



## **EXTERIOR LIGHTING DESIGN AND LIGHTING IMPACT ASSESSMENT**

On Behalf Of

**POTTERS-BALLOTINI LTD**

for

**STAIRFOOT GLASSWORKS**

**REPORT DATE: 27TH MARCH 2024**

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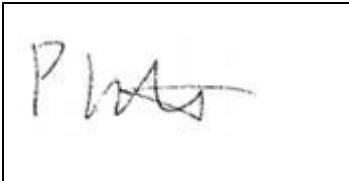
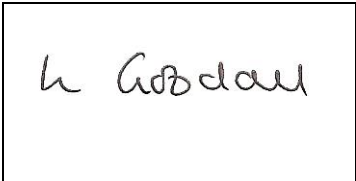
Summary

This exterior lighting report has been prepared to accompany a planning application for industrial development at the Stairfoot Glassworks. A scheme for external lighting within the development has been designed and an assessment of the potential impact of the proposed lighting on surrounding sensitive receptors has been undertaken.

Lighting requirements for the development include car parking areas, heavy-duty vehicle movement routes, the weighbridge, exterior material bays and the working areas surrounding a further processing screening plant.

The lighting design has been prepared to meet the relevant requirements of British Standards Institution guidance and to reduce adverse artificial lighting effects on surrounding existing receptors. Various best practice and design mitigation measures have been included during the design process to control light and reduce levels of light spill to meet the Institution of Lighting Professionals guidance recommendations.

The site is near residential dwellings to the east and borders woodland to the north, east and south east, which is a potential habitat for bats. The assessment demonstrates that an appropriate lighting design for the intended uses, meeting relevant British Standard requirements, can be achieved without adverse impact on surrounding sensitive receptors with appropriate mitigation controls. There is, therefore, no reason for this application to be refused on the grounds of lighting.

|             |                                                                                     |             |                                                                                       |
|-------------|-------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------|
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| Version | Date                          | Change                                       | Initials |
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|         |                               |                                              |          |
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# 1 Introduction

- 1.1 Miller Goodall Ltd has been instructed to prepare an exterior lighting design and associated lighting impact assessment to accompany a planning application for industrial development at the Stairfoot Glassworks. The site lies within the administrative boundary of Barnsley Metropolitan Borough Council (BMBC).
- 1.2 The exterior lighting design has been prepared to meet the relevant lighting standards set in British Standard Guidance. The design is supported by drawings, contour plots, impact assessment and the design process rationale.
- 1.3 A lighting impact assessment of the design has been undertaken to assess the potential obtrusive lighting impacts associated with the lighting design to sensitive human and ecological receptors during the operational phase, in accordance with relevant Institution of Lighting Professionals Guidance.

# 2 Site Description

- 2.1 The site previously operated as the Stairfoot Brickworks, however, all structures have now been demolished and the site is vacant. The site is located on the south eastern outskirts of Barnsley town centre.
- 2.2 Woodland encircles the site to the north, east, south east and south. Beyond the woodland to the north lies open land, with land features associated with historic industrial heritage. Existing residential dwellings at Clae Cott Lane are located to the east, beyond the woodland. A terrace of existing residential dwellings borders the site to the south east. The A633 borders the site to the south, with commercial uses located beyond.

# 3 Proposed Development

- 3.1 The proposed development is for an end of life waste glass recycling and repurposing facility known as Stairfoot Glassworks. Infrastructure at the site includes an office block with car parking, a weighbridge and gatehouse, exterior material storage bays, a lorry park, an exterior processing area for further screening and a main building with a workshop.

## 4 Relevant Guidance

### 4.1 National Planning Policy Framework

4.1.1 Paragraph 191 of the National Planning Policy Framework<sup>1</sup> states:

*"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: [...] c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."*

### 4.2 Planning Practice Guidance

4.2.1 Planning Practice Guidance (PPG) includes guidance on light pollution<sup>2</sup>. The PPG discusses when and where lighting is needed and important matters to consider in the design, such as dark sky areas and avoiding light pollution. The guidance states *'it is important to get the right light, in the right place and for it to be used at the right time'*, the 'three-R's' phrase is often observed in the lighting industry for good design practices.

4.2.2 The PPG is organised by a series of questions and answers, in addition to open-ended questions that encourage the developer and lighting designer to contemplate the design. The PPG continues by outlining good practice such as limiting upward light spill and selecting appropriate luminaire for the task.

### 4.3 British Standard & Lighting Standard Selection

4.3.1 The British Standard Institution (BSI) has issued British Standard (BS) documentation for lighting. Several BS documents provide luminance and illuminance levels for a variety of situations and scenarios in relation to lighting needs and use.

4.3.2 The BS documents provide a general 'guide-to' for all aspects of lighting, such as best practice, lighting standards and other aspects, but not inclusive, such as risk assessments, colour temperature, glare control and design of lighting installations.

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<sup>1</sup> Ministry of Housing, Communities & Local Government, 2023. National Planning Policy Framework.

<sup>2</sup> Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government, 2019. Planning Practice Guidance, Light Pollution.

**4.3.3** BS 12464-2:2014 Lighting of Outdoor Workplaces is of relevance to this assessment. The relevant lighting requirements required for this development are listed in Table 5.1 'general requirements', Table 5.7 'industrial sites and storage areas' and Table 5.9 'parking areas' of the BS 12464-2:2014 guidance<sup>3</sup>. Conflict areas and relevant lighting levels are also defined for the main entrance and weighbridge, taken from BS 5489-1:2020 <sup>[4]</sup> and BS 13201-2:2015 <sup>[5]</sup>. The lighting standards used in the design are provided in Section 5.

## 4.4 Institution of Lighting Professionals

### *Guidance Note 1, The Reduction of Obtrusive Light*

**4.4.1** The Institution of Lighting Professionals (ILP) GNI <sup>[6]</sup> provides methodologies to reduce the adverse effects of artificial light. The document identifies best practice installation and designs to limit the environmental effects of poor lighting that may lead to adverse levels of light spill, sky glow and glare to surrounding sensitive uses.

**4.4.2** Different environments may be more tolerant of light than others. The ILP has created a series of Environmental Zone (EZ) definitions that comprise limits for pre- and post-curfew<sup>7</sup>. The EZ and illuminance (lux) levels for intrusion into windows (such as dwellings) are provided in **Table 1**.

**Table 1: Environmental Zones**

| Environmental Zone & Definition                                                             | Light Intrusion (into windows) Ev (lux) |             |
|---------------------------------------------------------------------------------------------|-----------------------------------------|-------------|
|                                                                                             | Pre-curfew                              | Post-curfew |
| E0: Dark sky parks, UNESCO Starlight Reserves                                               | 0                                       | 0           |
| E1: Intrinsically dark landscapes. Examples: National Parks, Areas of Outstanding Beauty    | 2                                       | (1*)        |
| E2: Low district brightness. Examples: rural, small village, relatively dark urban location | 5                                       | 1           |
| E3: Medium district brightness. Examples: small town centres or urban locations             | 10                                      | 2           |

<sup>3</sup> British Standards Institution, 2021. BS EN 12464-2:2014 Light and Lighting – Lighting of Work Places, Part 2: Outdoor Work Places

<sup>4</sup> British Standards Institution, 2020. BS EN 5489-1:2020 Design of Road Lighting

<sup>5</sup> British Standards Institution, 2015. BS EN 13201-2:2015 Performance Requirements

<sup>6</sup> Institution of Lighting Professionals, 2021. Guidance Note 01 The Reduction of Obtrusive Light.

<sup>7</sup> There is no set curfew period for light. 23:00 to 07:00 is often taken to be curfew, which corresponds to other environmental disciplines such as acoustics, and sleeping patterns of humans. The curfew period may be stricter in locations of darker sky, for instance, and should be considered on a site-by-site basis.

| Environmental Zone & Definition                                                                                                                                                                     | Light Intrusion (into windows) Ev (lux) |             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------|
|                                                                                                                                                                                                     | Pre-curfew                              | Post-curfew |
| E4: High district brightness areas. Examples: town/city centres with high night-time activity levels                                                                                                | 25                                      | 5           |
| Ev: Vertical illuminance in lux                                                                                                                                                                     |                                         |             |
| *Permitted only from public road light installation                                                                                                                                                 |                                         |             |
| The EZ table also includes levels for sky glow, luminaire intensity (luminance) and building luminance. Sky glow, luminance and glare can be controlled through the luminaire selection and design. |                                         |             |
| Example levels of lux include: daytime (50,000), overcast sky (5,000), office & task (500), street lighting (5 to 20), full moon (0.25 to <1)                                                       |                                         |             |

*Professional Lighting Guide 4, Guidance on Undertaking Environmental Lighting Impact Assessments*

- 4.4.3 ILP Professional Lighting Guide (PLG) 04 <sup>[8]</sup> is the industry standard document outlining the approach, content recommendations and general advice and mitigation for completing lighting impact assessments in the UK. The aim of the guidance is to outline best practice measures in lighting design and provide practical guidance on the production and assessment of lighting impacts within new developments.
- 4.4.4 A key requirement of the guidance is that obtrusive light impact assessment must be modelled using a maintenance factor of 1.0 in the design and results. This ensures the scheme is assessed to the full lumen output at installation, representing worst-case exposure to sensitive receptors for the lifespan of the development, rather than at the maintained minimum design lumen output which degrades over the luminaire lifespan.

*Guidance Note 8, Bats and Artificial Lighting in the UK*

- 4.4.5 A preliminary ecological appraisal has identified that the woodland encircling the site is likely to be a feasible habitat for bats. Specific bat surveys have not yet been undertaken due to seasonal surveying. For the purposes of this assessment, it is assumed the woodland is sensitive and an appropriate design has been prepared to reduce light spill as much as practicable and inclusion of mitigation.

<sup>8</sup> Institution of Lighting Professionals, 2013. Professional Lighting Guide 4, Guidance on Undertaking Environmental Lighting Impact Assessments.

- 4.4.6 ILP Guidance Note (GN)8<sup>[9]</sup> is the only comprehensive guidance document available for assessing the potential impact on bats from artificial lighting. The guidance is clear that whilst it is the lighting designer's role to demonstrate lighting designs and minimise potential impact, the actual impact and significance to the bats should be dealt with by the professionally qualified ecologist.
- 4.4.7 A keynote of the guidance alludes to prevention, followed by mitigation. For example, does the area need lighting, and if so, how is it mitigated? There are no specific lux level thresholds for impact on bats and it is recognised that the impact to various bat species differs. Bats are particularly impacted by a light source wavelength, with the 'blue' waves being the most impacting. Colour temperatures of 2700 K or 3000 K are recommended.
- 4.4.8 The guidance states that vertical grids should be assessed above ground level, as bats would not reside at ground level. Therefore, vertical grids commence from 1 m above ground level, per industry best practice. The 2023 update of the guidance provides additional information on lux levels:

*"It is acknowledged that, especially for vertical calculation planes, very low levels of light (<0.5 lux) may occur even at considerable distances from the source if there is little intervening attenuation. It is therefore very difficult to demonstrate 'complete darkness' or a 'complete absence of illumination' on vertical planes where some form of lighting is proposed on site, despite efforts to reduce them as far as possible and where horizontal plane illuminance levels are zero.*

*Consequently, where 'complete darkness' on a feature or buffer is required, it may be appropriate to consider this to be where illuminance is at or below 0.2 lux on the horizontal plane, and at or below 0.4 lux on the vertical plane. These figures are still lower than what may be expected on a moonlit night and are in line with research findings for the illuminance found at hedgerows used by lesser horseshoe bats, a species well known for its light adverse behaviour<sup>10</sup>."*

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<sup>9</sup> Institution of Lighting Professionals, 2023. Guidance Note 8, Bats and Artificial Lighting in the UK

<sup>10</sup> Stone, E.L., Jones, G., Harris, S. (2012). *Conserving energy at a cost to biodiversity? Impacts of LED lighting on bats*. Glob. Change Biol. 18, 2458–2465

## 5 Methodology

### 5.1 Model and Assessment Methodology

- 5.1.1 The exterior lighting design has been modelled and prepared using the lighting software Lighting Reality (v 2.2.0). The Reality Outdoor package of the software has been used it is suited for area design. The lighting design is for the development contained in the red line boundary only.
- 5.1.2 The lighting design incorporates best practice design and mitigation, including the selection of appropriate luminaires and optics, heights and placement positions. Measures to reduce obtrusive light are inherent to the design, meeting the requirements of ILP GN1 <sup>[6]</sup>.
- 5.1.3 The design has been prepared using relevant maintenance factors to ensure maintained illuminance over the installation lifespan is maintained. The impact assessment is then assessed against a maintenance factor of 1.0, per the requirements of the ILP PLG4 Guidance<sup>8</sup>.
- 5.1.4 The potential effects on surrounding human and ecologically sensitive receptors have been assessed by preparing a series of horizontal and vertical illuminance plots.
- 5.1.5 Glare is reduced by the selection of appropriate products meeting G-class ratings. The contributions to skyglow are eliminated by selecting products that have full cut off and no upward light contribution. The selection of products has inherently reduced the adverse effects of glare and skyglow.

### 5.2 Environmental Zone

- 5.2.1 The site is located in an urban location and is concluded to reside in EZ E3 '*Medium district brightness. Examples: small town centres or urban locations*'.

### 5.3 Lighting Requirements

- 5.3.1 The lighting requirements of the development meet the relevant task requirements of BS12464-2 <sup>[3]</sup>. The lighting limits for the different operations at the site are presented in **Table 2**.

Table 2: Relevant Lighting Requirements for this Assessment

| Type of Area, task or activity                                                                                                                                                              | Maintained<br>Illuminance<br>( $\bar{E}_m, lx$ ) | Min<br>Illuminance<br>Uniformity ( $U_o$ ) | Min colour<br>rendering<br>index ( $R_a$ ) | Application                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------|--------------------------------------------|-------------------------------------------------------------|
| Conflict Class C4<br>(BS5489/13201)                                                                                                                                                         | 10                                               | 0.40                                       | -                                          | Conflict; Main<br>Entrance/Weighbridge                      |
| Short term handling of<br>material, loading/unloading<br>of bulk goods (BS12464)                                                                                                            | 20                                               | 0.25                                       | 20                                         | Main Area, Screening Plant<br>and Exterior Bays, Lorry Park |
| Light Traffic Parking<br>(BS12464)                                                                                                                                                          | 5                                                | 0.25                                       | 20                                         | Office Car Park                                             |
| The development has been designed for 0.40% uniformity, exceeding the minimum BS standards. C4 is also<br>representative and similar to 'traffic areas for slow moving vehicles' of BS12464 |                                                  |                                            |                                            |                                                             |

5.4 Sensitive Receptors

- 5.4.1 Sensitive receptors (ESR) considered in this assessment are shown in **Table 3** and **Figure 1**. A row of terrace residential dwellings border the site to the south east, bordering Wombwell Lane. These dwellings are adjacent to the red line boundary, however, they are approximately 40 m from the nearest lit task area (the car park servicing the offices).
- 5.4.2 The residential dwellings at Clae Cott Lane are located up to 130 m from a lit task area. Therefore, these sensitive receptors have been screened out, due to distance.
- 5.4.3 Woodland encircles the development site and may be a possible habitat for bats.

Table 3: Sensitive Receptors

| Receptor & Location                           | Coordinates |        | Type    |
|-----------------------------------------------|-------------|--------|---------|
|                                               | X           | Y      |         |
| ESR – Residential (Adjacent to Wombwell Lane) | 437962      | 404844 | Human   |
| Woodland                                      | -           | -      | Ecology |

| Receptor & Location | Coordinates |   | Type |
|---------------------|-------------|---|------|
|                     | X           | Y |      |

Figure 1: Sensitive Receptor Positions



5.5 Model Limitations

- 5.5.1 The lighting model does not take into account intervening vegetation, buildings or obstructions. Obstruction to light spill is, therefore, not accounted for in the model outputs.
- 5.5.2 The proposed office building will block the line of sight between the terrace of residential dwellings and much of the development site. The surrounding woodland will also limit light spill beyond the area.
- 5.5.3 The model is prepared on the assumption of flat ground. There are no significant topographic changes within the specific task lighting areas.

## 6 Baseline Assessment

### 6.1 Environment and Existing Light

6.1.1 The proposed development site is located towards the outskirts of Barnsley, however, the local area can be described as being urban. A commercial retail park is located to the south of the site, in addition to various residential estates to the north and east.

6.1.2 Existing light in the local environment includes:

- street lighting at the A633 (Wombwell Lane). and Clae Cott Lane;
- floodlighting at the retail estate, located to the east of the terraced dwellings; and
- extensive and high mast lighting at the retail park to the south of the site. The columns in parts of the southern retail park appear to be up to 10 m high, including the use of 360° optics.

6.1.3 The northern boundary is unlit and is composed of made ground associated with historic industrial use. A residential estate exists approximately 250 m to the north of the site, which is lit by street lights. The woodland surrounding the site has been identified as being a potentially suitable habitat for bats.

6.1.4 There are no power lines, structures or obstructions passing through the development site. Subsurface infrastructure would be reviewed during appropriate post-development assessments before installation or construction commenced.

## 7 Proposed Lighting Design

### 7.1 Equipment and Design Detail

7.1.1 The equipment used in the lighting design is from the manufacturer Phillips. The products used are from the Luma Gen2 range (Optics: DW50, DW50 Block Light). Product imagery and the practical details of the luminaires used in the design are provided in **Appendix A**.

7.1.2 The specifications of the products are:

- 4000 Kelvin (K) colour temperature (#740 neutral white);
- Glare ratings – G2, G3 and G6;
- ingress protection, IP66;
- impact protection rating, IK10; and
- colour rendering index 70.

- 7.1.3    The luminaires are positioned at 6 m (office car park), 8 m (service area, perimeter) and 12 m (processing areas, main area). The luminaires comprise columns and luminaires fixed to façade (at the processing building).
- 7.1.4    A colour temperature of 4000 K has been specified for the site due to the intended industrial task requirements providing a clearer white for the intended tasks and safety. It is recognised that 3000 K is more suited for ecological wildlife. Lighting will be switched off overnight therefore, any significant adverse effects from colour temperature will be removed.
- 7.1.5    Most luminaires have no tilt angle applied. A minor 5° tilt is applied to some luminaires around the processing area, to maximise uniformity and reduce backspill.
- 7.1.6    The equipment inventory is provided in **Table 4**.

Table 4: Equipment Inventory

| Product    | Type & Optic | Lumen Output (flux klm) | Wattage (W) | Quantity |
|------------|--------------|-------------------------|-------------|----------|
| Luma Gen 2 | DW50         | 7.50                    | 41          | 7        |
| Luma Gen 2 | DW50         | 2.00                    | 12          | 5        |
| Luma Gen 2 | DW50 BL1     | 36.00                   | 196         | 7        |
| Luma Gen 2 | DW50         | 36.00                   | 196         | 9        |

7.2    Glare and Skyglow

- 7.2.1    To reduce the potential for glare and obtrusive light, the ILP<sup>6</sup> recommends luminaires not exceed a 70° tilt from the horizontal. This has been ensured in the design. The products achieve various ‘good’ glare rating classes.
- 7.2.2    All luminaires include full light cut off above the 90° horizontal and, therefore, have no skyglow contributions.

## 7.3 Wattage

- 7.3.1 In comparison to the equipment inventory in **Table 4**, the total power requirement of the design is 3,483 watts (3.5 kW). This assumes full operation at installation. No revisions are made for switch-off or dimming.

## 7.4 Maintenance Factor

- 7.4.1 During the lifespan of a luminaire, lumen output will naturally degrade and experience loss of light. This effect is accounted for in the design by applying a maintenance factor (MF). Whilst this ensures that any degradation is accounted for and maintains lighting levels at the desired lighting level, an adverse countereffect is lighting levels at the commencement may be higher, before any degradation has occurred.
- 7.4.2 For lighting impact assessment, the ILP<sup>8</sup> recommends that MF 1.0 is used to assess potential impact to surrounding sensitive receptors, ensuring the light spill is assessed at worst-case conditions.
- 7.4.3 The lighting design has been prepared using a calculated MF, shown in **Appendix A**. For the impact assessment, the model is rerun with the MF set to 1.0.

# 8 Results

- 8.1 The Reality Outdoor report detailing equipment selections, the model and the results for each grid and area of use are provided in **Appendix B**. Each lit task area meets the requirements of BS12464-2. The Reality Outdoor appendix shows the output of MF set to 1.0. **Appendix C** shows a lux contour plan, displaying results from calculated MF.

# 9 Impact Assessment

## 9.1 Sensitive Human Receptors

- 9.1.1 Lux contributions to the existing residential sensitive receptors are zero, as shown in **Appendices B** and **C**. The potential impact to existing sensitive human receptors from adverse obtrusive light is not significant and below the limits for an EZ E3.

## 9.2 Sensitive Ecological Receptor

- 9.2.1 The proposed development abuts the woodland in all directions. As the proposed use is for an industrial activity, higher lux levels are needed to maintain operations and safety. Optics and

luminaire positioning are included to reduce the effects as much as practicable, however, light spill onto the woodland is unavoidable during the operational period.

- 9.2.2 Lux levels are approximately 5 to 10 lux at the woodland boundary during the operational period (directly north of the main building on the lorry route running along northern façade), reducing to less than 1 lux approximately 10 m into the woodland. Consequently, without further mitigation, there may be a potential impact.
- 9.2.3 The proposed development will cease operations by early evening. The outer areas will cease operations by 5.00 pm. Minor vehicle movements to the main building and office may arise after 5.00 pm until closure in the early evening. Therefore, the outer boundaries (i.e. service area, storage bays, western area) do not require to be lit. The times of elevated lux during hours of darkness are limited.
- 9.2.4 Vehicle movements will be 24/7, however, the number of overnight movements is minimal. The movements will travel directly from the entrance and to the lorry car park at the rear of the building. Consequently, some lighting along this route is necessary. However, suitable provisions can be included to mitigated overnight lighting impacts.
- 9.2.5 The most sensitive period for artificial lighting impacts to occur to bats in the woodland is overnight during activity periods. Mitigation has been included to reduce lighting outside of the operational timeframes, to ensure the potential impact of artificial light to bats is negligible and not significant. The Lux levels reduce to zero, with mitigation ensuring not significant effects.

## 10 Mitigation

- 10.1 The proposed development has been lit for day-to-day operations. The lighting design has been prepared with embedded mitigation, which includes appropriate optics and column placement to reduce light spill.
- 10.2 No mitigation is required during the daytime operational timeframes (i.e. pre-curfew). The woodland borders the site, therefore, there is a risk of light spill impacts from the site.
- 10.3 The business will utilise infrared CCTV (i.e. night vision), therefore, continuous maintained illuminance for security provisions is not required.
- 10.4 The workshop will not operate overnight, however, the site operations will require vehicle movements 24/7. Therefore, vehicle movements through the site, along the northern façade vehicle route and

into the lorry park are required. The number of vehicle movements overnight is minimal, resulting in approximately 1 to 4 individual movements each hour.

10.5 To ensure protection to the surrounding ecological habitats, it is recommended that the luminaires along the northern boundary are installed with motion detection. This will ensure the luminaires are dimmed or switched off overnight protecting ecological surroundings, and only return to full lumen output for a short period of time when a lorry is detected.

10.6 Where feasible for the overnight operations, all luminaires should be switched off when not in use. For example, the exterior bays and outer route are not expected to be in use overnight, and these could be switched off. Overnight lighting is likely to comprise the luminaires placed on the façade and in the lorry park only, which can be configured to suitably reduce lumen output overnight to achieve effectively zero lux onto the surrounding woodland.

## 11 Designers Risk Assessment

11.1 This design has been prepared for a planning application. Specifics surrounding installation and maintenance have yet to be defined.

11.2 In accordance with the Construction Design and Management Regulations 2015, the following assumptions and considerations should be noted. The Institution of Lighting Professionals has also published Guidance Note 4 (2016) '*CDM 2015 Overview*' to aid this process.

- The design provided in this report and appendices is for the purpose of the planning application. It is not a finalised construction design.
- The design does not account for installation or electrical installation considerations, site conditions or provide a risk assessment.
- The contractor shall liaise with the District Network Operator (DNO) and/or appointed electrical engineer to organise or action electrical amendments and connections. Competent person(s) certified to handle electrical installations shall install the equipment.
- The contractor shall identify any overhead or underground obstacles or infrastructure that may pose risk or harm associated with the installation of the design before the physical installation (i.e. utility drawings). The contractor shall consult with relevant Bodies, as necessary upon identifying any issues.
- The design assumes there are no obstacles. Obstacles identified in the site layout plan have been accounted for in the design (for example, physical proposed infrastructure and vegetation).
- Lighting column foundations shall be designed in accordance with the manufacturer's specifications. This may require liaison with an appointed civil engineer.

- Columns positions should be located to the rear of paths, verges, or as a minimum setback distance of 800 mm from the kerb/structure.
- Column maintenance doors are positioned perpendicular to the kerb, away from traffic. The Luma Gen2 includes maintenance friendly design.
- Future maintenance should be carried out to appropriate standards, health & safety procedures and to the manufacturer requirements/standard.
- All street lighting and other electrically supplied items of street furniture shall be manufactured, earthed and bonded in accordance with the relevant British Standards Institution guidelines.

## 12 Conclusion and Summary

- 12.1 An exterior lighting design and lighting impact assessment has been completed for a proposed industrial development. Lighting within the development is required for car parks, the weighbridge and gatehouse, general vehicle circulation, exterior material storage bays and a screening plant.
- 12.2 An exterior lighting design has been completed. Best practice and design selection have been included during the design process to reduce potential light spill from the outset of the design. The lighting design meets the lighting level standard requirements of British Standard 12464-2:2014 <sup>[3]</sup> for the intended uses. Glare is controlled through the selection of products and the design and skyglow contributions from the luminaires are zero.
- 12.3 A lighting impact assessment for human and ecologically sensitive receptors surrounding the site has been completed. An assessment to Environmental Zone E3 standards and a modelled maintenance factor of 1.0 has been assessed to ensure worst-case.
- 12.4 The increase of lux at existing residential receptors is not significant during the pre- and post-curfew operational time periods.
- 12.5 There is a risk of potential impact at the woodland edges bordering the site during night time periods, if no mitigation is undertaken to reduce lux levels. Therefore, lighting will cease at the end of the operational day and be switched off overnight. For the vehicle route to the lorry park, motion detection lighting will be used. Infrared CCTV is proposed, therefore, maintained lighting is not required for security. These interventions will ensure the light spill onto the woodland will be zero lux at the times of most sensitive use (i.e. bat activity overnight), ensuring negligible and not significant impacts.
- 12.6 The assessment demonstrates an appropriate lighting design for the intended uses, meeting relevant British Standard can be achieved without adverse impacts on surrounding sensitive

receptors (with the inclusion of overnight switch off). There is, therefore, no reason for the application to be refused on the grounds of lighting impact.

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# APPENDICES

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Appendix A –Lighting Design

Equipment

The details of the equipment, imagery and practical details of each product used are shown in **Table A.1**.

Table A.1: Equipment Details

| Product    | Type, Height & Optic                                                                                                                 | Ingress Protection (IP) | IK Rating | CRI | Image                                                                               |
|------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------|-----|-------------------------------------------------------------------------------------|
| Luma Gen 2 | DW50 (Wide, 6 m), DS50 (symmetrical, 10 m), DW50 BL (Wide Block Light, 8 m)<br>- Post top mounted single arm<br>- Double arm mounted | 66                      | 10        | 70  |  |

Maintenance Factor

The maintenance and choice of luminaire manufacturer is an important aspect to a future lighting design. During the lifespan of the luminaire, the product will gradually experience loss of light output. It is important that this managed appropriately in the design of the lighting installation, as a considerable proportion of light may be lost over the lifespan of the installation. This may ultimately make the installation unsafe as it could no longer be lit to the relevant light standard over the installation period.

The maintenance factor (fm) is calculated by multiplying four parameters: the luminous flux factor (fLF), survival factor (fS), luminaire maintenance factor (fLM) and surface maintenance factor (fSM). The surface maintenance factor is used for interior luminaires only, a value of 1 is used for exterior luminaires. A description of the three relevant parameters is provided below:

- Luminous Flux Factor (fLF): this value is obtained from the manufacturer’s datasheet. The value is typically displayed as median useful life L##, which is the length of time during which 50% of a population of operating LED based luminaires of the same type have flux degraded to less than their initial luminous flux.
- Survival Factor (fS): this relates to the replacement of luminaires after they have failed. If the luminaires are directly replaced for new (without delay), then a factor of 1 can be assumed.

However, the ILP GN11/20 [11] proposes a standard value of 0.97, which represents an arbitrary 3% failure rate of LED.

- Luminaire Maintenance Factor (f<sub>LM</sub>): this represents the dirt build-up and other deterioration of the optic surface/material during the installation lifespan. Luminaire maintenance factors are defined in Annex C of BS 5489-1:2020. This parameter selection depends on whether the column height is above or below 6 m, the EZ and the cleaning schedule.

The calculated maintenance factor and one applied to the lighting design is provided in **Table A.2**.

**Table A.2: Maintenance Factor**

| Parameter                                                     | Data Source                       | Value                                    |
|---------------------------------------------------------------|-----------------------------------|------------------------------------------|
| Luminous flux factor (f <sub>LF</sub> )                       | Phillips Luma Gen2 <sup>12</sup>  | 0.90                                     |
| Survival factor (f <sub>s</sub> )                             | ILP GN 11                         | 0.97                                     |
| Luminaire maintenance factor (f <sub>LM</sub> )               | Taken from BS 5489-1:2020 Annex C | >6 m column, EZ E3, 72 month clean: 0.92 |
| Calculation: f <sub>LF</sub> *f <sub>s</sub> *f <sub>LM</sub> |                                   | 0.90*0.97*0.92                           |
| Maintenance Factor (f <sub>m</sub> ) – Final Value            |                                   | <b>0.90</b>                              |

The design has been prepared using the calculated MF. The lux contour plan shows the calculated lighting levels.

<sup>11</sup> Institution of Lighting Professionals, 2020. Guidance Note 11, Maintenance Factor Determination of LED Luminaires

<sup>12</sup> Phillips. Available at:

[https://www.lighting.phillips.co.uk/prof/outdoor-luminaires/road-and-street/luma-gen2/LP\\_CF\\_BGP701\\_EU/family?filters=&pagesize=8&page=2](https://www.lighting.phillips.co.uk/prof/outdoor-luminaires/road-and-street/luma-gen2/LP_CF_BGP701_EU/family?filters=&pagesize=8&page=2)

**Appendix B – Lighting Reality: Reality Outdoor, Design Output**

**DATE:** 27 March 2024  
**DESIGNER:** SHD Lighting Consultancy Ltd  
**PROJECT No:** SHD1004  
**PROJECT NAME:** Former Stairfoot Brickworks



CAD layout reference: 965-D5A-XX-XX-DR-A-0003-Proposed\_Site\_Plan-S4-P08

Grid 2, Grid 3: BS 5489-1: 2020, Table A.1: Conflict class C4  
Minimum maintained average illuminance (Eav): >10.00 lux  
Lighting uniformity (Emin/Eav) > 0.40 (40%)

Grid 1, Grid 5 & Grid 7: BS EN 12464-2: 2024, Table 5.7  
Short term handling of large units and raw materials  
Minimum maintained average illuminance (Eav): >20.00 lux  
Lighting uniformity (Emin/Eav) > 0.25 (25%)

Grid 6: BS EN 12464-2:2014, Table 5.9  
Light traffic outdoor car park  
Minimum maintained average illuminance (Eav): >5.00 lux  
Lighting uniformity (Emin/Eav) > 0.25 (25%)

## **Outdoor Lighting Report**

**PREPARED BY:** SHD Lighting Consultancy Ltd  
Contact: info@shdlighting.co.uk  
Phone: 07834 490 192  
Website: www.shdlighting.co.uk

## Layout Report

### General Data

Dimensions in Metres Angles in Degrees

### Calculation Grids

| ID | Grid Name                     | X         | Y         | X' Length | Y' Length | X' Spacing | Y' Spacing |
|----|-------------------------------|-----------|-----------|-----------|-----------|------------|------------|
| 1  | Grid 1:                       | 437807.24 | 405044.11 | 129.00    | 84.00     | 1.50       | 1.50       |
| 2  | Grid 2: Access Road           | 437843.86 | 404927.68 | 30.00     | 50.92     | 1.50       | 1.50       |
| 3  | Grid 3: Service Road          | 437788.59 | 405024.91 | 109.51    | 27.00     | 1.50       | 1.50       |
| 4  | Grid 4: Whole Area            | 437779.54 | 404867.07 | 292.00    | 264.00    | 1.50       | 1.50       |
| 5  | Grid 5                        | 437917.96 | 404926.56 | 102.00    | 105.00    | 1.50       | 1.50       |
| 6  | Grid 6: Light traffic car ... | 437877.89 | 404920.00 | 64.48     | 36.00     | 1.50       | 1.50       |
| 7  | Grid 7                        | 437930.50 | 405007.07 | 42.00     | 18.00     | 1.50       | 1.50       |

### Luminaires

#### Luminaire A Data



|                    |                                                            |
|--------------------|------------------------------------------------------------|
| Supplier           | Philips                                                    |
| Type               | BGP703 DW50                                                |
| Lamp(s)            | LED-HB 5.2S 740                                            |
| Lamp Flux (klm)    | 7.50                                                       |
| File Name          | Luma Gen2 Mini_BGP703_DW50_7500_40LED_5.2S_CLO_L90_740.ies |
| Maintenance Factor | 0.90                                                       |
| Lum. Int. Class    | G3                                                         |
| No. in Project     | 7                                                          |

#### Luminaire B Data



|                    |                                                             |
|--------------------|-------------------------------------------------------------|
| Supplier           | Philips                                                     |
| Type               | BGP702 DW50                                                 |
| Lamp(s)            | LED-HB 5.2S 740                                             |
| Lamp Flux (klm)    | 2.00                                                        |
| File Name          | Luma Gen2 Micro_BGP702_DW50_2000_10LED_5.2S_CLO_L90_740.ies |
| Maintenance Factor | 0.90                                                        |
| Lum. Int. Class    | G3                                                          |
| No. in Project     | 5                                                           |

#### Luminaire C Data

|                    |                                                                   |
|--------------------|-------------------------------------------------------------------|
| Supplier           | Philips BL                                                        |
| Type               | BGP705 DW50 BL1                                                   |
| Lamp(s)            | LED-HB 5.2S 740                                                   |
| Lamp Flux (klm)    | 36.00                                                             |
| File Name          | Luma Gen2 Large_BGP705_DW50 BL1_36000_180LED_5.2S_CLO_L90_740.ies |
| Maintenance Factor | 0.90                                                              |
| Lum. Int. Class    | G2                                                                |
| No. in Project     | 7                                                                 |

#### Luminaire E Data



|                      |                                                               |
|----------------------|---------------------------------------------------------------|
| Supplier             | Philips                                                       |
| Type                 | BGP705 DW50                                                   |
| Lamp(s)              | LED-HB 5.2S 740                                               |
| Lamp Flux (klm)      | 36.00                                                         |
| File Name            | Luma Gen2 Large_BGP705_DW50_36000_180LED_5.2S_CLO_L90_740.ies |
| Maintenance Factor   | 0.90                                                          |
| Imax70,80,90(cd/klm) | 595.5, 51.0, 0.0                                              |
| No. in Project       | 9                                                             |

### Layout

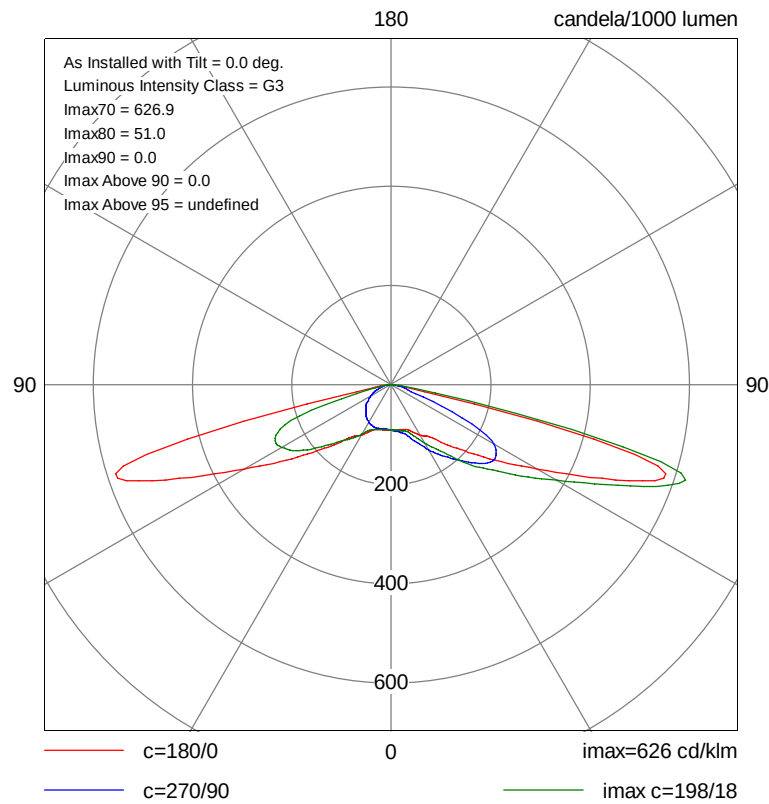
| ID | Type | X         | Y         | Height | Angle  | Tilt | Cant | Out-reach | Target X | Target Y | Target Z |
|----|------|-----------|-----------|--------|--------|------|------|-----------|----------|----------|----------|
| 1  | A    | 437856.64 | 404930.31 | 8.00   | 309.00 | 0.00 | 0.00 | 0.40      |          |          |          |
| 2  | E    | 437871.38 | 404975.01 | 12.00  | 34.00  | 5.00 | 0.00 | 0.40      |          |          |          |
| 3  | A    | 437864.95 | 404950.46 | 8.00   | 38.00  | 0.00 | 0.00 | 0.40      |          |          |          |
| 4  | C    | 437892.06 | 405049.27 | 12.00  | 234.00 | 5.00 | 0.00 | 0.40      |          |          |          |

### Layout Continued

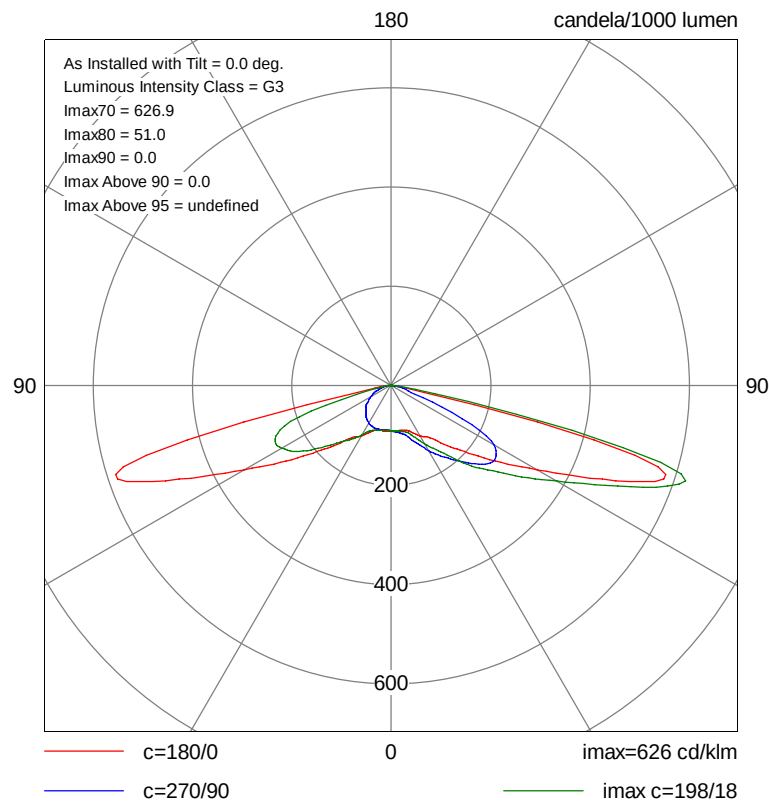
| ID | Type | X         | Y         | Height | Angle  | Tilt | Cant | Out-reach | Target X | Target Y | Target Z |
|----|------|-----------|-----------|--------|--------|------|------|-----------|----------|----------|----------|
| 5  | B    | 437900.72 | 404935.21 | 6.00   | 236.00 | 0.00 | 0.00 | 0.40      |          |          |          |
| 6  | E    | 437892.73 | 404977.12 | 10.00  | 143.00 | 5.00 | 0.00 | 0.40      |          |          |          |
| 7  | A    | 437806.06 | 405020.84 | 8.00   | 353.00 | 0.00 | 0.00 | 0.40      |          |          |          |
| 8  | A    | 437819.14 | 405046.88 | 8.00   | 329.00 | 0.00 | 0.00 | 0.40      |          |          |          |
| 9  | A    | 437848.53 | 405091.27 | 8.00   | 212.00 | 0.00 | 0.00 | 0.40      |          |          |          |
| 10 | E    | 437934.63 | 404945.42 | 10.00  | 321.00 | 5.00 | 0.00 | 0.40      |          |          |          |
| 11 | C    | 437990.16 | 404978.23 | 12.00  | 233.00 | 5.00 | 0.00 | 0.40      |          |          |          |
| 12 | C    | 438025.25 | 404954.22 | 12.00  | 236.00 | 5.00 | 0.00 | 0.40      |          |          |          |
| 13 | C    | 437994.67 | 404913.64 | 12.00  | 143.00 | 5.00 | 0.00 | 0.40      |          |          |          |
| 14 | E    | 437961.78 | 404981.29 | 10.00  | 321.00 | 5.00 | 0.00 | 0.40      |          |          |          |
| 15 | C    | 438009.65 | 404935.77 | 12.00  | 143.00 | 5.00 | 0.00 | 0.40      |          |          |          |
| 16 | E    | 437952.05 | 404996.42 | 10.00  | 58.00  | 0.00 | 0.00 | 0.40      |          |          |          |
| 17 | B    | 437930.69 | 404914.18 | 6.00   | 236.00 | 0.00 | 0.00 | 0.40      |          |          |          |
| 18 | E    | 437953.43 | 404913.77 | 12.00  | 54.00  | 5.00 | 0.00 | 0.40      |          |          |          |
| 19 | C    | 437870.69 | 405066.10 | 12.00  | 232.00 | 5.00 | 0.00 | 0.40      |          |          |          |
| 20 | E    | 437916.38 | 405007.58 | 10.00  | 144.00 | 5.00 | 0.00 | 0.40      |          |          |          |
| 21 | E    | 437852.76 | 404999.67 | 12.00  | 34.00  | 5.00 | 0.00 | 0.40      |          |          |          |
| 22 | E    | 437835.15 | 405050.12 | 12.00  | 325.00 | 5.00 | 0.00 | 0.40      |          |          |          |
| 23 | C    | 437914.02 | 405031.95 | 12.00  | 237.00 | 5.00 | 0.00 | 0.40      |          |          |          |
| 24 | B    | 437901.31 | 404904.55 | 6.00   | 56.00  | 0.00 | 0.00 | 0.40      |          |          |          |
| 25 | A    | 437823.20 | 405079.98 | 8.00   | 15.00  | 0.00 | 0.00 | 0.40      |          |          |          |
| 26 | A    | 437829.56 | 404984.50 | 8.00   | 40.00  | 0.00 | 0.00 | 0.40      |          |          |          |
| 27 | B    | 437919.81 | 404898.02 | 6.00   | 55.00  | 0.00 | 0.00 | 0.40      |          |          |          |
| 28 | B    | 437886.81 | 404914.54 | 6.00   | 56.00  | 0.00 | 0.00 | 0.40      |          |          |          |

## Polar Diagrams

### Luminaire A BGP703 DW50

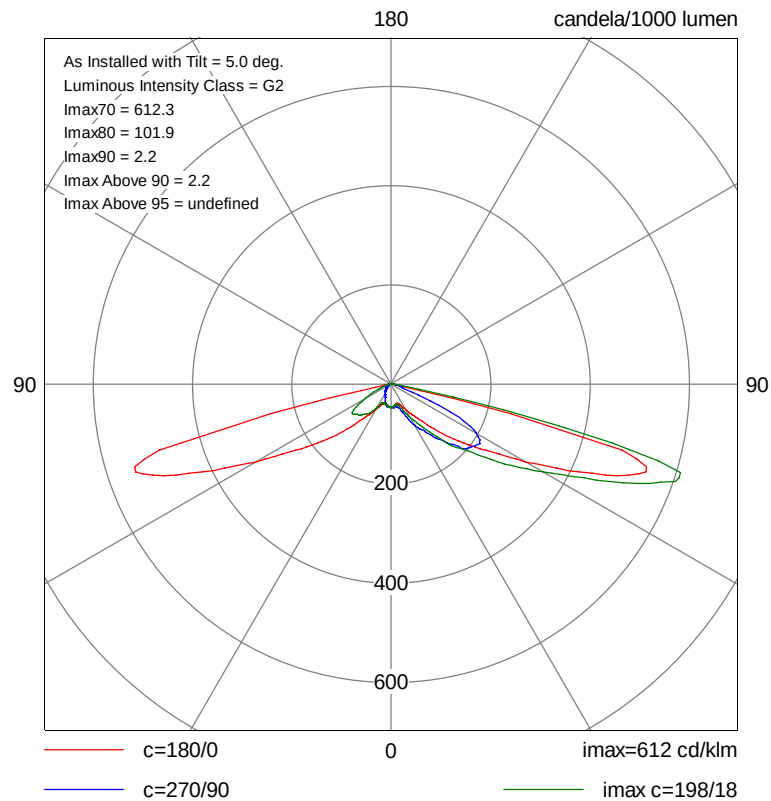


### Luminaire B BGP702 DW50

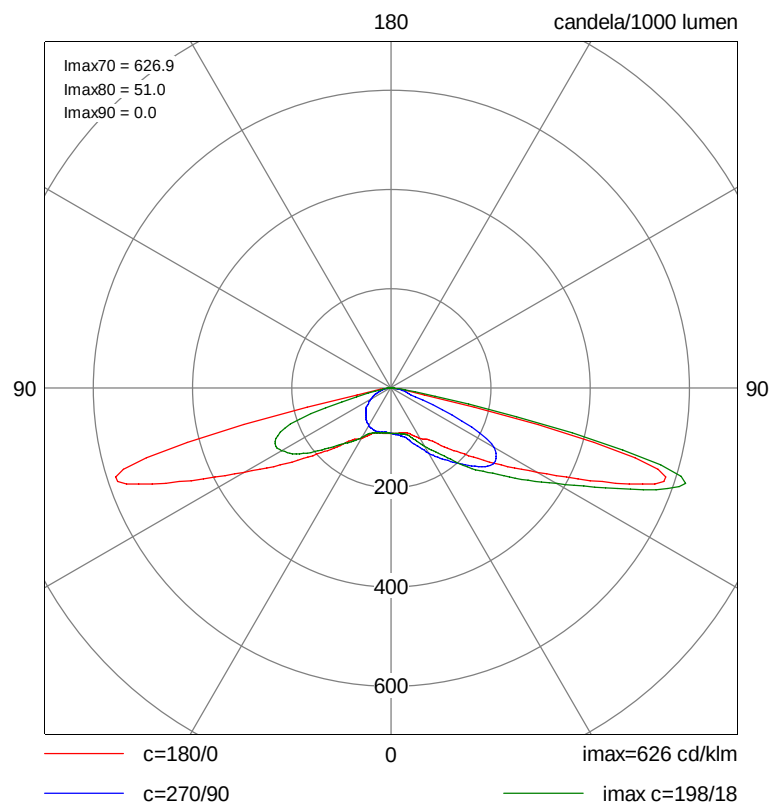


## Polar Diagrams Continued

### Luminaire C BGP705 DW50 BL1

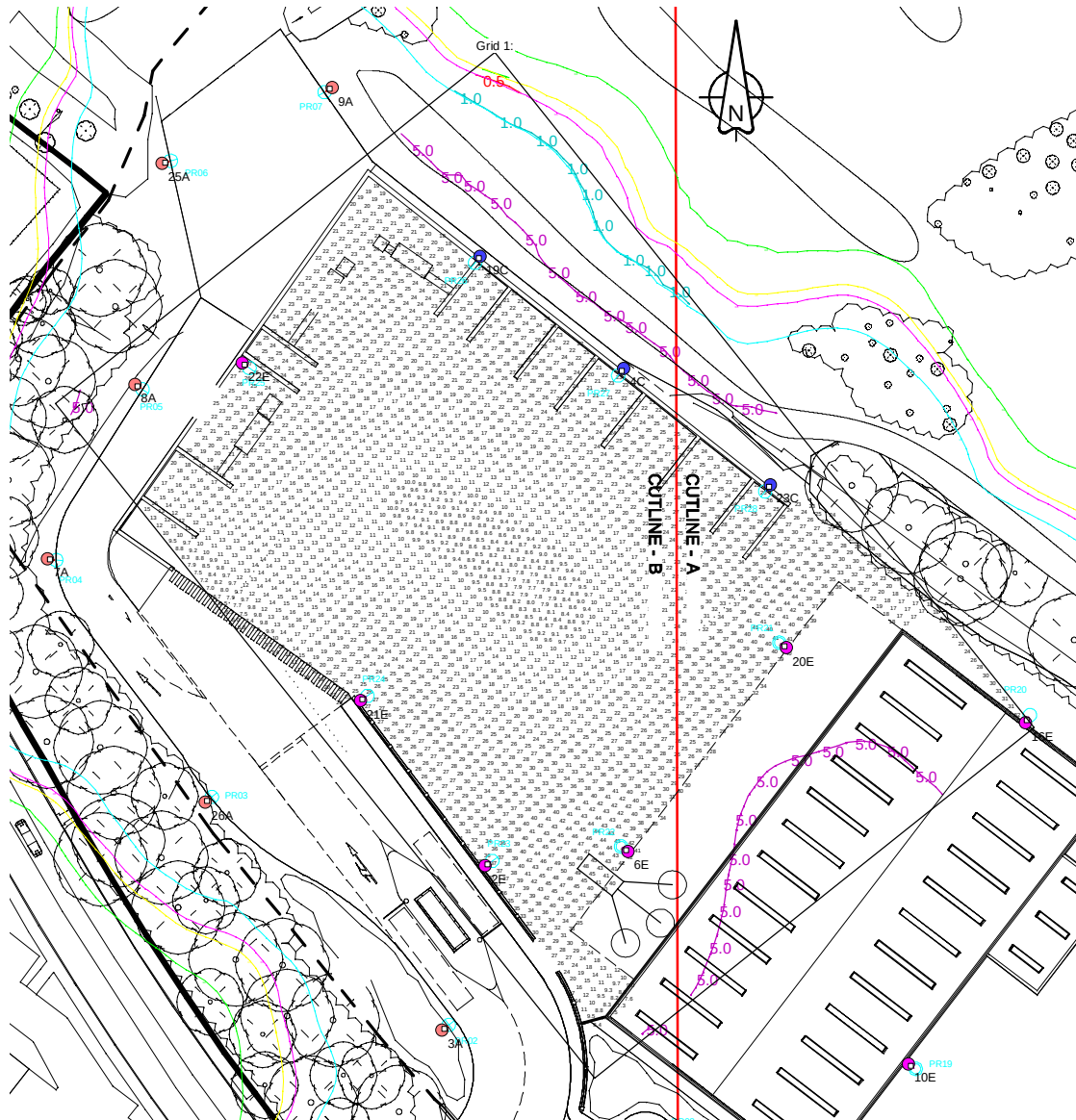


### Luminaire E BGP705 DW50



## Horizontal Illuminance (lux)

Grid 1:

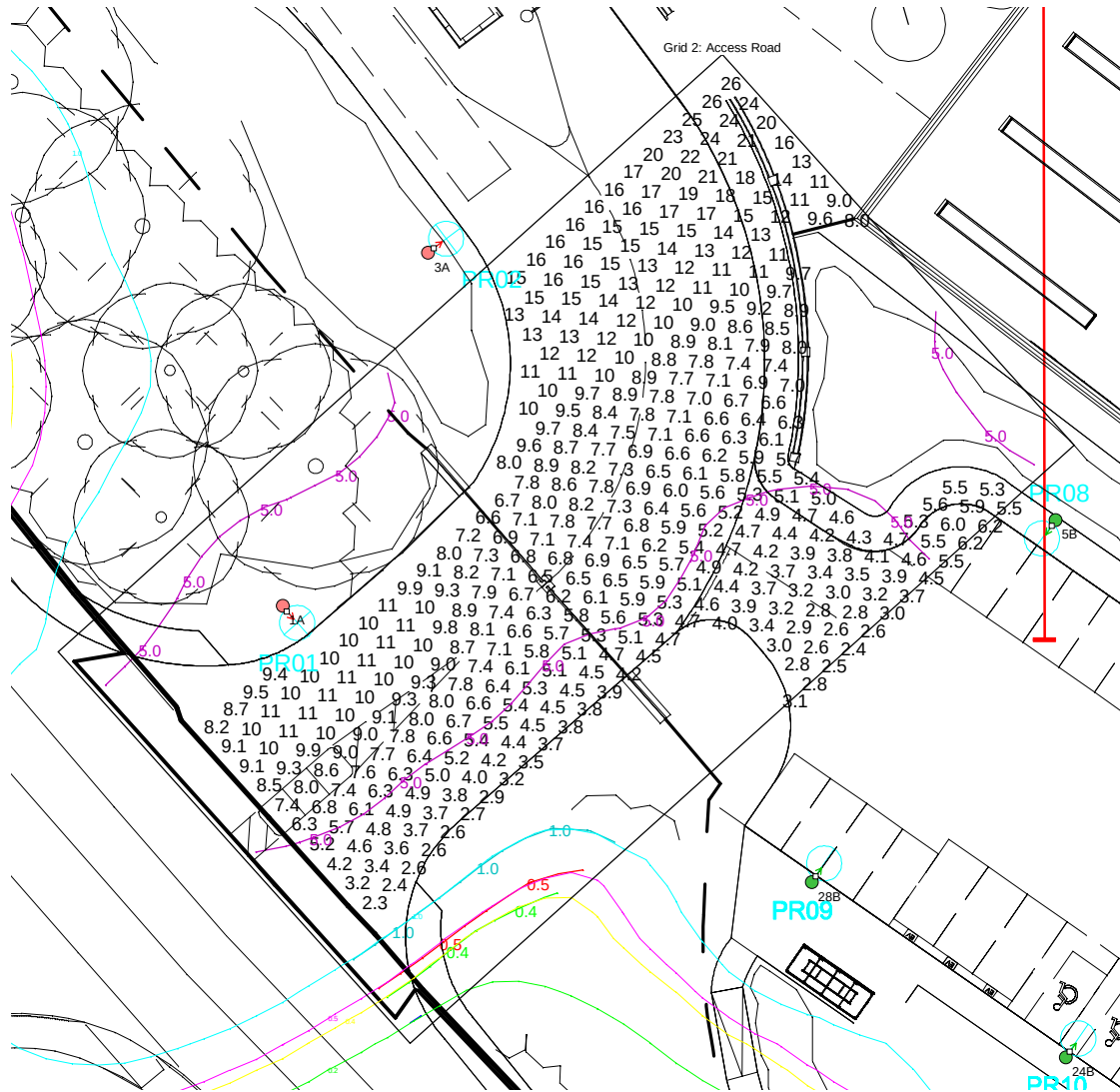


### Results

|           |       |
|-----------|-------|
| Eav       | 22.03 |
| Emin      | 5.81  |
| Emax      | 49.77 |
| Emin/Emax | 0.12  |
| Emin/Eav  | 0.26  |
|           |       |

## Horizontal Illuminance (lux)

Grid 2: Access Road



### Results

|           |       |
|-----------|-------|
| Eav       | 8.37  |
| Emin      | 2.30  |
| Emax      | 26.17 |
| Emin/Emax | 0.09  |
| Emin/Eav  | 0.27  |
|           |       |

## Horizontal Illuminance (lux)

Grid 3: Service Road

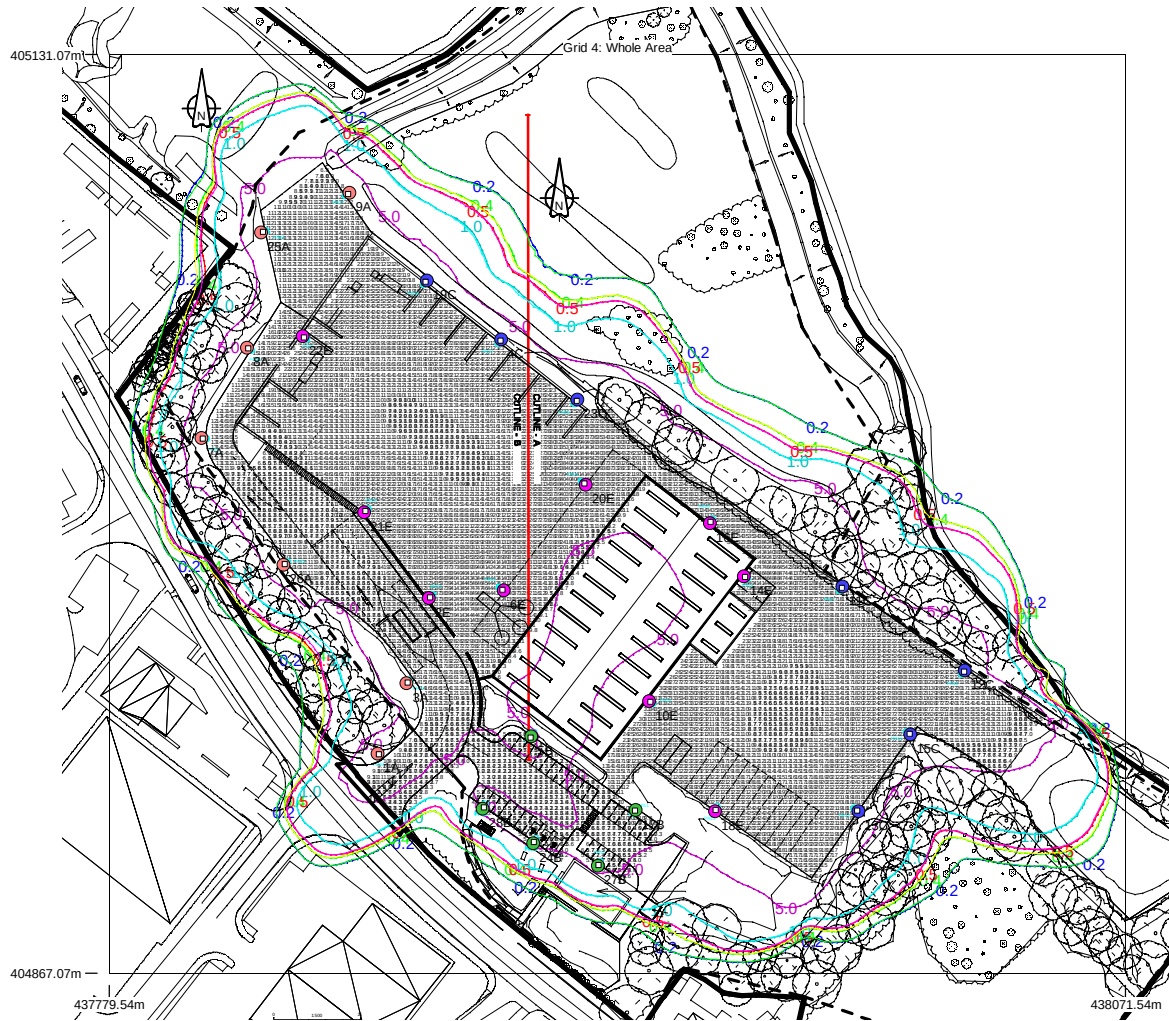


### Results

|           |       |
|-----------|-------|
| Eav       | 11.72 |
| Emin      | 5.09  |
| Emax      | 35.50 |
| Emin/Emax | 0.14  |
| Emin/Eav  | 0.43  |
|           |       |

## Horizontal Illuminance (lux)

Grid 4: Whole Area



## Horizontal Illuminance (lux)

Grid 5

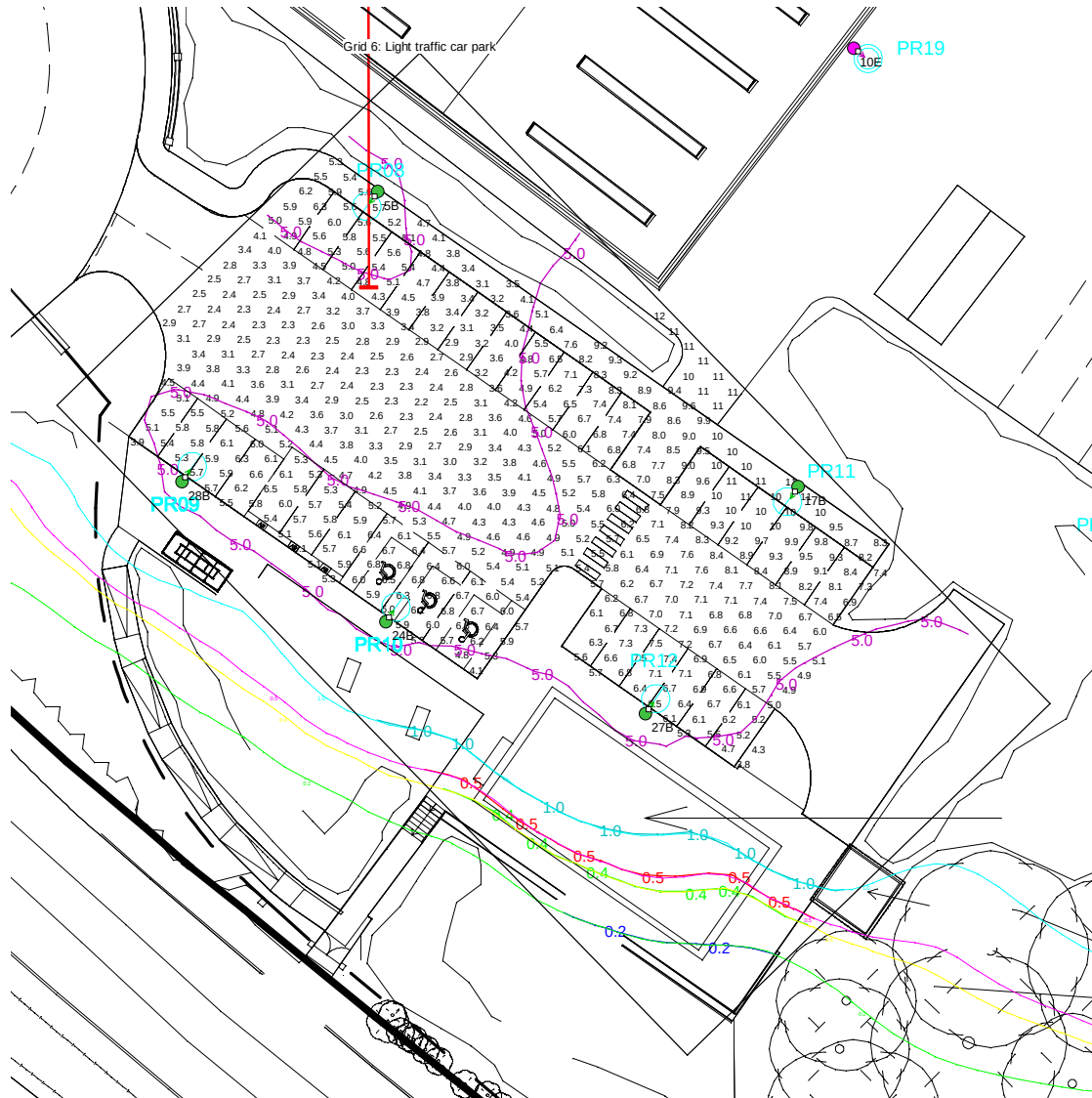


### Results

|           |       |
|-----------|-------|
| Eav       | 20.09 |
| Emin      | 5.22  |
| Emax      | 48.65 |
| Emin/Emax | 0.11  |
| Emin/Eav  | 0.26  |
|           |       |

## Horizontal Illuminance (lux)

Grid 6: Light traffic car park

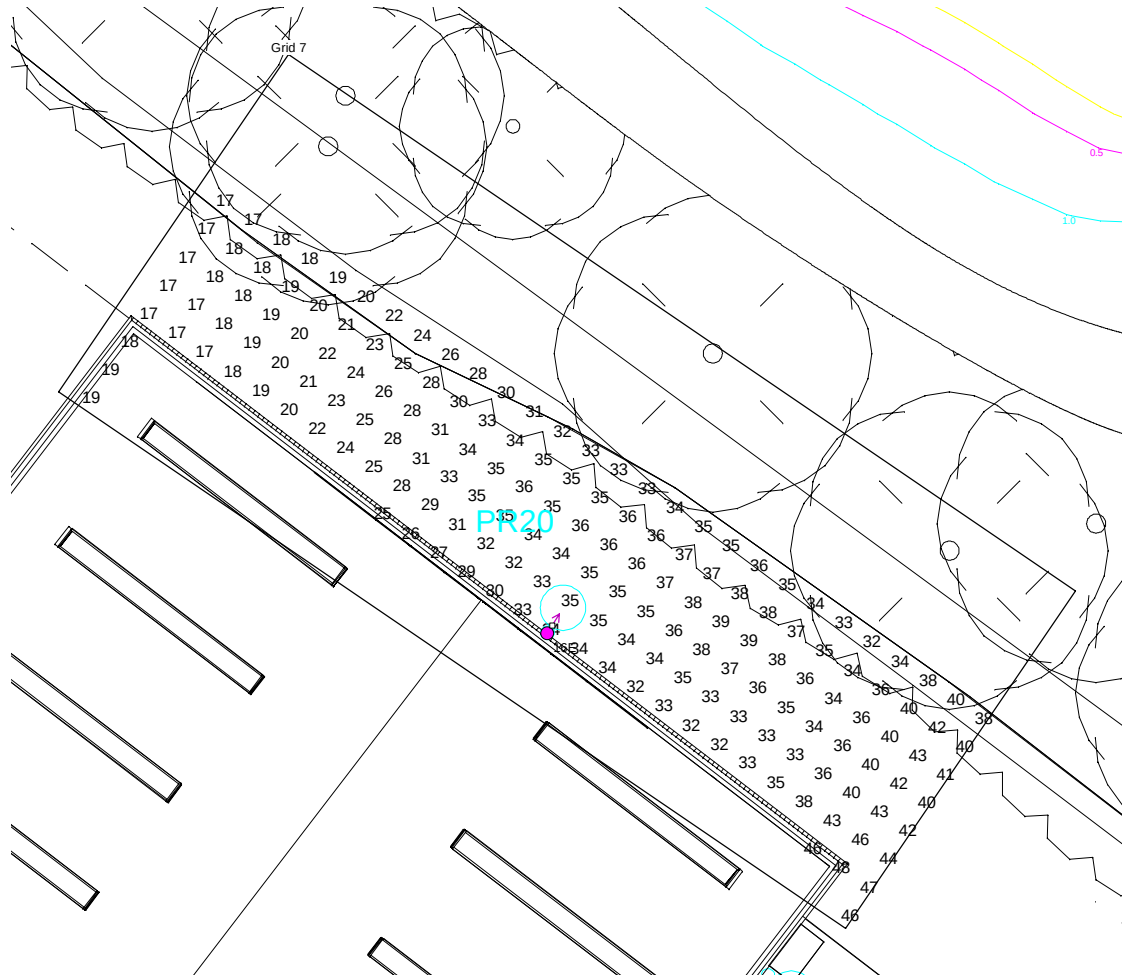


### Results

|           |       |
|-----------|-------|
| Eav       | 5.63  |
| Emin      | 2.25  |
| Emax      | 11.85 |
| Emin/Emax | 0.19  |
| Emin/Eav  | 0.40  |
|           |       |

## Horizontal Illuminance (lux)

Grid 7



### Results

|           |       |
|-----------|-------|
| Eav       | 31.16 |
| Emin      | 16.79 |
| Emax      | 48.09 |
| Emin/Emax | 0.35  |
| Emin/Eav  | 0.54  |
|           |       |

## **Appendix C – Layout and Luminaire Positions**

27/03/2024 13:57:40, SHD Plotstamp



LOCATION PLAN: EASTING 437843, NORTHING 404920

#### GENERAL NOTES

- Before construction commences, the site engineer shall ensure that all design information is mutually compatible with all other drawings and documents provided by the overseeing organisation and all drawings and documents are to be read in conjunction with one another.
- In the event of apparent ambiguity or contradiction, SHD Lighting Consultancy Ltd and the overseeing organisation shall be notified immediately.
- SHD Lighting Consultancy Ltd accept no liability in the event of not being notified and where construction work has commenced.
- This lighting design has been prepared in accordance with the HEMSA/HEA Guidance Note - CDM2015 Regulations, Issue 1.1 dated 09/04/15 - Procedure 2 and The Construction (Design and Management) Regulations 2015 - PART 3 Health and safety duties and roles - 9. Duties of designers.

#### NOTES

- All drawings and documents are to be read in conjunction with one another and are mutually compatible and shall be read as such.
- Any inaccuracies are to be reported to the overseeing organisation immediately.
- The information on this drawing does not account for installation considerations, site conditions or provide any form of risk assessment.
- Electrical installation work shall be carried out in accordance with the requirements of the latest edition of the IET wiring regulations, BS 7671
- The planting of trees near to lighting columns is to be avoided as future growth may inhibit lighting levels. Due to the layout of the plots and associated driveways it is inevitable that there will be conflict with proposed landscaping features. Where such instances occur the street lighting column locations will take precedence in order to satisfy the requirements of the British Standard.
- The calculation shown by this drawing assumes that the whole area being considered is in the same plane, i.e. there are no changes in gradient or elevation and no account has been taken for the blocking effect caused by buildings, trees, etc.
- Final lighting unit positions shall be agreed onsite with the overseeing organisation.
- Lighting unit foundations shall be designed in accordance with the manufacturer datasheet's for the columns and soil types present.
- Lighting columns shall be located to the rear of the footpath or verge, unless stated otherwise. If this is not possible the minimum setback distance for any lighting column to be erected from the kerb face shall be 800mm.
- Before construction commences, the site engineer shall ensure that all setting out information is mutually compatible with all the drawings and documents provided by the designers.
- Lighting unit positions indicated upon this drawing may change without prior or additional notice due to local site or environmental constraints subject to designers approval.
- The developer will be required to arrange payment for any energy liability charges with their electricity supplier and will be responsible, unconditionally, for the condition, operation and any risk or liability of all the street lighting equipment on all privately owned sections of the development.

#### STATUTORY SERVICE NOTES

- Current statutory service record plans should be obtained by the contractor / overseeing organisation before the commencement of any street lighting installation or removal works.
- It should be assumed by the contractor that not all services have been identified during the design period. It is the responsibility of the contractor to ensure that all unidentified services are carefully located and reported.
- The contractor shall identify the location of any overhead electrical or communication equipment prior to the undertaking of any onsite works. Should the presence of such equipment be identified, the contractor shall consult with the relevant statutory undertaker for further guidance.
- Installation and Removal works should be carried out in accordance with Energy Network Association Technical Specification 43-8, Electricity at Work Regulations 1989, Construction Design and Management (CDM) 2015 & G39/1 and all other relevant Health and Safety Executive regulations.
- All works in the vicinity of any overhead cables shall conform to the requirements of Health and Safety Executive, Guidance Note GS6 "Avoidance of danger from overhead power lines"
- All works in the vicinity of underground mains or cables shall conform to the requirements of Health and Safety Executive, Health and Safety Guidance HGS47 "Avoiding danger from underground services" and any additional requirements specified by the relevant undertaker.
- The contractor will be responsible for liaison with the undertakers and for programming the agreed protection and / or diversion works to any statutory undertakers apparatus into the overall works programme

#### LIGHTING CLASSIFICATION

This lighting design has been produced in accordance with: BS 5489-1:2020, BS EN 13201-2:2015 AND BS EN 12464-2: 2014 outdoor lighting documents and guidelines.

Car Park: BS EN 12464-2:2014, Table 5.9  
Light traffic outdoor car park  
Minimum maintained average illuminance (Eav): >5.00 lux  
Lighting uniformity (Emin/Eav) > 0.25 (25%)

Gatehouse: BS 5489-1: 2020, Table A.1: Conflict class C4  
Minimum maintained average illuminance (Eav): >10.00 lux  
Lighting uniformity (Emin/Eav) > 0.40 (40%)

Service Road: BS 5489-1: 2020, Table A.1: Conflict class C4  
Minimum maintained average illuminance (Eav): >10.00 lux  
Lighting uniformity (Emin/Eav) > 0.40 (40%)

Outdoor Processing: BS EN 12464-2: 2024, Table 5.7  
Short term handling of large units and raw materials  
Minimum maintained average illuminance (Eav): >20.00 lux  
Lighting uniformity (Emin/Eav) > 0.25 (25%)

The details provided on this drawing are subject to comments by all the relevant approving authorities or overseeing organisation. No construction works shall take place until technical approval has been obtained by the approving authority or overseeing organisation.  
It is to be understood that these drawings and the information shown are preliminary only and shall not be used for construction. Should the contractor commence work on site prior to obtaining technical approval, then it is entirely at their own risk and no liability shall be accepted by SHD Lighting Consultancy Ltd.

Wall mounted on building facade.  
Mounting height and luminaire location to be confirmed.

Luminaire: Philips Luma  
Mounting Type: Side entry mounted on wall bracket

Manufacturer Ref: Luma Gen2 Large BGP705 DW50 36000 180LED 5.2S CLO L90 740

Lumen Output: 36.00klm  
Luminaire Wattage: 196w  
Colour Temperature: Neutral White (4000k)  
Luminaire Tilt Inclination: 5°

Wall mounted on building facade.  
Mounting height and luminaire location to be confirmed.

Luminaire: Philips Luma  
Mounting Type: Side entry mounted on wall bracket

Manufacturer Ref: Luma Gen2 Large BGP705 DW50 36000 180LED 5.2S CLO L90 740

Lumen Output: 36.00klm  
Luminaire Wattage: 196w  
Colour Temperature: Neutral White (4000k)  
Luminaire Tilt Inclination: 0°

Proposed galvanised tubular steel lighting column of 12.0 metre nominal height with a planted base with glass flake root protection.  
Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar.

Luminaire: Philips Luma  
Mounting Type: Post top mounted at 5° tilt

Manufacturer Ref: Luma Gen2 Large BGP705 DW50 36000 180LED 5.2S CLO L90 740

Lumen Output: 36.00klm  
Luminaire Wattage: 196w  
Colour Temperature: Neutral White (4000k)  
Luminaire Tilt Inclination: 5°

Internal Wiring: Internal wiring to luminaire shall be 2.5mm² artic grade flexible cable

Door Orientation: Perpendicular to kerb edge facing away from oncoming traffic

#### ISOLUX CONTOUR KEY (AT GROUND LEVEL):

- 0.20 Isolux contour line
- 0.40 Isolux contour line
- 0.50 Isolux contour line
- 1.00 Isolux contour line

Proposed galvanised tubular steel lighting column of 8.0 metre nominal height with a planted base with glass flake root protection.  
Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar.

Luminaire: Philips Luma  
Mounting Type: Post top mounted at 0° tilt

Manufacturer Ref: Luma Gen2 Mini BGP703 DW50 6000 40LED 5.2S CLO L90 740

Lumen Output: 6.00klm  
Luminaire Wattage: 33w  
Colour Temperature: Neutral White (4000k)  
Luminous Intensity: G3

Internal Wiring: Internal wiring to luminaire shall be 2.5mm² artic grade flexible cable

Door Orientation: Perpendicular to kerb edge facing away from oncoming traffic

Proposed galvanised tubular steel lighting column of 6.0 metre nominal height with a planted base with glass flake root protection.  
Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar.

Luminaire: Philips Luma  
Mounting Type: Post top mounted at 0° tilt

Manufacturer Ref: Luma Gen2 Micro BGP702 DW50 2000 10LED 5.2S CLO L90 740

Lumen Output: 2.00klm  
Luminaire Wattage: 12w  
Colour Temperature: Neutral White (4000k)  
Luminous Intensity: G3

Internal Wiring: Internal wiring to luminaire shall be 1.5mm² artic grade flexible cable

Door Orientation: Perpendicular to kerb edge facing away from oncoming traffic

Proposed galvanised tubular steel lighting column of 12.0 metre nominal height with a planted base with glass flake root protection.  
Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar.

Luminaire: Philips Luma  
Mounting Type: Post top mounted at 5° tilt

Manufacturer Ref: Luma Gen2 Large BGP705 DW50 BL1 36000 180LED 5.2S CLO L90 740

Lumen Output: 36.00klm  
Luminaire Wattage: 196w  
Colour Temperature: Neutral White (4000k)  
Luminous Intensity: G2

Internal Wiring: Internal wiring to luminaire shall be 2.5mm² artic grade flexible cable

Door Orientation: Perpendicular to kerb edge facing away from oncoming traffic

Proposed galvanised tubular steel lighting column of 12.0 metre nominal height with a planted base with glass flake root protection.  
Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar.

Luminaire: Philips Luma  
Mounting Type: Post top mounted at 5° tilt

Manufacturer Ref: Luma Gen2 Large BGP705 DW50 36000 180LED 5.2S CLO L90 740

Lumen Output: 36.00klm  
Luminaire Wattage: 196w  
Colour Temperature: Neutral White (4000k)  
Luminous Intensity: G2

Internal Wiring: Internal wiring to luminaire shall be 2.5mm² artic grade flexible cable

Door Orientation: Perpendicular to kerb edge facing away from oncoming traffic

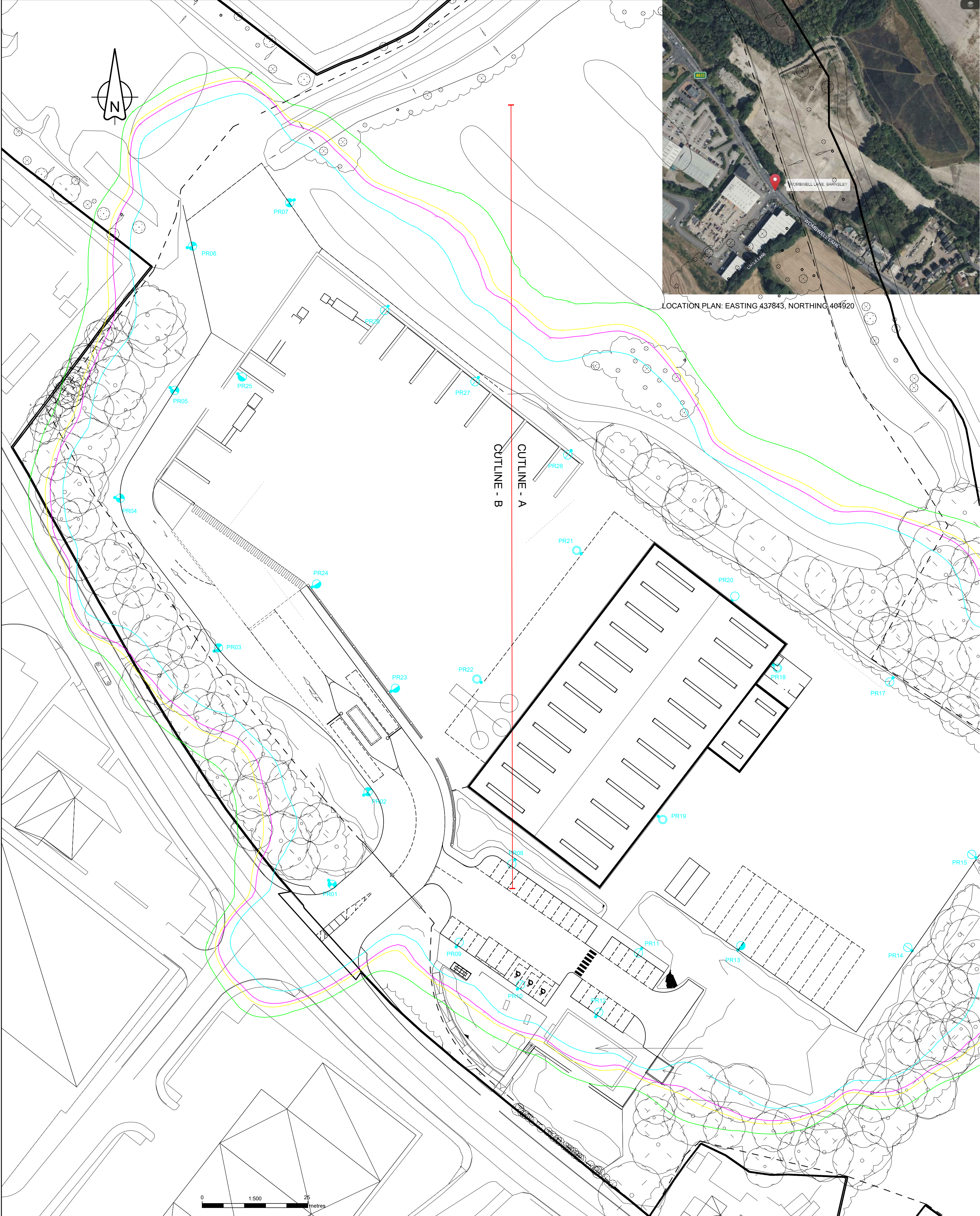
|     |                                       |            |     |
|-----|---------------------------------------|------------|-----|
| R1  | DEVELOPMENT LAYOUT CHANGE 20/03/2024  | 27/03/2024 | SRH |
| R0  | INITIAL DESIGN FOR REVIEW AND COMMENT | 11/01/2024 | SRH |
| REV | DESCRIPTION                           | DATE       | BY  |

# SHD

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|                  |                                               |        |            |
|------------------|-----------------------------------------------|--------|------------|
| SCHEME:          | FORMER STAIRFOOT BRICKWORKS<br>BARNSLEY       |        |            |
| DRAWING:         | PRIVATE LIGHTING DESIGN                       |        |            |
| CLIENT:          | MILLER GOODALL                                |        |            |
| DRAWING NUMBER:  | SHD1004-SHD-HLG-STN-DR-ED- Lighting Layout R1 | DRAWN: | SRH        |
|                  | CHECKED:                                      | SRH    |            |
|                  | SHEET 1 OF 3                                  |        | APPROVED:  |
| CONTRACT NUMBER: | SHD1004                                       | DATE:  | 11/01/2024 |
|                  | SCALE @ A1:                                   | 1:500  | REVISION:  |
|                  |                                               |        | R1         |

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION



GENERAL NOTES

- Before construction commences, the site engineer shall ensure that all design information is mutually compatible with all other drawings and documents provided by the overseeing organisation and all drawings and documents are to be read in conjunction with one another.
- In the event of apparent ambiguity or contradiction, SHD Lighting Consultancy Ltd and the overseeing organisation shall be notified immediately.
- SHD Lighting Consultancy Ltd accept no liability in the event of not being notified and where construction work has commenced.
- This lighting design has been prepared in accordance with the HEMSA/HEA Guidance Note - CDM2015 Regulations, Issue 1.1 dated 09/04/15 - Procedure 2 and The Construction (Design and Management) Regulations 2015 - PART 3 Health and safety duties and roles - 9. Duties of designers.

NOTES

- All drawings and documents are to be read in conjunction with one another and are mutually compatible and shall be read as such.
- Any inaccuracies are to be reported to the overseeing organisation immediately.
- The information on this drawing does not account for installation considerations, site conditions or provide any form of risk assessment.
- Electrical installation work shall be carried out in accordance with the requirements of the latest edition of the IET wiring regulations, BS 7671
- The planting of trees near to lighting columns is to be avoided as future growth may inhibit lighting levels. Due to the layout of the plots and associated driveways it is inevitable that there will be conflict with proposed landscaping features. Where such instances occur the street lighting column locations will take precedence in order to satisfy the requirements of the British Standard.
- The calculation shown by this drawing assumes that the whole area being considered is in the same plane, i.e. there are no changes in gradient or elevation and no account has been taken for the blocking effect caused by buildings, trees, etc.
- Final lighting unit positions shall be agreed onsite with the overseeing organisation.
- Lighting unit foundations shall be designed in accordance with the manufacturer datasheet's for the columns and soil types present.
- Lighting columns shall be located to the rear of the footpath or verge, unless stated otherwise. If this is not possible the minimum setback distance for any lighting column to be erected from the kerb face shall be 800mm.
- Before construction commences, the site engineer shall ensure that all setting out information is mutually compatible with all the drawings and documents provided by the designers.
- Lighting unit positions indicated upon this drawing may change without prior or additional notice due to local site or environmental constraints subject to designers approval.
- The developer will be required to arrange payment for any energy liability charges with their electricity supplier and will be responsible, unconditionally, for the condition, operation and any risk or liability of all the street lighting equipment on all privately owned sections of the development.

STATUTORY SERVICE NOTES

- Current statutory service record plans should be obtained by the contractor / overseeing organisation before the commencement of any street lighting installation or removal works.
- It should be assumed by the contractor that not all services have been identified during the design period. It is the responsibility of the contractor to ensure that all unidentified services are carefully located and reported.
- The contractor shall identify the location of any overhead electrical or communication equipment prior to the undertaking of any onsite works. Should the presence of such equipment be identified, the contractor shall consult with the relevant statutory undertaker for further guidance.
- Installation and Removal works should be carried out in accordance with Energy Network Association Technical Specification 43-8, Electricity at Work Regulations 1989, Construction Design and Management (CDM) 2015 & G39/1 and all other relevant Health and Safety Executive regulations.
- All works in the vicinity of any overhead cables shall conform to the requirements of Health and Safety Executive, Guidance Note GS6 "Avoidance of danger from overhead power lines"
- All works in the vicinity of underground mains or cables shall conform to the requirements of Health and Safety Executive, Health and Safety Guidance HGS47 "Avoiding danger from underground services" and any additional requirements specified by the relevant undertaker.
- The contractor will be responsible for liaison with the undertakers and for programming the agreed protection and / or diversion works to any statutory undertakers apparatus into the overall works programme

LIGHTING CLASSIFICATION

This lighting design has been produced in accordance with: BS 5489-1:2020, BS EN 13201-2:2015 AND BS EN 12464-2: 2014 outdoor lighting documents and guidelines.

Car Park: BS EN 12464-2:2014, Table 5.9

Light traffic outdoor car park  
Minimum maintained average illuminance (Eav): >5.00 lux  
Lighting uniformity (Emin/Eav) > 0.25 (25%)

Gatehouse: BS 5489-1: 2020, Table A.1: Conflict class C4

Minimum maintained average illuminance (Eav): >10.00 lux  
Lighting uniformity (Emin/Eav) > 0.40 (40%)

Service Road: BS 5489-1: 2020, Table A.1: Conflict class C4

Minimum maintained average illuminance (Eav): >10.00 lux  
Lighting uniformity (Emin/Eav) > 0.40 (40%)

Outdoor Processing: BS EN 12464-2: 2024, Table 5.7

Short term handling of large units and raw materials  
Minimum maintained average illuminance (Eav): >20.00 lux  
Lighting uniformity (Emin/Eav) > 0.25 (25%)

The details provided on this drawing are subject to comments by all the relevant approving authorities or overseeing organisation. No construction works shall take place until technical approval has been obtained by the approving authority or overseeing organisation. It is to be understood that these drawings and the information shown are preliminary only and shall not be used for construction. Should the contractor commence work on site prior to obtaining technical approval, then it is entirely at their own risk and no liability shall be accepted by SHD Lighting Consultancy Ltd.

|                             |                                                           |                                                                                             |
|-----------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Qty 4                       |                                                           | Wall mounted on building facade.<br>Mounting height and luminaire location to be confirmed. |
| Luminaire:                  | Philips Luma                                              |                                                                                             |
| Mounting Type:              | Side entry mounted on wall bracket                        |                                                                                             |
| Manufacturer Ref:           | Luma Gen2 Large BGP705 DW50 36000 180LED 5.2S CLO L90 740 |                                                                                             |
| Lumen Output:               | 36.00klm                                                  |                                                                                             |
| Luminaire Wattage:          | 196w                                                      |                                                                                             |
| Colour Temperature:         | Neutral White (4000k)                                     |                                                                                             |
| Luminaire Tilt Inclination: | 5°                                                        |                                                                                             |

|                             |                                                           |                                                                                             |
|-----------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Qty 1                       |                                                           | Wall mounted on building facade.<br>Mounting height and luminaire location to be confirmed. |
| Luminaire:                  | Philips Luma                                              |                                                                                             |
| Mounting Type:              | Side entry mounted on wall bracket                        |                                                                                             |
| Manufacturer Ref:           | Luma Gen2 Large BGP705 DW50 36000 180LED 5.2S CLO L90 740 |                                                                                             |
| Lumen Output:               | 36.00klm                                                  |                                                                                             |
| Luminaire Wattage:          | 196w                                                      |                                                                                             |
| Colour Temperature:         | Neutral White (4000k)                                     |                                                                                             |
| Luminaire Tilt Inclination: | 0°                                                        |                                                                                             |

|                     |                                                                         |                                                                                                                                                                                                                                                                               |
|---------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Qty 4               |                                                                         | Proposed galvanised tubular steel lighting column of 12.0 metre nominal height with a planted base with glass flake root protection.<br>Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar. |
| Luminaire:          | Philips Luma                                                            |                                                                                                                                                                                                                                                                               |
| Mounting Type:      | Post top mounted at 5° tilt                                             |                                                                                                                                                                                                                                                                               |
| Manufacturer Ref:   | Luma Gen2 Large BGP705 DW50 36000 180LED 5.2S CLO L90 740               |                                                                                                                                                                                                                                                                               |
| Lumen Output:       | 36.00klm                                                                |                                                                                                                                                                                                                                                                               |
| Luminaire Wattage:  | 196w                                                                    |                                                                                                                                                                                                                                                                               |
| Colour Temperature: | Neutral White (4000k)                                                   |                                                                                                                                                                                                                                                                               |
| Internal Wiring:    | Internal wiring to luminaire shall be 2.5mm² artic grade flexible cable |                                                                                                                                                                                                                                                                               |
| Door Orientation:   | Perpendicular to kerb edge facing away from oncoming traffic            |                                                                                                                                                                                                                                                                               |

ISOLUX CONTOUR KEY (AT GROUND LEVEL):

- 0.20 Isolux contour line
- 0.40 Isolux contour line
- 0.50 Isolux contour line
- 1.00 Isolux contour line

|                     |                                                                         |                                                                                                                                                                                                                                                                              |
|---------------------|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Qty 7               |                                                                         | Proposed galvanised tubular steel lighting column of 8.0 metre nominal height with a planted base with glass flake root protection.<br>Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar. |
| Luminaire:          | Philips Luma                                                            |                                                                                                                                                                                                                                                                              |
| Mounting Type:      | Post top mounted at 0° tilt                                             |                                                                                                                                                                                                                                                                              |
| Manufacturer Ref:   | Luma Gen2 Mini BGP703 DW50 6000 40LED 5.2S CLO L90 740                  |                                                                                                                                                                                                                                                                              |
| Lumen Output:       | 6.00klm                                                                 |                                                                                                                                                                                                                                                                              |
| Luminaire Wattage:  | 33w                                                                     |                                                                                                                                                                                                                                                                              |
| Colour Temperature: | Neutral White (4000k)                                                   |                                                                                                                                                                                                                                                                              |
| Luminous Intensity: | G3                                                                      |                                                                                                                                                                                                                                                                              |
| Internal Wiring:    | Internal wiring to luminaire shall be 2.5mm² artic grade flexible cable |                                                                                                                                                                                                                                                                              |
| Door Orientation:   | Perpendicular to kerb edge facing away from oncoming traffic            |                                                                                                                                                                                                                                                                              |

|                     |                                                                         |                                                                                                                                                                                                                                                                              |
|---------------------|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Qty 5               |                                                                         | Proposed galvanised tubular steel lighting column of 6.0 metre nominal height with a planted base with glass flake root protection.<br>Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar. |
| Luminaire:          | Philips Luma                                                            |                                                                                                                                                                                                                                                                              |
| Mounting Type:      | Post top mounted at 0° tilt                                             |                                                                                                                                                                                                                                                                              |
| Manufacturer Ref:   | Luma Gen2 Micro BGP702 DW50 2000 10LED 5.2S CLO L90 740                 |                                                                                                                                                                                                                                                                              |
| Lumen Output:       | 2.00klm                                                                 |                                                                                                                                                                                                                                                                              |
| Luminaire Wattage:  | 12w                                                                     |                                                                                                                                                                                                                                                                              |
| Colour Temperature: | Neutral White (4000k)                                                   |                                                                                                                                                                                                                                                                              |
| Luminous Intensity: | G3                                                                      |                                                                                                                                                                                                                                                                              |
| Internal Wiring:    | Internal wiring to luminaire shall be 1.5mm² artic grade flexible cable |                                                                                                                                                                                                                                                                              |
| Door Orientation:   | Perpendicular to kerb edge facing away from oncoming traffic            |                                                                                                                                                                                                                                                                              |

|                     |                                                                         |                                                                                                                                                                                                                                                                               |
|---------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Qty 7               |                                                                         | Proposed galvanised tubular steel lighting column of 12.0 metre nominal height with a planted base with glass flake root protection.<br>Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar. |
| Luminaire:          | Philips Luma                                                            |                                                                                                                                                                                                                                                                               |
| Mounting Type:      | Post top mounted at 5° tilt                                             |                                                                                                                                                                                                                                                                               |
| Manufacturer Ref:   | Luma Gen2 Large BGP705 DW50 BL1 36000 180LED 5.2S CLO L90 740           |                                                                                                                                                                                                                                                                               |
| Lumen Output:       | 36.00klm                                                                |                                                                                                                                                                                                                                                                               |
| Luminaire Wattage:  | 196w                                                                    |                                                                                                                                                                                                                                                                               |
| Colour Temperature: | Neutral White (4000k)                                                   |                                                                                                                                                                                                                                                                               |
| Luminous Intensity: | G2                                                                      |                                                                                                                                                                                                                                                                               |
| Internal Wiring:    | Internal wiring to luminaire shall be 2.5mm² artic grade flexible cable |                                                                                                                                                                                                                                                                               |
| Door Orientation:   | Perpendicular to kerb edge facing away from oncoming traffic            |                                                                                                                                                                                                                                                                               |

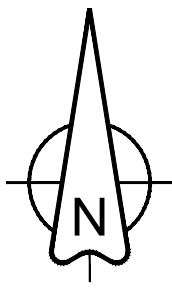
|                     |                                                                         |                                                                                                                                                                                                                                                                               |
|---------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Qty 4               |                                                                         | Proposed galvanised tubular steel lighting column of 12.0 metre nominal height with a planted base with glass flake root protection.<br>Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar. |
| Luminaire:          | Philips Luma                                                            |                                                                                                                                                                                                                                                                               |
| Mounting Type:      | Post top mounted at 5° tilt                                             |                                                                                                                                                                                                                                                                               |
| Manufacturer Ref:   | Luma Gen2 Large BGP705 DW50 36000 180LED 5.2S CLO L90 740               |                                                                                                                                                                                                                                                                               |
| Lumen Output:       | 36.00klm                                                                |                                                                                                                                                                                                                                                                               |
| Luminaire Wattage:  | 196w                                                                    |                                                                                                                                                                                                                                                                               |
| Colour Temperature: | Neutral White (4000k)                                                   |                                                                                                                                                                                                                                                                               |
| Luminous Intensity: | G2                                                                      |                                                                                                                                                                                                                                                                               |
| Internal Wiring:    | Internal wiring to luminaire shall be 2.5mm² artic grade flexible cable |                                                                                                                                                                                                                                                                               |
| Door Orientation:   | Perpendicular to kerb edge facing away from oncoming traffic            |                                                                                                                                                                                                                                                                               |

|     |                                       |            |     |
|-----|---------------------------------------|------------|-----|
| R1  | DEVELOPMENT LAYOUT CHANGE 20/03/2024  | 27/03/2024 | SRH |
| R0  | INITIAL DESIGN FOR REVIEW AND COMMENT | 11/01/2024 | SRH |
| REV | DESCRIPTION                           | DATE       | BY  |

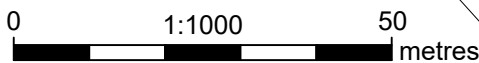


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|                                           |                                               |           |     |
|-------------------------------------------|-----------------------------------------------|-----------|-----|
| SCHEME:                                   | FORMER STAIRFOOT BRICKWORKS<br>BARNSELEY      |           |     |
| DRAWING:                                  | PRIVATE LIGHTING DESIGN                       |           |     |
| CLIENT:                                   | MILLER GOODALL                                |           |     |
| DRAWING NUMBER:                           | SHD1004-SHD-HLG-STN-DR-ED- Lighting Layout R1 | DRAWN:    | SRH |
|                                           | SHEET 2 OF 3                                  | CHECKED:  | SRH |
| CONTRACT NUMBER:                          | SHD1004                                       | APPROVED: |     |
|                                           | DATE: 11/01/2024                              | REVISION: | R1  |
| PRELIMINARY DESIGN - NOT FOR CONSTRUCTION |                                               |           |     |



LOCATION PLAN: EASTING 437843, NORTHING 404920



GENERAL NOTES

- Before construction commences, the site engineer shall ensure that all design information is mutually compatible with all other drawings and documents provided by the overseeing organisation and all drawings and documents are to be read in conjunction with one another.
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- This lighting design has been prepared in accordance with the HEMSA/HEA Guidance Note - CDM2015 Regulations, Issue 1.1 dated 09/04/15 - Procedure 2 and The Construction (Design and Management) Regulations 2015 - PART 3 Health and safety duties and roles - 9. Duties of designers.

NOTES

- All drawings and documents are to be read in conjunction with one another and are mutually compatible and shall be read as such.
- Any inaccuracies are to be reported to the overseeing organisation immediately.
- The information on this drawing does not account for installation considerations, site conditions or provide any form of risk assessment.
- Electrical installation work shall be carried out in accordance with the requirements of the latest edition of the IET wiring regulations, BS 7671
- The planting of trees near to lighting columns is to be avoided as future growth may inhibit lighting levels. Due to the layout of the plots and associated driveways it is inevitable that there will be conflict with proposed landscaping features. Where such instances occur the street lighting column locations will take precedence in order to satisfy the requirements of the British Standard.
- The calculation shown by this drawing assumes that the whole area being considered is in the same plane, i.e. there are no changes in gradient or elevation and no account has been taken for the blocking effect caused by buildings, trees, etc.
- Final lighting unit positions shall be agreed onsite with the overseeing organisation.
- Lighting unit foundations shall be designed in accordance with the manufacturer datasheet's for the columns and soil types present.
- Lighting columns shall be located to the rear of the footpath or verge, unless stated otherwise. If this is not possible the minimum setback distance for any lighting column to be erected from the kerb face shall be 800mm.
- Before construction commences, the site engineer shall ensure that all setting out information is mutually compatible with all the drawings and documents provided by the designers.
- Lighting unit positions indicated upon this drawing may change without prior or additional notice due to local site or environmental constraints subject to designers approval.
- The developer will be required to arrange payment for any energy liability charges with their electricity supplier and will be responsible, unconditionally, for the condition, operation and any risk or liability of all the street lighting equipment on all privately owned sections of the development.

STATUTORY SERVICE NOTES

- Current statutory service record plans should be obtained by the contractor / overseeing organisation before the commencement of any street lighting installation or removal works.
- It should be assumed by the contractor that not all services have been identified during the design period. It is the responsibility of the contractor to ensure that all unidentified services are carefully located and reported.
- The contractor shall identify the location of any overhead electrical or communication equipment prior to the undertaking of any onsite works. Should the presence of such equipment be identified, the contractor shall consult with the relevant statutory undertaker for further guidance.
- Installation and Removal works should be carried out in accordance with Energy Network Association Technical Specification 43-8, Electricity at Work Regulations 1989, Construction Design and Management (CDM) 2015 & G39/1 and all other relevant Health and Safety Executive regulations.
- All works in the vicinity of any overhead cables shall conform to the requirements of Health and Safety Executive, Guidance Note GS6 "Avoidance of danger from overhead power lines"
- All works in the vicinity of underground mains or cables shall conform to the requirements of Health and Safety Executive, Health and Safety Guidance HGS47 "Avoiding danger from underground services" and any additional requirements specified by the relevant undertaker.
- The contractor will be responsible for liaison with the undertakers and for programming the agreed protection and / or diversion works to any statutory undertakers apparatus into the overall works programme

LIGHTING CLASSIFICATION

This lighting design has been produced in accordance with: BS 5489-1:2020, BS EN 13201-2:2015 AND BS EN 12464-2: 2014 outdoor lighting documents and guidelines.

Car Park: BS EN 12464-2:2014, Table 5.9  
Light traffic outdoor car park  
Minimum maintained average illuminance (Eav): >5.00 lux  
Lighting uniformity (Emin/Eav) > 0.25 (25%)

Gatehouse: BS 5489-1: 2020, Table A.1: Conflict class C4  
Minimum maintained average illuminance (Eav): >10.00 lux  
Lighting uniformity (Emin/Eav) > 0.40 (40%)

Service Road: BS 5489-1: 2020, Table A.1: Conflict class C4  
Minimum maintained average illuminance (Eav): >10.00 lux  
Lighting uniformity (Emin/Eav) > 0.40 (40%)

Outdoor Processing: BS EN 12464-2: 2024, Table 5.7  
Short term handling of large units and raw materials  
Minimum maintained average illuminance (Eav): >20.00 lux  
Lighting uniformity (Emin/Eav) > 0.25 (25%)

The details provided on this drawing are subject to comments by all the relevant approving authorities or overseeing organisation. No construction works shall take place until technical approval has been obtained by the approving authority or overseeing organisation.  
It is to be understood that these drawings and the information shown are preliminary only and shall not be used for construction. Should the contractor commence work on site prior to obtaining technical approval, then it is entirely at their own risk and no liability shall be accepted by SHD Lighting Consultancy Ltd.

Qty 4

Wall mounted on building facade.  
Mounting height and luminaire location to be confirmed.

Luminaire: Philips Luma  
Mounting Type: Side entry mounted on wall bracket

Manufacturer Ref: Luma Gen2 Large BGP705 DW50 36000 180LED 5.2S CLO L90 740

Lumen Output: 36.00klm  
Luminaire Wattage: 196w  
Colour Temperature: Neutral White (4000k)  
Luminaire Tilt Inclination: 5°

Qty 1

Wall mounted on building facade.  
Mounting height and luminaire location to be confirmed.

Luminaire: Philips Luma  
Mounting Type: Side entry mounted on wall bracket

Manufacturer Ref: Luma Gen2 Large BGP705 DW50 36000 180LED 5.2S CLO L90 740

Lumen Output: 36.00klm  
Luminaire Wattage: 196w  
Colour Temperature: Neutral White (4000k)  
Luminaire Tilt Inclination: 0°

Qty 4

Proposed galvanised tubular steel lighting column of 12.0 metre nominal height with a planted base with glass flake root protection.  
Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar.

Luminaire: Philips Luma  
Mounting Type: Post top mounted at 5° tilt

Manufacturer Ref: Luma Gen2 Large BGP705 DW50 36000 180LED 5.2S CLO L90 740

Lumen Output: 36.00klm  
Luminaire Wattage: 196w  
Colour Temperature: Neutral White (4000k)

Internal Wiring: Internal wiring to luminaire shall be 2.5mm² artc grade flexible cable

Door Orientation: Perpendicular to kerb edge facing away from oncoming traffic

ISOLUX CONTOUR KEY (AT GROUND LEVEL):

- 0.20 Isolux contour line
- 0.40 Isolux contour line
- 0.50 Isolux contour line
- 1.00 Isolux contour line

Qty 7

Proposed galvanised tubular steel lighting column of 8.0 metre nominal height with a planted base with glass flake root protection.  
Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar.

Luminaire: Philips Luma  
Mounting Type: Post top mounted at 0° tilt

Manufacturer Ref: Luma Gen2 Mini BGP703 DW50 6000 40LED 5.2S CLO L90 740

Lumen Output: 6.00klm  
Luminaire Wattage: 33w  
Colour Temperature: Neutral White (4000k)  
Luminous Intensity: G3

Internal Wiring: Internal wiring to luminaire shall be 2.5mm² artc grade flexible cable

Door Orientation: Perpendicular to kerb edge facing away from oncoming traffic

Qty 5

Proposed galvanised tubular steel lighting column of 6.0 metre nominal height with a planted base with glass flake root protection.  
Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar.

Luminaire: Philips Luma  
Mounting Type: Post top mounted at 0° tilt

Manufacturer Ref: Luma Gen2 Micro BGP702 DW50 2000 10LED 5.2S CLO L90 740

Lumen Output: 2.00klm  
Luminaire Wattage: 12w  
Colour Temperature: Neutral White (4000k)  
Luminous Intensity: G3

Internal Wiring: Internal wiring to luminaire shall be 1.5mm² artc grade flexible cable

Door Orientation: Perpendicular to kerb edge facing away from oncoming traffic

Qty 7

Proposed galvanised tubular steel lighting column of 12.0 metre nominal height with a planted base with glass flake root protection.  
Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar.

Luminaire: Philips Luma  
Mounting Type: Post top mounted at 5° tilt

Manufacturer Ref: Luma Gen2 Large BGP705 DW50 BL1 36000 180LED 5.2S CLO L90 740

Lumen Output: 36.00klm  
Luminaire Wattage: 196w  
Colour Temperature: Neutral White (4000k)  
Luminous Intensity: G2

Internal Wiring: Internal wiring to luminaire shall be 2.5mm² artc grade flexible cable

Door Orientation: Perpendicular to kerb edge facing away from oncoming traffic

Qty 4

Proposed galvanised tubular steel lighting column of 12.0 metre nominal height with a planted base with glass flake root protection.  
Column to be manufactured to: EN 40, BS EN 1461 & BS 5649 standards as supplied by Mallatite, CU Phosco, Valmont Stainton or similar.

Luminaire: Philips Luma  
Mounting Type: Post top mounted at 5° tilt

Manufacturer Ref: Luma Gen2 Large BGP705 DW50 36000 180LED 5.2S CLO L90 740

Lumen Output: 36.00klm  
Luminaire Wattage: 196w  
Colour Temperature: Neutral White (4000k)  
Luminous Intensity: G2

Internal Wiring: Internal wiring to luminaire shall be 2.5mm² artc grade flexible cable

Door Orientation: Perpendicular to kerb edge facing away from oncoming traffic

|     |                                       |            |     |
|-----|---------------------------------------|------------|-----|
| R1  | DEVELOPMENT LAYOUT CHANGE 20/03/2024  | 27/03/2024 | SRH |
| R0  | INITIAL DESIGN FOR REVIEW AND COMMENT | 11/01/2024 | SRH |
| REV | DESCRIPTION                           | DATE       | BY  |

**SHD**

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|                                           |                                                |                    |              |
|-------------------------------------------|------------------------------------------------|--------------------|--------------|
| SCHEME:                                   | FORMER STAIRFOOT BRICKWORKS<br>BARNSELEY       |                    |              |
| DRAWING:                                  | PRIVATE LIGHTING DESIGN                        |                    |              |
| CLIENT:                                   | MILLER GOODALL                                 |                    |              |
| DRAWING NUMBER:                           | SHD1004-SHD-HLG-STAI-DR-ED- Lighting Layout R1 | DRAWN:             | SRH          |
|                                           | SHEET 3 OF 3                                   | CHECKED:           | SRH          |
| CONTRACT NUMBER:                          | SHD1004                                        | APPROVED:          |              |
|                                           | DATE: 11/01/2024                               | SCALE @ A1: 1:1000 | REVISION: R1 |
| PRELIMINARY DESIGN - NOT FOR CONSTRUCTION |                                                |                    |              |

## Glossary of Terms

**Arrangement** The pattern in which the luminaires are sited in plan (e.g. regular, along one edge or around the perimeter, staggered, opposite etc).

**Average Illuminance** Illuminance (lux) averaged over the specified area, road

**Average Luminance** Luminance ( $\text{cd}/\text{m}^2$ ) averaged over the specified area or solid angle

**Base Plate** [of the lighting column] Plate below ground level fixed to a planted lighting column to prevent the column sinking into the ground and to help prevent the column overturning

**Beam Angle** The total angle over which the luminous intensity of a beam drops to 50% of the peak value

**Bracket** A component used to support a luminaire at a definite distance from the axis of the lower straight position of a column

**Calculation Grid** A series of calculation grids set out in grid formation. Modelled at 1.5 \* 1.5 m grid spacing.

**Candela** SI unit of luminous intensity (cd).

**Carriageway** That part of the road normally used by vehicular traffic

**Colour Appearance** The apparent colour of light emitted by a particular light source – usually expressed as ‘cool’ (4000 Kelvin (K)), ‘intermediate’ (3500 K) and ‘warm’ or ‘warm white’ (3000 K). These terms are generalisations but are commonly used to describe light colour appearances

**Colour Rendering Index (Ra)** Measure of the degree to which the colour and appearance of an object appears ‘naturally’ when compared to a basis of reference e.g. artificial light, daylight.

**Colour Temperature** Temperature of the light measured in Kelvin (K)

**Conflict Area** Areas where different classes mix or cross. Examples such as road intersections, roundabouts, queuing locations, pedestrian crossings.

**Contrast** The difference in appearance of two or more parts of a field seen simultaneously or successively. E.g. brightness contrast, one object appearing more in dark than the other.

**Curfew** The time after which stricter requirements will apply. Planning conditions covering hours of operation or cessation lighting post-curfew will often be specified by a planning authority. There is no set definition of curfew and it can vary by location, however, 23:00 to 07:00 is often cited.

**Disability Glare** Glare that impairs the vision of objects without necessarily causing discomfort

**Discomfort Glare** Glare that causes discomfort without necessarily impairing the vision of an object

**District Network Operator (DNO)** The company responsible for the distribution of electrical energy in a predefined area

**Environmental Zone** Designated zone (area) where additional controls on exterior lighting are imposed

**Glare** Condition of vision in which discomfort or a reduction in the ability to see details or objects, caused by unsuitable distribution or range of luminance, or to extreme contrast

**Horizontal Illuminance** The illuminance on a horizontal plane at a specified height (ground level, unless otherwise specified)

**Illuminance** The amount of light (lumens) landing on a surface area. Measured as lux. The lighting of surfaces, object or surroundings so they may be seen

**Light Pollution** The spillage of light into areas where it is not desired

**Light Trespass** Light, normally measured in illuminance (lux) that impacts onto a surface outside of the area designed to be lit by the installation concerned

**Lighting Column** Support intended to hold one or more luminaires, consisting of a post, possibly an extension piece and a bracket.

**Louvre** Shield fitted to the luminaire exterior to reduce light in a particular direction. Used to reduce spill light.

**Lumen** SI unit of luminous flux. Luminous flux emitted in unit solid angle (steradian) by a uniform point source having a luminous intensity of 1 cd

**Luminaire** Apparatus which distributes, filters or transforms the light transmitted from one or more lamps. The light source i.e. LED

**Luminance** The amount of light that reaches the eye by reflection or direct transmission from an area

**Lux** SI unit of illuminance

**Maintenance Factor** The depreciation of light from a luminaire over the life cycle of it

**Obtrusive Light** Light outside the area to be lit that causes annoyance, discomfort, distraction or a reduction in the ability to see essential information e.g. at signal lights

**Photometer** Meter used to measure light. Minolta T10 is used by Miller Goodall Ltd to record illuminance (lux) levels

**Sky Glow** The brightening of the night sky that results from the reflection of radiation, scattered from the constituents of the atmosphere (e.g. gaseous molecules, aerosols and particulate matter), in the direction of observation

**Spacing** The distance between luminaires in an installation

**Spill Light** (stray light) Light emitted by an installation, which falls outside the boundaries that is being lit

**Upward Light Ratio (ULO)** Proportion of the light flux of a luminaire and/or installation that is emitted at and above the horizontal when the luminaire is mounted at an installation position. A measurement of sky glow.

**Vertical Illuminance** The illuminance on a vertical plane at a specified point.

