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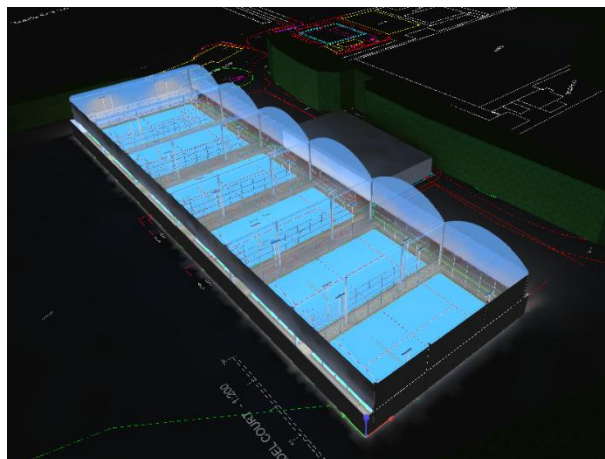
December 20th, 2025



Project:

PADEL facility – Sholing FC

PADEL Court lighting & Obtrusive light analysis



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Opti Ventures BV

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OBTRUSIVE LIGHT REVIEW SUMMARY

THE BASIS

A comprehensive lighting study was undertaken to ensure that the proposed lighting design and specified equipment for the PADEL Court facility would not only achieve but maintain the stringent standards required for sporting venues. According to the Lawn Tennis Association (LTA) guidelines for padel courts.

The study assessed the spatial arrangement of luminaires, the height and orientation of columns, and the technical characteristics of the chosen fixtures to verify that these standards could be met under all typical operating conditions. Advanced software modelling was used to simulate real-world lighting scenarios, accounting for both direct and reflected light within the facility.

In addition to achieving the optimal lighting levels for play, a critical objective of the study was to minimize obtrusive light beyond the court boundaries. This involved analysing potential impacts on adjacent residential areas and local wildlife habitats, ensuring that the facility would operate in harmony with its surroundings and comply with environmental lighting regulations. Specific attention was given to controlling glare, upward light, horizontal light trespass, precise aiming of luminaires and using the optimal luminaire optics.

Overall, this rigorous lighting assessment confirms that the PADEL Court installation will deliver high-quality, competition-ready illumination while maintaining minimal obtrusive light levels, thereby balancing both performance and environmental considerations.

METHODOLOGY

To ensure accuracy and compliance with lighting standards, topographical maps and facility drawings were incorporated into advanced lighting simulation software, (Dialux Pro). This allowed for precise modelling of artificial light distribution across the proposed PADEL Courts and surroundings. The simulations accounted for the positioning, mounting heights, and angles of all lighting fixtures, enabling a thorough evaluation of illumination levels both on the playing surface and in the immediate environment.

By replicating real-world conditions, the software was able to predict areas of potential light spill, glare, or insufficient illumination, guiding the design team in optimising fixture placement and specifications. This process not only addressed the requirements for high-quality, uniform lighting suitable for competitive play but also ensured that obtrusive light impacts on nearby residences, pathways, roads and ecological zones would be minimised through suitable luminaire selection, optics and careful adjustment of luminaire direction.

Through this meticulous approach, the lighting design could be refined iteratively, balancing the need for performance-level visibility with the imperative to protect local environmental quality and community amenity.

Site Context and Environmental Zone

Site Address:

The Mortgage Decisions Stadium, Portsmouth Rd, Southampton SO19 9PW

Proposed Use:

Padel Court Facility, with 6 external courts with a canopy. Preferred lighting scheme is to use a luminaire model that can provide switchable illumination levels to suit both Class I & Class II illumination, according to the Lawn Tennis Association (LTA) guidelines for padel courts.

- ❖ Outdoor courts: - Minimum illumination at ground level (Z=0)
 - National and International Competition
 - 500 lux (E av) with 0.7 uniformity
 - Regional competition, school& recreational use
 - 300 lux (E av) with 0.5 uniformity
- ❖ Indoor courts: - Minimum Performance at ground level (Z=0)
 - National and International Competition
 - 500 lux (E av) with 0.7 uniformity
 - Regional competition, school& recreational use
 - 300 lux (E av) with 0.5 uniformity

Surrounding Character:

Rural/Urban.

Assigned Environmental Zone (E0–E4):

E3

Justification for Zone Selection:

Based on “Surrounding Character”

CONSIDERATIONS

For more detail , please see the:

“Padel facility – Sholing FC - Court and obtrusive light simulation _Report”

For the purposes of the obtrusive light analysis, measurements are based on Class I illumination, representing the highest attainable illumination level.

The data extracted from the simulation pertains exclusively to the external court lighting, as the internal courts have no influence on the external lighting environment.

OBTRUSIVE LIGHT GUIDANCE

Guidance Notes for the Reduction of Obtrusive Light (Institution of Lighting Professionals GN01:2021)

Environmental zone classification

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 (SQM ~15 to 20)	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

Limitation of skyglow

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

Lighting limits

Lighting Limits by Environmental Zone				
Environmental Zone	Sky Glow ULR ⁶ (Max %)	Light Trespass Ev (lux) – Pre-Curfew	Light Trespass Ev (lux) – Post-Curfew ⁷	Building Luminance Average L (cd/m ²) – Pre-Curfew
E0	0	0	0	0
E1	0	2	0.1 (1 ⁸)	0
E2	2.5	5	1	5
E3	5	10	2	10
E4	15	25	5	25

BRITISH STANDARDS

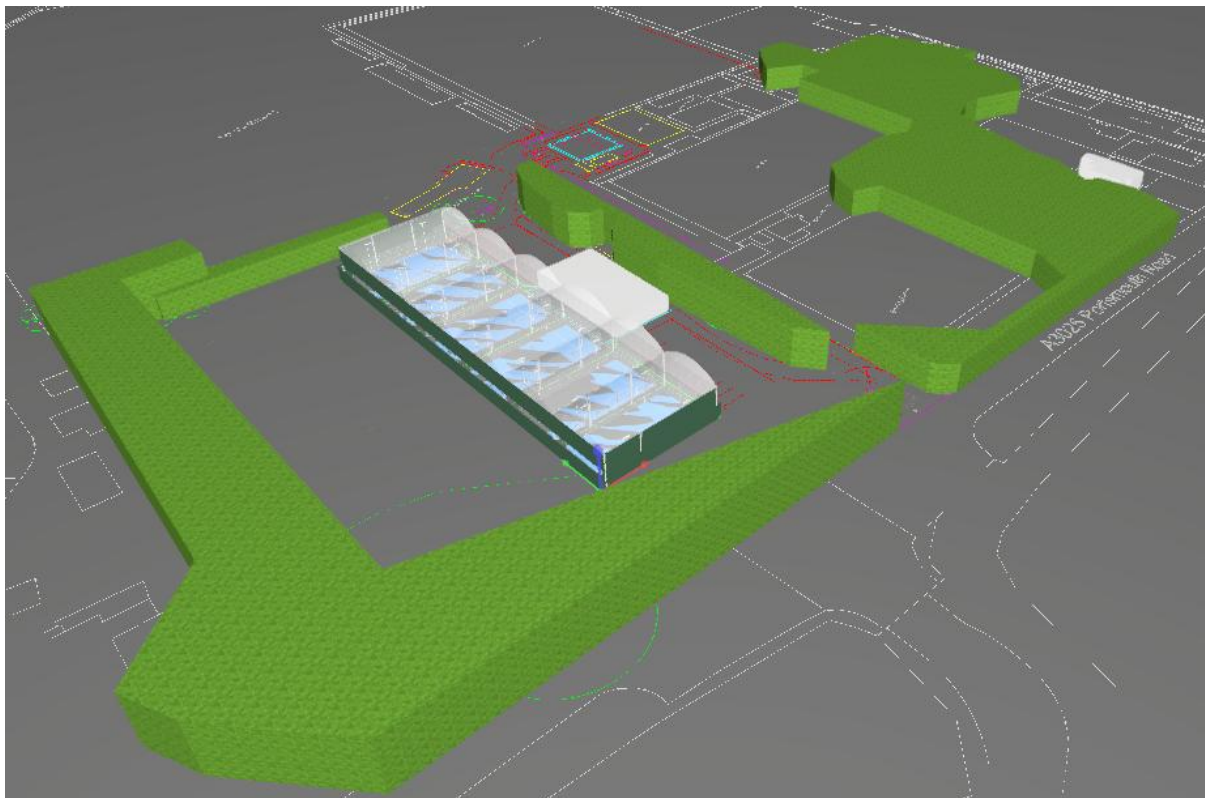
BS EN 12193:2018 – Light and Lighting – Sports Lighting.

This standard, applicable across Britain and Europe, outlines the requirements for lighting in both indoor and outdoor sports venues. It covers the majority of sports played throughout Europe and addresses key aspects such as the use of artificial lighting, methods for controlling light, ensuring uniformity, minimizing glare, and optimizing illuminance and colour characteristics to achieve the best possible performance.

OBSTACLES/OBJECTS DEPLOYED

- The facility building/club house.
- The external padel courts and canopy.
 - The canopy roof uses a clear polycarbonate .
 - The canopy sides from roof eaves to 3M above the ground (north, west & south), are opaque.
- A 3M security fence, with a virtual opaque material finish.
- Tree groups and hedges, where relevant.
- Closest residential property block (Colbury)

Graphic of “OBSTACLES/OBJECTS DEPLOYED”



SIMULATIONS

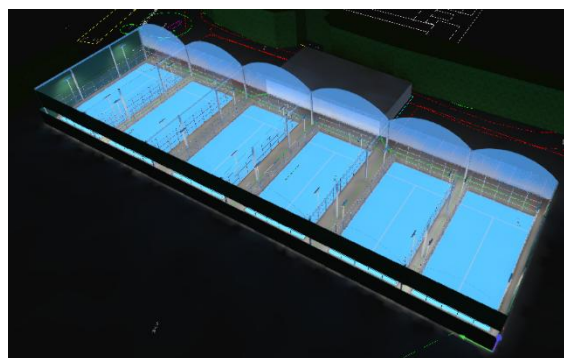
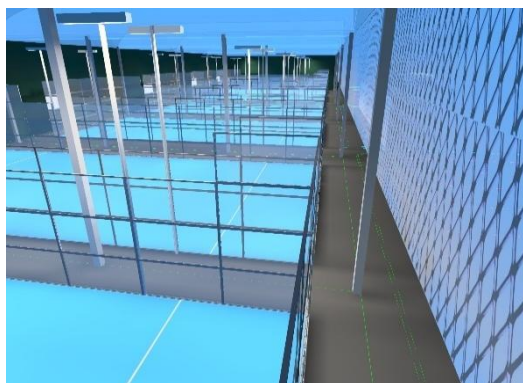
Court illumination performance.

Three forms of simulation have been made :

- All court lighting on (External), to simulate the obtrusive light effect. (worst case scenario).
- All lighting on to check court illumination performance (Internal & External)
- Individual courts being lit (Internal & external), to simulate the minimum illumination levels for Class I & II Padel illumination, when only a single court is lit.

The results are as follows:

Green cells indicate illumination used for obtrusive light		Individual court simulation (example) Class I	All lighting on Class I	Individual court simulation (example) Class II	All lighting on Class II
Internal Court 1	Ave lux	NA	596	NA	447
	Uniformity	NA	0.85	NA	0.85
Internal Court 2	Ave lux	NA	607	NA	455
	Uniformity	NA	0.89	NA	0.89
Internal Court 3	Ave lux	567	593	425	445
	Uniformity	0.88	0.9	0.88	0.9
Internal Court 4	Ave lux	NA	593	NA	444
	Uniformity	NA	0.89	NA	0.89
Internal Court 5	Ave lux	NA	607	NA	455
	Uniformity	NA	0.88	NA	0.88
External Court 6	Ave lux	NA	596	NA	447
	Uniformity	NA	0.86	NA	0.86



NOTE:

The results demonstrate that with all courts lit or single court is lit both classes achieve the required minimum illumination standards.

OBTRUSIVE LIGHT ASSESSMENT AND ANALYSIS.

For obtrusive light analysis, the luminaire maintenance factor of 1 (100% of output as new) has been used. Therefore, the luminaires output is set to the maximum obtrusive light impact. The light scene only includes the lighting for external PADEL courts, as no other external lighting has been advised.

Obtrusive light, sky glow and residential impact

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

Summary

- $R_{UL(ULR)}$ **0.0%** Direct upward emissions only
- R_{UF} 2.9% Total upward flux from the scene (Broader than ULR, includes reflective)
- R_{DLO} 100.0% Total downward flux from the scene

This lighting design has 0% ULR. This makes the lighting scheme appropriate for E0–E4 zones. (ULR)

Residential impacts

A vertical illuminance measurement was taken for the closest (109M from courts) residential property, (facing side to the facility). Due to the distance and level of vegetation, there are no other residential properties that need measurement. Therefore, this facility The metric for this has no impact on this receptor.

Residential	Index					
Colbury residence	OCG2					

The metric for this is so minimal, there are no issues for this receptor.

Road impacts (A3025)

The assessment follows ILP GN01 and BS EN 13201, using vertical illuminance, luminous intensity limits to evaluate potential effects on drivers.

A305 Receptor plane graphic & metrics



The metrics show minimal impact on this receptor

RECEPTOR	TYPE	Av. Lux	Min. Lux	Max. Lux
A3025	Horizontal illuminance	0.002	0.000	0.250
A3025	Vertical illuminance	0.001	0.000	0.140

Wildlife considerations

Illumination overspill

The total measured area, 200M radius for the courts, approximately 125,026m² surrounding the facility, recorded an average illumination of 0.002 lux at ground level (excluding the facility itself). The maximum observed value was 0.14 lux, while the minimum value was 0.00 lux.

There is no overspill beyond the boundaries of the facility

Please refer to the appended graphic: “Graphic of site and overspill calculation area”

Bat/Bird analysis

There are no bats nesting around the facility. However, the environmental/ecology consultant highlighted areas where bat flight may occur. The only possible disturbance would be ULR impacting high flight paths, which in this case is zero. Regarding low flight paths, the receptors are placed next to the areas defined by the consultant (1.5 – 3M).

Bat zone and receptor planes graphic



The areas identified for low level bat flight are along the sides of the areas highlighted in black.

Measurement planes are placed along side this (sides facing the facility), set at 1.5M from ground level.

Measurement planes are yellow highlighted.

Bat zone and receptor planes metrics

RECEPTOR	TYPE	FACILITY %	Av. Lux	Min. Lux	Max. Lux	Note
Bat flight (High level over the facility)	ULR	0%	NA	NA	NA	
Bat flight (High level over the facility)	RUF (includes reflectivity)	2.90%	NA	NA	NA	
Bat flight (Low level North side)	Horizontal illuminance	NA	0.057	0.004	0.450	
Bat flight (Low level North side)	Vertical illuminance		0.180	0.006	1.720	
Bat flight (Low level South side)	Horizontal illuminance		0.093	0.016	2.430	
Bat flight (Low level South side)	Vertical illuminance		0.260	0.006	5.080	Small impact area of total measurement
Bat flight (Low level West side)	Horizontal illuminance		0.032	0.003	1.350	
Bat flight (Low level West side)	Vertical illuminance		0.130	0.001	8.880	Small impact area close to entrance

Ground level wildlife

There are no specified protected species but with such a limited overspill, the impact on this receptor is extremely limited.

PROPOSED LUMINAIRE

ARON
LIGHT

Mounting cost minimization

Four PADELite Master lights are sufficient to cover one padel court, saving on both lighting fixtures and installation costs.



The lighting fixtures and driver boxes are equipped with quick-connect terminals, making maintenance convenient.

With advanced asymmetrical intense 40.5° optics, the lighting fixture can be horizontally installed without any complex adjustment. It provides exceptional illumination and also saves mounting costs.



This is a purpose designed and built luminaire, specifically for Padel Courts, It has a very low overspill impact and provides a high-level uniformity on the courts.

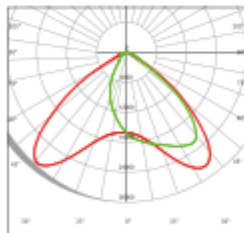
This luminaire has asymmetric optics without tilt angle, meaning a low glare and overspill impact

PADELite Master Product Range

ARON
LIGHT

Model No	PADELite Master - 240	PADELite Master - 320
Power Consumption (W) +/-10%	240W	320W
Input Voltage	120-240VAC, 50/60Hz	
Flicker Factor	<1%	
Surge Protection	20KV line-earth	
Insulation Class	Class I	
Control	1-10V dimmable, DALI optional	
Luminous Flux (lm) +/-7%	up to 39038	up to 54430
Efficacy (5700K Ra70)	up to 170lm/W	
Product Dimension (mm)	888x185x149	1325x185x149
Luminaire Net Weight (kg)	Lamp body: 1.9/ Driver box: 4.3	Lamp body: 2.8/ Driver box: 4.8
Beam Angle	F06301	
CCT & CRI	5700K (5000K, 3000K, 4000K optional), Ra70 (Ra80 optional)	
Luminaire Windage Area(SCx)	0.08 m ² at 0° / 0.11 m ² at 20°	0.1 m ² at 0° / 0.15 m ² at 20°
Protection Rating	IP66, IK10	
Operating Temperature	-30°C to +50°C	
Warranty	5 years	

Photometric Diagrams



Asymmetrical Intense 40.5°
(F06301)

The actual model proposed is a single unit with a power switch to change 240W/320W.

This provide both Class I and Class II illumination and an energy saving advantage.

Mounting Options



Bracket mounting



Pole mounting

SUMMARY

The proposed lighting system for the PADEL courts has been engineered to deliver Class I & II illumination standards, ensuring optimal visibility and safety for both players and spectators. The design incorporates advanced luminaire technology and precise orientation to minimise any obtrusive or stray light beyond the immediate playing areas. Notably, each court achieves the required Class 1 & II lighting levels whether illuminated individually or when all courts operate concurrently, demonstrating the robustness and flexibility of the system.

Comprehensive site analysis has confirmed that this lighting scheme adheres to the stringent criteria set forth for obtrusive light under Environmental Zone Classification E3. This means that the light emitted does not cause undue disturbance to neighbouring properties or the wider environment. The illumination simulation, performed with all court lighting fully operational, further reinforces the system's compliance by demonstrating that light overspill remains well within acceptable thresholds.

In addition, the lighting layout considers both the spatial arrangement of courts and surrounding landscape features, effectively targeting light where it is most needed and preventing unnecessary diffusion into adjacent areas. By achieving these outcomes, the lighting plan not only supports high-level sporting activity but also aligns with environmental stewardship and community expectations.

*Alan Fuller Senior Lighting consultant Europe
November 2025*



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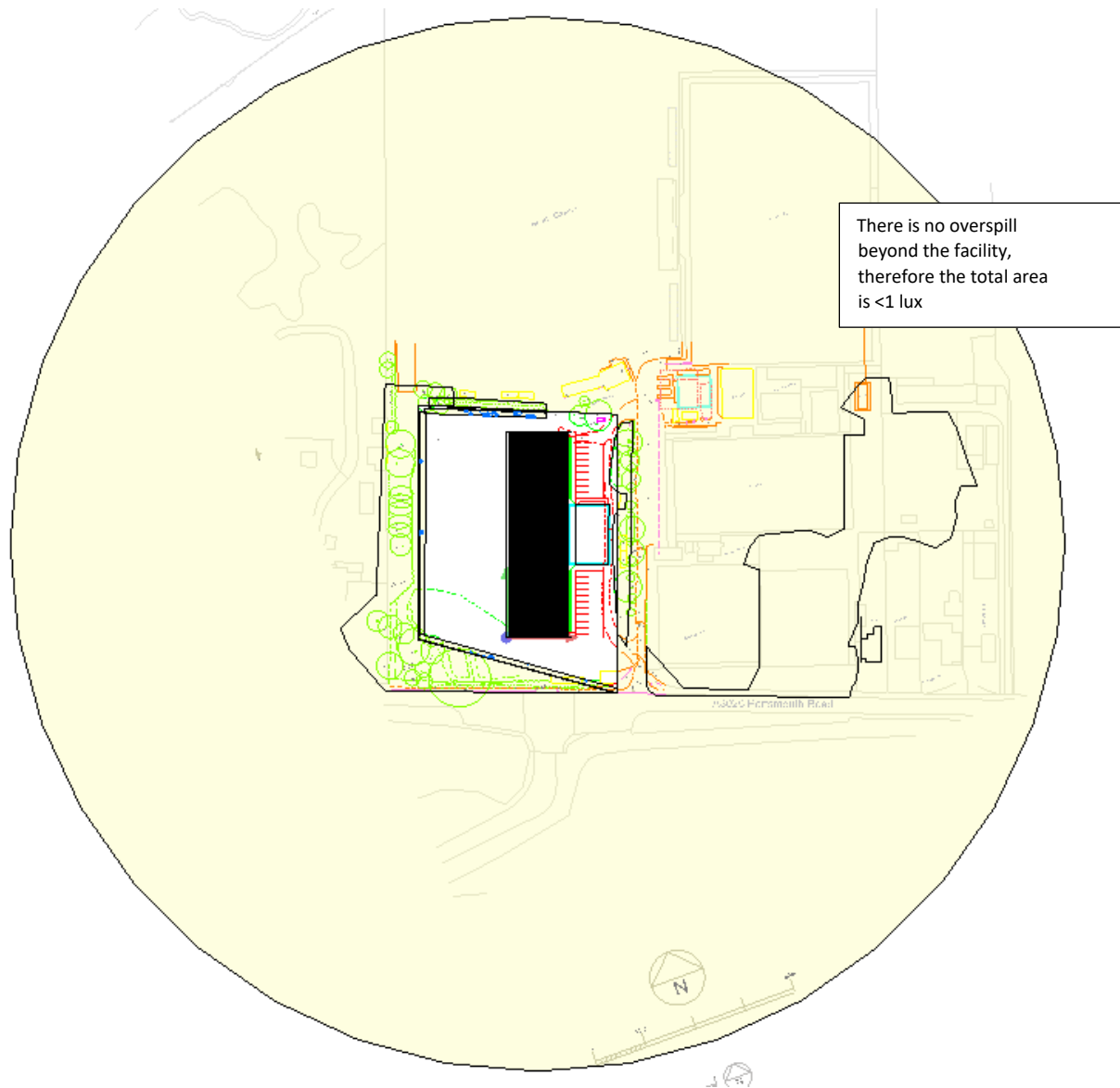
Alan Fuller is a distinguished international lighting consultant with approximately 25 years of professional experience and a portfolio encompassing nearly 2,000 completed projects. His expertise covers a diverse array of applications, including most sporting environments—ranging from individual tennis courts to premier football stadiums—as well as industrial, commercial, hospitality and streetlighting sectors.

Mr. Fuller has provided consultancy services to governmental bodies, energy companies, lighting manufacturers, and PADEL court producers. He has been instrumental in the delivery of numerous PADEL court facilities worldwide, many of which involved comprehensive analyses of obtrusive lighting.

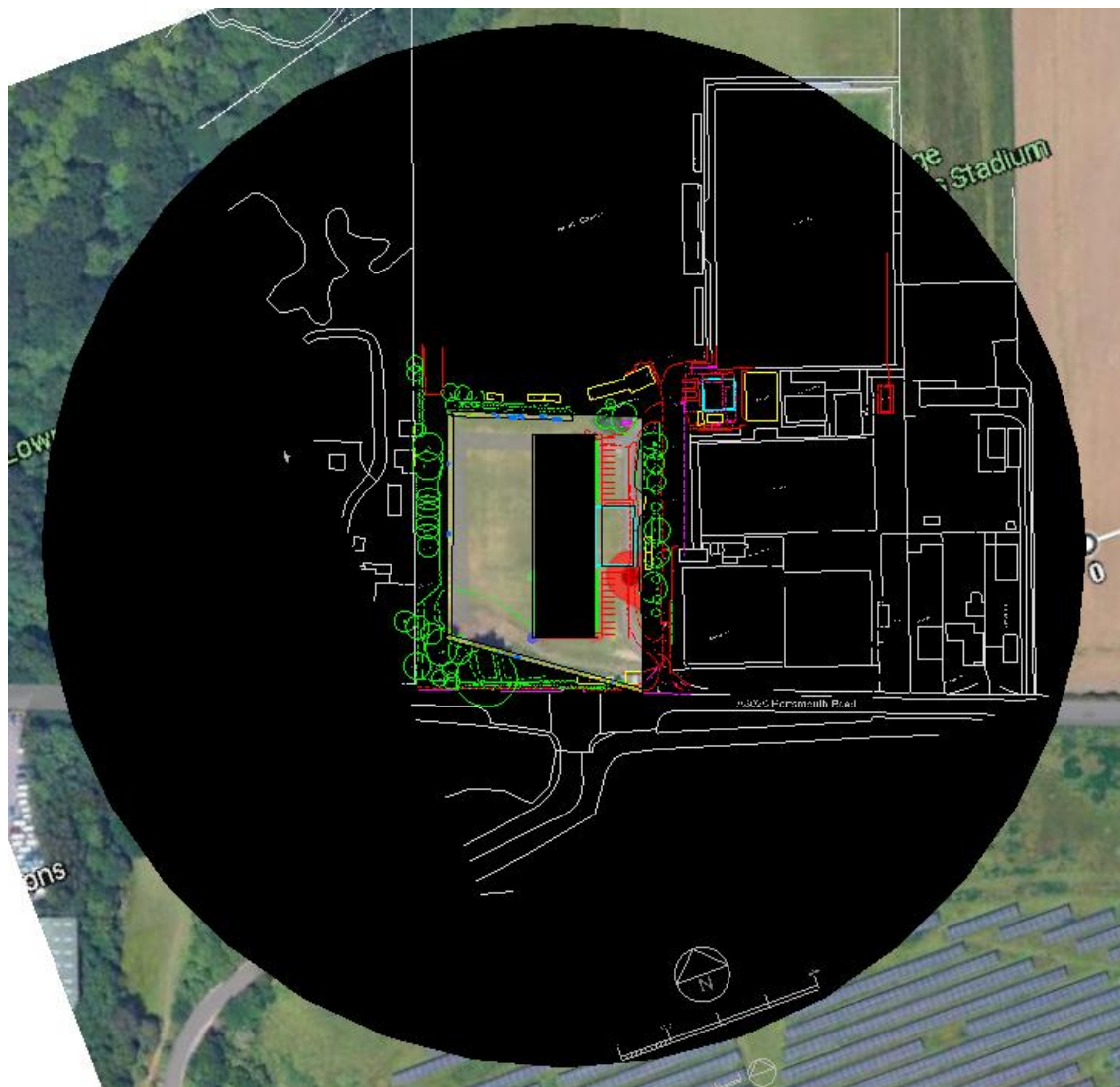
Significantly, Mr. Fuller acted as the lighting planner and consultant for the 2024 PADEL World Championship event.

APPENDED:

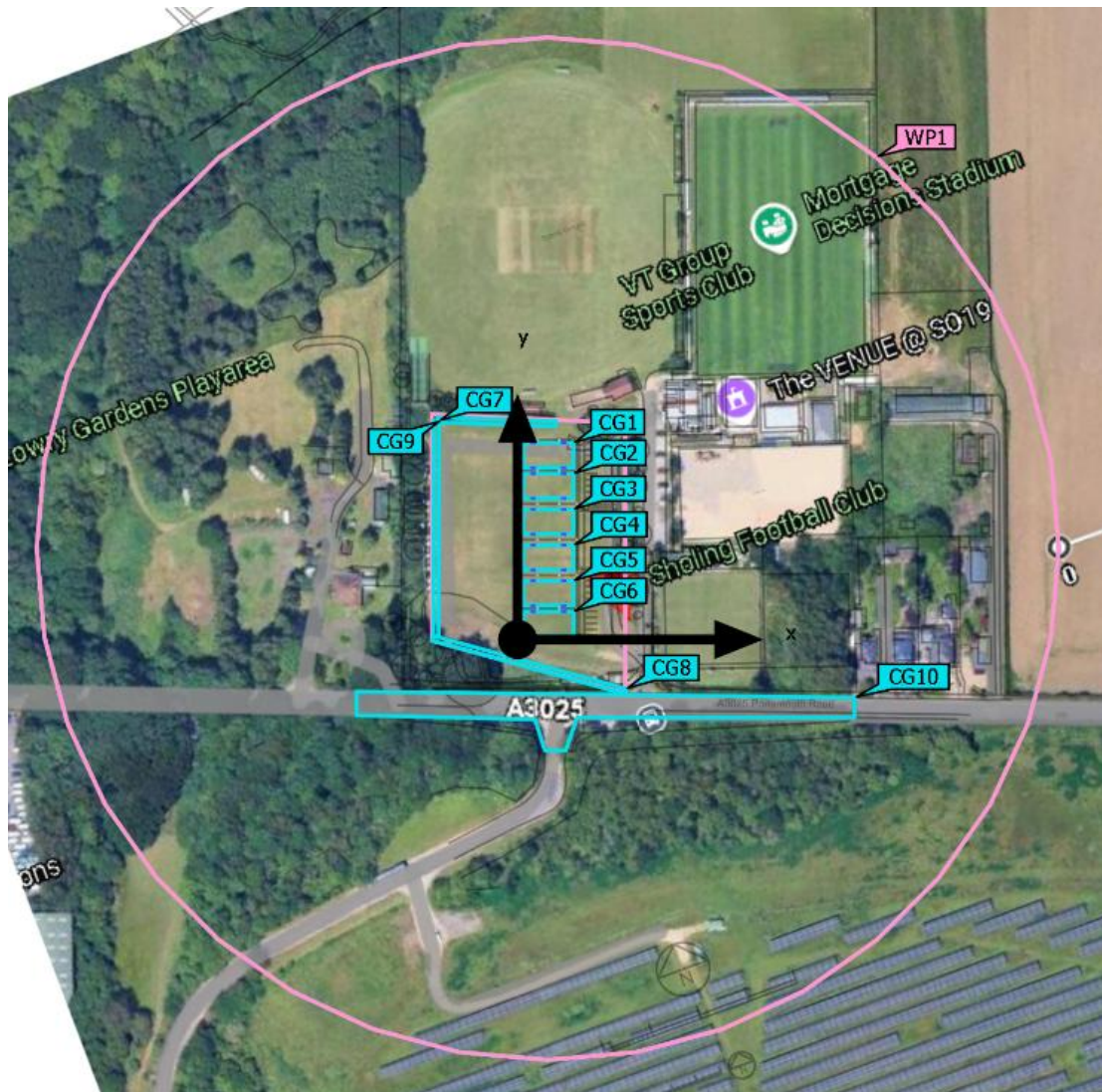
Graphic of site and overspill calculation area.



Graphic showing False Colour representation of overspill impacts

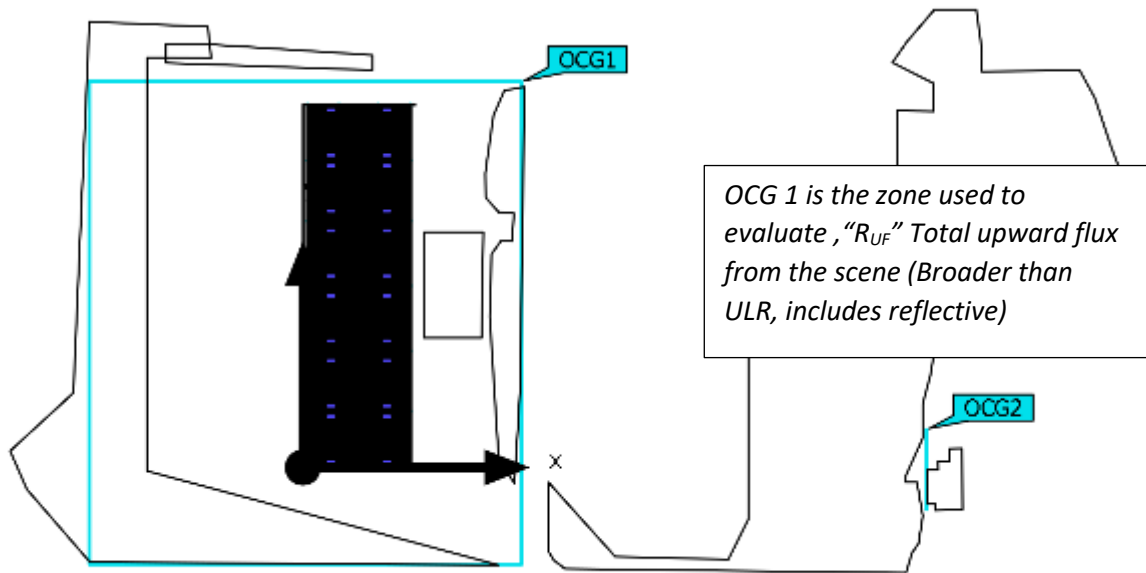


Graphic showing surface measurement planes (External)



ELEMENT	Index
R~150M Overspill	WP1
Covered Court 1	CG1
Covered Court 2	CG2
Covered Court3	CG3
Covered Court4	CG4
Covered Court5	CG5
Covered Court6	CG6
Bat flight West	CG7
Bat flight South	CG8
Bat flight North	CG9
A3025	CG10

Graphic showing obtrusive light measurement planes



Residential	Index
Colbury residence	OCG2

Extract from Technical study

Site 1 (320W Class I)

Calculation objects

Working planes

Properties	E	E _{min}	E _{max}	U ₂ (g ₁)	g ₂	Index
Working plane (200M Diametre overspill mesaurement) Perpendicular illuminance Height: 0.000 m, Wall zone: 0.000 m	0.002 lx	0.00 lx	0.14 lx	-	0.00	WP1

Calculation surfaces

Properties	E	E _{min}	E _{max}	U ₂ (g ₁)	g ₂	Index
A3025 Horizontal illuminance Height: 1.200 m	0.002 lx	0.00 lx	0.25 lx	-	0.00	CG10
A3025 Vertical illuminance Rotation: 0.0°, Height: 1.200 m	0.001 lx	0.000 lx	0.014 lx	-	0.00	CG10
Bat flight 1.5M from ground North Horizontal illuminance Height: 1.500 m	0.057 lx	0.004 lx	0.45 lx	0.070	0.009	CG9
Bat flight 1.5M from ground North Vertical illuminance Rotation: 287.3°, Height: 1.500 m	0.18 lx	0.006 lx	1.72 lx	0.033	0.003	CG9
Bat flight 1.5M from ground South Horizontal illuminance Height: 1.500 m	0.093 lx	0.016 lx	2.43 lx	0.17	0.007	CG8
Bat flight 1.5M from ground South Vertical illuminance Rotation: 68.9°, Height: 1.500 m	0.26 lx	0.006 lx	5.08 lx	0.023	0.001	CG8
Bat flight 1.5M from ground West Horizontal illuminance Height: 1.500 m	0.032 lx	0.003 lx	1.35 lx	0.094	0.002	CG7
Bat flight 1.5M from ground West Vertical illuminance Rotation: 0.0°, Height: 1.500 m	0.13 lx	0.005 lx	8.88 lx	0.038	0.001	CG7
Court 1 Perpendicular illuminance Height: 0.012 m	596 lx	508 lx	708 lx	0.85	0.72	CG1
Court 2 Perpendicular illuminance Height: 0.012 m	607 lx	539 lx	715 lx	0.89	0.75	CG2
Court 3 Perpendicular illuminance Height: 0.012 m	593 lx	532 lx	678 lx	0.90	0.78	CG3
Court 4 Perpendicular illuminance Height: 0.012 m	593 lx	530 lx	677 lx	0.89	0.78	CG4
Court 5 Perpendicular illuminance Height: 0.012 m	607 lx	536 lx	706 lx	0.88	0.76	CG5
Court 6 Perpendicular illuminance Height: 0.012 m	596 lx	511 lx	711 lx	0.86	0.72	CG6

END OF DOCUMENT