



EXTERIOR LIGHTING DESIGN AND LIGHTING IMPACT ASSESSMENT

On Behalf Of

BOURNE VALLEY ASSOCIATES LTD

for

**WHITE HOUSE FARM, WHITE HOUSE LANE,
SPENCERS WOOD, READING, BERKSHIRE, RG7**

1HR

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Summary

An exterior lighting design and associated light impact assessment have been prepared to accompany a planning application for a proposed commercial development at White House Farm, White House Lane, Spencers Wood, Reading, Berkshire, RG7 1HR.

Area and car park lighting are required. The site is located at the urban outskirts of Spencers Wood and resides in Environmental Zone E2 ‘low district brightness’.

The lighting design has been prepared to demonstrate that the development meets the lighting requirements of British Standard 12464-2: 2024 (lighting of outdoor work places), 5489-1:2020 (design of road lighting) and 13201-2:2015 (lighting performance requirements). Details of the lighting design, positioning and illuminance (lux) contour plots are appended to this report. Various best practices and embedded design mitigation measures have been included during the design process to control light and reduce levels of light spill.

Illuminance light spill contour plots and an impact assessment to consider vertical lux levels at surrounding sensitive receptors have been completed. The impact assessment indicates there are no adverse effects on surrounding sensitive receptors, and the overall effect of lighting can be concluded as not significant for both pre- and post-curfew time periods.

The lighting installation will only operate during business hours and lighting will be switched off from 20:00. Luminaires are also specified with Passive Infrared lighting (PIR) motion detection control.

There is, therefore, no reason for this application to be refused on the grounds of lighting.

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Signed		Signed	
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1	28 th July 2025	First issue	PW
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Contents

Summary	1
Contents	2
1 Introduction	4
2 Site Description	4
3 Proposed Development	5
4 Relevant Guidance	6
4.1 National Planning Policy Framework.....	6
4.2 Planning Practice Guidance.....	6
4.3 Institution of Lighting Professionals.....	6
4.4 British Standards Institution.....	8
5 Methodology	9
5.1 Consultation.....	9
5.2 Model and Assessment Approach	9
5.3 Environmental Zone	9
5.4 Lighting Requirements.....	9
5.5 Sensitive Receptors	10
5.6 Model Limitations	11
6 Baseline Assessment	12
7 Lighting Design	13
7.1 Equipment and Design Detail.....	13
7.2 Maintenance Factor	15
7.3 Wattage.....	17
8 Lighting Reality Model Results	17
9 Impact Assessment	18
10 Operational Control and Mitigation.....	19
11 Designers Risk Assessment.....	20

12 Conclusion and Summary

APPENDICES

Glossary of Terms

21

22

30

1 Introduction

- 1.1 Miller Goodall Ltd has been instructed to prepare an exterior lighting design and associated lighting impact assessment for a commercial development at White House Farm, White House Lane, Spencers Wood, Reading, Berkshire, RG7 1HR. The site lies within the administrative area of Wokingham Borough Council (WBC).
- 1.2 Area and car park lighting are required at the site. Best practice design and mitigation have been incorporated into the exterior lighting design. This includes the selection of appropriate luminaires and optics, heights and placement positions. Measures to reduce obtrusive light and pollution are inherent to the design, meeting the requirements of the Institution of Lighting Professionals (ILP) Guidance Note 1 ^[1].
- 1.3 The lighting design has been modelled using the industry-adopted and widely used 2D lighting software Lighting Reality. The Reality Outdoor package has been used as it is suited for area design. Drawings, illuminance contour plots and the impact assessment support the design.
- 1.4 A lighting impact assessment has been undertaken to provide a baseline review and an assessment of the potential obtrusive lighting impacts associated with the development on nearby sensitive receptors. The assessment has been prepared in accordance with guidance issued by the Institution of Lighting Professionals and British Standards Institution.

2 Site Description

- 2.1 The development site is the Reading branch of Lister Wilder Ltd, a supplier of mobile machinery equipment. The site is located at the urban outskirts of Reading and is approximately 1 km southwest of the village of Spencers Wood.
- 2.2 A mix of mobile home dwellings and open land borders the site to the north. Open land borders the site to the east with dwellings off Beech Hill Road and Cook Grove located beyond. White House Lane borders the site to the south, with woodland and a single dwelling located beyond. White House Lane and Whitehouse Farm (a road) border the site to the west, with woodland located beyond. The site location is shown in **Appendix A**.

¹ Institution of Lighting Professionals, 2021. Guidance Note 01 The Reduction of Obtrusive Light.

3 Proposed Development

3.1 The proposals comprise the demolition of 13 existing buildings and the construction and reconfiguration of the existing site. The demolition and extension will allow construction of a single main building in the centre of the site. The proposals consist of:

- Construction of a new processing unit to the east of the main building, oriented north-south.
- The main customer access, off Whitehouse Farm (road), will be improved, providing an improved roadway and a parking layby.
- The customer arrival area will be improved to provide improved customer frontage, signage and improved car parking provisions. Car parking spaces will be introduced along the full length of the western boundary, which is currently occupied by existing buildings that are to be demolished.
- The land to the northeast of the main building area will be reconfigured and improved. Storage spaces, a vehicle washing area and a turning circle will be created. These areas will remain unlit as they are only intended to be used during daylight hours.
- An existing mobile home will be moved approximately 20 m further north from its current position, to make way for the improved road. The mobile home will be integrated into the existing mobile home area.

3.2 The Applicant has identified that their lighting requirements are focused on the main building area and the customer's main access and frontage areas. The open storage areas to the northeast will remain unlit, as currently, as usage is only needed during daylight hours.

3.3 The existing site is lit by a variety of floodlights purchased from wholesalers. The lighting provisions have been installed on an ad-hoc basis to suit a particular operational need (such as entrances or open areas), with lighting installed over different periods. These floodlights are still in good condition, and the Applicant intends to keep these, with the exception of those that are installed on the buildings to be demolished.

4 Relevant Guidance

4.1 National Planning Policy Framework

4.1.1 Paragraph 198 of the National Planning Policy Framework² 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 pollution³. 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 emphasises *‘it is important to get the right light, in the right place and for it to be used at the right time’*. The three-Rs phrase is often observed in the lighting industry as the basis of 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 and lighting needs. The PPG continues by outlining good practices such as limiting upward light spill and selecting an appropriate luminaire for the task.

4.3 Institution of Lighting Professionals

Guidance Note 1, The Reduction of Obtrusive Light

4.3.1 The Institution of Lighting Professionals (ILP) GNI^[1] 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

² Ministry of Housing, Communities & Local Government, 2024. National Planning Policy Framework.

³ Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government, 2019. Planning Practice Guidance, Light Pollution.

glare to surrounding sensitive uses.

4.3.2 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-curfew⁴. 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 Park, 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
E4: High district brightness areas. Examples: town/city centres with high night-time activity levels	25	5

Ev: Vertical illuminance

*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

4.3.3 ILP Professional Lighting Guide (PLG) 04 ^[5] 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 this guidance is to outline best practice measures in lighting design and provide practical guidance on the production and assessment of lighting

⁴ The guide does not define a specific curfew. 23:00 to 07:00 is often taken to be curfew, which corresponds to other planning and environmental disciplines such as acoustics, and sleeping patterns of humans. A stricter curfew may apply, such as dark sky.

⁵ Institution of Lighting Professionals, 2013. Professional Lighting Guide 4, Guidance on Undertaking Environmental Lighting Impact Assessments.

impacts within new developments.

- 4.3.4 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 when lumen output is at the maximum at installation, rather than the lumen output representing the design level after degradation has occurred over time.

4.4 British Standards Institution

- 4.4.1 The British Standards 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 uses.
- 4.4.2 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. The guidance contains lighting standards for commercial uses, including horizontal average illuminance (lux), minimum lux maintained and uniformity percentages across the lit areas and uses.

12464-2:2024 Lighting of Work Places

- 4.4.3 The lighting of outdoor workplaces, Part 2 ^[6] is of relevance to this project. The document provides advice, guidance and lighting standards for a variety of workplace tasks and activities.

British Standard BS 5489:2020 and BS 13201:2015

- 4.4.4 British Standards BS 5489:2020 and BS 13201:2015 ^[7, 8] provide recommendations for street lighting standards. The documentation provides risk assessment processes for the selection of appropriate lighting classes. BS 5489 defines the overall principles of street lighting designs, and BS 13201 outlines specific performance requirements for the relevant classes of usage.
- 4.4.5 BS 5489 includes guidance on car park lighting, but it directs users to use the car park lighting levels listed in BS 12464.

⁶ British Standards Institution, 2024. BS EN 12464-2:2024 Light and Lighting – Lighting of Work Places, Part 2: Outdoor Work Places

⁷ British Standards Institution, 2020. BS EN 5489-1:2020 Design of Road Lighting, Part 1 Lighting of Roads and Public Amenity Spaces – Code of Practice

⁸ British Standards Institution, 2014. BS EN 13201-2:2015 Road Lighting, Part 2: Performance Requirements

5 Methodology

5.1 Consultation

- 5.1.1 The intended methodology for the lighting design and impact assessment was sent to the WBC Environmental Health Department on 3rd July 2025. No reply was received at the time of writing.
- 5.1.2 The methodology outlined that a design would be prepared to British Standards guidance and would include the existing luminaires in the design to ensure a robust assessment.

5.2 Model and Assessment Approach

- 5.2.1 The lighting design has been modelled using Lighting Reality and its software package, Reality Outdoor (v2.3.1).
- 5.2.2 The potential impact on surrounding sensitive receptors has been assessed by preparing a series of horizontal and vertical lux plots. The assessment includes lux predictions at the ground-floor (1.5 m window height) and the first-floor (4 m window height) windows for dwellings. Ecologically sensitive receptors include vertical lux predictions between 1 to 10 m.
- 5.2.3 The design includes calculated maintenance factors to ensure that the correct lighting levels are maintained for the installation's lifespan. An impact assessment is then completed by applying a 1.0 maintenance factor, per the requirements of the ILP PLG4 Guidance⁵.

5.3 Environmental Zone

- 5.3.1 The site is located at the urban edge and it is determined to be within EZ E2 *low district brightness*, *Examples: rural, small village, relatively dark urban location*.

5.4 Lighting Requirements

- 5.4.1 Lighting is required for the car parking areas, access road and area lighting around the buildings. **Table 2** shows the lighting standards applied.

Table 2: Relevant Lighting Requirements for this Assessment

Type of Area, task or activity	Maintained Illuminance ($\bar{E}_m, lx$)	Min Illuminance Uniformity (U_o)	Min colour rendering index (R_a)	Applied at
Main Entrance Access	10	0.40 (40%)	70	Main Vehicle Access Route
Traffic Area of Slow-Moving Vehicles	10	0.40 (40%)	70	Frontage of processing unit
Medium Car Park	10	0.25 (25%)	70	Customer/staff car park

- 5.4.2 The surroundings of the new building include parking, workshop and storage activities. The area around the new building is, therefore, lit to the BS 12464-2 lighting standard for *'traffic areas for slow moving vehicles'*. The *'medium car park'* standard is applied for the main customer area.
- 5.4.3 The vehicle access will include a mix of vehicles, machinery and foot users. A conflict class lighting standard is applied, and C4 is defined for the access. This also applies the same lighting standard as *'traffic areas for slow moving traffic'*, ensuring lux consistency across the site.
- 5.4.4 Only the areas around the building are lit. The open storage areas to the east and northeast remain unlit, as per the current baseline.
- 5.4.5 The relevant areas of the site are lit to this standard using newly installed luminaires. It should be noted that the interaction of the existing luminaires, which will be retained, is also included in the design.
- 5.4.6 The existing floodlights are low quality, and they have a symmetrical optic and limited light control owing to their wholesale origin. A common issue encountered with these types of products is their limited light spill quality, which often leads to the product being overly tilted to improve light spread, particularly as only one may be purchased to provide for a specific task/need. Consequently, whilst sufficient light may be provided, the uniformity quality (i.e. equal spread of light, reduction of dark spots) may be less likely to be met. Further details are provided in the results section concerning this.

5.5 Sensitive Receptors

- 5.5.1 The land to the north of the site is occupied by mobile home dwellings. Distant dwellings exist to the east and south of the site, too. Vertical lux intrusion at these existing sensitive receptors (ESR) has been compared to the pre- and post-curfew lux limits listed in **Table 1** for EZ E2.
- 5.5.2 The mobile home dwellings are single storey; therefore, it is only necessary to assess a ground floor 1.5 m height at ESR 1. ESR 2 and 3 are two storey dwellings and are, therefore, assessed at the ground floor (1.5 m) and the 1st floor (4 m estimated height).
- 5.5.3 An existing mobile home currently occupies part of the land to be redeveloped for the main access road. This property will be relocated and moved 20 m further from the Lister Wilder branch and into the mobile homes area. It is also no longer the closest property to the site after following its relocation. **Appendix B** provides further visual detail.
- 5.5.4 We have not been made aware of any ecological or bat constraints that require further assessment. A horizontal lux contour plot is included in this assessment.
- 5.5.5 **Table 3** shows the locations of sensitive receptors considered in this assessment, selected as worst-case positions nearest to the lit areas. The model calculates vertical lux via a 3D line source, with the height set from 1.5 to 4 m to represent the floors of the dwelling. **Appendix A** shows the ESR grid positions.

Table 3: Sensitive Receptors

Receptor	Location and Description	Coordinates*		Receptor
		X	Y	Type
ESR 1	Mobile Home at Beech Hill Road, Northwest	470819	165983	Human
ESR 2	Mobile Home at Beech Hill Road, Northeast	470845	165990	Human
ESR 3	Dwellings at Cook Grove	471014	165930	Human
ESR 4	Single Dwelling at White House Lane, South	470923	165864	Human
ESR 5	Environment, Sky Glow	N/A		Environment
*grid reference represents a central location along the vertical grid line				

5.6 Model Limitations

- 5.6.1 The light model does not take into account intervening vegetation, retaining walls, buildings or obstructions. Obstruction to light spill is, therefore, not accounted for in model outputs. Several buildings will be retained and/or constructed at the site that will aid in obstructing light from several luminaire positions.

- 5.6.2 Topography is not included in the model; model predictions are based on a flat land profile.
- 5.6.3 The site includes existing floodlights that are to be retained as they are in good condition and still functional, which is beneficial for the circular economy. However, as the products are from a wholesaler and were purchased at different periods, most of the equipment details are unknown. Photographs have been provided, and some of the products show manufacturer logos, which have allowed us to identify products and photometry that can be included in this lighting design, as otherwise there would be notable dark spots if the existing light sources were omitted.
- 5.6.4 The inclusion of the existing lighting is to complete and complement the prepared design, rather than being vital to the final calculations and comparison to the British Standard lighting levels. The existing lighting primarily serves specific areas that are not re-worked as part of the proposal's reconfiguration and newly lit areas.

6 Baseline Assessment

- 6.1 The existing business is extensively lit by floodlights and bulkhead luminaires that are installed on the façade 4 m high, below the roof eaves. There is a total of 27 luminaires at the site. 12 of these existing 27 luminaires will be recycled. **Appendix B** show existing luminaire positions and those to be recycled.
- 6.2 The existing luminaires consist of branded floodlights and wholesaler budget floodlights. Several floodlights are single-chip LED. The installation is a mix of ages and purposes, as they were installed ad hoc for a particular task, or purpose (such as a doorway). Single-chip luminaires are poor because they lack optic control, and they may often be over-tilted to provide more effective area coverage. The existing luminaires are tilted. However, they do all appear to be below a 70° tilt angle, meeting the ILP recommendation¹. Night photography indicates illumination does not extend beyond the boundaries. The photos appear to show some glare, but this may be related to the camera technology. Recommendations to reduce the tilt angle are made later in this report.
- 6.3 Lighting operates during customer business hours and early evening for staff. All existing floodlighting is fitted with passive infrared (PIR) motion detection, and lighting is switched off from 20:00.
- 6.4 The business has operated with its current lighting for several years and, to the operator's knowledge, there have been no complaints of adverse lighting issues encountered with the existing installation. The existing open storage areas to the northeast of the main area are unlit, and this will continue with these proposals.

- 6.5 The site resides in a broadly unlit area. Isolated lighting may exist in the mobile home area north of the site (i.e. porch lights). The land to the immediate east is unlit farmland; however, street lighting is present in the new build residential estate (ESR 3) approximately 70 m beyond. There is no street lighting on White House Lane or Yew Lane to the south of the site, nor in the mobile home area. Street view indicates isolated porch lighting at the dwelling to the south (ESR 4), and there is also an under-construction arboretum on the land, which may or may not be lit with commercial lighting around the building/delivery area upon completion.
- 6.6 Beyond the local area lies the urban area of Spencers Wood to the east and northeast, and Reading to the north.

7 Lighting Design

7.1 Equipment and Design Detail

Existing Lighting Equipment

- 7.1.1 Photographs of the existing installation are provided in **Appendix B**. One floodlight luminaire lists Ansell Lighting on the product casing. The rest of the luminaires are unbranded wholesaler floodlights. The Ansell Lighting floodlight appears to be from an older generation, as this specific one is not listed on their website; however, a similar design is shown. There are no photometry files available for the single-chip LED as these were obtained from a wholesaler.
- 7.1.2 The retained lighting is located along the eastern façade of the main building and the southern boundary areas. To provide a robust assessment, lighting from these should be included in the design.
- 7.1.3 The Ansell Lighting website includes a similar product to the one installed, part of the 'Calinor Evo' product range⁹. Photometry files (.ies and .ldt) are available for a variety of power ranges. The Calinor Evo also has limited optical control options (symmetrical only), making it ideal for this scenario as a 'limited optic' product, and for inclusion as a proxy for the other luminaires present at the site.

⁹ Ansell Lighting, Eden. Available at: <https://ansell-lighting.com/en/products/calinor-evo>

7.1.4 The operator is unable to confirm the floodlight wattages. However, reviewing the available photography appears to show similarities between all of the existing floodlights (i.e. light output, spread, tilt and install height). The existing lighting serves a specific local need, such as outside doorways and parking. A 20 watt floodlight is, therefore, assumed. Whilst this may not be the specific type, it does meet the overall purpose for including the existing floodlights in this design, to inform the proposed lighting design and cumulative light spill assessment.

7.1.5 As shown in **Appendix B**, photography indicates the floodlights are tilted. An estimated 50° tilt angle is applied for all existing luminaires in the model. The floodlights are positioned beneath the roof eaves; therefore, a 4 m height is specified. One luminaire is located at the gable end point, so this one is specified as 4.5 m high.

Proposed Lighting Equipment

7.1.6 The design has been prepared using Phillips ClearFlood¹⁰ Small Gen2 floodlight and Phillips Luma Gen2 street light¹¹. Key details of the product and design include:

- Ingress Protection (IP): IP66.
- Impact Rating (IK): IK09.
- Colour Rendering Index (CRI): 70.
- Motion detection.

7.1.7 All Clearflood floodlights are installed 4 m high on the façade of the buildings. They will be mounted on stirrup brackets at 0° tilt. The floodlights are positioned at key points around the buildings, such as doors and shutter doors. The DX10 optic (extra wide) is specified.

7.1.8 The Luma street light luminaires are mounted on 5 m high post-top columns via galvanised tubular columns with a planted base. The columns are positioned on the main access and along the western boundary. The DW50 optic (wide) is specified. The design includes single-arm columns, except for one double-arm column positioned between the access road and the car park.

7.1.9 The existing floodlights have a natural white colour temperature (4000 Kelvin). 4000K is, therefore, also specified for the proposed lighting to ensure consistency across the site.

¹⁰ Phillips, ClearFlood Gen2. Available at: https://www.lighting.philips.co.uk/prof/outdoor-luminaires/sports-and-area-floodlighting/area-and-recreational-floodlighting/clearflood-gen2/LP_CF_BVP655_EU/family

¹¹ Phillips, Luma Gen2. Available at: https://www.lighting.philips.co.uk/prof/outdoor-luminaires/road-and-street/luma-gen2/LP_CF_BGP701_EU/family

- 7.1.10 The main customer and car parking area in the west of the site consists of a wide space, between the building and the boundary. A minor 5° to 10° tilt angle is applied in these areas, which provides improved uniformity across the space.
- 7.1.11 **Table 4** details the lighting design equipment inventory.

Table 4: Equipment Inventory

Product	Type & Optic	Lumen Output (flux klm)	Wattage (w)	Quantity	Image
Ansell Lighting	Floodlight, Calinor Evo	2.25	20	15	
Phillips Clearflood Gen2	DX10	8.00	45	14	
Phillips Luma Gen2	DW50	4.00	24	7	

7.2 Maintenance Factor

- 7.2.1 During the lifespan of a luminaire, the lumen output naturally degrades, becomes obscured by dirt, and suffers light loss. This effect is accounted for in the design by applying a maintenance factor (MF), which models the end-of-life lighting level to account for this degradation. An adverse effect of this procedure is that the calculated MF models the lighting levels towards the end of the product lifespan and the post-degradation lumen output. Consequently, on day one of installation, the lumen output will be higher as no degradation of the product has yet to occur.
- 7.2.2 The maintenance factor (f_m) is calculated by multiplying four parameters: the luminous flux factor (f_{LF}), survival factor (f_s), luminaire maintenance factor (f_{LM}) and surface maintenance factor (f_{SM}). 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 (f_{LF}): 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 (f_s): 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 [12] proposes a standard value of 0.97, which represents an arbitrary 3% failure rate of LED.
- Luminaire Maintenance Factor (f_{LM}): 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.

7.2.3 The calculated maintenance factor and the one applied to the lighting design are provided in **Table 5**. The Ansell Lighting existing luminaire has been set to '1' in the design as the installation date is unknown, and this represents maximum output for the impact assessment.

Table 5: Maintenance Factor Calculation for the Proposed Lighting

Parameter	Data Source	Value
Luminous flux factor (f_{LF})	Phillips Clearflood, Luma Gen2	0.90
Survival factor (f_s)	ILP GN 11	0.97
Luminaire maintenance factor (f_{LM})	Taken from BS 5489-1:2020 Annex C	≤6 m height, EZ E2, 72 month clean: 0.92
Calculation: $f_{LF} * f_s * f_{LM}$		$0.90 * 0.97 * 0.92$
Maintenance Factor (f_m) – Final Value		0.80

7.2.4 For lighting impact assessment, the ILP⁵ recommends that MF 1.0 is set to assess the potential impact on surrounding sensitive receptors, ensuring the light spill is assessed at worst-case conditions, representing day one installation lighting levels.

7.2.5 The lighting design is initially prepared using a calculated MF and then revised to MF 1.0 for the impact assessment.

¹² Institution of Lighting Professionals, 2020. Guidance Note 11, Maintenance Factor Determination of LED Luminaires

7.3 Wattage

7.3.1 The total power requirement of the design (**Table 4**) is 1,098 watts (1.1 kW). This assumes full operation at installation. No revisions are made for switch off or dimming.

8 Lighting Reality Model Results

8.1 The Reality Outdoor output report provides equipment selections, optic images, positions and results for each calculation grid and area of use/task, shown in **Appendix C**. The Reality Outdoor appendix lists the results for MF1.0 for the purpose of the impact assessment. An AutoCAD horizontal lux contour plot and details of the design are provided in **Appendix C**. **Table 6** provides a summary of the design levels achieved.

Table 6: Lighting Model Design Results

Task	Targets	Design/Result Achieved
Access / Entrance	Average Horizontal Lux: 10 Uniformity: 0.40 (40%)	Average Horizontal Lux: 11.11 Uniformity: 0.40 (40%)
Customer And Main Parking Area	Average Horizontal Lux: 10 Uniformity: 0.25 (25%)	Average Horizontal Lux: 13.99 Uniformity: 0.33 (33%)
Staff Parking (South)	Average Horizontal Lux: 10 Uniformity: 0.25 (25%)	Average Horizontal Lux: 16.94 Uniformity: 0.05 (5%)
New Unit (west side)	Average Horizontal Lux: 10 Uniformity: 0.40 (40%)	Average Horizontal Lux: 24.01 Uniformity: 0.33 (33%)
New Unit (east side)	Average Horizontal Lux: 10 Uniformity: 0.40 (40%)	Average Horizontal Lux: 20.78 Uniformity: 0.39 (39%)

8.2 The task area 'New Unit (west side)' includes existing luminaires to the west (on the east façade of the existing building) and proposed luminaires to the east (on the west façade of the new unit) of the space. The calculation grid is the entire space between the buildings. The uniformity is slightly below the BS target; however, this is due to the mix between existing and new luminaires. As demonstrated by the east side calculation, uniformity is met using the Clearflood proposed luminaires. Consequently, the space outside the new unit, on the west side, will also meet the required BS targets.

- 8.3 The task area 'Staff Parking (South)' is an area that will continue to be lit by the existing floodlights. The recommended lighting level (lux) is met, but the uniformity is not met. This is due to the limited optic control offered by the existing floodlights. The Operator intends to retain these floodlights and advises that their lighting needs are met for this area. Therefore, no specific change is made to improve and meet the British Standard for this specific area. To supplement the existing lighting, a Clearflood luminaire has been included on the south façade of the new processing unit, which provides additional light due to its wide distribution optic.

9 Impact Assessment

- 9.1 The results presented are for a typical switched-on operation. The installation will incorporate lighting controls for evening and overnight operation, which will significantly reduce lux contributions. These include PIR motion detection and switch off from 20:00. **Appendix C** provides the Reality Outdoor results and **Appendix D** provides an AutoCAD technical summary and light spill drawing.

Horizontal Lux

- 9.2 The horizontal average lux contour plot is shown in **Appendix D**. The lux predicted at sensitive receptors surrounding the site is less than 0.5 lux.
- 9.3 The potential lux impact is, therefore, negligible and not significant.

Vertical Lux

- 9.4 The assessment has predicted vertical lux at four sensitive receptors. The vertical grid positions are shown in **Appendix A** and the result diagrams are shown in **Appendix C**. The results of the assessment are shown in **Table 7**. There is no operational lighting during the post-curfew hours.

Table 7: Vertical Lux Results at ESR Positions, Proposed Lighting

Receptor	Pre-	Post-	ESR Vertical Lux		Significance
	Curfew Limit (Lux)	curfew Limit (Lux)	1.5 m Height	4 m Height	
ESR 1: Mobile Home to Northwest	5	1	0.32	N/A	No Exceedance
ESR 2: Mobile Home to Northeast	5	1	0.10	N/A	No Exceedance
ESR 3: Dwellings at Cook Grove	5	1	0.25	0.2	No Exceedance
ESR 4: Single Dwelling at White House Lane, South	5	1	0.67	0.5	No Exceedance

9.5 The potential lux impact for both pre- and post-curfew is negligible and not significant as the vertical intrusion limit is not exceeded. As discussed, the site is not intending to operate overnight; therefore, the post-curfew limit is not relevant. But, as shown, the sensitive lighting design has near-zero contribution towards sensitive receptor positions.

Sky Glow

9.6 Proposed luminaires will be installed with no, to a very minor tilt at selective spots, tilt angles. The Phillips Clearflood and Luma have no upward light contribution. There are no significant sky glow contributions from the proposed installation.

9.7 The existing luminaires are outside the scope of these proposals. However, it is noted that all the existing luminaires include a large tilt angle (estimated at 50°). The Phillips luminaires include a wide distribution; therefore, the tilt applied to the existing luminaires may no longer be needed. Recommendations are listed in the section below, which would provide improvements to the baseline lit environment.

10 Operational Control and Mitigation

10.1 The Applicant requires lighting use during early to mid-evening up to 20:00. The existing installation includes PIR motion detection and switch off from 20:00. These same specifications will be included for the proposed lighting.

- 10.2 The Phillips luminaires include a wide distribution, and several of these are near or opposite the existing luminaires. Consequently, the large tilt applied to the existing luminaires may no longer be required. Model tests indicate that placing the luminaires flat (i.e. no tilt) still provides acceptable lighting across the site, with reference to the BS standards. However, it is recognised that a limitation of the model assumes all existing luminaires are Ansell Lighting Calinor Evo's, which may not be the case.
- 10.3 The operator should test whether these existing luminaires can be placed flat and the tilt reduced. This would provide benefits to the environment, but also to customers and staff, as tilt reductions will reduce glare effects.
- 10.4 The night photography in Appendix B shows that some of the floodlights are unlit. It is unknown if this is specific to the time or if the products no longer function. Any non-functional lighting should be replaced with a Phillips Clearflood luminaire.

11 Designers Risk Assessment

- 11.1 This lighting design has been prepared for a planning application. Specifics surrounding installation, connection 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 and output calculations are based on the products used, presented in **Appendix C**. Any revisions to this may alter the final lighting profile and should be accounted for in a redesign.
 - Assumptions are made for the existing luminaires as a means of aiding the modelling and calculations for the proposed lighting. It is assumed that no significant changes or removal of luminaires (beyond those identified) will occur. Any significant changes may affect the modelled values and the number of proposed luminaires required.
 - The design does not account for installation or electrical installation considerations, site conditions or provide an installation or maintenance risk assessment. Future maintenance needs have been accounted for in the design.
 - The contractor shall liaise with the District Network Operator (DNO) (UK Power Networks) 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 a 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.

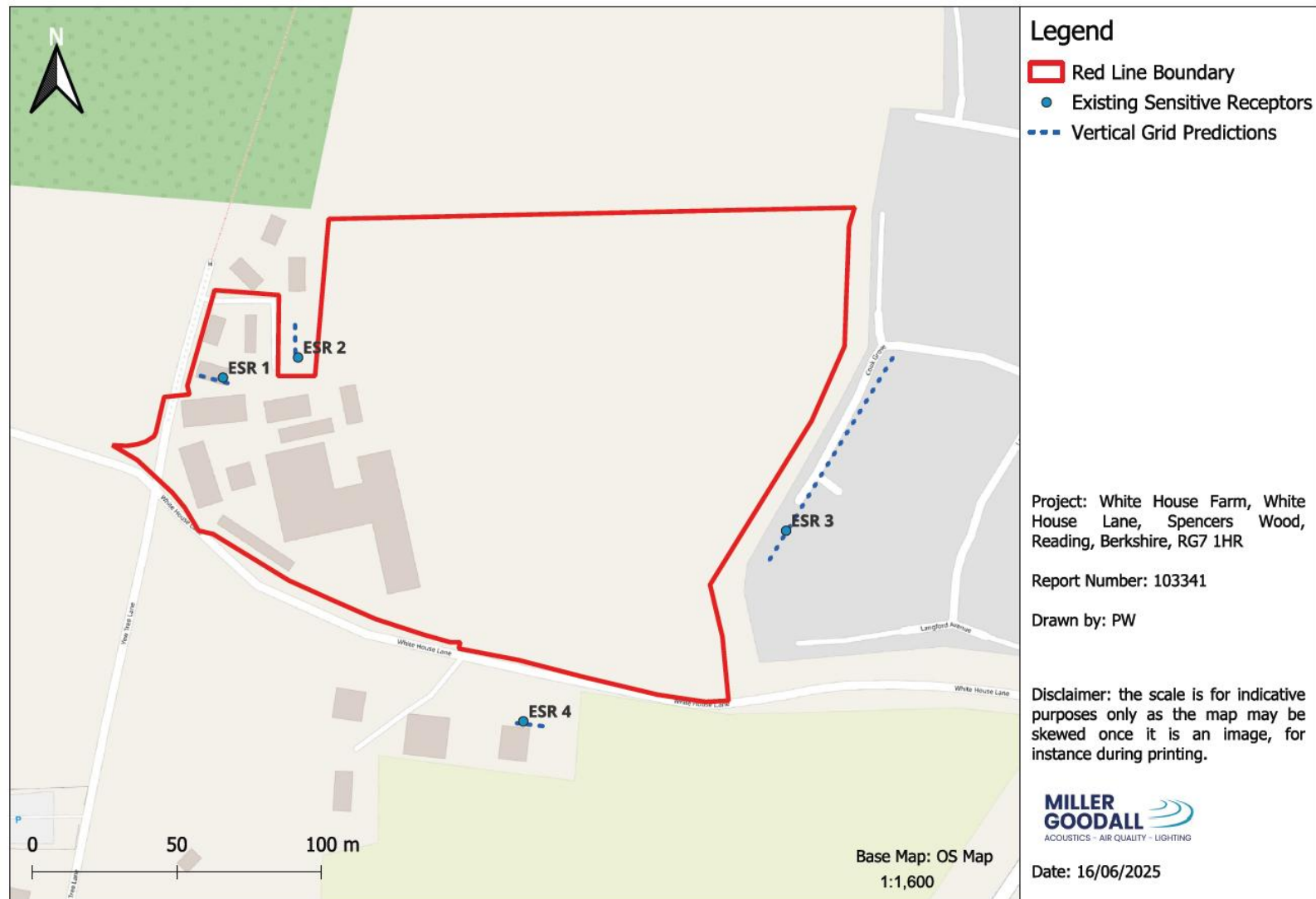
- The design assumes there are no obstacles. Obstacles identified in the site layout plan have been accounted for in the design (for example, structures and vegetation).
- Emergency lighting for fire evacuation is not included in this design. This should be designed to BS5266 Emergency Lighting Requirements by a suitably qualified professional.
- Future maintenance should be carried out according to appropriate standards, health & safety procedures and the manufacturer's requirements/standards.
- The installation and column planting shall be carried out according to relevant British Standard Institution guidance relevant to the activity and/or required action.

12 Conclusion and Summary

- 12.1** An exterior lighting design and impact assessment have been completed for the proposed commercial development at White House Farm, White House Lane, Spencers Wood, Reading, Berkshire, RG7 1HR.
- 12.2** The design includes best practice measures and design procedures to reduce obtrusive light impacts, meeting the requirements of the Institution of Lighting Professionals guidance. The assessment concludes that the potential illuminance vertical intrusion impact on surrounding human sensitive receptors is not significant.
- 12.3** The following operational controls will be used to control light in the post-curfew period:
- Lighting is switched off from 20:00.
 - Passive infrared sensor motion detection fitted to all luminaires.
- 12.4** The assessment demonstrates an appropriate lighting design for the intended use. It indicates that there will be no impact on surrounding sensitive receptors and that the adverse effects on the surrounding environment are limited due to the inclusion of embedded mitigation and operational controls in the design creation.
- 12.5** There is no reason for the application to be refused on the grounds of lighting.

APPENDICES

Appendix A – Site Location and Receptors



Appendix B – Baseline Environment and Existing Equipment Details

Existing Equipment, Demolition and Products to be Removed



*Note: the annotated plan lists halogen luminaires, but the photographs indicate LED fixtures.

Photographs



Ansell Lighting branding on the case



The Eastern building fronts onto White House Lane (south façade). Three budget luminaire floodlights, tilted.



Eastern building (east façade). A new building will be constructed opposite.



Floodlight above door. Single-chip LED. No branding.



Existing customer entrance. This floodlight is intended to be retained. Whilst it exists and is established, recommendations are made in this report to reduce the tilt as it is no longer required due to the wide distribution of the Phillips proposed luminaires in this area.



Viewpoint: looking towards the eastern building, southern façade. The middle and right side light are unlit. Glare is evident due to the tilt angle.



Viewpoint: looking towards the eastern building, east façade. The 'Service Department' image shown above. Glare is evident due to the tilt angle.



Single LED-chip luminaire, shown in the daytime photo, above the door



Luminaires on the eastern façade of the building. Glare is evident. Dark spots between the luminaires show the limited optical control associated with the existing luminaires.

Appendix C – Lighting Reality: Reality Outdoor, Design Output

The model output shows the results of MF 1.0 (impact). The design was initially prepared using the relevant calculated MF to ensure installation meets the relevant lighting requirements for the lifespan of the installation.

DATE: 27 November 2025
DESIGNER: Philip Walton
PROJECT No: 103341
PROJECT NAME: White House Farm, Lister Wilder, RG7 1HR



Lighting design drawn using AutoCAD File: 00836-00 - N - Lister Wilder - White House Farm

Lighting Standard, BS 12464-2:2024
- Task: Main Entrance Access (regular vehicle traffic)
Horizontal Average: 20 / Uniformity: 0.20 (20%)
- Task: Slow moving traffic, building frontage
Horizontal Average: 10 / Uniformity: 0.40 (40%)
- Task: 'Medium' car park
Horizontal Average: 10 / Uniformity: 0.25 (25%)

Exterior Lighting Design

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	Light Spill	470778.78	165868.22	189.19	146.10	1.49	1.49
2	Access - Entrance	470806.25	165959.34	68.01	10.92	1.48	1.37
3	Customer Area & Parking	470819.26	165885.05	61.24	74.76	1.49	1.50
4	Staff Parking (South)	470883.03	165886.76	50.91	20.84	1.50	1.49
5	New Build (West)	470890.86	165910.95	16.62	47.64	1.38	1.49
6	New build (East)	470918.73	165917.30	9.75	47.93	1.39	1.50
7	ESR 1 - Mobile Home (NW)	470815.10	165983.28	10.17	0.50	1.45	0.25
8	ESR 2 - Mobile Home (NE)	470845.54	165989.37	9.33	0.50	1.33	0.25
9	ESR 3 - Cook Grove	471026.13	165942.90	42.18	3.00	1.45	1.50
10	ESR 4 - Dwelling (south)	470920.21	165863.97	11.36	3.00	1.42	1.50

Luminaires

Luminaire A Data

Supplier	
Type	Calinor EVO
Lamp(s)	4000K
LampFlux(klm)/Colour	2.25 4000/
File Name	ACAE20_1_CW_B.Idt
Maintenance Factor	1.00
Imax70,80,90(cd/klm)	40.9, 7.5, 0.1
No. in Project	15

Luminaire B Data

Supplier	
Type	BVP650 T25 LED80-4S/730 PSU DX 10 BL 1/3000
Lamp(s)	LED80-4S/730/3000
Lamp Flux (klm)	8.00
File Name	BVP650 T25 LED80-4S_730 PSU DX10 BL 1 - ClearFlood.ies
Maintenance Factor	0.80
Imax70,80,90(cd/klm)	491.6, 70.5, 0.0
No. in Project	14



Luminaire C Data

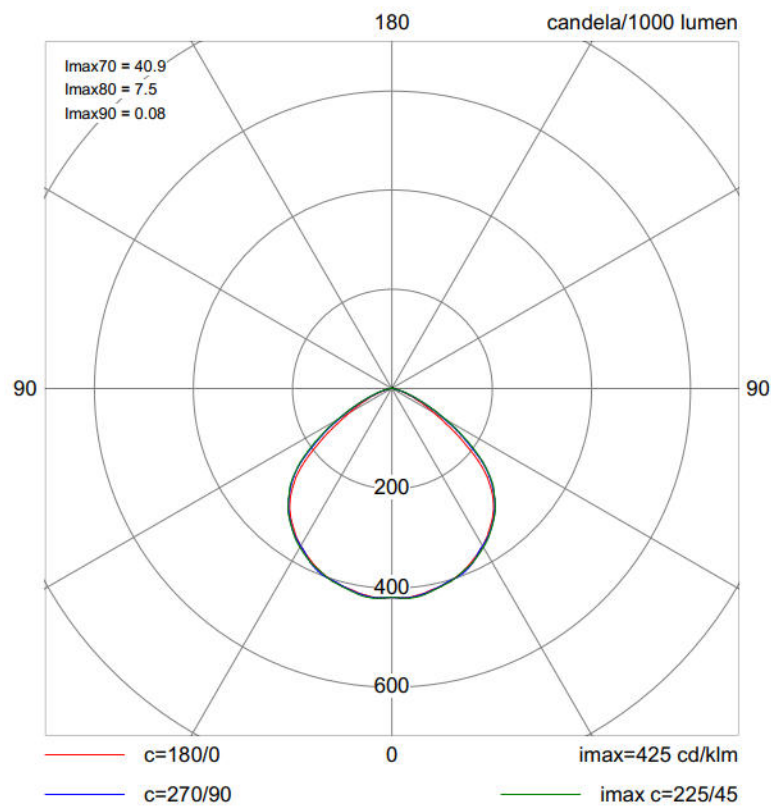
Supplier	Philips
Type	BGP702 DW50
Lamp(s)	LED-HB 5.2S 740
Lamp Flux (klm)	4.00
File Name	Luma Gen2 Micro_BGP702_DW50_4000_2 0LED_5.2S_CLO_L90_740.ies
Maintenance Factor	0.80
Imax70,80,90(cd/klm)	595.5, 51.0, 0.0
No. in Project	7

Layout

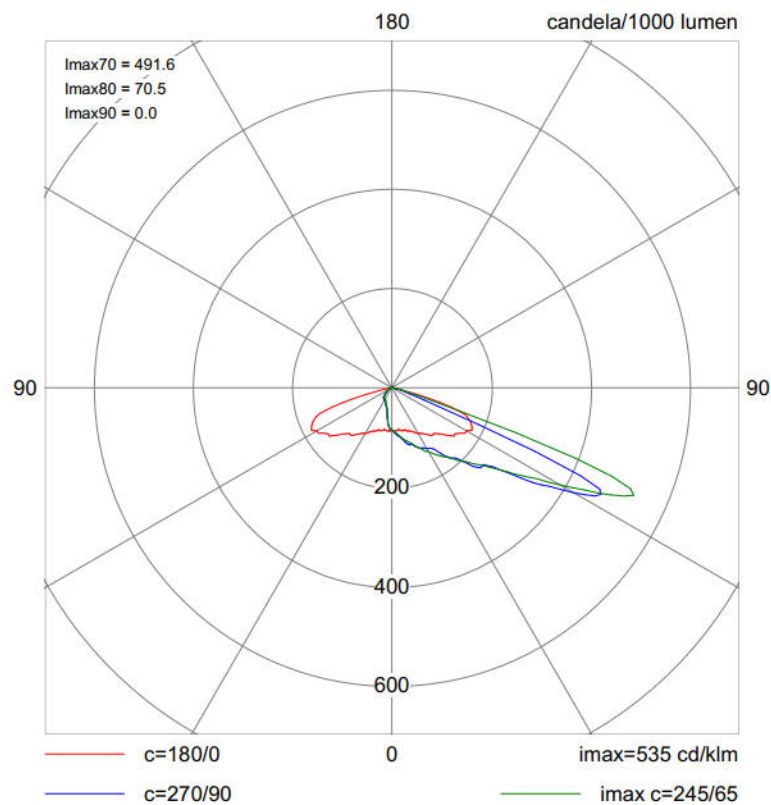
ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Target X	Target Y	Target Z
1	A	470948.04	165903.70	4.00	92.00	50.00	0.00	0.15			
2	A	470912.51	165901.85	4.00	92.00	50.00	0.00	0.15			
3	A	470930.08	165902.80	4.00	92.00	50.00	0.00	0.15			
4	A	470890.40	165910.80	4.00	282.00	50.00	0.00	0.15			
5	A	470879.20	165908.18	4.00	282.00	50.00	0.00	0.15			
6	A	470884.93	165909.55	4.50	282.00	50.00	0.00	0.15			
7	A	470890.60	165911.95	4.00	16.00	50.00	0.00	0.15			
8	A	470888.29	165921.68	4.00	16.00	50.00	0.00	0.15			
9	A	470886.03	165931.11	4.00	16.00	50.00	0.00	0.15			
10	A	470880.45	165954.40	4.00	16.00	50.00	0.00	0.15			
11	A	470871.49	165928.18	4.00	282.00	50.00	0.00	0.15			
12	A	470865.23	165926.68	4.50	282.00	50.00	0.00	0.15			
13	A	470857.04	165924.74	4.00	282.00	50.00	0.00	0.15			
14	B	470897.20	165954.28	4.00	196.00	5.00	0.00	0.40			
15	B	470905.51	165919.55	4.00	196.00	5.00	0.00	0.40			
16	B	470901.62	165935.70	4.00	196.00	0.00	0.00	0.40			
17	B	470909.64	165956.75	4.00	16.00	0.00	0.00	0.40			
18	B	470914.02	165938.30	4.00	16.00	0.00	0.00	0.40			
19	B	470917.80	165922.33	4.00	16.00	0.00	0.00	0.40			
20	C	470833.36	165975.25	5.00	282.00	5.00	0.00	0.50			
21	C	470864.00	165979.10	5.00	277.00	5.00	0.00	0.50			
22	B	470876.83	165962.38	4.00	107.00	0.00	0.00	0.40			
23	B	470836.31	165949.73	4.00	194.00	10.00	0.00	0.40			
24	B	470912.76	165916.15	4.00	284.00	0.00	0.00	0.40			
25	B	470846.85	165929.70	4.00	285.00	0.00	0.00	0.40			
26	B	470839.51	165935.74	4.00	195.00	10.00	0.00	0.40			
27	C	470865.82	165906.71	5.00	73.00	5.00	0.00	0.50			
28	C	470839.91	165916.17	5.00	60.00	0.00	0.00	0.50			
29	B	470843.87	165958.01	4.00	101.00	0.00	0.00	0.40			
30	A	470883.90	165939.94	4.00	16.00	50.00	0.00	0.15			
31	A	470881.70	165948.89	4.00	16.00	50.00	0.00	0.15			
32	C	470814.45	165937.06	5.00	15.00	5.00	0.00	0.50			
33	B	470863.22	165962.65	4.00	101.00	0.00	0.00	0.40			
34	B	470901.99	165961.23	4.00	109.00	0.00	0.00	0.40			
35/1	C	470816.06	165961.31	5.00	279.00	0.00	0.00	0.50			
36/1	C	470816.06	165961.31	5.00	99.00	0.00	0.00	0.50			

Polar Diagrams

Luminaire A Calinor EVO

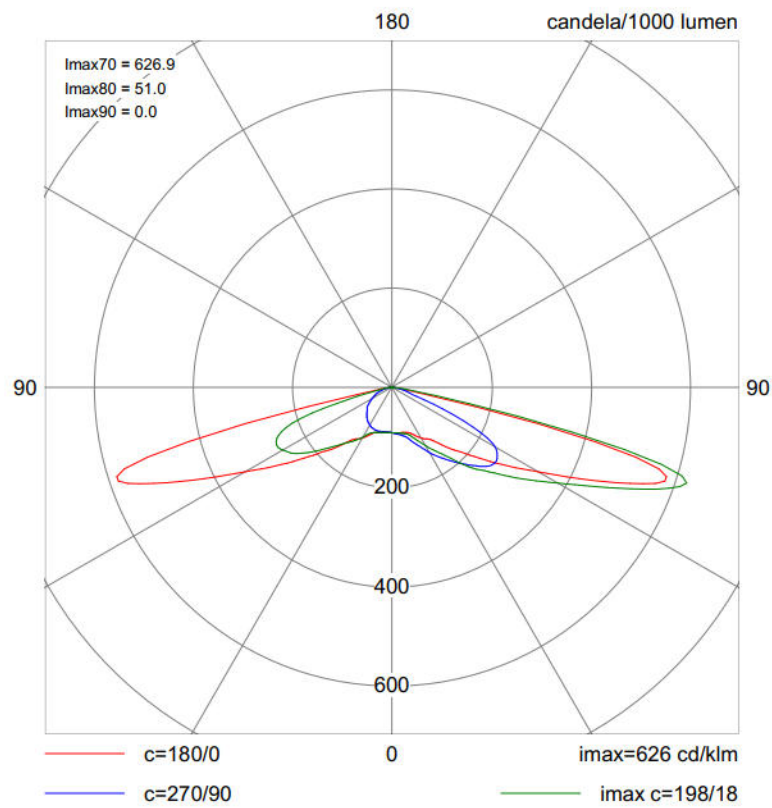


Luminaire B BVP650 T25 LED80-4S/730 PSU DX 10 BL1 /3000



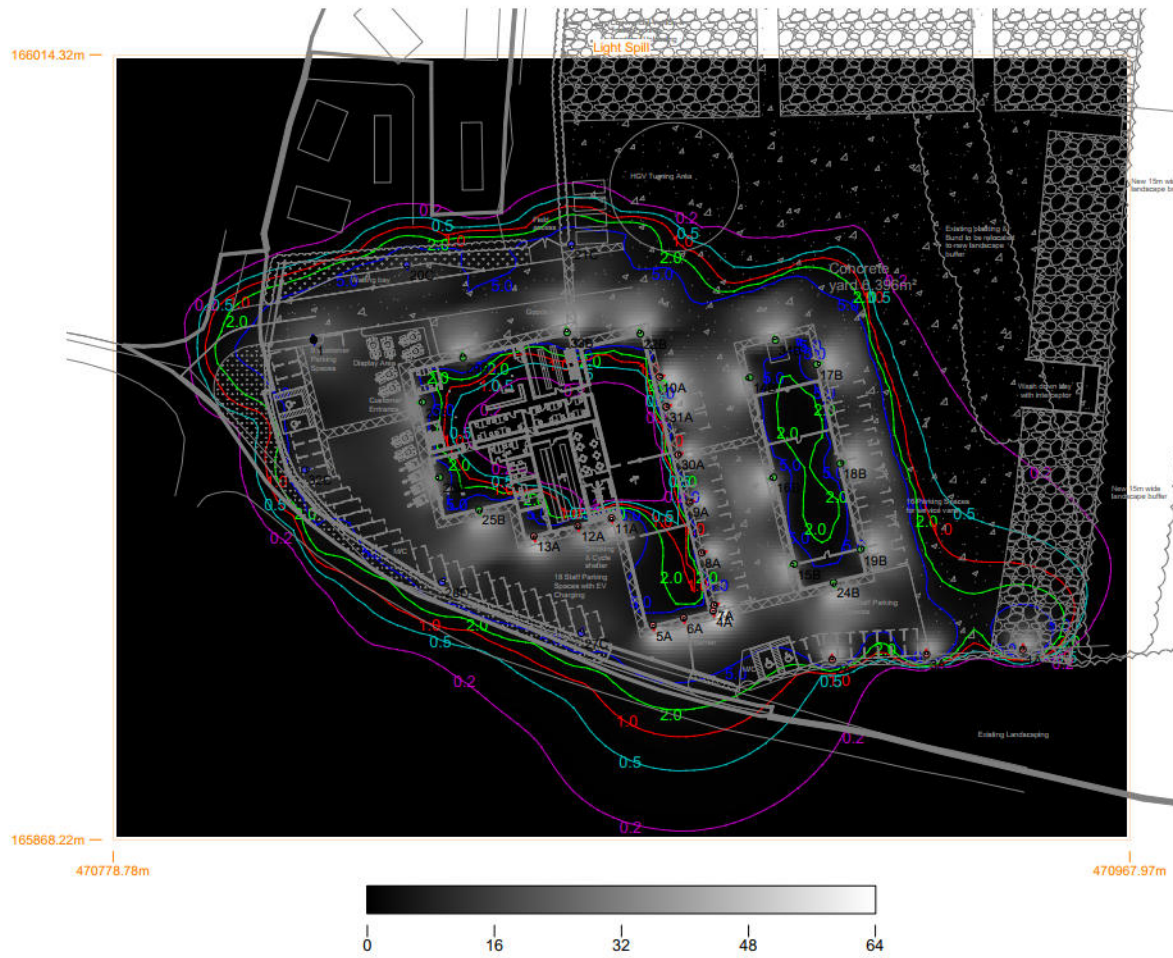
Polar Diagrams Continued

Luminaire C BGP702 DW50



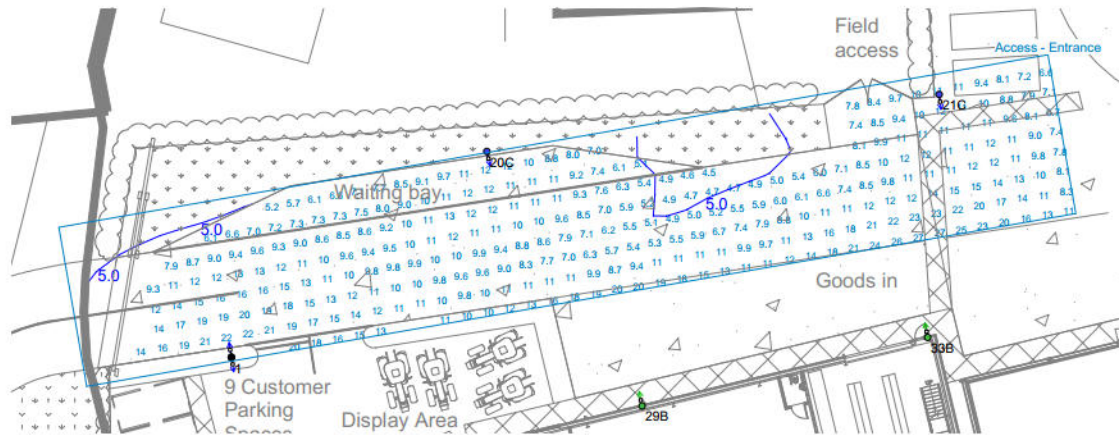
Horizontal Illuminance (lux)

Light Spill



Horizontal Illuminance (lux)

Access - Entrance



Results

Eav	11.11
Emin	4.46
Emax	26.73
Emin/Emax	0.17
Emin/Eav	0.40

Horizontal Illuminance (lux)

Customer Area & Parking

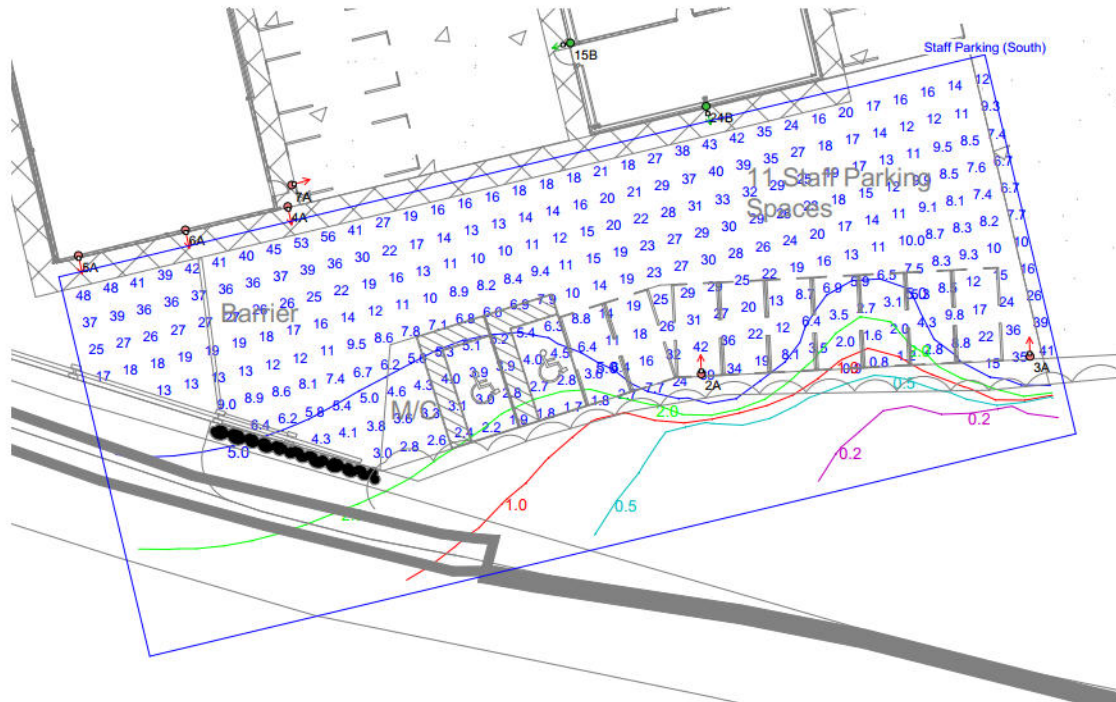


Results

Eav	13.99
Emin	4.56
Emax	49.05
Emin/Emax	0.09
Emin/Eav	0.33

Horizontal Illuminance (lux)

Staff Parking (South)

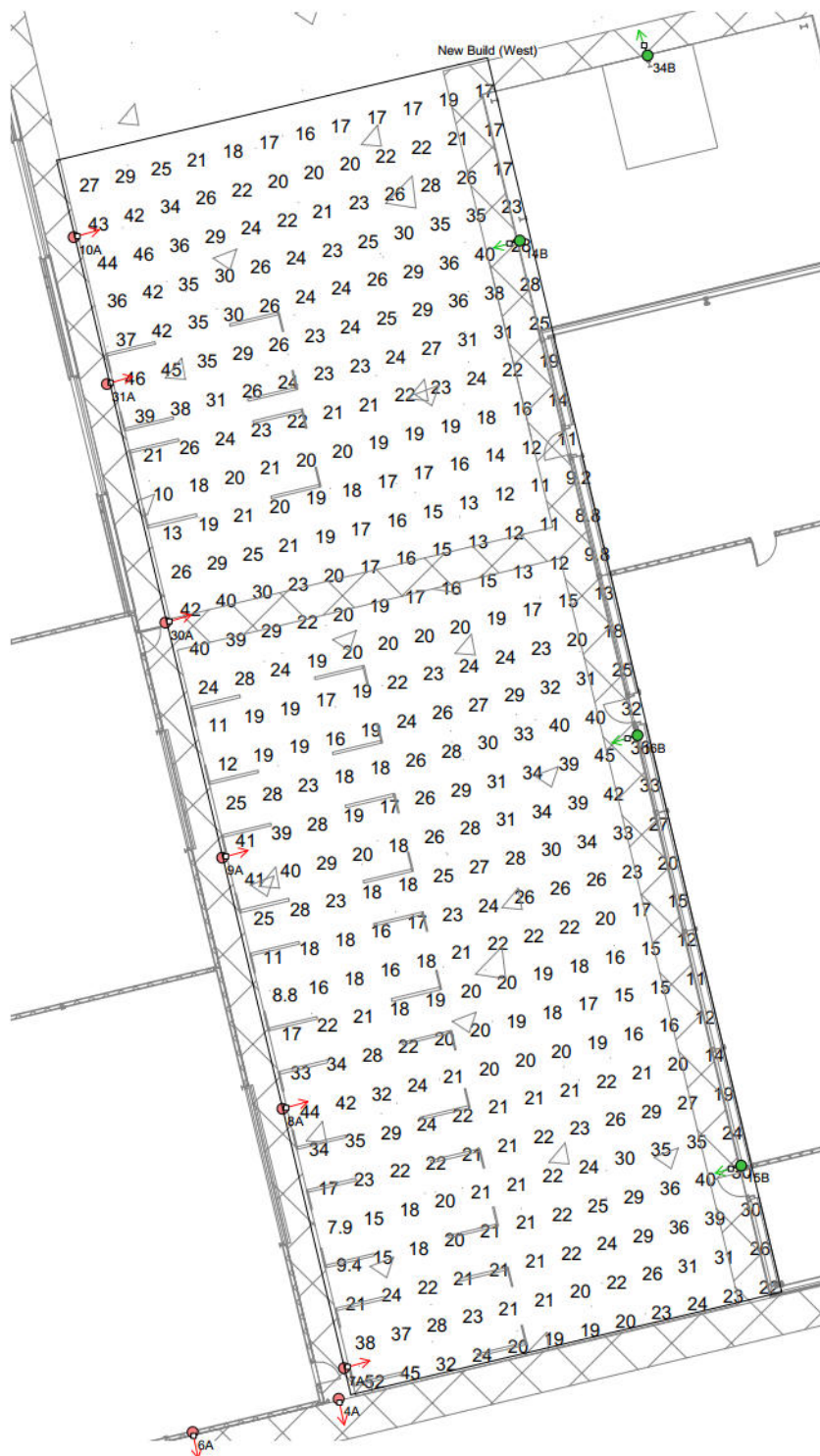


Results

Eav	16.94
Emin	0.84
Emax	55.91
Emin/Emax	0.02
Emin/Eav	0.05

Horizontal Illuminance (lux)

New Build (West)

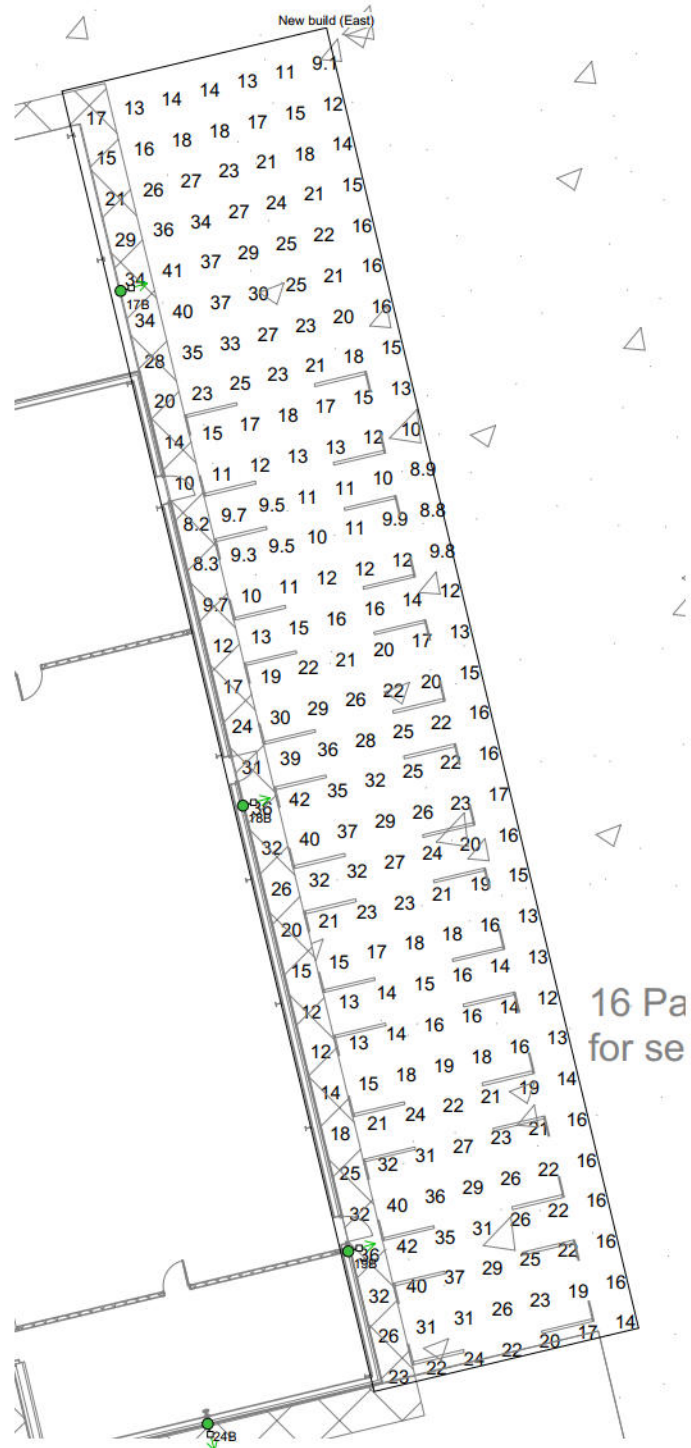


Results

Eav	24.01
Emin	7.85
Emax	52.24
Emin/Emax	0.15
Emin/Eav	0.33

Horizontal Illuminance (lux)

New build (East)



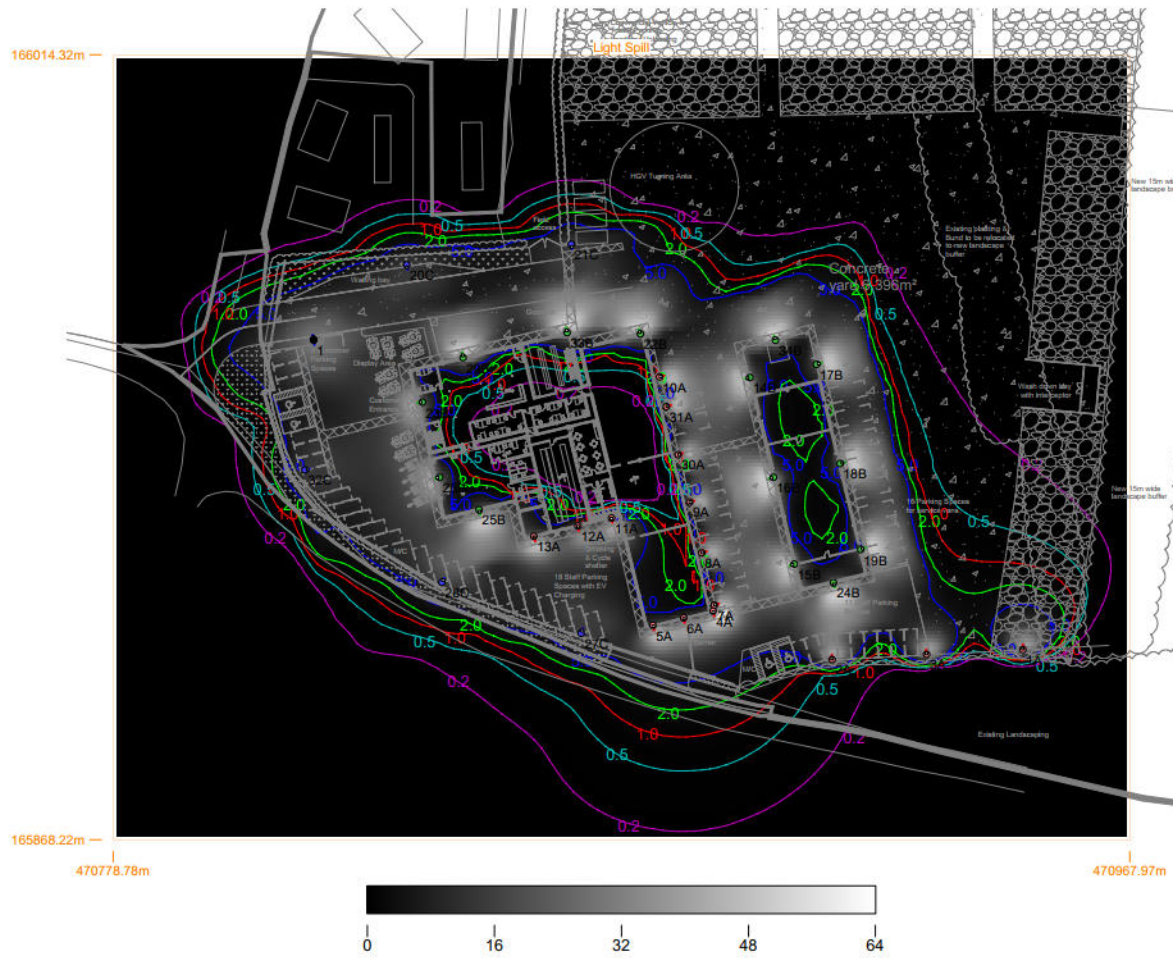
Results

Eav	20.78
Emin	8.21
Emax	42.41
Emin/Emax	0.19
Emin/Eav	0.39

**The following pages show
the results of the impact
assessment, with the
maintenance factor set to
1.0**

Horizontal Illuminance (lux)

Light Spill



Illuminance (lux)

ESR 1 - Mobile Home (NW)

0.2	0.2	0.2	0.2	0.2	0.2	0.3
0.2	0.2	0.2	0.2	0.2	0.3	0.3

Results

Eav	0.21
Emin	0.16
E _{max}	0.32
Emin/E _{max}	0.49
Emin/Eav	0.72

Illuminance (lux)

ESR 2 - Mobile Home (NE)

0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	0.1	0.1

Results

Eav	0.08
Emin	0.07
E _{max}	0.10
Emin/E _{max}	0.72
Emin/Eav	0.88

Illuminance (lux)

ESR 3 - Cook Grove

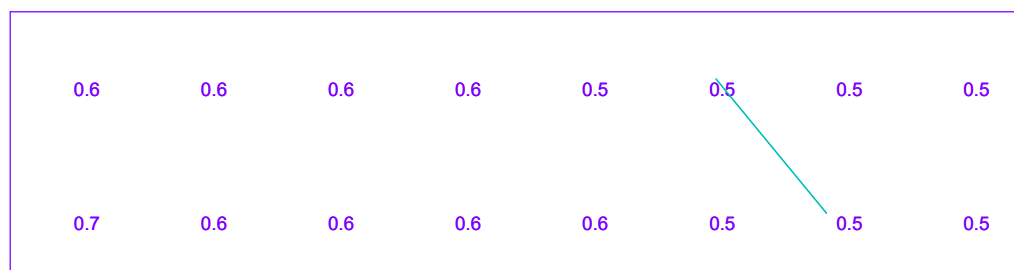
[illegible]

Results

Eav	0.21
Emin	0.16
E _{max}	0.25
Emin/E _{max}	0.67
Emin/Eav	0.80

Illuminance (lux)

ESR 4 - Dwelling (south)



Results

Eav	0.56
Emin	0.45
E _{max}	0.67
Emin/E _{max}	0.67
Emin/Eav	0.81

Appendix D – AutoCAD Drawing showing Design Details and Outputs

The AutoCAD output shows the results of MF 0.80 (design).



ESR 1 – Mobile Home (NW)

ESR 2 – Mobile Home (NE)

Wash down Bay with interceptor

ESR 3 – Cook Grove

ESR 4 – Dwelling (south)

Exterior Lighting Design

Miller Goodall Ltd
Ashworth House
Deakins Business Park
Egerton
Bolton
BL7 9RP
Tel: 01204 596166
E-mail: info@millergoodall.co.uk
www.millergoodall.co.uk

The lighting design has been prepared for the development planning application. The design is subject to comment and approval by the local authority and/or overseeing organisation. It is a preliminary design not for construction.

Installation is subject to technical approval and sign off.

The design has been prepared in accordance with Construction Design Management Regulations 2015, Part 3 Health and Safety Duties and Roles, Duties of Designer.

See the accompany lighting impact assessment and Reality Outdoor model outputs for details of relevant CDM risks and technical details of the prepared lighting design.

Installation constraints associated with civil, electrical and engineering disciplines require further consideration post-planning and before installation. Installation and constraints must be identified in accordance with specific standard, British Standards relevant to the discipline.

The lux drawing shows the outputs of the calculated maintenance factor (0.##).

Lighting standard
Table 6-41 General requirements of BS 12464-2
- Task: Main Entrance
Access (regular vehicle traffic)
Horizontal Average: 20 / Uniformity: 0.20 (20%)
- Task: Slow moving traffic, building frontage
Horizontal Average: 10 / Uniformity: 0.40 (40%)
- Task: 'Medium' car park
Horizontal Average: 10 / Uniformity: 0.25 (25%)

Specification
Product: Clearflood (DX10), Luma Gen2 (DW50)
Colour Temperature: 4000K
IK09, IP66
Tilt angle: 0 degree
Install height: 4m
(Clearflood), 5m (Luma Gen2)
Mounting: Clearflood (stirrup bracket, wall), Luma Gen2 (Post-top)

Existing Product (est.)
Ansell Lighting Calinor EVD 4000K, symmetrical optic

Note: Concerning area 'Staff Parking South', this area is lit by the Ansell Lighting, which has been lit ad-hoc according to the needs of the business using a wholesaler Floodlight overtime. A Clearflood product has been installed on the south facade of the new unit to fill a dark spot, but otherwise the Ansell Lighting symmetrical optic has limited ability to fulfil the preferred BS uniformity target. The Operator is comfortable that their needs are met using these existing luminaries at this location.

2	27/11/2025	Layout update	PW	PW
1	22/07/2025	Initial issue	PW	PW

Rev. Date. Purpose Drawn byApproved by

MILLER GOODALL
ACOUSTICS - AIR QUALITY - LIGHTING

Project: White House Farm, Lister Wilder

Client: Bourne Valley Associates Ltd

Scale @ A1: 1:6 Project Number: 103341

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 (cd/m²) 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 – often expressed in terms of ‘cool’ (4000 Kelvin (K)), ‘intermediate’ (3500 K) and ‘warm’ (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

Threshold Increment (TI) Measure of the loss of visibility caused by the disability glare of luminaires of a road lighting installation

Uplighter A light placed or designed to throw illumination upwards, usually for architectural purposes

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.

