



PLANNING SECTION
LEITRIM COUNTY COUNCIL

ED/25/38
02/09/2025

REF P. _____

Project Technical Details

Project: LED Lighting upgrade

Location: Carrick OnShannon Tennis Club

Contact: Philip Kelly

Ref: 25146 v3

Date: 21-8-25



Project Brief

Specification: 400lx average

Uniformity: PPA:>0.7 TPA :>0.6

lowest level of light to be 70% of average on PPA

E_{av} [lx]

Symbol for average Lux levels

u_0

Symbol for uniformity (lowest level as a % of Average)

Better Energy Management Ltd

Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

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DIALux Simulation for Tennis Courts

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Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, Ireland

Operator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

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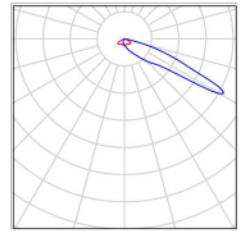
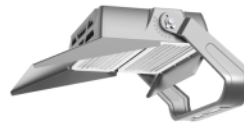
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Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com**Carrick on Shannon Tennis Club / Luminaire parts list**

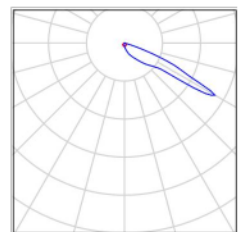
3 Pieces VG-1200-AS-1 Front+Rear Visors
Article No.:
Luminous flux (Luminaire): 143165 lm
Luminous flux (Lamps): 143344 lm
Luminaire Wattage: 1196.6 W
Luminaire classification according to CIE: 100
CIE flux code: 23 62 97 100 100
Fitting: 1 x User defined (Correction Factor 1.000).

See our luminaire
catalog for an image of
the luminaire.

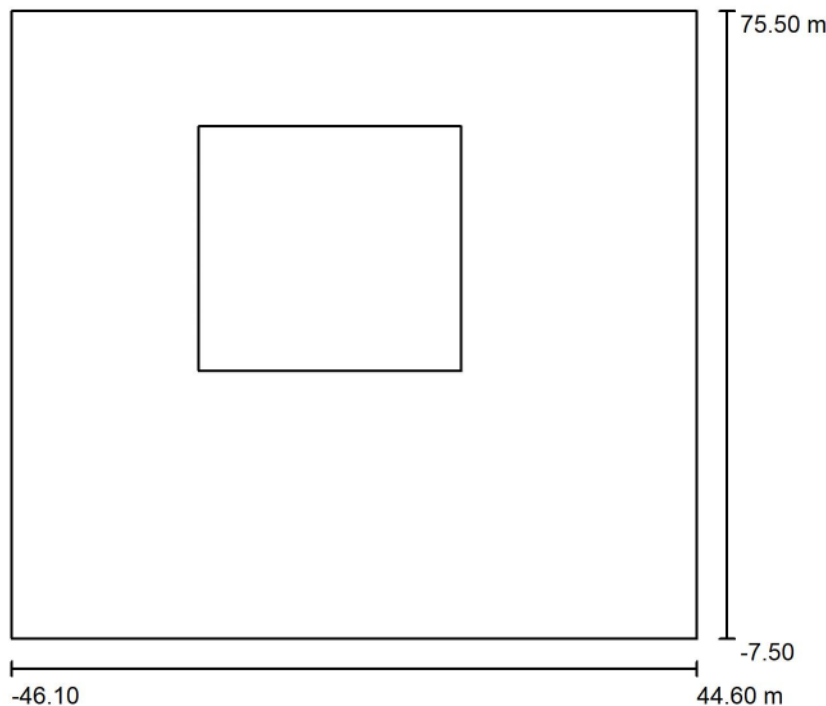


5 Pieces VG-1200-AS-1 All Visors
Article No.:
Luminous flux (Luminaire): 113167 lm
Luminous flux (Lamps): 113574 lm
Luminaire Wattage: 1200.0 W
Luminaire classification according to CIE: 100
CIE flux code: 23 66 98 100 99
Fitting: 1 x User defined (Correction Factor 1.000).

See our luminaire
catalog for an image of
the luminaire.



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Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com**Carrick on Shannon Tennis Club / Court 1 Only / Planning data**

Maintenance factor: 0.85, ULR (Upward Light Ratio): 0.0%

Scale 1:1000

Luminaire Parts List

No.	Pieces	Designation (Correction Factor)	Φ (Luminaire) [lm]	Φ (Lamps) [lm]	P [W]
1	1	VG-1200-AS-1 Front+Rear Visors (1.000)	143165	143344	1196.6
2	3	VG-1200 AS-1 All Visors (1.000)	113167	113574	1200.0
Total:			482666	Total: 484066	4796.6

Existing electrical load:

8no 1kw Mh = 8kw (allowing for ballast) total = 9.2kw

Running cost: €0.3112 +9% =€0.34/kw 9.2 *.34 = €3.13 per hour to run one court

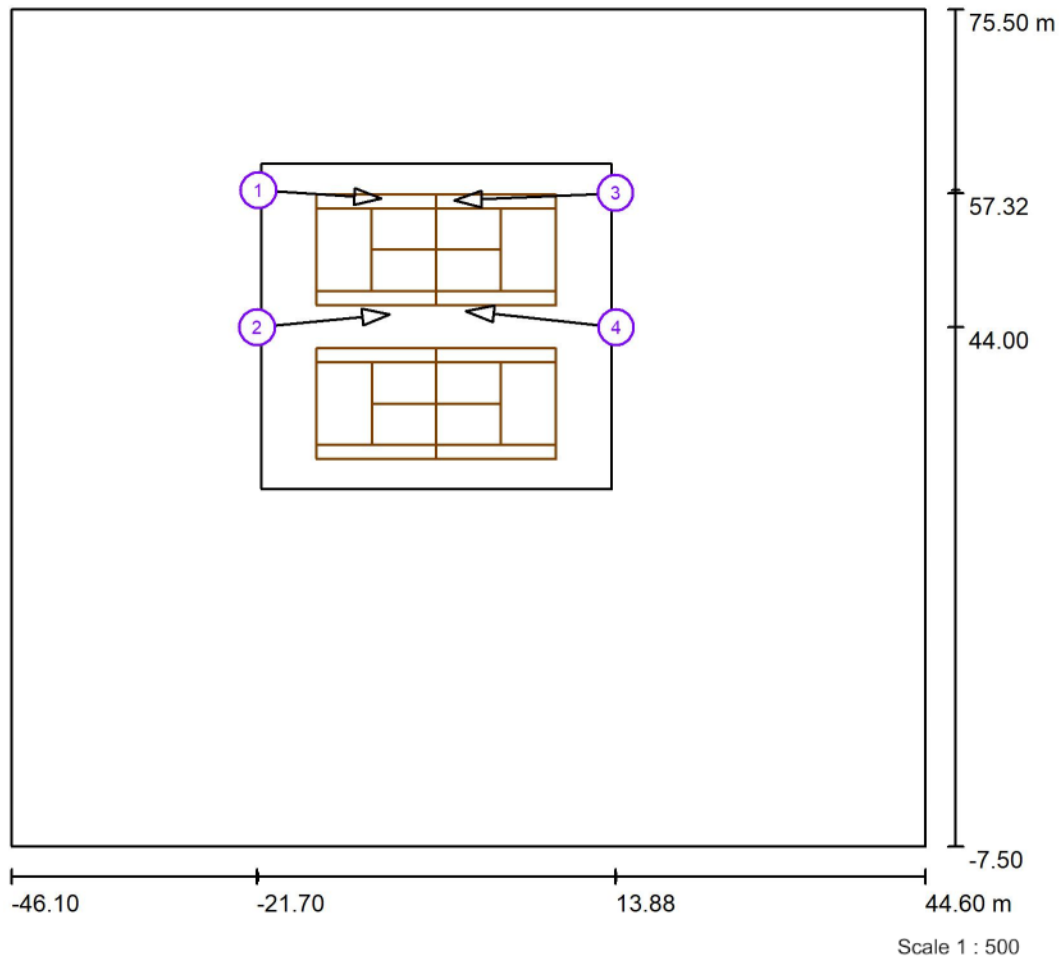
LED Lighting

4no 1.2kw = 4.8kw

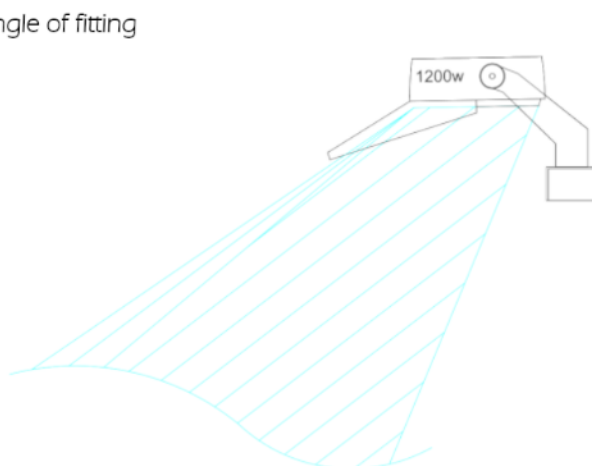
Running cost: €0.3112 +9% =€0.34/kw 4.8 *.34 = €1.63 per hour to run one court

Energy saving = 48%

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Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com**Carrick on Shannon Tennis Club / Court 1 Only / Sport Luminaires (Coordinates List)**

Actual angle of fitting



New design from BEM Ltd
ASYMMETRICAL LENS ALLOWS FOR
LIGHT TO BE DIRECTED FORWARD
RESULTING IN LOW GLARE

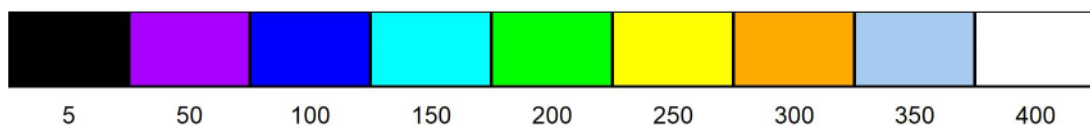
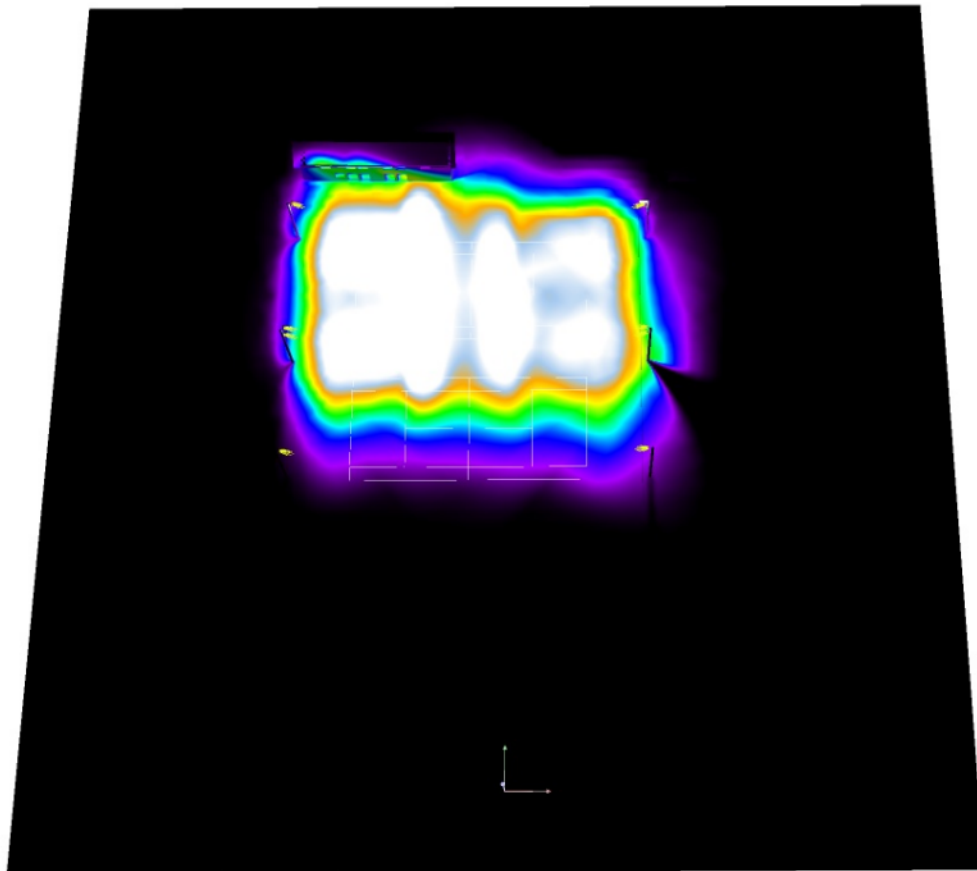
Scale 1 : 750

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Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, Ireland

Operator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / Court 1 Only / False Colour Rendering

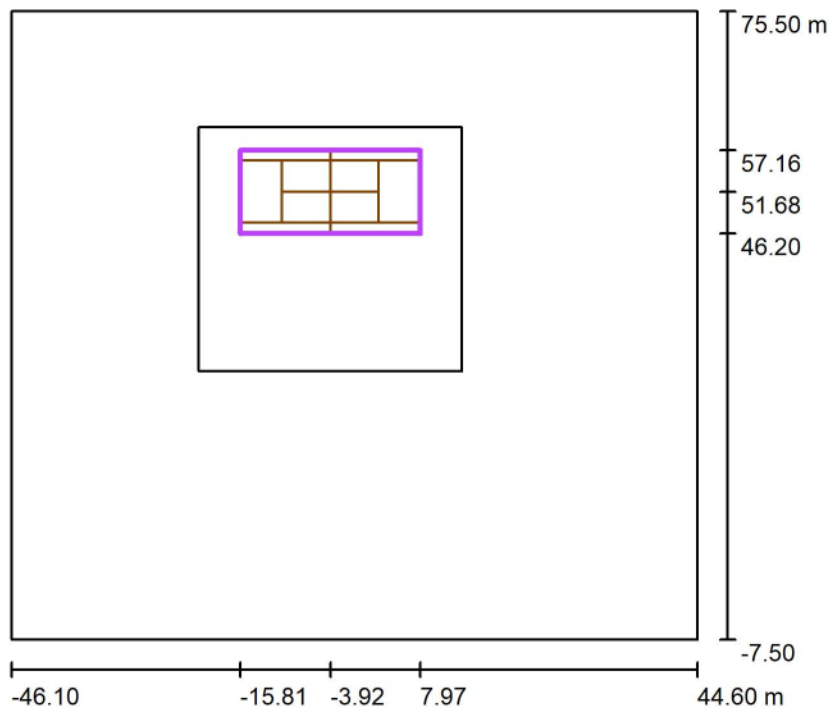


lx

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Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / Court 1 Only / Court 1 Calculation Grid (PPA) / Summary



Scale 1 : 1000

Position: (-3.922 m, 51.679 m, 0.000 m)
 Size: (23.780 m, 10.960 m)
 Rotation: (0.0°, 0.0°, 0.0°)
 Type: Normal, Grid: 13 x 5 Points
 Belongs to the following sport arena: Court 1

Results overview

No.	Type	E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u0	E_{min} / E_{max}	$E_{h\ m} / E_m$	H [m]	Camera
1	perpendicular	463	359	781	0.77	0.46	/	0.000	/

$E_{h\ m} / E_m$ = Relationship between middle horizontal and vertical illuminance, H = Measuring Height

Principle Playing area

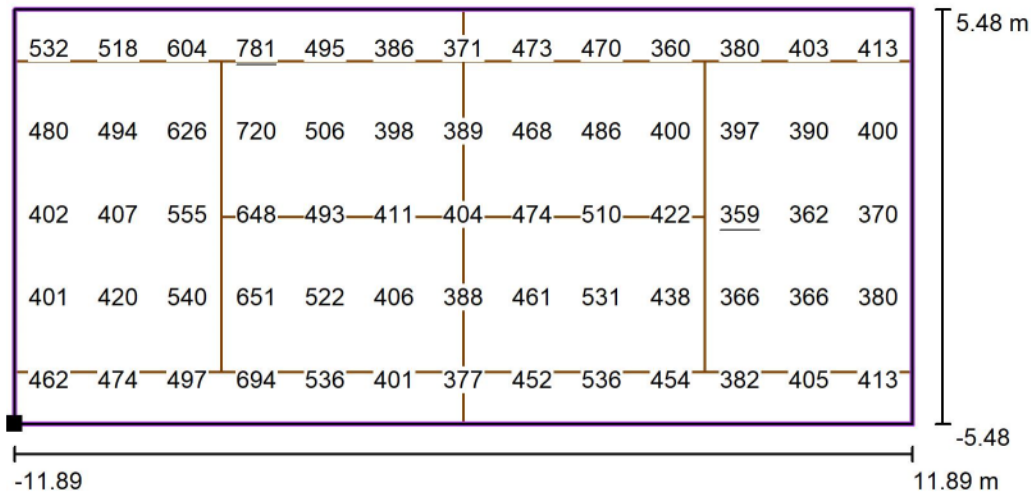
Average Lux: 463lx

Uniformity: 0.77 (lowest level of light is 77% of average)

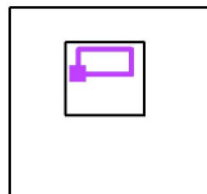
Better Energy Management Ltd

Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / Court 1 Only / Court 1 Calculation Grid (PPA) / Value Chart (E, Perpendicular)



Values in Lux, Scale 1 : 200

Position of surface in external scene:
Marked point: (-15.812 m, 46.199 m,
0.000 m)

Grid: 13 x 5 Points

 E_{av} [lx]
463

 E_{min} [lx]
359

 E_{max} [lx]
781

 u_0
0.77

 E_{min} / E_{max}
0.46

Principle Playing area

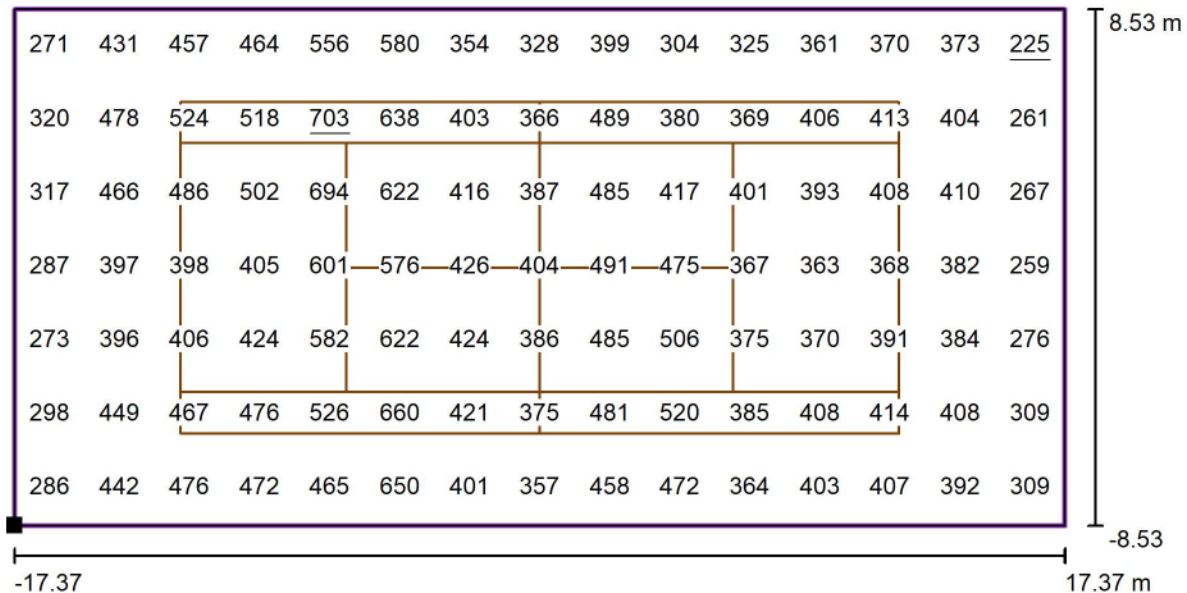
Average Lux: 463lx

Uniformity: 0.77 (lowest level of light is 77% of average)

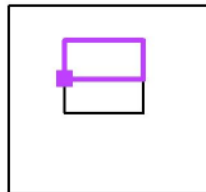
Better Energy Management Ltd

Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / Court 1 Only / Court 1 Calculation Grid (TPA) / Value Chart (E, Perpendicular)



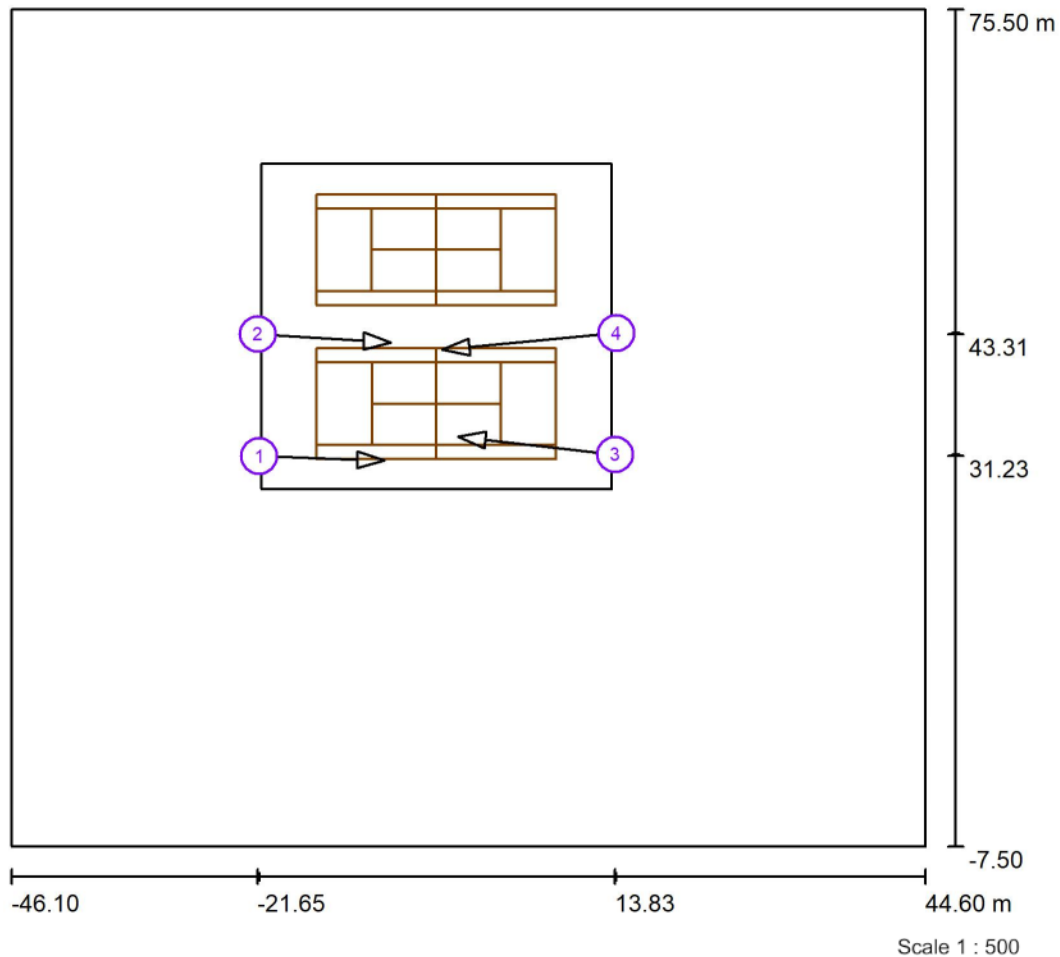
Values in Lux, Scale 1 : 250

Position of surface in external scene:
Marked point: (-21.297 m, 43.144 m,
0.000 m)

Grid: 15 x 7 Points

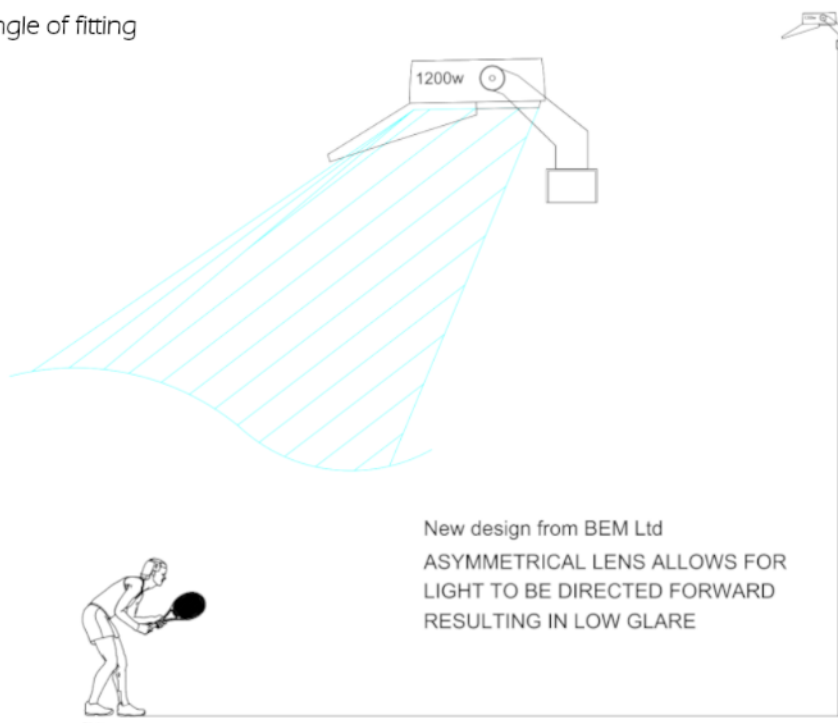
 E_{av} [lx]
425 E_{min} [lx]
225 E_{max} [lx]
703 u_0
0.53 E_{min} / E_{max}
0.32**Total Playing area****Average Lux: 425lx****Uniformity: 0.53 (lowest level of light is 53% of average)**

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Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
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Scale 1 : 750

Actual angle of fitting

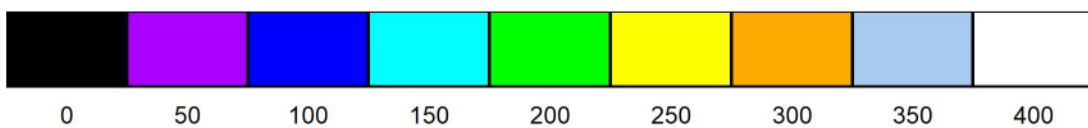
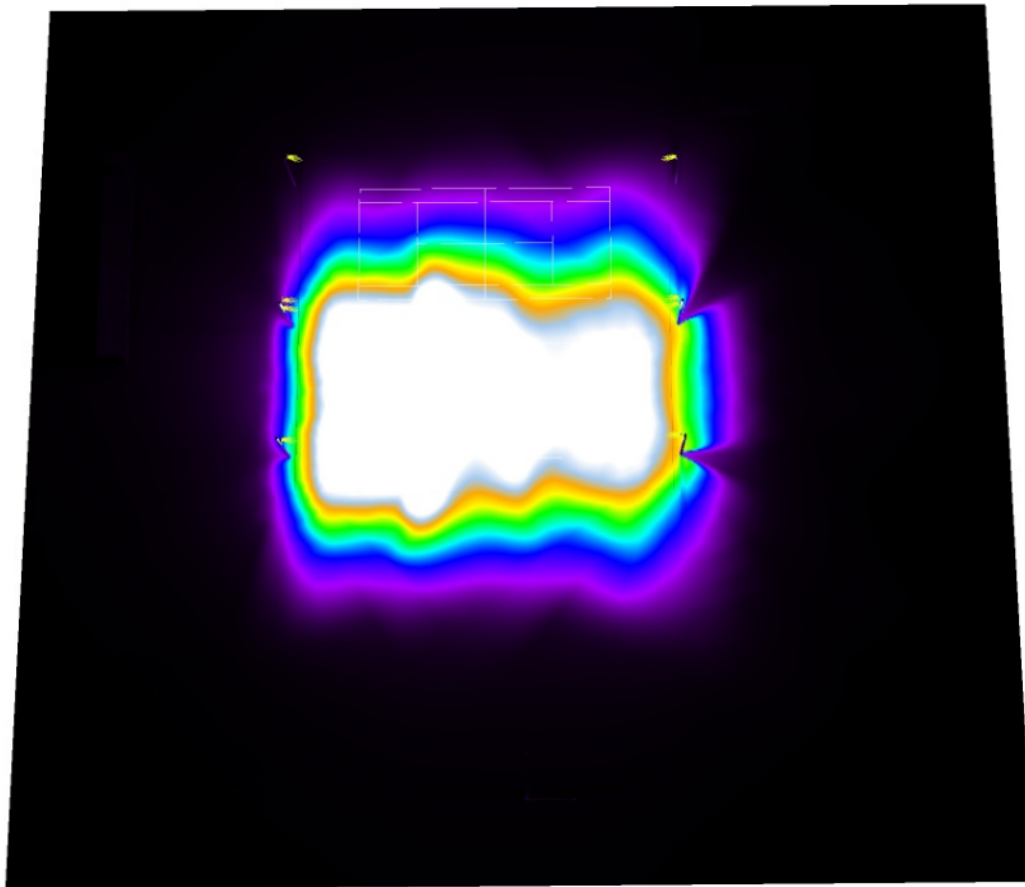


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Banagher Co Offaly, R42 VP70, Ireland

Operator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / Cour 2 Only / False Colour Rendering

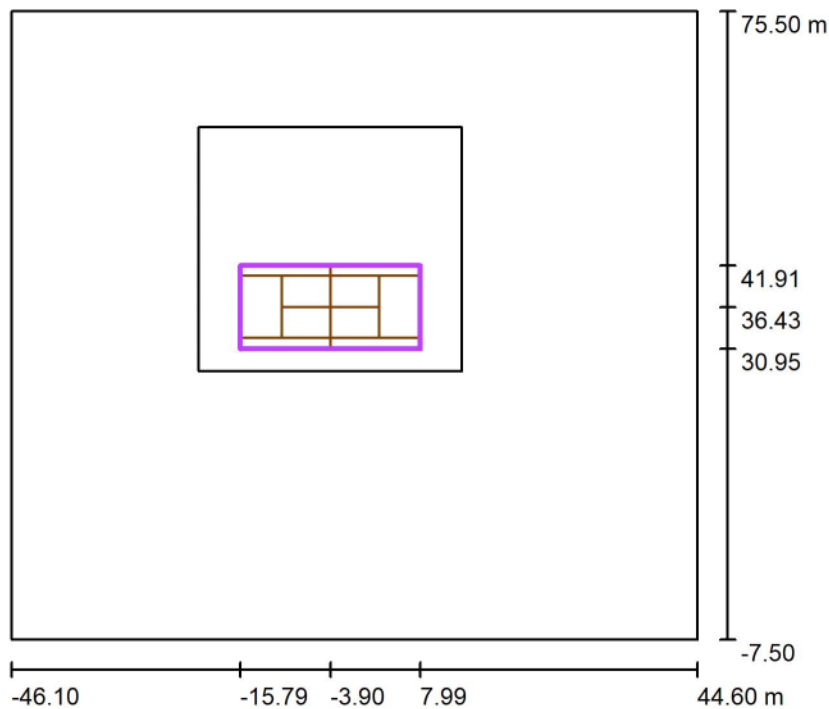


lx

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Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / Cour 2 Only / Court 2 Calculation Grid (PPA) / Summary



Scale 1 : 1000

Position: (-3.904 m, 36.426 m, 0.000 m)
 Size: (23.780 m, 10.960 m)
 Rotation: (0.0°, 0.0°, 0.0°)
 Type: Normal, Grid: 13 x 5 Points
 Belongs to the following sport arena: Court 2

Results overview

No.	Type	E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	$u0$	E_{min} / E_{max}	$E_{h\ m} / E_m$	H [m]	Camera
1	perpendicular	507	400	789	0.79	0.51	/	0.000	/

$E_{h\ m} / E_m$ = Relationship between middle horizontal and vertical illuminance, H = Measuring Height

Principle Playing area

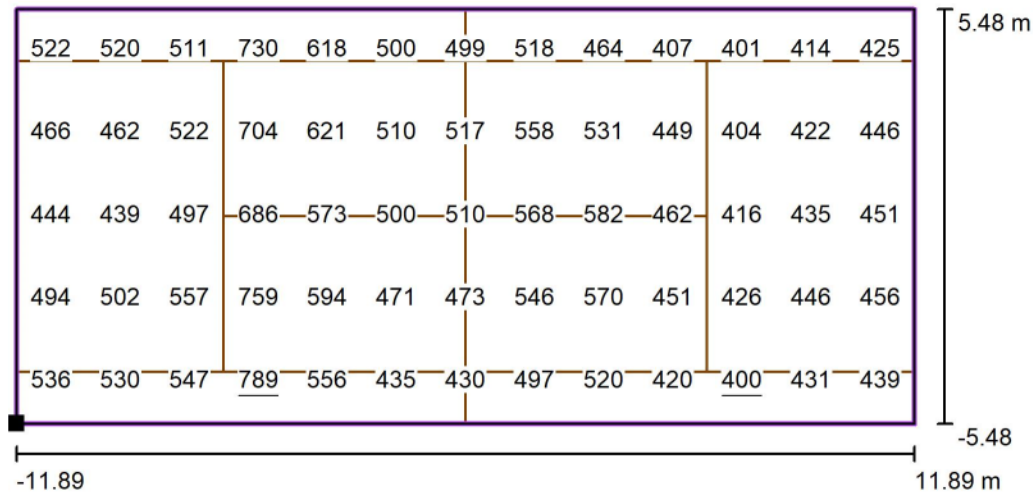
Average Lux: 507lx

Uniformity: 0.79 (lowest level of light is 79% of average)

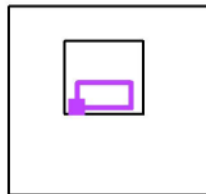
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Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / Cour 2 Only / Court 2 Calculation Grid (PPA) / Value Chart (E, Perpendicular)



Values in Lux, Scale 1 : 200

Position of surface in external scene:
Marked point: (-15.794 m, 30.946 m,
0.000 m)

Grid: 13 x 5 Points

 E_{av} [lx]
507

 E_{min} [lx]
400

 E_{max} [lx]
789

 u_0
0.79

 E_{min} / E_{max}
0.51

Principle Playing area

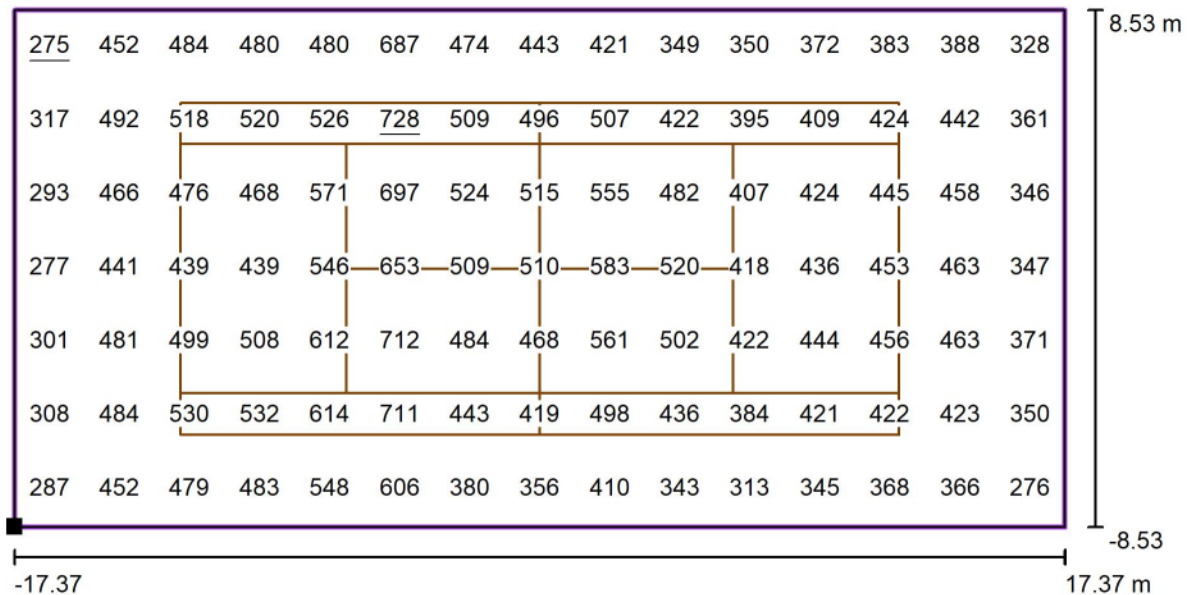
Average Lux: 507lx

Uniformity: 0.79 (lowest level of light is 79% of average)

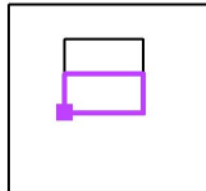
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Unit 4, Enterprise Centre, Church Street
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e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / Cour 2 Only / Court 2 Calculation Grid (TPA) / Value Chart (E, Perpendicular)



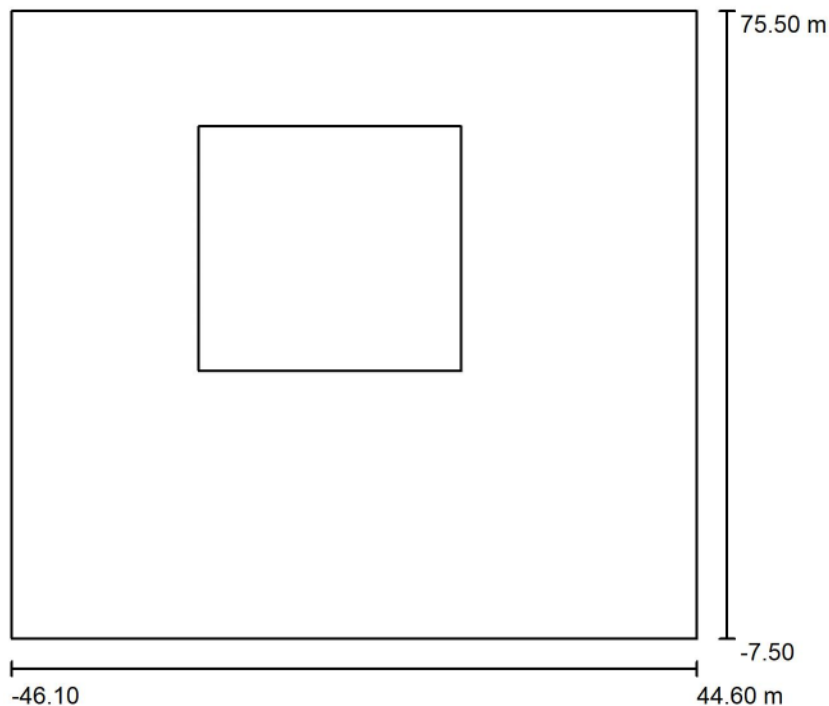
Values in Lux, Scale 1 : 250

Position of surface in external scene:
Marked point: (-21.279 m, 27.891 m,
0.000 m)

Grid: 15 x 7 Points

 E_{av} [lx]
456 E_{min} [lx]
275 E_{max} [lx]
728 u_0
0.60 E_{min} / E_{max}
0.38**Total Playing area****Average Lux: 456lx****Uniformity: 0.6 (lowest level of light is 60% of average)**

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Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com**Carrick on Shannon Tennis Club / All Lights On / Planning data**

Maintenance factor: 0.85, ULR (Upward Light Ratio): 0.0%

Scale 1:1000

Luminaire Parts List

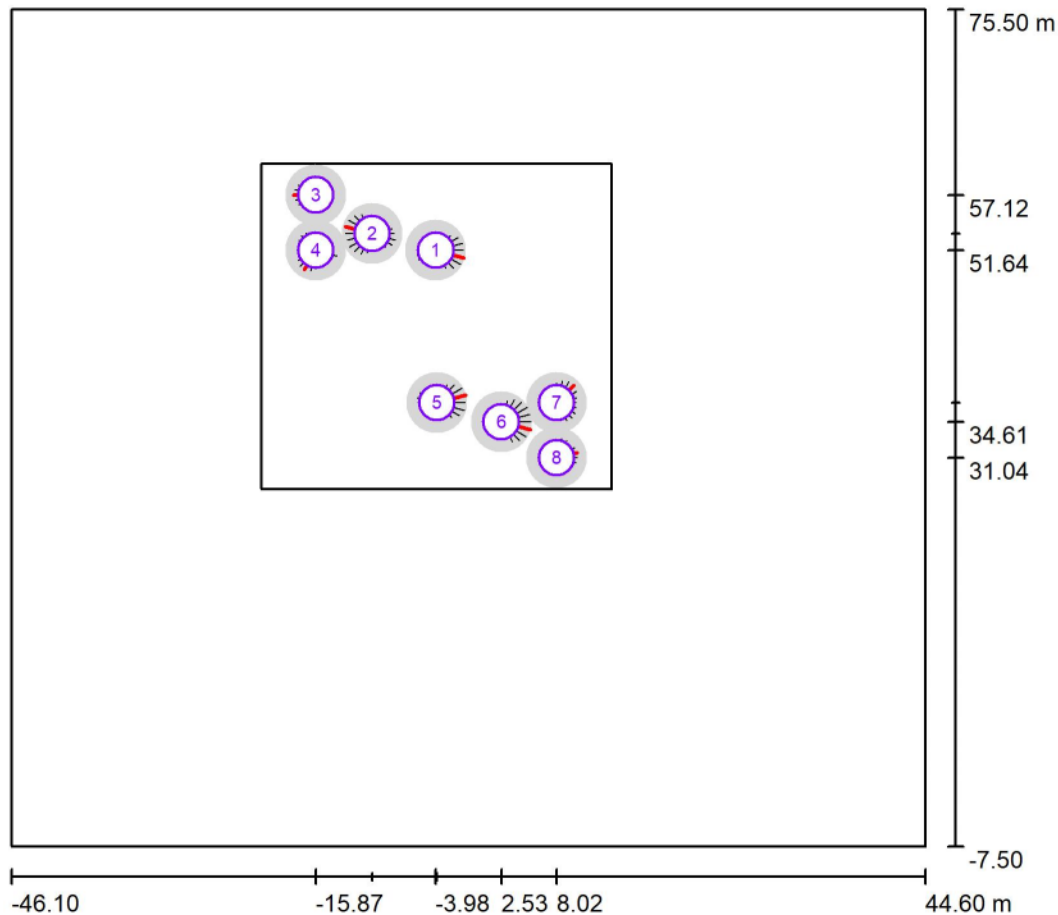
No.	Pieces	Designation (Correction Factor)	Φ (Luminaire) [lm]	Φ (Lamps) [lm]	P [W]
1	3	VG-1200-AS-1 Front+Rear Visors (1.000)	143165	143344	1196.6
2	5	VG-1200 AS-1 All Visors (1.000)	113167	113574	1200.0
Total:			995329	Total: 997902	9589.8

Total Electrical Load**9.6kw****Allowing for PF, total = 10kw**

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Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / All Lights On / GR Observer (Results Overview)



Scale 1 : 750

GR Observerlist

No.	Designation	Position [m]			Viewing sector [°]			Slope angle	Max
		X	Y	Z	Start	End	Increment		
1	GR Observer 1	-3.985	51.643	1.500	0.0	360.0	15.0	-2.0	47 ²⁾
2	GR Observer 1	-10.285	53.293	1.500	0.0	360.0	15.0	-2.0	46 ²⁾
3	GR Observer 1	-15.875	57.123	1.500	0.0	360.0	15.0	-2.0	44 ²⁾
4	GR Observer 1	-15.875	51.643	1.500	0.0	360.0	15.0	-2.0	45 ²⁾

Glare below recommended 50
range: 40-47

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Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / All Lights On / GR Observer (Results Overview)

GR Observerlist

No.	Designation	Position [m]			Start	Viewing sector [°]			Slope angle	Max
		X	Y	Z		End	Increment			
5	GR Observer 2	-3.875	36.523	1.500	0.0	360.0	15.0		-2.0	46 ²⁾
6	GR Observer 2	2.525	34.605	1.500	0.0	360.0	15.0		-2.0	40 ²⁾
7	GR Observer 2	8.015	36.523	1.500	0.0	360.0	15.0		-2.0	45 ²⁾
8	GR Observer 2	8.015	31.043	1.500	0.0	360.0	15.0		-2.0	42 ²⁾

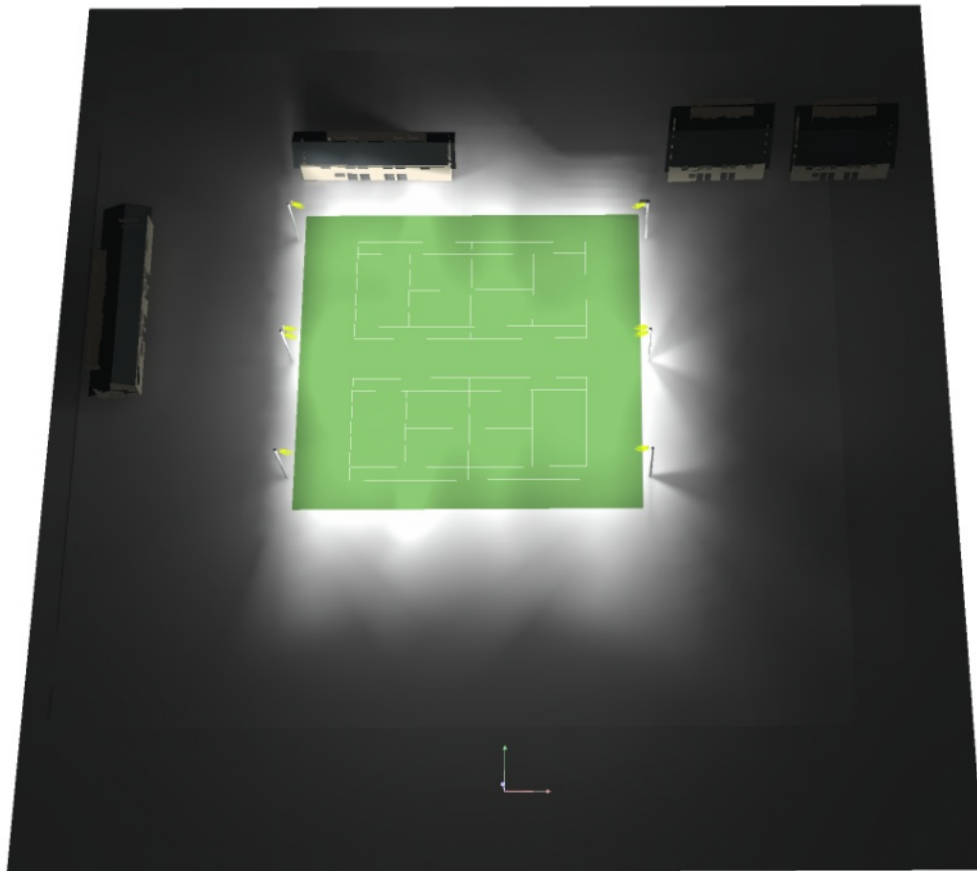
²⁾ The calculated equivalent veil luminance of the environment is based on the assumption of a complete diffuse reflection behavior of the environment (acc. EN 12464-2).

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Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, Ireland

Operator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / All Lights On / 3D Rendering

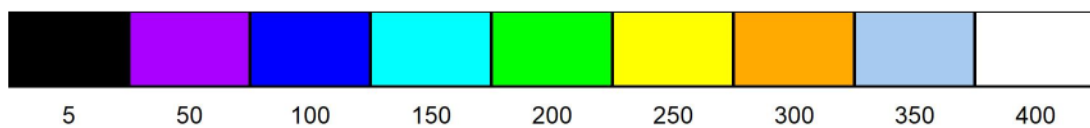
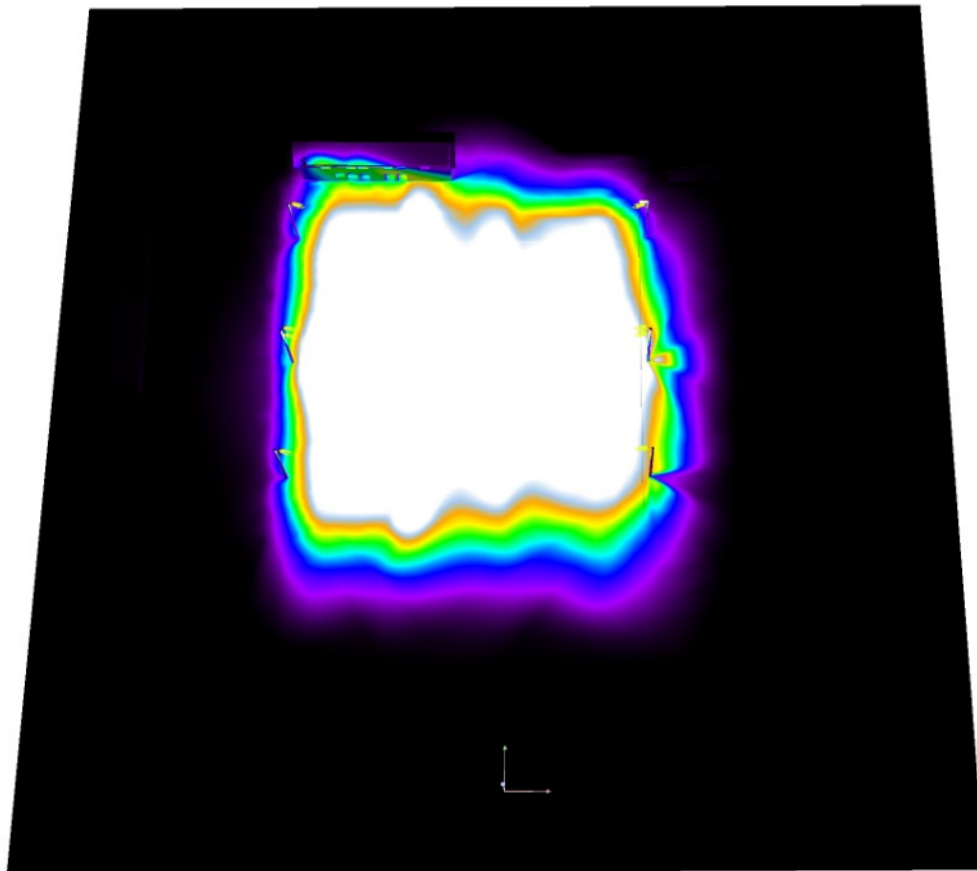


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Banagher Co Offaly, R42 VP70, Ireland

Operator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / All Lights On / False Colour Rendering

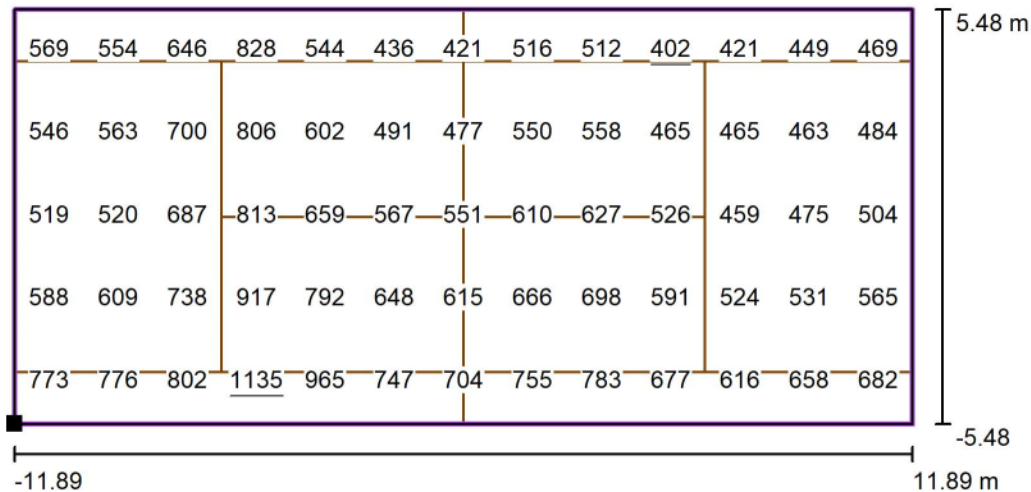


lx

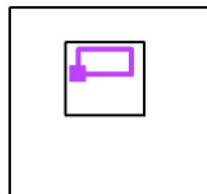
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Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / All Lights On / Court 1 Calculation Grid (PPA) / Value Chart (E, Perpendicular)



Values in Lux, Scale 1 : 200

Position of surface in external scene:
Marked point: (-15.812 m, 46.199 m,
0.000 m)

Grid: 13 x 5 Points

 E_{av} [lx]
615

 E_{min} [lx]
402

 E_{max} [lx]
1135

 u_0
0.65

 E_{min} / E_{max}
0.35

Both Courts Lighting

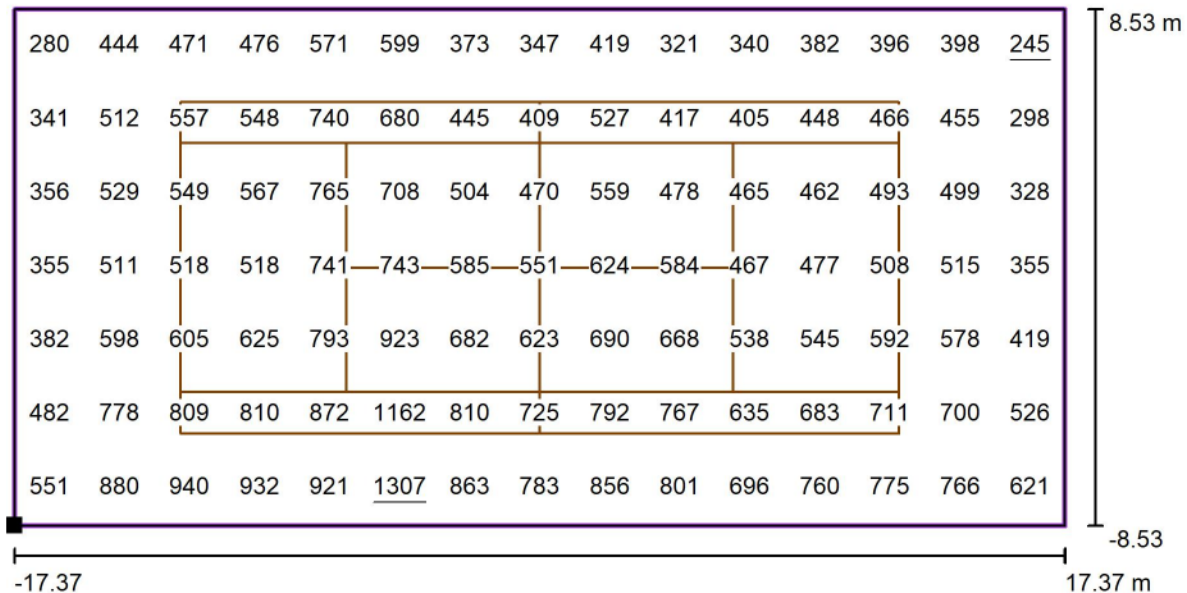
Average Lux over PPA = 615Lx

Uniformity = 0.65

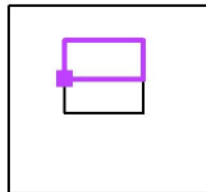
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Carrick on Shannon Tennis Club / All Lights On / Court 1 Calculation Grid (TPA) / Value Chart (E, Perpendicular)



Values in Lux, Scale 1 : 250

Position of surface in external scene:
Marked point: (-21.297 m, 43.144 m,
0.000 m)

Grid: 15 x 7 Points

 E_{av} [lx]
591 E_{min} [lx]
245 E_{max} [lx]
1307 u_0
0.41 E_{min} / E_{max}
0.19

Both Courts Lighting

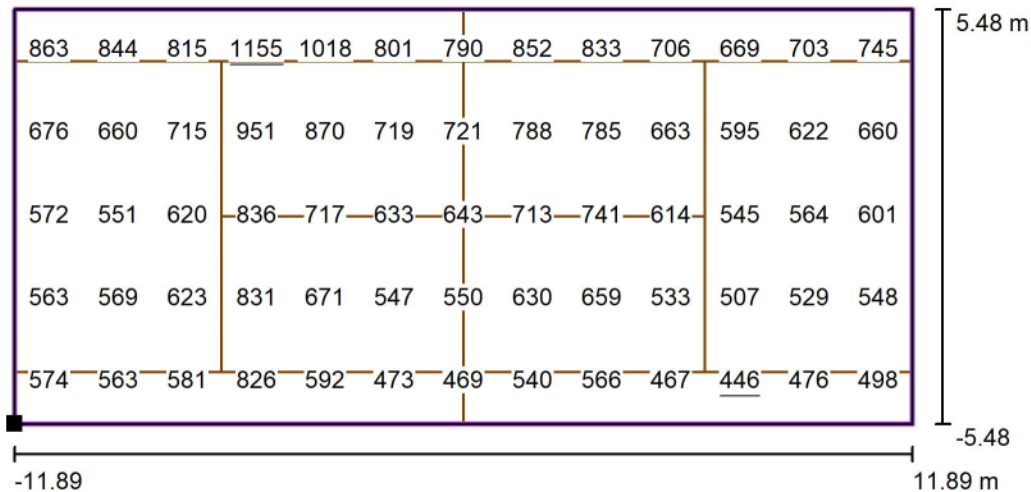
Average Lux over TPA = 591Lx

Uniformity = 0.41

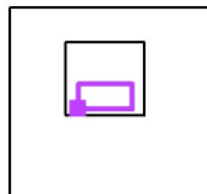
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Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / All Lights On / Court 2 Calculation Grid (PPA) / Value Chart (E, Perpendicular)



Values in Lux, Scale 1 : 200

Position of surface in external scene:
Marked point: (-15.794 m, 30.946 m,
0.000 m)

Grid: 13 x 5 Points

 E_{av} [lx]
668

 E_{min} [lx]
446

 E_{max} [lx]
1155

 u_0
0.67

 E_{min} / E_{max}
0.39

Both Courts Lighting

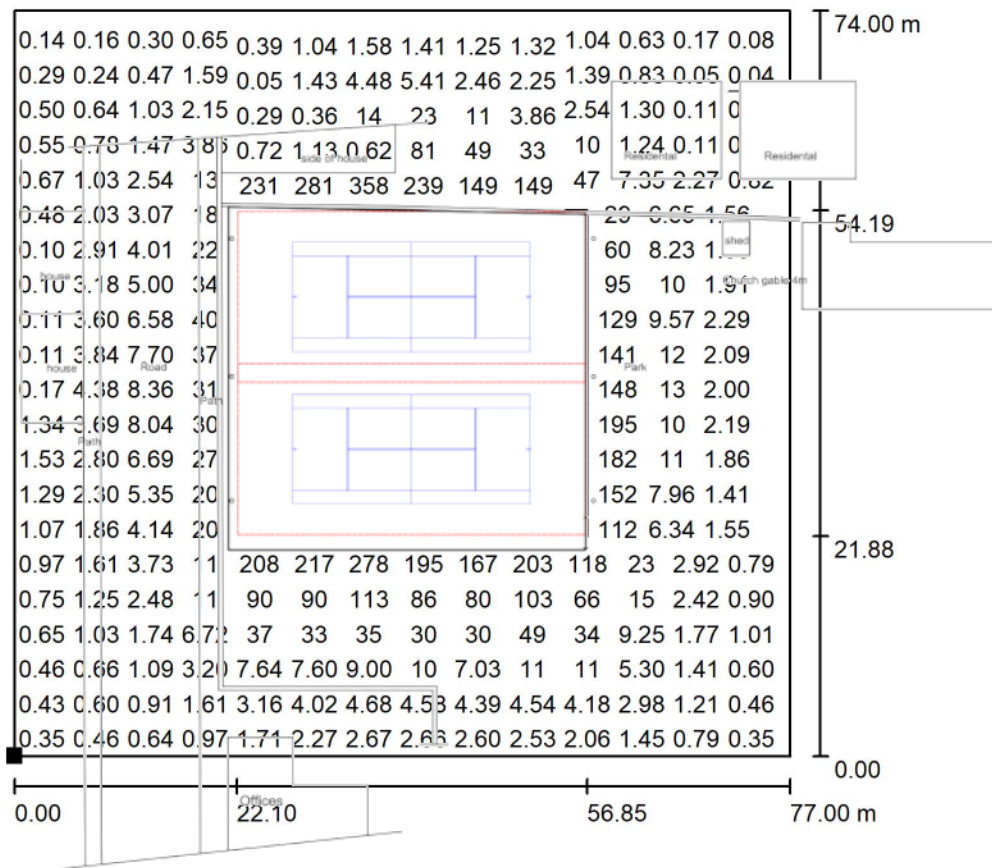
Average Lux over PPA = 668Lx

Uniformity = 0.67

Better Energy Management Ltd

Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / All Lights On / Horizontal lux 20m outside courts / Surface 1 / Value Chart (E)



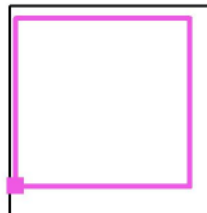
Values in Lux, Scale 1 : 750

Not all calculated values could be displayed.

Position of surface in external scene:

Marked point:

(-43.396 m, 6.047 m, 0.000 m)



Grid: 128 x 128 Points

 E_{av} [lx]
33

 E_{min} [lx]
0.04

 E_{max} [lx]
611

 u_0
0.001

 E_{min} / E_{max}
0.000

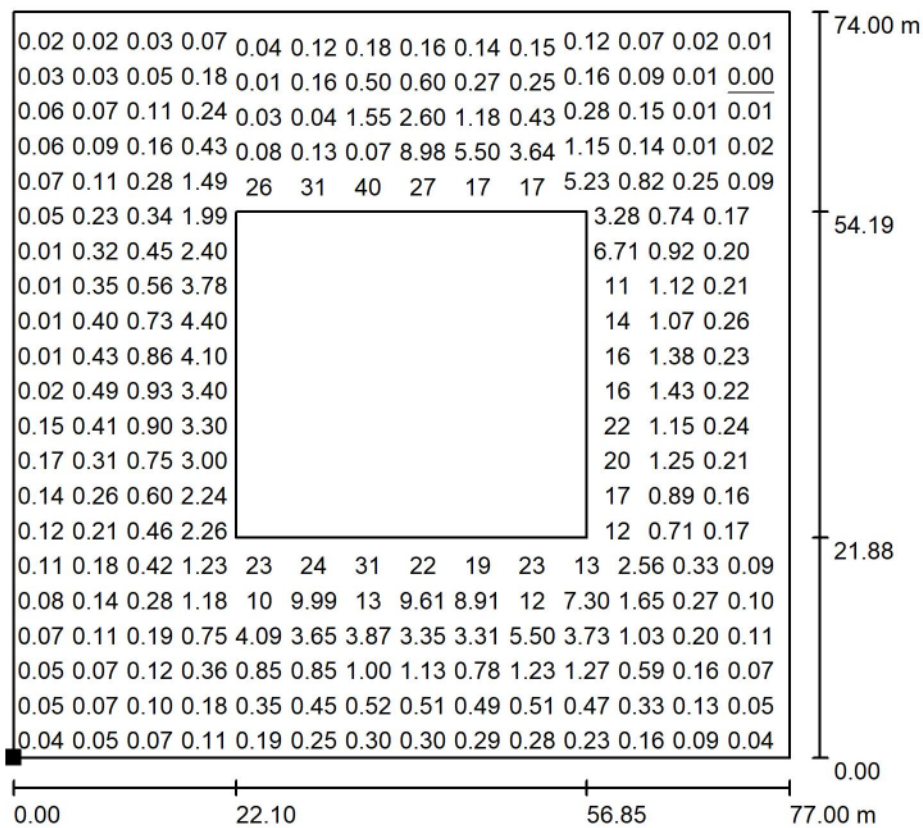
Carrick on Shannon Tennis Club / All Lights On / Horizontal lux 20m outside courts / Surface 1 / Value Chart (E)



Better Energy Management Ltd

Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / All Lights On / Horizontal lux 20m outside courts / Surface 1 / Value Chart (L)



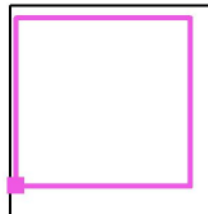
Values in Candela/m², Scale 1 : 750

Not all calculated values could be displayed.

Position of surface in external scene:

Marked point:

(-43.396 m, 6.047 m, 0.000 m)



Grid: 128 x 128 Points

 L_{av} [cd/m²]
3.68

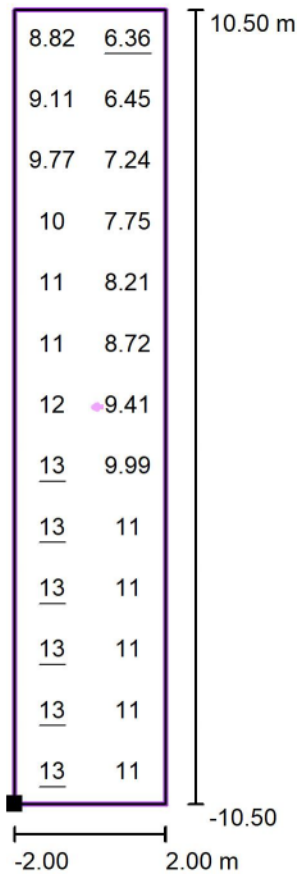
 L_{min} [cd/m²]
0.00

 L_{max} [cd/m²]
68

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Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
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Carrick on Shannon Tennis Club / All Lights On / Lux on Houses / Value Chart (E, Vertical)



Values in Lux, Scale 1 : 200

Position of surface in external scene:
Marked point: (-37.046 m, 39.202 m,
4.000 m)



Grid: 2 x 13 Points

 E_{av} [lx]
10

 E_{min} [lx]
6.36

 E_{max} [lx]
13

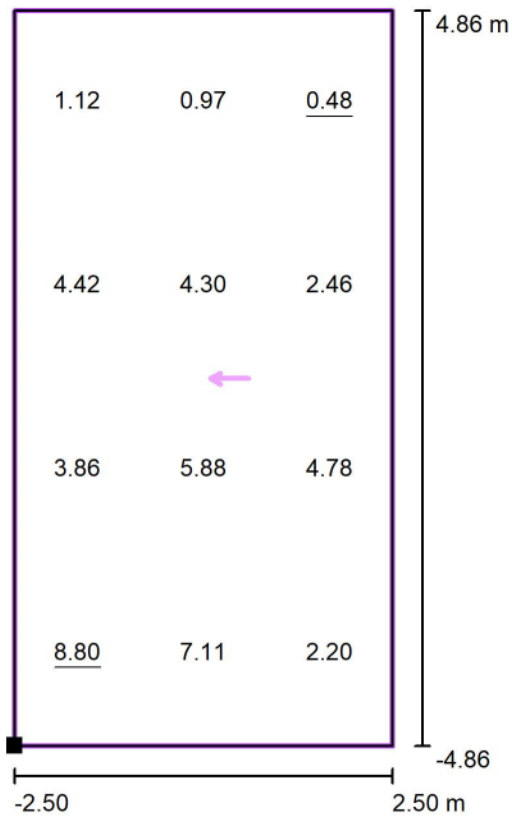
 u_0
0.61

 E_{min} / E_{max}
0.48

Better Energy Management Ltd

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Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / All Lights On / Lux on Residential House 1 / Value Chart (E, Vertical)



Values in Lux, Scale 1 : 100

Position of surface in external scene:
Marked point: (16.132 m, 63.390 m,
0.000 m)



Grid: 3 x 4 Points

 E_{av} [lx]
3.87

 E_{min} [lx]
0.48

 E_{max} [lx]
8.80

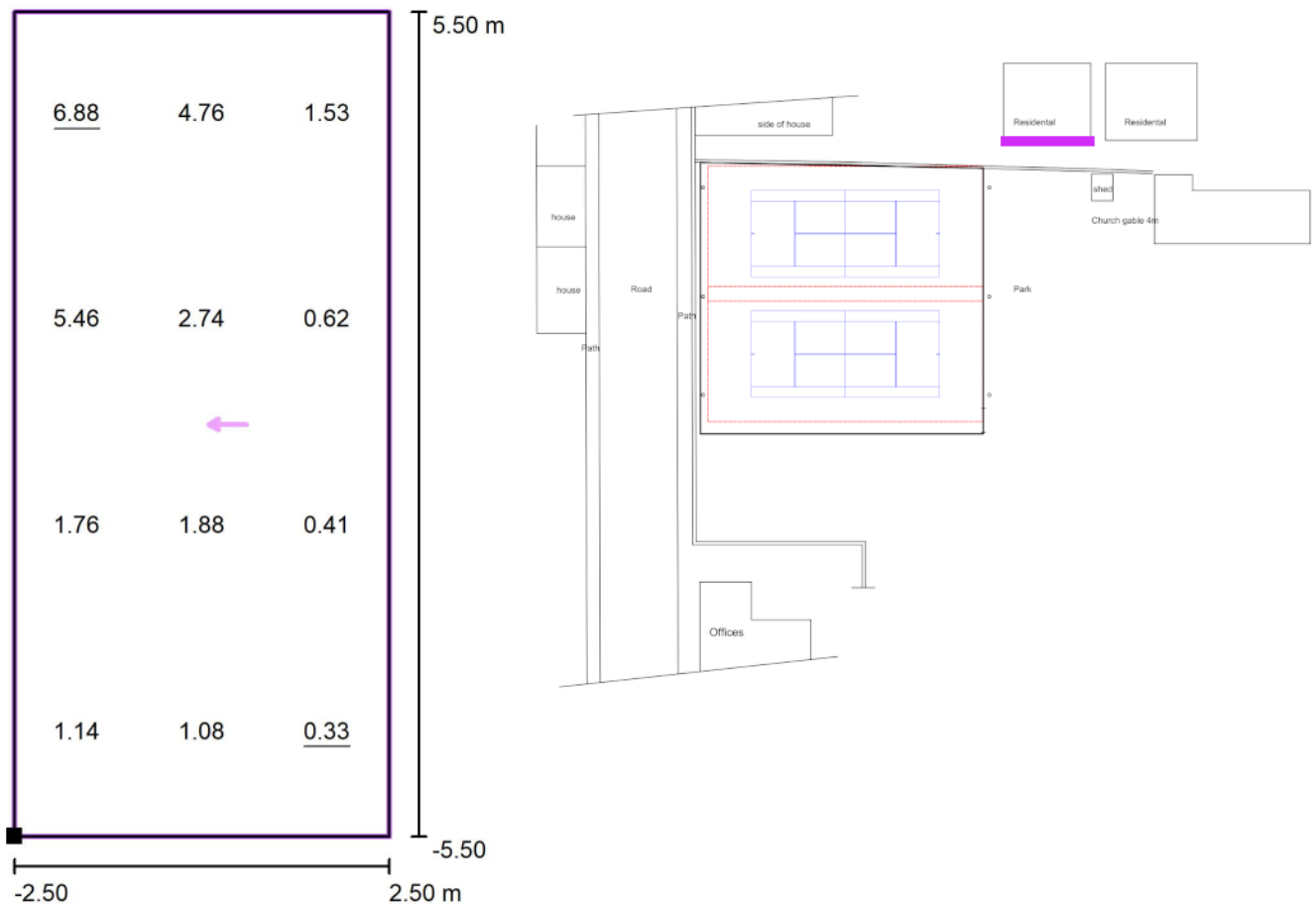
 u_0
0.12

 E_{min} / E_{max}
0.05

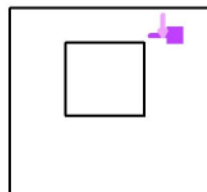
Better Energy Management Ltd

Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / All Lights On / Lux on Residential House 2 / Value Chart (E, Vertical)



Values in Lux, Scale 1 : 100

Position of surface in external scene:
Marked point: (27.129 m, 63.393 m,
0.000 m)

Grid: 3 x 4 Points

 E_{av} [lx]
2.38

 E_{min} [lx]
0.33

 E_{max} [lx]
6.88

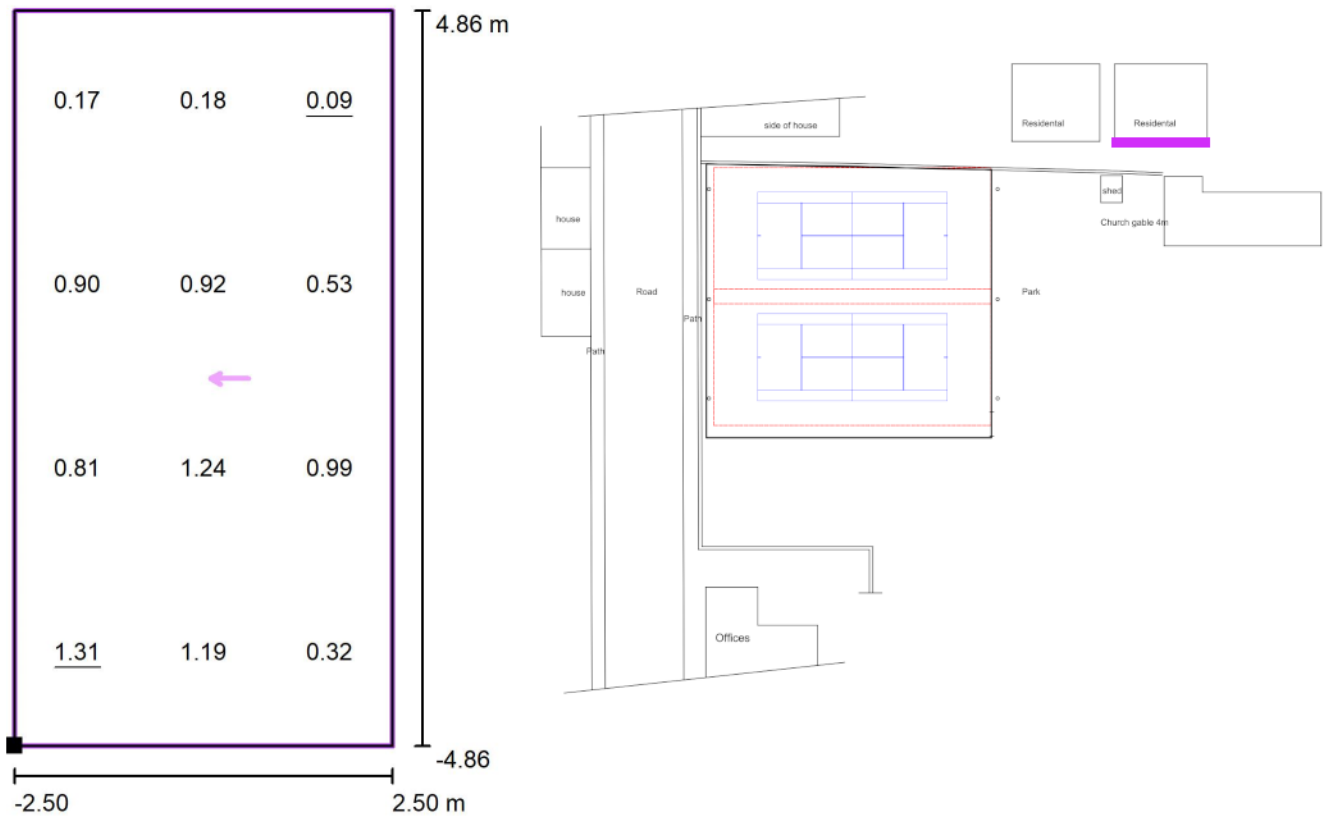
 u_0
0.14

 E_{min} / E_{max}
0.05

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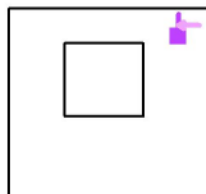
Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / All Lights On / Lux on Residential House 3 / Value Chart (E, Vertical)



Values in Lux, Scale 1 : 100

Position of surface in external scene:
Marked point: (29.003 m, 63.341 m,
0.000 m)



Grid: 3 x 4 Points

 E_{av} [lx]
0.72

 E_{min} [lx]
0.09

 E_{max} [lx]
1.31

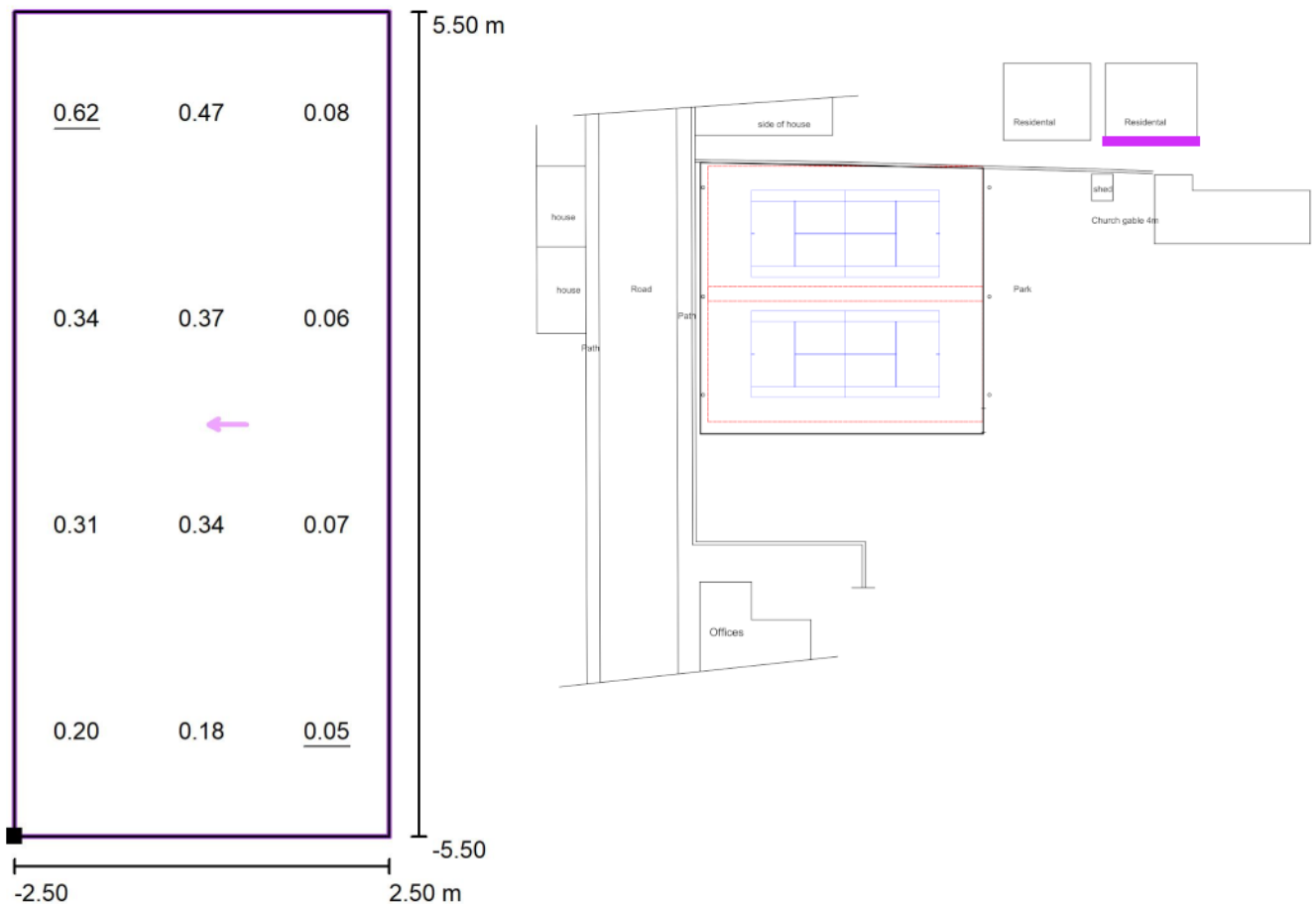
 u_0
0.12

 E_{min} / E_{max}
0.07

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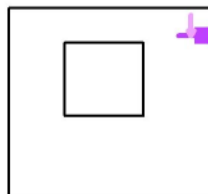
Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / All Lights On / Lux on Residential House 4 / Value Chart (E, Vertical)



Values in Lux, Scale 1 : 100

Position of surface in external scene:
Marked point: (40.000 m, 63.344 m,
0.000 m)



Grid: 3 x 4 Points

 E_{av} [lx]
0.26

 E_{min} [lx]
0.05

 E_{max} [lx]
0.62

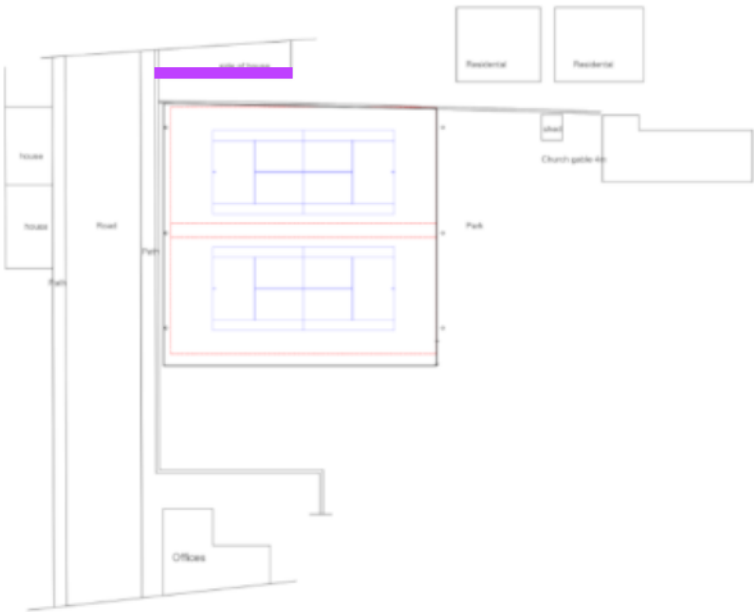
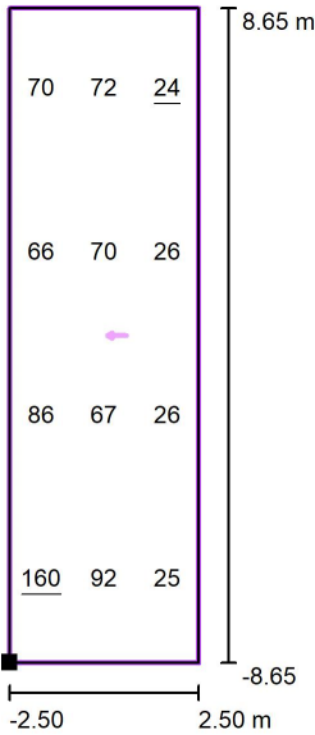
 u_0
0.18

 E_{min} / E_{max}
0.07

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Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, Ireland

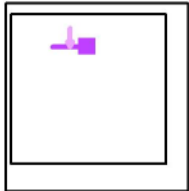
Operator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / All Lights On / Lux on Restaurant / Value Chart (E, Vertical)



Values in Lux, Scale 1 : 200

Position of surface in external scene:
Marked point: (-5.547 m, 64.037 m, 0.000 m)



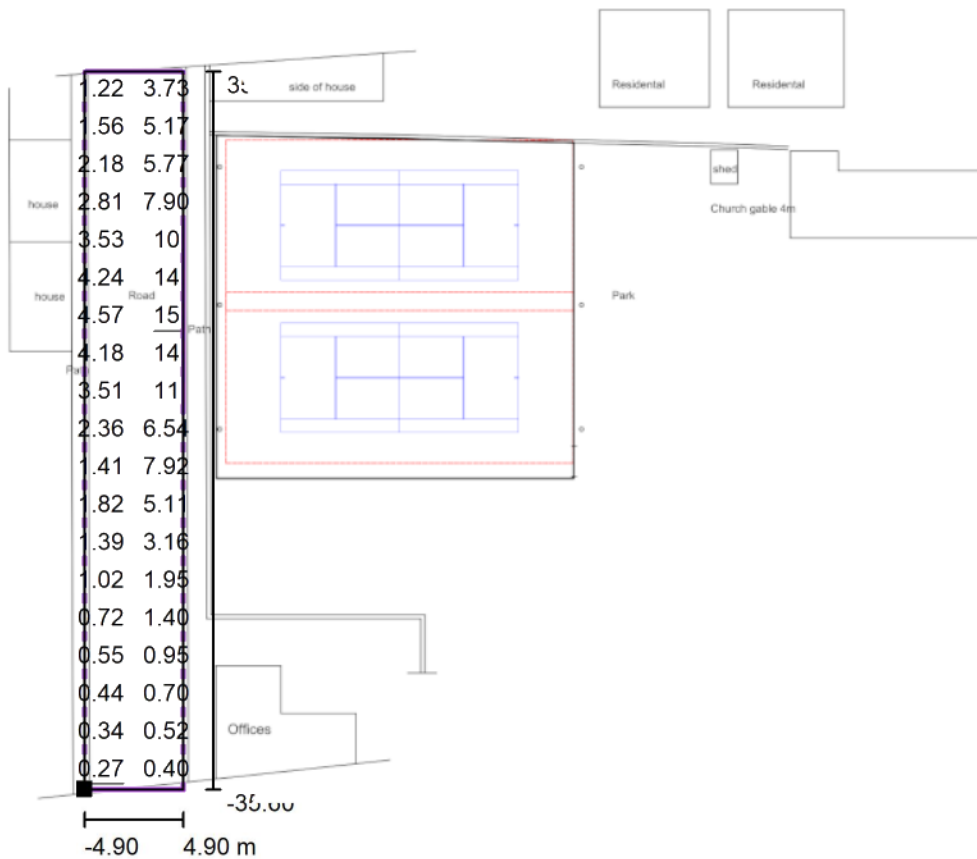
Grid: 3 x 4 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	$u0$	E_{min} / E_{max}
65	24	160	0.37	0.15

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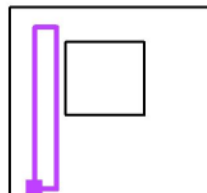
Unit 4, Enterprise Centre, Church Street
Banagher Co Offaly, R42 VP70, IrelandOperator Brendan Benny Murphy
Telephone +353 (0)86 7926161
Fax
e-Mail bmurphy@bem-ltd.com

Carrick on Shannon Tennis Club / All Lights On / Lux on Road / Value Chart (E, Horizontal)



Values in Lux, Scale 1 : 750

Not all calculated values could be displayed.

Position of surface in external scene:
Marked point: (-35.000 m, -4.400 m,
0.000 m)

Grid: 3 x 19 Points

 E_{av} [lx]
3.76

 E_{min} [lx]
0.27

 E_{max} [lx]
15

 $u0$
0.07

 E_{min} / E_{max}
0.02