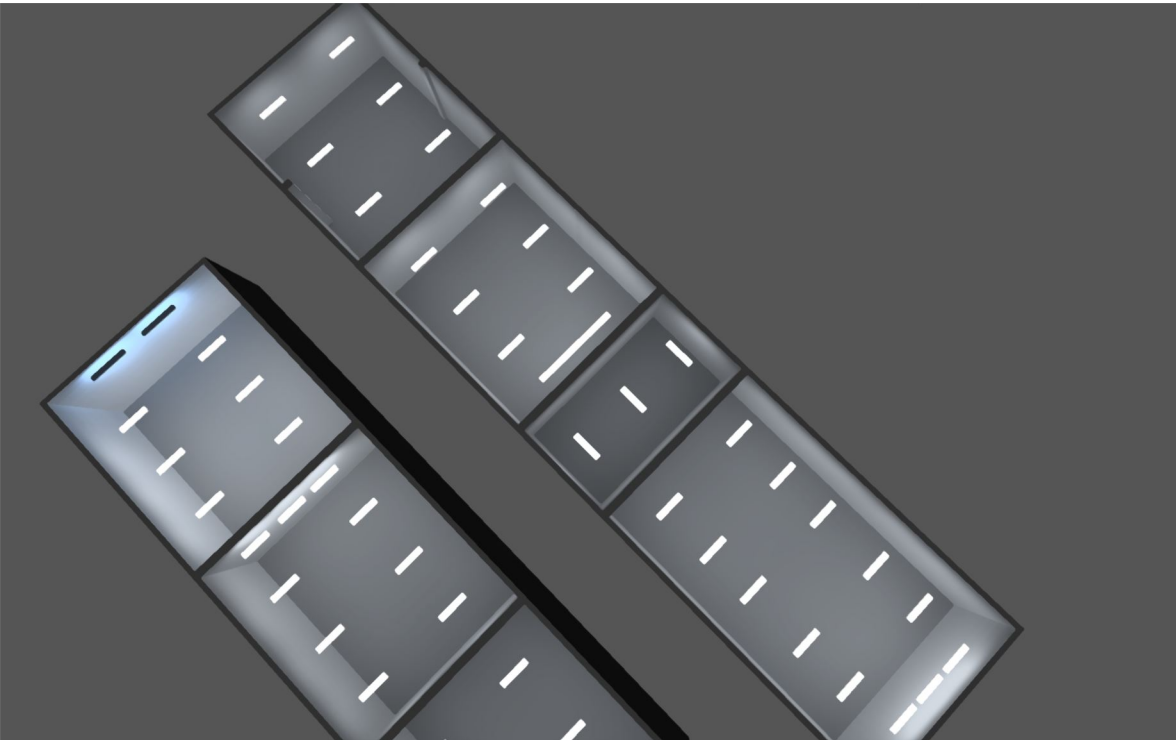


Date

2/19/2024

DIALux



Project

## Preface

Notes on planning:

The energy consumption quantities do not take into account light scenes and their dimming levels.

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### Building 1

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Site 1 - Building 1

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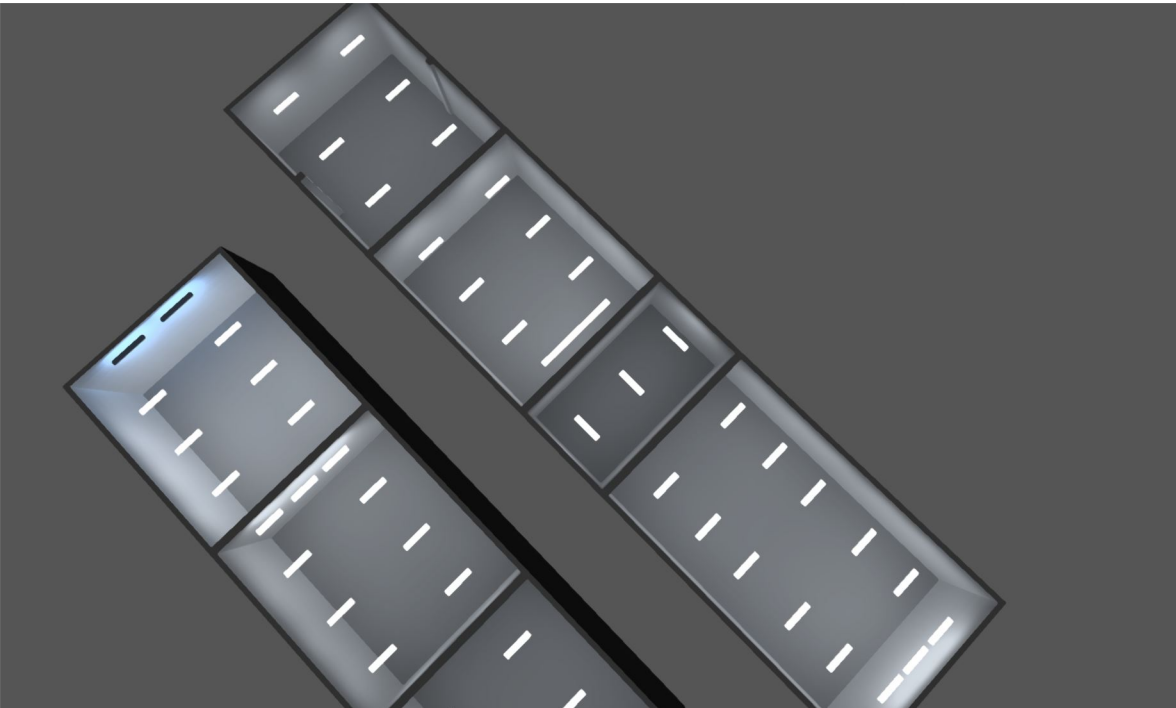
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## Description

## Luminaire list

 $\Phi_{\text{total}}$ 

308140 lm

 $P_{\text{total}}$ 

2667.0 W

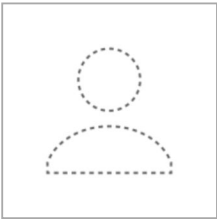
Luminous efficacy

115.5 lm/W

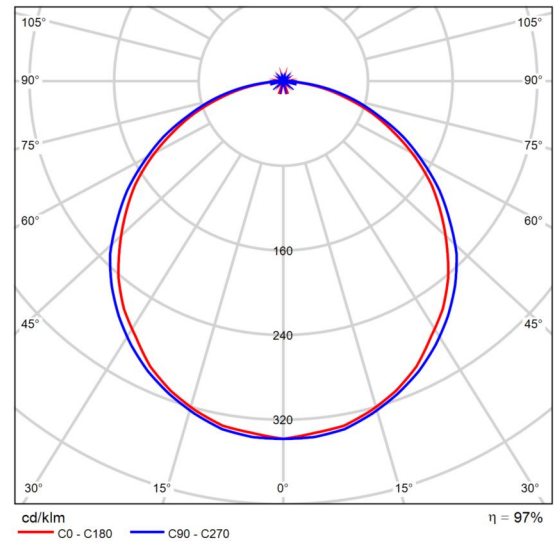
pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
5	SYLVANIA	2021734	OPTIX S 1500 ASYM 4K	37.0 W	4250 lm	114.9 lm/W
73	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm	115.6 lm/W

Product data sheet

Not yet a DIALux member - "START Panel 1200x300 HE 4100L m 840 LILO" /4000



P	34.0 W
$\Phi_{Lamp}$	4053 lm
$\Phi_{Luminaire}$	3930 lm
$\eta$	96.96 %
Luminous efficacy	115.6 lm/W
CCT	3000 K
CRI	100



Polar LDC

Glare evaluation according to UGR												
p Ceiling	70	70	50	50	30	70	70	50	50	30		
p Walls	50	30	50	30	30	50	30	50	30	30		
p Floor	20	20	20	20	20	20	20	20	20	20		
Room size X Y		Viewing direction at right angles to lamp axis					Viewing direction parallel to lamp axis					
2H	2H	17.1	18.5	17.4	18.7	19.0	17.0	18.4	17.3	18.6	18.9	
	3H	18.6	19.8	18.9	20.1	20.4	18.5	19.7	18.8	20.0	20.3	
	4H	19.2	20.3	19.5	20.6	20.9	19.1	20.2	19.4	20.5	20.9	
	6H	19.6	20.7	19.9	21.0	21.3	19.5	20.6	19.9	20.9	21.2	
	8H	19.7	20.7	20.1	21.1	21.4	19.6	20.6	20.0	21.0	21.3	
	12H	19.7	20.7	20.1	21.1	21.4	19.6	20.6	20.0	21.0	21.3	
4H	2H	17.7	18.9	18.1	19.2	19.5	17.7	18.8	18.0	19.1	19.4	
	3H	19.4	20.4	19.6	20.7	21.1	19.3	20.3	19.7	20.7	21.0	
	4H	20.1	21.0	20.5	21.3	21.7	20.0	20.9	20.4	21.3	21.7	
	6H	20.6	21.4	21.0	21.8	22.2	20.5	21.3	21.0	21.7	22.1	
	8H	20.7	21.5	21.2	21.9	22.3	20.7	21.4	21.1	21.8	22.3	
	12H	20.8	21.5	21.3	21.9	22.4	20.8	21.4	21.2	21.9	22.3	
8H	4H	20.3	21.0	20.8	21.4	21.9	20.3	21.0	20.7	21.4	21.8	
	6H	20.9	21.5	21.4	22.0	22.4	20.9	21.5	21.4	21.9	22.4	
	8H	21.1	21.7	21.6	22.1	22.6	21.1	21.6	21.6	22.1	22.6	
	12H	21.3	21.7	21.8	22.2	22.7	21.2	21.7	21.8	22.2	22.7	
	4H	20.3	21.0	20.8	21.4	21.9	20.3	20.9	20.7	21.4	21.8	
	6H	21.0	21.5	21.5	22.0	22.5	20.9	21.5	21.4	21.9	22.4	
12H	21.2	21.7	21.7	22.1	22.7	21.2	21.6	21.7	22.1	22.6		
Variation of the observer position for the luminaire distances S												
S = 1.0H		+0.1 / -0.1					+0.1 / -0.1					
S = 1.5H		+0.2 / -0.3					+0.2 / -0.4					
S = 2.0H		+0.5 / -0.6					+0.5 / -0.7					
Standard table		BK05					BK05					
Correction summand		3.6					3.6					
Corrected glare indices referring to 4053lm Total luminous flux												

UGR diagram (SHR: 0.25)

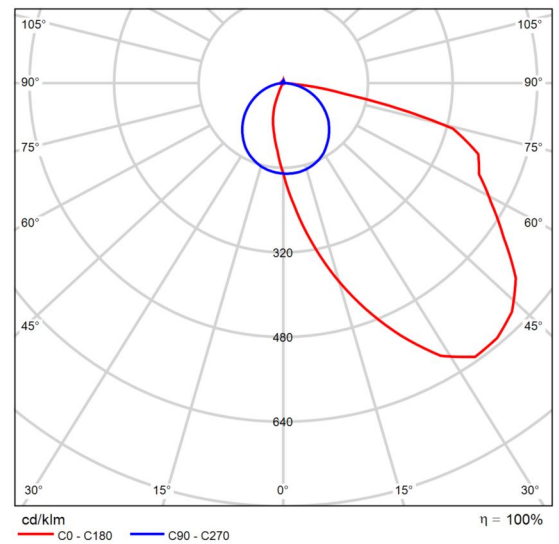


## Product data sheet

SYLVANIA - OPTIX S 1500 ASYM 4K



Article No.	2021734
P	37.0 W
$\Phi_{\text{Lamp}}$	4250 lm
$\Phi_{\text{Luminaire}}$	4250 lm
$\eta$	100.00 %
Luminous efficacy	114.9 lm/W
CCT	4000 K
CRI	80



Polar LDC

Building 1

**Luminaire list** $\Phi_{\text{total}}$ 

308140 lm

 $P_{\text{total}}$ 

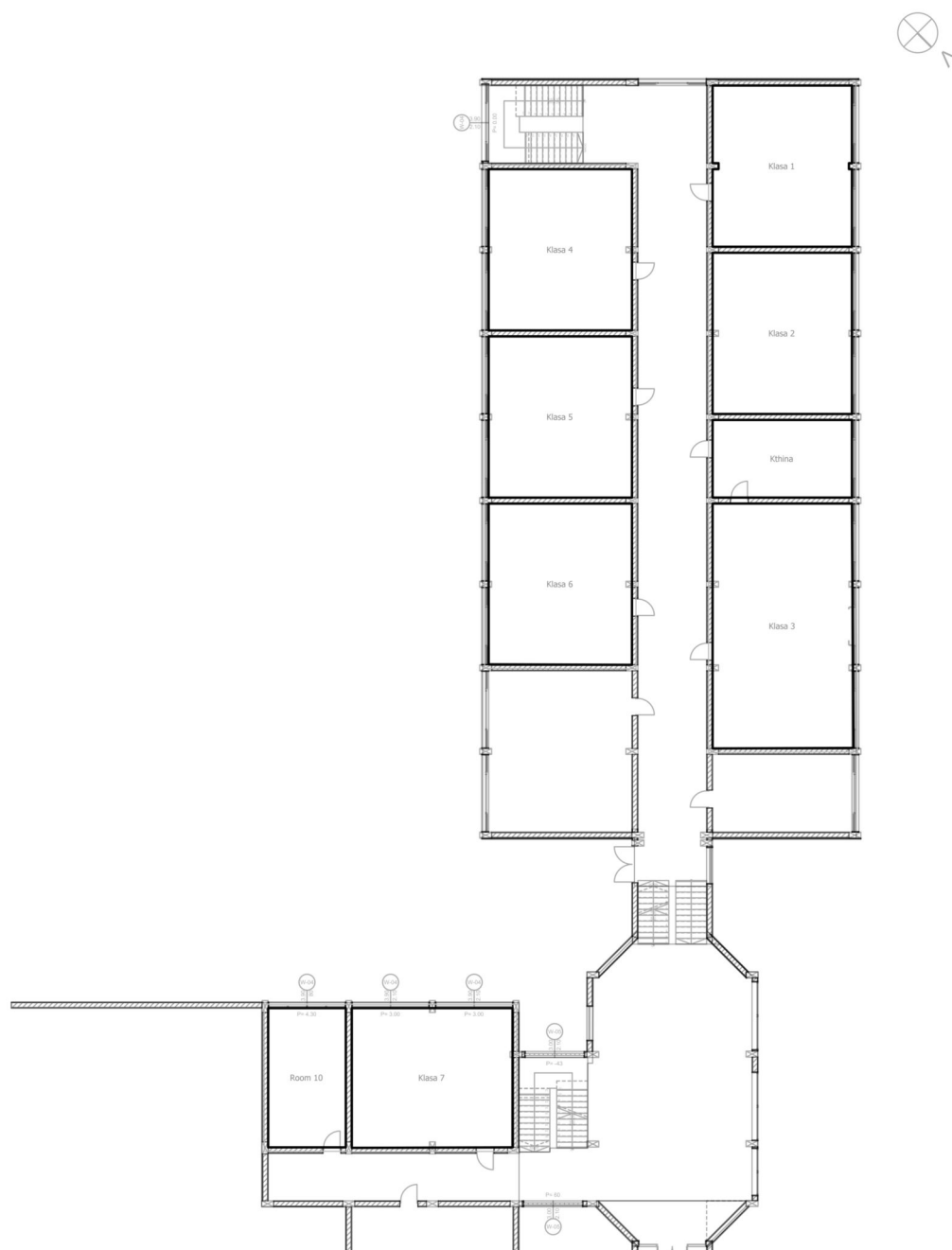
2667.0 W

Luminous efficacy

115.5 lm/W

pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
5	SYLVANIA	2021734	OPTIX S 1500 ASYM 4K	37.0 W	4250 lm	114.9 lm/W
73	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 (Light scene 1)

**Room list**

Building 1 · Klasa 3 (Light scene 1)

**Room list**

## Klasa 1

<b>P<sub>total</sub></b> 204.0 W	<b>A<sub>Room</sub></b> 56.56 m <sup>2</sup>	<b>Lighting power density</b> 3.61 W/m <sup>2</sup> = 1.48 W/m <sup>2</sup> /100 lx (Room)	<b>E<sub>perpendicular</sub> (Working plane)</b> 244 lx
-------------------------------------	---	---	--

pcs.	Manufacturer	Article No.	Article name	P	Φ <sub>Luminaire</sub>
6	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm

## Klasa 2

<b>P<sub>total</sub></b> 306.0 W	<b>A<sub>Room</sub></b> 56.70 m <sup>2</sup>	<b>Lighting power density</b> 5.40 W/m <sup>2</sup> = 1.51 W/m <sup>2</sup> /100 lx (Room)	<b>E<sub>perpendicular</sub> (Working plane)</b> 358 lx
-------------------------------------	---	---	--

pcs.	Manufacturer	Article No.	Article name	P	Φ <sub>Luminaire</sub>
9	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm

## Klasa 3

<b>P<sub>total</sub></b> 442.0 W	<b>A<sub>Room</sub></b> 86.49 m <sup>2</sup>	<b>Lighting power density</b> 5.11 W/m <sup>2</sup> = 1.39 W/m <sup>2</sup> /100 lx (Room)	<b>E<sub>perpendicular</sub> (Working plane)</b> 368 lx
-------------------------------------	---	---	--

pcs.	Manufacturer	Article No.	Article name	P	Φ <sub>Luminaire</sub>
13	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm

Building 1 · Klasa 3 (Light scene 1)

**Room list**

Klasa 4

<b>P<sub>total</sub></b> 482.0 W	<b>A<sub>Room</sub></b> 58.32 m <sup>2</sup>	<b>Lighting power density</b> 8.26 W/m <sup>2</sup> = 1.54 W/m <sup>2</sup> /100 lx (Room)	<b>E<sub>perpendicular</sub> (Working plane)</b> 536 lx
-------------------------------------	---	---	--

pcs.	Manufacturer	Article No.	Article name	P	Φ <sub>Luminaire</sub>
2	SYLVANIA	2021734	OPTIX S 1500 ASYM 4K	37.0 W	4250 lm
12	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm

Klasa 5

<b>P<sub>total</sub></b> 306.0 W	<b>A<sub>Room</sub></b> 58.31 m <sup>2</sup>	<b>Lighting power density</b> 5.25 W/m <sup>2</sup> = 1.51 W/m <sup>2</sup> /100 lx (Room)	<b>E<sub>perpendicular</sub> (Working plane)</b> 348 lx
-------------------------------------	---	---	--

pcs.	Manufacturer	Article No.	Article name	P	Φ <sub>Luminaire</sub>
9	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm

Klasa 6

<b>P<sub>total</sub></b> 204.0 W	<b>A<sub>Room</sub></b> 58.23 m <sup>2</sup>	<b>Lighting power density</b> 3.50 W/m <sup>2</sup> = 1.46 W/m <sup>2</sup> /100 lx (Room)	<b>E<sub>perpendicular</sub> (Working plane)</b> 240 lx
-------------------------------------	---	---	--

pcs.	Manufacturer	Article No.	Article name	P	Φ <sub>Luminaire</sub>
6	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm

Building 1 · Klasa 3 (Light scene 1)

**Room list**

Klasa 7

<b>P<sub>total</sub></b> 417.0 W	<b>A<sub>Room</sub></b> 56.59 m <sup>2</sup>	<b>Lighting power density</b> 7.37 W/m <sup>2</sup> = 1.76 W/m <sup>2</sup> /100 lx (Room)	<b>E<sub>perpendicular</sub> (Working plane)</b> 420 lx
-------------------------------------	---	---	--

pcs.	Manufacturer	Article No.	Article name	P	Φ <sub>Luminaire</sub>
3	SYLVANIA	2021734	OPTIX S 1500 ASYM 4K	37.0 W	4250 lm
9	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm

Kthina

<b>P<sub>total</sub></b> 102.0 W	<b>A<sub>Room</sub></b> 27.29 m <sup>2</sup>	<b>Lighting power density</b> 3.74 W/m <sup>2</sup> = 1.77 W/m <sup>2</sup> /100 lx (Room)	<b>E<sub>perpendicular</sub> (Working plane)</b> 211 lx
-------------------------------------	---	---	--

pcs.	Manufacturer	Article No.	Article name	P	Φ <sub>Luminaire</sub>
3	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm

Room 10

<b>P<sub>total</sub></b> 204.0 W	<b>A<sub>Room</sub></b> 27.28 m <sup>2</sup>	<b>Lighting power density</b> 7.48 W/m <sup>2</sup> = 1.89 W/m <sup>2</sup> /100 lx (Room)	<b>E<sub>perpendicular</sub> (Working plane)</b> 396 lx
-------------------------------------	---	---	--

pcs.	Manufacturer	Article No.	Article name	P	Φ <sub>Luminaire</sub>
6	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm

Building 1 · Klasa 3

**Luminaire list** $\Phi_{\text{total}}$ 

308140 lm

 $P_{\text{total}}$ 

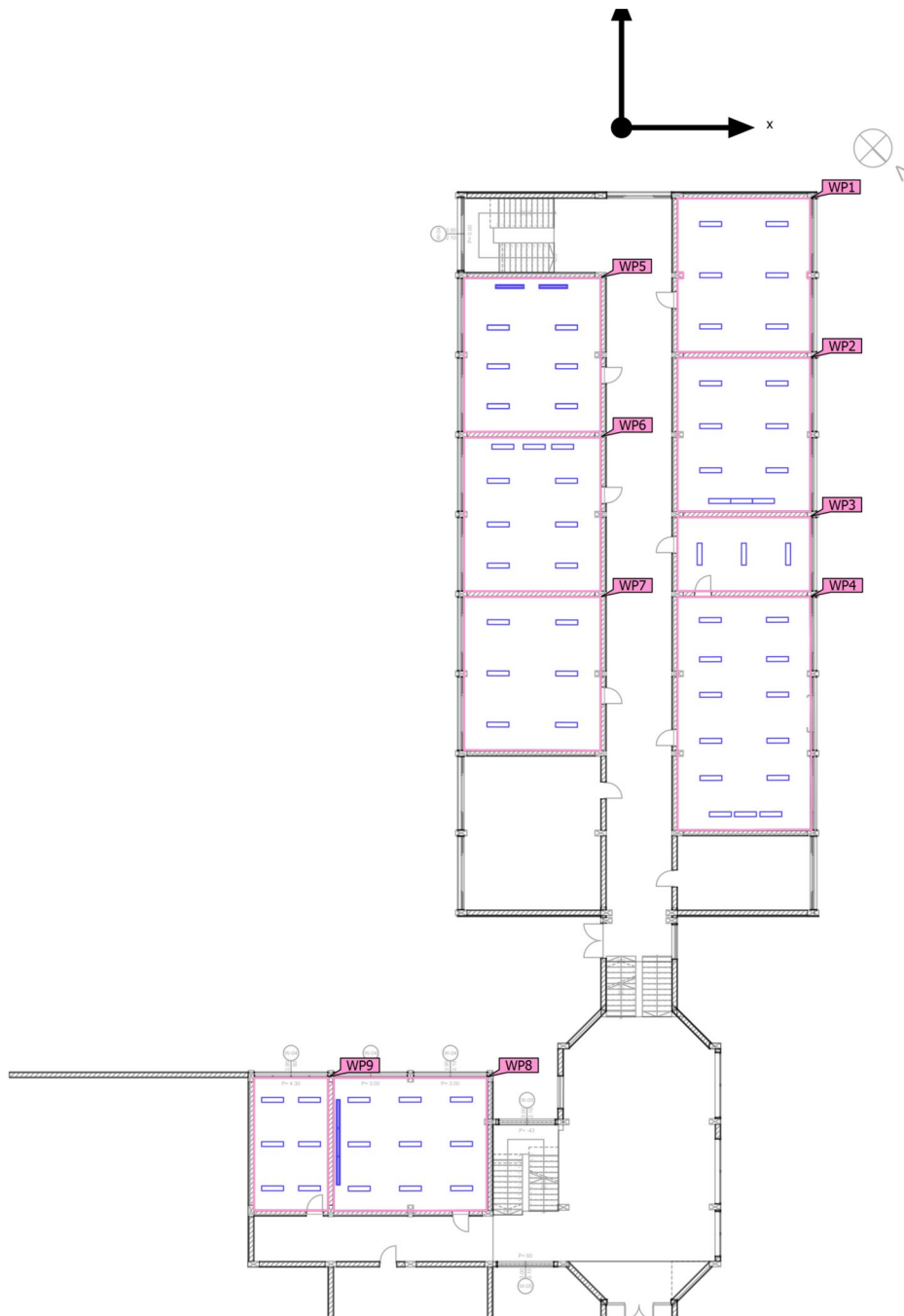
2667.0 W

Luminous efficacy

115.5 lm/W

pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
5	SYLVANIA	2021734	OPTIX S 1500 ASYM 4K	37.0 W	4250 lm	114.9 lm/W
73	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 (Light scene 1)

**Calculation objects**



Building 1 · Klasa 3 (Light scene 1)

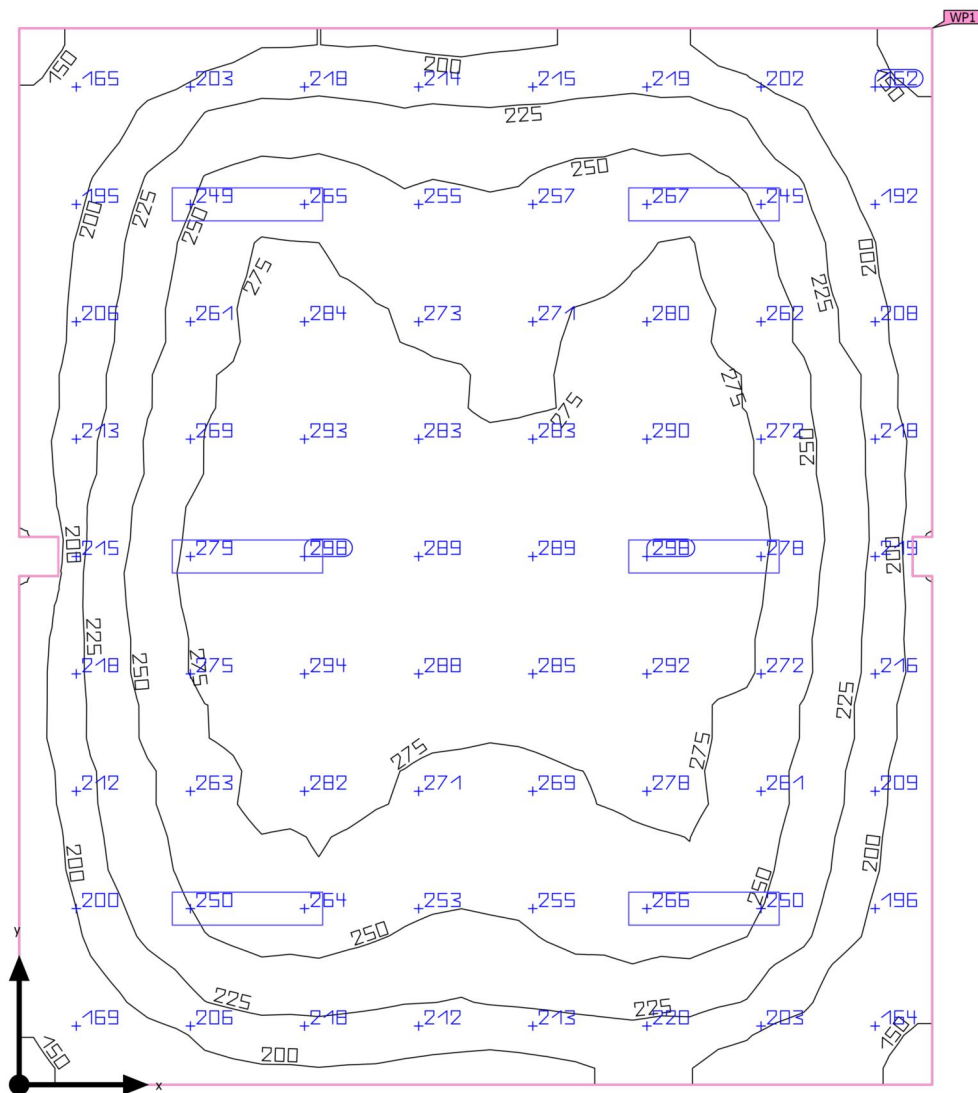
**Calculation objects**

## Working planes

Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 1) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	244 lx ( $\geq 300$ lx) ✗	138 lx	299 lx	0.57 ( $\geq 0.60$ ) ✗	0.46	WP1
Working plane (Klasa 2) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	358 lx ( $\geq 300$ lx) ✓	171 lx	560 lx	0.48 ( $\geq 0.40$ ) ✓	0.31	WP2
Working plane (Kthina) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	211 lx ( $\geq 200$ lx) ✓	132 lx	278 lx	0.63 ( $\geq 0.60$ ) ✓	0.47	WP3
Working plane (Klasa 3) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	368 lx ( $\geq 300$ lx) ✓	183 lx	527 lx	0.50 ( $\geq 0.40$ ) ✓	0.35	WP4
Working plane (Klasa 4) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	536 lx ( $\geq 300$ lx) ✓	265 lx	706 lx	0.49 ( $\geq 0.40$ ) ✓	0.38	WP5
Working plane (Klasa 5) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	348 lx ( $\geq 300$ lx) ✓	168 lx	503 lx	0.48 ( $\geq 0.40$ ) ✓	0.33	WP6
Working plane (Klasa 6) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	240 lx ( $\geq 300$ lx) ✗	136 lx	298 lx	0.57 ( $\geq 0.40$ ) ✓	0.46	WP7
Working plane (Klasa 7) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	420 lx ( $\geq 300$ lx) ✓	235 lx	549 lx	0.56 ( $\geq 0.60$ ) ✗	0.43	WP8
Working plane (Room 10) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	396 lx ( $\geq 500$ lx) ✗	270 lx	482 lx	0.68 ( $\geq 0.60$ ) ✓	0.56	WP9

Building 1 · Klasa 3 · Klasa 1 (Light scene 1)

## Summary



Ground area	56.56 m <sup>2</sup>	Clearance height	3.200 m
Reflection factors	Ceiling: 70.0 %, Walls: 50.0 %, Floor: 20.0 %	Mounting height	3.700 m
Maintenance factor	0.80 (fixed)	Height <sub>Working plane</sub>	0.800 m
		Wall zone <sub>Working plane</sub>	0.000 m

Building 1 · Klasa 3 · Klasa 1 (Light scene 1)

## Summary

### Results

	Symbol	Calculated	Target	Check	Index
Working plane	$\bar{E}_{\text{perpendicular}}$	244 lx	$\geq 300$ lx	✗	WP1
	$U_o (g_1)$	0.57	$\geq 0.60$	✗	WP1
Glare valuation <sup>(1)</sup>	$R_{UG, \text{max}}$	21	$\leq 19$	✗	
Energy estimation <sup>(2)</sup>	Consumption	271 kWh/a	max. 2000 kWh/a	✓	
Room	Lighting power density	3.61 W/m <sup>2</sup>	–		
		1.48 W/m <sup>2</sup> /100 lx	–		

(1) Based on a rectangular space of 8.100 m x 7.000 m and SHR of 0.25.

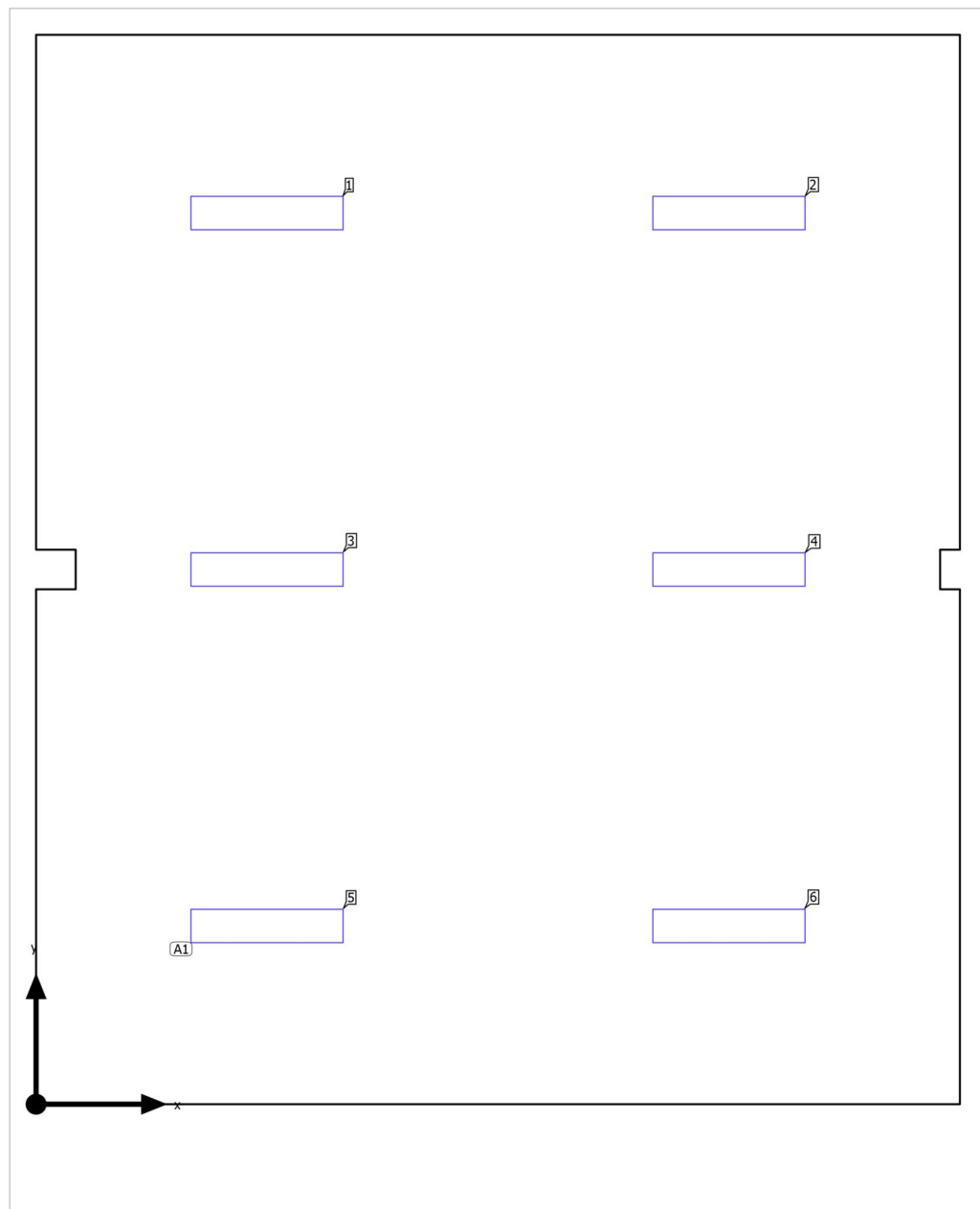
(2) Calculated using DIN:18599-4.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

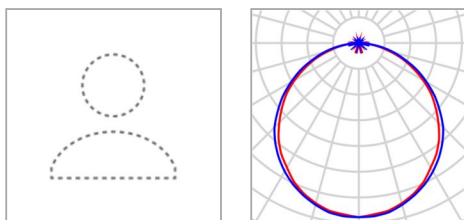
### Luminaire list

pcs.	Manufacturer	Article No.	Article name	$R_{UG}$	P	$\Phi$	Luminous efficacy
6	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	20	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Klasa 1

**Luminaire layout plan**

Building 1 · Klasa 3 · Klasa 1

**Luminaire layout plan**

Manufacturer	Not yet a DIALux member	P	34.0 W
Article name	"START Panel 1200x300 HE 4100L m 840 LILO" /4000	$\Phi_{\text{Luminaire}}$	3930 lm
Fitting	1x LED/4000		

6 x Not yet a DIALux member "START Panel 1200x300 HE 4100L m 840 LILO" /4000

Type	Field Arrangement	X	Y	Mounting height	Luminaire
1st luminaire (X/Y/Z)	1.750 m / 1.350 m / 3.700 m	1.750 m	6.750 m	3.700 m	1
X-direction	2 pcs., Centre - centre, 3.500 m	5.250 m	6.750 m	3.700 m	2
Y-direction	3 pcs., Centre - centre, 2.700 m	1.750 m	4.050 m	3.700 m	3
		5.250 m	4.050 m	3.700 m	4
Arrangement	A1	1.750 m	1.350 m	3.700 m	5
		5.250 m	1.350 m	3.700 m	6

Building 1 · Klasa 3 · Klasa 1

**Luminaire list** $\Phi_{\text{total}}$ 

23580 lm

 $P_{\text{total}}$ 

204.0 W

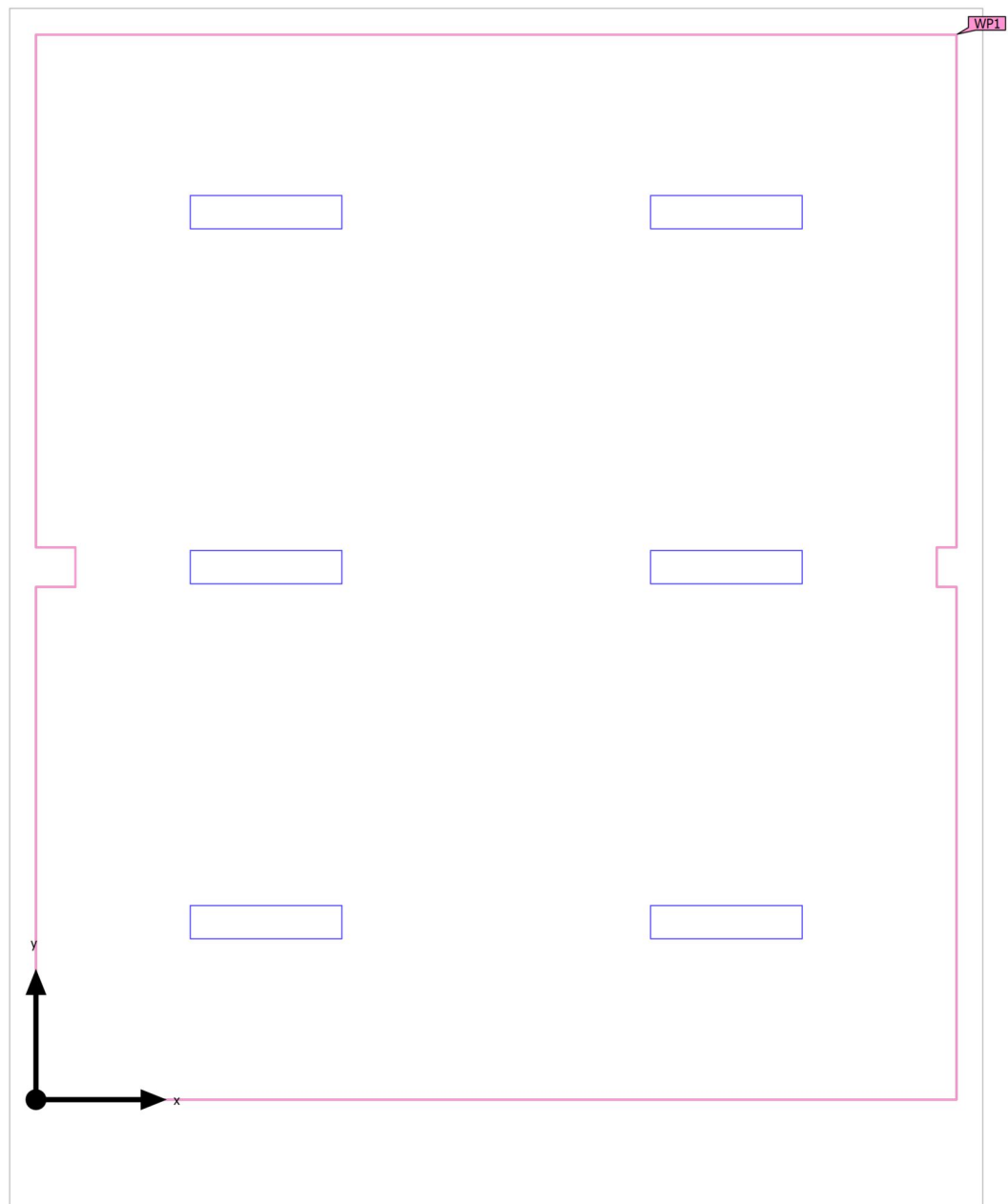
Luminous efficacy

115.6 lm/W

pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
6	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Klasa 1 (Light scene 1)

## Calculation objects



Building 1 · Klasa 3 · Klasa 1 (Light scene 1)

**Calculation objects**

## Working planes

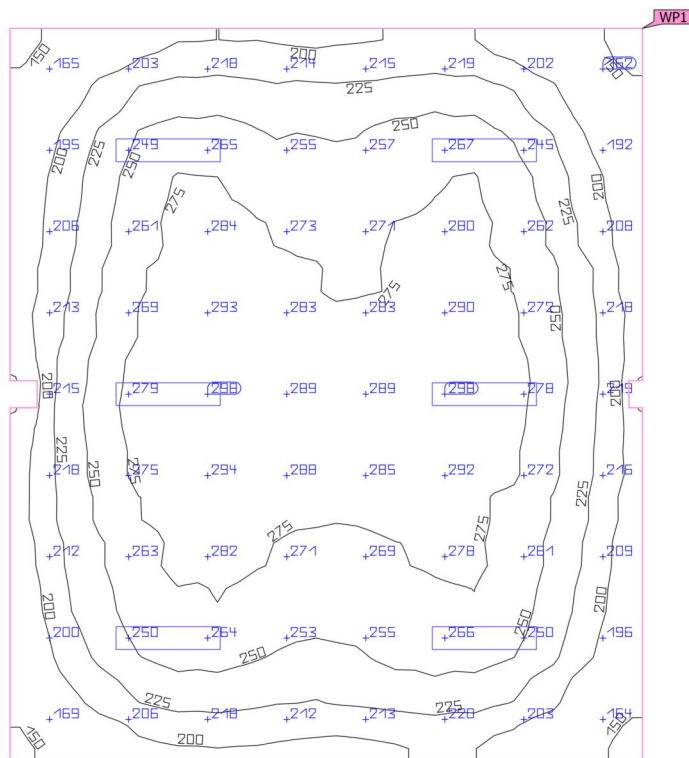
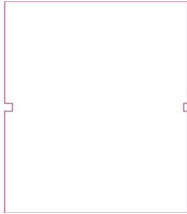
Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 1)	244 lx	138 lx	299 lx	0.57	0.46	WP1
Perpendicular illuminance (adaptive)	( $\geq 300$ lx)			( $\geq 0.60$ )		
Height: 0.800 m, Wall zone: 0.000 m	✗			✗		

(1) Based on a rectangular space of 8.100 m x 7.000 m and SHR of 0.25.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)



Building 1 · Klasa 3 · Klasa 1 (Light scene 1)

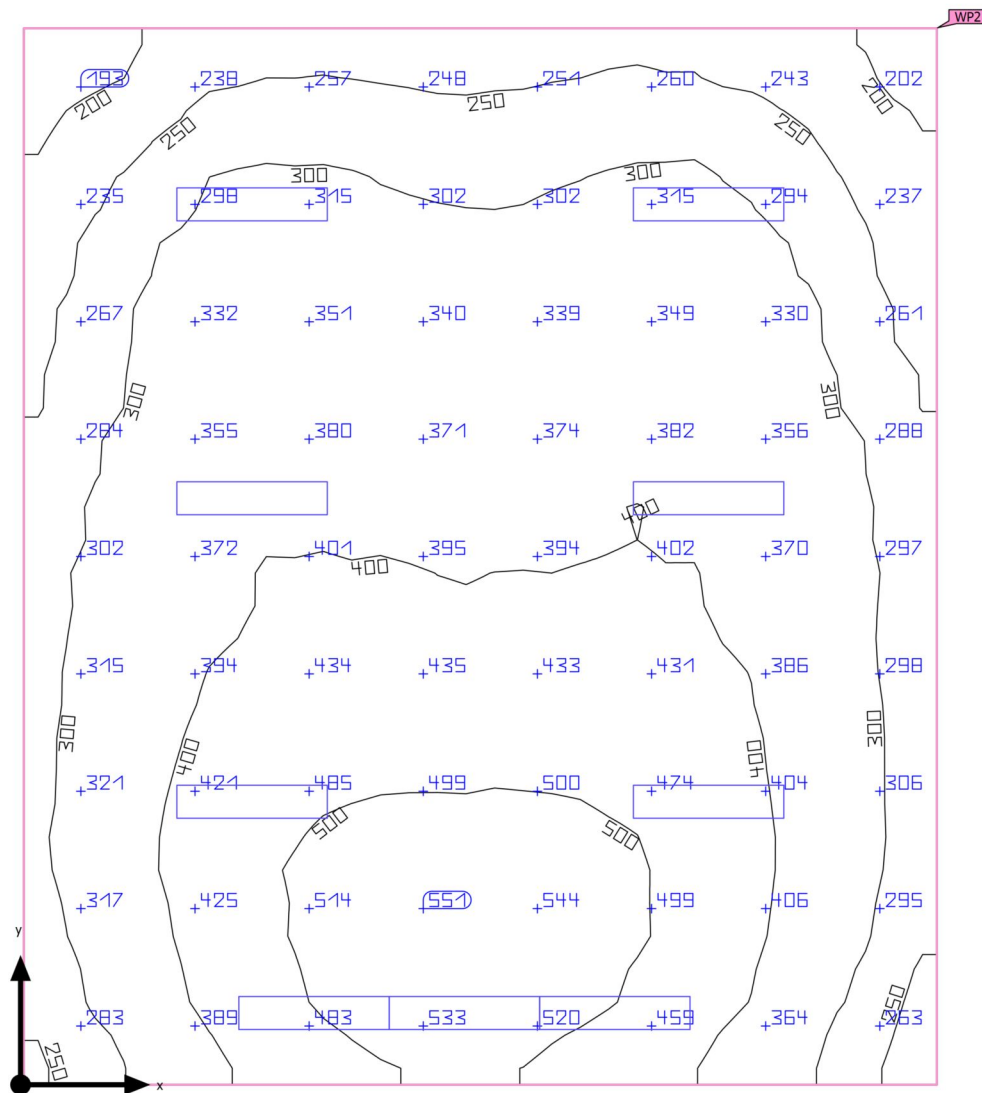
**Working plane (Klasa 1)**

Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 1)	244 lx	138 lx	299 lx	0.57	0.46	WP1
Perpendicular illuminance (adaptive)	(≥ 300 lx)			(≥ 0.60)		
Height: 0.800 m, Wall zone: 0.000 m	✗			✗		

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

Building 1 · Klasa 3 · Klasa 2 (Light scene 1)

## Summary



Ground area	56.70 m <sup>2</sup>	Clearance height	3.200 m
Reflection factors	Ceiling: 70.0 %, Walls: 50.0 %, Floor: 20.0 %	Mounting height	3.700 m
Maintenance factor	0.80 (fixed)	Height <sub>Working plane</sub>	0.800 m
		Wall zone <sub>Working plane</sub>	0.000 m

Building 1 · Klasa 3 · Klasa 2 (Light scene 1)

## Summary

### Results

	Symbol	Calculated	Target	Check	Index
Working plane	$\bar{E}_{\text{perpendicular}}$	358 lx	$\geq 300$ lx	✓	WP2
	$U_o (g_1)$	0.48	$\geq 0.40$	✓	WP2
Glare valuation <sup>(1)</sup>	$R_{UG, \text{max}}$	21	$\leq 19$	✗	
Energy estimation <sup>(2)</sup>	Consumption	407 kWh/a	max. 2000 kWh/a	✓	
Room	Lighting power density	5.40 W/m <sup>2</sup>	–		
		1.51 W/m <sup>2</sup> /100 lx	–		

(1) Based on a rectangular space of 8.099 m x 7.000 m and SHR of 0.25.

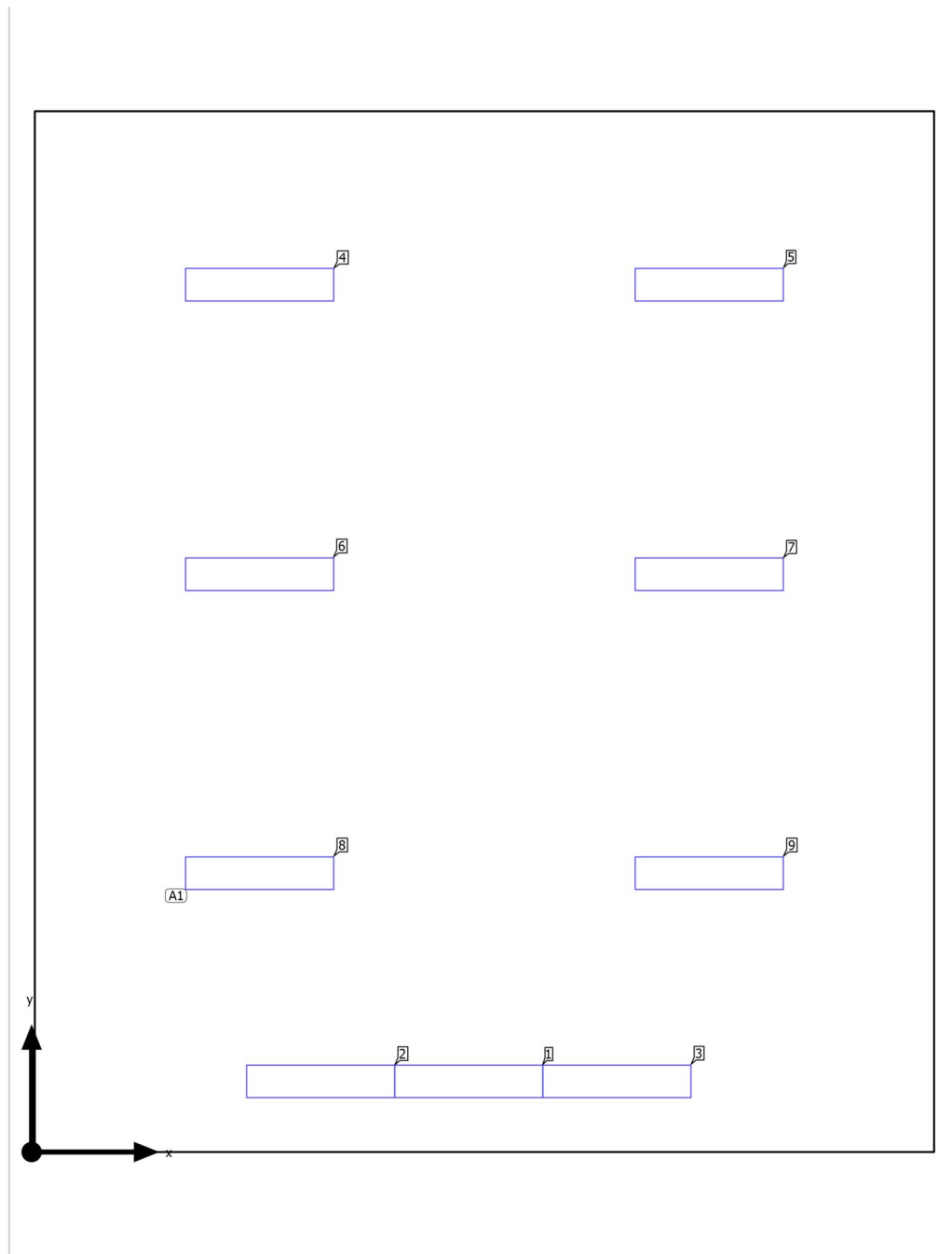
(2) Calculated using DIN:18599-4.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

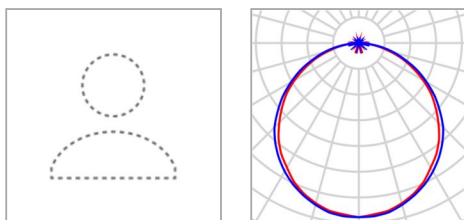
### Luminaire list

pcs.	Manufacturer	Article No.	Article name	$R_{UG}$	P	$\Phi$	Luminous efficacy
9	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	20	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Klasa 2

**Luminaire layout plan**

Building 1 · Klasa 3 · Klasa 2

**Luminaire layout plan**

Manufacturer	Not yet a DIALux member	P	34.0 W
Article name	"START Panel 1200x300 HE 4100L m 840 LILO" /4000	$\Phi_{\text{Luminaire}}$	3930 lm
Fitting	1x LED/4000		

6 x Not yet a DIALux member "START Panel 1200x300 HE 4100L m 840 LILO" /4000

Type	Field Arrangement	X	Y	Mounting height	Luminaire
1st luminaire (X/Y/Z)	1.775 m / 2.170 m / 3.700 m	1.775 m	6.749 m	3.700 m	4
X-direction	2 pcs., Centre - centre, Distances not equal	5.275 m	6.749 m	3.700 m	5
		1.775 m	4.496 m	3.700 m	6
Y-direction	3 pcs., Centre - centre, Distances not equal	5.275 m	4.496 m	3.700 m	7
		1.775 m	2.170 m	3.700 m	8
Arrangement	A1	5.275 m	2.170 m	3.700 m	9

## Individual luminaires

X	Y	Mounting height	Luminaire
3.403 m	0.550 m	3.700 m	1
2.250 m	0.550 m	3.700 m	2
4.556 m	0.550 m	3.700 m	3

Building 1 · Klasa 3 · Klasa 2

**Luminaire list** $\Phi_{\text{total}}$ 

35370 lm

 $P_{\text{total}}$ 

306.0 W

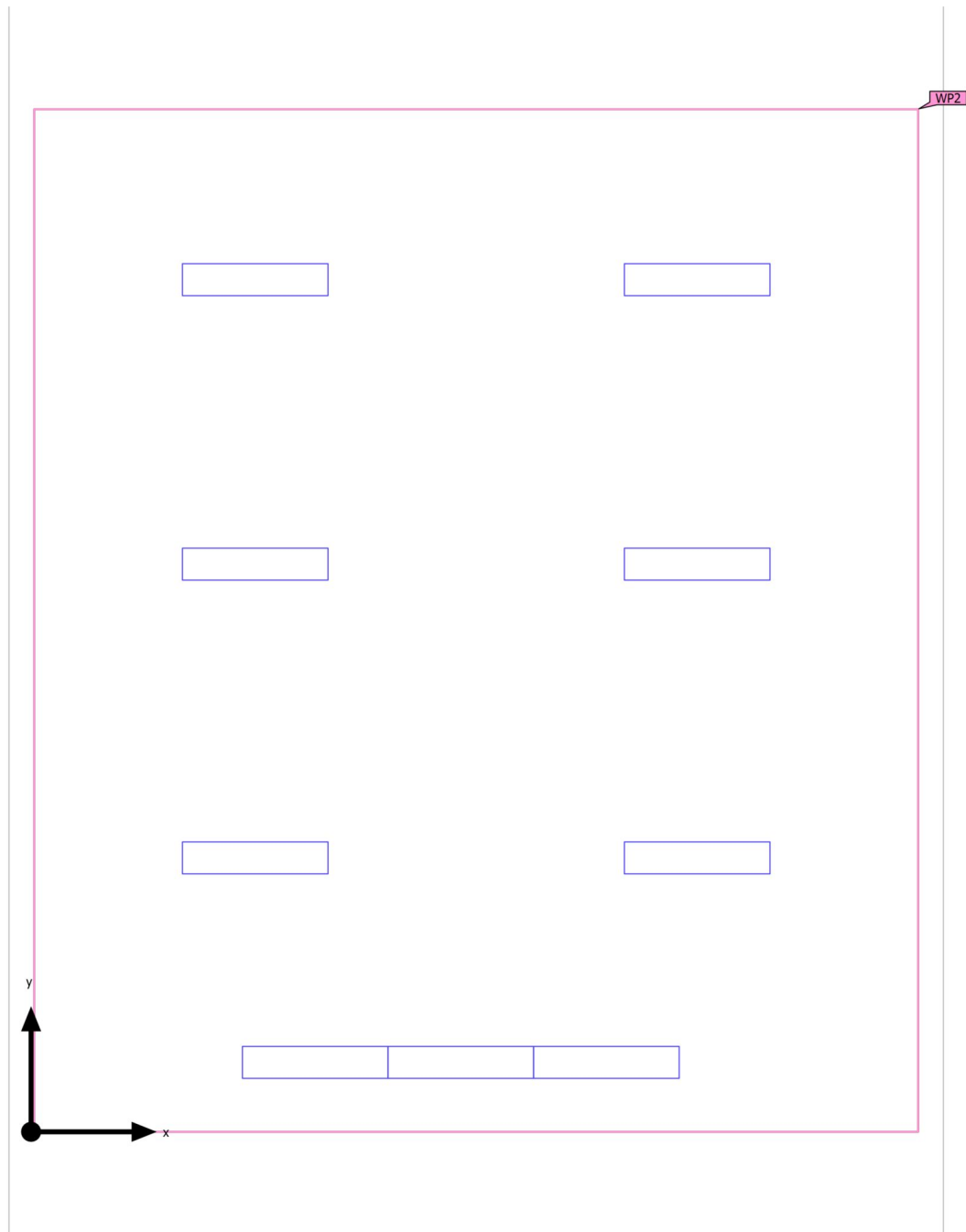
Luminous efficacy

115.6 lm/W

pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
9	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Klasa 2 (Light scene 1)

## Calculation objects



Building 1 · Klasa 3 · Klasa 2 (Light scene 1)

**Calculation objects**

## Working planes

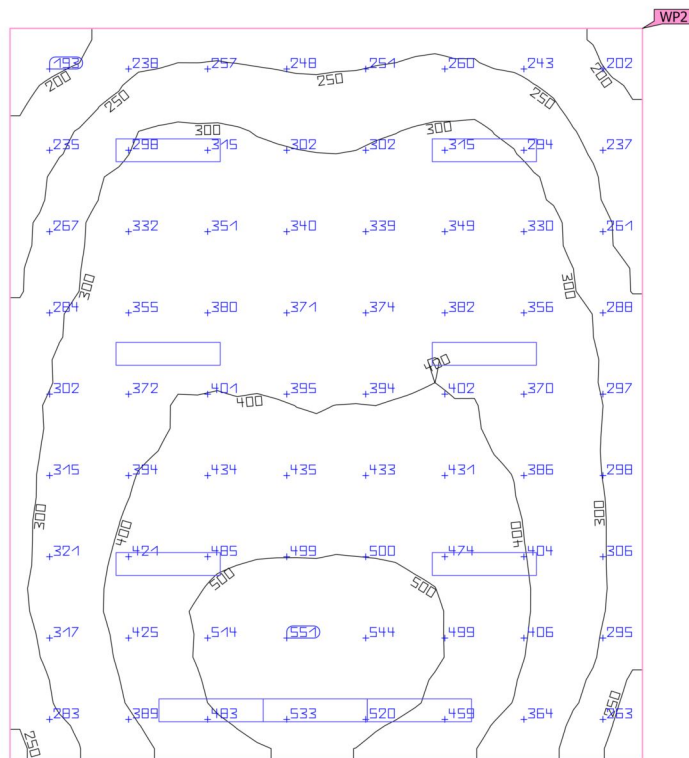
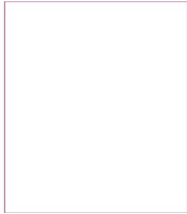
Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 2) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	358 lx ( $\geq 300$ lx) ✓	171 lx	560 lx	0.48 ( $\geq 0.40$ ) ✓	0.31	WP2

(1) Based on a rectangular space of 8.099 m x 7.000 m and SHR of 0.25.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)



Building 1 · Klasa 3 · Klasa 2 (Light scene 1)

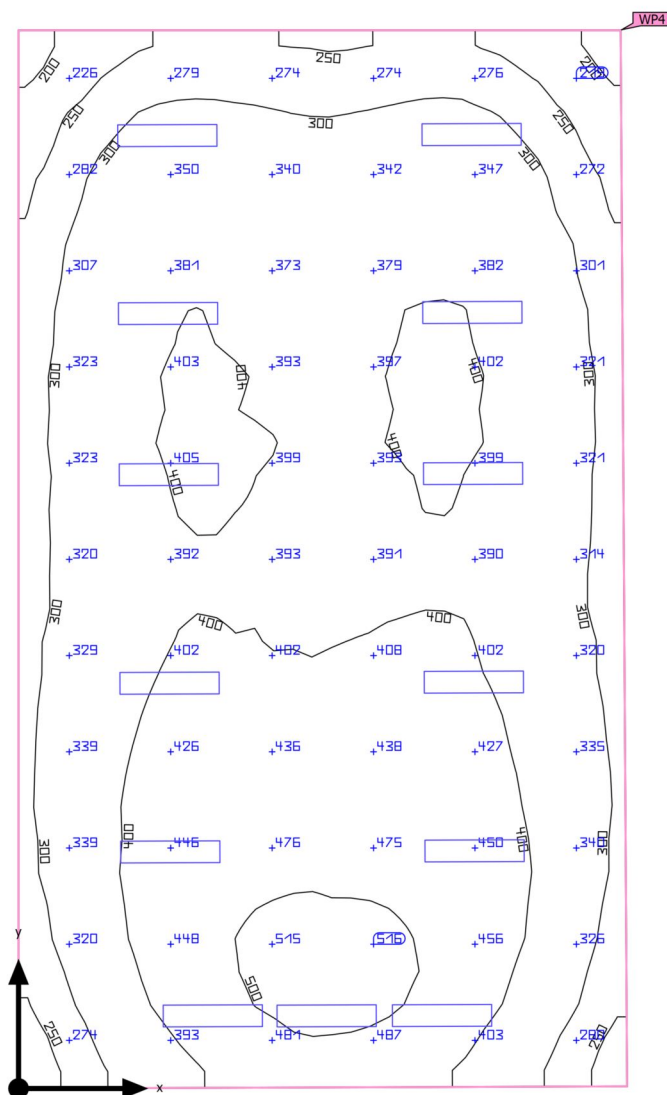
**Working plane (Klasa 2)**

Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 2)	358 lx	171 lx	560 lx	0.48	0.31	WP2
Perpendicular illuminance (adaptive)	$\geq 300$ lx			$\geq 0.40$		
Height: 0.800 m, Wall zone: 0.000 m	✓			✓		

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

Building 1 · Klasa 3 · Klasa 3 (Light scene 1)

## Summary



Ground area	86.49 m <sup>2</sup>	Clearance height	3.200 m
Reflection factors	Ceiling: 70.0 %, Walls: 50.0 %, Floor: 20.0 %	Mounting height	3.700 m
Maintenance factor	0.80 (fixed)	Height <sub>Working plane</sub>	0.800 m
		Wall zone <sub>Working plane</sub>	0.000 m

Building 1 · Klasa 3 · Klasa 3 (Light scene 1)

## Summary

### Results

	Symbol	Calculated	Target	Check	Index
Working plane	$\bar{E}_{\text{perpendicular}}$	368 lx	$\geq 300$ lx	✓	WP4
	$U_o (g_1)$	0.50	$\geq 0.40$	✓	WP4
Glare valuation <sup>(1)</sup>	$R_{UG, \text{max}}$	21	$\leq 19$	✗	
Energy estimation <sup>(2)</sup>	Consumption	588 kWh/a	max. 3050 kWh/a	✓	
Room	Lighting power density	5.11 W/m <sup>2</sup>	–		
		1.39 W/m <sup>2</sup> /100 lx	–		

(1) Based on a rectangular space of 7.075 m x 12.303 m and SHR of 0.25.

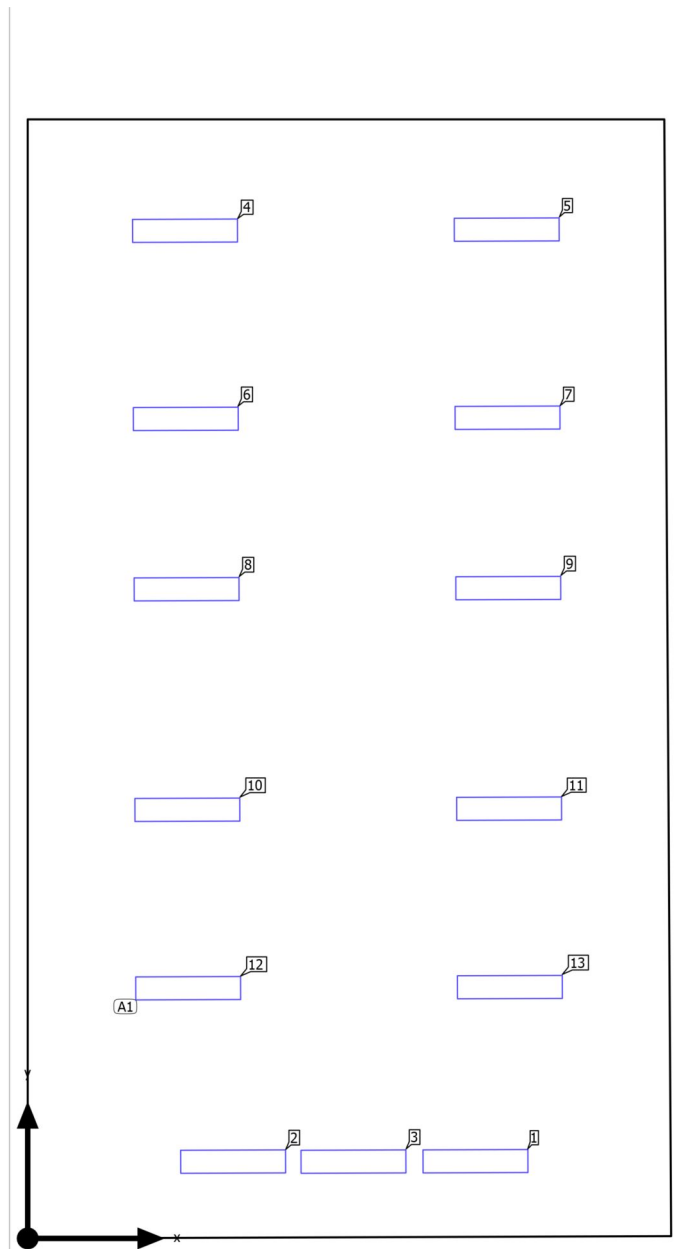
(2) Calculated using DIN:18599-4.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

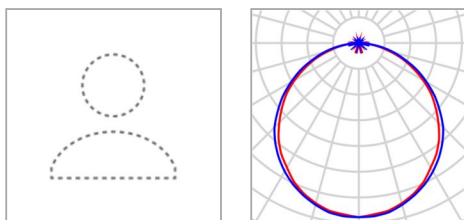
### Luminaire list

pcs.	Manufacturer	Article No.	Article name	$R_{UG}$	P	$\Phi$	Luminous efficacy
13	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	20	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Klasa 3

**Luminaire layout plan**

Building 1 · Klasa 3 · Klasa 3

**Luminaire layout plan**

Manufacturer	Not yet a DIALux member	P	34.0 W
Article name	"START Panel 1200x300 HE 4100L m 840 LILO" /4000	$\Phi_{\text{Luminaire}}$	3930 lm
Fitting	1x LED/4000		

10 x Not yet a DIALux member "START Panel 1200x300 HE 4100L m 840 LILO" /4000

Type	Field Arrangement	X	Y	Mounting height	Luminaire
1st luminaire (X/Y/Z)	1.764 m / 2.751 m / 3.700 m	1.730 m	11.078 m	3.700 m	4
X-direction	2 pcs., Centre - centre, Distances not equal	5.267 m	11.091 m	3.700 m	5
		1.738 m	9.010 m	3.700 m	6
Y-direction	5 pcs., Centre - centre, Distances not equal	5.276 m	9.022 m	3.700 m	7
		1.747 m	7.137 m	3.700 m	8
Arrangement	A1	5.285 m	7.150 m	3.700 m	9
		1.756 m	4.712 m	3.700 m	10
		5.293 m	4.725 m	3.700 m	11
		1.764 m	2.751 m	3.700 m	12
		5.302 m	2.763 m	3.700 m	13

Individual luminaires

Building 1 · Klasa 3 · Klasa 3

**Luminaire layout plan**

X	Y	Mounting height	Luminaire
4.923 m	0.849 m	3.700 m	1
2.259 m	0.845 m	3.700 m	2
3.582 m	0.845 m	3.700 m	3

Building 1 · Klasa 3 · Klasa 3

**Luminaire list** $\Phi_{\text{total}}$ 

51090 lm

 $P_{\text{total}}$ 

442.0 W

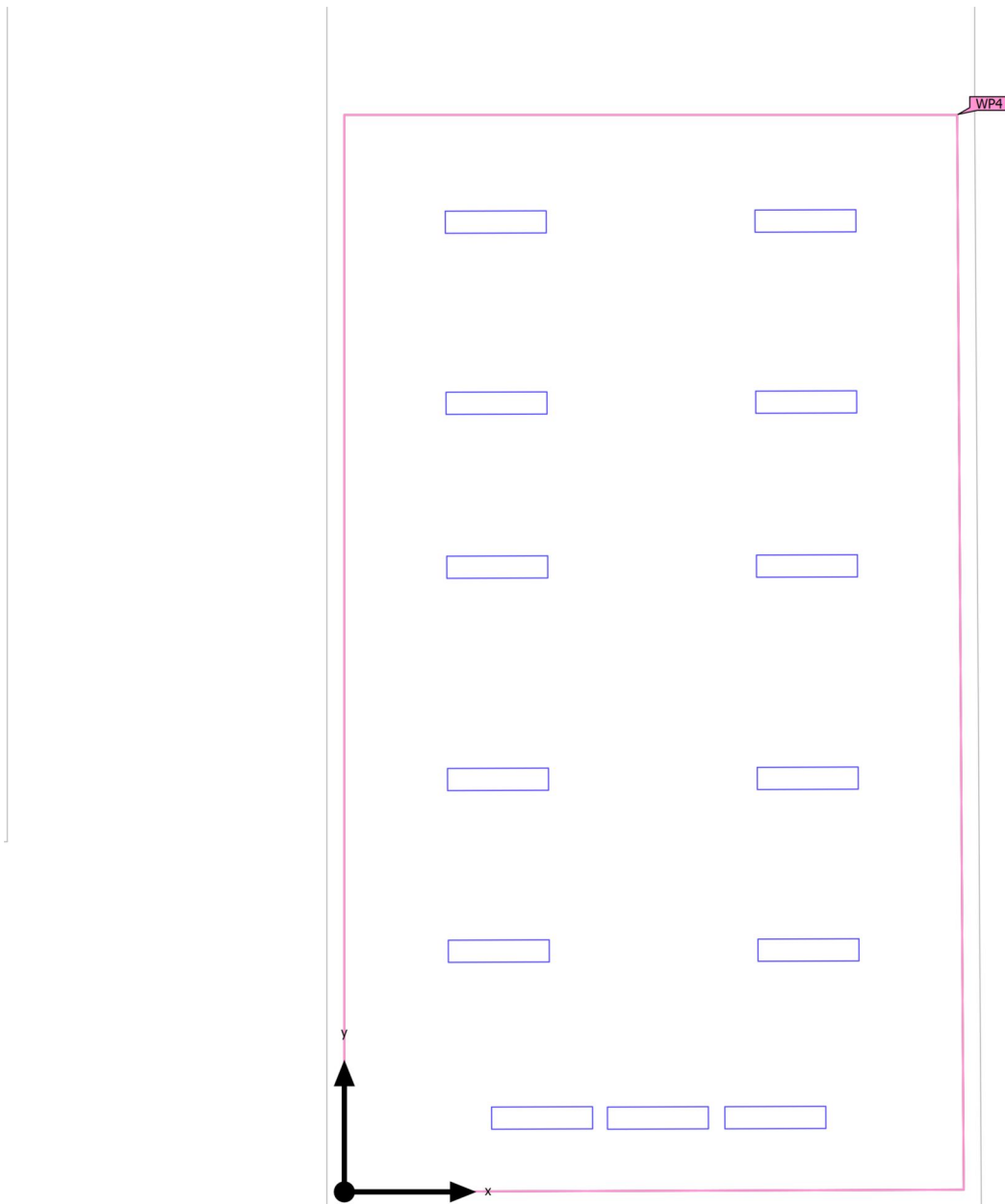
Luminous efficacy

115.6 lm/W

pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
13	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Klasa 3 (Light scene 1)

## Calculation objects





Building 1 · Klasa 3 · Klasa 3 (Light scene 1)

**Calculation objects**

## Working planes

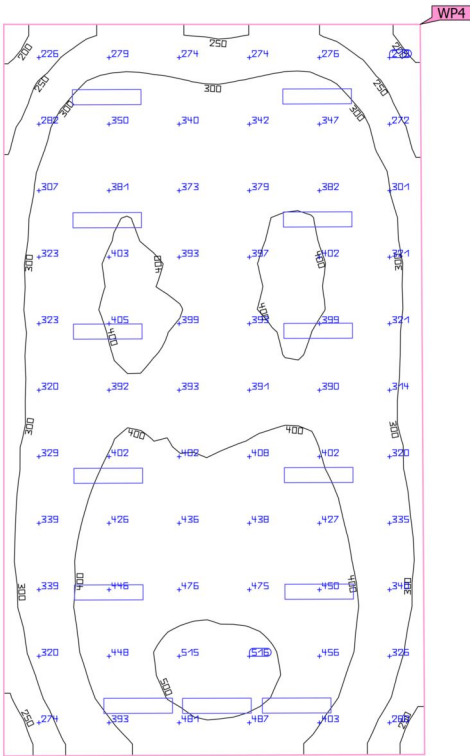
Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 3) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	368 lx ( $\geq 300$ lx) ✓	183 lx	527 lx	0.50 ( $\geq 0.40$ ) ✓	0.35	WP4

(1) Based on a rectangular space of 7.075 m x 12.303 m and SHR of 0.25.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

Building 1 · Klasa 3 · Klasa 3 (Light scene 1)

Working plane (Klasa 3)

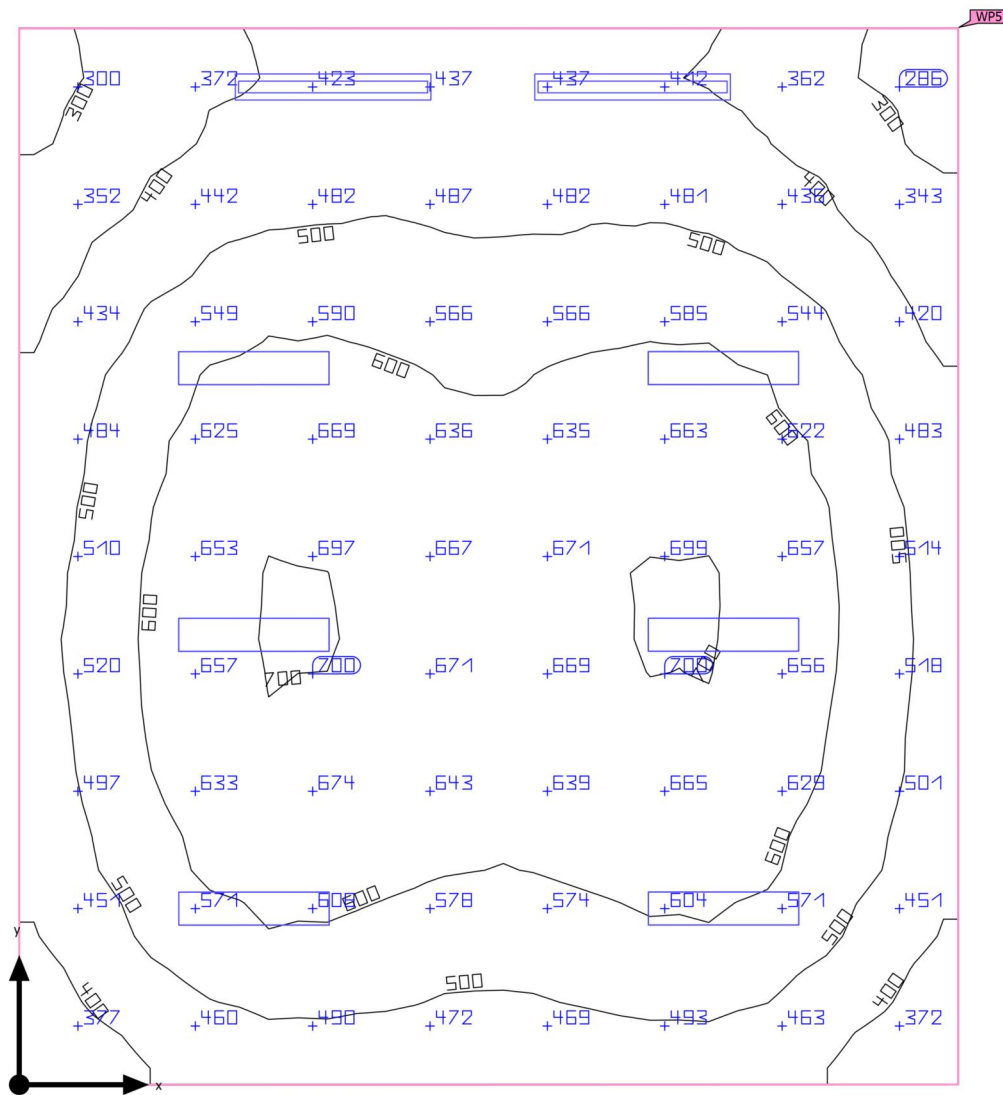


Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 3) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	368 lx (≥ 300 lx) ✓	183 lx	527 lx	0.50 (≥ 0.40) ✓	0.35	WP4

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

Building 1 · Klasa 3 · Klasa 4 (Light scene 1)

## Summary



Ground area	58.32 m <sup>2</sup>
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Reflection factors	Ceiling: 70.0 %, Walls: 50.0 %, Floor: 20.0 %
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Maintenance factor	0.80 (fixed)
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Clearance height	3.200 m
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Mounting height	3.700 m
-----------------	---------

Height <sub>Working plane</sub>	0.800 m
---------------------------------	---------

Wall zone <sub>Working plane</sub>	0.000 m
------------------------------------	---------

Building 1 · Klasa 3 · Klasa 4 (Light scene 1)

## Summary

### Results

	Symbol	Calculated	Target	Check	Index
Working plane	$\bar{E}_{\text{perpendicular}}$	536 lx	$\geq 300$ lx	✓	WP5
	$U_o (g_1)$	0.49	$\geq 0.40$	✓	WP5
Glare valuation <sup>(1)</sup>	$R_{UG, \max}$	21	$\leq 19$	✗	
Energy estimation <sup>(2)</sup>	Consumption	641 kWh/a	max. 2050 kWh/a	✓	
Room	Lighting power density	8.26 W/m <sup>2</sup>	–		
		1.54 W/m <sup>2</sup> /100 lx	–		

(1) Based on a rectangular space of 8.101 m x 7.200 m and SHR of 0.25.

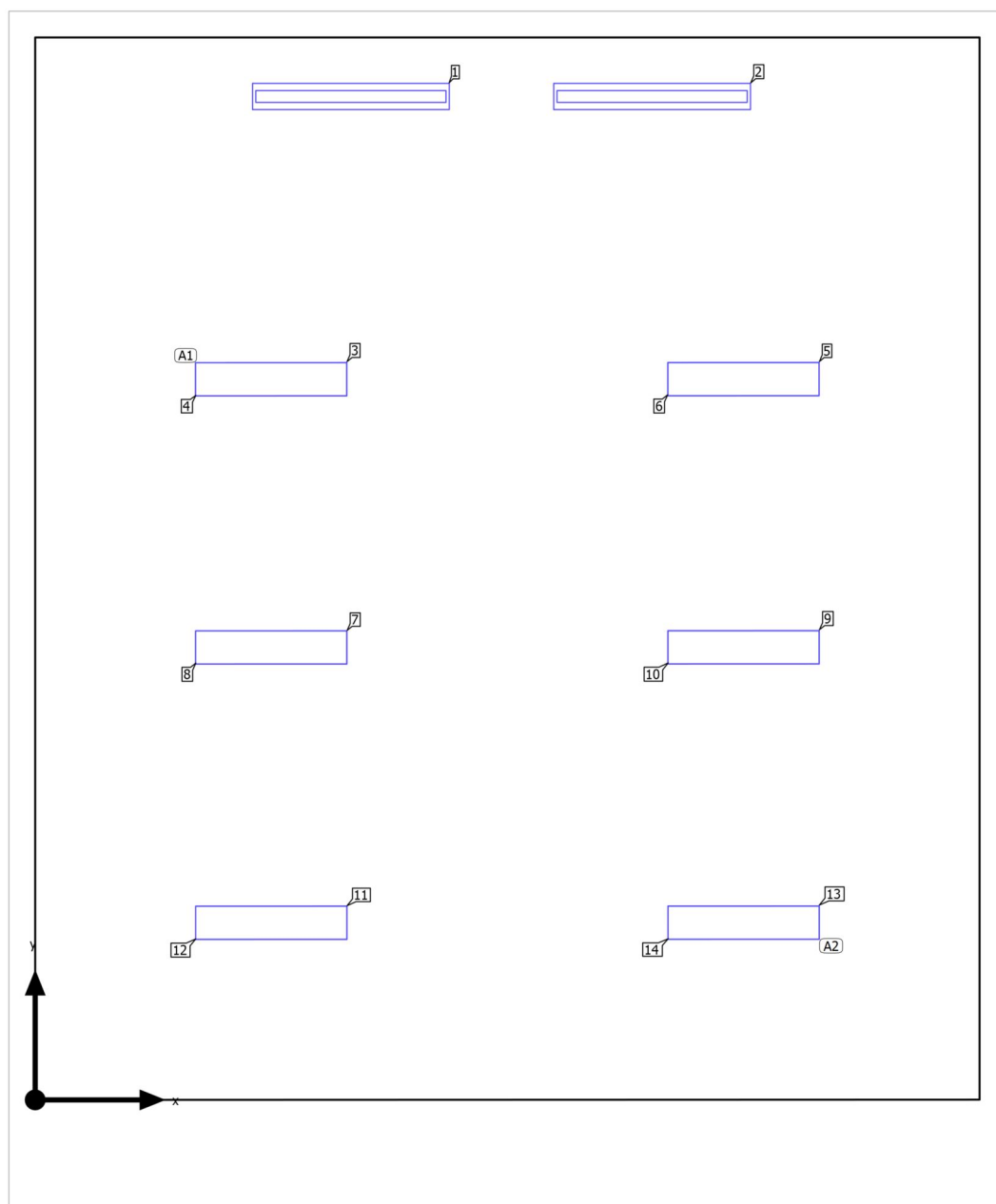
(2) Calculated using DIN:18599-4.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

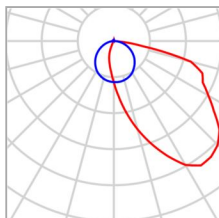
### Luminaire list

pcs.	Manufacturer	Article No.	Article name	$R_{UG}$	P	$\Phi$	Luminous efficacy
2	SYLVANIA	2021734	OPTIX S 1500 ASYM 4K	–	37.0 W	4250 lm	114.9 lm/W
12	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	20	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Klasa 4

**Luminaire layout plan**

Building 1 · Klasa 3 · Klasa 4

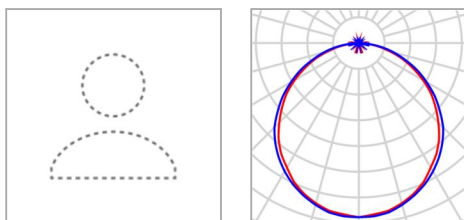
**Luminaire layout plan**

Manufacturer	SYLVANIA	P	37.0 W
Article No.	2021734	$\Phi_{\text{Luminaire}}$	4250 lm
Article name	OPTIX S 1500 ASYM 4K		
Fitting	1x LED		

## Individual luminaires

X	Y	Mounting height	Luminaire
2.407 m	7.651 m	3.700 m	1
4.703 m	7.651 m	3.700 m	2

Building 1 · Klasa 3 · Klasa 4

**Luminaire layout plan**

Manufacturer	Not yet a DIALux member	P	34.0 W
Article name	"START Panel 1200x300 HE 4100L m 840 LILO" /4000	$\Phi_{\text{Luminaire}}$	3930 lm
Fitting	1x LED/4000		

6 x Not yet a DIALux member "START Panel 1200x300 HE 4100L m 840 LILO" /4000

Type	Field Arrangement	X	Y	Mounting height	Luminaire
1st luminaire (X/Y/Z)	1.800 m / 1.351 m / 3.700 m	1.799 m	5.495 m	3.700 m	3
X-direction	2 pcs., Centre - centre, Distances not equal	5.400 m	5.496 m	3.700 m	5
		1.800 m	3.450 m	3.700 m	7
Y-direction	3 pcs., Centre - centre, Distances not equal	5.400 m	3.451 m	3.700 m	9
		1.800 m	1.351 m	3.700 m	11
Arrangement	A1	5.401 m	1.351 m	3.700 m	13

6 x Not yet a DIALux member "START Panel 1200x300 HE 4100L m 840 LILO" /4000

Type	Field Arrangement	X	Y	Mounting height	Luminaire
1st luminaire (X/Y/Z)	1.800 m / 1.351 m / 3.700 m	1.799 m	5.495 m	3.700 m	4
X-direction	2 pcs., Centre - centre, Distances not equal	5.400 m	5.496 m	3.700 m	6
		1.800 m	3.450 m	3.700 m	8

Building 1 · Klasa 3 · Klasa 4

**Luminaire layout plan**

Y-direction	3 pcs., Centre - centre, Distances not equal	X	Y	Mounting height	Luminaire
Arrangement	A2	5.400 m	3.451 m	3.700 m	10
		1.800 m	1.351 m	3.700 m	12
		5.401 m	1.351 m	3.700 m	14



Building 1 · Klasa 3 · Klasa 4

**Luminaire list** $\Phi_{\text{total}}$ 

55660 lm

 $P_{\text{total}}$ 

482.0 W

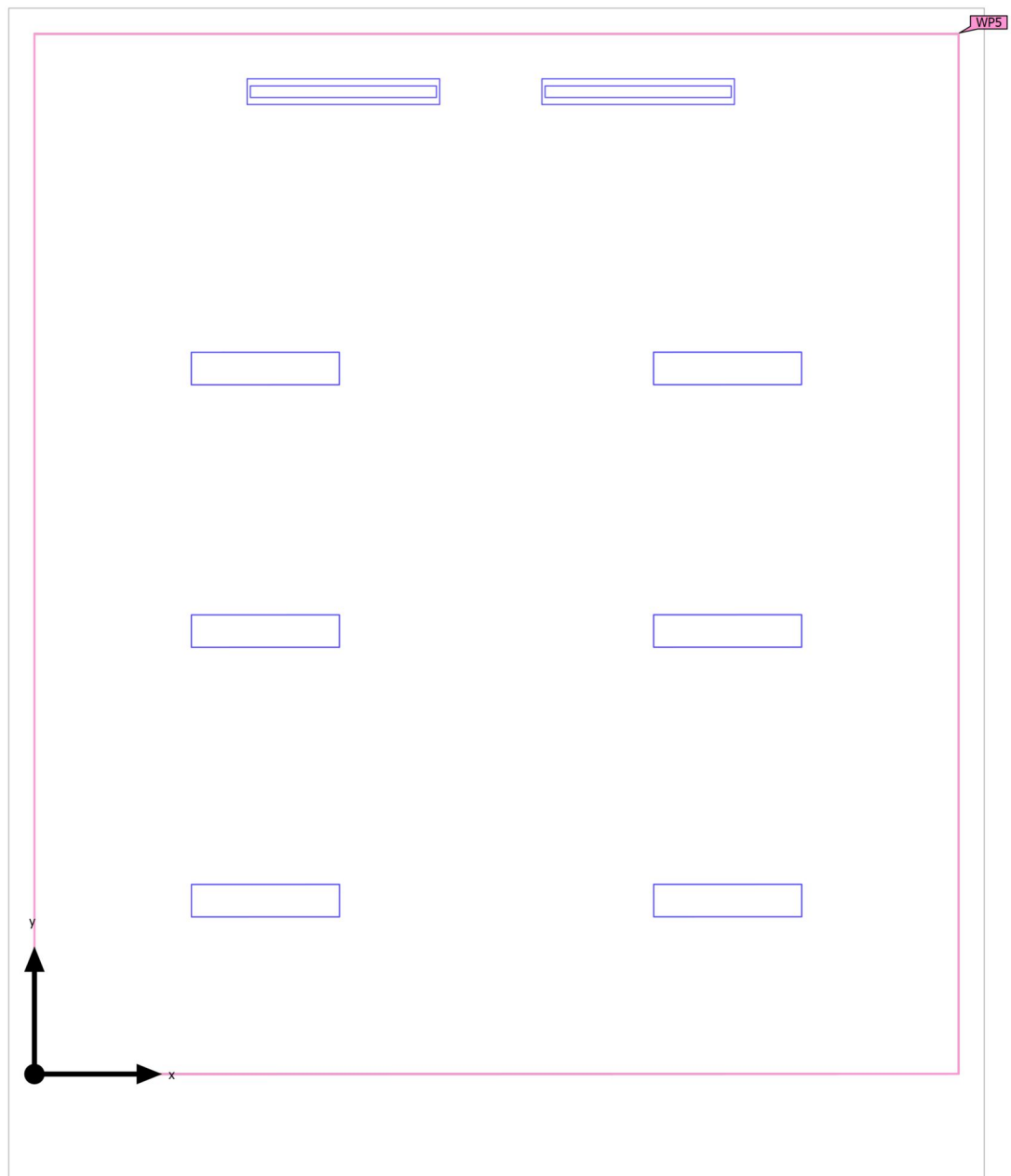
Luminous efficacy

115.5 lm/W

pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
2	SYLVANIA	2021734	OPTIX S 1500 ASYM 4K	37.0 W	4250 lm	114.9 lm/W
12	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Klasa 4 (Light scene 1)

## Calculation objects



Building 1 · Klasa 3 · Klasa 4 (Light scene 1)

**Calculation objects**

## Working planes

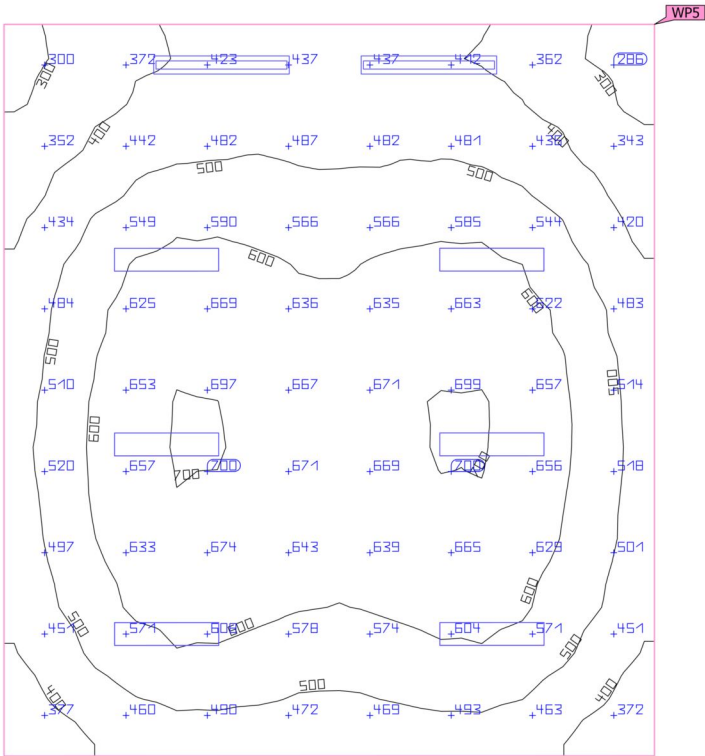
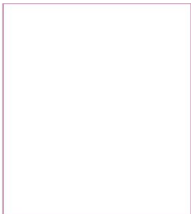
Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 4) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	536 lx ( $\geq 300$ lx) ✓	265 lx	706 lx	0.49 ( $\geq 0.40$ ) ✓	0.38	WP5

(1) Based on a rectangular space of 8.101 m x 7.200 m and SHR of 0.25.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

Building 1 · Klasa 3 · Klasa 4 (Light scene 1)

Working plane (Klasa 4)

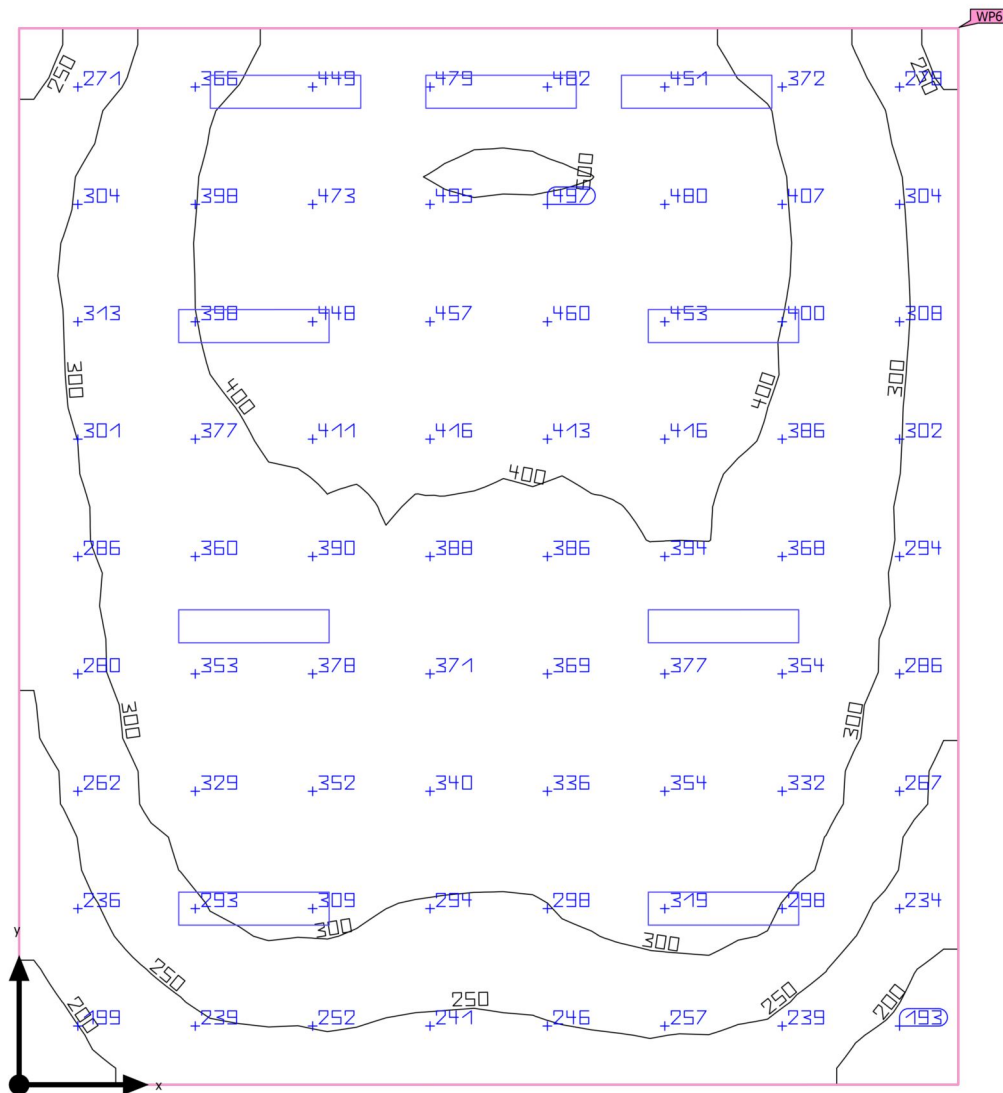


Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 4) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	536 lx (≥ 300 lx) ✓	265 lx	706 lx	0.49 (≥ 0.40) ✓	0.38	WP5

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

Building 1 · Klasa 3 · Klasa 5 (Light scene 1)

## Summary



Ground area	58.31 m <sup>2</sup>
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Reflection factors	Ceiling: 70.0 %, Walls: 50.0 %, Floor: 20.0 %
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Maintenance factor	0.80 (fixed)
--------------------	--------------

Clearance height	3.200 m
------------------	---------

Mounting height	3.700 m
-----------------	---------

Height <sub>Working plane</sub>	0.800 m
---------------------------------	---------

Wall zone <sub>Working plane</sub>	0.000 m
------------------------------------	---------

Building 1 · Klasa 3 · Klasa 5 (Light scene 1)

## Summary

### Results

	Symbol	Calculated	Target	Check	Index
Working plane	$\bar{E}_{\text{perpendicular}}$	348 lx	$\geq 300$ lx	✓	WP6
	$U_o (g_1)$	0.48	$\geq 0.40$	✓	WP6
Glare valuation <sup>(1)</sup>	$R_{UG, \text{max}}$	21	$\leq 19$	✗	
Energy estimation <sup>(2)</sup>	Consumption	407 kWh/a	max. 2050 kWh/a	✓	
Room	Lighting power density	5.25 W/m <sup>2</sup>	–		
		1.51 W/m <sup>2</sup> /100 lx	–		

(1) Based on a rectangular space of 8.099 m x 7.200 m and SHR of 0.25.

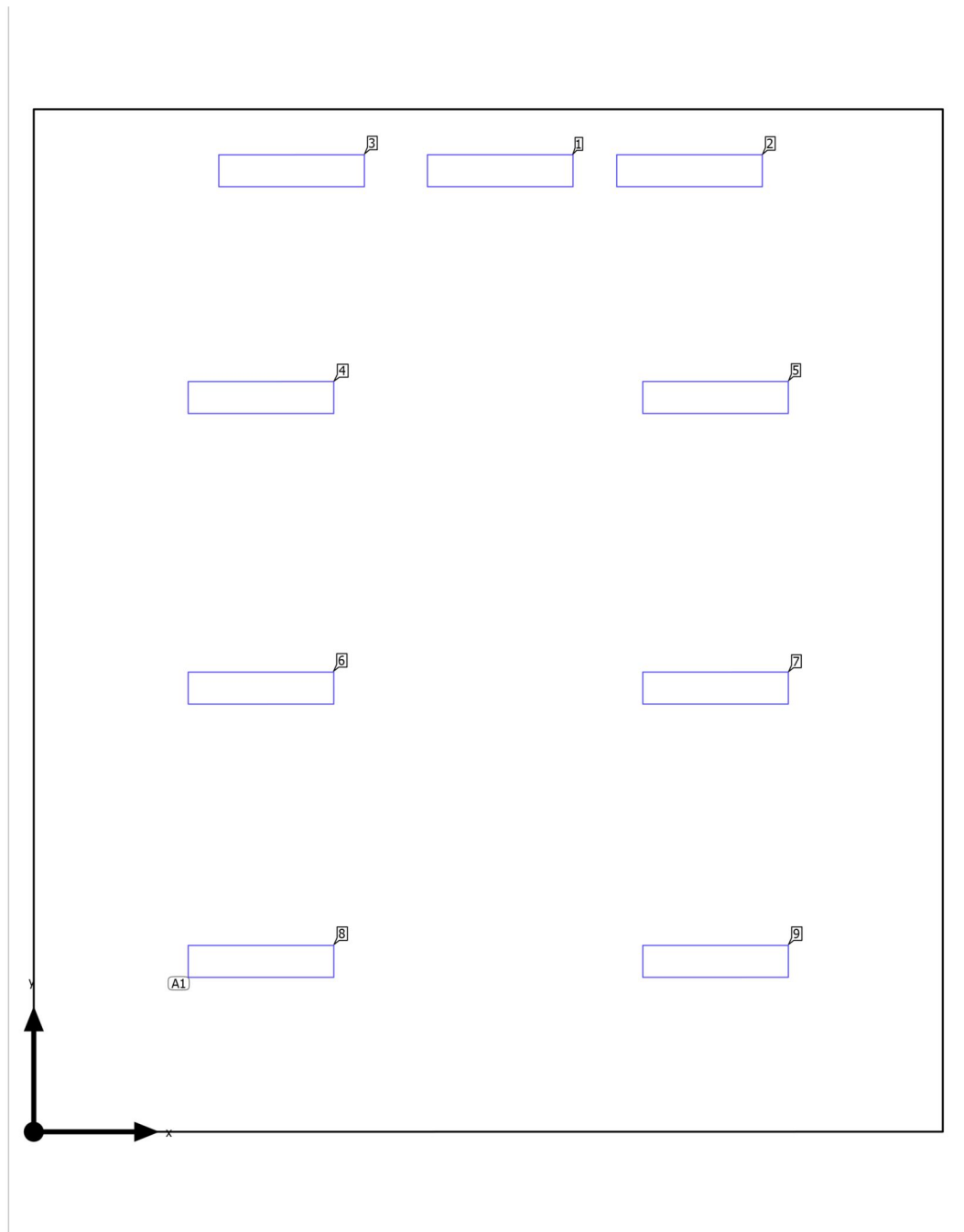
(2) Calculated using DIN:18599-4.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

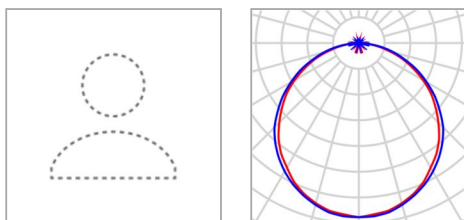
### Luminaire list

pcs.	Manufacturer	Article No.	Article name	$R_{UG}$	P	$\Phi$	Luminous efficacy
9	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	20	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Klasa 5

**Luminaire layout plan**

Building 1 · Klasa 3 · Klasa 5

**Luminaire layout plan**

Manufacturer	Not yet a DIALux member	P	34.0 W
Article name	"START Panel 1200x300 HE 4100L m 840 LILO" /4000	$\Phi_{\text{Luminaire}}$	3930 lm
Fitting	1x LED/4000		

6 x Not yet a DIALux member "START Panel 1200x300 HE 4100L m 840 LILO" /4000

Type	Field Arrangement	X	Y	Mounting height	Luminaire
1st luminaire (X/Y/Z)	1.800 m / 1.350 m / 3.700 m	1.800 m	5.816 m	3.700 m	4
X-direction	2 pcs., Centre - centre, Distances not equal	5.400 m	5.817 m	3.700 m	5
		1.800 m	3.515 m	3.700 m	6
Y-direction	3 pcs., Centre - centre, Distances not equal	5.400 m	3.515 m	3.700 m	7
		1.800 m	1.350 m	3.700 m	8
Arrangement	A1	5.400 m	1.350 m	3.700 m	9

## Individual luminaires

X	Y	Mounting height	Luminaire
3.695 m	7.613 m	3.700 m	1
5.194 m	7.613 m	3.700 m	2
2.042 m	7.613 m	3.700 m	3



Building 1 · Klasa 3 · Klasa 5

**Luminaire list** $\Phi_{\text{total}}$ 

35370 lm

 $P_{\text{total}}$ 

306.0 W

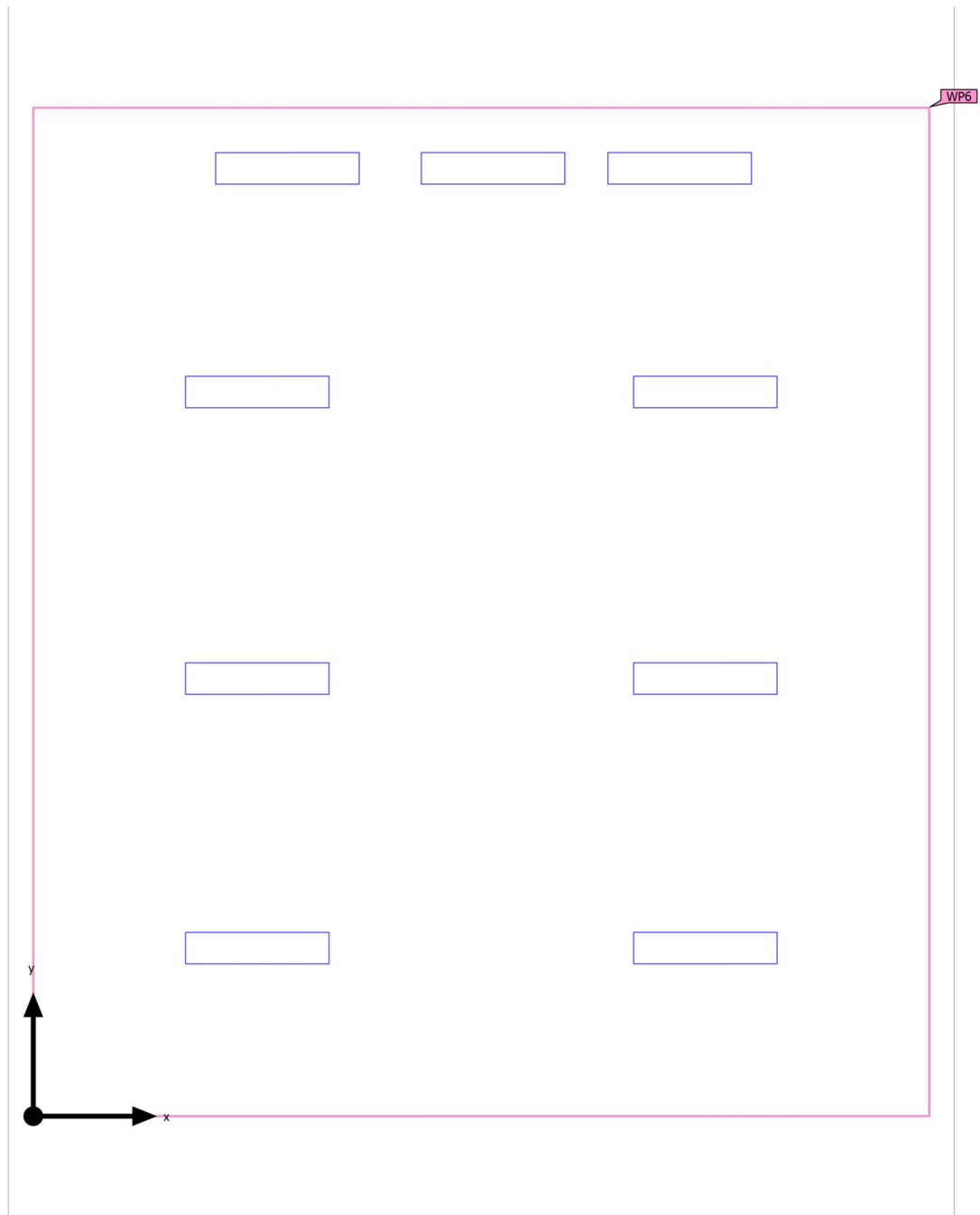
Luminous efficacy

115.6 lm/W

pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
9	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Klasa 5 (Light scene 1)

## Calculation objects



Building 1 · Klasa 3 · Klasa 5 (Light scene 1)

**Calculation objects**

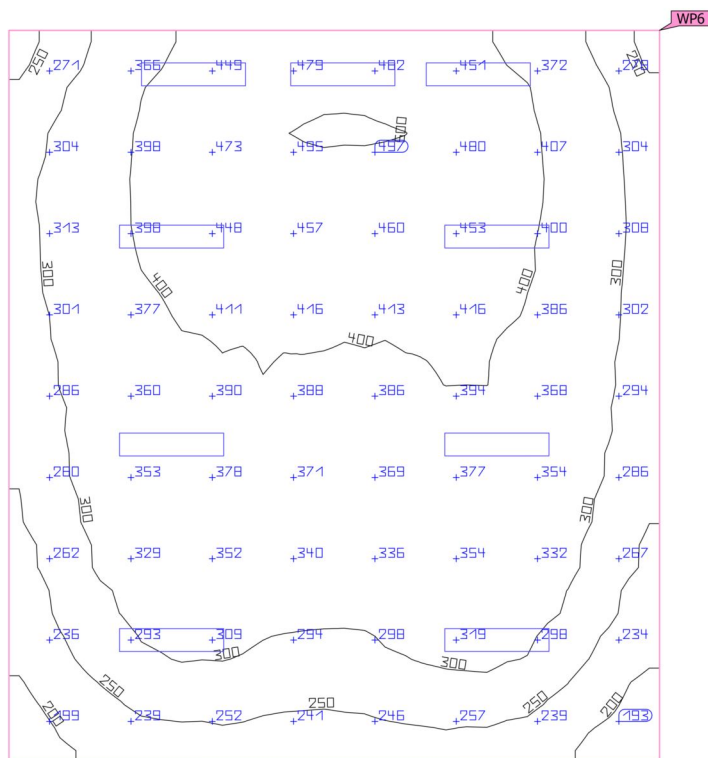
## Working planes

Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 5) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	348 lx ( $\geq 300$ lx) ✓	168 lx	503 lx	0.48 ( $\geq 0.40$ ) ✓	0.33	WP6

(1) Based on a rectangular space of 8.099 m x 7.200 m and SHR of 0.25.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

Building 1 · Klasa 3 · Klasa 5 (Light scene 1)

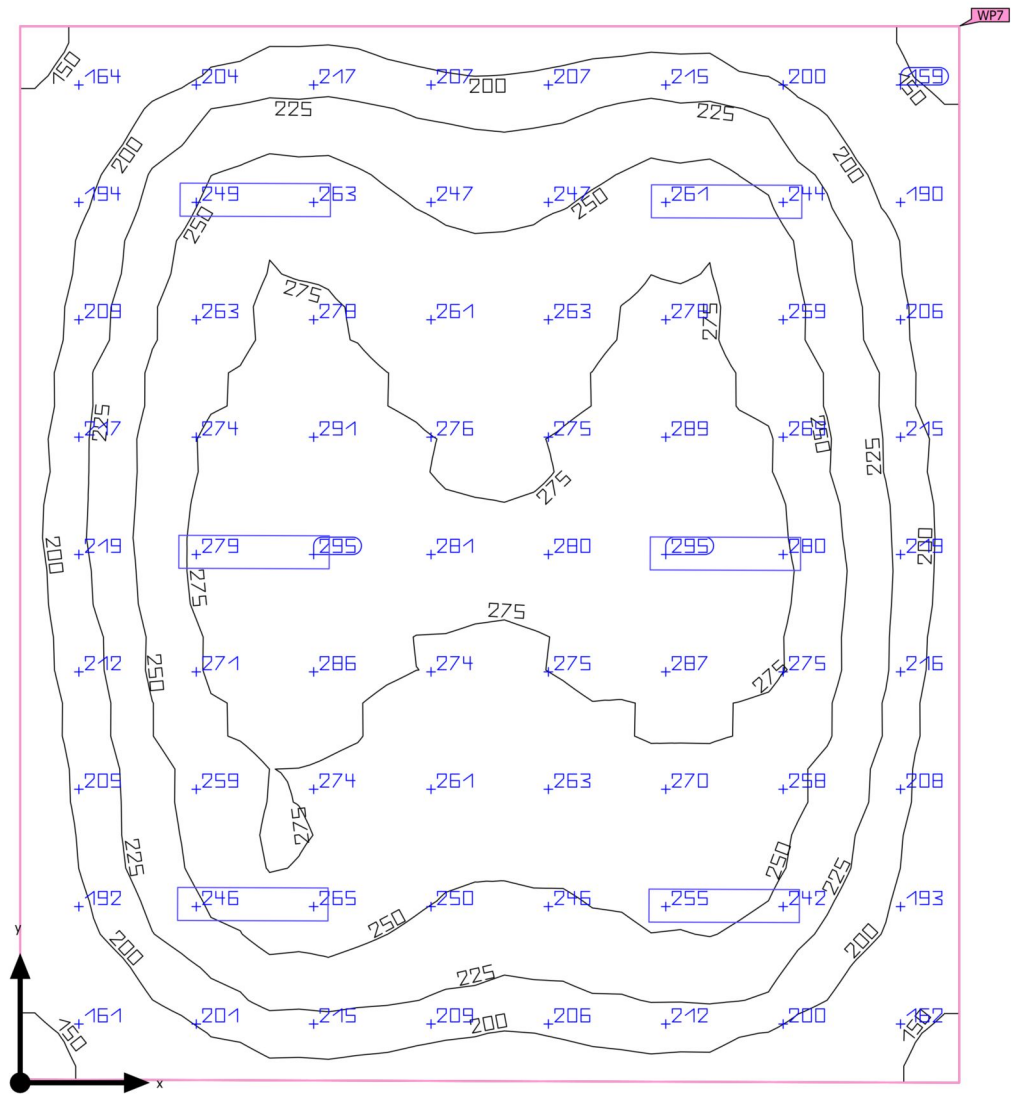
**Working plane (Klasa 5)**

Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 5)	348 lx	168 lx	503 lx	0.48	0.33	WP6
Perpendicular illuminance (adaptive)	( $\geq 300$ lx)			( $\geq 0.40$ )		
Height: 0.800 m, Wall zone: 0.000 m	✓			✓		

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

Building 1 · Klasa 3 · Klasa 6 (Light scene 1)

Summary



Ground area	58.23 m <sup>2</sup>	Clearance height	3.700 m
Reflection factors	Ceiling: 70.0 %, Walls: 50.0 %, Floor: 20.0 %	Mounting height	3.700 m
Maintenance factor	0.80 (fixed)	Height <sub>Working plane</sub>	0.800 m
		Wall zone <sub>Working plane</sub>	0.000 m

Building 1 · Klasa 3 · Klasa 6 (Light scene 1)

## Summary

### Results

	Symbol	Calculated	Target	Check	Index
Working plane	$\bar{E}_{\text{perpendicular}}$	240 lx	$\geq 300$ lx	✗	WP7
	$U_o (g_1)$	0.57	$\geq 0.40$	✓	WP7
Glare valuation <sup>(1)</sup>	$R_{UG, \text{max}}$	21	$\leq 19$	✗	
Energy estimation <sup>(2)</sup>	Consumption	271 kWh/a	max. 2050 kWh/a	✓	
Room	Lighting power density	3.50 W/m <sup>2</sup>	–		
		1.46 W/m <sup>2</sup> /100 lx	–		

(1) Based on a rectangular space of 8.100 m x 7.200 m and SHR of 0.25.

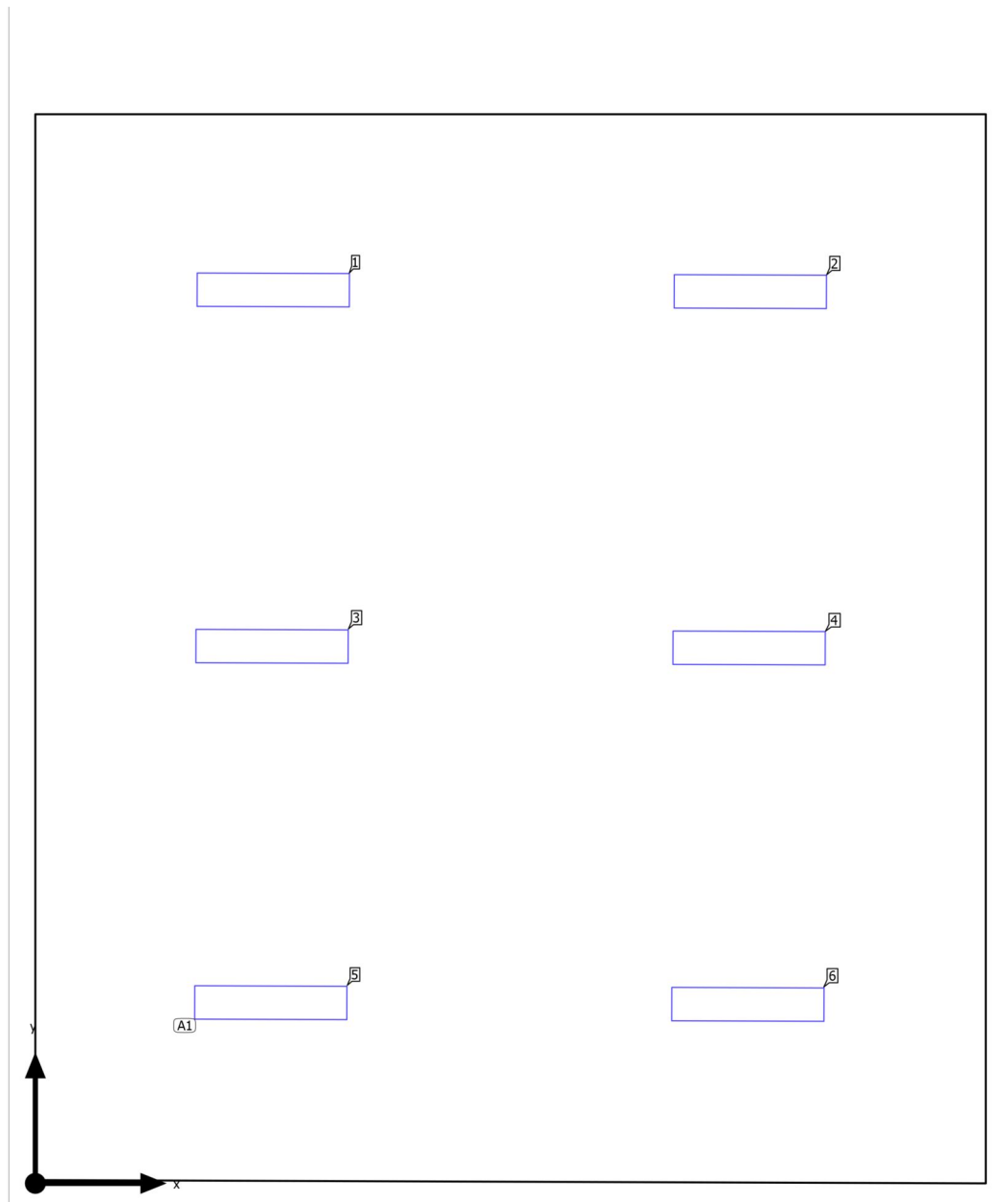
(2) Calculated using DIN:18599-4.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

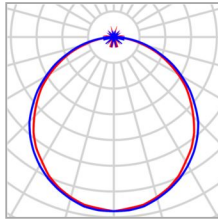
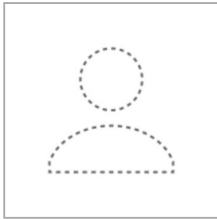
### Luminaire list

pcs.	Manufacturer	Article No.	Article name	$R_{UG}$	P	$\Phi$	Luminous efficacy
6	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	20	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Klasa 6

**Luminaire layout plan**

Building 1 · Klasa 3 · Klasa 6

**Luminaire layout plan**

Manufacturer	Not yet a DIALux member
Article name	"START Panel 1200x300 HE 4100L m 840 LILO" /4000
Fitting	1x LED/4000

P	34.0 W
$\Phi_{\text{Luminaire}}$	3930 lm

6 x Not yet a DIALux member "START Panel 1200x300 HE 4100L m 840 LILO" /4000

Type	Field Arrangement	X	Y	Mounting height	Luminaire
1st luminaire (X/Y/Z)	1.784 m / 1.369 m / 3.700 m	1.802 m	6.769 m	3.700 m	1
X-direction	2 pcs., Centre - centre, 3.614 m	5.416 m	6.756 m	3.700 m	2
Y-direction	3 pcs., Centre - centre, 2.700 m	1.793 m	4.069 m	3.700 m	3
		5.407 m	4.056 m	3.700 m	4
Arrangement	A1	1.784 m	1.369 m	3.700 m	5
		5.398 m	1.356 m	3.700 m	6



Building 1 · Klasa 3 · Klasa 6

**Luminaire list** $\Phi_{\text{total}}$ 

23580 lm

 $P_{\text{total}}$ 

204.0 W

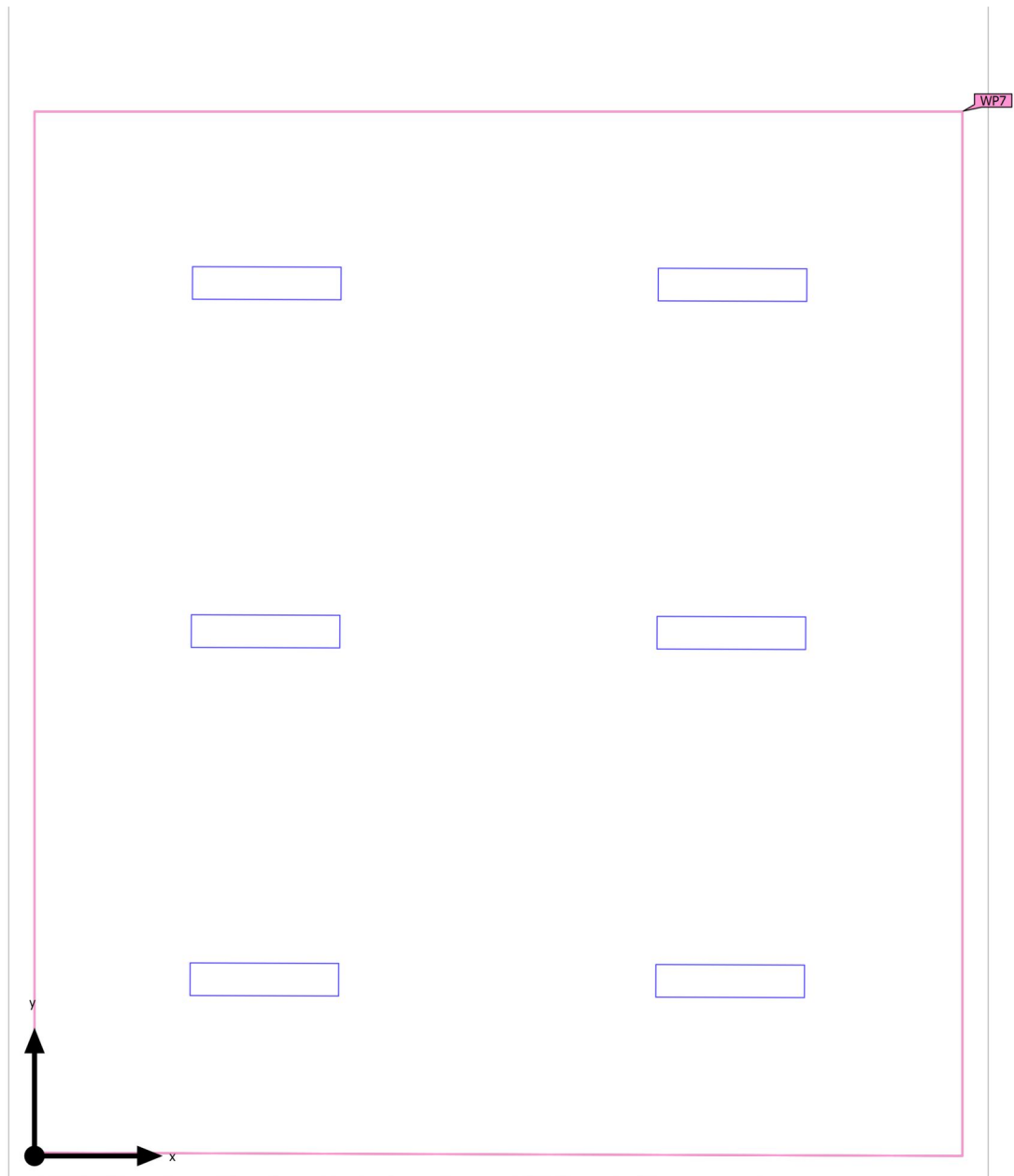
Luminous efficacy

115.6 lm/W

pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
6	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Klasa 6 (Light scene 1)

## Calculation objects



Building 1 · Klasa 3 · Klasa 6 (Light scene 1)

**Calculation objects**

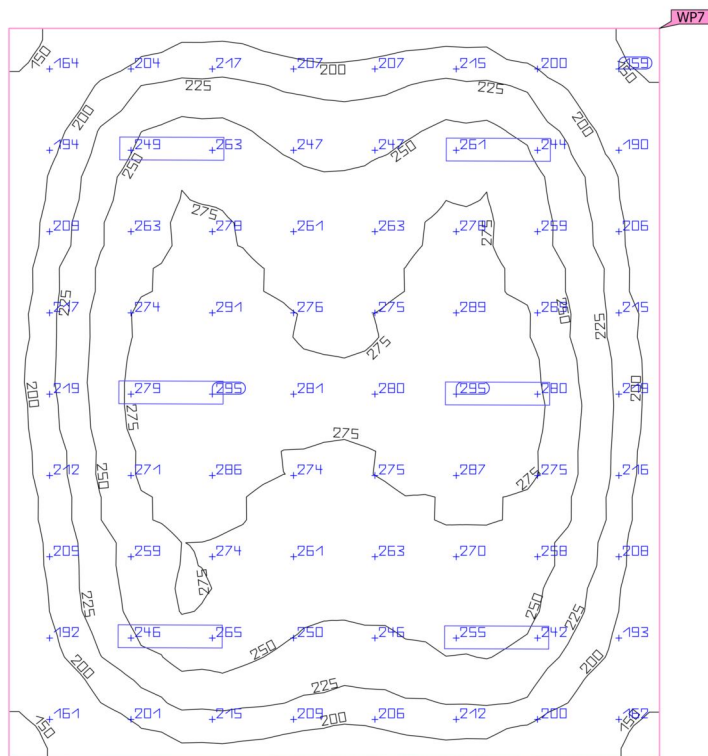
## Working planes

Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 6) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	240 lx ( $\geq 300$ lx) ✗	136 lx	298 lx	0.57 ( $\geq 0.40$ ) ✓	0.46	WP7

(1) Based on a rectangular space of 8.100 m x 7.200 m and SHR of 0.25.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

Building 1 · Klasa 3 · Klasa 6 (Light scene 1)

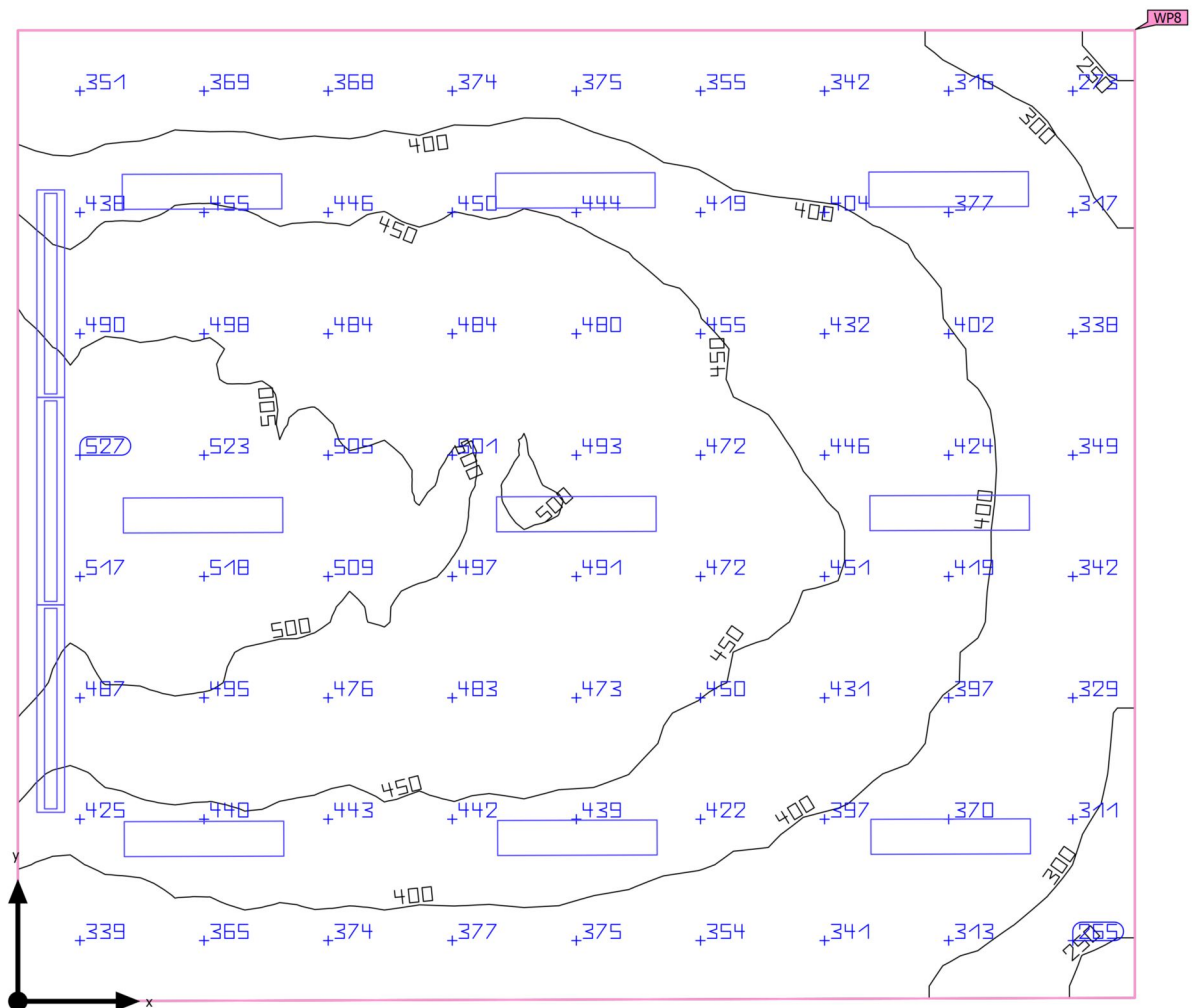
**Working plane (Klasa 6)**

Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 6)	240 lx	136 lx	298 lx	0.57	0.46	WP7
Perpendicular illuminance (adaptive)	(≥ 300 lx)			(≥ 0.40)		
Height: 0.800 m, Wall zone: 0.000 m	✗			✓		

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

Building 1 · Klasa 3 · Klasa 7 (Light scene 1)

## Summary



Ground area	56.59 m <sup>2</sup>
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Reflection factors	Ceiling: 70.0 %, Walls: 50.0 %, Floor: 20.0 %
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Maintenance factor	0.80 (fixed)
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Clearance height	3.200 m
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Mounting height	3.700 m
-----------------	---------

Height <sub>Working plane</sub>	0.800 m
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Wall zone <sub>Working plane</sub>	0.000 m
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Building 1 · Klasa 3 · Klasa 7 (Light scene 1)

## Summary

### Results

	Symbol	Calculated	Target	Check	Index
Working plane	$\bar{E}_{\text{perpendicular}}$	420 lx	$\geq 300$ lx	✓	WP8
	$U_o (g_1)$	0.56	$\geq 0.60$	✗	WP8
Glare valuation <sup>(1)</sup>	$R_{UG, \text{max}}$	21	$\leq 19$	✗	
Energy estimation <sup>(2)</sup>	Consumption	555 kWh/a	max. 2000 kWh/a	✓	
Room	Lighting power density	7.37 W/m <sup>2</sup>	–		
		1.76 W/m <sup>2</sup> /100 lx	–		

(1) Based on a rectangular space of 7.020 m x 8.075 m and SHR of 0.25.

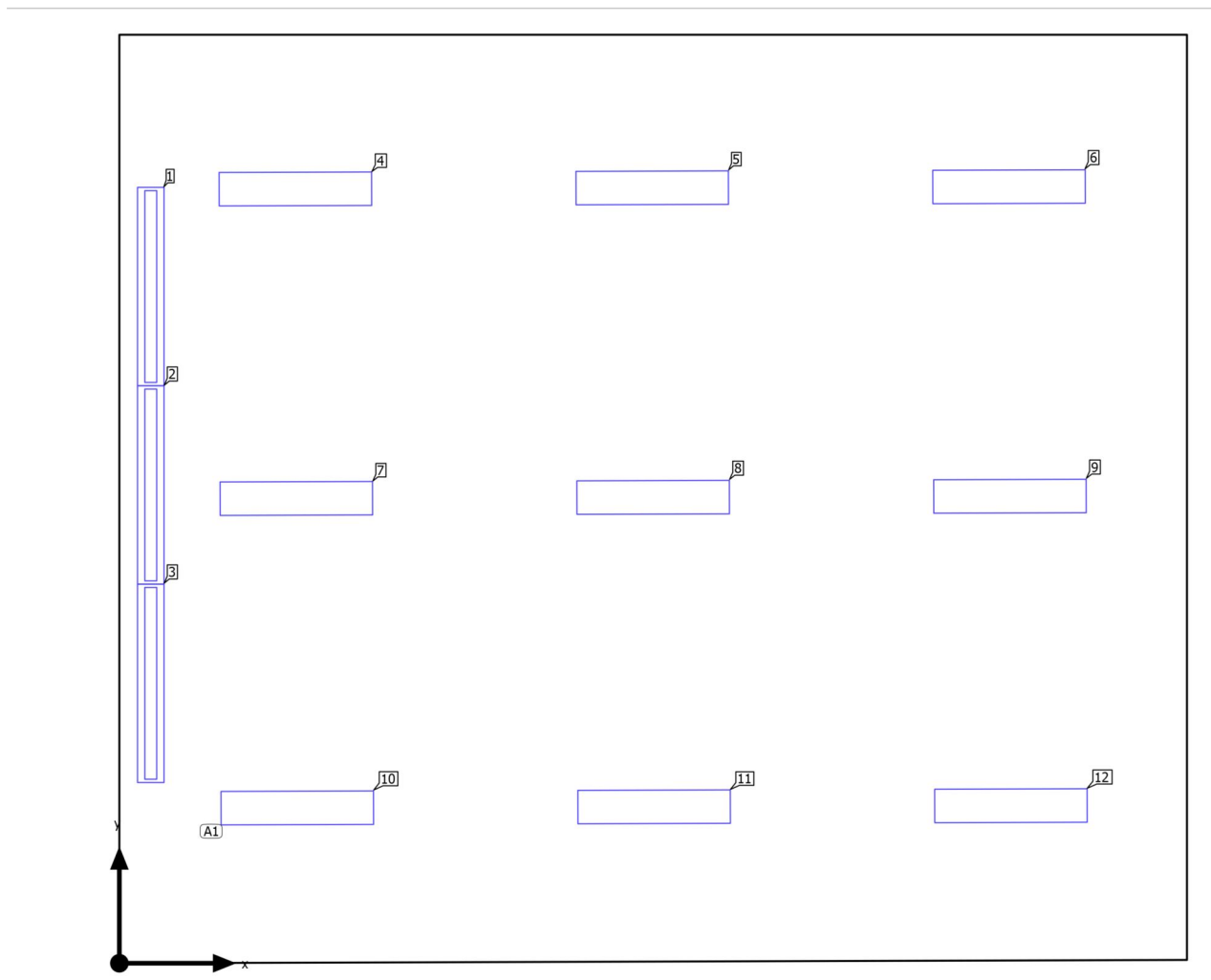
(2) Calculated using DIN:18599-4.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

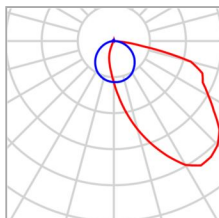
### Luminaire list

pcs.	Manufacturer	Article No.	Article name	$R_{UG}$	P	$\Phi$	Luminous efficacy
3	SYLVANIA	2021734	OPTIX S 1500 ASYM 4K	–	37.0 W	4250 lm	114.9 lm/W
9	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	20	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Klasa 7

**Luminaire layout plan**

Building 1 · Klasa 3 · Klasa 7

**Luminaire layout plan**

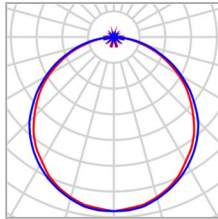
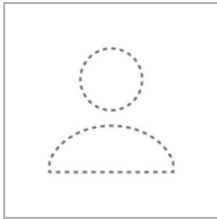
Manufacturer	SYLVANIA	P	37.0 W
Article No.	2021734	$\Phi_{\text{Luminaire}}$	4250 lm
Article name	OPTIX S 1500 ASYM 4K		
Fitting	1x LED		

## Individual luminaires

X	Y	Mounting height	Luminaire
0.237 m	5.116 m	3.700 m	1
0.237 m	3.616 m	3.700 m	2
0.237 m	2.116 m	3.700 m	3



Building 1 · Klasa 3 · Klasa 7

**Luminaire layout plan**

Manufacturer	Not yet a DIALux member
Article name	"START Panel 1200x300 HE 4100L m 840 LILO" /4000
Fitting	1x LED/4000

P	34.0 W
$\Phi_{\text{Luminaire}}$	3930 lm

9 x Not yet a DIALux member "START Panel 1200x300 HE 4100L m 840 LILO" /4000

Type	Field Arrangement	X	Y	Mounting height	Luminaire
1st luminaire (X/Y/Z)	1.346 m / 1.174 m / 3.700 m	1.331 m	5.854 m	3.700 m	4
X-direction	3 pcs., Centre - centre, 2.699 m	4.030 m	5.862 m	3.700 m	5
Y-direction	3 pcs., Centre - centre, 2.340 m	6.729 m	5.871 m	3.700 m	6
Arrangement	A1	1.339 m	3.514 m	3.700 m	7
		4.037 m	3.522 m	3.700 m	8
		6.736 m	3.531 m	3.700 m	9
		1.346 m	1.174 m	3.700 m	10
		4.045 m	1.183 m	3.700 m	11
		6.744 m	1.191 m	3.700 m	12

Building 1 · Klasa 3 · Klasa 7

**Luminaire list** $\Phi_{\text{total}}$ 

48120 lm

 $P_{\text{total}}$ 

417.0 W

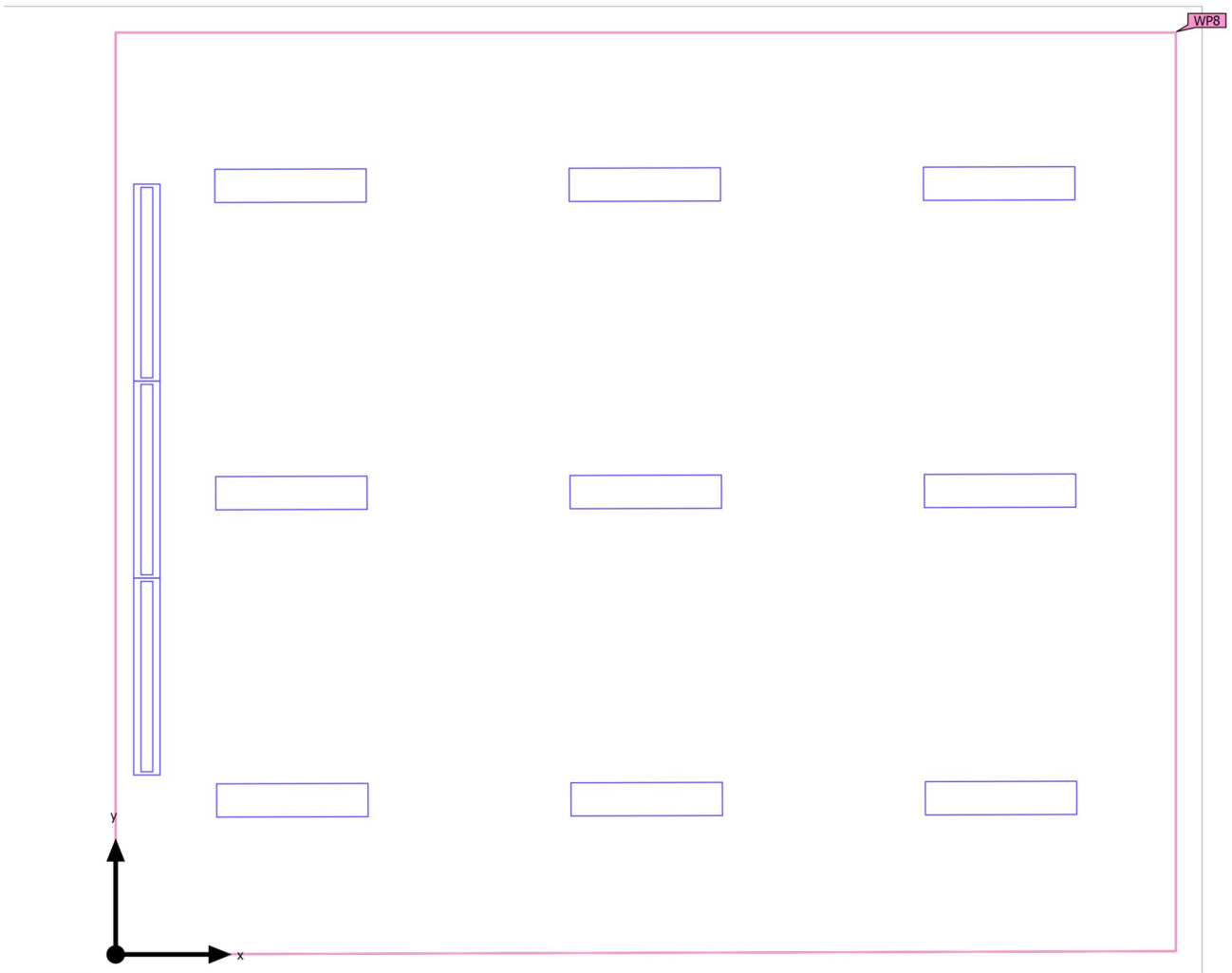
Luminous efficacy

115.4 lm/W

pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
3	SYLVANIA	2021734	OPTIX S 1500 ASYM 4K	37.0 W	4250 lm	114.9 lm/W
9	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Klasa 7 (Light scene 1)

## Calculation objects



Building 1 · Klasa 3 · Klasa 7 (Light scene 1)

**Calculation objects**

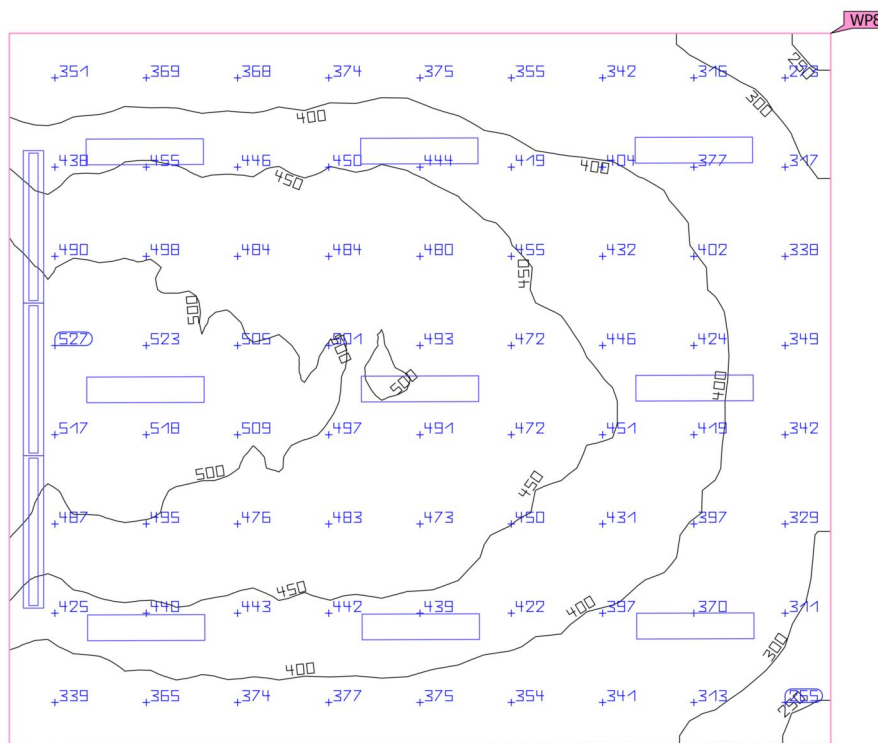
## Working planes

Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 7) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	420 lx ( $\geq 300$ lx) ✓	235 lx	549 lx	0.56 ( $\geq 0.60$ ) ✗	0.43	WP8

(1) Based on a rectangular space of 7.020 m x 8.075 m and SHR of 0.25.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

Building 1 · Klasa 3 · Klasa 7 (Light scene 1)

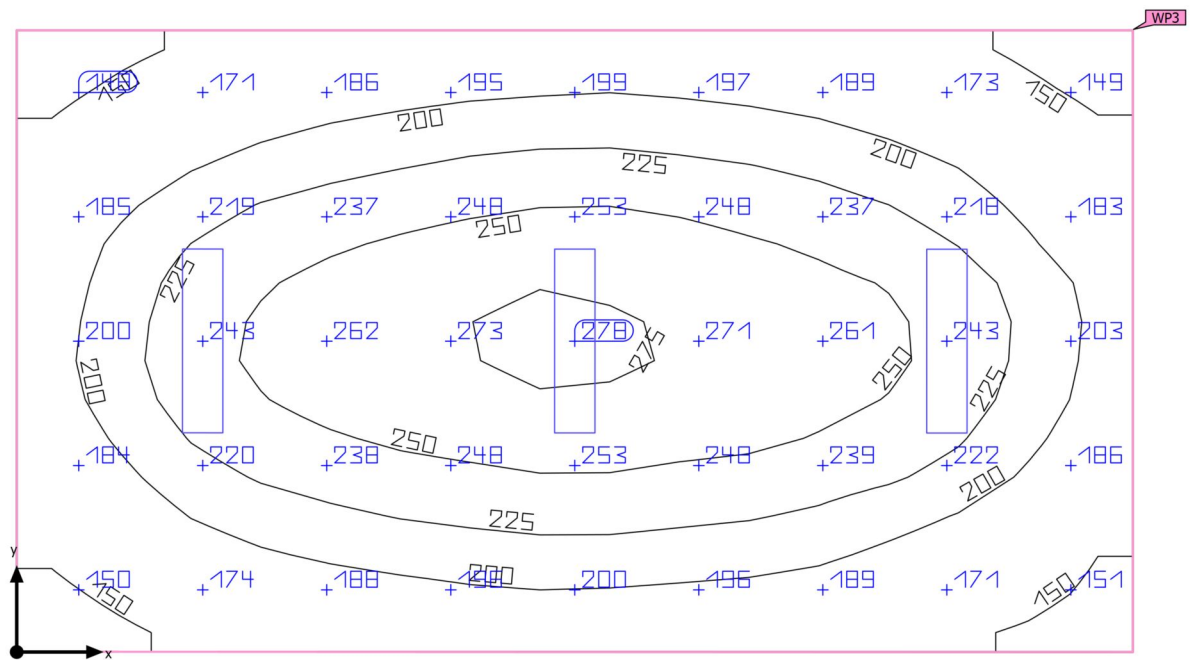
**Working plane (Klasa 7)**

Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Klasa 7)	420 lx	235 lx	549 lx	0.56	0.43	WP8
Perpendicular illuminance (adaptive)	(≥ 300 lx)			(≥ 0.60)		
Height: 0.800 m, Wall zone: 0.000 m	✓			✗		

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

Building 1 · Klasa 3 · Kthina (Light scene 1)

## Summary



Ground area	27.29 m <sup>2</sup>	Clearance height	3.200 m
Reflection factors	Ceiling: 70.0 %, Walls: 50.0 %, Floor: 20.0 %	Mounting height	3.700 m
Maintenance factor	0.80 (fixed)	Height <sub>Working plane</sub>	0.800 m
		Wall zone <sub>Working plane</sub>	0.000 m

Building 1 · Klasa 3 · Kthina (Light scene 1)

## Summary

### Results

	Symbol	Calculated	Target	Check	Index
Working plane	$\bar{E}_{\text{perpendicular}}$	211 lx	$\geq 200$ lx	✓	WP3
	$U_o (g_1)$	0.63	$\geq 0.60$	✓	WP3
Glare valuation <sup>(1)</sup>	$R_{UG, \text{max}}$	20	$\leq 19$	✗	
Energy estimation <sup>(2)</sup>	Consumption	136 kWh/a	max. 1000 kWh/a	✓	
Room	Lighting power density	3.74 W/m <sup>2</sup>	–		
		1.77 W/m <sup>2</sup> /100 lx	–		

(1) Based on a rectangular space of 3.900 m x 7.000 m and SHR of 0.25.

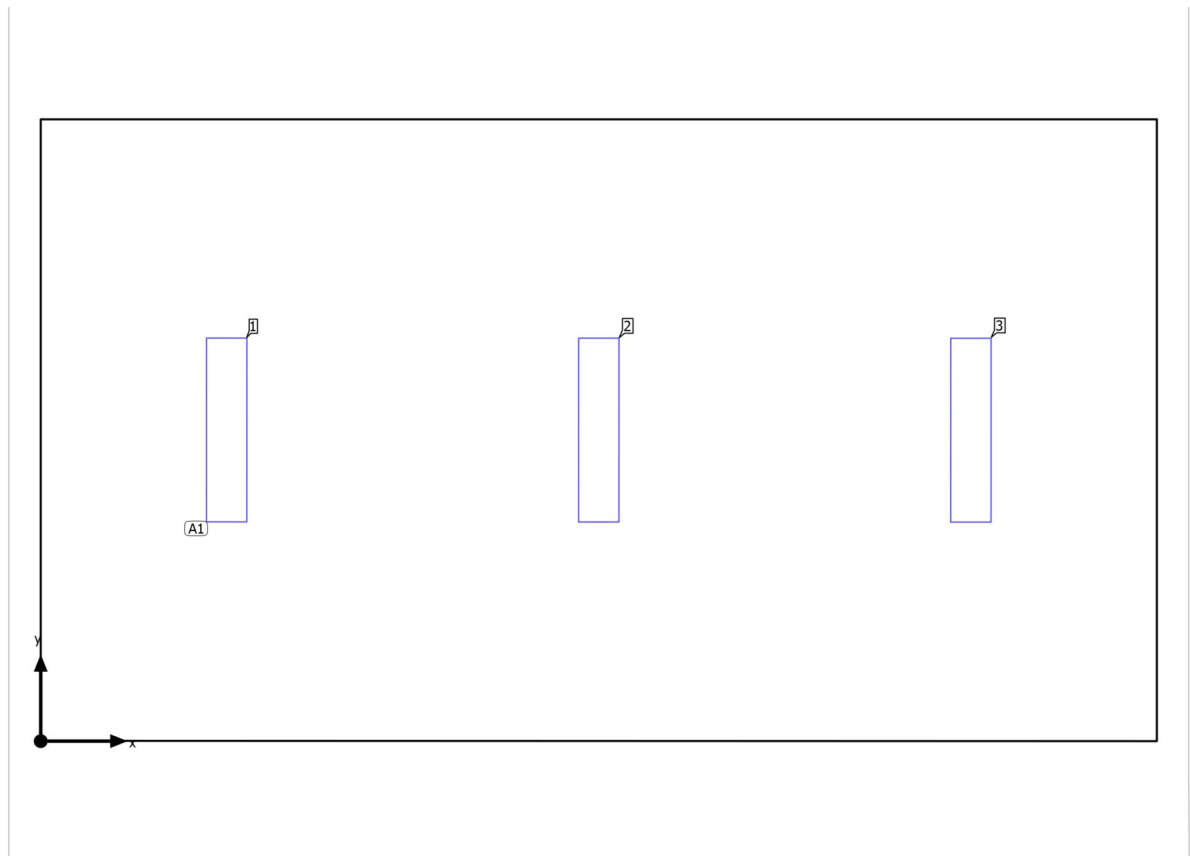
(2) Calculated using DIN:18599-4.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

### Luminaire list

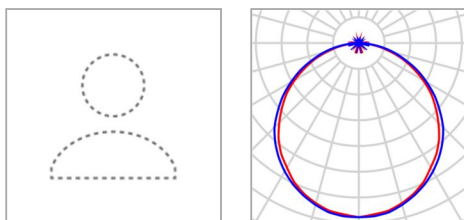
pcs.	Manufacturer	Article No.	Article name	$R_{UG}$	P	$\Phi$	Luminous efficacy
3	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	20	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Kthina

**Luminaire layout plan**



Building 1 · Klasa 3 · Kthina

**Luminaire layout plan**

Manufacturer	Not yet a DIALux member	P	34.0 W
Article name	"START Panel 1200x300 HE 4100L m 840 LILO" /4000	$\Phi_{\text{Luminaire}}$	3930 lm
Fitting	1x LED/4000		

3 x Not yet a DIALux member "START Panel 1200x300 HE 4100L m 840 LILO" /4000

Type	Field Arrangement	X	Y	Mounting height	Luminaire
1st luminaire (X/Y/Z)	1.166 m / 1.952 m / 3.700 m	1.166 m	1.952 m	3.700 m	1
X-direction	3 pcs., Centre - centre, 2.334 m	3.500 m	1.951 m	3.700 m	2
Y-direction	1 pcs., Centre - centre, 3.900 m	5.834 m	1.950 m	3.700 m	3
Arrangement	A1				

Building 1 · Klasa 3 · Kthina

**Luminaire list** $\Phi_{\text{total}}$ 

11790 lm

 $P_{\text{total}}$ 

102.0 W

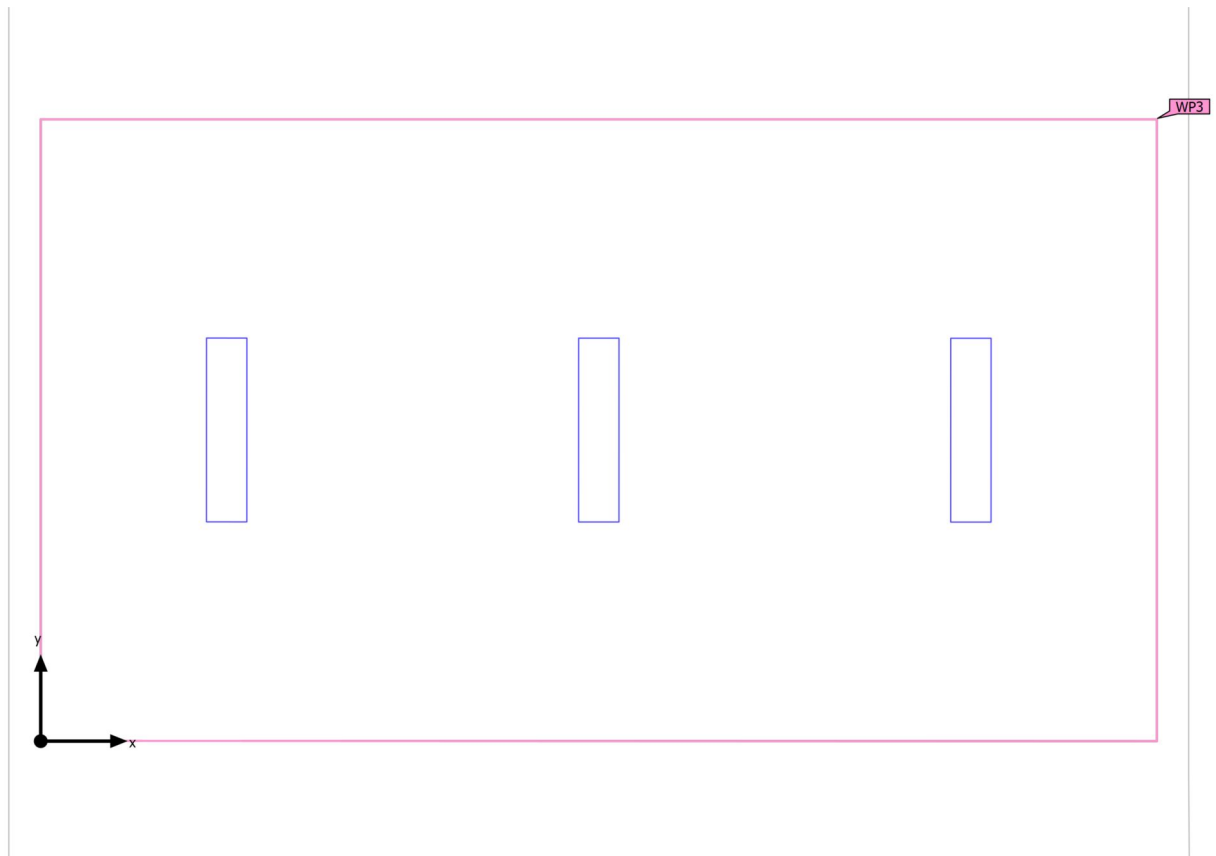
Luminous efficacy

115.6 lm/W

pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
3	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Kthina (Light scene 1)

## Calculation objects



Building 1 · Klasa 3 · Kthina (Light scene 1)

**Calculation objects**

## Working planes

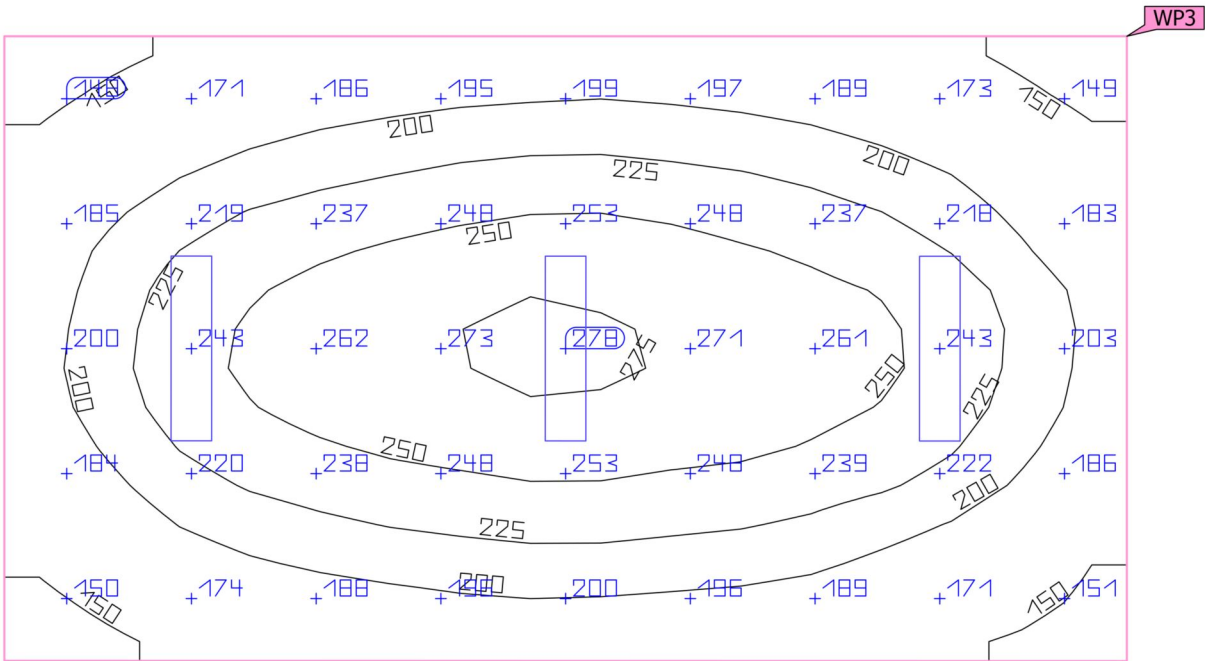
Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Kthina) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	211 lx ( $\geq 200$ lx) ✓	132 lx	278 lx	0.63 ( $\geq 0.60$ ) ✓	0.47	WP3

(1) Based on a rectangular space of 3.900 m x 7.000 m and SHR of 0.25.

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

Building 1 · Klasa 3 · Kthina (Light scene 1)

Working plane (Kthina)

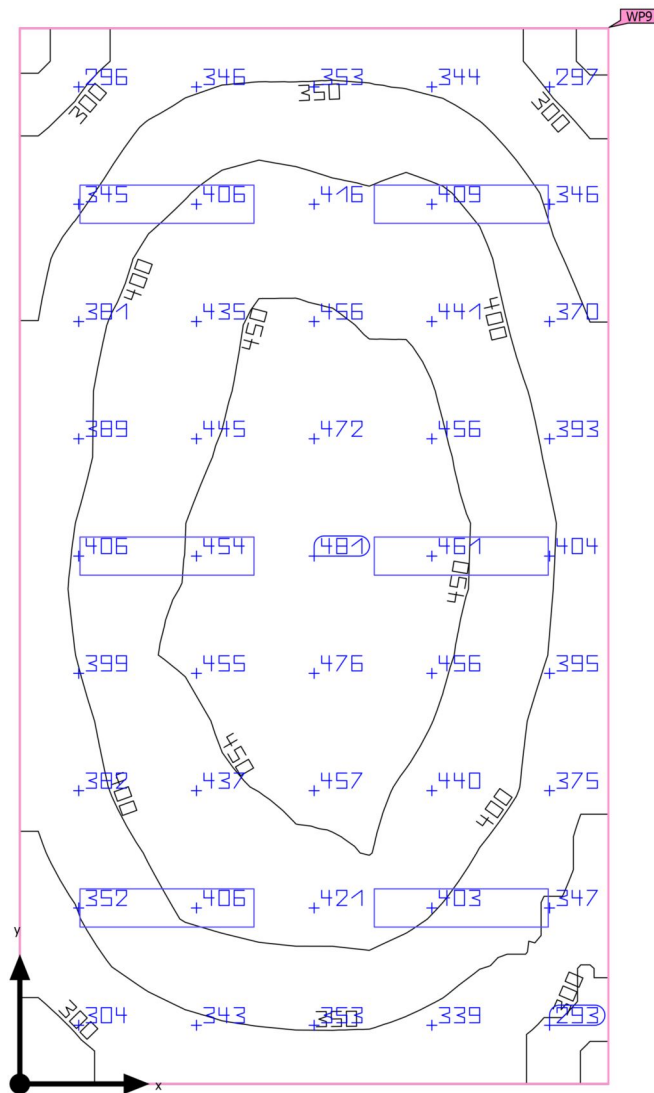


Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Kthina) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	211 lx (≥ 200 lx) ✓	132 lx	278 lx	0.63 (≥ 0.60) ✓	0.47	WP3

Utilisation profile: Educational premises - Educational buildings (5.36.1 Classrooms, tutorial rooms)

Building 1 · Klasa 3 · Room 10 (Light scene 1)

## Summary



Ground area	27.28 m <sup>2</sup>	Clearance height	3.700 m
Reflection factors	Ceiling: 70.0 %, Walls: 50.0 %, Floor: 20.0 %	Mounting height	3.700 m
Maintenance factor	0.80 (fixed)	Height <sub>Working plane</sub>	0.800 m
		Wall zone <sub>Working plane</sub>	0.000 m

Building 1 · Klasa 3 · Room 10 (Light scene 1)

## Summary

### Results

	Symbol	Calculated	Target	Check	Index
Working plane	$\bar{E}_{\text{perpendicular}}$	396 lx	$\geq 500$ lx	✗	WP9
	$U_o (g_1)$	0.68	$\geq 0.60$	✓	WP9
Glare valuation <sup>(1)</sup>	$R_{UG, \text{max}}$	20	$\leq 19$	✗	
Energy estimation <sup>(2)</sup>	Consumption	505 kWh/a	max. 1000 kWh/a	✓	
Room	Lighting power density	7.48 W/m <sup>2</sup>	–		
		1.89 W/m <sup>2</sup> /100 lx	–		

(1) Based on a rectangular space of 3.900 m x 6.995 m and SHR of 0.25.

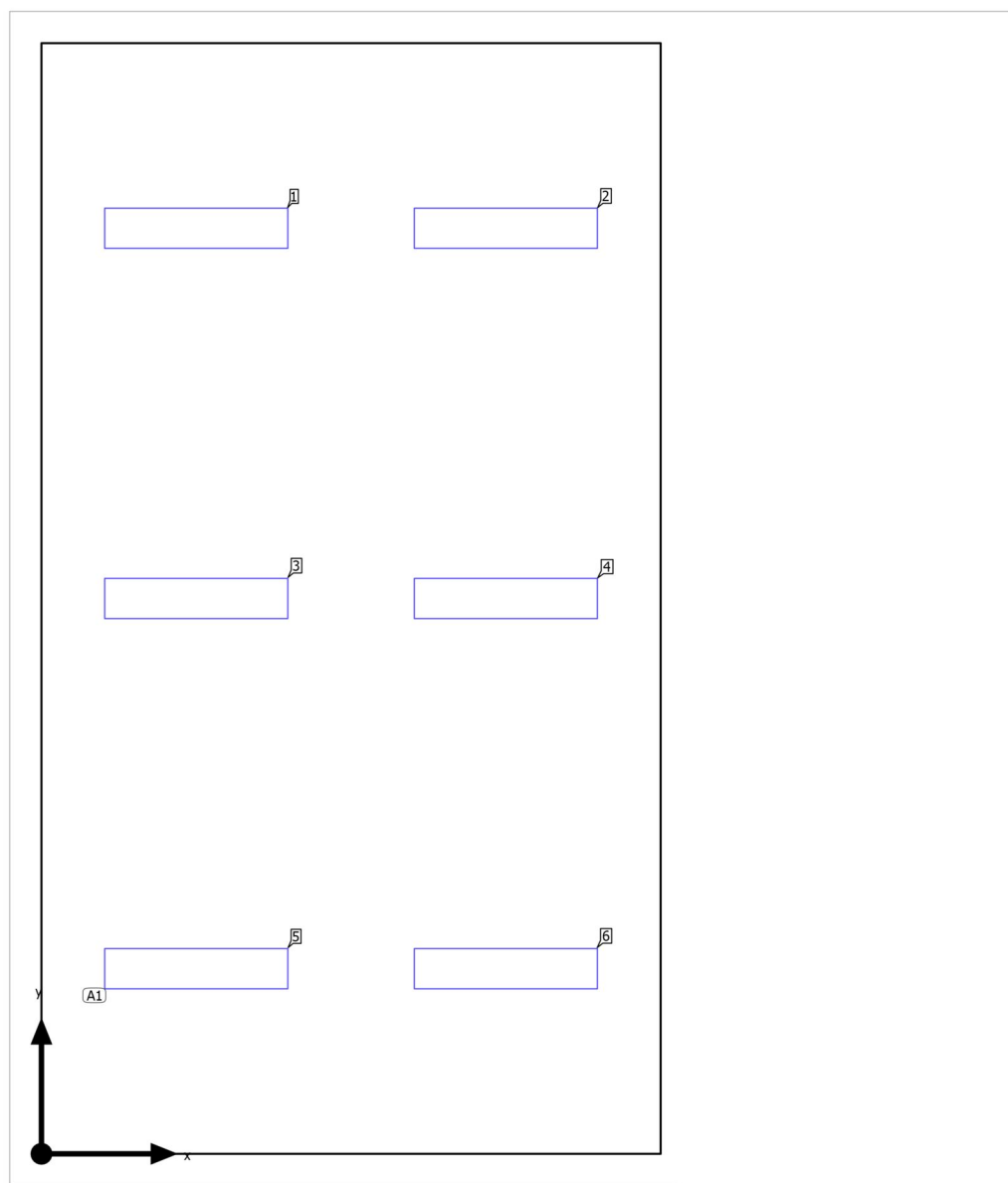
(2) Calculated using DIN:18599-4.

Utilisation profile: DIALux presetting (5.26.2 Standard (office))

### Luminaire list

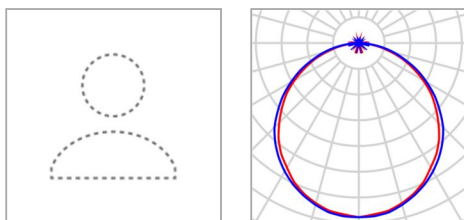
pcs.	Manufacturer	Article No.	Article name	$R_{UG}$	P	$\Phi$	Luminous efficacy
6	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	20	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Room 10

**Luminaire layout plan**



Building 1 · Klasa 3 · Room 10

**Luminaire layout plan**

Manufacturer	Not yet a DIALux member	P	34.0 W
Article name	"START Panel 1200x300 HE 4100L m 840 LILO" /4000	$\Phi_{\text{Luminaire}}$	3930 lm
Fitting	1x LED/4000		

6 x Not yet a DIALux member "START Panel 1200x300 HE 4100L m 840 LILO" /4000

Type	Field Arrangement	X	Y	Mounting height	Luminaire
1st luminaire (X/Y/Z)	0.975 m / 1.166 m / 3.700 m	0.975 m	5.829 m	3.700 m	1
X-direction	2 pcs., Centre - centre, 1.950 m	2.925 m	5.829 m	3.700 m	2
Y-direction	3 pcs., Centre - centre, 2.332 m	0.975 m	3.497 m	3.700 m	3
		2.925 m	3.497 m	3.700 m	4
Arrangement	A1	0.975 m	1.166 m	3.700 m	5
		2.925 m	1.166 m	3.700 m	6

Building 1 · Klasa 3 · Room 10

**Luminaire list** $\Phi_{\text{total}}$ 

23580 lm

 $P_{\text{total}}$ 

204.0 W

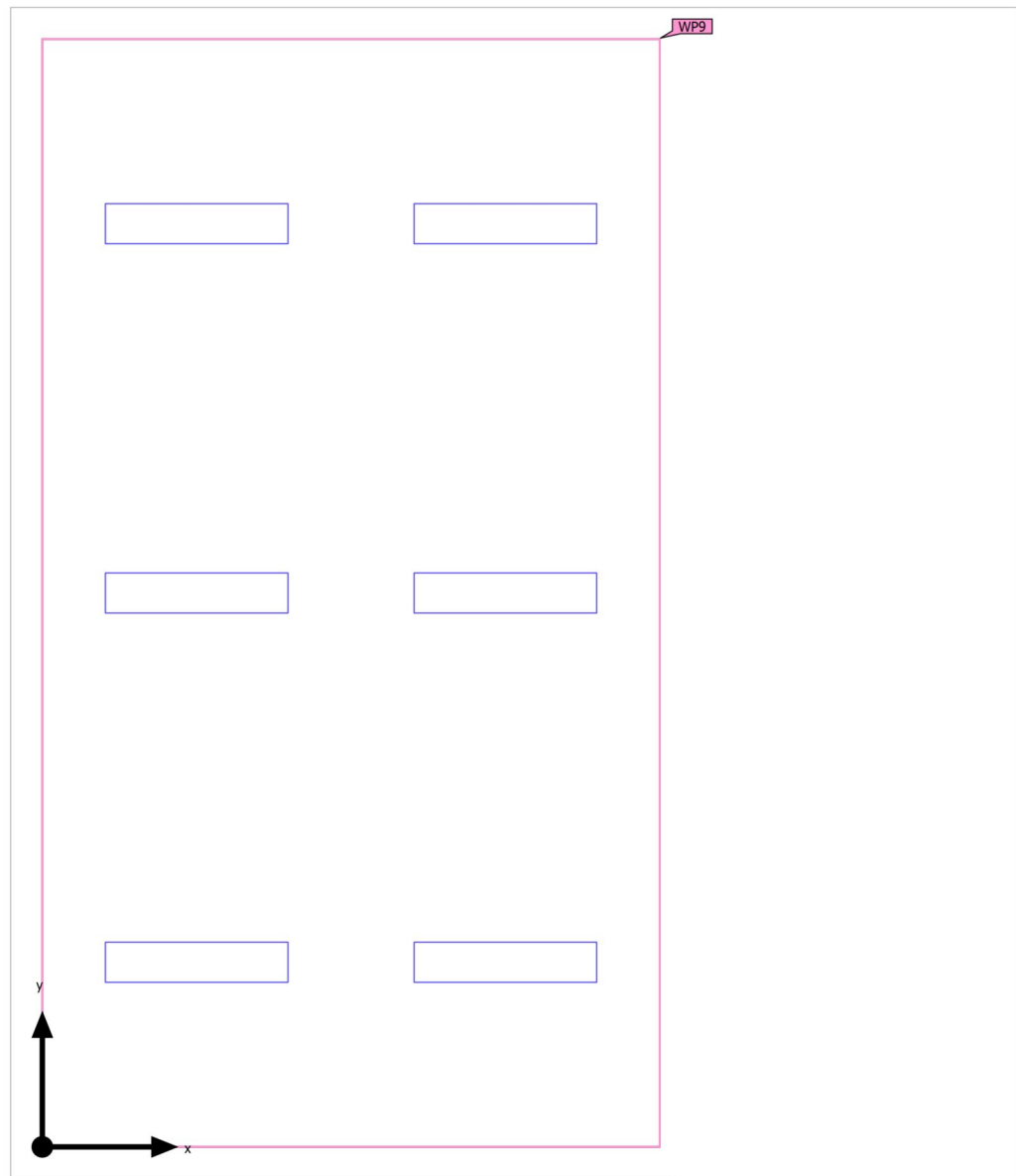
Luminous efficacy

115.6 lm/W

pcs.	Manufacturer	Article No.	Article name	P	$\Phi$	Luminous efficacy
6	Not yet a DIALux member		"START Panel 1200x300 HE 4100L m 840 LILO" /4000	34.0 W	3930 lm	115.6 lm/W

Building 1 · Klasa 3 · Room 10 (Light scene 1)

## Calculation objects



Building 1 · Klasa 3 · Room 10 (Light scene 1)

**Calculation objects**

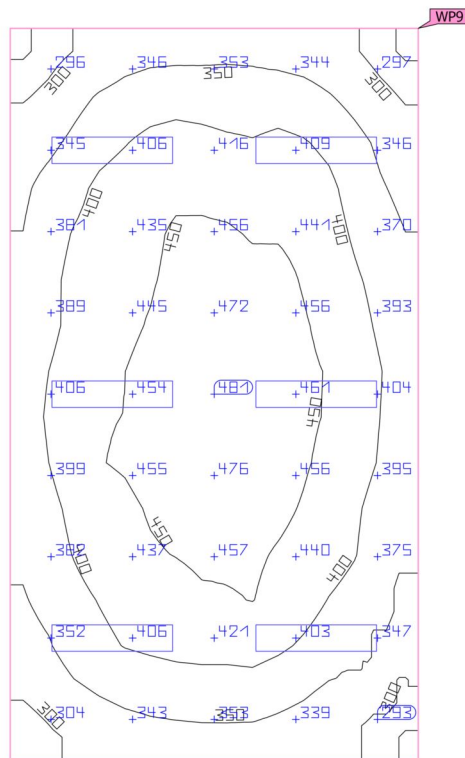
## Working planes

Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Room 10) Perpendicular illuminance (adaptive) Height: 0.800 m, Wall zone: 0.000 m	396 lx ( $\geq 500$ lx) ✗	270 lx	482 lx	0.68 ( $\geq 0.60$ ) ✓	0.56	WP9

(1) Based on a rectangular space of 3.900 m x 6.995 m and SHR of 0.25.

Utilisation profile: DIALux presetting (5.26.2 Standard (office))

Building 1 · Klasa 3 · Room 10 (Light scene 1)

**Working plane (Room 10)**

Properties	$\bar{E}$ (Target)	$E_{min}$	$E_{max}$	$U_o (g_1)$ (Target)	$g_2$	Index
Working plane (Room 10)	396 lx	270 lx	482 lx	0.68	0.56	WP9
Perpendicular illuminance (adaptive)	(≥ 500 lx)			(≥ 0.60)		
Height: 0.800 m, Wall zone: 0.000 m	✗			✓		

Utilisation profile: DIALux presetting (5.26.2 Standard (office))

## Glossary

### A

A	Formula symbol for a surface in the geometry
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### B

Background area	The background area borders the direct ambient area according to DIN EN 12464-1 and reaches up to the borders of the room. In larger rooms, the background area is at least 3 m wide. It is located horizontally at floor level.
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### C

CCT	<p>(Engl. correlated colour temperature)</p> <p>Body temperature of a thermal radiator which serves to describe its light colour. Unit: Kelvin [K]. The lesser the numerical value the redder; the greater the numerical value the bluer the light colour. The colour temperature of gas-discharge lamps and semi-conductors are termed "correlated colour temperature" in contrast to the colour temperature of thermal radiators.</p> <p>Allocation of the light colours to the colour temperature ranges acc. to EN 12464-1:</p> <p>Light colour - colour temperature [K]  warm white (ww) &lt; 3,300 K  neutral white (nw) ≥ 3,300 – 5,300 K  daylight white (dw) &gt; 5,300 K</p>
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Clearance height	The designation for the distance between upper edge of the floor and bottom edge of the ceiling (in the completely furnished status of room).
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Control group	A group of luminaires that are dimmed and controlled together. For each lighting scene, a control group provides its own dimming value. All luminaires within a control group share this dimming value. The control groups with their luminaires are automatically determined by DIALux on the basis of the created light scenes and their luminaire groups.
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CRI	<p>(Engl. colour rendering index)</p> <p>Designation for the colour rendering index of a luminaire or a lamp acc. to DIN 6169: 1976 or CIE 13.3: 1995.</p> <p>The general colour rendering index Ra (or CRI) is a dimensionless figure that describes the quality of a white light source in regards to its similarity with the remission spectra of defined 8 test colours (see DIN 6169 or CIE 1974) to a reference light source.</p>
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## Glossary

### D

Daylight autonomy	Describes what percentage of the daily working time the required illuminance is met by daylight. The nominal illuminance is used from the room profile, unlike described in EN 17037. The calculation is not done in the centre of the room but at the placed sensor measuring point. A room is considered sufficiently supplied with daylight if it achieves at least 50% daylight autonomy.
Daylight factor	Ratio of the illuminance achieved solely by daylight incidence at a point in the inside to the horizontal illuminance in the outer area under an unobstructed sky.  Formula symbol: D (Engl. daylight factor) Unit: %
Daylight quotient effective area	A calculation surface within which the daylight quotient is calculated.

### E

Energy evaluation	<p>Based on an hourly calculation procedure for daylight in indoor spaces, considering the project geometry and any existing daylight control systems. Orientation and location of the project are also considered. The calculation uses the specified system power of the luminaires to determine the energy demand. A linear relationship between power and luminous flux in the dimmed state is assumed for daylight-controlled luminaires. Times of use and nominal illuminance are determined from the usage profiles of the spaces. Switched-on luminaires that are explicitly excluded from control also consider the specified times-of-use. The daylight control systems use a simplified control logic that closes them at an outdoor horizontal illuminance of 27,500lx.</p> <p>The calendar year 2022 is used as a reference only. It is not a simulation of this year. The reference year is only used to assign the days of the week to the calculated results. The changeover to summer time is not considered. The reference sky type used is the average sky described in CIE 110 without direct sunlight.</p> <p>The method was developed together with the Fraunhofer Institute for Building Physics and is available for review by the Joint Working Group 1 ISO TC 274 as an extension of the previous annual regression-based method.</p>
Eta ( $\eta$ )	<p>(light output ratio)</p> <p>The light output ratio describes what percentage of the luminous flux of a free radiating lamp (or LED module) is emitted by the luminaire when installed.</p> <p>Unit: %</p>

## Glossary

### G

$g_1$	Often also $U_o$ (Engl. overall uniformity) Designates the overall uniformity of the illuminance on a surface. It is the quotient from $E_{min}$ to $\bar{E}$ and is required, for instance, in standards for illumination of workstations.
$g_2$	Actually it designates the "non-uniformity" of the illuminance on a surface. It is the quotient of $E_{min}$ to $E_{max}$ and is generally only relevant for certifying the emergency lighting acc. to EN 1838.

### I

<b>Illuminance</b>	Describes the ratio of the luminous flux that strikes a certain surface to the size of this surface ( $lm/m^2 = lx$ ). The illuminance is not tied to an object surface. It can be determined anywhere in space (inside or outside). The illuminance is not a product feature because it is a recipient value. Luxometers are used for measuring.  Unit: Lux Abbreviation: lx Formula symbol: E
<b>Illuminance, adaptive</b>	For the determining of the middle adaptive illuminance on a surface, this is rastered "adaptively". In the area of large illuminance differences within the surface, the raster is subdivided finer; within lesser differences, a rougher classification is made.
<b>Illuminance, horizontal</b>	Illuminance that is calculated or measured on a horizontal (level) surface (this can be for example a table top or the floor). The horizontal illuminance is usually identified by the formula letter $E_h$ .
<b>Illuminance, perpendicular</b>	Illuminance that is calculated or measured plumb-vertical to a surface. This needs to be taken into account for tilted surfaces. If the surface is horizontal or vertical, then there is no difference between the perpendicular and the horizontal or vertical illuminance.
<b>Illuminance, vertical</b>	Illuminance that is calculated or measured on a vertical surface (this can be for example the front of some shelves). The vertical illuminance is usually identified by the formula letter $E_v$ .

### L

<b>LENI</b>	(Engl. lighting energy numeric indicator) Lighting energy numeric indicator acc. to EN 15193  Unit: $kWh/(m^2 \cdot a)$
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## Glossary

LLMF	<p>(Engl. lamp lumen maintenance factor)/acc. to CIE 97: 2005 Lamp flux maintenance factor that takes the luminous flux reduction into account of a luminaire or an LED module in the course of the operating time. The lamp flux maintenance factor is specified as a decimal digit and can have a maximum value of 1 (no luminous flux reduction existing).</p>
LMF	<p>(Engl. luminaire maintenance factor)/acc. to CIE 97: 2005 Luminaire maintenance factor that takes the soiling into account of the luminaire in the course of the operating time. The luminaire maintenance factor is specified as a decimal digit and can have a maximum value of 1 (no soiling existing).</p>
LSF	<p>(Engl. lamp survival factor)/acc. to CIE 97: 2005 Lamp survival factor that takes the total failure into account of a luminaire in the course of the operating time. The lamp survival factor is specified as a decimal digit and can have a maximum value of 1 (no failures existing within the time concerned or prompt replacement after the failure).</p>
Luminance	<p>Dimension for the "brightness impression" that the human eye has of a surface. The surface itself can emit light thereby or light striking it can be reflected (emitter value). It is the only photometric value that the human eye can perceive.</p> <p>Unit: Candela per square metre Abbreviation: cd/m<sup>2</sup> Formula symbol: L</p>
Luminous efficacy	<p>Ratio of the emitted luminous flux <math>\Phi</math> [lm] to the absorbed electrical power P [W] Unit: lm/W.</p> <p>This ratio can be formed for the lamp or LED module (lamp or module light output), the lamp or module with control gear (system light output) and the complete luminaire (luminaire light output).</p>
Luminous flux	<p>Dimension for the total light output that is emitted from one light source in all directions. It is thus an "emitter value" that specifies the entire emitting output. The luminous flux of a light source can only be determined in a laboratory. A difference is made between the lamp or LED module luminous flux and the luminaire luminous flux.</p> <p>Unit: Lumen Abbreviation: lm Formula symbol: <math>\Phi</math></p>
Luminous intensity	<p>Describes the intensity of the light in a certain direction (emitter value). The luminous intensity is a matter of the luminous flux <math>\Phi</math> that is emitted in a certain spherical angle <math>\Omega</math>. The radiation characteristics of a light source are presented graphically in a light distribution curve (LDC). The luminous intensity is an SI base unit.</p> <p>Unit: Candela Abbreviation: cd Formula symbol: I</p>

## Glossary

### M

Maintenance factor	See MF
MF	<p>(Engl. maintenance factor)/acc. to CIE 97: 2005</p> <p>Maintenance factor as decimal number between 0 and 1 that describes the ratio of the new value of a photometric planning parameter (e.g. of the illuminance) to a maintenance value after a certain time. The maintenance factor takes into account the soiling of luminaires and rooms as well as the luminous flux reduction and the failure of light sources.</p> <p>The maintenance factor is taken into account either overall or determined in detail acc. to CIE 97: 2005 by the formula <math>RMF \times LMF \times LLMF \times LSF</math>.</p>

### P

P	<p>(Engl. power)</p> <p>Electric power consumption</p> <p>Unit: watt</p> <p>Abbreviation: W</p>
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### R

$R_{(UG)} \max$	<p>Measure of the psychological glare in indoor spaces.</p> <p>In addition to the luminance of luminaires, the level of the <math>R_{(UG)}</math> value also depends on the observer position, the viewing direction and the ambient luminance. The calculation is made according to the table method, see CIE 117. Among other things, EN 12464-1:2021 specifies maximum permissible <math>R_{(UG)}</math>-values <math>R_{(UGL)}</math> for various indoor workplaces.</p>
Reflection factor	The reflection factor of a surface describes how much of the striking light is reflected back. The reflection factor is defined by the colour of the surface.
RMF	<p>(Engl. room maintenance factor)/acc. to CIE 97: 2005</p> <p>Room maintenance factor that takes the soiling into account of the space encompassing surfaces in the course of the operating time. The room maintenance factor is specified as a decimal digit and can have a maximum value of 1 (no soiling existing).</p>

### S

Surrounding area	The ambient area directly borders the area of the visual task and should be planned with a width of at least 0.5 m according to DIN EN 12464-1. It is at the same height as the area of the visual task.
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## Glossary

### U

UGR (max)	(unified glare rating) Measure for the psychological glare effect in interiors. In addition to luminaire luminance, the UGR value also depends on the position of the observer, the viewing direction and the ambient luminance. Among other things, EN 12464-1 specifies maximum permissible UGR values for various indoor workplaces.
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UGR observer	Calculation point in the room, for the DIALux the UGR value is determined. The location and height of the calculation point should correspond to the typical observer position (position and eye level of the user).
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### V

Visual task area	The area that is needed for carrying out the visual task in accordance with DIN EN 12464 -1. The height corresponds with the height at which the visual task is executed.
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### W

Wall zone	Circumferential area between working plane and walls which is not taken into account for the calculation.
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Working plane	Virtual measuring or calculation surface at the height of the visual task that generally follows the room geometry. The working plane may also feature a wall zone.
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