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BRE Client Report

Review of daylight and sunlight assessment for Brighton Gasworks

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1 Introduction

1.1.1 A planning application, reference BH2021/04167, has been submitted to Brighton and Hove City Council for a proposal to develop the Brighton Gasworks site. Chapter 12 of the submitted Environmental Statement (ES) assesses loss of daylight, sunlight and overshadowing. A separate report “Daylight and Sunlight Assessment (Internal)” assesses provision to the proposal. Both the chapter and report are produced by Anstey Horne.

1.1.2 BRE have been commissioned by Brighton and Hove City Council to evaluate the chapter and report. The evaluation was to review the scope, methodology, text and conclusions of the assessments, but not verification of the calculations. This report gives the results of the evaluation. The review is based on the daylight and sunlight chapter and report with plans of the development submitted as part of the application, used together with aerial photography. No site visit was undertaken.

2 Evaluation criteria

2.1 Loss of daylight and sunlight to existing surrounding dwellings

2.1.1 The ES chapter analyses loss of daylight and sunlight to existing properties using BRE Report BR 209, 'Site Layout Planning for Daylight and Sunlight, a guide to good practice'. This source is appropriate and is widely used by local authorities to help determine planning applications.

2.1.2 The chapter correctly states that the advice given in the BRE Report is not mandatory. The guidance it contains is advisory and intended to aid with good design.

2.1.3 The loss of daylight guidelines within the BRE report are intended for use for habitable rooms (i.e. living rooms, kitchens, dining rooms and bedrooms) in nearby domestic dwellings.

2.1.4 The guidelines could also be applied to non-domestic buildings where occupants have a reasonable expectation of daylight, such as schools, hospitals, some offices, hotels and hostels. Other non-domestic properties would not need to be assessed. The chapter does not assess any non-domestic properties. The Brighton Waldorf School is to the north west of the development site. It would have an indirect view of the proposals. Since neighbouring residential properties with a more direct view of the site have been analysed (and results suggest negligible impacts) the school appears unlikely to be significantly impacted.

Loss of daylight

2.1.5 To assess loss of daylight to existing buildings, the BRE Report recommends the calculation of the vertical sky component (VSC) at the centre of the window. It sets out two guidelines for vertical sky component:

1. If the vertical sky component at the centre of the existing window exceeds 27% with the new development in place, then enough skylight should still be reaching the existing window.

2. If the vertical sky component with the new development is both less than 27% and less than 0.8 times its former value, then the area lit by the window is likely to appear more gloomy and electric lighting will be needed for more of the time.

2.1.6 Where room dimensions are known, the BRE Report also gives guidance on the distribution of light in the existing buildings, based on the areas of the working plane which can receive direct skylight before and after. The boundary between these areas is known as the no sky line. If this area is reduced to less than 0.8 times its value before, then the distribution of light in the room is likely to be adversely affected, and more of the room will appear poorly lit. Daylight distribution is only required by the BRE Report where room layouts are known.

2.1.7 The chapter includes daylight distribution calculations and states that for some properties layouts were sourced from the local authority planning portal or estate agent listings. At other properties the calculations are based on estimated layouts. These results are therefore subject to considerable uncertainty.

2.1.8 The BRE Report states that if the vertical sky component or daylight distribution results are below the guidelines then the diffuse daylighting of the existing building may be adversely affected. The chapter does not seem to apply this correctly. In some cases where windows

would be below the vertical sky component guidelines but the room would meet the daylight distribution guideline, a negligible impact has been assessed. This will underestimate the impact.

Loss of sunlight to windows

2.1.9 The BRE Report recommends that in existing buildings sunlight should be checked for all main living rooms of dwellings, and conservatories, if the development is to the south and they have a window facing within 90° of due south. If the centre of the window can receive more than one quarter of annual probable sunlight hours (APSH), including at least 5% of annual probable sunlight hours in the winter months between 21st September and 21st March, then the room should still receive enough sunlight. Any reduction in sunlight access below this level should be kept to a minimum. If the window already receives less than this and the sunlight is reduced to less than 0.8 times its current value, occupants will notice the loss of sunlight. If the overall annual loss is more than 4% of annual probable sunlight hours, the room would appear colder, less cheerful and less pleasant.

Loss of sunlight to gardens

2.1.10 The BRE Report states that existing gardens and open spaces should be checked via the calculation of hours of sunlight received on 21 March. If the space receives less than two hours of sunlight over less than half of its area with the proposed development in place and this area is less than 0.8 times the value currently, the loss of sunlight is likely to be noticeable.

Environmental impact assessment

2.1.11 Appendix I of the BRE Report gives advice on using the loss of daylight and sunlight guidelines (outlined above) as the basis for an environmental impact assessment. It suggests assessing skylight and sunlight impacts separately.

2.1.12 The BRE Report states that where the loss of skylight or sunlight fully meets the guidelines, the impact is assessed as negligible or minor adverse.

2.1.13 Where the loss of skylight or sunlight does not meet the guidelines, the impact is assessed as minor, moderate or major adverse. Factors tending towards a minor adverse impact include:

- Only a small number of windows are affected
- The loss of light is only marginally outside the guidelines
- An affected room has other sources of skylight or sunlight
- The affected building only has a low level requirement for skylight or sunlight

2.1.14 Factors tending towards a major adverse impact include:

- A large number of windows or large area of open space are affected
- The loss of light is substantially outside the guidelines
- All the windows in a particular property are affected
- The affected indoor or outdoor spaces have a particularly strong requirement for skylight or sunlight.

2.1.15 The chapter mentions these guidelines and also introduces magnitude of impact and sensitivity of receptor.

2.1.16 Magnitude of impact is ranked negligible, low, medium and high. This is based on the relative loss of light. For example the chapter's "low" magnitude of impact would be a value between 0.7-0.79 times that currently. Care needs to be taken if applying impacts in this way. For example a large loss of light to a secondary window in a room where all other windows at the property would meet the guidelines may impact the property less than if all windows were below the guidelines, albeit closer to the 0.8 ratio target. Also, a window which is already poorly lit may have a large relative reduction in value but a small absolute change.

2.1.17 The chapter states that living rooms, dining rooms, kitchens and all gardens and open spaces analysed have been classed as high sensitivity. Bedrooms have been classed as low sensitivity. Although the BRE Report does state that bedrooms may be less important than living areas for daylight distribution, it does not make this assertion for vertical sky component.

2.1.18 As part of this review an impact has been assessed based on the data provided in the chapter and the guidelines in Appendix I of the BRE Report. This has been compared to the impact stated in the chapter.

2.2 Daylight and sunlight provision to the proposed development

2.2.1 Daylight provision to the proposed rooms has been evaluated by Anstey Horne in a separate report using British Standard 8206-2:2008 'Code of Practice for Daylighting'. This standard has been superseded by BS EN17037 "Daylight in buildings" which uses different calculation methodologies. However, the BRE Report "Site layout planning for daylight and sunlight: a guide to good practice" is yet to be updated and still refers to BS8206. Local authorities may therefore still consider its use appropriate.

2.2.2 BS8206 uses the average daylight factor (ADF) to assess daylight provision. The ADF depends on internal surface areas and reflectances, glazing size and transmittance and external obstruction.

2.2.3 For daylight provision, BS8206 recommends the following minimum values for ADF:

- Bedrooms 1.0%
- Living rooms 1.5%
- Kitchens 2.0%

2.2.4 Where a room has a shared use, BS8206 states that the higher value should apply. However, local authorities frequently accept the living room standard for a shared kitchen/living room. This is a practical approach, as it is seldom in the final resident's interest to have a closed off, small kitchen which is completely artificially lit in order to force compliance with the Standard.

2.2.5 For combined living/kitchen/dining areas the Anstey Horne report provides results for the whole space. However, they have also "undertaken an assessment which notionally truncates the room to exclude the kitchen". This is not an appropriate assessment as the average daylight factor, by definition, is the average over the whole space. For the purposes of this review these results are not considered.

2.2.6 For floor to ceiling windows an extra factor should be applied to daylight received from glazing below the working plane (0.85m from the floor). This factor should be 0.15 or the floor reflectance (if known). The Anstey Horne report does not mention this criterion. If it has not been accounted for, the values presented could be an overestimate.

2.2.7 Anstey Horne state that a glazing transmittance of 0.68 was used with a maintenance factor (to take into account dirt on the glazing) of 0.92 in the calculations. These are consistent with the standard practice for low emissivity double glazing in an urban setting.

2.2.8 Anstey Horne state that a framing factor of 0.8 is used. This may be reasonable for the larger patio style windows, but for smaller windows a higher proportion of the aperture may be taken by glazing. Actual framing from the proposal drawings could have been used to increase accuracy of the calculations.

2.2.9 Anstey Horne have used reflectance values of 0.85 for ceilings, 0.81 for walls and 0.4 for floors. The values are high. In reality it would be difficult to maintain such high reflectances and the results may overestimate actual daylight provision.

2.2.10 For sunlight, BS 8206-2 recommends that interiors where the occupants expect sunlight should receive at least 25% of Annual Probable Sunlight Hours, including at least 5% in the winter months between 21st September and 21st March.

2.2.11 Results for all windows have been included in the Anstey Horne assessment and overall results discussed. However, living rooms are considered the key room for sunlight provision in the context of BS8206 and the BRE Report. This review has sought to assess the presented results for living areas per proposed block.

Sunlight provision to proposed garden and amenity areas

2.2.12 The BRE Report suggests for that proposed garden and amenity areas to be well sunlit they should receive two, or more, hours of sunlight on 21st March over at least half of their areas.

2.2.13 The Anstey Horne report has assessed open spaces at the proposed development using this methodology.

3 Loss of daylight and sunlight to surroundings

3.1.1 Figure 1 shows the site and surrounding area.

Figure 1: Proposal site (in yellow) and surrounding area. As taken from Appendix 12.1 of the Environmental Statement. North is to the right of the image.

3.1.2 The analysis appears to cover the closest applicable properties to the development and therefore the scope is reasonable, although this was not checked on site.

3.1.3 The following sections discuss the results for the surrounding properties.

3.2 John Howard Cottages and The Lodge

3.2.1 John Howard Cottages and The Lodge are to the north of the proposal site on the opposite side of Roedean Road. The closest areas directly facing the proposal site have been analysed. This is a reasonable approach.

3.2.2 All windows analysed would meet the vertical sky component guidelines. Daylight distribution (based on estimated layouts) and loss of sunlight guidelines would also be met.

3.2.3 The daylight and sunlight impact would be assessed as negligible.

3.2.4 The Brighton Waldorf School is to the east of these properties with a less direct view of the proposal site. The impact would similarly be expected not to be significant.

3.3 Roedean Court

3.3.1 Roedean Court is to the north of the proposal site on the corner of Roedean Road and Wilson Avenue. The south facing façade would face the proposal site.

3.3.2 There would be seven windows below the vertical sky component guidelines located on the third floor. In general, the results are close to the target values. The existing building has an overhanging section of the roof above these windows. Overhangs can restrict daylight provision from higher angles and force a reliance from an area opposite. The BRE Report gives further guidance on this and suggests the calculations be repeated with and without the overhangs in place. The chapter has not done this, but given the results on the lower floors it would be expected that without the overhang the guidelines would be met. All rooms meet the daylight distribution guideline (which appear based on known layouts). The BRE loss of sunlight guidelines would be met.

3.3.3 The chapter assesses a negligible impact for daylight and sunlight. This would tend to minor for the windows below the guidelines on the third floor, but the primary factor in this loss of light appears to be the existing overhang and not the proposed development.

3.4 5 and 7 Roedean Road

3.4.1 Referenced incorrectly as 5 and 7 Roedean Court in the main text of the chapter (but correctly labelled in the appendices), these properties are located to the north east of the site on the opposite side of Marina Way. The rear of the properties would have an indirect view of the proposal site.

3.4.2 The chapter appears to use known layouts with a living room and dining room (in a conservatory style extension) on the ground floor and a bedroom on the first floor of each property. Separate panes of the patio doors to the living room and parts of the dining room conservatory area are calculated individually.

3.4.3 The chapter suggests that three panes to the dining room conservatory of number 7 would be below the vertical sky component guidelines. Since other glazing to the room would meet the guidelines, the overall loss of daylight to the space is unlikely to be significant. The living area to number 7 would be below the daylight distribution guideline. The loss of sunlight guidelines would be met.

3.4.4 The chapter assessed a negligible impact for daylight and sunlight. We would suggest a minor impact on daylight to number 7 as the living area is below the daylight distribution guideline.

3.5 1 Marina Way

3.5.1 1 Marina Way is the closest of three properties to the east of the site on the opposite side of Marina Way whose front and rear windows would have an indirect view of the site.

3.5.2 The results presented suggest that one window would be below the vertical sky component guidelines. The value with the proposed development in place is 0.76 times that before, compared to the guideline of 0.8. This appears to be a patio style window on the main rear elevation lighting an unknown room. The daylight distribution and loss of sunlight guidelines would be met.

3.5.3 The chapter assesses a negligible impact to daylight and sunlight. We would suggest a minor impact to daylight as a window likely to light a main habitable room is below the vertical sky component guidelines.

3.6 14 and 20 to 34 (evens) Cliff Road

3.6.1 The properties at Cliff Road are to the east of the proposal site.

3.6.2 One window would be very marginally below the vertical sky component guidelines at number 24. A room each at number 26 and 32 would be below the daylight distribution guidelines. The apparent living area at number 26 would have an area able to receive direct skylight with the proposed development in place of 0.57 times the value currently, compared with a guideline of 0.8. The chapter assesses a negligible impact on daylight at all properties. However, we suggest a minor impact to numbers 24, 26 and 32 based on the results presented.

3.6.3 Only windows at 14 Cliff Road face southerly and would meet the BRE loss of sunlight guidelines. The sunlight impact is assessed as negligible.

3.7 Marine Gate

3.7.1 Marine Gate is a block of flats to the south east of the proposal site. The western façade faces the proposal site. The calculations appear to be based on at least partially known layouts.

3.7.2 There would be a significant loss of daylight to the western façade.

3.7.3 Eleven rooms on the first floor would have at least their primary west facing windows below the vertical sky component guidelines. This covers all except two of the predominantly west facing habitable rooms. Ten rooms would also be below the daylight distribution guideline.

3.7.4 On the second floor seven rooms (of ten predominantly west facing rooms) would have at least their primary windows below the guidelines with seven also below the daylight distribution guideline.

3.7.5 On the third floor four rooms would have their primary windows below the vertical sky component guidelines; four would be below the daylight distribution guideline.

3.7.6 On the fourth floor two bedrooms have their window below the vertical sky component guidelines; two living areas would be below the daylight distribution guideline.

3.7.7 On the fifth floor two rooms would have their primary windows below the vertical sky component guidelines, these are below overhangs. Two living areas would be below the daylight distribution guideline.

3.7.8 On the sixth floor one bedroom below an overhang would be below the vertical sky component guidelines. Two living rooms would be below the daylight distribution guideline.

3.7.9 On the seventh floor a bedroom and living room would be below the vertical sky component guidelines. One of the living rooms would be marginally below the daylight distribution guideline.

3.7.10 Some windows are located under overhangs created by rooms or balconies above, which can restrict daylight provision. However, the chapter does not repeat the calculations without them, as suggested in the BRE Report. Nevertheless it is clear from the results that, particularly on the

lower floors, this does not fully explain the loss of light and the proposed development does have a significant impact.

3.7.11 The chapter assesses a moderate impact on daylight. This could apply to the building as a whole but the results suggest that whole units, particularly on the first floor, could be significantly impacted. At these units the impact would tend to major.

3.7.12 The west façade of Marine Gate faces just north of due west and therefore loss of sunlight in the context of the BRE Report would be less of an issue. There are some living rooms with side facing southerly windows. The results presented in the chapter suggest that relevant living rooms as a whole would meet the BRE guidelines for loss of sunlight. The chapter assessment of negligible impact on sunlight is therefore reasonable.

3.8 Arundel Street

3.8.1 Properties at Arundel Street appear to be four storey, including a lower ground floor (three storeys for numbers 21 to 23). The rear of properties would face the proposal site. The chapter appears to analyse appropriate window positions, including in lower ground floor areas at some of the properties. It is assumed that all applicable windows have been analysed, but this has not been checked on site.

3.8.2 There is the potential for significant impacts at the rear of Arundel Street properties. The situation is complex and the chapter has used a mixture of known, partial and estimated layouts. Each property is discussed in turn based on the results presented in Appendix 12.3 of the ES Chapter.

1 Arundel Street

3.8.3 The results presented suggest that two windows are below the vertical sky component guidelines. These two windows appear to be two panes of a door. The door is obstructed by a porch structure, which reduces the existing amount of daylight received. The results suggest that daylight distribution would be met, although this appears based on estimated layouts.

3.8.4 The two panes would also be below the annual probable sunlight hours guideline.

3.8.5 The ES chapter assesses the loss of daylight and sunlight as negligible. However, there would be a minor impact to daylight to the room lit by the glazed door (assuming it is habitable). The existing porch also restricts daylight. There would be a minor impact to sunlight if the glazed door is the only window to the main living area. If it does not light a living area, or the living area has other windows which meet the guidelines, the impact would be negligible.

2 Arundel Street

3.8.6 One window would be below the vertical sky component guidelines. This window is next to an extension area on the ground floor. The same window would be below the annual probable sunlight hours guidelines. Rooms would meet the daylight distribution guideline, but appear to be based on estimated layouts.

3.8.7 The chapter assesses a negligible impact. Since the guidelines are not fully met a minor impact to daylight would be more reasonable (assuming the window lights a habitable room). There would be a minor impact to sunlight if the window lights a main living area.

3 Arundel Street

3.8.8 Two windows on the lower ground floor would be below the vertical sky component guidelines, although these are close to the target. Two rooms would be below the daylight distribution guideline (one on the lower ground floor and one of the first floor) although these seem to be based on estimated layouts. All windows meet the loss of sunlight guidelines.

3.8.9 The chapter's assessment of a minor adverse impact to daylight and negligible impact to sunlight is reasonable.

4 Arundel Street

3.8.10 The results presented in the chapter suggest that five windows would be below the vertical sky component guidelines (one on the lower ground floor, three on the ground floor and one on the second floor). Two would be marginal to the guidelines. Rooms meet the daylight distribution guideline, but these are based on estimated layouts. Two windows would be below the annual probable sunlight hours guidelines.

3.8.11 The chapter assesses a negligible impact since daylight distribution would be met. This is an incorrect application of the BRE Report. An assessment of minor impact to daylight would be more appropriate. There would also be a minor impact to sunlight if the windows light main living areas.

5 Arundel Street

3.8.12 The chapter appears to have used known layouts for this property. Two windows would be below the vertical sky component guidelines. One of these lights a kitchen which appears to have other sources of light which would meet the guidelines. The other window appears to be the only window lighting a living area. Daylight distribution would be met. One window would be below the annual probable sunlight hours guideline and another would be below the winter guideline. The chapter suggests these windows do not light living areas.

3.8.13 The chapter assesses a negligible impact to daylight. A minor impact would be more applicable since a living room window is below the guidelines. The sunlight impact would be negligible assuming the layout is correct.

6 Arundel Street

3.8.14 Eight of the nine windows analysed at 6 Arundel Street would be below the vertical sky component guidelines. The remaining window just meets the guideline. Some windows would have large losses of light. Four rooms would be below the daylight distribution guideline. These appear to be based on estimated layouts, so there may be an even greater loss of light if the rooms are deeper in reality. Six windows would be below the annual probable sunlight hours guideline with five below the winter guideline. There would be large losses of sunlight to the lower ground and ground floors.

3.8.15 The chapter assesses a moderate to major impact on daylight and sunlight. This is reasonable since there is a significant loss of daylight and sunlight.

7 Arundel Street

3.8.16 None of the eight windows analysed at 7 Arundel Street would meet the vertical sky component guidelines. There would be a significant loss of daylight, even to windows on the second floor. Three rooms would also be below the daylight distribution guideline. Five of the windows would also be below the annual probable sunlight hours guideline, with four of these also below the

winter. Two of the windows on the ground floor would have all of their current sunlight provision removed.

3.8.17 The assessment of a major impact to daylight and a moderate to major impact to sunlight appears reasonable.

8 Arundel Street

3.8.18 Five of the six windows analysed would be below the vertical sky component guidelines. One room would be below the daylight distribution guideline. The calculations appear to be based on at least partly known layouts. Three of the windows would be below the annual probable sunlight hours guideline, with one also below the winter guideline (the other two have no winter sun currently).

3.8.19 The assessment of a moderate to major impact to daylight and sunlight is reasonable.

9 Arundel Street

3.8.20 Three windows would be below the vertical sky component guidelines. One room would be below the daylight distribution guideline. The chapter appears to use known layouts. One window would be below the annual and winter probable sunlight hours guidelines. The layout used suggests this is a kitchen.

3.8.21 The moderate adverse impact to daylight assessed in the chapter is reasonable. The chapter assesses a moderate impact to sunlight. If the window impacted does light a kitchen and no living room is involved, then loss of sunlight would be less of an issue.

10 Arundel Street

3.8.22 The calculations appear to be based on at least a partially known layout. Five of the six windows analysed would be below the vertical sky component guidelines. Windows on the ground floor would be most impacted, with a large relative loss of light. Two windows would be below the loss of sunlight guidelines, but the results suggest one of these appears to light a bedroom. Two bedrooms would be below the daylight distribution guideline.

3.8.23 The chapter's assessment of a moderate to major loss of daylight is reasonable. The chapter assesses a moderate impact to sunlight. If the lower ground floor room (labelled as unknown), which has a significant loss of sunlight, is not a living area, then the loss of sunlight would be less of an issue.

11 Arundel Street

3.8.24 Eight of the nine windows analysed at 11 Arundel Street would be below the vertical sky component guidelines. The daylight distribution results (based on estimated layouts) suggest for or the eight rooms would be below the guideline. Four windows would be below the annual probable sunlight hours guidelines. Three of these do not receive any winter sunlight. The remaining window receives a small amount of winter sunlight which would be removed by the development.

3.8.25 The assessment of a moderate to major impact to daylight is reasonable. The chapter assesses a moderate impact to sunlight. If the windows below the guidelines are all main sources for living areas the impact would tend to major as a large amount of the currently received sunlight would be lost.

12 Arundel Street

3.8.26 Seven of the eleven windows analysed would be below the vertical sky component guidelines. Four rooms would be below the daylight distribution guideline. This appears to be based on estimated layouts. Three windows would be below the annual probable sunlight hours guidelines. Eight would be below the winter guidelines.

3.8.27 The assessment of a moderate to major impact to daylight and moderate impact to sunlight is reasonable.

13 Arundel Street

3.8.28 Eight of the eleven windows analysed would be below the vertical sky component guidelines. Three of the seven rooms assessed would be below the daylight distribution guideline. Information on the layouts appears to have been used for the lower ground floor. Four windows would be below the annual probable sunlight hours guidelines. Three would be below the winter guidelines.

3.8.29 The assessment of a moderate to major impact on daylight and sunlight is reasonable. The sunlight impact would be less of an issue if the windows below the guidelines do not light living areas.

14 Arundel Street

3.8.30 The layout and uses of the rooms appear to be known. Three windows would be below the vertical sky component guidelines. Two of these light a bedroom and the other lights a study. One of the bedroom windows is marginal to the guideline target. All rooms analysed would meet the daylight distribution guideline. One window would be below the annual and winter probable sunlight hours guidelines. However the chapter suggests this lights a kitchen where loss of sunlight would be less of an issue.

3.8.31 The assessment of a minor impact to daylight and negligible impact to sunlight is reasonable.

15 Arundel Street

3.8.32 A partially known layout appears to have been used in the calculations. Seven of the eight windows analysed would be below the vertical sky component guidelines. The values with the proposal range between 0.58 to 0.75 times those currently, against a guideline of 0.8. One of the windows appears to light a living area with another window which would meet the guidelines. A bedroom would be below the daylight distribution guideline. Two windows would be below the annual and winter probable sunlight hours guidelines. The labelled living room on the lower ground floor would meet the guidelines.

3.8.33 The assessments of moderate daylight impact and minor sunlight impact are reasonable.

16 Arundel Street

3.8.34 Seven of the ten windows analysed at 16 Arundel Street would be below the vertical sky component guidelines. All rooms meet the daylight distribution guideline, although these appear based on estimated layouts. All windows would meet the annual probable sunlight hours guidelines (although this is marginal to the target in one case). One window would be below the winter guideline.

3.8.35 The chapter assesses a minor impact to daylight. We suggest this would be moderate as a large proportion of the windows at the property would be below the vertical sky component guidelines. The chapter assesses a negligible impact to sunlight. We would suggest this would be minor if the window below the winter sunlight target or the window which marginally meets the guidelines light living areas.

17 Arundel Street

3.8.36 The calculations appear to be based on partially known plans (first and second floor). All five windows analysed would be below the vertical sky component guidelines. Two rooms would be below the daylight distribution guideline. Two windows would be below the annual probable sunlight hours guidelines, with one also below the winter.

3.8.37 The assessment of moderate impact to daylight and sunlight is reasonable.

18 Arundel Street

3.8.38 The room layouts shown in the appendix suggest that the only habitable room at the rear of 18 Arundel Street is a kitchen on the lower ground floor. One of the two kitchen windows would be below the vertical sky component guidelines. The room would meet the daylight distribution guideline. The windows would meet the loss of sunlight guidelines, although if they do light a kitchen loss of sunlight would be less of an issue anyway.

3.8.39 The chapter assesses a negligible impact to daylight and sunlight. We would suggest the daylight impact would be minor since the window below the guidelines does lose around half of its' daylight.

19 Arundel Street

3.8.40 The layout shown in the chapter suggests that the only habitable room at the rear of 19 Arundel Street is a kitchen on the lower ground floor. One of the four windows analysed that lights this room would be below the vertical sky component guidelines. This window appears to be the main rear facing window. It is currently well daylit but the vertical sky component received would be reduced to less than half the current value with the proposed development in place. The room marginally meets the daylight distribution guideline.

3.8.41 The chapter assesses a negligible impact for daylight and sunlight. A negligible sunlight impact is reasonable since no living rooms are involved. We would suggest a minor impact to daylight since the apparent main window to the kitchen is impacted and the daylight distribution only just meets the guidelines.

20 Arundel Street

3.8.42 The chapter appears to use a partial layout of the property with unknown rooms on the lower ground floor, a kitchen on the ground floor and non-habitable rooms on the upper floors. Six windows would be below the vertical sky component guidelines, including all four areas of glazing to the ground floor kitchen. Around half of the current daylight received would be lost by the proposal. Two rooms, including the kitchen, would be below the daylight distribution guidelines. Two windows to the unknown lower ground floor room would be below the annual probable sunlight hours guidelines.

3.8.43 The chapter assesses the daylight impact as major. This would certainly be the case for the ground floor kitchen, which would have a substantial loss of light. The chapter assesses the

sunlight impact as moderate. This would only apply if the lower ground floor room impacted is a living area.

21 Arundel Street

3.8.44 The calculations for 21 Arundel Street appear to be based on estimated layouts. Eight of the ten windows analysed would be below the vertical sky component guidelines. Of the two windows that meet the guidelines, one appears to be a roof light. Five of the six estimated rooms would be below the daylight distribution guideline. Three windows would be below the annual probable sunlight hours guidelines, with two of these also below the winter guidelines.

3.8.45 The chapter assesses a moderate to major impact on daylight and moderate impact to sunlight. This assessment appears reasonable.

22 Arundel Street

3.8.46 The calculations for 22 Arundel Street appear to be based on a known layout of a kitchen and bedroom on the ground floor and a bedroom on the first floor. All windows analysed would be below the vertical sky component guidelines. All glazing analysed to the ground floor kitchen and bedroom would lose around half of their daylight. The bedroom window on the first floor would lose around 40% of its current daylight. The two bedrooms would meet the daylight distribution guideline while the kitchen would be below the guideline. Five glazing areas analysed would be below the annual probable sunlight hours guidelines, with three of these also below the winter guideline.

3.8.47 The chapter assesses a moderate to major impact to daylight. This is reasonable but may tend to major since all windows would have a large reduction in vertical sky component. The chapter assesses a major impact to sunlight. The layout presented suggests that no living areas are involved. If this is the case, loss of sunlight would be less of an issue.

23 Arundel Street

3.8.48 The calculations for 23 Arundel Street appear to be based on a known layout of a kitchen and living rooms on the ground floor and a kitchen and bedroom on the first floor. The ground floor kitchen and living room would be below the vertical sky component guidelines. The daylight received would be reduced up to around half of their current values. The bedroom on the first floor would also be below the vertical sky component guidelines. The ground floor living room would be below the daylight distribution guideline. The living room would also be below the annual and winter probable sunlight hours guidelines.

3.8.49 The chapter assesses a moderate to major impact to daylight and major impact to sunlight. This is reasonable; the living room on the ground floor is where the impact would tend to major.

24 Arundel Street

3.8.50 24 to 26 Arundel Street are on the opposite site of the road. Their front facades face the proposal site.

3.8.51 A ground floor living room would meet the vertical sky component, daylight distribution and loss of sunlight guidelines. The first floor bedroom, lit by a bay window and secondary window, would have the side parts of the bay window just above the vertical sky component guidelines and the main bay window and secondary window just below the guidelines. Daylight distribution would be met.

3.8.52 The chapter assesses a negligible impact on daylight and sunlight. We suggest this may be minor adverse for daylight to the bedroom.

25 Arundel Street

3.8.53 A ground floor living room and first floor bedroom would meet the vertical sky component and daylight distribution guidelines. The living room meets the loss of sunlight guidelines.

3.8.54 The chapter assesses a negligible impact to daylight and sunlight. This is reasonable, but could tend to minor for daylight as the main parts of the bay windows would only meet the vertical sky component guidelines by a small margin.

26 Arundel Street

3.8.55 A ground floor living room and first floor bedroom would meet the vertical sky component and daylight distribution guidelines. The living room meets the loss of sunlight guidelines.

3.8.56 The chapter assesses a negligible impact to daylight and sunlight. This is reasonable, but, similarly to the neighbouring number 25, could tend to minor for daylight as the main parts of the bay windows would only meet the vertical sky component guidelines by a small margin.

3.9 Loss of sunlight to gardens and open spaces

3.9.1 The chapter has assessed loss of sunlight to the nearest gardens and open spaces to the development using the appropriate guideline of two hours of sunlight on 21st March. All the nearest relevant areas appear to have been considered.

3.9.2 Gardens and open space on the opposite side of Roedean Road and at Cliff Road, Marina Way and Marine Gate would meet the BRE guidelines. The impact would be assessed as negligible.

3.9.3 There results suggest there would be significant impacts to gardens of some properties on Arundel Street.

3.9.4 There would be a major impact at 1 to 4 Arundel Street as the areas able to receive at least two hours of sunlight on 21 March are severely reduced. At numbers 3 and 4 the area of the gardens able to receive at least two hours of sunlight would be reduced to nothing.

3.9.5 At 6 and 7 Arundel Street the results show that none of the areas would be able to receive two hours of sunlight on 21 March with the development in place. However, the figure in the appendix suggest that this would be the case currently.

3.9.6 At 8 and 9 Arundel Street there would be a major impact as the areas able to receive two hours of sunlight on 21 March are severely reduced.

3.9.7 The results presented suggest that areas analysed at number 10 to 20 would meet the guidelines or have gardens with no area able to receive at least two hours sunlight on 21 March currently. For number 14, 15 and 17 where two spaces per property have been analysed, the values shown in the table 12.16 in the chapter for each space appear to be the wrong way round when compared to the diagrams in appendix 12.6.

3.9.8 The chapter suggests that there would be a negligible impact to 21 Arundel Street. This appears to be incorrect as one of the two spaces analysed would be below the BRE guidelines. The resultant space able to receive two hours does not appear to cover at least 50% of the garden

area analysed, though it is not possible to be certain with the data given.. We suggest there may be at least a minor impact.

3.9.9 There would be a minor impact to the gardens of 22 and 23 Arundel Street as the areas able to receive at least two hours of sunlight on 21 March with the proposed development in place would be reduced to 0.71 and 0.75 times the current areas, compared to the guideline of 0.8.

4 Daylight and sunlight provision to new dwellings

4.1 Introduction

4.1.1 Residential accommodation is spread out over a number of proposed blocks. Figure 2 shows the site and location of the blocks.

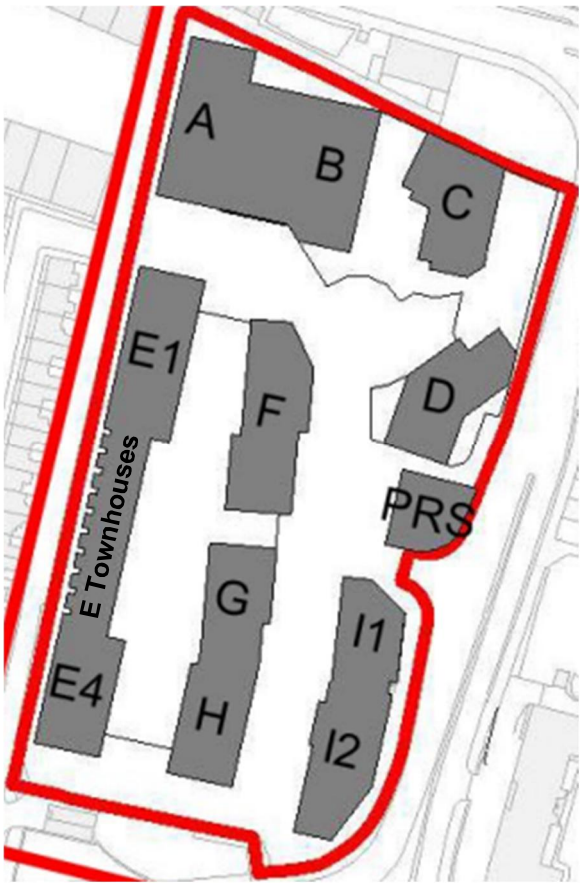

Figure 2: Proposed site plan. Adapted from drawing by ERP Architects as submitted as part of the application.

4.2 Daylight provision

4.2.1 Daylight and sunlight provision has been assessed in a separate report “Daylight and Sunlight Assessment (Internal)”.

4.2.2 Anstey Horne have assessed all habitable rooms at the proposed development. Average daylight factors have been calculated and compared with the recommendations in BS8206.

4.2.3 Two kitchen/diners would be below the 2.0% kitchen recommendation in the Block E townhouses.

4.2.4 The results as presented in the report's appendix suggests that 21 bedrooms would be below the 1.0% average daylight factor recommendation.

4.2.5 61 combined living/kitchen/dining areas would be below the 2.0% recommended for a kitchen. However, 40 of these would be able to meet the 1.5% recommended for a living area. There would be 21 living areas below the living room criterion.

4.2.6 Table 1 summarises the location of bedrooms, living areas and kitchens below the recommendations.

Table 1: Summary of rooms below daylighting recommendations in BS8206.

Block	Number of bedrooms below 1.0% recommended ADF	Number of living areas below 1.5% recommended ADF	Number of combined living/kitchen/dining areas meeting living room 1.5% ADF, but below 2.0% kitchen recommendation. Or single kitchens below recommendation
A	5	4	2
B	4	5	10
C	1	0	0
D	2	3	4
E1	5	4	2
E Townhouses	0	0	2 (Kitchen only areas)
E4	2	0	6
F	1	4	7
G	0	0	0
H	1	1	3
I1	0	0	0
I2	0	0	0
Total	21	21	42

4.2.7 Worst-case areas include the lower floors of Blocks A, B and E1.

4.2.8 As discussed above, the results may be an overestimate of the daylight received due to unrealistically high reflectances, possible exclusion of a factor for glazing below the working plane and estimated framing factors. With more realistic assumptions the number of rooms below the recommendations may be greater than the figures presented suggest.

4.3 Sunlight provision to living areas

4.3.1 The Anstey Horne report has presented results for all windows and rooms. However, sunlight provision to living areas is most relevant in the context of the BRE Report. As part of this review the results for proposed living areas have been assessed and compared against the recommendation of 25% annual probable sunlight hours, including at least 5% in the winter months.

4.3.2 Overall, the results presented appear to suggest around 47% of proposed living areas would be able to meet both annual and winter guidelines. Around 41% would meet neither guideline and 12% would meet one guideline, but not both. This is mediocre sunlight provision overall. If living areas where orientated randomly it would be expected that 50% would face southerly and therefore be able to meet the guidelines.

4.3.3 Table 2 summarises the proportion of living areas in each block able to meet the guidelines, either partly or fully.

Table 2: Summary of rooms below sunlighting recommendations in BS8206.

Block	Below both annual and winter guidelines	Meets one, but not both, guidelines	Meets both annual and winter guidelines
A	38%	17%	45%
B	63%	8%	29%
C	23%	2%	74%
D	35%	0%	65%
E1	71%	0%	29%
E Townhouses	100%	0%	0%
E4	42%	21%	37%
F	28%	33%	37%
G	35%	22%	43%
H	52%	2%	46%
I1	60%	3%	37%
I2	21%	16%	63%
Total	41%	12%	47%

4.3.4 Areas with particularly poor sunlight potential include the townhouses where none of the proposed living rooms would meet the guidelines. There are also particularly low proportions of living areas able to meet both guidelines in Blocks B, E1, E4 F and I1.

4.4 Sunlight provision to open spaces

4.4.1 The Anstey Horne report has analysed proposed open spaces with reference to the guidelines in the BRE Report for at least two hours of sunlight on 21 March over at least half of the space.

4.4.2 Figure 3, taken from the report, shows the areas able to receive at least two hours of sunlight on 21 March.

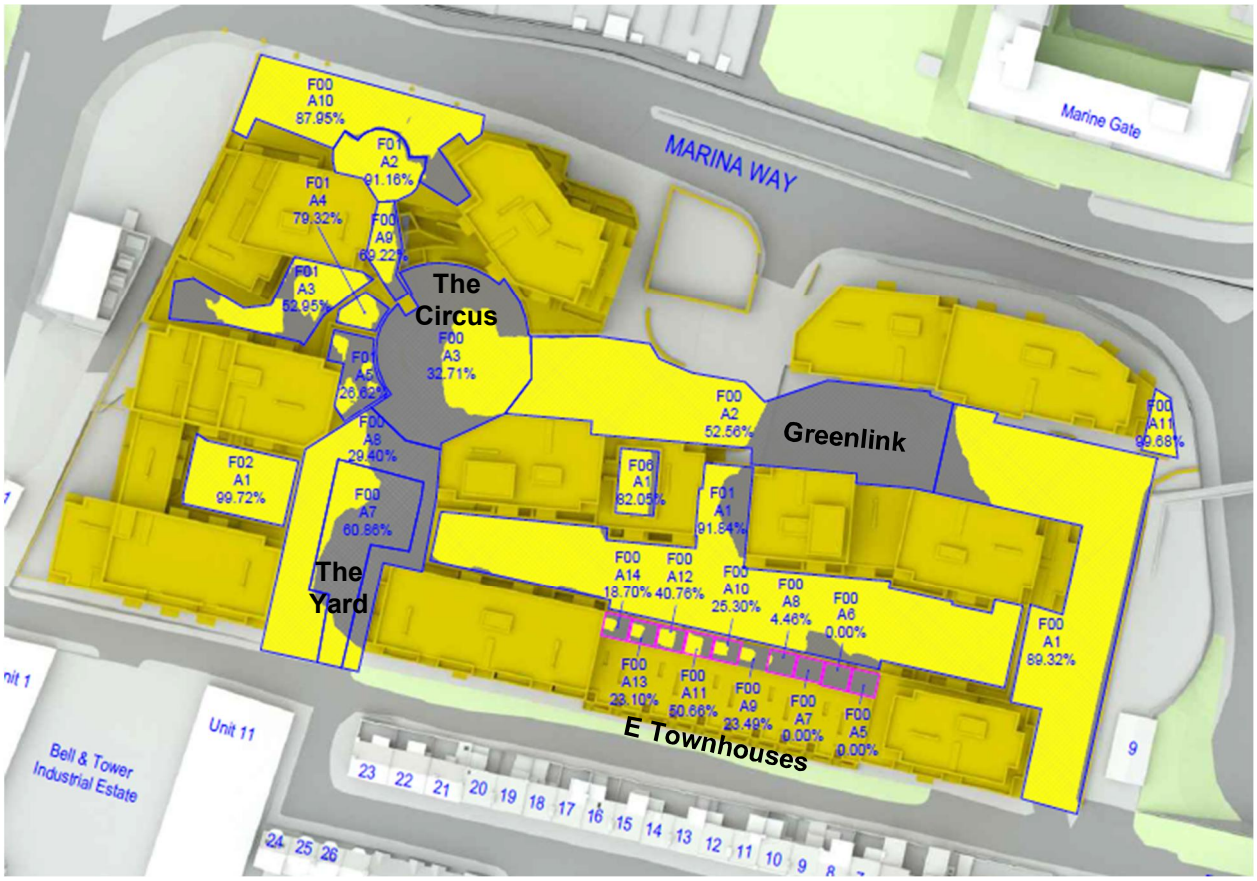

Figure 3: Sunlight results for proposed gardens and open spaces. Yellow areas (surrounded by blue or pink lines) show areas able to receive at least two hours of sunlight on 21 March. Grey areas would receive less than two hours. North is to the left of the picture.

4.4.3 The area to the east of the townhouses and Blocks E1 and E4 would meet the BRE guidelines and be well sunlit. As would the space to the south of the site.

4.4.4 The “Greenlink” area would just meet the BRE guidelines as just over 52% of the analysed area would be able to receive at least two hours of sunlight on 21 March. The northern section would be well sunlit, the southern section less well sunlit.

4.4.5 “The Circus” would be below the BRE guidelines and would be classed as inadequately sunlit.

4.4.6 “The Yard” has been analysed as two separate areas (the labelled results in the report and Figure 3 above appear to be the wrong way round). The northern area would be well sunlit. The central and southern areas would not be well sunlit. It appears the central area is to be used for vehicular access; sunlight provision here may be less of an issue.

4.4.7 Areas to the north of the site generally meet the BRE guidelines, including the courtyard space in Blocks A and B and the area between Blocks B and C (although this is marginal to the guideline). A first floor commercial terrace (labelled as F01 A5 in the report and Figure 3) would be below the guideline.

4.4.8 The gardens to the townhouses would be poorly sunlit. Only one of the ten gardens would meet the BRE guidelines, and this only just meets the 50% target. Three of the gardens (shown as A5

to A7 in Figure 3) would have none of their area able to receive at least two hours of sunlight on 21 March.

5 Conclusions

5.1 BRE have reviewed the daylight and sunlight chapter and internal assessment submitted as part of planning application BH2021/04167 for a proposed development at the Brighton Gasworks site. Both assessments were produced by Anstey Horne.

5.2 The Anstey Horne assessments use the methodology in the BRE Report "Site layout planning for daylight and sunlight: a guide to good practice" to assess loss of daylight and sunlight to surrounding properties. This is appropriate. For daylight and sunlight provision to the proposal the recommendations in British Standard 8206-2:2008 "Code of Practice for Daylighting" are used. Although this has been superseded by BS EN17037 "Daylight in Buildings" the BRE Report refers to BS8206 and therefore its use may be considered appropriate.

5.3 An appropriate number of surrounding dwellings have been included in the assessment.

Summary of impact to surrounding areas

5.4 The below table summarises the results where at least a minor impact is assessed. Where this review suggests a different impact to that presented in the ES Chapter the difference is explained.

Table 3: Summary of daylight and sunlight impacts

Impact	Daylight to windows and rooms	Sunlight to windows	Sunlight to gardens
Minor	- Roedean Court [Chapter suggests negligible, but there would be windows below guidelines. However, this appears primarily due to an existing overhang above the third floor] - 7 Roedean Road [Chapter suggests negligible, but living room would be below daylight distribution guideline] - 1 Marina Way [Chapter suggests negligible but one window would be below vertical sky component guidelines] - 24, 26 and 32 Cliff Road [Chapter suggests negligible but there is one window and two rooms below the guidelines] - 1 Arundel Street [Chapter suggests negligible, which would be correct if glazed door lights non-habitable room]* - 2 Arundel Street [Chapter suggests negligible but one window below guidelines]* - 3 Arundel Street* - 4 Arundel Street [Chapter suggests negligible, but five windows below guidelines]* - 5 Arundel Street [Chapter suggests negligible but two windows below guidelines] - 14 Arundel Street	- 1 Arundel Street [Chapter suggests negligible, which would be correct if glazed door is not primary window to living area]+ - 2 Arundel Street [Chapter suggests negligible, which would be correct if impacted windows do not light living area]+ - 4 Arundel Street [Chapter suggests negligible but two windows below guidelines]+ - 14 Arundel Street + - 15 Arundel Street + - 16 Arundel Street [Chapter suggests negligible, but one window would be below winter guideline. Impact would only apply if lights living area]+	- 21 Arundel Street - 22 Arundel Street - 23 Arundel Street

Impact	Daylight to windows and rooms	Sunlight to windows	Sunlight to gardens
	- 18 Arundel Street [Chapter suggests negligible but kitchen window below guidelines] - 19 Arundel Street [Chapter suggests negligible but apparent main kitchen window is impacted] - 24 Arundel Street [Chapter suggest negligible, but may tend to minor for first floor bedroom where main bay window is below guidelines] - 25 Arundel Street [Chapter suggests negligible, but may tend to minor as main bay windows only just meet guidelines] - 26 Arundel Street [Chapter suggests negligible, but may tend to minor as main bay windows only just meet guidelines]		
Moderate	- Marine Gate [Tending to major for units on lower floors if all their rooms are impacted] - 9 Arundel Street - 15 Arundel Street - 16 Arundel Street [Chapter suggest minor impact, but large proportion of windows are impacted]* - 17 Arundel Street	- 9 Arundel Street + - 10 Arundel Street + - 11 Arundel Street [If windows below guidelines are all main sources to living areas impact would tend to major]+ - 12 Arundel Street+ - 17 Arundel Street - 20 Arundel Street + - 21 Arundel Street +	
Moderate to Major	- 6 Arundel Street* - 8 Arundel Street - 10 Arundel Street - 11 Arundel Street* - 12 Arundel Street* - 13 Arundel Street - 21 Arundel Street* - 22 Arundel Street [Tending to major as all windows would have a large reduction in vertical sky component] - 23 Arundel Street [Tending to major for ground floor living room]	- 6 Arundel Street + - 8 Arundel Street + - 13 Arundel Street +	
Major	- 7 Arundel Street* - 20 Arundel Street [Particularly to ground floor kitchen]	- 7 Arundel Street + - 22 Arundel Street + - 23 Arundel Street	- 1 Arundel Street - 2 Arundel Street - 3 Arundel Street - 4 Arundel Street - 8 Arundel Street - 9 Arundel Street

*Would be reduced if impacted windows/rooms do not light habitable areas.

+Would be reduced if impacted windows do not light living rooms.

5.5 It is clear the proposed development would impact neighbouring areas, particularly the rear of Arundel Street where several properties would have at least moderate to major impacts. However, the situation in this location is complex and the assessment has been based on a mix of known, partial and estimated plans. At some properties there is the potential for the impact to be reduced if

non-habitable rooms are involved or windows that would have a loss of sunlight do not light living areas.

Summary of daylight and sunlight to the scheme

5.6 The results in the ES chapter suggest that 21 bedrooms across the scheme would be below the average daylight factor recommendations. 61 combined living/kitchen/dining areas and two separate kitchens would be below the 2.0% recommended for a kitchen. However, 40 of these combined living areas would be able to meet the 1.5% recommended for a living area. There would therefore be 21 living areas below the living room criterion.

5.7 The daylighting results may be an overestimate of provision (see below) and with more realistic factors more rooms could be below the recommendations.

5.8 Sunlight results presented suggest that only around 47% of proposed living areas would be able to meet both annual and winter probable sunlight hours guidelines. Areas with particularly poor sunlight potential include the townhouses and Blocks B, E1, E4 F and I1.

5.9 The open space to the east of the townhouses and Blocks E1 and E4 would meet the BRE guidelines for sunlight on 21 March and be well sunlit. As would the space to the south of the site and generally spaces to the north of the site. The “Greenlink” area would just meet the BRE guidelines. The northern part of “The Yard” would be well sunlit; the central and southern parts would not.

5.10 “The Circus” would be below the BRE guideline and would be classed as inadequately sunlit. A first floor commercial terrace would also be below the guideline.

5.11 The gardens to the townhouses would be poorly sunlit. Only one of the ten gardens would meet the BRE guideline, and this only just meets the 50% target. Three gardens would have none of their area able to receive at least two hours of sunlight on 21 March.

Points to note

5.12 The review of the Anstey Horne assessment has found the following points of note:

- In some cases a negligible impact has been suggested by Anstey Horne if the vertical sky component guidelines have not been met, but the daylight distribution guidelines have. This is an incorrect application of the BRE Report which states that the diffuse daylight of an existing room may be adversely impacted if either guideline is not met.
- The values of surface reflectance used in the average daylight factor calculations are high and would be difficult to maintain in reality. The results may therefore be an overestimate.
- A framing factor of 0.8 is used in the daylight provision calculations across all windows. This may be suitable for the larger windows but could overestimate the glazing for smaller windows. This may overestimate the average daylight factor results.
- It is unclear if account for glazing below the working plane has been included in the average daylight factor calculations. If not, the results may be an overestimate of the daylight received.
- As a result of the above three points the number of rooms below the daylight recommendations may be higher than those shown in the Anstey Horne assessment and discussed above.

- The “Daylight and Sunlight Assessment (Internal)” includes separate results for combined living/dining/kitchen areas with “notionally truncated kitchens”. This is not the correct application of the methodology and we suggest these results should not be considered.

Report Ends