

Gravesend Rugby Football Club

100 Lux Lighting Design

Project code: LD2- Training Pitch
Date: 25-05-2022

Designer: Andy Collins

Description: LED Floodlighting solution to RFU Match Play standards:
-100 Lux average - 0.50 min/ave uniformity.



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.



Highlights Floodlighting Ltd

Unit 3 Manor Farm Court
Manor Road
Lower Sundon
LU3 3NZ

Telephone: 01525 874 888
Mobile Phone: 07795 478 595
E-Mail: mail@highlights.co.uk



Table of Contents

1.	Project Description	3
1.1	Description	3
1.2	3-D Project Overview	4
1.3	Top Project Overview	5
2.	Summary	6
2.1	Observer Information	6
2.2	Obstacle Information	6
2.3	Project Luminaires	6
2.4	Calculation Results	7
3.	Calculation Results	8
3.1	Rugby: Graphical Table	8
3.2	Rugby: Iso Contour	9
3.3	Rugby: Filled Iso Contour	10
3.4	Spillage Horizontal: Graphical Table	11
3.5	Spillage Horizontal: Iso Contour	12
3.6	Spillage Horizontal: Filled Iso Contour	13
4.	Luminaire Details	14
4.1	Project Luminaires	14

1. Project Description

1.1 Description

LED Floodlighting solution to RFU Match Play standards:
-100 Lux average - 0.50 min/ave uniformity.

The LED Luminaires perform with internal integral louvres to mitigate unnecessary spillage and glare to the adjacent surrounding area.

Training Pitch Lighting:

8 Philips OptiVision Gen3.5 LED 1500w 4000K luminaires mounted on 4 existing relocated lighting columns and 4 proposed lighting columns at 10m high.

Rugby pitch Size: 106m x 53m including 2 x 6m in-goal areas.

Aiming Offset of Luminaire = 35 degrees.

Calculation grid complies with RFU regulations using CIBSE LG4 Sports Appendix 1.

Columns are 5m back from the playing area.

Total Installed Power = 12 Kw.

400v power supply required.

Project Maintenance Factors:

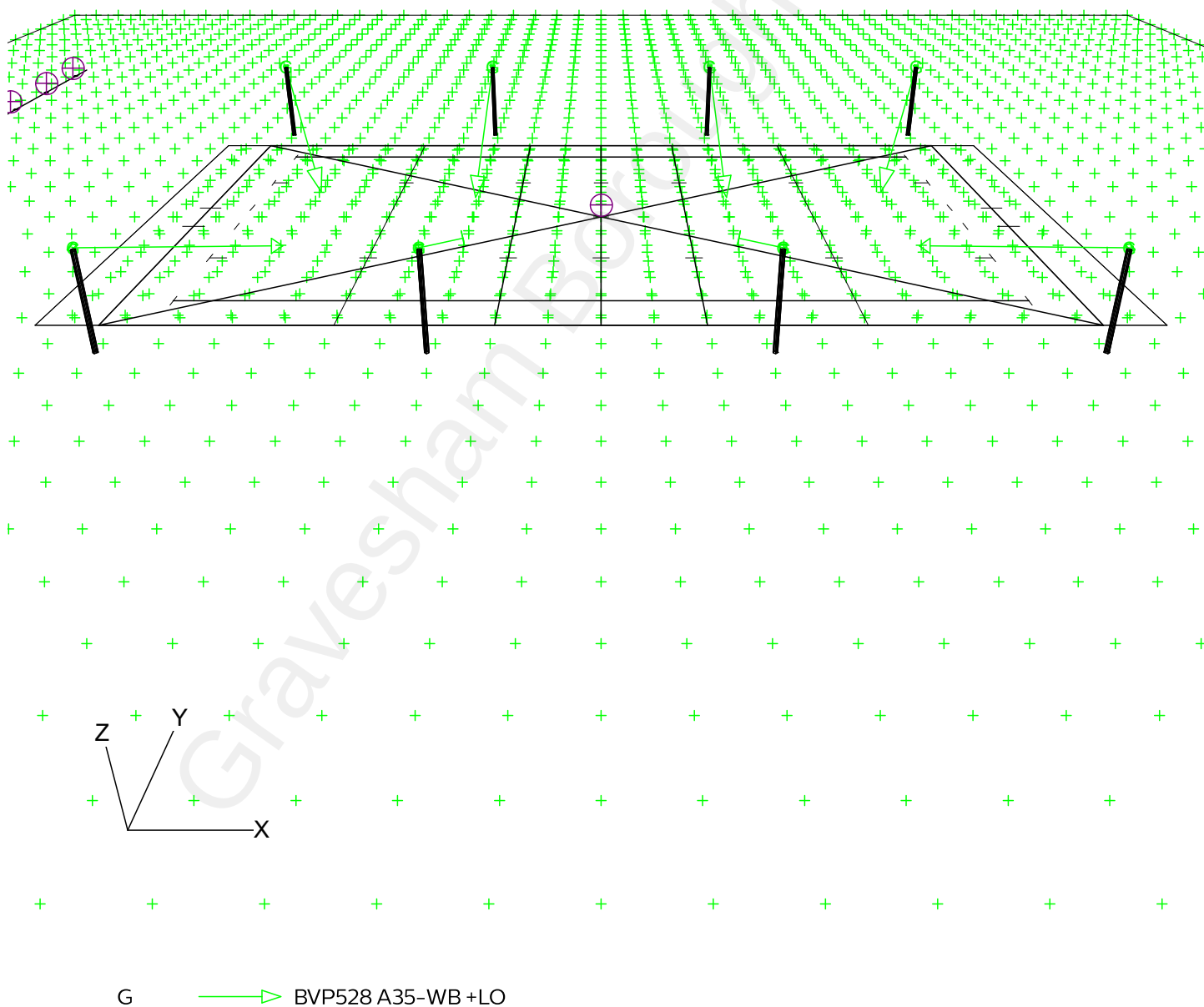
Performance Results = 0.90

Spillage Charts = 1

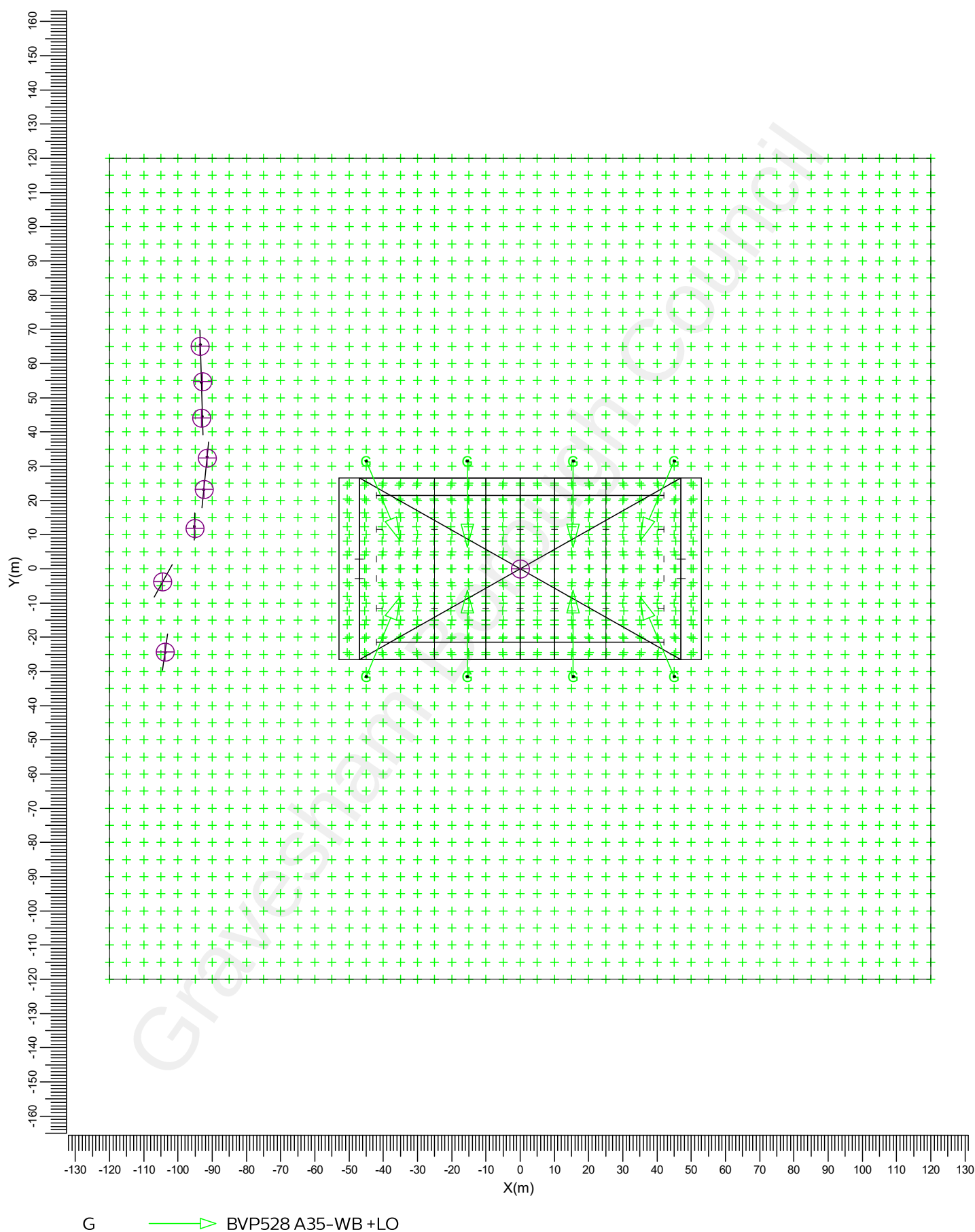
Upward Light Ratio (ULR) is 0.00

The light spill shown is not maintained and therefore demonstrates maximum lumen intensity from initial installation.

1.2 3-D Project Overview



1.3 Top Project Overview



Scale
1:1500

2. Summary

2.1 Observer Information

Code	Observer	Position		
		X (m)	Y (m)	Z (m)
Bb	Property Observer 1	-93.53	65.16	1.50
Cc	Property Observer 2	-92.91	54.81	1.50
Dd	Property Observer 3	-93.09	44.03	1.50
Ee	Property Observer 4	-91.54	32.36	1.50
Ff	Property Observer 5	-92.43	23.27	1.50
Gg	Property Observer 6	-95.11	11.86	1.50
Hh	Property Observer 7	-104.56	-3.81	1.50

2.2 Obstacle Information

Obstacle	Transparency (%)	Position		
		X (m)	Y (m)	Z (m)
Column 1+4+5+8	100	45.00	31.50	0.00
		-45.00	31.50	0.00
		45.00	-31.50	0.00
		-45.00	-31.50	0.00
		15.50	31.50	0.00
Column 2+3+6+7	100	-15.50	31.50	0.00
		15.50	-31.50	0.00
		-15.50	-31.50	0.00
		15.50	31.50	0.00
		-15.50	31.50	0.00

2.3 Project Luminaires

Code	Qty	Luminaire Type	Lamp Type	Power (W)	Flux (lm)
G	8	BVP528 A35-WB +LO	1 * LED2220/740 OUT T15 50K	1500.0	1 * 222600

The total installed power: 12.00 (kWatt)

Number of Luminaires Per Switching Mode:

Switching Mode	Luminaire Code	Power (kWatt)
	G	
Spillage	8	12.00
Rugby	8	12.00

Number of Luminaires Per Arrangement:

Arrangement	Luminaire Code	Power (kWatt)
	G	
Column 1+4+5+8	4	6.00
Column 2+3+6+7	4	6.00

2.4 Calculation Results

Switching Modes:

Code	Switching Mode	Maintenance factor
1	Spillage	1.00
2	Rugby	0.90

(II)luminance Calculations:

Calculation	Switching Mode	Type	Unit	Ave Min/AveMin/Max		
Rugby	2	Surface Illuminance	lux	151	0.51	0.29
Spillage Horizontal	1	Surface Illuminance	lux	21.1	0.00	0.00

Obtrusive Light Calculations:

Switching Mode	Observer Code	Luminaire Code	Position			Aiming Angles			Maximum Intensity (cd)
			X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0	
1	Bb	G	-15.50	-31.50	10.20	90.00	68.00	0.00	900
1	Cc	G	-15.50	-31.50	10.20	90.00	68.00	0.00	1137
1	Dd	G	-15.50	-31.50	10.20	90.00	68.00	0.00	1226
1	Ee	G	45.00	-31.50	10.20	113.14	68.00	-0.00	915
1	Ff	G	45.00	-31.50	10.20	113.14	68.00	-0.00	860
1	Gg	G	-15.50	-31.50	10.20	90.00	68.00	0.00	772
1	Hh	G	45.00	-31.50	10.20	113.14	68.00	-0.00	617

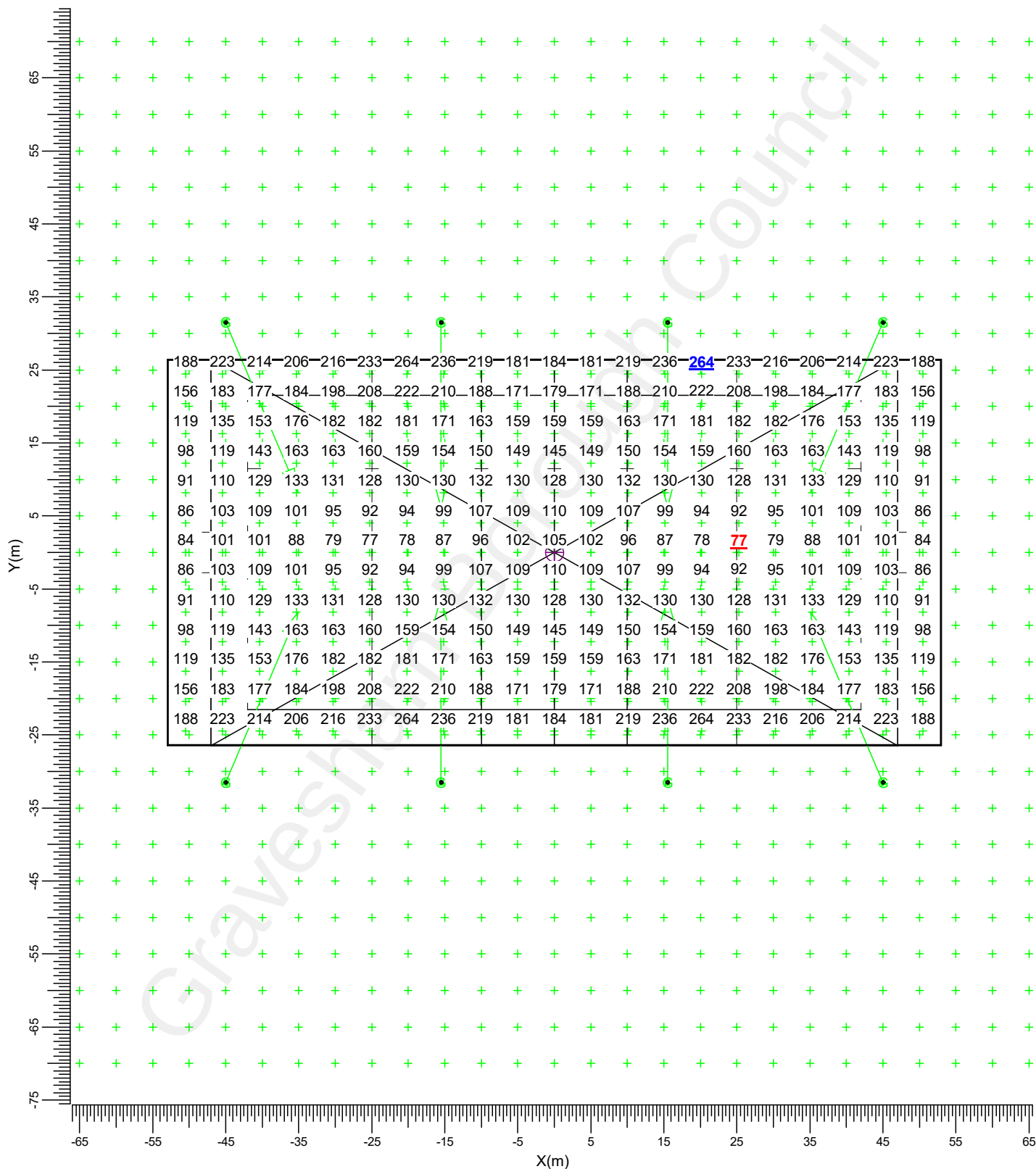
Switching Mode	ULR
1	0.00
2	0.00

3. Calculation Results

3.1 Rugby: Graphical Table

Rugby

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



G → BVP528 A35-WB +LO

Average
151

Min/Ave
0.51

Min/Max
0.29

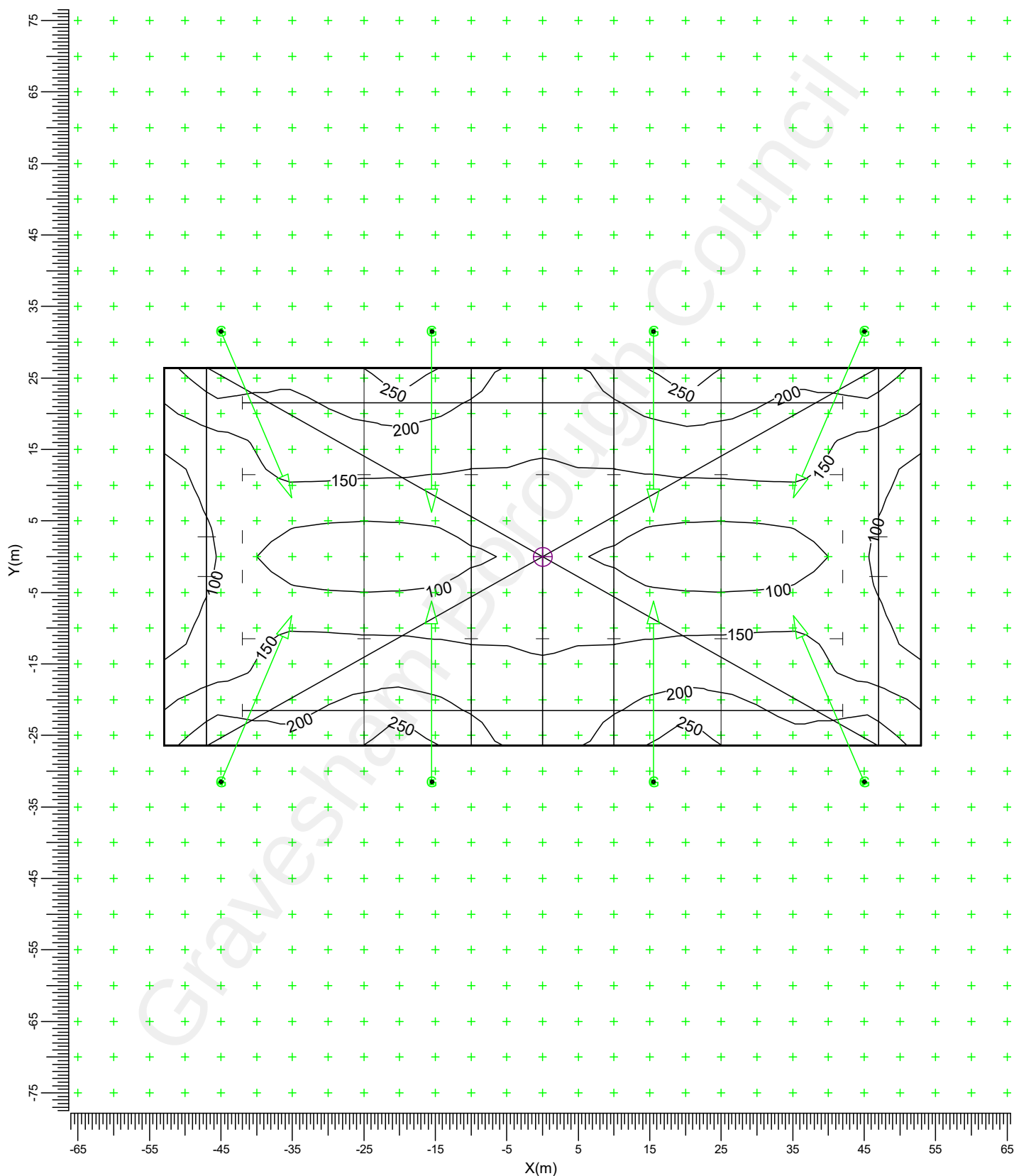
Project maintenance factor
0.90

Scale
1:750

3.2 Rugby: Iso Contour

Rugby

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



G ———▶ BVP528 A35-WB +LO

Average
151

Min/Ave
0.51

Min/Max
0.29

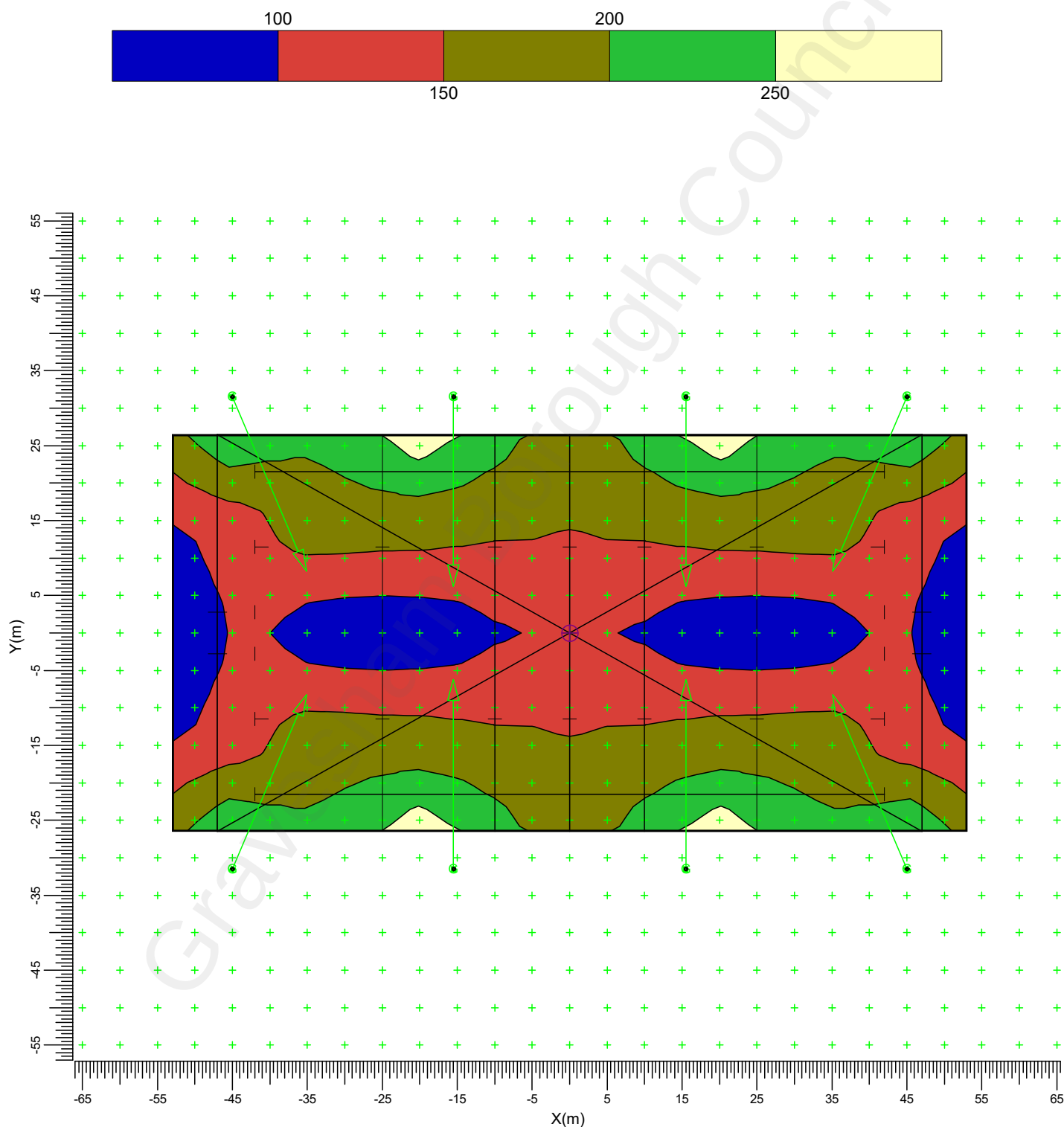
Project maintenance factor
0.90

Scale
1:750

3.3 Rugby: Filled Iso Contour

Rugby

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



G ———▶ BVP528 A35-WB +LO

Average
151

Min/Ave
0.51

Min/Max
0.29

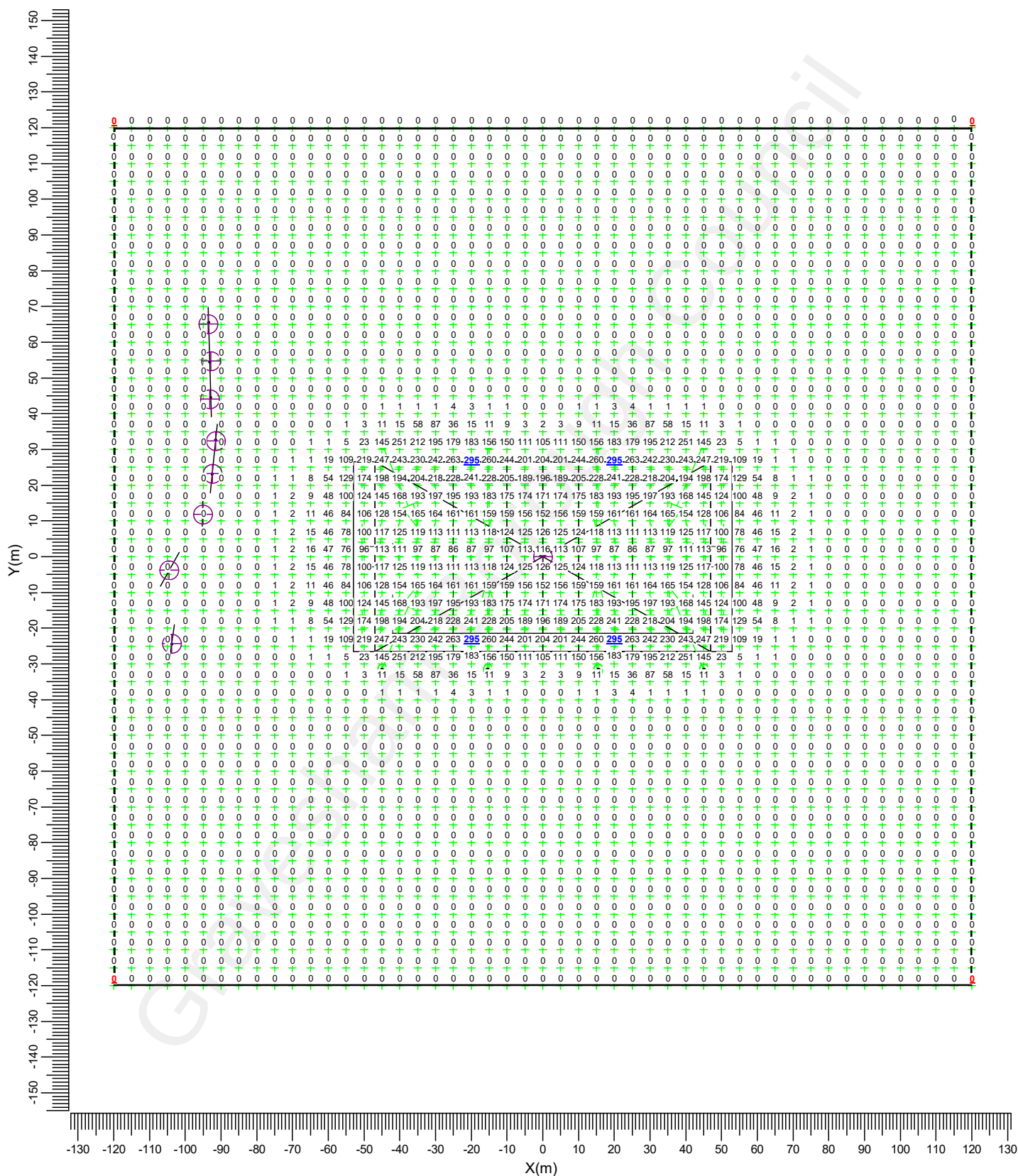
Project maintenance factor
0.90

Scale
1:750

3.4 Spillage Horizontal: Graphical Table

Spillage

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



G BVP528 A35-WB +LO

Average
21.1

Min/Ave
0.00

Min/Max
0.00

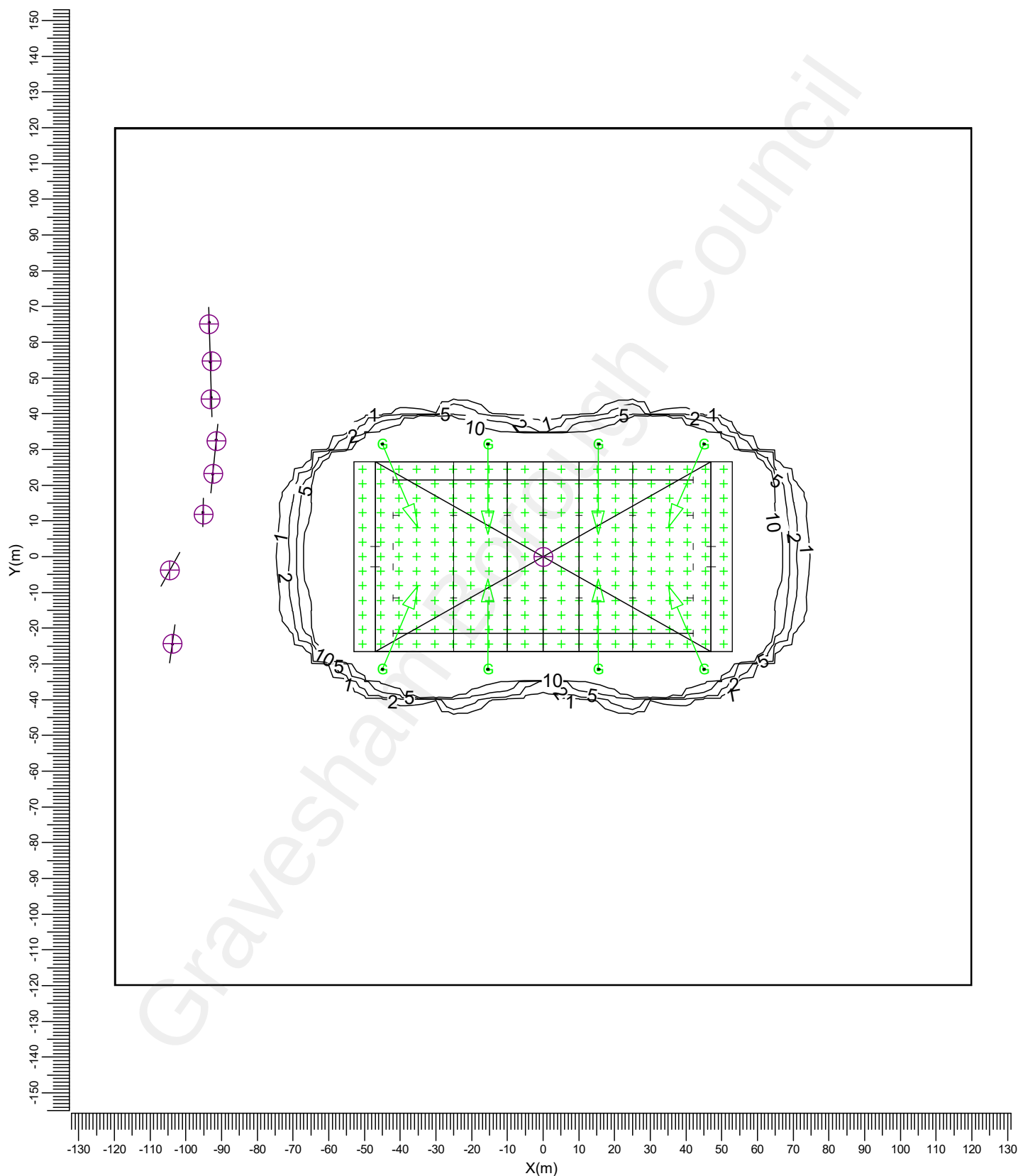
Project maintenance factor
1.00

Scale
1:1500

3.5 Spillage Horizontal: Iso Contour

Spillage

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



G  BVP528 A35-WB +LO

Average
21.1

Min/Ave
0.00

Min/Max
0.00

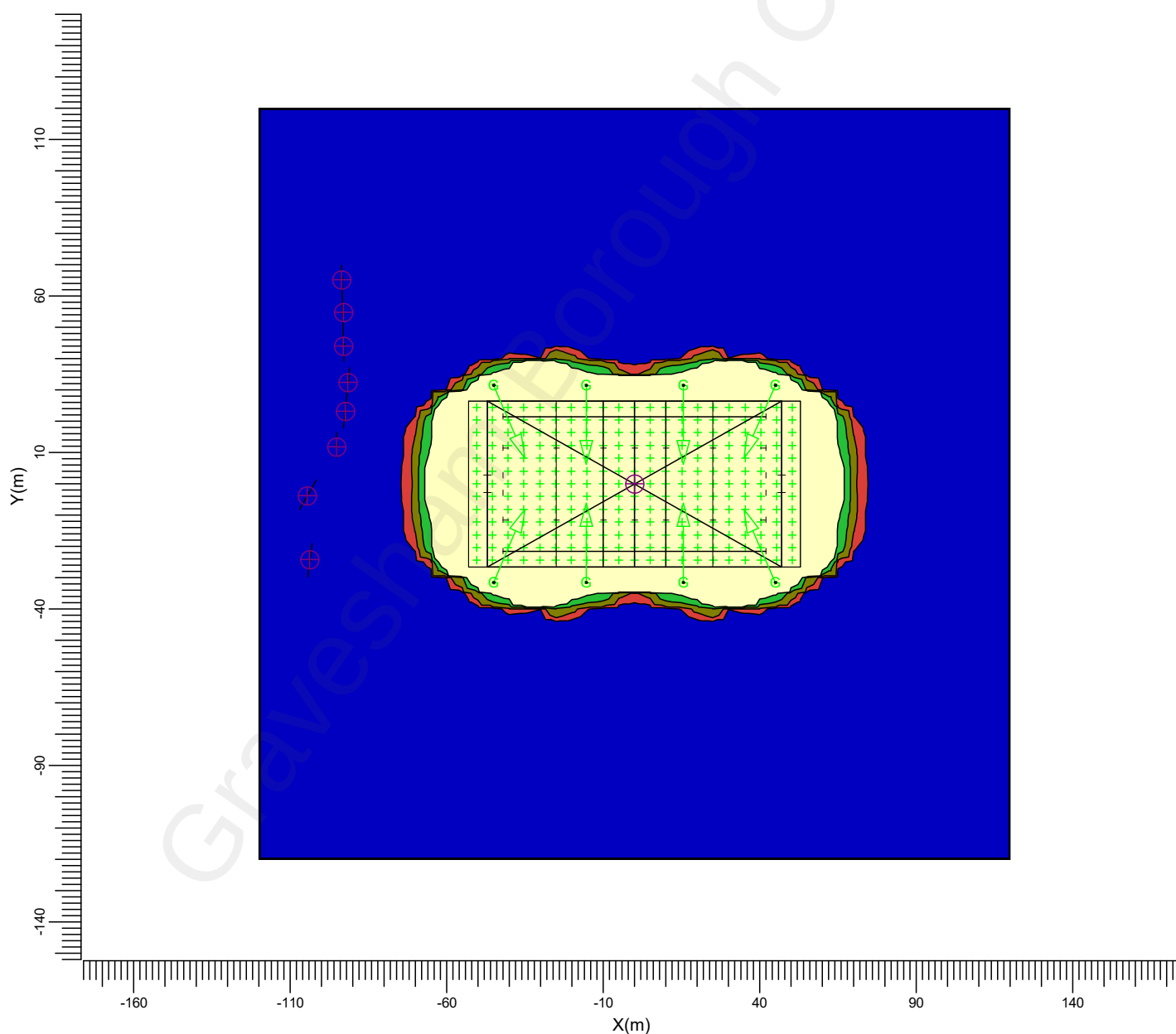
Project maintenance factor
1.00

Scale
1:1500

3.6 Spillage Horizontal: Filled Iso Contour

Spillage

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



Average
21.1

Min/Ave
0.00

Min/Max
0.00

Project maintenance factor
1.00

Scale
1:2000

4. Luminaire Details

4.1 Project Luminaires

OptiVision LED

BVP528 1xLED22220/740 OUT T15 50K A35-WB +LO

Light output ratios

DLOR	: 0.71
ULOR	: 0.00
TLOR	: 0.71
Ballast	: N/A
Lamp flux	: 222600 lm
Luminaire wattage	: 1500.0 W
Measurement code	: LVM2049200

Note: Luminaire data not from database.

