MAX FORDHAM

University College School, Hampstead

External Lighting Statement

15th December 2023

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ISSUE HISTORY

Issue	Date	Description
P01	15/12/2023	Planning Issue

CONTENTS

1.0 INTRODUCTION

This External Lighting Statement has been prepared by Max Fordham LLP on behalf of University College School (the 'Applicant') in support of an application for full planning permission for Project 200 at University College School, Hampstead (the 'Site') within the jurisdiction Camden London Borough Council ('CLBC').

The development is part demolition, part redevelopment and extension to provide a building of ground and first floor, reinstated and raised tennis courts on the roof, and new / enhanced surrounding landscape areas, accommodating education (class F1) and performance use, and associated ancillary spaces. The site of the proposed new development is bordered by residential properties on Ellerdale Road and Arkwright Road.

Max Fordham LLP are appointed to provide MEP design services. The initial external lighting design has largely been led by the project architect, Ed Toovey Architects, and the landscape architect, Staton Cohen Landscape Architecture, in terms of fitting types, layout of walkways, steps, entrances, etc., and incorporation of ecology considerations.

The scheme has also benefited from an early stage floodlighting assessment for the three tennis courts. This has been carried out by a sports lighting specialist and has demonstrated that the courts can be lit sufficiently without causing obtrusive light spill into neighbouring properties. The full results of this lighting assessment are included in the appendices of this report.

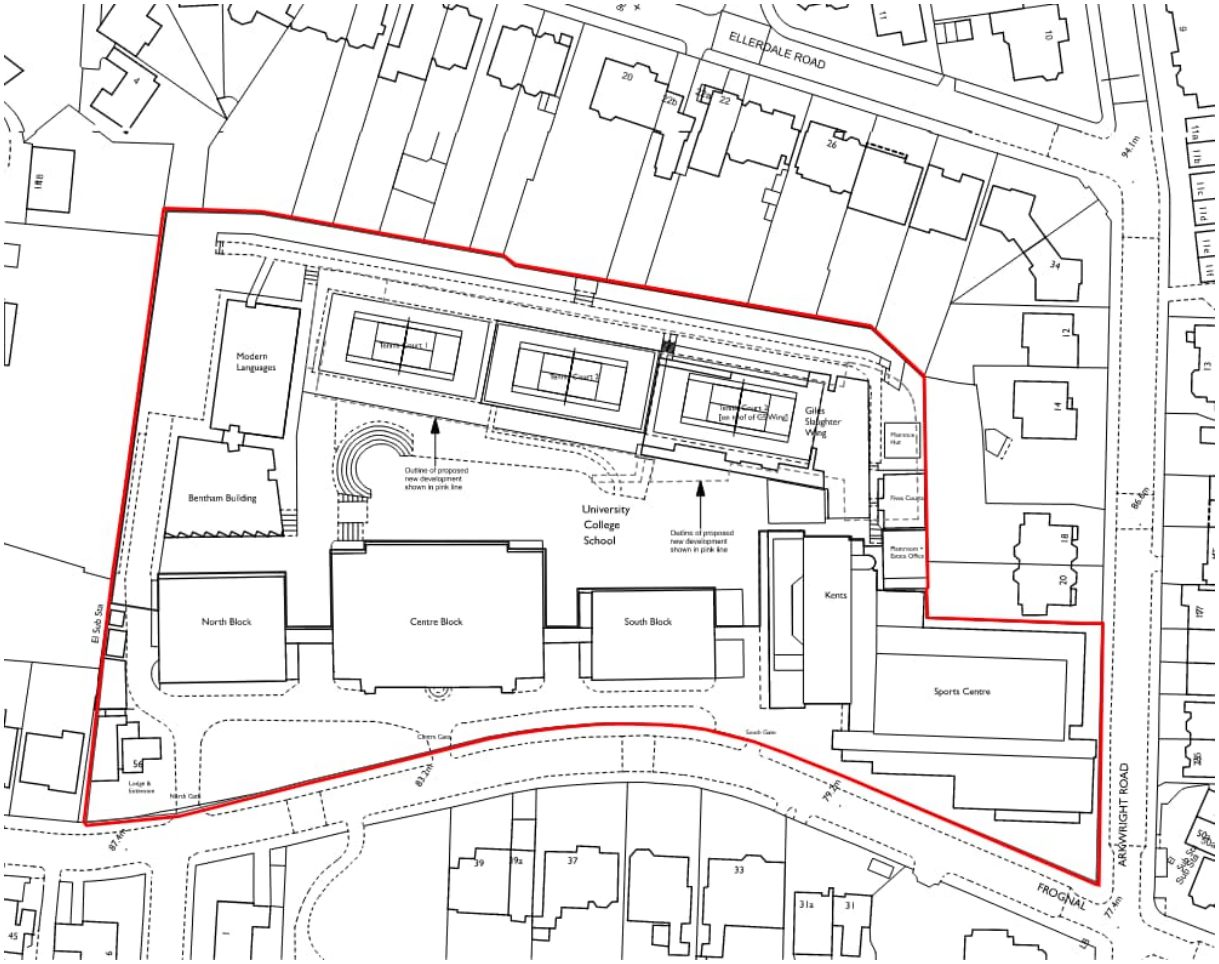

Figure 1: University College School (UCS), Hampstead site location plan

2.0 EXTERNAL LIGHTING STRATEGY

Although the external lighting design for University College School Project 200 is not yet fully defined, the general strategy for the proposed new development will include the necessary measures required to optimise the efficiency of the scheme, support safety and security around the site, and reduce night-time light pollution.

The external lighting strategy for the school is to provide functional lighting to the main pedestrian walkways, bike storage areas, any loading and unloading points, and to also provide lighting around the perimeter of the new building for security. In addition, new floodlights are being provided to the raised tennis courts on the roof of the new development. These will be directional LED luminaires to allow the courts to be used outside of daylight hours while improving the energy efficiency and avoiding light spill into nearby residential properties.

The proposed lighting design will provide an efficient solution through the selection of fittings and lamps, the effective arrangement of fittings, and the implementation of controls to limit the use of artificial lighting outside of normal operating hours and when adequate daylight is available.

Light pollution and spill, with its impact on the natural environment and neighbouring properties, will be minimised by specifying directional fittings with hoods / shrouds where possible, not over-lighting the site, and ensuring that only necessary lights will remain on outside of the school day.

The final proposed lighting installation will be assessed against the Institution of Lighting Professionals (ILP) "Guidance Notes for the Reduction of Obtrusive Light GN01:2011"

3.0 INITIAL CONCEPT DESIGN

Please see MF drawing 'J7271-MXF-XX-00-DR-E-31000' which describes the area covered by the proposed external lighting strategy and the proposed lux level requirements.

As the project progresses a detailed design will be developed, based on the information submitted under this report. The following sections set out standards that have been considered when forming the strategy.

Standards for the Reduction of Night-Time Light Pollution

Lighting will be provided to satisfy the requirements of the ILP "Guidance Notes for the Reduction of Obtrusive Light GN01:2011". The key elements of this guidance being:

- To provide adequate levels of light to external areas, allowing spaces to be used effectively and safely, while avoiding "over-lighting". Lights should be turned off or dimmed at times when they are not required.
- To limit the visible source intensity by reducing the beam angle of light from external fittings to no greater than 70° from the downward vertical plane. Where fittings do not comply with this requirement, buildings or other fixed structures should be used to obstruct light spill.
- To limit light spill above the horizontal plane, which causes "Sky Glow"
- To limit light trespass into the windows of nearby properties.
- To minimise deliberate feature lighting.
- To reduce the levels of light trespass, visible source intensity and building luminance after a curfew in the evening.

The following table is taken from the ILP document, and offers guidance on the reasonable constraints for external lighting installations in a range of different environmental zones:

Obtrusive Light Limitations for Exterior Lighting Installations						
Environmental Zone	Sky Glow Upward Light Ratio ULR (max %)	Light Intrusion (into Windows) Ev (lux)		Luminaire Intensity I (kcd)		Building Luminance Pre-curfew
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average L (cd/m2)
E0	0	0	0	0	0	0
E1	0	2	1	2.5	0	0
E2	2.5	5	1	7.5	0.5	5
E3	5.0	10	2	10	1.0	10
E4	15.0	25	5	25	2.5	25

Where Environmental Zones E2 and E3 are defined as:
E2: Low district brightness (Rural, village, or relatively dark outer suburban locations).
E3: Medium district brightness (Small town centres or suburban locations).

The Senior School would appear to fit in category E3 and we have therefore used zone E3 as a benchmark for the purposes of this report.

External Lighting Levels

A key element of the ILP Guidance Notes is the provision of adequate external light levels without over-lighting.

External lighting will be provided to give lux levels in accordance with BS EN 12464-2:2014 and CIBSE LG 6: Lighting the exterior environment. Specifically, the following light levels have been used as a basis for the design:

- Pedestrian circulation routes: 10 lux average.
- Steps: 50 lux average.

As CCTV coverage is only required at external doors and bike stores, downlights and wall-mounted fittings on the building facade along with bike shelter lighting will illuminate these locations.

Emergency lighting will be provided at building exits to facilitate safe exit from the building, and along any circulation routes that lead to the fire assembly point. Such routes will be lit to a level of 1 lux along the centre line, as prescribed by CIBSE Lighting Guide 12: Emergency Lighting.

It is anticipated that lighting will generally be automatically switched off by a time clock between the curfew time and the morning. Some functional lighting meeting the ILP guidance will remain on for security and safety reasons. A daylight sensor will be provided to prevent fittings being turned or left on during daylight hours.

Control of Spill Light

General light spill will be limited by the careful selection and placement of luminaires for each task. Where possible fittings will be supplied with hoods, and will provide directional light to avoid the unnecessary illumination of surrounding areas. There are no quantitative recommendations for this made by the ILP document, but the reduction of spill light is largely achieved as a result of compliance with the recommendations to control upward light, light trespass and source intensity.

Of particular interest on this project when considering light spill, is the new floodlight installation to the tennis courts. As these courts are being raised further off the ground and are relatively near to neighbouring residential properties, the new floodlighting is of particular importance. A specialist floodlighting designer / supplier has been engaged to carry out modelling of the proposed scheme and determine suitable fittings and mounting positions that will meet the school's requirements with minimal impact on the neighbours. Refer to the appendices for their assessment documentation.

Control of Upward Light, Trespass and Source Intensity

Upward light from the scheme will be less than the ILP recommended maximum of 2.5% of the total luminaire flux of lights within the site.

Additionally, the light trespass resulting from the scheme will also be below the recommended maximum trespass levels of 5 lux before and 1 lux after the curfew.

Conclusion

In summary, though not yet fully developed, the final lighting design will meet the requirements of the site without compromising the amenities of the surrounding buildings. Light spill and glare will be considered and controlled throughout the development of the design.

4.0 SPORTS LIGHTING

A sports and floodlighting specialist, Kingfisher, was engaged to undertake design and analysis work for the proposed tennis court lighting, with respect to illuminance and uniformity requirements on the Principal Playing Area and Total Playing Area, and also to assess potential light spill issues which could affect the nearby residential properties. The analysis found that the Principal Playing Area light level requirements can be met while reusing the existing masts. Although further review is required at the next stage to develop the floodlighting design, this proposal appears to satisfy the school's requirements. Kingfisher also modelled light spill to ensure the neighbouring residential property facades will not be affected. For more information, refer to the Kingfisher design and datasheet in the appendices.

5.0 APPENDICES

5.1 Appendix I – External Lighting Strategy Site-Wide Layout

5.2 Appendix II – Kingfisher Tennis Court Lighting Assessment

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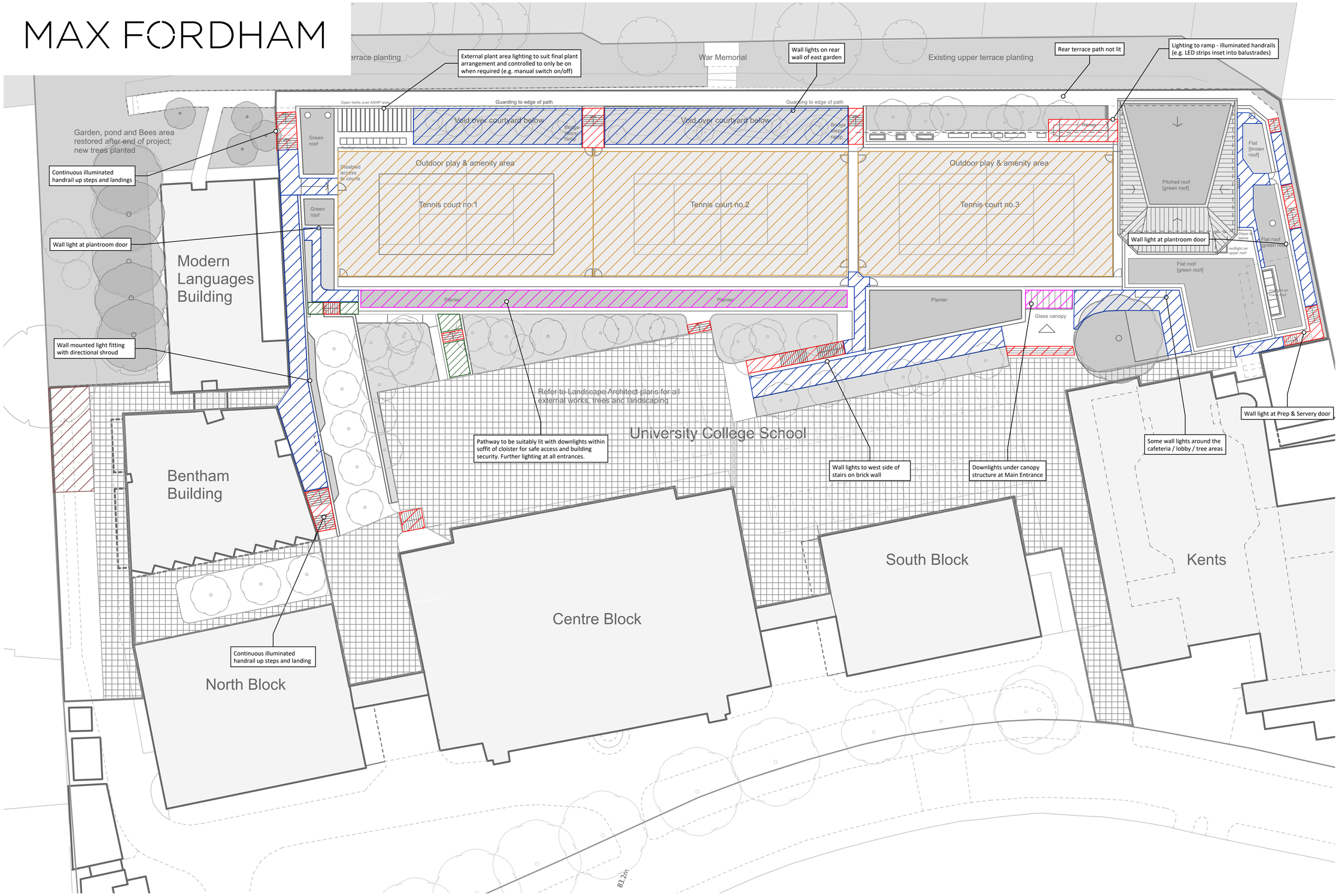


NOTES

1. To be read in conjunction with MF External Lighting Statement J7271-MXF-XX-XX-RP-E-31000 and all relevant architectural and landscape information.

2. Lighting to all escape routes, refuge points, and muster / assembly areas to incorporate emergency backup in accordance with the Fire Engineer's requirements.

3. External lighting to be provided in accordance with BS EN 124-2:2014 and Lighting Guide 6: The exterior environment.

4. Daylight sensors to be provided to prevent fittings being turned or left on during daylight hours.

KEY

- Pedestrian walkways
  Average illuminance = 10 lux
  Uniformity = 0.25
  Wall mounted light fittings
- Pedestrian steps / ramps
  Average illuminance = 50 lux
  Uniformity = 0.4
  Illuminated handrails
- Covered pedestrian walkways
  Average illuminance = 10 lux
  Uniformity = 0.25
  Under canopy / soffit downlights
- Tennis courts
  Refer to sport floodlighting specialist's information
- Bike stands
  Lighting will be incorporated into bike shelter roofs and to suit CCTV camera coverage
- Pedestrian woodland walkway
  Average illuminance = 10 lux
  Uniformity = 0.25
  Bollard lighting
- Existing building lighting
  No changes proposed

project
UCS Project 200

job number **7271** | project leader **TB** | issue date **15/12/2023**

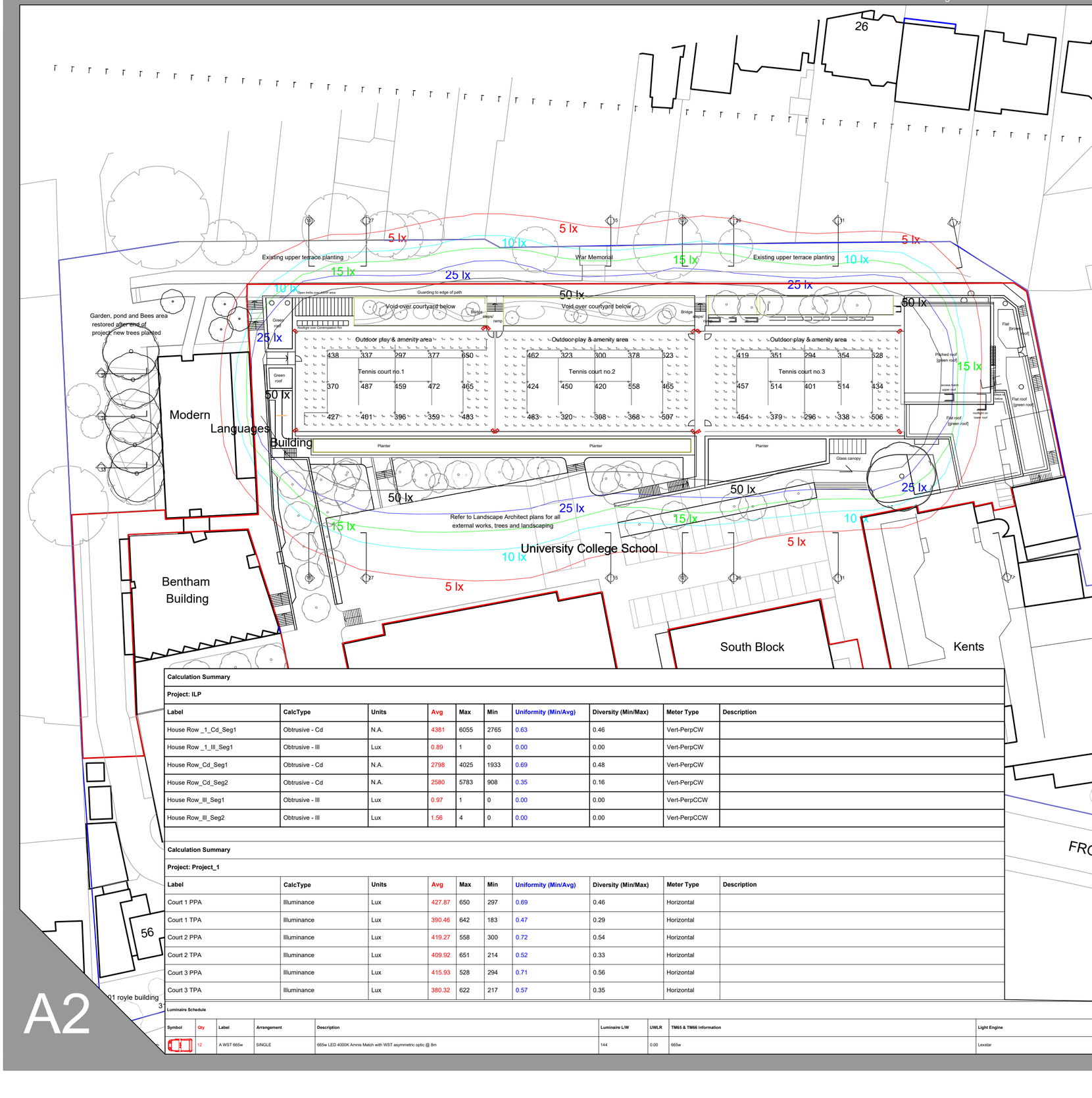
status code **S2** | revision **P01** | status description **For Planning**

sketch title
External Lighting Site Layout

scale at A1
1 : 250

project code **J7271** | originator **MXF** | volume **XX** | level **00** | type **DR** | role **E** | number **31000**

Dimensions are not to be scaled from this drawing



Kingfisher Lighting

Part of the Luceco PLC group of companies LUCECO

Obtrusive Light - Compliance Report
CIE 150:2017, E2-Low District Brightness, Pre-Curfew
Filename: 51003 UCS School tennis courts lighting
24/11/2023 15:15:42

Illuminance
Maximum Allowable Value: 5 Lux

Calculations Tested (3):

Calculation Label	Test Results	Max. Illum.
House Row_Ill_Seg1	PASS	1
House Row_Ill_Seg2	PASS	4
House Row _1_Ill_Seg1	PASS	1

Luminous Intensity (Cd) At Vertical Planes
Maximum Allowable Value calculated from CIE 150:2017 (varies by Projected Area sq.m. and Distance Factor)
For E2-Low District Brightness, Projected Area and Distance Factors:
(0.002, 0.57) (0.01, 1.3) (0.03, 2.5) (0.13, 5) (0.5, 10)
Projected Area (sq.m) = Approx. projected emitting area of luminaire in direction of observer
Distance (m) = Distance from luminaire to observer
Max Cd Allowed = Projected Area Factor * Distance

Calculations Tested (3):

Calculation Label	Test Results
House Row_Cd_Seg1	PASS
House Row_Cd_Seg2	PASS
House Row _1_Cd_Seg1	PASS

Calculation Summary

Project: ILP

Label	CalcType	Units	Avg	Max	Min	Uniformity (Min/Avg)	Diversity (Min/Max)	Meter Type	Description
House Row _1_Cd_Seg1	Obtrusive - Cd	N.A.	4381	6055	2765	0.63	0.46	Vert-PerpCW	
House Row _1_Ill_Seg1	Obtrusive - Ill	Lux	0.89	1	0	0.00	0.00	Vert-PerpCW	
House Row_Cd_Seg1	Obtrusive - Cd	N.A.	2798	4025	1933	0.69	0.48	Vert-PerpCW	
House Row_Cd_Seg2	Obtrusive - Cd	N.A.	2580	5783	908	0.35	0.16	Vert-PerpCW	
House Row_Ill_Seg1	Obtrusive - Ill	Lux	0.97	1	0	0.00	0.00	Vert-PerpCCW	
House Row_Ill_Seg2	Obtrusive - Ill	Lux	1.56	4	0	0.00	0.00	Vert-PerpCCW	

Calculation Summary

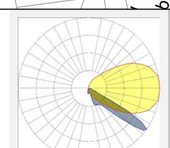
Project: Project_1

Label	CalcType	Units	Avg	Max	Min	Uniformity (Min/Avg)	Diversity (Min/Max)	Meter Type	Description
Court 1 PPA	Illuminance	Lux	427.87	650	297	0.69	0.46	Horizontal	
Court 1 TPA	Illuminance	Lux	390.46	642	183	0.47	0.29	Horizontal	
Court 2 PPA	Illuminance	Lux	419.27	558	300	0.72	0.54	Horizontal	
Court 2 TPA	Illuminance	Lux	409.92	651	214	0.52	0.33	Horizontal	
Court 3 PPA	Illuminance	Lux	415.93	528	294	0.71	0.56	Horizontal	
Court 3 TPA	Illuminance	Lux	380.32	622	217	0.57	0.35	Horizontal	

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	Luminaire L/W	UWLR	TM65 & TM66 Information	Light Engine
	12	A WST 665w	SINGLE	665w LED 4000K Amnis Match with WST asymmetric optic @ 8m	144	0.00	665w	Lexstar


AMNIS Match


Polar Curve WST

QR Code

N

A2

UCS School tennis courts lighting

Scale	Project Number
1:500 at A2	51003
Date	Drawing No.
24/11/2023	Rev A

Lighting Designer : R Houchin

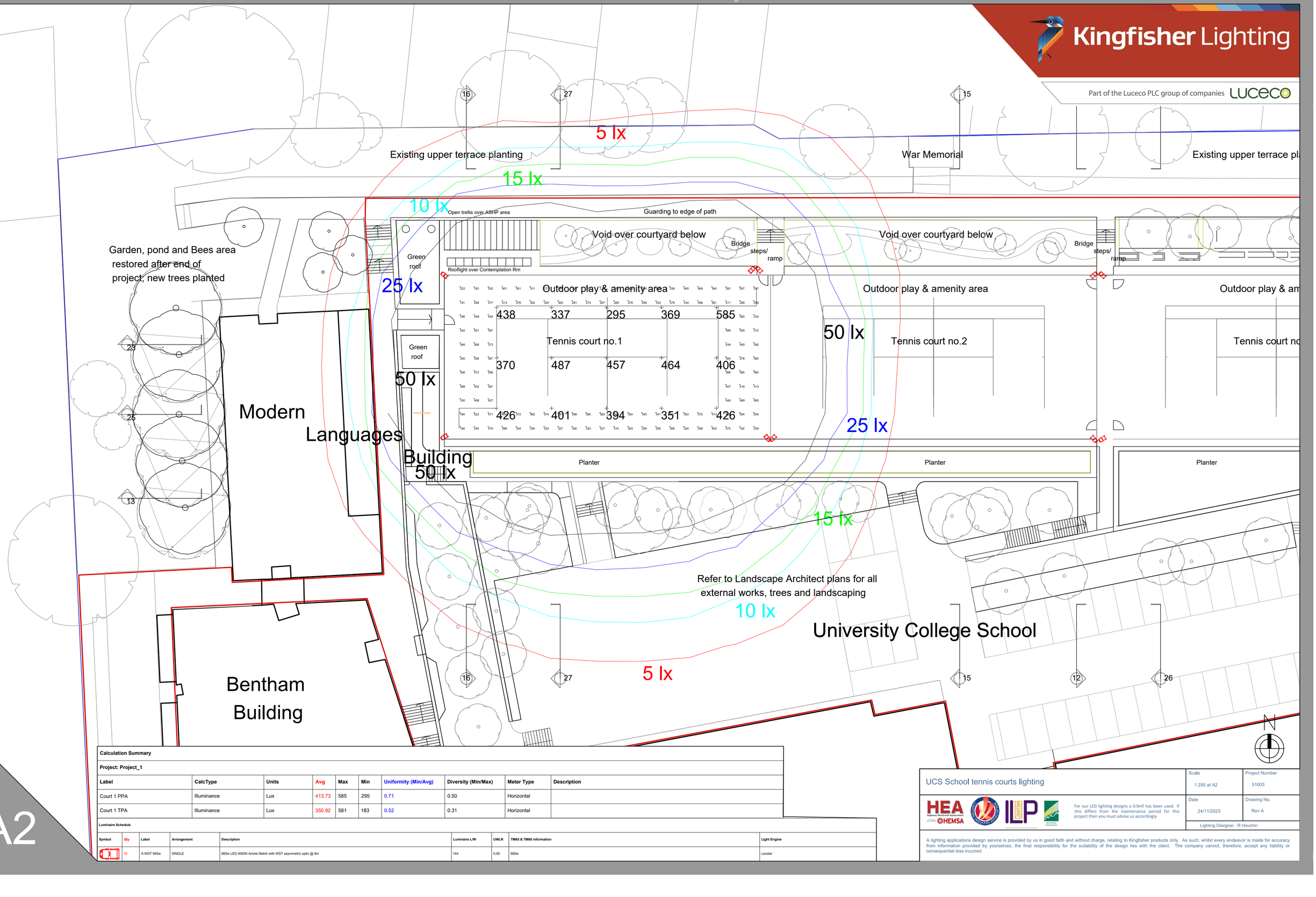
HEA Highway Electrical Association HEMSA · ILP Institution of Lighting Professionals

For our LED lighting designs a 0.9mf has been used. If this differs from the maintenance period for this project then you must advise us accordingly

Dimensions are not to be scaled from this drawing

Kingfisher Lighting

Part of the Luceco PLC group of companies LUCECO



Calculation Summary

Project: Project_1

Label	CalcType	Units	Avg	Max	Min	Uniformity (Min/Avg)	Diversity (Min/Max)	Meter Type	Description
Court 1 PPA	Illuminance	Lux	413.73	585	295	0.71	0.50	Horizontal	
Court 1 TPA	Illuminance	Lux	350.92	581	183	0.52	0.31	Horizontal	

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	Luminaire L/W	UWLR	TM65 & TM66 Information	Light Engine
	12	A WST 665w	SINGLE	665w LED 4000K Amnis Match with WST asymmetric optic @ 8m	144	0.00	665w	Lexstar

A2

UCS School tennis courts lighting

Scale	Project Number
1:250 at A2	51003
Date	Drawing No.
24/11/2023	Rev A

Lighting Designer : R Houchin

HEA Highway Electrical Association HEMSA · ILP Institution of Lighting Professionals · Ancillary Contractor

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Kingfisher Lighting

Part of the Luceco PLC group of companies LUCECO

Existing upper terrace planting

War Memorial

Existing upper terrace planting

15 lx

10 lx

15 lx

25 lx

50 lx

5 lx

Open trellis over ASHP area

Guarding to edge of path

Void over courtyard below

Bridge

steps/ ramp

Void over courtyard below

Bridge

steps/ ramp

Green roof

Rooflight over Contemplation Rm

Outdoor play & amenity area

50 lx

Outdoor play & amenity area

Outdoor play & amenity area

Pitched roof [green roof]

access hatch upper roof

Steps below

Green roof

Tennis court no.1

420 315 296 374 492

Tennis court no.2

381 443 417 553 435

436 313 304 363 475

Tennis court no.3

rooflight on lower roof

Flat roof [green roof]

ern Languages Building

Planter

Planter

Planter

Glass canopy

50 lx

25 lx

15 lx

10 lx

5 lx

Refer to Landscape Architect plans for all external works, trees and landscaping

University College School

South Blo

am ing

16 27 15 12 26 11

N

A2

Calculation Summary

Project: Project_1

Label	CalcType	Units	Avg	Max	Min	Uniformity (Min/Avg)	Diversity (Min/Max)	Meter Type	Description
Court 2 PPA	Illuminance	Lux	401.13	553	296	0.74	0.54	Horizontal	
Court 2 TPA	Illuminance	Lux	358.20	572	210	0.59	0.37	Horizontal	

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	Luminaire L/W	UWLR	TM65 & TM66 Information	Light Engine
	12	A WST 665w	SINGLE	665w LED 4000K Amnis Match with WST asymmetric optic @ 8m	144	0.00	665w	Lexstar

UCS School tennis courts lighting

Scale	Project Number
1:250 at A2	51003
Date	Drawing No.
24/11/2023	Rev A

Lighting Designer : R Houchin

HEA Highway Electrical Association HEMSA · ILP Institution of Lighting Professionals · Ancillary Commander

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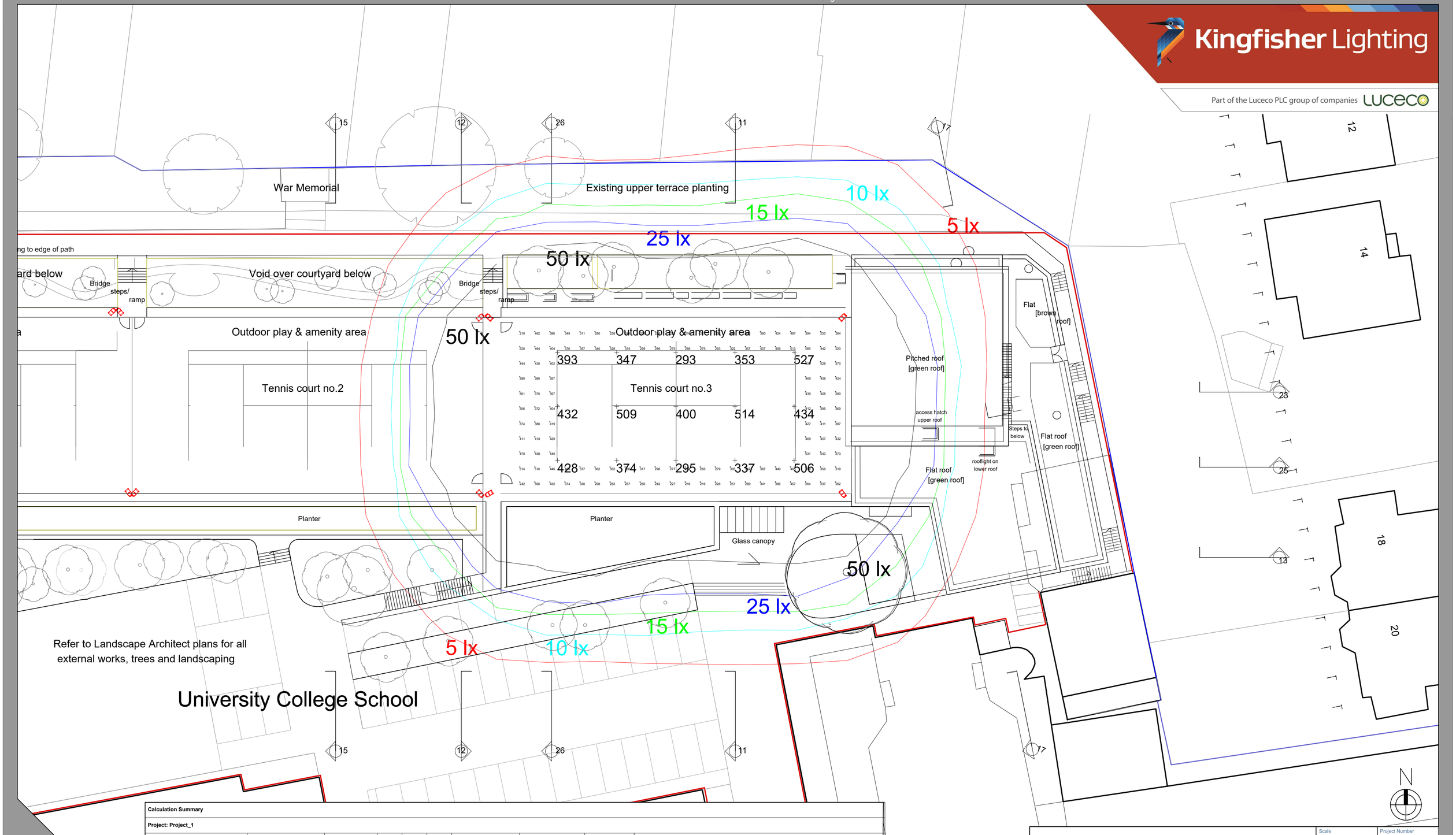
Kingfisher Lighting

Part of the Luceco PLC group of companies LUCECO



A2

Calculation Summary

Project: Project_1

Label	CalcType	Units	Avg	Max	Min	Uniformity (Min/Avg)	Diversity (Min/Max)	Meter Type	Description
Court 3 PPA	Illuminance	Lux	409.47	527	293	0.72	0.56	Horizontal	
Court 3 TPA	Illuminance	Lux	362.94	585	216	0.60	0.37	Horizontal	

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	Luminaire L/W	UWLR	TM65 & TM66 Information	Light Engine
	12	A WST 665w	SINGLE	665w LED 4000K Amnis Match with WST asymmetric optic @ 8m	144	0.00	665w	Lexstar

Kents

UCS School tennis courts lighting

Scale	Project Number
1:250 at A2	51003
Date	Drawing No.
24/11/2023	Rev A

Lighting Designer : R Houchin

HEA Highway Electrical Association HEMSA · ILP Institution of Lighting Professionals

For our LED lighting designs a 0.9mf has been used. If this differs from the maintenance period for this project then you must advise us accordingly

Kingfisher SPORT

Part of the Luceco plc group of companies

Datasheet

Amnis Match

Specification Text

The luminaire shall be manufactured from high pressure die-cast aluminium. It shall have an LED efficacy of up to 145 luminaire lm/W and will be capable of producing up to 99,000 luminaire lumens at 4000K with a CRI >70. It shall have an asymmetric forward throw optic and is rated at IP66 and IK08.

For IDA Accredited Specification add: The luminaire shall produce a CCT of 2700K with a fixed bracket mount.

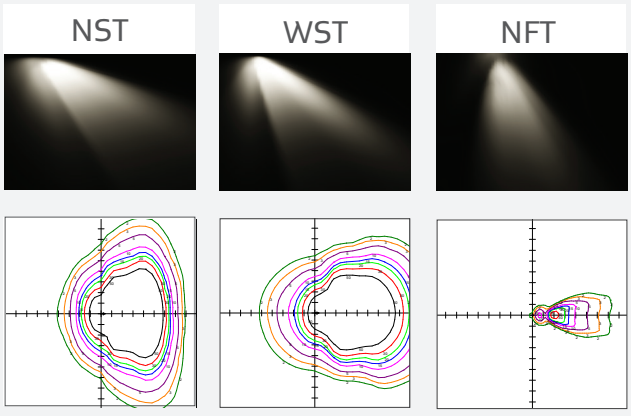
Specification

Weight:

Fitting:	23.7 kg
Driver:	8.0 kg
Fitting with integral driver:	16.7 kg

Windage:	0.19m²
Material:	Die-cast Aluminium
Paint Finish:	Marine Grade Powder Coated Anthracite Grey

Optics

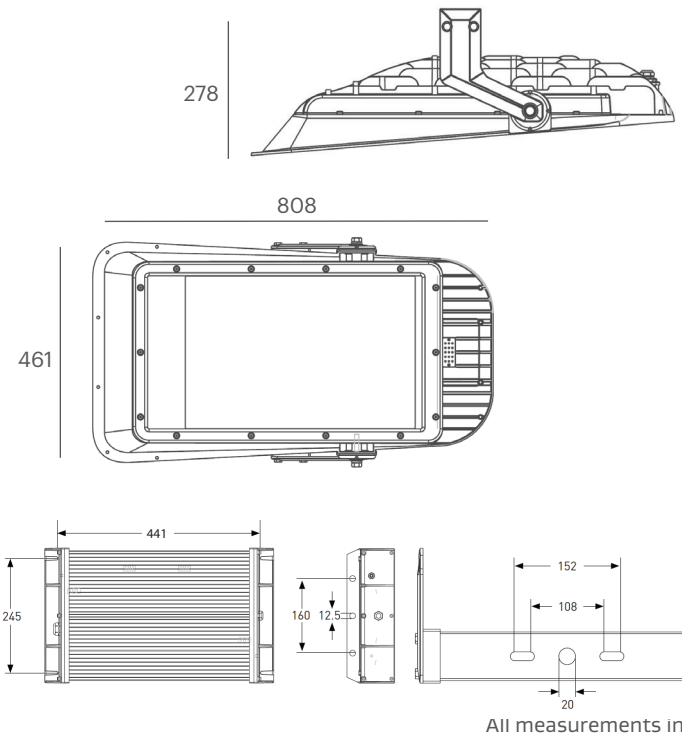


Key Features

- 450W - 665W
- 59,000 - 99,000 Luminaire Lumens
- Efficacy up to 145 lm/W
- 2700K, 4000K
- CRI >70, CRI >80, CRI >90
- Lifetime >100,000hr
- Asymmetrical
- Driver options
- Marine grade paint

LED | DIM | IP66 | IK08 | Control Compatible

Dimensions



All measurements in mm

Code	Power	Luminaire Lumens	Optic	CCT(K)	IP	IK	Weight (kg)		Paint Finish
Seperate driver							Fitting	Driver	
LAFM94NRS6WST740	665W	94000	Wide Short Throw	4000	IP66	IK08	23.7	8.0	Anthracite Grey
LAFM87NRS6NST740	665W	87000	Narrow Short Throw	4000	IP66	IK08	23.7	8.0	Anthracite Grey
LAFM99NRS6NFT740	685W	99000	Narrow Forward Throw	4000	IP66	IK08	23.7	8.0	Anthracite Grey
Integral driver									
LAFM64ID4WST740	450W	63500	Wide Short Throw	4000	IP66	IK08	16.7	-	Anthracite Grey
LAFM59ID4NST740	450W	59000	Narrow Short Throw	4000	IP66	IK08	16.7	-	Anthracite Grey
LAFM65ID4NFT740	450W	65000	Narrow Forward Throw	4000	IP66	IK08	16.7	-	Anthracite Grey

Accessories / Options

- External & integral spill shields
- Control options
- Dimmable options
- Colour Temperature options

Mounting Options

- Bracket mounted