



Consideration of Potential Impact from Light Emissions for a proposed replacement Cattle Housing building at Black Moss Farm, Elmridge, Chipping, PR3 2NY.

Prepared for:

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1. Introduction

- 1.1. Martin Environmental Solutions has been commissioned to undertake a consideration of the potential impact from installed lighting associated for a proposed replacement Cattle Housing building at Black Moss Farm, Elmridge, Chipping, PR3 2NY.

Site Location and Context

- 1.2. The development site is situated in a predominantly agricultural area surrounded by agricultural pasture land. The main farm complex lies to the east and south of the site with Black Moss Cottage to the northwest of the farm, ~78m away.
- 1.3. An aerial Photograph is enclosed in Figure 1, together with a proposed layout drawing in Figure 2.
- 1.4. The report has been produced to clarify the potential impact on the proposed development and to identify mitigation measures if required to ensure the development is appropriate in terms of light impact.



2. Policy and Guidance

- 2.1. The impact of intrusive lighting can be a material consideration in the determination of planning applications. The planning system has the task of guiding development to the most appropriate locations. It is recognised that on occasions it will be difficult to reconcile some land uses, such as housing, or hospitals, with other activities that may generate high levels of light pollution e.g., sports arenas, transport facilities. However, the planning system is tasked to ensure that, wherever practicable, sensitive developments are separated from major sources of light pollution.
- 2.2. The Government's publication of the National Planning Policy Framework (NPPF), updated in December 2025, states that planning policies and decisions should ensure that new development is appropriate for its location taking into account the effects of pollution on health... In doing so decisions should limit the impact of light pollution from artificial light on local amenity...
- 2.3. In addition, there exists several guidance documents on the design of lighting installations to avoid any adverse impact from installations including the minimisation of overspill from sites.
- 2.4. The Environmental Protection Act 1990 also includes artificial lighting emitted from premises as a potential statutory nuisance or prejudicial to health and action can be taken against any site causing a statutory nuisance due to light emissions.
- 2.5. Developments therefore need to be designed to ensure that lighting from the site or lighting that has the potential to impact on a new development will not result in a statutory nuisance, by way of design and/or mitigation measures.
- 2.6. The Institute of Lighting Engineers has provided guidance in the form of the "Guidance Note 1 for the reduction of obtrusive light" 2021. The guidance gives advice on the siting of lightings and the level of overspill, and upward light that is suitable for different areas and in partnership with the Bat Conservation Trust the '*Bats and artificial lighting in the UK*' guidance.



2.7. These documents deal key considerations when considering the installation of lighting, particularly external lighting, with the key aim to avoid light spillage from the site.



3. The Assessment

The development

3.1 The proposed development consists of the erection of a modern agricultural building to replace the old housing on site. The building will consist of a steel frame with 1.5m high concrete walls to the lower section of each wall, and open curtained area and profile metal sheeting to the roof and gable ends.

3.2 Figure 2 below provides an overview of the proposed development.

Potential Impact

3.3 The proposed lighting design includes a 30 luminaires points within the building, with two additional security lights, one on each gable end. These will be fitted with PIR sensors to operate only when required. The proposed lighting will be modern LED luminaires designed to minimise upward light and concentrate the lighting towards the floor. This helps to minimise light emissions from the site.

3.4 The following lighting proposal and calculations have been produced to ensure a suitable level of lighting is provided within the building while minimising the overspill light and the effect on nearby properties. Philips' 'Calculux' design software has been used to prepare the lighting design and is included in Appendix 1.

3.5 The design has been based around the Collingwood Caiman CSP 4ft internal strip luminaire and the luminaire and a Collingwood FL02_CS 30 floodlight, with PIR detector. Details of each are provided in Appendix B.

3.6 Internal luminaires are just above the eaves height and point straight down with the roof above.

3.7 An overspill plot has been prepared for the design. This is included within Appendix 1, Section 3 of this report. The drawing and table show predicted light levels over an area surrounding the site, are generally below 0.1 lux off site, with a level of 0.00Lux at the nearby residential property. This does not include any existing lighting in the area or wider farm complex.



- 3.8 The Institute of Lighting Engineers 'Guidance Notes for the Reduction of Obtrusive Light GN01:2021' in edifies Environmental Zones and associated ideal lighting levels within each. The area in question lies within designated environmental area, namely the Forest of Bowland Area of Outstanding Natural Beauty (AOB), with a few properties in the area including the farm and neighbouring property and the other agricultural buildings within the larger farm complex.
- 3.9 Given the existing surrounding buildings the site was initially identified as being within an environmental zone E2 or Rural, sparsely inhabited areas, while the wider area outside the farm complex would be environmental zone E1, *Dark or Natural, relatively uninhabited rural areas and AOB's*. However following comments from the council, the site has been reclassified as an environmental zone E1.
- 3.10 The ILE guidance suggests a vertical illuminance at neighbouring properties (light overspill) level of 2lux pre-curfew and 0.1lux post curfew. The lighting design identifies a level of 0.00lux at the nearest neighbouring property, thus complying with the guidance from the ILE.
- 3.11 The ILE guidance also provides information on the level of light to be directed into the night sky or upward light ratio (ULR) as a percentage. The guidance recommends an UPR of 0% for environmental zones E0 & E1, while an E2 zone a level of 2.5% is recommended.
- 3.12 A review of the lighting design has identified an ULR of 0.08%, this ratio is derived from the internal luminaires only, with the security lighting having no effect on the ULR, see Appendix C. The software calculates this figure from the data provided for each luminaire included within the design and is defined as the proportion of flux that is emitted above the horizontal axis of the luminaire.
- 3.13 The internal luminaires beam angles are shown within the flyer information in Appendix B, and it is this information that has been utilised by the software to determine the



resulting ULR. The software does not take account of the fact that the luminaires will be internal to the building, with a roof over them.

- 3.14 The resulting low level of ULR report is therefore an over representation of the true ULR that will be experienced from the development. It is also worth noting that the design does not consider the existing lighting within the area and from other buildings, or a comparison against the existing structure which is to be replaced.
- 3.15 It is sometimes the case that lighting solutions cause nuisance not because of the overspill light but as a result of glare or of the brightness of the lights when seen directly, this is known as the source intensity. To minimise the impact from glare lighting the angle of elevation of the external luminaires – i.e. the angle between the vertical and the line of peak output of the luminaires, also referred to as Tilt90, has been kept at $<70^{\circ}$.
- 3.16 Predictions of source intensity have been made for observer's positions at the nearest residential property. For each of these calculations, the reported figure is the maximum source intensity to be seen by looking at any of the site luminaires. In addition, a hood can be applied to the security light to help restrict the angle of emitted light reducing any over spill or glare towards neighbouring properties. The PIR sensor will ensure its operation only in the event of someone being within the area, again reducing potential impact on any neighbouring land.
- 3.17 The site corresponds to Environmental Zone type E1, defined as '*Dark areas*'. For such an area ILE recommends, for the size of luminaire, a level of 110.5cd, the resulting design provides a level of $<98\text{cd}$ at the nearest receptor property. This would be reduced further with the fitting of a hood to the flood light.
- 3.18 The design calculation does not take into account the existing lighting levels in the area or the fact that a small dense thicket of woodland is present between the neighbouring property and the receptor. Even so the level of potential glare is lower than that recommended and as such no adverse impact is considered likely.



Environmental Impact

3.19 In addition, a consideration of the impact from the site on the surrounding environment has been undertaken, specifically in relation to the impact on bats. It has been confirmed that no bat roosts have been identified in the vicinity of the site although the potential for roosts exists within the existing farm buildings. The site lighting design and overspill plan confirms that this area will not be affected by lighting from the site, with lighting levels being below 1 lux beyond the farm yard.



4 Conclusion

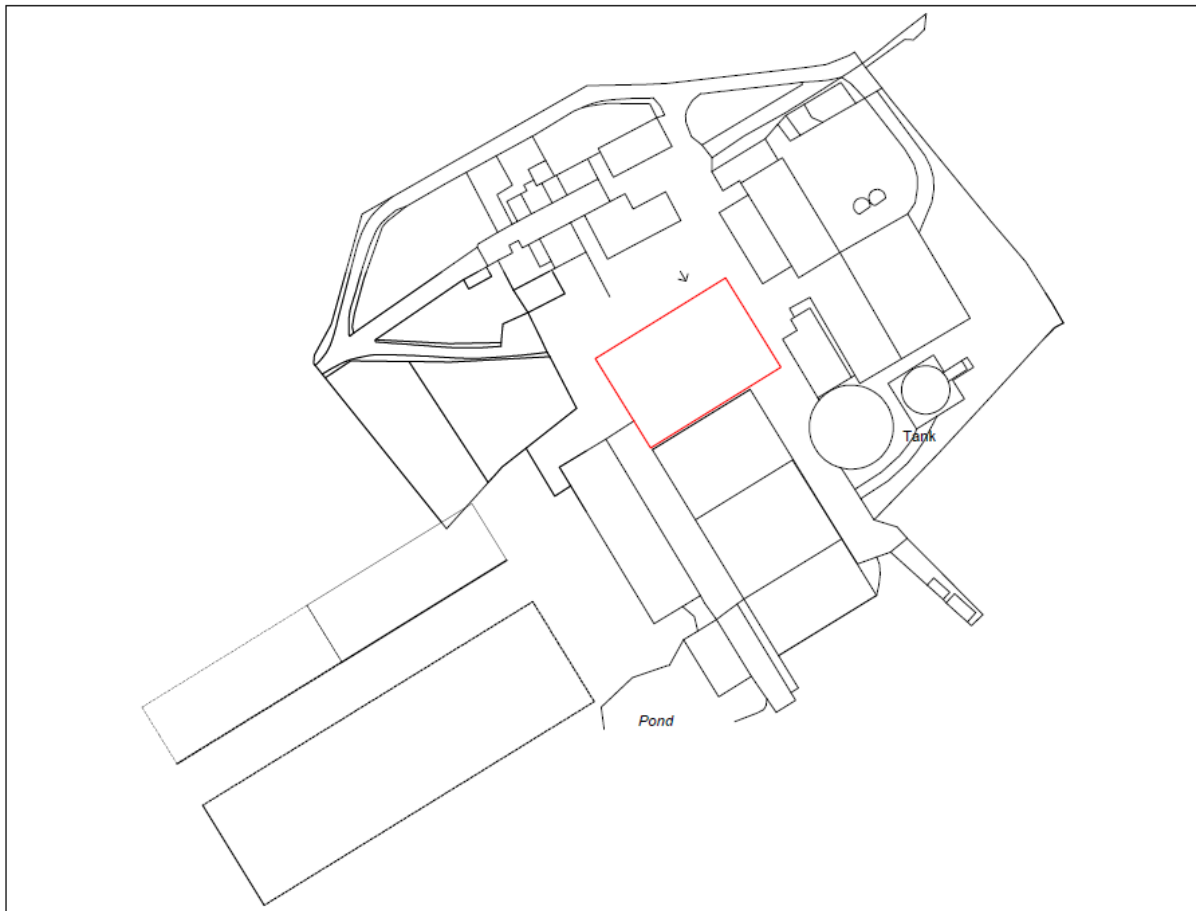
- 4.1 The purpose of the assessment was to explore the impact of the proposed lighting design on neighbouring land uses.
- 4.2 The calculations have not taken into account the existing ambient light, or existing vegetation, however in order to be obtrusive, the overspill light from the site would have to be greater than the existing sources of light in the area.
- 4.3 The lighting design therefore ensures the obtrusive light from the site will not have an adversely impact on adjacent land use as required by the National Planning Policy Framework.



Figure 1 – Aerial Photograph



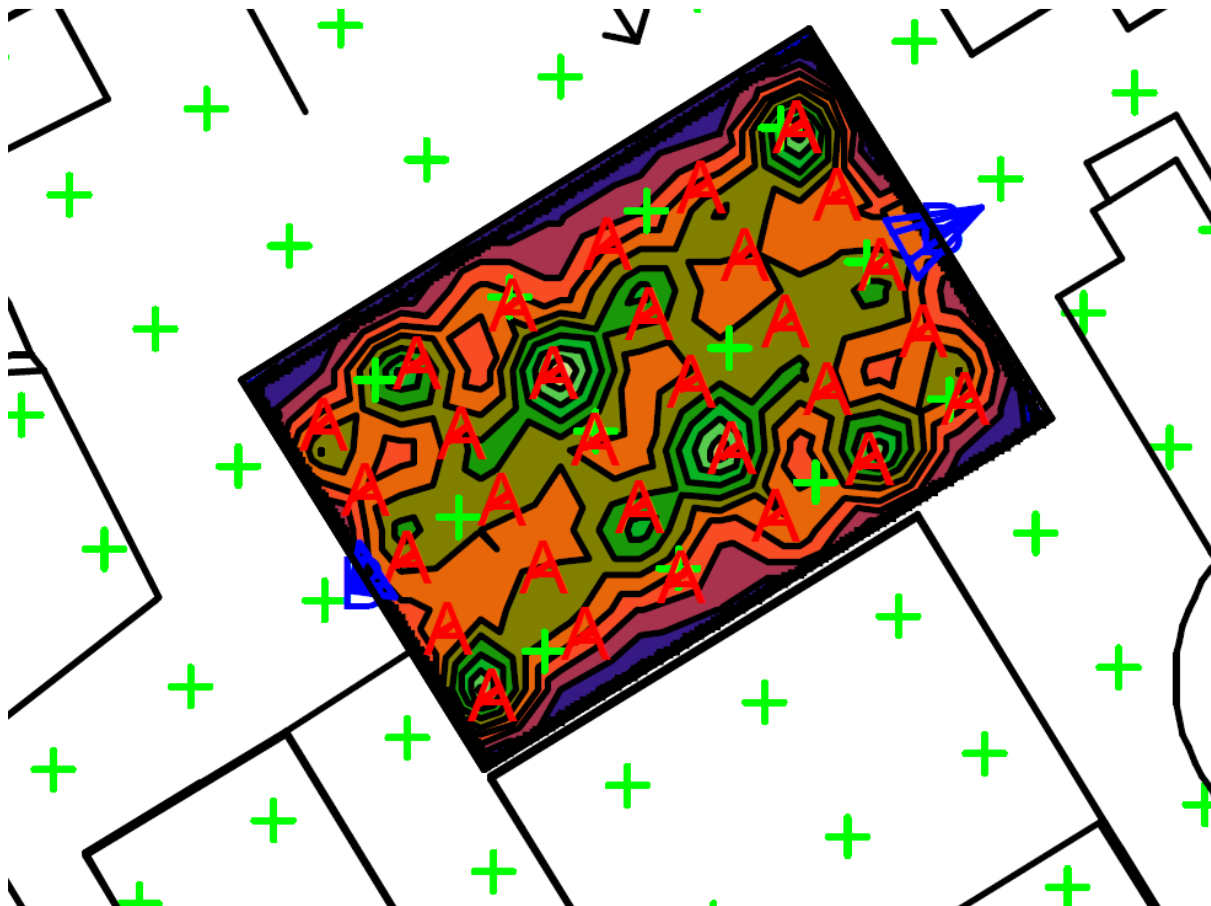
Figure 2 – Proposed Layout Plan



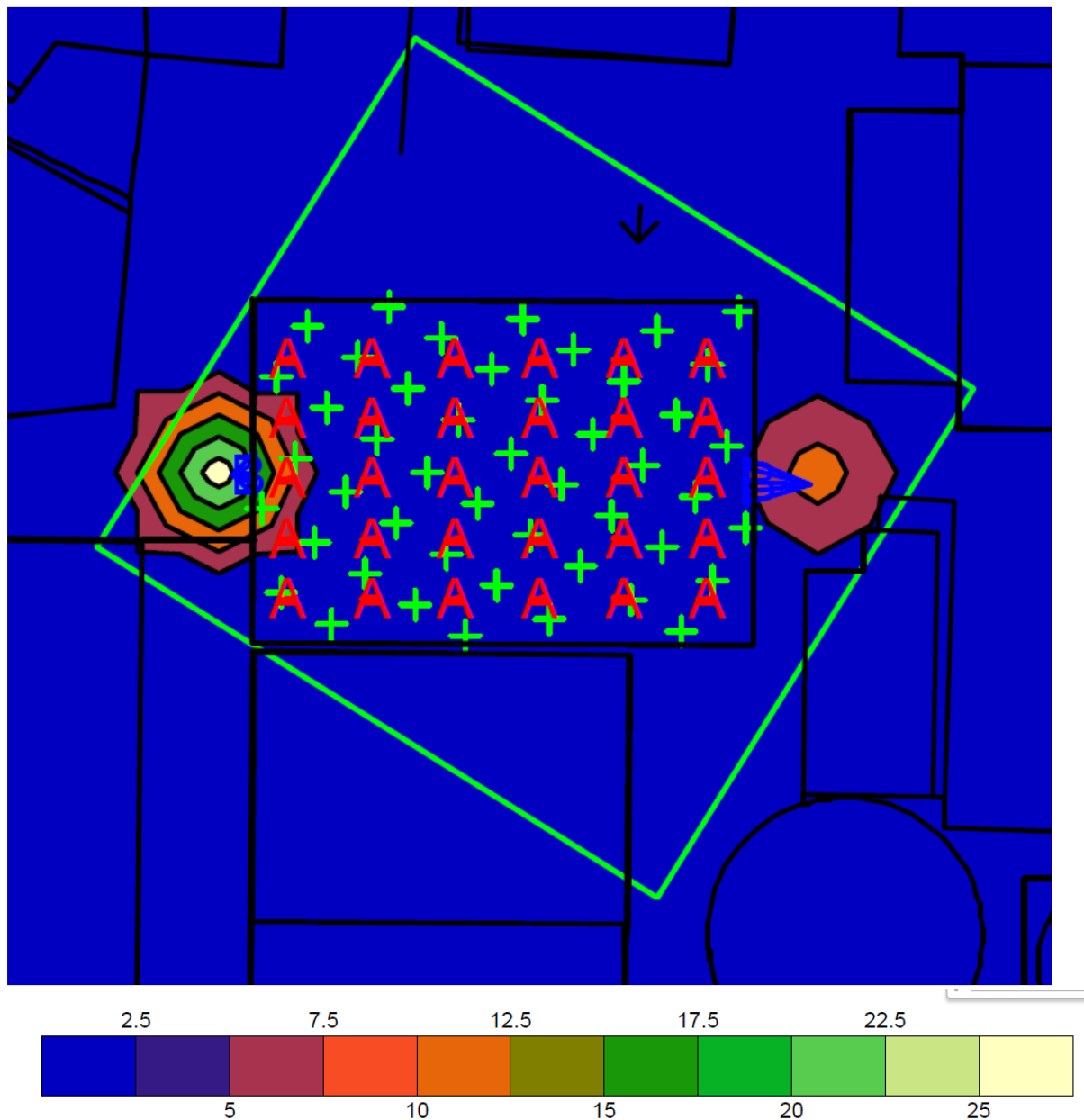
Appendix A – Lighting Design

Separate attachment

Internal Lighting, page 12 extract

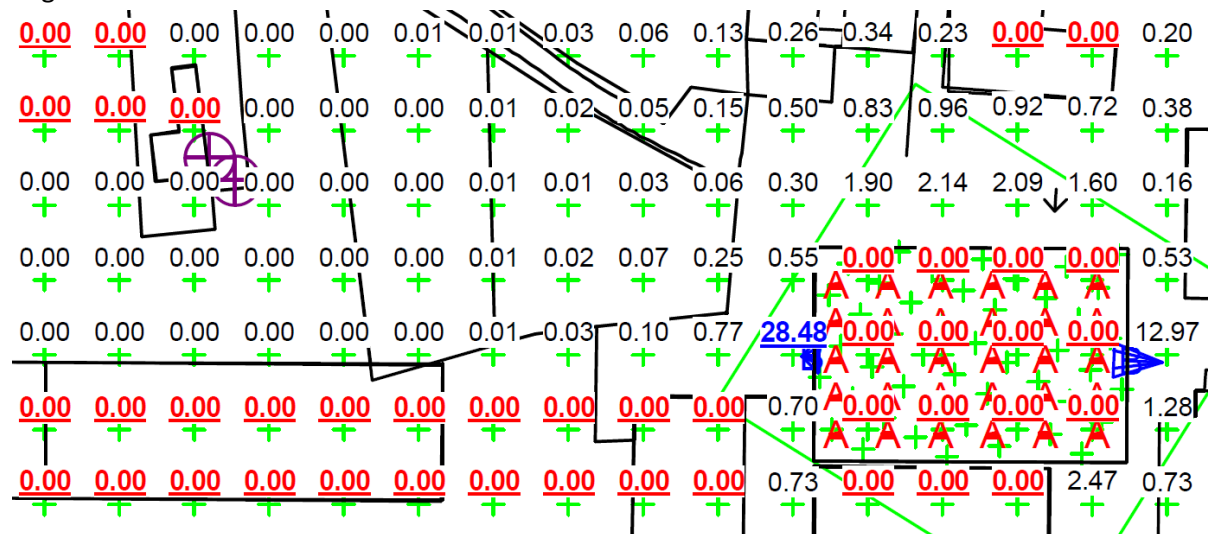


External lighting, Page 18 extract





Page 16 extract



Appendix B – Project Luminaires



CAIMAN CSP 4FT SINGLE

OCT Colour Switchable

FEATURES

IP rating	IP65
IK rating	IK08
CSP Switchable	Switchable OCT
Sensor Option	PIR with accessory
Dimmable Option	No
LED Lifetime	L70 50,000h
Colour Rendering Index	CRI>80
Colour Constancy	SDCM4
Emergency Option	Yes, Self-Test

INSTALLATION INFORMATION

Input	220-240V AC
Maximum Ambient Temperature	-20°C - 35°C
Weight	1.20Kg (EM: 1.60Kg)
Inrush Current	90A 0.5ms
Construction Material	Anti-UV Polycarbonate
SELV	Yes
Electric Class (I, II, III)	I
Suitable for coastal areas	Yes (with modification)
Install Connector Type	Loop In / Loop out
UK Building Regulations	Part P
Mounting Options	Surface
Power Factor	0.9

Photometrics @ 25°C

Product Code	Finish	Type	Beam	W	Colour	lm	lm/W	lx@1m	EM lm	Energy
AC4SN	Grey RAL7005	Standard	120°	20W	3000K	2300	115	561	-	
					4000K	2600	130	623	-	
					6500K	2500	125	599	-	

Default Settings: 4000K colour temperature. Energy rating is a reflection of the LED light source.

WIRING INFORMATION

Cable Required for Connector	H05RN-F cable diameter 4 - 10mm, max conductor size 3x 1.5mm²
Type of Wiring Required	Parallel

ACCESSORIES

EMBOLTMOPEN	Sold Separately
EMBOLTMCOR	3 hour emergency conversion pack, corridor area, manual test
PIRBOLT	PIR on/off daylight Sensor

COLLINGWOOD LIGHTING

LIGHTING INNOVATION

OCT switchable between 3000K, 4000K & 6500K

Grade 316 Coastal protection kit available

BESA mounting kit available

WARRANTY

Warranty	5 years
Battery Warranty	2 years
On-Site Warranty	2 years

FEATURES & BENEFITS

IP65 for the highest level of dust protection and able to withstand jets of water from any direction

304 stainless steel clips for high corrosion resistance and anti-tamper screws for vandal proofing

IK08 for robust impact protection

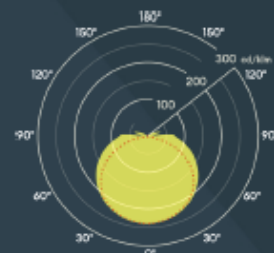
Unique gear tray slots that allow us to easily integrate third party control gear for your project. Just ask.

Extended mounting sliders to help make refurbishment easier

Safety tether cable to gear tray enables fast installation

Compression cable gland included in fixings kit
Emergency option available

BEAM ANGLE: 120°



1245mm
51mm
Ø1mm
Ø1mm



FL02

20W colour switchable floodlight

FEATURES

IP rating	IP65
IK rating	IK07
CSP Switchable	Switchable CCT
Tiltable (°)	180
UGR	UGR<16
Sensor Option	PIR
Dimmable Option	No
LED Lifetime	L70 50,000h
Colour Rendering Index	CR>80
Colour Constancy	SDCM5
Rotation angle (°)	360

INSTALLATION INFORMATION

Input	220-240V AC
Maximum Ambient Temperature	-40°C - 40°C
Weight	620g
Inrush Current	11A 4740s
Construction Material	Black painted cast aluminium
Electric Class (1, 2, 3)	I
Earth Leakage	0.1
Suitable for coastal areas	Yes
Install Connector Type	Flying lead
UK Building Regulations	N/A
Mounting Options	Wall
Power Factor	0.5

Photometrics @ 25°C

Product Code	Finish	Type	Beam	W	Colour	lm	lm/W	lx@1m	Energy
FL02BXCS	Black	Standard	120°	20W	3000K	2200	110	832	
					4000K	2400	120	1040	
					6500K	2400	120	999	
FL02BPCS	Black	PIR sensor	120°	20W	3000K	2200	110	832	
					4000K	2400	120	1040	
					6500K	2400	120	999	
FL02WXCS	White RAL9016	Standard	120°	20W	3000K	2200	110	832	
					4000K	2400	120	1040	
					6500K	2400	120	999	
FL02WPXS	White RAL9016	PIR sensor	120°	20W	3000K	2200	110	832	
					4000K	2400	120	1040	
					6500K	2400	120	999	
FL02AXCS	Anthracite grey RAL7016	Standard	120°	20W	3000K	2200	110	832	
					4000K	2400	120	1040	
					6500K	2400	120	999	
FL02APCS	Anthracite grey RAL7016	PIR sensor	120°	20W	3000K	2200	110	832	
					4000K	2400	120	1040	
					6500K	2400	120	999	

Energy rating is a reflection of the LED light source.

WIRING INFORMATION

Cable / Flying Lead	1m H05RN-F rubberised cable 3x1.0mm² Ø7mm
Type of Wiring Required	Parallel
Input Cable Type	3x1.0mm²

ACCESSORIES

COLLINGWOOD
LIGHTING

LIGHTING INNOVATION

- High efficacy of up to 120lm/W
- Fast fix bracket for quick & easy installation
- Ideal for coastal areas

WARRANTY

Warranty 5 years

FEATURES & BENEFITS

Colour switchable between 3 colour temperatures

IP65 rated, meaning it provides optimum protection against the impacts of rainwater and general adverse weather conditions

A unique 360° rotation for total flexibility, and a 180° tilt

Supplied with 1m cable

Wide 120° beam angle, reducing the number of fittings per area required

Performs in even more extreme conditions from -40°C to +40°C

IP65 PIR option provides override function to leave permanently on or off

