Kapan Municipality (Armenia)

One-pager on Street Lighting Projects

(Identification form for municipal project proposals on EE modernization of street lighting[1])

1. Information about municipality	
Name of municipality:	Kapan
Region / Oblast:	Syunik
Country:	Armenia
Number of citizens:	38927
City budget (most recent year)	3567374 EURO 1929949400 AMD[2]
Website of municipality:	www.kapan.am
Member of CoM since:	15.07.2016
Date of SECAP approval:	Under development
Name of contact:	Never Grigoryan
Position:	Energy Manager
Email:	nver-grigoryan-2015@mail.ru
Phone:	+374 94 119400

2. SEAP/SECAP Sector	Public Lighting / Street Lighting

3. Description of object	
Parameter	**Street N1**
Street name	Road toward Shinararneri Street
Classification /category of street[3]	Գ2
Length of street, m	2200
Width of street, m	7-9
Sidewalks[4]	On both sides of the street (in some sites on one only), length 1.5-2 m
Number of lighting points, pcs	37
Distance between lighting poles, m	40
Mounting height of a luminaire, m	6-7
Position of luminaries	On one side of the street
Type of installed lamps	HPS
Capacity of installed lamps, W	250
Total installed capacity of street lighting system, kW	12.5
Annual hours of operation of the system, hours	1825
Average illuminance level, lux	
Control system (Yes/No)	No
Type of control system (e.g. time relay/lighting sensor)	No
Underground cable wiring (Yes/No)	No
Power metering system (Yes/No)	No
Type of power metering system (e.g. two-tariff)	N/A

[1] The information provided with this form is for information purposes only. No rights can be exerted because of information provided with this form, nor can the municipality be held accountable for any mistakes or incorrect information provided within.

[2] Use the exchange rate of your national bank on the moment of filling in the form.

[3] Please refer to relevant laws/norms.

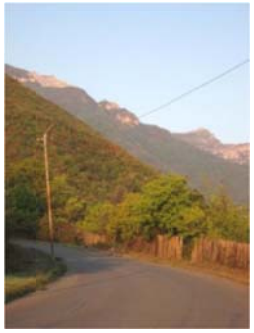
[4] For example: on both sides (1.5-2 m width), or on one side (1.5-2 m width, on the side of lighting poles), or on one side (1.5-2 m width, in front of the lighting poles).

Short description (conditions of infrastructure, number of non-operated lamps, metering system e.g. individual or combined with other consumers, other information)	The illumination system is not operational. Renovation and installation of new luminaries is needed.

4. Annual energy consumption (MWh/year) and costs over the past 3 years

Year	Energy consumption (MWh/year)	Energy consumption costs		O&M costs		Total costs per year	
		EUR	AMD	EUR	AMD	EUR	AMD

5. Photos showing pre-project situation (daylight and night time)



6. Available supporting documents (If necessary, provide links or attach copies of documents)
Reference to any available supporting documents like energy audits, feasibility studies, etc. Document / Source N1: DIALux Lighting Calculation (see attached)

7. Energy efficiency measures and modernizations to be implemented at Street N1 (in case of more streets, add more tables)

Energy efficiency measure & modernizations	Number of units	Indicative costs per unit (with VAT)[5]		Subtotal costs	
		EUR	AMD	EUR	AMD
Installation of street luminaires, pcs.	55	160	84000	8800	4620000
Repair of lighting poles, pcs. (shall be done by the municipality)	37	9.5	5000	351.5	185000
Installation of lighting poles, pcs. (shall be done by the municipality)	18	152	80000	2736	1440000
Installation of underground cable, m	3000	0.15	80	450	240000
Installation of control boxes, pcs.	450	0.48	250	214	112500
Installation of metering system, pcs.	1	28.6	15000	28.6	15000
Introduction of dimming system, pcs.	1	95.2	50000	95.2	50000
Introduction of dimming system, pcs.	1	100	52500	100	525
Complimentary equipment, pcs.					
- brackets (installation)	18	19	10000	342	18000
- brackets (renovation)	37	5.7	3000	211.4	111000
- fixing elements	55	1.9	1000	104.5	55000
Other works (description)	-				
TOTAL	-			**10345.4**	**5436000**

8. Other costs

Description	Indicative costs (EUR)	Indicative costs (AMD)
Human resources/PIU	Kapan Municipality	
Structural study	133.3	70000
Energy Audit	114.3	60000
Technical design	762	400000
State expertise	152	80000
Site supervision	571	300000
Installation works (labor)	Kapan Municipality	
Other (please specify)		
TOTAL	**1732.6**	**910000**

9. Grad total costs	Street N2
EURO	**12078**
AND	**6346000**

[5] These are indicative costs based on the data from real implemented projects under the Covenant of Mayors – Demonstration Projects (CoM-DeP programme). However, municipalities are advised to contact suppliers / service providers to obtain more accurate information for their specific case / country.

10. Description of system after implementation		
Parameter	**Street N1**	
Street name	Road toward Shinararneri Street	
Number of lighting points, pcs	55	
Type of new luminaires (e.g. HPS, LED, PV integrated LED)	LED	
Type of control system (e.g. time relay/lighting sensor)	Light relay	
Individual capacity of new luminaires, W	80	
Total installed capacity of new street lighting system, kW	4.0	
Average illuminance level, lux	0.89 candela/m^2 / 12.8 lux	
Annual hours of operation of the system, hours	2190	
Annual energy consumption of the system, MWh[6]	8.76	
Annual energy consumption costs, Euro / AMD	693.5	364124
Annual O&M costs, Euro / AMD	105	55000
Annual energy consumption and O&M costs, Euro / AMD	**798.3**	**419124**

11. Expected results		
Annual energy savings, MWh[7]	**10.48**	
Annual monetary savings, EUR/local currency	**847.6**	**444959.7**
Annual CO_2 emission reduction[8], tCO_2	**2.33**	

12. Timetable of the project	
Description of step	**Indicative time needed (days)**
Recruitment/Mobilization of IPU	5
Energy audit (drafting ToR, procurement of services, implementation, report)	20
Technical design (drafting ToR, procurement, implementation, report)	20
State expertise	10
Procurement	60
Works/site supervision	25
Final acceptance (incl. correction of defects)	5
Calculation of real savings (measurement &verification)	5
TOTAL	**150**

13. Other information

[6] In case of PV integrated solar LED street lights that generate electricity to be accumulated in batteries in the daytime and consumed by the lighting system in the nighttime, or to be supplied to a national grid via a net-metering system (bidirectional electricity meters) in the daytime and consumed by the lighting system in the nighttime, only electricity supplied to the lighting system by a national grid or other sources shall be counted.

[7] It is important that you fill in reasonable estimates of energy savings. Too optimistic energy savings will raise questions about your trustworthiness as partner.

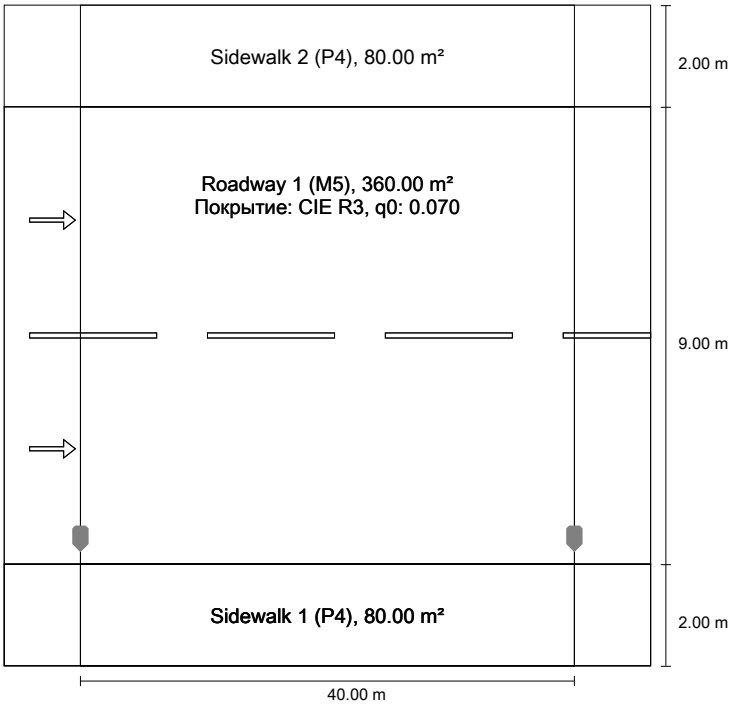
[8] For calculation of CO_2 emission reduction, please refer to national GHG emission factors (SECAP Guide).

Дата:
20.09.2019

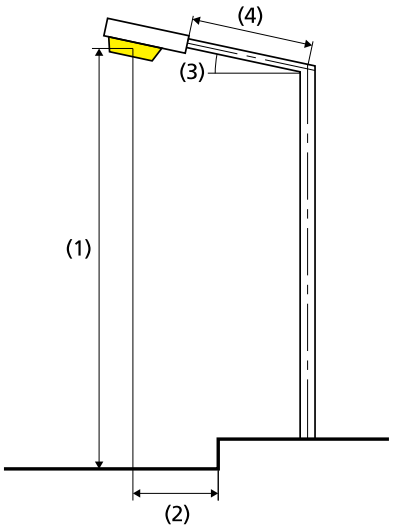
Kapan street illumination

Road 9m
Poles 7m
Poles distance 40m

Street 1 по EN 13201:2015



LED-80W



Лампа:	
Световой поток (светильник):	9700.00 lm
Световой поток (лампа):	
Рабочие часы	
4000 h:	100.0 %, 80.0 W
W/km:	2000.0
Расположение:	односторонне внизу
Расстояние между мачтами:	40.000 m
Наклон консоли (3):	5.0°
Длина консоли (4):	0.000 m
Высота световых точек (1):	7.000 m
Свес световой точки (2):	0.500 m

Результаты для полей оценки

Коэффициент эксплуатации: 0.80

Sidewalk 2 (P4)

Ecp [lx]	Emin [lx]
* 6.29	* 3.46

Roadway 1 (M5)

Lcp [cd/m²] ≥ 0.60	Uo ≥ 0.40	Ul ≥ 0.50	TI [%] ≤ 20	EIR
✓ 0.89	✓ 0.44	✓ 0.54	✓ 20	* 0.42

Sidewalk 1 (P4)

Ecp [lx]	Emin [lx]
* 10.16	* 2.57

* Для сведения; не входит в оценку

ULR:	0.00
ULOR:	0.00
Наибольшие значения силы света	
при 70° и выше:	592 cd/klm *
при 80° и выше:	340 cd/klm *
при 90° и выше:	3.63 cd/klm *
Класс интенсивности света:	/

В во всех направлениях, которые образуют указанный угол с нижней вертикалью в инсталлированных и готовых к работе светильниках.

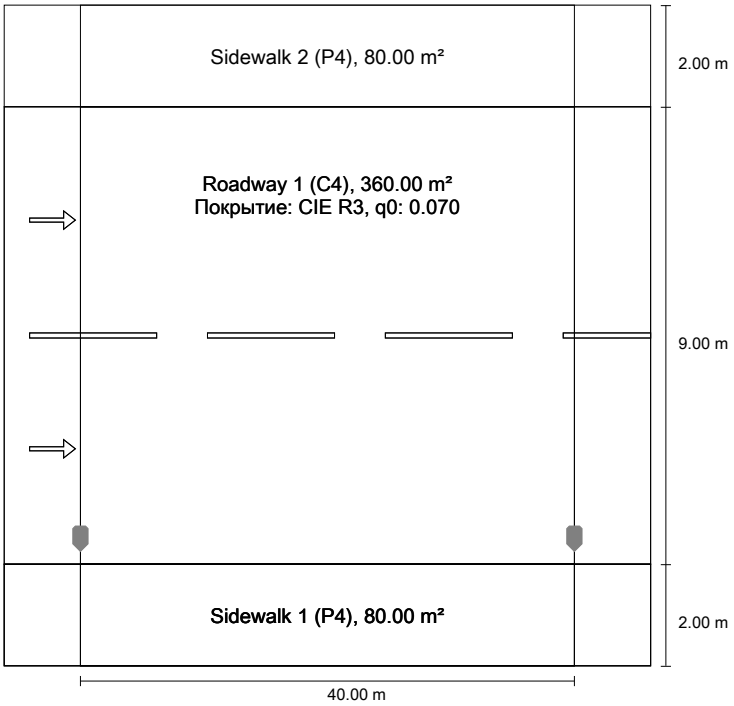
* Значения интенсивности света в [свечей/килолюмен] для расчета класса интенсивности света относятся в соответствии с EN 13201:2015 к световому потоку.

Компоновка отвечает классу индекса ослепления D.3

Результаты для показателей энергоэффективности

Индикатор плотности мощности (Dp)	0.013 W/lxm²
Интенсивность потребления энергии	
Расположение: LED-80W (320.0 кВт-ч/год)	0.6 кВт-ч/m² год

Street 2 по EN 13201:2015



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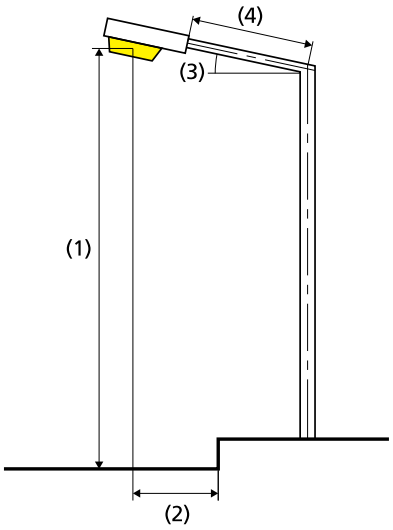

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Ecp [lx]	Emin [lx]
* 6.29	* 3.46

Roadway 1 (C4)

Ecp [lx] ≥ 10.00	Uo ≥ 0.25
✔ 12.81	✔ 0.28

Sidewalk 1 (P4)

Ecp [lx]	Emin [lx]
* 10.16	* 2.57

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