Trowbridge FC

LED Floodlighting 200lux

Project code: 400421108
Date: 29-04-2024

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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1. Project Description

1.1 Description

Maintenance Factor:- 0.90

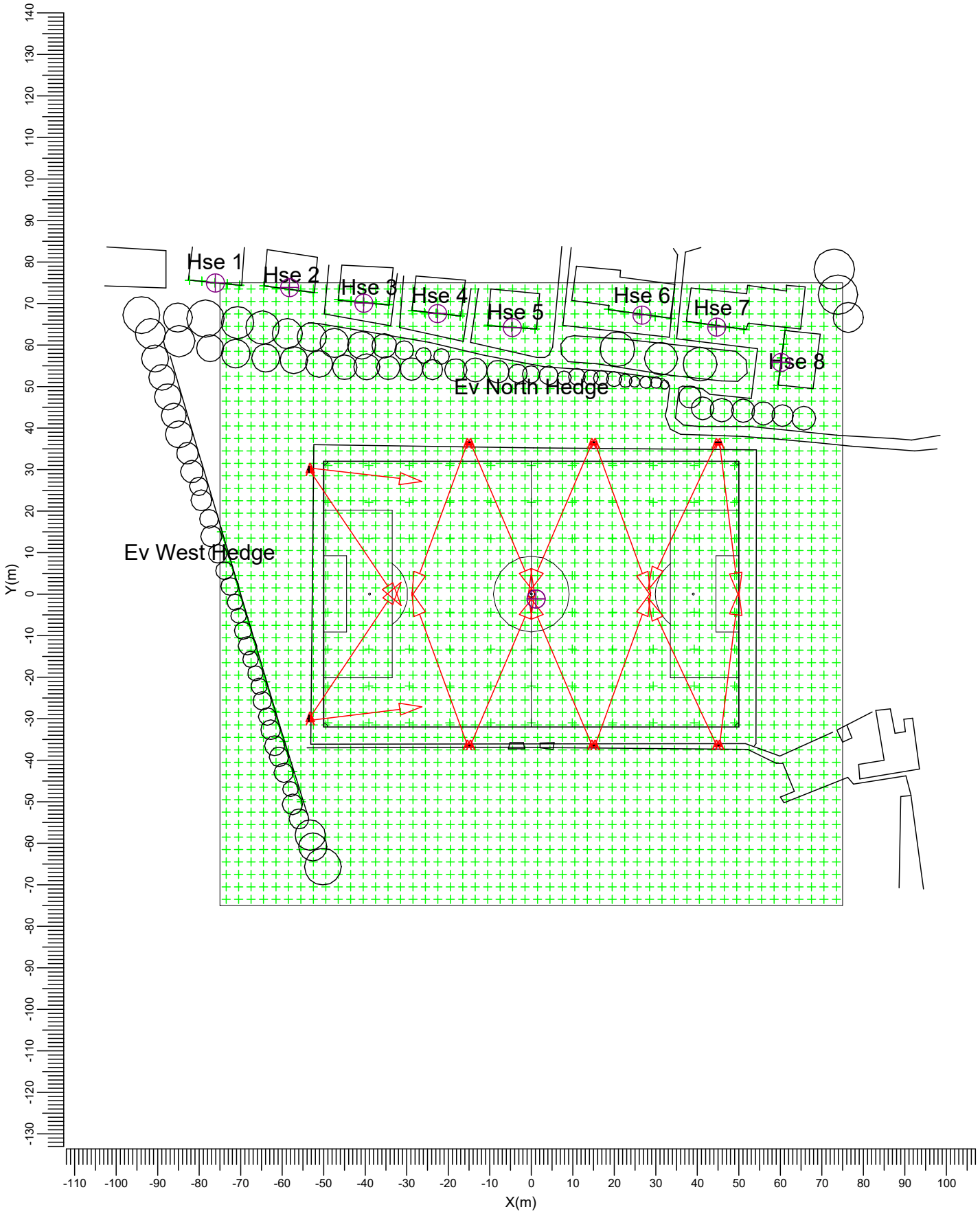
Pitch 100m x 64m

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 4.5m

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 Obstacle Information

Obstacle	Transparency (%)	Position		
		X (m)	Y (m)	Z (m)
Block	0	-53.60	-30.70	14.40
		-53.60	30.70	14.40
Pillar	0	-53.80	-30.00	0.00
		-53.80	30.00	0.00
Block1	0	-53.60	-29.90	14.40
		-53.60	29.90	14.40
Pillar1	0	-15.00	-36.50	0.00
		15.00	-36.50	0.00
		-15.00	36.50	0.00
		15.00	36.50	0.00
Pillar2	0	45.00	-36.50	0.00
		45.00	36.50	0.00
Block2	0	44.30	36.50	14.40
Block3	0	45.10	36.50	14.40

2.3 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	-
Obtrusive Light	16	-

Number of Luminaires Per Arrangement:

Arrangement	Luminaire Code	Power (kWatt)
	A	
Centre Columns	4	5.21
Centre Columns1	4	5.21
East End columns	2	2.61
East End columns1	2	2.61

Arrangement	Luminaire Code	Power (kWatt)
	A	
West End Columns	2	2.61
West End Columns1	2	2.61

2.4 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	214	134		0.63	0.43
Eh Spill @ 0.0m	1	Horizontal Illuminance	lux					
Eh Spill @ 1.5m	1	Horizontal Illuminance	lux					
Eh Spill @ 4.0m	1	Horizontal Illuminance	lux					
Ev Hse 1	2	Surface Illuminance	lux			0.09		
Ev Hse 2	2	Surface Illuminance	lux			0.14		
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			0.30		
Ev Hse 6	2	Surface Illuminance	lux			0.28		
Ev Hse 7	2	Surface Illuminance	lux			0.27		
Ev Hse 8	2	Surface Illuminance	lux			0.11		

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	-15.40	-36.35	15.00	110.00	69.00	0.00	511
1	Bb	A	-15.40	-36.35	15.00	110.00	69.00	0.00	546
1	Cc	A	14.60	-36.35	15.00	113.00	69.00	-0.00	544
1	Dd	A	14.60	-36.35	15.00	113.00	69.00	-0.00	568
1	Ee	A	44.60	-36.35	15.00	115.00	69.00	0.00	555
1	Ff	A	-14.60	-36.35	15.00	67.00	69.00	0.00	558
1	Gg	A	15.40	-36.35	15.00	70.00	69.00	-0.00	576
1	Hh	A	45.40	-36.35	15.00	83.00	68.00	0.00	572

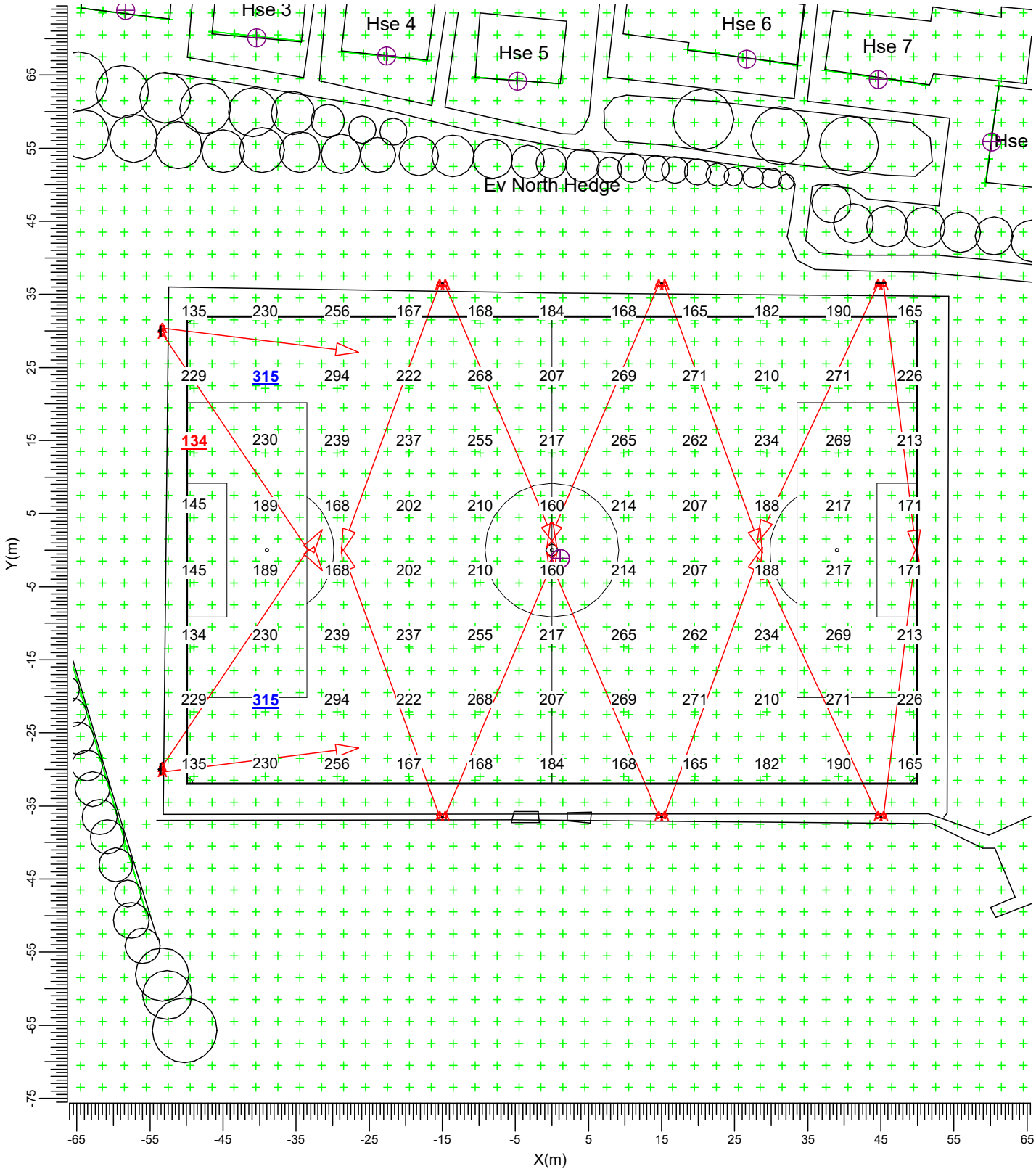
Switching Mode	ULR
1	0.00
2	0.00

3. Calculation Results

3.1 Football: Graphical Table

Performance

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



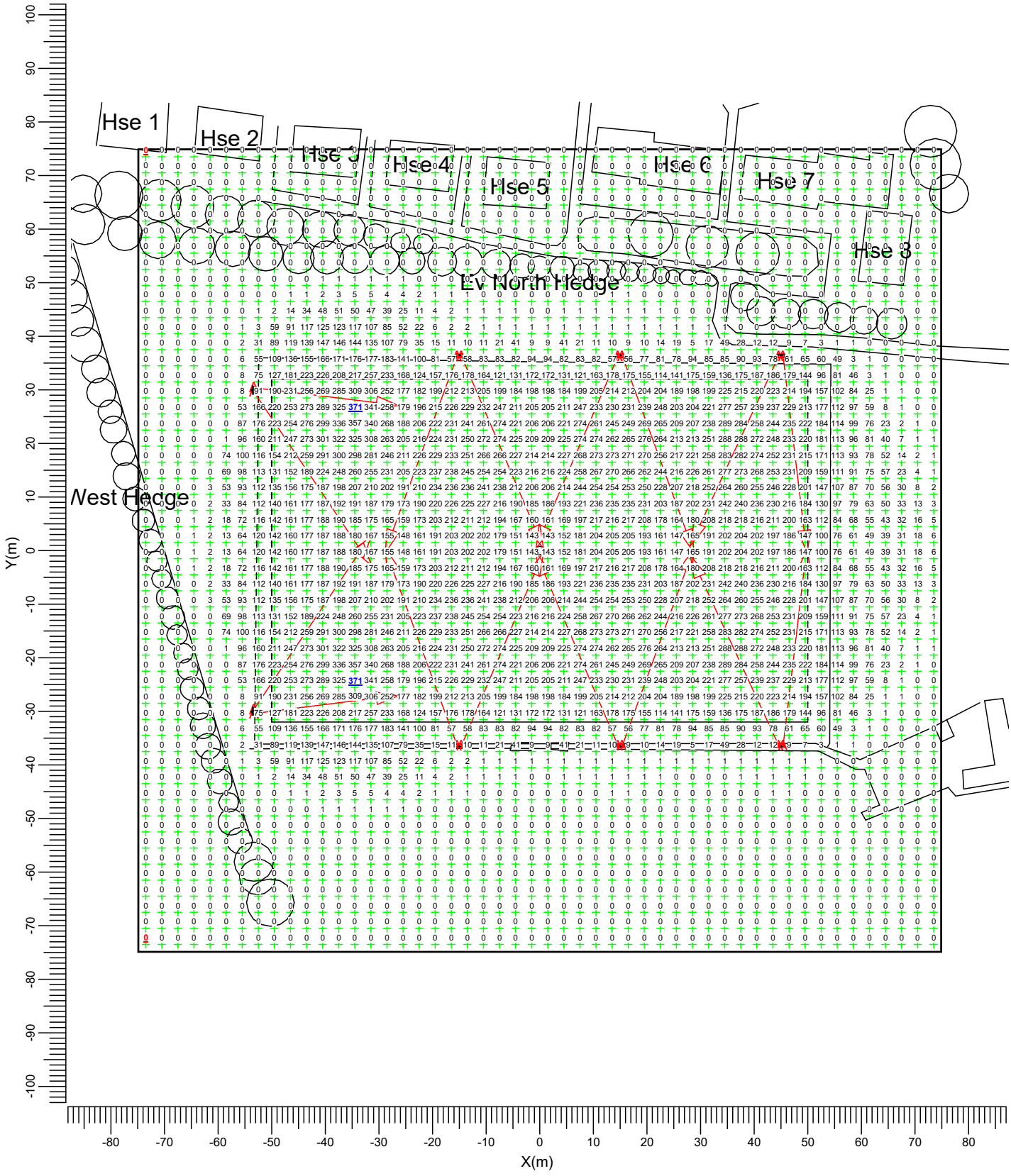
A → BVP528 OUT T45 A35-NB LO

Average	Minimum	Min/Ave	Min/Max	Project maintenance factor	Scale
214	134	0.63	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

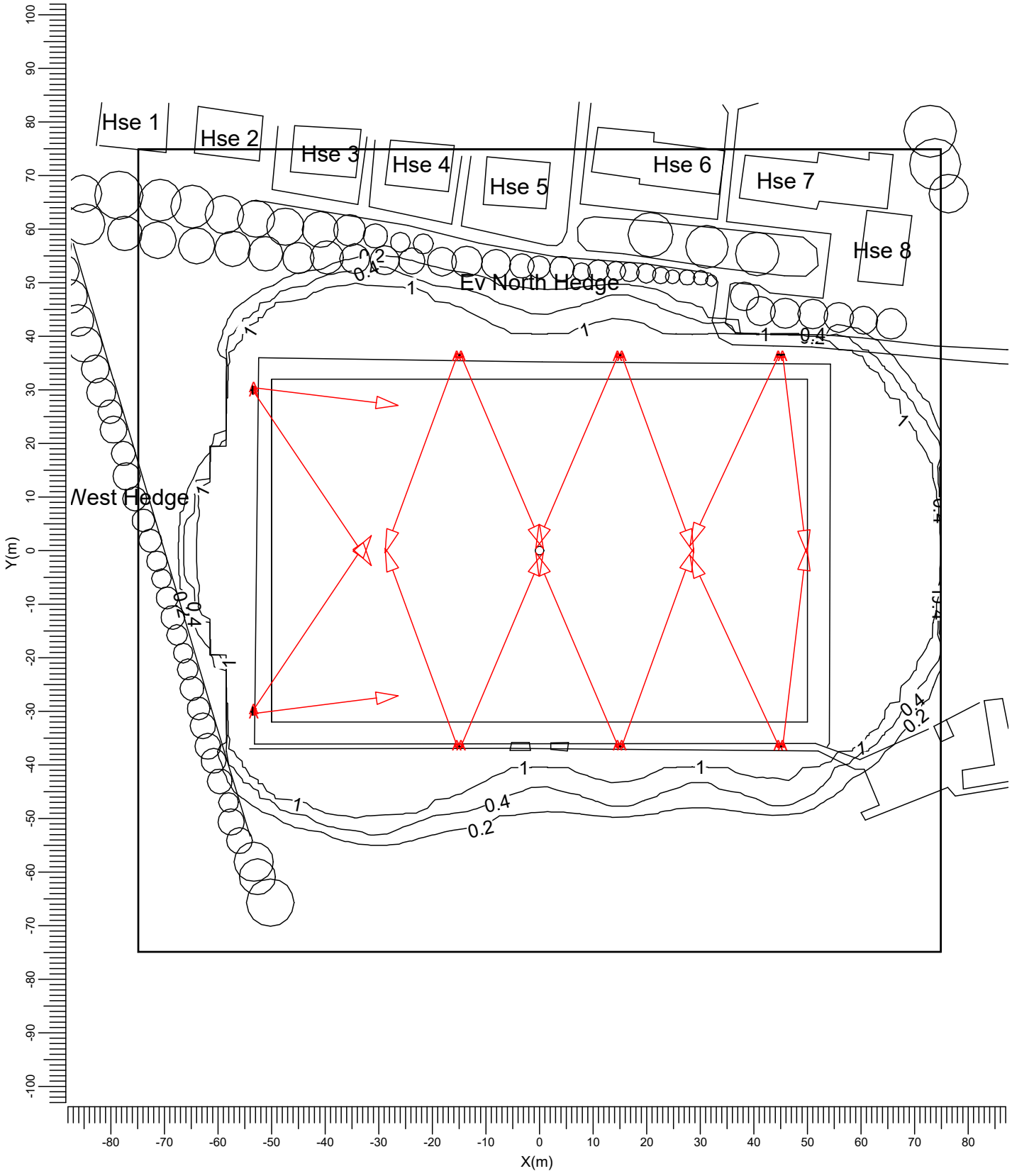
Project maintenance factor
0.90

Scale
1:1000

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

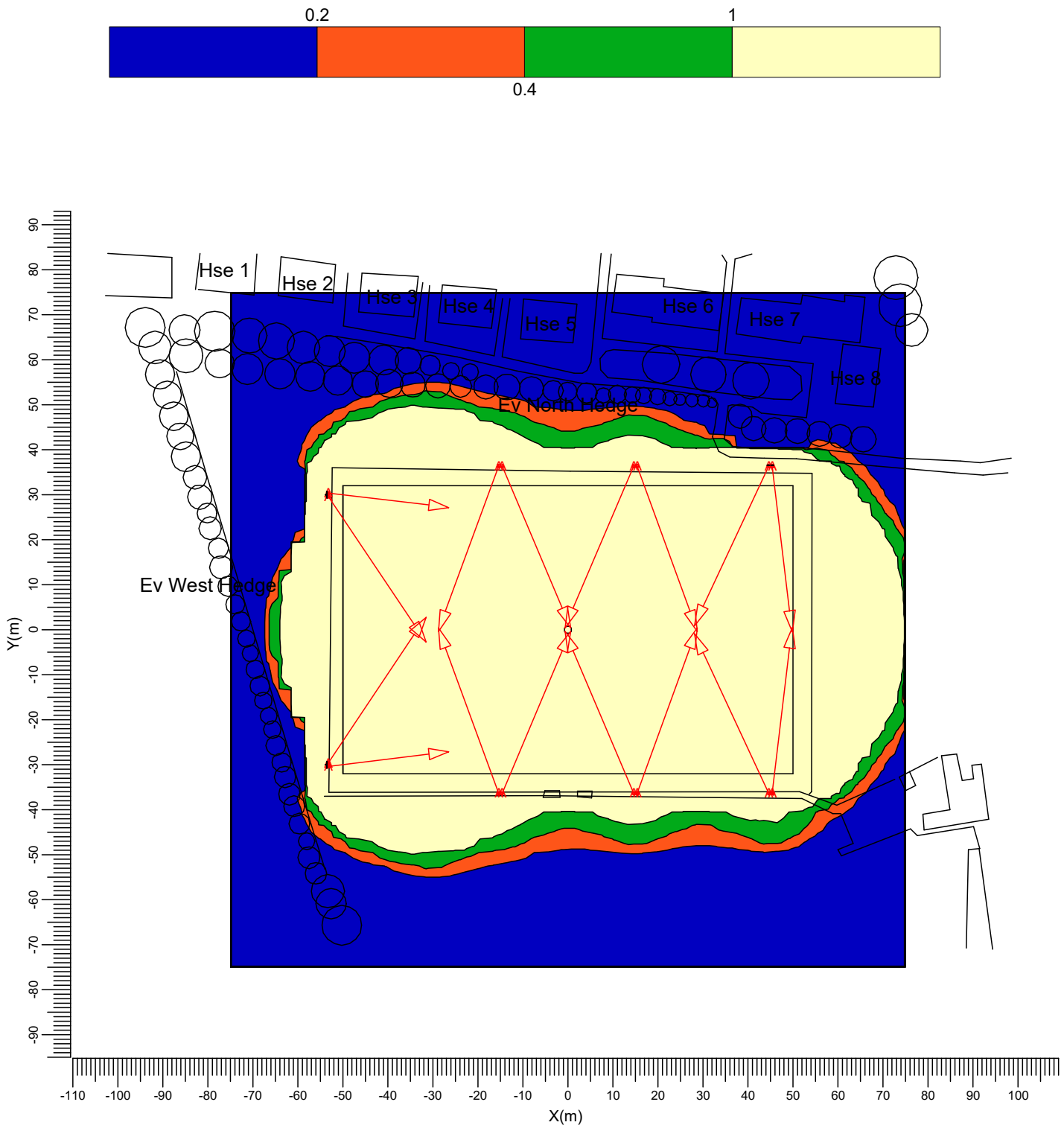
Project maintenance factor
0.90

Scale
1:1000

3.4 Eh Spill @ 0.0m: Filled Iso Contour

Performance

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



A → BVP528 OUT T45 A35-NB LO

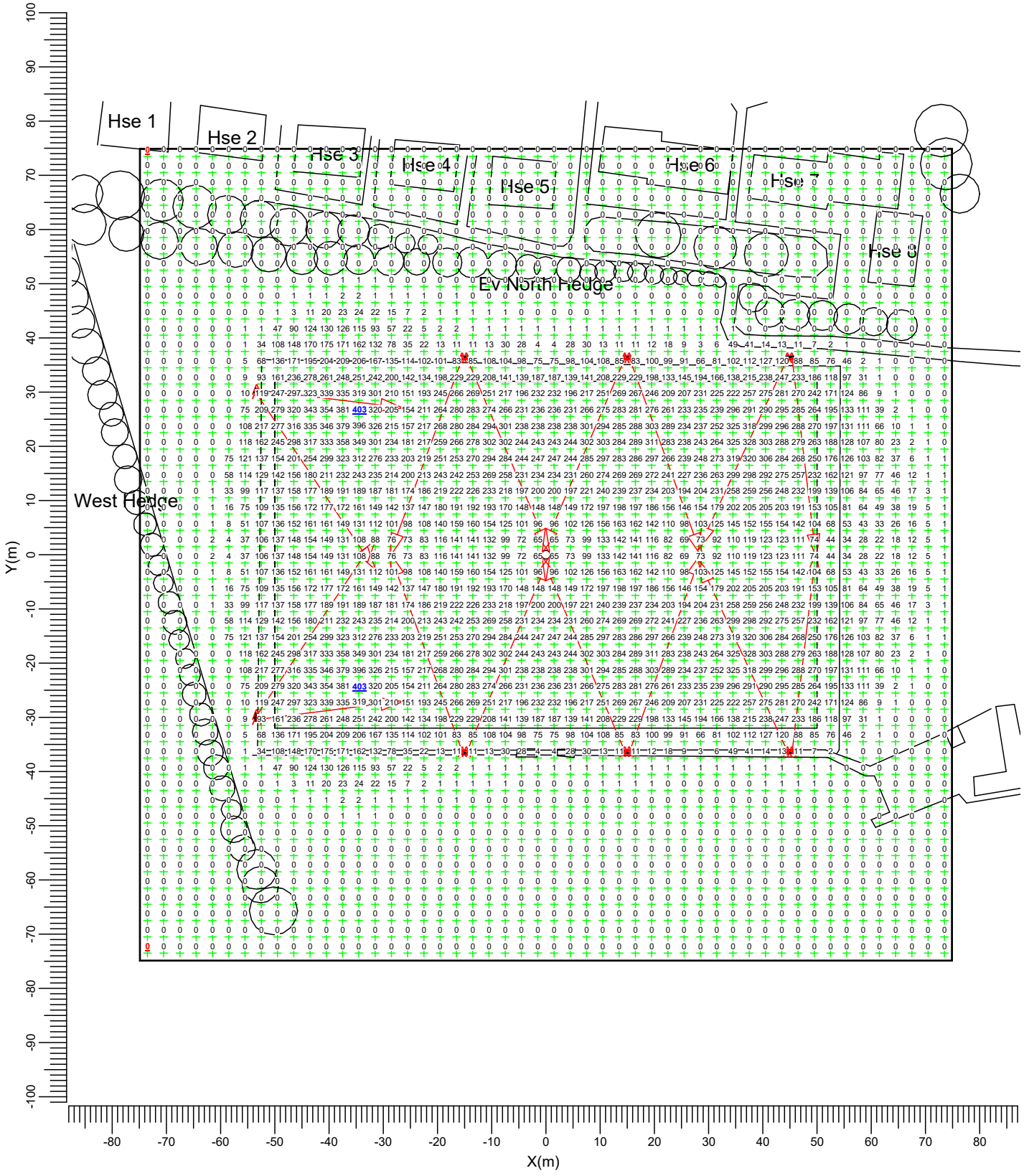
Project maintenance factor
0.90

Scale
1:1250

3.5 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

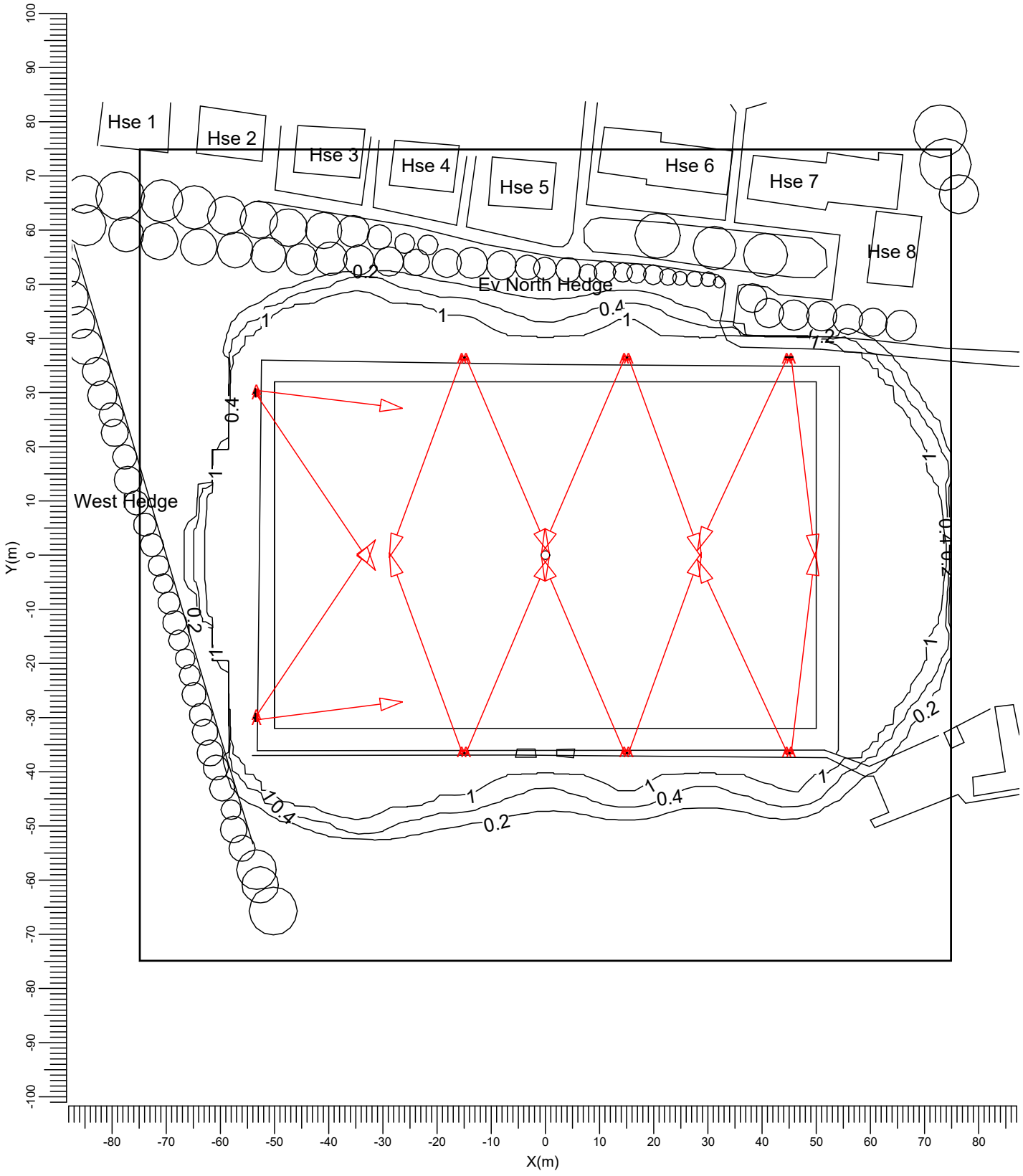
Project maintenance factor
0.90

Scale
1:1000

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

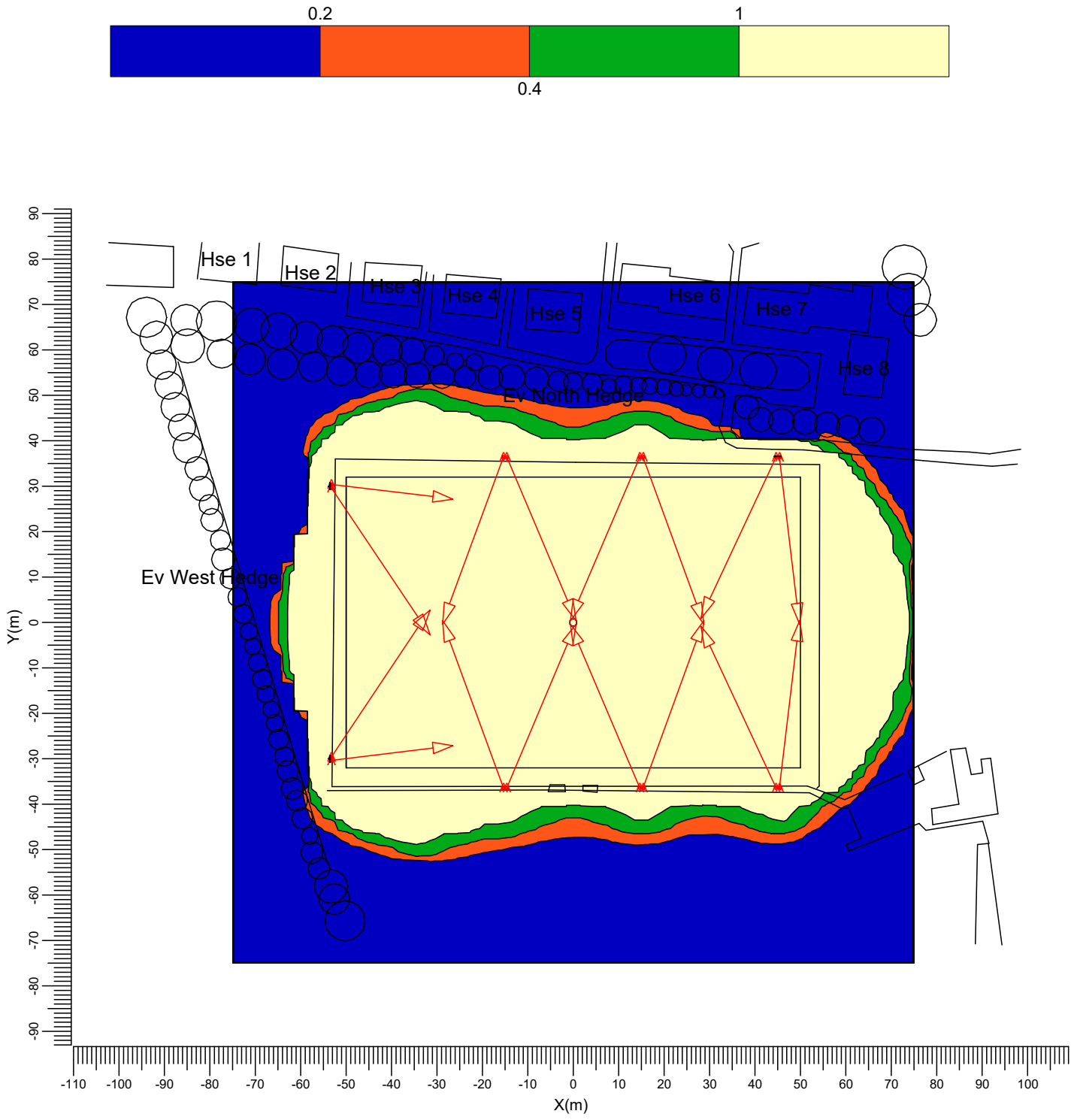
Project maintenance factor
0.90

Scale
1:1000

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



A BVP528 OUT T45 A35-NB LO

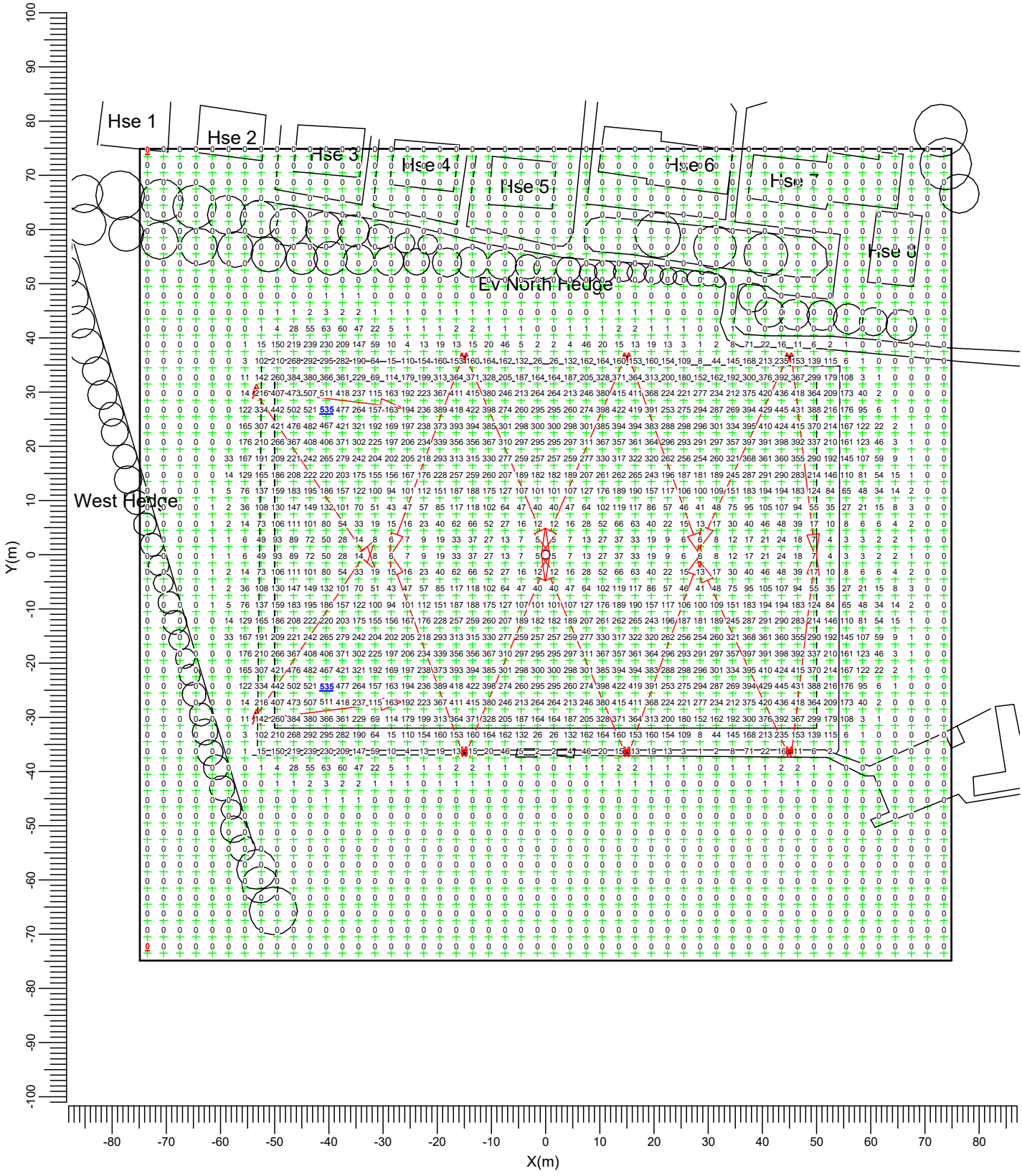
Project maintenance factor
0.90

Scale
1:1250

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

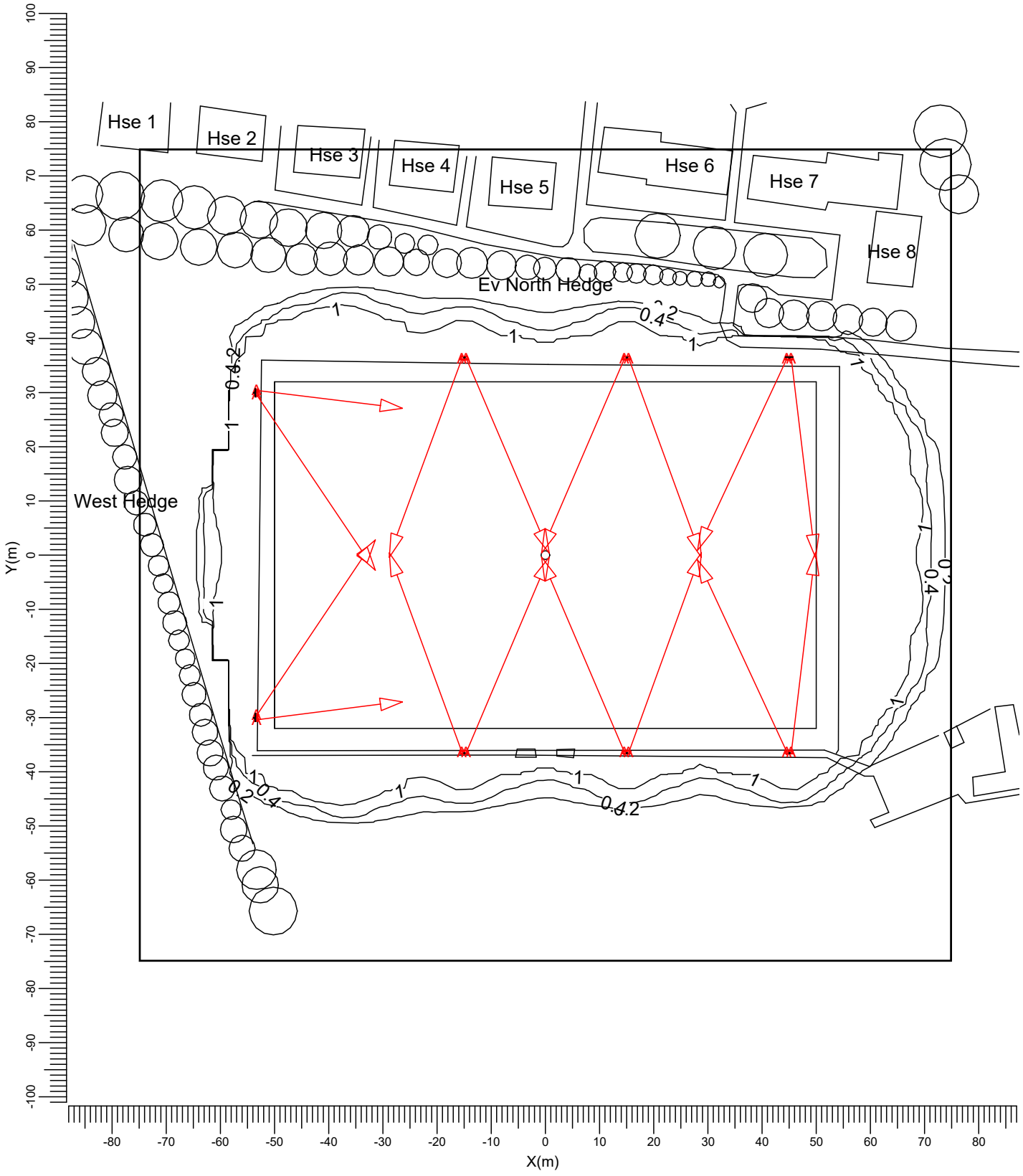
Project maintenance factor
0.90

Scale
1:1000

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

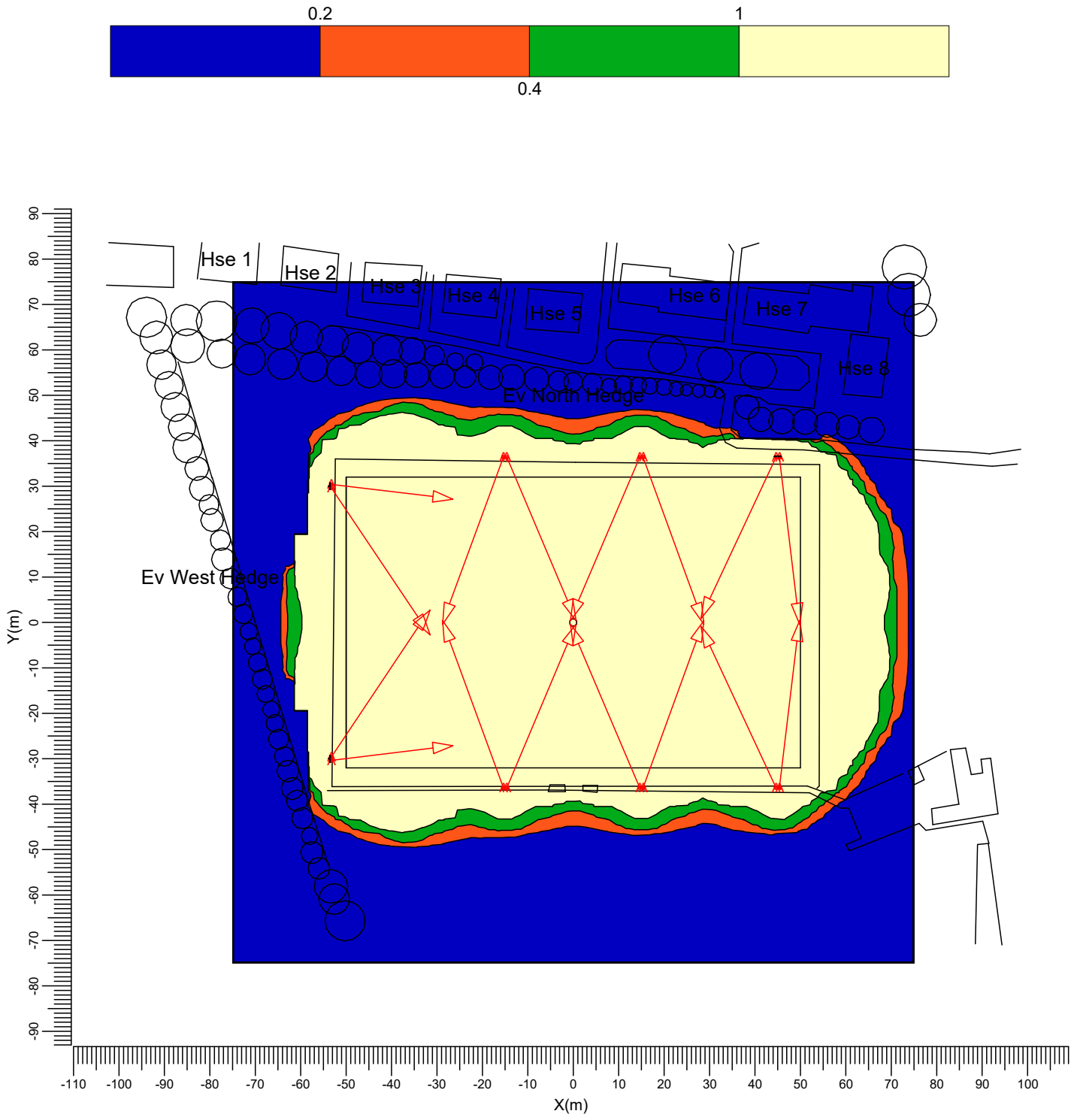
Project maintenance factor
0.90

Scale
1:1000

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



A → BVP528 OUT T45 A35-NB LO

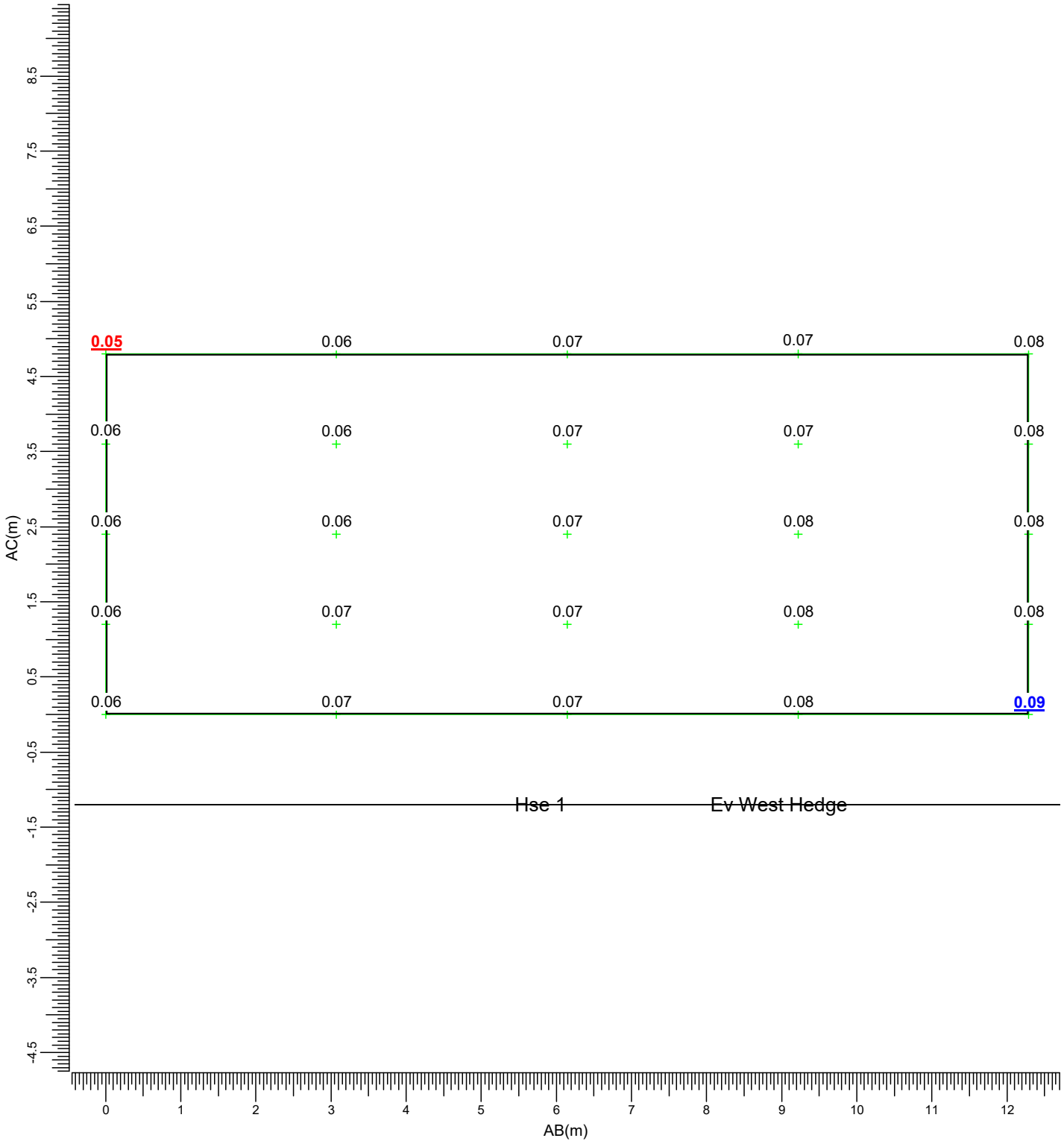
Project maintenance factor
0.90

Scale
1:1250

3.11 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)

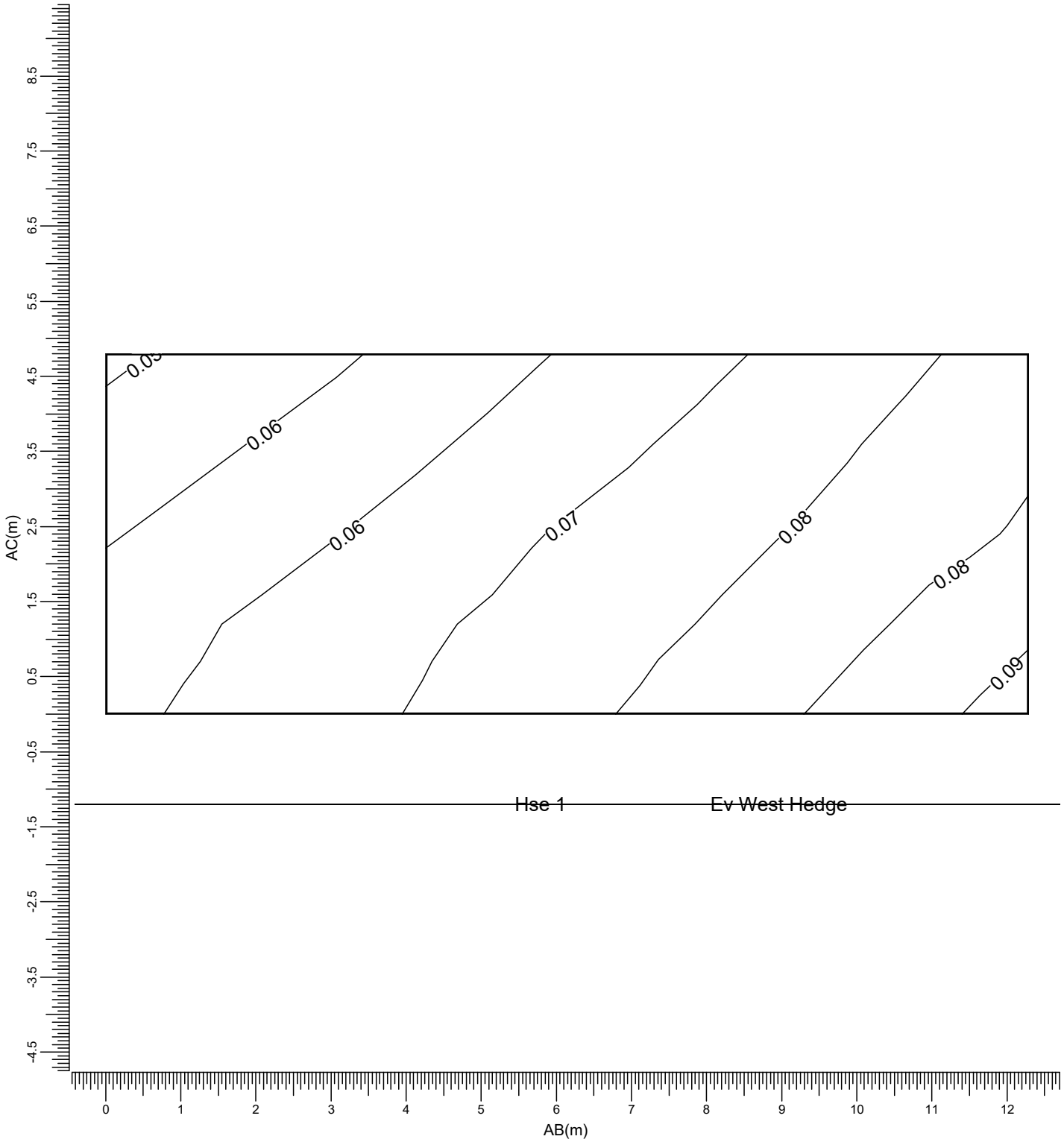
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.09	1.00	1:75

3.12 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)

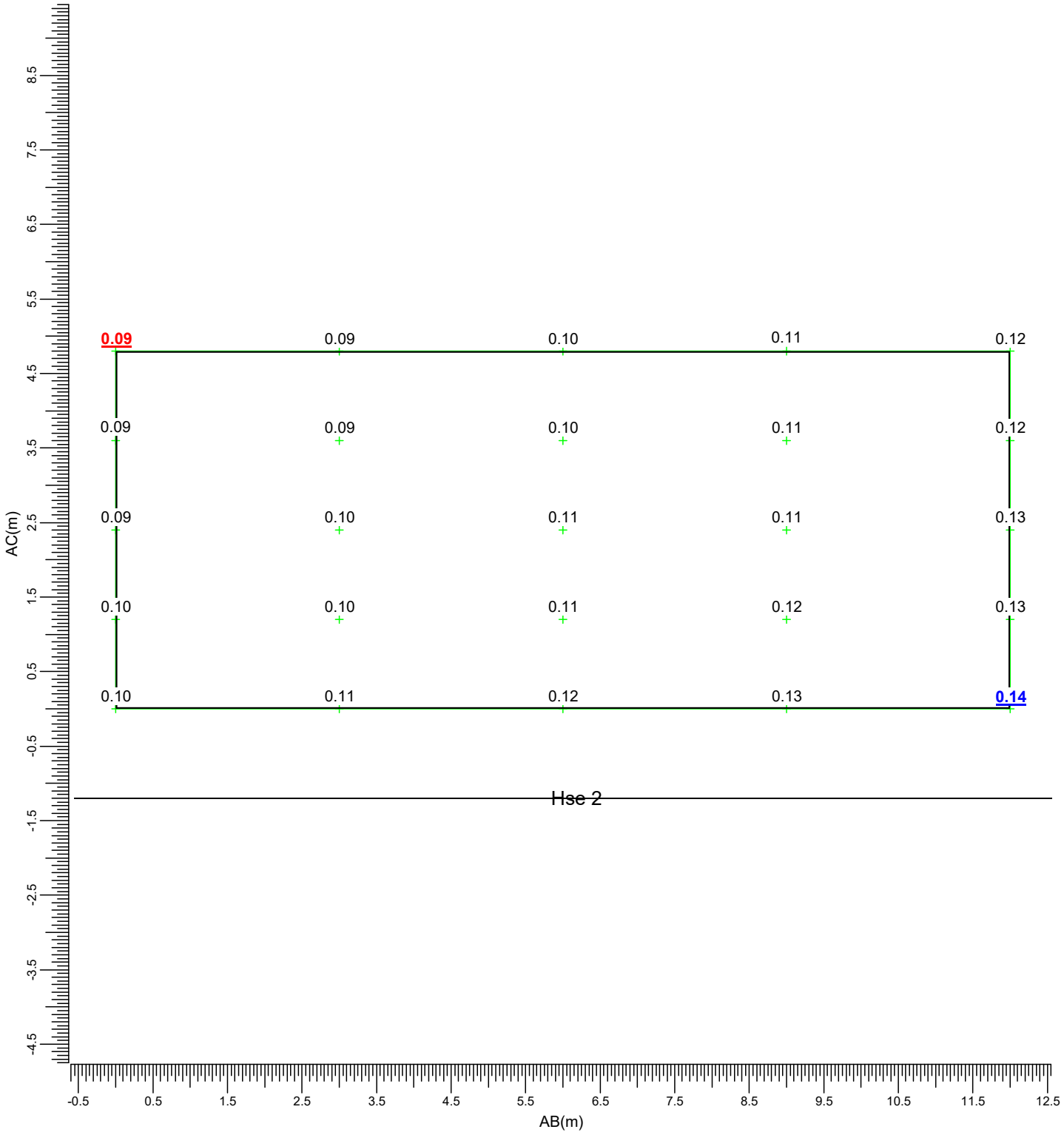
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.09	1.00	1:75

3.13 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)

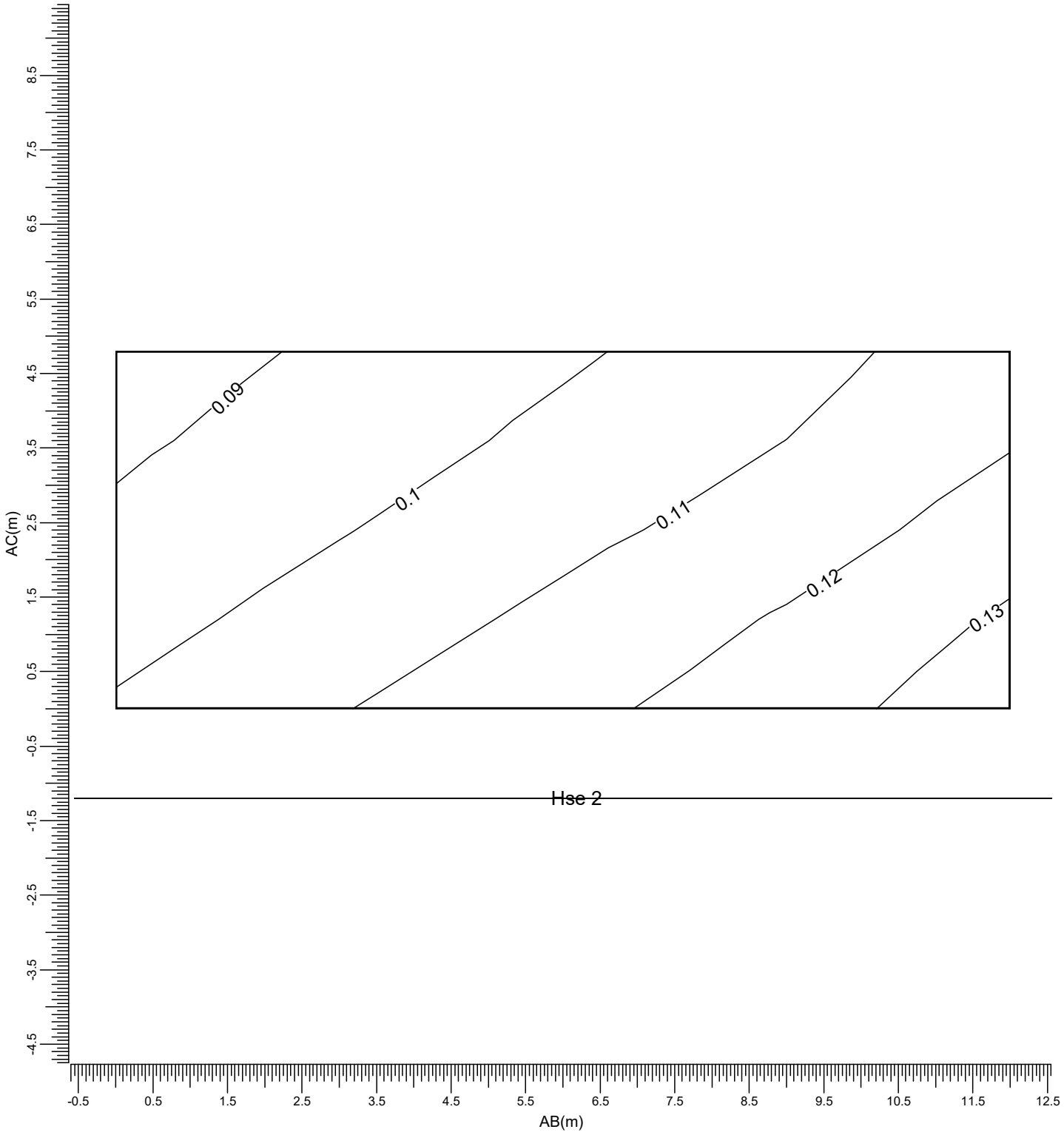
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.14	1.00	1:75

3.14 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)

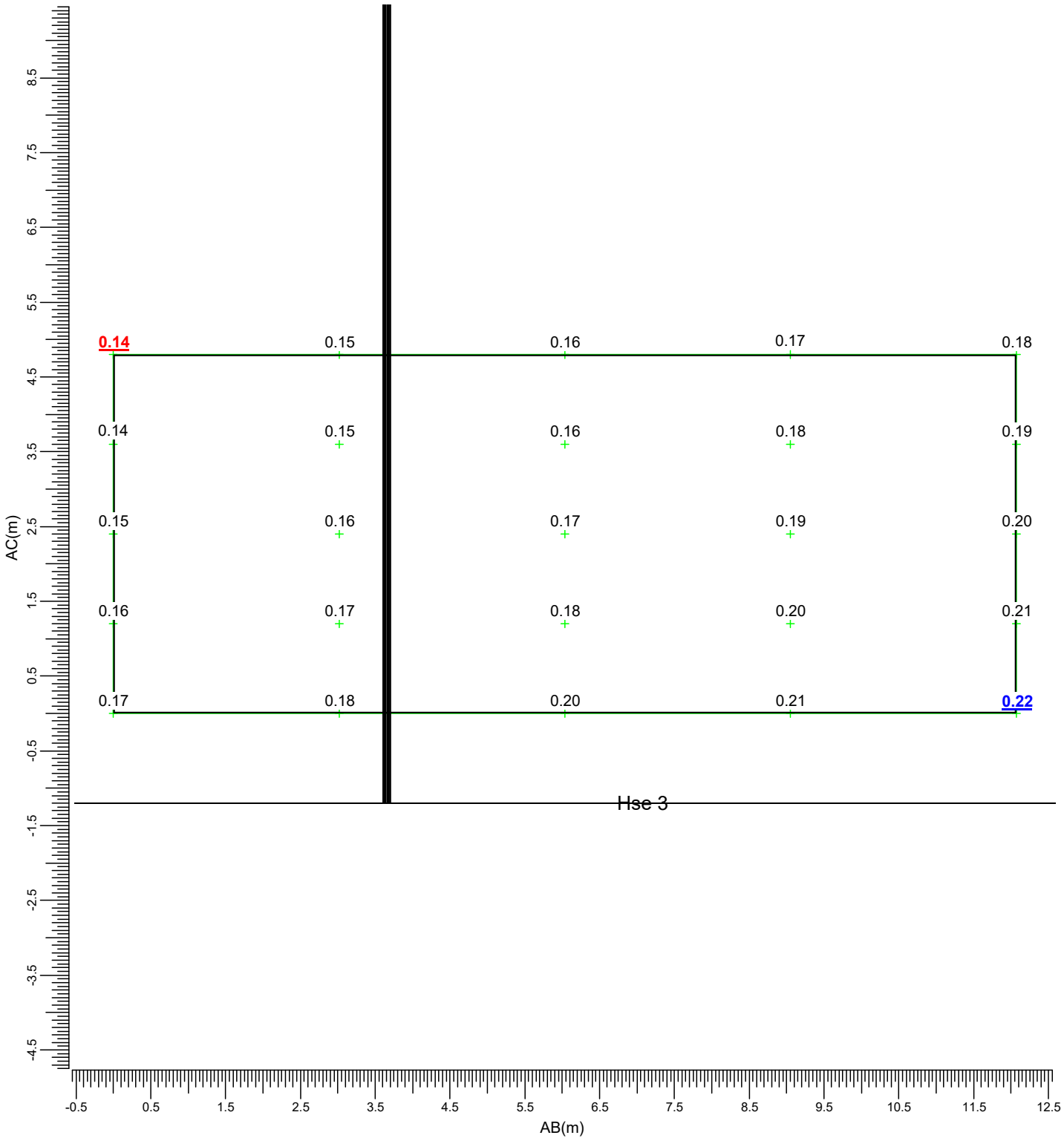
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.14	1.00	1:75

3.15 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)

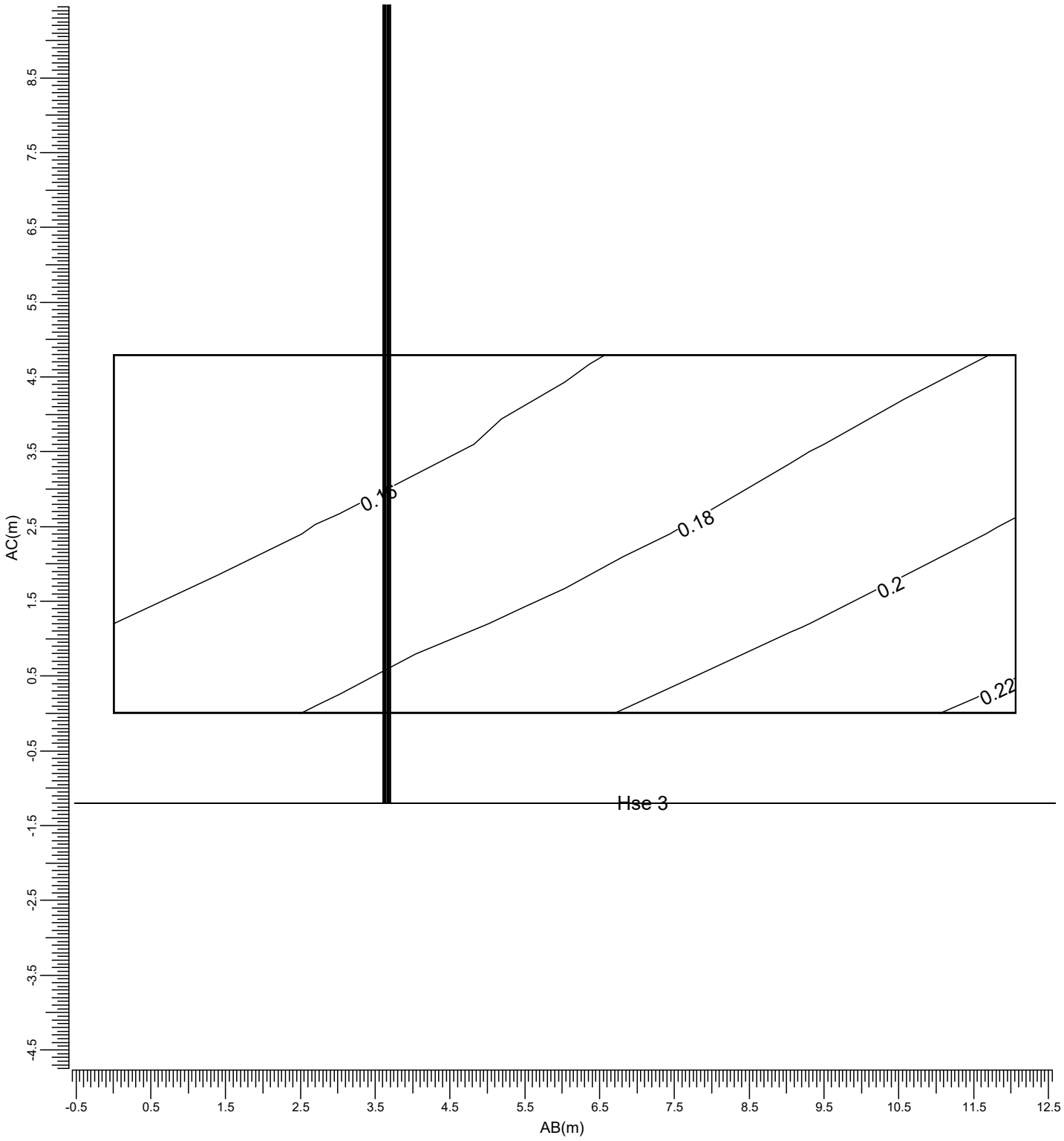
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.22	1.00	1:75

3.16 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)

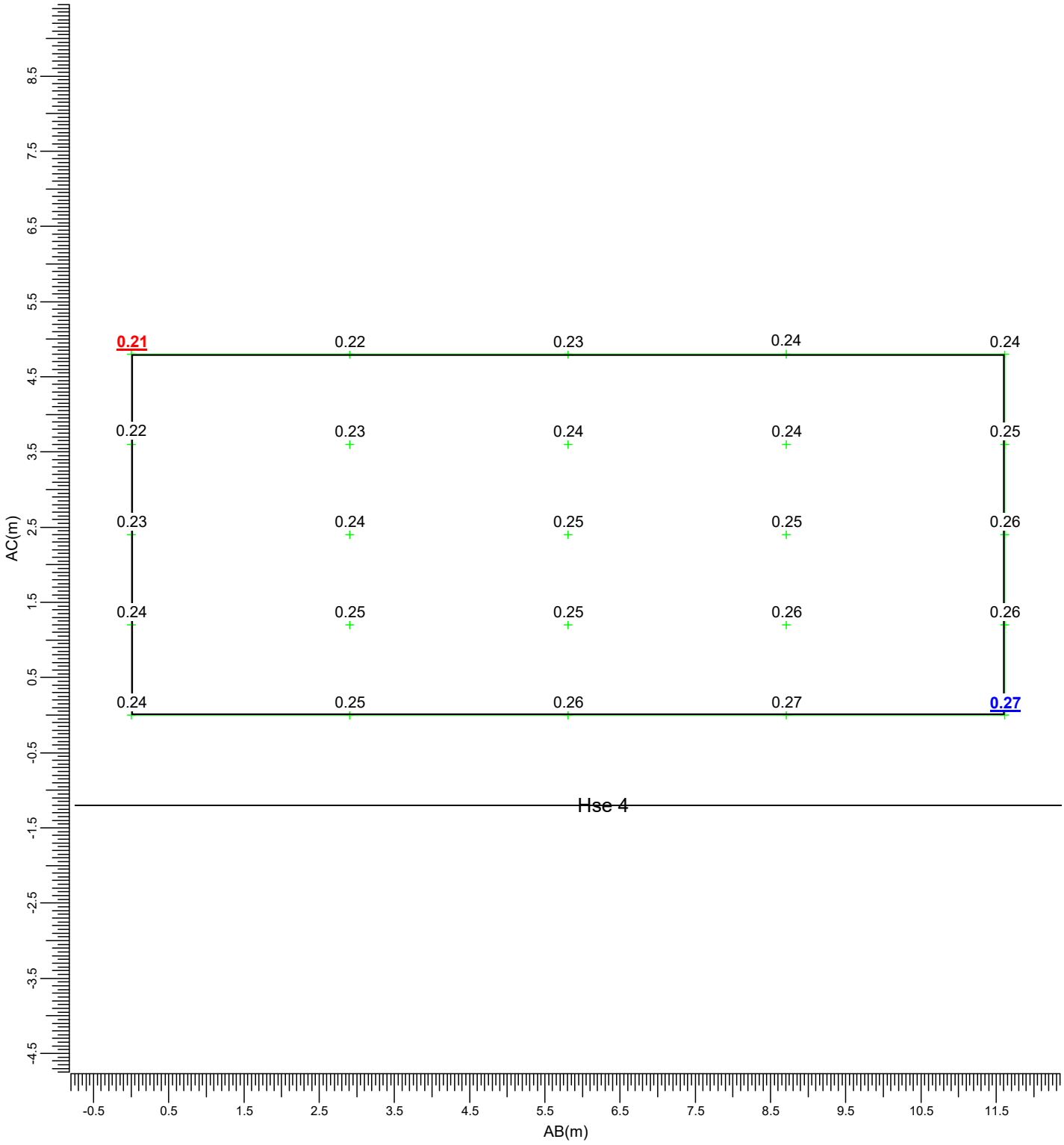
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.22	1.00	1:75

3.17 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)

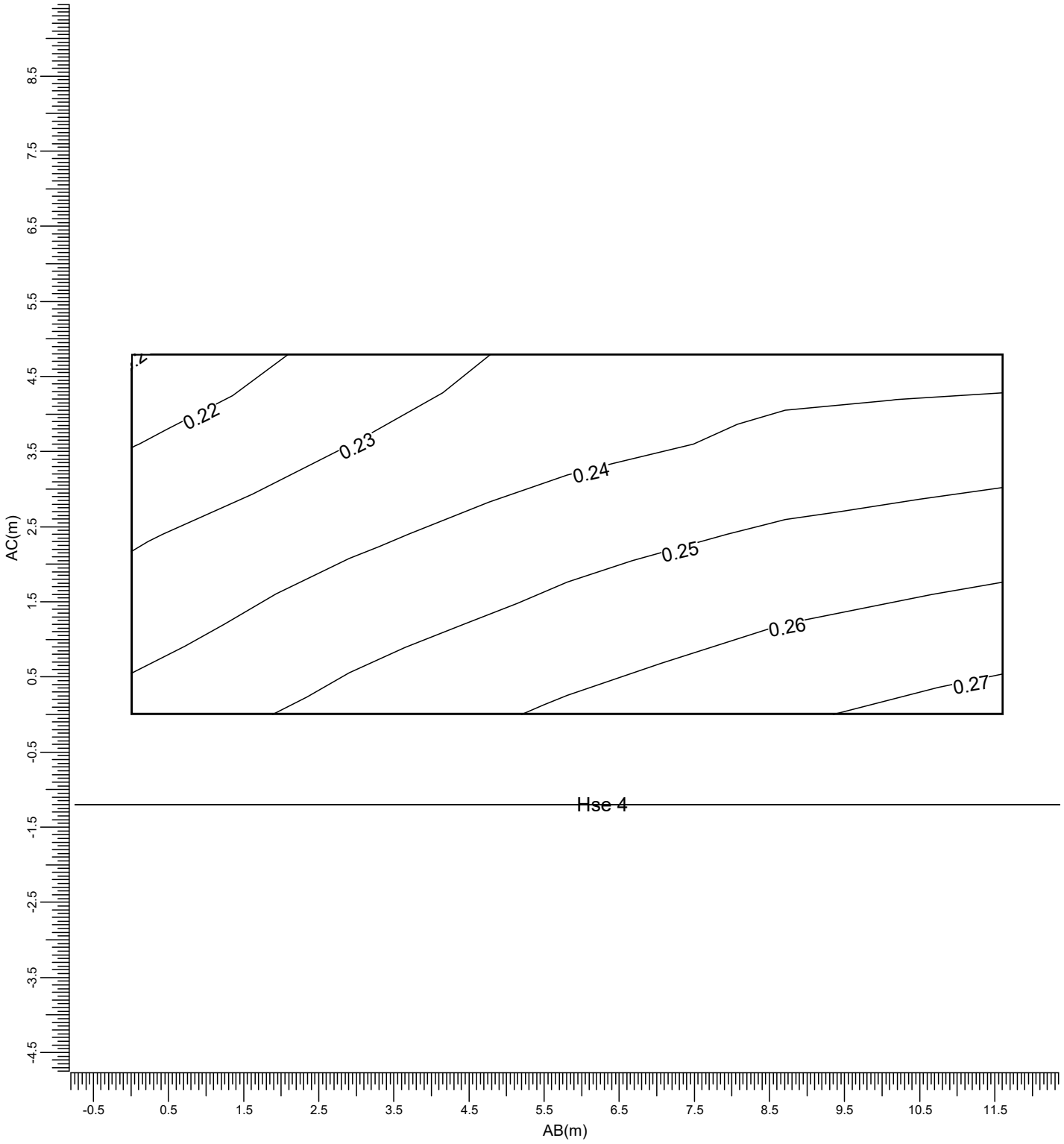
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.27	1.00	1:75

3.18 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)

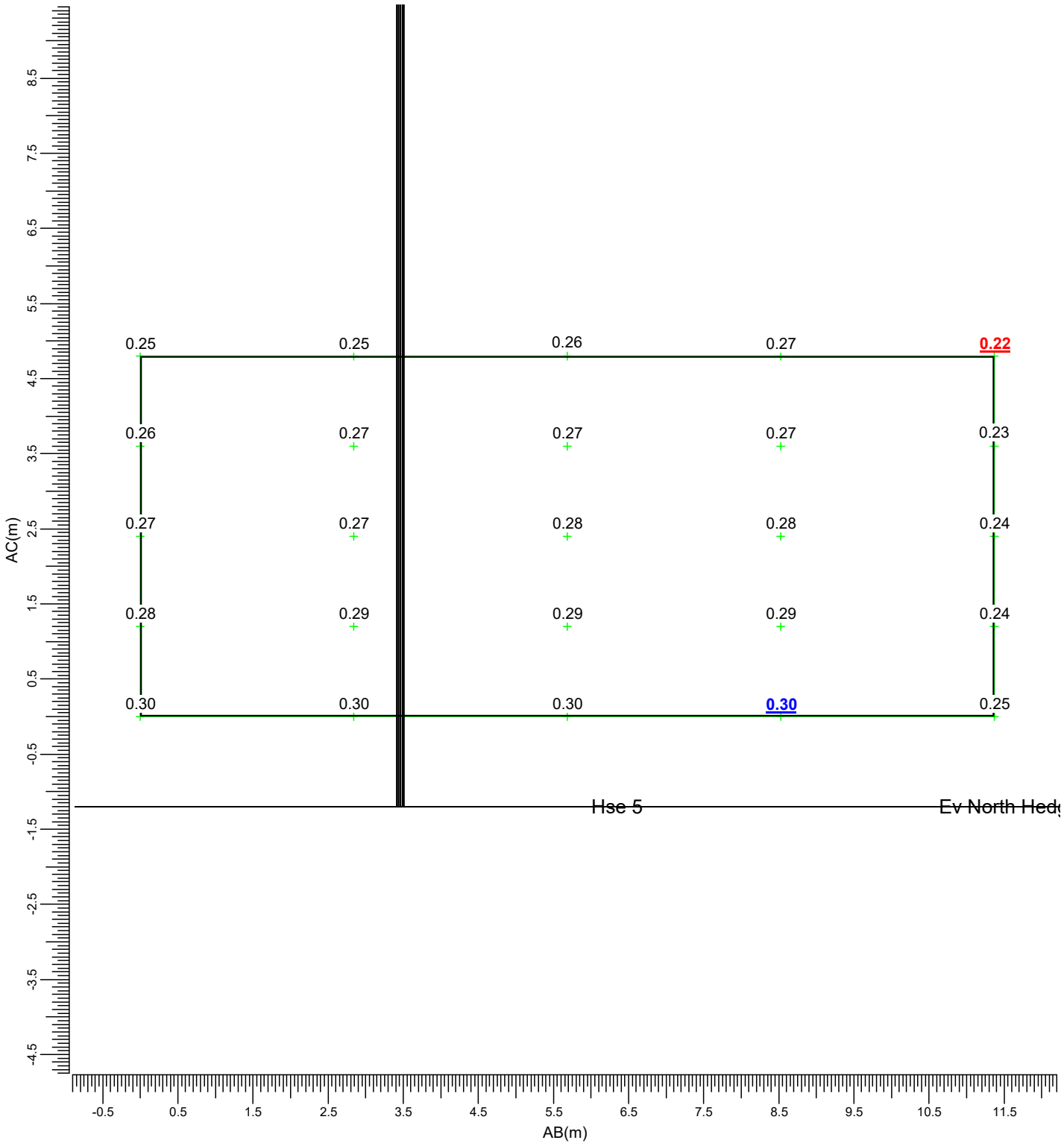
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.27	1.00	1:75

3.19 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)

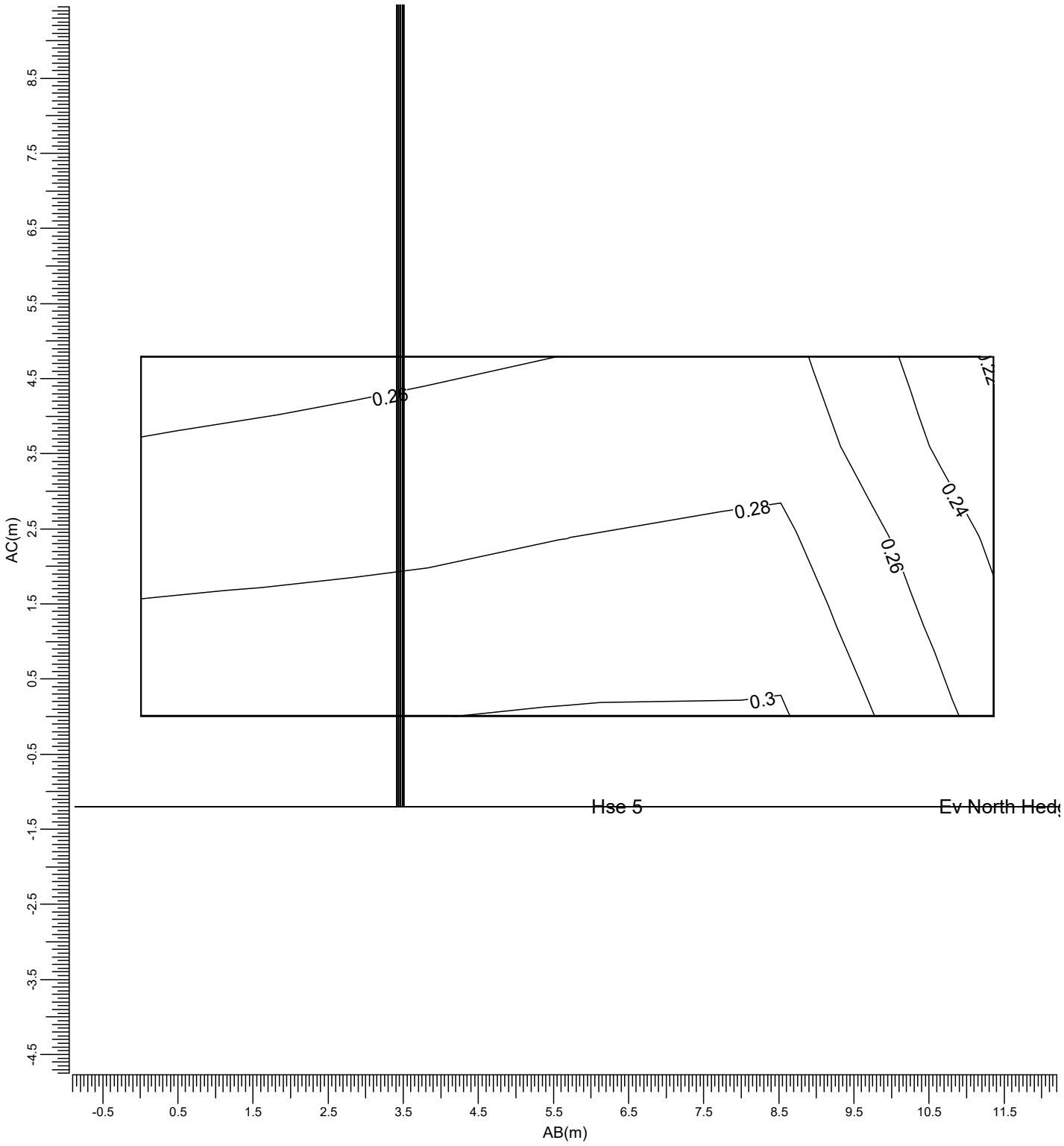
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.30	1.00	1:75

3.20 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)

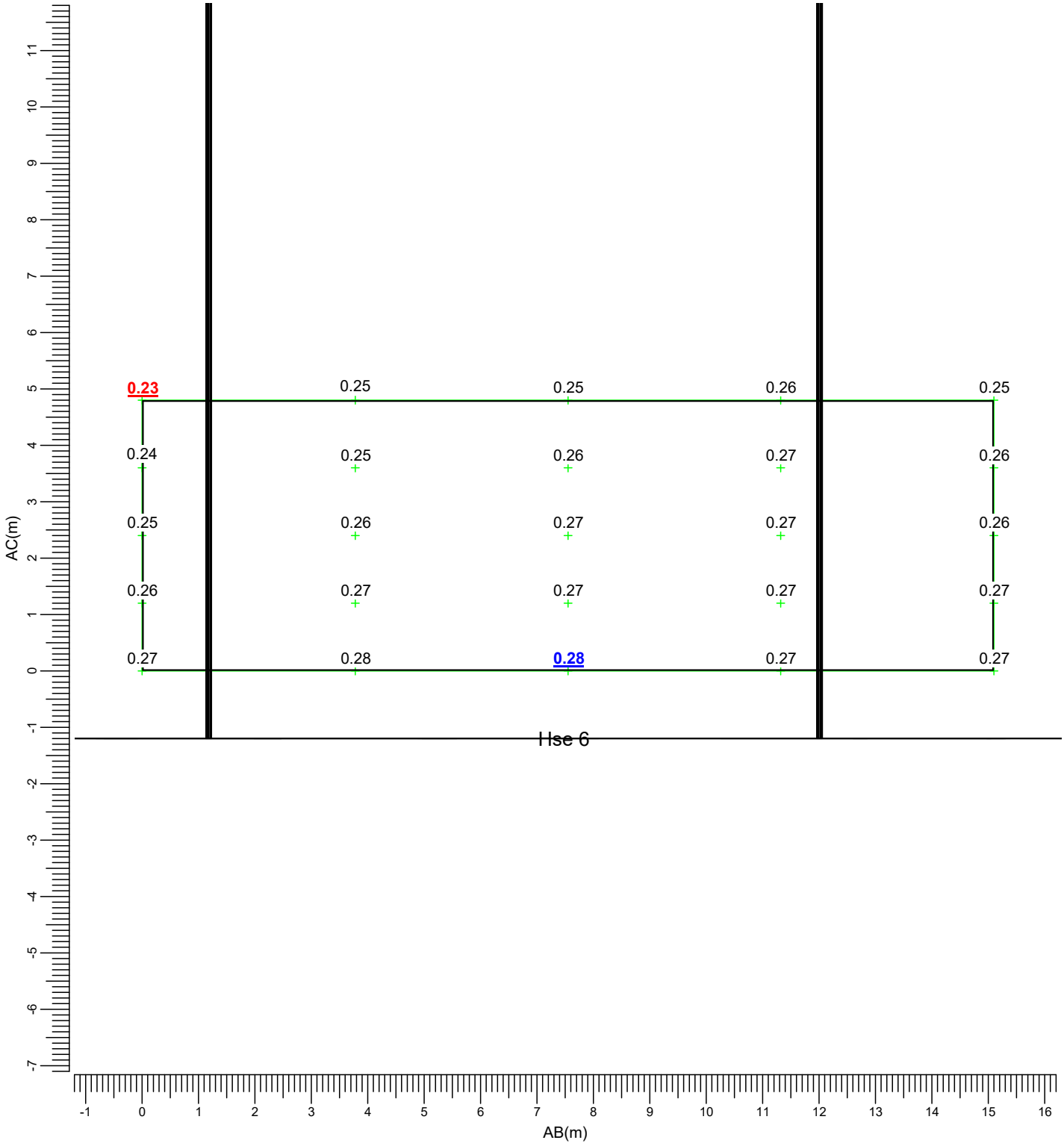
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.30	1.00	1:75

3.21 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)

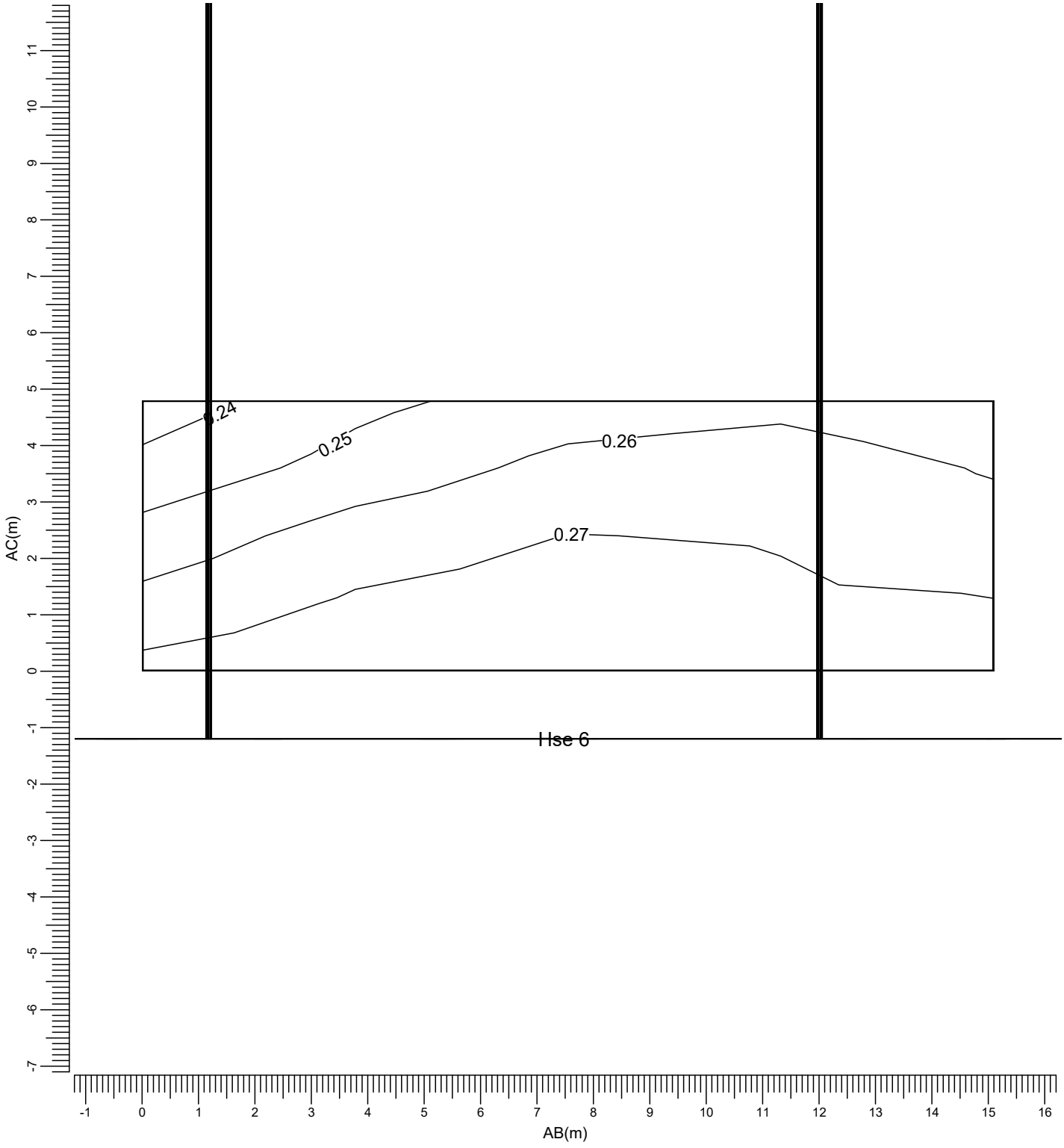
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.28	1.00	1:100

3.22 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)

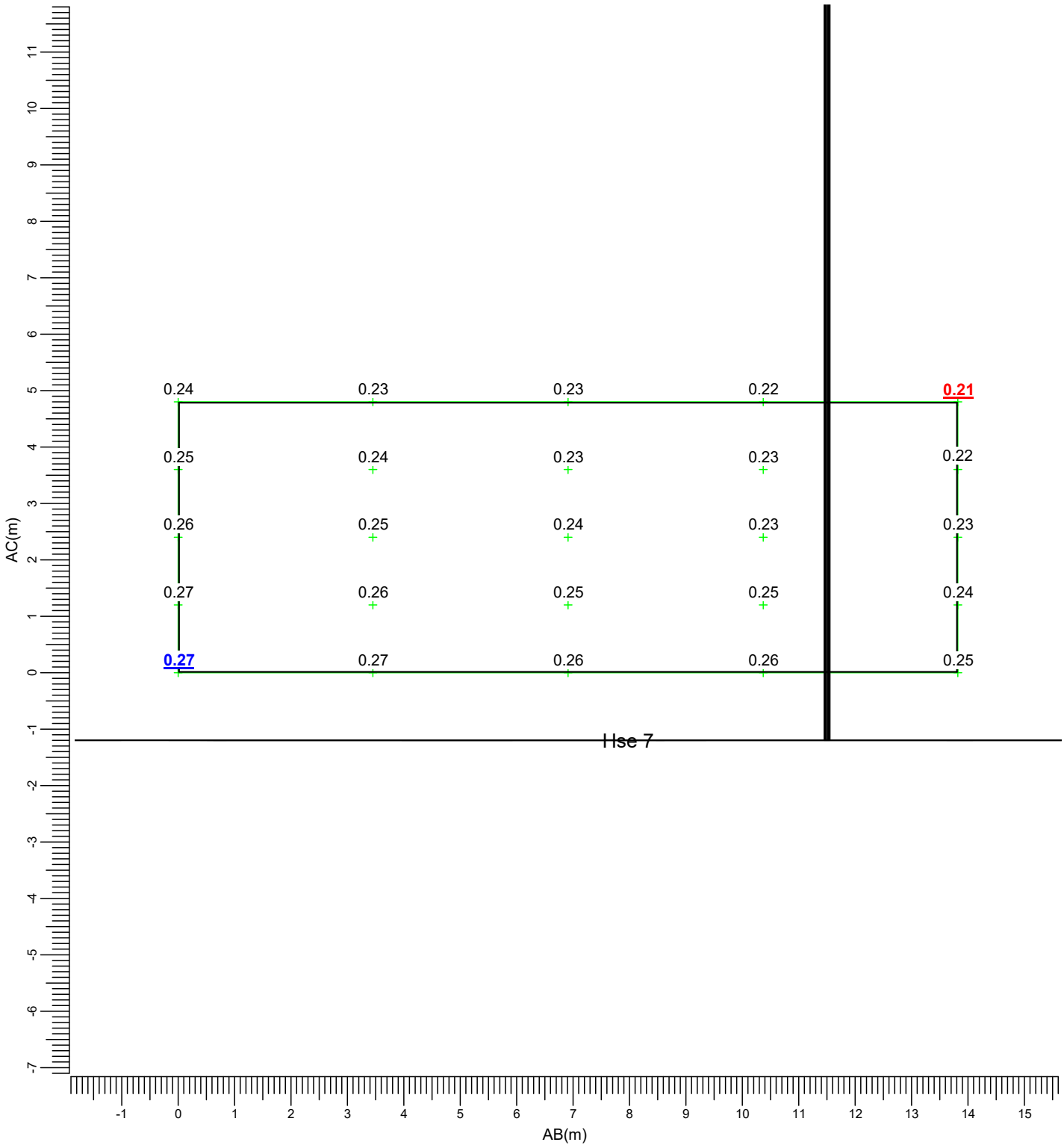
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.28	1.00	1:100

3.23 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)

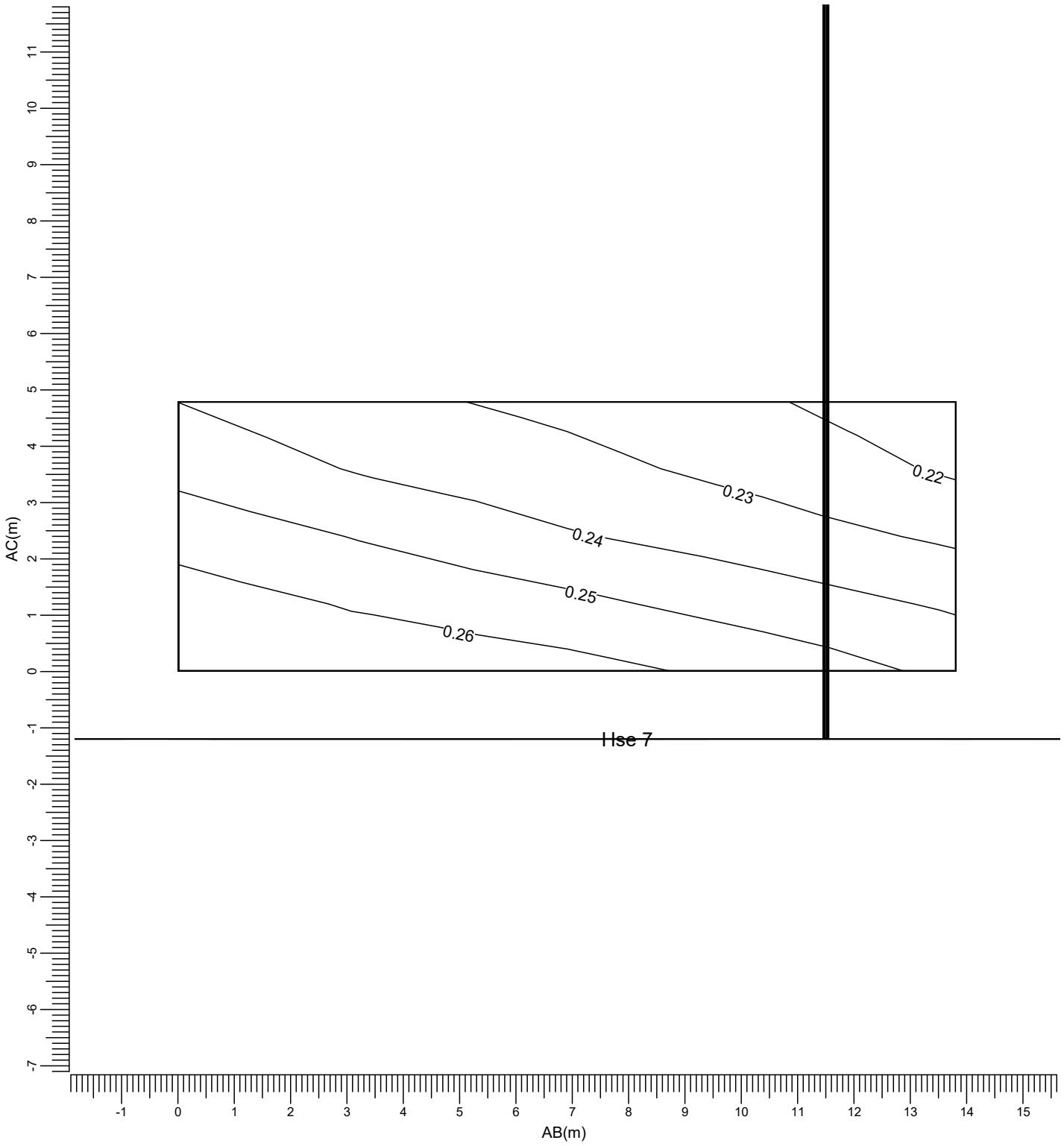
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.27	1.00	1:100

3.24 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)

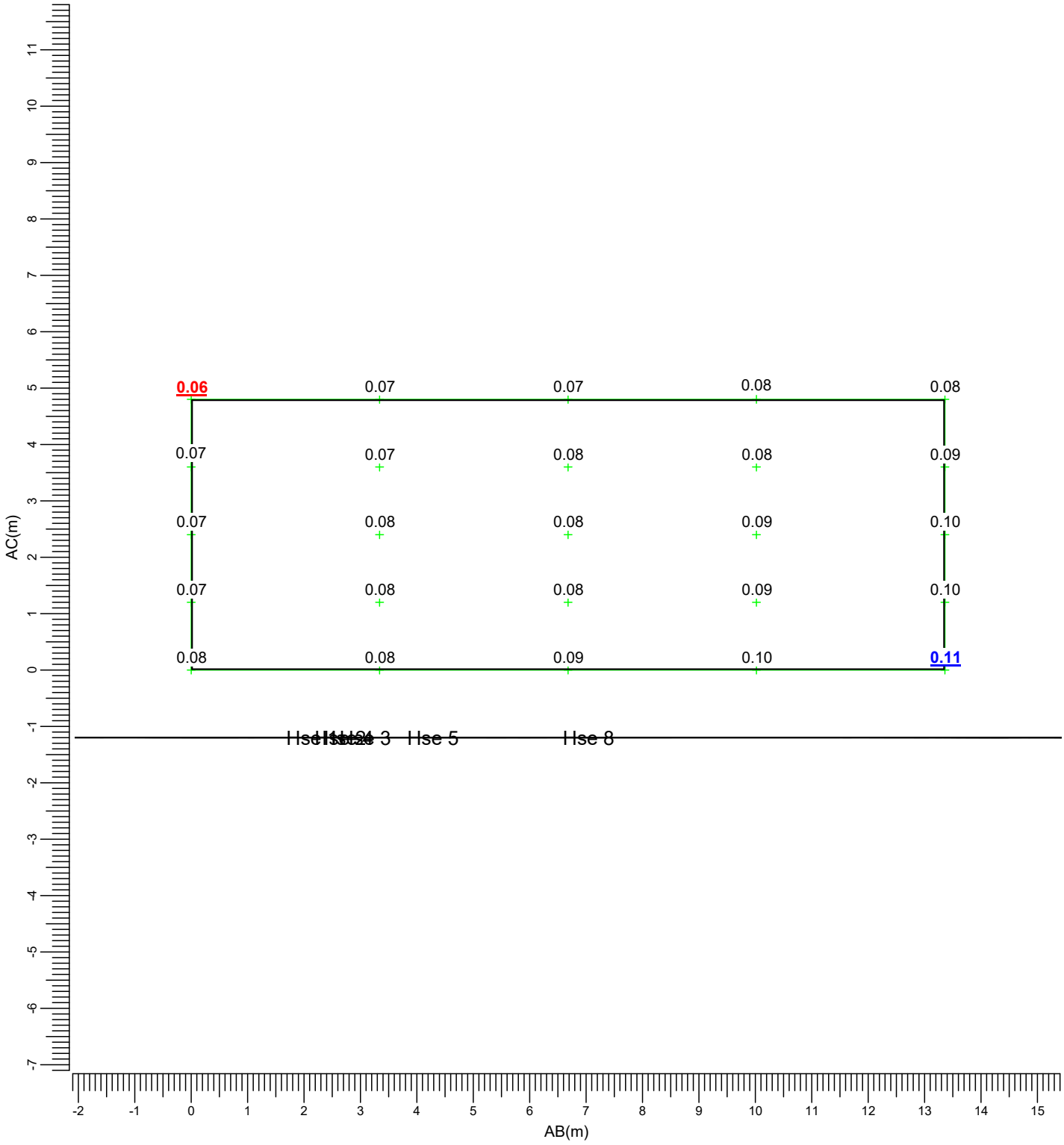
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.27	1.00	1:100

3.25 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)

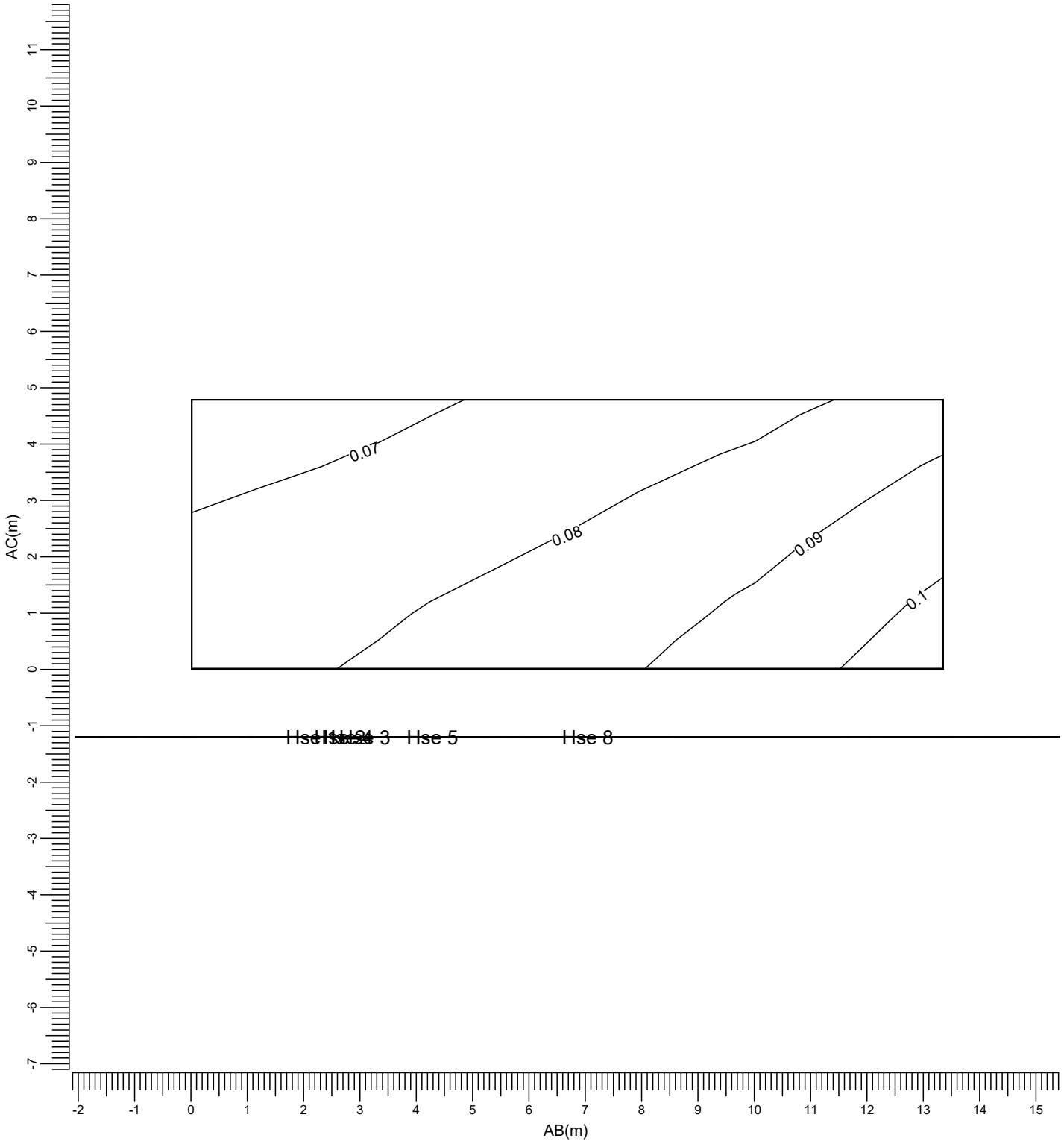
A : BVP528 OUT T45 A35-NB LO

Maximum	Project maintenance factor	Scale
0.11	1.00	1:100

3.26 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
0.11	1.00	1:100

4. Luminaire Details

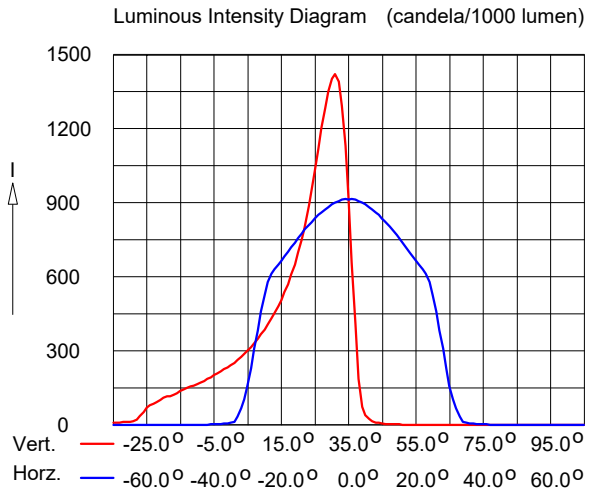
4.1 Project Luminaires

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
4	West End Columns1
5	Centre Columns1
6	East End columns1

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	-14.60	-36.35	15.00	0.67	-0.38	0.00	0.00	1	90	90
1 * A	-14.60	36.35	15.00	0.67	0.38	0.00	0.00	1	90	90
1 * A	14.60	-36.35	15.00	-0.67	-0.38	0.00	0.00	1	90	90
1 * A	14.60	36.35	15.00	-0.67	0.38	0.00	0.00	1	90	90
1 * A	-53.30	-30.40	15.00	-26.44	-27.10	0.00	0.00	2	90	90
1 * A	-53.30	30.40	15.00	-26.44	27.10	0.00	0.00	2	90	90
1 * A	44.60	-36.35	15.00	28.09	-0.93	0.00	0.00	3	90	90
1 * A	44.60	36.35	15.00	28.09	0.93	0.00	0.00	3	90	90
1 * A	-53.30	-29.60	15.00	-31.45	2.80	0.00	0.00	4	90	90
1 * A	-53.30	29.60	15.00	-31.45	-2.80	0.00	0.00	4	90	90
1 * A	-15.40	-36.35	15.00	-28.76	0.37	0.00	0.00	5	90	90
1 * A	-15.40	36.35	15.00	-28.76	-0.37	0.00	0.00	5	90	90
1 * A	15.40	-36.35	15.00	28.76	0.37	0.00	0.00	5	90	90
1 * A	15.40	36.35	15.00	28.76	-0.37	0.00	0.00	5	90	90
1 * A	45.40	-36.35	15.00	49.92	0.50	0.00	0.00	6	90	90
1 * A	45.40	36.35	15.00	49.92	-0.50	0.00	0.00	6	90	90

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	-14.60	-36.35	15.00	67.0	69.0	0.0	0.00	1	90	90
1 * A	-14.60	36.35	15.00	-67.0	69.0	-0.0	0.00	1	90	90
1 * A	14.60	-36.35	15.00	113.0	69.0	-0.0	0.00	1	90	90
1 * A	14.60	36.35	15.00	-113.0	69.0	0.0	0.00	1	90	90
1 * A	-53.30	-30.40	15.00	7.0	61.0	0.0	0.00	2	90	90
1 * A	-53.30	30.40	15.00	-7.0	61.0	-0.0	0.00	2	90	90
1 * A	44.60	-36.35	15.00	115.0	69.0	0.0	0.00	3	90	90
1 * A	44.60	36.35	15.00	-115.0	69.0	-0.0	0.00	3	90	90
1 * A	-53.30	-29.60	15.00	56.0	69.0	0.0	0.00	4	90	90
1 * A	-53.30	29.60	15.00	-56.0	69.0	-0.0	0.00	4	90	90
1 * A	-15.40	-36.35	15.00	110.0	69.0	0.0	0.00	5	90	90
1 * A	-15.40	36.35	15.00	-110.0	69.0	-0.0	0.00	5	90	90
1 * A	15.40	-36.35	15.00	70.0	69.0	-0.0	0.00	5	90	90
1 * A	15.40	36.35	15.00	-70.0	69.0	0.0	0.00	5	90	90
1 * A	45.40	-36.35	15.00	83.0	68.0	0.0	0.00	6	90	90
1 * A	45.40	36.35	15.00	-83.0	68.0	-0.0	0.00	6	90	90