

Manege

Installation : Area lighting

Project number : APH 2001

Customer : Solar Technology

Processed by : Adrian Hoe

Date : 30.10.2017

Project description:

Lighting level achieved for a Manege 60m x 20m with the fittings mounted on a 4m column at the back of a 1.4m stock post and rail fence.

An overspill calculation has also been provided showing there is minimal light outside an area 2.5m back from the fence.

Lighting levels achieved

4.5 lux ave

0.3 Uo

This has been achieved using 8 x Solar Tech Arena Lights

The following values are based on exact calculations on calibrated lamps, luminaires and their arrangement. In practice, gradual divergences can occur.

Guarantee claims for luminaire data are excluded.

Relux and the luminaire manufacturers accept no liability for consequential damage and damage which is occasioned to the user or to third parties.

Object : Manege
Installation : Area lighting
Project number : APH 2001
Date : 30.10.2017

Table of contents

First Page	1
Table of contents	2
1 Luminaire data	
1.1 Solar Tech Arena (!SCL-01)	
1.1.1 Data sheet	3
2 Exterior 1	
2.1 Summary, Exterior 1	
2.1.1 Result overview, Overspill Lighting	4
2.1.2 Result overview, Evaluation area 1	5
2.2 Calculation results, Exterior 1	
2.2.1 Table, Reference plane 1.1 (E)	6
2.2.2 Table, Overspill Lighting (E)	8
2.2.3 Pseudo colours, Reference plane 1.1 (E)	10
2.2.4 Pseudo colours, Overspill Lighting (E)	11
2.2.5 3D luminance, View 1	12

Object : Manege
Installation : Area lighting
Project number : APH 2001
Date : 30.10.2017

1 Luminaire data

1.1 Solar Tech Arena (!SCL-01)

1.1.1 Data sheet

Manufacturer: Solar Technology Ltd

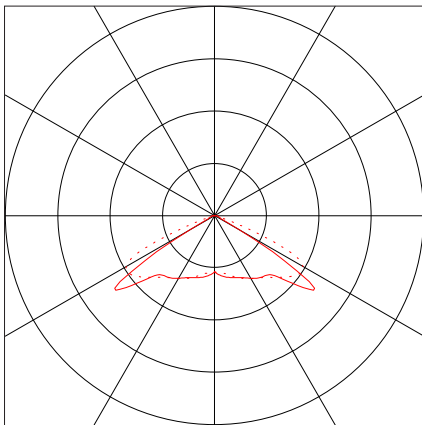
!SCL-01 Solar Tech Arena

Luminaire data

Luminaire efficiency : 146.2%
Luminaire efficacy :
Classification : A30 ↓100.0% ↑0.0%
CIE Flux Codes : 31 75 99 100 147
UGR 4H 8H (20%, 50%, 70%)
C0 / C90 : 63.0 / 65.6
Control gear :
Diameter : 400 mm
Height : 1 mm

Equipped with

Quantity : 1
Designation :
Colour :
Luminous flux : 1000 lm

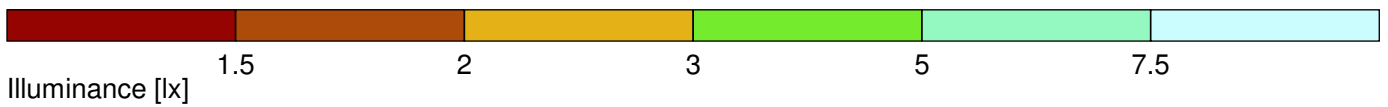
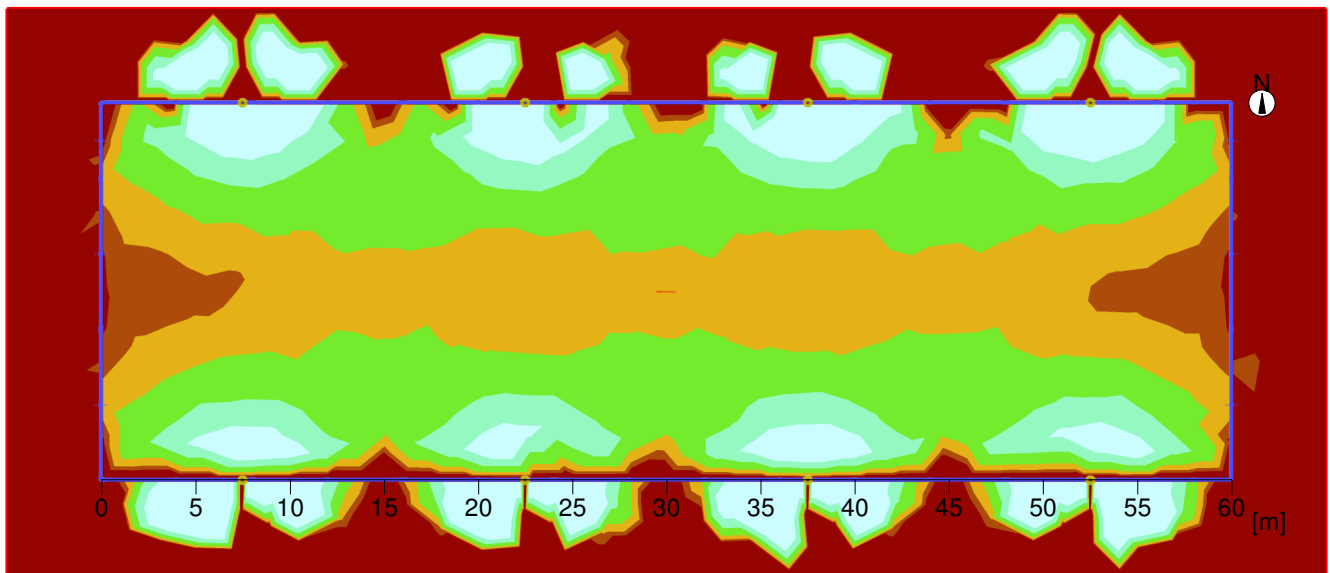


Object : Manege
 Installation : Area lighting
 Project number : APH 2001
 Date : 30.10.2017

2 Exterior 1

2.1 Summary, Exterior 1

2.1.1 Result overview, Overspill Lighting



General


Calculation algorithm used	Average indirect fraction
Height of evaluation surface photometric centre height. [m]:	0.00 m
Maintenance factor	4.00 m
	0.90

Total luminous flux of all lamps	8000 lm
Total power	0 W
Total power per area (1200.00 m²)	0.00 W/m²

Illuminance

Average illuminance	Eav	3.3 lx
Minimum illuminance	Emin	0 lx
Maximum illuminance	Emax	17.1 lx
Uniformity U _o	Emin/Em	1:1210 (0)
Diversity U _d	Emin/Emax	1:6330 (0)

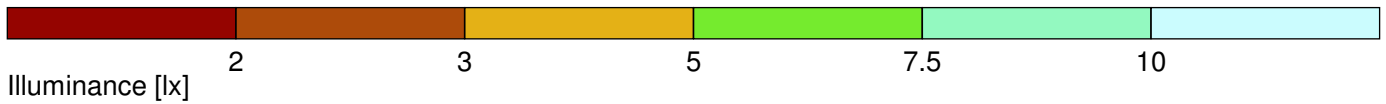
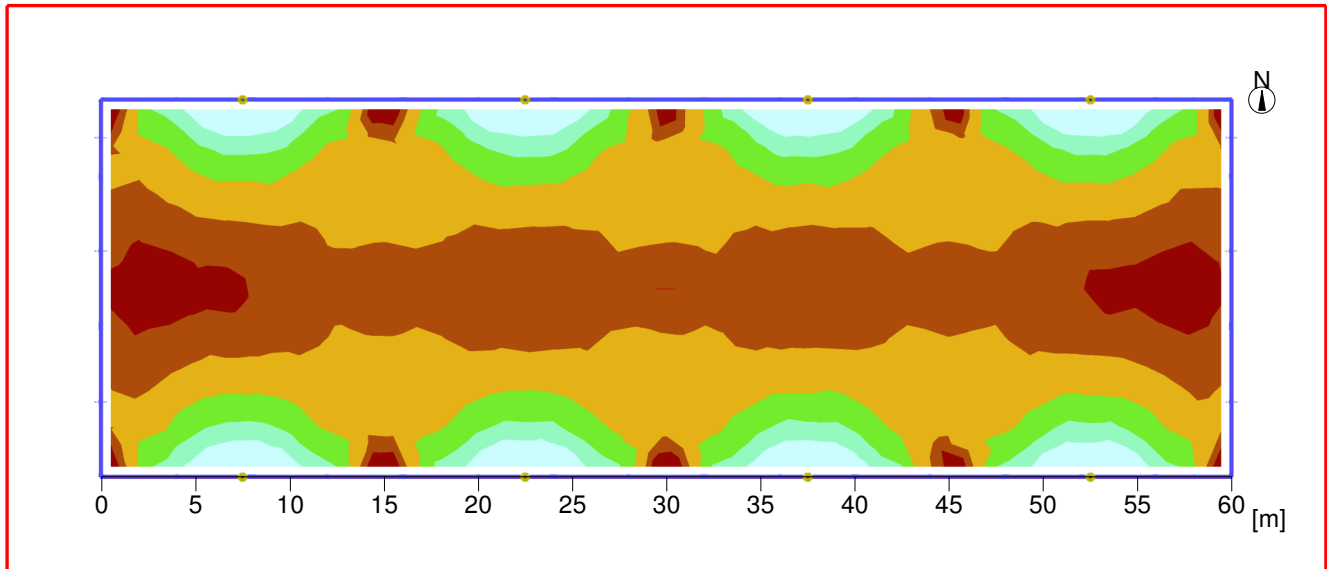
Type No.\Make

1		8	Solar Technology Ltd
			Order No. : ISCL-01
			Luminaire name : Solar Tech Arena
			Equipment : 1 x / 1000 lm

Object : Manege
 Installation : Area lighting
 Project number : APH 2001
 Date : 30.10.2017

2.1 Summary, Exterior 1

2.1.2 Result overview, Evaluation area 1



General

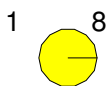
Calculation algorithm used	Average indirect fraction
photometric centre height.	4.00 m
Maintenance factor	0.90
Total luminous flux of all lamps	8000 lm

Evaluation area 1

Reference plane 1.1

	Horizontal
Em	4.54 lx
Emin	1.35 lx
Emin/Eav (Uo)	0.30
Emin/Emax (Ud)	0.09
Position	0.00 m

Type No.\Make



Solar Technology Ltd

Order No.	: !SCL-01
Luminaire name	: Solar Tech Arena
Equipment	: 1 x / 1000 lm

Object : Manege
 Installation : Area lighting
 Project number : APH 2001
 Date : 30.10.2017

2 Exterior 1

2.2 Calculation results, Exterior 1

2.2.1 Table, Reference plane 1.1 (E)

[m]	1.8	6.9	8.7	12.2	14	13.4	9.6	7.2	3	1.4	5.4	8.3	11.6	14.4	14.4	11	7.9	4.4	(1.3)	4.3	7.9	10.9	14.4	14.3	11.6	8.5	4.9	2.2
18	3.1	4.6	5.8	7.6	8.4	8	6.5	4.7	3.7	3.3	4.5	5.6	7.4	8.5	8.5	7.1	5.2	4.1	3.6	4.5	5.2	7.1	8.5	8.6	7.7	5.7	4.6	3.7
16	3.2	3.3	4.1	5	5.2	5.3	4.5	3.6	3.9	4.3	3.6	4.1	5.1	5.6	5.5	4.8	3.9	3.7	4.5	3.7	3.9	4.8	5.4	5.5	5.1	4.1	3.7	4.4
14	2.5	2.4	2.9	3.3	3.4	3.5	3.3	3.2	3.5	3.6	3.4	3.2	3.5	3.7	3.7	3.5	3.2	3.4	3.6	3.5	3.2	3.5	3.6	3.7	3.5	3.3	3.4	3.6
12	2.1	2	2.2	2.4	2.4	2.6	2.8	3	3.1	3	3.1	2.9	2.8	2.6	2.7	2.8	3	3.1	3	3.1	3	2.8	2.7	2.6	2.8	2.9	3.1	3
10	1.9	1.8	1.9	1.9	2	2.3	2.6	2.8	2.8	2.7	2.8	2.8	2.5	2.2	2.2	2.6	2.8	2.8	2.8	2.8	2.8	2.6	2.3	2.2	2.5	2.8	2.8	2.8
8	1.9	1.8	1.9	2	2	2.3	2.7	2.8	2.8	2.8	2.8	2.8	2.5	2.2	2.3	2.6	2.8	2.8	2.8	2.8	2.8	2.6	2.3	2.2	2.5	2.8	2.8	2.8
6	2.2	2.1	2.2	2.4	2.4	2.6	2.8	3	3	3	3.1	2.9	2.8	2.6	2.7	2.8	3	3.1	3	3.1	3	2.8	2.7	2.6	2.8	2.9	3.1	3
4	2.5	2.5	2.9	3.4	3.4	3.4	3.3	3.3	3.5	3.6	3.4	3.3	3.5	3.7	3.7	3.5	3.2	3.5	3.7	3.4	3.3	3.4	3.7	3.7	3.5	3.3	3.4	3.6
2	3.2	3.2	4.2	5.1	5.2	5.2	4.5	3.6	3.9	4.2	3.7	4.2	5.1	5.6	5.4	4.9	3.9	3.7	4.5	3.7	3.8	4.8	5.4	5.4	5.1	4.1	3.7	4.3
0	1.9	6.9	8.9	12.3	14	13.5	9.6	7.3	3.2	1.4	5.4	8.5	11.9	14.7	14.3	10.9	7.9	4.9	1.4	4.2	7.8	10.7	14.3	14.3	11.9	8.2	5.2	2.1
	0	5	10	15	20	25	30	35	40																			
	Illuminance [lx]																											



Part1

Height of the reference plane : 0.00 m
 Average illuminance Eav : 4.5 lx
 Minimum illuminance Emin : 1.3 lx
 Maximum illuminance Emax : 14.7 lx
 Uniformity Uo Emin/Eav : 1 : 3.37 (0.30)
 Diversity Ud Emin/Emax : 1 : 10.89 (0.09)

Object : Manege
 Installation : Area lighting
 Project number : APH 2001
 Date : 30.10.2017

2 Exterior 1

2.2 Calculation results, Exterior 1

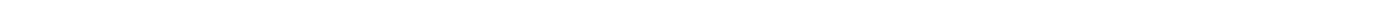
2.2.1 Table, Reference plane 1.1 (E)



3.4	7.3	9.6	13.2	14	12.5	8.9	6.8	1.6
3.7	4.9	6.2	7.9	8.5	7.6	5.8	4.4	3.2
3.9	3.6	4.5	5.3	5.3	4.9	4.1	3.1	3.2
3.5	3.2	3.2	3.6	3.4	3.3	2.9	2.5	2.5
3.1	3	2.8	2.7	2.4	2.4	2.2	2	2.2
2.8	2.8	2.6	2.3	2	1.9	1.9	1.8	2
2.8	2.9	2.7	2.3	2	1.9	1.9	1.8	1.9
3.1	3	2.8	2.6	2.4	2.3	2.2	2	2.1
3.6	3.2	3.3	3.5	3.4	3.3	2.9	2.5	2.5
3.8	3.7	4.5	5.3	5.2	5	4.2	3.2	3.2
4.5	4.8	6.5	8.4	8.3	7.6	5.9	4.5	3.3
3	7.3	9.6	13.2	13.9	12.3	8.6	6.7	1.8
45		50		55	[m]			



Part2



Object : Manege
 Installation : Area lighting
 Project number : APH 2001
 Date : 30.10.2017

2.2 Calculation results, Exterior 1

2.2.2 Table, Overspill Lighting (E)

[m]	(0)	0.1	0.1	0.1	0.5	(0)	6	0.3	0.1	0.1	0.7	0.3	(0)	0.4	0.8	0.1	0.1	0.2	0.4	(0)	0.3	0.7	0.1	0.1	0.6	6	(0)	
27.5	0.1	0.1	0.3	6.4	16.7	3.8	10.7	11.5	1.1	0.8	1.1	15.3	1.5	5.2	7.3	0.3	0.3	8.2	5.2	1.5	15.3	1.1	0.9	1.1	11.2	10.7	3.8	
25.0	0.1	0.1	1.1	2.9	8.8	14.9	13.4	8.4	2.8	1.9	2.3	11	15.2	2	8.2	2.5	1	8.6	3.9	15.4	12.4	8	0.9	1.6	4.7	13.3	14.9	
22.5	(0)	0.2	2.1	4.7	6.8	8.8	7.8	5.6	4.1	3.6	5	7.5	9	7.7	5.2	3.9	4	5.6	7.6	8.9	7.4	4.9	2.9	4.4	5.2	8.1	9	
20.0	(0)	(0)	2.3	3.1	4.1	4.7	4.5	3.8	3.7	4	3.4	4.6	5	4.6	3.7	3.9	3.9	3.8	4.7	4.9	4.5	3.7	4	3.8	3.7	4.7	4.6	
17.5	0.7	0.9	1.8	2.2	2.6	2.8	3.2	3	3.2	3.3	3.1	2.9	3	3.1	3.1	3.3	3.3	3.1	3	3	3	3.2	3.3	3.3	3.1	3.1	2.8	
15.0	0.1	0.9	1.6	1.9	2	2	2.4	2.8	2.8	2.8	2.8	2.5	2.2	2.6	2.9	2.8	2.8	2.8	2.5	2.2	2.6	2.8	2.8	2.8	2.8	2.8	2	
12.5	0.3	0.1	1.5	1.8	1.9	2.1	2.3	2.8	2.8	2.8	2.9	2.6	2.2	2.5	2.9	2.8	2.8	2.8	2.5	2.2	2.5	2.9	2.8	2.8	2.8	2.8	2	
10.0	0.7	0.2	1.8	2.3	2.6	2.9	3	3.1	3.1	3.2	3.1	3	3	2.9	3.1	3.3	3.2	3.1	3.1	3	3	3.2	3.2	3.3	3	2.9	2.8	
7.5	0.5	0.4	2.3	3.1	4.2	4.5	4.5	3.7	3.8	3.9	3.6	4.7	4.9	4.6	3.7	4	3.8	3.7	4.7	5	4.5	3.5	4	3.9	3.7	4.5	4.7	
5.0	(0)	0.5	2.1	4.7	6.9	8.4	7.8	5.4	4.8	4.3	5.3	7.4	8.3	6.4	5.3	4	3.9	5.4	8	8.8	7.5	5.2	4.1	4.2	5.6	7.8	8.7	
2.5	0.2	0.1	1	1	1.6	2.5	2.3	1.6	1.1	0.6	1.6	2.5	2.5	1.3	1.6	0.8	1.1	1.7	2.7	2.9	2.4	1.8	0.7	1.4	1.4	1.3	1.9	
0.0	(0)	0.1	0.1	0.2	0.3	(0)	0.6	0.3	0.1	0.1	0.8	0.3	(0)	0.3	1	0.1	0.1	0.2	1.8	(0)	0.3	0.8	0.1	0.1	0.7	0.2	(0)	
	0				10					20					30						40					50		
	Illuminance [lx]																											



Part1

Height of the reference plane	:	0.00 m
Average illuminance	Eav	: 3.3 lx
Minimum illuminance	Emin	: 0 lx
Maximum illuminance	Emax	: 17.1 lx
Uniformity Uo	Emin/Eav	: 1 : 1214.42 (0.00)
Diversity Ud	Emin/Emax	: 1 : 6327.86 (0.00)

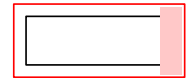
Object : Manege
 Installation : Area lighting
 Project number : APH 2001
 Date : 30.10.2017

2.2 Calculation results, Exterior 1

2.2.2 Table, Overspill Lighting (E)

0,5	0,1	0,1	0,1	(0)
6,7	6,4	0,3	0,1	0,1
1,2	3,2	1,3	0,1	0,1
7	4,6	2,1	0,4	0,1
4,1	3,1	2,3	0,3	(0)
2,6	2,2	1,8	0,1	0,1
2	1,8	1,5	(0)	0,3
2	1,8	1,5	0,3	(0)
2,6	2,3	1,8	1,3	0,1
4,1	3,2	2,4	0,9	0,2
7	4,6	1,9	(0)	0,1
2,3	1,4	1,1	(0)	0,1
7,1	4,7	0,3	0,2	0,1
0,3	0,2	0,1	0,1	(0)

60 [m]

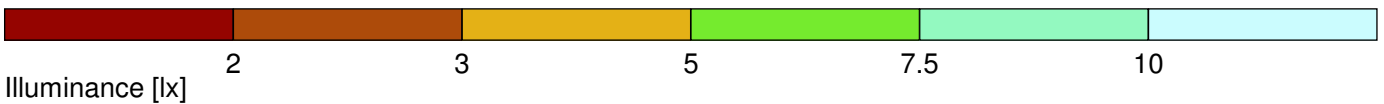
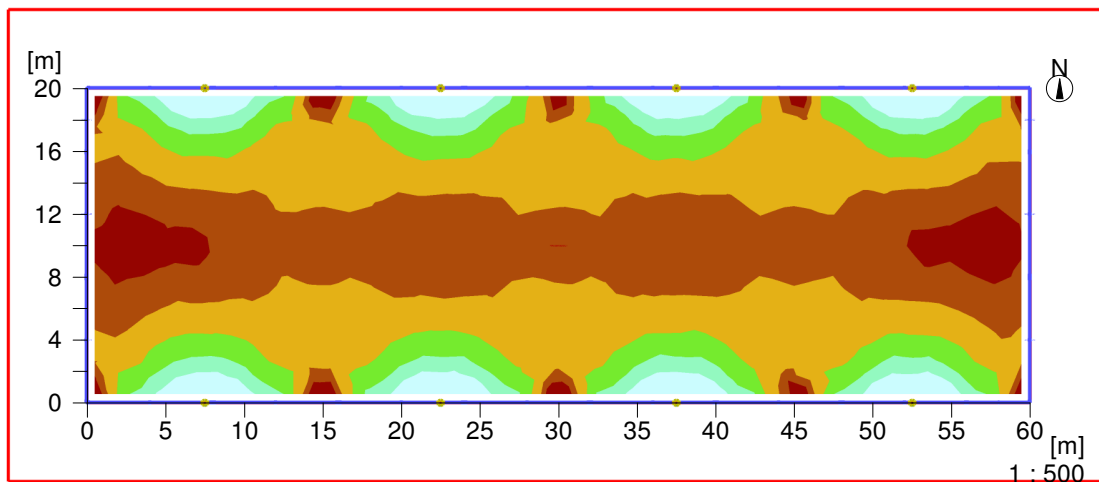


Part2

Object : Manege
 Installation : Area lighting
 Project number : APH 2001
 Date : 30.10.2017

2.2 Calculation results, Exterior 1

2.2.3 Pseudo colours, Reference plane 1.1 (E)

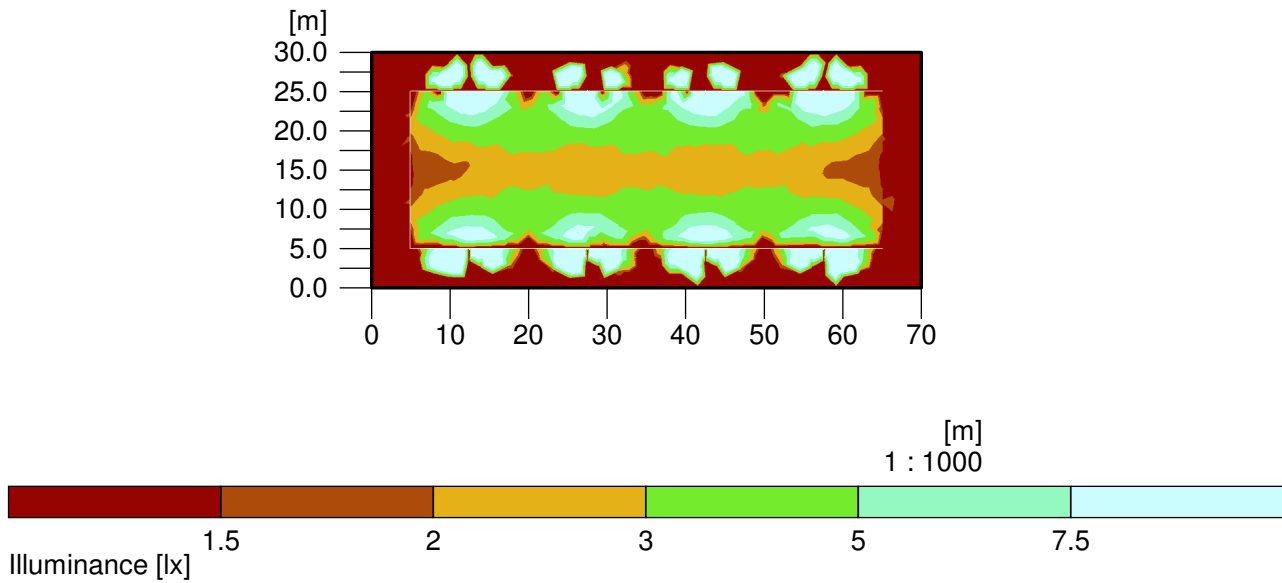


Height of the reference plane		: 0.00 m
Average illuminance	Eav	: 4.5 lx
Minimum illuminance	Emin	: 1.3 lx
Maximum illuminance	Emax	: 14.7 lx
Uniformity U _o	Emin/Eav	: 1 : 3.37 (0.30)
Diversity U _d	Emin/Emax	: 1 : 10.89 (0.09)

Object : Manege
 Installation : Area lighting
 Project number : APH 2001
 Date : 30.10.2017

2.2 Calculation results, Exterior 1

2.2.4 Pseudo colours, Overspill Lighting (E)

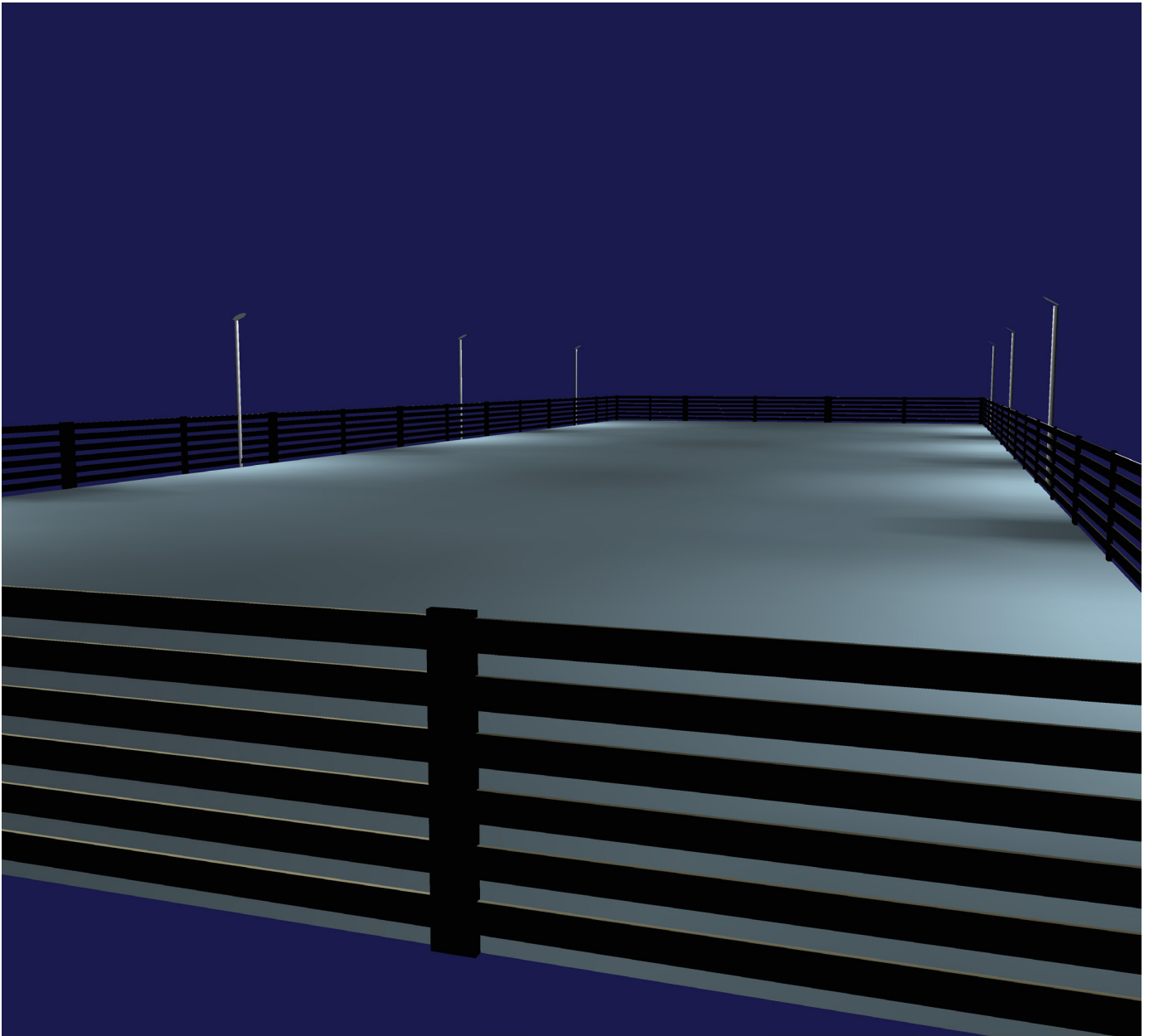


Height of the reference plane		: 0.00 m
Average illuminance	Eav	: 3.3 lx
Minimum illuminance	Emin	: 0 lx
Maximum illuminance	Emax	: 17.1 lx
Uniformity U _o	Emin/Eav	: 1 : 1214.42 (0.00)
Diversity U _d	Emin/Emax	: 1 : 6327.86 (0.00)

Object : Manege
Installation : Area lighting
Project number : APH 2001
Date : 30.10.2017

2.2 Calculation results, Exterior 1

2.2.5 3D luminance, View 1



Luminance in the scene
Minimum: : 0 cd/m²
Maximum: : 3930 cd/m²