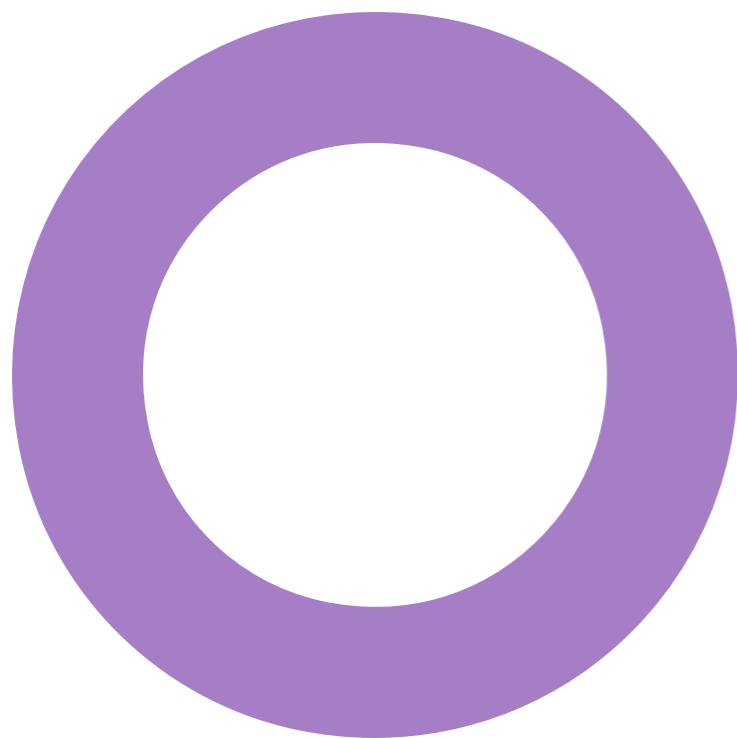


**Elmsbrook Local Centre,  
Bicester.**  
**A2Dominion.**

DAYLIGHT & SUNLIGHT ASSESSMENT  
08 OCTOBER 2019



## Audit sheet.

Rev	Date	Description	Prepared	Verified
0	05/03/2019	First issue	RKW	JMS
1	29/05/2019	Revised design	JMS	RKW
2	08/10/2019	Updated planning application	RKW	JMS

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## 1. Introduction.

The first part of this report presents the findings of a daylight and sunlight assessment of residential units within the proposed Elmsbrook Local Centre, Oxfordshire. The development comprises two blocks, with apartments arranged over two floors. The second part of this report looks at the potential reduction in daylight and sunlight amenity to the existing dwellings, north of the proposed development. The 3D model used for daylight analysis is shown in Figure 1.

- Proposed development
- Existing properties

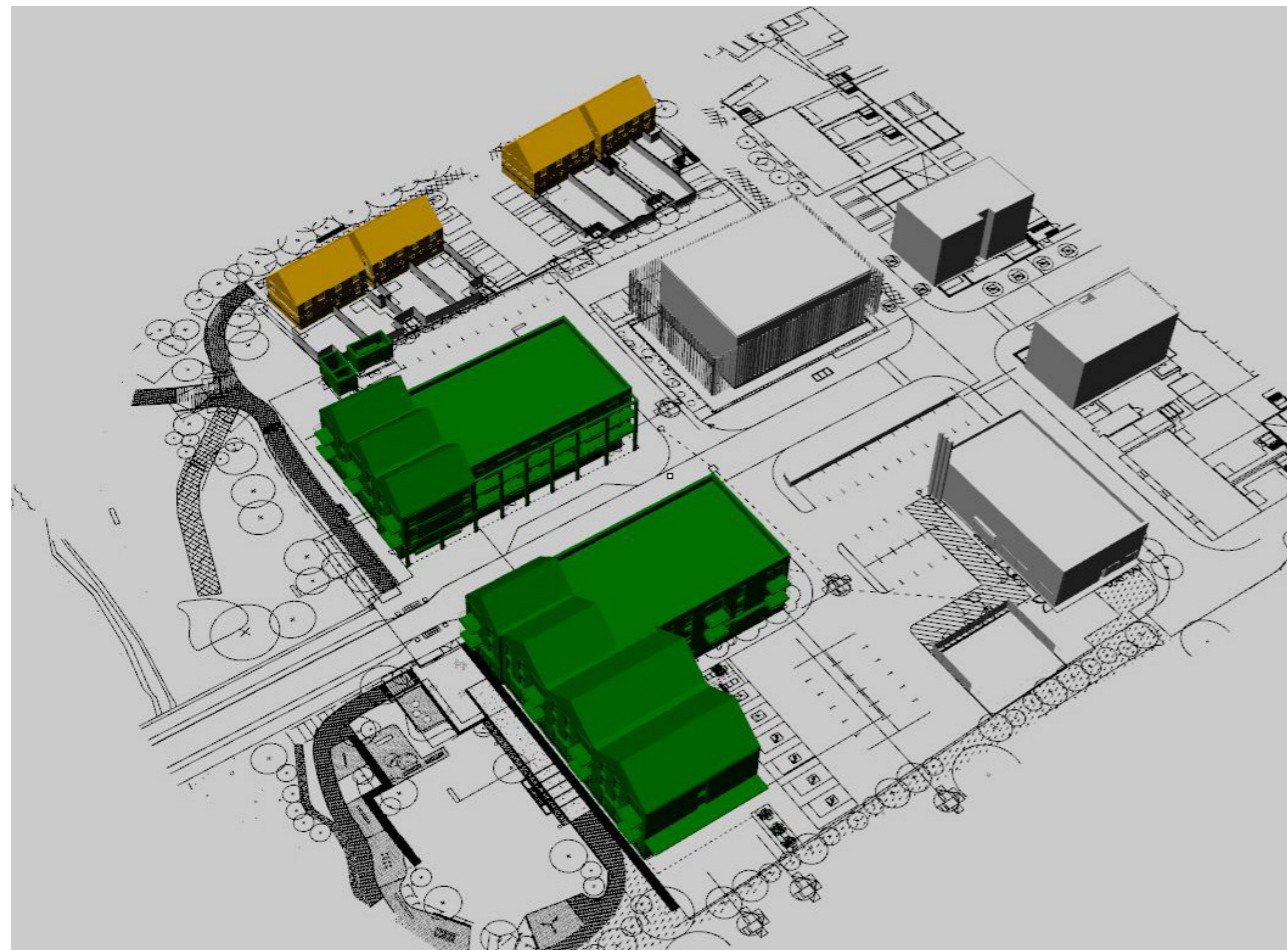


Figure 1 3D Rhino Model model

## 2. Daylight criteria.

The criteria used in this assessment are based on the BRE document *Site Layout Planning for Daylight and Sunlight*, 2011 (referred to as BR209) and British Standard BS 8206-2 *Code of practice for daylighting*, 2008. BR209 and BS8206-2 recommend the same targets for daylight levels and sunlight availability in dwellings. Whilst the British Standard is rather concise, BR209 goes into more detail and gives guidance on how daylight and sunlight assessments should be carried out.

### 2.1 Daylight (skylight) evaluation

BR209 and BS8206-2 use the Average Daylight Factor (ADF) metric to quantify light from the sky (i.e. without direct sunlight). Put simply, ADF is the ratio of internal illuminance (lux) to the external unobstructed horizontal illuminance. It is dependant on a number of factors, including window area, glazing transmittance, the light reflectance of surfaces within the room and externally, and the presence of obstructions that obscure the amount of sky that can be seen from the window. Both documents recommend minimum ADF values for residential rooms as follows:

Room type	ADF target
Kitchens	2.0%
Living rooms	1.5%
Bedrooms	1.0%

To evaluate the depth of daylight penetration in rooms, the No Sky Line (NSL) metric is also calculated. The recommended target for NSL is 80%. In other words, 80% of the working plane should have a direct view of the sky.

### 2.2 Sunlight evaluation

The guidance in BR209 and BS8206-2 uses Probable Sunlight Hours (PSH) to quantify the amount of sunlight received at a given point. The point of interest is usually taken to be at the centre of the window, since this gives a good overall indication of the quantity of sunlight that would be received within the room.

PSH recommendations are given in both annual terms (Annual PSH or APSH) and specifically for the winter period (Winter PSH or WPSH), when sunlight in the interior is particularly desirable. The guidance recommends that, in spaces where occupants can reasonably expect direct sunlight, 25% of annual probable sunlight hours should be achieved, with 5% occurring in winter (between 21 Sep and 21 Mar). The guidance applies only to living rooms, and excludes windows that face within 90° of due north.

Room type	APSH target	WPSH target
Living rooms	25%	5%

To evaluate the impact a new development will have on the existing external amenity areas such as gardens or play areas, BR209 recommends that at least half of the amenity area should receive at least two hours of sunlight on the 21st of March. It is instructive to draw the 'two hours sun contour' which marks this area on plan.

Relevant extracts from BR209 and BS8206-2 can be found in Appendix A.

### 3. Applicable units for assessment.

Compliance with daylight criteria was assessed by calculating the average daylight factor (ADF) and no sky line (NSL) of each applicable room and comparing the results with the target values. For sunlight, an Annual Probable Sunlight Hours (APSH) and Winter Probable Sunlight Hours (WPSH) analysis was undertaken. Sunlight hours have not been calculated for windows that face within 90° of due north, since these cannot reasonably expect to meet the sunlight criteria. Furthermore, the PSH recommendations only apply to main living room windows. Therefore, of the sample of rooms selected for assessment, only some were subjected to PSH analysis, as indicated in Figures 2. As the floor plans for Level 01 & 02 are the same, the apartment numbering is the same for both floors.

Note that although the internal daylight and sunlight calculations focus on the North Building only, the impact of the mass of the South Building upon daylight and sunlight within proposed and existing dwellings has been taken into account.



Figure 2 Assessed apartments - North building Levels 01 and 02

### 4. Daylight model.

A Revit model provided by ADP architects on 28.05.2019 was imported into Rhino 3D, where daylight was modelled using a Radiance plug-in. Radiance can handle 3D models of arbitrary complexity, allowing for high-accuracy daylight simulations.

The glazing is based on double glazing with a light transmittance value of 0.65.

The light reflectance values of materials used in the model were as follows:

- External surfaces of Elmsbrook development: 50%
- Surrounding buildings: 20%
- External ground: 20%

Interior reflectance values:

- Floors: 20%
- Walls: 50%
- Ceilings: 70%

The calculation planes were set to 0.85m above finished floor level with sensory nodes at 0.3m intervals. Circulation areas are excluded where these are clearly identifiable within open plan apartments.

The following drawings and models, provided by ADP architects on 28/05/2019, were used as a basis for the daylight modelling within the proposed apartments:

- ELC2-ADP-00-ZZ-M3-A-0001\_S2-P06\_
- ELC2-ADP-00-GF-DR-A-1000 (PROPOSED GA - GROUND FLOOR)
- ELC2-ADP-00-01-DR-A-1001 (PROPOSED GA - FIRST FLOOR)
- ELC2-ADP-00-02-DR-A-1002 (PROPOSED GA - SECOND FLOOR)
- ELC2-ADP-00-XX-DR- A-1200 -(ELEVATIONS (1 OF 3)
- ELC2-ADP-00-XX-DR-A-1201 - ELEVATIONS (2 of 3)
- ELC2-ADP-00-XX-DR- A-1202 - ELEVATIONS (3 of 3)

## 5. Daylight within proposed apartments - Results.

### 5.1 ADF results

Table 1 gives a summary of Average Daylight Factor (ADF) compliance for the rooms that were analysed. The detailed results can be found in Appendix B.

The results show that 12 out of the 21 rooms on level 01 achieve the required targets. Compliance increases as we move up to level 02, with 15 of 21 rooms able to achieve the required ADF. The overall compliance rate for the development is 64%. It is noted that none of the rooms in Apartments 4 and 5 on either level meet the required ADF targets, along with the kitchen/living rooms in Apartments 2, 6, 7 and 8 on both levels. This is primarily due to overshadowing by the South Building and the depth of the kitchen/living rooms within the apartments.

**Table 1 ADF results summary**

Floor	Number of rooms	Number of rooms that meet ADF target	% ADF Compliance
01	21	12	57%
02	21	15	71%
<b>Total</b>	<b>42</b>	<b>27</b>	<b>64%</b>

### 5.2 NSL results

Table 2 gives a summary of No Sky Line (NSL) compliance for the rooms that were analysed. The detailed results can be found in Appendix C.

17 rooms on Level 01 and 19 on Level 02 comply with the NSL target. The rooms that do not meet the target are located in Apartments 3, 4 and 5 on both levels. This indicates that the depth of daylight penetration in these apartments is affected by the obstruction of the South Building. The overall compliance rate for the development is 86%.

**Table 2 NSL results summary**

Floor	Number of rooms	Number of rooms that meet NSL target	% NSL Compliance
01	21	17	81%
02	21	19	90%
<b>Total</b>	<b>42</b>	<b>36</b>	<b>86%</b>

## 6. Sunlight within proposed apartments - Results.

Table 3 gives a summary of compliance with Annual Probable Sunlight Hours (APSH) and Winter Probable Sunlight Hours (WPSH) targets for the rooms. Two windows fail to achieve the APSH target of 25%, located in the kitchen/living rooms of Apartments 4 & 5. All windows achieve the target WPSH (5%). The detailed results can be found in Appendix D.

**Table 3 PSH results summary**

Level	Number of rooms	Number of rooms that meet APSH target	% APSH Compliance	Number of Srooms that meet WPSH target	% WPSH Compliance
01	7	5	71%	7	100%
02	7	7	100%	7	100%
<b>All</b>	<b>14</b>	<b>12</b>	<b>86%</b>	<b>14</b>	<b>100%</b>

## 7. Affect on neighbouring dwellings.

This section of the report presents an assessment of the potential reduction in daylight and sunlight in surrounding buildings. Eight residential dwellings have been identified which could be affected by the proposed development. These dwellings are located north of the proposed site, as shown in Figure 3.

### Legend

- Proposed building
- Affected dwellings

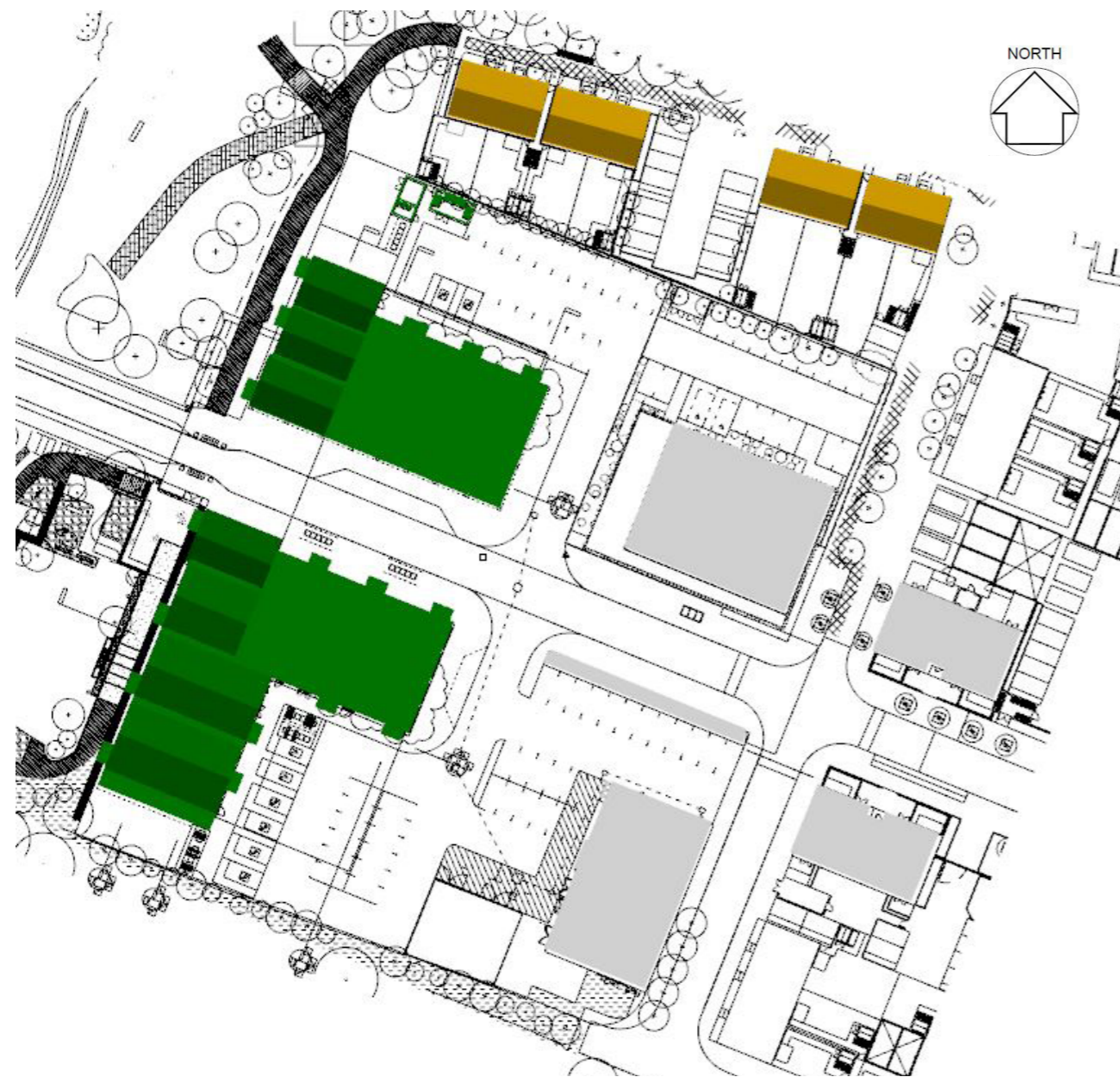


Figure 3 Plan showing proposed building and affected properties

### 7.1 Plot naming convention

The houses have a rear elevation that faces the proposed site.

The plots are numbered 301-366 as shown in Figure 4. Drawings of the rear elevations are shown in Figure 5 to 8.

### Legend

- Plot 301 & 302
- Plot 303 & 304
- Plot 305 & 306
- Plot 365 & 366

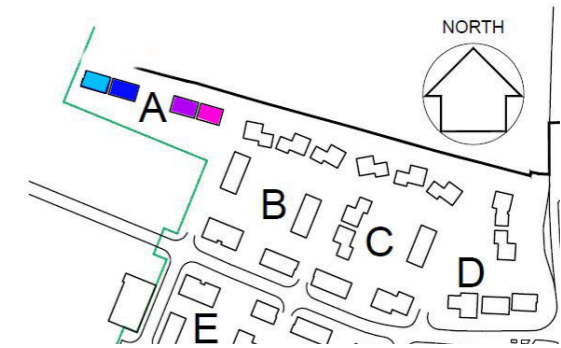


Figure 4 Plot numbering



Figure 5 Plot 301 & 302



Figure 6 Plot 303 & 304



Figure 7 Plot 305 & 306



Figure 8 Plot 365 & 366

## 7.2 Assessment methodology.

For each affected building, daylight and sunlight are evaluated for a baseline condition and for the proposed condition, with Elmsbrook Local Centre building in place. The following metrics were calculated:

- Vertical Sky Component (VSC)
- No Sky Line (NSL)
- Probable Sunlight Hours (PSH)
- 2 hour sunlight contour line during Equinox for rear gardens

By comparing the daylight and sunlight metrics in the baseline and proposed conditions, the impact of the proposed building can be quantified.

Further detail about the calculation and use of the above metrics can be found in Appendix A.

The room naming convention used in the assessment is in line with the naming convention in the received plans. The assessment of impact on neighbouring dwellings is based on the following drawings:

- AA2699C-4.1-202-I
- AA2699C-4.1-203-F
- AA2699C-4.1-222-G
- AA2699C-4.1-301-K
- AA2699C-4.1-302-I
- AA2699C-4.1-303-I
- AA2699C-4.1-322-H

## 7.3 Baseline and proposed conditions

The baseline condition is taken as the existing site and neighbouring buildings, Figure 9, whilst the proposed condition is as existing with the addition of the proposed development at Elmsbrook local centre, Figure 10.

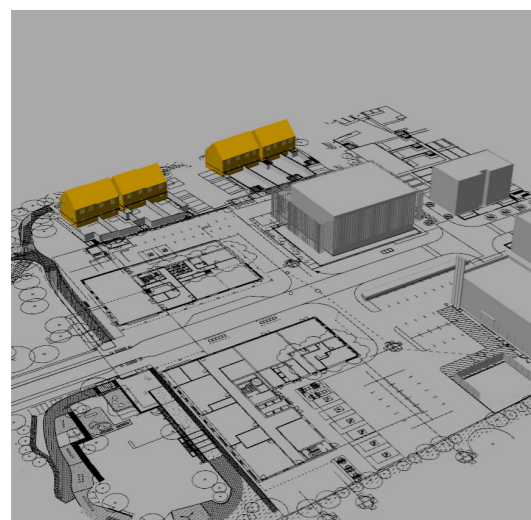


Figure 9 Baseline condition

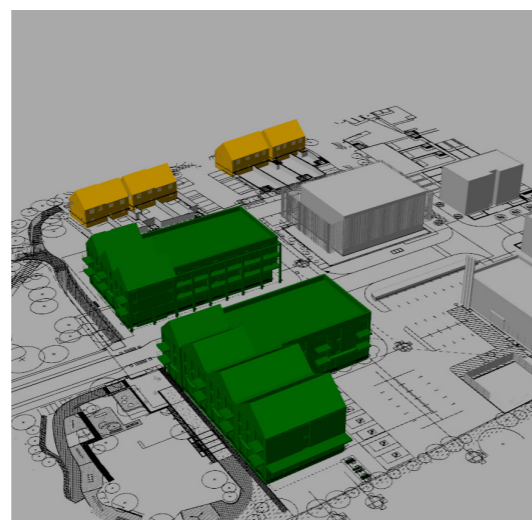


Figure 10 Proposed condition

## 8. Affect on neighbouring dwellings - Results.

The detailed numerical results for Vertical Sky Component (VSC), No Sky Line (NSL) Probable Sunlight Hours (PSH) and overshadowing of amenity areas during Equinox are given in Appendix E. The findings are summarised below.

### Baseline Condition

- All rooms achieve the recommended value of VSC (27%).
- All windows receive the recommended annual PSH (25%) and winter PSH (5%)
- All gardens receive 2 hours or more of sunlight for greater than 50% of the amenity area during Equinox.

### Proposed Condition.

- All rooms achieve the recommended value of VSC (27%). No rooms undergo a reduction of more than 20%
- Two of the 20 rooms assessed (bedroom 3 at plot 301 and bedroom 2 at plot 302) undergo a reduction of more than 20%, indicating a noticeable reduction in the depth of daylight penetration
- All windows receive the recommended APSH (25%).
- All windows encounter a reduction of 20% or more for winter sunlight hours (WPSH), suggesting that the change could be perceptible to current occupants. However, all windows still achieve the recommended 5%.
- All gardens receive 2 hours or more of sunlight for greater than 50% of the amenity area during Equinox.

Table 5 Affect on neighbouring dwellings: Results summary

Test	Total no. of rooms/ windows	No. of spaces/windows that meet BRE recommendations		
		Baseline	Proposed	No. of rooms/windows with reduction of more than 20%
VSC	20	20	20	0
NSL	20	18	15	2
APSH	8	8	8	0
WPSH	8	8	8	8
Overshadowing	8	8	8	0

## 9. Conclusion.

This first part of this report presents the results of a daylight and sunlight assessment of the residential units in the proposed Elmsbrook Local Centre, Bicester. The second half of this report looks at the potential impact the proposed development will have on neighbouring residential buildings. The daylight and sunlight criteria used in this assessment are based on BRE *Site Layout Planning for Daylight and Sunlight*, 2011 (BR209) and British Standard BS 8206-2 *Code of practice for daylighting*, 2008.

Table 6 gives a summary of the Average Daylight Factor (ADF), No Sky Line (NSL), Annual Probable Sunlight Hours (APSH) results for the proposed development. The result suggest that 64% of rooms within the proposed apartments in the North Building meet the recommended targets for Average Daylight Factor. The kitchen/living rooms in all except apartments 1 & 3 on each floor do not meet the ADF target of 2%. This is primarily due to overshadowing by the South Building, and the fact that kitchen/living rooms within several of the apartments are single aspect, which is an inherent feature of the plan layout. Apartments which are dual aspect but still do not comply (Apartments 6 & 7) could be improved by increasing the size of the small windows on the side of the building. Projecting balconies on both floors have the effect of reducing daylight levels within some apartments on Level 01. However, the value of external amenity space provided by balconies could be considered an overriding principle when balanced against daylight levels within the apartments.

The No Sky Line results suggest that the majority of apartments will enjoy a reasonable depth of daylight penetration within the rooms. The rooms that do not achieve recommended values for NSL are located in Apartments 3, 4 and 5 on Level 01 and 4 & 5 on Level 02. This suggests that the reduced depth of daylight penetration in these apartments is primarily due to the daylight obstruction of the South Building.

The Annual Probable Sunlight Hours analysis indicates that the majority of kitchen/living room windows within the development will receive a reasonable level of direct sunlight.

It is Hoare Lea's professional opinion that the proposed residential units have a reasonable level of compliance with the daylight and sunlight recommendations, but that daylight levels could be improved by the changes suggested above.

The second part of the study evaluated the impact of the proposed development upon plots 301-365 to the north of the site. Table 7 gives a summary of analysis results for Vertical Sky Component (VSC), No Sky Line (NSL), Annual Probable Sunlight Hours (APSH) and 2 hours of sunlight during equinox (overshadowing). The results show that all dwellings exceed the BRE recommendation both with and without the proposed development on site for VSC, APSH and overshadowing. Two rooms (bedroom 3 at plot 301 and bedroom 2 at plot 302) undergo a reduction in NSL of greater than 20%, indicating a noticeable reduction in daylight penetration within these rooms.

The results indicate that the impact on daylight and sunlight within existing residential units to the north of the site will be minimal, with two bedrooms undergoing a reduction in daylight penetration that could be noticeable by occupants. However the results indicate that the quantity of daylight and sunlight within the existing dwellings will remain above recommended levels with the proposed development in place. The results also indicate that the rear gardens will not be unduly overshadowed by the proposed development.

**Table 6 Elmsbrook residential units - Results summary**

Level	ADF compliance (%)	NSL compliance (%)	APSH compliance (%)	WPSH compliance (%)
01	57	81	71	100
02	71	90	100	100
<b>All</b>	<b>64</b>	<b>86</b>	<b>86</b>	<b>100</b>

**Table 7 Surrounding buildings - Results summary**

Test	Total no. of spaces/windows	No. of spaces/windows that meet BRE recommendations		
		Baseline	Proposed	No. of rooms/windows with reduction of more than 20%
VSC	20	20	20	0
NSL	20	18	15	2
APSH	8	8	8	0
WPSH	8	8	8	8
2 hour contour	8	8	8	0



## Appendix A.

### Relevant extracts from BR209 & BS8206-2.

## Appendix A.

Relevant extracts from BR209 and BS8206-2.

From BRE Site Layout Planning for Daylight and Sunlight, 2011 (BR209):

# APPENDIX C INTERIOR DAYLIGHTING RECOMMENDATIONS

C1 The British Standard *Code of practice for daylighting* (BS 8206-2)<sup>[C1]</sup> and the CIBSE *Lighting Guide LG 10 Daylighting and window design*<sup>[C2]</sup> contain advice and guidance on interior daylighting. The guidance contained in this publication (BR 209) is intended to be used with BS 8206-2 and LG 10. Both these publications refer to BR 209.

C2 For skylight BS 8206-2 and LG 10 put forward three main criteria, based on average daylight factor (ADF); room depth; and the position of the no sky line.

### Average daylight factor

C3 This is the average illuminance on the working plane in a room, divided by the illuminance on an unobstructed horizontal surface outdoors. The CIE standard overcast sky (see the Glossary) is used, and the ratio is usually expressed as a percentage.

C4 If a predominantly daylit appearance is required, then the ADF should be 5% or more if there is no supplementary electric lighting, or 2% or more if supplementary electric lighting is provided. There are additional recommendations for dwellings of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms. These additional recommendations are minimum values of ADF which should be attained even if a predominantly daylit appearance is not achievable.

### Position of the no sky line

C16 If a significant area of the working plane (normally more than 20%) lies beyond the no sky line (ie it receives no direct skylight) then the distribution of daylight in the room will look poor and supplementary electric lighting will be required. Appendix D gives guidance on how to plot the no sky line.

C17 Note that the criteria in C14, C15 and C16 need to be satisfied if the whole of a room is to look adequately daylit. Even if the amount of daylight in a room (given by the ADF) is sufficient, the overall daylit appearance will be impaired if its distribution is poor.

BS8206-2 Code of practice for daylighting, 2008:

## 5.6 Minimum values of average daylight factor in dwellings

Even if a predominantly daylit appearance is not achievable in a dwelling, it is recommended that the average daylight factor should be at least the relevant value as given in Table 2.

Table 2 Minimum average daylight factor

Room type	Minimum average daylight factor %
Bedrooms	1
Living rooms	1.5
Kitchens	2

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%.

## Appendix A.

Relevant extracts from BR209 and BS8206-2.

From BRE Site Layout Planning for Daylight and Sunlight, 2011 (BR209):

### Summary

3.3.17 It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March.

## Appendix B.

### Detailed Average Daylight Factor (ADF) results.

## Appendix B Detailed ADF results.

Tables B1 & B2 give the detailed Average Daylight Factor (ADF) results for each room.

Refer to Figure 2 for apartment naming convention.

**Table B1 ADF results - Level 01**

Level	Apartment	Room type	Target ADF (%)	Calculated ADF (%)	Compliant? Y/N
1	1	Bed 2	1	2.75	Y
1	1	Liv/Kit	2	2.09	Y
1	1	Bed 1	1	1.68	Y
1	2	Liv/Kit	2	1.20	N
1	2	Bed 1	1	1.35	Y
1	3	Bed 1	1	1.61	Y
1	3	Liv/Kit	2	2.59	Y
1	3	Bed 2	1	1.29	Y
1	4	Bed 1	1	0.41	N
1	4	Liv/Kit	2	0.76	N
1	5	Bed 1	1	0.39	N
1	5	Liv/Kit	2	0.66	N
1	6	Bed 2	1	0.43	N
1	6	Liv/Kit	2	1.36	N
1	6	Bed 1	1	1.72	Y
1	7	Bed 1	1	1.77	Y
1	7	Liv/Kit	2	1.71	N
1	7	Bed 2	1	1.39	Y
1	8	Liv/Kit	2	1.05	N
1	8	Bed 2	1	1.38	Y
1	8	Bed 1	1	1.80	Y
<b>Total no. of rooms</b>					<b>21</b>
<b>No. of compliant rooms</b>					<b>12</b>
<b>Total compliance for level 01 (%)</b>					<b>57</b>

**Table B2 ADF results - Level 02**

Level	Apartment	Room type	Target ADF (%)	Calculated ADF (%)	Compliant? Y/N
2	1	Bed 2	1	2.74	Y
2	1	Liv/Kit	2	3.09	Y
2	1	Bed 1	1	1.68	Y
2	2	Liv/Kit	2	2.22	Y
2	2	Bed 1	1	1.34	Y
2	3	Bed 1	1	1.59	Y
2	3	Liv/Kit	2	3.48	Y
2	3	Bed 2	1	1.32	Y
2	4	Bed 1	1	0.88	N
2	4	Liv/Kit	2	1.69	N
2	5	Bed 1	1	0.82	N
2	5	Liv/Kit	2	1.42	N
2	6	Bed 2	1	1.04	Y
2	6	Liv/Kit	2	1.86	N
2	6	Bed 1	1	1.81	Y
2	7	Bed 1	1	1.87	Y
2	7	Liv/Kit	2	2.35	Y
2	7	Bed 2	1	1.33	Y
2	8	Liv/Kit	2	1.86	N
2	8	Bed 2	1	1.30	Y
2	8	Bed 1	1	1.68	Y
<b>Total no. of rooms</b>					<b>21</b>
<b>No. of compliant rooms</b>					<b>15</b>
<b>Total compliance for level 02 (%)</b>					<b>71</b>

## Appendix C.

### Detailed No Sky Line (NSL) results.

## Appendix C Detailed NSL results.

Tables C1 & C2 give the detailed No Sky Line (NSL) results for each room.

Refer to Figure 2 for apartment naming convention.

**Table C1 NSL results - Level 01**

Level	Apartment	Room type	Target NSL (%)	Calculated NSL (%)	Compliant? Y/N
1	1	Bed 2	80	100.00	Y
1	1	Liv/Kit	80	99.65	Y
1	1	Bed 1	80	96.50	Y
1	2	Liv/Kit	80	99.38	Y
1	2	Bed 1	80	97.80	Y
1	3	Bed 1	80	97.92	Y
1	3	Liv/Kit	80	100.00	Y
1	3	Bed 2	80	78.85	N
1	4	Bed 1	80	66.67	N
1	4	Liv/Kit	80	60.86	N
1	5	Bed 1	80	84.62	Y
1	5	Liv/Kit	80	56.17	N
1	6	Bed 2	80	84.67	Y
1	6	Liv/Kit	80	93.33	Y
1	6	Bed 1	80	91.54	Y
1	7	Bed 1	80	91.67	Y
1	7	Liv/Kit	80	90.56	Y
1	7	Bed 2	80	94.00	Y
1	8	Liv/Kit	80	99.38	Y
1	8	Bed 2	80	94.44	Y
1	8	Bed 1	80	86.11	Y
<b>Total no. of rooms</b>					<b>21</b>
<b>No. of compliant rooms</b>					<b>17</b>
<b>Total compliance for level 01 (%)</b>					<b>81</b>

**Table C2 NSL results - Level 02**

Level	Apartment	Room type	Target ADF (%)	Calculated ADF (%)	Compliant? Y/N
2	1	Bed 2	80	100.00	Y
2	1	Liv/Kit	80	99.65	Y
2	1	Bed 1	80	96.50	Y
2	2	Liv/Kit	80	99.69	Y
2	2	Bed 1	80	97.80	Y
2	3	Bed 1	80	97.92	Y
2	3	Liv/Kit	80	100.00	Y
2	3	Bed 2	80	88.46	Y
2	4	Bed 1	80	86.54	Y
2	4	Liv/Kit	80	59.94	N
2	5	Bed 1	80	82.25	Y
2	5	Liv/Kit	80	53.03	N
2	6	Bed 2	80	80.67	Y
2	6	Liv/Kit	80	97.33	Y
2	6	Bed 1	80	89.23	Y
2	7	Bed 1	80	91.67	Y
2	7	Liv/Kit	80	97.22	Y
2	7	Bed 2	80	94.00	Y
2	8	Liv/Kit	80	100.00	Y
2	8	Bed 2	80	94.44	Y
2	8	Bed 1	80	88.89	Y
<b>Total no. of rooms</b>					<b>21</b>
<b>No. of compliant rooms</b>					<b>19</b>
<b>Total compliance for level 01 (%)</b>					<b>90</b>

## Appendix D.

### Detailed Annual Probable Sunlight Hours (APSH) results.



## Appendix D Detailed APSH results.

Tables D1 & D2 give the detailed Annual Probable Sunlight Hours (APSH) and Winter Probable Sunlight Hours (WPSH) results for each room.

Refer to Figure 2 for apartment naming convention.

**Table D1 APSH results - Level 01**

	Apartment	Room	Target APSH (%)	Calculated APSH (%)	Compliant? Y/N	Target WPSH (%)	Calculated WPSH (%)	Compliant? Y/N
1	1	Liv/Kit	25	36.67	Y	5	15.95	Y
1	2	Liv/Kit	25	37.30	Y	5	16.57	Y
1	3	Liv/Kit	25	35.45	Y	5	16.34	Y
1	4	Liv/Kit	25	18.78	N	5	14.34	Y
1	5	Liv/Kit	25	20.33	N	5	15.73	Y
1	6	Liv/Kit	25	37.84	Y	5	23.66	Y
1	7	Liv/Kit	25	38.55	Y	5	12.22	Y
<b>Total no. of rooms</b>					<b>7</b>			<b>7</b>
<b>No. of compliant rooms</b>					<b>5</b>			<b>7</b>
<b>Total compliance for level 01 (%)</b>					<b>71</b>			<b>100</b>

**Table D2 APSH results - Level 02**

	Apartment	Room	Target APSH (%)	Calculated APSH (%)	Compliant? Y/N	Target WPSH (%)	Calculated WPSH (%)	Compliant? Y/N
2	1	Liv/Kit	25	47.22	Y	5	17.39	Y
2	2	Liv/Kit	25	47.22	Y	5	17.39	Y
2	3	Liv/Kit	25	47.22	Y	5	17.39	Y
2	4	Liv/Kit	25	58.76	Y	5	27.43	Y
2	5	Liv/Kit	25	62.37	Y	5	29.30	Y
2	6	Liv/Kit	25	54.47	Y	5	28.90	Y
2	7	Liv/Kit	25	42.15	Y	5	14.52	Y
<b>Total no. of rooms</b>					<b>7</b>			<b>7</b>
<b>No. of compliant rooms</b>					<b>7</b>			<b>7</b>
<b>Total compliance for level 01 (%)</b>					<b>100</b>			<b>100</b>

## Appendix E.

### Detailed results - Plot 301 to 366.

**Appendix E Detailed daylight & sunlight results - Plot 301 & 366.**

**Table E1 No sky line (NSL) results - Plot 301 - 366**

Level	Plot	Room use	Target (%)	Baseline (%)	Proposed (%)	Change (%)
G	301	Living	80	90.63	82.19	-9.31
G	302	Living	80	91.63	81.63	-10.91
G	303	Living	80	93.62	83.69	-10.61
G	304	Living	80	90.63	81.44	-10.14
G	305	Living	80	91.36	80.86	-11.49
G	306	Living	80	88.65	85.60	-3.44
G	365	Living	80	90.50	86.60	-4.31
G	366	Living	80	89.63	88.54	-1.22
1	301	Bedroom 2	80	95.65	95.65	0.00
1	301	Bedroom 3	80	88.27	67.60	-23.42
1	302	Bedroom 2	80	86.35	66.50	-22.99
1	303	Bedroom 2	80	94.57	82.07	-13.22
1	303	Bedroom 3	80	88.65	80.15	-9.59
1	304	Bedroom 3	80	82.80	75.27	-9.09
1	304	Bedroom 2	80	86.6	80.63	-6.89
1	305	Bedroom 2	80	72.33	72.33	0.00
1	306	Bedroom 3	80	74.62	71.23	-4.54
1	306	Bedroom 2	80	93.17	93.17	0.00
1	365	Bedroom 2	80	95.67	95.67	0.00
1	366	Bedroom 2	80	94.12	94.12	0.00
<b>No. meeting target</b>				<b>18/20</b>	<b>15/20</b>	
<b>No. with reduction of more than 20%</b>						<b>2/20</b>

**Table E2 Vertical Sky Component (VSC) results - Plot 301 - 366**

Room	Plot	Room use	Target (%)	Baseline (%)	Proposed (%)	Change (%)
G	301	Living	27	37.94	31.78	-16.24
G	302	Living	27	37.42	31.05	-17.02
G	303	Living	27	37.25	31.56	-15.28
G	304	Living	27	36.56	32.23	-11.84
G	305	Living	27	35.15	33.33	-5.18
G	306	Living	27	34.63	33.23	-4.04
G	365	Living	27	34.66	33.57	-3.14
G	366	Living	27	35.26	34.45	-2.30
1	301	Bedroom 2	27	38.20	33.54	-12.20
1	301	Bedroom 3	27	37.93	33.28	-12.26
1	302	Bedroom 2	27	37.76	33.56	-11.12
1	303	Bedroom 2	27	37.09	34.16	-7.90
1	303	Bedroom 3	27	36.13	34.84	-3.57
1	304	Bedroom 3	27	35.81	34.93	-2.46
1	304	Bedroom 2	27	34.68	31.36	-9.57
1	305	Bedroom 2	27	36.23	32.54	-10.18
1	306	Bedroom 3	27	35.16	30.26	-13.94
1	306	Bedroom 2	27	34.00	30.63	-9.91
1	365	Bedroom 2	27	35.81	34.95	-2.40
1	366	Bedroom 2	27	35.88	35.22	-1.84
<b>No. meeting target</b>				<b>20/20</b>	<b>20/20</b>	
<b>No. with reduction of more than 20%</b>						<b>0/20</b>

**Table E3 Probable Sunlight Hours (PSH) results - Plot 301 - 366**

Level	Plot	Room use	Annual Probable Sunlight Hours (APSH)				Winter Probable Sunlight Hours (WPSH)			
			Target (%)	Baseline (%)	Proposed (%)	Change (%)	Target (%)	Baseline (%)	Proposed (%)	Change (%)
G	301	Living	25.0	76.24	65.02	-14.72	5	33.71	22.49	-33.29
G	302	Living	25.0	75.63	63.02	-16.67	5	33.09	20.48	-38.10
G	303	Living	25.0	76.35	64.82	-15.11	5	33.32	21.78	-34.63
G	304	Living	25.0	75.85	65.98	-13.02	5	32.82	22.94	-30.10
G	305	Living	25.0	74.76	68.46	-8.43	5	32.23	26.31	-18.36
G	306	Living	25.0	72.44	68.43	-5.53	5	30.13	26.24	-12.92
G	365	Living	25.0	72.76	69.53	-4.44	5	30.22	27.06	-10.47
G	366	Living	25.0	73.10	70.78	-3.18	5	30.56	26.24	-14.15
<b>No. meeting target</b>				<b>8/8</b>	<b>8/8</b>			<b>8/8</b>	<b>8/8</b>	
<b>No. with reduction of more than 20%</b>						<b>0/8</b>				<b>8/8</b>

**Table E4 2 hour sunlight contour line - Plot 301 - 366**

Plot	Target (%)	Baseline (%)	Proposed (%)	Change (%)
301	50	81	72	-11.02
302	50	79	77	-2.47
303	50	84	84	0.00
304	50	81	80	-0.86
305	50	88	88	0.00
306	50	86	86	0.00
365	50	89	89	0.00
366	50	75	75	0.00
<b>No. meeting target</b>		<b>8/8</b>	<b>8/8</b>	
<b>No. with reduction of more than 20%</b>				<b>0/8</b>



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