

Manchester Academy

Artificial Turf Pitch

Project code: SIS009

Date: 01-03-2021

Designer: Wesley Bugg

Description: Match play:
Maintained average illuminance >200 lux
Uniformity Ratio (Ev.min/Ev.ave) >0.60

All luminaires have a zero upward light ratio without the use of additional accessories.

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.

Surfacing Standards LTD

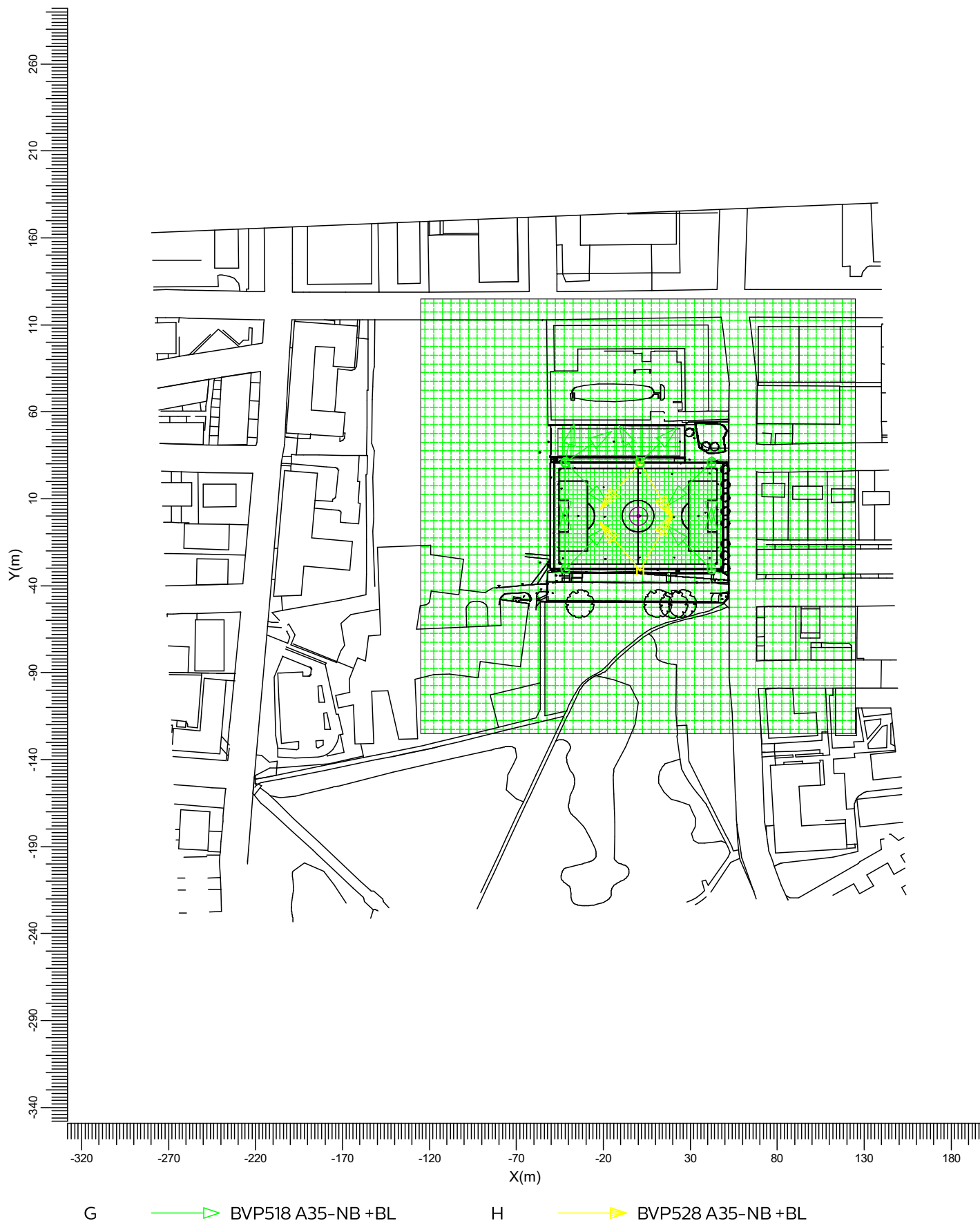
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1. Project Description

1.1 Top Project Overview



Scale
1:3000

2. Summary

2.1 Project Luminaires

Code	Qty	Luminaire Type	Lamp Type	Power (W)	Flux (lm)
G	12	BVP518 A35-NB +BL	1 * LED1480/757 OUT T15 50K	1000.0	1 * 148400
H	4	BVP528 A35-NB +BL	1 * LED2220/757 OUT T15 50K	1500.0	1 * 222600

The total installed power: 18.00 (kWatt)

Number of Luminaires Per Switching Mode:

Switching Mode	Luminaire Code		Power (kWatt)
	G	H	
200lux Switching	8	4	14.00
10% Amenity Lighting	8	4	14.00
Spillage Switching	12	4	18.00
Back Lighting	4	0	4.00

Number of Luminaires Per Arrangement:

Arrangement	Luminaire Code		Power (kWatt)
	G	H	
Mast	0	2	3.00

2.2 Calculation Results

Switching Modes:

Code	Switching Mode	Maintenance factor
1	200lux Switching	0.90
2	10% Amenity Lighting	0.10
3	Spillage Switching	1.00
4	Back Lighting	0.90

(II)luminance Calculations:

Calculation	Switching Mode	Type	Unit	Ave Min/AveMin/Max		
Football	1	Surface Illuminance	lux	207	0.68	0.47
Amenity Lighting 10%	2	Surface Illuminance	lux	2.39	0.00	0.00
Back Lighting	4	Surface Illuminance	lux	192	0.43	0.26
Spillage Grid	3	Surface Illuminance	lux			
Horizontal	3	Horizontal Illuminance	lux			

Glare Rating for Grid of Observers:

Calculation	Switching Mode	Observer Grid	Reference Grid	Reflectance	GR-Max
Glare Rating	1	Football	Football	0.25	46.6

Obtrusive Light Calculations:

Switching Mode	ULR
1	0.00

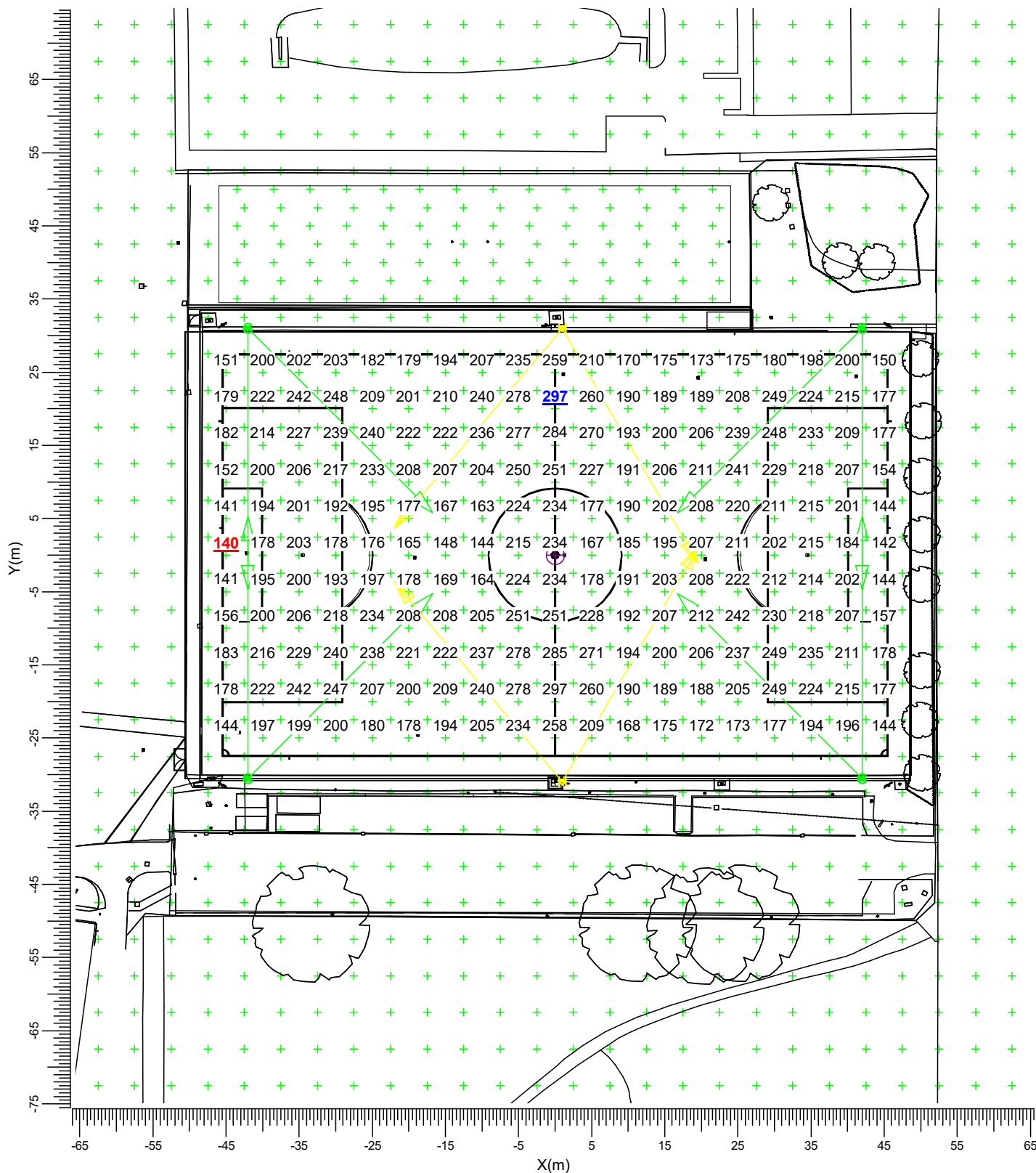
Switching Mode	ULR
2	0.00
3	0.00
4	0.00

3. Calculation Results

3.1 Football: Graphical Table

200lux Switching

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



G  BVP518 A35-NB +BL

H  BVP528 A35-NB +BL

Average
207

Min/Ave
0.68

Min/Max
0.47

Project maintenance factor
0.90

Scale
1:750

3.2 Amenity Lighting 10%: Graphical Table

10% Amenity Lighting

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



G

➤ BVP518 A35-NB +BL

H

➤ BVP528 A35-NB +BL

Average
2.39

Min/Ave
0.00

Min/Max
0.00

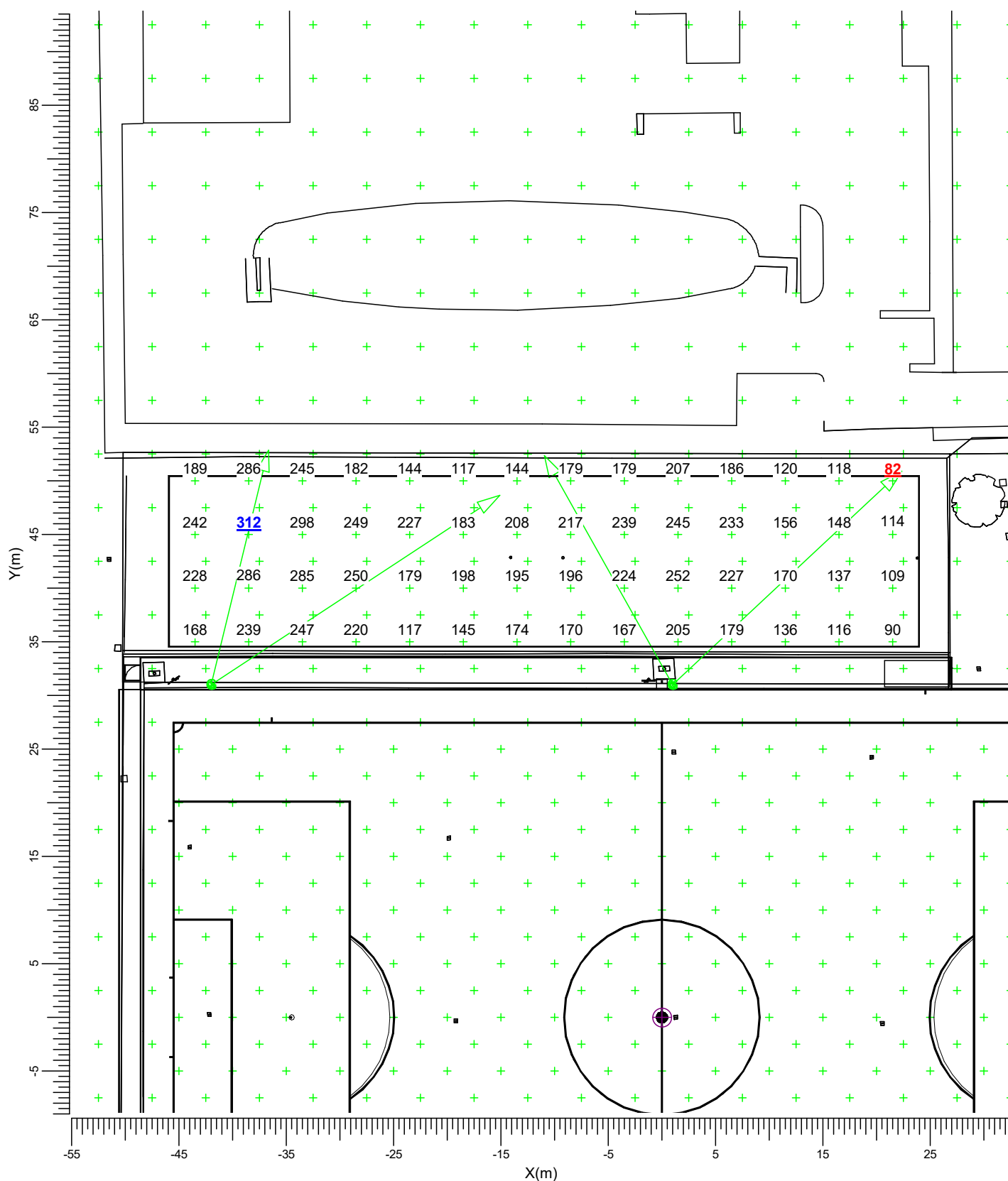
Project maintenance factor
0.10

Scale
1:2000

3.3 Back Lighting: Graphical Table

Back Lighting

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



G ———▶ BVP518 A35-NB +BL

Average
192

Min/Ave
0.43

Min/Max
0.26

Project maintenance factor
0.90

Scale
1:500

3.4 Spillage Grid: Iso Contour

Spillage Switching

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



G : BVP518 A35-NB +BL

H : BVP528 A35-NB +BL

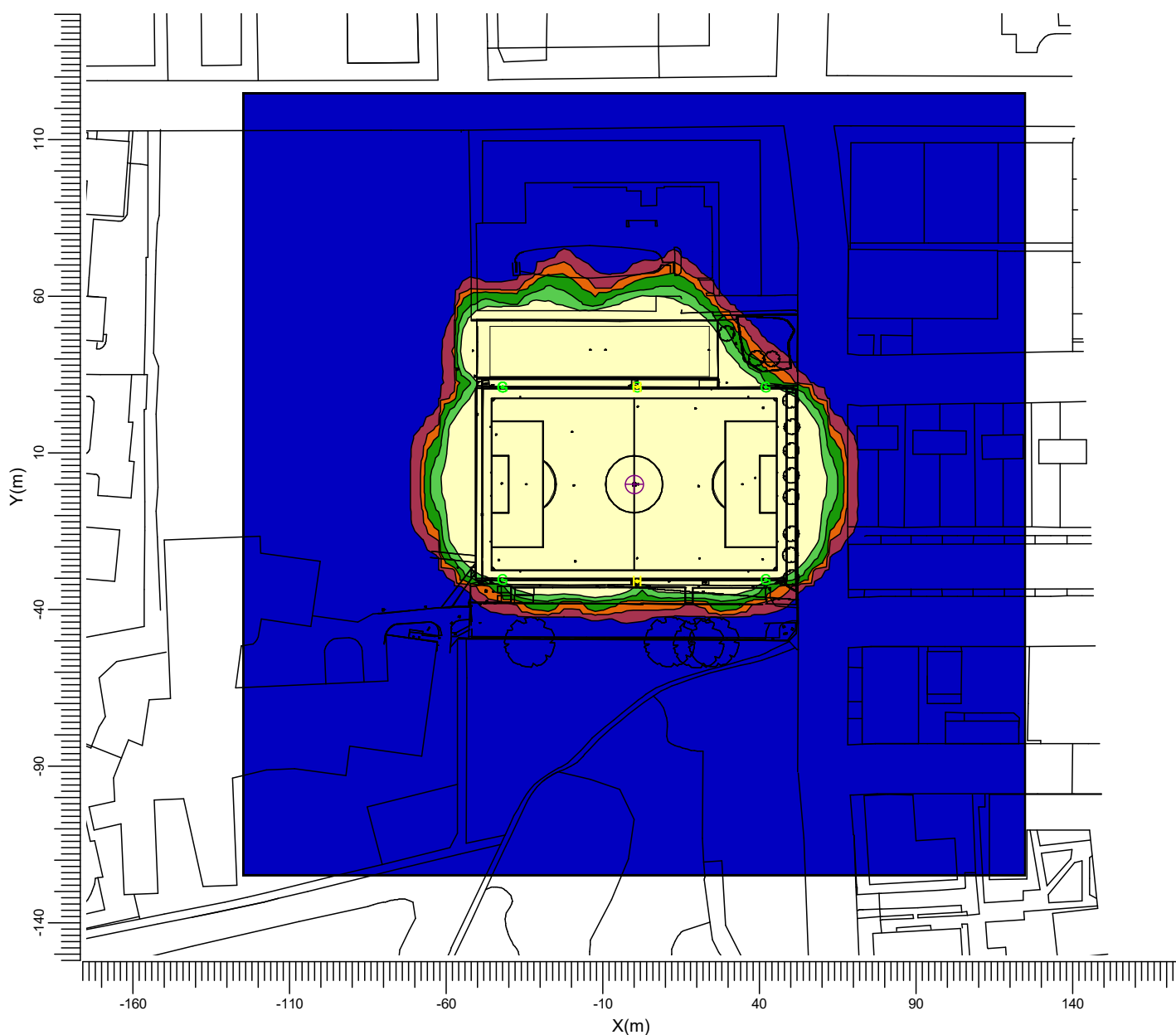
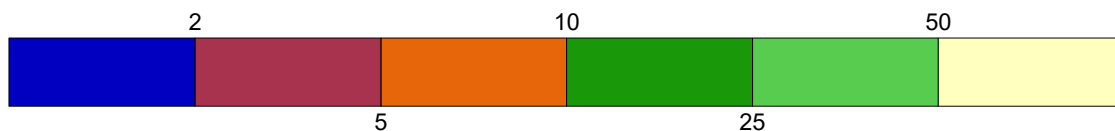
Project maintenance factor
1.00

Scale
1:2000

3.5 Spillage Grid: Filled Iso Contour

Spillage Switching

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



G : BVP518 A35-NB +BL

H : BVP528 A35-NB +BL

Project maintenance factor
1.00

Scale
1:2000

3.6 Horizontal: Iso Contour

Spillage Switching

Grid : Spillage Grid at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)
Height above grid : 1.80 m



G : BVP518 A35-NB +BL

H : BVP528 A35-NB +BL

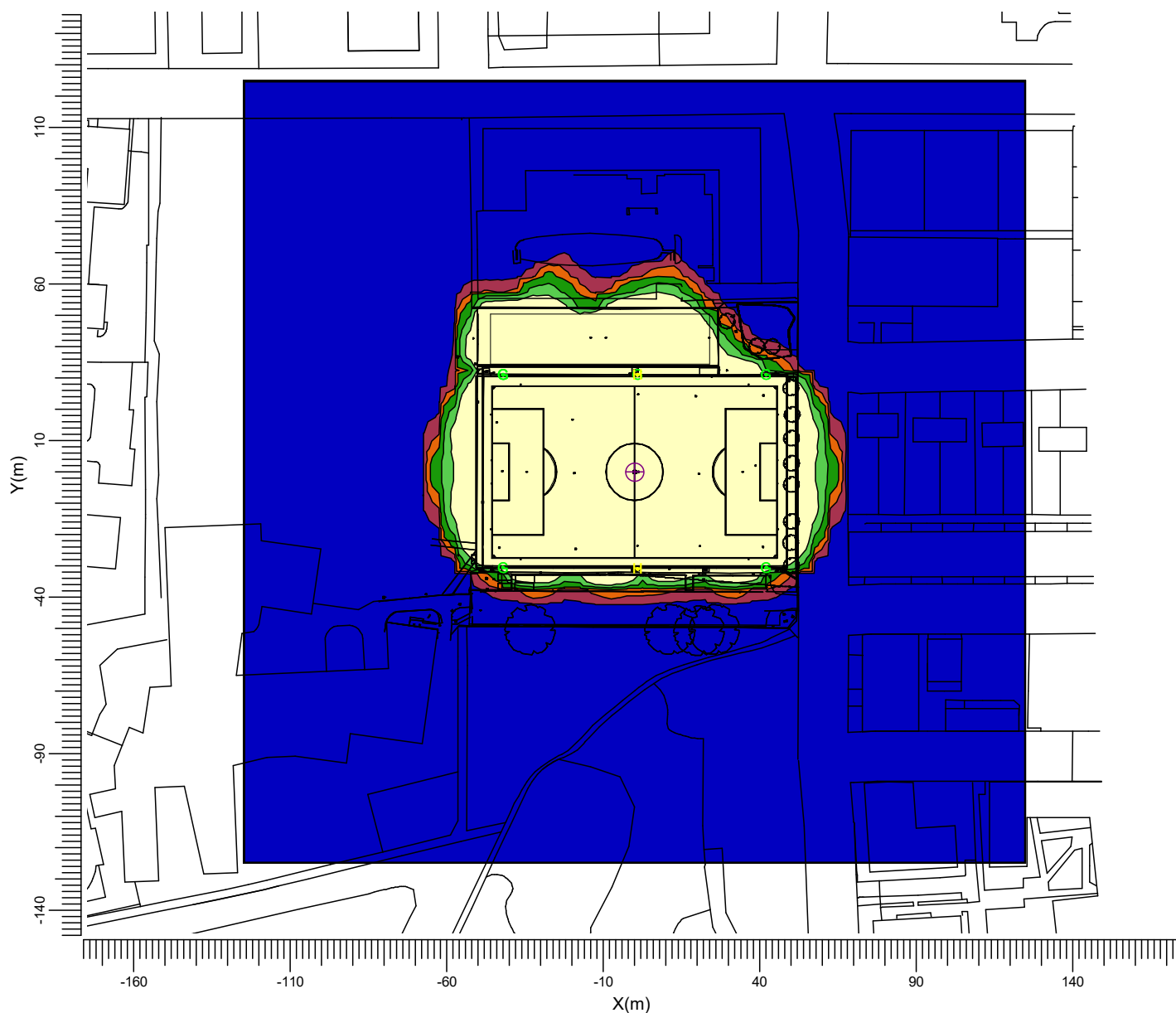
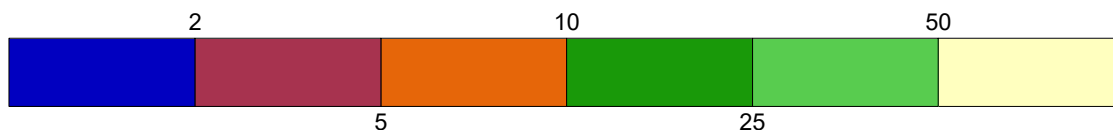
Project maintenance factor
1.00

Scale
1:2000

3.7 Horizontal: Filled Iso Contour

Spillage Switching

Grid : Spillage Grid at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)
Height above grid : 1.80 m



G : BVP518 A35-NB +BL

H : BVP528 A35-NB +BL

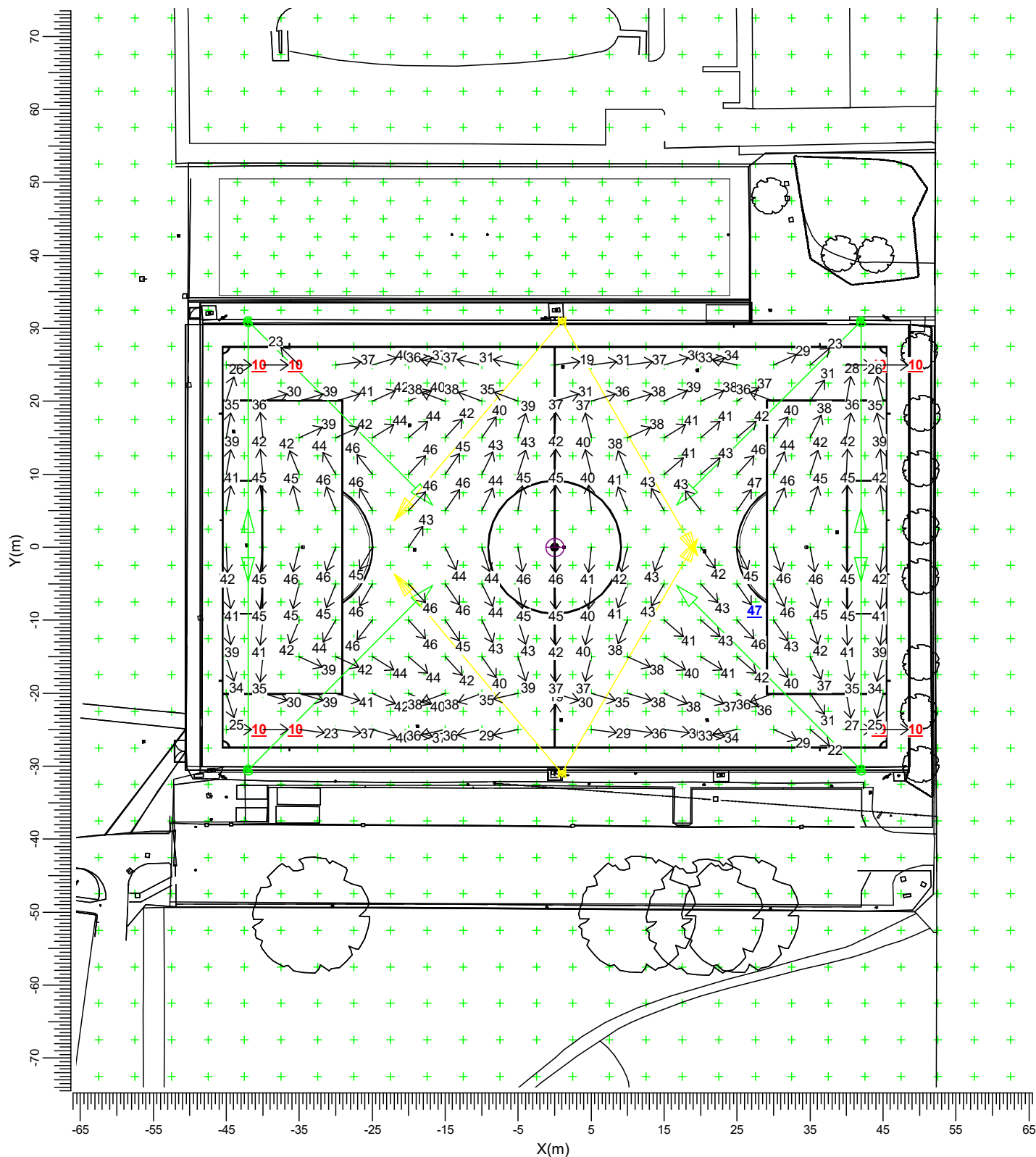
Project maintenance factor
1.00

Scale
1:2000

3.8 Glare Rating: Graphical Table

200lux Switching

Grid of Observers : Football
Calculation : Glare Rating
Grid for Background Luminance: Football (Reflectance: 0.25)
Vertical Viewing Angle : -2.0 deg



G ———▶ BVP518 A35-NB +BL

H ———▶ BVP528 A35-NB +BL

Maximum
46.6

Project maintenance factor
0.90

Scale
1:750

4. Luminaire Details

4.1 Project Luminaires

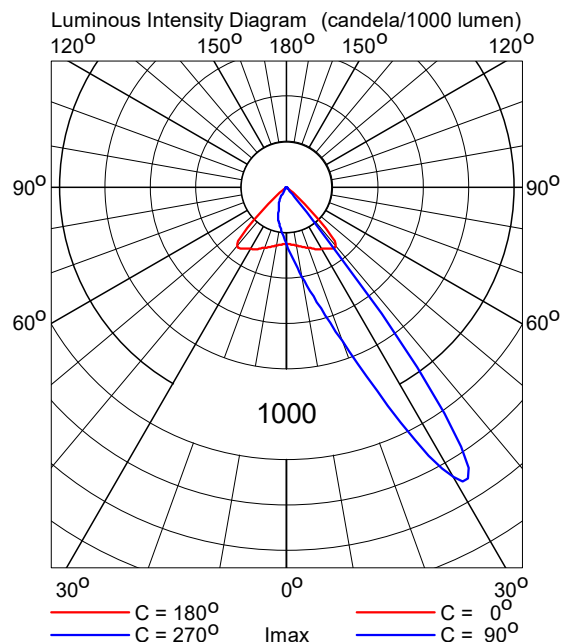
OptiVision LED

BVP518 1xLED1480/757 OUT T15 50K A35-NB +BL

Light output ratios

DLOR	: 0.72
ULOR	: 0.00
TLOR	: 0.72
Ballast	: N/A
Lamp flux	: 148400 lm
Luminaire wattage	: 1000.0 W
Measurement code	: LVM2047600

Note: Luminaire data not from database.



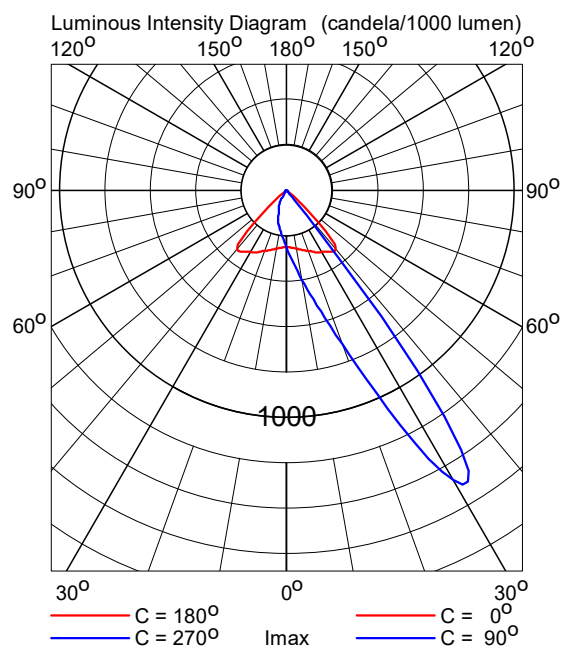
OptiVision LED

BVP528 1xLED2220/757 OUT T15 50K A35-NB +BL

Light output ratios

DLOR	: 0.72
ULOR	: 0.00
TLOR	: 0.72
Ballast	: N/A
Lamp flux	: 222600 lm
Luminaire wattage	: 1500.0 W
Measurement code	: LVM2047600

Note: Luminaire data not from database.



5. Installation Data

5.1 Legends

Project Luminaires:

Code	Qty	Luminaire Type	Lamp Type	Flux (lm)
G	12	BVP518 A35-NB +BL	1 * LED1480/757 OUT T15 50K	1 * 148400
H	4	BVP528 A35-NB +BL	1 * LED2220/757 OUT T15 50K	1 * 222600

Switching Modes:

Code	Switching Mode
1	200lux Switching
2	10% Amenity Lighting
3	Spillage Switching
4	Back Lighting

5.2 Luminaire Positioning and Orientation

Qty and Code	Position			Aiming Angles			Switching Modes			
	X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0	1	2	3	4
1 * G	-42.00	-30.50	13.00	45.0	70.0	-0.0	+	+	+	-
1 * G	-42.00	-30.50	13.00	90.0	70.0	-0.0	+	+	+	-
1 * G	-42.00	31.00	13.00	76.3	60.0	0.0	-	-	+	+
1 * G	-42.00	31.00	13.00	33.3	68.0	0.0	-	-	+	+
1 * G	-42.00	31.00	13.00	-45.0	70.0	0.0	+	+	+	-
1 * G	-42.00	31.00	13.00	-90.0	70.0	0.0	+	+	+	-
1 * H	1.00	-31.00	13.00	130.0	70.0	-0.0	+	+	+	-
1 * H	1.00	-31.00	15.00	60.0	68.0	-0.0	+	+	+	-
1 * G	1.00	31.00	13.00	119.3	62.0	0.0	-	-	+	+
1 * G	1.00	31.00	13.00	43.0	66.0	0.0	-	-	+	+
1 * H	1.00	31.00	13.00	-130.0	70.0	0.0	+	+	+	-
1 * H	1.00	31.00	15.00	-60.0	68.0	0.0	+	+	+	-
1 * G	42.00	-30.50	13.00	135.0	70.0	0.0	+	+	+	-
1 * G	42.00	-30.50	13.00	90.0	70.0	0.0	+	+	+	-
1 * G	42.00	31.00	13.00	-135.0	70.0	-0.0	+	+	+	-
1 * G	42.00	31.00	13.00	-90.0	70.0	-0.0	+	+	+	-