



MARIBOR – TEZENSKA STREET SLOVENIA

RECONSTRUCTION OF STREET LIGHTING TO LED TECHNOLOGY



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GENERAL

Street:

Tezenska street, Maribor, Slovenia

Number of lamps:

14 street lamps

Installation:

6 – 7 m telecommunication pole height with distance app 60m

Lamps before installation:

ROMA lamps 70 W, installed under 15 deg inclination

Lamps after reconstruction:

LED lamps LSL30, full dimming version

Measuring equipment:

- Camera LMK mobile advanced, TechnoTeam Bildverarbeitung GmbH, number of calibration 3630718002
- Instrument for measuring illumination, T10, (class A), Konica Minolta, number of calibration 6569

ILLUMINATION LEVEL BEFORE RECONSTRUCTION, 60m BETWEEN THE POLES

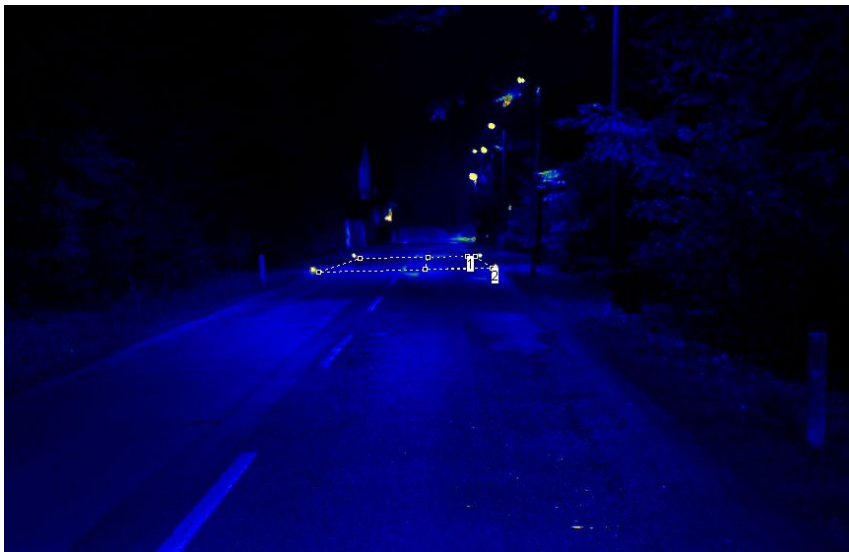
Tezenska street can be classified as road class ME5 in accordance with its velocity of traffic with requested level of brightness 0,5cdm²



Lamp before reconstruction



Illumination before reconstruction



Brightens before reconstruction

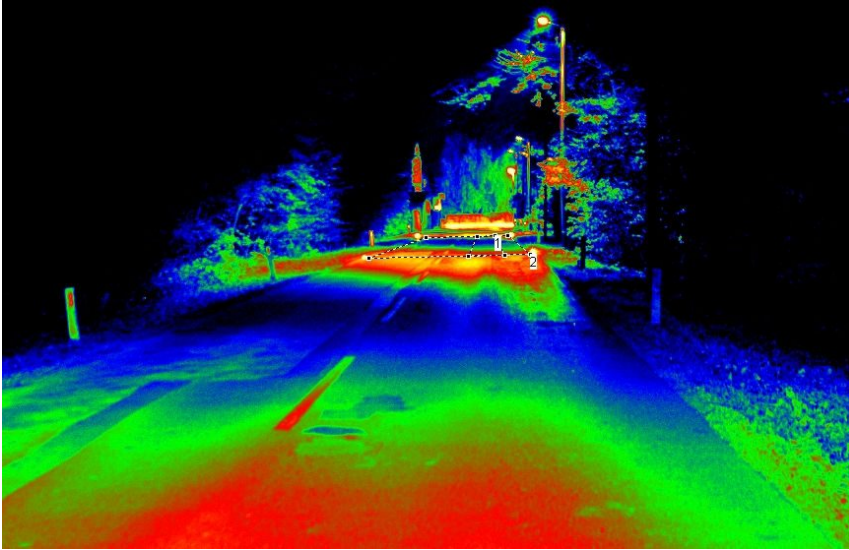
Middle value of brightness is 0,13 cd/m²

Middle value if illumination is 2,9 lx

Uniformity of illumination is not measured because of long distance between the poles. Measured values are expected, because of long distance between the poles even with most advanced lamps the requested value according to the road class requirements could not be met.

ILLUMINATION LEVEL BEFORE RECONSTRUCTION, 60m BETWEEN THE POLES

Tezenska street can be classified as road class ME5 in accordance with its velocity of traffic with requested level of brightness 0,5cdm²



Brightens after reconstruction



Lamp after reconstruction

Middle value of brightness is 0,2 cd/m²

Middle value if illumination is 4,1 lx

Uniformity of illumination is not measured because of long distance between the poles. Measured values are expected, because of long distance between the poles even with most advanced lamps the requested value according to the road class requirements could not be met.



ENERGY SAVINGS

BEFORE RECONSTRUCTION

W 49.96Hz 25/09/09 08:51 100%

kW	+1.363	PF	+0.437
Wh	0000000		
kVAR	€2.794	DPF	+0.439
VARh	€0000000		
	‡0000000	Tan	+2.048
kVA	3.119		
VAh	0000000		



49.97Hz 25/09/09 08:48 100%

V	A
RMS 236.9 v~	13.7 A~
DC -0.3 v=	
THD 1.5 %	8.0 %
CF 1.39	1.50
PST 0.32	KF 1.06
DF 1.5 %	8.0 %



AFTER RECONSTRUCTION

W 50.00Hz 20/10/09 17:14 100%

W	+552.3	PF	+0.941
Wh	0000000		
VAR	‡181.8	DPF	+0.950
VARh	€0000000		
	‡0000000	Tan	-0.329
VA	586.9		
VAh	0000000		



49.98Hz 20/10/09 17:17 100%

V	A
RMS 240.2 v~	2.4 A~
DC -0.3 v=	
THD 2.4 %	13.1 %
CF 1.37	1.50
PST 0.41	KF 3.05
DF 2.4 %	13.1 %



BEFROE RECONSTRUCTION

Total consumption of street:

1.363 W

AFTER RECONSTRUCTION

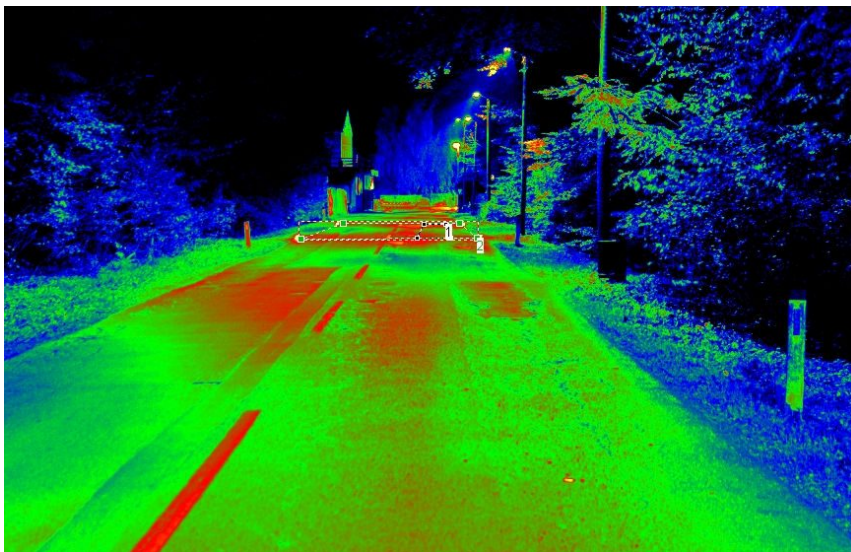
Total consumption of street:

552 W



ILLUMINATION LEVEL AFTER RECONSTRUCTION, 30m BETWEEN THE POLES

There were installed 3 more lamps on additional poles so distance between teh poles is 30m



Brightens after reconstruction

Middle value of brightness: 0,51cd/m²

Minimum value of brightness: 0,21 cd/m²

Maximum value in direction of observer: 0,69 cd/m²

Minimum value in direction of observer: 0,31 cd/m²

$U_0 = 0,41$ (standard requirements 0,35)

$U_L = 0,45$ (standard requirements 0,40)

m/m	0	1,5	4,5	7,5	10,5	13,5	16,5	19,5	22,5	25,5	28,5	30,0
6												
5,50		10,09	8,43	5,34	3,85	2,68	2,52	3,26	4,52	7,01	9,6	
4,50		15,42	11,03	6,35	4,61	3,07	2,96	4,1	5,34	8,77	11,55	
3,50		<u>17,94</u>	<u>14,51</u>	<u>9,68</u>	<u>6,13</u>	<u>4,13</u>	<u>3,98</u>	<u>5,52</u>	<u>7,56</u>	<u>12,68</u>	<u>16,41</u>	
2,50		18,95	15,91	10,6	7,31	4,91	4,41	5,86	8,55	12,93	17,83	
1,50		17,96	16,08	10,33	6,96	4,01	3,65	4,15	7,51	12,7	19,42	
0,50		15,19	7,98	5,16	4,25	2,79	2,68	3,09	4,24	8	14,28	



Middle value of illumination: **8,4** lx

Minimum value of illumination: 2,52 lx

Maximum value of illumination in direction of observer: 19,42 lx

Minimum value of illumination in direction of observer: 3,65 lx