



Stag Brewery, Mortlake

Sports Pitch Lighting Assessment

For Reselton Properties

April 2023

(Section 02)

Mortlake Stage Brewery Development - R6

F/ball Pitch LED Ltg15m 200 Lx 0.6 U0 LO

Project code: 0400061129, D-507524

Date: 13-04-2023

Customer: Michael Grubb Studios

Customer Representative: Steve Langham

Designer: Steve Johnston

Description: This revision uses latest upgraded OptiVision LED Gen 3.5 with Full Cut off LO Louvre fitted internally.

As output is much greater fitting size can be reduced from BVP528 to BVP518, reducing wattage of fittings to just over 1 Kw each

Fittings have 0% losses at 10,000 hours and 1% at 25,000 hrs so MF used is now increased to 0.95 MF

Assumed Environmental Zone for Richmond is E3/E4
Max Spill on Building is allowed to be 10/25 lux
Max Pre Curfew

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.

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1. Project Description

1.1 Description

Designed to Sport England Outdoor Football Pitch Class II
FA Standard = 200 lux ave, 0.6 Uo
60 Ra

Pitch now rotated 90 degrees and new drawing layout included

MF for OptiVivision LED Sports Lighting = 0.95 MF

8 No 15m columns with 2 No luminaires on each

Luminaires are Philips OptiVision LED luminaires with Louvre
16 No OptiVision LED BVP518 OUT T35 1xLED1720-4S/740/740 E3/D4I A35-NB LO

16 No fittings in total
GR Max claculation shown on Pitch grid

Grid points doubled to be within 5m spacing. Not placed on lines as helps
Calculation result and not required for Commissioning results.

Spill Light Isocontours are shown outside Pitch Area based upon the Spill Light
levels shown in Sport England Document and ILP Guidance Notes for Obtrusive
Light 2011. These are 2,5,10 & 25 lux levels.

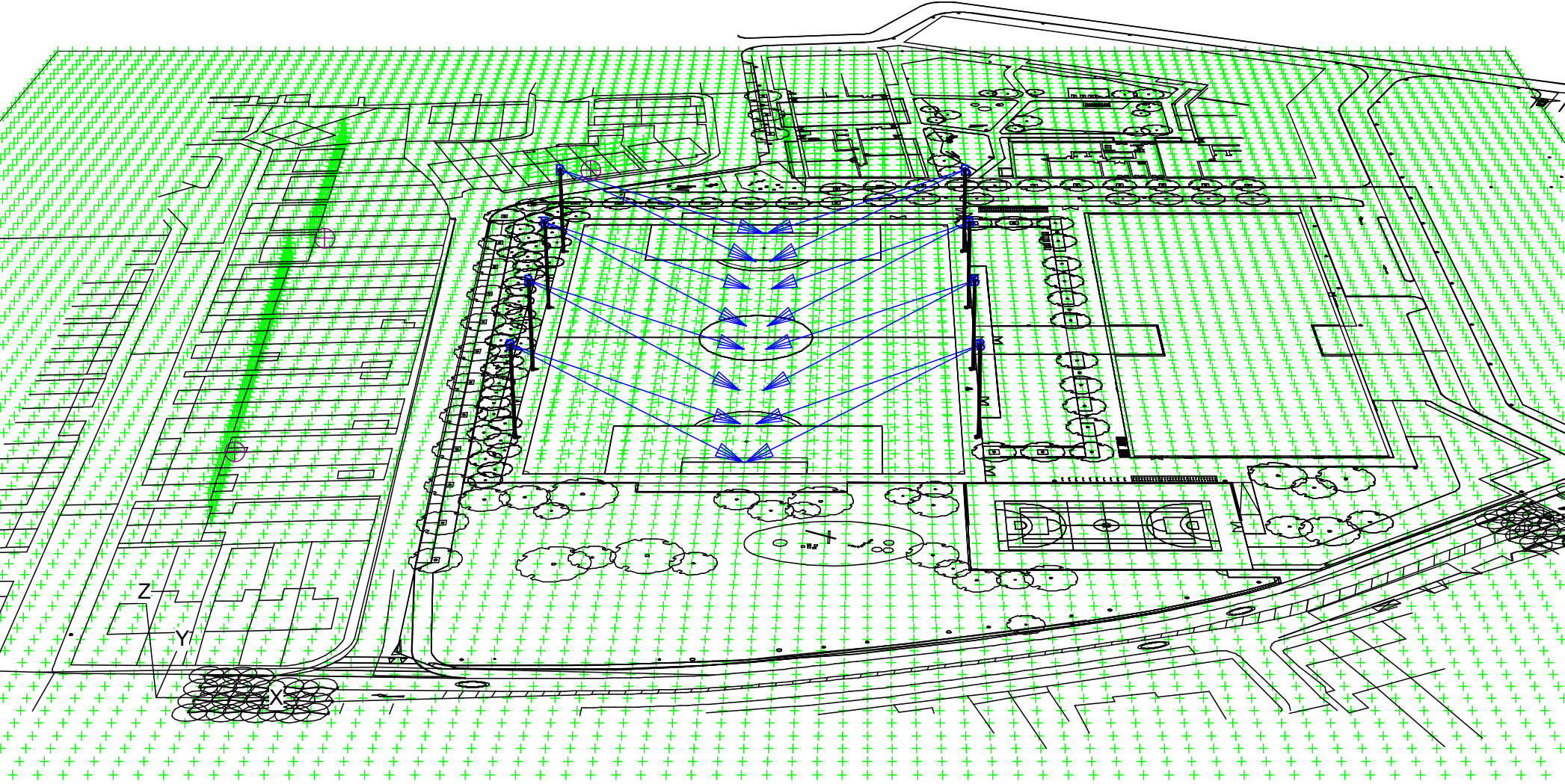
Spill lighting iso-contour results are shown with an MF of 1.0 which is worst
case when newly installed. Observers at houses added @ 1.5m for Ltg Intensity
There is no Eh Spill on the nearest Corner Building behind goal

Pre Curfew Spill light through windows are E1 = 2 lux, E2 = 5 lux, E3 = 10 lux,
calculation with internal louvre fitted is below 1 lux on houses
so conforms with E1
Zones

Tilt angles are no higher than 68 degree peak beam.
Peak beam angle included in Tilt 90 of calculation so
68 deg peak beam tilt (38 degree Physical housing tilt as 30 deg asymmetric)

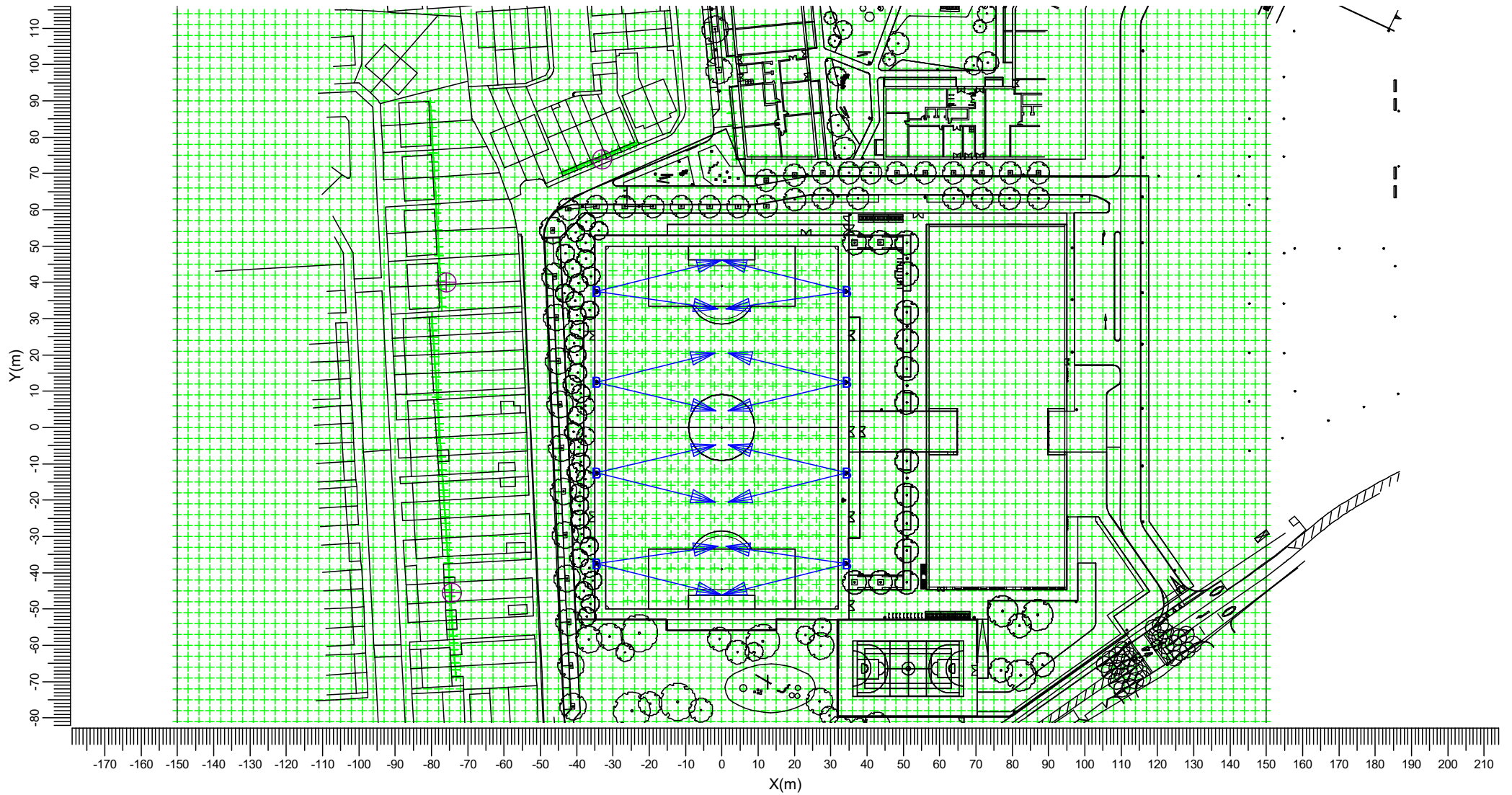
Louvres are fitted internally around each LED to reduce spill in all directions
Light intensity at angles and glare reduction.


1.2 3-D Project Overview



B —▶ BVP518 OUT T35 A35-NB LO

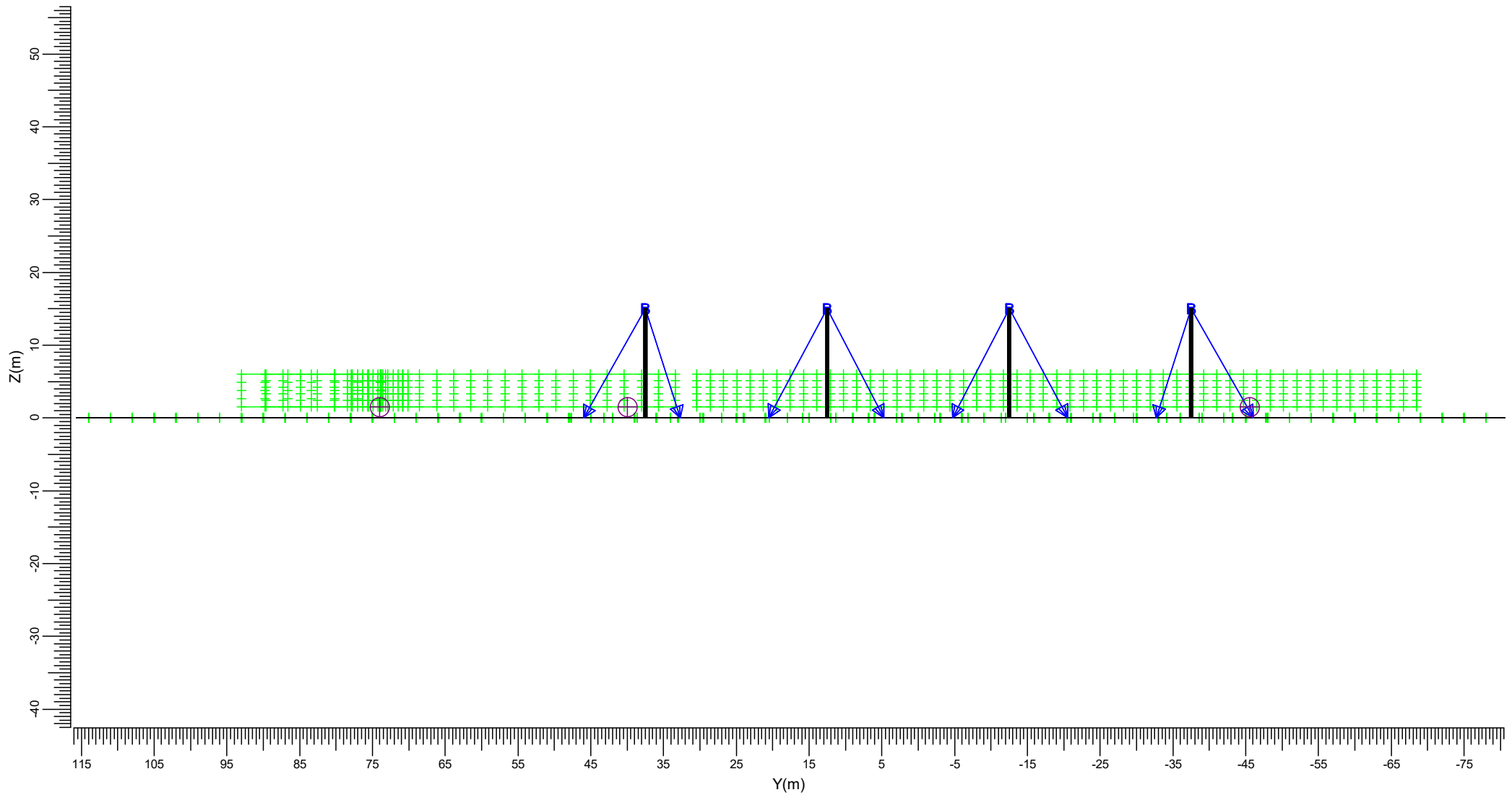
1.3 Top Project Overview



B  BVP518 OUT T35 A35-NB LO

Scale
1:1500

1.4 Left Project Overview



B ———▶ BVP518 OUT T35 A35-NB LO

Scale
1:750

2. Summary

2.1 Observer Information

Code	Observer	Position		
		X (m)	Y (m)	Z (m)
Aa	North Houses	-33.00	74.00	1.50
Bb	North West Houses	-76.00	40.00	1.50
Cc	South West Houses	-74.50	-45.50	1.50

2.2 Obstacle Information

Obstacle	Transparency (%)	Position		
		X (m)	Y (m)	Z (m)
Corner Columns	0	-34.50	-37.50	0.00
		34.50	-37.50	0.00
		-34.50	37.50	0.00
		34.50	37.50	0.00
		-34.50	-12.50	0.00
Centre Columns	0	34.50	-12.50	0.00
		-34.50	12.50	0.00
		34.50	12.50	0.00
		-34.50	12.50	0.00
		34.50	12.50	0.00

2.3 Project Luminaires

Code	Qty	Luminaire Type	Lamp Type	Power (W)	Flux (lm)
B	16	BVP518 OUT T35 A35-NB LO	1 * LED1720-4S/740	1006.0	1 * 172000

The total installed power: 16.10 (kWatt)

Number of Luminaires Per Switching Mode:

Switching Mode	Luminaire Code	Power (kWatt)
	B	
Performance	16	16.10
Spill Ltg	16	16.10

Number of Luminaires Per Arrangement:

Arrangement	Luminaire Code	Power (kWatt)
	B	
Centre Columns	0	0.00
Centre Columns plus 1m	0	0.00
End Columns	8	8.05
End Columns plus 1m	0	0.00
Half way line 1	0	0.00
Half way line 2	8	8.05
Half way line 3	0	0.00
Half way line 4	0	0.00

2.4 Calculation Results

Switching Modes:

Code	Switching Mode	Maintenance factor
1	Performance	0.95
2	Spill Ltg	1.00

(II)luminance Calculations:

Calculation	Switching Mode	Type	Unit	Ave	Min	Max	Min/Ave	Min/Max
Football	1	Surface Illuminance	lux	221	133	294	0.60	0.45
Ev West houses @1.5m-6m	2	Surface Illuminance	lux			0.20		
Ev NWest house @1.5m-6m	2	Surface Illuminance	lux			0.18		
Ev Nth houses @1.5m-6m1	2	Surface Illuminance	lux			0.19		
Spill Ltg Grid	2	Surface Illuminance	lux					

Glare Rating for Grid of Observers:

Calculation	Switching Mode	Observer Grid	Reference Grid	Reflectance	GR-Max
GR Max for Pitch	1	Football	Football	0.25	46.4

Obtrusive Light Calculations:

Switching Mode	Observer Code	Luminaire Code	Position			Aiming Angles			Maximum Intensity (cd)
			X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0	
2	Aa	B	34.50	37.50	15.00	166.07	67.00	0.00	413
2	Bb	B	34.50	12.50	15.00	166.13	66.00	0.00	471
2	Cc	B	34.50	-12.50	15.00	-166.13	66.00	-0.00	494

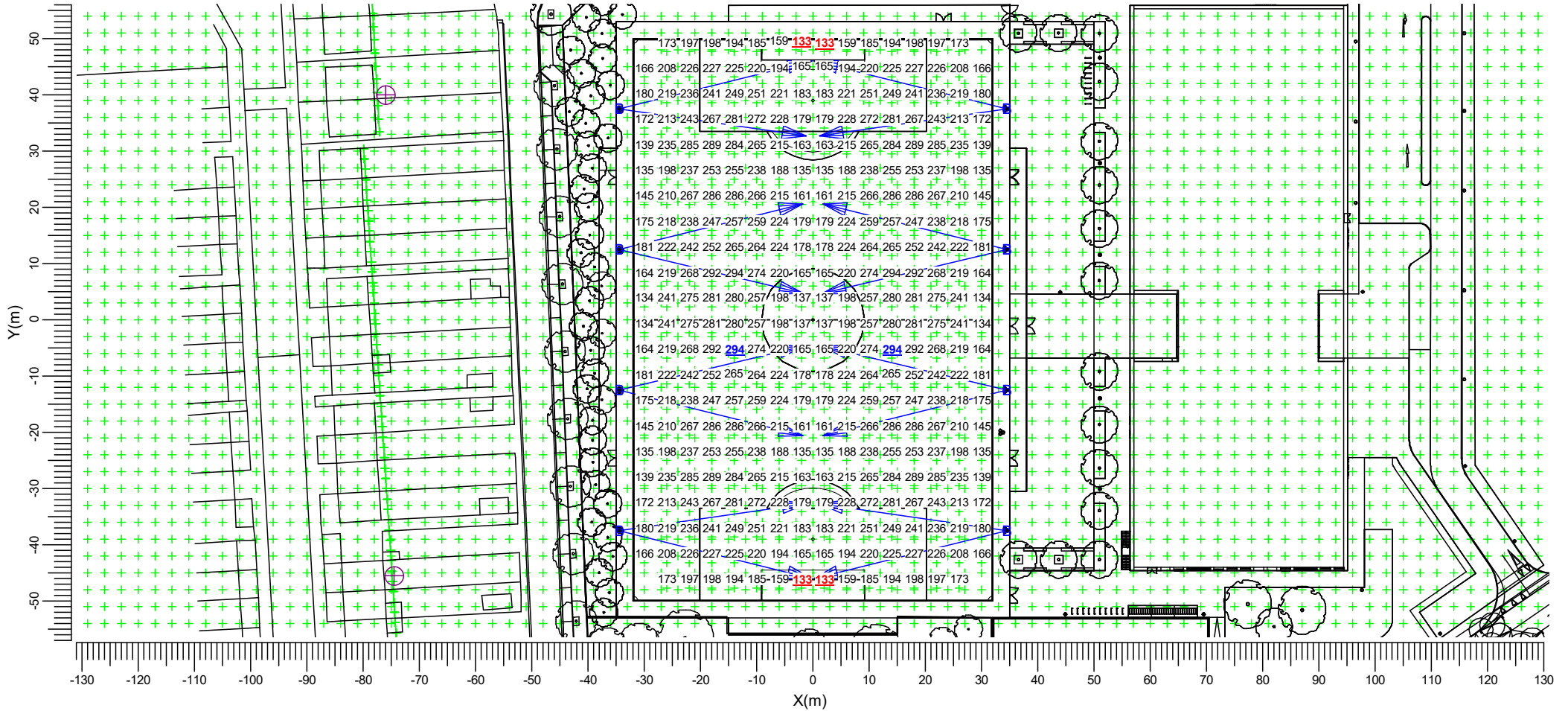
Switching Mode	ULR
1	0.00
2	0.00

3. Calculation Results

3.1 Football: Graphical Table

Performance

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



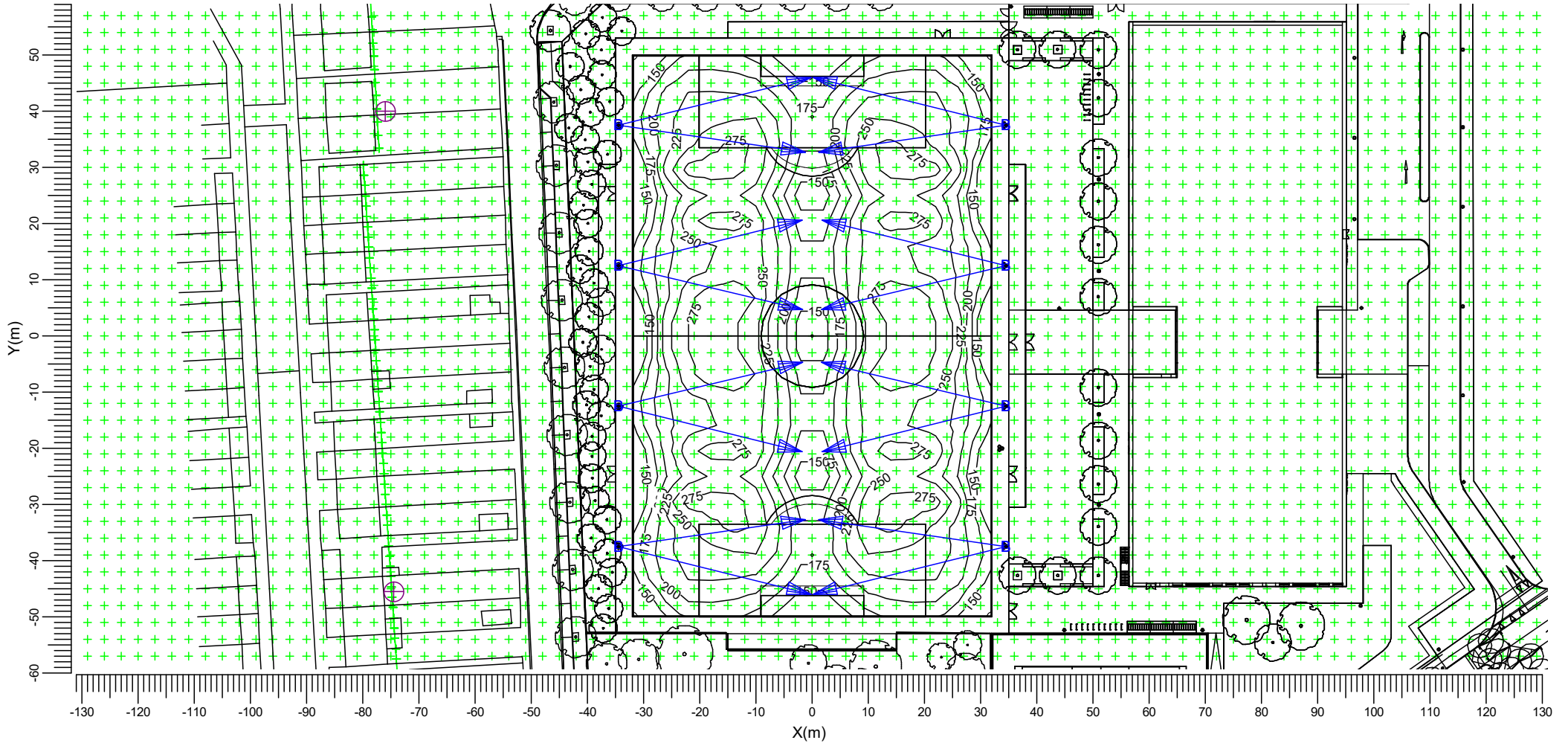
B BVP518 OUT T35 A35-NB LO

Average	Minimum	Maximum	Min/Ave	Min/Max	Project maintenance factor	Scale
221	133	294	0.60	0.45	0.95	1:1000

3.2 Football: Iso Contour

Performance

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



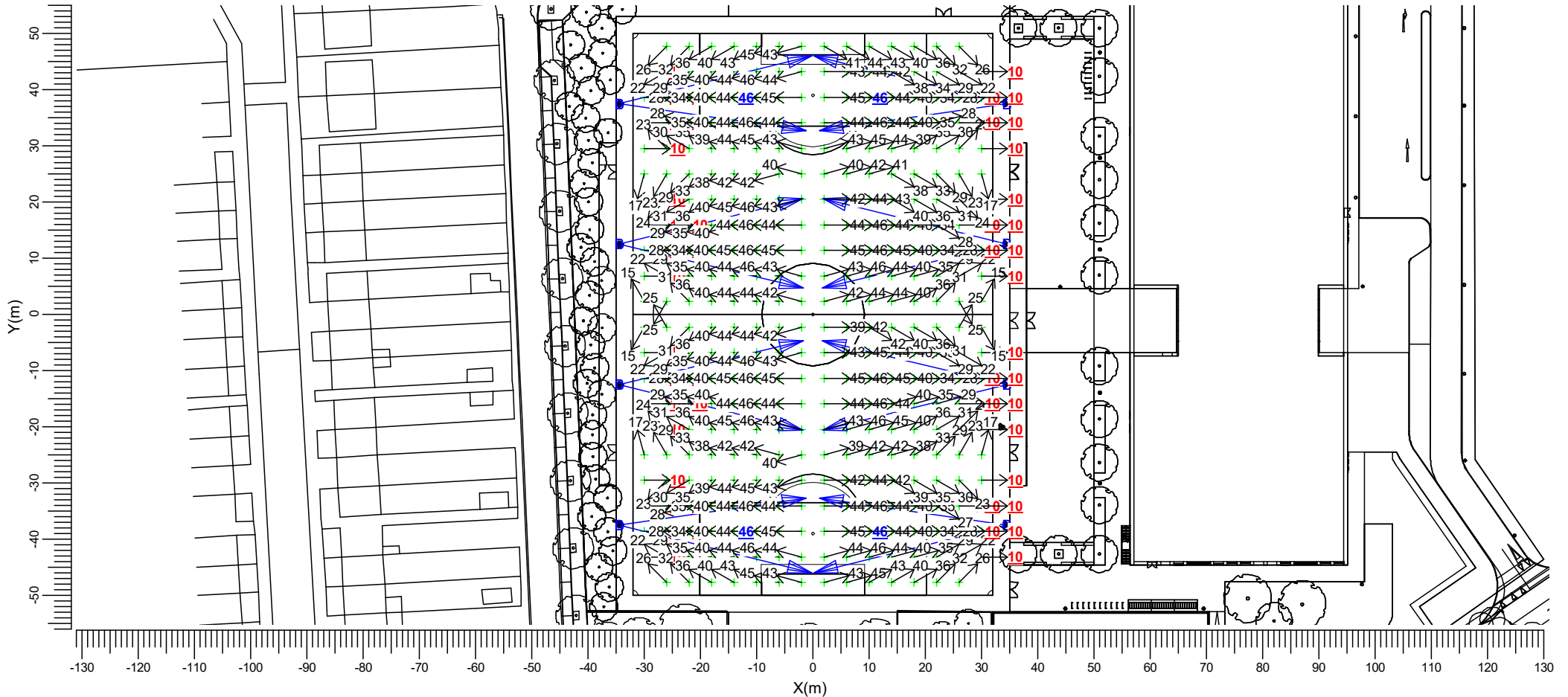
B BVP518 OUT T35 A35-NB LO

Average 221	Minimum 133	Maximum 294	Min/Ave 0.60	Min/Max 0.45	Project maintenance factor 0.95	Scale 1:1000
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3.3 GR Max for Pitch: Graphical Table

Performance

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



B BVP518 OUT T35 A35-NB LO

Maximum
46.4

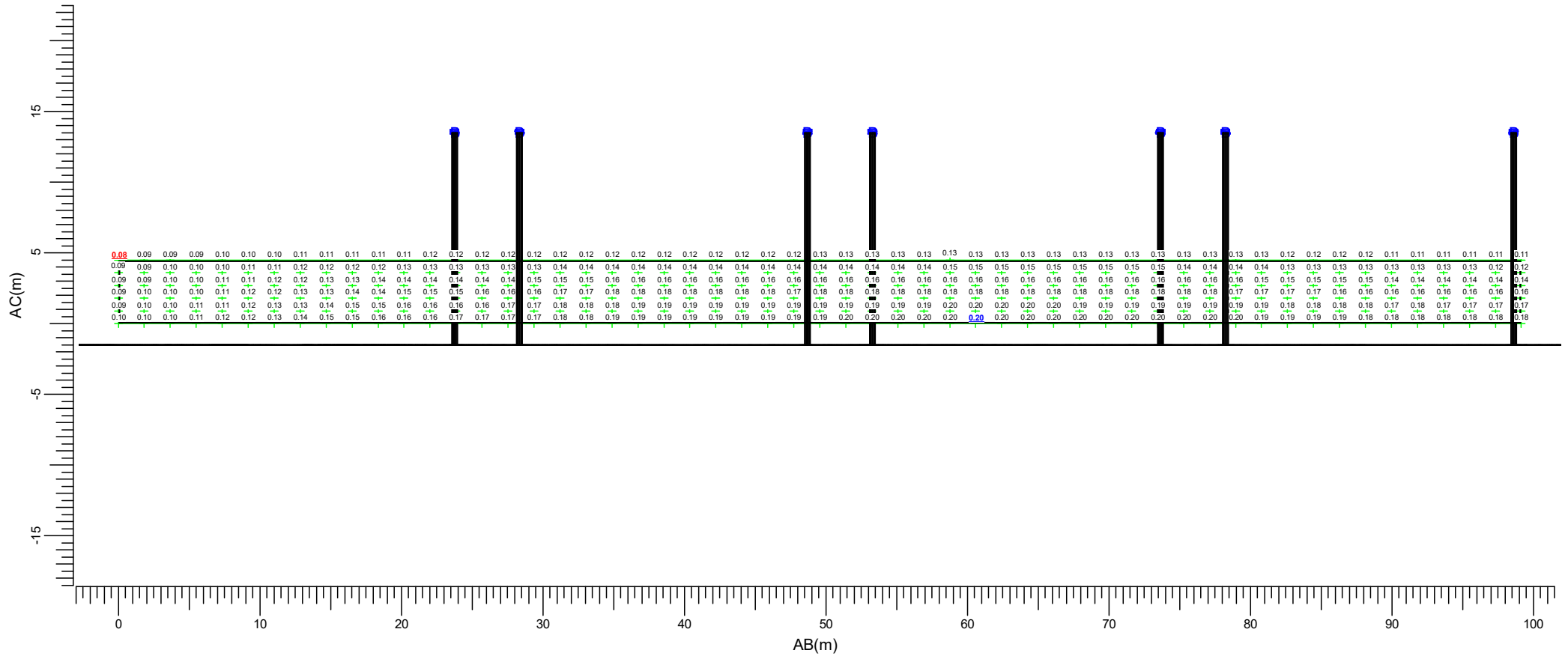
Project maintenance factor
0.95

Scale
1:1000

3.4 Ev West houses @1.5m-6m: Graphical Table

Spill Ltg

Grid : Ev West houses @1.5m-6m
 Calculation : Surface Illuminance (lux)



(-73.29, -68.50, 6.00) C----D (-79.88, 30.44, 6.00)
 | |
 (-73.29, -68.50, 1.50) A----B (-79.88, 30.44, 1.50)

B: BVP518 OUT T35 A35-NB LO

Maximum
 0.20

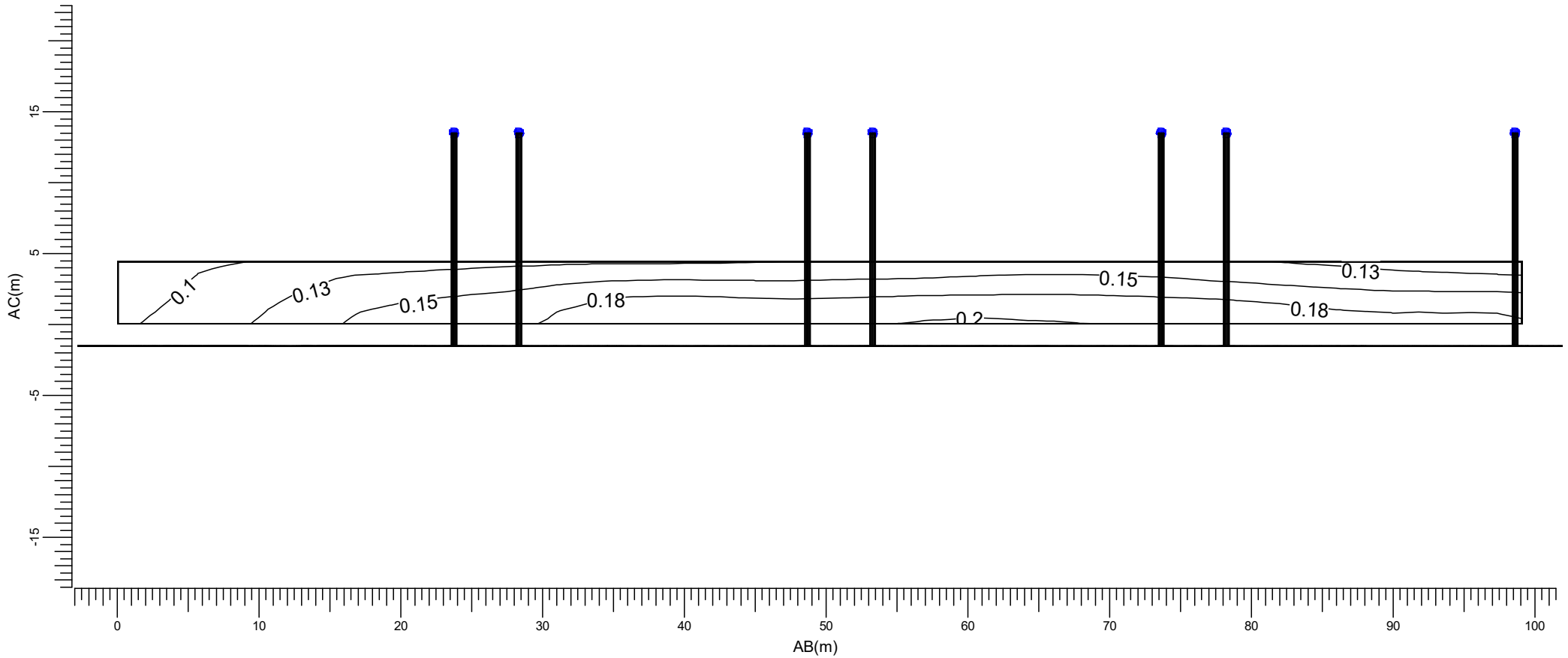
Project maintenance factor
 1.00

Scale
 1:400

3.5 Ev West houses @1.5m-6m: Iso Contour

Spill Ltg

Grid : Ev West houses @1.5m-6m
 Calculation : Surface Illuminance (lux)



(-73.29, -68.50, 6.00) C-----D (-79.88, 30.44, 6.00)
 | |
 (-73.29, -68.50, 1.50) A-----B (-79.88, 30.44, 1.50)

B: BVP518 OUT T35 A35-NB LO

Maximum
 0.20

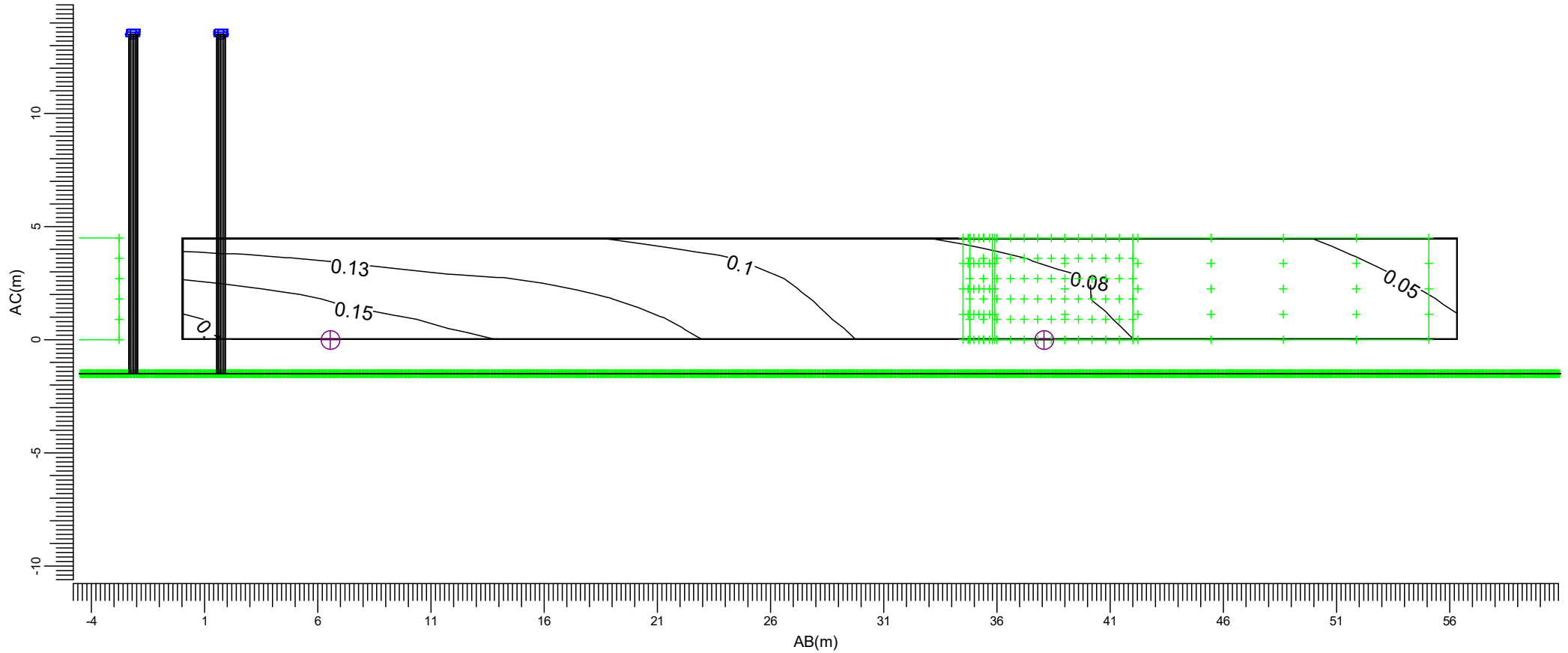
Project maintenance factor
 1.00

Scale
 1:400

3.7 Ev NWest house @1.5m-6m: Iso Contour

Spill Ltg

Grid : Ev NWest house @1.5m-6m
 Calculation : Surface Illuminance (lux)



(-77.12, 33.38, 6.00) C-----D (-80.29, 89.63, 6.00)
 | |
 (-77.12, 33.38, 1.50) A-----B (-80.29, 89.63, 1.50)

B: BVP518 OUT T35 A35-NB LO

Maximum
 0.18

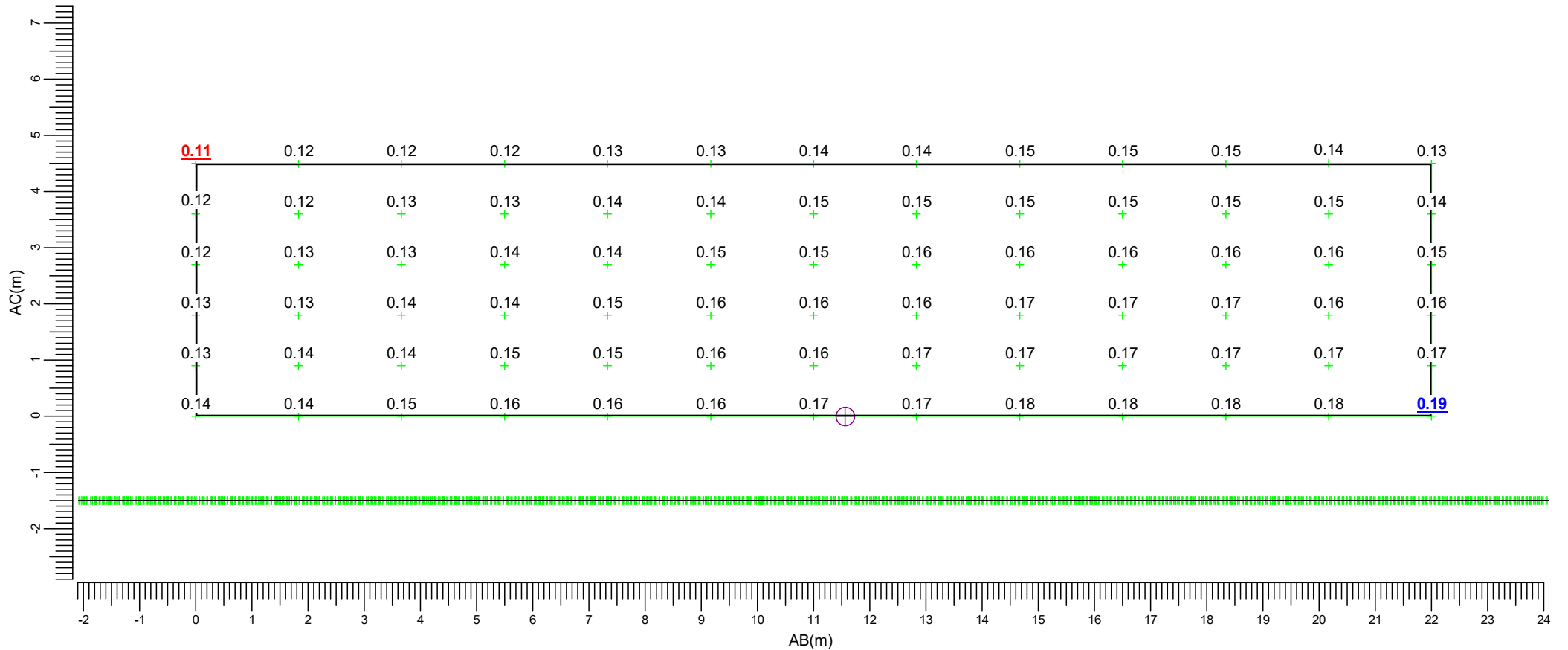
Project maintenance factor
 1.00

Scale
 1:250

3.8 Ev Nth houses @1.5m-6m1: Graphical Table

Spill Ltg

Grid : Ev Nth houses @1.5m-6m1
 Calculation : Surface Illuminance (lux)



(-43.90, 70.10, 6.00) C----D (-23.54, 78.45, 6.00)
 (-43.90, 70.10, 1.50) A----B (-23.54, 78.45, 1.50)

B: BVP518 OUT T35 A35-NB LO

Maximum
0.19

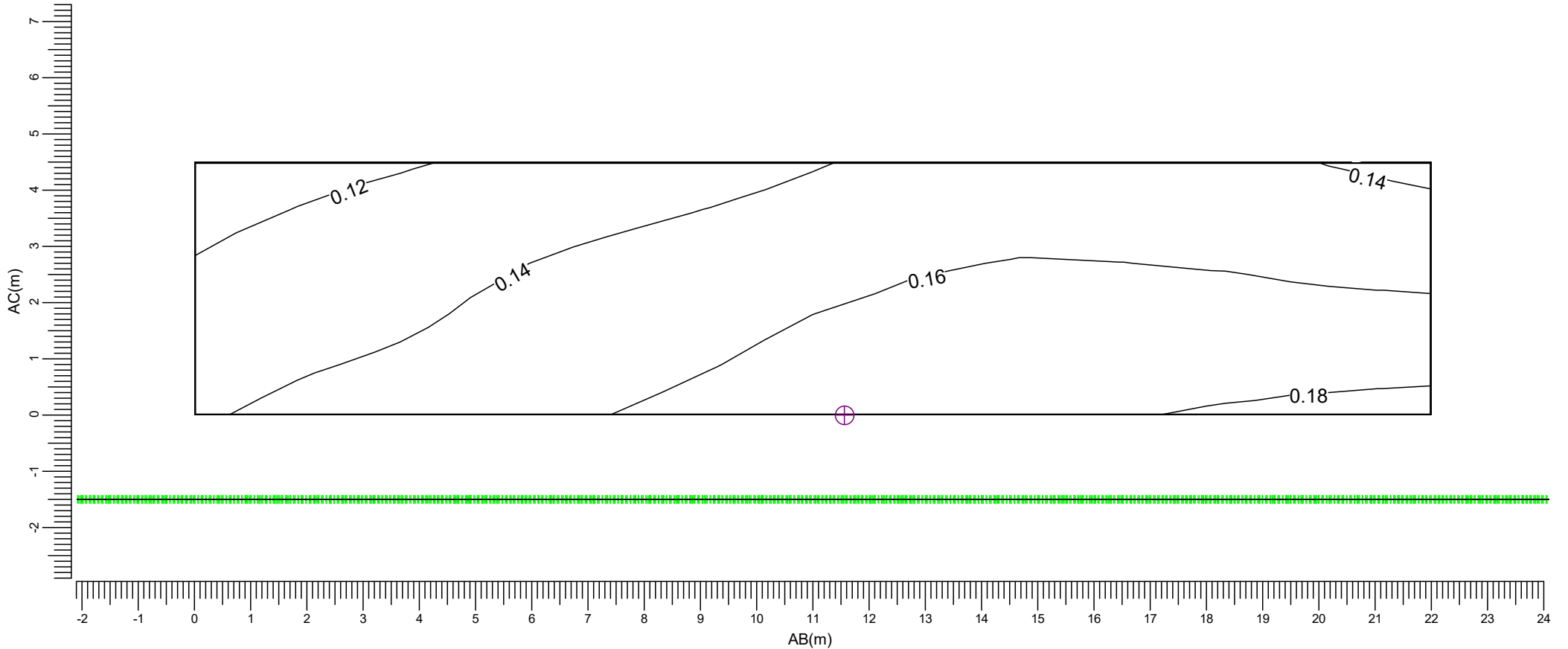
Project maintenance factor
1.00

Scale
1:100

3.9 Ev Nth houses @1.5m-6m1: Iso Contour

Spill Ltg

Grid : Ev Nth houses @1.5m-6m1
 Calculation : Surface Illuminance (lux)



(-43.90, 70.10, 6.00) C----D (-23.54, 78.45, 6.00)
 | |
 (-43.90, 70.10, 1.50) A----B (-23.54, 78.45, 1.50)

B: BVP518 OUT T35 A35-NB LO

Maximum
 0.19

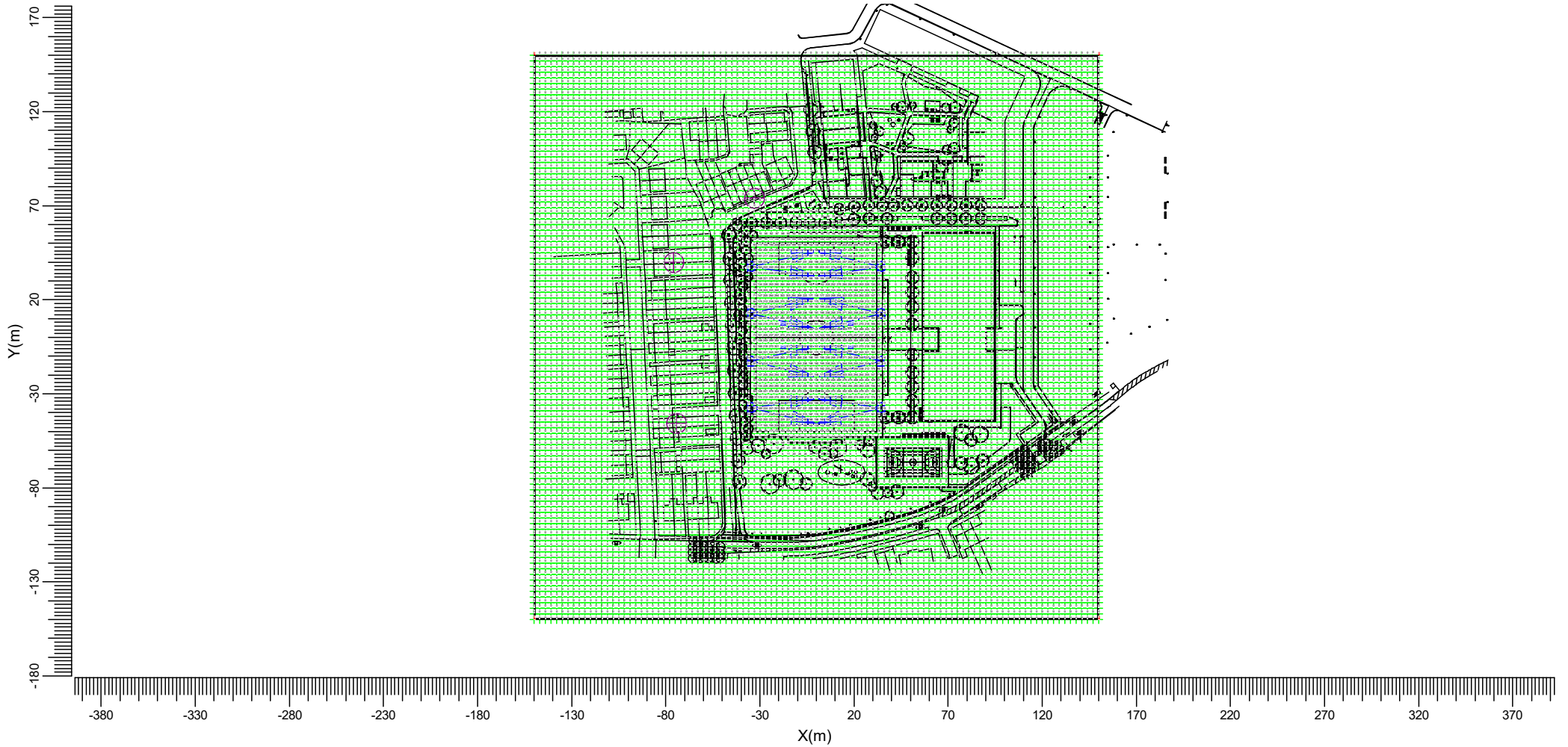
Project maintenance factor
 1.00


Scale
 1:100

3.10 Spill Ltg Grid: Graphical Table

Spill Ltg

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



B  BVP518 OUT T35 A35-NB LO

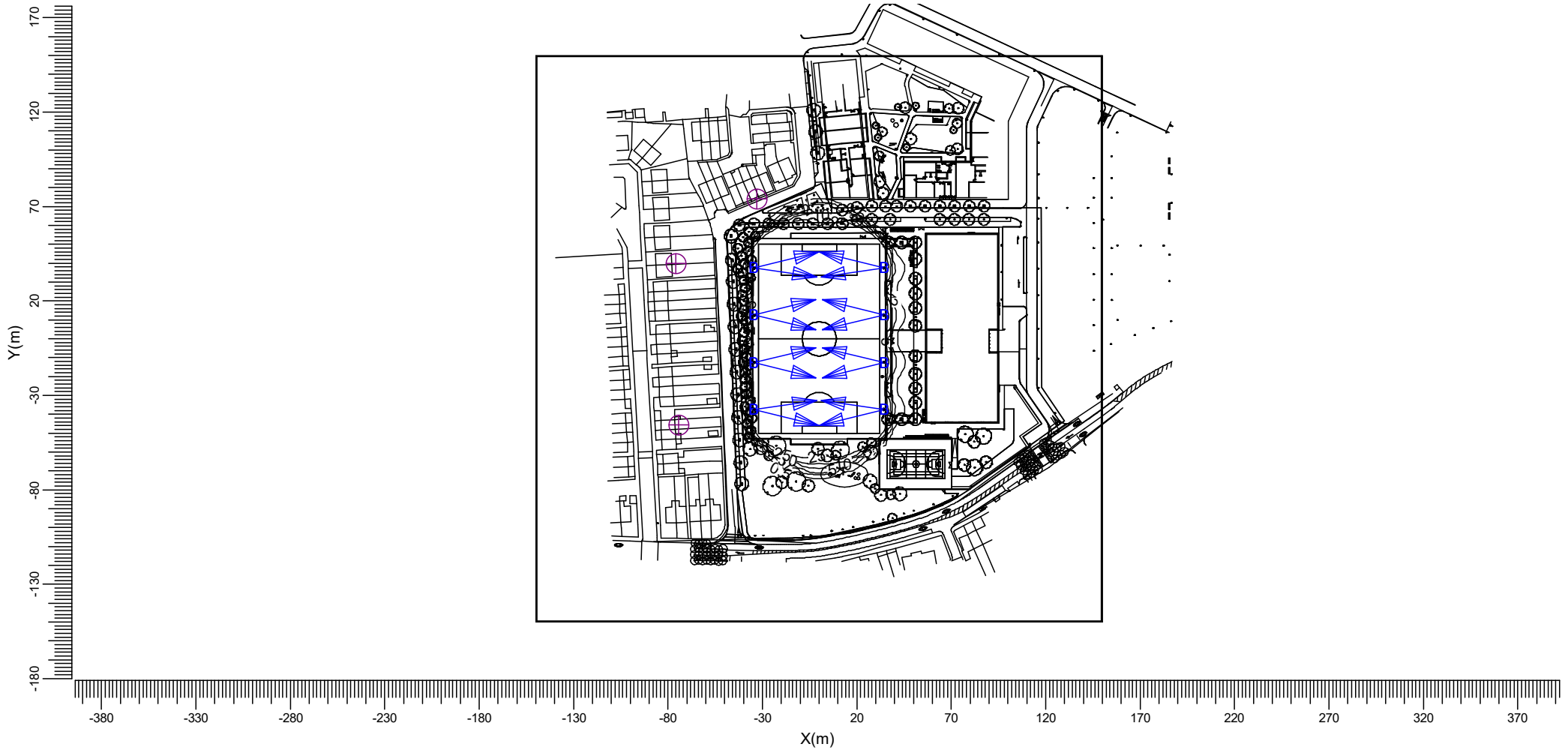
Project maintenance factor
1.00


Scale
1:3000

3.11 Spill Ltg Grid: Iso Contour

Spill Ltg

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



B  BVP518 OUT T35 A35-NB LO

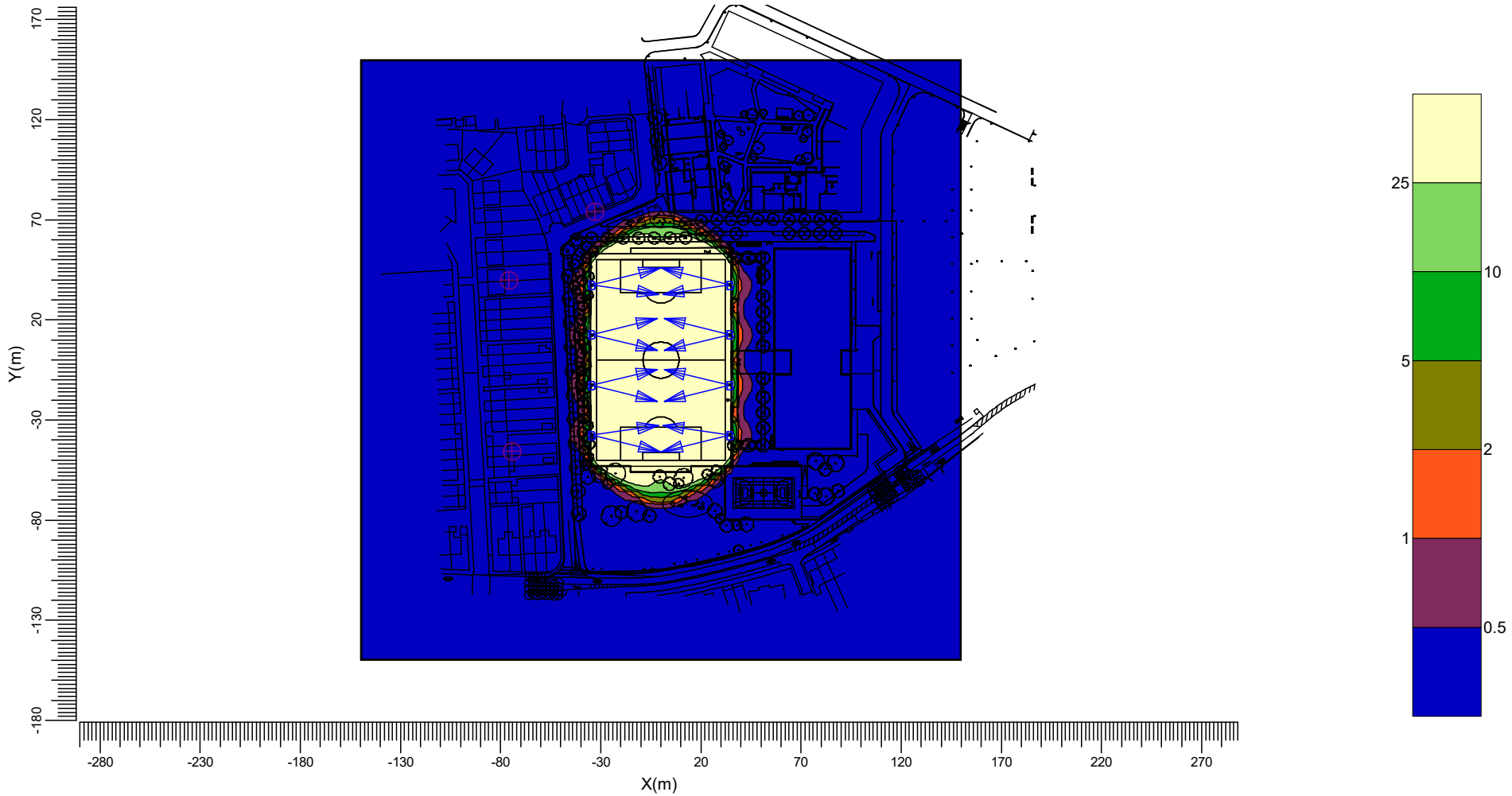
Project maintenance factor
1.00


Scale
1:3000

3.12 Spill Ltg Grid: Filled Iso Contour

Spill Ltg

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



B  BVP518 OUT T35 A35-NB LO

Project maintenance factor
1.00

Scale
1:3000

4. Luminaire Details

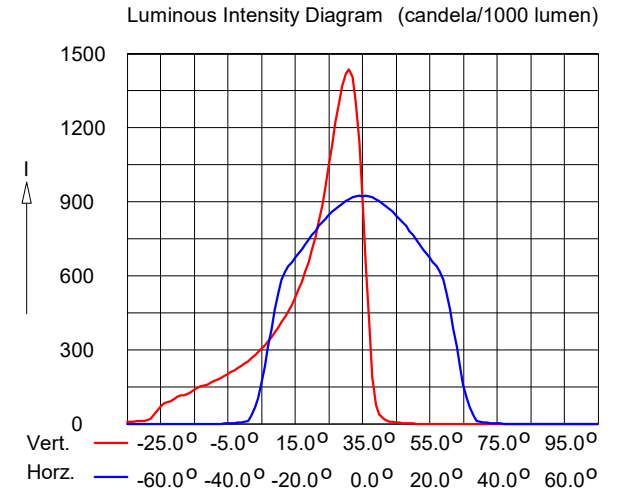
4.1 Project Luminaires

OptiVision LED gen3.5 2022
BVP518 OUT T35 1xLED1720-4S/740/740 E3/D4I A35-NB LO

Light output ratios

DLOR	: 0.59
ULOR	: 0.00
TLOR	: 0.59
Ballast	: E3/D4I
Lamp flux	: 172000 lm
Luminaire wattage	: 1006.0 W
Measurement code	: LVM2047300

Note: Luminaire data not from database.



5. Installation Data

5.1 Legends

Project Luminaires:

Code	Qty	Luminaire Type	Lamp Type	Flux (lm)
B	16	BVP518 OUT T35 A35-NB LO	1 * LED1720-4S/740	1 * 172000

Arrangements:

Code	Arrangement
1	End Columns
2	Centre Columns
3	Centre Columns plus 1m
4	End Columns plus 1m
5	Half way line 1
6	Half way line 2
7	Half way line 3
8	Half way line 4

Switching Modes:

Code	Switching Mode
1	Performance
2	Spill Ltg

5.2 Luminaire Positioning and Orientation

Qty and Code	Position			Aiming Points			Aiming Angles			ULR	Arr.	Switching Modes	
	X (m)	Y (m)	Z (m)	X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0			1	2
1 * B	-34.50	-37.50	15.00	-1.15	-32.71	0.00	8.2	66.0	0.0	0.00	1	+	+
1 * B	-34.50	-37.50	15.00	-0.20	-46.01	0.00	-13.9	67.0	0.0	0.00	1	+	+
1 * B	-34.50	37.50	15.00	-1.15	32.71	0.00	-8.2	66.0	-0.0	0.00	1	+	+
1 * B	-34.50	37.50	15.00	-0.20	46.01	0.00	13.9	67.0	-0.0	0.00	1	+	+
1 * B	34.50	-37.50	15.00	1.15	-32.71	0.00	171.8	66.0	-0.0	0.00	1	+	+

Qty and Code	Position			Aiming Points			Aiming Angles			ULR	Arr.	Switching Modes	
	X (m)	Y (m)	Z (m)	X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0			1	2
1 * B	34.50	-37.50	15.00	0.20	-46.01	0.00	-166.1	67.0	-0.0	0.00	1	+	+
1 * B	34.50	37.50	15.00	1.15	32.71	0.00	-171.8	66.0	0.0	0.00	1	+	+
1 * B	34.50	37.50	15.00	0.20	46.01	0.00	166.1	67.0	0.0	0.00	1	+	+
1 * B	-34.50	-12.50	15.00	-1.72	-4.73	0.00	13.3	66.0	0.0	0.00	6	+	+
1 * B	-34.50	-12.50	15.00	-1.79	-20.58	0.00	-13.9	66.0	0.0	0.00	6	+	+
1 * B	-34.50	12.50	15.00	-1.72	4.73	0.00	-13.3	66.0	-0.0	0.00	6	+	+
1 * B	-34.50	12.50	15.00	-1.79	20.58	0.00	13.9	66.0	-0.0	0.00	6	+	+
1 * B	34.50	-12.50	15.00	1.72	-4.73	0.00	166.7	66.0	-0.0	0.00	6	+	+
1 * B	34.50	-12.50	15.00	1.79	-20.58	0.00	-166.1	66.0	-0.0	0.00	6	+	+
1 * B	34.50	12.50	15.00	1.72	4.73	0.00	-166.7	66.0	0.0	0.00	6	+	+
1 * B	34.50	12.50	15.00	1.79	20.58	0.00	166.1	66.0	0.0	0.00	6	+	+