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Investor: Město Kostelec nad Orlicí			

Akce: Projekt pro výstavbu a opravu komunikace Erbenova, Na Spojce a Tůmova, Kostelec nad Orlicí	Zakázkové číslo: 048/2017		Paré:
	Datum: 12/2017		
	Formát: -		
Objekt: SO 401 Veřejné osvětlení - ul. Erbenova	Stupeň: DSP + PDPS		
Obsah: Výpočet osvětlení	Měřítko: -	Číslo výkresu: C.4.1.5	

Kostelec nad Orlicí

část: ul. Erbenova / Tůmova

Návrh zatřídění dle ČSN CEN/TR 13201-1 z 09/2016

1) Příjezdová komunikace https://goo.gl/maps/KHMkXJ5CJHN2

Table 1 — Parameters for the selection of lighting class M

Parameter	Options	Description [a]		Weighting Value V_W [a]
Design speed or speed limit	Very high	v ≥ 100 km/h		2
	High	70 < v < 100 km/h		1
	Moderate	40 < v ≤ 70 km/h		-1
	Low	v ≤ 40 km/h		-2
Traffic volume		Motorways, multilane routes	Two lane routes	
	High	> 65 % of maximum capacity	> 45 % of maximum capacity	1
	Moderate	35 % - 65 % of maximum capacity	15 % - 45 % of maximum capacity	0
	Low	< 35 % of maximum capacity	< 15 % of maximum capacity	-1
Traffic composition	Mixed with high percentage of non-motorised			2
	Mixed			1
	Motorised only			0
Separation of carriageway	No			1
	Yes			0
Junction density		Intersection/km	Interchanges, distance between bridges, km	
	High	> 3	< 3	1
	Moderate	≤ 3	≥ 3	0
Parked vehicles	Present			1
	Not present			0
Ambient luminosity	High	shopping windows, advertisement expressions, sport fields, station areas, storage areas		1
	Moderate	normal situation		0
	Low			-1
Navigational task	Very difficult			2
	Difficult			1
	Easy			0

[a] The values stated in the column are an example. Any adaptation of the method or more appropriate weighting values can be used instead, on the national level.

VWS = 0 => M6

Table 1 — M lighting classes

Class	Luminance of the road surface of the carriageway for the dry and wet road surface condition				Disability glare	Lighting of surroundings
	Dry conditions			Wet	Dry conditions	Dry conditions
	$\overline{L}$ [minimum maintained] cd·m²	U_o [minimum]	U_l [a] [minimum]	U_{ow} [b] [minimum]	f_{TI} [c] [maximum] %	R_{EI} [d] [minimum]
M1	2,00	0,40	0,70	0,15	10	0,35
M2	1,50	0,40	0,70	0,15	10	0,35
M3	1,00	0,40	0,60	0,15	15	0,30
M4	0,75	0,40	0,60	0,15	15	0,30
M5	0,50	0,35	0,40	0,15	15	0,30
M6	0,30	0,35	0,40	0,15	20	0,30

2) Chodník

Table 4 — Parameters for the selection of lighting class P

Parameter	Options	Description [a]	Weighting Value V_W [a]
Travel speed	Low	v ≤ 40 km/h	1
	Very low (walking speed)	Very low, walking speed	0
Use intensity	Busy		1
	Normal		0
	Quiet		-1
Traffic composition	Pedestrians, cyclists and motorised traffic		2
	Pedestrians and motorised traffic		1
	Pedestrians and cyclists only		1
	Pedestrians only		0
	Cyclists only		0
Parked vehicles	Present		1
	Not present		0
Ambient luminosity	High	shopping windows, advertisement expressions, sport fields, station areas, storage areas	1
	Moderate	normal situation	0
	Low		-1
Facial recognition	Necessary		Additional requirements [b]
	Not necessary		No additional requirements

[a] The values stated in the column are an example. Any adaptation of the method or more appropriate weighting values can be used instead, on the national level.
[b] Specific guidelines on use of facial recognition parameter are defined at national level for each country.

VWS = -2 => P6

Table 3 — P lighting classes

Class	Horizontal illuminance		Additional requirement if facial recognition is necessary	
	$\bar{E}$ [a] [minimum maintained] lx	E_{min} [maintained] lx	$E_{v,min}$ [maintained] lx	$E_{sc,min}$ [maintained] lx
P1	15,0	3,00	5,0	5,0
P2	10,0	2,00	3,0	2,0
P3	7,50	1,50	2,5	1,5
P4	5,00	1,00	1,5	1,0
P5	3,00	0,60	1,0	0,6
P6	2,00	0,40	0,6	0,2
P7	performance not determined	performance not determined		

[a] To provide for uniformity, the actual value of the maintained average illuminance shall not exceed 1,5 times the minimum $\bar{E}$ value indicated for the class.

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výpočet VO v ulicích:
- Na Spojce
- Erbenova / Tůmova

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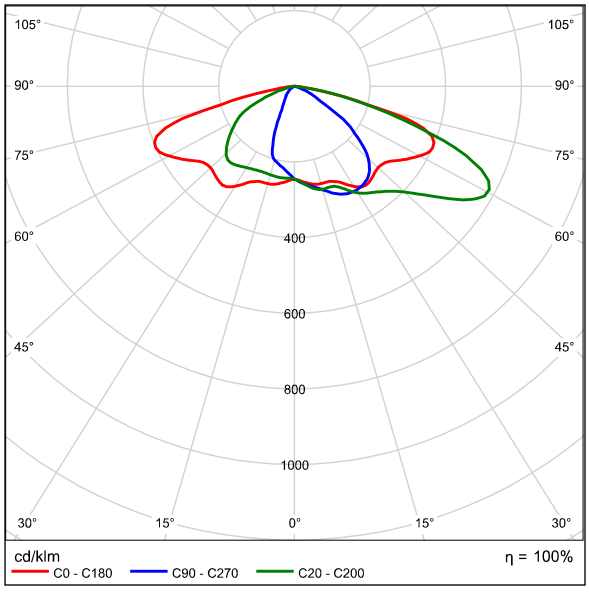
iGuzzini illuminazione 0_EC42 Wow 36,5W 1xLED

Light output ratio: 100%
Lamp luminous flux: 3870 lm
Luminaire luminous flux: 3870 lm
Power: 36.5 W
Luminous efficacy: 106.0 lm/W

Luminous emittance 1 / Polar LDC



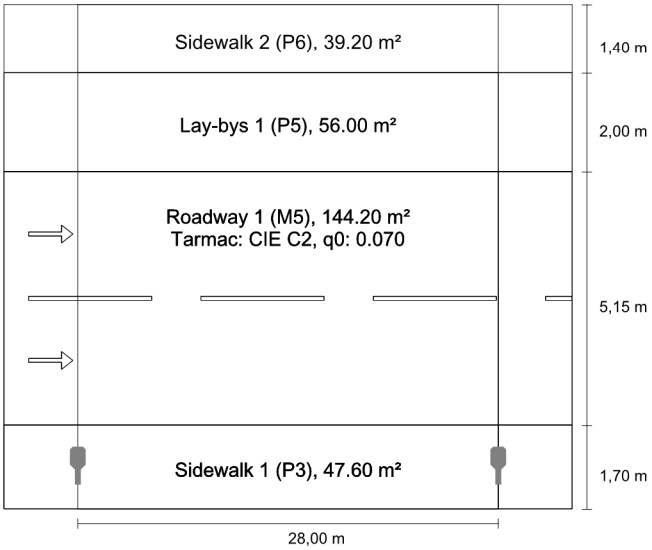
EC42 :
Outdoor luminaire with direct light street optic for a high level of visual comfort (G4), designed to use LED lamps. The optical assembly and the pole attachment system are made of EN1706AC 46100LF aluminium alloy and subjected to a multi-step, pre-treatment process, in which the main phases are: degreasing, fluorozirconation (a protective surface film) and sealing (with a nano-structured silane layer). The painting stage consists of a primer and a liquid acrylic paint, cured at 150 °C, with a high level of weather resistance. Option of also adjusting, with a graduated scale, the inclination in relation to the road surface of +15°/-10° (in 5° steps) for a pole-top installation and +5°/20° (in 5° steps) for a lateral installation. 5 mm thick tempered sodium-calcium closure glass. The glass secured to the frame closes the led optical assembly which is secured to the components assembly with a hinge and 2 screws. The high IP rating is guaranteed by the silicone gasket placed between the two elements. Complete with circuit featuring monochrome LEDs and silver aluminium reflectors. LED assembly can be replaced directly on site.
Possibility of replacing the LEDs in groups of 12 in the laboratory. DALI electronic control gear. Midnight (100%-70%) or Bi-energy without external programming mode operation. Customised Midnight programming, fixed dimming and compatibility with flow regulators via a special programming interface. Control gear connected with quick-coupling connectors. Driver with automatic internal temperature control system. Tool-free removable control gear plate unit. The optical assembly is fixed to the wall-mounted or pole-top attachment with two clamping screws and two safety grub screws facilitate assembly. The light flow emitted in the upper hemisphere of the system in the horizontal position is null (in conformity with the strictest standards for the prevention of light pollution). All external screws are made of stainless steel.

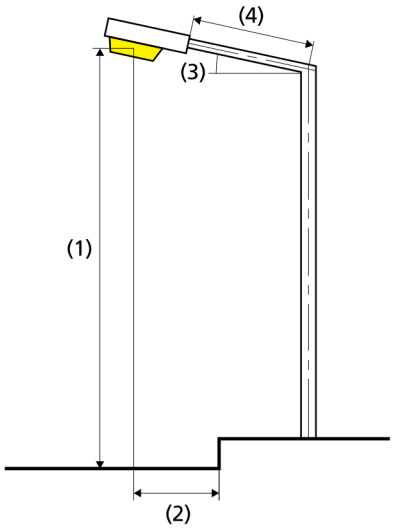
0 - Rotation of the sleeve
EC42.015 - Pole-mounted system – ST1 optic - Warm White - Dali - o46-60-76mm - 36.5W 3870lm - 3000K - Grey
A56W - Lamp LED Warm White

Order No.: 4

Na Spojce according to EN 13201:2015

iGuzzini illuminazione 0_EC42 Wow 36,5W





Lamp:	user-defined
Luminous flux (luminaire):	2902.94 lm
Luminous flux (lamp):	2903.00 lm
Operating Hours	
4000 h:	100.0 %, 27.4 W
W/km:	986.4
Arrangement:	single side bottom
Pole distance:	28.000 m
Boom inclination (3):	0.0°
Boom length (4):	0.000 m
Light centre height (1):	6.100 m
Light overhang (2):	-0.700 m

Results for valuation fields

Maintenance factor: 0.81

Sidewalk 2 (P6)

Em [lx] ≥ 2.00 ≤ 3.00	Emin [lx] ≥ 0.40
✓ 2.01	✓ 1.53

Lay-bys 1 (P5)

Em [lx] ≥ 3.00 ≤ 4.50	Emin [lx] ≥ 0.60
✓ 3.74	✓ 2.26

Roadway 1 (M5)

TI [%] ≤ 15	Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	EIR
✓ 13	✓ 0.50	✓ 0.44	✓ 0.61	* 0.50

Sidewalk 1 (P3)

Em [lx] ≥ 7.50 ≤ 11.25	Emin [lx] ≥ 1.50
✓ 8.01	✓ 3.05

ULR:	0.00
ULOR:	0.00
Maximum luminous intensities	
at 70°:	445 cd/klm
at 80°:	85.8 cd/klm
at 90°:	0.00 cd/klm
Luminous intensity class:	G*4

Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.

Arrangement complies with glare index class D.6

* Informative, not part of the valuation

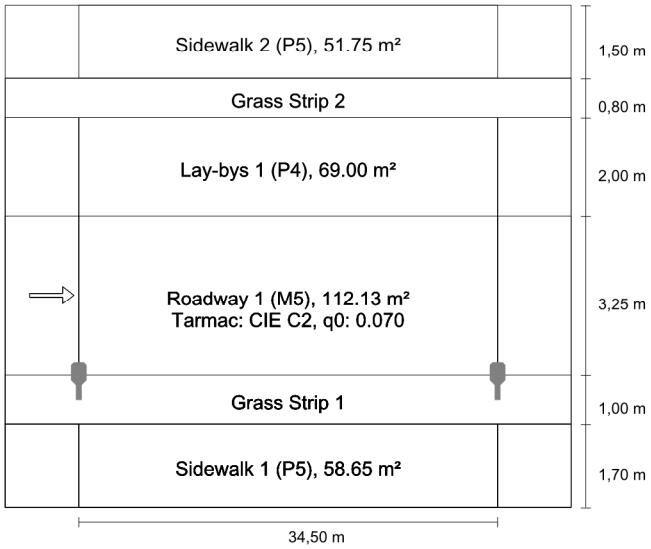
Results for energy efficiency indicators

Power density indicator (Dp)	0.015 W/lxm²

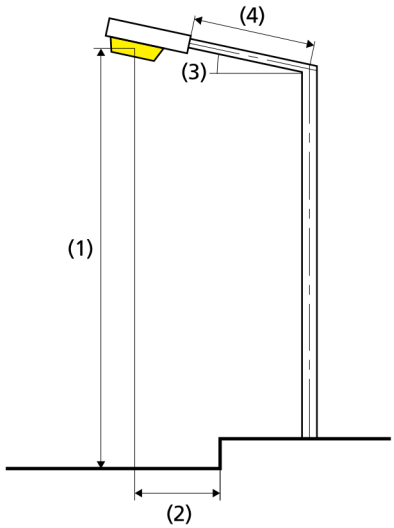
Energy consumption density

Arrangement: Wow 36,5W (DIM 75%) (109.6 kWh/yr) 0.4 kWh/m² yr

Erbenova, Tůmova according to EN 13201:2015



iGuzzini illuminazione 0_EC42 Wow 36,5W



Lamp:	user-defined
Luminous flux (luminaire):	2902.94 lm
Luminous flux (lamp):	2903.00 lm
Operating Hours	
4000 h:	100.0 %, 27.4 W
W/km:	794.6
Arrangement:	single side bottom
Pole distance:	34.500 m
Boom inclination (3):	0.0°
Boom length (4):	0.000 m
Light centre height (1):	6.100 m
Light overhang (2):	0.000 m

Results for valuation fields

Maintenance factor: 0.81

Sidewalk 2 (P5)

Em [lx] ≥ 3.00 ≤ 4.50	Emin [lx] ≥ 0.60
✓ 3.01	✓ 1.21

Lay-bys 1 (P4)

Em [lx] ≥ 5.00 ≤ 7.50	Emin [lx] ≥ 1.00
✓ 5.95	✓ 1.75

Roadway 1 (M5)

TI [%] ≤ 15	Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	EIR ≥ 0.30
✓ 12	✓ 0.54	✓ 0.48	✓ 0.40	✓ 0.67

Sidewalk 1 (P5)

Em [lx] ≥ 3.00 ≤ 4.50	Emin [lx] ≥ 0.60
✓ 4.64	✓ 1.09

ULR:	0.00
ULOR:	0.00
Maximum luminous intensities	
at 70°:	445 cd/klm
at 80°:	85.8 cd/klm
at 90°:	0.00 cd/klm
Luminous intensity class:	G*4

Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.

Arrangement complies with glare index class D.6

Results for energy efficiency indicators

Power density indicator (Dp)	0.017 W/lxm²
Energy consumption density	
Arrangement: Wow 36,5W (DIM 75%) (109.6 kWh/yr)	0.4 kWh/m² yr