Old College Tennis Club

Outdoor LED Tennis Lighting Design

Project code:	5716b
Date:	02/07/2021
Client:	Old College Tennis Club
Client Representative:	
Lighting Consultant:	
Project Consultant:	
Planning Consultant:	
Lighting Design Company:	Luminance Pro Lighting Systems Ltd
Lighting Design Representative:	Matthew Haskins
Lighting Design Software:	CalcuLux Area 7.7.0.1
Design Criteria:	To provide a lighting scheme suitable for Lawn Tennis Associations minimum standard, whilst minimising light spill and glare to neighbouring properties. PPA = 400 Lux maintained at 0.7 uniformity TPA = 300 Lux maintained at 0.6 uniformity
Columns:	6 No. New 6.4 metre columns to match existing 3 No. Existing columns to be utilised
Luminaires:	4 No. New (HiLux model: Match LED) 6 No. Existing (HiLux model: Match LED)
Notes:	This lighting design is solely based on the use of the equipment detailed. Any deviation from this equipment will produce differing results. The superior optics of the HiLux Match LED luminaire have been specifically selected to minimise the effects of nuisance overspill to adjacent dwellings.

The nominal values shown in this report are the result of precision calculations, based upon precisely positioned luminaires in a fixed relationship to each other and to the area under examination. In practice the values may vary due to tolerances on luminaires, luminaire positioning, reflection properties and electrical supply.

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lighting design centre

HiLux

NICEIC APPROVED CONTRACTOR UKAS PRODUCT CERTIFICATION 118

SAFCA

Table of Contents

1. Project Description

1.1 Top Project Overview

Scale
1:1000

2. Summary

2.1 General Information

The overall maintenance factor used for this project is 0.90.

2.2 Observer Information

Code	Observer	Position		
		X (m)	Y (m)	Z (m)
Aa	College Gardens - 1	36.53	25.63	4.00
Bb	College Gardens - 2	37.11	20.63	4.00
Cc	College Gardens - 3	38.36	15.98	4.00
Dd	College Gardens - 4	39.10	11.15	4.00
Ee	College Gardens - 5	40.27	6.07	4.00
Ff	College Gardens - 6	41.10	0.58	4.00
Gg	College Gardens - 7	26.96	-15.56	4.00
Hh	College Gardens - 8	28.29	-20.63	4.00
Ii	College Gardens - 9	29.20	-25.05	4.00
Jj	College Gardens - 10	29.79	-29.79	4.00
Kk	College Gardens - 11	31.04	-34.70	4.00
Ll	College Gardens - 12	31.70	-39.61	4.00

2.3 Obstacle Information

Obstacle	Transparency (%)	Position		
		X (m)	Y (m)	Z (m)
Hedge 01	0	16.25	-18.95	0.00
Hedge 02	0	13.74	-50.64	0.00
Hedge 03	0	12.98	-45.32	0.00
Hedge 04	0	15.40	-30.63	0.00

2.4 Project Luminaires

Code	Qty	Luminaire Type	Lamp Type	Power (W)	Flux (lm)
A	14	HiLux Match Slim LED - 420 w/360def	1 * LED	413.0	1 * 55020
B	2	HiLux Match Slim LED - 480 w/360def	1 * LED	472.0	1 * 62880
C	8	HiLux Match Slim LED - 600 w/360def	1 * LED	590.0	1 * 76700
D	5	HiLux Match Slim LED - 360	1 * LED	354.0	1 * 57360
E	11	HiLux Match Slim LED - 420	1 * LED	413.0	1 * 66920

The total installed power: 17.76 (kWatt)

Number of Luminaires Per Switching Mode:

Switching Mode	Luminaire Code					Power (kWatt)
	A	B	C	D	E	
Court 1	2	2	2	0	1	3.36
Court 2	1	0	2	1	3	3.19
Court 3	4	0	2	0	1	3.25
Court 3A	1	0	2	1	3	3.19
Court 4	4	0	2	1	0	3.19
Court 5	1	0	2	2	2	3.13
Court 6	4	0	2	0	1	3.25
Court 7	1	0	2	1	3	3.19
Courts 1,2	2	2	2	1	3	4.54
Courts 3,3A	4	0	2	1	3	4.42
Courts 4,5	4	0	2	2	2	4.37
Courts 6,7	4	0	2	1	3	4.42
All lights	14	2	8	5	11	17.76

Number of Luminaires Per Arrangement:

Arrangement	Luminaire Code					Power (kWatt)
	A	B	C	D	E	
C1 P1	0	1	0	0	0	0.47
C1 P2	1	0	0	0	0	0.41
C1 P3	0	1	0	0	0	0.47
C1 P4	0	0	0	0	1	0.41
C1 P5	0	0	1	0	0	0.59
C1 P6	0	0	1	0	0	0.59
C2 P1	1	0	0	0	0	0.41
C2 P2	0	0	0	0	1	0.41
C2 P3	0	0	0	1	0	0.35
C2 P4	0	0	0	0	1	0.41
C3 P1	1	0	0	0	0	0.41
C3 P2	1	0	0	0	0	0.41
C3 P3	1	0	0	0	0	0.41
C3 P4	0	0	0	0	1	0.41
C3,3A P1	0	0	1	0	0	0.59
C3,3A P2	0	0	1	0	0	0.59
C3A P1	1	0	0	0	0	0.41
C3A P2	0	0	0	0	1	0.41
C3A P3	0	0	0	1	0	0.35
C3A P4	0	0	0	0	1	0.41
C4 P1	0	0	0	1	0	0.35
C4 P2	2	0	0	0	0	0.83
C4 P3	1	0	0	0	0	0.41
C5 P1	1	0	0	0	0	0.41
C5 P2	0	0	2	0	0	1.18
C5 P3	0	0	0	0	2	0.83
C5 P4	0	0	0	1	0	0.35
C6 L1	3	0	0	0	0	1.24
C6 P1	0	0	0	0	1	0.41
C6P2	0	0	2	0	0	1.18
C7 L1	0	0	0	1	2	1.18
C7 P1	1	0	0	0	0	0.41

2.5 Calculation Results

Switching Modes:

Code	Switching Mode
1	Court 1
2	Court 2
3	Court 3
4	Court 3A
5	Court 4
6	Court 5
7	Court 6
8	Court 7
9	Courts 1,2
10	Courts 3,3A
11	Courts 4,5
12	Courts 6,7
13	All lights

(Il)luminance Calculations:

Calculation	Switching Mode	Type	Unit	Ave	Min/Ave
PPA 3	3	Surface Illuminance	lux	435	0.90
PPA 3A	4	Surface Illuminance	lux	443	0.88
TPA 3	3	Surface Illuminance	lux	415	0.63
College Gardens Grid 01	13	Surface Illuminance	lux		
College Gardens Grid 02	13	Surface Illuminance	lux		
Overspill	13	Surface Illuminance	lux		

Obtrusive Light Calculations:

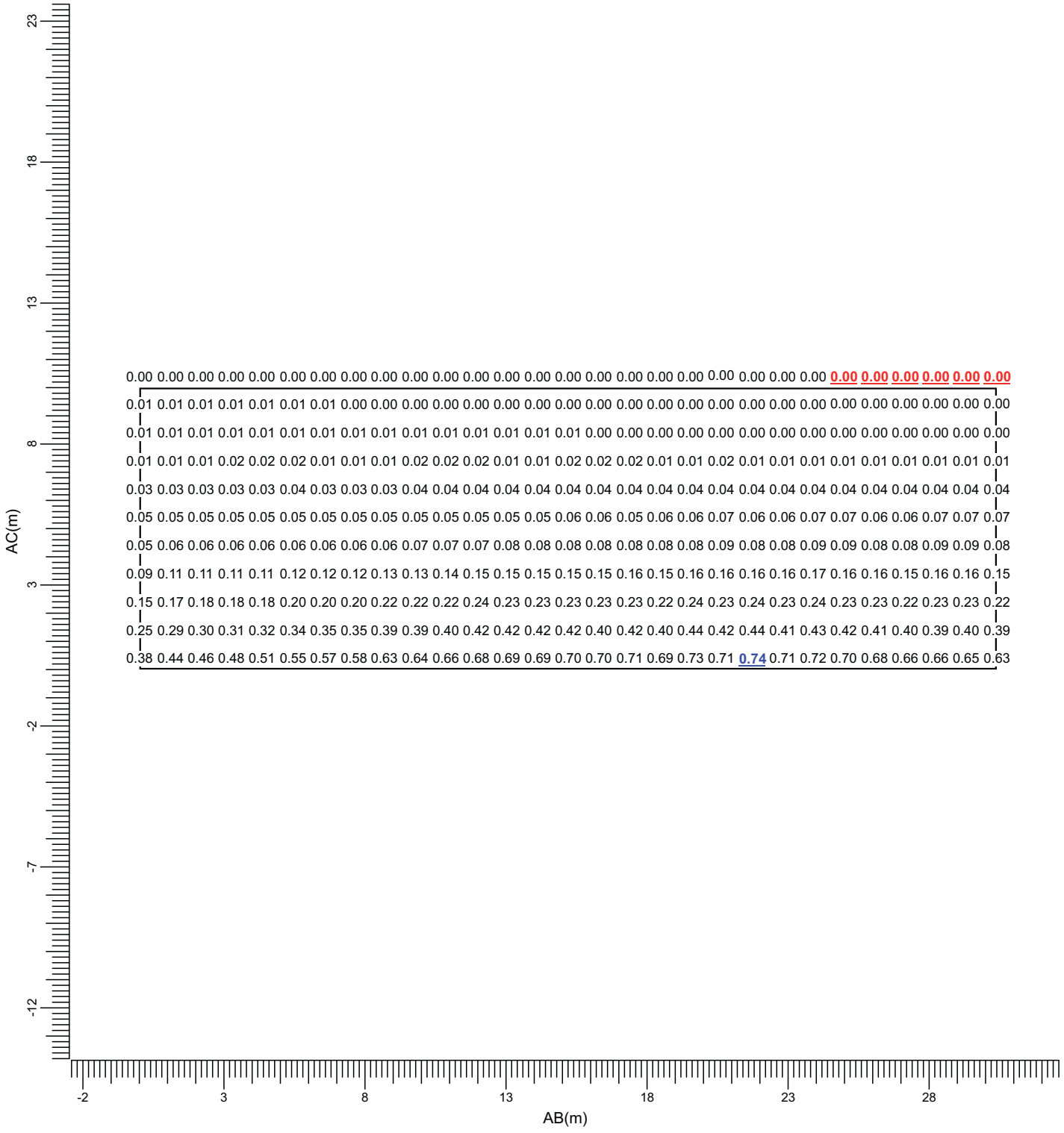
Switching Mode	Observer Code	Luminaire Code	Position			Aiming Angles			Maximum Intensity (cd)
			X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0	
13	Aa	C	0.00	-17.06	6.80	90.00	54.50	0.00	68
13	Bb	E	14.60	11.89	6.70	-180.00	59.50	0.00	58
13	Cc	E	14.60	11.89	6.70	-180.00	59.50	0.00	58
13	Dd	C	0.00	-17.06	6.80	90.00	54.50	0.00	57
13	Ee	C	0.00	-17.06	6.80	90.00	54.50	0.00	62
13	Ff	C	0.00	-17.06	6.80	90.00	54.50	0.00	72
13	Gg	E	14.60	-11.89	6.70	-180.00	59.50	0.00	245
13	Hh	E	14.60	-11.89	6.70	-180.00	59.50	0.00	158
13	Ii	E	14.60	-11.89	6.70	-180.00	59.50	0.00	112
13	Jj	E	14.60	-11.89	6.70	-180.00	59.50	0.00	96
13	Kk	E	14.60	-11.89	6.70	-180.00	59.50	0.00	75
13	Ll	C	-10.96	-20.78	6.40	-80.20	54.50	0.00	67

3. Calculation Results

3.1 College Gardens Grid 01: Graphical Table

All lights

Grid : College Gardens Grid 01
Calculation : Surface Illuminance (lux)



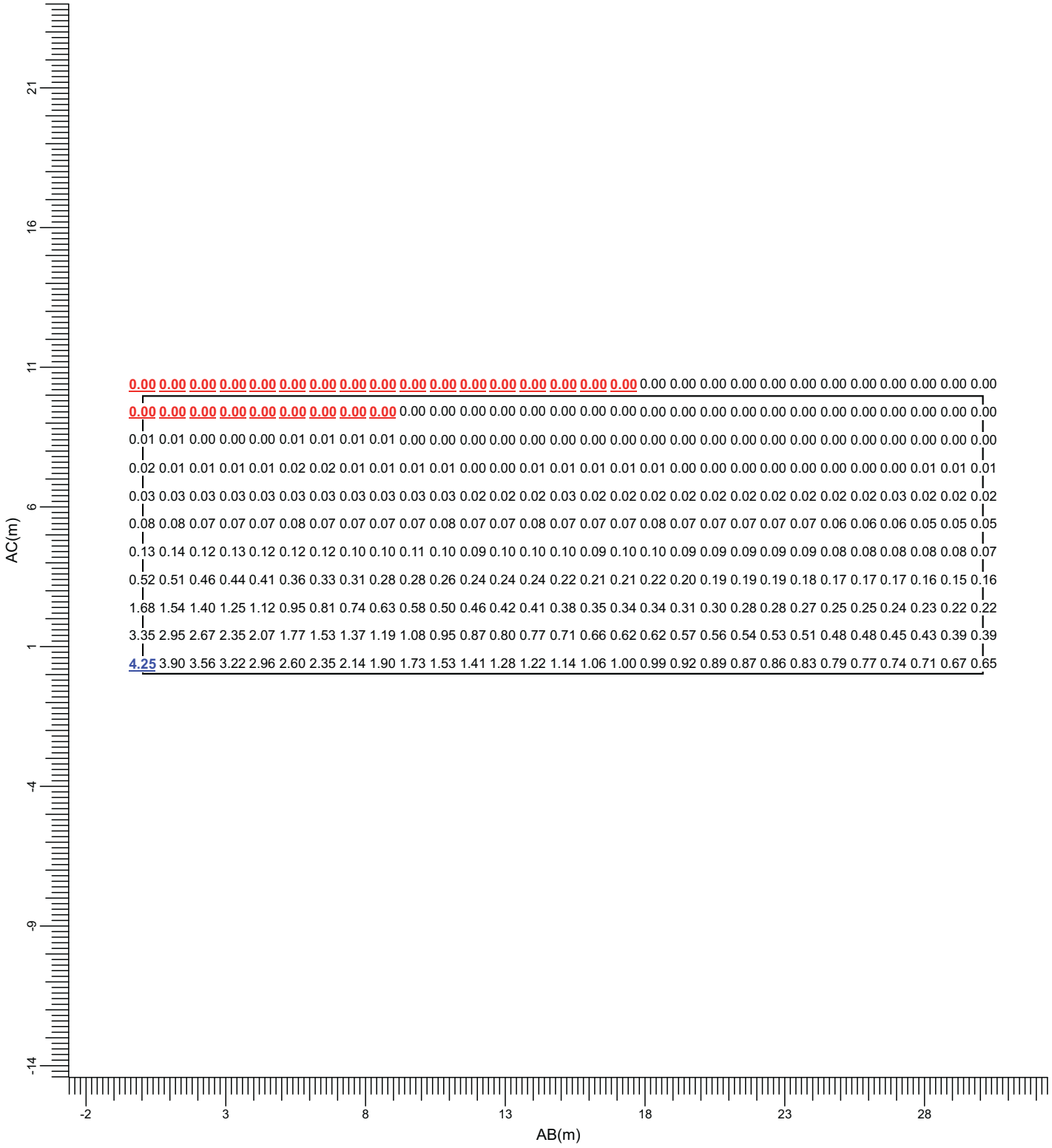
Project maintenance factor
0.90

Scale
1:200

3.2 College Gardens Grid 02: Graphical Table

All lights

Grid : College Gardens Grid 02
Calculation : Surface Illuminance (lux)



(26.50, -12.50, 12.50) C-----D (32.50, -42.00, 12.50)
| |
(26.50, -12.50, 2.50) A-----B (32.50, -42.00, 2.50)

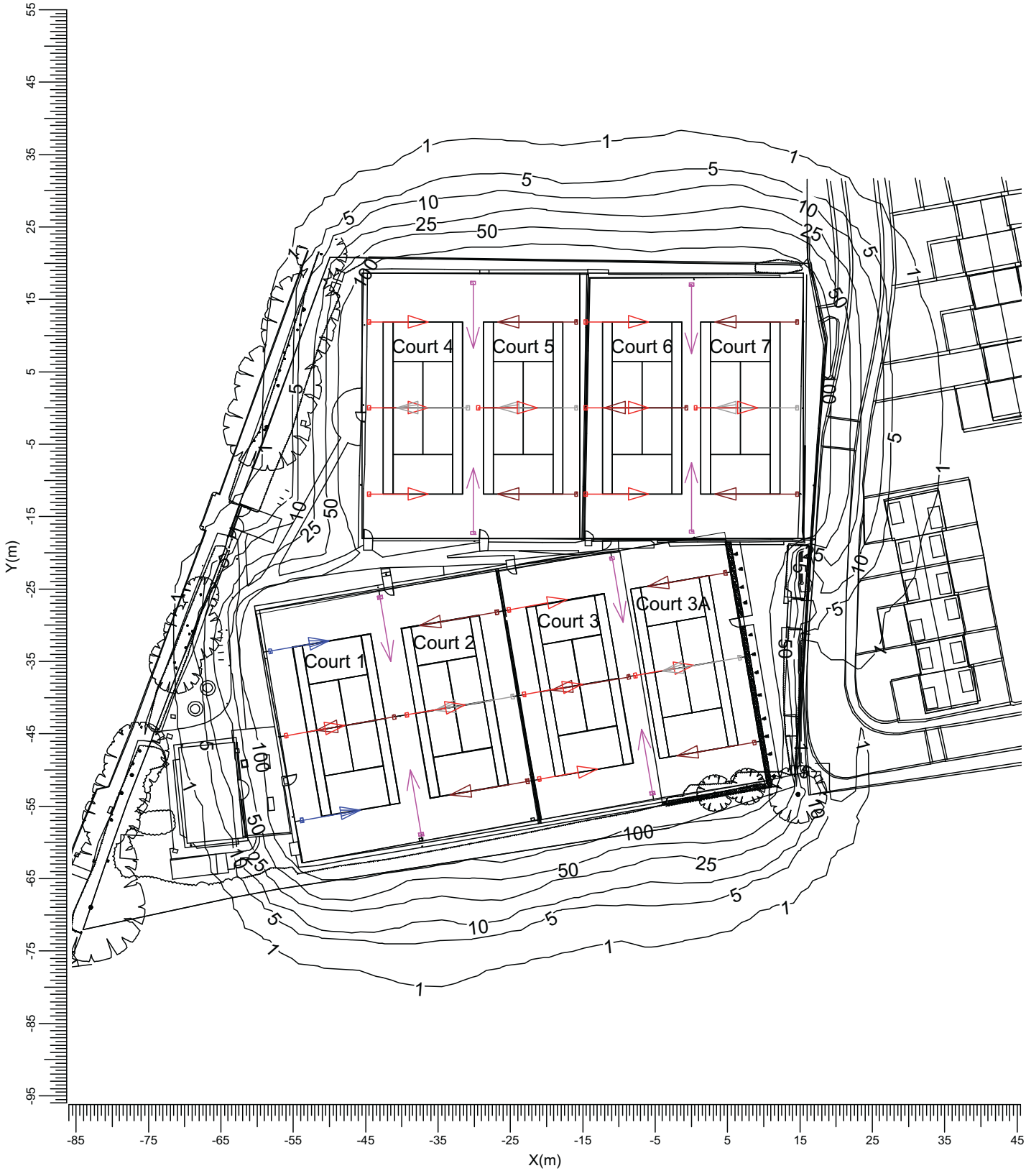
Project maintenance factor
0.90

Scale
1:200

3.3 Overspill: Iso Contour

All lights

Grid : Overspill at Z = -0.00 m
Calculation : Surface Illuminance (lux)



HiLux Match Slim LED - 420 w/360def
HiLux Match Slim LED - 600 w/360def
HiLux Match Slim LED - 420
HiLux Match Slim LED - 480 w/360def
HiLux Match Slim LED - 360

Project maintenance factor
0.90

Scale
1:750

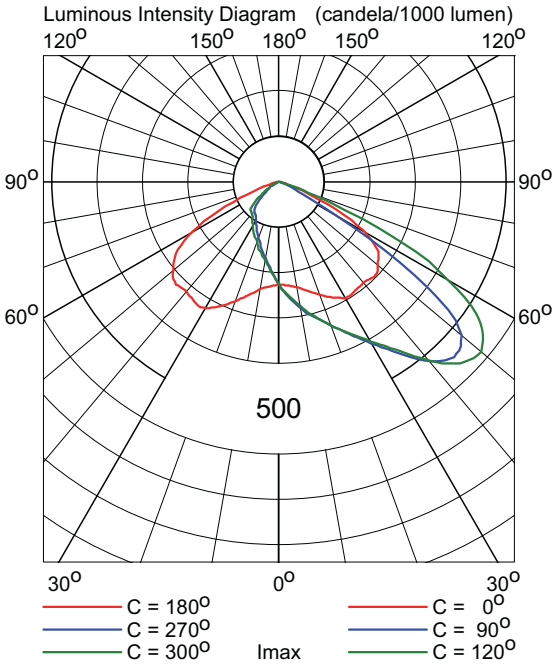
4. Luminaire Details

4.1 Project Luminaires

HiLux Match Slim LED - 420 w/360def

Light output ratios
- DLOR : 1.00
- ULOR : 0.00
- TLOR : 1.00

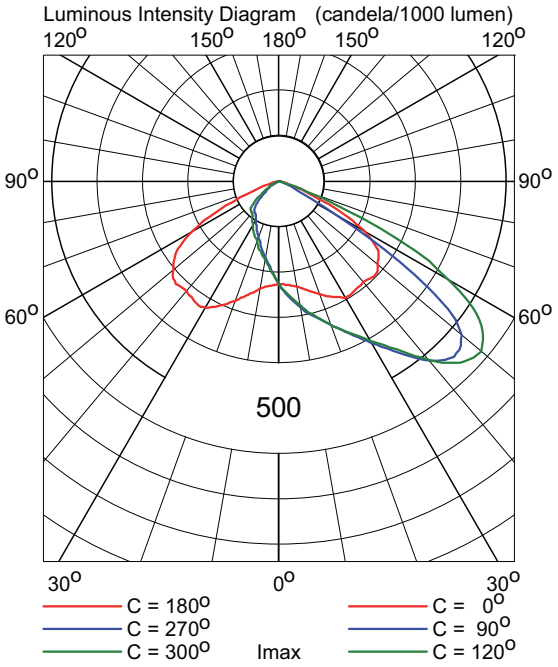
Lamp flux : 55020 lm
Luminaire wattage : 413.0 W
Measurement code : 213v1.0



HiLux Match Slim LED - 480 w/360def

Light output ratios
- DLOR : 1.00
- ULOR : 0.00
- TLOR : 1.00

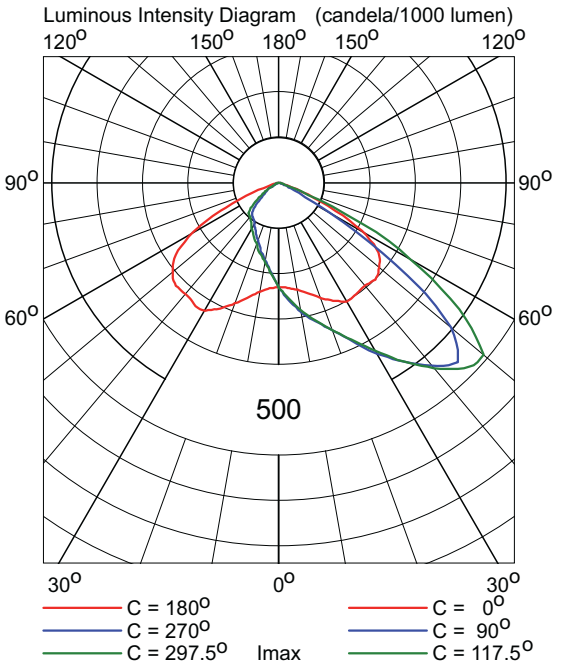
Lamp flux : 62880 lm
Luminaire wattage : 472.0 W
Measurement code : 213v1.0



HiLux Match Slim LED - 600 w/360def

Light output ratios
- DLOR : 1.00
- ULOR : 0.00
- TLOR : 1.00

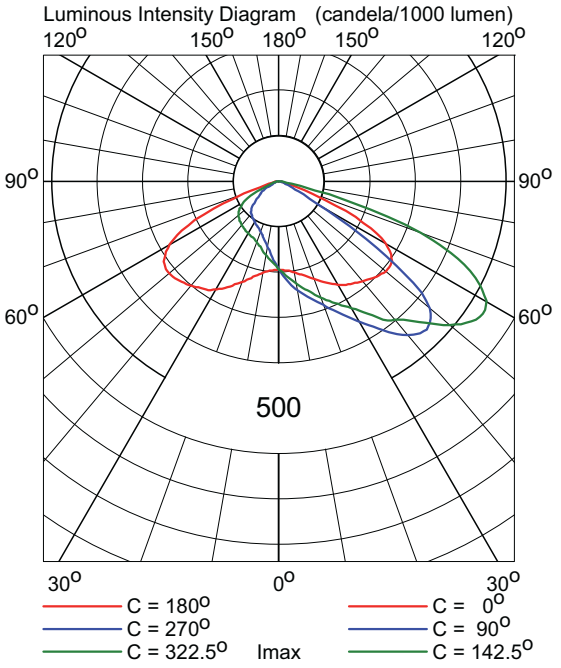
Lamp flux : 76700 lm
Luminaire wattage : 590.0 W
Measurement code : 212v1.0



HiLux Match Slim LED - 360

Light output ratios
- DLOR : 1.00
- ULOR : 0.00
- TLOR : 1.00

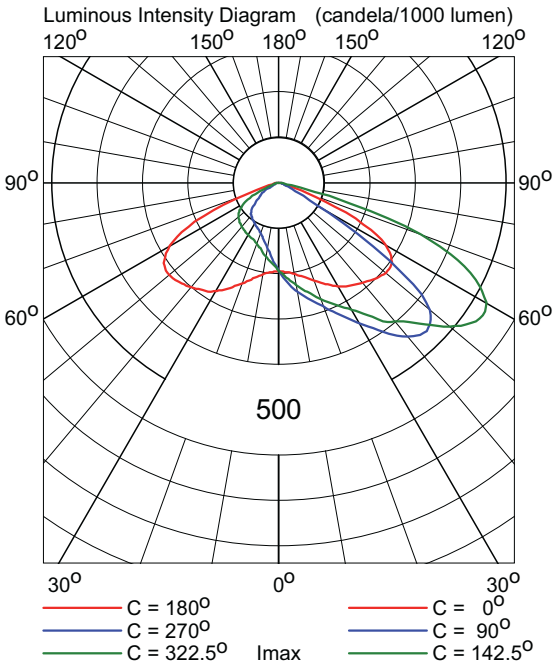
Lamp flux : 57360 lm
Luminaire wattage : 354.0 W
Measurement code : LPLS180v1.



HiLux Match Slim LED - 420

Light output ratios
- DLOR : 1.00
- ULOR : 0.00
- TLOR : 1.00

Lamp flux : 66920 lm
Luminaire wattage : 413.0 W
Measurement code : LPLS180v1.



Observer, Vertical Grid, Obstacle & Deflector Locations

Obtrusive Light - Compliance Report

Guidance notes for the reduction of obtrusive light
Environmental zone classification: E2-Rural - Low District Brightness
Pre-Curfew
Project code: 5716b
02/07/2021

Maximum values of vertical illuminance on properties (CIE 150 table 2)

Maximum Allowable Value: 5 Lux

Calculations Tested (2):

Calculation Label	Max. Illum. (Lux)	Max. Allowable (Lux)	Test Results
College Gardens Grid 01	0.74	5	PASS
College Gardens Grid 02	4.25	5	PASS

Limits for the luminous intensity of bright luminaires (CIE 150 table 3 (amended))

Maximum Allowable Value: 7500 Cd

Calculations Tested (12):

Calculation Label	Max. Measured (Cd)	Max. Allowable (Cd)	Test Results
Aa	68	7500	PASS
Bb	58	7500	PASS
Cc	58	7500	PASS
Dd	57	7500	PASS
Ee	62	7500	PASS
Ff	72	7500	PASS
Gg	245	7500	PASS
Hh	158	7500	PASS
Ii	112	7500	PASS
Jj	96	7500	PASS
Kk	75	7500	PASS
Ll	67	7500	PASS

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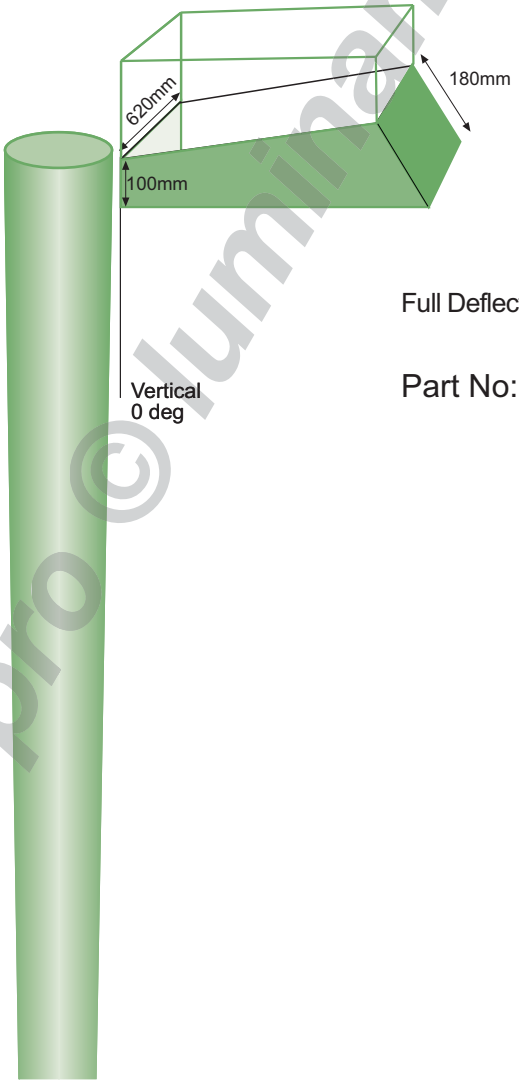
Match LED Slim Gen3
Deflector



Full Deflector

Part No: HLDFULL

*This indicative drawing is for information only.

Manufactured & Distributed in the United Kingdom by:
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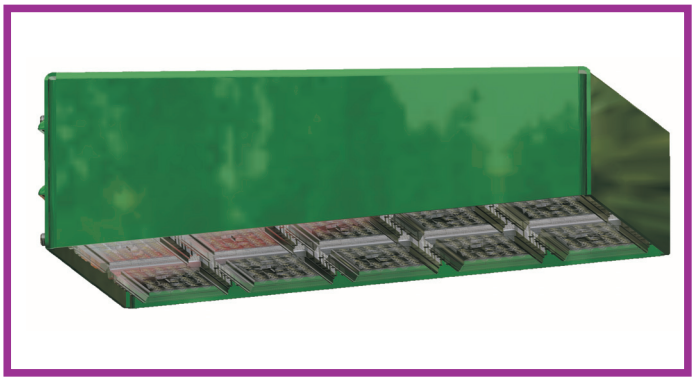


HiLux®

Match® Slim LED

The Match Slim LED is a new generation of HiLux high performance luminaires designed for use in sports lighting.

Match Slim LED

Box quantity	1
Net Weight	10.5 - 16kg
Body colour (standard)	RAL6005
Optic	Standard**
IP rating	IP68
Windage	0.035m^2
Mounting method	4 x M10 factory fitted
Lamp type	LED
Luminaire power	300W - 600W
Lamp colour	5000 K
Supply voltage	230v

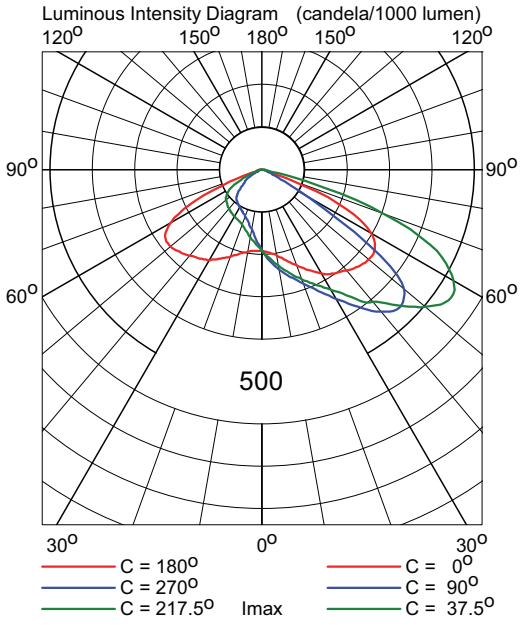
- ✓ LED low energy lighting
- ✓ Exceptional light control
- ✓ Designed for outdoor sports lighting
- ✓ Lightweight aluminium body
- ✓ Stainless steel components
- ✓ Computer designed optics
- ✓ Heavy duty mounting
- ✓ IP68 ingress protection for main elements
- ✓ Powder coat finish (RAL 6005) Green
- ✓ 5 year limited warranty via direct install*
- ✓ 5 & 10 year onsite extended warranty available*

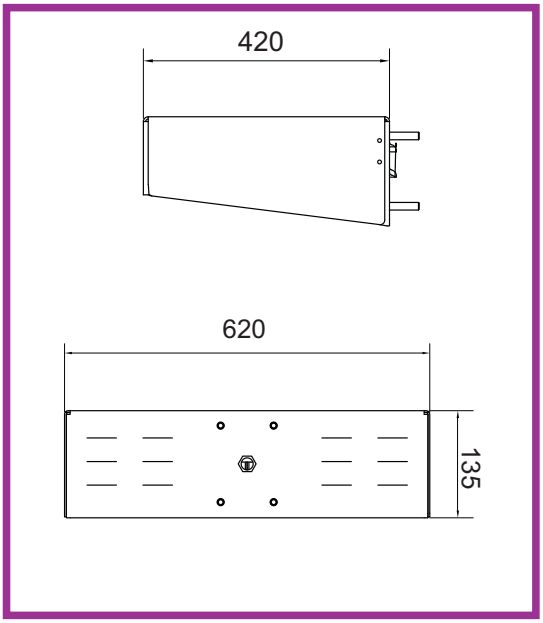
Product code:

MATCH-SLIM/LED

Options

/C - Alternative colour finish





* Conditions apply
** Various optics available

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Ref: MATCHSLIMLED/GEN3/V1.7/Feb 2021