

OBLICZENIA OŚWIETLENIA POMIESZCZEŃ PODLEGAJĄCYCH PRZEBUDOWIE (do obliczeń przyjęto parametry istniejących opraw podlegających przeniesieniu):

1. Pomieszczenie 0.3 umywalki (2,88x2,31x2,72) – wymagane 200lx

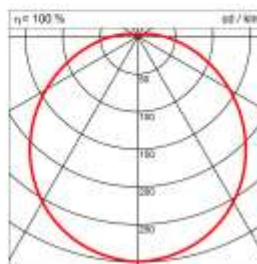
Room data

Length/Width:	2.88 m / 2.31 m
Room height:	2.72 m
Height of the reference plane:	0.75 m
Mounting height:	2.72 m
Reflectance values:	
- Ceiling:	70%
- Floor:	20%
- Walls:	50%



Luminaires

Supplier:	OSRAM
Order No.:	5MD22CA6L4
Luminaire name:	Europlex® LED
Equipment	LED 4000K / CRI >= 80
Classification:	A40 ↓93.0% ↑6.0%
CIE flux codes:	43 73 91 94 100
System Load:	42 W
Length/Width/Height:	390/0/110 mm



General

Calculation algorithm used:	Luminaire amount
Maintenance factor:	0.8

Note regarding the maintenance factor: The maintenance factor is a value which defines the ratio of the new value of the lighting intensity of an lighting system to its maintenance value. It is required for the planning process and takes account of consumption, pollution and other factors that affect the lighting equipment during the use.

Results

Total luminous flux of luminaires:	4740 lm
Total power:	84.0 W
Total power / surface(6.6528 m²):	12.0 W/m² (4 W/m²/100 lx)
Number of luminaires:	2 p.c.
Average illuminance Ea:	287 lx

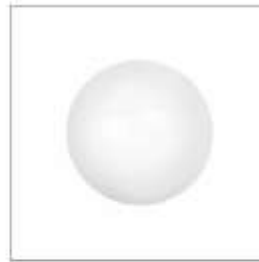
"The following values are based on exact calculations on calibrated lamps, luminaires and their arrangement. In practice, gradual divergences can occur. Guarantee claims for luminaire data are excluded. Relux and the luminaire manufacturers accept no liability for consequential damage and damage which is occasioned to the user or to third parties."

OSRAM

2. Pomieszczenie 0.3 pisuary (1,80x2,48x2,72) – wymagane 200lx

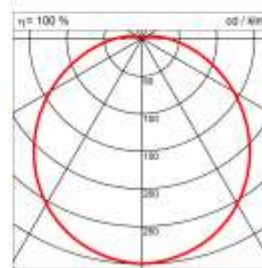
Room data

Length/Width:	1.8 m / 2.48 m
Room height:	2.72 m
Height of the reference plane:	0.75 m
Mounting height:	2.72 m
Reflectance values:	
- Ceiling:	70%
- Floor:	20%
- Walls:	50%



Luminaires

Supplier:	OSRAM
Order No.:	SMD22CA6L4
Luminaire name:	Europlex® LED
Equipment	LED 4000K / CRI >= 80
Classification:	A40 ↓93.0% ↑6.0%
CIE flux codes:	43 73 91 94 100
System Load:	42 W
Length/Width/Height:	390/0/110 mm



General

Calculation algorithm used:	Luminaire amount
Maintenance factor:	0.8

Note regarding the maintenance factor: The maintenance factor is a value which defines the ratio of the new value of the lighting intensity of an lighting system to its maintenance value. It is required for the planning process and takes account of consumption, pollution and other factors that affect the lighting equipment during the use.

Results

Total luminous flux of luminaires:	4740 lm
Total power:	84.0 W
Total power / surface(4.464 m ²):	18.0 W/m ² (5 W/m ² /100 lx)
Number of luminaires:	2 p.c.
Average illuminance Ea:	348 lx

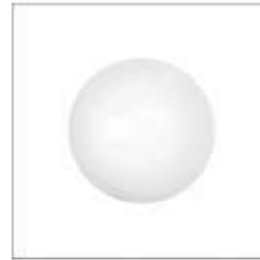
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3. Pomieszczenie 0.3 kabina (1,01x1,23x2,72) – wymagane 200lx

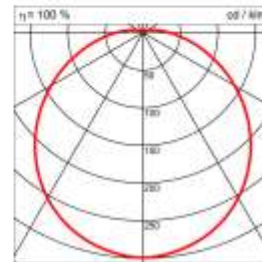
Room data

Length/Width:	1.01 m / 1.23 m
Room height:	2.72 m
Height of the reference plane:	0.75 m
Mounting height:	2.72 m
Reflectance values:	
- Ceiling:	70%
- Floor:	20%
- Walls:	50%



Luminaires

Supplier:	OSRAM
Order No.:	5MD22CA3L4
Luminaire name:	Europlex® LED
Equipment	LED 4000K / CRI >= 80
Classification:	A40 ↓93.0% ↑6.0%
CIE flux codes:	43 73 91 94 100
System Load:	28 W
Length/Width/Height:	390/0/110 mm



General

Calculation algorithm used:	Luminaire amount
Maintenance factor:	0.8

Note regarding the maintenance factor: The maintenance factor is a value which defines the ratio of the new value of the lighting intensity of an lighting system to its maintenance value. It is required for the planning process and takes account of consumption, pollution and other factors that affect the lighting equipment during the use.

Results

Total luminous flux of luminaires:	1600 lm
Total power:	28.0 W
Total power / surface(1.2423 m²):	22.0 W/m² (10 W/m²/100 lx)
Number of luminaires:	1 p.c.
Average illuminance E _a :	207 lx

The following values are based on exact calculations on calibrated lamps, luminaires and their arrangement. In practice, gradual divergences can occur. Guarante claims for luminaire data are excluded. Reflux and the luminaire manufacturers accept no liability for consequential damage and damage which is occasioned to the user or to third parties.

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4. Pomieszczenie 0.4 umywalki (2,88x2,30x2,72) – wymagane 200lx

Wynik analogicznie jak dla pomieszczenia 0.4 umywalki.

5. Pomieszczenie 0.4 komunikacja kabin (1,46x3,07x2,72) – wymagane 200lx

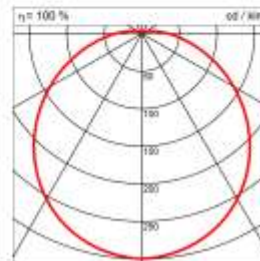
Room data

Length/Width:	1.46 m / 3.07 m
Room height:	2.72 m
Height of the reference plane:	0.75 m
Mounting height:	2.72 m
Reflectance values:	
- Ceiling:	70%
- Floor:	20%
- Walls:	50%



Luminaires

Supplier:	OSRAM
Order No.:	5MD22CA6L4
Luminaire name:	Europlex® LED
Equipment	LED 4000K / CRI >= 80
Classification:	A40 ↓93.0% ↑6.0%
CIE flux codes:	43 73 91 94 100
System Load:	42 W
Length/Width/Height:	390/0/110 mm



General

Calculation algorithm used:	Luminaire amount
Maintenance factor:	0.8

Note regarding the maintenance factor: The maintenance factor is a value which defines the ratio of the new value of the lighting intensity of an lighting system to its maintenance value. It is required for the planning process and takes account of consumption, pollution and other factors that affect the lighting equipment during the use.

Results

Total luminous flux of luminaires:	4740 lm
Total power:	84.0 W
Total power / surface(4.4822 m²):	18.0 W/m² (5 W/m²/100 lx)
Number of luminaires:	2 p.c.
Average illuminance E _a :	314 lx

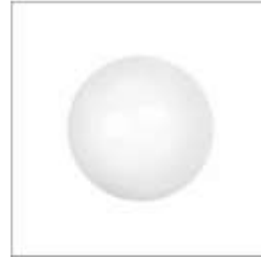
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OSRAM

6. Pomieszczenie 0.4 kabina (1,32x1,01x2,72) – wymagane 200lx

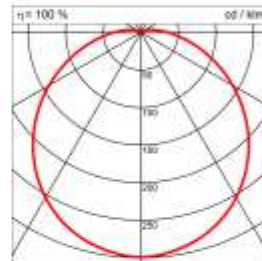
Room data

Length/Width:	1.32 m / 1.01 m
Room height:	2.72 m
Height of the reference plane:	0.75 m
Mounting height:	2.72 m
Reflectance values:	
- Ceiling:	70%
- Floor:	20%
- Walls:	50%



Luminaires

Supplier:	OSRAM
Order No.:	5MD22CA3L4
Luminaire name:	Europlex® LED
Equipment	LED 4000K / CRI >= 80
Classification:	A40 ↓93.0% ↑6.0%
CIE flux codes:	43 73 91 94 100
System Load:	28 W
Length/Width/Height:	390/0/110 mm



General

Calculation algorithm used:	Luminaire amount
Maintenance factor:	0.8

Note regarding the maintenance factor: The maintenance factor is a value which defines the ratio of the new value of the lighting intensity of an lighting system to its maintenance value. It is required for the planning process and takes account of consumption, pollution and other factors that affect the lighting equipment during the use.

Results

Total luminous flux of luminaires:	1600 lm
Total power:	28.0 W
Total power / surface(1.3332 m²):	21.0 W/m² (10 W/m²/100 lx)
Number of luminaires:	1 p.c.
Average illuminance E _a :	202 lx

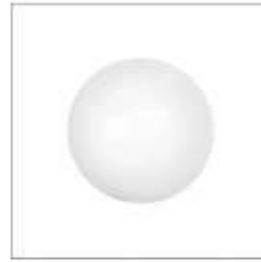
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7. Pomieszczenie 0.5 toaleta niepełnosprawnych (2,88x1,52x2,72) – wymagane 200lx

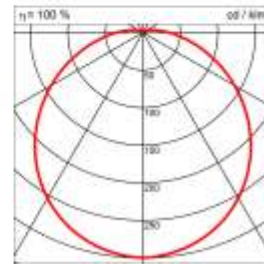
Room data

Length/Width:	2.88 m / 1.52 m
Room height:	2.72 m
Height of the reference plane:	0.75 m
Mounting height:	2.72 m
Reflectance values:	
- Ceiling:	70%
- Floor:	20%
- Walls:	50%



Luminaires

Supplier:	OSRAM
Order No.:	5MD22CA6L4
Luminaire name:	Europlex® LED
Equipment	LED 4000K / CRI >= 80
Classification:	A40 ↓93.0% ↑6.0%
CIE flux codes:	43 73 91 94 100
System Load:	42 W
Length/Width/Height:	390/0/110 mm



General

Calculation algorithm used:	Luminaire amount
Maintenance factor:	0.8

Note regarding the maintenance factor: The maintenance factor is a value which defines the ratio of the new value of the lighting intensity of an lighting system to its maintenance value. It is required for the planning process and takes account of consumption, pollution and other factors that affect the lighting equipment during the use.

Results

Total luminous flux of luminaires:	4740 lm
Total power:	84.0 W
Total power / surface(4.3776 m ²):	19.0 W/m ² (5 W/m ² /100 lx)
Number of luminaires:	2 p.c.
Average illuminance E _a :	321 lx

The following values are based on exact calculations on calibrated lamps, luminaires and their arrangement. In practice, gradual divergences can occur. Guarantees claims for luminaire data are excluded. Reflex and the luminaire manufacturers accept no liability for consequential damage and damage which is occasioned to the user or to third parties.

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8. Pomieszczenie 0.6 magazynek (2,81x0,54x2,72) – wymagane 100lx

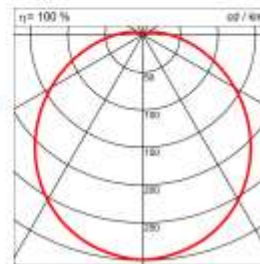
Room data

Length/Width:	2.81 m / 0.54 m
Room height:	2.72 m
Height of the reference plane:	0.75 m
Mounting height:	2.72 m
Reflectance values:	
- Ceiling:	70%
- Floor:	20%
- Walls:	50%



Luminaires

Supplier:	OSRAM
Order No.:	5MD22CA3L4
Luminaire name:	Europlex® LED
Equipment	LED 4000K / CRI >= 80
Classification:	A40 ↓93.0% ↑6.0%
CIE flux codes:	43 73 91 94 100
System Load:	28 W
Length/Width/Height:	390/0/110 mm



General

Calculation algorithm used:	Luminaire amount
Maintenance factor:	0.8

Note regarding the maintenance factor: The maintenance factor is a value which defines the ratio of the new value of the lighting intensity of an lighting system to its maintenance value. It is required for the planning process and takes account of consumption, pollution and other factors that affect the lighting equipment during the use.

Results

Total luminous flux of luminaires:	1600 lm
Total power:	28.0 W
Total power / surface(1.5174 m²):	18.0 W/m² (10 W/m²/100 lx)
Number of luminaires:	1 p.c.
Average illuminance Ea:	173 lx

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OSRAM

9. Pomieszczenie 0.8 natryski (2,81x0,54x2,72) – wymagane 200lx

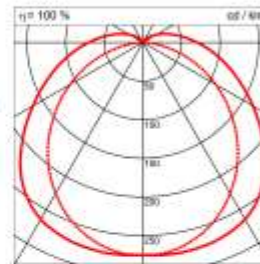
Room data

Length/Width:	2.86 m / 2.19 m
Room height:	2.72 m
Height of the reference plane:	0.75 m
Mounting height:	2.72 m
Reflectance values:	
- Ceiling:	70%
- Floor:	20%
- Walls:	50%



Luminaires

Supplier:	OSRAM
Order No.:	2LS71271T44B
Luminaire name:	Compact Monsun® LED
Equipment	LED 4000K / CRI >= 80
Classification:	A40 ↓92.0% ↑7.0%
CIE flux codes:	42 72 90 92 100
System Load:	31 W
Length/Width/Height:	1277/84/102 mm



General

Calculation algorithm used:	Luminaire amount
Maintenance factor:	0.8

Note regarding the maintenance factor: The maintenance factor is a value which defines the ratio of the new value of the lighting intensity of an lighting system to its maintenance value. It is required for the planning process and takes account of consumption, pollution and other factors that affect the lighting equipment during the use.

Results

Total luminous flux of luminaires:	4300 lm
Total power:	31.0 W
Total power / surface(6.2634 m²):	4.0 W/m² (1 W/m²/100 lx)
Number of luminaires:	1 p.c.
Average illuminance E _a :	259 lx

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.

OSRAM

10. Pomieszczenie 0.8 umywalki (2,81x0,54x2,72) – wymagane 200lx

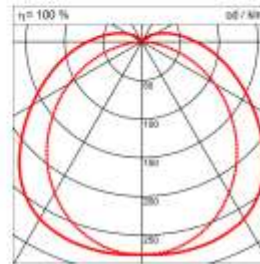
Room data

Length/Width:	2.86 m / 2.38 m
Room height:	2.72 m
Height of the reference plane:	0.75 m
Mounting height:	2.72 m
Reflectance values:	
- Ceiling:	70%
- Floor:	20%
- Walls:	50%



Luminaires

Supplier:	OSRAM
Order No.:	2LS71271T44B
Luminaire name:	Compact Monsun® LED
Equipment	LED 4000K / CRI >= 80
Classification:	A40 ↓92.0% ↑7.0%
CIE flux codes:	42 72 90 92 100
System Load:	31 W
Length/Width/Height:	1277/84/102 mm



General

Calculation algorithm used:	Luminaire amount
Maintenance factor:	0.8

Note regarding the maintenance factor: The maintenance factor is a value which defines the ratio of the new value of the lighting intensity of an lighting system to its maintenance value. It is required for the planning process and takes account of consumption, pollution and other factors that affect the lighting equipment during the use.

Results

Total luminous flux of luminaires:	4300 lm
Total power:	31.0 W
Total power / surface(6.8068 m²):	4.0 W/m² (1 W/m²/100 lx)
Number of luminaires:	1 p.c.
Average illuminance Ea:	249 lx

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.

OSRAM

11. Pomieszczenie 0.8 toaleta niepełnosprawnych (2,81x0,54x2,72) – wymagane 200lx
Wynik analogicznie jak dla pomieszczenia 0.5 toaleta niepełnosprawnych.
12. Pomieszczenie 0.9 natryski (2,81x0,54x2,72) – wymagane 200lx
Wynik analogicznie jak dla pomieszczenia 0.8 natryski.
13. Pomieszczenie 0.9 umywalki (2,81x0,54x2,72) – wymagane 200lx
Wynik analogicznie jak dla pomieszczenia 0.8 umywalki.
14. Pomieszczenie 0.9 toaleta niepełnosprawnych (2,81x0,54x2,72) – wymagane 200lx
Wynik analogicznie jak dla pomieszczenia 0.5 toaleta niepełnosprawnych.
15. Pomieszczenie 0.12 natryski (2,81x0,54x2,72) – wymagane 200lx
Wynik analogicznie jak dla pomieszczenia 0.8 natryski.
16. Pomieszczenie 0.12 umywalki (2,81x0,54x2,72) – wymagane 200lx
Wynik analogicznie jak dla pomieszczenia 0.8 umywalki.
17. Pomieszczenie 0.12 toaleta niepełnosprawnych (2,81x0,54x2,72) – wymagane 200lx
Wynik analogicznie jak dla pomieszczenia 0.5 toaleta niepełnosprawnych.
18. Pomieszczenie 0.13 natryski (2,81x0,54x2,72) – wymagane 200lx
Wynik analogicznie jak dla pomieszczenia 0.8 natryski.
19. Pomieszczenie 0.13 umywalki (2,81x0,54x2,72) – wymagane 200lx
Wynik analogicznie jak dla pomieszczenia 0.8 umywalki.
20. Pomieszczenie 0.13 toaleta niepełnosprawnych (2,81x0,54x2,72) – wymagane 200lx
Wynik analogicznie jak dla pomieszczenia 0.5 toaleta niepełnosprawnych.

21. Pomieszczenie 1.11 rezerwa (2,84x6,33x2,85) – wymagane 300lx

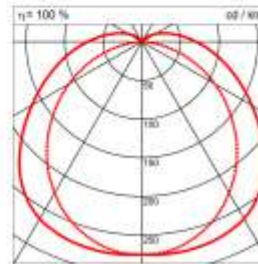
Room data

Length/Width:	2.84 m / 6.33 m
Room height:	2.85 m
Height of the reference plane:	0.75 m
Mounting height:	2.85 m
Reflectance values:	
- Ceiling:	70%
- Floor:	20%
- Walls:	50%



Luminaires

Supplier:	OSRAM
Order No.:	2LS71271V54B
Luminaire name:	Compact Monsun® LED
Equipment	LED 4000K / CRI >= 80
Classification:	A40 ↓92.0% ↑7.0%
CIE flux codes:	42 72 90 92 100
System Load:	45.4 W
Length/Width/Height:	1577/84/102 mm



General

Calculation algorithm used:	Luminaire amount
Maintenance factor:	0.8

Note regarding the maintenance factor: The maintenance factor is a value which defines the ratio of the new value of the lighting intensity of an lighting system to its maintenance value. It is required for the planning process and takes account of consumption, pollution and other factors that affect the lighting equipment during the use.

Results

Total luminous flux of luminaires:	11800 lm
Total power:	90.0 W
Total power / surface(17.9772 m²):	5.0 W/m² (1 W/m²/100 lx)
Number of luminaires:	2 p.c.
Average illuminance Ea:	304 lx

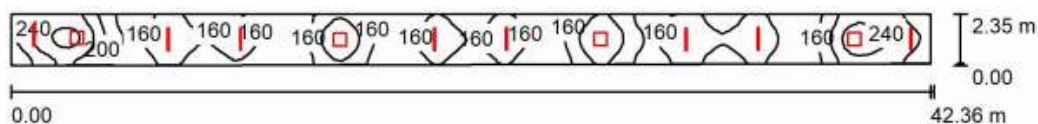
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OSRAM

OBLICZENIA OŚWIETLENIA POMIESZCZEŃ – OPRAWY NOWE

22. Pomieszczenie 0.1 komunikacja (42,36x2,70x2,72) – wymagane 100lx

Korytarz główny / Podsumowanie



Wysokość pomieszczenia: 2.720 m, Współczynnik konserwacji: 0.77

Wartości Lux, Skala 1:303

Powierzchnia	ρ [%]	E_m [lx]	E_{min} [lx]	E_{max} [lx]	E_{min} / E_m
Płaszczyzna pracy	/	177	119	296	0.674
Podłoga	20	177	119	295	0.673
Sufit	70	53	37	97	0.698
Ściany (4)	50	128	46	379	/

Płaszczyzna pracy:

Wysokość: 0.000 m
Siatka: 128 x 16 Punkty
Margines: 0.000 m

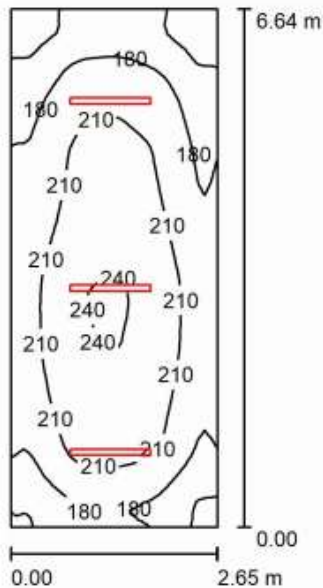
Wykaz opraw

Nr.	Ilość	Etykieta (Czynnik korekcyjny)	Φ (Oprawa) [lm]	Φ (Lampy) [lm]	P [W]
1	4	ESSYSTEM 5168301N FLAT LED 595.LED 840 4300lm OPAL 41W IP20 RAL9016 DRV (1.000)	4300	4300	41.0
2	8	ESSYSTEM F0600-00130R9016L1026 FX65 OP BIS 1026 LED830 2900lm 25W IP20 ONOFF DRVRAL9016 (1.000)	2900	2900	25.0
W sumie:			40398W	sumie: 40400	364.0

Specyfikacja mocy przyłączeniowej: $3.73 \text{ W/m}^2 = 2.10 \text{ W/m}^2/100 \text{ lx}$ (Powierzchnia podstawowa: 97.63 m^2)

23. Pomieszczenie komunikacja (korytarz boczny) (2,64x6,63x2,72) – wymagane 100lx

Korytarz boczny / Podsumowanie



Wysokość pomieszczenia: 2.720 m, Wysokość montażu: 2.720 m,
Współczynnik konserwacji: 0.77

Wartości Lux, Skala 1:86

Powierzchnia	ρ [%]	E_m [lx]	E_{min} [lx]	E_{max} [lx]	E_{min} / E_m
Plaszczyzna pracy	/	198	127	243	0.639
Podłoga	20	198	124	243	0.628
Sufit	70	61	42	76	0.680
Ściany (4)	50	142	56	281	/

Plaszczyzna pracy:

Wysokość: 0.000 m
Siatka: 32 x 64 Punkty
Margines: 0.000 m

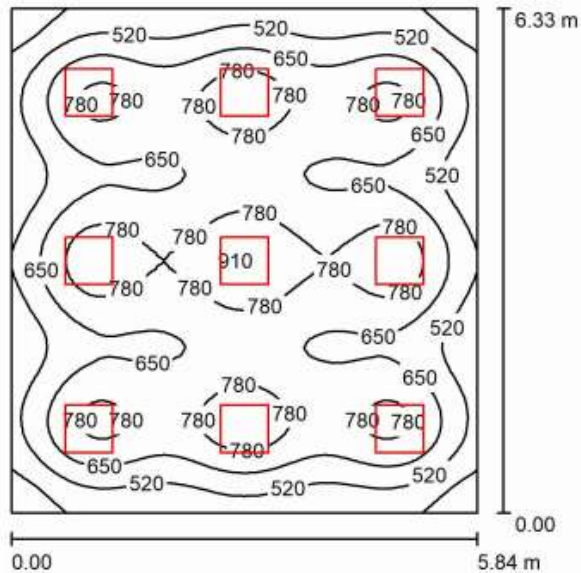
Wykaz opraw

Nr.	Ilość	Etykieta (Czynnik korekcyjny)	Φ (Oprawa) [lm]	Φ (Lampy) [lm]	P [W]
1	3	ESSYSTEM F0600-00130R9016L1026 FX65 OP BIS 1026 LED830 2900lm 25W IP20 ONOFF DRVRAL9016 (1.000)	2900	2900	25.0
W sumie:			8700	8700	75.0

Specyfikacja mocy przyłączeniowej: $4.28 \text{ W/m}^2 = 2.16 \text{ W/m}^2/100 \text{ lx}$ (Powierzchnia podstawowa: 17.54 m^2)

24. Pomieszczenie 1.4 Pokój nauczycielski (5,84x6,33x2,85) – wymagane 500lx

Pomieszczenie 3 / Podsumowanie



Wysokość pomieszczenia: 2.850 m, Wysokość montażu: 2.850 m,
Współczynnik konserwacji: 0.77

Wartości Lux, Skala 1:82

Powierzchnia	ρ [%]	E_m [lx]	E_{min} [lx]	E_{max} [lx]	E_{min} / E_m
Płaszczyzna pracy	/	654	306	920	0.468
Podłoga	20	576	303	759	0.526
Sufit	70	124	97	140	0.779
Ściany (4)	50	266	119	380	/

Płaszczyzna pracy:

Wysokość: 0.850 m
Siatka: 64 x 64 Punkty
Margines: 0.000 m

UGR

Wzdłuż- W poprzek do osi oświetlenia
Lewa ściana 17 17
Dolna ściana 17 17
(CIE, SHR = 0.25.)

Wykaz opraw

Nr.	Ilość	Etykieta (Czynnik korekcyjny)	Φ (Oprawa) [lm]	Φ (Lampy) [lm]	P [W]
1	9	ESSYSTEM 5167101AT FLAT LED OFFICE 595.LED 840 4000lm DMPR 40W IP20 RAL9016 DRV (1.000)	4000	4000	40.0
W sumie:			35998W	sumie: 36000	360.0

Specyfikacja mocy przyłączeniowej: $9.74 \text{ W/m}^2 = 1.49 \text{ W/m}^2/100 \text{ lx}$ (Powierzchnia podstawowa: 36.97 m^2)