

16 Daylight, Sunlight, Overshadowing and Night Light

16.1 Introduction

The proposals involve the removal of all non-listed (protected) existing buildings on-site and the erection of three new buildings and refurbishment of those existing. The largest element of the new development will be a thirty storey tower situated on the west of the site. Illustrations of the scheme are presented in the Townscape and Visual Impact chapter of the ES and of course detailed design drawings are presented in the main planning application package and Design and Access Statement. These documents should be consulted for the definitive details of the scheme.

The site is presently occupied by low level buildings and an open car park and as such the adjacent low rise buildings have access to light that is facilitated by the semi-open nature of the site and are also unaffected by shading from the low level structures presently on the site. Furthermore, there is little in the way of nightlight from the site at present. All of these aspects could change if the development proceeds. This section of the ES therefore focuses on these three main aspects:

- Daylight & Sunlight;
- Overshadowing (Shading); and
- Night Light

In terms of their potential to impact neighbouring residential properties.

The development proposals that were put forward in 2009 (and subsequently approved) are similar to those presented in the 2015 development proposals and indeed Phase 1 (now under construction) is derived from those initial proposals. Delva Patman Associates were commissioned to prepare a detailed daylight, sunlight and shadowing study of the 2009 proposals to assess the likely impact of the proposed development on the neighbouring residential amenity adjacent to the site.

The study was carried out in accordance with the recommendations of the Building Research Establishment Report "Site Layout Planning for Daylight & Sunlight 1991" (BRE209) and BS 8206-2:2008 lighting for buildings Part 2. The findings of that study were subsequently assessed by an independent consultant (GVA Schatunowski Brooks) on behalf of BCC (in the light of a number of objections relating to neighbouring residents). It was concluded that in the context of an urban environment, although there was a diminishment in light to some



properties as a result of the development, it would not be uncharacteristic residual light levels for a city centre built environment.

The 2015 proposals, which are the subject of this application, although they differ in certain detailed respects are fundamentally similar in terms of mass, orientation, size, etc. Indeed the 2015 proposals are entirely within the envelope that was permitted in 2009. As such, the daylight, sunlight and shadowing assessments used for the 2009 scheme have been revisited for the current scheme as fundamentally the approach and environmental conditions have not changed since that time and the development proposals have not altered drastically in this regard (see comparative summary below). Consequently, the concept of a development comprising a tall tower and related multi-level buildings on this site does have the benefit of a previous detailed study sufficient for impact assessment purposes and a new full study has not been commissioned for this EIA (although the shading analysis has been updated). Notwithstanding this, the developer has stated that an audit will be undertaken of the daylight and sunlight issues by an independent rights to light specialist as an early stage in the imminent planning process.

Comparison of the 2009 and 2015 proposed developments

The physical differences between the modelled and consented 2009 scheme and proposed 2015 scheme are illustrated in a series of comparative diagrams overleaf. Of particular note with respect to the assessment of shading especially is the slight increase in height of the main tower and the increase in mass of the lower storeys of Building A (Building 2 on the 2015 scheme).

As can be seen from the comparative elevations on the following pages, the mass and form of the two schemes are broadly similar with there being a marginal increase in height (but slimming) of the main tower (by 3.6m) and a reduction in height of the second and third towers (again by a few metres) but these have also changed position slightly coming forward in the scheme. The main physical change is the slimming of the main tower and increase in mass of the lower storeys of Building 2 (compared to Building A on the original scheme). It is stressed again that in terms of the development envelope and development volume, the 2015 proposals are within the limits of the 2009 scheme.

In addition, the potential night light impact of the proposed development has been considered, based upon a lighting masterplan proposed by Hoare Lea. Whilst a formal night light assessment has not been undertaken, the implications of new sources of night light have been addressed for the purpose of this ES.



Environmental Statement

Beorma Quarter (Phase 2 & 3), Birmingham



Figure 16.1a: 2009 Digbeth High Street Elevation (with tower heights)



Figure 16.1b: 2015 Scheme Digbeth High Street Elevation (with tower heights)



Environmental Statement Beorma Quarter (Phase 2 & 3), Birmingham



Figure 16.2a: 2009 Scheme Well Lane Elevation



Figure 16.2b: 2015 Scheme Well Lane Elevation



Environmental Statement Beorma Quarter (Phase 2 & 3), Birmingham



Figure 16.3a: 2009 Scheme – Allison Street Elevation



Figure 16.3b: 2015 Scheme – Allison Street Elevation



16.2 Legislation and Policy Context

16.2.1 Daylight, Sunlight and Overshadowing

The study was undertaken in accordance with the recommendations of the Building Research Establishment report *"Site Layout Planning for Daylight & Sunlight 1991"*. The BRE Report is the standard specifically identified in the Birmingham City Council Unitary Development Plan by which daylight, sunlight and overshadowing should be assessed.

The BRE Report is intended for use in conjunction with interior daylighting recommendations in the British Standard BS 8206-2:2008 Lighting for Buildings – Part 2: Code of practice for daylighting and the Applications Manual: window design of the Chartered Institute of Building Services Engineers (CIBSE). If the BRE, BS and CIBSE guidance notes are followed there is the potential to achieve good daylighting in new buildings nearby, and to protect the daylighting of adjoining land for future development.

The BRE guide is intended for building designers and their clients, consultants and planning officials. The advice given is not mandatory and the report should not be seen as a part 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 the many factors in site layout design. In certain circumstances the developer or planning authority may wish to use alternative target values.

Whilst technical analysis can be carried out in accordance with numerical guidelines and reported factually by comparison with those guidelines, the final assessment as to whether affected dwellings are left with acceptable amounts of daylight and sunlight in an inner city context where the findings are to be interpreted in a flexible manner is a matter of subjective opinion. The diminishment of daylight needs to be balanced against for example improvements in lighting, pedestrian safety and other factors. Even though a scheme may have impacts in specific attributes the overall environmental impact may still be beneficial.

16.2.2 Night Light

Birmingham Plan

Paragraph 3.14G in the Birmingham Plan seeks to ensure the image of the "City at Night", and particularly that of the City Centre, has the highest quality in order that Birmingham can be seen as an attractive place after dark. BCC asserts that, at a basic level, well-designed lighting helps to improve pedestrian safety, road safety and legibility. BCC further states:



An approach combining high quality lighting of buildings, places and spaces, can enhance the quality of the environment and even change it to create a more exciting night-time character. However, the City Council wishes to limit light pollution by avoiding unnecessary up-lighting. The local planning authority will encourage developers to provide imaginative lighting that enhances the night-time appearance of the scheme and the amenity of the area. In appropriate circumstances these will be secured through the use of Section 106 agreements. This will be particularly important in the case of major projects in prominent locations.

Lighting Places (SPD - 2008)

Lighting Places was published as a draft Supplementary Planning Document in 2008 following recognition by BCC that there are increasing levels of activity in a 24 hour city that should be supported by a coordinated lighting strategy that complimented guidance for the built environment generally and the city centre and local centres in particular.

The introduction to the SPD states:

The city centre is made up of different areas with different uses, different architectural characteristics and qualities and different levels and types of activity at different times of the day and night. Each area needs to be considered on it merits and lighting requirements. Some areas will see no change either in the built environment or in the lighting provided. In other areas there will be considerable change and it is here that Lighting Places should have the most impact. Similarly local centres have their own character that lightning can help reinforce. Adopted policy and guidance on lighting for specific areas will encourage developers to provide imaginative lighting that helps define the character of the area, but also enhances the night-time appearance of the schemes.

Following from paragraph 3.14G of the Plan, which deals with the City at Night, the SPD identifies the aims of Lighting Places as enhancing the functional and aesthetic quality of lighting in all its forms in order to:

- Create an exciting and dynamic night-time city environment.
- Develop an iconic city skyline.
- Make public places safer.
- To give greater amenity value to public places.

The SPD then goes on to identify 13 specific policies covering all aspects of lighting including:

• The requirements for, and of, enhanced lighting schemes;



- The use of lighting to create local distinctiveness;
- Requirements for external lighting in new or refurbished buildings next to "address streets";
- Requirements for external lighting in new or refurbished buildings next to "access streets";
- General requirements for the lighting of new or refurbished buildings;
- Requirement of new lighting schemes to consider the aesthetic as well as the functional at an early stage of the design process; and
- Encouragement of developers and their architects to engage with artists and specialist designers early in the process to identify lighting opportunities and incorporate lighting equipment as an integral part of designs.

16.3 Assessment Methodology and Significance Criteria

The Daylight & Sunlight assessments have been undertaken by reference to the Building Research Establishment (BRE) guidelines "Site Layout Planning for Daylight & Sunlight - A Guide to Good Practice".

The BRE Report advises that daylight and sunlight levels should be assessed for the main habitable rooms of neighbouring residential properties. Habitable rooms in residential properties are defined as kitchens, living rooms and dining rooms. Bedrooms are less important as they are mainly occupied at night time.

The studies were undertaken by calculating the daylight based on waldram template drawings provided within the BRE guidelines. The study was undertaken with drawings derived from the 2009 scheme. These are:

- Oakwood Land Survey Dwg No's: DB/CS/MPse, DB/CSne, DB/CSee, DB/HM/Ee, DB/HN/Se, DB/MH/NEe, DB/MH/NWe, DB/VBe, DB/ASe, DB/BW/SEe, DB/BW/SWe, DB/CP/NWe, DB/CP/SEe, DB/CP/SWe, DB/HS/WLIs, DB/HSe, DB/PS/ASIs, DB/PSse/01, DB/PSwe/01, DB/SB/SEe, DB/STM/ENe &DB/STM/WSe
- Trevor Horne Architects 07125/PLA 003 021 & PLA 030 034 (relating to the 2009 tower)

However, shading has also been assessed in relation to the 2015 scheme by Broadway Malayan as part of their Design and Access Statement.



Daylight

The BRE Guide states that:

"If, for any part of the new development, the angle from the centre of the lowest affected window to the head of the new development is more than 25°, then a more detailed check is needed to find the loss of skylight to the existing buildings."

The BRE guidelines propose three main methods for calculating daylight.

The three main methods predominantly used are those involving the measurement of the total amount of skylight available (the vertical sky component (VSC)) and its distribution within the building (the Average Daylight Factor (ADF)) and (No Sky Line).

The VSC calculation is a general test of potential for daylight to a building, measuring the light available on the outside plane of windows. This assessment is generally considered too simplistic on its own to be used in tight urban environments such as this site. Nevertheless, the results obtained are used within the calculation of the ADF method.

The second recognised method of assessment for daylight is the Average Daylight Factor (ADF) calculation, which assesses the quality and distribution of light within a room served by a window and takes into account the VSC value, the size and number of the windows in a room and the use to which the room is put. ADF assesses actual light distribution within a defined room area whereas the VSC considers potential light. British Standard 8206, Code of Practice for Daylighting recommends ADF values of 1% in bedrooms, 1.5% in living rooms and 2% in kitchens. For other uses, where it is expected that supplementary electric lighting will be used throughout the daytime, such as in offices, the ADF value should be 2%. There is no general requirement within the BRE guidelines to assess ADF values, other than for neighbouring residential buildings.

The third method of assessment for daylight is the No-Sky Line assessment, which also assesses the distribution of light and divides those areas of the working plane which can receive direct skylight, from those which cannot. It provides an indication of how good the daylight distribution is within a room and is also part of the consideration of the VSC and ADF standards.

All three assessments have their own distinguishing features depending on the characteristics of the development site in question. The first method, the VSC assessment, is best suited for sites that are not within a tight urban context such as this. This is because the reduction values recommended by the BRE Report do not make allowance for the low level of the existing buildings in this situation. If the principles of the VSC assessment were used for this type of



site, then any new development will be restricted to no more than 20% additional massing of the former building. This is considered as unrealistic in this urban setting and for this reason concentration has been focused on the second and third methods of assessing daylight – ADF & No-Sky Line.

The No sky-line and, in particular, the ADF assessments are better suited to demonstrate the quality and distribution within a habitable room of a neighbouring dwelling.

Neighbouring residential properties likely to be affected by the development proposals have been included in the daylight assessment, notably:

- RTP Crisp Warehouse, Allison Street
- 4 Digbeth

Drawing 07340/LOC/801A, in *Appendix 16*, illustrates the residential properties tested against the 2009 scheme. The same properties are relevant for the 2015 proposed scheme.

Sunlight

The BRE have produced sunlight templates for London, Manchester and Edinburgh indicating the Annual Probable Sunlight Hours (APSH) for these regions. The London template has been selected for this study as Birmingham is central to London and Manchester in terms of latitude.

A sunlight analysis is undertaken by measuring annual probable sunlight hours (APSH) for the main windows of rooms which face within 900 of due south. The maximum number of annual probable sunlight hours for the London orientation is 1,486 hours. The BRE guidelines propose that the appropriate date for undertaking a sunlight assessment is on 21st March, being the spring equinox. Calculations of both summer and winter availability are made with the winter analysis covering the period from the 21st September to 21st March. For residential accommodation, the main requirement for sunlight is in living rooms and it is regarded as less important in bedrooms and kitchens.

Due to the orientation of the site not all neighbouring properties tested for daylight analysis qualify for sunlight analysis. Therefore, only one property was tested for sunlight adequacy:

• RTP Crisp Warehouse, Allison Street

The sunlight assessment has been undertaken using the APSH calculation method.



Shadowing

The BRE advises that for gardens and open spaces to appear to be adequately sunlit throughout the year, no more than 40% (two-fifths) and preferably no more than 25% (one quarter) of any such space should be prevented by buildings from receiving any sun at all on 21 March.

The site and adjacent properties have been assessed to demonstrate the shadow path around the 2015 proposed scheme for mid-summer, mid-winter and spring equinox, in accordance with the BRE recommendations.

Night Light

In accordance with the section on the City at Night and paragraph 3.14G of the Birmingham Plan and the Lighting Places SPD (2008), the applicants have appointed specialist lighting designers, Hoare Lea, to prepare imaginative proposals for the high quality lighting of the buildings, places and spaces created by the Beorma Quarter in order to reinforce the image of the City as an attractive place after dark. Initial lighting design ideas are discussed in the remainder of this chapter, and also in the main body of the text within the Design and Access Statement prepared by Broadway Malayan, as submitted with the planning application.

16.3.1 Significance Criteria

In describing the significance criteria as set out below, it should be noted that they have been developed to protect residential properties, which are the most sensitive receptors. The guidance given by BRE has been used as a basis for the criteria to assess the Development's potential impacts. The BRE guidance specifies:

"...In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre a higher degree of obstruction may be unavoidable..."

The report adds:

"...Different criteria may be used, based on the requirements for daylighting in an area viewed against other site layout constraints."

In consideration of the above, it is important to note that the site is located in an urban centre that, in parts, currently experiences daylight levels below the BRE recommendations. This is discussed within the 'Baseline Conditions' section of this report. Thus, in these instances the BRE guidance states that the:



"...guidelines should be applied sensibly and flexibly".

Under these circumstances, the less stringent, higher BRE target percentage loss values and significance criteria may be justifiable.

16.4 Baseline Conditions

16.4.1 Daylight, Sunlight & Shadowing

An analysis of the impact of the existing buildings (the baseline conditions) against which to compare any potential impact arising from the development has been undertaken based on drawing 07340/SPT/805 in *Appendix 16* (which is based on a 27 storey tower on this site – the revised proposals involve a 30 storey tower but it is only 3.6m taller than the 27 storey tower).

It is noted that the site is in close proximity to adjacent properties to the north of the site on Well Lane and to the South of the site on Digbeth.

The existing buildings are generally of low level not more than three storeys in height, that allow very good levels of natural light to reach all adjacent neighbouring buildings. Especially to that of Well Lane where currently there is a car park directly adjacent to the RTP Crisp warehouse.

An analysis of the existing daylight levels enjoyed by all relevant neighbouring properties has been undertaken in order to provide a baseline against which the impacts arising from the proposed development can be assessed. The detailed results of this analysis are presented in *Appendix 16*.

The BRE guidance is summarised in *Table 16.1* and this has been used as the basis for the criteria used in the assessment of daylight and sunlight impacts.

Table 16.1: BRE Daylight Guidance used in the Assessment

Issue	Criteria
Daylight	A window may be adversely affected if the vertical sky component (VSC) measured at the centre of the window is less than 27% and less than 0.8 times its former value.
	A room may be adversely affected if the No-Sky Line is less than 80% of the room area and is less than 0.8 times its former value.
	A room may be adversely affected if the average daylight factor (ADF) is less than 1% for a bedroom, 1.5% for a living room or 2% for a kitchen. For offices a minimum figure of 2% is required.



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SECTION 16: DAYLIGHT, OVERSHADOWING & NIGHT LIGHT

Issue	Criteria
Sunlight	A window may be adversely affected if a point at the centre of the window receives in the year less than 25% of the annual probable sunlight hours including at least 5% of the annual probable sunlight hours (APSH) during the winter months (21 September to 21 March) and less than 0.8 times its former sunlight hours during either period.
Overshadowing	The BRE advises that for gardens and open spaces to appear to be adequately sunlit throughout the year, no more than 40% (two-fifths) and preferably no more than 25% (one quarter) of any such space should be prevented by buildings from receiving any sun at all on 21 March (spring equinox).
	If as a result of any new development there is a reduction of more than 20% of the former values, then the loss of sunlight is likely to be noticeable. It follows that if some sun is received on 21 March, there will be sun over the summer months, however this may be reduced by the development proposals.

This BRE guidance has been used to generate significance criteria that have been used to assess the impact of the Development. For No-Sky Line and APSH criteria, they are:

- Windows experiencing less than 20% reduction represent negligible to minor beneficial impacts;
- Windows experiencing between 20 and 29.9% reduction represent minor adverse impacts;
- Windows experiencing between 30 and 39.9% reduction represent moderate adverse impacts; and
- Windows experiencing greater than 40% reduction represents substantial adverse impacts.

For ADF criteria, they are for example in Living Rooms:

- Greater than 1.5% represents minor beneficial impacts;
- 1.0 1.49% represents negligible to minor adverse impacts;
- 0.5 0.99% represents minor adverse to moderate adverse impacts; and
- Less than 0.49% represents substantial adverse impacts.

Criteria figures may differ depending on room use.



16.4.2 Night Light

The site is currently occupied by a number of properties with a variety of uses including residential flats, retail outlets, a public house, offices, disused former Cold Store (ice manufacture), disused public house, disused picture house, an unoccupied unit, disused lock up garage building and a pay and display car park (unsurfaced). The current uses of the site generate a limited amount of night light and less so as the site has become more moribund and premises have closed down or become vacant. The light intensity given off from the site and immediate surroundings is relatively subdued compared to the general dominance of light scatter from Birmingham city centre, which is a dominant light feature at night.

16.5 Assessment of Impacts and Mitigation Measures

Daylight – ADF Assessment

The results of the ADF analysis on the relevant overlooking rooms are presented in the *Tables 16.2* & *Table 16.3*. The full results of the daylight analysis are presented in *Appendix 16* in tabular form with a sample waldram diagram plot in *Appendix 16*.

Table 16.2: Number of Living Rooms Experiencing Negligible and Adverse Daylight Impacts asa Result of the Development (ADF Method)

Address	Total Number of Living Rooms & Dining Rooms Tested	Number of Rooms Experiencing Adverse Impacts				
		Greater than 1.5% represents negligible impacts	1.0 - 1.49% represents Minor adverse impacts	0.5 - 0.99% Represents moderate adverse impacts	Less than 0.49% represents substantial adverse impacts	
RTP Crisp	14	9	5	0	0	
4 Digbeth	3	3	0	0	0	
Total	17	12	5	0	0	

Table 16.2 indicates that of the 17 neighbouring living rooms and dining rooms assessed 12 will fully comply with the target values set by the BRE for Average Daylight Factor assessment, 5 will experience negligible to minor adverse impacts. This equates to 70% of the rooms tested fall within the guidelines set out in the BRE guide.

The overall impact of the proposed scheme is considered to have a **negligible to minor adverse impact** on surrounding amenity in daylight terms.



Address	TotalNumber of RooNumber ofGreater thanBed rooms1.0%Testedrepresentsnegligibleimpacts	Number of Rooms Experiencing Adverse Impacts				
		0.66 - 0.99% Represents minor adverse impacts	0.33 - 0.65% Represents moderate adverse impacts	Less than 0.33% represents substantial adverse impacts		
RTP Crisp	9	8	1	0	0	
4 Digbeth	0	0	0	0	0	
Total	9	8	1	0	0	

Table 16.3: Number of Bedrooms Experiencing Negligible and Adverse Daylight Impacts as aResult of the Development (ADF Method)

Table 16.3 indicates that of the 9 neighbouring bedrooms assessed 8 will fully comply with the target values set by the BRE for Average Daylight Factor assessment. This equates to 88% of the bedrooms tested are within the guidelines set out in the BRE Guide.

The overall impact for ADF to the neighbouring properties is considered to be **negligible to minor adverse impacts** when measured against the significance criteria.

Daylight – "No Sky" Line

The full results of the daylight analysis are presented in *Appendix 16* and in graphical and tabular form in *Appendix 16*. A summary of the results of the "No Sky" Line analysis on the relevant overlooking rooms are presented in the *Table 16.4* below.

Table 16.4: Number of Bedrooms Experiencing Negligible and Adverse Daylight Impacts as aResult of the Development ("No Sky" Line Method)

Address	Total Number of Bedrooms Tested	Number of Rooms Experiencing Adverse Impacts				
		Greater than 1.0% represents negligible impacts	0.66 – 0.99% represents minor adverse impacts	0.33 - 0.65% Represents moderate adverse impacts	Less than 0.33% represents substantial adverse impacts	
RTP Crisp	23	6	0	0	17	
4 Digbeth	3	0	0	0	3	



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Address	Total	Number of Rooms Experiencing Adverse Impacts				
	Number of Bedrooms Tested	Greater than 1.0% represents negligible impacts	0.66 – 0.99% represents minor adverse impacts	0.33 - 0.65% Represents moderate adverse impacts	Less than 0.33% represents substantial adverse impacts	
Total	26	6	0	0	20	

Table 16.4 indicates that of the 26 neighbouring habitable rooms assessed 6 will fully comply with the target values set by the BRE for the "No Sky" Line assessment and 20 will experience an adverse impact. This equates to 23% of the rooms tested fall within the guidelines set out in the BRE Guide.

The results for this particular assessment have no minimum standard in the guidelines where a room that currently has good light distribution; this standard can be failed even when the room is left with good levels of light following the development. This is not always a realistic standard in urban locations.

Sunlight – APSH

The results of the Annual Probable Sunlight Hours (APSH) analysis on the relevant overlooking windows are presented in the *Table 16.5*. The full results of the sunlight analysis are presented in *Appendix 16* in tabular form along with a sample sunlight template in *Appendix 16*.

Due to the orientation of the site not all of the elevations tested for daylight analysis qualify for sunlight analysis.

Table 16.5: Number of Windows Experiencing Negligible and Adverse Sunlight Impacts as aResult of the Development (APSH Method)

Address	Total Number of Windows Tested	Windows Meeting BRE Guidelines for APSH – Over 25%	Number of Rooms Experiencing Adverse Impacts			
			<20% Reduction (negligible impact)	20-29.9% Reduction (minor adverse impact)	30-39.9% reduction (moderate adverse impact	>40% reduction (substantial adverse impact)
RTP Crisp	14	3	0	0	0	11
Total	14	3	0	0	0	11



Table16.5 indicates that of the 14 windows assessed 11 will exceed BRE target values for APSH as a result of the proposed development, and 3 will comply with BRE target values.

The results for the sunlight assessment demonstrate that RTP Crisp warehouse currently receives excellent levels of existing sunlight due to the low level of the existing Beorma site. This would be impacted by the development proposals and could only be mitigated if the proposed development was restricted in height which would not be practical or viable.

Shadowing

Whilst the impacts identified for the daylight and sunlight assessment were felt likely to be of a similar scale and magnitude for the 2009 assessed and 2015 proposed schemes, the increase in main tower height may have affected the shading analysis and so a revised overshadowing analysis was provided based on the 2015 scheme.



Figure 16.4: Shading Analysis – Mid Summer

The solar azimuth is at its highest point in Mid-Summer, facilitating longer hours of daylight and subsequently, greater sun penetration to the Beorma site. As a result the phase two tower shades St. Martin's church and Selfridges to the North West across Park Street from early morning. In addition to this phase three, to the east of the Beorma Quarter, shades



Orwell place completely and provides partial shading to Well Lane. As the sun moves in to the afternoon, the north east of the site becomes shaded completely and Allison Street partially to the east. Phase two also begins to shade Park Street, however this is limited until 18:00 hours. The terraces to phase two enjoy significant solar gain due to their elevated position, with some passive shading facilitated by an extended parapet to the perimeter. Finally, early evening sees a site wide reduction in natural light with no direct overshadowing from either phase two or three of the Beorma Quarter.



Figure 16.5: Shading Analysis - Equinox

At each equinox the Beorma Quarter begins to receive higher levels of light, albeit in the early part of the day, as the solar azimuth increases. More specifically the phase two tower shades the façade of Selfridges until 09:00 with phase three partially shading Orwell Place throughout the day. Early to mid-afternoon sees the shadowing effects of phases two and three moving clockwise across Well Lane and Allison Street. As early evening approaches, the eastern side of the development is in complete shade with only part of Park Street left naturally illuminated around the junction of St Martins church and Selfridges. The external terraces to phase two receive unobstructed daylight from approximately 09:00 to 18:00 hours due to their elevated position.



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Figure 16.6: Shading Analysis – Mid Winter

The Beorma development and surrounding context, as a general rule, receives a limited amount of sunlight due to the low solar azimuth at this time of year. Both Orwell and St. Martin's Place are predominantly shaded as a result. As the sun rises and moves toward midday, the phase two tower provides significant shading to Park Street to the north and the adjacent car park for much of the day. Conversely, the facade of Selfridges and St. Martin's church receive direct sunlight for a portion of the day from approximately 10:00 to 13:00 hours. The elevated terraced areas to the phase two tower enjoy a level of sun penetration however due to the low solar azimuth and shorter days this period is condensed between midday and 15:00 hours

The assessment of the amenity within the development demonstrates that although the scheme creates a small area of permanent shadow on the March 21 spring equinox, the results will fully comply with the minimum recommendations of the BRE guide and is therefore considered acceptable in shadowing terms.

Night Light

Due to the nature and scale of the proposed development, there will be an increase in night light generated at the site which could affect neighbouring buildings and residential properties



within the proposed scheme itself and the surrounding area. The detailed lighting design is not yet available. A detailed scheme will be presented and agreed with the Local Authority by means of a planning condition. The opportunity to mitigate out potential impacts will exist at that time.

In principle, the lighting scheme will aim to avoid unnecessary light pollution, primarily through intelligent specification and the location of lighting equipment. The use of flat-glass, full cut-off luminaries and accessories such as cowls, louvres and baffles will accurately control where light falls and will largely eliminate unwanted light. The intensities of all light sources on the project will be kept as low as is practical whilst still meeting the technical and aesthetic requirements of the design. Whilst there will inevitably be some light emanating from the interiors of generously glazed buildings, the lighting of the Beorma Quarter should generate no direct light trespass from exterior luminaires. Similarly upward spill-light will be minimised, so as not to contribute to sky-glow pollution. Finally, a sensible strategy for control will ensure that lighting is turned down to a minimal safe and secure state at a suitable "curfew" time, to be agreed with the Local Authority. Feature-lighting elements and building façade lighting can be switched-off completely at an agreed time, depending on the functions of the building's tenants. There may therefore be three sets of lighting conditions; dusk until "closing time", "closing time until late" and "late until dawn".

It may be desirable to illuminate the building façades in order to enhance the architecture and create site definition from a distance. If this is the case then it is suggested that certain architectural elements are illuminated, as opposed to a blanket floodlighting of the buildings. This approach should ensure that the illumination is subtle and prevents large amounts of light pollution to the local environment. Care will also be taken to ensure that the chosen methods of illumination do not impact on the apartments themselves and light spill should be well considered.

The proposed redevelopment of the site together with the new lighting installation will help enhance and improve the quality of the site, whilst providing a safe environment, in-line with current guidance and codes of practice.

There are no night light implications for the construction phase as significant night time floodlit working is not anticipated so other than security lighting to as similar level as occurs at present there will be no night time light sources.

The impact of night light upon the surrounding human receptors is considered to be insignificant compared to the general light scatter from the City centre. The impact of night light upon the surrounding ecological receptors is similarly considered to be insignificant.



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BS5489-1:2013 Category CE2 Requirements: 20 lux average, 0.4 uniformity

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Preliminary lighting layouts of pedestrian areas and main elevation facades lighting zones are presented in Figure 16.7 and Figure 16.8 below.



Figure 16.7 Proposed Lighting Of Pedestrian and Vehicular Routes

855489-1:2013 Category SI Requirements: 15 lux average, 5 lux minimum SI



Figure 16.8: Proposed Façade Lighting Zones



16.6 Summary

The site is situated in Digbeth, Birmingham, which is an inner city urban area and is in close proximity to the adjacent properties. The existing buildings are generally of low level that varies in height with a cleared car park directly outside the RTP Crisp warehouse, which currently allows very good levels of natural light into the adjacent buildings for an urban centre such as this.

The Birmingham Unitary Development Plan adopts the BRE Site Layout Planning for Daylight & Sunlight 1991, a guide to good practice daylight & sunlight as the standard to cover the protection of residential amenity under which daylight & sunlight can be considered.

To assess the developments' potential impact on daylight and sunlight on neighbouring properties a baseline assessment was undertaken. The main methods of assessment included the Average Daylight Factor (ADF) and the No-Sky Line assessment for daylight analysis using the measured survey data to form the calculation along with the waldram diagram template. The Annual Probable Sunlight Hours (ASPH) using the sunlight template drawings provided by the Building Research Establishment was also used.

All neighbouring residential properties adjacent to the development site that are likely to be affected have been considered in this assessment.

The ADF analysis indicated that 76% of the neighbouring rooms tested will meet the minimum BRE guidelines as a result of the development proposals, with a small number of rooms just falling below the standard of the BRE guidelines.

Generally the scheme is considered to have a negligible to minor adverse impact when measured against the significance criteria of the three methods of daylight assessment undertaken.

The APSH sunlight analysis indicates that the scheme will generally have an adverse impact for main living rooms within RTP Crisp warehouse. This is more as a result of the very low level existing buildings rather than as a result of excessive bulk and massing being proposed.

The overshadowing analysis indicates that the scheme will comply with the minimum criteria outlined in the BRE guidelines.

Overall, the analysis undertaken demonstrates that given the approach recommended by the BRE guidelines, the impact of the proposed development will generally create a predominately negligible impact on the residential amenity adjacent to the development site and is



considered to be acceptable in daylight & sunlight standards on the surrounding properties considering this built up urban location.

Whilst a detailed lighting design is not yet available, the scheme will aim to avoid unnecessary light pollution, primarily through intelligent specification and the location of lighting equipment. The intensities of all light sources will be kept as low as is practical whilst still meeting the technical, aesthetic and safety requirements of the design. A sensible strategy for control will ensure that lighting is turned down to a minimal safe and secure state at a suitable "curfew" time, with feature-lighting elements and building façade lighting being switched-off at an agreed time, depending on the functions of the building's tenants. A detailed scheme will be presented and agreed with the Local Authority by means of a planning condition. The opportunity to mitigate out potential impacts will exist at that time.

The proposed redevelopment of the site together with the new lighting installation will help enhance and improve the quality of the site, whilst providing a safe environment, in-line with current guidance and codes of practice.

The impact of night light upon the surrounding human receptors is considered to be insignificant compared to the general light scatter from the City centre. The impact of night light upon the surrounding ecological receptors is similarly considered to be insignificant.

There are no night light implications for the construction phase as significant nightime floodlit working is not anticipated so other than security lighting to as similar level as occurs at present there will be no night time light sources.

Based upon the appraisal of daylight, overshadowing & night light impacts discussed above, the residual impacts associated with the **Construction Phase** are deemed to be of **LOW** significance and short-term and temporary in nature. The residual impacts associated with the **Operational Phase** are deemed to be of **LOW** significance and long-term or permanent in nature.