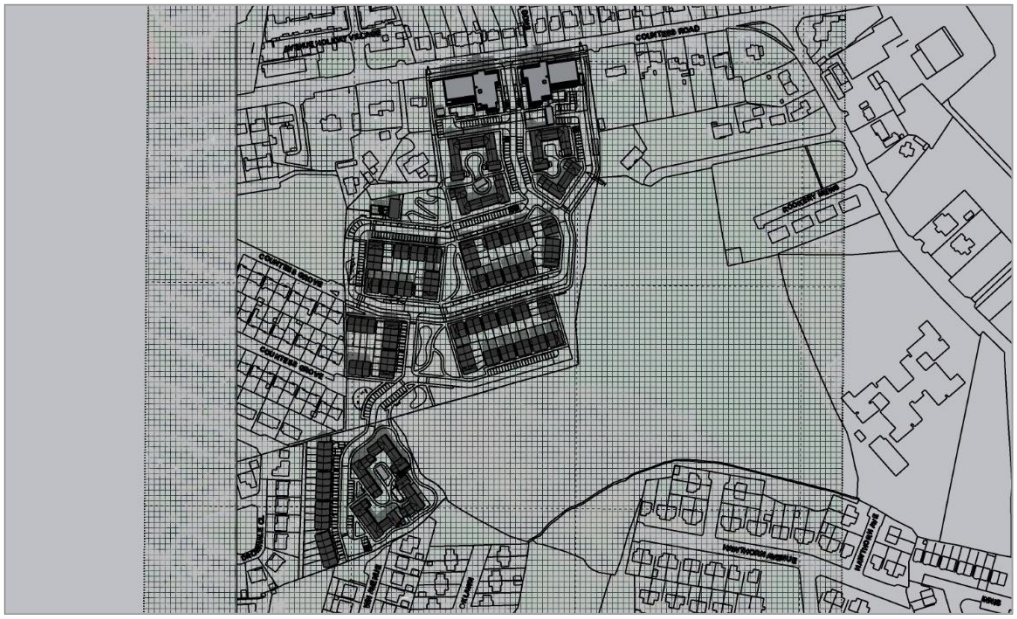
10.00 March 21st



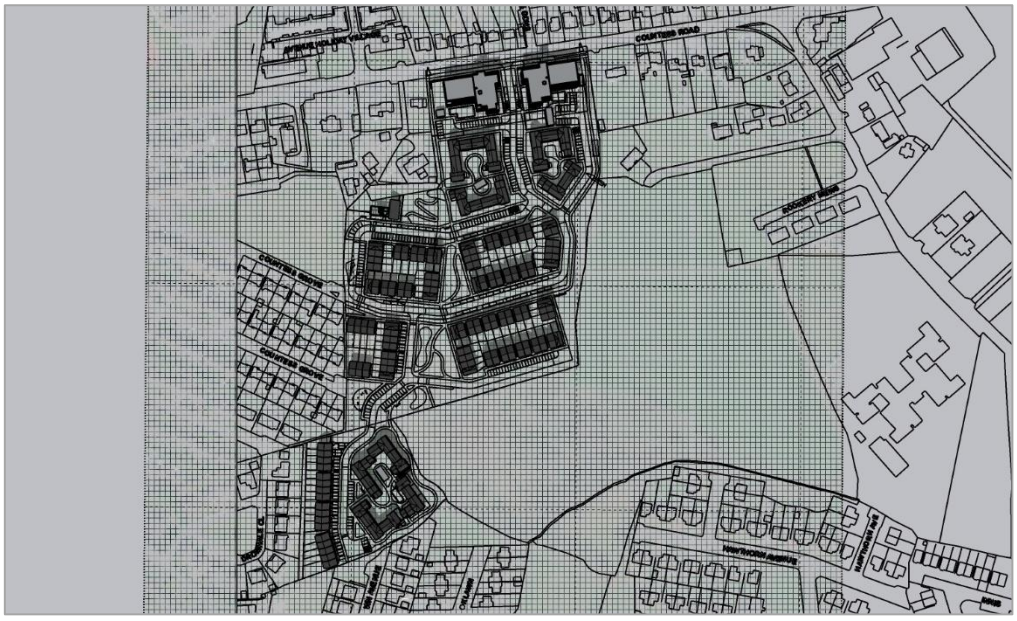
11.00 March 21st



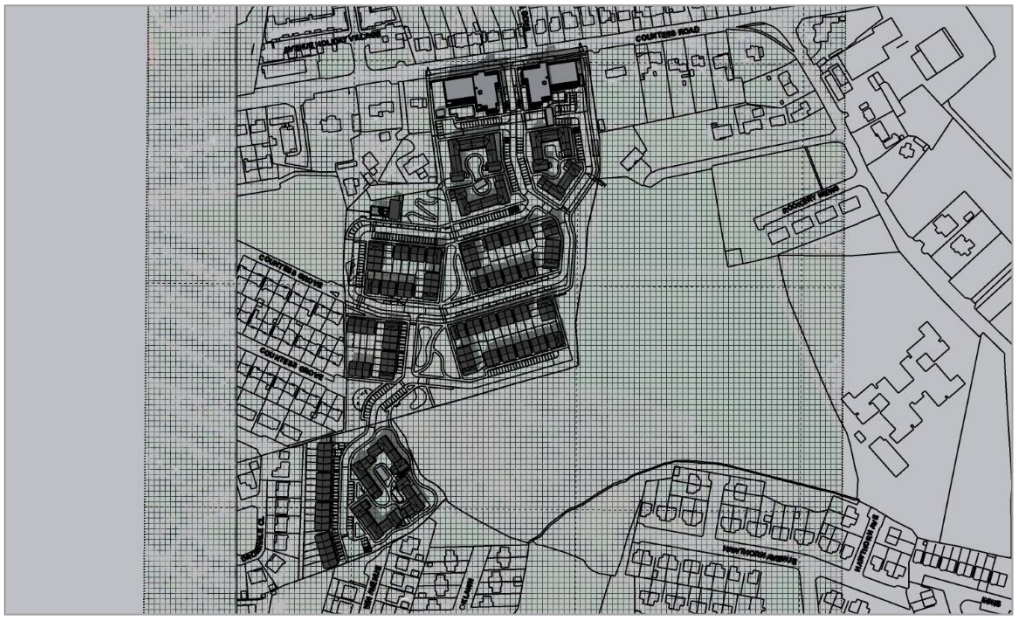

12.00 March 21st



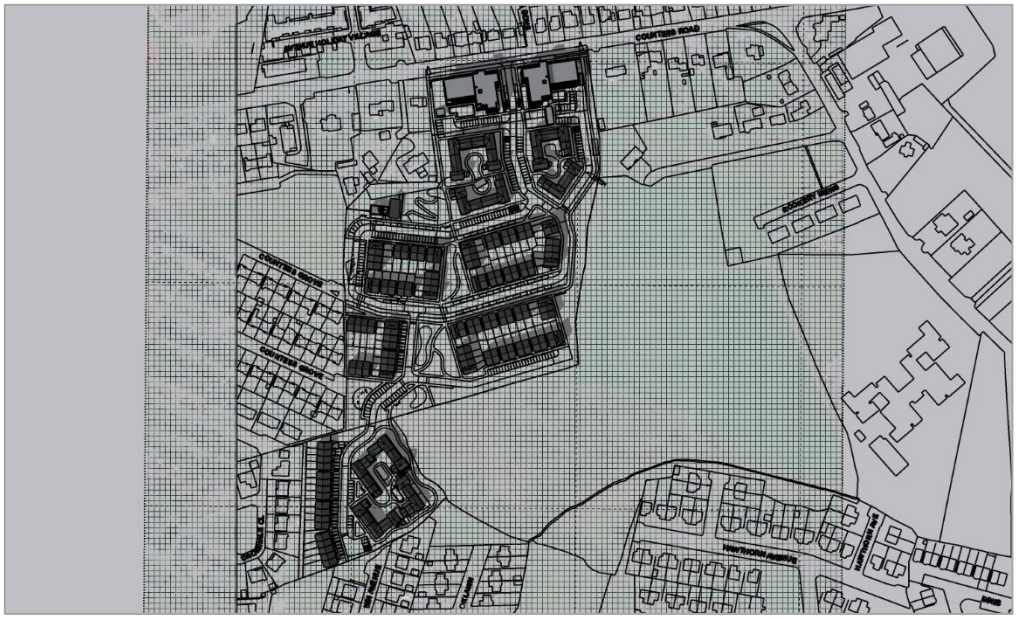

13.00 March 21st



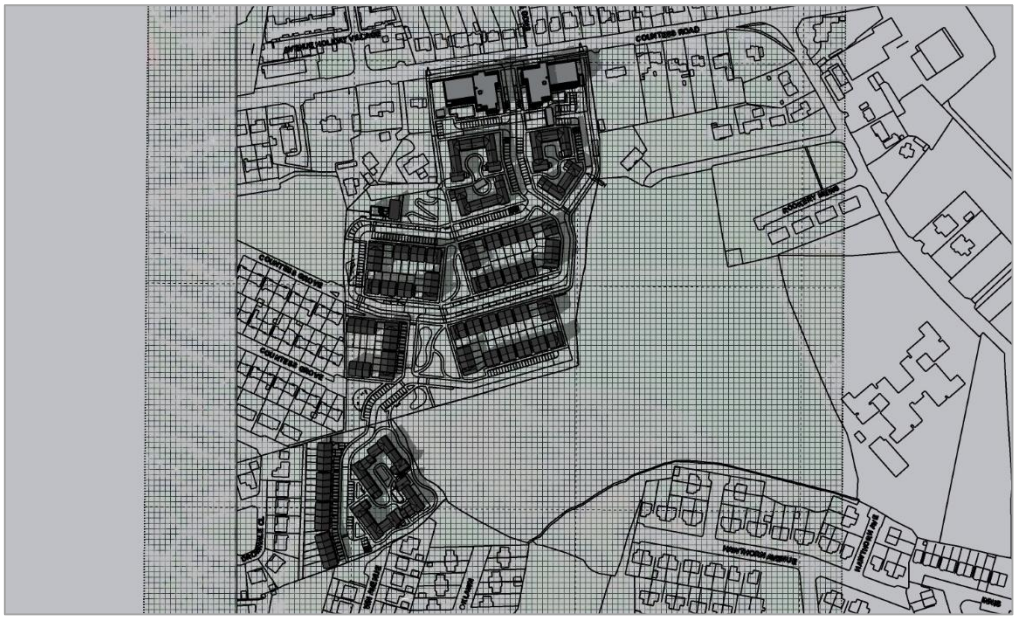
14.00 March 21st



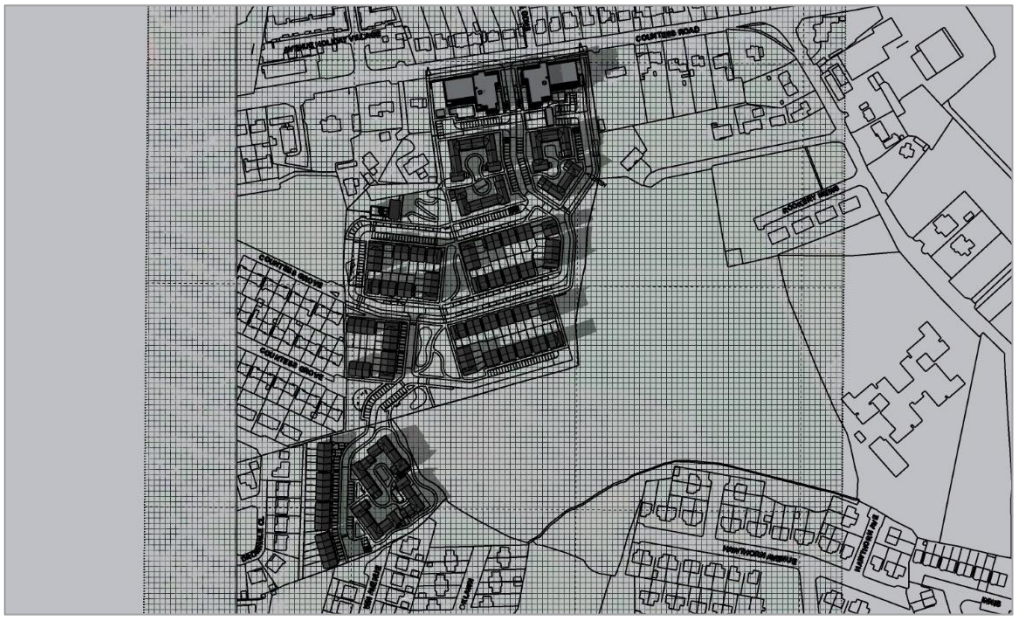

15.00 March 21st




16.00 March 21st



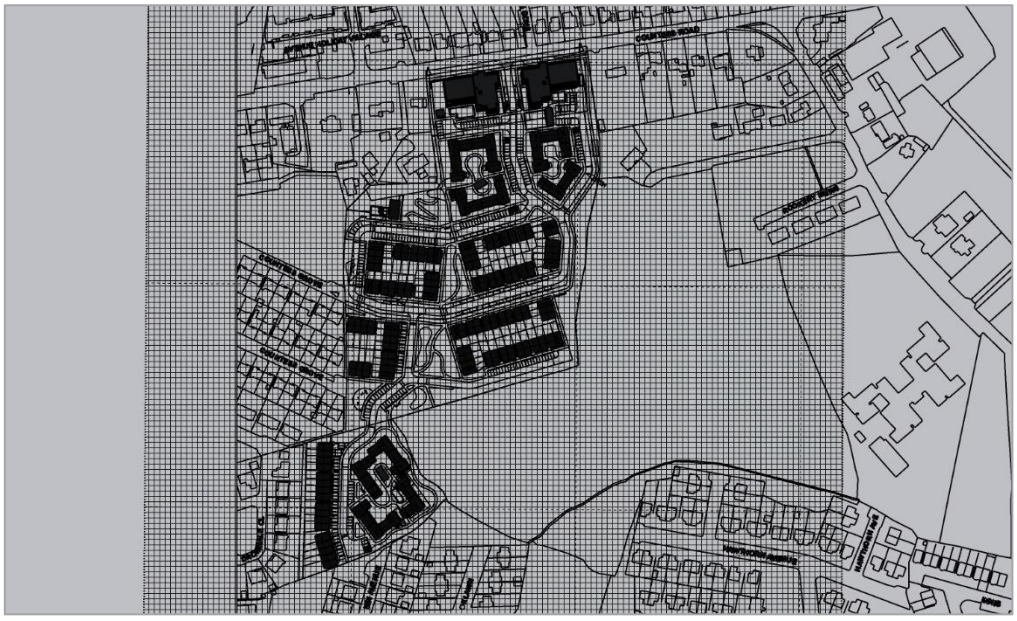
17.00 March 21st



18.00 March 21st



19.00 March 21st



# Appendix B

Sunlight calculation results of the developments proposed amenity areas providing the overall hours of sunlight on March 21st together with the recommended BRE sunlight standards.

**A** 861.40 m2

NEW STATUS March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | Sun time.area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 67% | 33% | 60 | 284 | 17,056 |
| 8.00 | 16% | 84% | 60 | 724 | 43,415 |
| 9.00 | 16% | 84% | 60 | 724 | 43,415 |
| 10.00 | 16% | 84% | 60 | 724 | 43,415 |
| 11.00 | 16% | 84% | 60 | 724 | 43,415 |
| 12.00 | 16% | 84% | 60 | 724 | 43,415 |
| 13.00 | 16% | 84% | 60 | 724 | 43,415 |
| 14.00 | 16% | 84% | 60 | 724 | 43,415 |
| 15.00 | 24% | 76% | 60 | 655 | 39,280 |
| 16.00 | 44% | 56% | 60 | 482 | 28,943 |
| 17.00 | 68% | 32% | 60 | 276 | 16,539 |
| 18.00 | 73% | 27% | 60 | 233 | 13,955 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area 2
Achieved sun hours on @ 50% area 9.00
Achieved total sun time (hrs) 8.12
Achieved daily sun time * area 419674

**B** 887.50 m2

NEW STATUS March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | Sun time.area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 71% | 29% | 60 | 257 | 15,443 |
| 8.00 | 16% | 84% | 60 | 746 | 44,730 |
| 9.00 | 16% | 84% | 60 | 746 | 44,730 |
| 10.00 | 16% | 84% | 60 | 746 | 44,730 |
| 11.00 | 16% | 84% | 60 | 746 | 44,730 |
| 12.00 | 16% | 84% | 60 | 746 | 44,730 |
| 13.00 | 16% | 84% | 60 | 746 | 44,730 |
| 14.00 | 16% | 84% | 60 | 746 | 44,730 |
| 15.00 | 16% | 84% | 60 | 746 | 44,730 |
| 16.00 | 16% | 84% | 60 | 746 | 44,730 |
| 17.00 | 16% | 84% | 60 | 746 | 44,730 |
| 18.00 | 61% | 39% | 60 | 346 | 20,768 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area 2
Achieved sun hours on @ 50% area 10.00
Achieved total sun time (hrs) 9.08
Achieved daily sun time * area 483510

**G** 757.10 m2

NEW STATUS March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | Sun time.area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 |
| 8.00 | 100% | 0% | 60 | 0 | 0 |
| 9.00 | 86% | 14% | 60 | 106 | 6,360 |
| 10.00 | 56% | 44% | 60 | 333 | 19,987 |
| 11.00 | 46% | 54% | 60 | 409 | 24,530 |
| 12.00 | 45% | 55% | 60 | 416 | 24,984 |
| 13.00 | 42% | 58% | 60 | 439 | 26,347 |
| 14.00 | 40% | 60% | 60 | 454 | 27,256 |
| 15.00 | 40% | 60% | 60 | 454 | 27,256 |
| 16.00 | 59% | 41% | 60 | 310 | 18,625 |
| 17.00 | 89% | 11% | 60 | 83 | 4,997 |
| 18.00 | 100% | 0% | 60 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area 2
Achieved sun hours on @ 50% area 5.00
Achieved total sun time (hrs) 3.97
Achieved daily sun time * area 180341

**H** 328.80 m2

NEW STATUS March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | Sun time.area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 |
| 8.00 | 100% | 0% | 60 | 0 | 0 |
| 9.00 | 100% | 0% | 60 | 0 | 0 |
| 10.00 | 80% | 20% | 60 | 66 | 3,946 |
| 11.00 | 59% | 41% | 60 | 135 | 8,088 |
| 12.00 | 49% | 51% | 60 | 168 | 10,061 |
| 13.00 | 49% | 51% | 60 | 168 | 10,061 |
| 14.00 | 49% | 51% | 60 | 168 | 10,061 |
| 15.00 | 61% | 39% | 60 | 128 | 7,694 |
| 16.00 | 76% | 24% | 60 | 79 | 4,735 |
| 17.00 | 80% | 20% | 60 | 66 | 3,946 |
| 18.00 | 100% | 0% | 60 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area 2
Achieved sun hours on @ 50% area 3.00
Achieved total sun time (hrs) 2.97
Achieved daily sun time * area 58592

**C** 1300.80 m2

NEW STATUS March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | Sun time.area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 93% | 7% | 60 | 91 | 5,463 |
| 8.00 | 87% | 13% | 60 | 169 | 10,146 |
| 9.00 | 34% | 66% | 60 | 859 | 51,512 |
| 10.00 | 20% | 80% | 60 | 1041 | 62,438 |
| 11.00 | 16% | 84% | 60 | 1093 | 65,560 |
| 12.00 | 16% | 84% | 60 | 1093 | 65,560 |
| 13.00 | 16% | 84% | 60 | 1093 | 65,560 |
| 14.00 | 16% | 84% | 60 | 1093 | 65,560 |
| 15.00 | 16% | 84% | 60 | 1093 | 65,560 |
| 16.00 | 16% | 84% | 60 | 1093 | 65,560 |
| 17.00 | 23% | 77% | 60 | 1002 | 60,097 |
| 18.00 | 90% | 10% | 60 | 130 | 7,805 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area 2
Achieved sun hours on @ 50% area 9.00
Achieved total sun time (hrs) 7.57
Achieved daily sun time * area 590823

**D** 1421.30 m2

NEW STATUS March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | Sun time.area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 61% | 39% | 60 | 554 | 33,258 |
| 8.00 | 46% | 54% | 60 | 768 | 46,050 |
| 9.00 | 16% | 84% | 60 | 1194 | 71,634 |
| 10.00 | 16% | 84% | 60 | 1194 | 71,634 |
| 11.00 | 16% | 84% | 60 | 1194 | 71,634 |
| 12.00 | 16% | 84% | 60 | 1194 | 71,634 |
| 13.00 | 16% | 84% | 60 | 1194 | 71,634 |
| 14.00 | 16% | 84% | 60 | 1194 | 71,634 |
| 15.00 | 19% | 81% | 60 | 1151 | 69,075 |
| 16.00 | 25% | 75% | 60 | 1066 | 63,959 |
| 17.00 | 59% | 41% | 60 | 583 | 34,964 |
| 18.00 | 67% | 33% | 60 | 469 | 28,142 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area 2
Achieved sun hours on @ 50% area 9.00
Achieved total sun time (hrs) 8.27
Achieved daily sun time * area 705249

**I** 553.40 m2

NEW STATUS March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | Sun time.area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 |
| 8.00 | 100% | 0% | 60 | 0 | 0 |
| 9.00 | 89% | 11% | 60 | 61 | 3,652 |
| 10.00 | 68% | 32% | 60 | 177 | 10,625 |
| 11.00 | 57% | 43% | 60 | 238 | 14,278 |
| 12.00 | 43% | 57% | 60 | 315 | 18,926 |
| 13.00 | 43% | 57% | 60 | 315 | 18,926 |
| 14.00 | 49% | 51% | 60 | 282 | 16,934 |
| 15.00 | 59% | 41% | 60 | 227 | 13,614 |
| 16.00 | 70% | 30% | 60 | 166 | 9,961 |
| 17.00 | 91% | 9% | 60 | 50 | 2,988 |
| 18.00 | 100% | 0% | 60 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area 2
Achieved sun hours on @ 50% area 3.00
Achieved total sun time (hrs) 3.31
Achieved daily sun time * area 109905

**J** 255.80 m2

NEW STATUS March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | Sun time.area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 |
| 8.00 | 100% | 0% | 60 | 0 | 0 |
| 9.00 | 88% | 12% | 60 | 31 | 1,842 |
| 10.00 | 66% | 34% | 60 | 87 | 5,218 |
| 11.00 | 56% | 44% | 60 | 113 | 6,753 |
| 12.00 | 44% | 56% | 60 | 143 | 8,595 |
| 13.00 | 37% | 63% | 60 | 161 | 9,669 |
| 14.00 | 37% | 63% | 60 | 161 | 9,669 |
| 15.00 | 26% | 74% | 60 | 189 | 11,358 |
| 16.00 | 16% | 84% | 60 | 215 | 12,892 |
| 17.00 | 21% | 79% | 60 | 202 | 12,125 |
| 18.00 | 64% | 36% | 60 | 92 | 5,525 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area 2
Achieved sun hours on @ 50% area 6.00
Achieved total sun time (hrs) 5.45
Achieved daily sun time * area 83647

**E** 911.50 m2

NEW STATUS March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | Sun time.area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 98% | 2% | 60 | 18 | 1,094 |
| 8.00 | 78% | 22% | 60 | 201 | 12,032 |
| 9.00 | 46% | 54% | 60 | 492 | 29,533 |
| 10.00 | 21% | 79% | 60 | 720 | 43,205 |
| 11.00 | 16% | 84% | 60 | 766 | 45,940 |
| 12.00 | 16% | 84% | 60 | 766 | 45,940 |
| 13.00 | 16% | 84% | 60 | 766 | 45,940 |
| 14.00 | 16% | 84% | 60 | 766 | 45,940 |
| 15.00 | 19% | 81% | 60 | 738 | 44,299 |
| 16.00 | 45% | 55% | 60 | 501 | 30,080 |
| 17.00 | 86% | 14% | 60 | 128 | 7,657 |
| 18.00 | 91% | 9% | 60 | 82 | 4,922 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area 2
Achieved sun hours on @ 50% area 8.00
Achieved total sun time (hrs) 6.52
Achieved daily sun time * area 356579

**F** 1051.50 m2

NEW STATUS March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | Sun time.area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 |
| 8.00 | 31% | 69% | 60 | 726 | 43,532 |
| 9.00 | 20% | 80% | 60 | 841 | 50,472 |
| 10.00 | 16% | 84% | 60 | 883 | 52,996 |
| 11.00 | 16% | 84% | 60 | 883 | 52,996 |
| 12.00 | 16% | 84% | 60 | 883 | 52,996 |
| 13.00 | 16% | 84% | 60 | 883 | 52,996 |
| 14.00 | 16% | 84% | 60 | 883 | 52,996 |
| 15.00 | 18% | 82% | 60 | 862 | 51,734 |
| 16.00 | 22% | 78% | 60 | 820 | 49,210 |
| 17.00 | 43% | 57% | 60 | 599 | 35,961 |
| 18.00 | 87% | 13% | 60 | 137 | 8,202 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area 2
Achieved sun hours on @ 50% area 10.00
Achieved total sun time (hrs) 7.99
Achieved daily sun time * area 504089

**K** 285.90 m2

NEW STATUS March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | Sun time.area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 70% | 30% | 60 | 86 | 5,146 |
| 8.00 | 21% | 79% | 60 | 226 | 13,552 |
| 9.00 | 16% | 84% | 60 | 240 | 14,409 |
| 10.00 | 16% | 84% | 60 | 240 | 14,409 |
| 11.00 | 16% | 84% | 60 | 240 | 14,409 |
| 12.00 | 16% | 84% | 60 | 240 | 14,409 |
| 13.00 | 16% | 84% | 60 | 240 | 14,409 |
| 14.00 | 16% | 84% | 60 | 240 | 14,409 |
| 15.00 | 23% | 77% | 60 | 220 | 13,209 |
| 16.00 | 26% | 74% | 60 | 212 | 12,694 |
| 17.00 | 48% | 52% | 60 | 149 | 8,920 |
| 18.00 | 90% | 10% | 60 | 29 | 1,715 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area 2
Achieved sun hours on @ 50% area 10.00
Achieved total sun time (hrs) 8.26
Achieved daily sun time * area 141692

# Appendix C

Daylight calculation results of existing VSC and the VSC after the introduction of the new proposed development.

| **Receptor 1** | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 33 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC |
| Target distance 33m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 87 | 2 | 93 | 2 | | | | | 180 | 37% | 17 | 8 | 64 | 14 | 42 | 6 | 57 | 2 | 180 | 34% | 0.93 |

| **Receptor 2** | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 33 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC |
| Target distance 34m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 53 | 7 | 127 | 5 | | | | | 180 | 35% | 53 | 7 | 14 | 5 | 35 | 9 | 78 | 16 | 180 | 33% | 0.93 |

| **Receptor 3** | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC |
| Target distance 20m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 94 | 8 | 86 | 2 | | | | | 180 | 35% | 115 | 8 | 17 | 2 | 38 | 13 | 10 | 25 | 180 | 34% | 0.95 |

| **Receptor 4** | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC |
| Target distance 19m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 73 | 8 | 107 | 4 | | | | | 180 | 35% | 58 | 8 | 48 | 33 | 54 | 11 | 20 | 4 | 180 | 31% | 0.88 |

| **Receptor 5** | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC |
| Target distance 20m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 145 | 10 | 35 | 4 | | | | | 180 | 34% | 20 | 24 | 25 | 4 | 135 | 10 | | | 180 | 33% | 0.98 |

| **Receptor 6** | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC |
| Target distance 34m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 82 | 10 | 98 | 2 | | | | | 180 | 35% | 82 | 10 | 37 | 2 | 49 | 20 | 12 | 8 | 180 | 33% | 0.94 |

| **Receptor 7** | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC |
| Target distance 32m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 77 | 10 | 103 | 2 | | | | | 180 | 35% | 77 | 10 | 38 | 2 | 52 | 20 | 13 | 8 | 180 | 33% | 0.93 |

| **Receptor 8** | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC |
| Target distance 29m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 80 | 9 | 100 | 2 | | | | | 180 | 35% | 80 | 9 | 59 | 21 | 16 | 8 | 25 | 2 | 180 | 33% | 0.93 |

| **Receptor 9** | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC |
| Target distance 29m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 78 | 9 | 102 | 2 | | | | | 180 | 35% | 78 | 9 | 62 | 21 | 17 | 8 | 23 | 2 | 180 | 32% | 0.92 |

| **Receptor 10** | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC |
| Target distance 28m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 77 | 9 | 103 | 2 | | | | | 180 | 36% | 77 | 9 | 64 | 21 | 18 | 8 | 21 | 2 | 180 | 32% | 0.91 |

| **Receptor 11** | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC |
| Target distance 28m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 72 | 8 | 108 | 2 | | | | | 180 | 36% | 65 | 8 | 73 | 23 | 26 | 11 | 16 | 2 | 180 | 32% | 0.90 |

| **Receptor 12** | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC |
| Target distance 28m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 71 | 8 | 109 | 2 | | | | | 180 | 36% | 64 | 8 | 74 | 23 | 27 | 11 | 15 | 2 | 180 | 31% | 0.89 |

| **Receptor 13** | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor l | ∑ VSC |
| Target distance 30m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 72 | 2 | 95 | 22 | 13 | 6 | | | 180 | 32% | 72 | 21 | 95 | 22 | 13 | 6 | | | 180 | 29% | 0.90 |

| Receptor 14 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 28m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 65 | 7 | 115 | 2 | | | | | 180 | 36% | 46 | 7 | 77 | 23 | 37 | 12 | 20 | 2 | 180 | 31% | 0.88 |

| Receptor 15 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 28m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 64 | 7 | 116 | 2 | | | | | 180 | 36% | 45 | 7 | 78 | 23 | 38 | 12 | 19 | 2 | 180 | 31% | 0.88 |

| Receptor 16 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 30m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 75 | 2 | 105 | 18 | | | | | 180 | 33% | 75 | 21 | 105 | 18 | | | | | 180 | 29% | 0.90 |

| Receptor 17 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 32m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 75 | 4 | 105 | 21 | | | | | 180 | 32% | 57 | 21 | 18 | 4 | 105 | 21 | | | 180 | 29% | 0.92 |

| Receptor 18 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 30m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 127 | 2 | 53 | 5 | | | | | 180 | 36% | 54 | 21 | 24 | 5 | 49 | 19 | 53 | 5 | 180 | 32% | 0.88 |

| Receptor 19 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 31m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 127 | 2 | 53 | 5 | | | | | 180 | 36% | 55 | 21 | 23 | 5 | 50 | 19 | 52 | 5 | 180 | 32% | 0.88 |

| Receptor 20 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 29m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 72 | 2 | 108 | 4 | | | | | 180 | 36% | 47 | 17 | 22 | 5 | 57 | 21 | 54 | 5 | 180 | 32% | 0.89 |

| Receptor 21 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 29m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 72 | 2 | 108 | 4 | | | | | 180 | 36% | 46 | 17 | 21 | 5 | 59 | 21 | 54 | 5 | 180 | 32% | 0.89 |

| Receptor 22 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 27m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 40 | 6 | 140 | 2 | | | | | 180 | 36% | 36 | 6 | 77 | 23 | 46 | 13 | 21 | 2 | 180 | 31% | 0.87 |

| Receptor 23 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 27m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 41 | 6 | 139 | 2 | | | | | 180 | 36% | 35 | 6 | 78 | 23 | 45 | 13 | 22 | 2 | 180 | 31% | 0.87 |

| Receptor 24 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 27m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 110 | 5 | 70 | 2 | | | | | 180 | 36% | 82 | 23 | 37 | 13 | 61 | 5 | | | 180 | 31% | 0.88 |

| Receptor 25 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 27m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 110 | 5 | 70 | 2 | | | | | 180 | 36% | 83 | 23 | 36 | 13 | 61 | 5 | | | 180 | 31% | 0.88 |

| Receptor 26 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 27m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 112 | 5 | 68 | 2 | | | | | 180 | 36% | 81 | 23 | 28 | 13 | 71 | 5 | | | 180 | 31% | 0.88 |

| Receptor 27 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 27m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 113 | 5 | 67 | 2 | | | | | 180 | 36% | 82 | 23 | 27 | 13 | 71 | 5 | | | 180 | 31% | 0.88 |

| Receptor 28 | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 42 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor l | Σ VSC | |
| Target distance 28m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 117 | 5 | 63 | 2 | | | | | 180 | 36% | 62 | 23 | 20 | 13 | 98 | 5 | | | 180 | 32% | 0.90 |

**Receptor 29**

| VSC test distance 42 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 28m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 118 | 5 | 62 | 2 | | | | | 180 | 36% | 63 | 23 | 19 | 13 | 98 | 5 | | | 180 | 32% | 0.90 |

**Receptor 30**

| VSC test distance 42 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 28m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 122 | 6 | 58 | 2 | | | | | 180 | 36% | 50 | 23 | 15 | 12 | 115 | 6 | | | 180 | 33% | 0.92 |

**Receptor 31**

| VSC test distance 42 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 32m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 123 | 6 | 57 | 2 | | | | | 180 | 36% | 51 | 23 | 14 | 12 | 115 | 6 | | | 180 | 33% | 0.92 |

**Receptor 32**

| VSC test distance 42 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 20m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 77 | 5 | 103 | 9 | | | | | 180 | 34% | 33 | 27 | 70 | 9 | 77 | 5 | | | 180 | 33% | 0.97 |

**Receptor 33**

| VSC test distance 42 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 16m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 72 | 8 | 108 | 2 | | | | | 180 | 36% | 44 | 8 | 64 | 36 | 72 | 9 | | | 180 | 30% | 0.84 |

**Receptor 34**

| VSC test distance 42 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 21m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 98 | 17 | 82 | 1 | | | | | 180 | 34% | 98 | 17 | 46 | 14 | 36 | 7 | | | 180 | 31% | 0.94 |

**Receptor 35**

| VSC test distance 33 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 20m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 90 | 4 | 90 | 2 | | | | | 180 | 36% | 35 | 4 | 45 | 12 | 100 | 24 | | | 180 | 30% | 0.83 |

**Receptor 36**

| VSC test distance 33 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 21m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 91 | 15 | 89 | 2 | | | | | 180 | 34% | 91 | 15 | 72 | 23 | 17 | 19 | | | 180 | 30% | 0.88 |

**Receptor 37**

| VSC test distance 33 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 23m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 54 | 22 | 126 | 2 | | | | | 180 | 34% | 54 | 22 | 74 | 24 | 52 | 18 | | | 180 | 29% | 0.83 |

**Receptor 38**

| VSC test distance 24 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 31m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 77 | 17 | 103 | 2 | | | | | 180 | 34% | 77 | 17 | 21 | 2 | 37 | 18 | 45 | 7 | 180 | 32% | 0.95 |

**Receptor 39**

| VSC test distance 24 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 26m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 41 | 23 | 80 | 2 | 33 | 17 | 26 | 2 | 180 | 34% | 41 | 23 | 80 | 16 | 33 | 17 | 26 | 10 | 180 | 31% | 0.92 |

**Receptor 40**

| VSC test distance 24 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 26m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 46 | 17 | 103 | 2 | 31 | 16 | | | 180 | 34% | 46 | 17 | 63 | 17 | 31 | 16 | 40 | 10 | 180 | 31% | 0.92 |

**Receptor 41**

| VSC test distance 24 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 17m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 97 | 23 | 83 | 2 | | | | | 180 | 32% | 97 | 23 | 45 | 25 | 38 | 10 | | | 180 | 29% | 0.91 |

**Receptor 42**

| VSC test distance 24 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 17m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 69 | 6 | 111 | 2 | | | | | 180 | 36% | 69 | 6 | 41 | 25 | 70 | 9 | | | 180 | 33% | 0.91 |

**Receptor 43**

| VSC test distance 24 m | EXISTING | | | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 30m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 101 | 6 | 79 | 2 | | | | | 180 | 36% | 86 | 6 | 25 | 8 | 69 | 30 | | | 180 | 31% | 0.87 |

**Receptor 44**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 8m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 27 | 12 | 153 | 2 | | | | | 180 | 36% | 27 | 12 | 69 | 37 | 84 | 10 | | | 180 | 29% | 0.81 |

**Receptor 45**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 9m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 125 | 17 | 55 | 2 | | | | | 180 | 32% | 125 | 17 | 55 | 14 | | | | | 180 | 31% | 0.95 |

**Receptor 46**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 20m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 72 | 17 | 108 | 2 | | | | | 180 | 34% | 72 | 17 | 44 | 20 | 64 | 12 | | | 180 | 31% | 0.91 |

**Receptor 47**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 9m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 24 | 16 | 156 | 2 | | | | | 180 | 36% | 24 | 16 | 55 | 35 | 101 | 10 | | | 180 | 30% | 0.83 |

**Receptor 48**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 16m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 125 | 16 | 55 | 2 | | | | | 180 | 33% | 125 | 16 | 55 | 8 | | | | | 180 | 32% | 0.98 |

**Receptor 49**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 31m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 71 | 16 | 109 | 2 | | | | | 180 | 34% | 71 | 16 | 57 | 13 | 13 | 7 | 39 | 2 | 180 | 33% | 0.95 |

**Receptor 50**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 22m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 77 | 6 | 103 | 2 | | | | | 180 | 36% | 41 | 2 | 53 | 9 | 24 | 16 | 62 | 11 | 180 | 34% | 0.93 |

**Receptor 51**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 18m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 52 | 17 | 128 | 8 | | | | | 180 | 33% | 52 | 17 | 27 | 8 | 44 | 13 | 47 | 12 | 170 | 32% | 0.96 |

**Receptor 52**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 23m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 72 | 17 | 108 | 8 | | | | | 180 | 33% | 72 | 17 | 28 | 8 | 28 | 18 | 52 | 12 | 180 | 31% | 0.96 |

**Receptor 53**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 17m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 121 | 6 | 59 | 17 | | | | | 180 | 34% | 39 | 6 | 59 | 17 | 82 | 20 | | | 180 | 31% | 0.93 |

**Receptor 54**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 21m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 70 | 5 | 110 | 15 | | | | | 180 | 33% | 110 | 15 | 52 | 20 | 18 | 5 | | | 180 | 31% | 0.95 |

**Receptor 55**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 24m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 42 | 12 | 76 | 2 | 62 | 6 | | | 180 | 35% | 112 | 16 | 42 | 12 | 26 | 5 | | | 180 | 32% | 0.91 |

**Receptor 56**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 24m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 41 | 12 | 77 | 2 | 62 | 6 | | | 180 | 35% | 113 | 16 | 41 | 12 | 26 | 5 | | | 180 | 32% | 0.91 |

**Receptor 57**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 25m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 32 | 9 | 70 | 6 | 78 | 2 | | | 180 | 36% | 29 | 9 | 122 | 16 | 29 | 5 | | | 180 | 32% | 0.90 |

**Receptor 58**

| VSC test distance 24 m | EXISTING | | | | | | | | NEW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target distance 25m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | Σ Hor | Σ VSC | change |
| | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | |
| | 31 | 9 | 71 | 6 | 78 | 2 | | | 180 | 36% | 30 | 9 | 121 | 16 | 29 | 5 | | | 180 | 32% | 0.90 |

| **Receptor 59** | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 24 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 25m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 74 | 2 | 106 | 7 | | | | | 180 | 36% | 122 | 16 | 58 | 7 | | | | | 180 | 32% | 0.90 |

| **Receptor 60** | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 24 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 25m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 75 | 2 | 105 | 7 | | | | | 180 | 36% | 123 | 16 | 57 | 7 | | | | | 180 | 32% | 0.90 |

| **Receptor 61** | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 24 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 25m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 70 | 2 | 110 | 7 | | | | | 180 | 35% | 117 | 16 | 63 | 7 | | | | | 180 | 32% | 0.92 |

| **Receptor 62** | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 24 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 25m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 70 | 2 | 110 | 7 | | | | | 180 | 35% | 116 | 16 | 64 | 7 | | | | | 180 | 32% | 0.92 |

| **Receptor 63** | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 24 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 27m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 65 | 2 | 115 | 8 | | | | | 180 | 35% | 104 | 16 | 76 | 8 | | | | | 180 | 32% | 0.92 |

| **Receptor 64** | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 24 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 27m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 64 | 2 | 116 | 8 | | | | | 180 | 35% | 103 | 16 | 77 | 8 | | | | | 180 | 32% | 0.92 |

| **Receptor 65** | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 24 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 21m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 85 | 6 | 95 | 6 | | | | | 180 | 35% | 23 | 10 | 30 | 19 | 127 | 6 | | | 180 | 34% | 0.97 |

| **Receptor 66** | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 24 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 20m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 71 | 5 | 54 | 2 | 55 | 17 | | | 180 | 34% | 23 | 5 | 33 | 19 | 69 | 9 | 55 | 17 | 180 | 32% | 0.94 |

| **Receptor 67** | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 24 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 24m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 144 | 5 | 36 | 2 | | | | | 180 | 36% | 68 | 5 | 52 | 8 | 60 | 21 | | | 180 | 33% | 0.92 |

| **Receptor 68** | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 24 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 17m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 140 | 4 | 40 | 2 | | | | | 180 | 36% | 56 | 4 | 28 | 7 | 96 | 31 | | | 180 | 30% | 0.83 |

| **Receptor 69** | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 24 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 14m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 96 | 4 | 40 | 18 | 44 | 2 | | | 180 | 35% | 40 | 18 | 104 | 31 | 36 | 7 | | | 180 | 28% | 0.81 |

| **Receptor 70** | EXISTING | | | | | | | | NEW | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VSC test distance 24 m | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | Section 1 | | Section 2 | | Section 3 | | Section 4 | | ∑ Hor | ∑ VSC | |
| Target distance 16m | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | Hor° | Ver° | | | change |
| | 35 | 4 | 145 | 2 | | | | | 180 | 36% | 83 | 2 | 97 | 30 | | | | | 180 | 30% | 0.83 |

# Appendix D

Sunlight calculation results of existing amenity spaces before and after the introduction of the new proposed development.

**1** — 1,250 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 62% | 38% | 60 | 475 | 28,500 |
| 8.00 | 58% | 42% | 60 | 525 | 31,500 |
| 9.00 | 48% | 52% | 60 | 650 | 39,000 |
| 10.00 | 45% | 55% | 60 | 688 | 41,250 |
| 11.00 | 26% | 74% | 60 | 925 | 55,500 |
| 12.00 | 20% | 80% | 60 | 1000 | 60,000 |
| 13.00 | 18% | 82% | 60 | 1025 | 61,500 |
| 14.00 | 16% | 84% | 60 | 1050 | 63,000 |
| 15.00 | 20% | 80% | 60 | 1000 | 60,000 |
| 16.00 | 37% | 63% | 60 | 788 | 47,250 |
| 17.00 | 37% | 63% | 60 | 788 | 47,250 |
| 18.00 | 40% | 60% | 60 | 750 | 45,000 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 7.73
Achieved daily sun time * area 579750

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 62% | 38% | 60 | 475 | 28,500 | 0 |
| 8.00 | 58% | 42% | 60 | 525 | 31,500 | 0 |
| 9.00 | 48% | 52% | 60 | 650 | 39,000 | 0 |
| 10.00 | 45% | 55% | 60 | 688 | 41,250 | 0 |
| 11.00 | 26% | 74% | 60 | 925 | 55,500 | 0 |
| 12.00 | 20% | 80% | 60 | 1000 | 60,000 | 0 |
| 13.00 | 18% | 82% | 60 | 1025 | 61,500 | 0 |
| 14.00 | 16% | 84% | 60 | 1050 | 63,000 | 0 |
| 15.00 | 20% | 80% | 60 | 1000 | 60,000 | 0 |
| 16.00 | 37% | 63% | 60 | 788 | 47,250 | 0 |
| 17.00 | 43% | 57% | 60 | 713 | 42,750 | -4,500 |
| 18.00 | 90% | 10% | 60 | 125 | 7,500 | -37,500 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 9.00
Achieved total sun time (hrs) 7.17 — 0.93
Achieved daily sun time * area 537750 — 0.93

**2** — 2,300 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 59% | 41% | 60 | 943 | 56,580 |
| 8.00 | 37% | 63% | 60 | 1449 | 86,940 |
| 9.00 | 21% | 79% | 60 | 1817 | 109,020 |
| 10.00 | 18% | 82% | 60 | 1886 | 113,160 |
| 11.00 | 18% | 82% | 60 | 1886 | 113,160 |
| 12.00 | 18% | 82% | 60 | 1886 | 113,160 |
| 13.00 | 18% | 82% | 60 | 1886 | 113,160 |
| 14.00 | 18% | 82% | 60 | 1886 | 113,160 |
| 15.00 | 25% | 75% | 60 | 1725 | 103,500 |
| 16.00 | 25% | 75% | 60 | 1725 | 103,500 |
| 17.00 | 26% | 74% | 60 | 1702 | 102,120 |
| 18.00 | 30% | 70% | 60 | 1610 | 96,600 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 8.87
Achieved daily sun time * area 1224060

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 59% | 41% | 60 | 943 | 56,580 | 0 |
| 8.00 | 37% | 63% | 60 | 1449 | 86,940 | 0 |
| 9.00 | 21% | 79% | 60 | 1817 | 109,020 | 0 |
| 10.00 | 18% | 82% | 60 | 1886 | 113,160 | 0 |
| 11.00 | 18% | 82% | 60 | 1886 | 113,160 | 0 |
| 12.00 | 18% | 82% | 60 | 1886 | 113,160 | 0 |
| 13.00 | 18% | 82% | 60 | 1886 | 113,160 | 0 |
| 14.00 | 18% | 82% | 60 | 1886 | 113,160 | 0 |
| 15.00 | 25% | 75% | 60 | 1725 | 103,500 | 0 |
| 16.00 | 34% | 66% | 60 | 1518 | 91,080 | -12,420 |
| 17.00 | 46% | 54% | 60 | 1242 | 74,520 | -27,600 |
| 18.00 | 67% | 33% | 60 | 759 | 45,540 | -51,060 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.21 — 0.93
Achieved daily sun time * area 1132980 — 0.93

**3** — 140 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 62 | 3,696 |
| 8.00 | 39% | 61% | 60 | 85 | 5,124 |
| 9.00 | 18% | 82% | 60 | 115 | 6,888 |
| 10.00 | 15% | 85% | 60 | 119 | 7,140 |
| 11.00 | 15% | 85% | 60 | 119 | 7,140 |
| 12.00 | 15% | 85% | 60 | 119 | 7,140 |
| 13.00 | 15% | 85% | 60 | 119 | 7,140 |
| 14.00 | 15% | 85% | 60 | 119 | 7,140 |
| 15.00 | 15% | 85% | 60 | 119 | 7,140 |
| 16.00 | 16% | 84% | 60 | 118 | 7,056 |
| 17.00 | 24% | 76% | 60 | 106 | 6,384 |
| 18.00 | 36% | 64% | 60 | 90 | 5,376 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.21
Achieved daily sun time * area 77364

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 62 | 3,696 | 0 |
| 8.00 | 39% | 61% | 60 | 85 | 5,124 | 0 |
| 9.00 | 18% | 82% | 60 | 115 | 6,888 | 0 |
| 10.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 11.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 12.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 13.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 14.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 15.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 16.00 | 16% | 84% | 60 | 118 | 7,056 | 0 |
| 17.00 | 24% | 76% | 60 | 106 | 6,384 | 0 |
| 18.00 | 36% | 64% | 60 | 90 | 5,376 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.21 — 1.00
Achieved daily sun time * area 77364 — 1.00

**4** — 110 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 48 | 2,904 |
| 8.00 | 39% | 61% | 60 | 67 | 4,026 |
| 9.00 | 18% | 82% | 60 | 90 | 5,412 |
| 10.00 | 15% | 85% | 60 | 94 | 5,610 |
| 11.00 | 15% | 85% | 60 | 94 | 5,610 |
| 12.00 | 15% | 85% | 60 | 94 | 5,610 |
| 13.00 | 15% | 85% | 60 | 94 | 5,610 |
| 14.00 | 15% | 85% | 60 | 94 | 5,610 |
| 15.00 | 15% | 85% | 60 | 94 | 5,610 |
| 16.00 | 16% | 84% | 60 | 92 | 5,544 |
| 17.00 | 24% | 76% | 60 | 84 | 5,016 |
| 18.00 | 36% | 64% | 60 | 70 | 4,224 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.21
Achieved daily sun time * area 60786

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 48 | 2,904 | 0 |
| 8.00 | 39% | 61% | 60 | 67 | 4,026 | 0 |
| 9.00 | 18% | 82% | 60 | 90 | 5,412 | 0 |
| 10.00 | 15% | 85% | 60 | 94 | 5,610 | 0 |
| 11.00 | 15% | 85% | 60 | 94 | 5,610 | 0 |
| 12.00 | 15% | 85% | 60 | 94 | 5,610 | 0 |
| 13.00 | 15% | 85% | 60 | 94 | 5,610 | 0 |
| 14.00 | 15% | 85% | 60 | 94 | 5,610 | 0 |
| 15.00 | 15% | 85% | 60 | 94 | 5,610 | 0 |
| 16.00 | 16% | 84% | 60 | 92 | 5,544 | 0 |
| 17.00 | 24% | 76% | 60 | 84 | 5,016 | 0 |
| 18.00 | 36% | 64% | 60 | 70 | 4,224 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.21 — 1.00
Achieved daily sun time * area 60786 — 1.00

**5** — 110 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 48 | 2,904 |
| 8.00 | 39% | 61% | 60 | 67 | 4,026 |
| 9.00 | 18% | 82% | 60 | 90 | 5,412 |
| 10.00 | 15% | 85% | 60 | 94 | 5,610 |
| 11.00 | 15% | 85% | 60 | 94 | 5,610 |
| 12.00 | 15% | 85% | 60 | 94 | 5,610 |
| 13.00 | 15% | 85% | 60 | 94 | 5,610 |
| 14.00 | 15% | 85% | 60 | 94 | 5,610 |
| 15.00 | 15% | 85% | 60 | 94 | 5,610 |
| 16.00 | 16% | 84% | 60 | 92 | 5,544 |
| 17.00 | 24% | 76% | 60 | 84 | 5,016 |
| 18.00 | 36% | 64% | 60 | 70 | 4,224 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.21
Achieved daily sun time * area 60786

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 48 | 2,904 | 0 |
| 8.00 | 39% | 61% | 60 | 67 | 4,026 | 0 |
| 9.00 | 18% | 82% | 60 | 90 | 5,412 | 0 |
| 10.00 | 15% | 85% | 60 | 94 | 5,610 | 0 |
| 11.00 | 15% | 85% | 60 | 94 | 5,610 | 0 |
| 12.00 | 15% | 85% | 60 | 94 | 5,610 | 0 |
| 13.00 | 15% | 85% | 60 | 94 | 5,610 | 0 |
| 14.00 | 15% | 85% | 60 | 94 | 5,610 | 0 |
| 15.00 | 15% | 85% | 60 | 94 | 5,610 | 0 |
| 16.00 | 16% | 84% | 60 | 92 | 5,544 | 0 |
| 17.00 | 24% | 76% | 60 | 84 | 5,016 | 0 |
| 18.00 | 36% | 64% | 60 | 70 | 4,224 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.21 — 1.00
Achieved daily sun time * area 60786 — 1.00

**6** — 55 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 24 | 1,452 |
| 8.00 | 39% | 61% | 60 | 34 | 2,013 |
| 9.00 | 18% | 82% | 60 | 45 | 2,706 |
| 10.00 | 15% | 85% | 60 | 47 | 2,805 |
| 11.00 | 15% | 85% | 60 | 47 | 2,805 |
| 12.00 | 15% | 85% | 60 | 47 | 2,805 |
| 13.00 | 15% | 85% | 60 | 47 | 2,805 |
| 14.00 | 15% | 85% | 60 | 47 | 2,805 |
| 15.00 | 15% | 85% | 60 | 47 | 2,805 |
| 16.00 | 16% | 84% | 60 | 46 | 2,772 |
| 17.00 | 24% | 76% | 60 | 42 | 2,508 |
| 18.00 | 36% | 64% | 60 | 35 | 2,112 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.21
Achieved daily sun time * area 30393

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 24 | 1,452 | 0 |
| 8.00 | 39% | 61% | 60 | 34 | 2,013 | 0 |
| 9.00 | 18% | 82% | 60 | 45 | 2,706 | 0 |
| 10.00 | 22% | 78% | 60 | 43 | 2,574 | -231 |
| 11.00 | 15% | 85% | 60 | 47 | 2,805 | 0 |
| 12.00 | 15% | 85% | 60 | 47 | 2,805 | 0 |
| 13.00 | 15% | 85% | 60 | 47 | 2,805 | 0 |
| 14.00 | 15% | 85% | 60 | 47 | 2,805 | 0 |
| 15.00 | 15% | 85% | 60 | 47 | 2,805 | 0 |
| 16.00 | 16% | 84% | 60 | 46 | 2,772 | 0 |
| 17.00 | 24% | 76% | 60 | 42 | 2,508 | 0 |
| 18.00 | 36% | 64% | 60 | 35 | 2,112 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.14 — 1.00
Achieved daily sun time * area 30162 — 1.00

## 7 — 105 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 46 | 2,772 |
| 8.00 | 39% | 61% | 60 | 64 | 3,843 |
| 9.00 | 18% | 82% | 60 | 86 | 5,166 |
| 10.00 | 15% | 85% | 60 | 89 | 5,355 |
| 11.00 | 15% | 85% | 60 | 89 | 5,355 |
| 12.00 | 15% | 85% | 60 | 89 | 5,355 |
| 13.00 | 15% | 85% | 60 | 89 | 5,355 |
| 14.00 | 15% | 85% | 60 | 89 | 5,355 |
| 15.00 | 15% | 85% | 60 | 89 | 5,355 |
| 16.00 | 16% | 84% | 60 | 88 | 5,292 |
| 17.00 | 24% | 76% | 60 | 80 | 4,788 |
| 18.00 | 36% | 64% | 60 | 67 | 4,032 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.21
Achieved daily sun time * area 58023

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 46 | 2,772 | 0 |
| 8.00 | 39% | 61% | 60 | 64 | 3,843 | 0 |
| 9.00 | 26% | 74% | 60 | 78 | 4,662 | -504 |
| 10.00 | 17% | 83% | 60 | 87 | 5,229 | -126 |
| 11.00 | 15% | 85% | 60 | 89 | 5,355 | 0 |
| 12.00 | 15% | 85% | 60 | 89 | 5,355 | 0 |
| 13.00 | 15% | 85% | 60 | 89 | 5,355 | 0 |
| 14.00 | 15% | 85% | 60 | 89 | 5,355 | 0 |
| 15.00 | 15% | 85% | 60 | 89 | 5,355 | 0 |
| 16.00 | 16% | 84% | 60 | 88 | 5,292 | 0 |
| 17.00 | 24% | 76% | 60 | 80 | 4,788 | 0 |
| 18.00 | 36% | 64% | 60 | 67 | 4,032 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.11 0.99
Achieved daily sun time * area 57393 0.99

## 8 — 140 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 62 | 3,696 |
| 8.00 | 39% | 61% | 60 | 85 | 5,124 |
| 9.00 | 18% | 82% | 60 | 115 | 6,888 |
| 10.00 | 15% | 85% | 60 | 119 | 7,140 |
| 11.00 | 15% | 85% | 60 | 119 | 7,140 |
| 12.00 | 15% | 85% | 60 | 119 | 7,140 |
| 13.00 | 15% | 85% | 60 | 119 | 7,140 |
| 14.00 | 15% | 85% | 60 | 119 | 7,140 |
| 15.00 | 15% | 85% | 60 | 119 | 7,140 |
| 16.00 | 16% | 84% | 60 | 118 | 7,056 |
| 17.00 | 24% | 76% | 60 | 106 | 6,384 |
| 18.00 | 36% | 64% | 60 | 90 | 5,376 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.21
Achieved daily sun time * area 77364

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 62 | 3,696 | 0 |
| 8.00 | 43% | 57% | 60 | 80 | 4,788 | -336 |
| 9.00 | 23% | 77% | 60 | 108 | 6,468 | -420 |
| 10.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 11.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 12.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 13.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 14.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 15.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 16.00 | 16% | 84% | 60 | 118 | 7,056 | 0 |
| 17.00 | 24% | 76% | 60 | 106 | 6,384 | 0 |
| 18.00 | 36% | 64% | 60 | 90 | 5,376 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.12 1.00
Achieved daily sun time * area 76608 1.00

## 9 — 95 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 42 | 2,508 |
| 8.00 | 39% | 61% | 60 | 58 | 3,477 |
| 9.00 | 18% | 82% | 60 | 78 | 4,674 |
| 10.00 | 15% | 85% | 60 | 81 | 4,845 |
| 11.00 | 15% | 85% | 60 | 81 | 4,845 |
| 12.00 | 15% | 85% | 60 | 81 | 4,845 |
| 13.00 | 15% | 85% | 60 | 81 | 4,845 |
| 14.00 | 15% | 85% | 60 | 81 | 4,845 |
| 15.00 | 15% | 85% | 60 | 81 | 4,845 |
| 16.00 | 16% | 84% | 60 | 80 | 4,788 |
| 17.00 | 24% | 76% | 60 | 72 | 4,332 |
| 18.00 | 36% | 64% | 60 | 61 | 3,648 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.21
Achieved daily sun time * area 52497

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 42 | 2,508 | 0 |
| 8.00 | 80% | 20% | 60 | 19 | 1,140 | -2,337 |
| 9.00 | 18% | 82% | 60 | 78 | 4,674 | 0 |
| 10.00 | 15% | 85% | 60 | 81 | 4,845 | 0 |
| 11.00 | 15% | 85% | 60 | 81 | 4,845 | 0 |
| 12.00 | 15% | 85% | 60 | 81 | 4,845 | 0 |
| 13.00 | 15% | 85% | 60 | 81 | 4,845 | 0 |
| 14.00 | 15% | 85% | 60 | 81 | 4,845 | 0 |
| 15.00 | 15% | 85% | 60 | 81 | 4,845 | 0 |
| 16.00 | 16% | 84% | 60 | 80 | 4,788 | 0 |
| 17.00 | 24% | 76% | 60 | 72 | 4,332 | 0 |
| 18.00 | 36% | 64% | 60 | 61 | 3,648 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.8 0.96
Achieved daily sun time * area 50160 0.96

## 10 — 100 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 44 | 2,640 |
| 8.00 | 39% | 61% | 60 | 61 | 3,660 |
| 9.00 | 18% | 82% | 60 | 82 | 4,920 |
| 10.00 | 15% | 85% | 60 | 85 | 5,100 |
| 11.00 | 15% | 85% | 60 | 85 | 5,100 |
| 12.00 | 15% | 85% | 60 | 85 | 5,100 |
| 13.00 | 15% | 85% | 60 | 85 | 5,100 |
| 14.00 | 15% | 85% | 60 | 85 | 5,100 |
| 15.00 | 15% | 85% | 60 | 85 | 5,100 |
| 16.00 | 16% | 84% | 60 | 84 | 5,040 |
| 17.00 | 24% | 76% | 60 | 76 | 4,560 |
| 18.00 | 36% | 64% | 60 | 64 | 3,840 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.21
Achieved daily sun time * area 55260

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 60% | 40% | 60 | 40 | 2,400 | -240 |
| 8.00 | 85% | 15% | 60 | 15 | 900 | -2,760 |
| 9.00 | 19% | 81% | 60 | 81 | 4,860 | -60 |
| 10.00 | 19% | 81% | 60 | 81 | 4,860 | -240 |
| 11.00 | 16% | 84% | 60 | 84 | 5,040 | -60 |
| 12.00 | 15% | 85% | 60 | 85 | 5,100 | 0 |
| 13.00 | 15% | 85% | 60 | 85 | 5,100 | 0 |
| 14.00 | 15% | 85% | 60 | 85 | 5,100 | 0 |
| 15.00 | 15% | 85% | 60 | 85 | 5,100 | 0 |
| 16.00 | 16% | 84% | 60 | 84 | 5,040 | 0 |
| 17.00 | 24% | 76% | 60 | 76 | 4,560 | 0 |
| 18.00 | 36% | 64% | 60 | 64 | 3,840 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.65 0.94
Achieved daily sun time * area 51900 0.94

## 11 — 135 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 59 | 3,564 |
| 8.00 | 39% | 61% | 60 | 82 | 4,941 |
| 9.00 | 18% | 82% | 60 | 111 | 6,642 |
| 10.00 | 15% | 85% | 60 | 115 | 6,885 |
| 11.00 | 15% | 85% | 60 | 115 | 6,885 |
| 12.00 | 15% | 85% | 60 | 115 | 6,885 |
| 13.00 | 15% | 85% | 60 | 115 | 6,885 |
| 14.00 | 15% | 85% | 60 | 115 | 6,885 |
| 15.00 | 15% | 85% | 60 | 115 | 6,885 |
| 16.00 | 16% | 84% | 60 | 113 | 6,804 |
| 17.00 | 24% | 76% | 60 | 103 | 6,156 |
| 18.00 | 36% | 64% | 60 | 86 | 5,184 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.21
Achieved daily sun time * area 74601

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 77% | 23% | 60 | 31 | 1,863 | -1,701 |
| 8.00 | 59% | 41% | 60 | 55 | 3,321 | -1,620 |
| 9.00 | 30% | 70% | 60 | 95 | 5,670 | -972 |
| 10.00 | 15% | 85% | 60 | 115 | 6,885 | 0 |
| 11.00 | 15% | 85% | 60 | 115 | 6,885 | 0 |
| 12.00 | 15% | 85% | 60 | 115 | 6,885 | 0 |
| 13.00 | 15% | 85% | 60 | 115 | 6,885 | 0 |
| 14.00 | 15% | 85% | 60 | 115 | 6,885 | 0 |
| 15.00 | 15% | 85% | 60 | 115 | 6,885 | 0 |
| 16.00 | 16% | 84% | 60 | 113 | 6,804 | 0 |
| 17.00 | 24% | 76% | 60 | 103 | 6,156 | 0 |
| 18.00 | 36% | 64% | 60 | 86 | 5,184 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.68 0.95
Achieved daily sun time * area 70308 0.95

## 12 — 160 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 70 | 4,224 |
| 8.00 | 39% | 61% | 60 | 98 | 5,856 |
| 9.00 | 18% | 82% | 60 | 131 | 7,872 |
| 10.00 | 15% | 85% | 60 | 136 | 8,160 |
| 11.00 | 15% | 85% | 60 | 136 | 8,160 |
| 12.00 | 15% | 85% | 60 | 136 | 8,160 |
| 13.00 | 15% | 85% | 60 | 136 | 8,160 |
| 14.00 | 15% | 85% | 60 | 136 | 8,160 |
| 15.00 | 15% | 85% | 60 | 136 | 8,160 |
| 16.00 | 16% | 84% | 60 | 134 | 8,064 |
| 17.00 | 24% | 76% | 60 | 122 | 7,296 |
| 18.00 | 36% | 64% | 60 | 102 | 6,144 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.21
Achieved daily sun time * area 88416

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 88% | 12% | 60 | 19 | 1,152 | -3,072 |
| 8.00 | 59% | 41% | 60 | 66 | 3,936 | -1,920 |
| 9.00 | 19% | 81% | 60 | 130 | 7,776 | -96 |
| 10.00 | 15% | 85% | 60 | 136 | 8,160 | 0 |
| 11.00 | 15% | 85% | 60 | 136 | 8,160 | 0 |
| 12.00 | 15% | 85% | 60 | 136 | 8,160 | 0 |
| 13.00 | 15% | 85% | 60 | 136 | 8,160 | 0 |
| 14.00 | 15% | 85% | 60 | 136 | 8,160 | 0 |
| 15.00 | 15% | 85% | 60 | 136 | 8,160 | 0 |
| 16.00 | 16% | 84% | 60 | 134 | 8,064 | 0 |
| 17.00 | 24% | 76% | 60 | 122 | 7,296 | 0 |
| 18.00 | 36% | 64% | 60 | 102 | 6,144 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.68 0.95
Achieved daily sun time * area 83328 0.95

## 13 — 500 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 56% | 44% | 60 | 220 | 13,200 |
| 8.00 | 39% | 61% | 60 | 305 | 18,300 |
| 9.00 | 18% | 82% | 60 | 410 | 24,600 |
| 10.00 | 15% | 85% | 60 | 425 | 25,500 |
| 11.00 | 15% | 85% | 60 | 425 | 25,500 |
| 12.00 | 15% | 85% | 60 | 425 | 25,500 |
| 13.00 | 15% | 85% | 60 | 425 | 25,500 |
| 14.00 | 15% | 85% | 60 | 425 | 25,500 |
| 15.00 | 15% | 85% | 60 | 425 | 25,500 |
| 16.00 | 16% | 84% | 60 | 420 | 25,200 |
| 17.00 | 24% | 76% | 60 | 380 | 22,800 |
| 18.00 | 36% | 64% | 60 | 320 | 19,200 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.21
Achieved daily sun time * area 276300

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 89% | 11% | 60 | 55 | 3,300 | -9,900 |
| 8.00 | 48% | 52% | 60 | 260 | 15,600 | -2,700 |
| 9.00 | 18% | 82% | 60 | 410 | 24,600 | 0 |
| 10.00 | 15% | 85% | 60 | 425 | 25,500 | 0 |
| 11.00 | 15% | 85% | 60 | 425 | 25,500 | 0 |
| 12.00 | 15% | 85% | 60 | 425 | 25,500 | 0 |
| 13.00 | 15% | 85% | 60 | 425 | 25,500 | 0 |
| 14.00 | 15% | 85% | 60 | 425 | 25,500 | 0 |
| 15.00 | 15% | 85% | 60 | 425 | 25,500 | 0 |
| 16.00 | 16% | 84% | 60 | 420 | 25,200 | 0 |
| 17.00 | 24% | 76% | 60 | 380 | 22,800 | 0 |
| 18.00 | 36% | 64% | 60 | 320 | 19,200 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 8.79 0.96
Achieved daily sun time * area 263700 0.96

## 14 — 770 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 41% | 59% | 60 | 454 | 27,258 |
| 8.00 | 28% | 72% | 60 | 554 | 33,264 |
| 9.00 | 24% | 76% | 60 | 585 | 35,112 |
| 10.00 | 20% | 80% | 60 | 616 | 36,960 |
| 11.00 | 19% | 81% | 60 | 624 | 37,422 |
| 12.00 | 19% | 81% | 60 | 624 | 37,422 |
| 13.00 | 19% | 81% | 60 | 624 | 37,422 |
| 14.00 | 19% | 81% | 60 | 624 | 37,422 |
| 15.00 | 19% | 81% | 60 | 624 | 37,422 |
| 16.00 | 26% | 74% | 60 | 570 | 34,188 |
| 17.00 | 39% | 61% | 60 | 470 | 28,182 |
| 18.00 | 67% | 33% | 60 | 254 | 15,246 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 8.6
Achieved daily sun time * area 397320

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -27,258 |
| 8.00 | 58% | 42% | 60 | 323 | 19,404 | -13,860 |
| 9.00 | 37% | 63% | 60 | 485 | 29,106 | -6,006 |
| 10.00 | 20% | 80% | 60 | 616 | 36,960 | 0 |
| 11.00 | 19% | 81% | 60 | 624 | 37,422 | 0 |
| 12.00 | 19% | 81% | 60 | 624 | 37,422 | 0 |
| 13.00 | 19% | 81% | 60 | 624 | 37,422 | 0 |
| 14.00 | 19% | 81% | 60 | 624 | 37,422 | 0 |
| 15.00 | 19% | 81% | 60 | 624 | 37,422 | 0 |
| 16.00 | 26% | 74% | 60 | 570 | 34,188 | 0 |
| 17.00 | 39% | 61% | 60 | 470 | 28,182 | 0 |
| 18.00 | 67% | 33% | 60 | 254 | 15,246 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 9.00
Achieved total sun time (hrs) 7.58 0.89
Achieved daily sun time * area 350196 0.89

## 15 — 1,100 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 62% | 38% | 60 | 418 | 25,080 |
| 8.00 | 58% | 42% | 60 | 462 | 27,720 |
| 9.00 | 48% | 52% | 60 | 572 | 34,320 |
| 10.00 | 45% | 55% | 60 | 605 | 36,300 |
| 11.00 | 26% | 74% | 60 | 814 | 48,840 |
| 12.00 | 20% | 80% | 60 | 880 | 52,800 |
| 13.00 | 18% | 82% | 60 | 902 | 54,120 |
| 14.00 | 16% | 84% | 60 | 924 | 55,440 |
| 15.00 | 20% | 80% | 60 | 880 | 52,800 |
| 16.00 | 37% | 63% | 60 | 693 | 41,580 |
| 17.00 | 37% | 63% | 60 | 693 | 41,580 |
| 18.00 | 40% | 60% | 60 | 660 | 39,600 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 7.73
Achieved daily sun time * area 510180

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -25,080 |
| 8.00 | 87% | 13% | 60 | 143 | 8,580 | -19,140 |
| 9.00 | 65% | 35% | 60 | 385 | 23,100 | -11,220 |
| 10.00 | 45% | 55% | 60 | 605 | 36,300 | 0 |
| 11.00 | 26% | 74% | 60 | 814 | 48,840 | 0 |
| 12.00 | 20% | 80% | 60 | 880 | 52,800 | 0 |
| 13.00 | 18% | 82% | 60 | 902 | 54,120 | 0 |
| 14.00 | 16% | 84% | 60 | 924 | 55,440 | 0 |
| 15.00 | 20% | 80% | 60 | 880 | 52,800 | 0 |
| 16.00 | 37% | 63% | 60 | 693 | 41,580 | 0 |
| 17.00 | 37% | 63% | 60 | 693 | 41,580 | 0 |
| 18.00 | 40% | 60% | 60 | 660 | 39,600 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 9.00
Achieved total sun time (hrs) 6.89 0.90
Achieved daily sun time * area 454740 0.90

## 16 — 950 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 70% | 30% | 60 | 285 | 17,100 |
| 8.00 | 60% | 40% | 60 | 380 | 22,800 |
| 9.00 | 51% | 49% | 60 | 466 | 27,930 |
| 10.00 | 45% | 55% | 60 | 523 | 31,350 |
| 11.00 | 26% | 74% | 60 | 703 | 42,180 |
| 12.00 | 20% | 80% | 60 | 760 | 45,600 |
| 13.00 | 18% | 82% | 60 | 779 | 46,740 |
| 14.00 | 16% | 84% | 60 | 798 | 47,880 |
| 15.00 | 20% | 80% | 60 | 760 | 45,600 |
| 16.00 | 37% | 63% | 60 | 599 | 35,910 |
| 17.00 | 47% | 53% | 60 | 504 | 30,210 |
| 18.00 | 59% | 41% | 60 | 390 | 23,370 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 8.00
Achieved total sun time (hrs) 7.31
Achieved daily sun time * area 416670

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -17,100 |
| 8.00 | 60% | 40% | 60 | 380 | 22,800 | 0 |
| 9.00 | 51% | 49% | 60 | 466 | 27,930 | 0 |
| 10.00 | 45% | 55% | 60 | 523 | 31,350 | 0 |
| 11.00 | 26% | 74% | 60 | 703 | 42,180 | 0 |
| 12.00 | 20% | 80% | 60 | 760 | 45,600 | 0 |
| 13.00 | 18% | 82% | 60 | 779 | 46,740 | 0 |
| 14.00 | 16% | 84% | 60 | 798 | 47,880 | 0 |
| 15.00 | 20% | 80% | 60 | 760 | 45,600 | 0 |
| 16.00 | 37% | 63% | 60 | 599 | 35,910 | 0 |
| 17.00 | 47% | 53% | 60 | 504 | 30,210 | 0 |
| 18.00 | 59% | 41% | 60 | 390 | 23,370 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 8.00
Achieved total sun time (hrs) 7.01 0.96
Achieved daily sun time * area 399570 0.96

## 17 — 400 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 76% | 24% | 60 | 96 | 5,760 |
| 8.00 | 60% | 40% | 60 | 160 | 9,600 |
| 9.00 | 51% | 49% | 60 | 196 | 11,760 |
| 10.00 | 45% | 55% | 60 | 220 | 13,200 |
| 11.00 | 26% | 74% | 60 | 296 | 17,760 |
| 12.00 | 20% | 80% | 60 | 320 | 19,200 |
| 13.00 | 18% | 82% | 60 | 328 | 19,680 |
| 14.00 | 16% | 84% | 60 | 336 | 20,160 |
| 15.00 | 20% | 80% | 60 | 320 | 19,200 |
| 16.00 | 37% | 63% | 60 | 252 | 15,120 |
| 17.00 | 41% | 59% | 60 | 236 | 14,160 |
| 18.00 | 49% | 51% | 60 | 204 | 12,240 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 9.00
Achieved total sun time (hrs) 7.41
Achieved daily sun time * area 177840

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -5,760 |
| 8.00 | 68% | 32% | 60 | 128 | 7,680 | -1,920 |
| 9.00 | 51% | 49% | 60 | 196 | 11,760 | 0 |
| 10.00 | 45% | 55% | 60 | 220 | 13,200 | 0 |
| 11.00 | 26% | 74% | 60 | 296 | 17,760 | 0 |
| 12.00 | 20% | 80% | 60 | 320 | 19,200 | 0 |
| 13.00 | 18% | 82% | 60 | 328 | 19,680 | 0 |
| 14.00 | 16% | 84% | 60 | 336 | 20,160 | 0 |
| 15.00 | 20% | 80% | 60 | 320 | 19,200 | 0 |
| 16.00 | 37% | 63% | 60 | 252 | 15,120 | 0 |
| 17.00 | 41% | 59% | 60 | 236 | 14,160 | 0 |
| 18.00 | 49% | 51% | 60 | 204 | 12,240 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 9.00
Achieved total sun time (hrs) 7.09 0.96
Achieved daily sun time * area 170160 0.96

## 18 — 5,500 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 46% | 54% | 60 | 2970 | 178,200 |
| 8.00 | 23% | 77% | 60 | 4235 | 254,100 |
| 9.00 | 21% | 79% | 60 | 4345 | 260,700 |
| 10.00 | 12% | 88% | 60 | 4840 | 290,400 |
| 11.00 | 12% | 88% | 60 | 4840 | 290,400 |
| 12.00 | 12% | 88% | 60 | 4840 | 290,400 |
| 13.00 | 12% | 88% | 60 | 4840 | 290,400 |
| 14.00 | 12% | 88% | 60 | 4840 | 290,400 |
| 15.00 | 12% | 88% | 60 | 4840 | 290,400 |
| 16.00 | 12% | 88% | 60 | 4840 | 290,400 |
| 17.00 | 24% | 76% | 60 | 4180 | 250,800 |
| 18.00 | 36% | 64% | 60 | 3520 | 211,200 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 12.00
Achieved total sun time (hrs) 9.66
Achieved daily sun time * area 3187800

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 88% | 12% | 60 | 660 | 39,600 | -138,600 |
| 8.00 | 34% | 66% | 60 | 3630 | 217,800 | -36,300 |
| 9.00 | 21% | 79% | 60 | 4345 | 260,700 | 0 |
| 10.00 | 12% | 88% | 60 | 4840 | 290,400 | 0 |
| 11.00 | 12% | 88% | 60 | 4840 | 290,400 | 0 |
| 12.00 | 12% | 88% | 60 | 4840 | 290,400 | 0 |
| 13.00 | 12% | 88% | 60 | 4840 | 290,400 | 0 |
| 14.00 | 12% | 88% | 60 | 4840 | 290,400 | 0 |
| 15.00 | 12% | 88% | 60 | 4840 | 290,400 | 0 |
| 16.00 | 12% | 88% | 60 | 4840 | 290,400 | 0 |
| 17.00 | 24% | 76% | 60 | 4180 | 250,800 | 0 |
| 18.00 | 36% | 64% | 60 | 3520 | 211,200 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 9.13 0.95
Achieved daily sun time * area 3012900 0.95

## 19 — 300 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 44% | 56% | 60 | 168 | 10,080 |
| 8.00 | 30% | 70% | 60 | 210 | 12,600 |
| 9.00 | 22% | 78% | 60 | 234 | 14,040 |
| 10.00 | 22% | 78% | 60 | 234 | 14,040 |
| 11.00 | 22% | 78% | 60 | 234 | 14,040 |
| 12.00 | 27% | 73% | 60 | 219 | 13,140 |
| 13.00 | 30% | 70% | 60 | 210 | 12,600 |
| 14.00 | 35% | 65% | 60 | 195 | 11,700 |
| 15.00 | 47% | 53% | 60 | 159 | 9,540 |
| 16.00 | 53% | 47% | 60 | 141 | 8,460 |
| 17.00 | 70% | 30% | 60 | 90 | 5,400 |
| 18.00 | 85% | 15% | 60 | 45 | 2,700 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 9.00
Achieved total sun time (hrs) 7.13
Achieved daily sun time * area 128340

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -10,080 |
| 8.00 | 50% | 50% | 60 | 150 | 9,000 | -3,600 |
| 9.00 | 35% | 65% | 60 | 195 | 11,700 | -2,340 |
| 10.00 | 26% | 74% | 60 | 222 | 13,320 | -720 |
| 11.00 | 22% | 78% | 60 | 234 | 14,040 | 0 |
| 12.00 | 27% | 73% | 60 | 219 | 13,140 | 0 |
| 13.00 | 30% | 70% | 60 | 210 | 12,600 | 0 |
| 14.00 | 35% | 65% | 60 | 195 | 11,700 | 0 |
| 15.00 | 47% | 53% | 60 | 159 | 9,540 | 0 |
| 16.00 | 53% | 47% | 60 | 141 | 8,460 | 0 |
| 17.00 | 70% | 30% | 60 | 90 | 5,400 | 0 |
| 18.00 | 85% | 15% | 60 | 45 | 2,700 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 7.00
Achieved total sun time (hrs) 6.2 0.87
Achieved daily sun time * area 111600 0.87

## 20 — 125 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 64% | 36% | 60 | 45 | 2,700 |
| 8.00 | 52% | 48% | 60 | 60 | 3,600 |
| 9.00 | 20% | 80% | 60 | 100 | 6,000 |
| 10.00 | 17% | 83% | 60 | 104 | 6,225 |
| 11.00 | 16% | 84% | 60 | 105 | 6,300 |
| 12.00 | 16% | 84% | 60 | 105 | 6,300 |
| 13.00 | 16% | 84% | 60 | 105 | 6,300 |
| 14.00 | 16% | 84% | 60 | 105 | 6,300 |
| 15.00 | 16% | 84% | 60 | 105 | 6,300 |
| 16.00 | 20% | 80% | 60 | 100 | 6,000 |
| 17.00 | 36% | 64% | 60 | 80 | 4,800 |
| 18.00 | 44% | 56% | 60 | 70 | 4,200 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.67
Achieved daily sun time * area 65025

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -2,700 |
| 8.00 | 52% | 48% | 60 | 60 | 3,600 | 0 |
| 9.00 | 20% | 80% | 60 | 100 | 6,000 | 0 |
| 10.00 | 17% | 83% | 60 | 104 | 6,225 | 0 |
| 11.00 | 16% | 84% | 60 | 105 | 6,300 | 0 |
| 12.00 | 16% | 84% | 60 | 105 | 6,300 | 0 |
| 13.00 | 16% | 84% | 60 | 105 | 6,300 | 0 |
| 14.00 | 16% | 84% | 60 | 105 | 6,300 | 0 |
| 15.00 | 16% | 84% | 60 | 105 | 6,300 | 0 |
| 16.00 | 20% | 80% | 60 | 100 | 6,000 | 0 |
| 17.00 | 36% | 64% | 60 | 80 | 4,800 | 0 |
| 18.00 | 44% | 56% | 60 | 70 | 4,200 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.31 0.96
Achieved daily sun time * area 62325 0.96

## 21 — 125 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 64% | 36% | 60 | 45 | 2,700 |
| 8.00 | 52% | 48% | 60 | 60 | 3,600 |
| 9.00 | 20% | 80% | 60 | 100 | 6,000 |
| 10.00 | 17% | 83% | 60 | 104 | 6,225 |
| 11.00 | 16% | 84% | 60 | 105 | 6,300 |
| 12.00 | 16% | 84% | 60 | 105 | 6,300 |
| 13.00 | 16% | 84% | 60 | 105 | 6,300 |
| 14.00 | 16% | 84% | 60 | 105 | 6,300 |
| 15.00 | 16% | 84% | 60 | 105 | 6,300 |
| 16.00 | 20% | 80% | 60 | 100 | 6,000 |
| 17.00 | 36% | 64% | 60 | 80 | 4,800 |
| 18.00 | 44% | 56% | 60 | 70 | 4,200 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.67
Achieved daily sun time * area 65025

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -2,700 |
| 8.00 | 52% | 48% | 60 | 60 | 3,600 | 0 |
| 9.00 | 20% | 80% | 60 | 100 | 6,000 | 0 |
| 10.00 | 17% | 83% | 60 | 104 | 6,225 | 0 |
| 11.00 | 16% | 84% | 60 | 105 | 6,300 | 0 |
| 12.00 | 16% | 84% | 60 | 105 | 6,300 | 0 |
| 13.00 | 16% | 84% | 60 | 105 | 6,300 | 0 |
| 14.00 | 16% | 84% | 60 | 105 | 6,300 | 0 |
| 15.00 | 16% | 84% | 60 | 105 | 6,300 | 0 |
| 16.00 | 20% | 80% | 60 | 100 | 6,000 | 0 |
| 17.00 | 36% | 64% | 60 | 80 | 4,800 | 0 |
| 18.00 | 44% | 56% | 60 | 70 | 4,200 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.31 0.96
Achieved daily sun time * area 62325 0.96

## 22 — 240 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 44% | 56% | 60 | 134 | 8,064 |
| 8.00 | 30% | 70% | 60 | 168 | 10,080 |
| 9.00 | 22% | 78% | 60 | 187 | 11,232 |
| 10.00 | 22% | 78% | 60 | 187 | 11,232 |
| 11.00 | 22% | 78% | 60 | 187 | 11,232 |
| 12.00 | 27% | 73% | 60 | 175 | 10,512 |
| 13.00 | 30% | 70% | 60 | 168 | 10,080 |
| 14.00 | 35% | 65% | 60 | 156 | 9,360 |
| 15.00 | 47% | 53% | 60 | 127 | 7,632 |
| 16.00 | 53% | 47% | 60 | 113 | 6,768 |
| 17.00 | 70% | 30% | 60 | 72 | 4,320 |
| 18.00 | 85% | 15% | 60 | 36 | 2,160 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 9.00
Achieved total sun time (hrs) 7.13
Achieved daily sun time * area 102672

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -8,064 |
| 8.00 | 50% | 50% | 60 | 120 | 7,200 | -2,880 |
| 9.00 | 35% | 65% | 60 | 156 | 9,360 | -1,872 |
| 10.00 | 26% | 74% | 60 | 178 | 10,656 | -576 |
| 11.00 | 24% | 76% | 60 | 182 | 10,944 | -288 |
| 12.00 | 27% | 73% | 60 | 175 | 10,512 | 0 |
| 13.00 | 30% | 70% | 60 | 168 | 10,080 | 0 |
| 14.00 | 35% | 65% | 60 | 156 | 9,360 | 0 |
| 15.00 | 47% | 53% | 60 | 127 | 7,632 | 0 |
| 16.00 | 53% | 47% | 60 | 113 | 6,768 | 0 |
| 17.00 | 70% | 30% | 60 | 72 | 4,320 | 0 |
| 18.00 | 85% | 15% | 60 | 36 | 2,160 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 7.00
Achieved total sun time (hrs) 6.18 0.87
Achieved daily sun time * area 88992 0.87

## 23 — 100 m2

**EXISTING STATUS** — March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 64% | 36% | 60 | 36 | 2,160 |
| 8.00 | 52% | 48% | 60 | 48 | 2,880 |
| 9.00 | 20% | 80% | 60 | 80 | 4,800 |
| 10.00 | 17% | 83% | 60 | 83 | 4,980 |
| 11.00 | 16% | 84% | 60 | 84 | 5,040 |
| 12.00 | 16% | 84% | 60 | 84 | 5,040 |
| 13.00 | 16% | 84% | 60 | 84 | 5,040 |
| 14.00 | 16% | 84% | 60 | 84 | 5,040 |
| 15.00 | 16% | 84% | 60 | 84 | 5,040 |
| 16.00 | 20% | 80% | 60 | 80 | 4,800 |
| 17.00 | 36% | 64% | 60 | 64 | 3,840 |
| 18.00 | 44% | 56% | 60 | 56 | 3,360 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.67
Achieved daily sun time * area 52020

**NEW STATUS** — March 21st — change

| Time | Shadow | Sunlight | Sun time | Sun area | time * area | time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -2,160 |
| 8.00 | 66% | 34% | 60 | 34 | 2,040 | -840 |
| 9.00 | 20% | 80% | 60 | 80 | 4,800 | 0 |
| 10.00 | 17% | 83% | 60 | 83 | 4,980 | 0 |
| 11.00 | 16% | 84% | 60 | 84 | 5,040 | 0 |
| 12.00 | 16% | 84% | 60 | 84 | 5,040 | 0 |
| 13.00 | 16% | 84% | 60 | 84 | 5,040 | 0 |
| 14.00 | 16% | 84% | 60 | 84 | 5,040 | 0 |
| 15.00 | 16% | 84% | 60 | 84 | 5,040 | 0 |
| 16.00 | 20% | 80% | 60 | 80 | 4,800 | 0 |
| 17.00 | 36% | 64% | 60 | 64 | 3,840 | 0 |
| 18.00 | 44% | 56% | 60 | 56 | 3,360 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.17 — 0.95
Achieved daily sun time * area 49020 — 0.95

## 24 — 100 m2

**EXISTING STATUS** — March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 64% | 36% | 60 | 36 | 2,160 |
| 8.00 | 52% | 48% | 60 | 48 | 2,880 |
| 9.00 | 20% | 80% | 60 | 80 | 4,800 |
| 10.00 | 17% | 83% | 60 | 83 | 4,980 |
| 11.00 | 16% | 84% | 60 | 84 | 5,040 |
| 12.00 | 16% | 84% | 60 | 84 | 5,040 |
| 13.00 | 16% | 84% | 60 | 84 | 5,040 |
| 14.00 | 16% | 84% | 60 | 84 | 5,040 |
| 15.00 | 16% | 84% | 60 | 84 | 5,040 |
| 16.00 | 20% | 80% | 60 | 80 | 4,800 |
| 17.00 | 36% | 64% | 60 | 64 | 3,840 |
| 18.00 | 44% | 56% | 60 | 56 | 3,360 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.67
Achieved daily sun time * area 52020

**NEW STATUS** — March 21st — change

| Time | Shadow | Sunlight | Sun time | Sun area | time * area | time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -2,160 |
| 8.00 | 66% | 34% | 60 | 34 | 2,040 | -840 |
| 9.00 | 20% | 80% | 60 | 80 | 4,800 | 0 |
| 10.00 | 17% | 83% | 60 | 83 | 4,980 | 0 |
| 11.00 | 16% | 84% | 60 | 84 | 5,040 | 0 |
| 12.00 | 16% | 84% | 60 | 84 | 5,040 | 0 |
| 13.00 | 16% | 84% | 60 | 84 | 5,040 | 0 |
| 14.00 | 16% | 84% | 60 | 84 | 5,040 | 0 |
| 15.00 | 16% | 84% | 60 | 84 | 5,040 | 0 |
| 16.00 | 20% | 80% | 60 | 80 | 4,800 | 0 |
| 17.00 | 36% | 64% | 60 | 64 | 3,840 | 0 |
| 18.00 | 44% | 56% | 60 | 56 | 3,360 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.17 — 0.95
Achieved daily sun time * area 49020 — 0.95

## 25 — 250 m2

**EXISTING STATUS** — March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 44% | 56% | 60 | 140 | 8,400 |
| 8.00 | 30% | 70% | 60 | 175 | 10,500 |
| 9.00 | 22% | 78% | 60 | 195 | 11,700 |
| 10.00 | 22% | 78% | 60 | 195 | 11,700 |
| 11.00 | 22% | 78% | 60 | 195 | 11,700 |
| 12.00 | 27% | 73% | 60 | 183 | 10,950 |
| 13.00 | 30% | 70% | 60 | 175 | 10,500 |
| 14.00 | 35% | 65% | 60 | 163 | 9,750 |
| 15.00 | 47% | 53% | 60 | 133 | 7,950 |
| 16.00 | 53% | 47% | 60 | 118 | 7,050 |
| 17.00 | 70% | 30% | 60 | 75 | 4,500 |
| 18.00 | 85% | 15% | 60 | 38 | 2,250 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 9.00
Achieved total sun time (hrs) 7.13
Achieved daily sun time * area 106950

**NEW STATUS** — March 21st — change

| Time | Shadow | Sunlight | Sun time | Sun area | time * area | time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 44% | 56% | 60 | 140 | 8,400 | 0 |
| 8.00 | 40% | 60% | 60 | 150 | 9,000 | -1,500 |
| 9.00 | 22% | 78% | 60 | 195 | 11,700 | 0 |
| 10.00 | 22% | 78% | 60 | 195 | 11,700 | 0 |
| 11.00 | 22% | 78% | 60 | 195 | 11,700 | 0 |
| 12.00 | 27% | 73% | 60 | 183 | 10,950 | 0 |
| 13.00 | 30% | 70% | 60 | 175 | 10,500 | 0 |
| 14.00 | 35% | 65% | 60 | 163 | 9,750 | 0 |
| 15.00 | 47% | 53% | 60 | 133 | 7,950 | 0 |
| 16.00 | 53% | 47% | 60 | 118 | 7,050 | 0 |
| 17.00 | 70% | 30% | 60 | 75 | 4,500 | 0 |
| 18.00 | 85% | 15% | 60 | 38 | 2,250 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 9.00
Achieved total sun time (hrs) 7.03 — 0.99
Achieved daily sun time * area 105450 — 0.99

## 26 — 85 m2

**EXISTING STATUS** — March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 64% | 36% | 60 | 31 | 1,836 |
| 8.00 | 52% | 48% | 60 | 41 | 2,448 |
| 9.00 | 20% | 80% | 60 | 68 | 4,080 |
| 10.00 | 17% | 83% | 60 | 71 | 4,233 |
| 11.00 | 16% | 84% | 60 | 71 | 4,284 |
| 12.00 | 16% | 84% | 60 | 71 | 4,284 |
| 13.00 | 16% | 84% | 60 | 71 | 4,284 |
| 14.00 | 16% | 84% | 60 | 71 | 4,284 |
| 15.00 | 16% | 84% | 60 | 71 | 4,284 |
| 16.00 | 20% | 80% | 60 | 68 | 4,080 |
| 17.00 | 36% | 64% | 60 | 54 | 3,264 |
| 18.00 | 44% | 56% | 60 | 48 | 2,856 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.67
Achieved daily sun time * area 44217

**NEW STATUS** — March 21st — change

| Time | Shadow | Sunlight | Sun time | Sun area | time * area | time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 64% | 36% | 60 | 31 | 1,836 | 0 |
| 8.00 | 52% | 48% | 60 | 41 | 2,448 | 0 |
| 9.00 | 20% | 80% | 60 | 68 | 4,080 | 0 |
| 10.00 | 17% | 83% | 60 | 71 | 4,233 | 0 |
| 11.00 | 16% | 84% | 60 | 71 | 4,284 | 0 |
| 12.00 | 16% | 84% | 60 | 71 | 4,284 | 0 |
| 13.00 | 16% | 84% | 60 | 71 | 4,284 | 0 |
| 14.00 | 16% | 84% | 60 | 71 | 4,284 | 0 |
| 15.00 | 16% | 84% | 60 | 71 | 4,284 | 0 |
| 16.00 | 20% | 80% | 60 | 68 | 4,080 | 0 |
| 17.00 | 36% | 64% | 60 | 54 | 3,264 | 0 |
| 18.00 | 44% | 56% | 60 | 48 | 2,856 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.67 — 1.00
Achieved daily sun time * area 44217 — 1.00

## 27 — 540 m2

**EXISTING STATUS** — March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 44% | 56% | 60 | 302 | 18,144 |
| 8.00 | 30% | 70% | 60 | 378 | 22,680 |
| 9.00 | 22% | 78% | 60 | 421 | 25,272 |
| 10.00 | 22% | 78% | 60 | 421 | 25,272 |
| 11.00 | 22% | 78% | 60 | 421 | 25,272 |
| 12.00 | 27% | 73% | 60 | 394 | 23,652 |
| 13.00 | 30% | 70% | 60 | 378 | 22,680 |
| 14.00 | 35% | 65% | 60 | 351 | 21,060 |
| 15.00 | 47% | 53% | 60 | 286 | 17,172 |
| 16.00 | 53% | 47% | 60 | 254 | 15,228 |
| 17.00 | 70% | 30% | 60 | 162 | 9,720 |
| 18.00 | 85% | 15% | 60 | 81 | 4,860 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 9.00
Achieved total sun time (hrs) 7.13
Achieved daily sun time * area 231012

**NEW STATUS** — March 21st — change

| Time | Shadow | Sunlight | Sun time | Sun area | time * area | time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 74% | 26% | 60 | 140 | 8,424 | -9,720 |
| 8.00 | 42% | 58% | 60 | 313 | 18,792 | -3,888 |
| 9.00 | 30% | 70% | 60 | 378 | 22,680 | -2,592 |
| 10.00 | 28% | 72% | 60 | 389 | 23,328 | -1,944 |
| 11.00 | 26% | 74% | 60 | 400 | 23,976 | -1,296 |
| 12.00 | 29% | 71% | 60 | 383 | 23,004 | -648 |
| 13.00 | 31% | 69% | 60 | 373 | 22,356 | -324 |
| 14.00 | 36% | 64% | 60 | 346 | 20,736 | -324 |
| 15.00 | 47% | 53% | 60 | 286 | 17,172 | 0 |
| 16.00 | 53% | 47% | 60 | 254 | 15,228 | 0 |
| 17.00 | 70% | 30% | 60 | 162 | 9,720 | 0 |
| 18.00 | 85% | 15% | 60 | 81 | 4,860 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 8.00
Achieved total sun time (hrs) 6.49 — 0.92
Achieved daily sun time * area 210276 — 0.92

## 28 — 290 m2

**EXISTING STATUS** — March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 48% | 52% | 60 | 151 | 9,048 |
| 8.00 | 27% | 73% | 60 | 212 | 12,702 |
| 9.00 | 19% | 81% | 60 | 235 | 14,094 |
| 10.00 | 15% | 85% | 60 | 247 | 14,790 |
| 11.00 | 15% | 85% | 60 | 247 | 14,790 |
| 12.00 | 15% | 85% | 60 | 247 | 14,790 |
| 13.00 | 15% | 85% | 60 | 247 | 14,790 |
| 14.00 | 15% | 85% | 60 | 247 | 14,790 |
| 15.00 | 19% | 81% | 60 | 235 | 14,094 |
| 16.00 | 44% | 56% | 60 | 162 | 9,744 |
| 17.00 | 67% | 33% | 60 | 96 | 5,742 |
| 18.00 | 100% | 0% | 60 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.01
Achieved daily sun time * area 139374

**NEW STATUS** — March 21st — change

| Time | Shadow | Sunlight | Sun time | Sun area | time * area | time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -9,048 |
| 8.00 | 100% | 0% | 60 | 0 | 0 | -12,702 |
| 9.00 | 21% | 79% | 60 | 229 | 13,746 | -348 |
| 10.00 | 15% | 85% | 60 | 247 | 14,790 | 0 |
| 11.00 | 15% | 85% | 60 | 247 | 14,790 | 0 |
| 12.00 | 15% | 85% | 60 | 247 | 14,790 | 0 |
| 13.00 | 15% | 85% | 60 | 247 | 14,790 | 0 |
| 14.00 | 15% | 85% | 60 | 247 | 14,790 | 0 |
| 15.00 | 19% | 81% | 60 | 235 | 14,094 | 0 |
| 16.00 | 44% | 56% | 60 | 162 | 9,744 | 0 |
| 17.00 | 67% | 33% | 60 | 96 | 5,742 | 0 |
| 18.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 8.00
Achieved total sun time (hrs) 6.74 — 0.85
Achieved daily sun time * area 117276 — 0.85

## 29 — 140 m2

**EXISTING STATUS** — March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 48% | 52% | 60 | 73 | 4,368 |
| 8.00 | 27% | 73% | 60 | 102 | 6,132 |
| 9.00 | 19% | 81% | 60 | 113 | 6,804 |
| 10.00 | 15% | 85% | 60 | 119 | 7,140 |
| 11.00 | 15% | 85% | 60 | 119 | 7,140 |
| 12.00 | 15% | 85% | 60 | 119 | 7,140 |
| 13.00 | 15% | 85% | 60 | 119 | 7,140 |
| 14.00 | 15% | 85% | 60 | 119 | 7,140 |
| 15.00 | 19% | 81% | 60 | 113 | 6,804 |
| 16.00 | 44% | 56% | 60 | 78 | 4,704 |
| 17.00 | 67% | 33% | 60 | 46 | 2,772 |
| 18.00 | 100% | 0% | 60 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.01
Achieved daily sun time * area 67284

**NEW STATUS** — March 21st — change

| Time | Shadow | Sunlight | Sun time | Sun area | time * area | time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -4,368 |
| 8.00 | 100% | 0% | 60 | 0 | 0 | -6,132 |
| 9.00 | 21% | 79% | 60 | 111 | 6,636 | -168 |
| 10.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 11.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 12.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 13.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 14.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 15.00 | 19% | 81% | 60 | 113 | 6,804 | 0 |
| 16.00 | 44% | 56% | 60 | 78 | 4,704 | 0 |
| 17.00 | 67% | 33% | 60 | 46 | 2,772 | 0 |
| 18.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 8.00
Achieved total sun time (hrs) 6.74 — 0.85
Achieved daily sun time * area 56616 — 0.85

## 30 — 140 m2

**EXISTING STATUS** — March 21st

| Time | Shadow | Sunlight | Sun time | Sun area | time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 48% | 52% | 60 | 73 | 4,368 |
| 8.00 | 27% | 73% | 60 | 102 | 6,132 |
| 9.00 | 19% | 81% | 60 | 113 | 6,804 |
| 10.00 | 15% | 85% | 60 | 119 | 7,140 |
| 11.00 | 15% | 85% | 60 | 119 | 7,140 |
| 12.00 | 15% | 85% | 60 | 119 | 7,140 |
| 13.00 | 15% | 85% | 60 | 119 | 7,140 |
| 14.00 | 15% | 85% | 60 | 119 | 7,140 |
| 15.00 | 19% | 81% | 60 | 113 | 6,804 |
| 16.00 | 44% | 56% | 60 | 78 | 4,704 |
| 17.00 | 67% | 33% | 60 | 46 | 2,772 |
| 18.00 | 100% | 0% | 60 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.01
Achieved daily sun time * area 67284

**NEW STATUS** — March 21st — change

| Time | Shadow | Sunlight | Sun time | Sun area | time * area | time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -4,368 |
| 8.00 | 100% | 0% | 60 | 0 | 0 | -6,132 |
| 9.00 | 21% | 79% | 60 | 111 | 6,636 | -168 |
| 10.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 11.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 12.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 13.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 14.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 15.00 | 19% | 81% | 60 | 113 | 6,804 | 0 |
| 16.00 | 44% | 56% | 60 | 78 | 4,704 | 0 |
| 17.00 | 67% | 33% | 60 | 46 | 2,772 | 0 |
| 18.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 8.00
Achieved total sun time (hrs) 6.74 — 0.85
Achieved daily sun time * area 56616 — 0.85

## 31 — 140 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 48% | 52% | 60 | 73 | 4,368 |
| 8.00 | 27% | 73% | 60 | 102 | 6,132 |
| 9.00 | 19% | 81% | 60 | 113 | 6,804 |
| 10.00 | 15% | 85% | 60 | 119 | 7,140 |
| 11.00 | 15% | 85% | 60 | 119 | 7,140 |
| 12.00 | 15% | 85% | 60 | 119 | 7,140 |
| 13.00 | 15% | 85% | 60 | 119 | 7,140 |
| 14.00 | 15% | 85% | 60 | 119 | 7,140 |
| 15.00 | 19% | 81% | 60 | 113 | 6,804 |
| 16.00 | 44% | 56% | 60 | 78 | 4,704 |
| 17.00 | 67% | 33% | 60 | 46 | 2,772 |
| 18.00 | 100% | 0% | 60 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.01
Achieved daily sun time * area 67284

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -4,368 |
| 8.00 | 100% | 0% | 60 | 0 | 0 | -6,132 |
| 9.00 | 21% | 79% | 60 | 111 | 6,636 | -168 |
| 10.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 11.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 12.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 13.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 14.00 | 15% | 85% | 60 | 119 | 7,140 | 0 |
| 15.00 | 19% | 81% | 60 | 113 | 6,804 | 0 |
| 16.00 | 44% | 56% | 60 | 78 | 4,704 | 0 |
| 17.00 | 67% | 33% | 60 | 46 | 2,772 | 0 |
| 18.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 8.00
Achieved total sun time (hrs) 6.74 0.85
Achieved daily sun time * area 56616 0.85

## 32 — 190 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 48% | 52% | 60 | 99 | 5,928 |
| 8.00 | 27% | 73% | 60 | 139 | 8,322 |
| 9.00 | 19% | 81% | 60 | 154 | 9,234 |
| 10.00 | 15% | 85% | 60 | 162 | 9,690 |
| 11.00 | 15% | 85% | 60 | 162 | 9,690 |
| 12.00 | 15% | 85% | 60 | 162 | 9,690 |
| 13.00 | 15% | 85% | 60 | 162 | 9,690 |
| 14.00 | 15% | 85% | 60 | 162 | 9,690 |
| 15.00 | 19% | 81% | 60 | 154 | 9,234 |
| 16.00 | 44% | 56% | 60 | 106 | 6,384 |
| 17.00 | 67% | 33% | 60 | 63 | 3,762 |
| 18.00 | 100% | 0% | 60 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.01
Achieved daily sun time * area 91314

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | -5,928 |
| 8.00 | 100% | 0% | 60 | 0 | 0 | -8,322 |
| 9.00 | 19% | 81% | 60 | 154 | 9,234 | 0 |
| 10.00 | 15% | 85% | 60 | 162 | 9,690 | 0 |
| 11.00 | 15% | 85% | 60 | 162 | 9,690 | 0 |
| 12.00 | 15% | 85% | 60 | 162 | 9,690 | 0 |
| 13.00 | 15% | 85% | 60 | 162 | 9,690 | 0 |
| 14.00 | 15% | 85% | 60 | 162 | 9,690 | 0 |
| 15.00 | 19% | 81% | 60 | 154 | 9,234 | 0 |
| 16.00 | 44% | 56% | 60 | 106 | 6,384 | 0 |
| 17.00 | 67% | 33% | 60 | 63 | 3,762 | 0 |
| 18.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 8.00
Achieved total sun time (hrs) 6.76 0.85
Achieved daily sun time * area 77064 0.85

## 33 — 350 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 48% | 52% | 60 | 182 | 10,920 |
| 8.00 | 27% | 73% | 60 | 256 | 15,330 |
| 9.00 | 19% | 81% | 60 | 284 | 17,010 |
| 10.00 | 15% | 85% | 60 | 298 | 17,850 |
| 11.00 | 15% | 85% | 60 | 298 | 17,850 |
| 12.00 | 15% | 85% | 60 | 298 | 17,850 |
| 13.00 | 15% | 85% | 60 | 298 | 17,850 |
| 14.00 | 15% | 85% | 60 | 298 | 17,850 |
| 15.00 | 19% | 81% | 60 | 284 | 17,010 |
| 16.00 | 44% | 56% | 60 | 196 | 11,760 |
| 17.00 | 67% | 33% | 60 | 116 | 6,930 |
| 18.00 | 100% | 0% | 60 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.01
Achieved daily sun time * area 168210

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 68% | 32% | 60 | 112 | 6,720 | -4,200 |
| 8.00 | 27% | 73% | 60 | 256 | 15,330 | 0 |
| 9.00 | 19% | 81% | 60 | 284 | 17,010 | 0 |
| 10.00 | 15% | 85% | 60 | 298 | 17,850 | 0 |
| 11.00 | 15% | 85% | 60 | 298 | 17,850 | 0 |
| 12.00 | 15% | 85% | 60 | 298 | 17,850 | 0 |
| 13.00 | 15% | 85% | 60 | 298 | 17,850 | 0 |
| 14.00 | 15% | 85% | 60 | 298 | 17,850 | 0 |
| 15.00 | 19% | 81% | 60 | 284 | 17,010 | 0 |
| 16.00 | 44% | 56% | 60 | 196 | 11,760 | 0 |
| 17.00 | 67% | 33% | 60 | 116 | 6,930 | 0 |
| 18.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 9.00
Achieved total sun time (hrs) 7.81 0.98
Achieved daily sun time * area 164010 0.98

## 34 — 500 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 |
| 8.00 | 69% | 31% | 60 | 155 | 9,300 |
| 9.00 | 29% | 71% | 60 | 355 | 21,300 |
| 10.00 | 25% | 75% | 60 | 375 | 22,500 |
| 11.00 | 16% | 84% | 60 | 420 | 25,200 |
| 12.00 | 14% | 86% | 60 | 430 | 25,800 |
| 13.00 | 14% | 86% | 60 | 430 | 25,800 |
| 14.00 | 14% | 86% | 60 | 430 | 25,800 |
| 15.00 | 17% | 83% | 60 | 415 | 24,900 |
| 16.00 | 18% | 82% | 60 | 410 | 24,600 |
| 17.00 | 23% | 77% | 60 | 385 | 23,100 |
| 18.00 | 38% | 62% | 60 | 310 | 18,600 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.23
Achieved daily sun time * area 246900

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 8.00 | 69% | 31% | 60 | 155 | 9,300 | 0 |
| 9.00 | 29% | 71% | 60 | 355 | 21,300 | 0 |
| 10.00 | 25% | 75% | 60 | 375 | 22,500 | 0 |
| 11.00 | 16% | 84% | 60 | 420 | 25,200 | 0 |
| 12.00 | 14% | 86% | 60 | 430 | 25,800 | 0 |
| 13.00 | 14% | 86% | 60 | 430 | 25,800 | 0 |
| 14.00 | 14% | 86% | 60 | 430 | 25,800 | 0 |
| 15.00 | 17% | 83% | 60 | 415 | 24,900 | 0 |
| 16.00 | 18% | 82% | 60 | 410 | 24,600 | 0 |
| 17.00 | 23% | 77% | 60 | 385 | 23,100 | 0 |
| 18.00 | 48% | 52% | 60 | 260 | 15,600 | -3,000 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.13 0.99
Achieved daily sun time * area 243900 0.99

## 35 — 400 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 62% | 38% | 60 | 152 | 9,120 |
| 8.00 | 58% | 42% | 60 | 168 | 10,080 |
| 9.00 | 48% | 52% | 60 | 208 | 12,480 |
| 10.00 | 45% | 55% | 60 | 220 | 13,200 |
| 11.00 | 26% | 74% | 60 | 296 | 17,760 |
| 12.00 | 20% | 80% | 60 | 320 | 19,200 |
| 13.00 | 18% | 82% | 60 | 328 | 19,680 |
| 14.00 | 16% | 84% | 60 | 336 | 20,160 |
| 15.00 | 20% | 80% | 60 | 320 | 19,200 |
| 16.00 | 37% | 63% | 60 | 252 | 15,120 |
| 17.00 | 37% | 63% | 60 | 252 | 15,120 |
| 18.00 | 40% | 60% | 60 | 240 | 14,400 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 7.73
Achieved daily sun time * area 185520

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 62% | 38% | 60 | 152 | 9,120 | 0 |
| 8.00 | 58% | 42% | 60 | 168 | 10,080 | 0 |
| 9.00 | 48% | 52% | 60 | 208 | 12,480 | 0 |
| 10.00 | 45% | 55% | 60 | 220 | 13,200 | 0 |
| 11.00 | 26% | 74% | 60 | 296 | 17,760 | 0 |
| 12.00 | 20% | 80% | 60 | 320 | 19,200 | 0 |
| 13.00 | 18% | 82% | 60 | 328 | 19,680 | 0 |
| 14.00 | 16% | 84% | 60 | 336 | 20,160 | 0 |
| 15.00 | 20% | 80% | 60 | 320 | 19,200 | 0 |
| 16.00 | 37% | 63% | 60 | 252 | 15,120 | 0 |
| 17.00 | 37% | 63% | 60 | 252 | 15,120 | 0 |
| 18.00 | 69% | 31% | 60 | 124 | 7,440 | -6,960 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 9.00
Achieved total sun time (hrs) 7.44 0.97
Achieved daily sun time * area 178560 0.97

## 36 — 1,500 m2

**EXISTING STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area |
|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 |
| 7.00 | 38% | 62% | 60 | 930 | 55,800 |
| 8.00 | 28% | 72% | 60 | 1080 | 64,800 |
| 9.00 | 24% | 76% | 60 | 1140 | 68,400 |
| 10.00 | 19% | 81% | 60 | 1215 | 72,900 |
| 11.00 | 18% | 82% | 60 | 1230 | 73,800 |
| 12.00 | 17% | 83% | 60 | 1245 | 74,700 |
| 13.00 | 17% | 83% | 60 | 1245 | 74,700 |
| 14.00 | 17% | 83% | 60 | 1245 | 74,700 |
| 15.00 | 17% | 83% | 60 | 1245 | 74,700 |
| 16.00 | 20% | 80% | 60 | 1200 | 72,000 |
| 17.00 | 27% | 73% | 60 | 1095 | 65,700 |
| 18.00 | 37% | 63% | 60 | 945 | 56,700 |
| 19.00 | 100% | 0% | 60 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 12.00
Achieved total sun time (hrs) 9.21
Achieved daily sun time * area 828900

**NEW STATUS**

| Time | Shadow | Sunlight | Sun time | Sun area | March 21st time * area | change time * area |
|---|---|---|---|---|---|---|
| 24 Hr | % / % | | min | m2 | min*m2 | min*m2 |
| 6.00 | 100% | 0% | 60 | 0 | 0 | 0 |
| 7.00 | 38% | 62% | 60 | 930 | 55,800 | 0 |
| 8.00 | 28% | 72% | 60 | 1080 | 64,800 | 0 |
| 9.00 | 24% | 76% | 60 | 1140 | 68,400 | 0 |
| 10.00 | 19% | 81% | 60 | 1215 | 72,900 | 0 |
| 11.00 | 18% | 82% | 60 | 1230 | 73,800 | 0 |
| 12.00 | 17% | 83% | 60 | 1245 | 74,700 | 0 |
| 13.00 | 17% | 83% | 60 | 1245 | 74,700 | 0 |
| 14.00 | 17% | 83% | 60 | 1245 | 74,700 | 0 |
| 15.00 | 17% | 83% | 60 | 1245 | 74,700 | 0 |
| 16.00 | 20% | 80% | 60 | 1200 | 72,000 | 0 |
| 17.00 | 27% | 73% | 60 | 1095 | 65,700 | 0 |
| 18.00 | 67% | 33% | 60 | 495 | 29,700 | -27,000 |
| 19.00 | 100% | 0% | 60 | 0 | 0 | 0 |

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 11.00
Achieved total sun time (hrs) 8.91 0.97
Achieved daily sun time * area 801900 0.97

End of Report