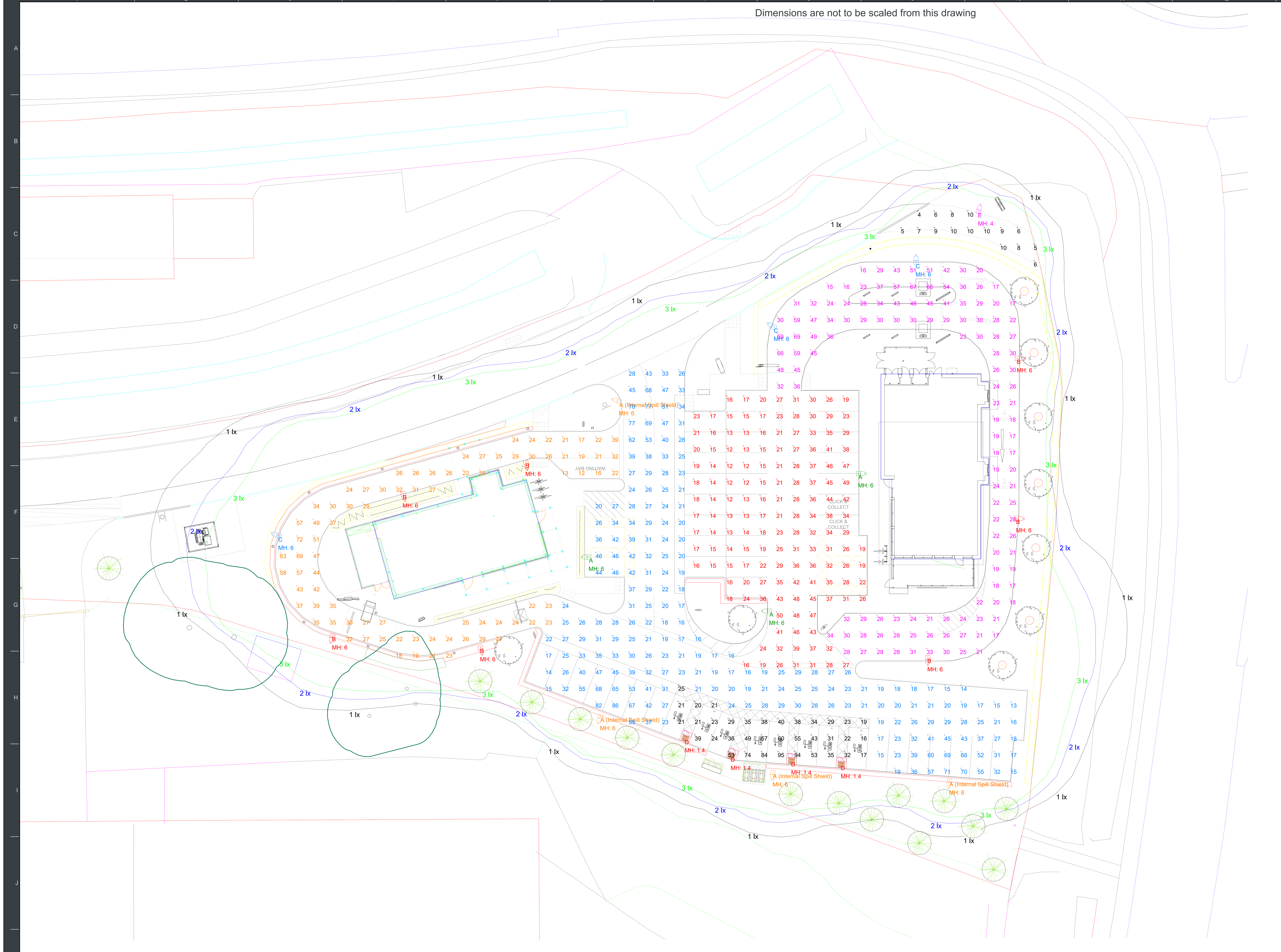
Dimensions are not to be scaled from this drawing



Project Number D54594 | Project Title - Land at A151/A16 Spalding - Unit 1 Starbucks - Unit 2 Burger King | Date 10/01/2025 | Kingfisher Lighting

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BREEAM New Construction 2018 (UK)

POL 04 - External Lighting

Aim: To ensure that external lighting is concentrated in the appropriate areas and that upward lighting is minimised, thereby reducing unnecessary light pollution, energy consumption and nuisance to neighbouring properties

Number Of Credits Available:	1
Minimum Standards:	No

GN01 Extracts below. For the full document click the ILP Logo https://theilp.org.uk/

Table 1: The effect on the ability to view the night sky

Angle Of Light Emitted (Degrees)	Sky Glow Effect	Glare Effect
100-180	Local	Little
95-100	Significant	Some
90-95	High	High
85-90	Significant	High
0-85	Minimum	Some

Table 2: Environmental zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Rural	Low district brightness	Sparsely inhabited rural areas, village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High district brightness	Town / City centres with high levels of night-time activity

Table 6: Maximum values of upward light ratio (ULR) of luminaires

Light technical parameter	E0	E1	E2	E3	E4
Upward light ratio (ULR) / %	0	0	2.5	5	15

Note 1: This is the primary approach to limit skyglow and is suitable to compare different single luminaires and mitigate the contribution of each luminaire within an installation.

Note 2: This does not take into account the effect of light reflected upwards from ground that also contributes to skyglow.

Note 3: Some lighting schemes will require the deliberate and careful use of upward light, e.g. ground recessed luminaires, ground mounted floodlights and festive lighting, to which these limits cannot apply. However, care should always be taken to minimise any upward waste light by the proper application of suitably directional luminaires and light controlling attachments.

Table 7: Maximum values of upward flux ratio of installation (of four or more luminaires)

Light technical parameter	Type of installation	E0	E1	E2	E3	E4
Upward flux ratio (UFR) / %	Road	n/a	2	3	8	12
	Amenity	n/a	n/a	6	12	35
	Sports	n/a	n/a	2	6	15

Table 7 allows the effect of both direct and reflected upward components of a whole installation to be considered. The factor being the upward flux ratio (UFR).

Note: n/a within table 7 denotes that lighting of this type is not usually expected within these zones

This should only be considered where an installation consists of four or more luminaires that form an installation with a defined performance requirement or specialised fauna growth lighting systems (such as those use to promote grass growth in sports stadia) and is in proximity to:
• Optical observatories
• Lies within dark (E1) zones which abuts a protected (E0) dark sky zone ** Further information on ILP website**

Note 1: Where an area to be lit lies close to the boundary of two zones the obtrusive light limitation values used should be those applicable to the most rigorous zone (see comment below)

Note 2: Rural zones under protected designations should use a higher standard of policy

Note 3: Zone E0 must always be surrounded by an E1 Zone

Note 4: Zoning should be agreed with the local planning authority. Due to local requirements a more stringent zone classification may be applied to protect special / specific areas

Note 5: SQM (Sky Quality Meter) is referenced by the International Dark Skies Association (IDA). SQM is an instrument used to measure the luminance of the night sky. It is typically used by astronomers to quantify skyglow, using units of magnitudes per square arcsecond. the scale is between 16:00 (a bright night sky) and 22:00 (the least light pollution). The criteria for zone E0 was revised in mid 2019, with the new requirements not being made retrospective

Note 6: Astronomical Observable Dark Skies will offer clearer views of the Milky Way and of other objects such as the Andromeda Galaxy and the Orion Nebula

Note 7: Although values of SQM 20 to 20.5 may not offer clear views of astronomical dark sky objects such as the Milky Way, these skies will have their own relative intrinsic value in the UK

Assessment Criteria

1 - External lighting pollution has been eliminated through effective design that removes the need for external lighting. This does not adversely affect the safety and security of the site and its users.
OR alternatively, where the building does have external lighting, one credit can be awarded as follows:
2 - The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the "Institution of Lighting Professionals (ILP) Guidance notes for the reduction of obtrusive light, 2011."
3 - All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00.
4 - If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes.
5 - Illuminated advertisements are designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements.2.

** NOTE - ILP Guidance Note 1 updated - KBCN1385 **
Pol 04 references the ILP Guidance notes for the reduction of obtrusive light 2011. This has now been updated to the ILP Guidance note 1 for the reduction of obtrusive light 2021. This is available for free from the ILP website. Requirements Table 2 of the guidance note classifies different lighting environments into Zones E0 to E4. Use this table to define which sets of requirements apply to the assessment. Tables 3-8 of the guidance note define the requirements for criterion 2. For cut-off type luminaires which (by design) block out light in obstructive directions, calculations are not required for meeting requirements relating to:
•Vertical illuminance (Table 3), and
•Luminous intensity (Table 4).
This update will be reflected in the future revisions of the relevant manuals.

ENE 03 - Energy efficient external lighting

Aim: To reduce energy consumption through the specification of energy efficient light fittings for external areas of the development.

Number Of Credits Available:	1
Minimum Standards:	No

Assessment Criteria

The following demonstrates compliance:
1 - No external lighting (which includes lighting on the building, at entrances and signs).
OR
2 - External light fittings within the construction zone with:
2.a: - Average initial luminous efficacy of not less than 70 luminaire lumens per circuit Watt
2.b: - Automatic control to prevent operation during daylight hours
2.c: - Presence detection in areas of intermittent pedestrian traffic

HEA 01 Visual Comfort

Aim: To encourage best practice in visual performance and comfort by ensuring daylighting, artificial lighting and occupant controls are considered.

Number Of Credits Available:	1
Minimum Standards:	No

Assessment Criteria

9 All external lighting located within the construction zone is specified in accordance with BS 5489-1:2013 Code for the practice for the design of road lighting. Lighting of roads and public amenity areas3 and BS EN 12464-2:20144 Light and lighting - Lighting of work places - Part 2: Outdoor work places. External lighting should provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night.

10 Where no external light fittings are specified (either separate from or mounted on the external building façade or roof), the criteria relating to external lighting do not apply and the credit can be awarded on the basis of compliance with criteria 7–8.c above. If no internal lighting is specified, the credit cannot be awarded.

Project Number D54594 | Project Title - Land at A151/A16 Spalding - Unit 1 Starbucks - Unit 2 Burger King | Date 02/06/2025 | Kingfisher Lighting

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Darksky Approved (2700K)	Luminaire Image	Qty	Luminaire	Light Source	Watts (W)	Luminaire Lumens (lm)	Lm/W	LOR	Total Lumens	ULOR	Upward Lumens	Light Engine: Colour Temperature (K)	L Value	B Value	Rated Life (Hrs)	CRI	ILP GN01 - Table 1 & Table 7: Beam Angle	Sky Glow Effect	Glare Effect	Source Intensity cd/1000 lm (80° to <90°)	- Bollards Only ↓ % of luminaire lumens (100°-110°)	CO² Calculation For A Year: ** ART Hour Per Day	CO² (Tonnes)	Kw/Hour
		3	VIVA-CITY Pro	vcp - 80w LED FW70	80.0	11040	138.00	100%	33120	0.0%	0	4000	L80	B20	100,000	≥70	70°	Minimum	Some	3029	n/a	12	0.22	1051.20
		4	VIVA-CITY Pro	vcp - 80w LED FWB70	80.0	8567	107.09	100%	34268	0.0%	0	4000	L80	B20	100,000	≥70	62.5°	Minimum	Some	155	n/a	12	0.29	1401.60
		7	VIVA-CITY Pro	vcp - 60w LED AYB70	60.0	5244	87.40	100%	36708	0.0%	0	4000	L80	B20	100,000	≥70	62.5°	Minimum	Some	1523	n/a	12	0.38	1839.60
		3	VIVA-CITY Pro	vcp - 60w LED FWB70	60.0	6798	113.30	100%	20394	0.0%	0	4000	L80	B20	100,000	≥70	62.5°	Minimum	Some	123	n/a	12	0.16	788.40
		1	VIVA-CITY Pro	vcp - 10w LED AYB70	10.0	698	69.80	100%	698	0.0%	0	4000	L80	B20	100,000	≥70	62.5°	Minimum	Some	202	n/a	12	0.01	43.80

BREEAM Summary

GN01 - 2021

** Environmental Zone to be confirmed by assessor **

Environmental Zone	E3

Upward Light Ratio (ULR) - Table 6	Target	Achieved	Status
	5.0%	0.0%	Pass

Note - Not a BREEAM requirement for Cut-Off Lanterns (See POL4 Assesment Criteria above)

Table 4 - Source Intensity (Candelas)			
Pre Curfew - A_p > 0.5	10,000		Pass
Pre Curfew - A_p > 0.5	1,000		Pass

Table 3 - Light Trespass into Windows (Lux)			
Pre Curfew	10		Pass
Post Curfew	2		Pass

Total Installation Lumens	125188	Total Upward Light	0.0%
Total CO2 Per Year (Tonnes)			1
Total Electric Consumption (Kw)			1
Total Electric Consumption Per Year (Kwh)			5125
Average Luminaire Lumens Per Circuit Watt			107

Compliance Status Summary

Pol 04	Reduction Of Night Time Light Pollution	Pass
Ene 03	Energy Efficent External Lighting	Pass
Hea 01	Internal And External Lighting Levels	Pass

Note - HEA01 in this report only applies to exterior lighting
** ART = (Average Run Time)
Date 02/06/2025

Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Min/Avg	Min/Max	Meter Type	Description
EV Charging Bays	Illuminance	Lux	39.06	95	16	0.41	0.17	Horizontal	
Main Car Park & Public Areas	Illuminance	Lux	31.23	86	13	0.42	0.15	Horizontal	
New Bridleway Route	Illuminance	Lux	7.69	10	4	0.52	0.40	Horizontal	
Unit 1 Drive Thru	Illuminance	Lux	30.14	72	12	0.40	0.17	Horizontal	
Unit 2 Car Park	Illuminance	Lux	25.78	50	12	0.47	0.24	Horizontal	
Unit 2 Drive Thru	Illuminance	Lux	30.10	69	15	0.50	0.22	Horizontal	

Luminaire Schedule

Symbol	Qty	Label	Arrangement	LLF	Description	Luminaire L/W	UWLR	Light Engine	Total Watts
	3	A	Single	0.900	80W LED 4000K VIVA-CITY Pro 805mA with FW70 forward throw optic column mounted at 6m	138	0.00		240
	4	A (Internal Spill Shield)	Single	0.900	80W LED 4000K VIVA-CITY Pro 805mA with FWB70 forward throw optic column mounted at 6m	107	0.00		320
	7	B	Single	0.900	60W LED 4000K VIVA-CITY Pro 610mA with AYB70 street optic column mounted at 6m	87	0.00		420
	3	C	Single	0.900	60W LED 4000K VIVA-CITY Pro 610mA with FWB70 forward throw optic column mounted at 6m	113	0.00		180
	4	D	Single	1.000	ProCharger with 7·5W LED · 3000K · radial optic	101	0.24		29.37
	1	E	Single	0.900	10W VIVA-CITY Pro·4000K·400mA·AYB70 spill control street optic column mounted at 4m	70	0.00		10



Land at A151/A16 Spalding - Unit 1 Starbucks - Unit 2 Burger King

A1

Scale	Project Number
1: 250 at A1	D54594C
Date	**Drawing No.**
2 June 2025	D54594/JB/C

Designed By : J Buck MSLL

For this lighting design a 0.9mf has been used. If it differs from the maintenance plan for this project then you must advise us accordingly

Kingfisher Lighting
Part of the LUCECO plc group of companies

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Rev.	Description	Initials



For more information on EV charging for your installation please visit www.sync.energy or click the image