

East Grinstead Tennis Squash & Racketball Club_Report v4.0

Supports Planning Application for: Retrofit LED Lighting Installation and Column Replacement.

Lighting Assessment using Maintenance Factor 1.



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Preliminary remarks

This report accompanies the planning application to Mid Sussex District Council for the installation of energy-efficient LED floodlighting at East Grinstead Tennis, Squash & Racketball Club.

We propose replacing the existing metal halide floodlights on courts 1-2 and 4-5 with Ensolve Modular 30 LED luminaires. Following independent inspection, 3 no. 9m hexagonal flange-plated columns on courts 4-5 have been condemned. They should be replaced with 9m tubular flange-plated columns mounted on the existing anchor kits. An existing 1 no. 8m root-mounted tubular column on courts 1-2 should also be replaced like-for-like. The number, positions and heights of all columns will remain unchanged, as will the mounting height of the luminaires.

A detailed lighting assessment shows that the proposed installation will operate within the relevant obtrusive light thresholds. Shielding and louvres have been used in the lighting scheme and further shielding can be added during installation if necessary.

To demonstrate a worst-case scenario, the lighting report uses a Maintenance Factor (MF) of 1.

The design has been developed in accordance with the Institution of Lighting Professionals' Guidance Note 01/21: The Reduction of Obtrusive Light, which reflects international standards outlined in CIE 150:2017.

The proposed LED installation offers several key benefits including:

- **Environmental & Economical:** Significantly lower energy consumption and running costs. Additionally, reduced light pollution when compared to the existing traditional metal halide floodlighting.
- **Operational:** Instant illumination and minimal maintenance requirements.
- **Community:** Improved access to high-quality sports facilities with minimal impact on surrounding areas.

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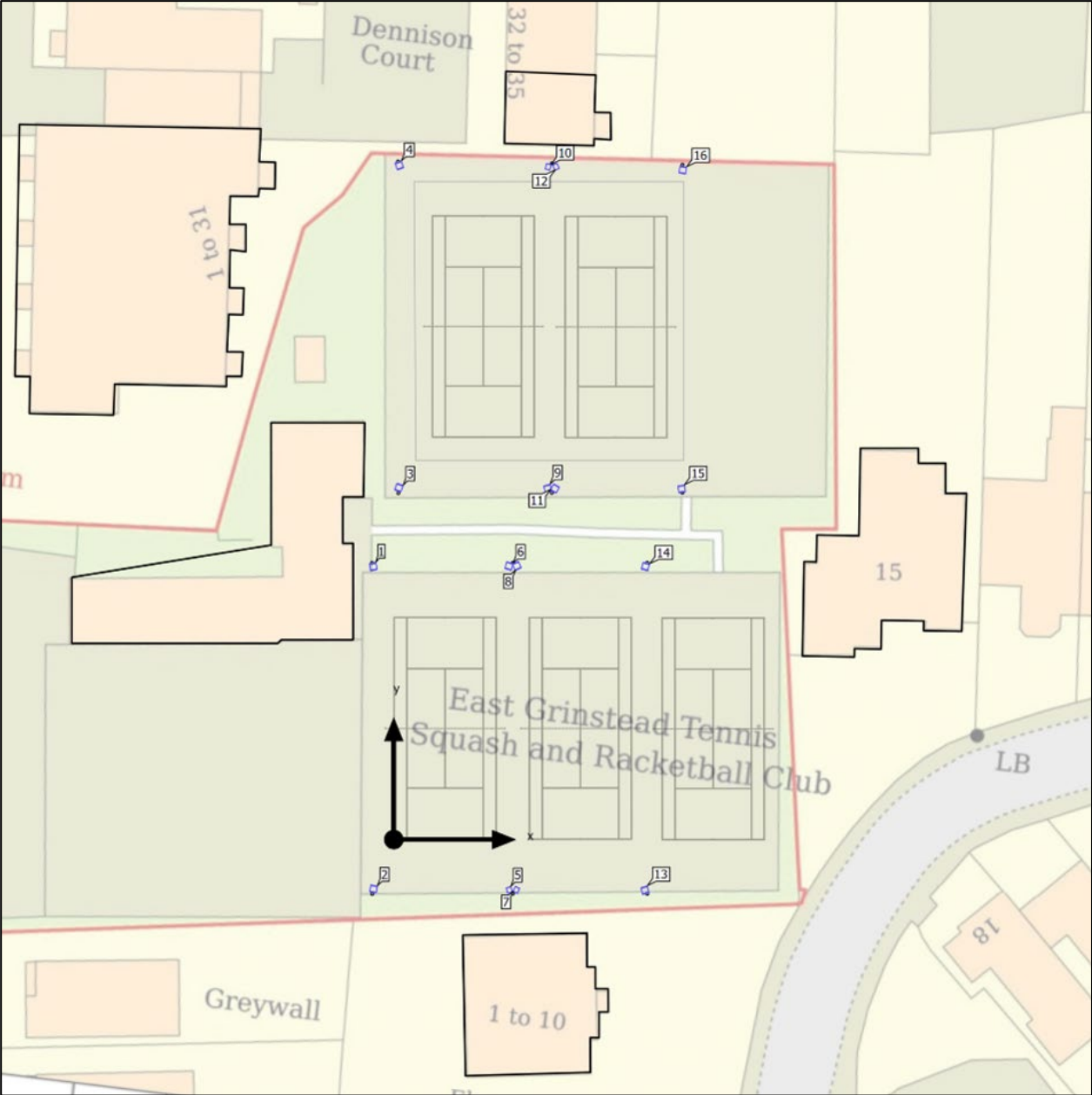


Luminaire list

Φ_{total} 1491384 lm	P_{total} 14435.6 W
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pcs.	Manufacturer	Article Name	Article No.	P	Φ
4	Ensolve Solutions	Modular 30	EN-800W-A60N-H-BS-Pro	802.3 W	81086 lm
8	Ensolve Solutions	Modular 30	ENLP-1000W-A60N-H-BS	1002.2 W	104175 lm
4	Ensolve Solutions	Modular 30	ENLP-800W-A60N-H-BS	802.2 W	83410 lm

Luminaire layout plan



Luminaire layout plan

Ensolve Modular 30 - EN-800W-A60N-H-BS-Pro
1x EN-800W-A60N-H-BS-Pro

X	Y	Mounting Height	Maintenance Factor (MF)	Luminaire
12.395 m	-5.423 m	8.200 m	1	5
13.143 m	-5.413 m	8.200 m	1	7
16.572 m	72.145 m	8.200 m	1	10
17.396 m	72.152 m	8.200 m	1	12

Ensolve Modular 30 - ENLP-1000W-A60N-H-BS
1x ENLP-1000W-A60N-H-BS

X	Y	Mounting Height	Maintenance Factor (MF)	Luminaire
-2.208 m	29.288 m	8.200 m	1	1
-2.181 m	-5.327 m	8.200 m	1	2
0.540 m	37.702 m	8.200 m	1	3
0.586 m	72.309 m	8.200 m	1	4
26.961 m	-5.469 m	8.200 m	1	13
27.010 m	29.311 m	8.200 m	1	14
30.893 m	37.560 m	8.200 m	1	15
31.015 m	71.822 m	8.200 m	1	16

Ensolve Modular 30 - ENLP-800W-A60N-H-BS
1x ENLP-800W-A60N-H-BS

X	Y	Mounting Height	Maintenance Factor (MF)	Luminaire
12.368 m	29.361 m	8.200 m	1	6
13.192 m	29.367 m	8.200 m	1	8
16.526 m	37.607 m	8.200 m	1	9
17.274 m	37.617 m	8.200 m	1	11

OUTDOOR SPORTS

ENSOLVE MODULAR 30



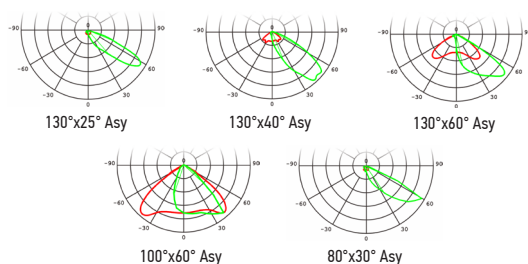
PERFORMANCES

Power (W)	400 W to 1800 W
Efficiency (lumens)	Up to 165 lumens/W
Colour Rendering Index	Ra>70, Ra>80, Ra>90
IP/IK Index	IP 66, IK08
Colour temperature	3000K, 4000K, 5000K, 5700K
Lumen maintenance	L90 60 000h

OPTIONS

Light Controls	0-10V, DALI, DMX
Spill Reducction	Shielding available
Detectors	Motion sensor, Photocel
Spill Reduction	Back light shields, spill control reflectors
Accessories	Bird spikes
Colour Options	Black, Grey, RAL Green
Optics	Multiple optics available to optimise playing areas

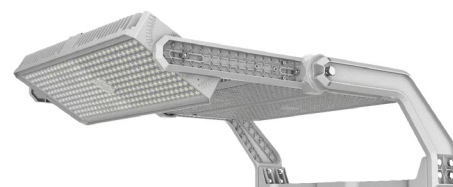
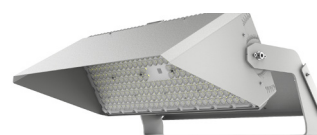
OPTICS



The Ensolve Modular 30 features multiple low glare optics and shielding options, making them great for the most challenging lighting design.

Made from premium-grade aluminium, the housing units offer durability and excellent thermal performance. Advanced heat sink technology ensures reliable operation for over 20 years or 100,000 hours, providing a virtually maintenance-free solution and reducing operating costs.

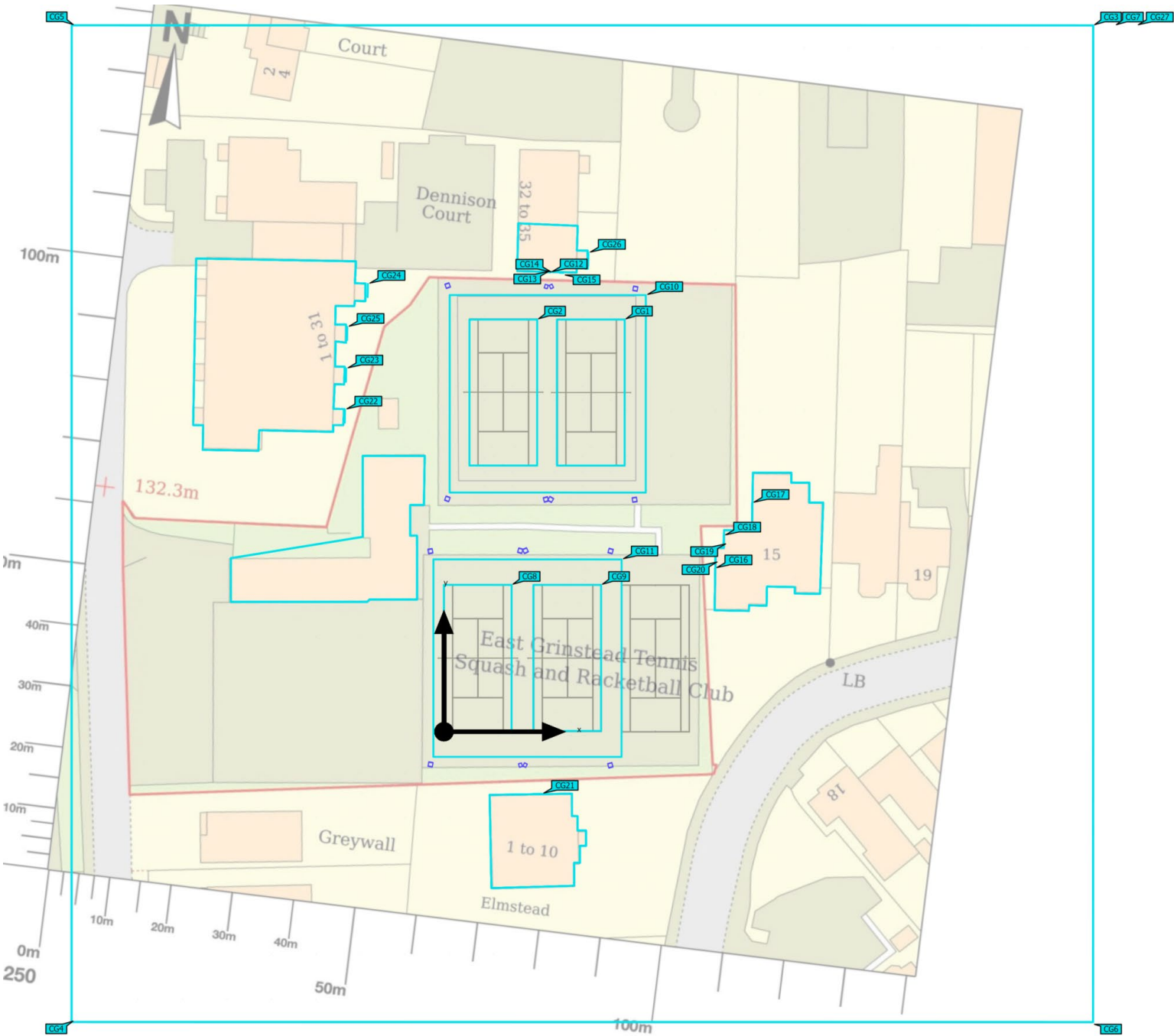
With superior functionality and efficiency, this luminaire will enhance any sports facility with exceptional lighting quality and long-lasting reliability, meeting the high standards of professional sporting events.



SAMSUNG



Calculation objects - Horizontal Light Spill
All Courts On - MF1



Calculation objects - Horizontal Light Spill

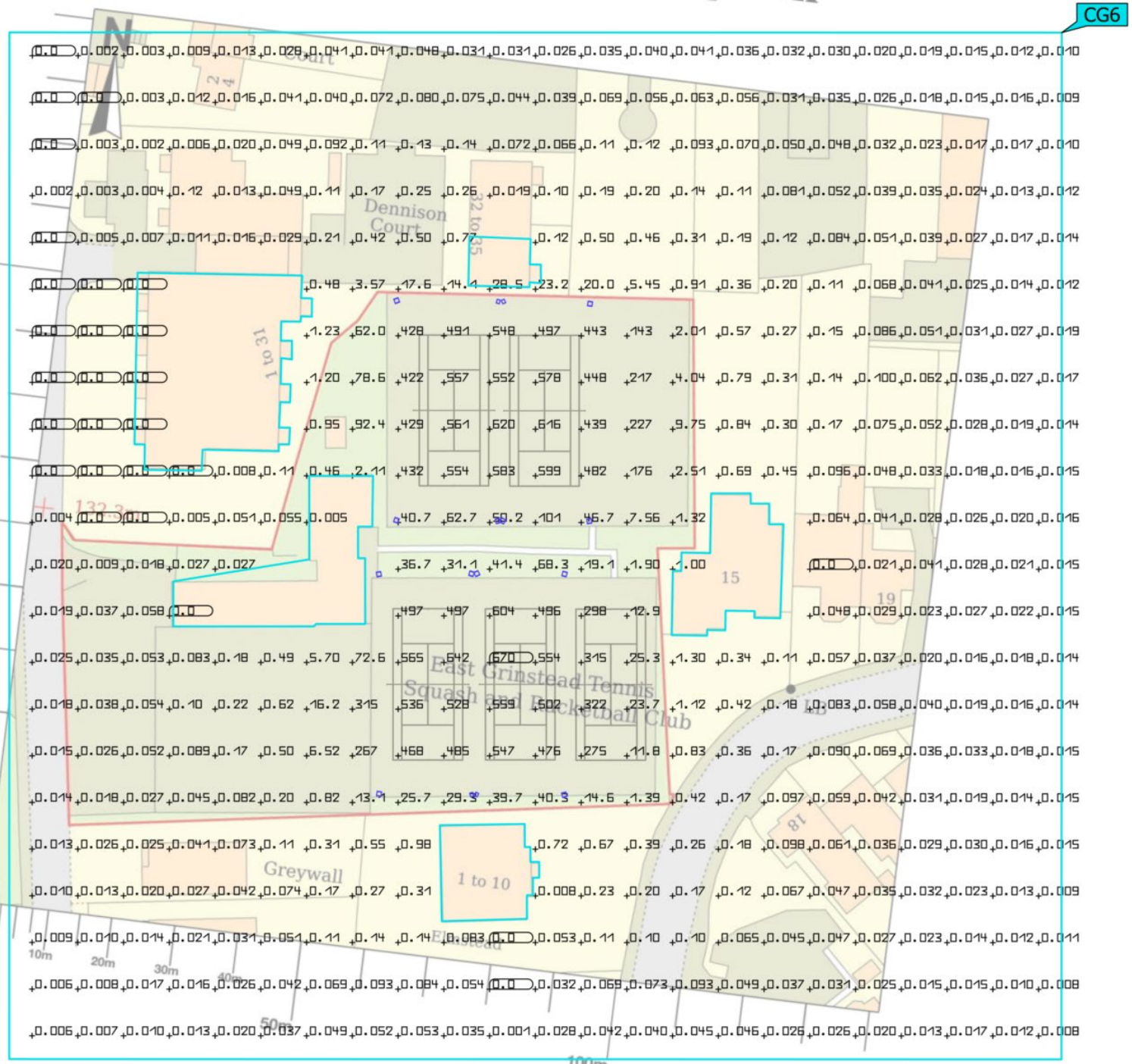
All Courts On - MF1

Calculation surfaces

Properties	$\bar{E}$	E_{min}	E_{max}	Index
Horizontal Light Spill Tennis Courts @ +0.0m Perpendicular illuminance	47.9 lx	0.00 lx	670 lx	CG6
Horizontal Light Spill Tennis Courts @ +0.8m Perpendicular illuminance	48.2 lx	0.00 lx	686 lx	CG7
Horizontal Light Spill Tennis Courts @ +3.0m Perpendicular illuminance	43.1 lx	0.00 lx	1087 lx	CG5
Horizontal Light Spill Tennis Courts @ +6.0m Perpendicular illuminance	9.34 lx	0.00 lx	919 lx	CG4
Horizontal Light Spill Tennis Courts @ +8.0m Perpendicular illuminance	0.022 lx	0.00 lx	9.51 lx	CG3

Horizontal Light Spill - Lux Chart @ 0.0m

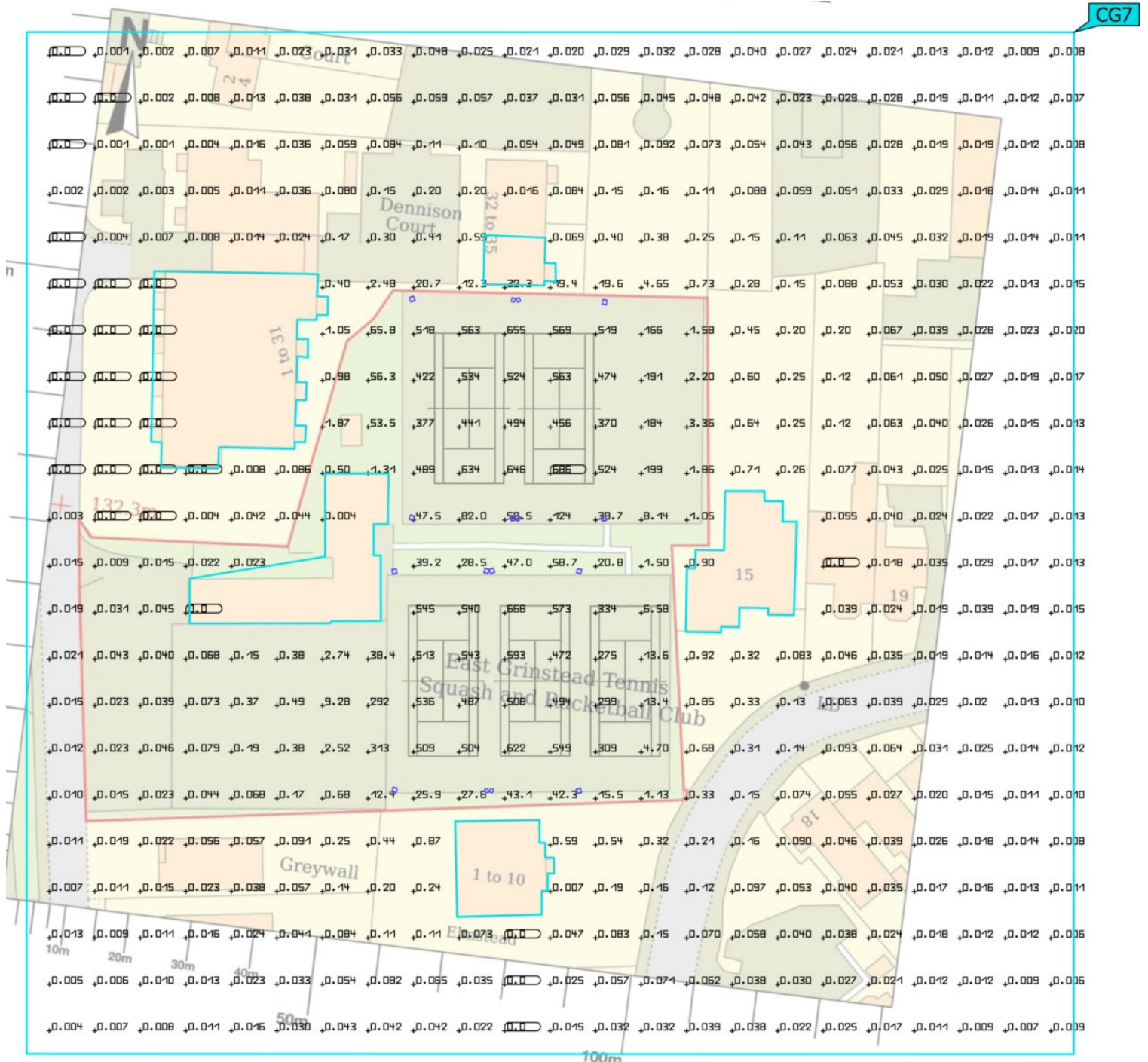
All Courts On - MF1



Properties	E	E _{min}	E _{max}	Index
Horizontal Light Spill Tennis Courts @ +0.0m Perpendicular illuminance	47.9 lx	0.00 lx	670 lx	CG6

Horizontal Light Spill - Lux Chart @ 0.8m

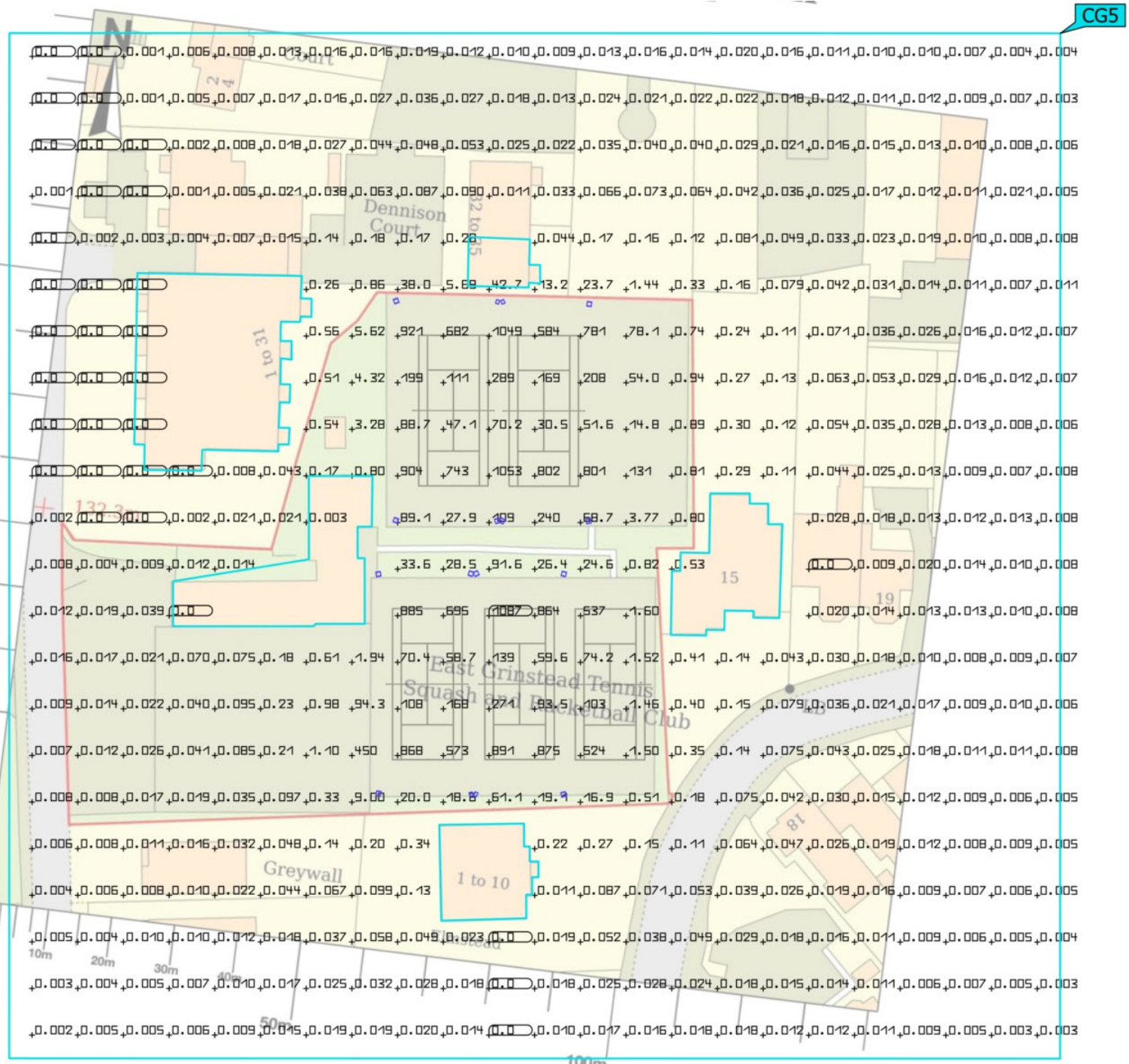
All Courts On - MF1



Properties	E	E _{min}	E _{max}	Index
Horizontal Light Spill Tennis Courts @ +0.8m Perpendicular illuminance	48.2 lx	0.00 lx	686 lx	CG7

Horizontal Light Spill - Lux Chart @ 3.0m

All Courts On - MF1



Properties	E	E _{min}	E _{max}	Index
Horizontal Light Spill Tennis Courts @ +3.0m Perpendicular illuminance	43.1 lx	0.00 lx	1087 lx	CG5

Horizontal Light Spill - Lux Chart @ 6.0m

All Courts On - MF1



Properties	E	E _{min}	E _{max}	Index
Horizontal Light Spill				
Tennis Courts @ +6.0m	9.34 lx	0.00 lx	919 lx	CG4
Perpendicular illuminance				

Horizontal Light Spill - Lux Chart @ 8.0m
All Courts On - MF1



Properties	Ē	E _{min}	E _{max}	Index
Horizontal Light Spill Tennis Courts @ +8.0m Perpendicular illuminance	0.022 lx	0.00 lx	9.51 lx	CG3

Calculation objects - Vertical Light Spill

All Courts On - MF1

Calculation surfaces

Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #1-10 Elmstead - 13 Portland Rd @ 4.500m Perpendicular illuminance	3.50 lx	2.71 lx	4.72 lx	CG21
Vertical Light Spill #15 Portland Rd - A @ 4.747m Perpendicular illuminance	2.78 lx	2.26 lx	3.41 lx	CG16
Vertical Light Spill #15 Portland Rd - B @ 4.747m Perpendicular illuminance	2.95 lx	2.45 lx	3.73 lx	CG20
Vertical Light Spill #15 Portland Rd - C @ 6.500m Perpendicular illuminance	3.35 lx	2.87 lx	3.94 lx	CG18
Vertical Light Spill #15 Portland Rd - D @ 2.147m Perpendicular illuminance	2.22 lx	1.88 lx	2.55 lx	CG19
Vertical Light Spill #15 Portland Rd - E @ 4.300m Perpendicular illuminance	2.09 lx	1.79 lx	2.56 lx	CG17
Vertical Light Spill #1-31 Dennison Ct - A @ +3.100m Perpendicular illuminance	0.28 lx	0.090 lx	0.50 lx	CG24
Vertical Light Spill #1-31 Dennison Ct - B @ +3.050m Perpendicular illuminance	0.83 lx	0.64 lx	1.12 lx	CG25
Vertical Light Spill #1-31 Dennison Ct - C @ +3.100m Perpendicular illuminance	1.29 lx	1.04 lx	1.76 lx	CG23
Vertical Light Spill #1-31 Dennison Ct - D @ +3.100m Perpendicular illuminance	1.59 lx	1.23 lx	2.60 lx	CG22
Vertical Light Spill #32-35 Dennison Ct - Left @ +1.750m Perpendicular illuminance	6.28 lx	4.52 lx	8.59 lx	CG13
Vertical Light Spill #32-35 Dennison Ct - Lower Right @ +1.750m Perpendicular illuminance	5.08 lx	4.06 lx	6.39 lx	CG15
Vertical Light Spill #32-35 Dennison Ct - Side @ +3.100m Perpendicular illuminance	0.15 lx	0.10 lx	0.22 lx	CG26
Vertical Light Spill #32-35 Dennison Ct - Upper Left @ +4.350m Perpendicular illuminance	8.26 lx	6.00 lx	9.67 lx	CG12
Vertical Light Spill #32-35 Dennison Ct - Upper Right @ +4.350m Perpendicular illuminance	6.95 lx	6.55 lx	7.78 lx	CG14

Annex I

Lux Chart of Vertical Light Spill onto Residential Properties

Vertical Light Spill
#1-10 Elmstead - 13 Portland Rd
All Courts On - MF1



Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #1-10 Elmstead - 13 Portland Rd @ 4.500m Perpendicular illuminance	3.50 lx	2.71 lx	4.72 lx	CG21

Vertical Light Spill
#15 Portland Rd - A
All Courts On - MF1



Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #15 Portland Rd - A @ 4.747m Perpendicular illuminance	2.78 lx	2.26 lx	3.41 lx	CG16

Vertical Light Spill
#15 Portland Rd - B
All Courts On - MF1



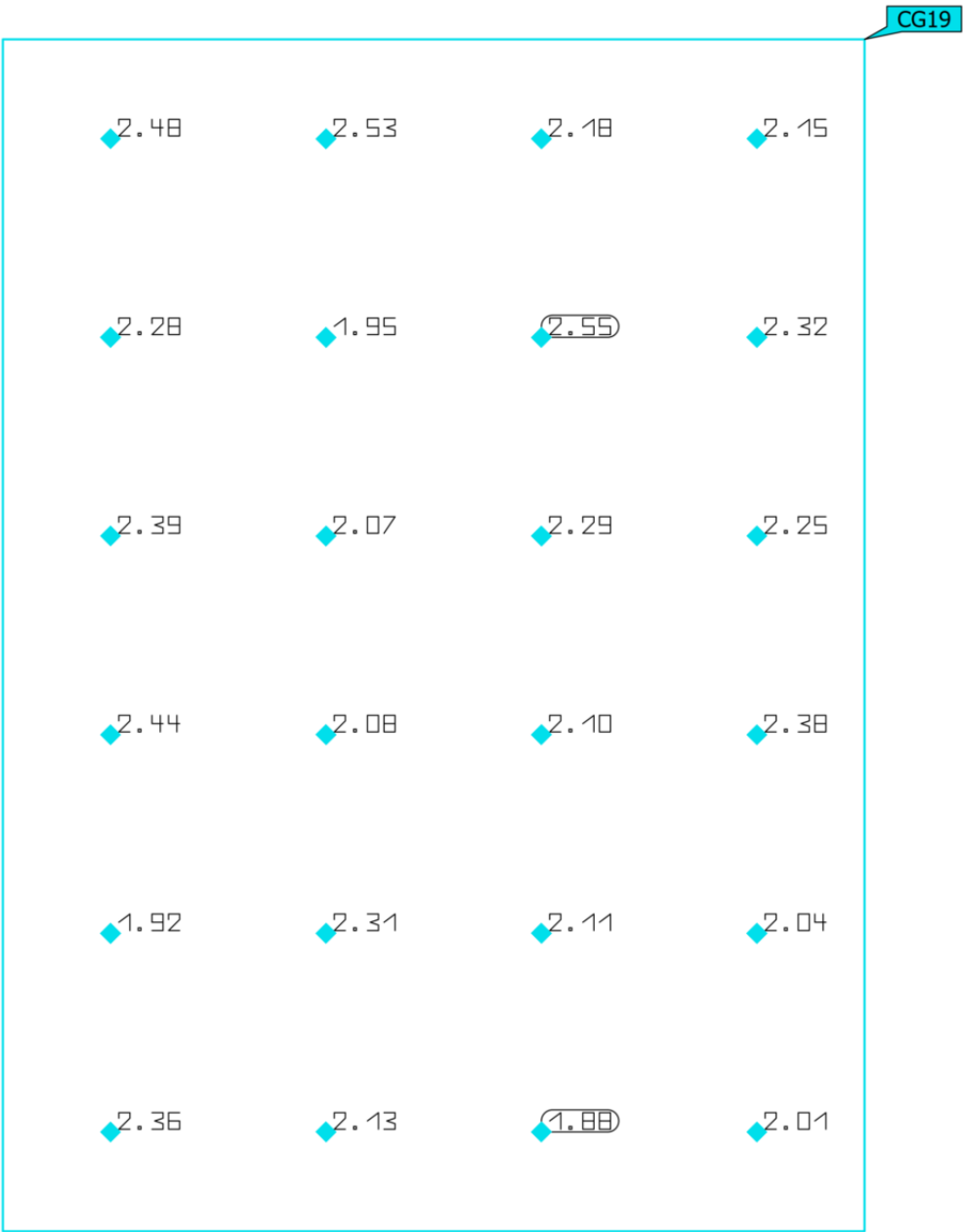
Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #15 Portland Rd - B @ 4.747m Perpendicular illuminance	2.95 lx	2.45 lx	3.73 lx	CG20

Vertical Light Spill
#15 Portland Rd - C
All Courts On - MF1



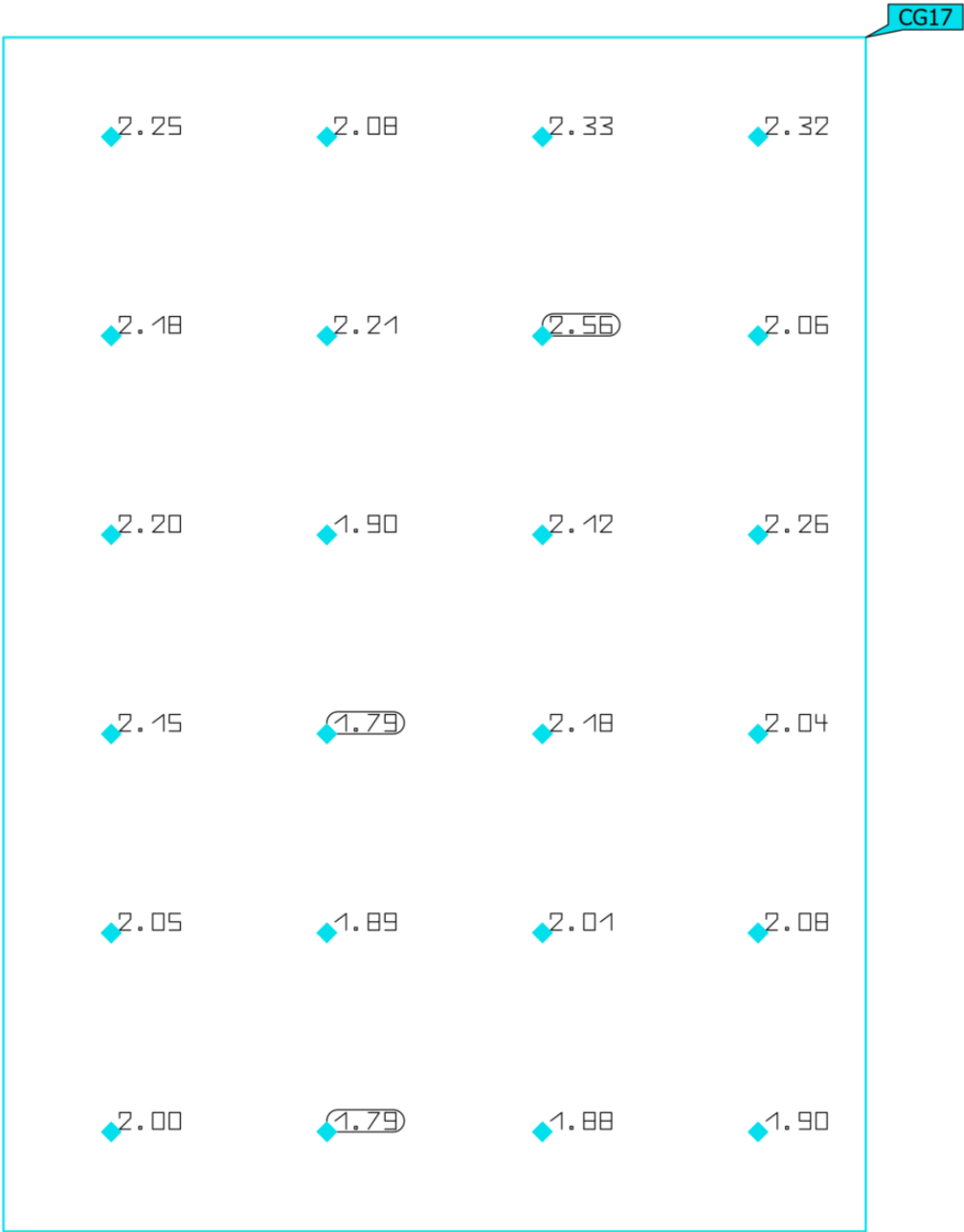
Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #15 Portland Rd - C @ 6.500m Perpendicular illuminance	3.35 lx	2.87 lx	3.94 lx	CG18

Vertical Light Spill
#15 Portland Rd - D
All Courts On - MF1



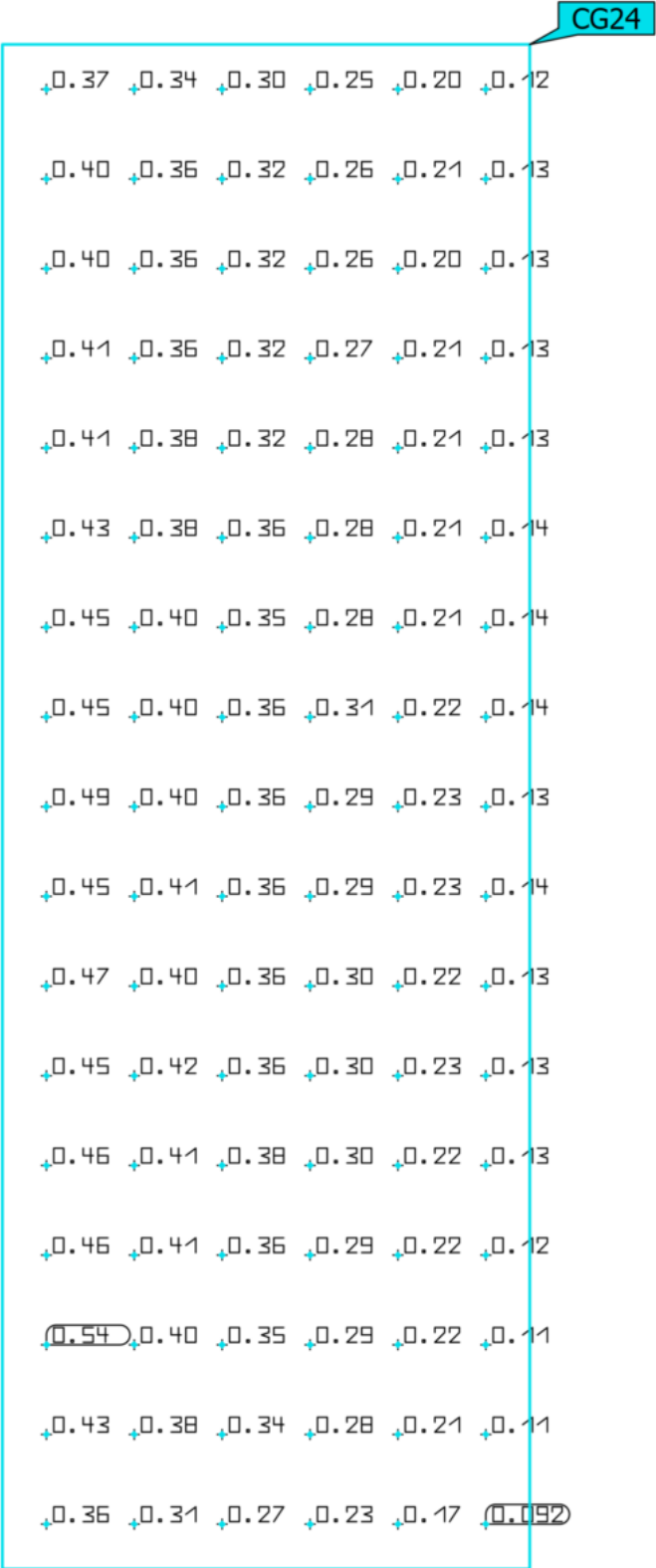
Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #15 Portland Rd - D @ 2.147m Perpendicular illuminance	2.22 lx	1.88 lx	2.55 lx	CG19

Vertical Light Spill
#15 Portland Rd - E
All Courts On - MF1



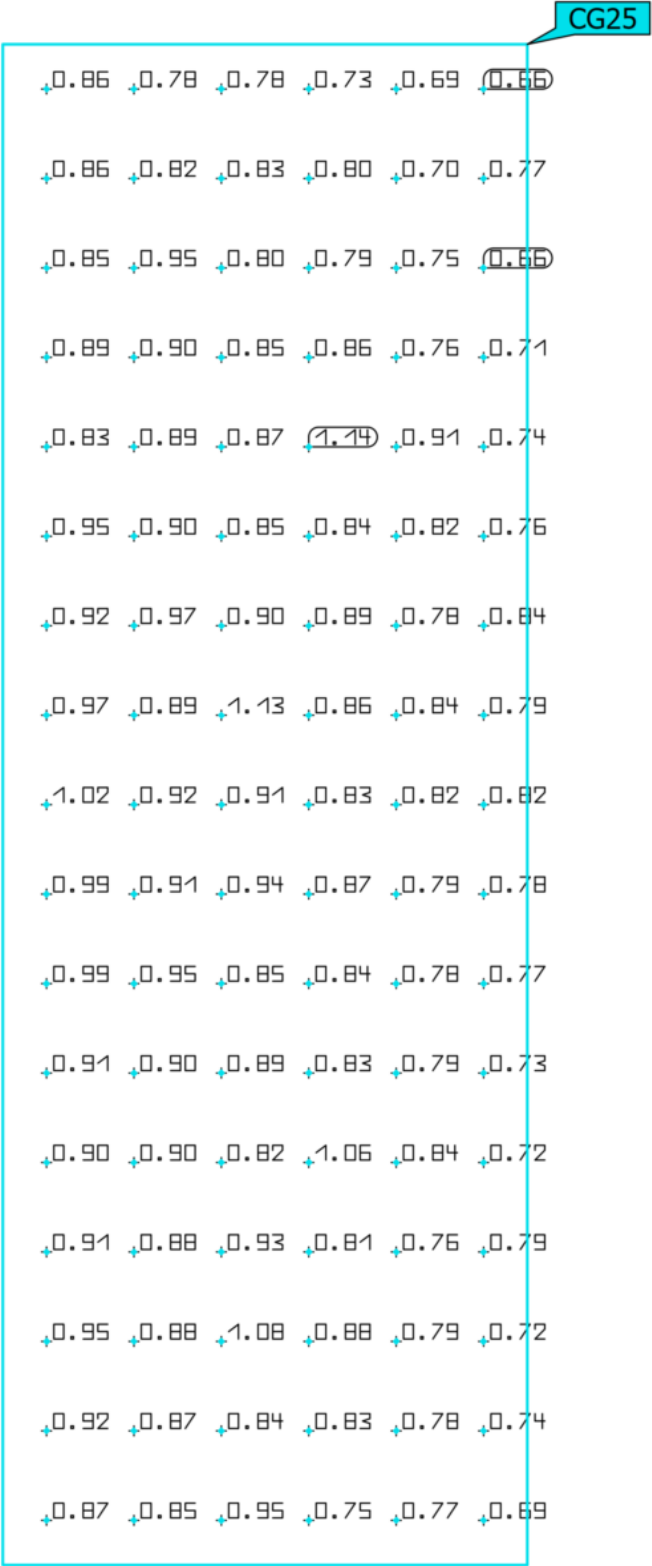
Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #15 Portland Rd - E @ 4.300m Perpendicular illuminance	2.09 lx	1.79 lx	2.56 lx	CG17

Vertical Light Spill
#1-31 Dennison Ct - A
All Courts On - MF1



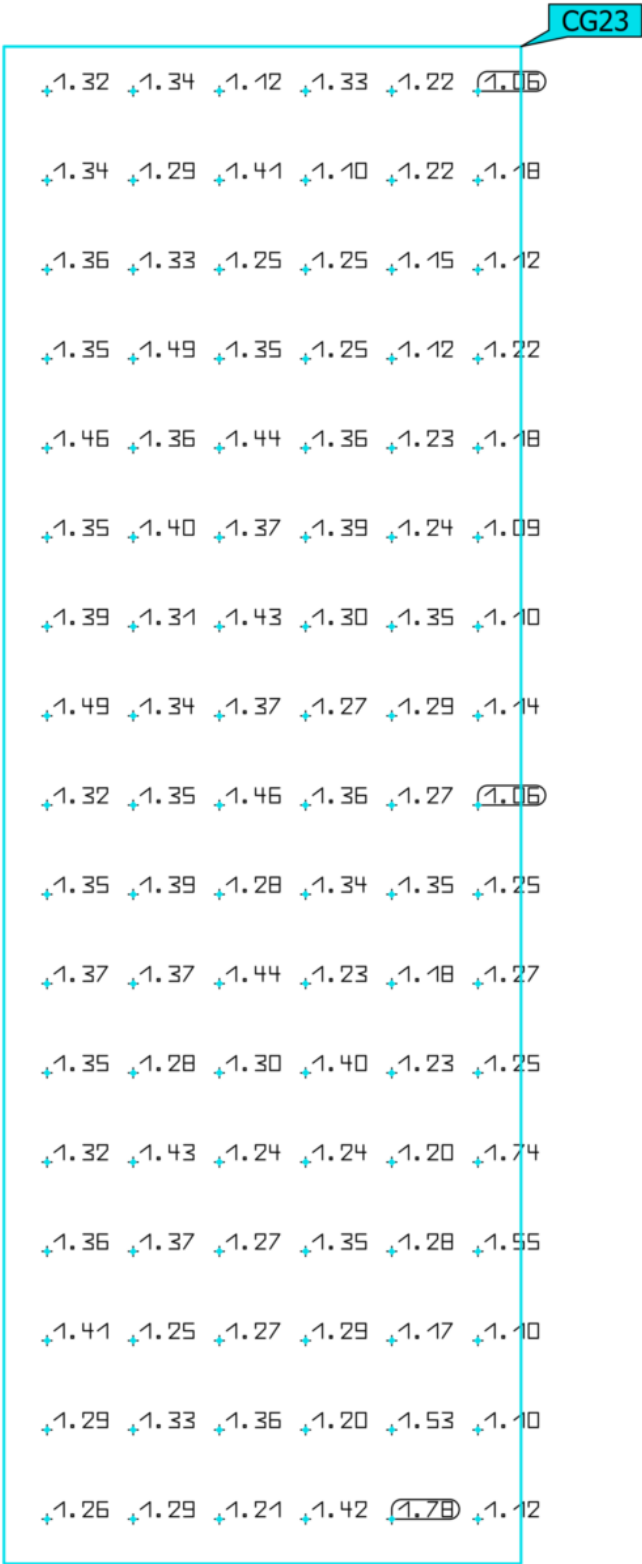
Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #1-31 Dennison Ct - A @ +3.100m Perpendicular illuminance	0.28 lx	0.090 lx	0.50 lx	CG24

Vertical Light Spill
#1-31 Dennison Ct - B
All Courts On - MF1



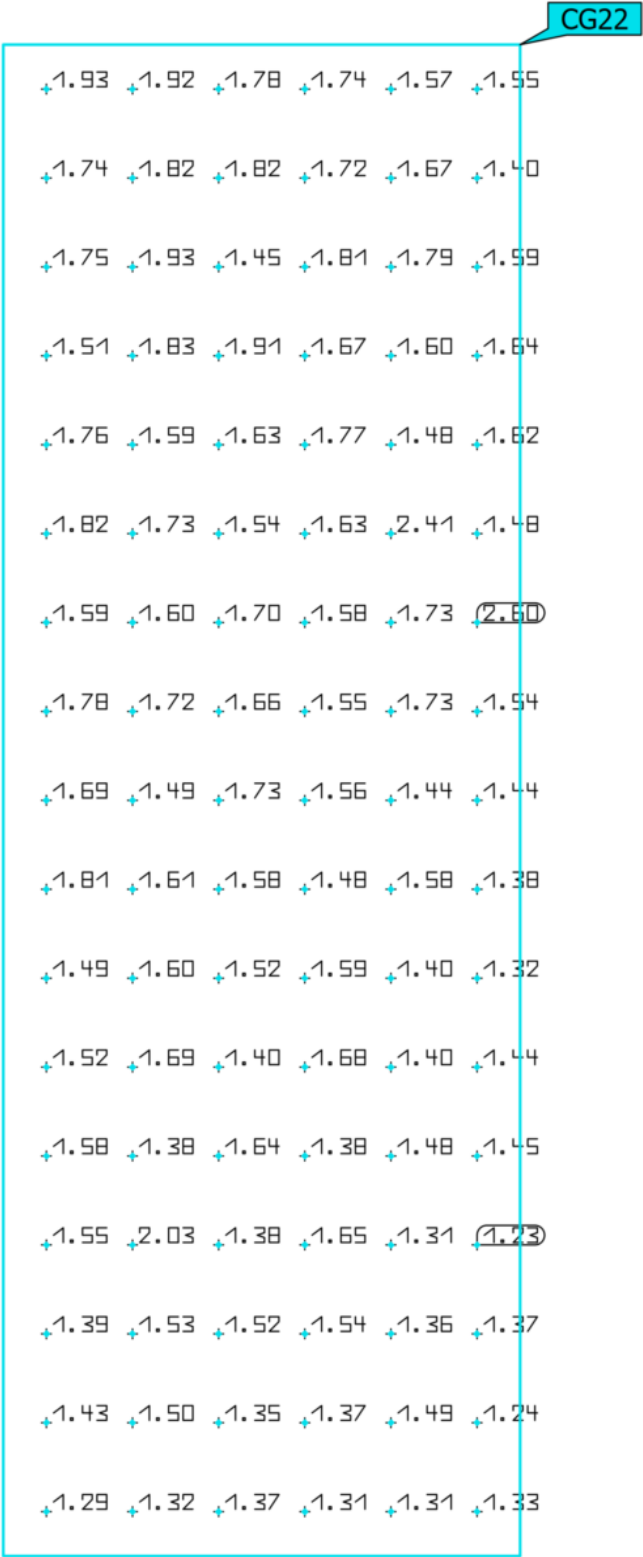
Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #1-31 Dennison Ct - B @ +3.050m Perpendicular illuminance	0.83 lx	0.64 lx	1.12 lx	CG25

Vertical Light Spill
#1-31 Dennison Ct - C
All Courts On - MF1



Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #1-31 Dennison Ct - C @ +3.100m Perpendicular illuminance	1.29 lx	1.04 lx	1.76 lx	CG23

Vertical Light Spill
#1-31 Dennison Ct - D
All Courts On - MF1



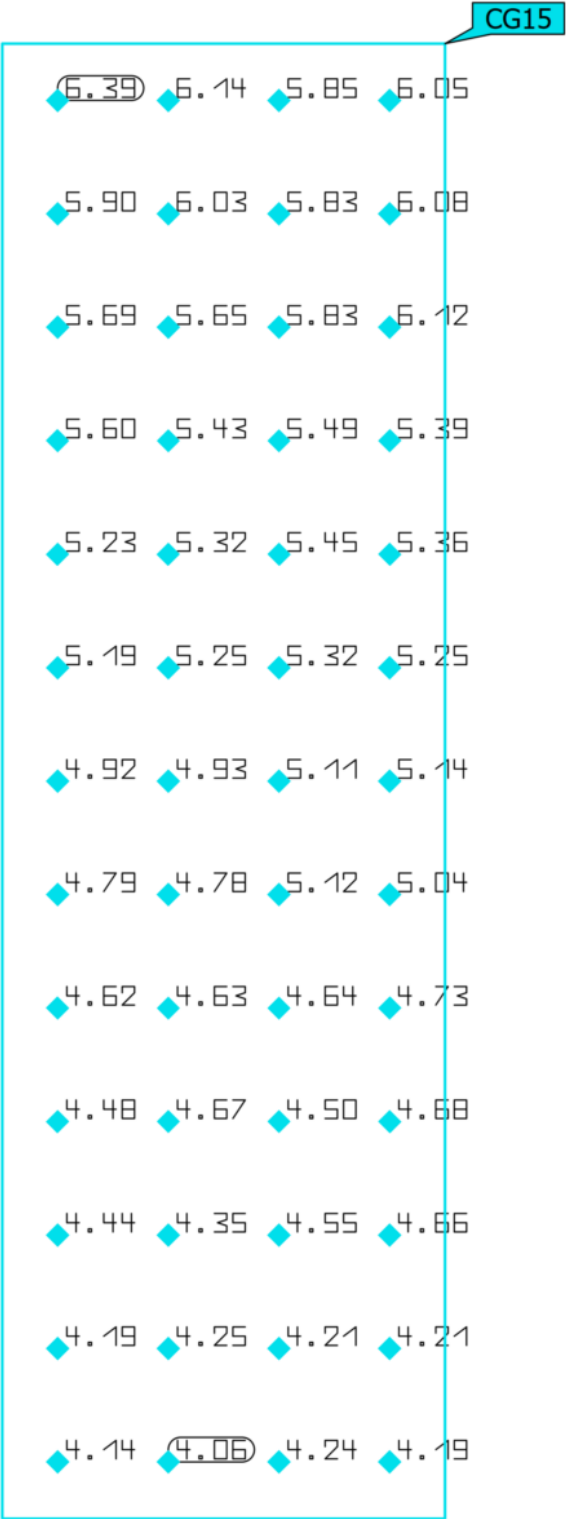
Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #1-31 Dennison Ct - D @ +3.100m Perpendicular illuminance	1.59 lx	1.23 lx	2.60 lx	CG22

Vertical Light Spill
#32-35 Dennison Ct - Left
All Courts On - MF1



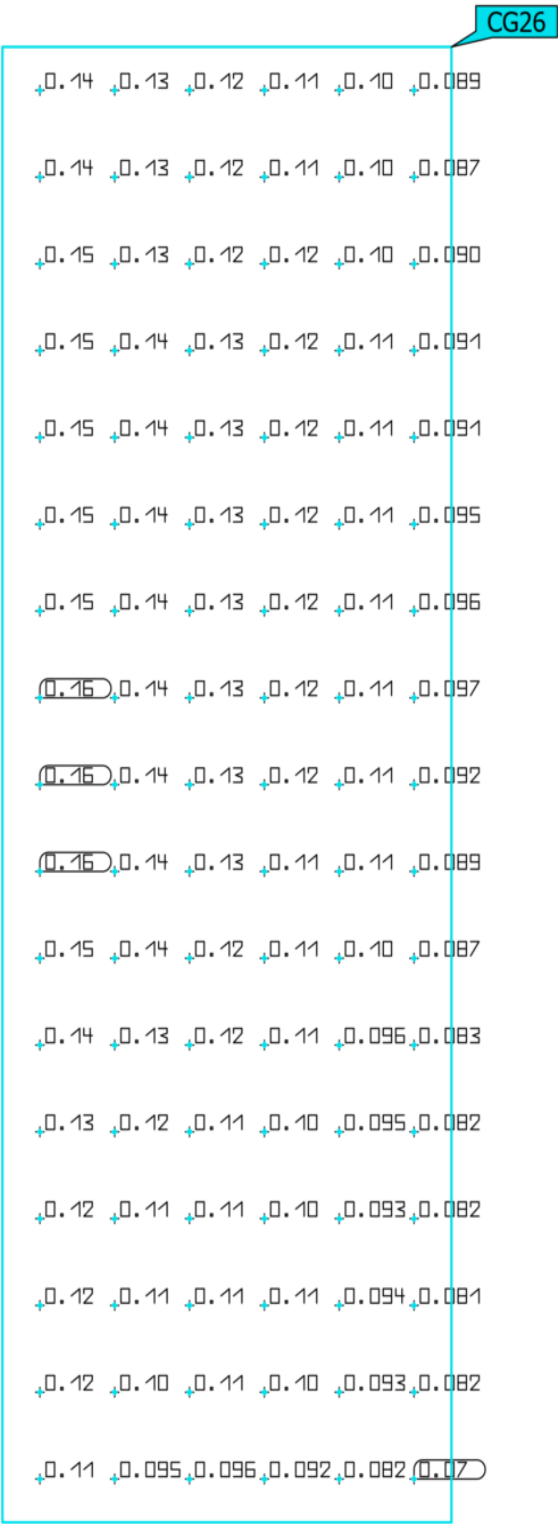
Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #32-35 Dennison Ct - Left @ +1.750m Perpendicular illuminance	6.28 lx	4.52 lx	8.59 lx	CG13

Vertical Light Spill
#32-35 Dennison Ct - Lower Right
All Courts On - MF1



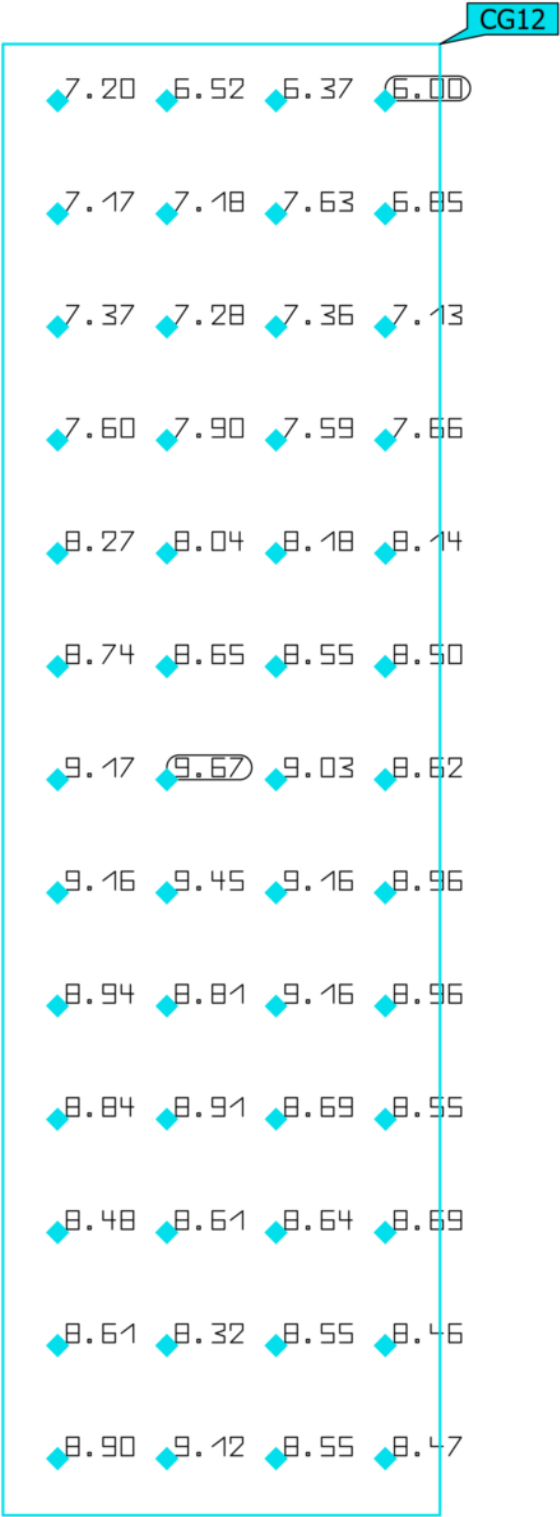
Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #32-35 Dennison Ct - Lower Right @ +1.750m Perpendicular illuminance	5.08 lx	4.06 lx	6.39 lx	CG15

Vertical Light Spill
#32-35 Dennison Ct - Side
All Courts On - MF1



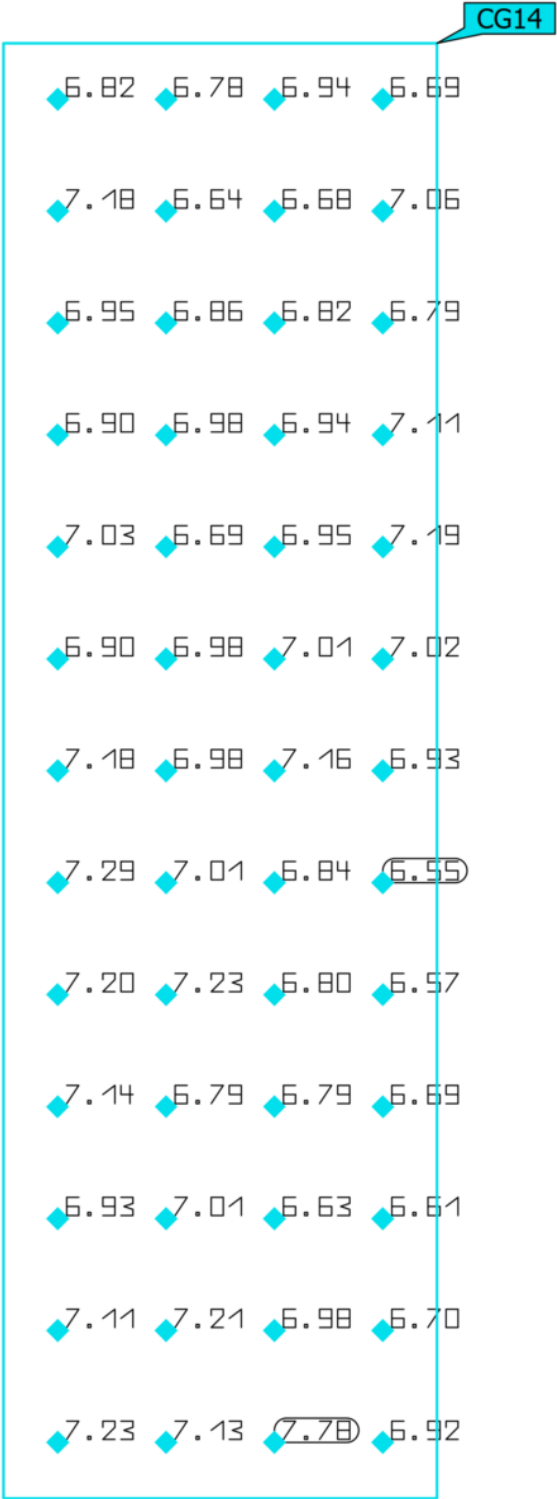
Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #32-35 Dennison Ct - Side @ +3.100m Perpendicular illuminance	0.15 lx	0.10 lx	0.22 lx	CG26

Vertical Light Spill
#32-35 Dennison Ct - Upper Left
All Courts On - MF1



Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #32-35 Dennison Ct - Upper Left @ +4.350m Perpendicular illuminance	8.26 lx	6.00 lx	9.67 lx	CG12

Vertical Light Spill
#32-35 Dennison Ct - Upper Right
All Courts On - MF1

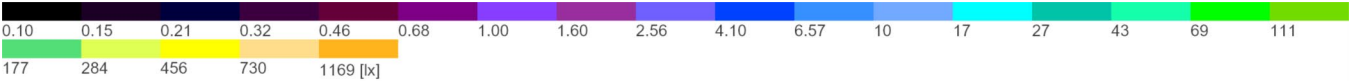
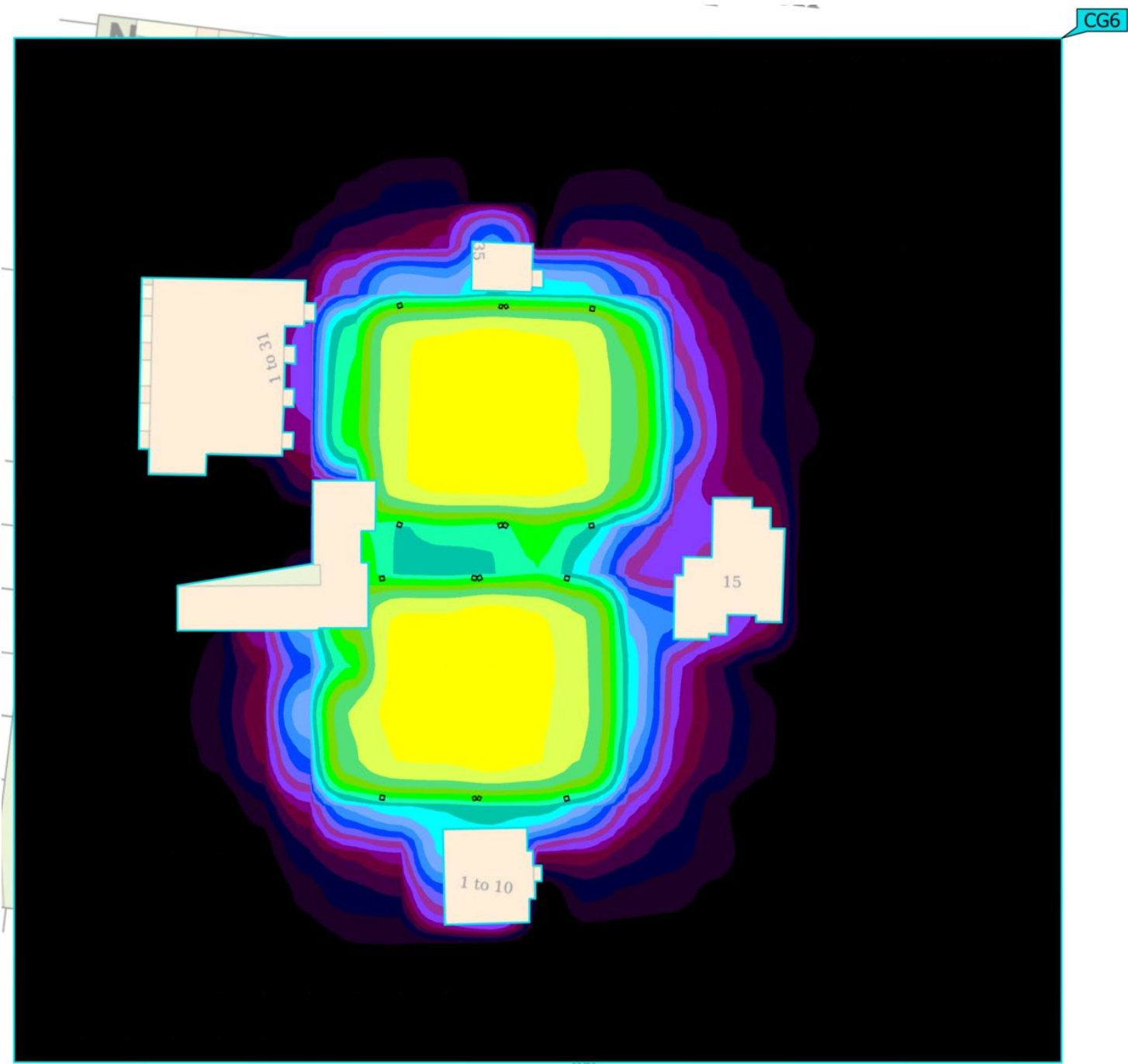


Properties	$\bar{E}$	E_{min}	E_{max}	Index
Vertical Light Spill #32-35 Dennison Ct - Upper Right @ +4.350m Perpendicular illuminance	6.95 lx	6.55 lx	7.78 lx	CG14

Annex II

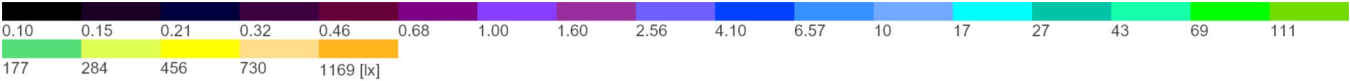
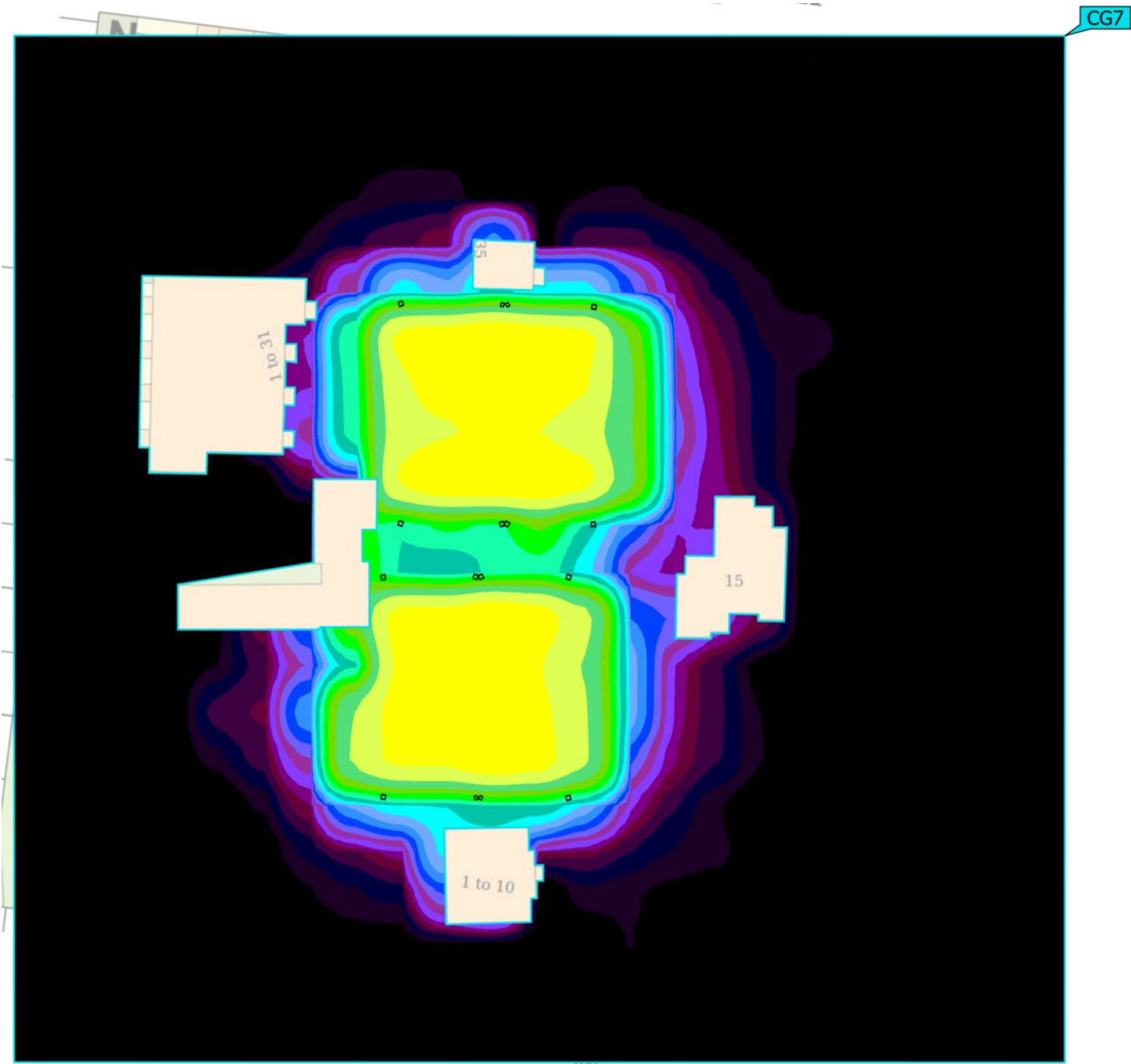
False Colours of Horizontal Light Spill

Horizontal Light Spill - False Colours @ 0.0m
All Courts On - MF1



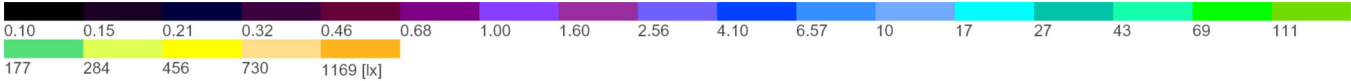
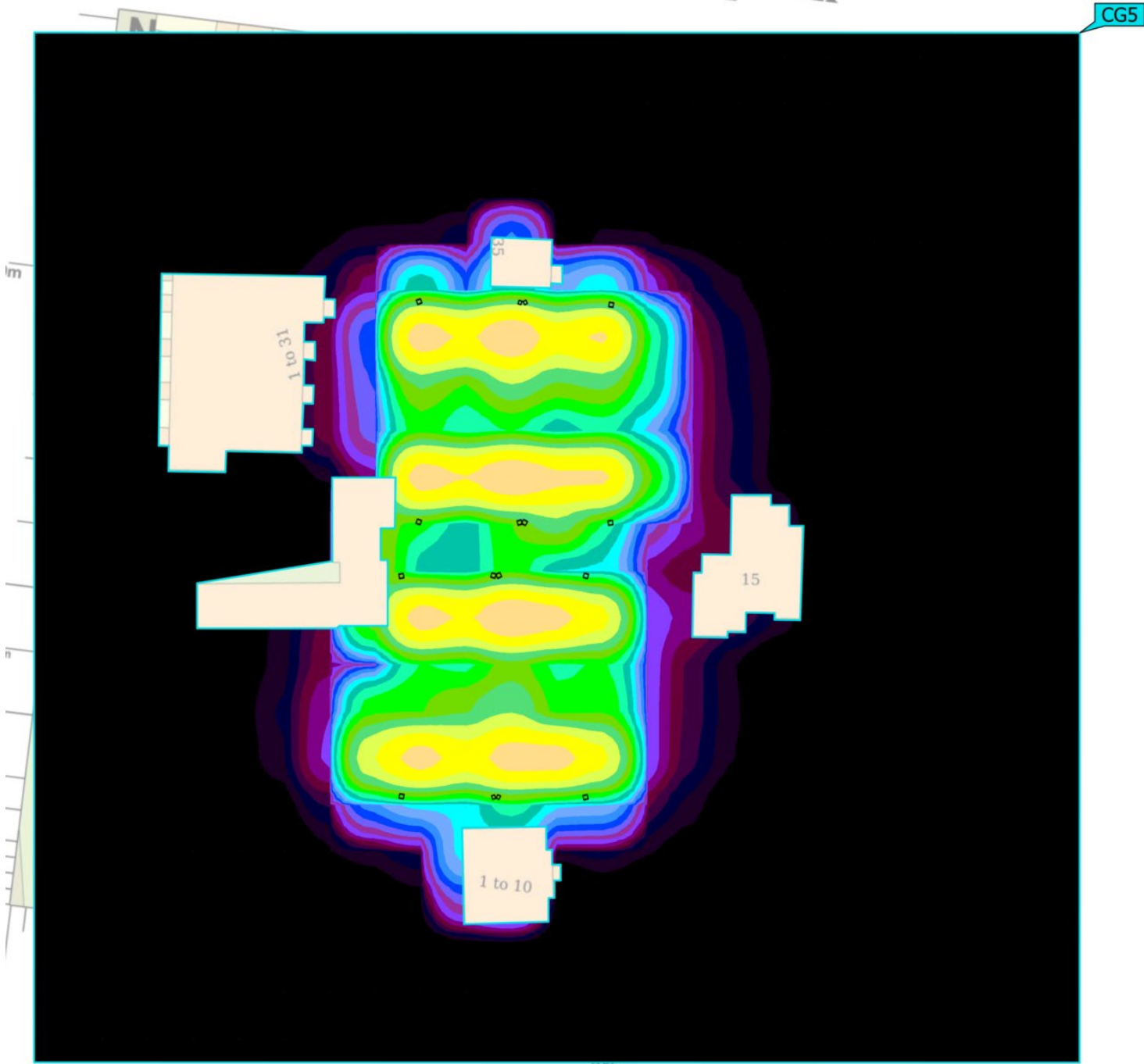
Properties	$\bar{E}$	E_{min}	E_{max}	Index
Horizontal Light Spill Tennis Courts @ +0.0m Perpendicular illuminance	47.9 lx	0.00 lx	670 lx	CG6

Horizontal Light Spill - False Colours @ 0.8m
All Courts On - MF1



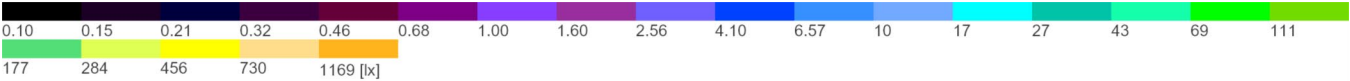
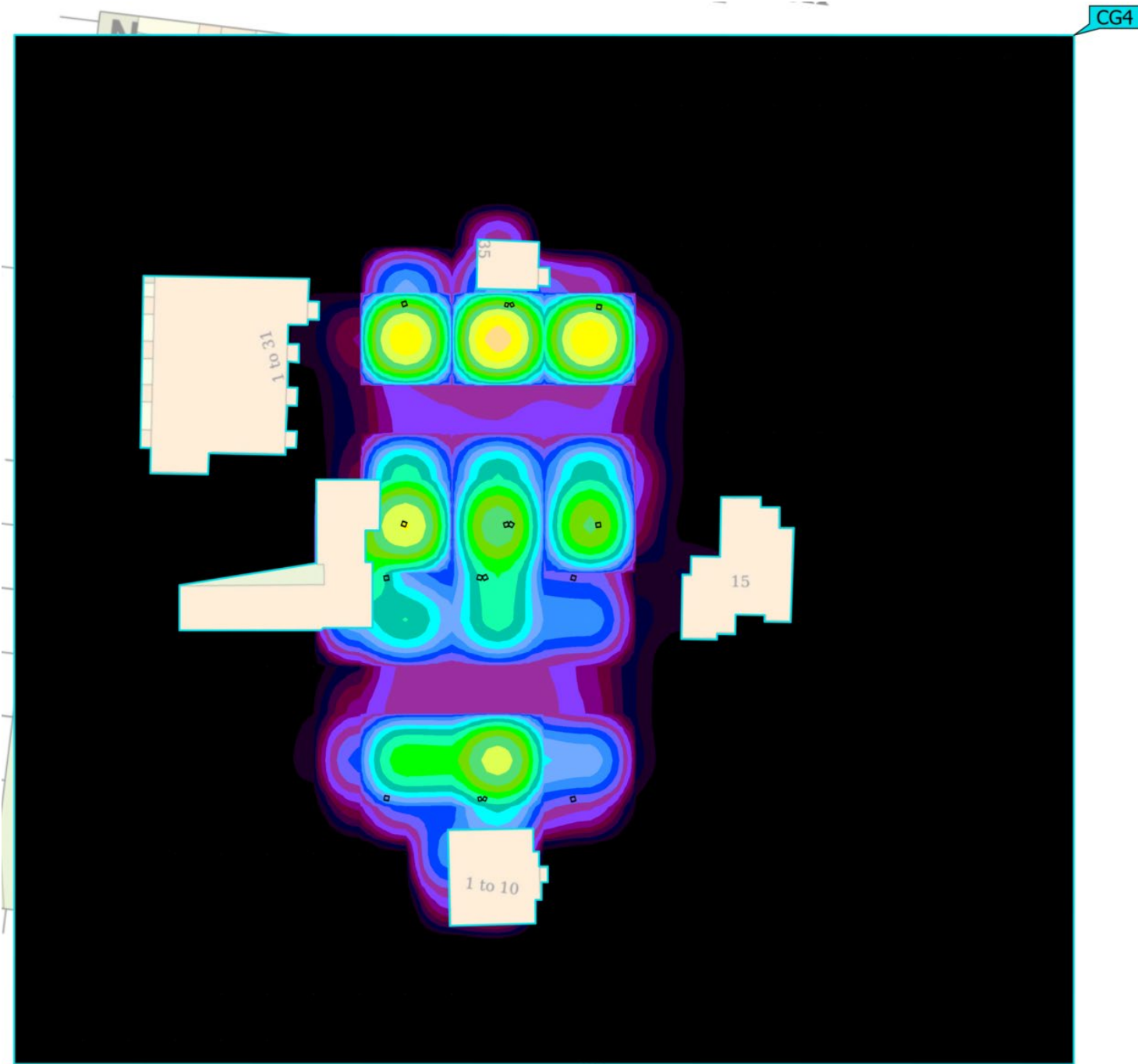
Properties	$\bar{E}$	E_{min}	E_{max}	Index
Horizontal Light Spill Tennis Courts @ +0.8m Perpendicular illuminance	48.2 lx	0.00 lx	686 lx	CG7

Horizontal Light Spill - False Colours @ 3.0m
All Courts On - MF1



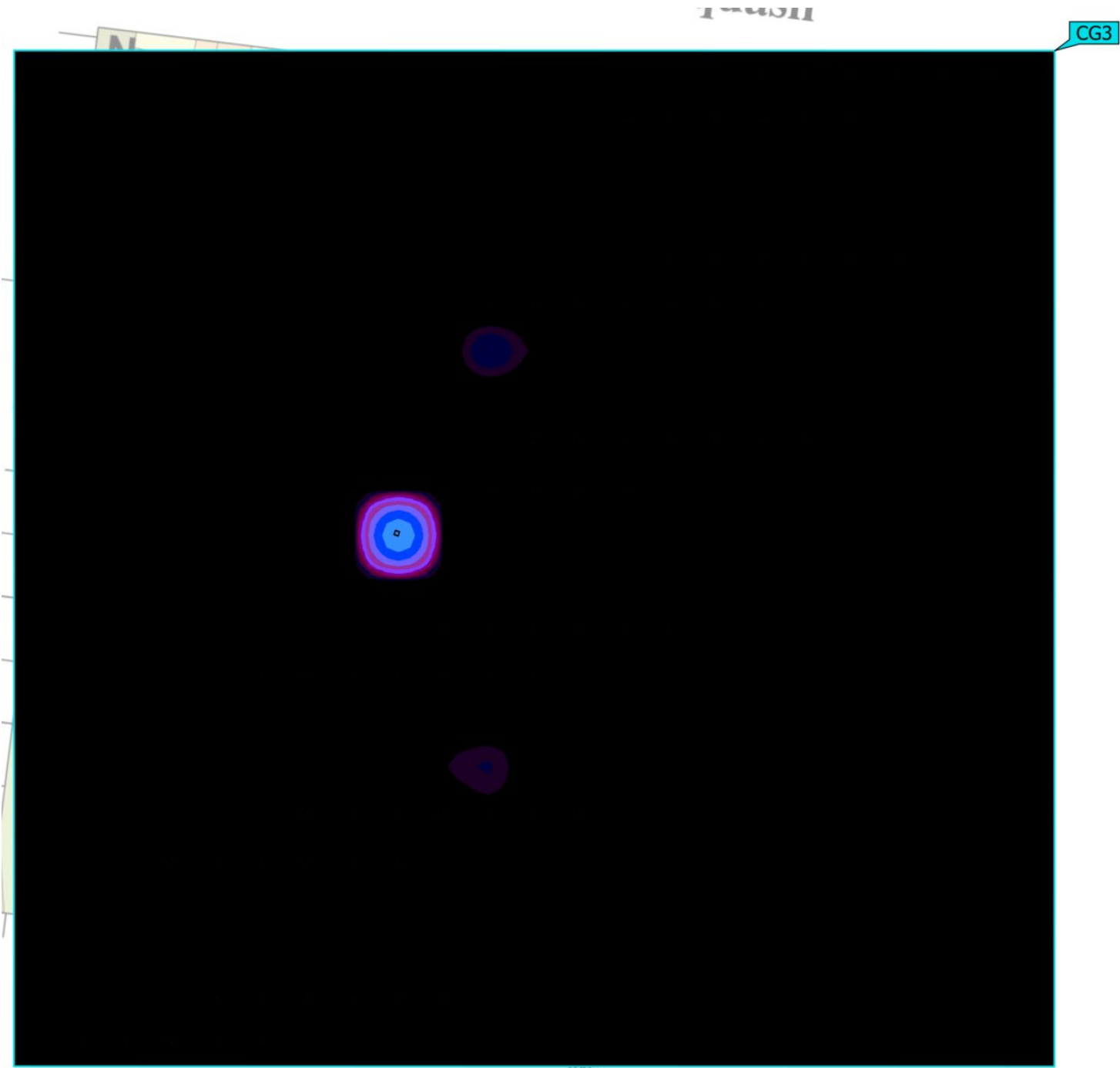
Properties	$\bar{E}$	E_{min}	E_{max}	Index
Horizontal Light Spill Tennis Courts @ +3.0m Perpendicular illuminance	43.1 lx	0.00 lx	1087 lx	CG5

Horizontal Light Spill - False Colours @ 6.0m
All Courts On - MF1

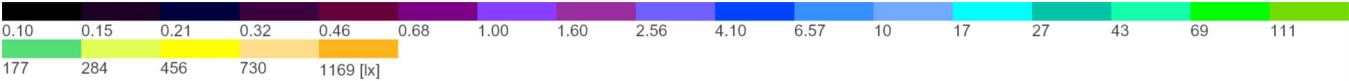


Properties	$\bar{E}$	E_{min}	E_{max}	Index
Horizontal Light Spill Tennis Courts @ +6.0m Perpendicular illuminance	9.34 lx	0.00 lx	919 lx	CG4

Horizontal Light Spill - False Colours @ 8.0m
All Courts On - MF1



NB: Buildings do not show on this image as 8m is above the height of the buildings



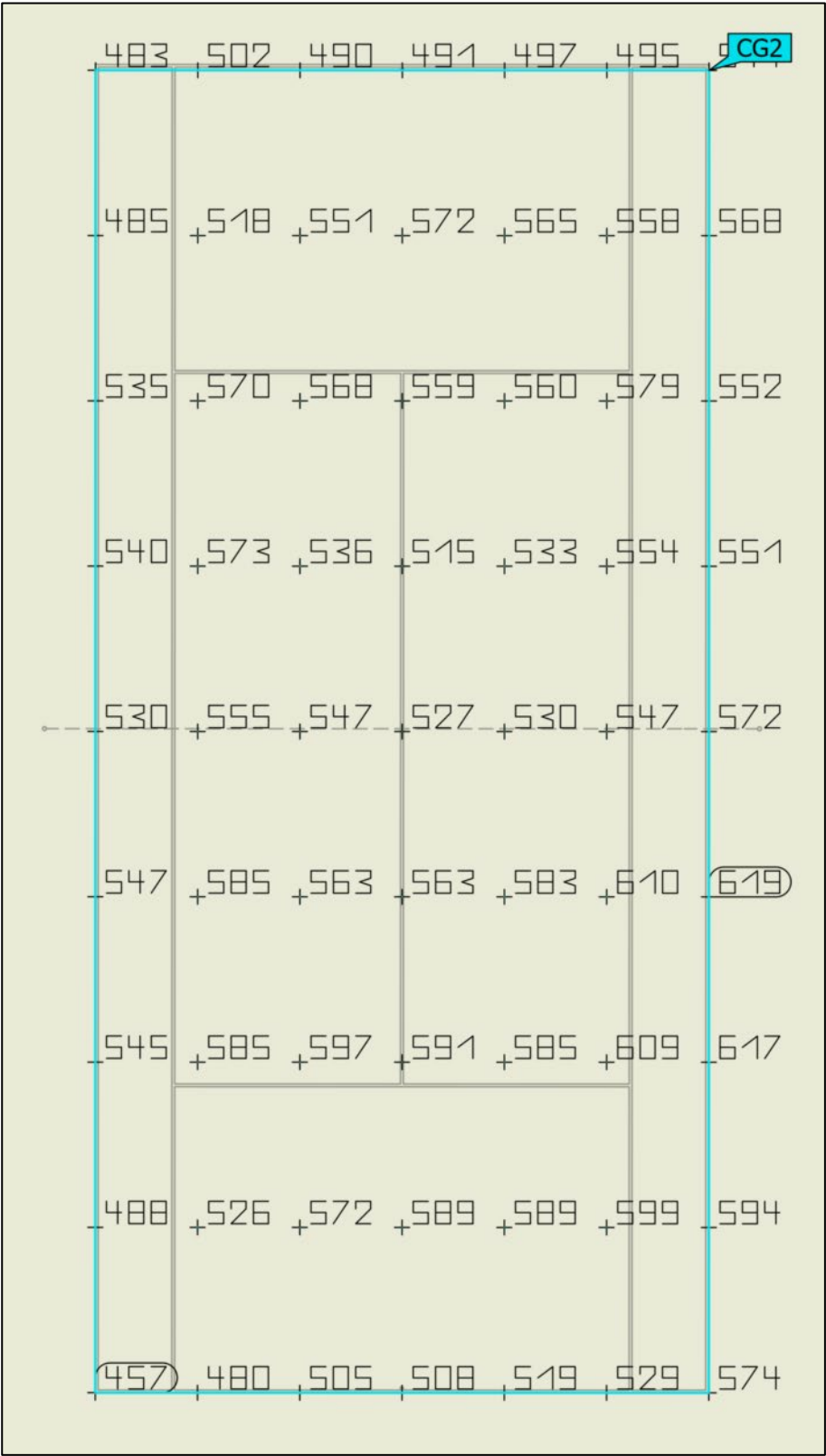
Properties	$\bar{E}$	E_{min}	E_{max}	Index
Horizontal Light Spill Tennis Courts @ +8.0m Perpendicular illuminance	0.022 lx	0.00 lx	9.51 lx	CG3

Annex III

Lighting Levels on the Tennis Courts

(All courts on)

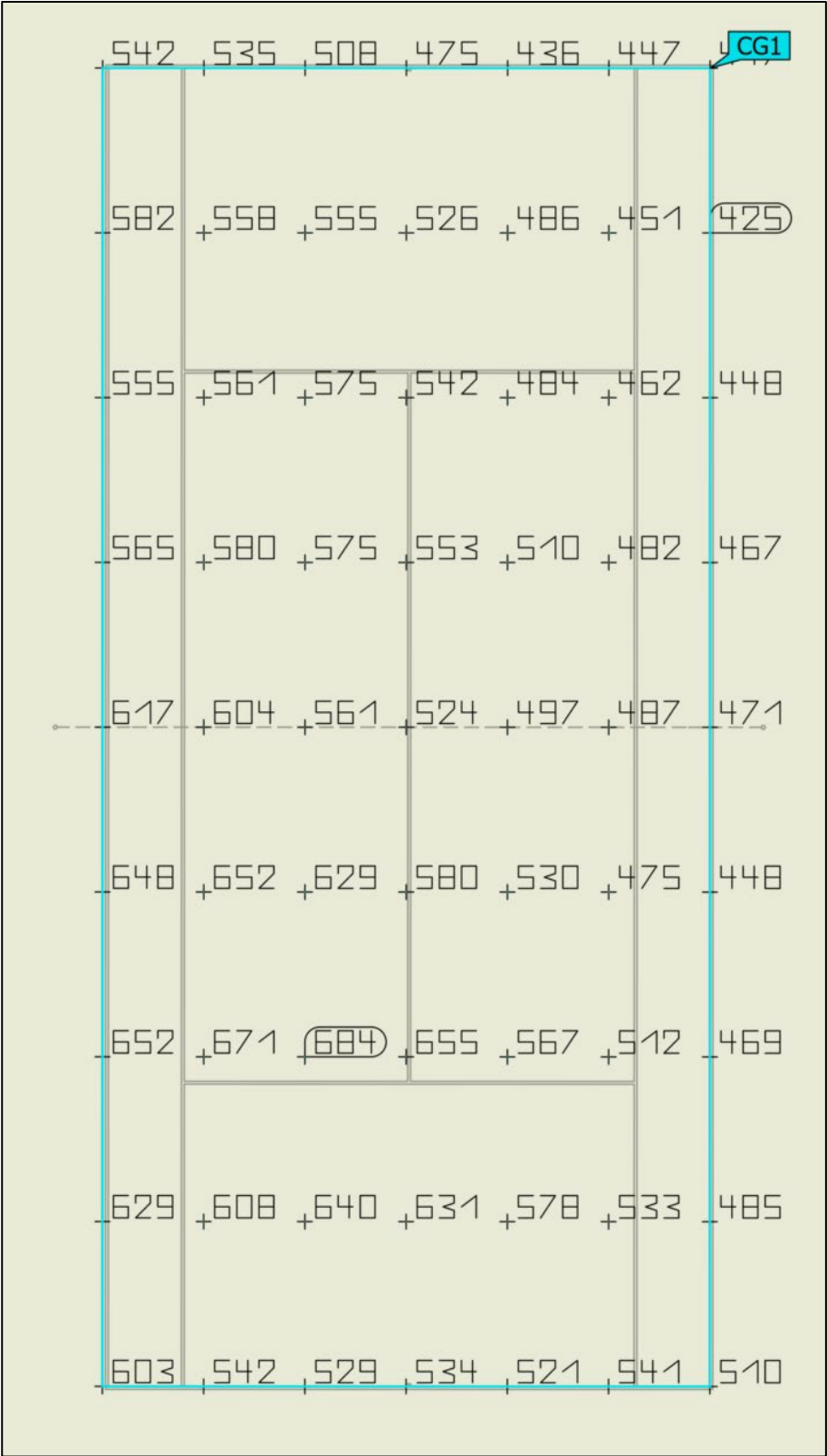
Lux Chart on Principal Playing Area of Court 1 (MF1)



Properties	$\bar{E}$	E_{min}	E_{max}	Index
PPA of Court 1 Height: 0.000m Perpendicular illuminance	549 lx	457 lx	619 lx	CG2

(All courts on)

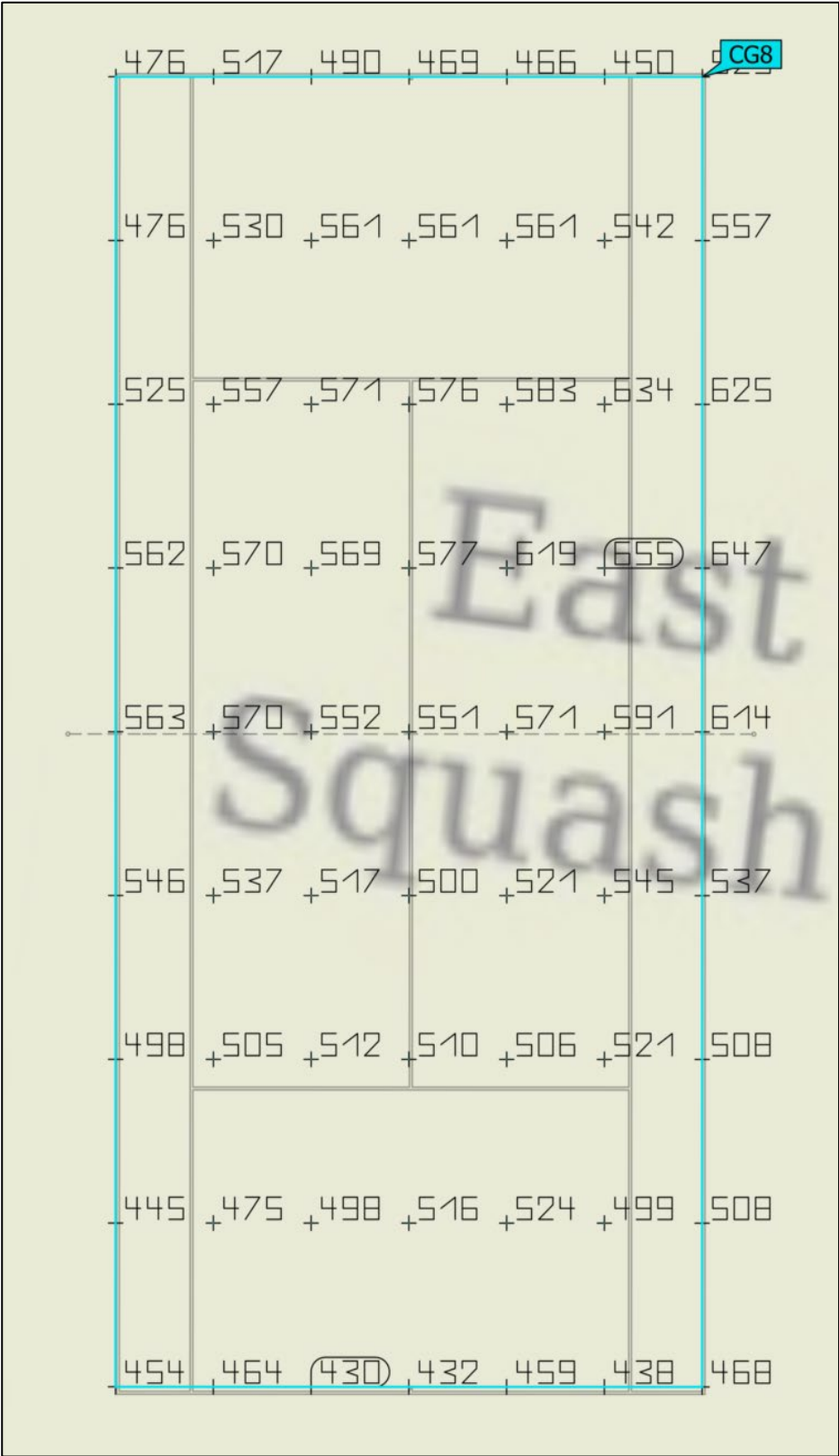
Lux Chart on Principal Playing Area of Court 2 (MF1)



Properties	$\bar{E}$	E_{min}	E_{max}	Index
PPA of Court 2 Height: 0.000m Perpendicular illuminance	542 lx	425 lx	684 lx	CG1

(All courts on)

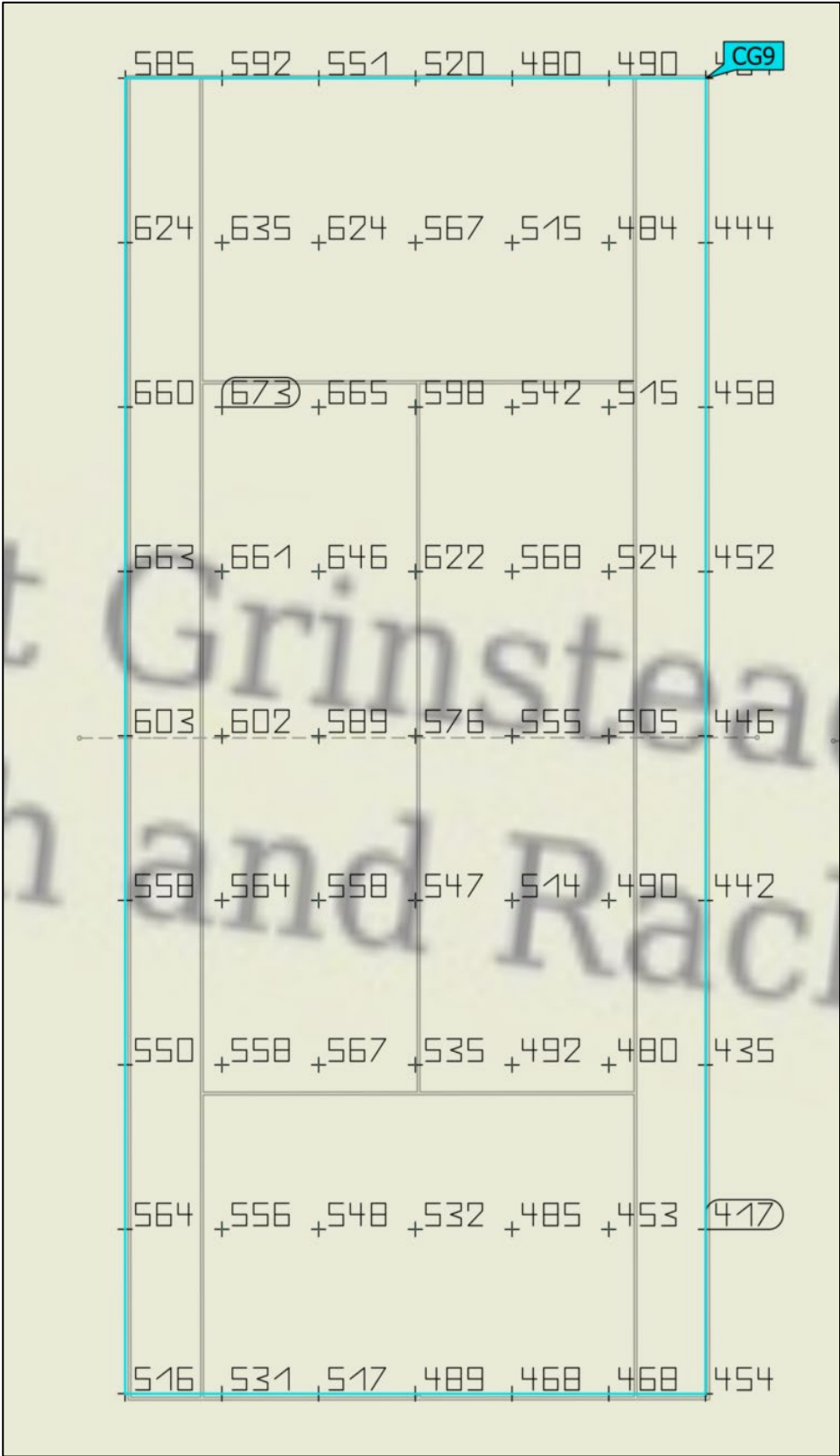
Lux Chart on Principal Playing Area of Court 4 (MF1)



Properties	$\bar{E}$	E_{min}	E_{max}	Index
PPA of Court 4 Height: 0.000m Perpendicular illuminance	529 lx	430 lx	655 lx	CG8

(All courts on)

Lux Chart on Principal Playing Area of Court 5 (MF1)



Properties	$\bar{E}$	E_{min}	E_{max}	Index
PPA of Court 5 Height: 0.000m Perpendicular illuminance	540 lx	417 lx	673 lx	CG9