Trowbridge FC

LED Floodlighting 200lux

Project code: 400421108
Date: 01-09-2023

Designer: Andrew Poplett

Description:



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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Table of Contents

1. Project Description 3

1.1 Description 3
1.2 Top Project Overview 4

2. Summary 5

2.1 Observer Information 5
2.2 Project Luminaires 5
2.3 Calculation Results 5

3. Calculation Results 7

3.1 Football: Graphical Table 7
3.2 Eh Spill @ 0.0m: Graphical Table 8
3.3 Eh Spill @ 0.0m: Iso Contour 9
3.4 Eh Spill @ 0.0m: Filled Iso Contour 10
3.5 Eh Spill @ 1.5m: Graphical Table 11
3.6 Eh Spill @ 1.5m: Iso Contour 12
3.7 Eh Spill @ 1.5m: Filled Iso Contour 13
3.8 Eh Spill @ 4.0m: Graphical Table 14
3.9 Eh Spill @ 4.0m: Iso Contour 15
3.10 Eh Spill @ 4.0m: Filled Iso Contour 16
3.11 Ev West Hedge: Graphical Table 17
3.12 Ev West Hedge: Iso Contour 18
3.13 Ev West Hedge: Filled Iso Contour 19
3.14 Ev North Hedge: Graphical Table 20
3.15 Ev North Hedge: Iso Contour 21
3.16 Ev North Hedge: Filled Iso Contour 22
3.17 Ev Hse 1: Graphical Table 23
3.18 Ev Hse 1: Iso Contour 24
3.19 Ev Hse 2: Graphical Table 25
3.20 Ev Hse 2: Iso Contour 26
3.21 Ev Hse 3: Graphical Table 27
3.22 Ev Hse 3: Iso Contour 28
3.23 Ev Hse 4: Graphical Table 29
3.24 Ev Hse 4: Iso Contour 30
3.25 Ev Hse 5: Graphical Table 31
3.26 Ev Hse 5: Iso Contour 32
3.27 Ev Hse 6: Graphical Table 33
3.28 Ev Hse 6: Iso Contour 34
3.29 Ev Hse 7: Graphical Table 35
3.30 Ev Hse 7: Iso Contour 36
3.31 Ev Hse 8: Graphical Table 37
3.32 Ev Hse 8: Iso Contour 38

4. Luminaire Details 39

4.1 Project Luminaires 39

5. Installation Data 40

5.1 Legends 40
5.2 Luminaire Positioning and Orientation 40

1. Project Description

1.1 Description

Maintenance Factor:- 0.90

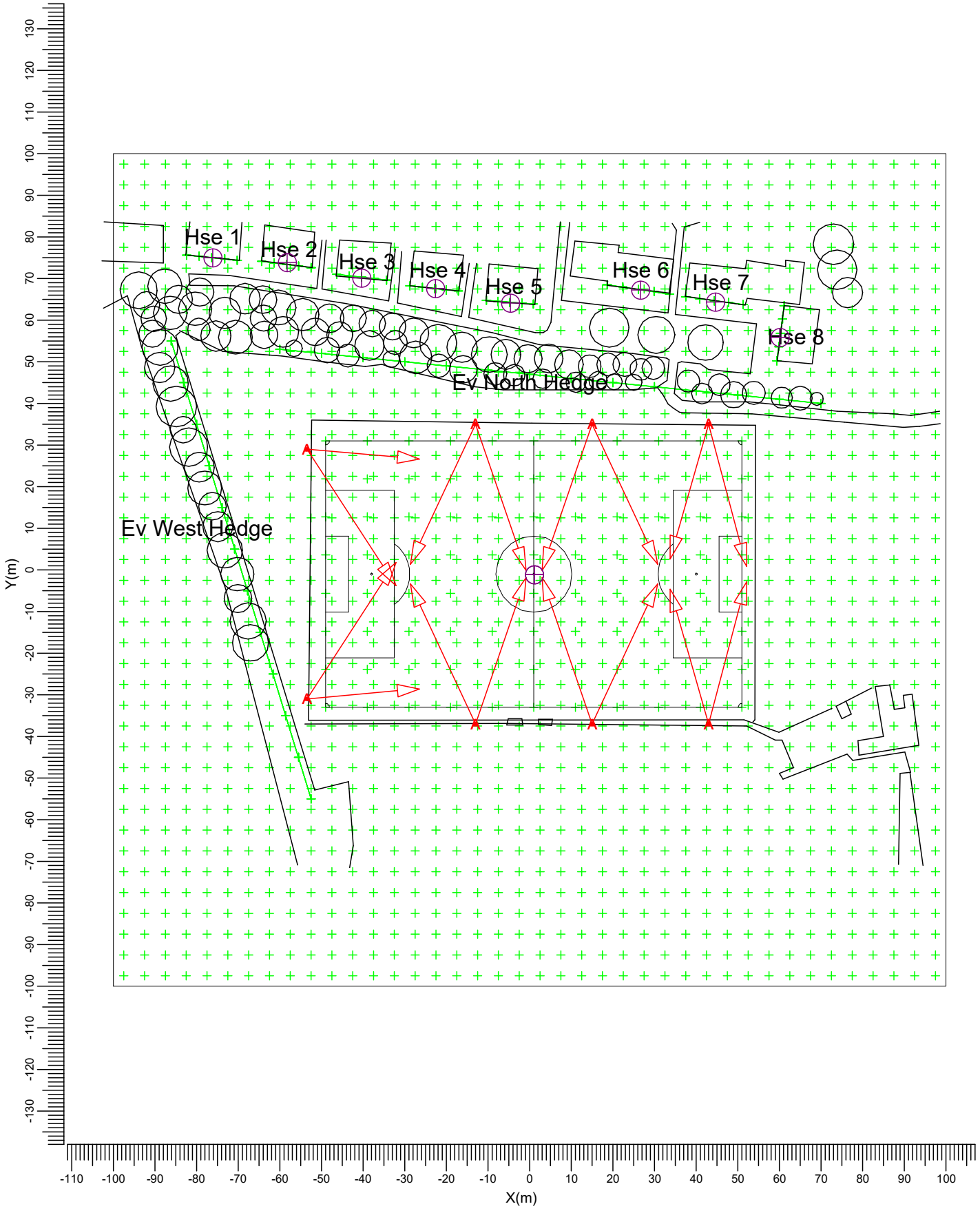
Pitch 100m x 64m

The design has been completed using the Philips Asymmetric OptiVision LED GEN 3.5 Floodlights. A total of 16no have been used to achieve an average of 200lux.

Floodlights are mounted on 8 x 15 metre columns - Columns set back 4m

All Floodlights fitted with LO (full cut off) integral louvres.

1.2 Top Project Overview



Scale
1:1250

2. Summary

2.1 Observer Information

Code	Observer	Position		
		X (m)	Y (m)	Z (m)
Aa	Hse 1	-76.18	74.95	1.50
Bb	Hse 2	-58.34	73.88	1.50
Cc	Hse 3	-40.39	70.12	1.50
Dd	Hse 4	-22.66	67.65	1.50
Ee	Hse 5	-4.71	64.18	1.50
Ff	Hse 6	26.59	67.21	1.50
Gg	Hse 7	44.65	64.40	1.50
Hh	Hse 8	60.14	55.87	1.50

2.2 Project Luminaires

Code	Qty	Luminaire Type	Lamp Type	Power (W)	Flux (lm)
A	16	BVP528 OUT T45 A35-NB LO	1 * LED2300-4S/740	1303.1	1 * 230000

The total installed power: 20.85 (kWatt)

Number of Luminaires Per Switching Mode:

Switching Mode	Luminaire Code	Power (kWatt)
	A	
Performance	16	20.85
Obtrusive Light	16	20.85

Number of Luminaires Per Arrangement:

Arrangement	Luminaire Code	Power (kWatt)
	A	
Centre Columns	8	10.42
East End columns	4	5.21
West End Columns	4	5.21

2.3 Calculation Results

Switching Modes:

Code	Switching Mode	Maintenance factor
1	Performance	0.90
2	Obtrusive Light	1.00

(Il)luminance Calculations:

Calculation	Switching Mode	Type	Unit	Ave	Min	Max	Min/Ave	Min/Max
Football	1	Surface Illuminance	lux	229	148		0.64	0.43
Eh Spill @ 0.0m	1	Horizontal Illuminance	lux					
Eh Spill @ 1.5m	1	Horizontal Illuminance	lux					

Calculation	Switching Mode	Type	Unit	Ave	Min	Max	Min/Ave	Min/Max
Eh Spill @ 4.0m	1	Horizontal Illuminance	lux					
Ev West Hedge	1	Surface Illuminance	lux			0.99		
Ev North Hedge	1	Surface Illuminance	lux			1.41		
Ev Hse 1	2	Surface Illuminance	lux			0.08		
Ev Hse 2	2	Surface Illuminance	lux			0.13		
Ev Hse 3	2	Surface Illuminance	lux			0.22		
Ev Hse 4	2	Surface Illuminance	lux			0.27		
Ev Hse 5	2	Surface Illuminance	lux			0.32		
Ev Hse 6	2	Surface Illuminance	lux			0.29		
Ev Hse 7	2	Surface Illuminance	lux			0.30		
Ev Hse 8	2	Surface Illuminance	lux			0.13		

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	Aa	A	-13.00	-37.00	15.00	115.00	68.00	0.00	560
1	Bb	A	-13.00	-37.00	15.00	115.00	68.00	0.00	575
1	Cc	A	-13.00	-37.00	15.00	115.00	68.00	0.00	578
1	Dd	A	15.00	-37.00	15.00	109.00	68.00	-0.00	584
1	Ee	A	-53.50	-31.00	15.00	57.00	69.00	0.00	608
1	Ff	A	-13.00	-37.00	15.00	71.00	68.00	0.00	591
1	Gg	A	-13.00	-37.00	15.00	71.00	68.00	0.00	577
1	Hh	A	15.00	-37.00	15.00	65.00	68.00	-0.00	601

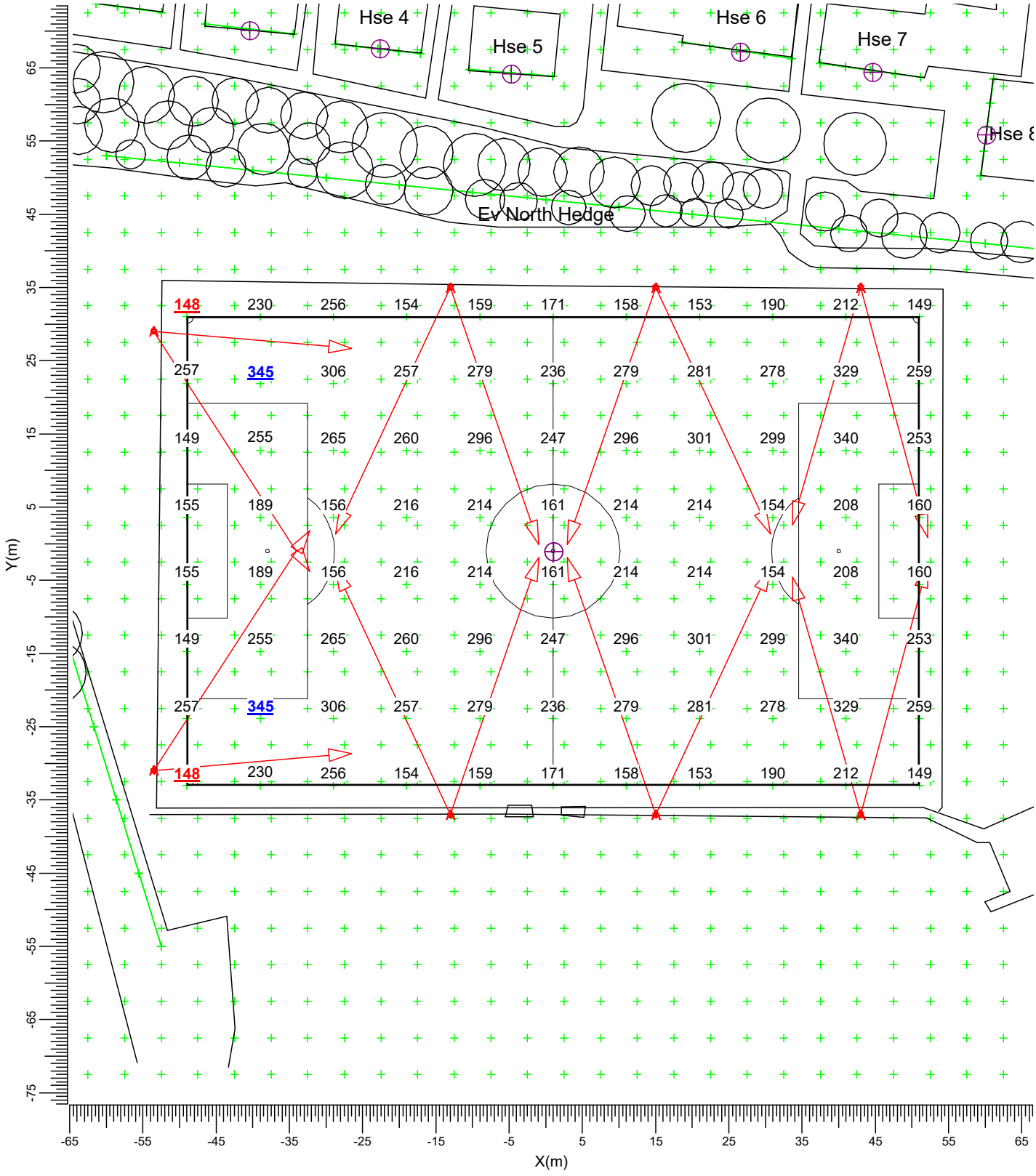
Switching Mode	ULR
1	0.00
2	0.00

3. Calculation Results

3.1 Football: Graphical Table

Performance

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



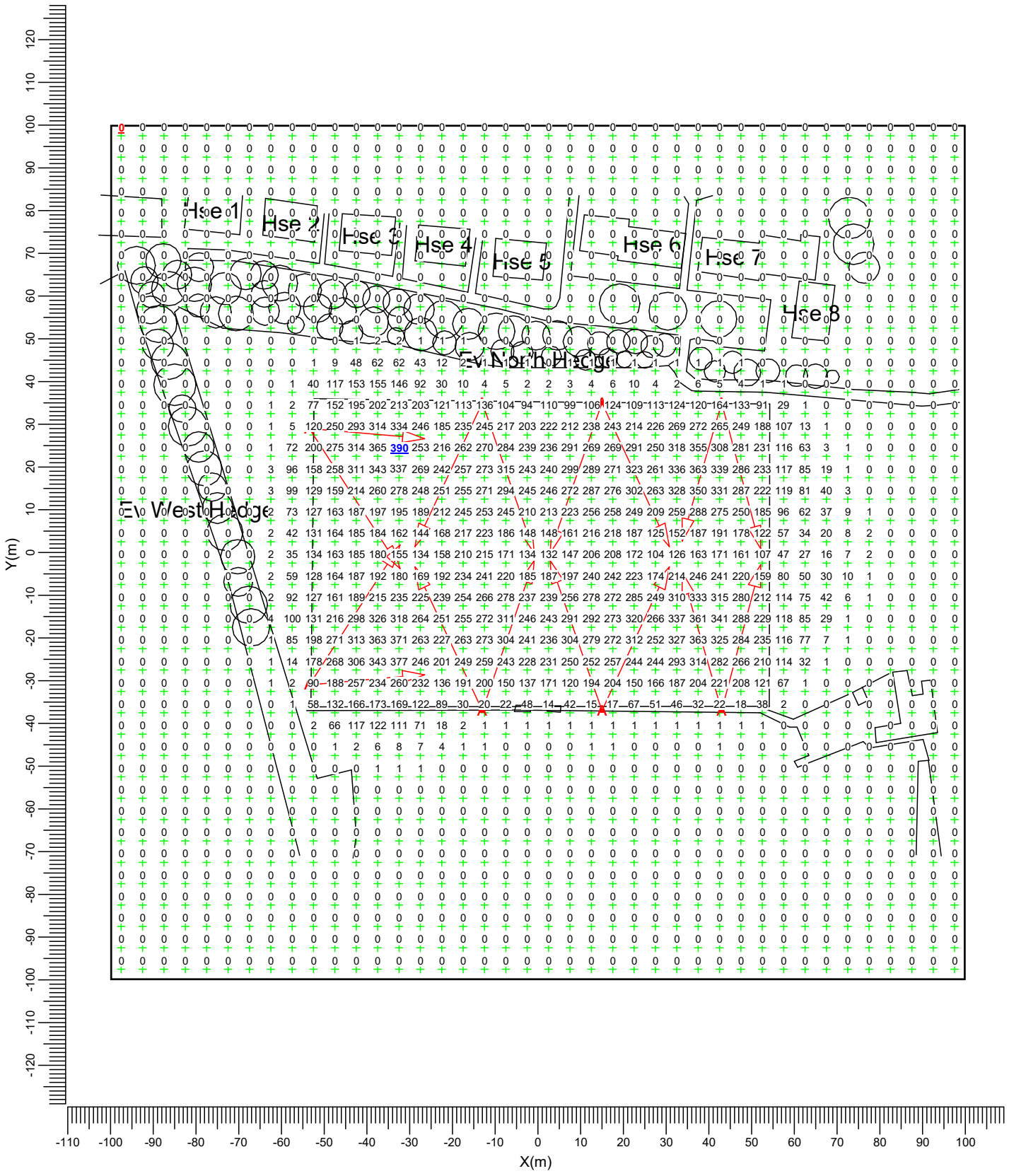
A BVP528 OUT T45 A35-NB LO

Average	Minimum	Min/Ave	Min/Max	Project maintenance factor	Scale
229	148	0.64	0.43	0.90	1:750

3.2 Eh Spill @ 0.0m: Graphical Table

Performance

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



A BVP528 OUT T45 A35-NB LO

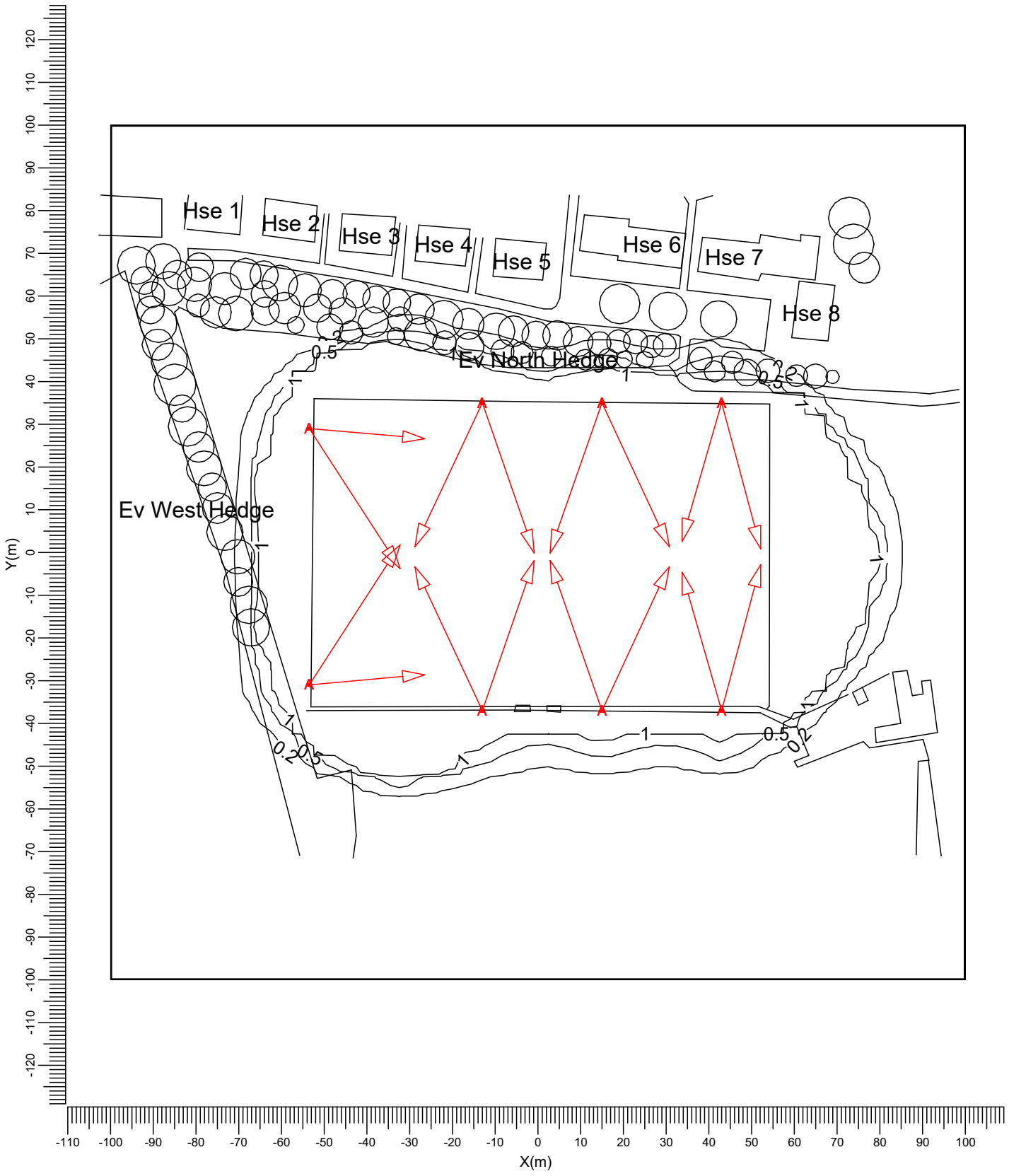
Project maintenance factor
0.90

Scale
1:1250

3.3 Eh Spill @ 0.0m: Iso Contour

Performance

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



A BVP528 OUT T45 A35-NB LO

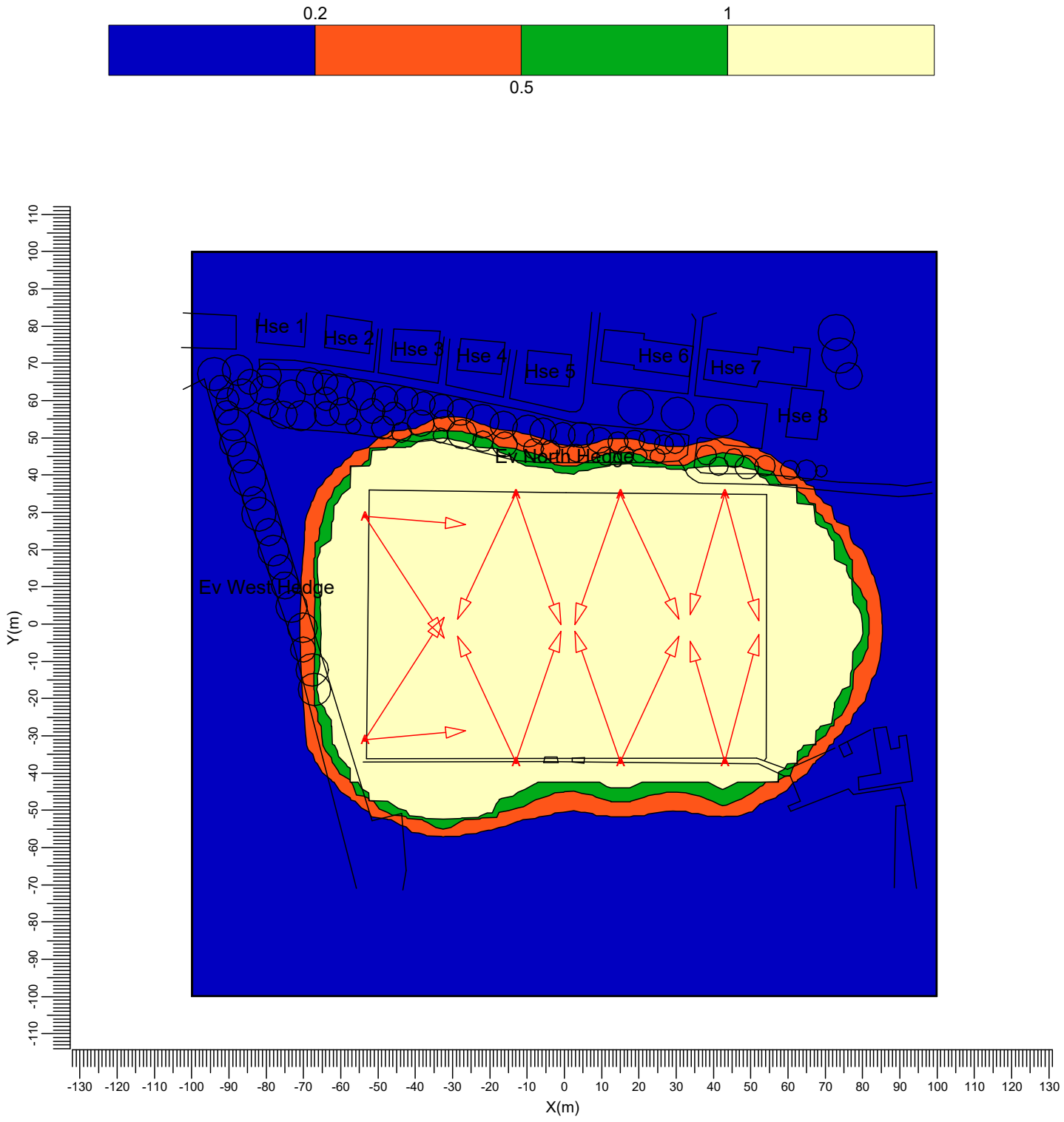
Project maintenance factor
0.90

Scale
1:1250

3.4 Eh Spill @ 0.0m: Filled Iso Contour

Performance

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



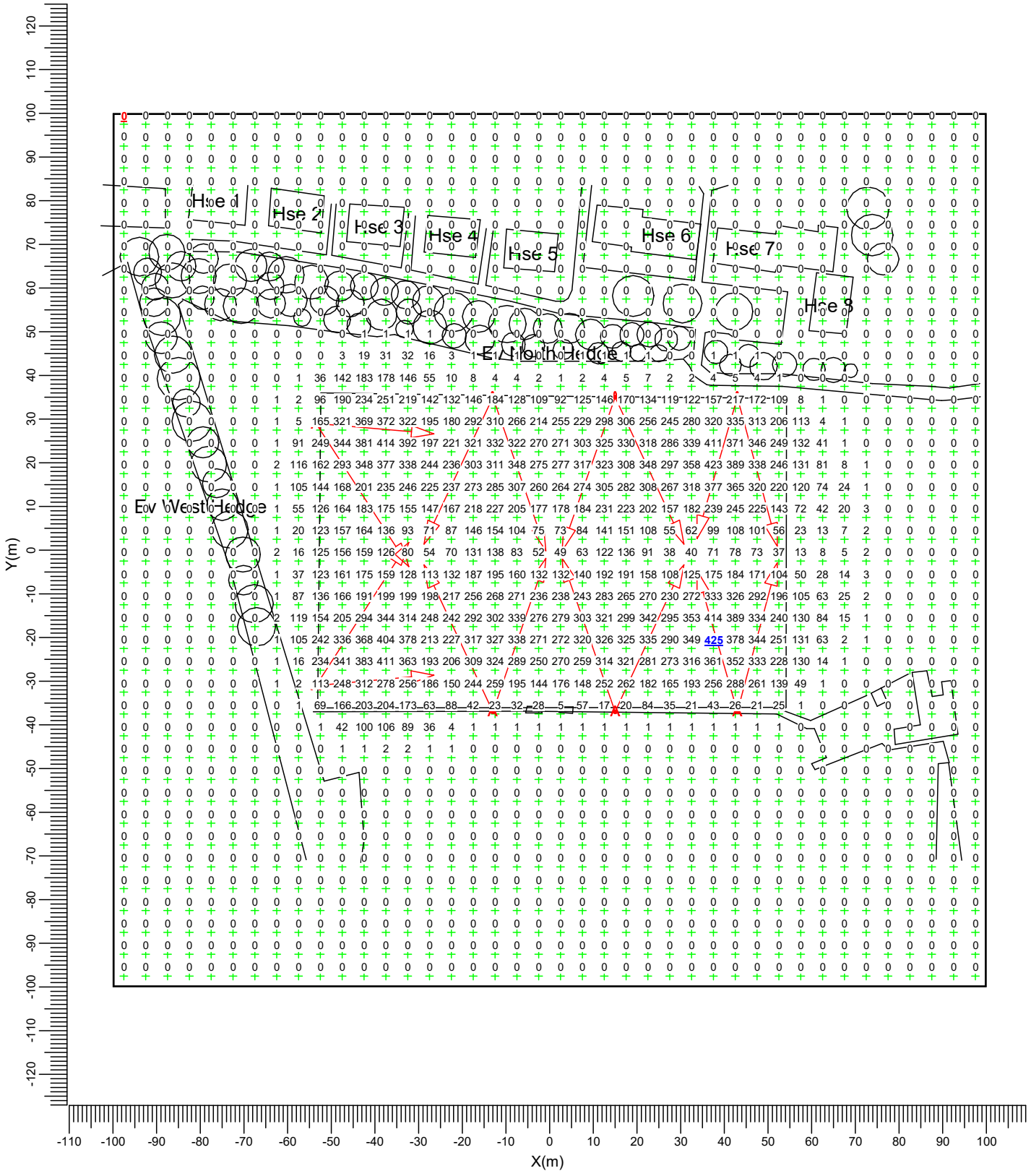
Project maintenance factor
0.90

Scale
1:1500

3.5 Eh Spill @ 1.5m: Graphical Table

Performance

Grid : Spill Grid at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)
Height above grid : 1.50 m



A → BVP528 OUT T45 A35-NB LO

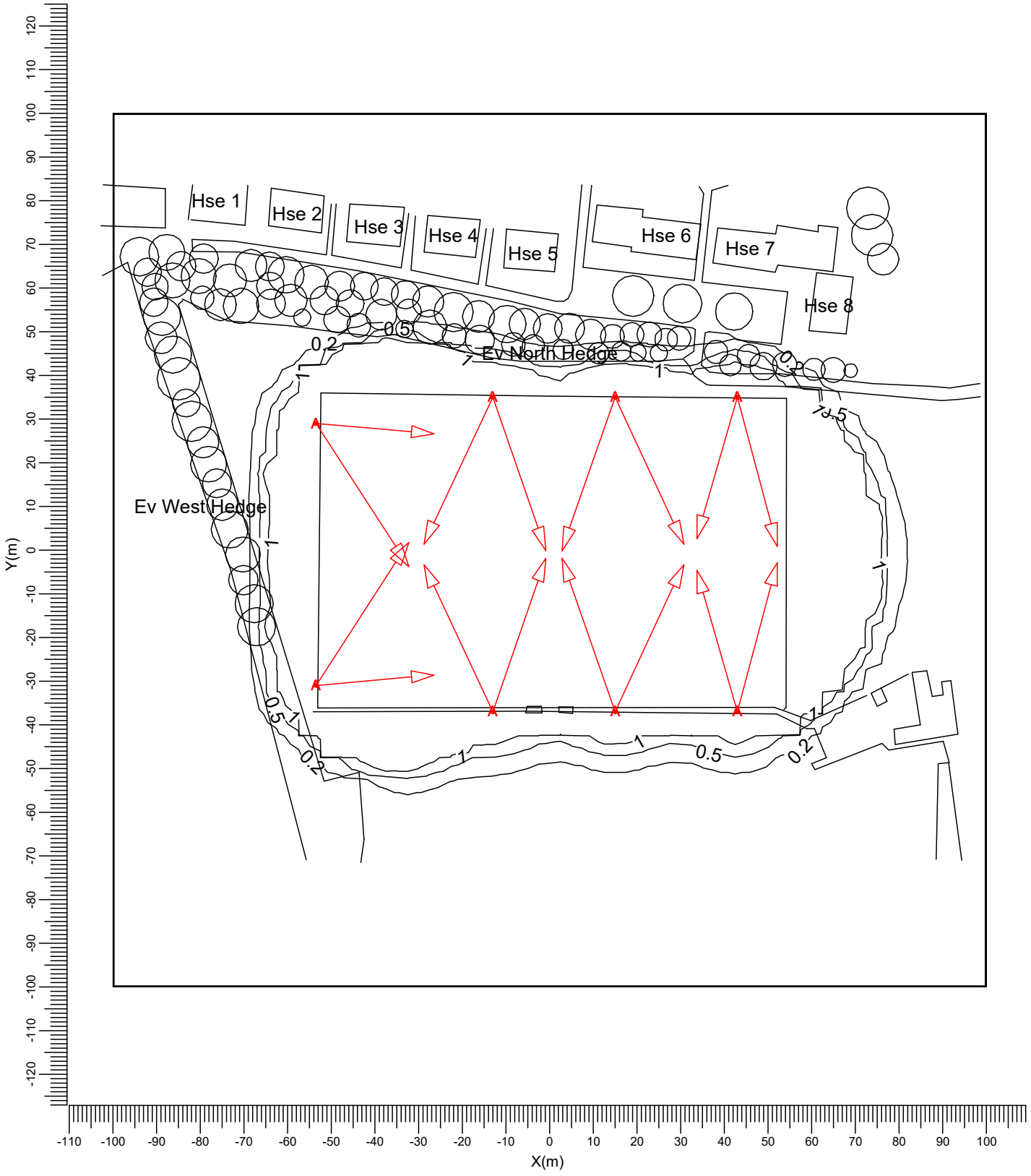
Project maintenance factor
0.90

Scale
1:1250

3.6 Eh Spill @ 1.5m: Iso Contour

Performance

Grid : Spill Grid at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)
Height above grid : 1.50 m



A → BVP528 OUT T45 A35-NB LO

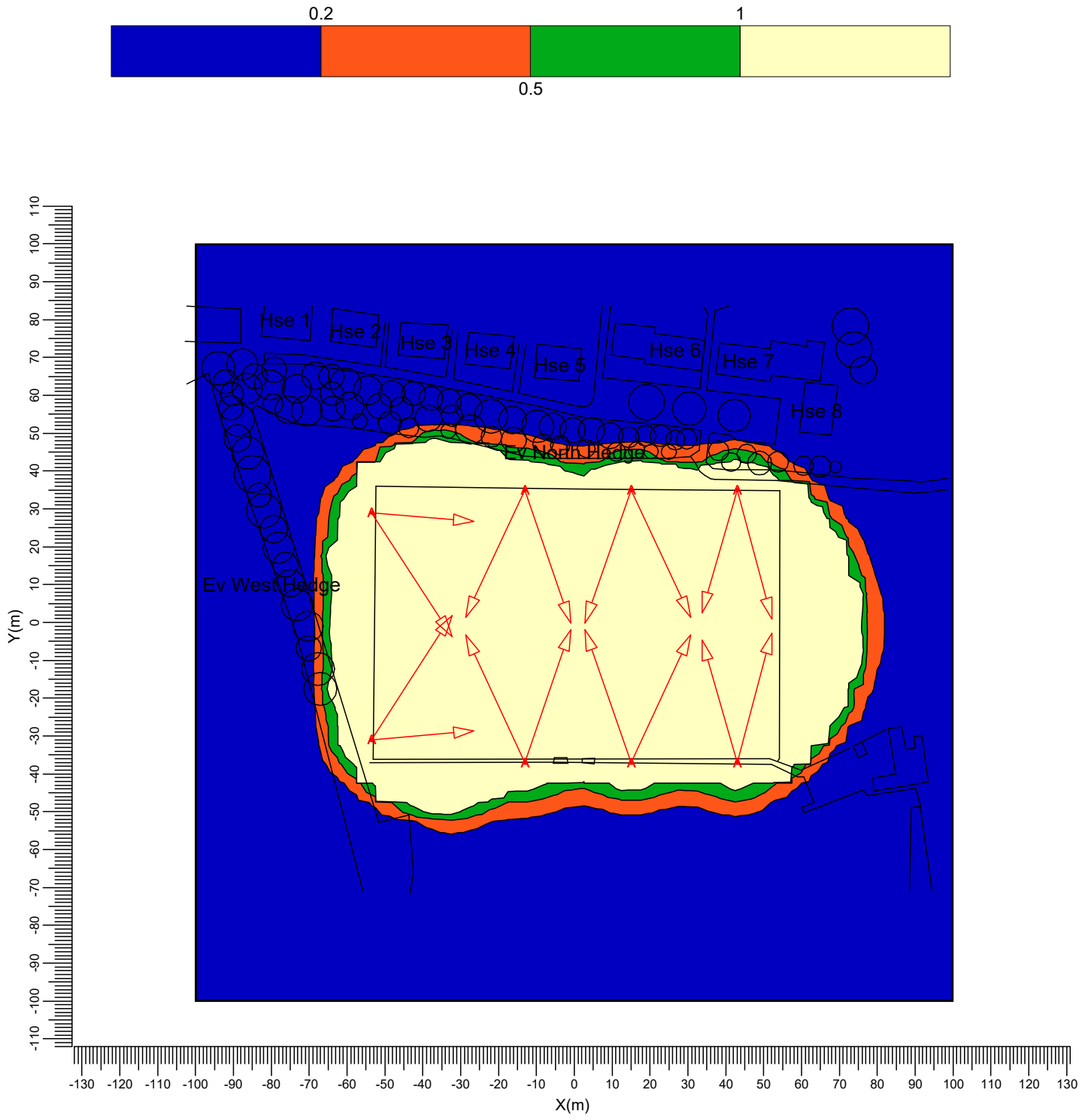
Project maintenance factor
0.90

Scale
1:1250

3.7 Eh Spill @ 1.5m: Filled Iso Contour

Performance

Grid : Spill Grid at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)
Height above grid : 1.50 m



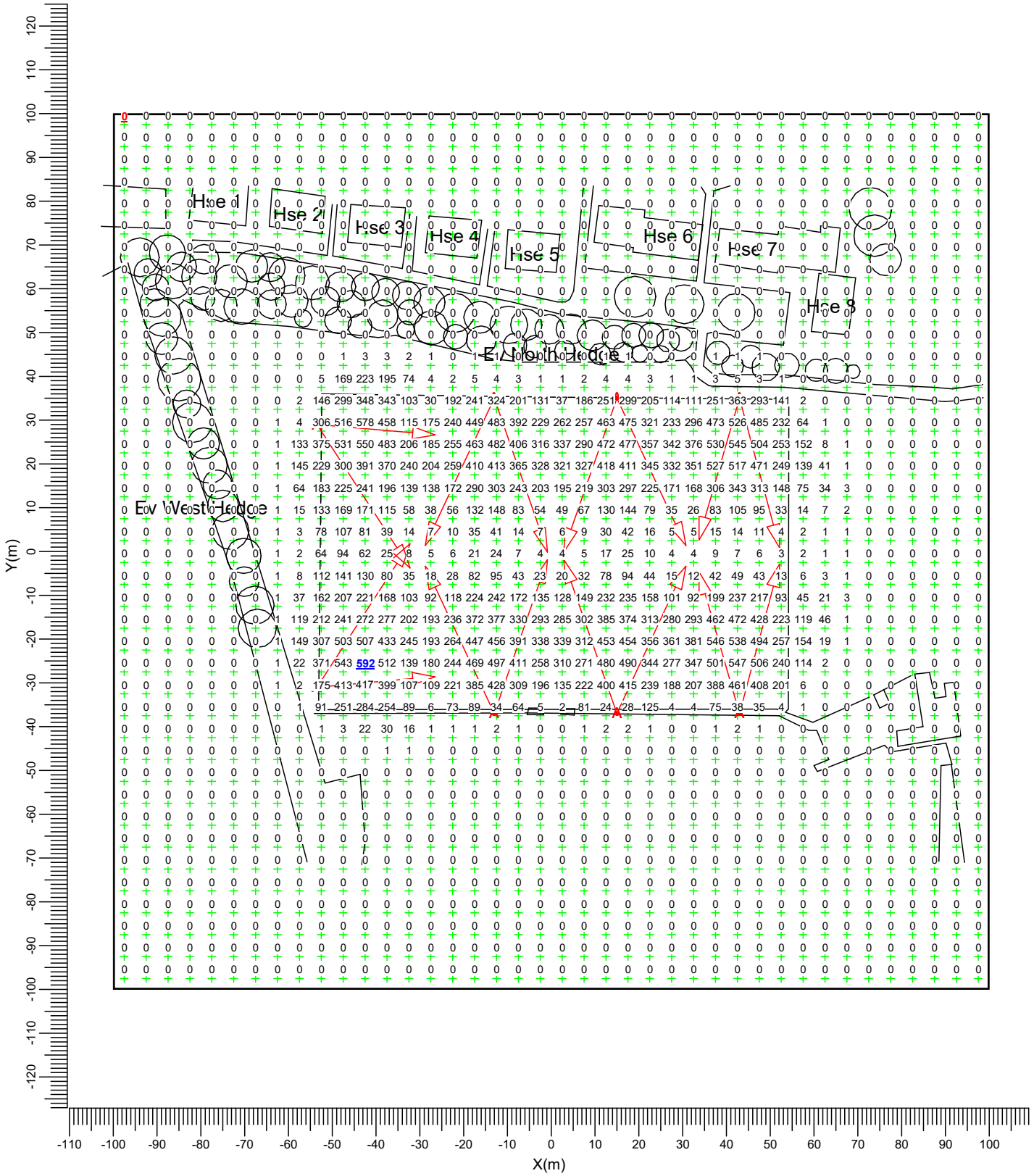
Project maintenance factor
0.90

Scale
1:1500

3.8 Eh Spill @ 4.0m: Graphical Table

Performance

Grid	:	Spill Grid at Z = -0.00 m
Calculation	:	Horizontal Illuminance (lux)
Height above grid	:	4.00 m



A → BVP528 OUT T45 A35-NB LO

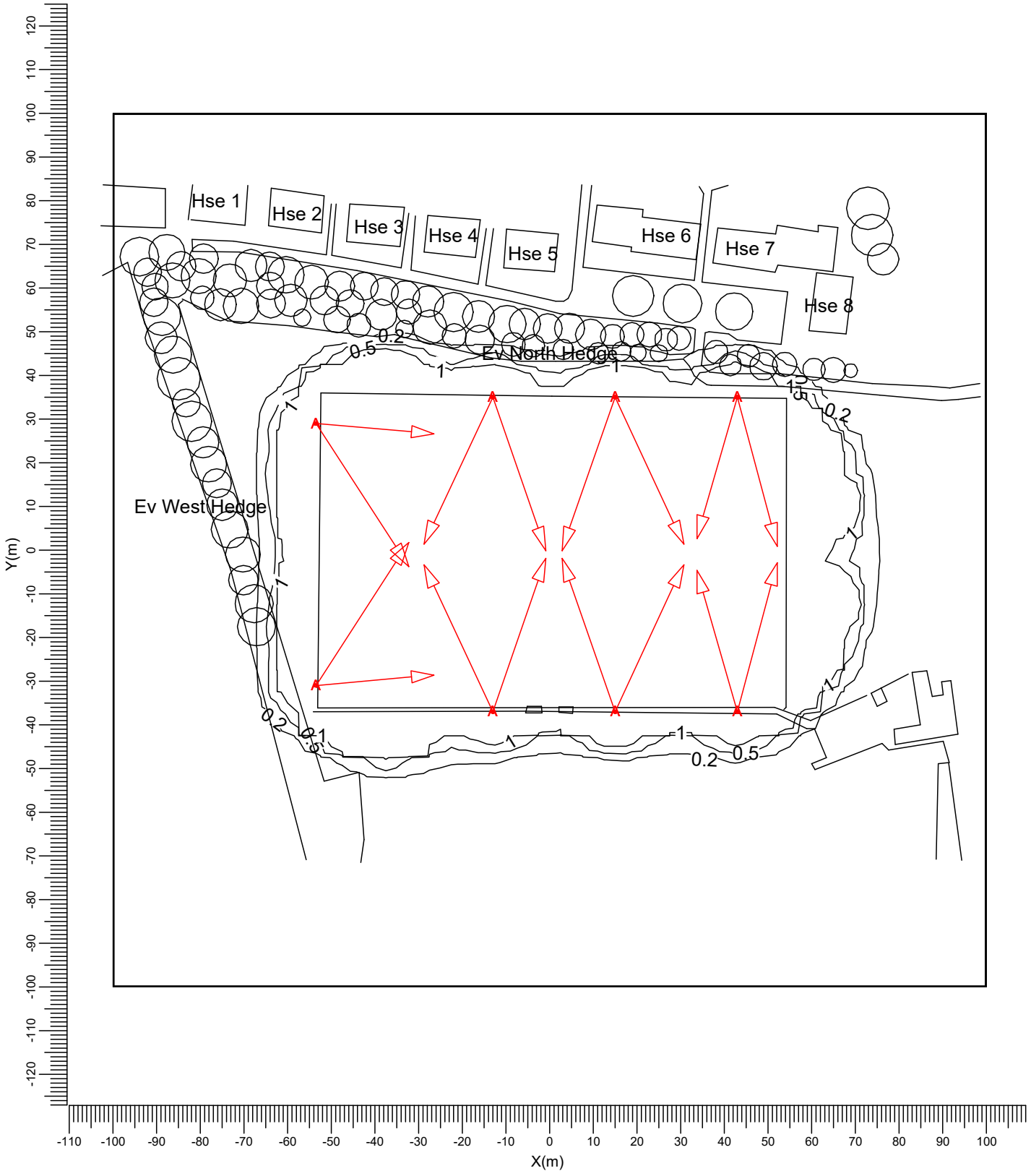
Project maintenance factor
0.90

Scale
1:1250

3.9 Eh Spill @ 4.0m: Iso Contour

Performance

Grid : Spill Grid at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)
Height above grid : 4.00 m



A → BVP528 OUT T45 A35-NB LO

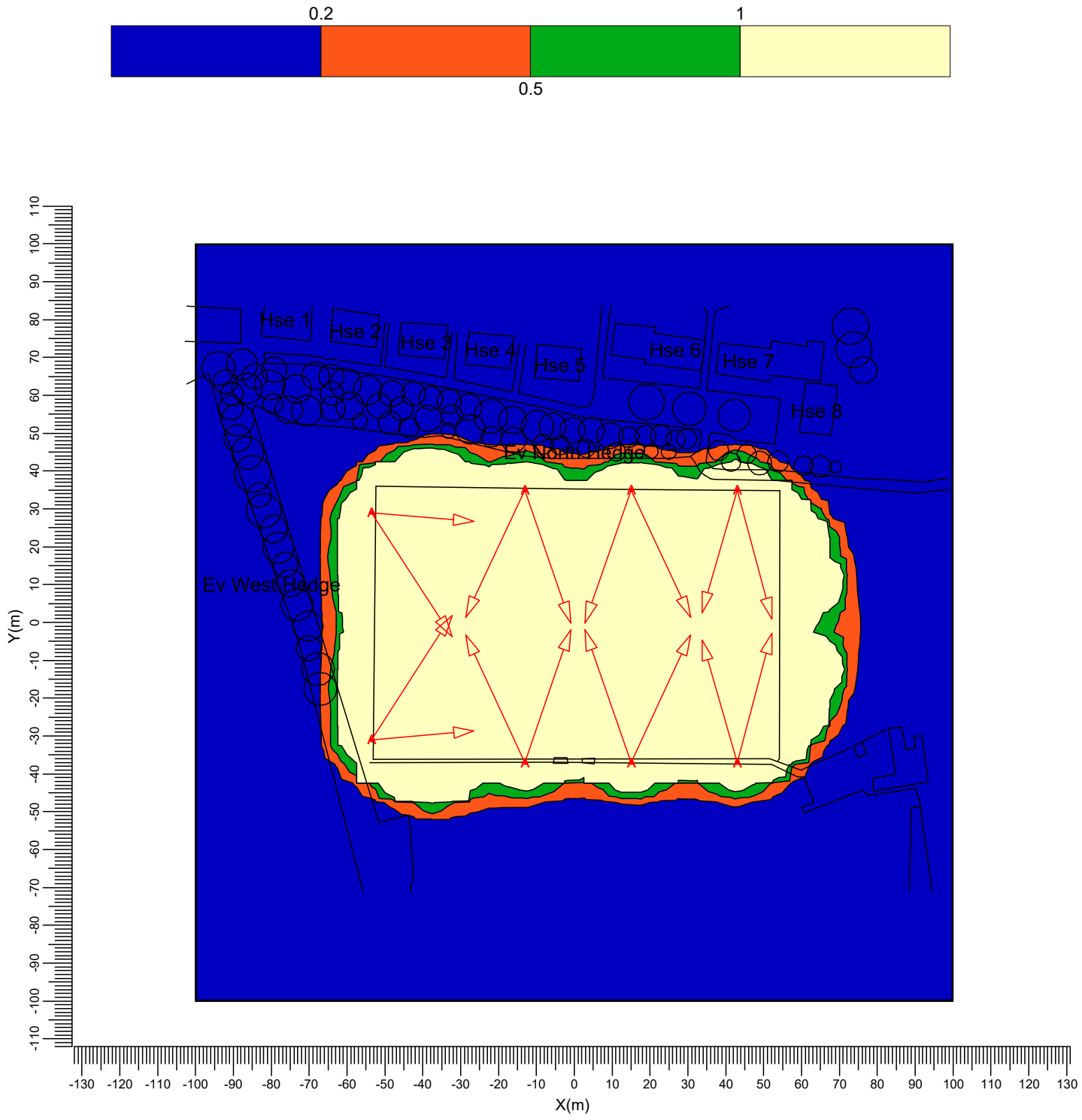
Project maintenance factor
0.90

Scale
1:1250

3.10 Eh Spill @ 4.0m: Filled Iso Contour

Performance

Grid : Spill Grid at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)
Height above grid : 4.00 m



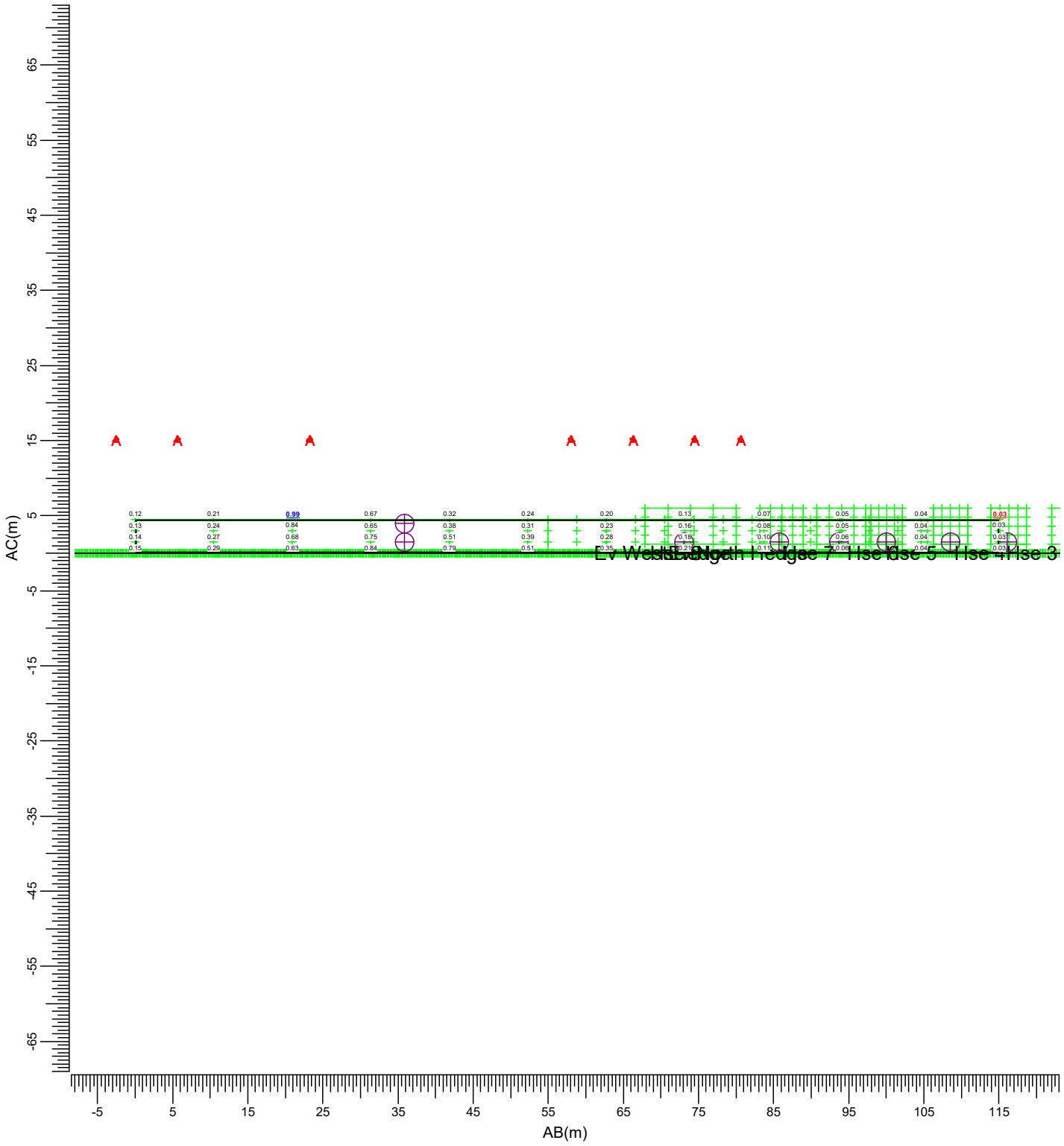
Project maintenance factor
0.90

Scale
1:1500

3.11 Ev West Hedge: Graphical Table

Performance

Grid : Ev West Hedge
Calculation : Surface Illuminance (lux)



(-52.50, -55.00, 4.50) C-----D (-86.20, 55.00, 4.50)
| |
(-52.50, -55.00, 0.00) A-----B (-86.20, 55.00, 0.00)

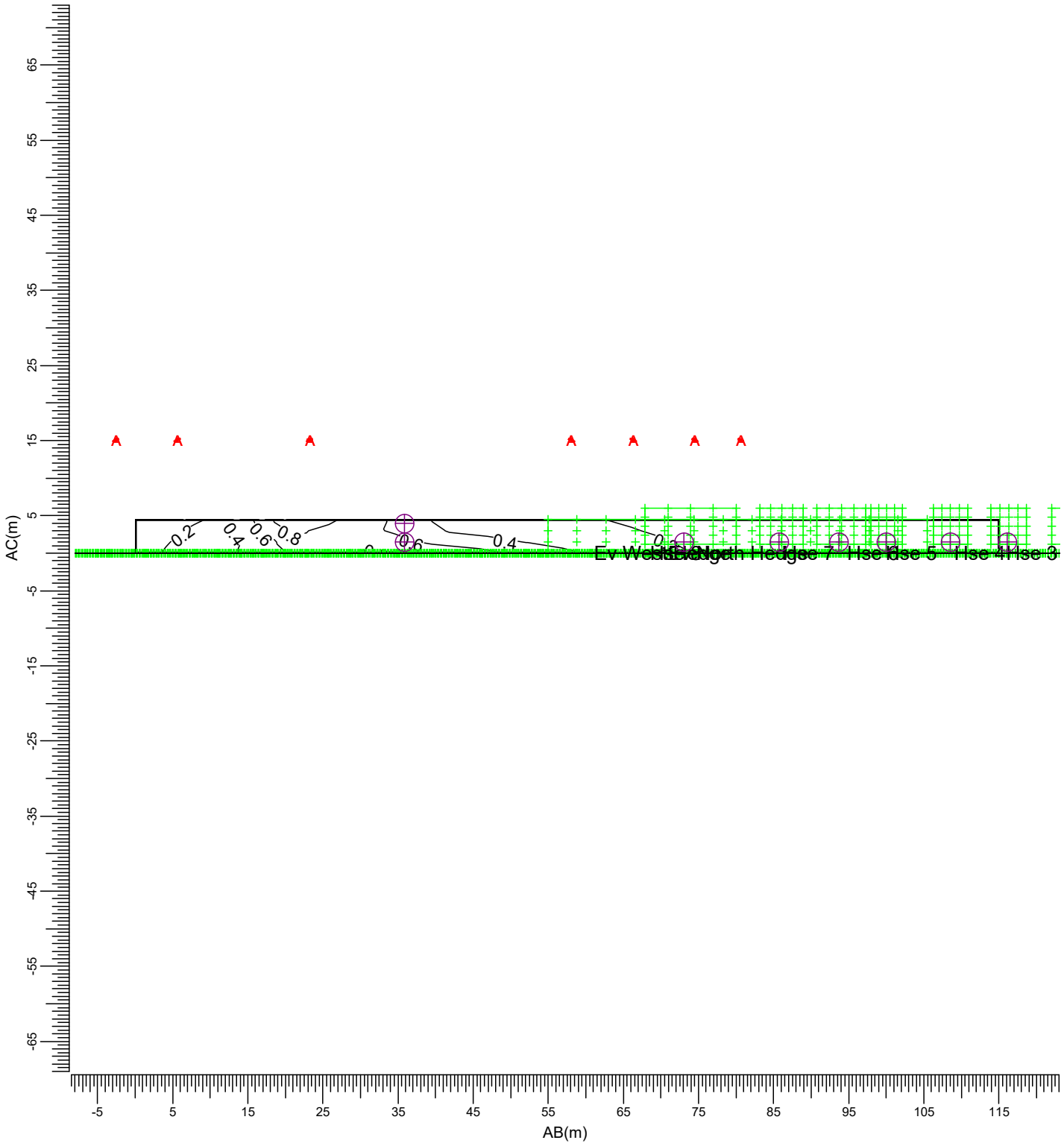
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.99	0.90	1:750

3.12 Ev West Hedge: Iso Contour

Performance

Grid : Ev West Hedge
Calculation : Surface Illuminance (lux)



(-52.50, -55.00, 4.50) C-----D (-86.20, 55.00, 4.50)
| |
(-52.50, -55.00, 0.00) A-----B (-86.20, 55.00, 0.00)

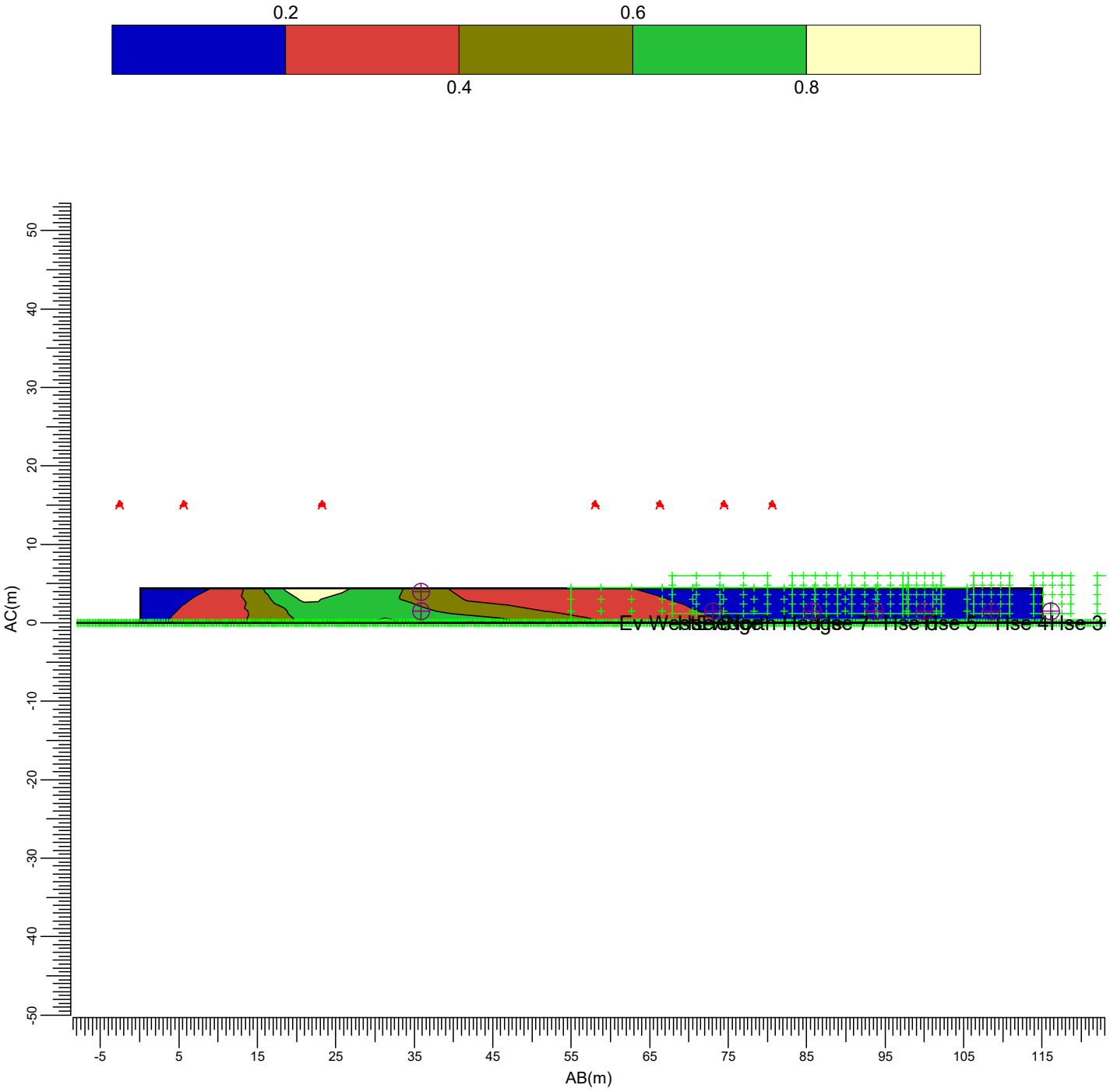
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.99	0.90	1:750

3.13 Ev West Hedge: Filled Iso Contour

Performance

Grid : Ev West Hedge
Calculation : Surface Illuminance (lux)



(-52.50, -55.00, 4.50) C-----D (-86.20, 55.00, 4.50)
| |
(-52.50, -55.00, 0.00) A-----B (-86.20, 55.00, 0.00)

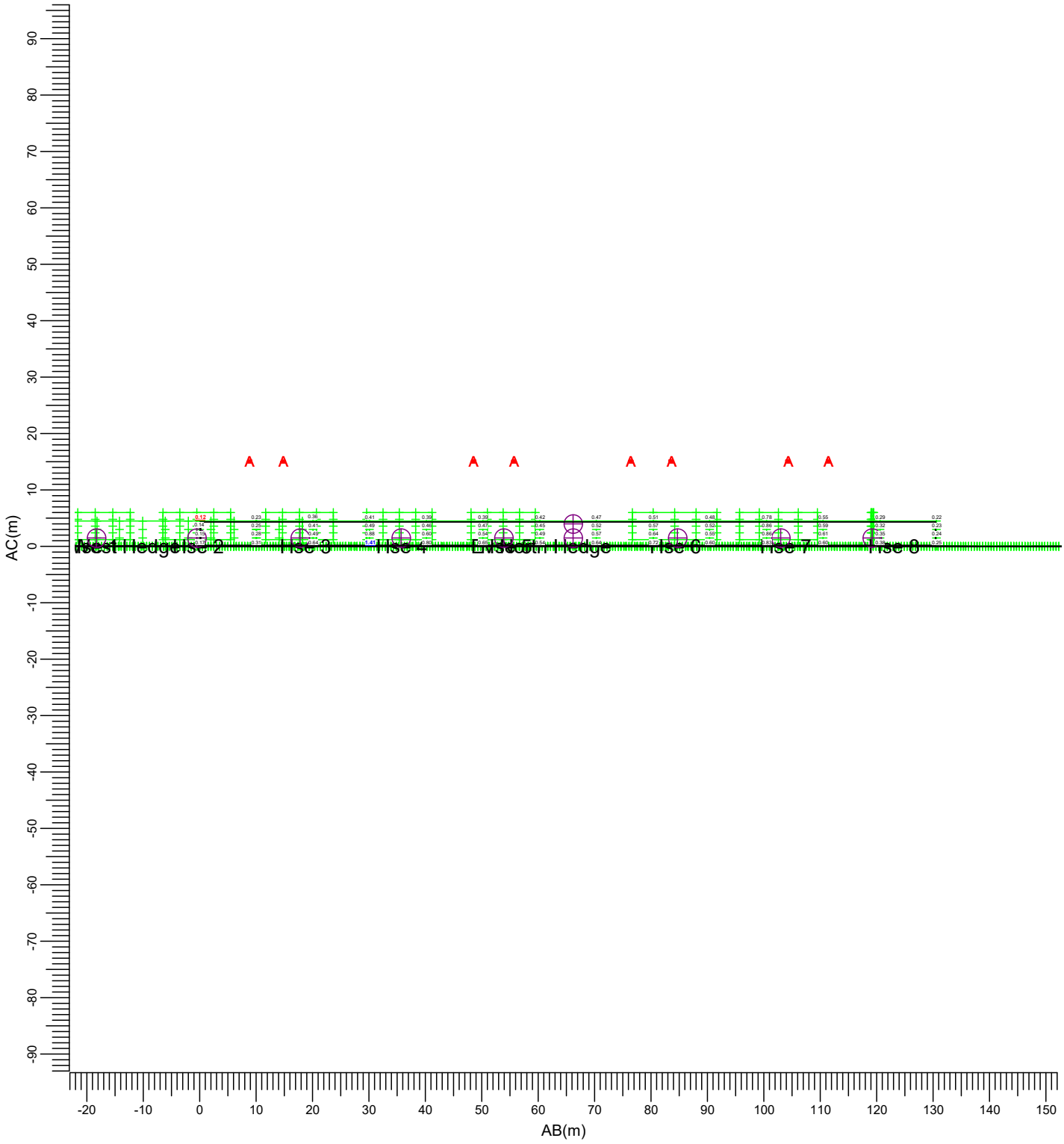
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.99	0.90	1:750

3.14 Ev North Hedge: Graphical Table

Performance

Grid : Ev North Hedge
Calculation : Surface Illuminance (lux)



(-60.00, 53.00, 4.50) C-----D (70.00, 40.00, 4.50)
| |
(-60.00, 53.00, 0.00) A-----B (70.00, 40.00, 0.00)

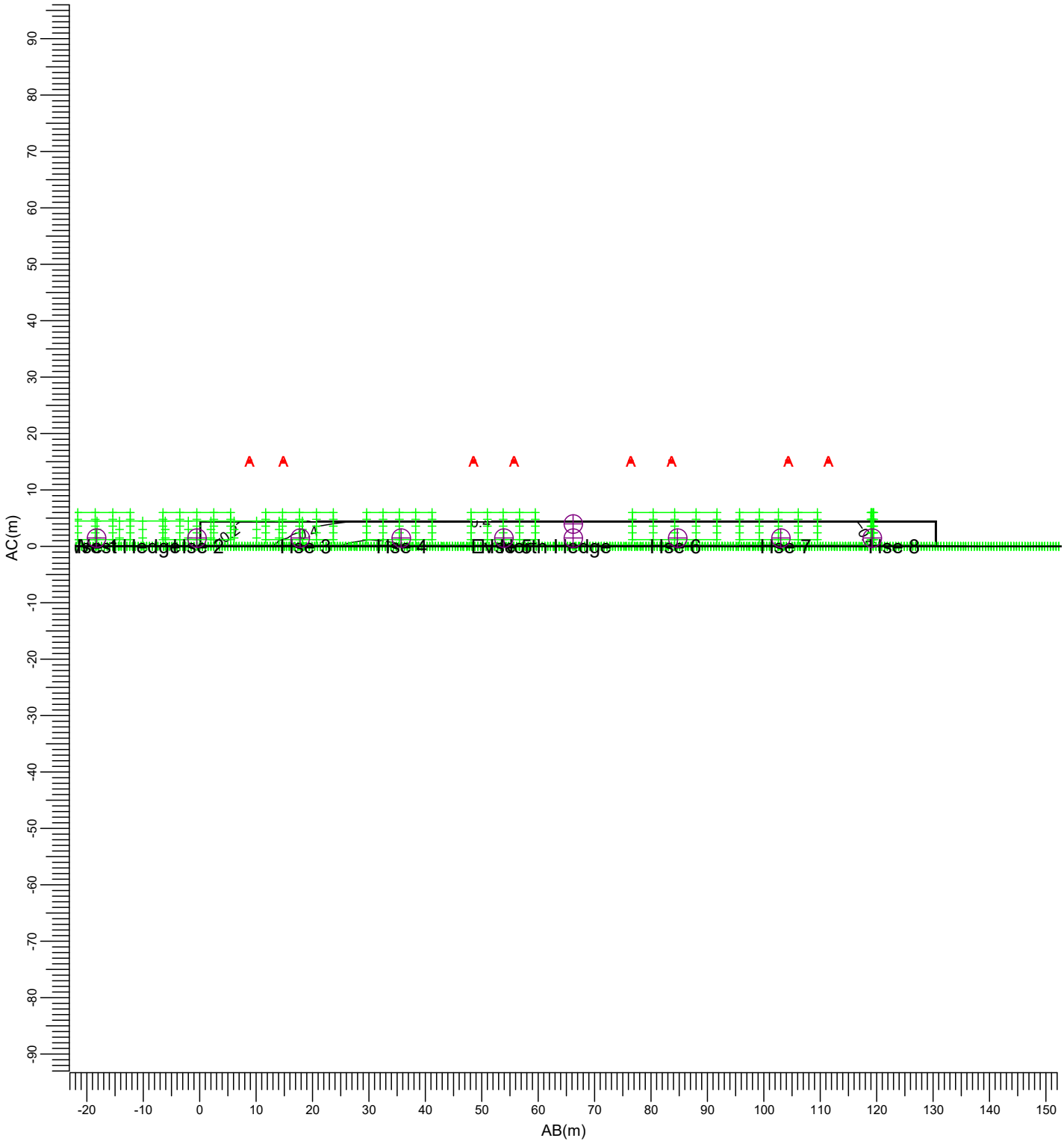
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
1.41	0.90	1:1000

3.15 Ev North Hedge: Iso Contour

Performance

Grid : Ev North Hedge
Calculation : Surface Illuminance (lux)



(-60.00, 53.00, 4.50) C-----D (70.00, 40.00, 4.50)
| |
(-60.00, 53.00, 0.00) A-----B (70.00, 40.00, 0.00)

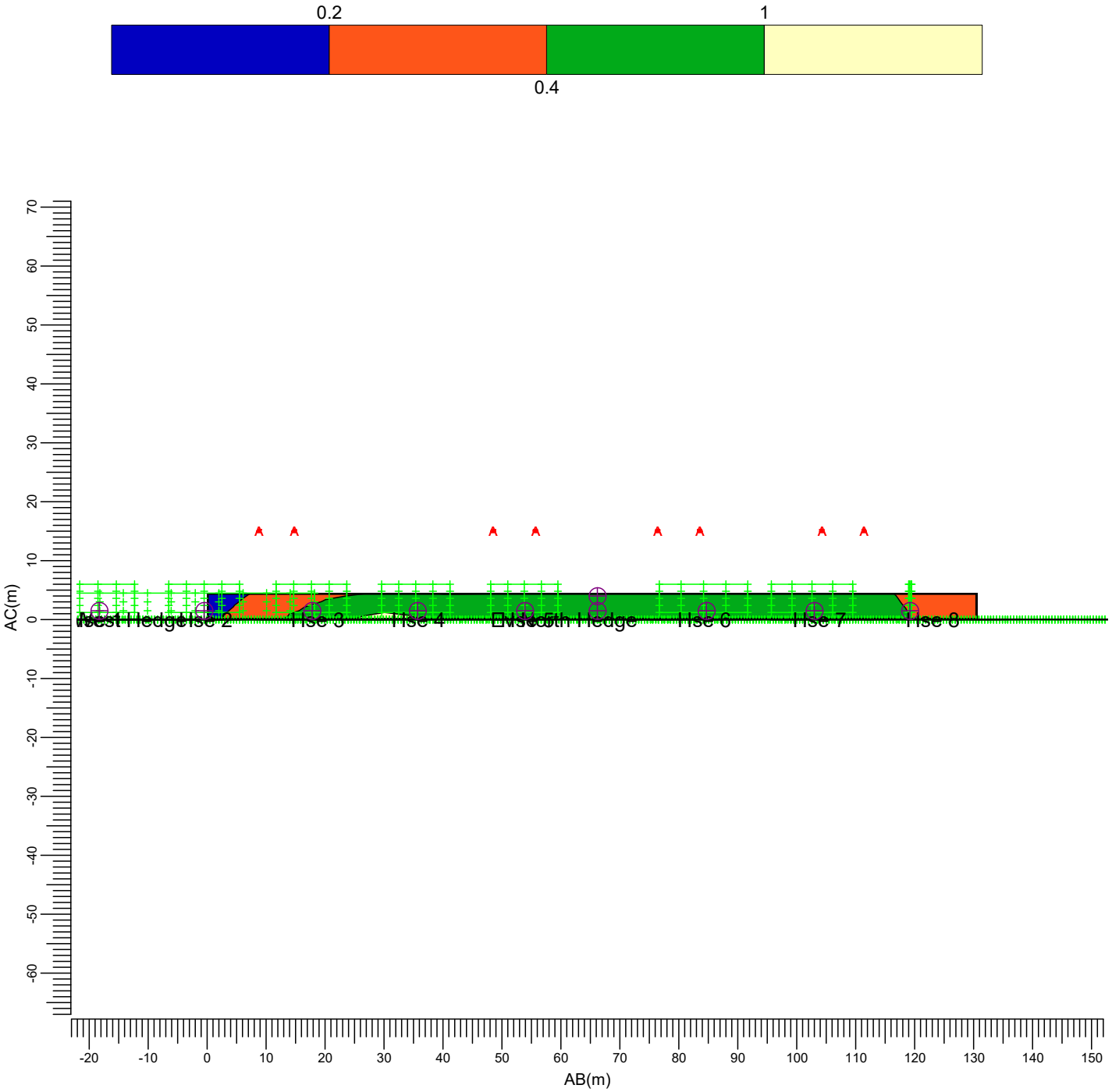
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
1.41	0.90	1:1000

3.16 Ev North Hedge: Filled Iso Contour

Performance

Grid : Ev North Hedge
Calculation : Surface Illuminance (lux)



(-60.00, 53.00, 4.50) C-----D (70.00, 40.00, 4.50)
| |
(-60.00, 53.00, 0.00) A-----B (70.00, 40.00, 0.00)

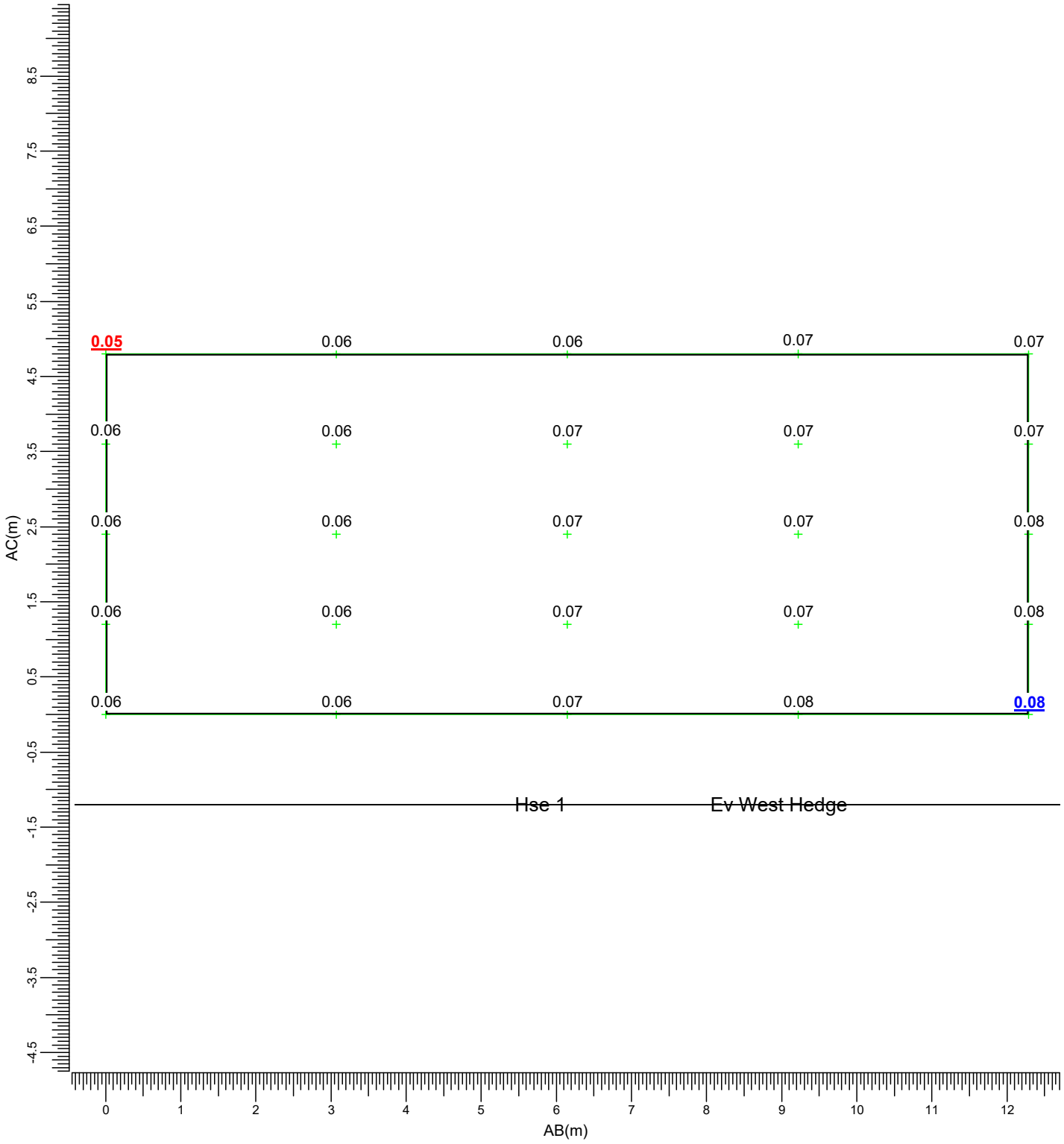
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
1.41	0.90	1:1000

3.17 Ev Hse 1: Graphical Table

Obtrusive Light

Grid : Ev Hse 1
Calculation : Surface Illuminance (lux)



(-82.46, 75.62, 6.00) C-----D (-70.23, 74.40, 6.00)
| |
(-82.46, 75.62, 1.20) A-----B (-70.23, 74.40, 1.20)

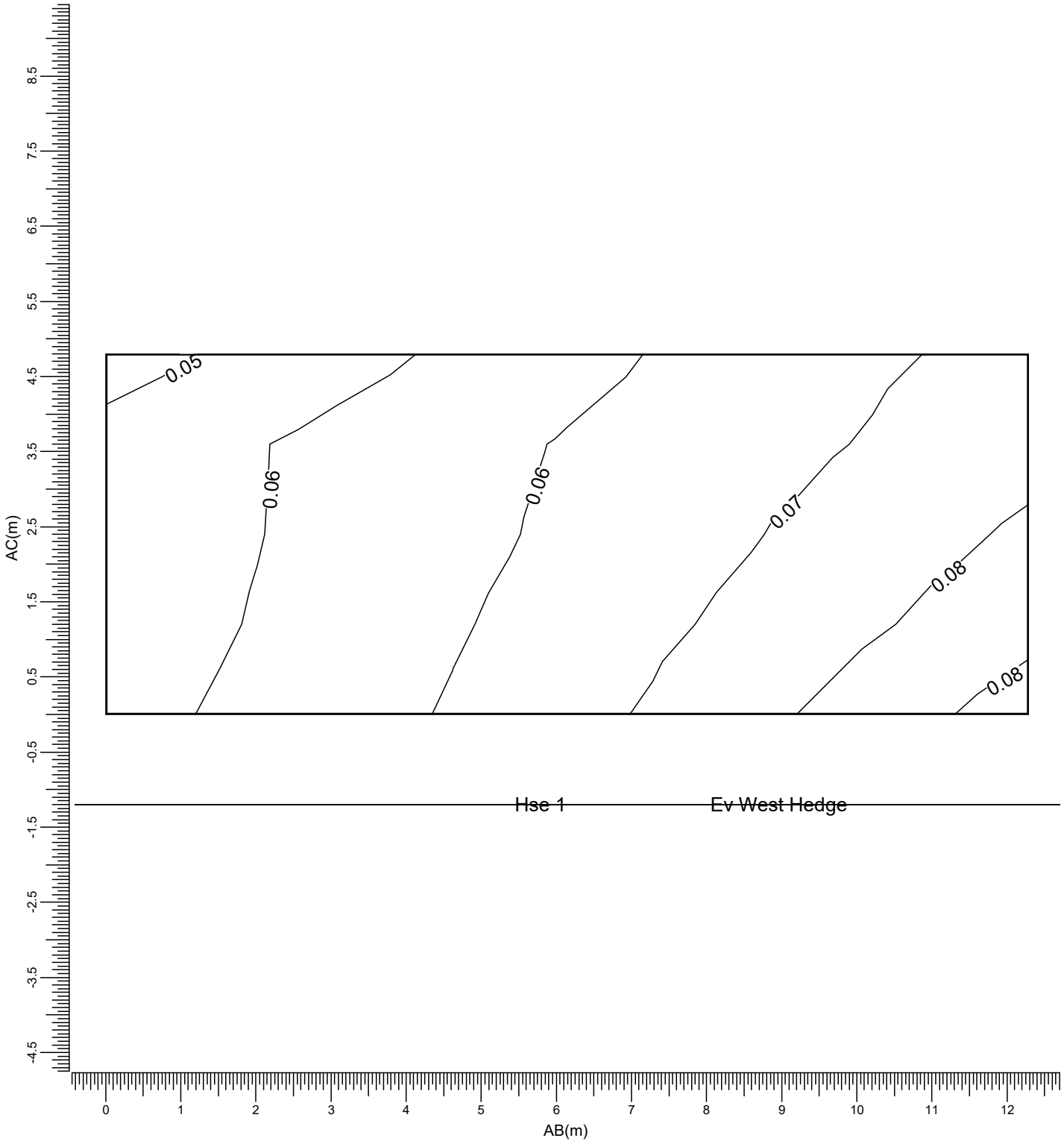
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.08	1.00	1:75

3.18 Ev Hse 1: Iso Contour

Obtrusive Light

Grid : Ev Hse 1
Calculation : Surface Illuminance (lux)



(-82.46, 75.62, 6.00) C-----D (-70.23, 74.40, 6.00)
| |
(-82.46, 75.62, 1.20) A-----B (-70.23, 74.40, 1.20)

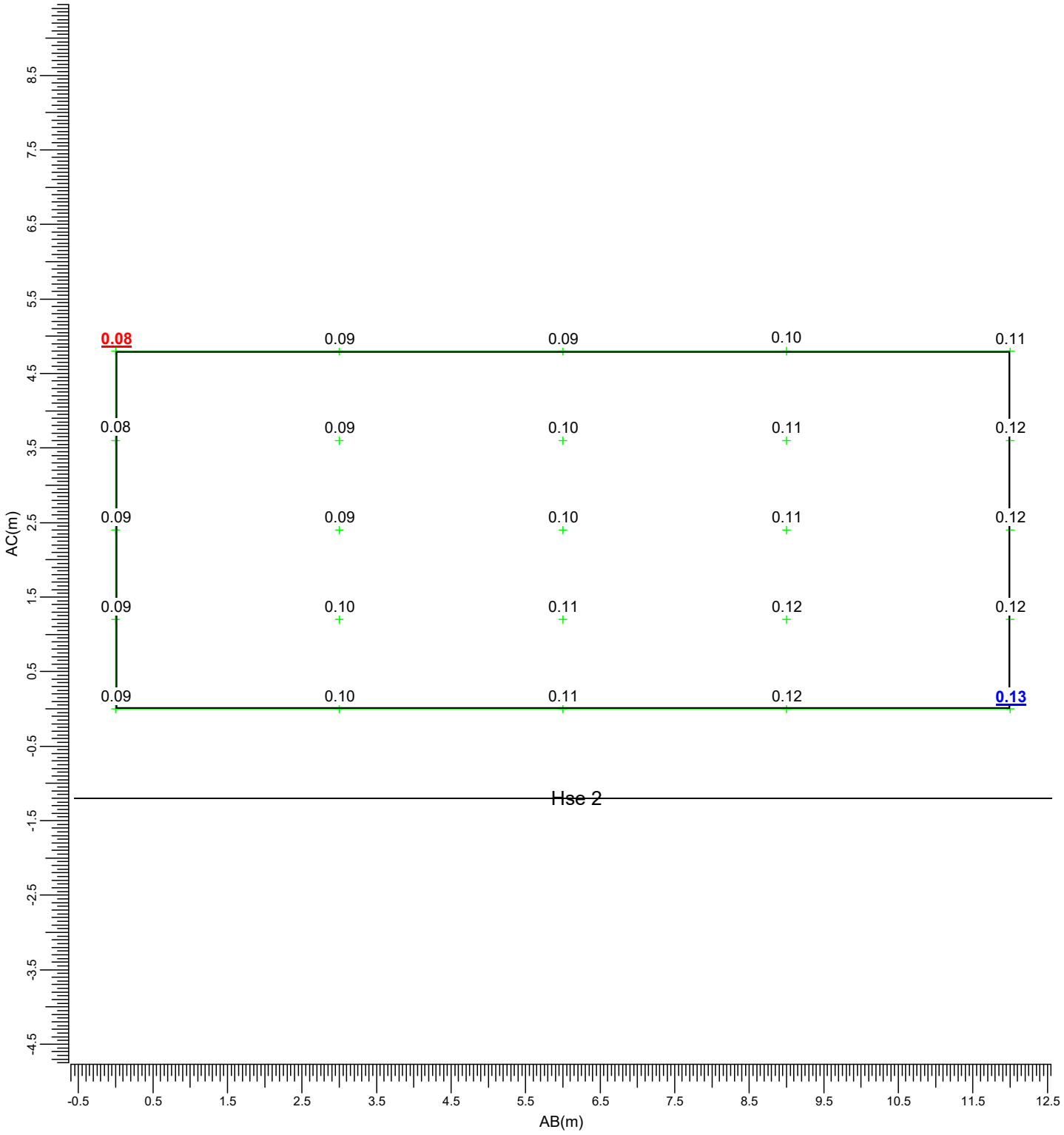
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.08	1.00	1:75

3.19 Ev Hse 2: Graphical Table

Obtrusive Light

Grid : Ev Hse 2
Calculation : Surface Illuminance (lux)



(-64.41, 74.16, 6.00) C-----D (-52.51, 72.60, 6.00)
| |
(-64.41, 74.16, 1.20) A-----B (-52.51, 72.60, 1.20)

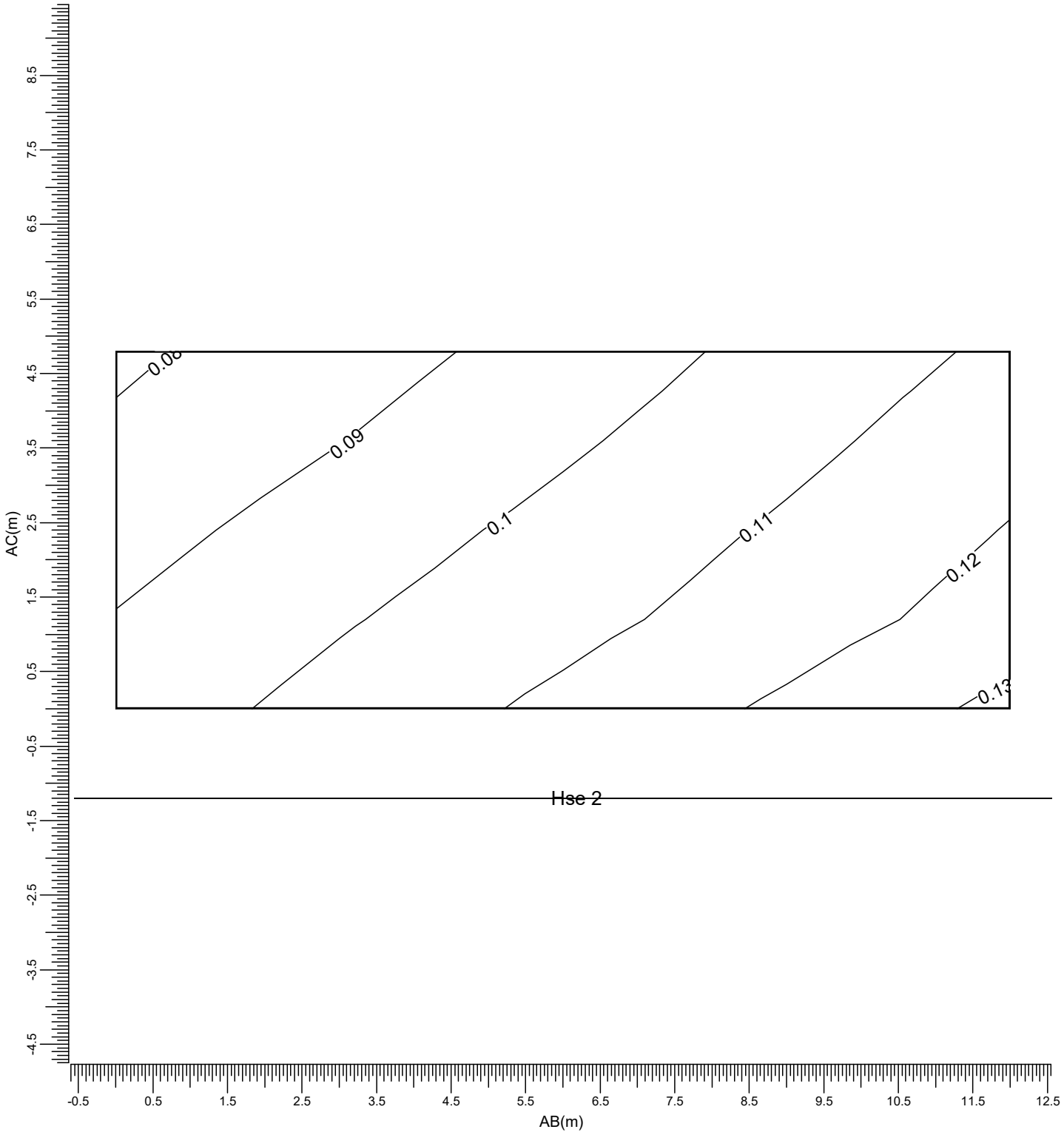
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.13	1.00	1:75

3.20 Ev Hse 2: Iso Contour

Obtrusive Light

Grid : Ev Hse 2
Calculation : Surface Illuminance (lux)



(-64.41, 74.16, 6.00) C-----D (-52.51, 72.60, 6.00)
| |
(-64.41, 74.16, 1.20) A-----B (-52.51, 72.60, 1.20)

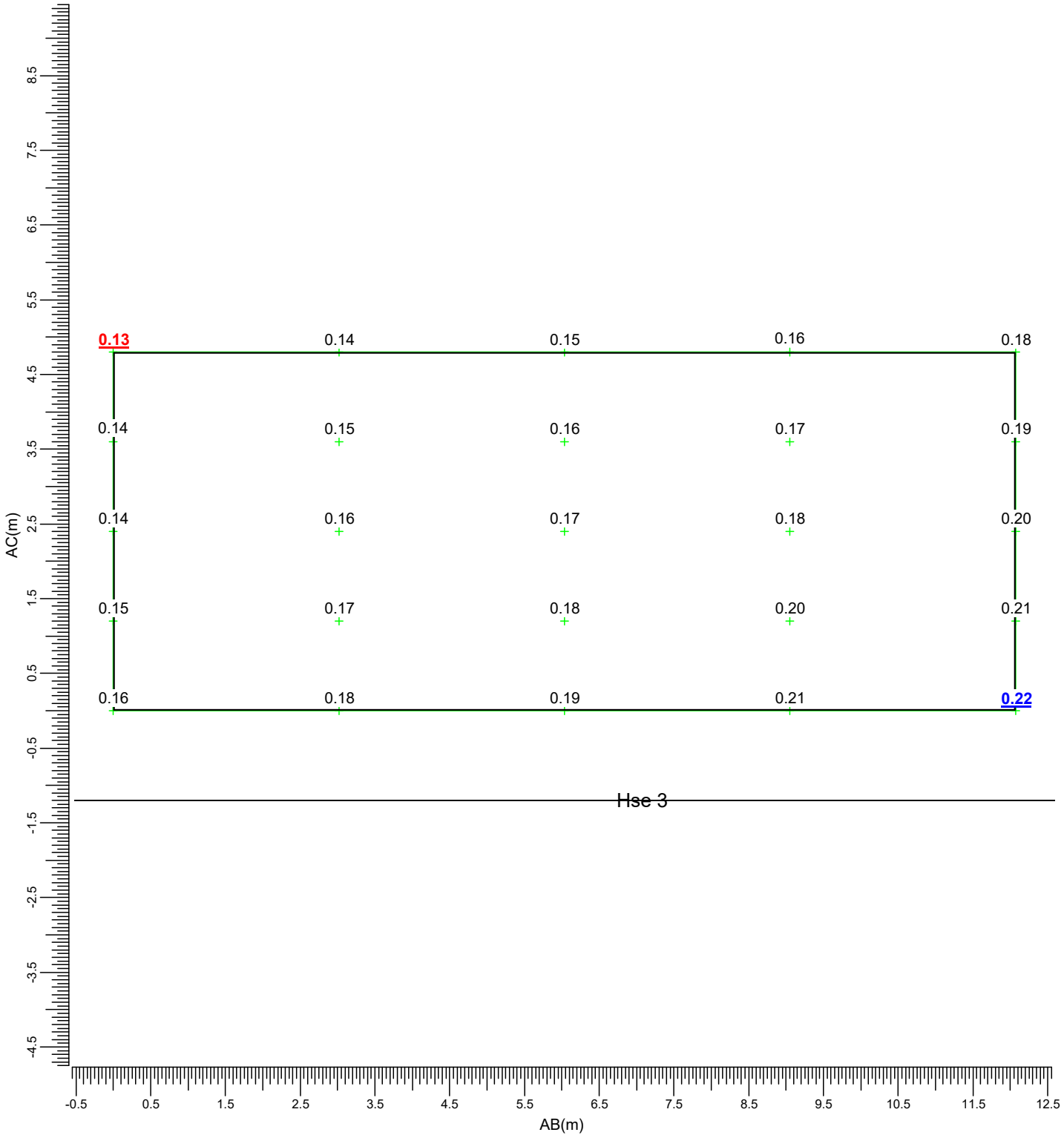
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.13	1.00	1:75

3.21 Ev Hse 3: Graphical Table

Obtrusive Light

Grid : Ev Hse 3
Calculation : Surface Illuminance (lux)



(-46.45, 70.98, 6.00) C-----D (-34.45, 69.67, 6.00)
| |
(-46.45, 70.98, 1.20) A-----B (-34.45, 69.67, 1.20)

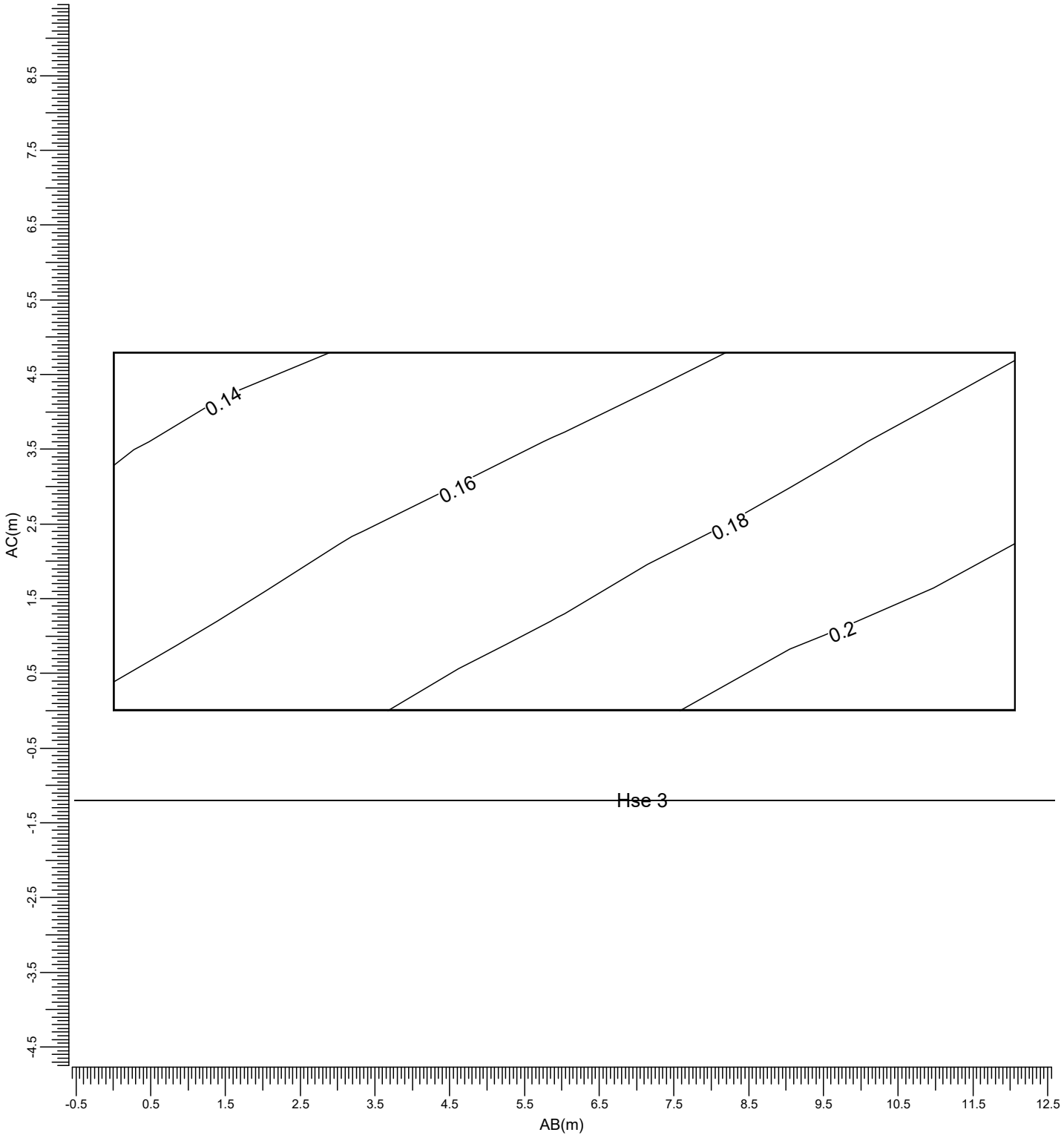
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.22	1.00	1:75

3.22 Ev Hse 3: Iso Contour

Obtrusive Light

Grid : Ev Hse 3
Calculation : Surface Illuminance (lux)



(-46.45, 70.98, 6.00) C-----D (-34.45, 69.67, 6.00)
| |
(-46.45, 70.98, 1.20) A-----B (-34.45, 69.67, 1.20)

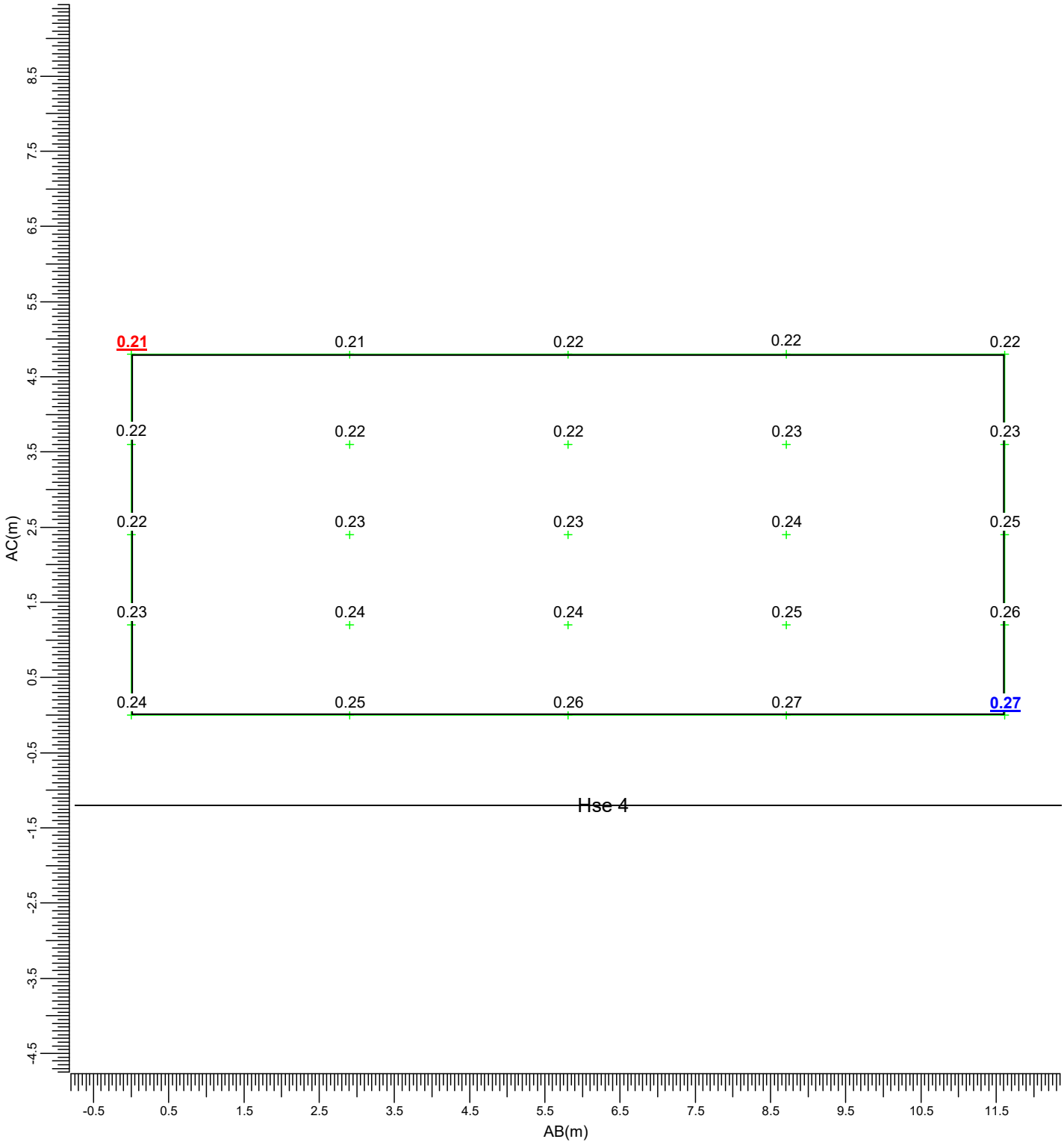
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.22	1.00	1:75

3.23 Ev Hse 4: Graphical Table

Obtrusive Light

Grid : Ev Hse 4
Calculation : Surface Illuminance (lux)



(-28.72, 68.21, 6.00) C-----D (-17.17, 66.98, 6.00)
| |
(-28.72, 68.21, 1.20) A-----B (-17.17, 66.98, 1.20)

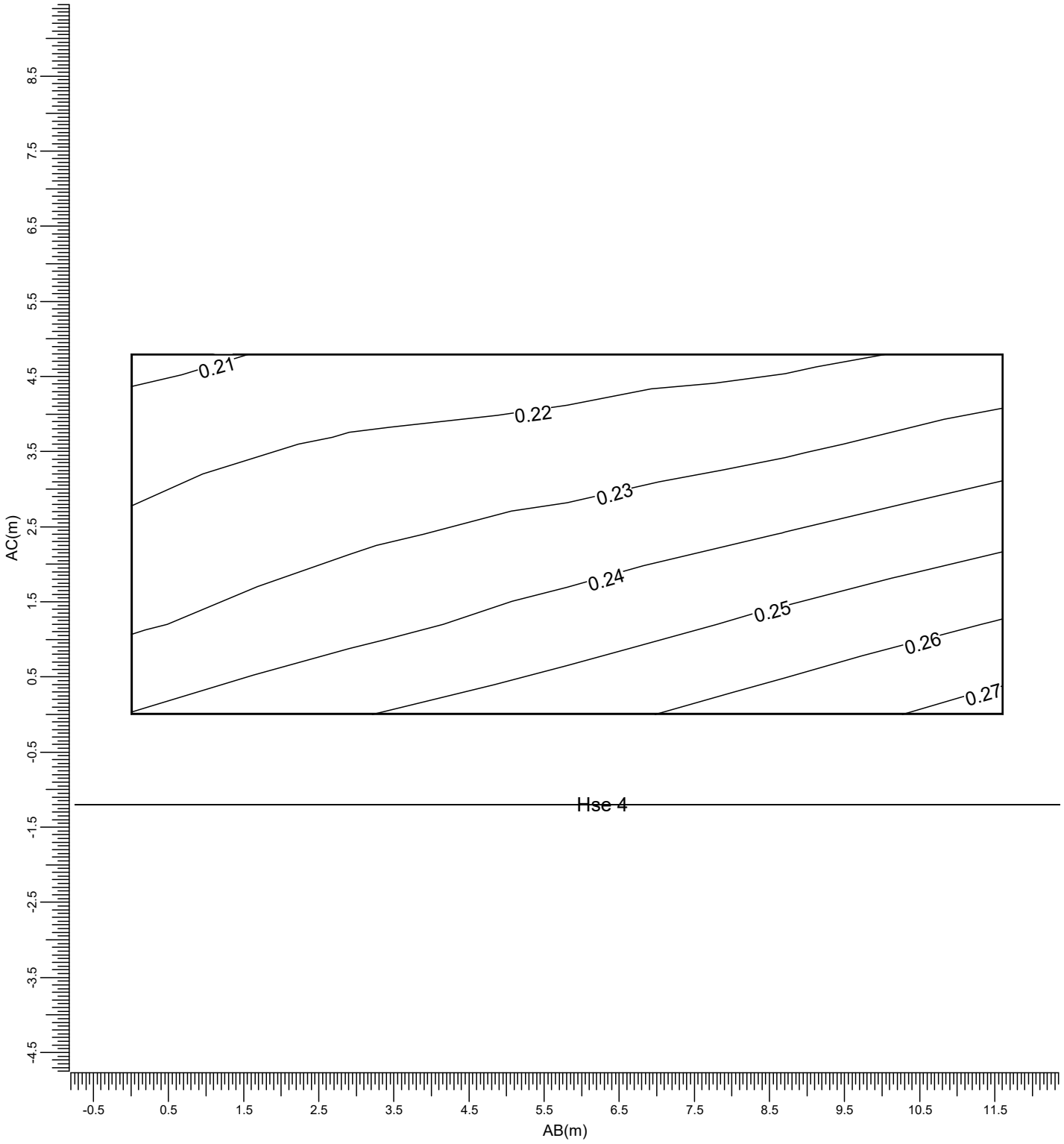
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.27	1.00	1:75

3.24 Ev Hse 4: Iso Contour

Obtrusive Light

Grid : Ev Hse 4
Calculation : Surface Illuminance (lux)



(-28.72, 68.21, 6.00) C-----D (-17.17, 66.98, 6.00)
| |
(-28.72, 68.21, 1.20) A-----B (-17.17, 66.98, 1.20)

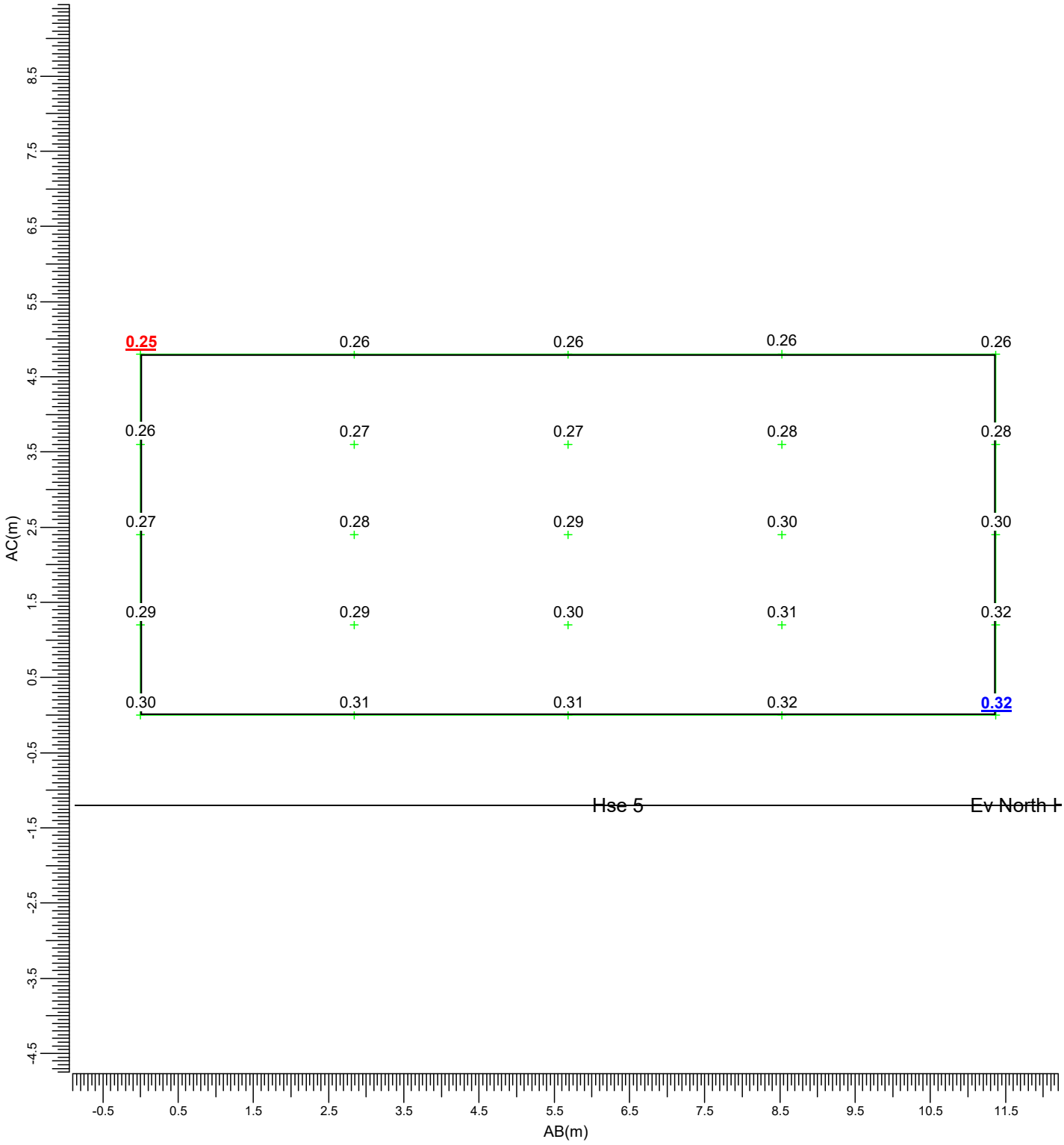
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.27	1.00	1:75

3.25 Ev Hse 5: Graphical Table

Obtrusive Light

Grid : Ev Hse 5
Calculation : Surface Illuminance (lux)



(-10.43, 64.74, 6.00) C-----D (0.90, 63.84, 6.00)
| |
(-10.43, 64.74, 1.20) A-----B (0.90, 63.84, 1.20)

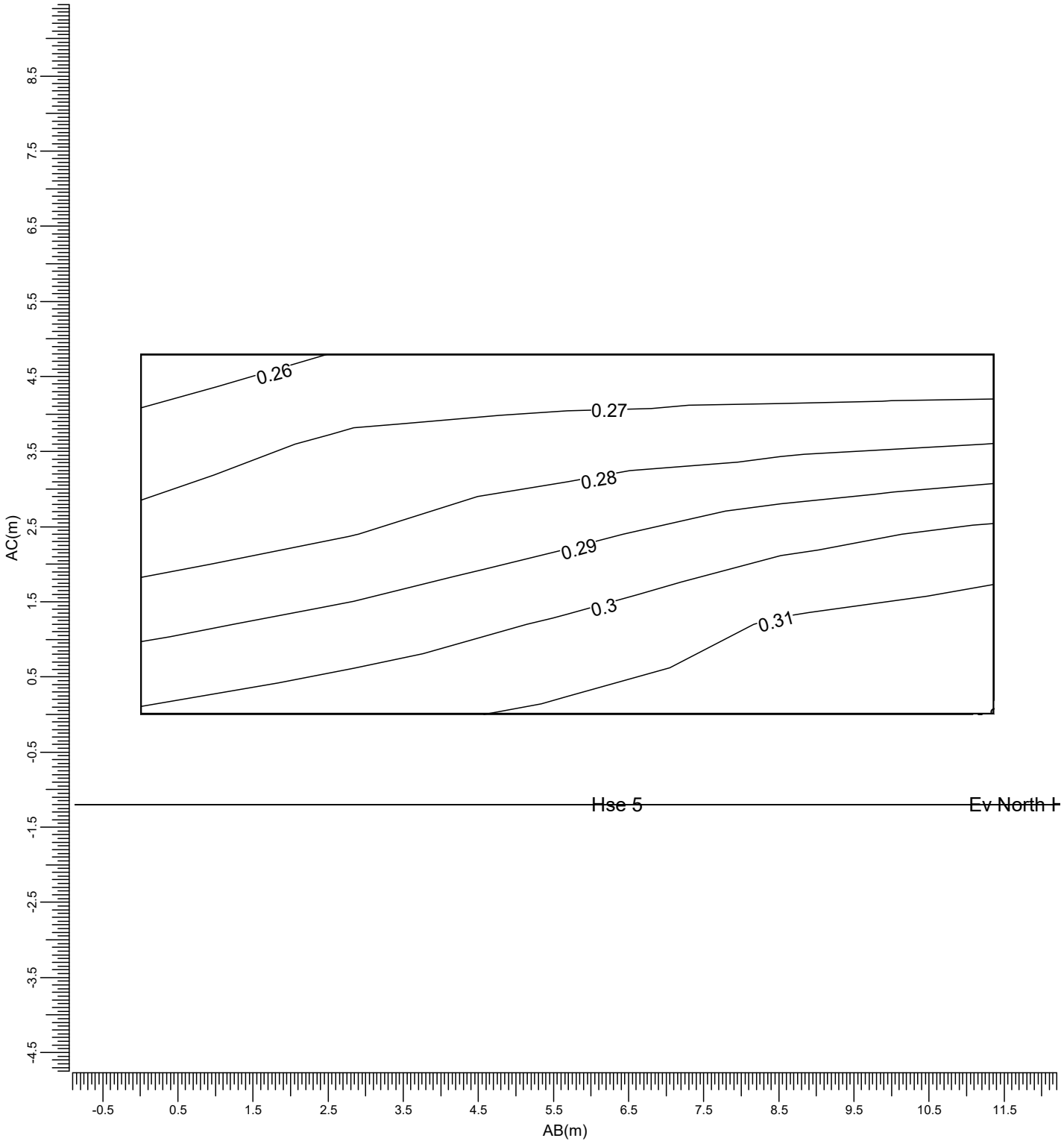
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.32	1.00	1:75

3.26 Ev Hse 5: Iso Contour

Obtrusive Light

Grid : Ev Hse 5
Calculation : Surface Illuminance (lux)



(-10.43, 64.74, 6.00) C-----D (0.90, 63.84, 6.00)
| |
(-10.43, 64.74, 1.20) A-----B (0.90, 63.84, 1.20)

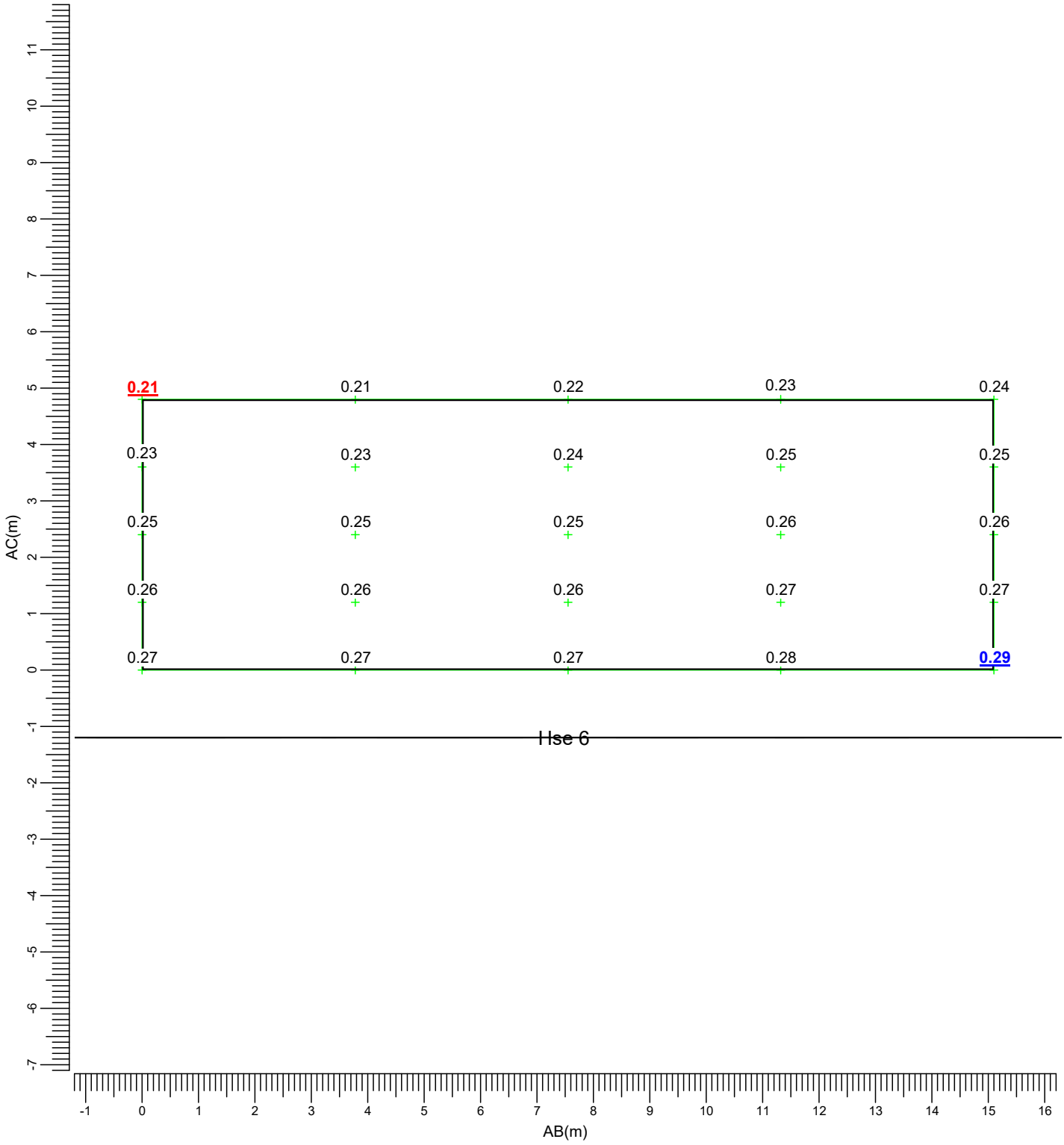
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.32	1.00	1:75

3.27 Ev Hse 6: Graphical Table

Obtrusive Light

Grid : Ev Hse 6
Calculation : Surface Illuminance (lux)



(18.62, 68.55, 6.00) C-----D (33.55, 66.31, 6.00)
(18.62, 68.55, 1.20) A-----B (33.55, 66.31, 1.20)

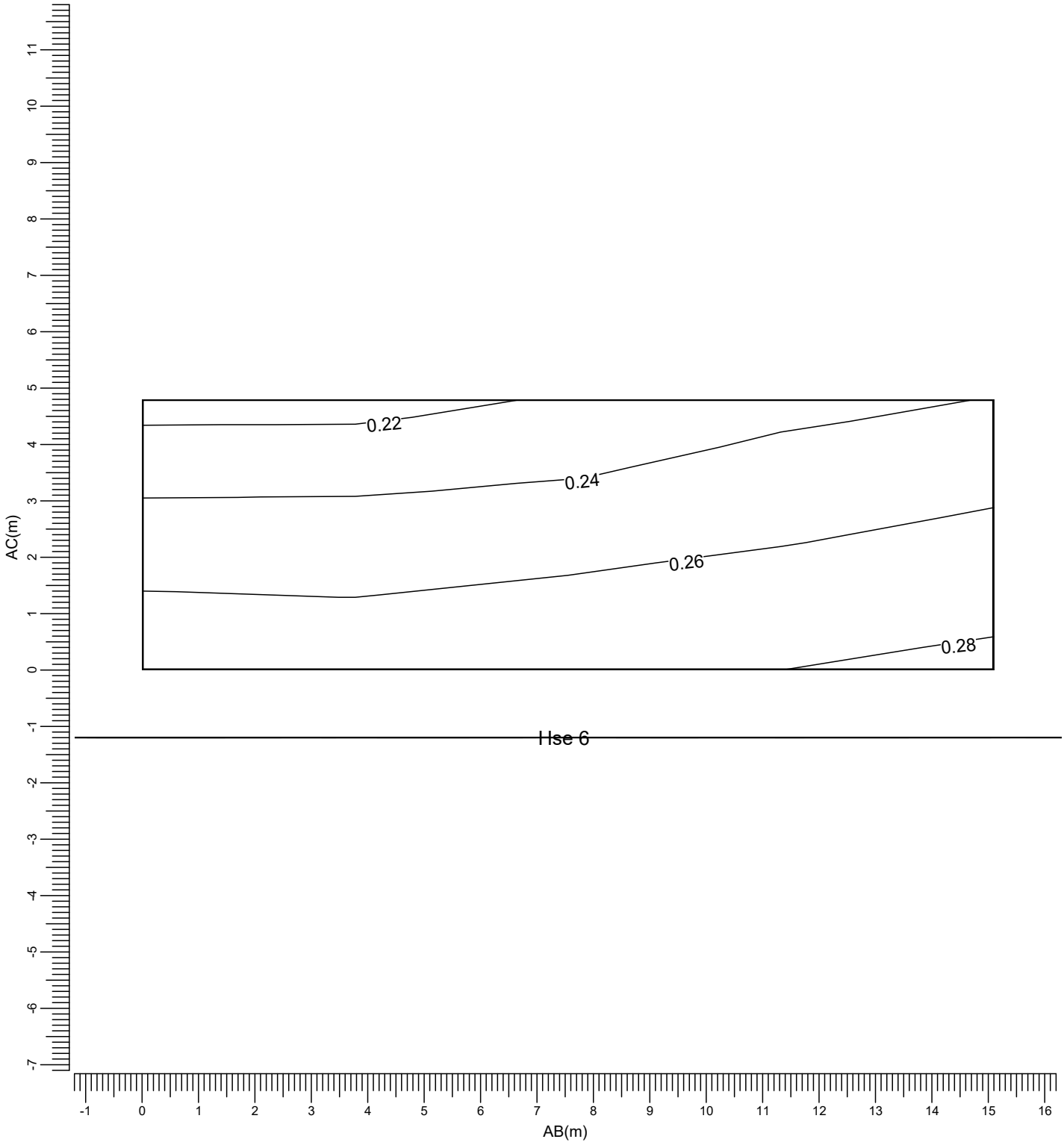
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.29	1.00	1:100

3.28 Ev Hse 6: Iso Contour

Obtrusive Light

Grid : Ev Hse 6
Calculation : Surface Illuminance (lux)



(18.62, 68.55, 6.00) C-----D (33.55, 66.31, 6.00)
(18.62, 68.55, 1.20) A-----B (33.55, 66.31, 1.20)

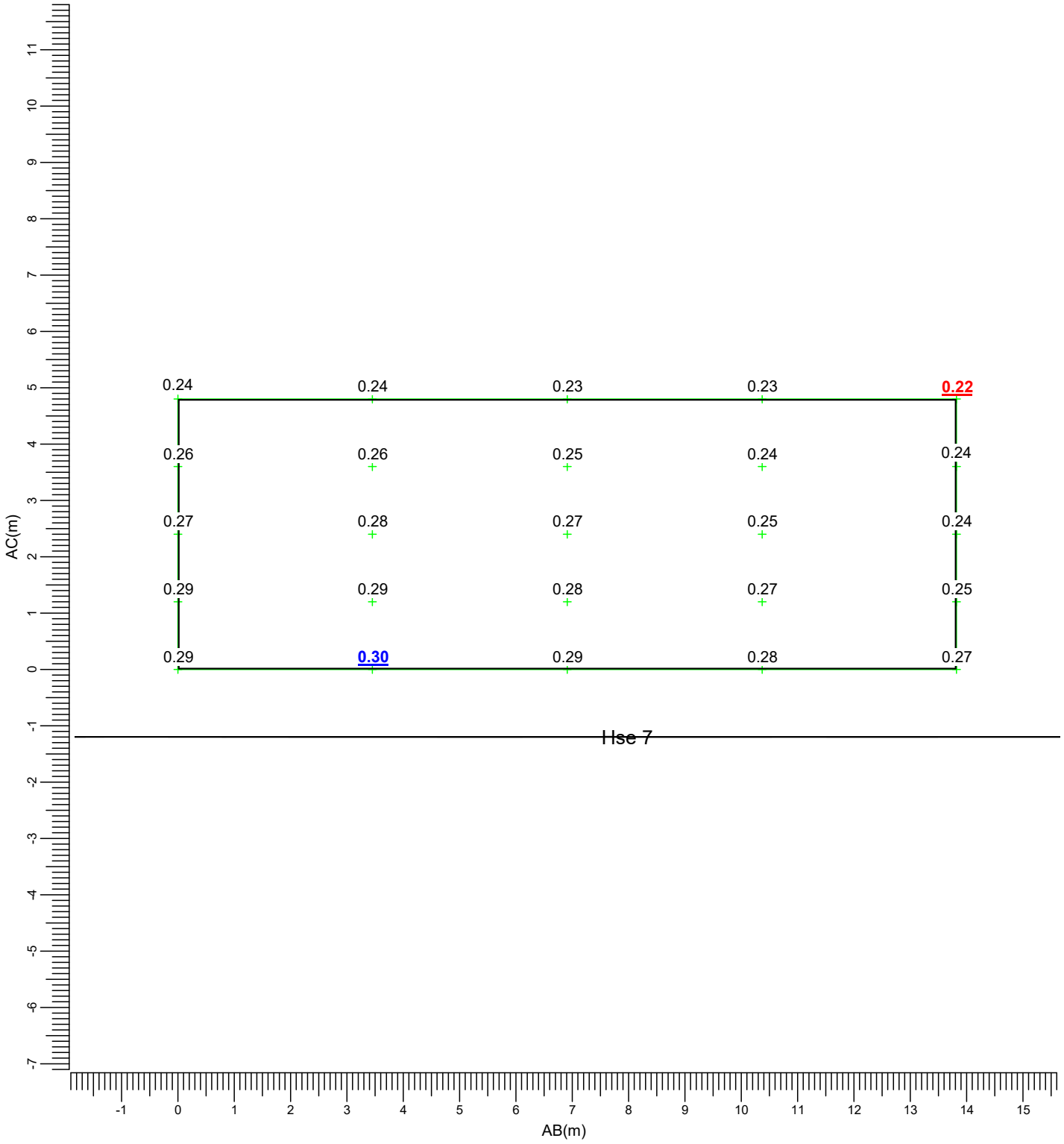
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.29	1.00	1:100

3.29 Ev Hse 7: Graphical Table

Obtrusive Light

Grid : Ev Hse 7
Calculation : Surface Illuminance (lux)



(37.47, 65.63, 6.00) C-----D (51.16, 63.71, 6.00)
| |
(37.47, 65.63, 1.20) A-----B (51.16, 63.71, 1.20)

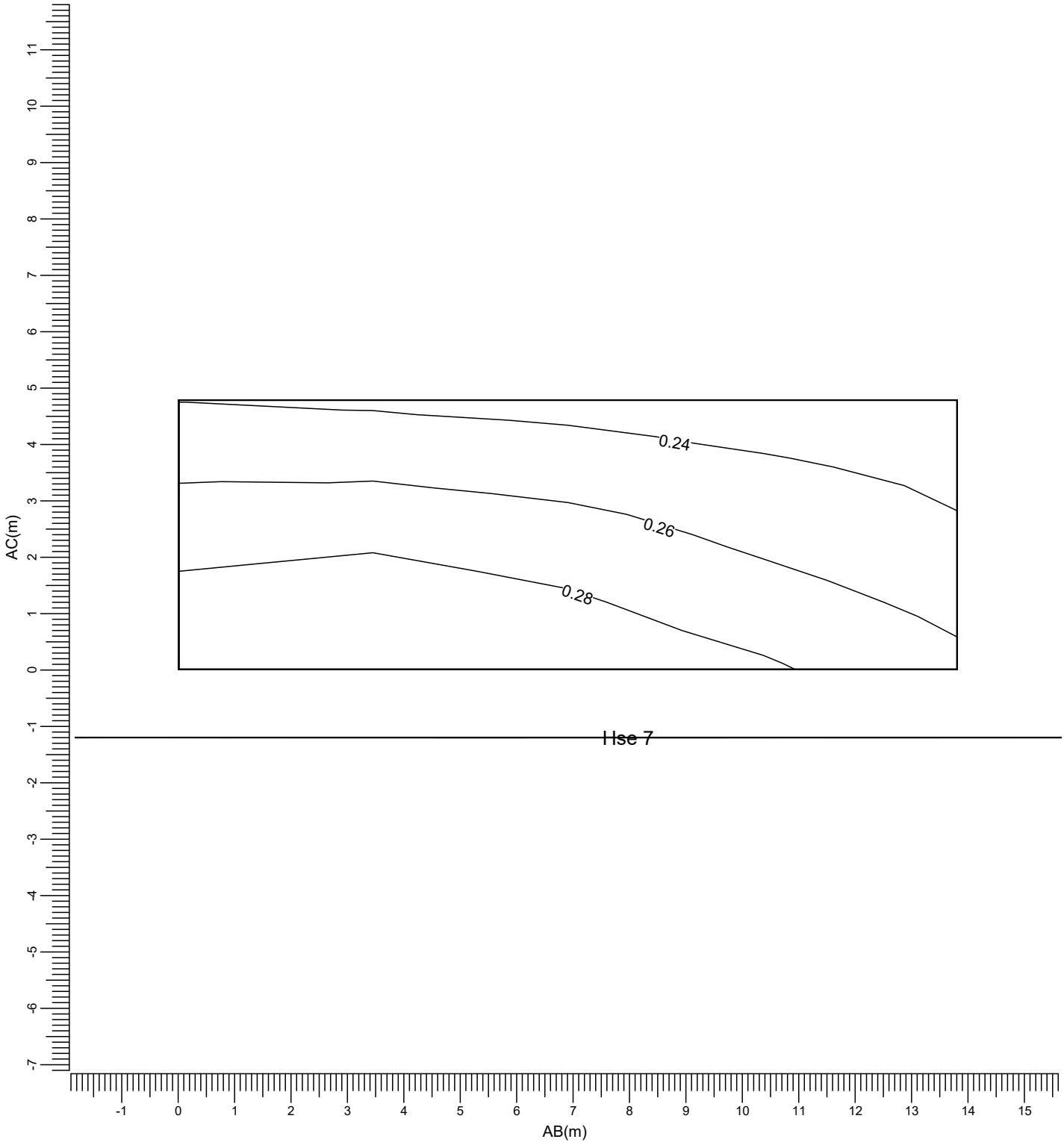
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.30	1.00	1:100

3.30 Ev Hse 7: Iso Contour

Obtrusive Light

Grid : Ev Hse 7
Calculation : Surface Illuminance (lux)



(37.47, 65.63, 6.00) C-----D (51.16, 63.71, 6.00)
| |
(37.47, 65.63, 1.20) A-----B (51.16, 63.71, 1.20)

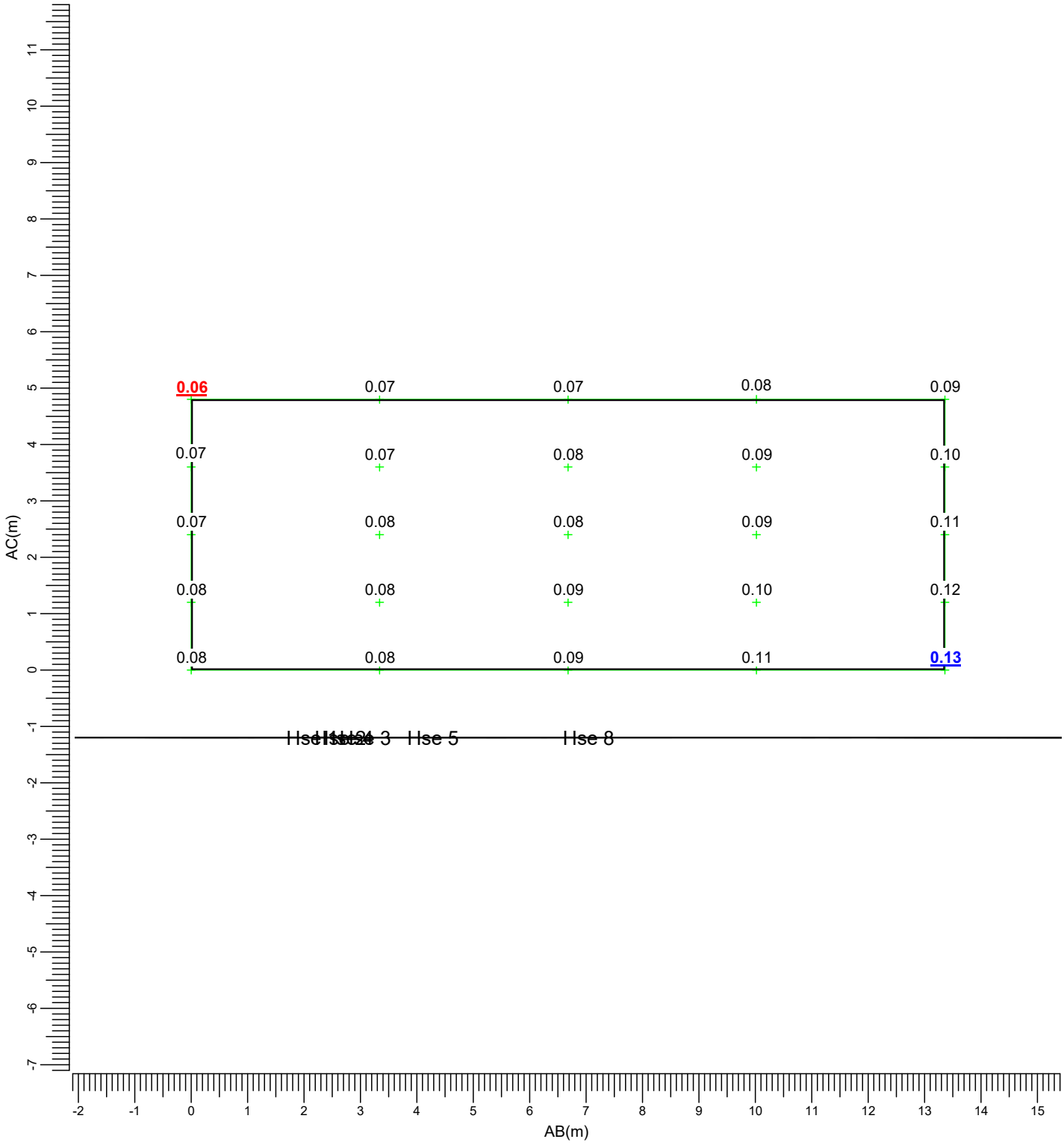
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.30	1.00	1:100

3.31 Ev Hse 8: Graphical Table

Obtrusive Light

Grid : Ev Hse 8
Calculation : Surface Illuminance (lux)



(61.15, 63.50, 6.00) C-----D (59.35, 50.26, 6.00)
| |
(61.15, 63.50, 1.20) A-----B (59.35, 50.26, 1.20)

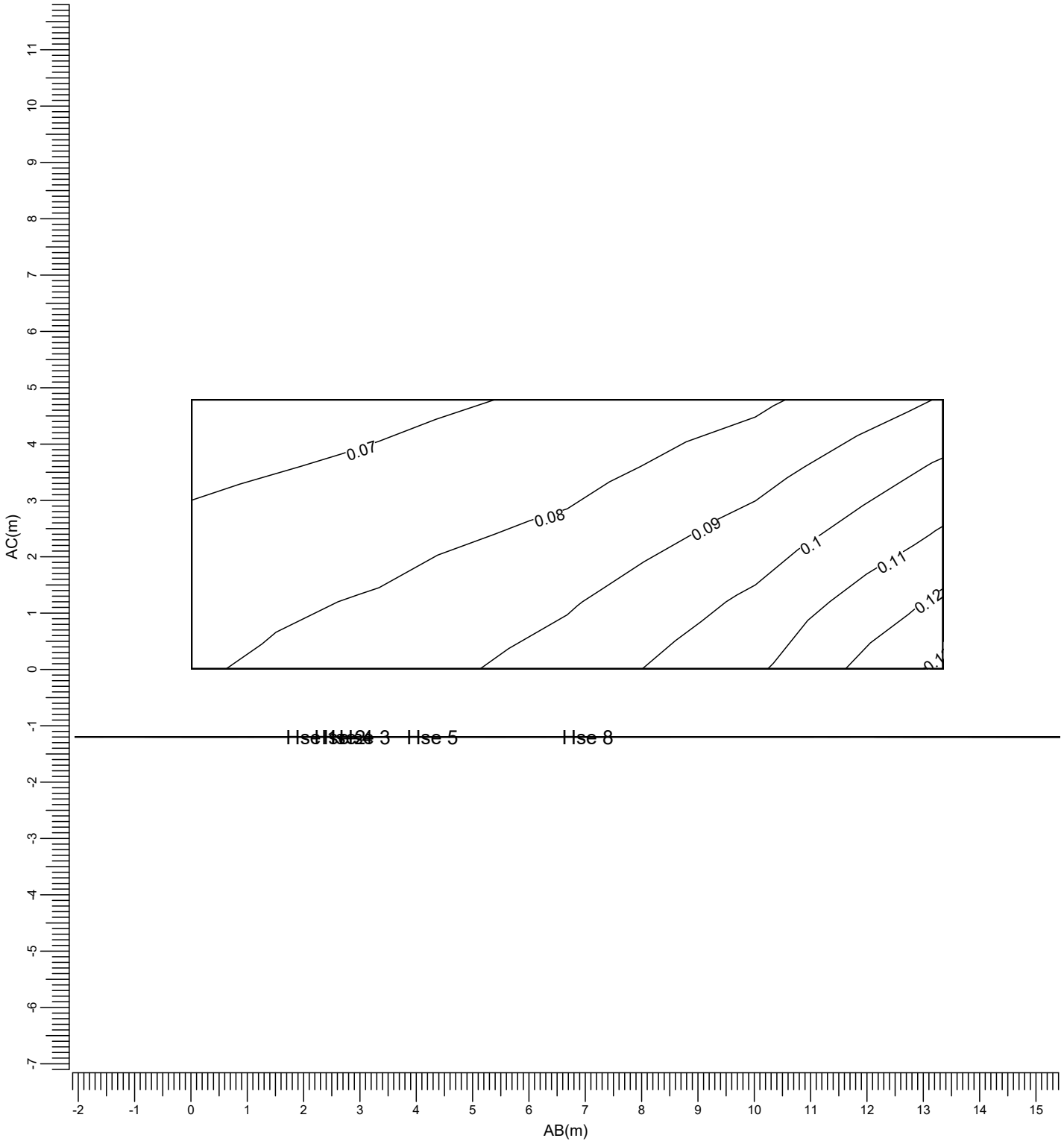
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.13	1.00	1:100

3.32 Ev Hse 8: Iso Contour

Obtrusive Light

Grid : Ev Hse 8
Calculation : Surface Illuminance (lux)



(61.15, 63.50, 6.00) C-----D (59.35, 50.26, 6.00)
| |
(61.15, 63.50, 1.20) A-----B (59.35, 50.26, 1.20)

A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.13	1.00	1:100

4. Luminaire Details

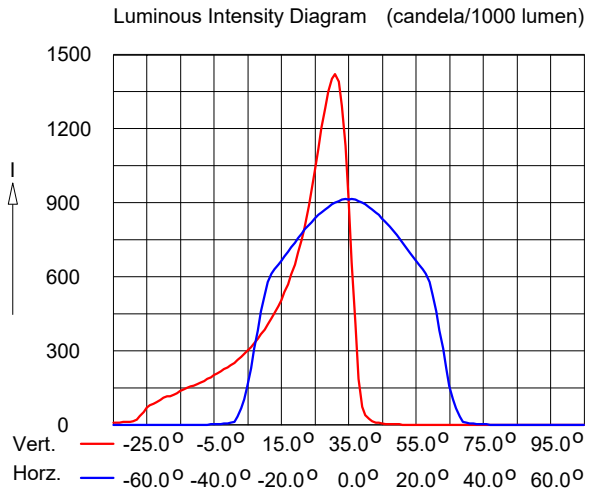
4.1 Project Luminaires

OptiVision LED gen3.5 2022
BVP528 OUT T45 1xLED2300-4S/740/740 E3/D4I A35-NB LO

Light output ratios

DLOR	:	0.58
ULOR	:	0.00
TLOR	:	0.58
Ballast	:	E3/D4I
Lamp flux	:	230000 lm
Luminaire wattage	:	1303.1 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)
A	16	BVP528 OUT T45 A35-NB LO	1 * LED2300-4S/740	1 * 230000

Arrangements:

Code	Arrangement
1	Centre Columns
2	West End Columns
3	East End columns

Switching Modes:

Code	Switching Mode
1	Performance
2	Obtrusive Light

5.2 Luminaire Positioning and Orientation

Including Aiming Points:

Qty and Code	Position			Aiming Points			ULR	Arr.	Switching Modes	
	X (m)	Y (m)	Z (m)	X (m)	Y (m)	Z (m)			1	2
1 * A	-13.00	-37.00	15.00	-0.91	-1.90	0.00	0.00	1	+	+
1 * A	-13.00	-37.00	15.00	-28.69	-3.35	0.00	0.00	1	+	+
1 * A	-13.00	35.00	15.00	-0.91	-0.10	0.00	0.00	1	+	+
1 * A	-13.00	35.00	15.00	-28.69	1.35	0.00	0.00	1	+	+
1 * A	15.00	-37.00	15.00	2.91	-1.90	0.00	0.00	1	+	+
1 * A	15.00	-37.00	15.00	30.69	-3.35	0.00	0.00	1	+	+
1 * A	15.00	35.00	15.00	2.91	-0.10	0.00	0.00	1	+	+
1 * A	15.00	35.00	15.00	30.69	1.35	0.00	0.00	1	+	+
1 * A	-53.50	-31.00	15.00	-26.54	-28.64	0.00	0.00	2	+	+
1 * A	-53.50	-31.00	15.00	-32.22	1.77	0.00	0.00	2	+	+
1 * A	-53.50	29.00	15.00	-26.54	26.64	0.00	0.00	2	+	+
1 * A	-53.50	29.00	15.00	-32.22	-3.77	0.00	0.00	2	+	+
1 * A	43.00	-37.00	15.00	33.71	-4.61	0.00	0.00	3	+	+
1 * A	43.00	-37.00	15.00	52.15	-2.87	0.00	0.00	3	+	+
1 * A	43.00	35.00	15.00	33.71	2.61	0.00	0.00	3	+	+
1 * A	43.00	35.00	15.00	52.15	0.87	0.00	0.00	3	+	+

Including Aiming Angles:

Qty and Code	Position			Aiming Angles			ULR	Arr.	Switching Modes	
	X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0			1	2
1 * A	-13.00	-37.00	15.00	71.0	68.0	0.0	0.00	1	+	+
1 * A	-13.00	-37.00	15.00	115.0	68.0	0.0	0.00	1	+	+
1 * A	-13.00	35.00	15.00	-71.0	68.0	-0.0	0.00	1	+	+

Qty and Code	Position			Aiming Angles			ULR	Arr.	Switching Modes	
	X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0			1	2
1 * A	-13.00	35.00	15.00	-115.0	68.0	-0.0	0.00	1	+	+
1 * A	15.00	-37.00	15.00	109.0	68.0	-0.0	0.00	1	+	+
1 * A	15.00	-37.00	15.00	65.0	68.0	-0.0	0.00	1	+	+
1 * A	15.00	35.00	15.00	-109.0	68.0	0.0	0.00	1	+	+
1 * A	15.00	35.00	15.00	-65.0	68.0	0.0	0.00	1	+	+
1 * A	-53.50	-31.00	15.00	5.0	61.0	0.0	0.00	2	+	+
1 * A	-53.50	-31.00	15.00	57.0	69.0	0.0	0.00	2	+	+
1 * A	-53.50	29.00	15.00	-5.0	61.0	-0.0	0.00	2	+	+
1 * A	-53.50	29.00	15.00	-57.0	69.0	-0.0	0.00	2	+	+
1 * A	43.00	-37.00	15.00	106.0	66.0	0.0	0.00	3	+	+
1 * A	43.00	-37.00	15.00	75.0	67.0	0.0	0.00	3	+	+
1 * A	43.00	35.00	15.00	-106.0	66.0	-0.0	0.00	3	+	+
1 * A	43.00	35.00	15.00	-75.0	67.0	-0.0	0.00	3	+	+