# REPORT

**on**

# DAYLIGHT, SUNLIGHT AND OVERSHADOWING WITHIN THE PROPOSED DEVELOPMENT

**at**

# AGAR GROVE ESTATE, CAMDEN, LONDON

REF: AH/SFT/ROL6940

January 2013

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## APPENDICES

Figure 1: Oblique aerial photograph of the site looking north

(Source: Microsoft Bing)


Figure 2: 3D view of computer model in the proposed condition

## 1. INTRODUCTION

1.1. This report is submitted in support of a planning application by the London Borough of Camden ("the Applicant") for the redevelopment of the Agar Grove Estate in Camden ("the Site").

1.2. The application site is bounded by Agar Grove to the north, Camley Street to the east, a railway track to the south and Agar Place/Wrotham Road on the western boundary.

1.3. The Agar Grove Estate was constructed by Camden Council in the 1960s and comprises some 249 dwellings arranged as a series of low / medium rise blocks of flats and an 18 storey tower (Lulworth House).

1.4. The proposed development is designed by Hawkins Brown and Mae Architects and comprises the demolition of the existing buildings on the site, with the exception of Lulworth House, Cranbourne House, Ferndown House and the Agar Children's Centre, the creation of new build dwellings, the extension and refurbishment of Lulworth House and creation of new dwellings set within areas of landscaped open space.

1.5. Anstey Horne has been commissioned to undertake a formal technical assessment of the daylight and sunlight levels within the proposed accommodation. We have used 3D computer modelling and our specialist computer software to calculate the levels of daylight and sunlight that will be available in the proposed habitable rooms. Our 3D model of the proposed scheme is illustrated in Figure 1 at page ii and in our drawings at Appendix A.

1.6. Whilst the Building Regulations do not impose any minimum requirements for daylight or sunlight provision in buildings, the following guidelines make various recommendations:

- BS8206-2: 2008, 'Lighting for buildings – Part 2: Code of practice for daylighting' (2008)
- BRE Report 209, 'Site layout planning for daylight and sunlight – A guide to good practice' (2011, second edition)
- CIBSE Lighting Guide LG10, *'Daylight and window design'* (1999)

1.7. The abovementioned guides give advice on minimum recommended average daylight factors (ADF) and no sky contour (NSC) in habitable rooms in dwellings. They also make recommendations for sunlight to interiors, based on the percentage of annual probable sunlight hours (APSH).

1.8. This report summarises the relevant planning policy, the basic principles of daylighting and sunlighting, the methods used to assess the potential levels that will be achieved in the new accommodation, the information used in compiling our 3D computer model and the results of our technical assessment. Drawings and full tables of results of our assessment are attached in the appendices.

## 2. PLANNING POLICY AND GUIDANCE

2.1 The document 'The Planning System: General Principles', published in 2005 by the Office of the Deputy Prime Minister (now Communities and Local Government) explains: "*The planning system does not exist to protect the private interests of one person against the activities of another, although private interests may coincide with the public interest in some cases... The basic question is... whether the proposal would unacceptably affect amenities and the existing use of land and buildings which ought to be protected in the public interest*".

2.2 A useful advisory text is BRE Report 209 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice' (second edition, 2011) by PJ Littlefair (the 'BRE Guide'). The BRE Guide gives advice on site layout planning to achieve good daylighting and sunlighting in new buildings and to retain it in existing surrounding buildings. Whilst the BRE Guide is intended for use by designers, consultants and planning officials it specifically states in its introduction that "*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*."

### Local Planning Policy and Guidance

2.3 The development site is located within London Borough of Camden ('LBC').

2.4 LBC adopted their Local Development Framework ('LDF'), in November 2010.

2.5 LBC's LDF Policy DP26, 'Managing the impact of development on occupiers and neighbours', states: "*The Council will protect the quality of life of occupiers and neighbours by only granting permission for development that does not cause harm to amenity. The factors we will consider include: … b) overshadowing and outlook; c) sunlight, daylight and artificial light levels.…*"

2.6 Policy DP26 goes on to confirm that: "*To assess whether acceptable levels of daylight and sunlight are available to habitable spaces, the Council will take into account the standards recommended in the British Research Establishment's Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice (1991).*"

2.7 LBC has also published additional advice on their planning policies in their Supplementary Planning Documents ('SPD'). The relevant guidance on daylight and sunlight amenity is found within its SPD 'Camden Planning Guidance 2011', under 'CPG 6 – Amenity'. It states that: "*while we strongly support the aims of the BRE methodology for assessing sunlight and daylight we will view the results flexibly and where appropriate we may accept alternative targets to address any special circumstances of a site. For example, to enable new development to respect the existing layout and form in some historic areas. This flexible approach is at the Council's discretion and any exception from the targets will be assessed on a case by case basis*."

2.8 The Council's Planning Guidance 2011 continues: "*As the BRE guidance suggests, the readings will be interpreted flexibly as their aim is to support rather than constrain natural lighting. However, daylight is only one of the many factors in site layout design. Therefore, when applying these standards in Camden, we will take into consideration other site factors and constraints*."

2.9 I confirm that we have undertaken our daylight and sunlight study in accordance with BRE Report 209 'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice'.

## 3. METHOD OF ASSESSMENT AND NUMERICAL GUIDELINES

### Daylight within new development

3.1 Section 2.1 of the BRE guide makes recommendations concerning daylight in new buildings. Where window positions and sizes are known, it is more informative to calculate the interior daylighting inside the building. The guidelines recommend calculating the average daylight factor (ADF), which is the mean daylight factor on the horizontal working plane inside the room and is a measure of the overall amount of daylight in a space.

3.2 BS8206 and BRE Report 209 recommend the following minimum values of ADF in housing:-

- 1% for bedrooms
- 1.5% for living rooms
- 2% for kitchens

3.3 BS8206-2: 2008 notes that *"Where one room serves more than one purpose, the minimum average daylight factor should be that for the room type with the highest value. For example, in a space which combines a living room and a kitchen the minimum average daylight factor should be 2%"*.

3.4 There are a number of ways that the ADF can be calculated. We have followed the method described in Appendix C of the BRE Guide, which uses the following equation:

$$ADF = \frac{TMA_W\theta}{A(1-R^2)}$$

where,

**T** is the diffuse visible light transmittance of the glazing;

**M** is the maintenance factor allowing for the effects of dirt;

$\mathbf{A_w}$ is the net glazed area of the window;

$\theta$ is the angle of visible sky;

**A** is the total area of all the room surfaces (ceilings, floors, walls and windows); and

**R** is the area-weighted average reflectance for the room surfaces.

3.5 The angle of visible sky (θ) at each window can be directly related to the VSC as described in Appendix C of the BRE Guide. The values used in our assessment for the other parameters in the ADF formula are explained in section 5 of this report.

3.6 The guidelines also recommend that the distribution of daylight in the room should be checked. This can be done by plotting the no-sky line, i.e. the line on the working plane that divides those areas that can receive direct skylight from those that cannot, as described in Appendix D of the BRE Guide. The BRE Guidelines suggest that "*if a significant area of the working plane (normally more than 20%) lies beyond the no-sky line (i.e. it receives no direct skylight), then the distribution of daylight in the room will look poor and supplementary electric lighting will be required*".

**Sunlight within new development**

3.7 Section 3.1 of the BRE Guide makes recommendations concerning sunlight in new buildings. It advises that *"In housing, the main requirement for sunlight is in living rooms, where it is valued at any time of day but especially in the afternoon. Sunlight is also required in conservatories. It is viewed as less important in bedrooms and in kitchens, where people prefer it in the mornings rather than the afternoon."*

3.8 The BRE guidance advises that site layout can be used to affect the duration of sunlight in buildings. It notes that *"A dwelling with no main window wall within 90° of due south is likely to be perceived as insufficiently sunlit. This is usually an issue only for flats. Sensitive layout design of flats will attempt to ensure that each individual dwelling has at least one main living room which can receive a reasonable amount of sunlight."*

3.9 The guide notes that *"The aim should be to minimise the number of dwellings whose living rooms face solely north, northeast or northwest, unless there is some corresponding factor such as an appealing view to the north." It also acknowledges that "for larger developments of flats, especially those with constraints, it may not be possible to have every living room facing within 90° of due south"*.

3.10 Access to sunlight can be quantified: "*BS8206 recommends that interiors where the occupants expect sunlight should receive at least one quarter (25%) of annual probable sunlight hours (APSH), including in the winter months between 21 September and 21 March at least 5% of APSH"*.

3.11 'Probable sunlight hours' means *"the total amount of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness for the location in question"*. The calculation uses a sunlight probability model that is based on sunlight statistics. The sunlight probability diagram is shown in Figure A.3 of BS8206-2:2008. There are 100 dots on the diagram, with each dot representing 1% of probable sunlight hours. The density of dots on the diagram is proportional to the probability of the sun shining from a particular area of sky.

3.12 The annual probable sunlight hours on an unobstructed plane varies according to location, with London receiving 1,486 sunlight hours, Manchester 1,392 hours and Glasgow 1,267 hours. So, in London a figure of 1% APSH equates 14.86 probable sunlight hours over the course of the year.

3.13 Although the criterion can be applied to rooms of all orientations, the guide notes that *"if a room faces significantly north of due east or west it is unlikely to be met"*.

3.14 The calculation point is taken on the inside face of the window wall so that sunlight blocked by reveals is not included. Where rooms are lit by more than one window it is sensible to consider the aggregate amount of sunlight reaching the room, though care should be taken to avoid double-counting. The BRE Guide advises as follows: *"If a room has multiple windows on the same wall or adjacent walls, the highest value APSH should be taken. If a room has two windows on opposite walls, the APSH due to each can be added together."*

3.15 Whilst the BRE guidelines may, in theory, be applied anywhere, APSH values of 25% annually and 5% in the winter months are often not possible in modern, dense, city-centre sites.

3.16 BS8206 notes that "*The degree of satisfaction is related to the expectation of sunlight. If a room is necessarily north facing or if the building is in a densely-built urban area, the absence of sunlight is more acceptable than when its exclusion seems arbitrary. It is the duration of sunlight in an interior, rather than its intensity or the size of the sunny patch, which correlates best with the occupants' satisfaction."*

3.17 The BRE Guide notes that whilst BS8206 is intended to give good access to sunlight in a range of situations, in some circumstances *"the designer or planning authority may wish to choose a different target value for hours of sunlight.*"

3.18 In the summary the BRE Guide states that a dwelling will appear reasonably sunlit provided that at least one main window wall faces within 90° of due south and the centre of at least one window to a main living room can receive 25% APSH, including at least 25% APSH in the winter months between 21 September and 21 March. Where groups of dwellings are planned, *"site layout should aim to maximise the number of dwellings with a main living room that meets the above recommendations"*.

**Sunlight to proposed amenity spaces within new development**

3.19 Section 3.3 of the BRE Guide makes recommendations concerning sunlight to open spaces between buildings. It notes that sunlight into these open spaces *"is valuable for a number of reasons, to:*

- *provide attractive sunlit views (all year)*
- *make outdoor activities like sitting out and children's play more pleasant (mainly warmer months)*
- *encourage plant growth (mainly spring and summer)*
- *dry out the ground, reducing moss and slime (mainly in colder months).*
- *melt frost, ice and snow (in winter)*
- *dry clothes (all year)."*

3.20 The BRE Guide recognises that different types of amenity space can have different sunlighting requirements and that it is difficult to suggest a hard and fast rule. The equinox (21 March) can be chosen as a date for assessment. The Guide recommends that *"at least half of the amenity areas … should receive at least two hours of sunlight on 21 March. It is instructive to draw the 'two hours sun contour', which marks this area on plan, because the use of specific parts of a site can be planned with sunlight in mind".*

**Computer simulation**

3.21 The appendices to the BRE Guide describe various manual methods for calculating VSC and APSH and for plotting the no-sky line on the working plane. However, where the obstructions on the skyline are complex these methods can be difficult to apply and the results can be crude. We therefore prefer to use computer simulation and our specialist software, which is based on the more accurate Waldram method described in Appendix B of the BRE Guide.

3.22 Our software calculates the VSC at each window, converts this into an equivalent angle of visible sky (θ) and uses this to calculate ADF in each room. The information upon which our computer model was based is explained in the next section of this report.

## 4. APPLICATION OF THE BRE GUIDE

4.1 In its introduction BRE Report 209 states its "*main aim is … to help ensure good conditions in the local environment considered broadly, with enough sunlight and daylight on or between the buildings for good interior and exterior conditions"*.

4.2 The Guide notes that it *"is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design."*

4.3 Clearly, the BRE Guide is an advisory document, not a rigid set of rules. Care must therefore be taken when applying its recommendations.

4.4 In theory the BRE Guide's numerical guidelines may be applied to any setting, whether that is a city centre, suburban area or rural village. However, it notes, "*In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings.*"

4.5 Clearly, rigid application of the BRE Guide's standard numerical guidelines may be inappropriate in a built-up urban environment where higher density affordable development may be desirable and where there simply cannot be the same expectation of light as in a suburban or rural context.

## 5. INFORMATION USED IN THE TECHNICAL STUDY

5.1 We undertook our technical study using a 3D computer model of the proposed scheme and its surrounding buildings, which we built from the following information:

5.1.1 Proposed scheme:

- City Scape Model – Agar Grove 2010 FULL.dwg (10/12/13)
- Hawkins Brown Architect's Drawing Nos.

  Block A – 1423_DWG_PLOTA_00_200, 250. 251.

  Blocks B1 + B – 1423_DWG_PLOTB_00_202 – 204, 250 – 253.

  Blocks J, K + L – 1423_DWG_PLOTJKL_00_200, 251 – 254.
- Mae Architects Drawing Nos.

  Block CDE – 1423_DWG_PL_CDE_00_200. 250 – 255, 280.

  Block F – 1423_DWG_PL_F_00_200, 250 – 252, 280.

  Block G – 1423_DWG_PL_G_00_200, 250 – 252, 280.

  Block H – 1423_DWG_PL_H_00_200, 250 – 252, 280.

  Block I – 1423_DWG_PL_I_00_200, 250 – 251, 280.

Received between 03/12/2013 and 06/12/2013.

5.1.2 Existing building on the site and existing surrounding buildings:

- Greenhatch Group Drawings Numbered:- 3D CAD Model received 25/07/13 and 18313A – Lulworth House – 3D.dwg
- Hawkins Brown Architects' and MAE Architects' Sketch Up model received 03/07/13 (surrounding massing)

- OS map.
- Aerial photography from Microsoft Virtual Earth.
- Site visits and photographs.

5.2 The computer model is illustrated on the drawings at Appendix A.

5.3 In calculating the daylight (ADF) levels the following values were applied in the BRE / BS formula:

- T (diffuse glass transmission): 0.68 for clear double glazing with a low emissivity coating (Lulworth Tower); 0.54 for clear triple glazing with low emissivity coating (all new units);
- M (maintenance factor for dirt on glass): 0.92 (i.e. 8% loss) for vertical glazing;
- $A_w$ (window aperture area): measured from 3D computer model multiplied by 0.9 for the frame correction factor;
- A (total surface area of room): measured from the 3D computer model; and
- R (area-weighted surface reflectance of room): calculated for each room based on the following surface finishes and reflectances:
    - Ceilings: white 0.85
    - Walls: white 0.85
    - Floors: light wood flooring 0.4

## 6. RESULTS OF TECHNICAL STUDY

6.1 We tested all of the new blocks and Lulworth House at the lowest level of habitable accommodation. Where target values were not completely met in daylight have gone on to test the next floor up.

6.2 In all we tested 297 rooms, of which 132 are living rooms, dining rooms and kitchens (or a combination thereof) and 165 are bedrooms. Where windows are set back beneath balconies serving the floor above, we have included the obstructing effect of the balcony within our model. Although we have tested various types of habitable room, the guidelines focus on main living rooms and conservatories and the results should be considered in this context.

6.3 The rooms tested are shown outlined on our drawing nos. ROL6940_5_401 to 409 at Appendix E. The drawings give the use of each room and the room and window references used in our detailed tables of results.

**Daylight and Sunlight within new development**

6.4 The average daylight factor (ADF) results for the proposed habitable rooms tested are shown in the table at Appendix B (along with the relevant target for the room use concerned) and on the room layout drawings at Appendix E.

6.5 The daylight distribution (DD) results are shown, in terms of percentage of room with a view of sky, in the table at Appendix C and the no-sky contour is plotted on the room layout drawings at Appendix E.

6.6 For sunlight, the guidelines acknowledge that *"if a room faces significantly north of due east or west [the sunlight criterion] is unlikely to be met"*. We therefore only tested the rooms in our model whose windows face within 90° of due south. The annual probable sunlight hours (APSH) results for the rooms tested are given in the table at Appendix D.

Block A

6.7 We have assessed 50 rooms within Block A at ground and first floor level. 39 of the 50 rooms tested meet their respective target value for Average Daylight Factor (ADF). The exceptions are 5 KD's and 2 living rooms at ground floor level and 4 bedrooms and 2 LKD's at first floor. It can be seen from reviewing the results that 10 of these rooms are located on the south facing side of the building and are beneath the recessed balconies which limit the available daylight. There is also the presence of moveable external screens, designed prevent thermal sunlight gains and attenuate the noise from the adjacent railway, which also impact on the daylight. However, when one goes on to assess the Daylight Distribution it can be seen that all but one of the rooms assessed meet the target of having the over 80% of the room being able to receive light directly from the sky. The exception is a KD at ground floor level (R2/1070) which receives DD to 70% of its area.

6.8 The daylight levels for the upper levels, i.e. second floor and above, will receive higher ADF values because they are in a more elevated position.

6.9 For sunlight, 31 of the rooms tested have windows that face within 90 degrees of due south. The APSH results confirm that only 1 window serving room R1/1000 at ground floor level meets the sunlight target of 25% APSH with 5% achieved in the winter months. However on closer inspection, it can be seen that all but 3 of the remaining 30 windows receive more than the recommend 5% winter APSH. The presence of the overhanging balcony and sliding sunlight screens reduces the available APSH in the summer months. All of the windows assessed face south and are therefore capable of receiving direct sunlight however, the design of the external screens enables the occupant to each room to limit the amount of sunlight on an individual personal basis.

Block B and B1

6.10 We have assessed 87 rooms between second and fourth floors. 84 of the 87 rooms tested meet their respective target value for ADF. The only exceptions are 3 LKD's (rooms R1/202, R11/203 and R11/2004 at second, third and fourth floor level) which receive ADF values of 1.51%, 1.16% and 1.58% respectively. These rooms are located within a recess to the building which limits available daylight due to the projecting balcony above and the blinkering effect of the recess. However, when one assesses the Daylight Distribution results for these rooms it can be seen that have good DD with over 90% of their area having access to direct skylight.

6.11 For sunlight, 51 of the rooms tested have windows that face within 90 degrees of due south. 24 of these meet the target APSH values. Of the 27 rooms which do not, 15 are bedrooms and the guidance states that sunlight to bedrooms is less important. The 12 remaining rooms are LKDs (e.g. rooms R15/202 second floor and R11/203 at third floor), which are all located within recessed areas of the building or directly beneath deep overhanging balconies which severely limits the amount of available APSH especially in the summer months. This is illustrated by the fact that almost all do not reach the APSH target for total APSH but nevertheless receive levels of winter sun in excess of 5%.

Blocks C, D and E

6.12 We have assessed 40 rooms at ground and first floor levels. 27 rooms meet their respective target value for ADF. 3 of those which do not do so are LKDs at ground floor level (R1/4040, R1/4050 and R2/4050) and receive ADF values of 0.91%, 1.74% and 0.86% respectively The 3LKD's have a DD of between 60% and 80% and therefore these rooms will benefit in having a large area of the room capable of receiving direct light from the sky. The rooms at ground floor level are impacted by the deep internal facing recess and overhanging balconies which limits the amount of available daylight. The other 10 rooms which would not meet their ADF target area all internal facing bedrooms at first floor level however, the Guidance does state that daylight to bedrooms is less important.

6.13 For sunlight, 25 of the rooms tested have windows that face within 90 degrees of due south. Ten of these windows meet the APSH target values. Of the 15 which do not, 11 are to first floor bedrooms, most of which look out onto recessed balconies. Also, the BRE Guide states that sunlight to bedrooms is less important. The remaining 4 rooms are LKDs at ground floor level (rooms R1/4040, R2/4040, R1/4050 and R2/4050). They all have an orientation of just within 90 degrees of due south and for this reason, their available sunlight will be limited. It should also be noted that these are located beneath deep recessed balconies which limit the APSH availability further.

Block F

6.14 We have assessed 35 rooms between ground and first floor; all 28 rooms at first floor meet the respective target ADF value. Seven ground floor LKD's, all with a large internalised kitchen in the middle of the room, receive ADFs of between 1.42% and 1.86%. The DD analysis for these rooms indicate that over 80% of the area to all these LKD's will receive light direct from the sky and so meet the DD targets. Although these rooms would not meet the ADF targets, the kitchen area will look out on to a well-lit dining area as recommended in Section 2.1.13 in the BRE Guidance. These rooms are another example where the presence of the overhanging balconies over the north facing windows at ground floor levels limits the available daylight.

6.15 For sunlight, 21 of the rooms tested have windows that face within 90 degrees of due south. 16 of these rooms meet the APSH targets which include all of the LKD's at ground floor and 9 bedrooms at first floor. The 5 rooms at first floor level which do not meet the total APSH target value are all bedrooms which the guidance states are less important. It is worth noting that all of these bedrooms have winter APSH levels in excess of the target values.

Block G

6.16 We have assessed 10 rooms at ground floor level and the results confirm that they all meet or exceed their target ADF and DD values.

6.17 For sunlight, 5 of the rooms tested have windows that face within 90 degrees of due south all of which have at least 1 window which meet the target APSH values.

Block H

6.18 We have assessed 20 rooms at ground floor level and the results confirm that they all meet or exceed their target ADF and DD values.

6.19 For sunlight, 10 of the rooms tested have windows that face within 90 degrees of due south, and 5 of these rooms meet the target APSH values. There are 5 KD's that do not ( R1/8040, R1/8060, R2/8060, R1/8080 and R2/808) are area all located within recessed areas of the building which limits the amount of available sunlight, but all these rooms would still have access to at least 21% total APSH with 4% during the winter months, so only marginally below the targets in the BRE Guide.

Lulworth House

6.20 We have assessed the 4 LKDs at ground floor levels and the results confirm that all of the results for all the rooms meet the target ADF and DD values.

6.21 The residential accommodation at ground floor does not have any windows within 90 degrees of due south, but the results confirm the 4 LKDs would nevertheless receive good levels of APSH due to their open aspect to the west.

Block I

6.22 We have assessed 31 rooms between and ground first floors and the results confirm that 25 of these rooms meet respective ADF target values. Of the rooms which do not, 3 are LKDs at ground floor level (R1/6020, R1/6030 and R1/6040) with ADF values of between 1.27% and 1.83%. The other 5 rooms are at first floor level comprising 4 LKDs (R1/6031, R5/6001, R6/6001 and R11/6031) and a bedroom (R6/6031). The 4 LKDs have ADF values of between 0.12% and 1.39% and the bedroom 0.81%, but all are located at the back of winter gardens with structure to the main elevation which limits the available daylight. This type of configuration is not one envisaged by the ADF formula in the BRE Guide and these particular ADF results may be underestimating the true ADF within the rooms.

6.23 For sunlight, 21 of the rooms tested have windows that face within 90 degrees of due south. None meet the APSH target values. This has been caused by the recesses and the fact the windows face almost due east, thereby significantly limiting the available sunlight.

Blocks J, K and L

6.24 We have assessed 21 rooms at ground floor, 17 of the rooms tested meet the respective ADF target value. The 4 rooms that do not meet the target are a LKD, LD, Kitchen and KD (R3/3100, R4/3100, R6/3100 and R4/3000) which have ADF values ranging between 1.77% and 1.95% ADF. When one reviews the Daylight Distribution for these rooms, their DD's are between 55% and 98% of the floor area.

6.25 For sunlight, 18 of the rooms tested have windows that face within 90 degrees of due south, 9 of which meet the APSH minimum targets as set out in the Guide. The remaining 9 rooms are all LKDs however, they fail to make the target values due to the fact that their orientation is just within 90 degrees of due south thereby limiting the amount of available sunlight and the presence of overhead balconies reducing the available sunlight further.

**Sunlight to proposed amenity spaces**

6.26 The sunlight results for the amenity spaces within the proposed development are shown on our drawing at Appendix F. We have plotted the 'two-hours sun contour' on 21 March for each amenity space, which divides the areas that can receive at least two hours of sunlight (which are shown coloured yellow on the drawings), from those that receive less than two hours (which are shown coloured grey). The percentage of each amenity space receiving at least two hours of sunlight is shown on the drawings. The BRE Guide recommends that at least 50% of the amenity area should be able to do so.

6.27 We have assessed 9 external amenity areas within the development site. 8 of the amenity areas will receive more than 2 hours of sunlight on March 21st to over 57% of their area. The remaining area (R1/405) is located between blocks C, D and E and will receive more than 2 hours sunlight on March 21st to 34% of its area. This is due to the fact that this amenity area is relatively small and is situated close to the surrounding blocks. However, our assessment demonstrates that with the exception of this one area, the overall amount of sunlight within the amenity areas will be good.

## 7. SUMMARY AND CONCLUSION

7.1 There are no mandatory standards for daylight or sunlight provision within dwellings in the Building Regulations or the Code for Sustainable Homes environmental assessment method; however a number of good practice guides are available.

7.2 The London Borough of Camden's planning policy seeks to provide good living conditions for residents of new housing developments, including the provision of adequate daylight and sunlight and refers to the guidance published in BRE Report 209 '*Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice*', which gives useful advice and recommends various numerical guidelines.

7.3 With respect to daylight, 297 rooms have been tested across the site for daylight with the ADF and Daylight Distribution tests and the sunlight test of APSH. For each block of the proposed development we have tested habitable rooms of the lowest level of accommodation and where daylight targets were not met, we have also gone on to test the habitable rooms on the floor above.

7.4 For daylight, 83.5% of rooms tested would meet or exceed their relevant ADF targets. Approximately 79% of rooms tested would satisfy the Daylight Distribution recommendations. If an assessment was to be carried out for every habitable room in the whole development i.e. all the upper floors, the percentage of rooms meeting both the ADF and DD targets would significantly increase due to the fact that those rooms at a higher elevation will receive more daylight.

7.5 Of those rooms which do not meet their ADF targets, the majority have some or all of their windows at the rear of recessed balconies and/or beneath projections (for example balconies serving the floors above). Features such as these will inevitably reduce the amount of daylight (and sunlight) to windows but obviously provide valuable amenity space.

7.6 Our analysis demonstrates that where there are rooms that do not meet the target values, the subject individual unit has been designed to have other habitable rooms that will meet the daylight targets.

7.7 153 of the rooms tested for sunlight have one or more windows which face within 90 degrees of due south and of these 46% of rooms would meet the APSH targets in the BRE Guide. Of those rooms which would not, the majority of the windows are recessed behind the main structure of the individual blocks, beneath overhanging balconies, behind moveable sun shading/noise attenuation screens or face only just within 90 degrees of due south, all of which can significantly reduce the amount of available sunlight.

7.8 With respect to overshadowing to external amenity areas, it is considered inevitable within a development of this nature that some amenity spaces will be situated to the north of tall buildings or within courtyards, which will consequently affect their access to direct sunlight. It can be seen however, that an effort has been made to locate the main amenity space and play areas such that they will receive good access to direct sunlight, and eight of the nine amenity areas tested will meet the recommendations of the BRE Guide.

7.9 We have only tested the lower floors for residential accommodation within each block and where target values were not completely met, we tested the next floor up. The results on upper floors will inevitably be better and therefore it would be reasonable to surmise that this will translate to a large percentage of rooms meeting the daylight and sunlight targets within the whole development. Overall a much higher percentage of windows/rooms would meet the targets in the BRE Guide for sunlight and daylight so that taking in the round, the results will be acceptable.

7.10 In conclusion, during the design process efforts have been made in order to optimise daylight and sunlight conditions within the proposed accommodation. Full adherence to the BRE Guide is challenging when dealing with other material design parameters and the desire to achieve good daylight and sunlight conditions must always be balanced against other requirements that often make this hard to achieve, such as providing private amenity space and achieving a suitable density for the site. Nevertheless, in our opinion, the general aims and objectives of the London Borough of Camden's planning policy on daylight and sunlight will be satisfied.

……..

Lance Harris MRICS

**Director**
**ANSTEY HORNE**

24 January 2014