

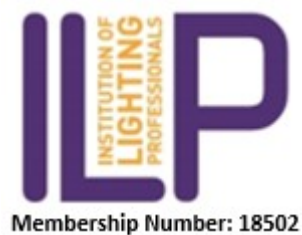
Hitchin RFC

200 Lux LED Lighting Design

Date: 23-04-2026

Designer: Andy Collins

Description: LED solution compliant to relevant RFU Match Play standards:
-200 Lux average - 0.60 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.



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1. Project Description

1.1 Description

-The LED Luminaires perform with internal integral louvres to mitigate unnecessary light spillage and glare to the surrounding area. 600mm by 600mm rear louvre plates have been added to the 7 No. boundary adjacent Luminaires on the far side for further light spill reduction.

Vertical illuminance calculations were undertaken on the boundary elevations of adjacent residential properties located on Bedford road.

The assessment confirms that the maximum vertical light spill affecting the properties described above will be below 5 Lux. The lighting design therefore fully complies to the Institution of Lighting Professionals Guidance Note 01/21 for an Environmental E2 zone:- Rural - Low district brightness.

-Rugby Pitch Lighting: (200 Lux average - 0.60 min/ave uniformity)

12 Philips OptiVision Gen3.5 LED 1506w 4000K luminaires mounted on 6 proposed lighting columns at 15m high.

Rugby pitch size: 91.50m x 65m including 2 x 6m in-goal areas

-Back Lighting:

2 Philips OptiVision Gen3.5 LED 1506w 4000K luminaires mounted on the rear of 2 of the proposed lighting columns from the Match Pitch area at 15m high.

Back Lighting area size: 65m x 15m.

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 = 21.08 Kw (31 amps per phase)

400v power supply required.

Project Maintenance Factors:

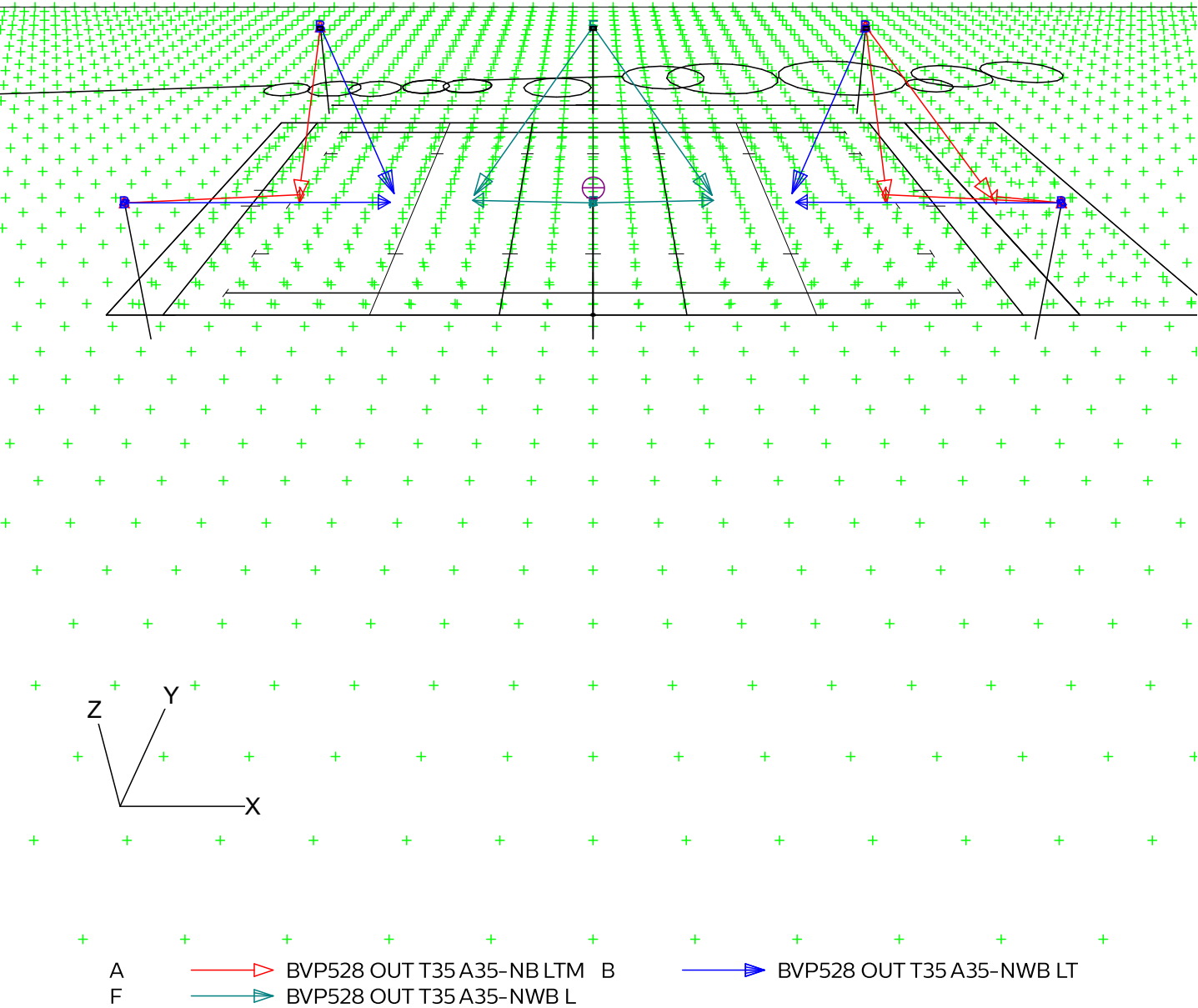
Performance Results = 0.95

Spillage Charts = 1

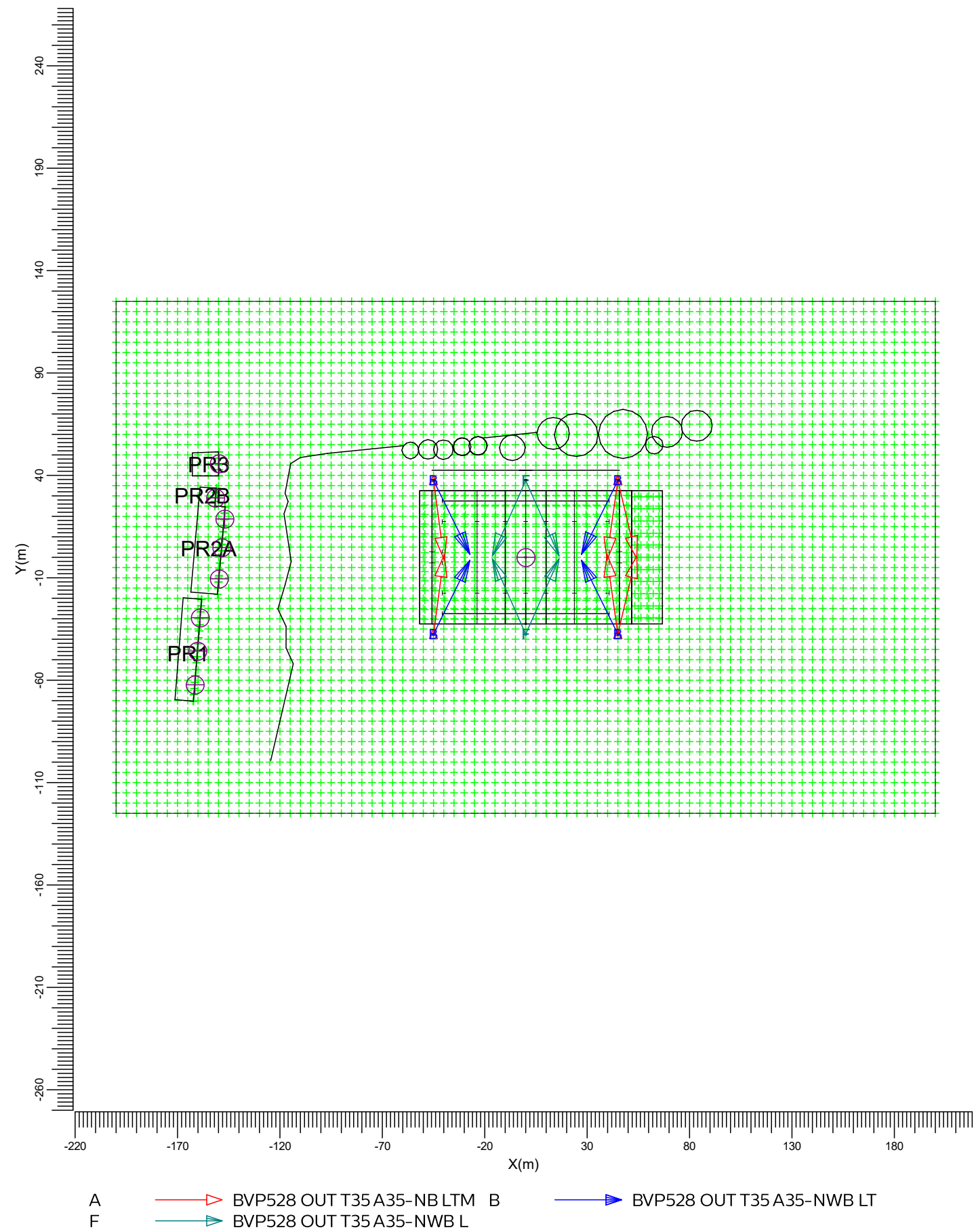
Upward Light Ratio (ULR) is 0.00

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
1:2500

2. Summary

2.1 Observer Information

Code	Observer	Position		
		X (m)	Y (m)	Z (m)
Bb	Obs 1- Bedford Rd PR1	-161.61	-62.18	1.50
Cc	Obs 2 - Bedford Rd PR1	-160.32	-45.68	1.50
Dd	Obs 3 - Bedford Rd PR1	-158.91	-29.44	1.50
Ee	Obs 4 - Bedford Rd PR2A	-149.75	-10.41	1.50
Ff	Obs 5 - Bedford Rd PR2A	-148.47	4.67	1.50
Gg	Obs 6 - Bedford Rd PR2A	-146.99	18.69	1.50
Hh	Obs 7 - Bedford Rd PR2B	-151.45	29.10	1.50
Ii	Obs 8 - Bedford Rd PR3	-149.75	45.67	1.50

2.2 Obstacle Information

Obstacle	Transparency (%)	Position		
		X (m)	Y (m)	Z (m)
Louvres 1+3	0	-44.70	37.70	14.40
		44.70	37.70	14.40
Louvres 2	0	0.30	37.70	14.40
		-0.30	37.70	14.40

2.3 Project Luminaires

Code	Qty	Luminaire Type	Lamp Type	Power (W)	Flux (lm)
A	6	BVP528 OUT T35 A35-NB LTM	1 * LED2590-4S/740	1505.9	1 * 259000
B	4	BVP528 OUT T35 A35-NWB LTM	1 * LED2590-4S/740	1505.9	1 * 259000
F	4	BVP528 OUT T35 A35-NWB LO	1 * LED2590-4S/740	1505.9	1 * 259000

The total installed power: 21.08 (kWatt)

Number of Luminaires Per Switching Mode:

Switching Mode	Luminaire Code			Power (kWatt)
	A	B	F	
Spillage	6	4	4	21.08
Rugby Pitch	4	4	4	18.07
Back Lighting	2	0	0	3.01

Number of Luminaires Per Arrangement:

Arrangement	Luminaire Code			Power (kWatt)
	A	B	F	
Column 1+3+4+6	4	4	0	12.05
Column 1+4 BL	2	0	0	3.01
Column 2+5	0	0	4	6.02

2.4 Calculation Results

Switching Modes:

Code	Switching Mode	Maintenance factor
1	Spillage	1.00
2	Rugby Pitch	0.95
3	Back Lighting	0.95

(II)luminance Calculations:

Calculation	Switching Mode	Type	Unit	Ave	Max Min/AveMin/Max
Rugby Pitch	2	Surface Illuminance	lux	236	0.60 0.46
Back Lighting	3	Surface Illuminance	lux	116	0.56 0.42
Spillage HorizontalR1	1	Surface Illuminance	lux	23.8	0.00 0.00
Ev Grid Bedford Rd PR1	1	Surface Illuminance	lux		0.16
Ev Grid Bedford Rd PR2A	1	Surface Illuminance	lux		0.24
Ev Grid Bedford Rd PR2B	1	Surface Illuminance	lux		0.19
Ev Grid Bedford Rd PR3	1	Surface Illuminance	lux		0.18

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	B	45.00	37.50	15.00	-116.13	69.50	0.00	1547
1	Cc	B	45.00	37.50	15.00	-116.13	69.50	0.00	1777
1	Dd	B	45.00	37.50	15.00	-116.13	69.50	0.00	1809
1	Ee	B	45.00	37.50	15.00	-116.13	69.50	0.00	1991
1	Ff	B	45.00	-37.50	15.00	116.13	69.50	-0.00	1968
1	Gg	B	45.00	-37.50	15.00	116.13	69.50	-0.00	1953
1	Hh	B	45.00	-37.50	15.00	116.13	69.50	-0.00	1831
1	Ii	B	45.00	-37.50	15.00	116.13	69.50	-0.00	1813

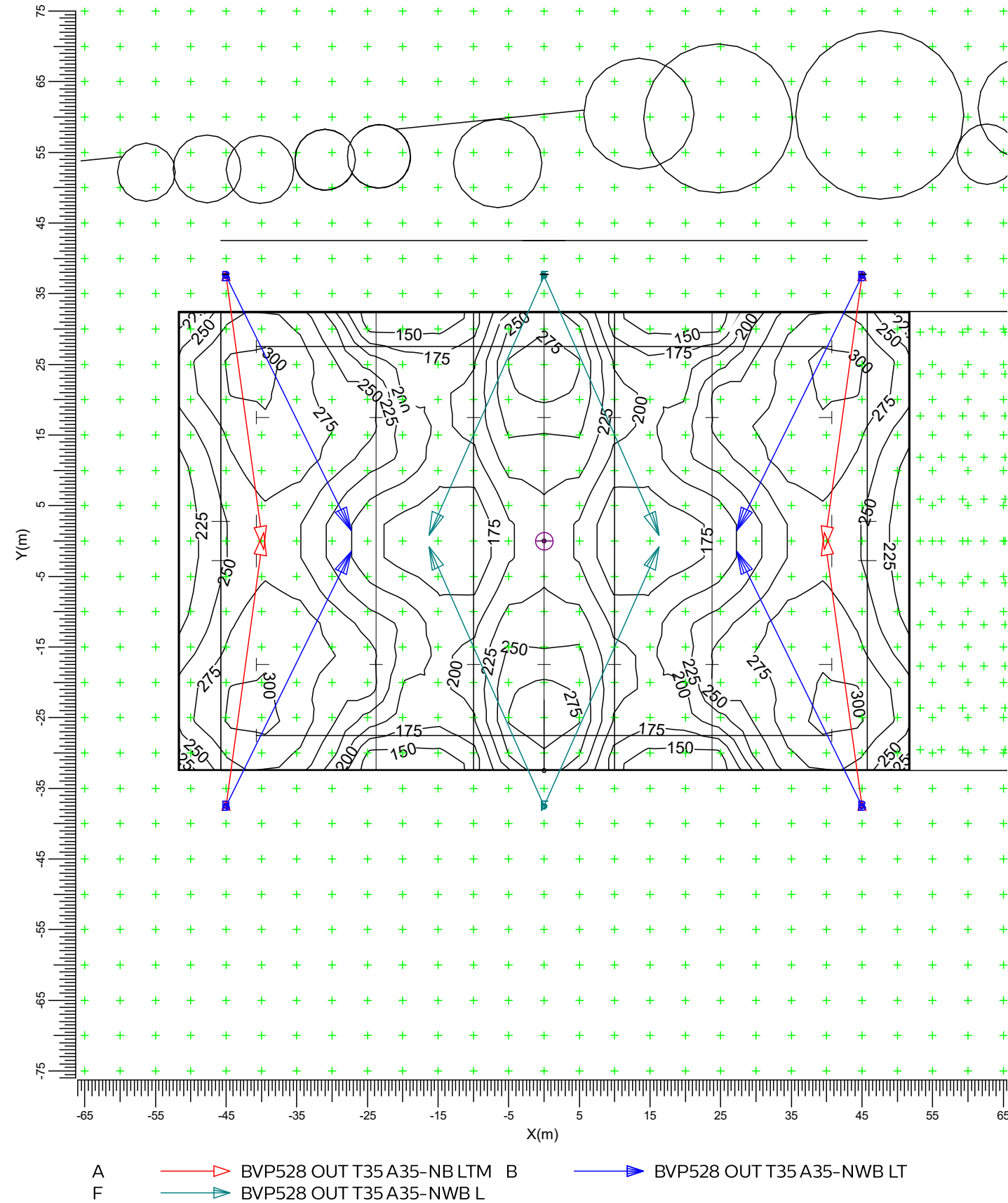
Switching Mode	ULR
1	0.00
2	0.00
3	0.00

3.2 Rugby Pitch: Iso Contour

Rugby Pitch

Grid : Rugby Pitch 1 at Z = -0.00 m

Calculation : Surface Illuminance (lux)

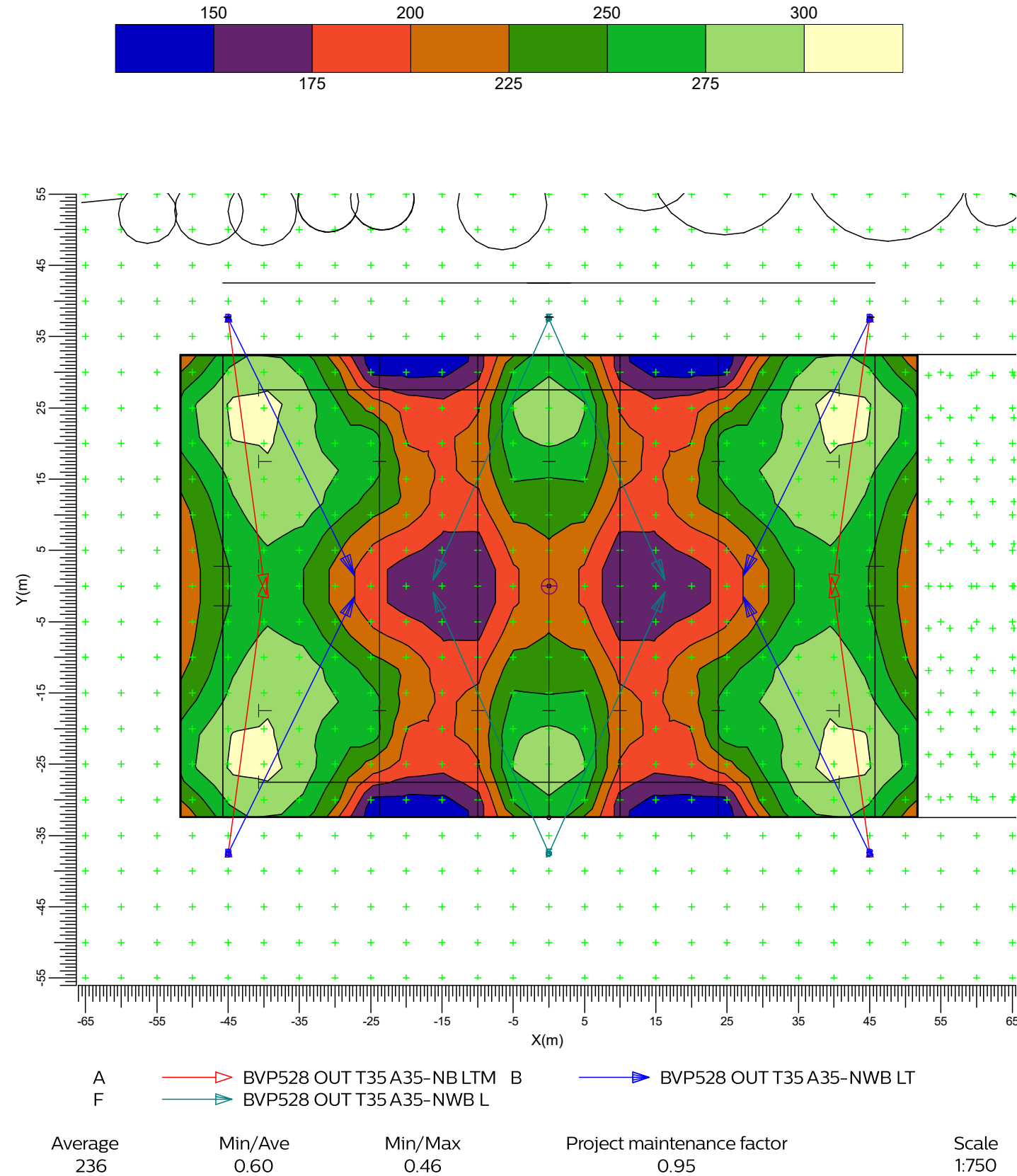


3.3 Rugby Pitch: Filled Iso Contour

Rugby Pitch

Grid : Rugby Pitch 1 at Z = -0.00 m

Calculation : Surface Illuminance (lux)

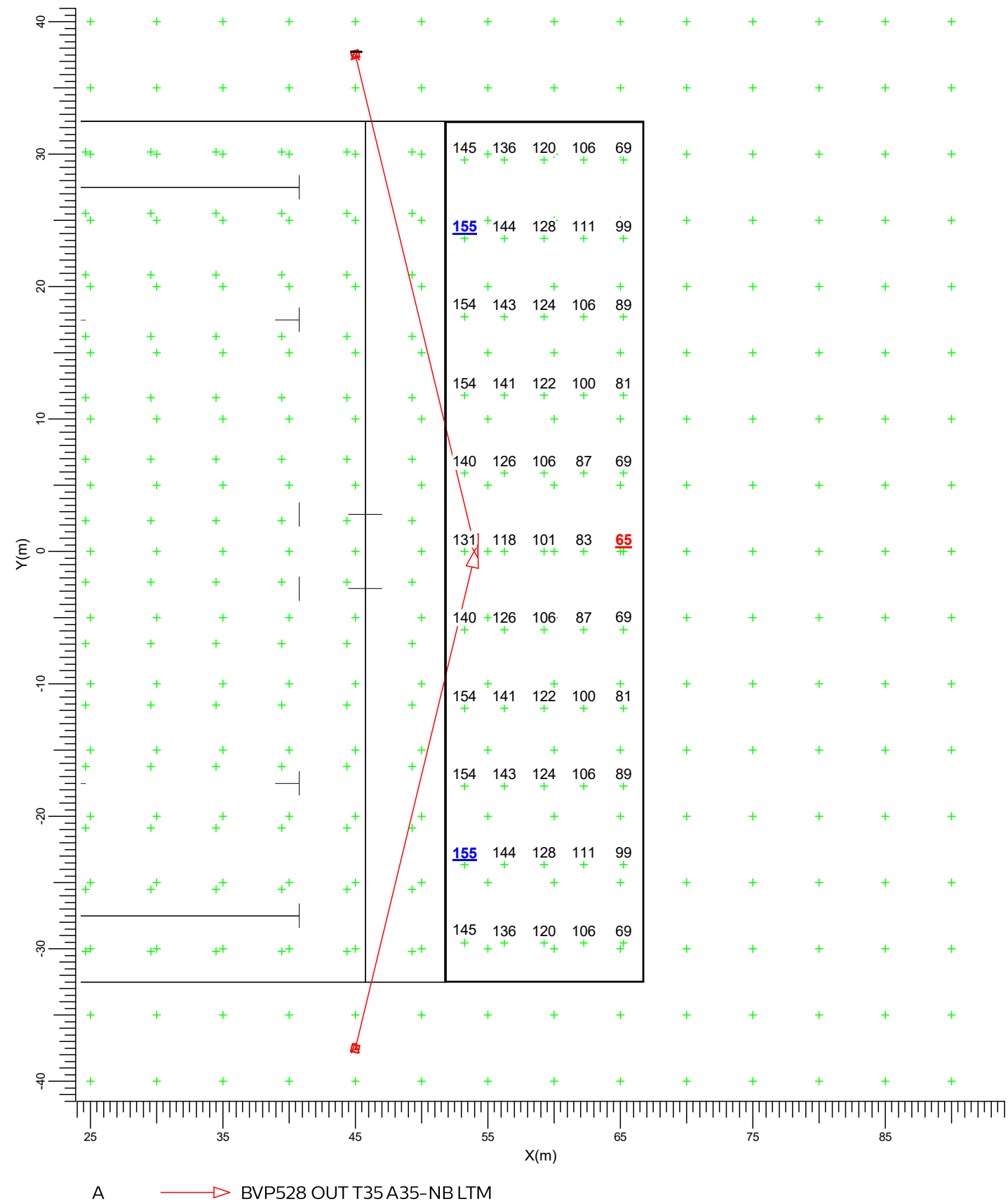


3.4 Back Lighting: Graphical Table

Back Lighting

Grid : Back Lighting at Z = -0.00 m

Calculation : Surface Illuminance (lux)

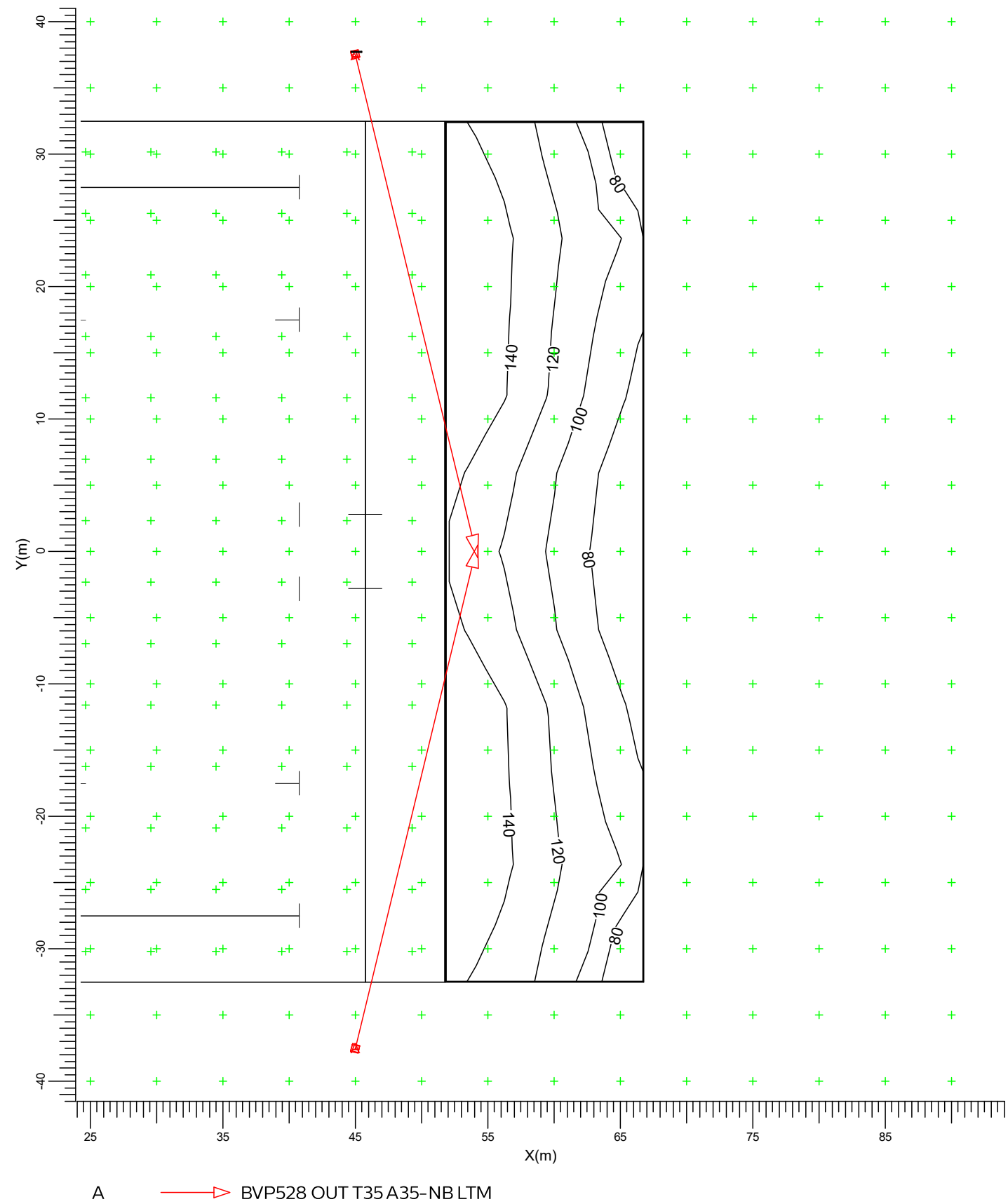


3.5 Back Lighting: Iso Contour

Back Lighting

Grid : Back Lighting at Z = -0.00 m

Calculation : Surface Illuminance (lux)



Average 116	Min/Ave 0.56	Min/Max 0.42	Project maintenance factor 0.95	Scale 1:400
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3.6 Back Lighting: Filled Iso Contour

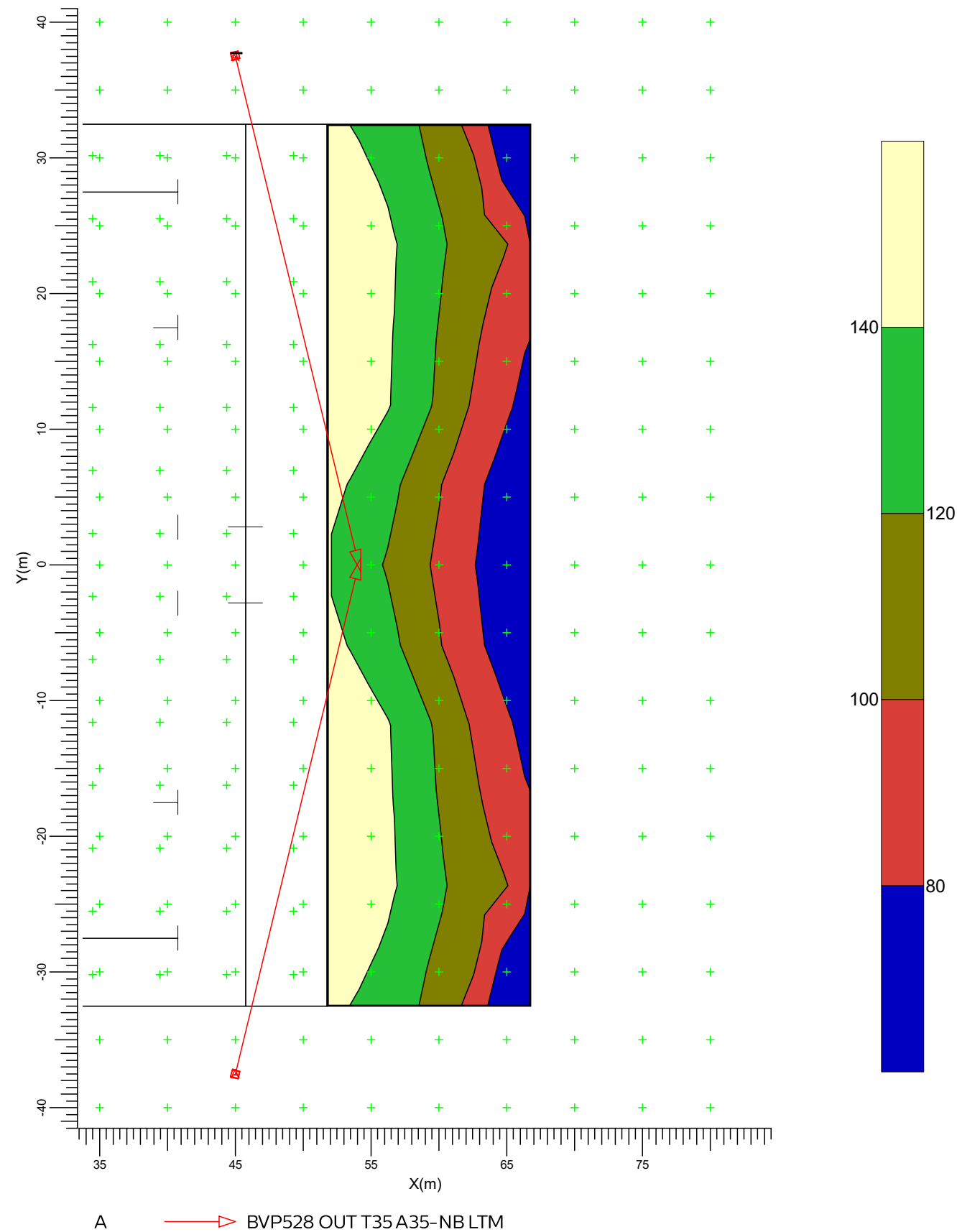
Back Lighting

Grid

Calculation

: Back Lighting at Z = -0.00 m

: Surface Illuminance (lux)



Average116

Min/Ave0.56

Min/Max0.42

Project maintenance factor0.95

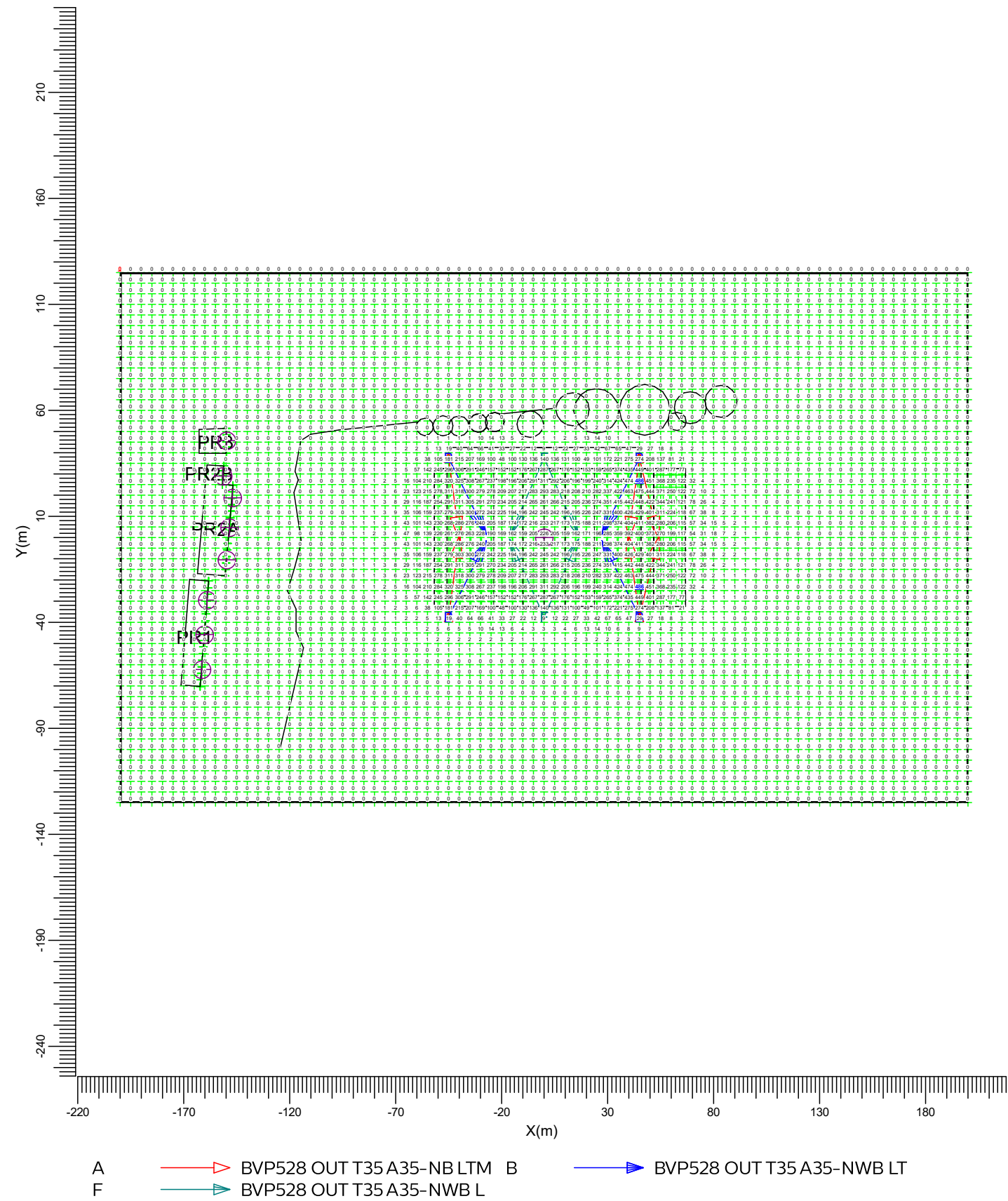
Scale1:400

3.7 Spillage HorizontalR1: Graphical Table

Spillage

Grid : Spillage at Z = -0.00 m

Calculation : Surface Illuminance (lux)

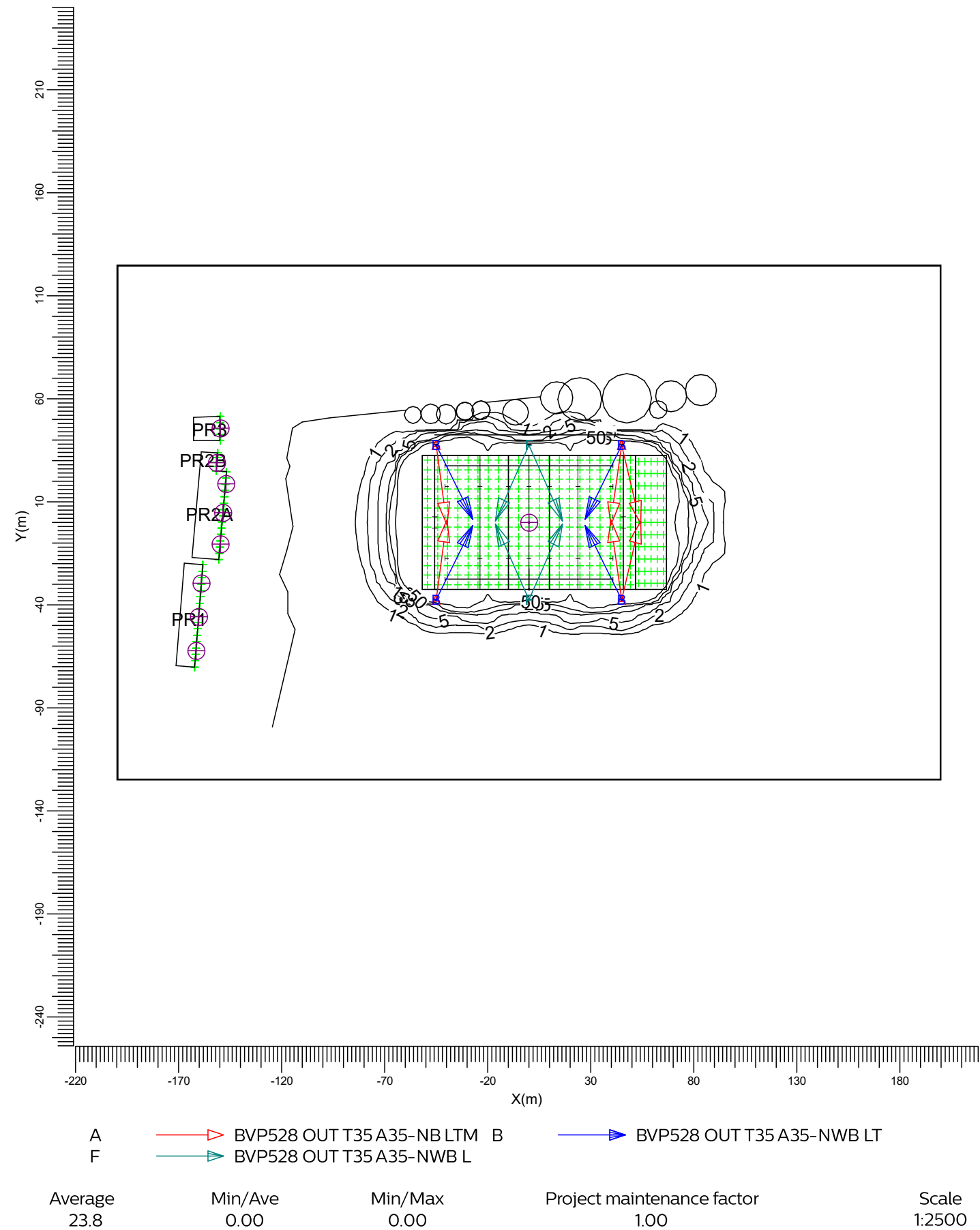


3.8 Spillage HorizontalR1: Iso Contour

Spillage

Grid : Spillage at Z = -0.00 m

Calculation : Surface Illuminance (lux)

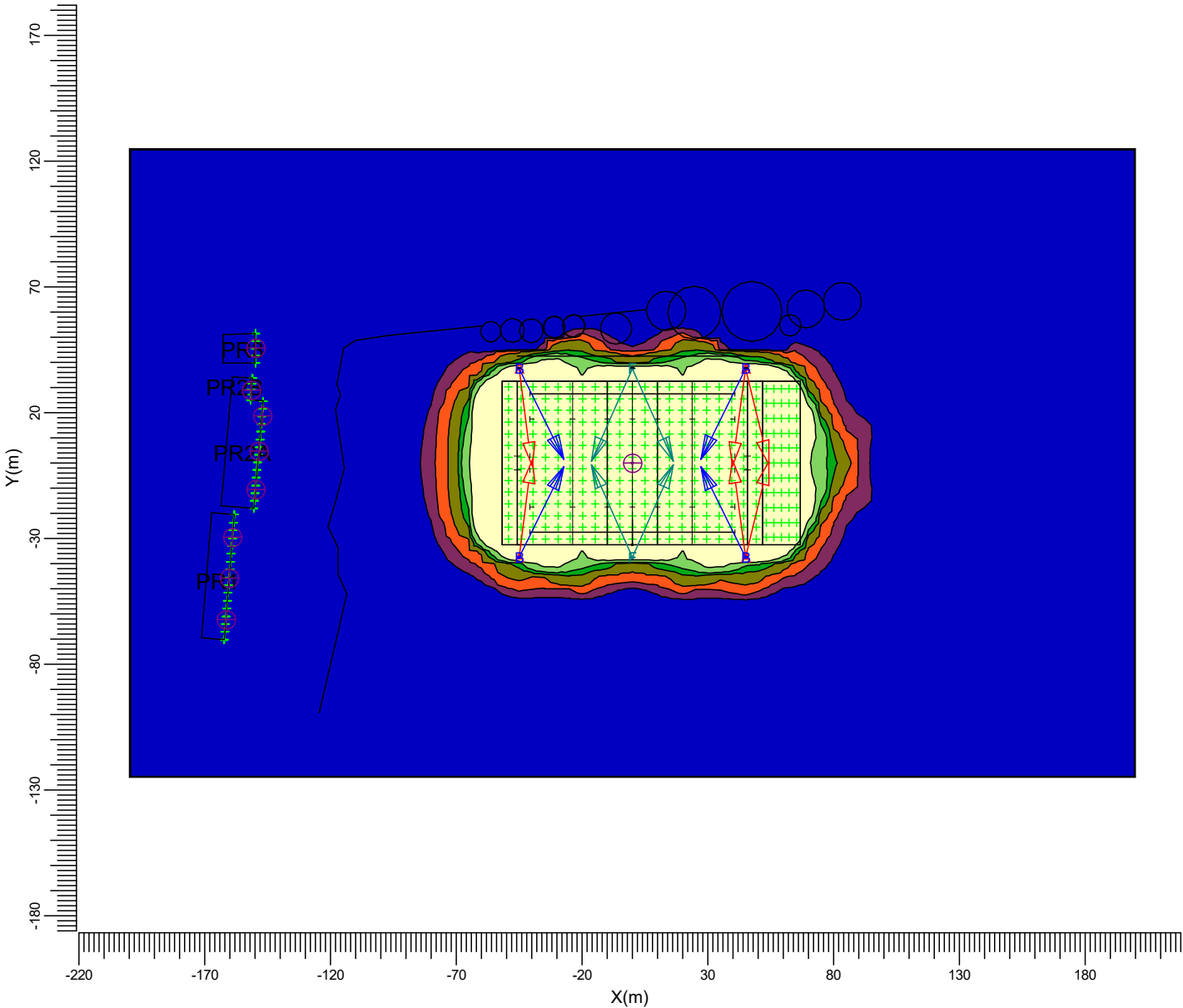


3.9 Spillage HorizontalR1: Filled Iso Contour

Spillage

Grid : Spillage at Z = -0.00 m

Calculation : Surface Illuminance (lux)



A

F

→

→

BVP528 OUT T35 A35-NB LTM

BVP528 OUT T35 A35-NWB L

B

→

BVP528 OUT T35 A35-NWB LT

Average
23.8

Min/Ave
0.00

Min/Max
0.00

Project maintenance factor
1.00

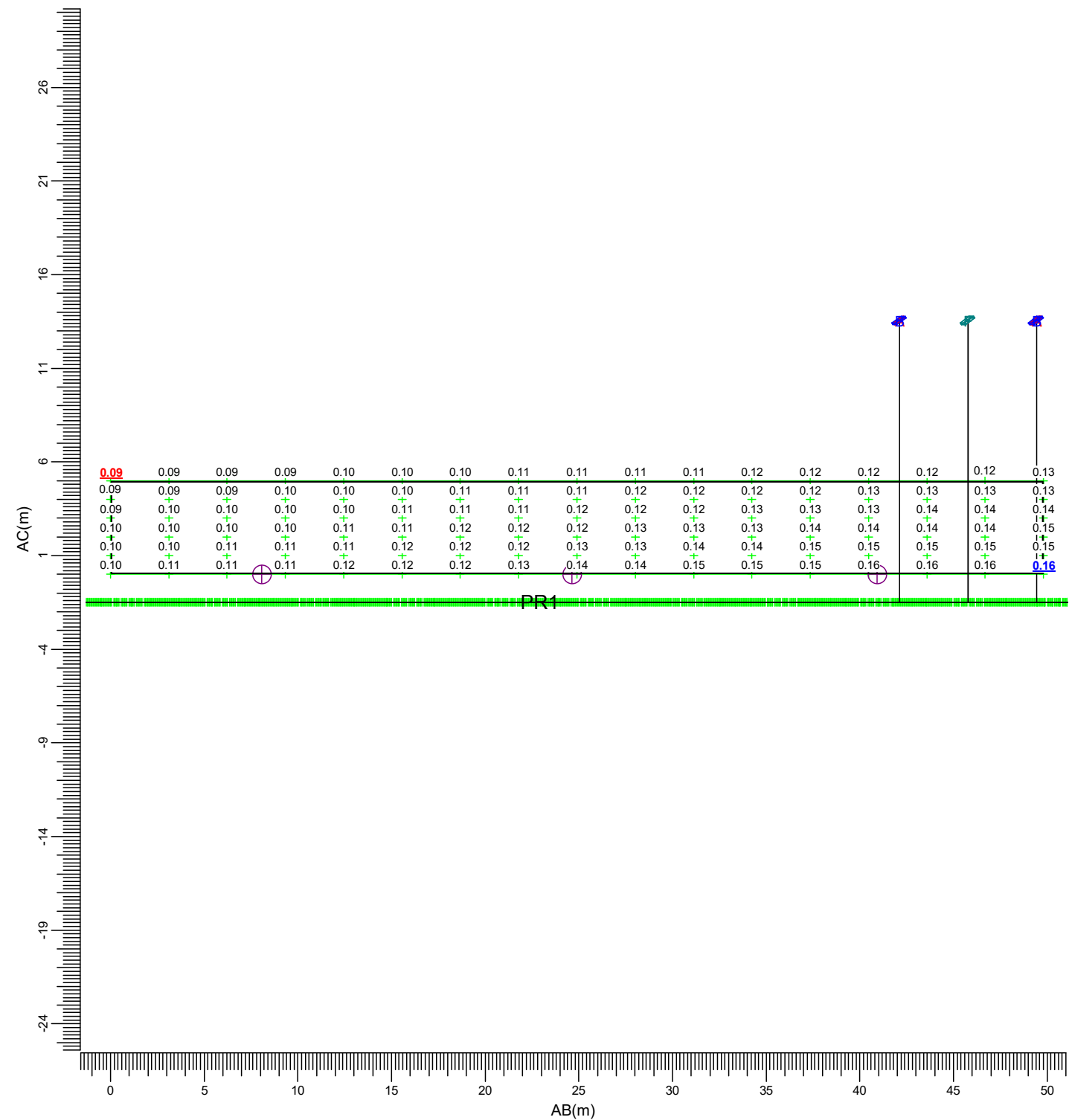
Scale
1:2500

3.10 Ev Grid Bedford Rd PR1: Graphical Table

Spillage

Grid : Ev Grid Bedford Rd PR1

Calculation : Surface Illuminance (lux)



(-162.30, -70.22, 6.50)

(-162.30, -70.22, 1.50)

C-----D (-158.26, -20.58, 6.50)

A-----B (-158.26, -20.58, 1.50)

A : BVP528 OUT T35 A35-NB LTM

F : BVP528 OUT T35 A35-NWB LO

B : BVP528 OUT T35 A35-NWB LTM

Maximum0.16

Project maintenance factor1.00

Scale1:300

3.11 Ev Grid Bedford Rd PR1: Iso Contour

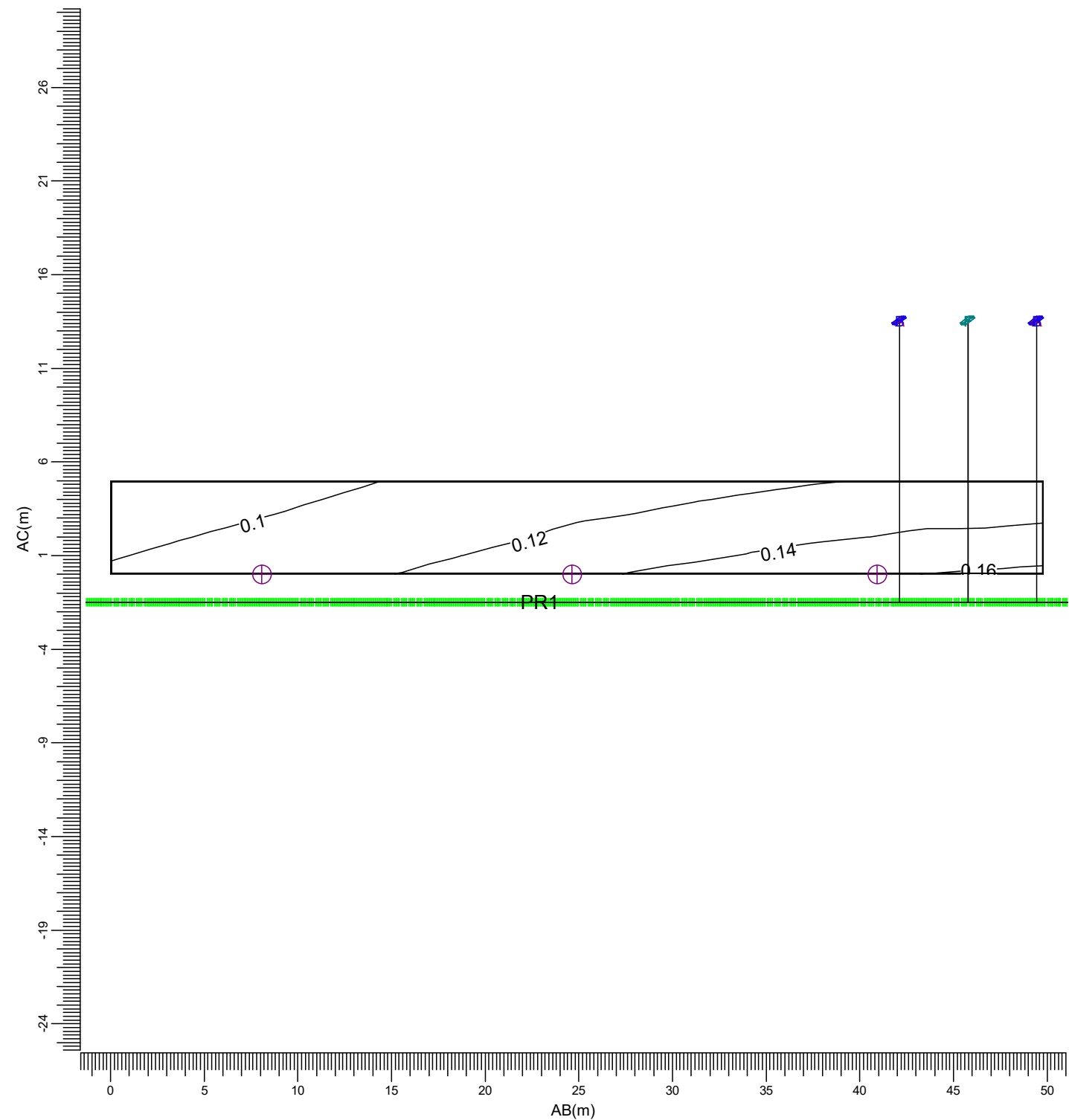
Spillage

Grid

Calculation

: Ev Grid Bedford Rd PR1

: Surface Illuminance (lux)



(-162.30, -70.22, 6.50)

C-----D (-158.26, -20.58, 6.50)

|

(-162.30, -70.22, 1.50)

A-----B (-158.26, -20.58, 1.50)

A : BVP528 OUT T35 A35-NB LTM

F : BVP528 OUT T35 A35-NWB LO

B : BVP528 OUT T35 A35-NWB LTM

Maximum

0.16

Project maintenance factor

1.00

Scale

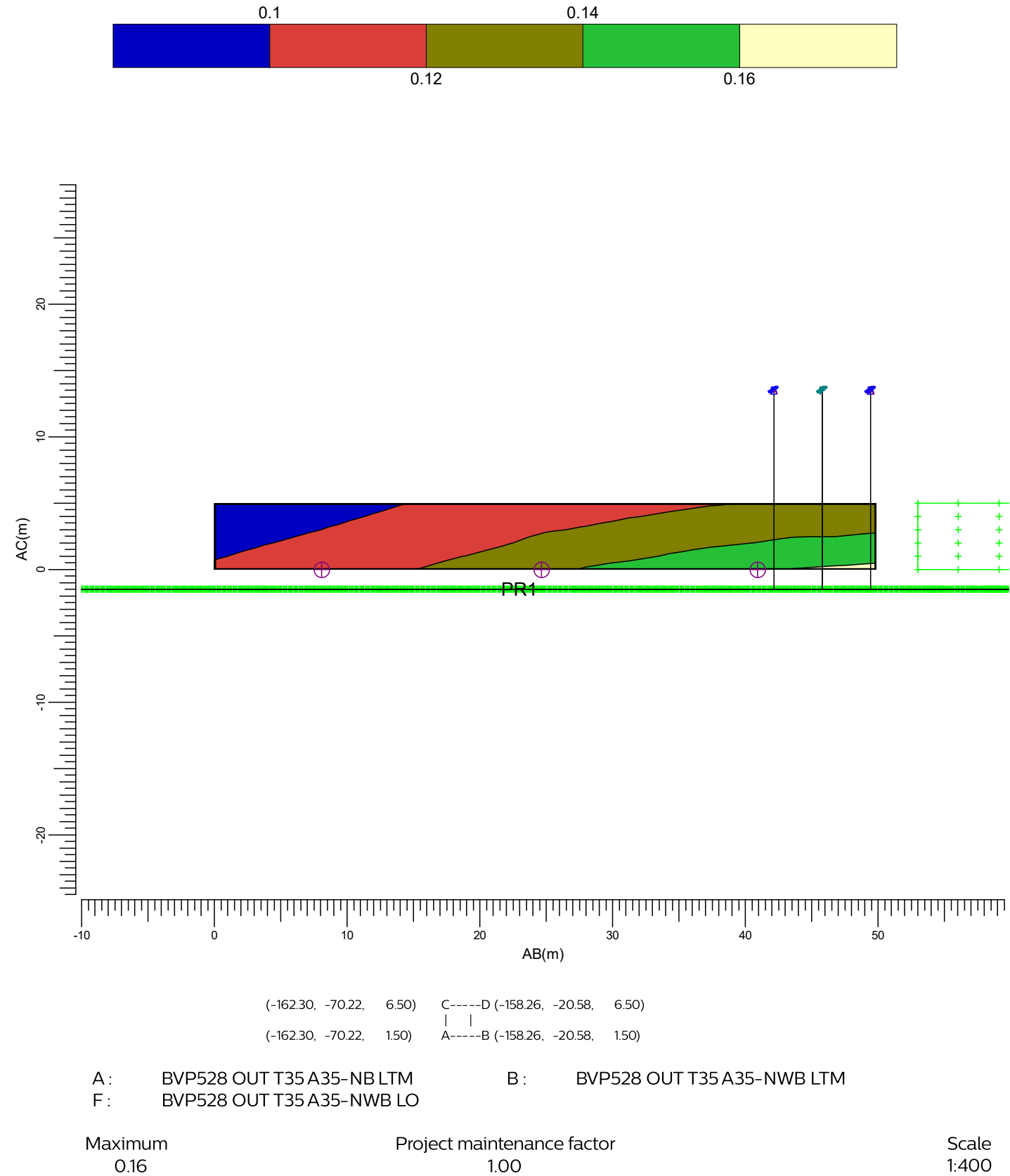
1:300

3.12 Ev Grid Bedford Rd PR1: Filled Iso Contour

Spillage

Grid : Ev Grid Bedford Rd PR1

Calculation : Surface Illuminance (lux)

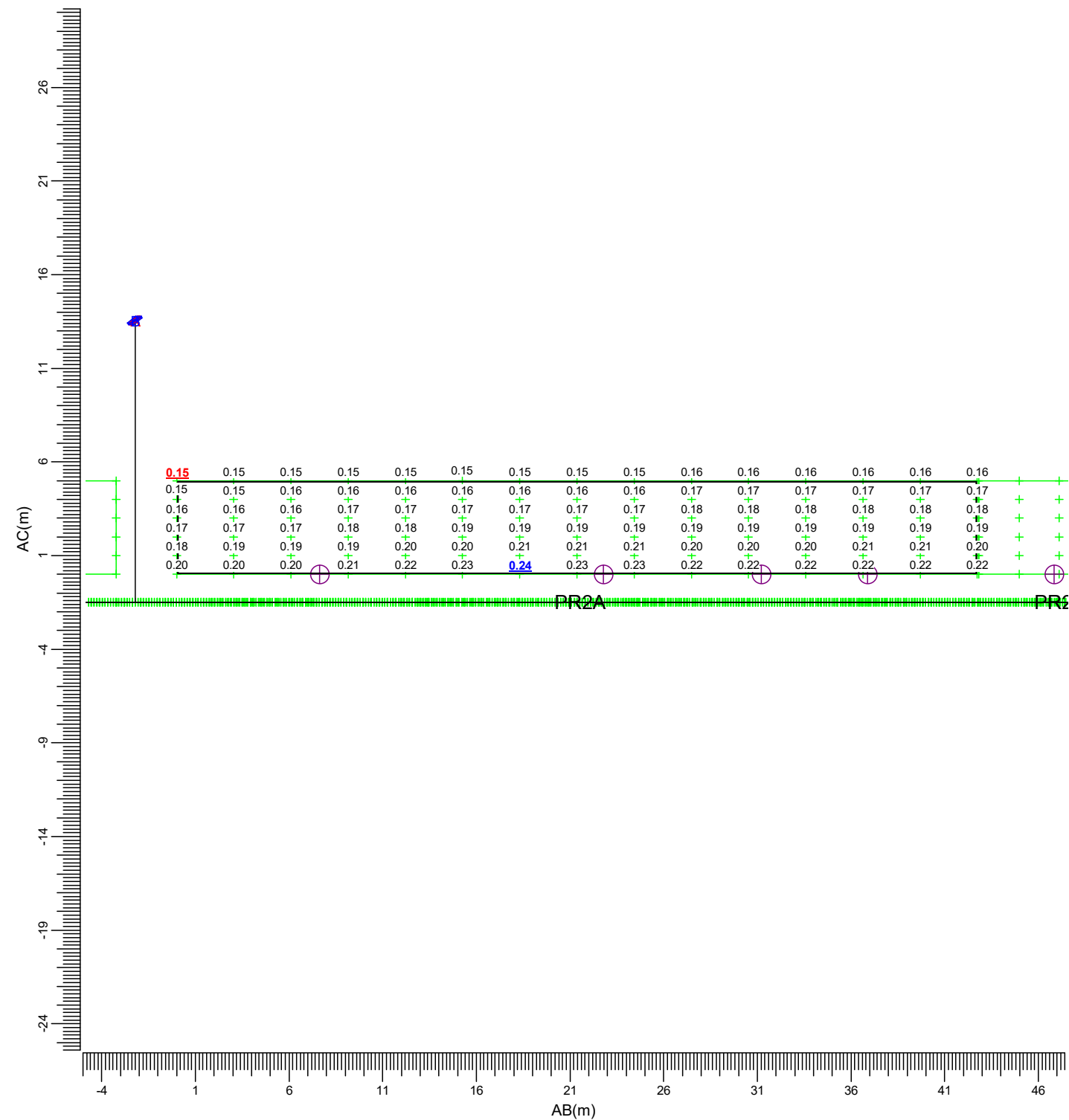


3.13 Ev Grid Bedford Rd PR2A: Graphical Table

Spillage

Grid : Ev Grid Bedford Rd PR2A

Calculation : Surface Illuminance (lux)



(-150.50, -18.02, 6.50) C-----D (-146.74, 24.56, 6.50)

(-150.50, -18.02, 1.50) A-----B (-146.74, 24.56, 1.50)

A : BVP528 OUT T35 A35-NB LTM

F : BVP528 OUT T35 A35-NWB LO

B : BVP528 OUT T35 A35-NWB LTM

Maximum 0.24

Project maintenance factor 1.00

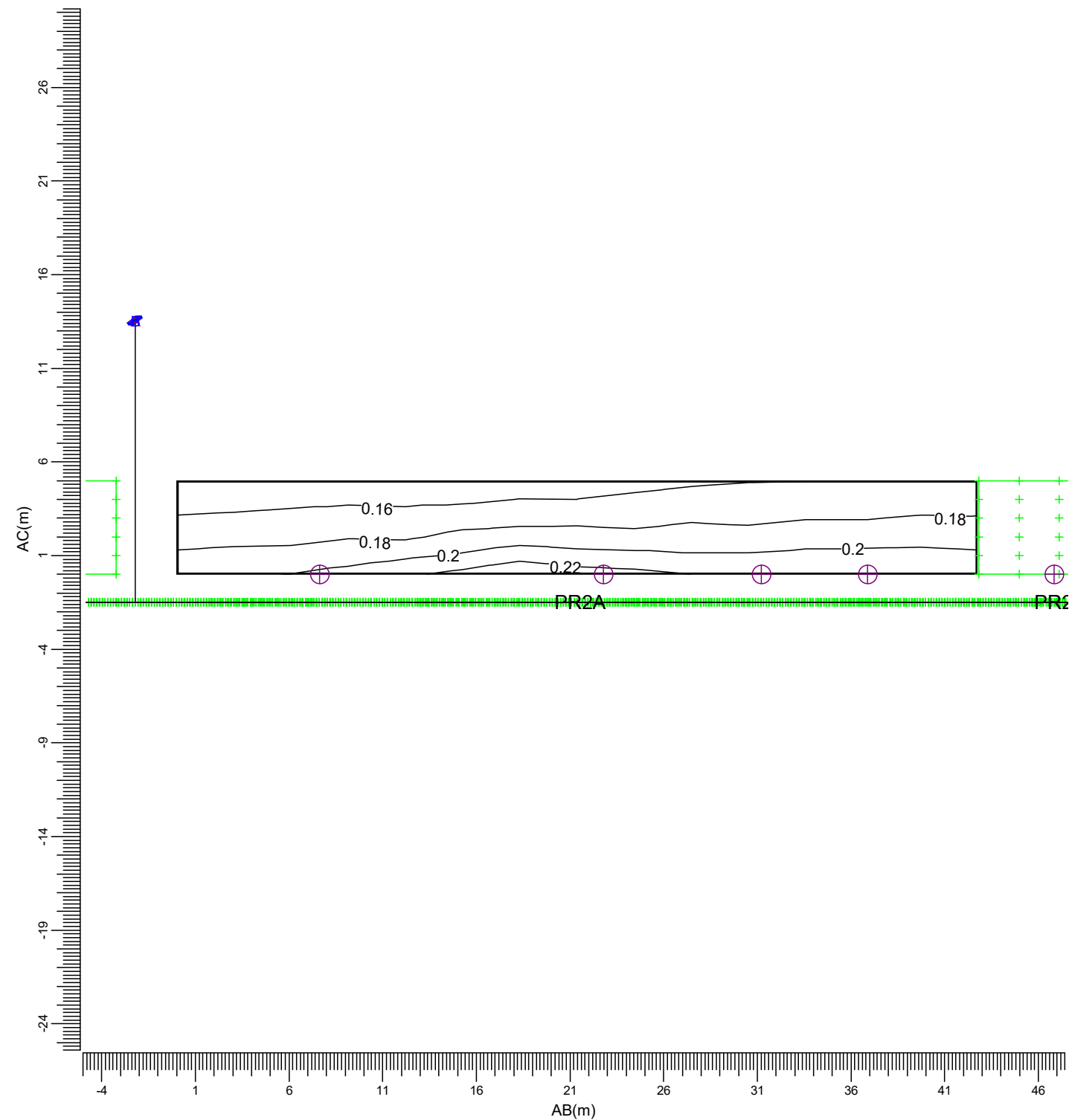
Scale 1:300

3.14 Ev Grid Bedford Rd PR2A: Iso Contour

Spillage

Grid : Ev Grid Bedford Rd PR2A

Calculation : Surface Illuminance (lux)



(-150.50, -18.02, 6.50) C-----D (-146.74, 24.56, 6.50)

(-150.50, -18.02, 1.50) A-----B (-146.74, 24.56, 1.50)

A : BVP528 OUT T35 A35-NB LTM

F : BVP528 OUT T35 A35-NWB LO

B : BVP528 OUT T35 A35-NWB LTM

Maximum0.24

Project maintenance factor1.00

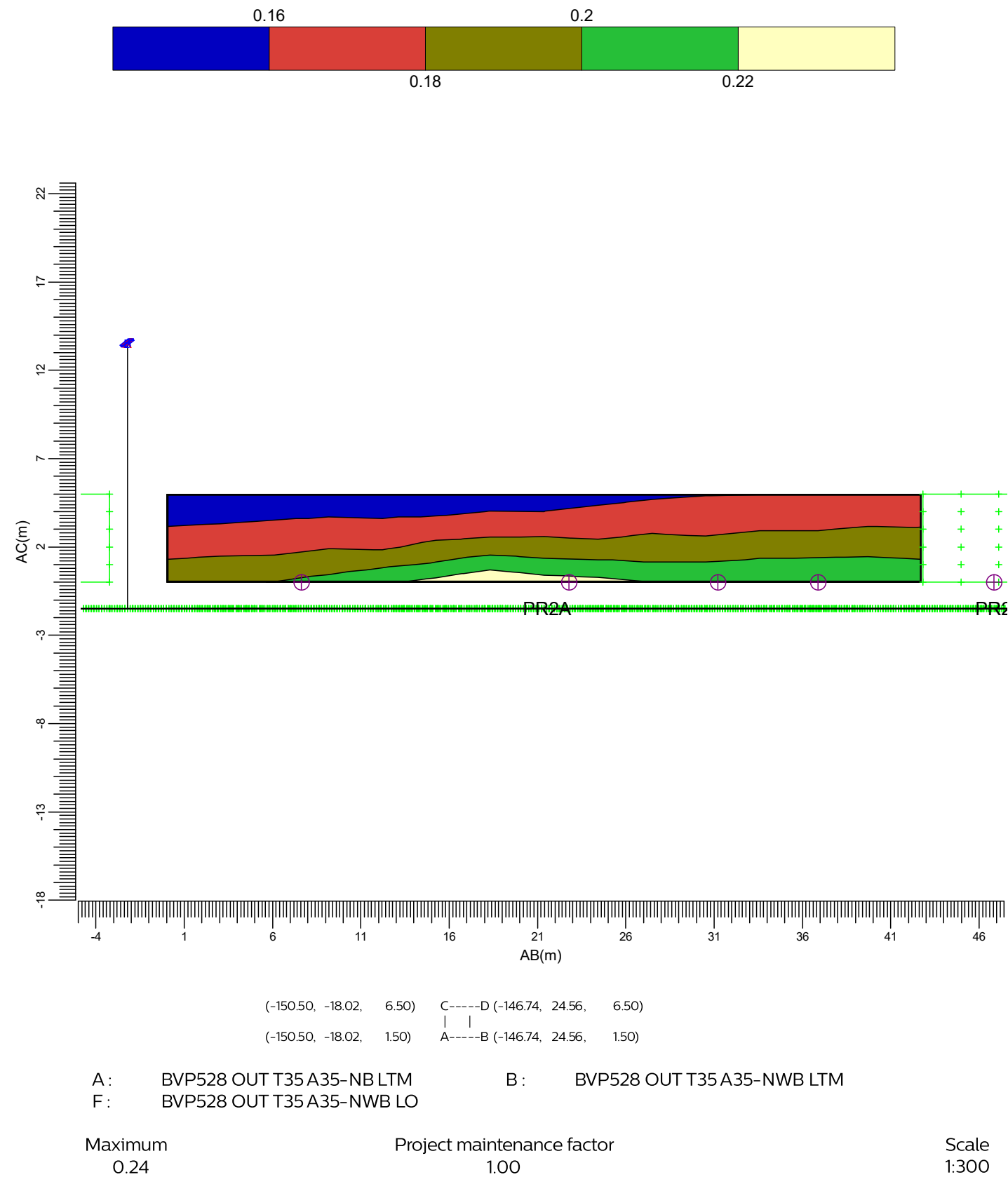
Scale1:300

3.15 Ev Grid Bedford Rd PR2A: Filled Iso Contour

Spillage

Grid : Ev Grid Bedford Rd PR2A

Calculation : Surface Illuminance (lux)

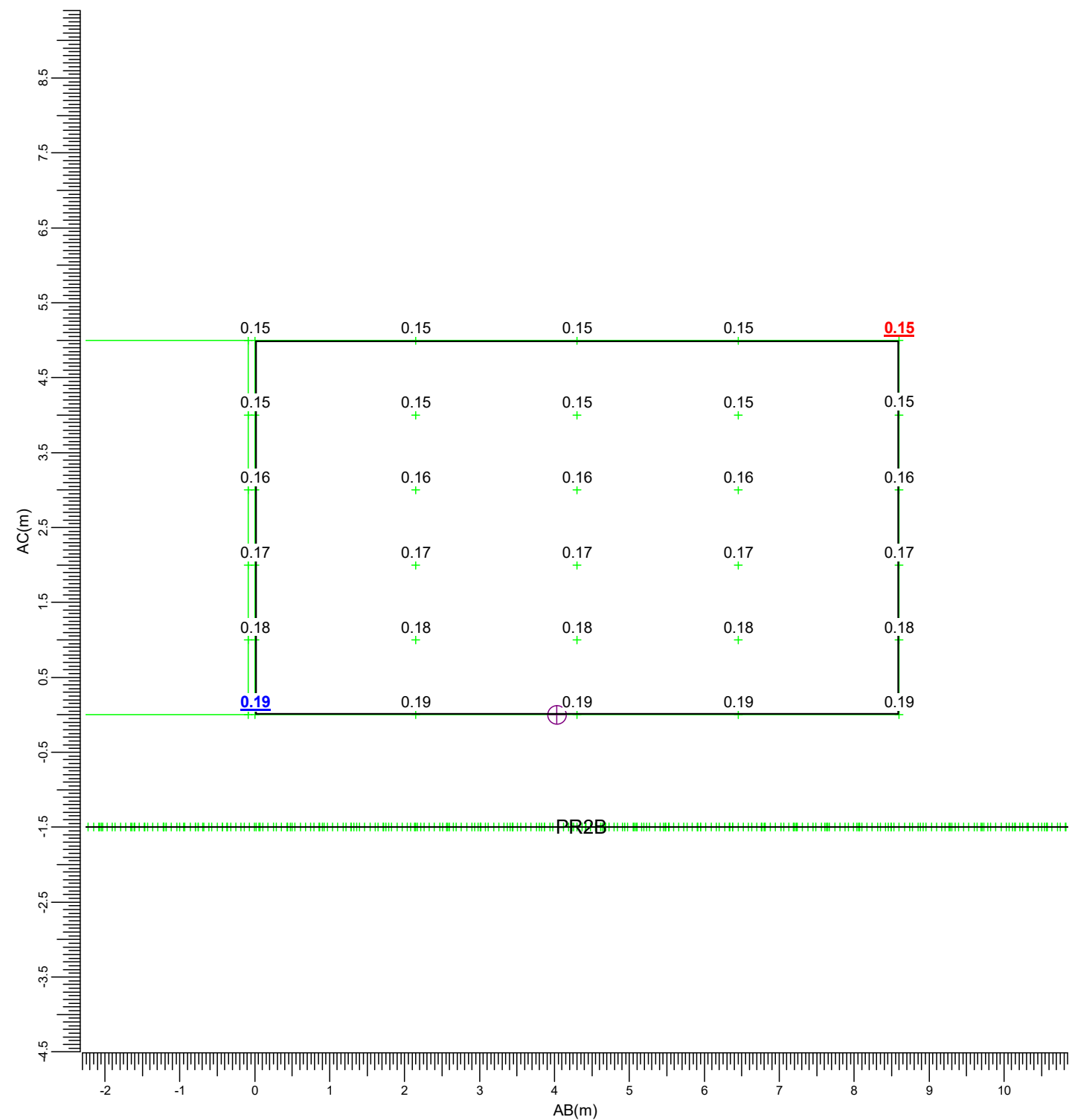


3.16 Ev Grid Bedford Rd PR2B: Graphical Table

Spillage

Grid : Ev Grid Bedford Rd PR2B

Calculation : Surface Illuminance (lux)



(-151.83, 25.09, 6.50) C-----D (-151.09, 33.66, 6.50)

(-151.83, 25.09, 1.50) A-----B (-151.09, 33.66, 1.50)

A : BVP528 OUT T35 A35-NB LTM

F : BVP528 OUT T35 A35-NWB LO

B : BVP528 OUT T35 A35-NWB LTM

Maximum 0.19

Project maintenance factor 1.00

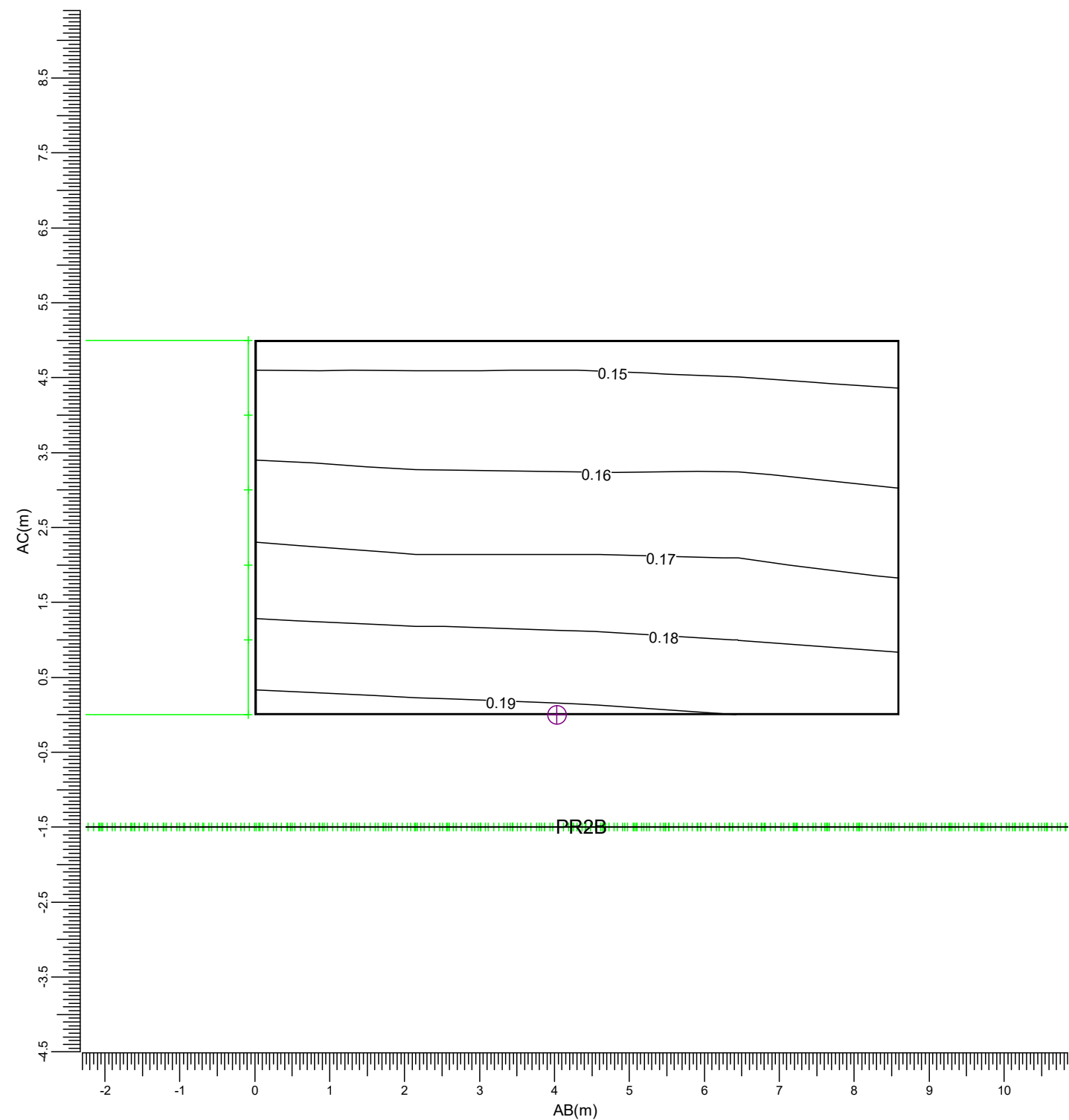
Scale 1:75

3.17 Ev Grid Bedford Rd PR2B: Iso Contour

Spillage

Grid : Ev Grid Bedford Rd PR2B

Calculation : Surface Illuminance (lux)



(-151.83, 25.09, 6.50) C-----D (-151.09, 33.66, 6.50)

(-151.83, 25.09, 1.50) A-----B (-151.09, 33.66, 1.50)

A : BVP528 OUT T35 A35-NB LTM

F : BVP528 OUT T35 A35-NWB LO

B : BVP528 OUT T35 A35-NWB LTM

Maximum0.19

Project maintenance factor1.00

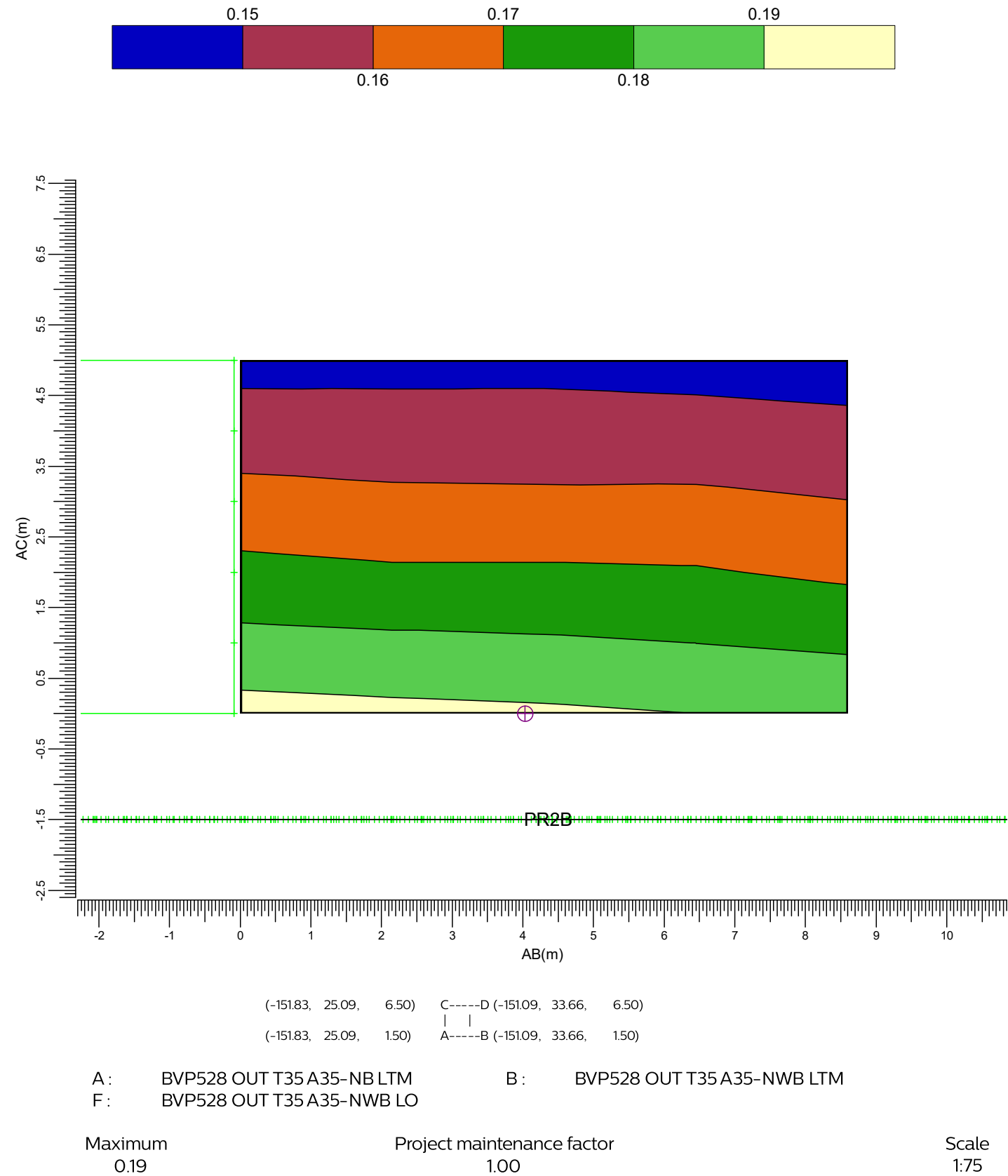
Scale1:75

3.18 Ev Grid Bedford Rd PR2B: Filled Iso Contour

Spillage

Grid : Ev Grid Bedford Rd PR2B

Calculation : Surface Illuminance (lux)

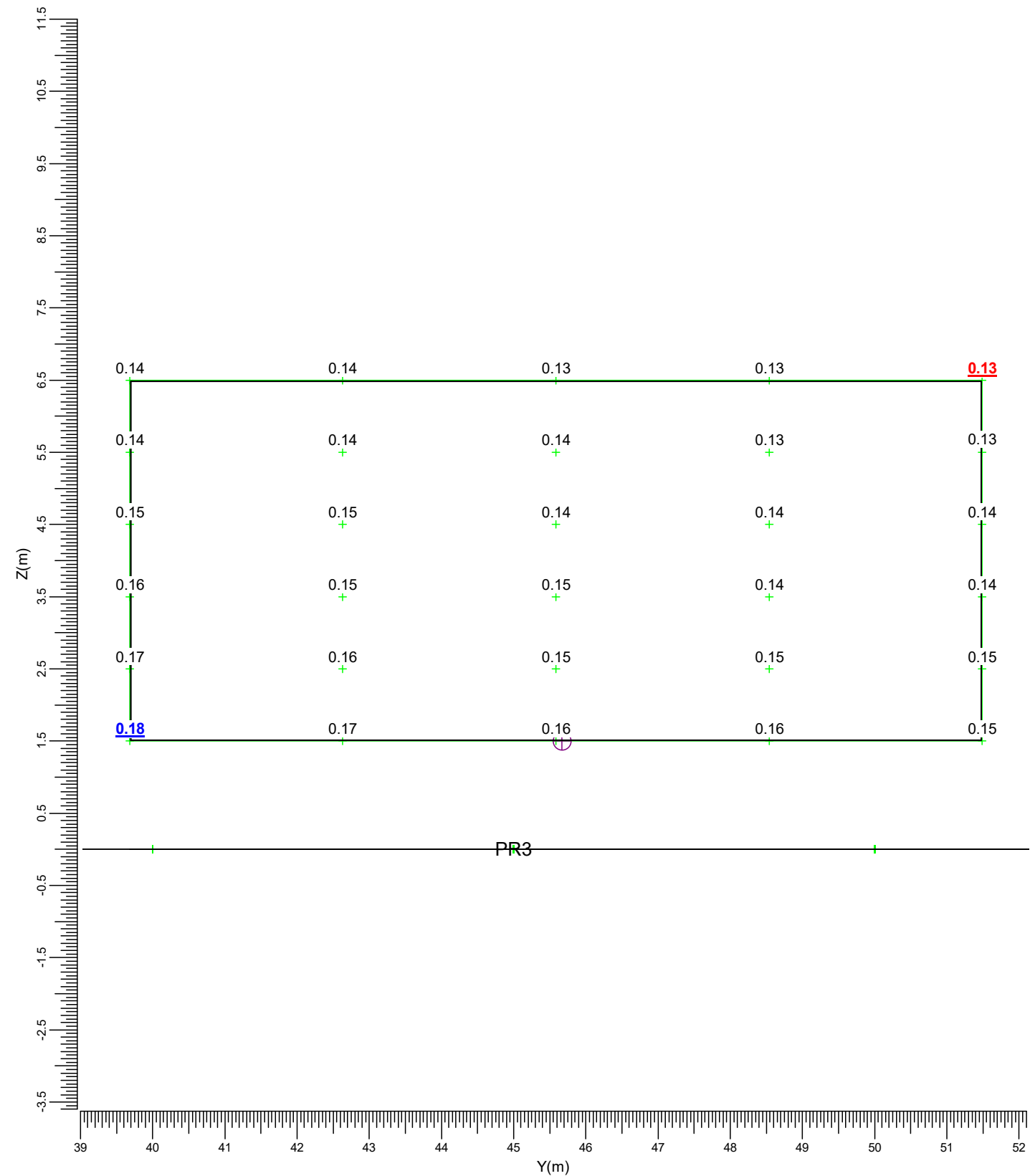


3.19 Ev Grid Bedford Rd PR3: Graphical Table

Spillage

Grid : Ev Grid Bedford Rd PR3 at X = -149.87 m

Calculation : Surface Illuminance (lux)



A : BVP528 OUT T35 A35-NB LTM

B : BVP528 OUT T35 A35-NWB LTM

F : BVP528 OUT T35 A35-NWB LO

Maximum
0.18

Project maintenance factor
1.00

Scale
1:75

3.20 Ev Grid Bedford Rd PR3: Iso Contour

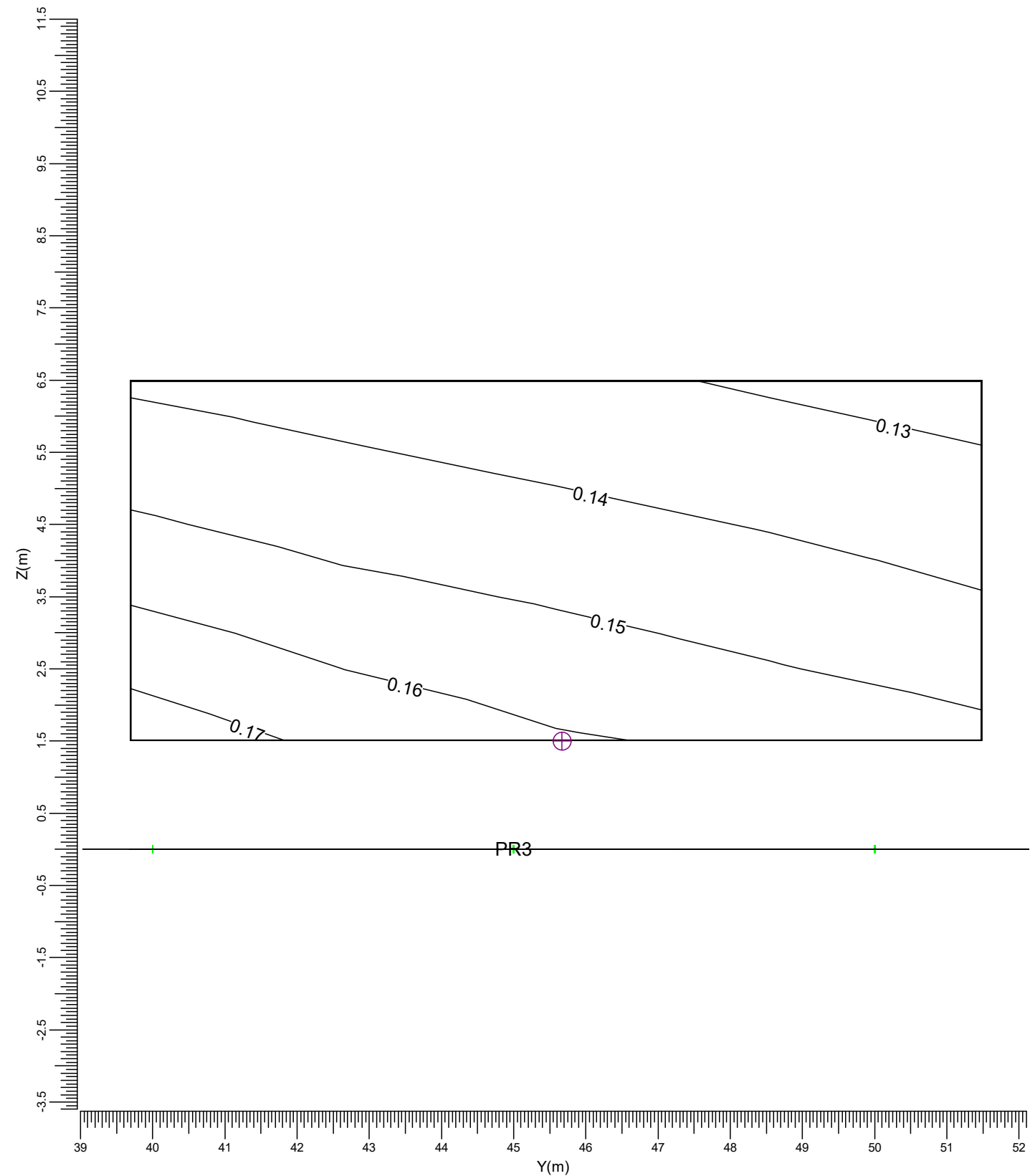
Spillage

Grid

Calculation

: Ev Grid Bedford Rd PR3 at X = -149.87 m

: Surface Illuminance (lux)



A : BVP528 OUT T35 A35-NB LTM

F : BVP528 OUT T35 A35-NWB LO

B : BVP528 OUT T35 A35-NWB LTM

Maximum

0.18

Project maintenance factor

1.00

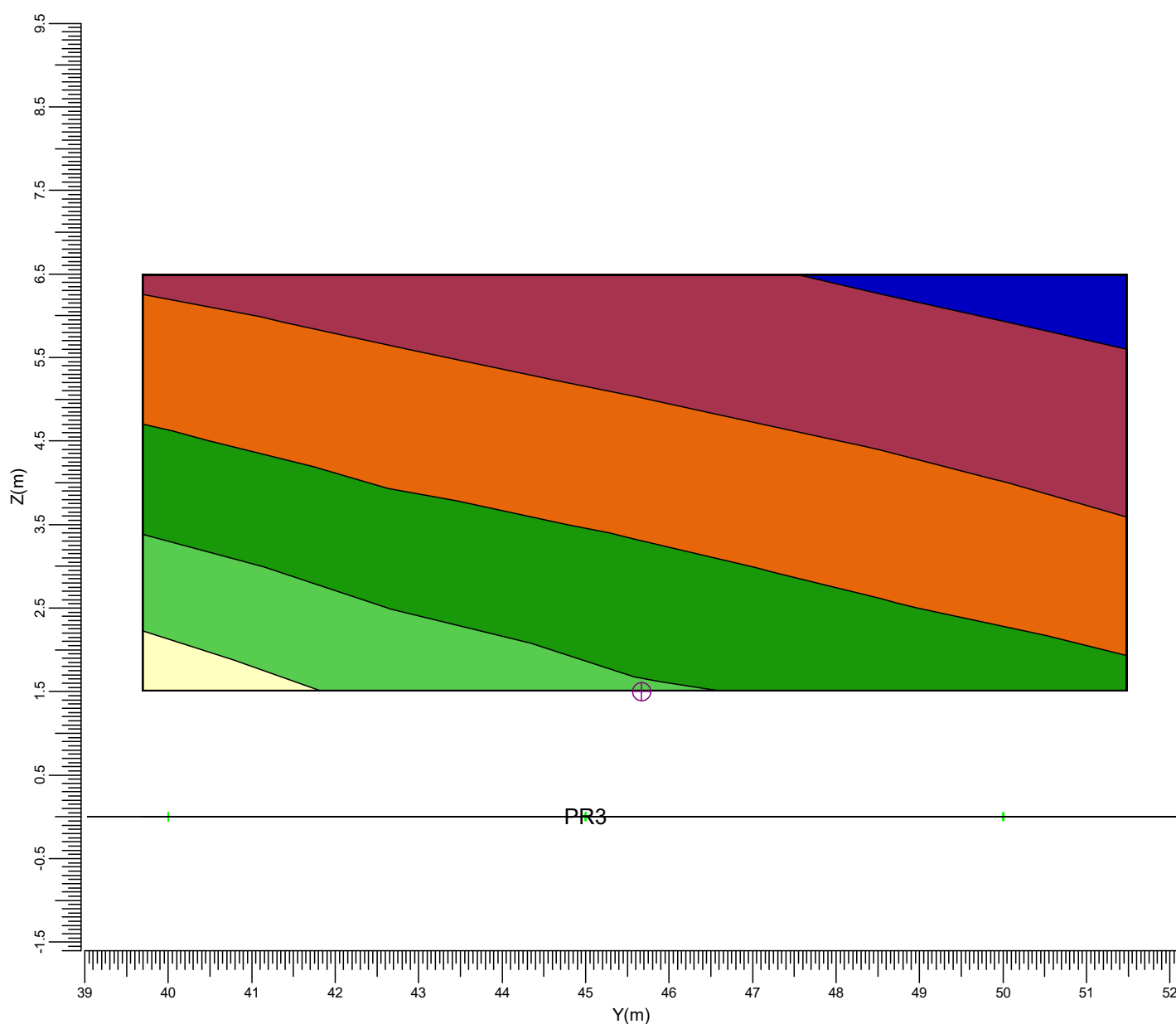
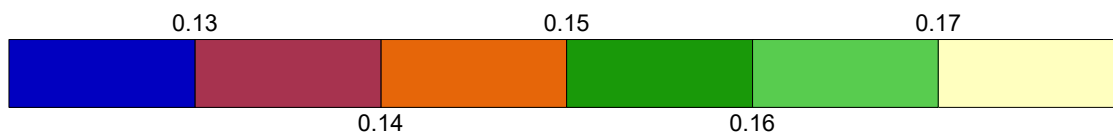
Scale

1:75

3.21 Ev Grid Bedford Rd PR3: Filled Iso Contour

Spillage

Grid : Ev Grid Bedford Rd PR3 at X = -149.87 m
 Calculation : Surface Illuminance (lux)



A : BVP528 OUT T35 A35-NB LTM
 F : BVP528 OUT T35 A35-NWB LO

B : BVP528 OUT T35 A35-NWB LTM

Maximum
0.18

Project maintenance factor
1.00

Scale
1:75

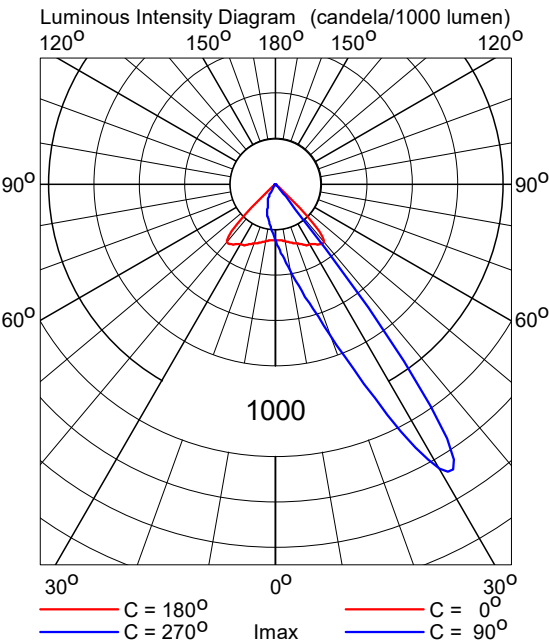
4. Luminaire Details

4.1 Project Luminaires

OptiVision LED gen3.5 2022
BVP528 OUT T35 1xLED2590-4S/740/740 E3/D4I A35-NB LTM

Light output ratios	
DLOR	: 0.71
ULOR	: 0.00
TLOR	: 0.71
Ballast	: E3/D4I
Lamp flux	: 259000 lm
Luminaire wattage	: 1505.9 W
Measurement code	: LVM2047600

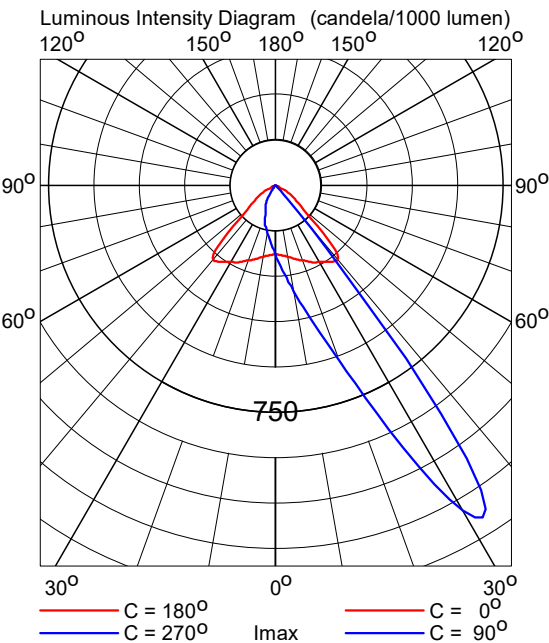
Note: Luminaire data not from database.



OptiVision LED gen3.5 2022
BVP528 OUT T35 1xLED2590-4S/740/740 E3/D4I A35-NWB LTM

Light output ratios	
DLOR	: 0.71
ULOR	: 0.00
TLOR	: 0.71
Ballast	: E3/D4I
Lamp flux	: 259000 lm
Luminaire wattage	: 1505.9 W
Measurement code	: LVM2J47600

Note: Luminaire data not from database.



OptiVision LED gen3.5 2022
BVP528 OUT T35 1xLED2590-4S/740/740 E3/D4I A35-NWB LO

Light output ratios	
DLOR	: 0.61
ULOR	: 0.00
TLOR	: 0.61
Ballast	: E3/D4I
Lamp flux	: 259000 lm
Luminaire wattage	: 1505.9 W
Measurement code	: LVM2J47300

Note: Luminaire data not from database.

