Street Lighting: Average Illuminance and Pole Spacing

Average road illuminance from luminaire flux, utilisation and maintenance factors, road width and pole spacing, and the spacing for a target.

Method: Lumen method for road lighting; E = ΦCU·MF/(WS) (illuminating engineering practice)

Input parameters

Unit system: SI

Parameter	Value	Unit
Luminous flux per luminaire (lm)	15,000	
Coefficient of utilisation	40.000	%
Maintenance factor	80.000	%
Road width	8.0000	m
Pole spacing	30.000	m
Arrangement	Single-sided or staggered (one luminaire per spacing)	
Target average illuminance	15.000	lx

Calculated results

Parameter	Value	Unit
Average illuminance	20.000	lx
Spacing for the target	40.000	m
Spacing for the target per road width (not S/h: compare S with the mounting height separately)	5.0000	

Notes for this case

- Lumen method for roads: CU from the luminaire's utilisation curve for the road width and mounting height. Uniformity also limits spacing (often S ≤ 3–4 times mounting height).

Formula and method

$$E_{avg} = \frac{n\Phi\, CU\, MF}{WS}, \quad S_{req} = \frac{n\Phi\, CU\, MF}{WE_t}$$

Variables

Φ	Luminous flux per luminaire (lm)	-
CU	Coefficient of utilisation	-
MF	Maintenance factor	-
W	Road width	m
S	Pole spacing	m
$\mathrm{arrangement}$	Arrangement	-
E_t	Target average illuminance	lx
E_{avg}	Average illuminance	lx
S_{req}	Spacing for the target	m
S_{req}/W	Spacing for the target per road width; this is not the S/h uniformity ratio, so compare S with the mounting height separately	-

Method and standards

Lumen method.

Assumptions and limits

- Average values only.

References

- Lumen method for road lighting
- E = ΦCU·MF/(WS) (illuminating engineering practice)

Report details

Report reference	FCC-69GY-TQZT (the same inputs always give the same reference)
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Release checks	2 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/electrical/lighting/street-lighting-spacing

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.