

Chapter 16 – Daylight ,Sunlight and Overshadowing Assessment

This chapter has been prepared by Nathaniel Lichfield and Partners, specialist sub-consultants to Scott Wilson. Appendices 1 to 7 referenced within this chapter can be found in Section 16 of Volume 3 of the ES.



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Planning Design Economics

**Daylight, Sunlight and
Overshadowing
Assessment**

Provision of an Energy
from Waste Combined
Heat and Power
Facility, North Yard,
Devonport

Scott Wilson Limited

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Report Addendum

This Daylight, Sunlight and Overshadowing Assessment of the effects of the proposed Energy from Waste Combined Heat and Power (EfW CHP) facility at North Yard, Devonport was first undertaken in October 2010.

The design of the proposed EfW CHP facility has subsequently been revised in April 2011 to enhance the appearance of the building. The building appearance has been enhanced through the use of curved structural 'ribs', echoing the hull of a boat, which extend beyond the horizontal apex of the building. The air cooled condensers also incorporate the exposed structural ribs. Elevations of the revised proposal are shown in Figures 6.2 and 6.4 of the Environmental Statement.

Nathaniel Lichfield and Partners Ltd has been asked to assess whether these alterations would materially alter the results of our previous assessment issued in October 2010. To do this we have compared 3D AutoCAD models of the original and revised schemes. This has demonstrated that the majority of the alterations are within the envelope of the previously proposed structure and will, therefore, have no impact on the existing results. The general massing of the building remains unaltered and those additional elements or alterations made, principally the curved structural ribs, are minor and not of significant size or bulk. We, therefore, consider that none of the alterations made would have an effect on the results of the calculations already undertaken. Changes to the results outlined in the following report, tables and plots arising from the amendments would be negligible. We consider that the revised proposal is compliant with the BRE Guidelines, and that the results and conclusions of this Assessment are applicable to the revised scheme.

It is, therefore, concluded that the revised development will not give rise to any materially unacceptable daylight, sunlight or overshadowing impacts in the context of the BRE guidelines. We respectfully conclude that there are no reasons on which planning permission should be refused on daylight, sunlight or overshadowing impact grounds.

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1.0 Introduction

1.1 This report considers the effects of the proposed development of an Energy from Waste Combined Heat and Power Facility (EfW CHP) facility at North Yard, Devonport, Plymouth on the daylight, sunlight and overshadowing levels experienced at existing neighbouring buildings and areas of open space. It has been prepared on behalf MVV under the instruction of their planning and environmental consultants Scott Wilson Limited (It should be noted that this assessment is different from the Landscape and Visual Impact Assessment, which can be found in Chapter 8 of the Environmental Statement).

1.2 The proposed development comprises the development of a new EfW CHP facility at the northern edge of the North Yard, Devonport.

1.3 The assessment considers the impacts of the proposal on existing neighbouring buildings to the west, northwest and east of the application site. Construction of the proposed EfW CHP facility is planned to commence in early 2012 and be completed in 2014.

1.4 The quantitative assessment has been undertaken in accordance with the guidelines set out in the Building Research Establishment (BRE) report “*Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice*” (BR209, 1991). The Guide is intended to be advisory and does not contain mandatory standards. The introduction states:

“The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and this document 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 because natural lighting is only one of many factors in site layout design.”

1.5 This assessment considers the impacts of the development in terms of daylight, sunlight and overshadowing. It does not address rights to light, which is a legal matter rather than a planning consideration.

1.6 This assessment has been carried out using the following information:

- Ordnance Survey MasterMap digital mapping;
- Aerial Photography of the site and surroundings;
- Planning application drawings of the proposed development by Savage and Chadwick Architects;
- A 3D model of the proposed development by Savage and Chadwick; and,
- A 2D topographical site survey carried out by Merrett Survey Partnership.

1.7 The assessment model used for the calculations has been developed from the information above using a 5m contour to create a 3D model. The positions of

individual buildings have been placed using a combination of Ordnance Survey mapping and spot heights so that the building elevations are close approximations of their true positions. The level of accuracy in the building levels and positions is therefore the closest that can be achieved without more detailed survey information to allow calculations at the scale required. The model is therefore 'accurate' within these parameters.

- 1.8 The model is constructed of different coloured visual elements that represent the terrain (green), proposed facility (grey) and other buildings assessed (red).
- 1.9 The level of ambient daylight received by a window is quantified in terms of its Vertical Sky Component (VSC), which represents the amount of vertical skylight falling on a vertical window. The VSC and sunlight reference points are taken from a point that represents the midpoint of a window on its vertical plane, and appear as square boxes on the buildings in the model. We have assessed a number of windows at nearby properties and further details of this are set out below. For this reason VSC does not require the modeling of the internal dimensions of the rooms at the properties assessed and the windows therefore appear 'closed' on the model. This has no impact on the assessment results.
- 1.10 In accordance with the requirements of BRE guidance existing vegetation has not been modeled as part of the assessment.
- 1.11 The report is divided into the following subsequent sections:
- Section 2.0 provides a brief description of the site and surroundings and the nature of the proposed development, highlighting features of relevance to the assessment of daylight, sunlight and overshadowing levels;
 - Section 3.0 provides an outline of the scope of the assessment;
 - Section 4.0 provides an assessment of the impact of the proposal on levels of daylight at the reference points;
 - Section 5.0 describes the assessment of the proposal's impact on levels of sunlight at the reference points;
 - Section 6.0 provides an assessment of the proposal's impact on levels of overshadowing experienced within areas of open space; and
 - Section 7.0 provides a summary of the assessment and our conclusions are drawn.
- 1.12 The assessment is supported by a set of analytical daylight, sunlight and overshadowing plots attached at Appendices 1-7.

2.0 **Site Surroundings and the Proposal**

Site and Surroundings

- 2.1 The application site is situated at the northern end of North Yard, Devonport in Plymouth. It is accessed via service roads within the North Yard via the Camel's Head entrance to the dockyard located on Wolseley Road (A3064).
- 2.2 The site is currently situated within Her Majesty's Naval Base (HMNB) Devonport. If the development goes ahead the land would be taken out of HMNB jurisdiction. The part of the site on which the EfW CHP facility itself will be constructed was until recently used by a firm called Ashcroft to process demolition rubble created from different construction projects throughout the Naval Base and dockyard. The site is located between the line of a disused railway that formerly served the northern side of North Yard Dock, now the site of Blackie's Wood, and scrub land to the east adjacent to the Weston Mill Viaduct. The site is also adjacent to two tidal streams (Weston Mill Creek and Camel's Head Creek) to the east and south east which feed into Weston Mill Lake.
- 2.3 To the south east and south west of the site are land and buildings comprising light industrial and storage uses. These are not considered sensitive to light effects and there is no requirement for assessment under the BRE guidelines
- 2.4 The areas surrounding the site to the northwest, north and east tend to slope upwards away from the tidal stream and North Yard Dock and comprise largely residential areas. The site lies at an elevation of approximately 7m to 10m AOD.

The Proposed Development

- 2.5 The proposed development comprises the construction of a building which will be orientated in a north northeast-south southwest alignment across the site and will occupy less than half the site area. The building will rise to a height of 45.1m above ground level (the site will be cleared to a site datum level of 9m AOD) and a single slimline emission stack will rise to 95m above ground level at the north end of the building (104m AOD).
- 2.6 The proposed facility will be surrounded by roads/servicing areas and landscaped spaces.
- 2.7 The AutoCAD daylight and sunlight model of the proposed development is illustrated at Appendix 1. The scheme is described in greater detail in the Design and Access Statement which will be submitted with the planning application.

3.0 **Scope of Assessment**

Daylight and Sunlight

- 3.1 As set out at Section 2.0, the application site is surrounded to the south east and south west by buildings in employment uses. There is no requirement under the BRE guidelines to assess non residential buildings.
- 3.2 Residential properties are located to the west, northwest, east and north east of the site. The windows at a representative sample of the nearest residential properties have been identified for assessment. It should be noted that the proposed development is located within a valley and that the majority of properties requiring assessment are located at a higher level AOD.
- 3.3 To the west of the site are five blocks of flats, each six storeys high on the south east side of Talbot Gardens. Of the habitable rooms associated with these flats, those on the south east elevations with ground floor windows facing the proposal will be most affected by the proposed development. As such, four windows from the ground floor of each of the closest five blocks of flats have been assessed (window reference points: 1-12 Talbot Gardens W1-W4; 13-24 Talbot Gardens W1-W4; 25-36 Talbot Gardens W1-W4; 37-48 Talbot Gardens W1-W4 and 49-60 Talbot Gardens W1-W4).
- 3.4 Three further blocks of flats (each three storeys) facing south east onto Savage Road are located to the north west of the site. Of the habitable rooms within these flats those on the south east elevations with ground floor windows facing the development will be most affected by the proposals. As such, a representative sample of windows from the ground floor of each of these blocks of flats has been assessed (window reference points 1-3 Savage Road – W1; 4-6 Savage Road – W1; 7-9 Savage Road – W1; 10-12 Savage Road – W1; 13-15 Savage Road – W1; 16-18 Savage Road – W1; 19-21 Savage Road – W1; 22-24 Savage Road – W1; 25-27 Savage Road – W1 and 28-30 Savage Road – W1;).
- 3.5 To the east and north east of the site there are terraced residential properties located on both Hamoaze Road and Wolseley Road. These properties have windows facing the proposed development. Of these windows, those located at ground floor level will be most affected by the proposals and a number of windows at ground floor level have been assessed as a representative sample from the following properties: Nos. 17, 18, 19, 20, 20a, 20b, 21, 22, 23, 24, 25, 26, 27, 28 and 29 Hamoaze Road and Nos. 504, 506, 508, 510, 512, 514, 516, 518, 520 and 522 Wolseley Road.
- 3.6 These window reference points represent the windows that will be most impacted upon by the proposed EfW CHP facility and are representative of the impacts of the scheme on other neighbouring windows serving the residential accommodation. The assessment of these sample windows enables conclusions to be drawn regarding the overall effects of the development on the area's other residential buildings.

- 3.7 All of the windows have been assessed in relation to both daylight impacts and those that face within 90 degrees of due south have also been assessed in relation to sunlight impacts. The locations of the window reference points and their relationship to the proposed development are illustrated in Appendix 1.

Overshadowing

- 3.8 As outlined in Section 2.0, the area surrounding the application site includes existing areas of woodland (Blackie's Wood) and scrubland adjacent to the tidal streams serving the Weston Mill Lake. The proposed development also includes areas of peripheral landscaping and planting.
- 3.9 All of these areas have been considered in the overshadowing analysis undertaken for the scheme. The assessment has been based on transient overshadowing plots carried out at hourly intervals on the March and September Equinoxes and June and December Solstices. The dates for these measurements are derived from the date of the Spring Equinox (21 March) stated in the BRE Guidance.
- 3.10 The overshadowing plots are illustrated at Appendix 7.

4.0 Daylight

4.1 This section assesses the impact of the proposed development on the level of daylight received at the aforementioned reference points.

Methodology

4.2 The level of ambient daylight received by a window is quantified in terms of its vertical sky component (VSC), which represents the amount of vertical skylight falling on a vertical window.

4.3 The daylight assessment has been based on three dimensional AutoCAD models constructed for the site and surroundings as existing and with the proposed development in place (Appendix 1). The heights (above ground level) and locations of the surrounding buildings and the proposed development have been taken from Ordnance Survey digital plan data, site observations, aerial photography of the site and surroundings and Scott Wilson drawings.

4.4 The VSC levels at each of the windows requiring assessment have been quantified using Waldram Tools daylight and sunlight software (MBS Software Ltd).

4.5 The Waldram Tools software produces empirical results as figures accompanied by representative visual plots of the existing and proposed buildings and terrain from the assessment point. The plot itself should not be read as a 'visually accurate' representation of the view from the window as if you were looking directly out of it. It represents a plot of a 180 degree horizontal view and 90 degree vertical view from the assessment point on the window. Therefore the visual representation produced in the Waldram Tools plot effectively wraps around the view from the window as demonstrated by the curved grid on the plot itself. These divisions on the grid represent the degree intervals through 180 (horizontal) and 90 (vertical) degrees, so the true visual representation of the 'view' from the window is stretched over this grid. This is why some elements illustrated may appear stretched or compressed depending on where they fall on the grid.

4.6 The BRE good practice guide outlines numerical guidelines that represent flexible targets for new developments in relation to the VSC at nearby reference points. The document states that:

*"If the vertical sky component, with the new development in place, is both less than 27% **and** less than 0.8 times its former value, then the loss of light is likely to be noticeable."* (our emphasis)

4.7 The guidelines therefore require that either the VSC target or the degree of change in daylighting are met (i.e. if the 27% target is adhered to, there is no requirement under the BRE guidelines for the resultant VSC level to remain at 0.8 times the former VSC level).

Results

- 4.8 The following provides a summary of the results of the VSC analysis obtained for the 55 windows serving neighbouring residential buildings that will be most impacted on by the development (a full results table is included at Appendix 2 and the results plots are included at Appendix 3):
- 4.9 The results of the assessment demonstrate that the resultant VSC levels at all of the reference points will all either be above the BRE target level of 27% following construction of the proposed development or within 80% of their former value.
- 4.10 The results reflect the topographical situation of the building in relation to the properties assessed. The majority of properties are located at a significantly higher level AOD than the proposed facility and at some distance from it. Only obstructions above the mid point of the window reference point assessed will have an impact on the level of daylight at the reference point. As a large section of the proposed facility is located below the majority of the mid points of the reference points assessed, this section of the building will have no impact on the levels of daylight.
- 4.11 As a result of the height differences and the distance of the proposed facility from the reference points, the proposed facility takes up only a very limited proportion of the sky represent in the majority of the visual plots included at Appendix 2 and 3. This is an accurate representation of the impact of the proposed facility and demonstrates the very limited impact that it has on the levels of existing daylight and view of the sky.
- 4.12 The proposed development is therefore in compliance with the BRE guidelines in relation to all of the windows assessed and, in the terms set out by the guidance, the impacts of the development on these windows are unlikely to be noticeable.
- 4.13 As all windows assessed for VSC are compliant, there is no requirement under the BRE Guidance to assess the Average Daylight Factor (ADF) at the rooms served by the window reference points. The size and shape of the windows and the rooms they serve are therefore not a consideration within this assessment where impact of the proposed facility is negligible and fully compliant with the BRE Guidance in terms of VSC.
- 4.14 Given that the windows assessed represent the windows serving neighbouring buildings that will be most affected by the development in terms of daylighting because they are closest to ground level, it is reasonable to infer that all other windows serving neighbouring buildings and those which are higher off the ground in the case of the flats assessed will also comply with the BRE daylight guidelines following construction of the proposal.

5.0 Sunlight

5.1 This section assesses the impact of the proposed ERF on the level of sunlight received at the aforementioned reference points.

Methodology

5.2 This section assesses the levels of annual and winter sunlight experienced by the window reference points assessed. As outlined above, all of the window reference points have been assessed in relation to sunlight availability.

5.3 The levels of sunlight availability at the window reference points assessed have been calculated based on the three dimensional AutoCAD models of the site and surroundings as existing and with the development in place, using the Waldram Tools daylight and sunlight software. The Waldram tools software produces empirical results as figures located at the top right of each plot accompanied by visual representation of the available annual and winter sunlight similar to the daylight plots described at paragraph 4.5. In addition to the obstructions shown in the VSC plots the sunlight plots illustrate the available annual and winter sunlight through a series of coloured 'suns'. Annual 'suns' are represented by yellow circles and winter 'suns' by blue circles. The position of the spread of annual and winter 'suns' illustrated on the plot alters its position on the plot grid dependant on the orientation of the reference point assessed. For example reference points facing almost due east or due west will have fewer 'suns' and these will be clustered the periphery of the plot.

5.4 Those 'suns' that are located obstructions are not counted, and only those windows that face within 90 degrees of due south are assessed under the BRE Guidance.

5.5 The calculations produced provide the percentage year round sunlight availability and the percentage of sunlight availability received during the winter months.

5.6 The BRE good practice guide states that, if the available annual sunlight hours received by a window are both less than 25% and less than 0.8 times their former value then the occupants of the existing building will notice the loss of sunlight. In relation to winter sunlight the BRE guide states that, if the available winter sunlight hours are both less than 5% and less than 0.8 times their former value then the occupants of the existing building will notice the loss of winter sunlight. As with daylighting, the guidelines require that either the sunlight availability targets or the degree of change in sunlighting are met (i.e. if the 25/5% target is adhered to, there is no requirement under the BRE guidelines for the resultant sunlight levels to remain at 0.8 times the former levels).

Results

- 5.7 The following provides a summary of the sunlight results obtained from the assessment. Tables containing the full results of the Annual and Winter Sunlight analysis are attached at Appendices 4 and 5 respectively. The sunlight results plots are attached at Appendix 6.
- 5.8 The results of the annual and winter sunlight availability assessments demonstrate that the annual and winter sunlight levels received at all 45 window reference points assessed that are within 90 degrees of due south will remain above the BRE guide level with the proposed EfW CHP facility in place. The proposal is therefore fully compliant with relevant BRE guidance in relation to annual and winter sunlighting and the scheme is unlikely to result in any noticeable impacts on the levels of sunlight received by neighbouring buildings.
- 5.9 As with daylighting, given that the 45 windows assessed represent the windows serving existing neighbouring buildings that will be most affected by the proposed EfW CHP facility in terms of sunlight availability because they are closest to the ground level, it is reasonable to conclude that the development will comply with the BRE annual sunlight guidelines in relation to all other neighbouring windows and those which are higher off the ground in the case of the flats.

6.0 **Overshadowing**

6.1 The levels of sunlight experienced within existing woodland, scrubland and surrounding areas of proposed landscaping have been assessed. The assessment has considered the impacts of the scheme in terms of transient overshadowing and permanent overshadowing.

Methodology

Transient Overshadowing

6.2 Transient overshadowing plots have been carried out to illustrate the impacts of the proposed EfW CHP facility in terms of overshadowing throughout the year.

6.3 The BRE guidance states that the Spring Equinox (21 March) is a suitable date for assessment. In addition, transient overshadowing plots have been carried out for the Summer Solstice (21 June), Autumn Equinox (21 September) and Winter Solstice (21 December) to illustrate the effects of the development throughout the year.

6.4 We appreciate that the date of the Equinoxes and Solstices alter, however for consistency the dates are measured from the date of the Spring Equinox (21 March) set out in the BRE Guidance.

6.5 The assessment is based on a three dimensional model of the development and plots have been carried out at hourly intervals between 08.00am and 18.00pm on the four dates assessed.

Permanent Overshadowing

6.6 The BRE overshadowing 'test' relates to the area of amenity space that is cast into permanent shadow by a development. Accordingly, the areas of woodland, scrubland and landscaped areas which are in permanent shadow as a result of the development have also been considered.

6.7 The BRE overshadowing guidelines are based on the area of an amenity space that is in permanent shadow on 21 March. The guide states:

"...for it to appear adequately sunlit throughout the year, no more than two-fifths and preferably no more than a quarter of any garden or amenity area should be prevented by buildings from receiving any sun at all on 21 March. If, as a result of new development, an existing garden or amenity area does not meet these guidelines, and the area which can receive some sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable".

Results

6.8 The following provides a review of the overshadowing plots attached at Appendix 7.

Transient Overshadowing: Spring and Autumn Equinox

- 6.9 The transient overshadowing plots prepared for the Spring and Autumn Equinoxes are very similar. The plots demonstrate that the proposed development will cause sections of the hillside below Talbot Gardens and Savage Road to be in shadow during the morning on these dates. At midday and during the early afternoon on 21 March/September, extremely limited areas beyond the application site to the north will be in shadow. During the latter part of the afternoon on 21 March/September, the development cause some temporary overshadowing of the Weston Mill Lake stream and valley but by late afternoon the shadow will be nearly indiscernible from the gradual fall of evening.
- 6.10 Overall, the surrounding areas of open space cast into shadow by the development, including Blackie's Wood and the Weston Mill Lake stream, on these dates will be limited and temporary.

Transient Overshadowing: Summer Solstice

- 6.11 The plots undertaken for 21 June demonstrate that, during the summer months, the proposed development will result in negligible overshadowing of existing open spaces. Blackie's Wood will experience some limited transient overshadowing during the morning and the Weston Mill Lake stream will experience some overshadowing from the middle of the afternoon. There will only be very limited transient overshadowing of the slope below Talbot Gardens and Savage Road in the early-mid morning but at no point will the upper parts of the slope of the residential properties themselves be in shadow. The northern part of application site itself will be marginally cast into transient shadow during parts of the morning, mid and late afternoon on this date, but this impact will be both minor and temporary.

Transient Overshadowing: Winter Solstice

- 6.12 The plots undertaken for 21 December demonstrate that, during the winter months, the proposed development will result in a negligible level of temporary overshadowing of existing areas of open and partially wooded undeveloped land in the vicinity of the site. Areas to the north east and north of the development site will experience some overshadowing between 8am and 2pm but these effects will be limited and temporary. No residential properties will be in shadow as a result of the development during any part of the day, although the slope below Savage Road will be in transient shadow in the early morning when the sun is low. The low level of the sun, existing topography and the early sunset render the plots for 4pm and 6pm irrelevant as and the development will have virtually no impact on the existing situation at these times.

Permanent Overshadowing

- 6.13 The transient overshadowing plots for 21 March demonstrate that all areas of existing and proposed woodland, scrub woodland, open space and landscaped

space will receive direct sunlight for significant sections of the day. Accordingly, none of the areas considered will be in permanent shadow at the March equinox as a result of the proposed development.

6.14 The development therefore complies fully with the BRE overshadowing 'test' in relation to all of the existing and proposed areas of surrounding land assessed.

7.0 **Summary and Conclusions**

7.1 This assessment has considered the impacts of the proposed EfW CHP facility at the North Yard, Devonport on the daylight and sunlight levels received by existing neighbouring buildings and the levels of overshadowing that will be received within existing and proposed areas of open space. It has been carried out in accordance with BRE guidelines relating to the analysis of daylight, sunlight and overshadowing.

7.2 Fifty-five window reference points within neighbouring buildings have been assessed in relation to daylight and sunlight. The windows assessed represent the windows serving neighbouring buildings that will be most affected by the proposed development in terms of daylighting and sunlighting.

7.3 The assessment has also considered the impacts of the proposed EfW CHP facility on the levels of shadow experienced within existing woodland and amenity space and proposed landscaping within the proposal site.

Daylight

7.4 VSC plots were undertaken for 55 neighbouring window reference points surrounding the site to the west, north west, north east and east. The windows considered serve the closest residential units to the proposal site.

7.5 They were selected for assessment as they represent the existing windows that will receive the lowest levels of daylighting following construction of the proposed development (i.e. a worst case scenario approach has been adopted in the assessment).

7.6 The windows assessed therefore enable reasonable inferences to be drawn regarding the wider impacts of the development on other neighbouring residential accommodation that will be less affected by the proposal.

7.7 The results of the VSC plots demonstrate that all 55 windows assessed will either receive VSC levels above the BRE guide levels or levels that fall above 80% of the existing level following construction of the proposed EfW CHP facility. All of the windows therefore comply with the BRE guidelines for ambient daylighting and none are likely to experience a noticeable reduction in daylight following the development.

7.8 Given that the windows assessed comprise those that will be most impacted on by the development, it is concluded by reasonable inference that the proposed development will not give rise to any unacceptable effects in terms of the daylight levels received by existing neighbouring buildings, in the context of the BRE guidance.

Sunlight

- 7.9 Sunlight availability plots have been prepared for the 45 windows serving the residential properties assessed that face within 90 degrees of due south. The plots show that all of the window reference points assessed will receive annual and winter sunlight levels above the BRE target levels with the proposed EfW CHP facility in place.
- 7.10 Given that the windows assessed represent the windows serving neighbouring buildings that will be most impacted upon by the proposed development, it is reasonable to infer that all other neighbouring buildings will also adhere to the BRE guidelines in relation to annual and winter sunlighting following construction of the proposal. Accordingly, under the terms set out by the BRE guidelines, it is concluded that the scheme will not result in any unacceptable impacts in terms of annual and winter sunlighting.

Overshadowing

- 7.11 The proposed EfW CHP facility has been assessed in terms of transient and permanent overshadowing. Plots have been prepared to illustrate the impacts of the development on the sunlight levels received within existing woodland, scrubland and open space and proposed open spaces within the development site at the March/September equinoxes and June solstice.
- 7.12 The plots show that the existing areas of woodland, scrub woodland and open space will experience some limited overshadowing at certain times of day on 21 March/September, and extremely limited overshadowing on 21 June. The low level of the sun and existing surrounding topography mean that the development will have negligible impact on the existing levels of overshadowing on 21 December. In all cases these effects will be minor and temporary.
- 7.13 The proposed development will not result in any permanent overshadowing of existing surrounding woodland, open space or proposed landscaping. The proposal will have no material overshadowing effects on Blackie's Wood to the north west of the site or on the Weston Mill Lake stream to the east of the site. Accordingly, the proposed development complies fully with the BRE guidelines in relation to overshadowing.

Overall Conclusions

- 7.14 The proposed development will not result in any unacceptable impacts in relation to daylighting, annual and winter sunlight availability and overshadowing. The development complies with the relevant BRE guide levels in relation to the daylight, sunlight and overshadowing levels experienced within the neighbouring residential buildings and existing amenity spaces assessed.
- 7.15 Given that the window reference points and surrounding areas assessed represent the windows serving existing buildings and surrounding areas that will be most affected by the development, it is reasonable to conclude that all other

neighbouring buildings and areas of woodland, open and amenity space will also be in compliance with the BRE guide levels.

7.16

It is therefore concluded that the development will not give rise to any materially unacceptable daylight, sunlight or overshadowing impacts in the context of the BRE guidelines. We respectfully conclude that there are no reasons on which planning permission should be refused on daylight, sunlight or overshadowing impact grounds.