Dorothy Hyman Sports Centre

Artificial Turf Pitch

Project code: SSL2221
Date: 29-03-2017

Designer: Sam McDonald

Description: FA/FIFA min/ave 200lux full pitch with min 0.6 uniformity.
The results within this report and scheme are currently not showing a maintenance factor and will be the results when first installed and up to the first 100hrs of usage. After the first 100 hours of use the lights will naturally diminish by 20% (refered to as a maintenance factor of 0.8) further reducing the lighting and spillage levels significantly lower than those portrayed within this report.

The levels after the first 100 hours of use will be at:

Football = 217ave/lux at 0.60 uniformity

Sports Luminaires are mounted at 15m above the surface with Philips double asymmetrical Optivision
8no. MVP507 1xMHN-FC/2000W/400V/740 + RL.
8no. MVP507 1xMHN-FC/2000W/400V/740.
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
1a Perth House
Corbygate Business Park
Corby
Northants
NN17 5JG
Telephone: 01536400012
Mobile Phone: 07909250267
E-Mail: sam@surfacingstandards.co.uk

Table of Contents

1. Project Description 3

1.1 Top Project Overview 3

2. Summary 4

2.1 General Information 4
2.2 Observer Information 4
2.3 Project Luminaires 4
2.4 Calculation Results 4

3. Calculation Results 6

3.1 Football: Graphical Table 6
3.2 Spillage: Graphical Table 7
3.3 Spillage: Iso Contour 8
3.4 Spillage: Filled Iso Contour 9
3.5 Evo Spillage: Graphical Table 10
3.6 Evo Spillage: Iso Contour 11
3.7 Evo Spillage: Filled Iso Contour 12
3.8 Football Glare: Graphical Table 13

4. Luminaire Details 14

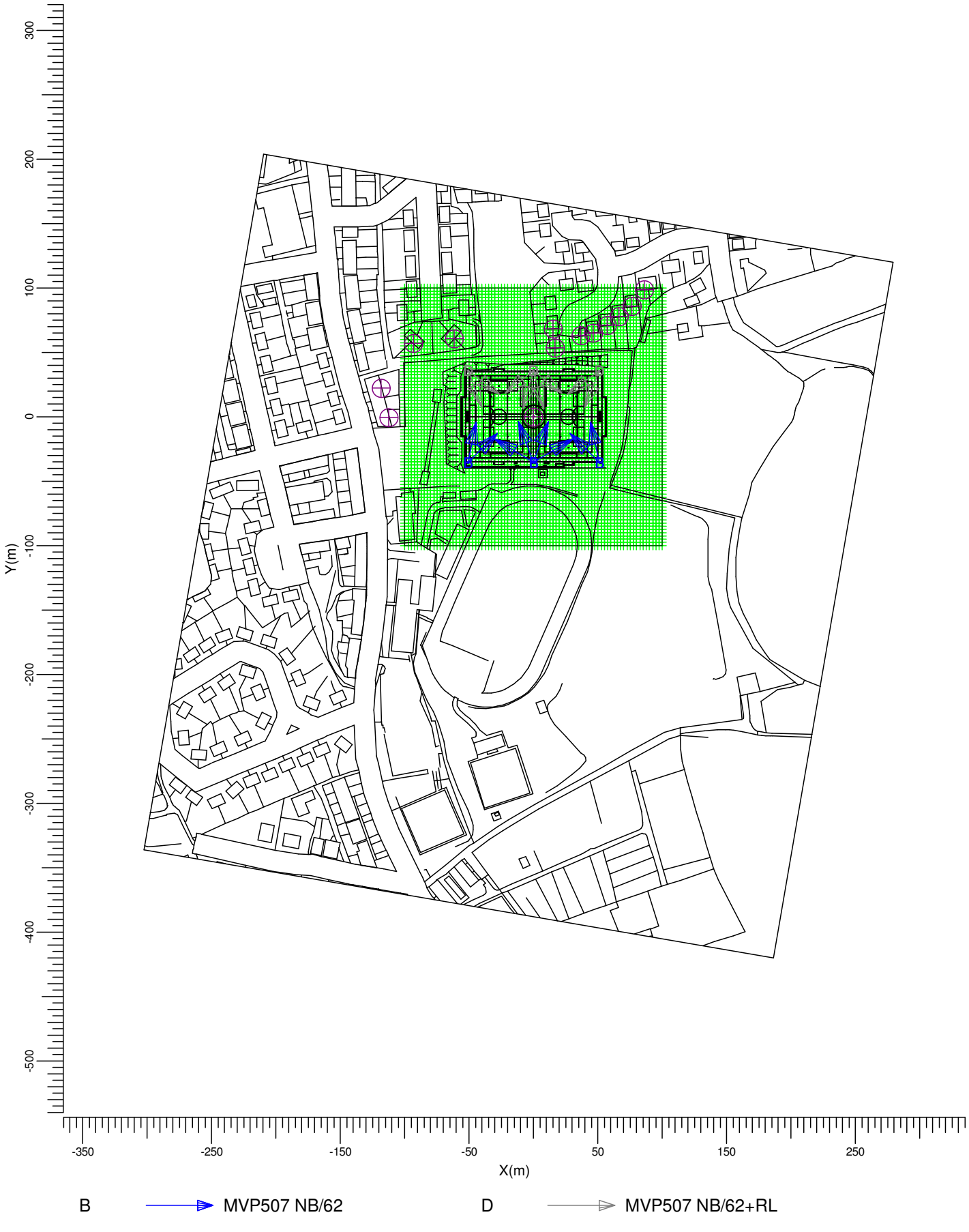
4.1 Project Luminaires 14

5. Installation Data 15

5.1 Legends 15
5.2 Luminaire Positioning and Orientation 15

1. Project Description

1.1 Top Project Overview



Scale
1:4000

2. Summary

2.1 General Information

The overall maintenance factor used for this project is 1.00.

2.2 Observer Information

Code	Observer	Position		
		X (m)	Y (m)	Z (m)
Aa	Centre	-0.00	-0.00	1.79
Bb	House 1	-112.50	-0.50	1.80
Cc	House 2	-118.48	22.24	1.80
Dd	House 3	-93.25	57.00	1.80
Ee	House 4	-61.73	60.85	1.80
Ff	House 5	16.77	53.40	1.80
Gg	House 6	36.78	62.94	1.80
Hh	House 7	46.28	65.27	1.80
Ii	House 8	57.12	70.88	1.80
Jj	House 9	66.25	78.00	1.80
Kk	House 10	76.26	85.74	1.80
Ll	House 11	86.01	98.50	1.80
Mm	House 12	15.00	68.25	1.80

2.3 Project Luminaires

Code	Qty	Luminaire Type	Lamp Type	Power (W)	Flux (lm)
B	8	MVP507 NB/62	1 * MHN-FC2000W/400V/740	2119.0	1 * 210000
D	8	MVP507 NB/62+RL	1 * MHN-FC2000W/400V	2119.0	1 * 210000

The total installed power: 33.90 (kWatt)

Number of Luminaires Per Arrangement:

Arrangement	Luminaire Code		Power (kWatt)
	B	D	
Coners2	4	0	8.48
Coners3	0	4	8.48
Mid Top	0	4	8.48
Mids3	4	0	8.48

2.4 Calculation Results

(Il)luminance Calculations:

Calculation	Type	Unit	Ave	Min	Min/Ave	Min/Max
Football	Surface Illuminance	lux	271	163	0.60	0.29
Spillage	Surface Illuminance	lux	61.2	0.0	0.00	0.00
Evo Spillage	Illuminance -> Aa	lux	15.2	0.0	0.00	0.00

Glare Rating for Grid of Observers:

Calculation	Observer Grid	Reference Grid	Reflectance	GR-Max
Football Glare	Football	Football	0.25	48.6

Obtrusive Light Calculations:

Luminaire Code	Position	Aiming Angles	Maximum Intensity (cd)

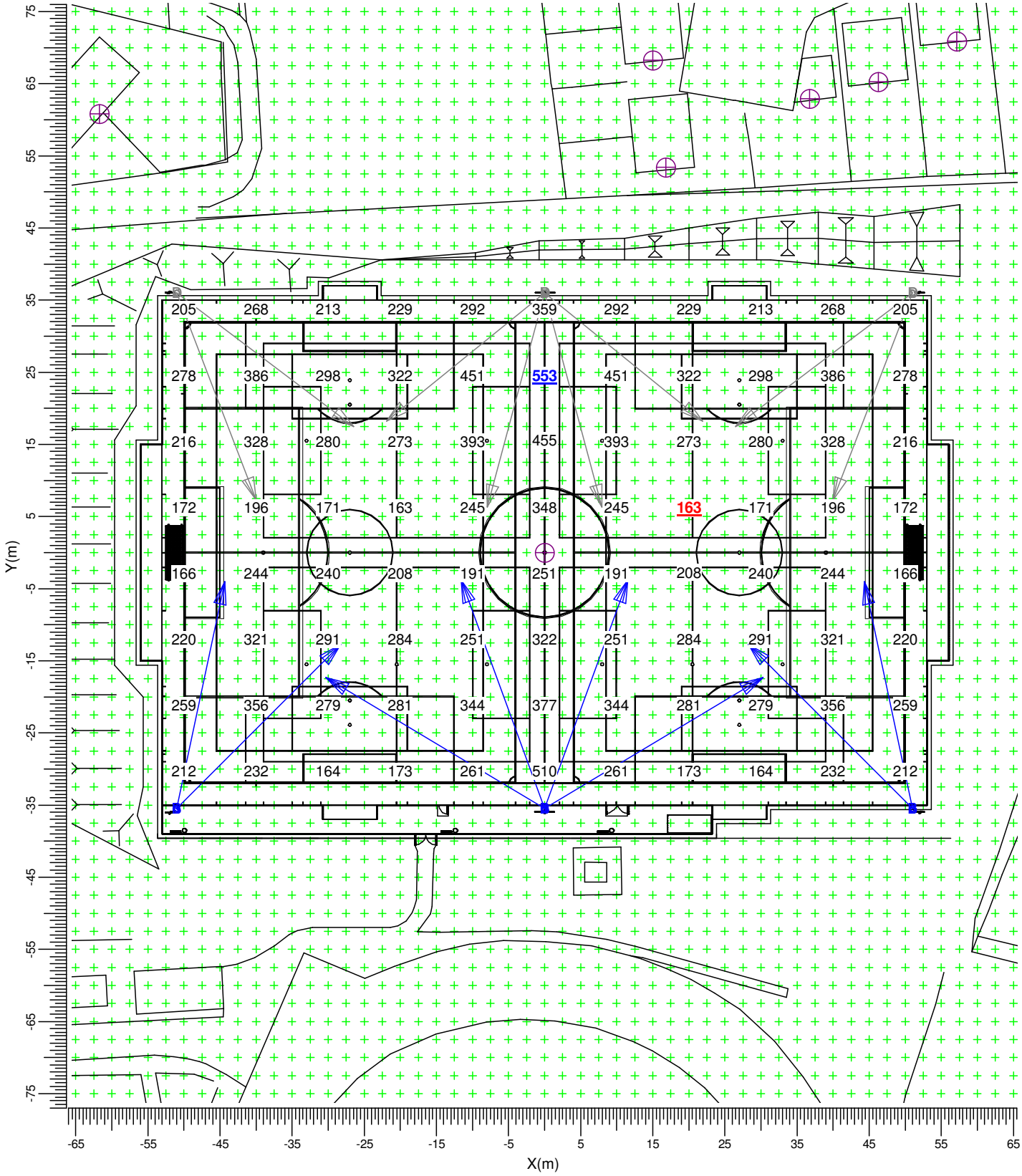
Observer Code	Luminaire Code	Position			Aiming Angles			Maximum Intensity (cd)
		X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0	
Bb	B	0.00	-35.50	15.00	149.00	67.00	0.00	1888
Cc	B	0.00	-35.50	15.00	149.00	67.00	0.00	1187
Dd	B	0.00	-35.50	15.00	149.00	67.00	0.00	1228
Ee	B	0.00	-35.50	15.00	149.00	67.00	0.00	1332
Ff	B	0.00	-35.50	15.00	70.00	66.00	0.00	2894
Gg	B	0.00	-35.50	15.00	70.00	66.00	0.00	1686
Hh	B	0.00	-35.50	15.00	70.00	66.00	0.00	1266
Ii	B	0.00	-35.50	15.00	70.00	66.00	0.00	764
Jj	B	0.00	-35.50	15.00	70.00	66.00	0.00	575
Kk	B	0.00	-35.50	15.00	70.00	66.00	0.00	491
Ll	B	0.00	-35.50	15.00	70.00	66.00	0.00	402
Mm	B	0.00	-35.50	15.00	70.00	66.00	0.00	1731

The upward light ratio (ULR) is 0.00.

3. Calculation Results

3.1 Football: Graphical Table

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

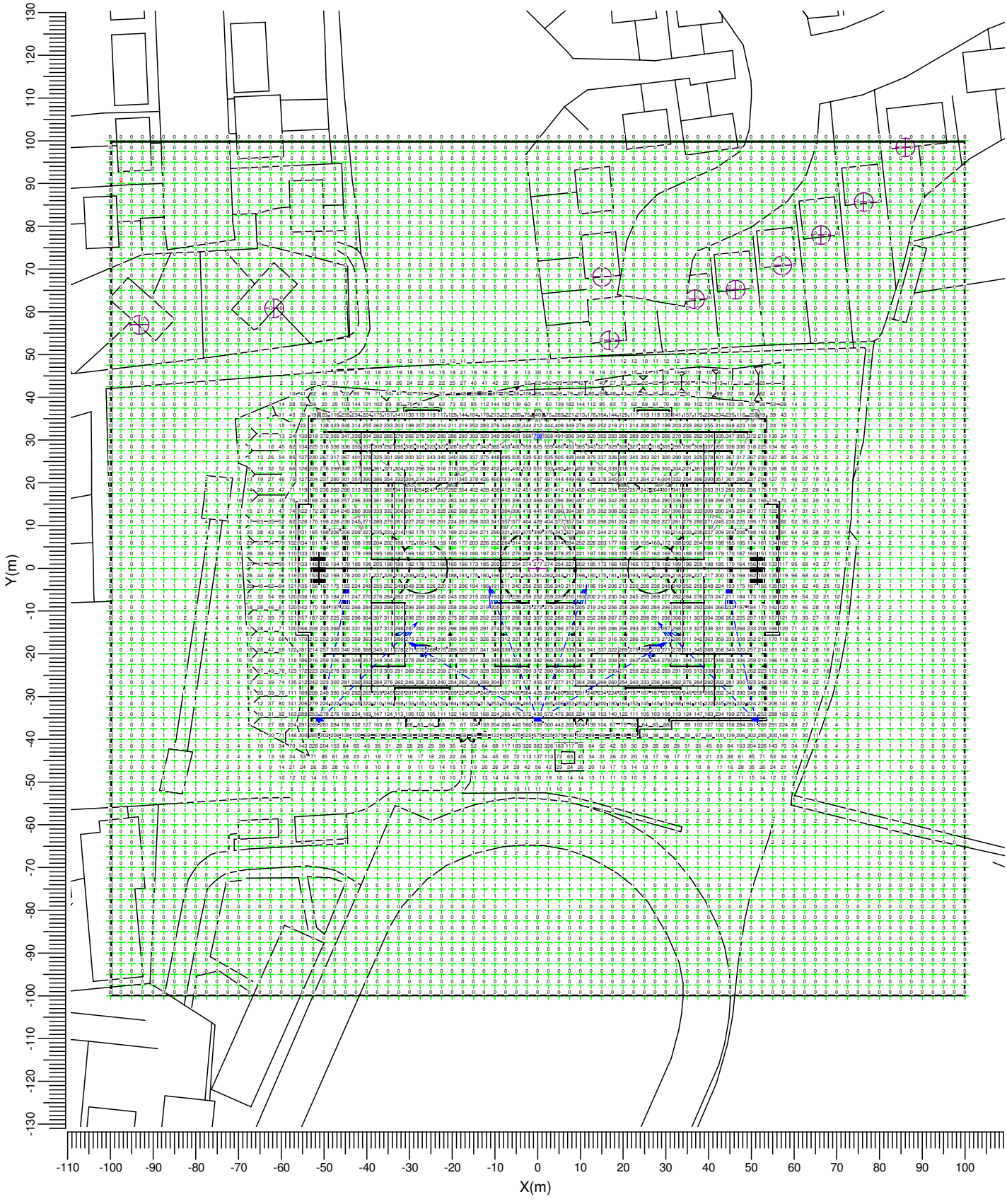


B MVP507 NB/62 D MVP507 NB/62+RL

Average	Minimum	Min/Ave	Min/Max	Project maintenance factor	Scale
271	163	0.60	0.29	1.00	1:750

3.2 Spillage: Graphical Table

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

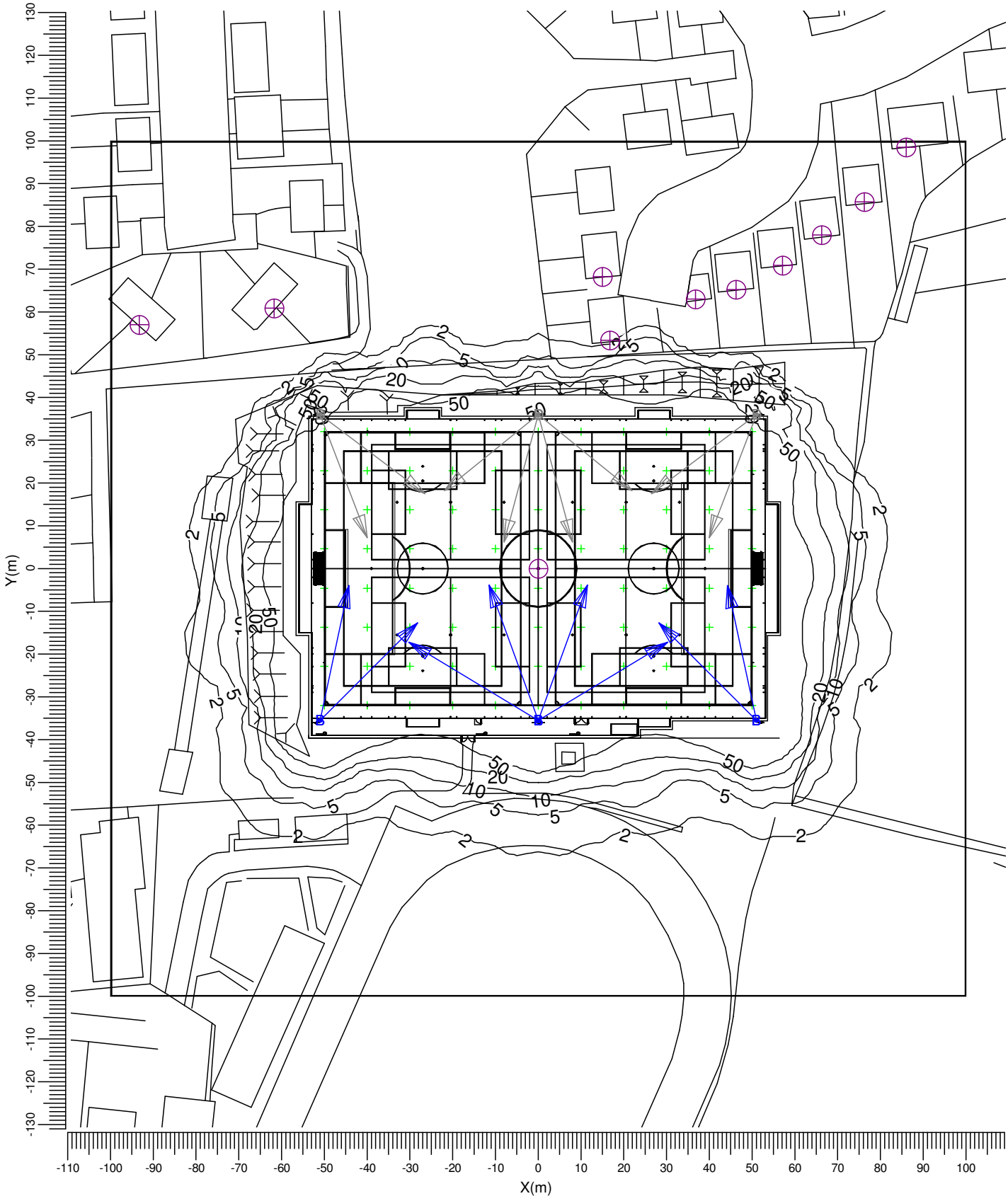


B MVP507 NB/62 D MVP507 NB/62+RL

Average	Minimum	Min/Ave	Min/Max	Project maintenance factor	Scale
61.2	0.0	0.00	0.00	1.00	1:1250

3.3 Spillage: Iso Contour

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

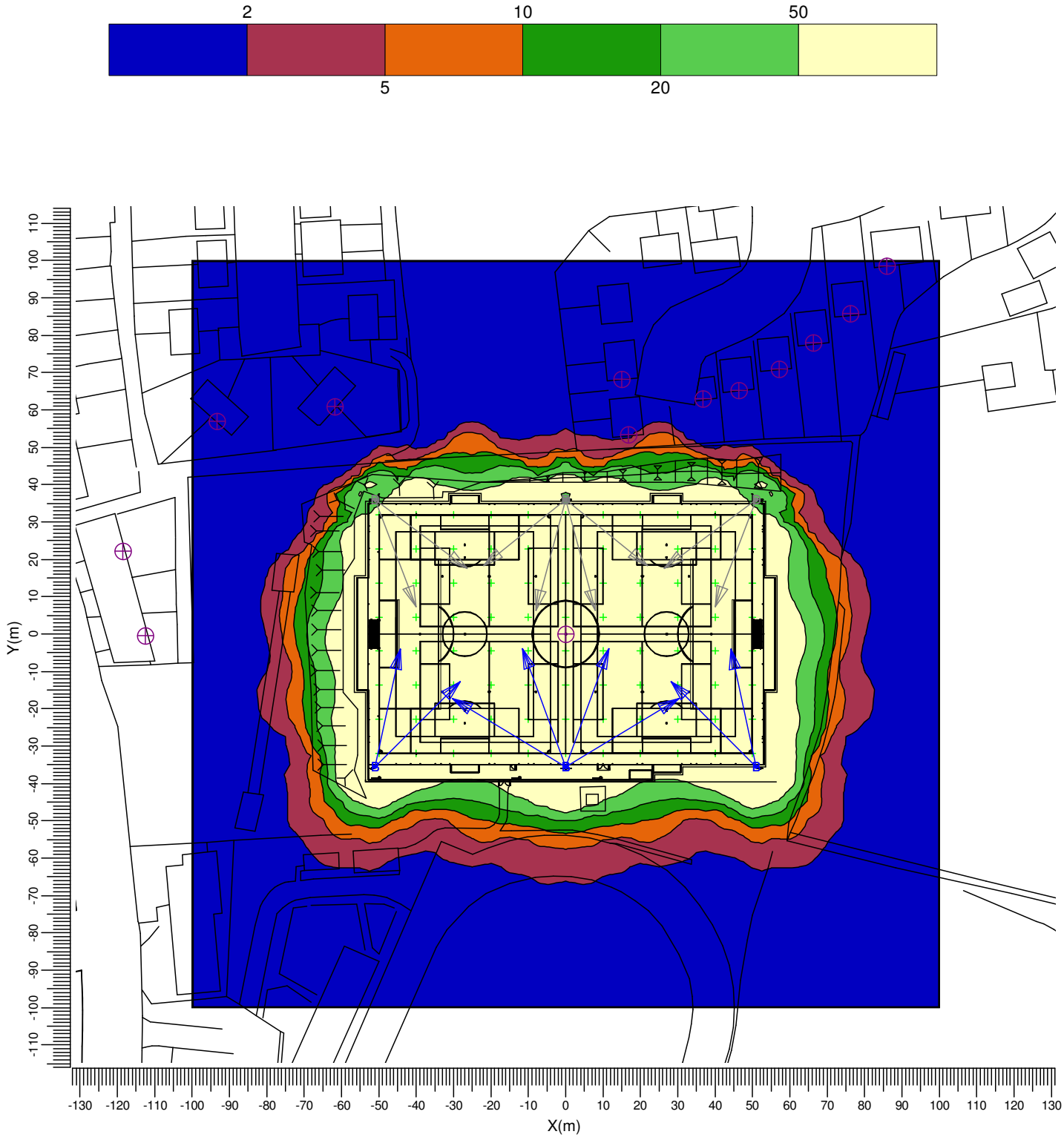


B MVP507 NB/62 D MVP507 NB/62+RL

Average	Minimum	Min/Ave	Min/Max	Project maintenance factor	Scale
61.2	0.0	0.00	0.00	1.00	1:1250

3.4 Spillage: Filled Iso Contour

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

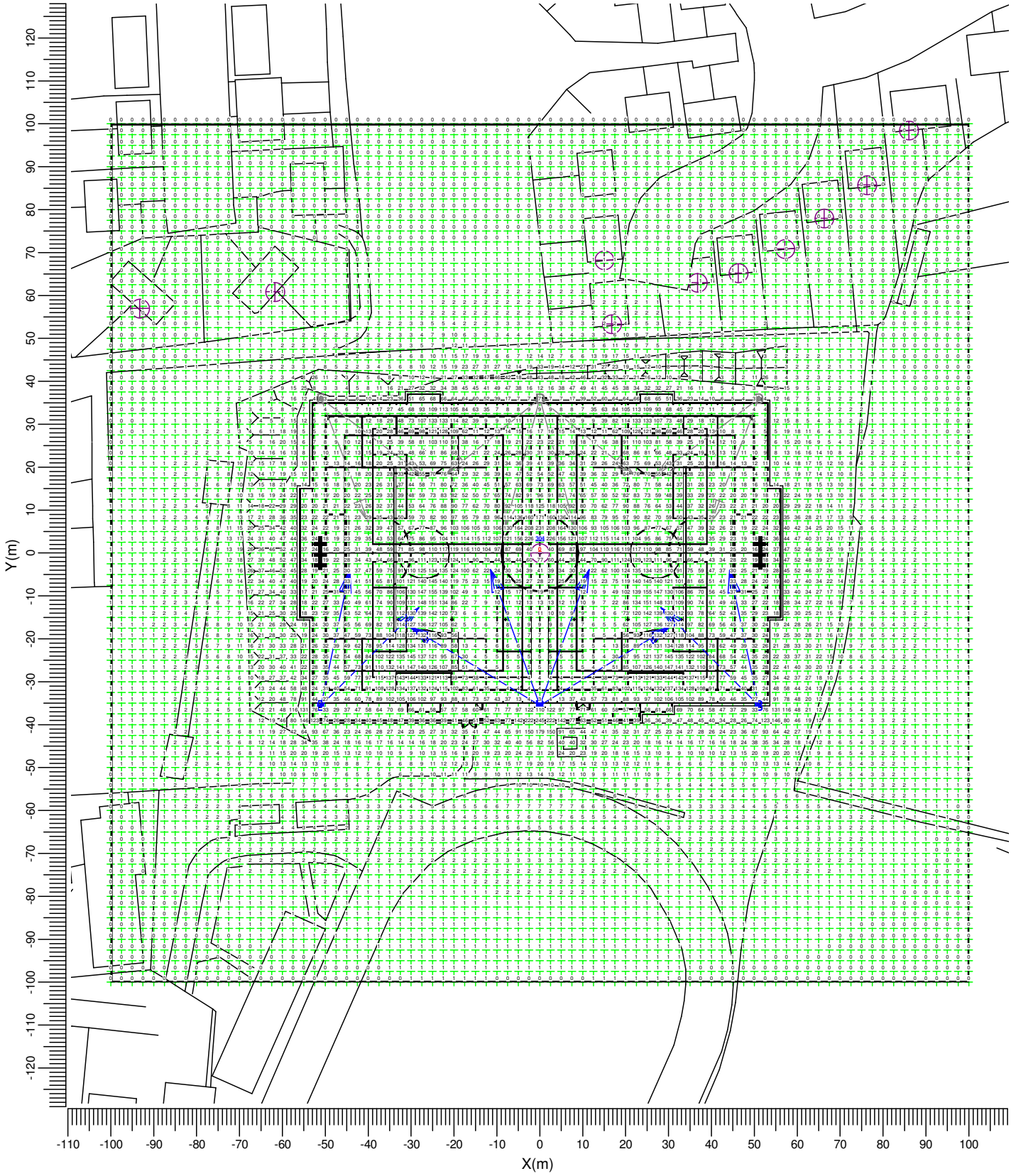


B MVP507 NB/62 D MVP507 NB/62+RL

Average	Minimum	Min/Ave	Min/Max	Project maintenance factor	Scale
61.2	0.0	0.00	0.00	1.00	1:1500

3.5 Evo Spillage: Graphical Table

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

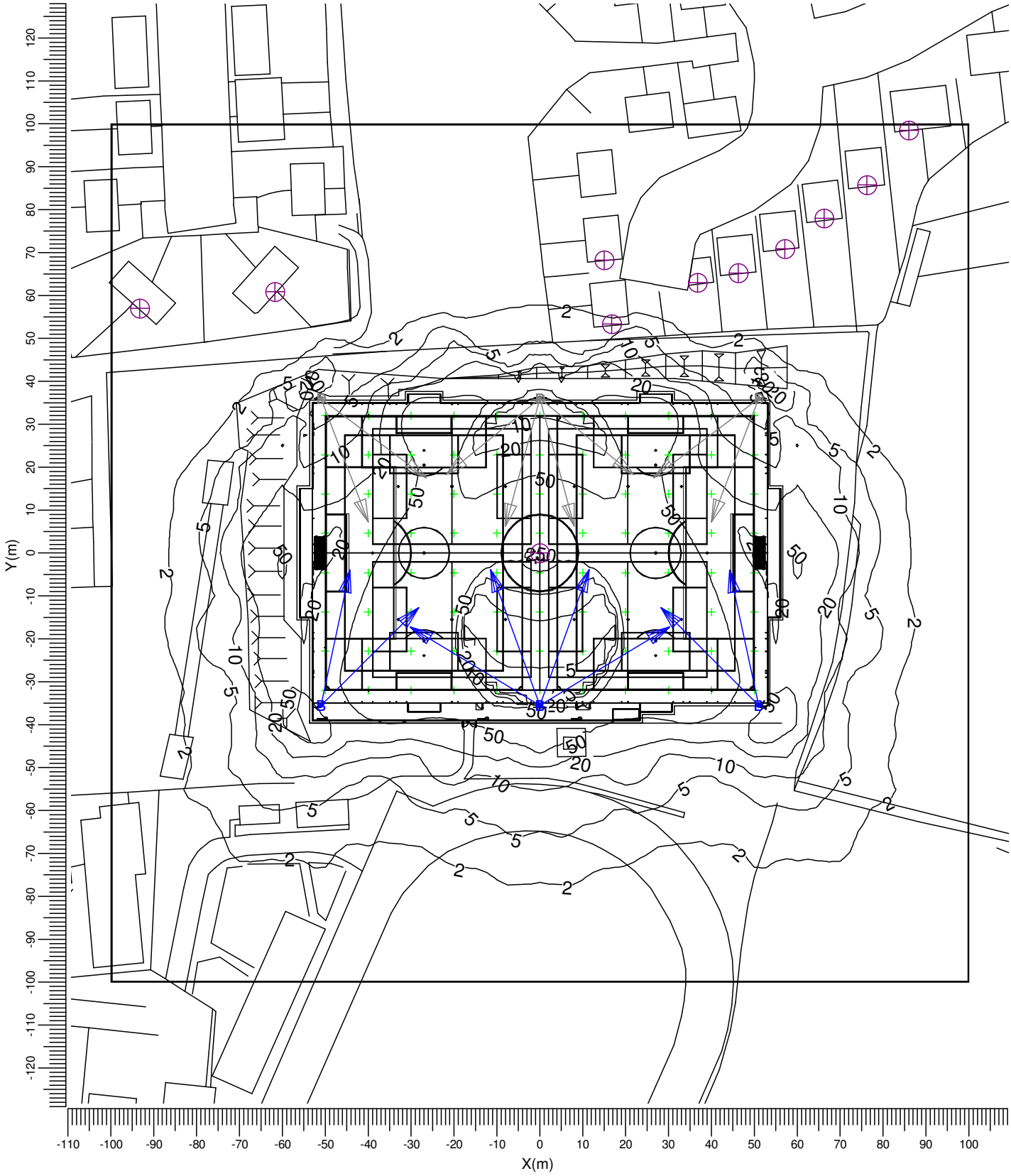


B MVP507 NB/62 D MVP507 NB/62+RL

Average	Minimum	Min/Ave	Min/Max	Project maintenance factor	Scale
15.2	0.0	0.00	0.00	1.00	1:1250

3.6 Evo Spillage: Iso Contour

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

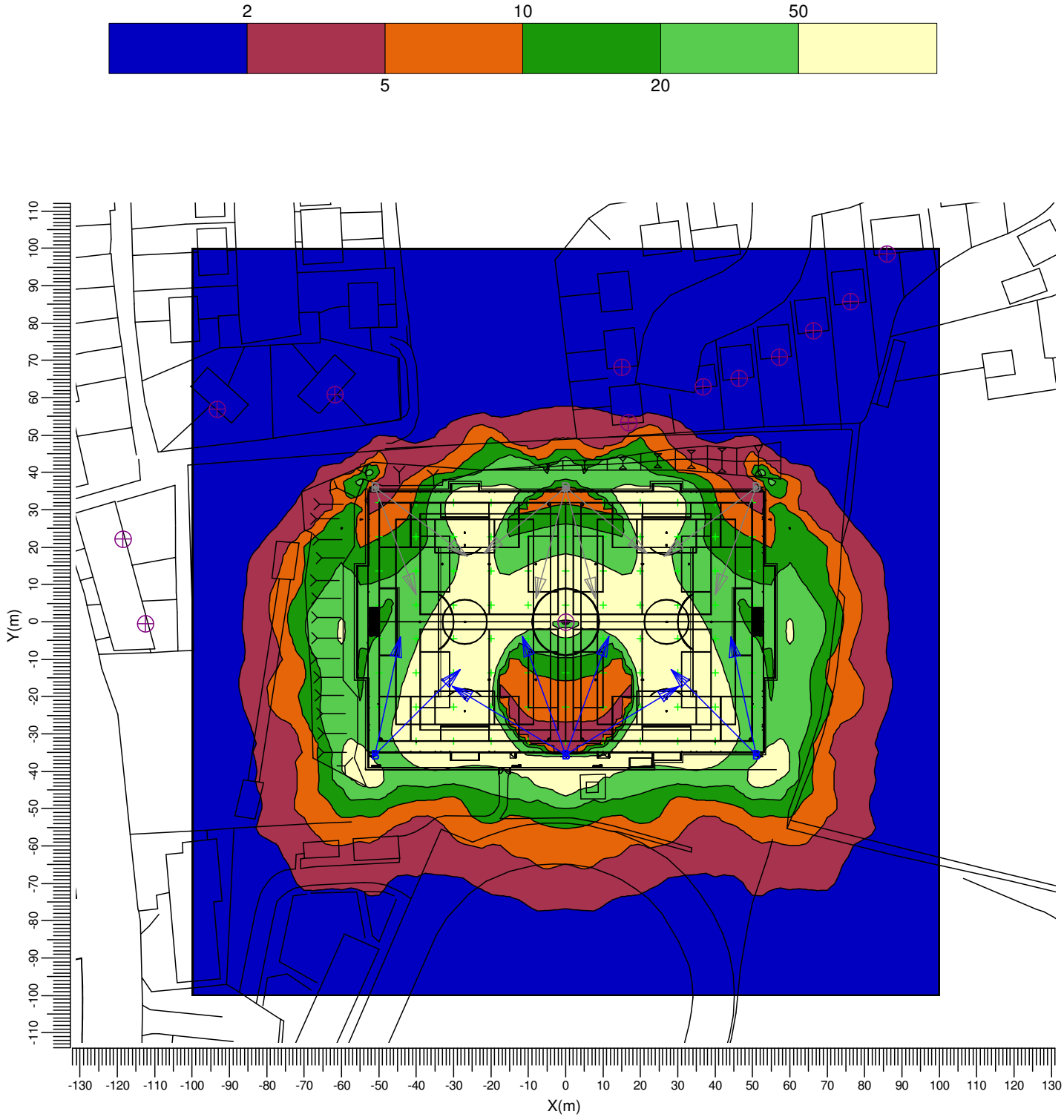


B MVP507 NB/62 D MVP507 NB/62+RL

Average	Minimum	Min/Ave	Min/Max	Project maintenance factor	Scale
15.2	0.0	0.00	0.00	1.00	1:1250

3.7 Evo Spillage: Filled Iso Contour

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

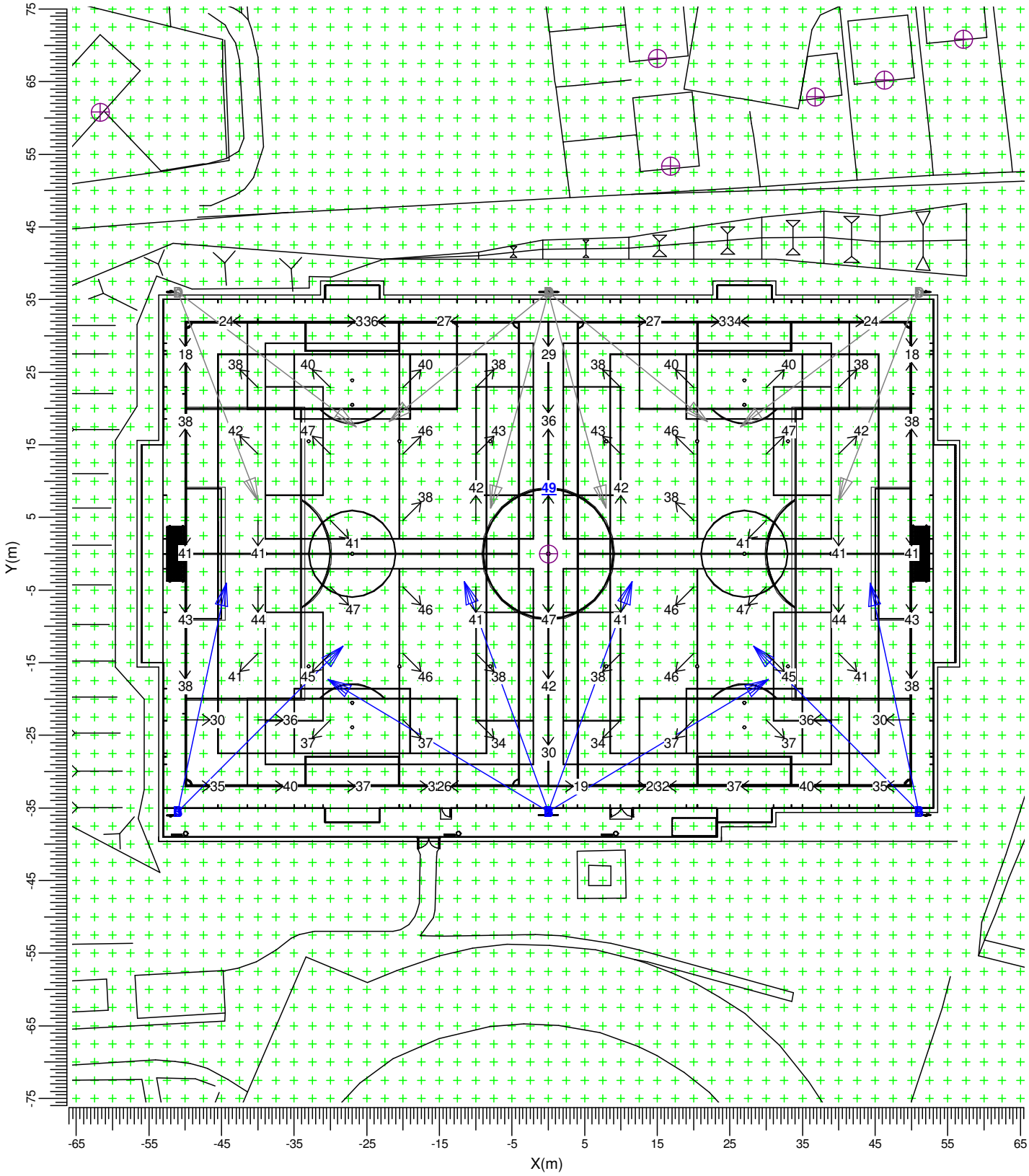


B MVP507 NB/62 D MVP507 NB/62+RL

Average	Minimum	Min/Ave	Min/Max	Project maintenance factor	Scale
15.2	0.0	0.00	0.00	1.00	1:1500

3.8 Football Glare: Graphical Table

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



B MVP507 NB/62 D MVP507 NB/62+RL

Project maintenance factor
1.00

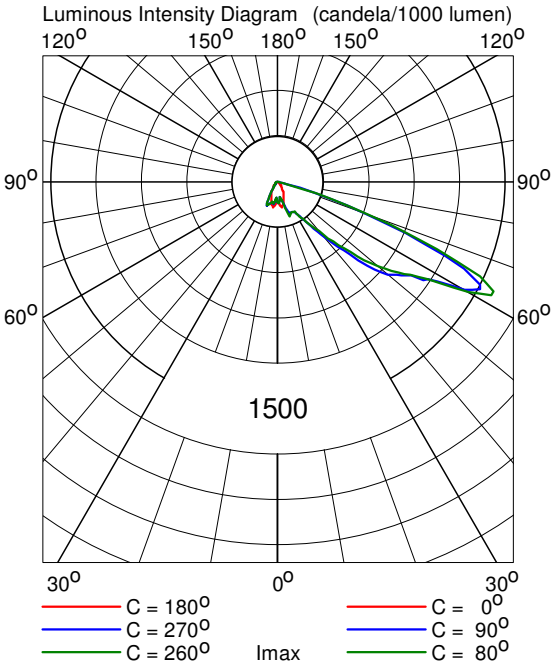
Scale
1:750

4. Luminaire Details

4.1 Project Luminaires

OptiVision MVP507
MVP507 1xMHN-FC2000W/400V/740 NB/62

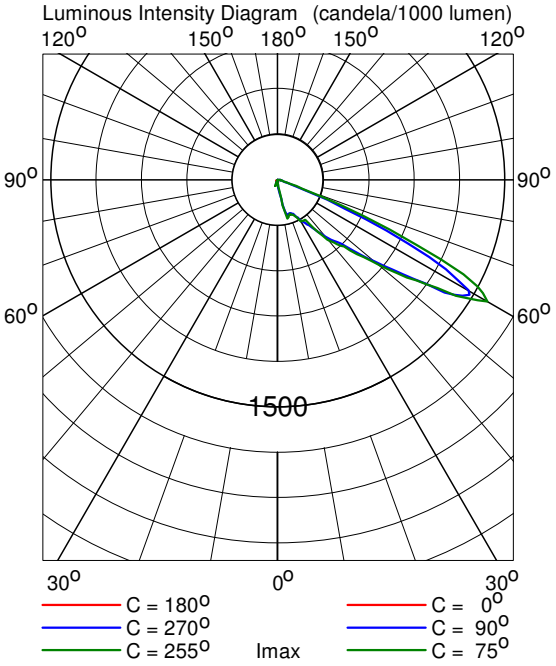




Light output ratios
- DLOR : 0.83
- ULOR : 0.00
- TLOR : 0.83

Ballast : Conventional
Lamp flux : 210000 lm
Luminaire wattage : 2119.0 W
Measurement code : LVMA700101

OPTIVISION
MVP507 1xMHN-FC2000W/400V/740 Conventional NB/62+RL



Light output ratios
- DLOR : 0.66
- ULOR : 0.00
- TLOR : 0.66

Ballast : Conventional
Lamp flux : 210000 lm
Luminaire wattage : 2119.0 W
Measurement code : LVA1302001

Note: Luminaire data not from database.

5. Installation Data

5.1 Legends

Project Luminaires:

Code	Qty	Luminaire Type	Lamp Type	Flux (lm)
B	8	MVP507 NB/62	1 * MHN-FC2000W/400V/740	1 * 210000
D	8	MVP507 NB/62+RL	1 * MHN-FC2000W/400V	1 * 210000

5.2 Luminaire Positioning and Orientation

Qty and Code	Position			Aiming Angles		
	X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0
1 * B	-51.00	-35.50	15.00	45.0	65.0	-0.0
1 * B	-51.00	-35.50	15.00	78.0	65.0	-0.0
1 * D	-51.00	36.00	15.00	-37.0	64.0	0.0
1 * D	-51.00	36.00	15.00	-69.0	64.0	0.0
1 * B	-0.00	-35.50	15.00	70.0	66.0	0.0
1 * B	-0.00	-35.50	15.00	110.0	66.0	-0.0
1 * B	-0.00	-35.50	15.00	149.0	67.0	0.0
1 * B	-0.00	-35.50	15.00	31.0	67.0	-0.0
1 * D	-0.00	36.00	15.00	-75.0	64.0	0.0
1 * D	-0.00	36.00	15.00	-105.0	64.0	-0.0
1 * D	-0.00	36.00	15.00	-39.0	62.0	0.0
1 * D	-0.00	36.00	15.00	-141.0	62.0	-0.0
1 * B	51.00	-35.50	15.00	135.0	65.0	0.0
1 * B	51.00	-35.50	15.00	102.0	65.0	0.0
1 * D	51.00	36.00	15.00	-143.0	64.0	-0.0
1 * D	51.00	36.00	15.00	-111.0	64.0	-0.0