REGIONE CAMPANIA

COMUNE
MONTECORICE

PROVINCIA
SALERNO

INTERVENTO PER IL MIGLIORAMENTO DELL'EFFICIENZA ENERGETICA E RIQUALIFICAZIONE DEGLI IMPIANTI DI ILLUMINAZIONE PUBBLICA CON TECNOLOGIA A LED

RELAZIONE TECNICA
CALCOLO ILLUMINOTECNICO

CODICE
R03

COMMITTENTE
Comune di Montecorice

PROGETTO DEFINITIVO/ESECUTIVO

PROGETTO
Ing. Dante D'Agresti

REVISIONI

N°	DATA	DISEGN.	CONTR.	APPROV.	MOTIVO DELLA REVISIONE
0	Ottobre 2018				Emissione progetto definitivo/esecutivo

FILE:HD-RETE\COMUNEMONTECORICE\18.06-PD-PE_RIQUALIFICAZIONE IMPIANTI

RELAZIONE TECNICA - CALCOLO ILLUMINOTECNICO

INDICE:

CAPO I **PREMESSA**

I.1) **Introduzione**

La presente relazione specialistica redatta ai sensi dell'art.35 del D.P.R. 5 ottobre 2010, n.207, implementa il progetto esecutivo per le opere relative a **"Intervento per il miglioramento dell'efficienza energetica e riqualificazione degli impianti di illuminazione pubblica con tecnologia a led"** da realizzarsi nel comune di Montecorice, in provincia di Salerno.

Il progetto di fattibilità tecnica-economica è stato approvato dal comune di Montecorice con delibera di Giunta Comunale n. 97 del 15 ottobre 2018.

I.2) **Generalità**

La relazione precisa i criteri ed i riferimenti normativi che sono alla base del dimensionamento dell'impianto di pubblica illuminazione e le procedure di calcolo utilizzate per definire le caratteristiche degli elementi costituenti il sistema.

Il dimensionamento degli impianti di pubblica illuminazione è funzione dei parametri relativi alle categorie in cui ricadono le strade interessate dall'intervento.

Il rispetto dei parametri consente agli utenti di usufruire della viabilità in condizioni di sicurezza ed in maniera agevole.

I parametri di riferimento, definiti in funzione della tipologia delle strade, sono contenuti nella norma UNI 11248 "Illuminazione stradale – Selezione delle categorie illuminotecniche" e riguardano principalmente l'illuminazione media dell'area in oggetto di studio, l'uniformità della distribuzione della luce e l'assenza di abbagliamento.

Un'attenta analisi illuminotecnica non trascura gli aspetti relativi al contesto in cui l'impianto si inserisce, così da limitare l'impatto ambientale e di rendere lo stesso parte integrante del tessuto urbano.

CAPO II **Calcolo illuminotecnico**

II.1) **Generalità**

Il calcolo illuminotecnico trae origine dalla definizione dei parametri di progetto e quindi dalla classificazione del territorio interessato. In particolare si definiscono tre categorie illuminotecniche cosiddette di riferimento, di progetto, di esercizio.

La categoria di riferimento è diretta conseguenza delle leggi e norme in materia.

La categoria di progetto definisce i requisiti illuminotecnici da considerare.

La categoria di esercizio è definita con particolare riguardo al contenimento dei consumi energetici e ai parametri di influenza che variano nel tempo.

Le norme a cui si fa particolare riferimento sono così elencate:

- D. Lgs. n. 285 del 30/04/1992 *"Nuovo Codice della Strada".*
- D.M. LL.PP. del 12/04/1995 "Direttive per la redazione, adozione ed attuazione dei Piani Urbani del Traffico (Art. 36 del D. Lgs. 30 aprile 1992, n. 285)".
- D.M. n. 6792 del 05/11/2001 "Norme funzionali e geometriche per la costruzione delle strade".
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- UNI 10819 2013 Impianti di illuminazione esterna - Requisiti per la limitazione della dispersione verso l'alto del flusso luminoso.

II.2) **Classificazione delle strade**

Il Nuovo Codice definisce *"strada",* l'area ad uso pubblico destinata alla circolazione dei pedoni, dei veicoli e degli animali. Lo stesso Codice, all'art.2 comma 2, classifica le strade in base alle loro caratteristiche costruttive, tecniche e funzionali nei seguenti tipi:

A Autostrade
B Strade extraurbane principali
C Strade extraurbane secondarie
D Strade urbane di scorrimento
E Strade urbane di quartiere
F Strade locali

Le strade extraurbane di cui al comma 2, lettere B, C ed F ai sensi dell'art. 2 comma 6 del codice sono così distinte:

- **Statali** quando costituiscono le grandi direttrici del traffico nazionale, congiungono la rete viabile principale dello Stato con quelle degli Stati limitrofi, congiungono tra loro i capoluoghi di regione ovvero i capoluoghi di provincia situati in regioni diverse, ovvero costituiscono diretti ed importanti collegamenti tra strade statali; allacciano alla rete delle strade statali i porti marittimi, gli aeroporti, i centri di particolare importanza industriale, turistica e climatica; servono traffici interregionali o presentano particolare interesse per l'economia di vaste zone del territorio nazionale.
- **Regionali**: quando allacciano i capoluoghi di provincia della stessa regione tra loro o con il capoluogo di regione ovvero allacciano i capoluoghi di provincia o i comuni con la rete statale se ciò sia particolarmente rilevante per ragioni di carattere industriale, commerciale, agricolo, turistico e climatico.
- **Provinciali** quando allacciano al capoluogo di provincia capoluoghi dei singoli comuni della rispettiva provincia o più capoluoghi di comuni tra loro ovvero quando allacciano alla rete statale o regionale i capoluoghi di comune, se ciò sia particolarmente rilevante per ragioni di carattere industriale, commerciale, agricolo, turistico e climatico.
- **Comunali** quando congiungono il capoluogo del comune con le sue frazioni o le frazioni fra loro, ovvero congiungono il capoluogo con la stazione ferroviaria, tranviaria o automobilistica, con un aeroporto o porto marittimo, lacuale o fluviale, con interporti o nodi di scambio intermodale o con le località che sono sede di essenziali servizi interessanti la collettività comunale. Ai fini del presente codice, le strade "vicinali" sono assimilate alle strade comunali.

Le strade urbane di cui al comma 2, lettere D, E e F, sono sempre comunali quando siano situate nell'interno dei centri abitati, eccettuati i tratti interni di strade statali, regionali o provinciali che attraversano centri abitati con popolazione non superiore a diecimila abitanti.

Successivamente il D.M. 12 aprile 1995 introduce altri tipi di strade che si possono trovare in ambito urbano, con funzione e caratteristiche intermedie rispetto alle tipologie sopra elencate, come:

- strade di scorrimento veloce, intermedie tra le autostrade e le strade di scorrimento;
- strade interquartiere, intermedie tra quelle di scorrimento e quelle di quartiere;
- strade locali interzonali, intermedie tra quelle di quartiere e quelle locali, anche con funzioni di servizio rispetto alle strade di quartiere.

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F	Strade locali zonali
F	Strade locali

II.3) **Classificazione illuminotecnica delle strade**

Il calcolo è stato definito sulla scorta della categoria illuminotecniche assegnata a ciascun strada. La classificazione illuminotecnica delle strade definisce i valori di luminanza posti a base della progettazione. La classificazione di una strada, ai fini illuminotecnici, può derivare dal PUT (Piano Urbano del Traffico) se esistente o, in mancanza, dall'applicazione della norma italiana UNI 11248 e la norma UNI EN 13201.

Nel nostro caso la categoria progettuale, posta alla base delle verifiche illuminotecniche, è stata definita applicando la norma UNI 11248 e la norma UNI EN 13201, tenendo in considerazioni la valutazione del rischio definita attraverso i parametri di influenza significativi e diversificati a seconda delle caratteristiche delle strade, collocazione sul territorio, flussi e tipologia del traffico ed altro.

II.4) **Conclusioni**

Il calcolo illuminotecnico, in definitiva, è stato condotto nel pieno rispetto della normativa comunitaria, nazionale, regionale e di settore applicabile ed ha considerato gli aspetti ambientali e di integrazione dell'impianto all'interno del contesto urbano.

L'analisi delle elaborazioni condotte, mediante adeguato software di calcolo illuminotecnico, consentono di verificare il **formale rispetto dei parametri illuminotecnici delle norme vigenti**, come si evidenza nei documenti allegati alla presente relazione.

II.5) **Allegati**

A seguire sono allegati i tabulati del calcolo illuminotecnico.

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II.5) **Allegati**

A seguire sono allegati i tabulati del calcolo illuminotecnico.

Date:
01.06.2018

PG48_14_06_2018_Municipality MONTECORICE_Q4

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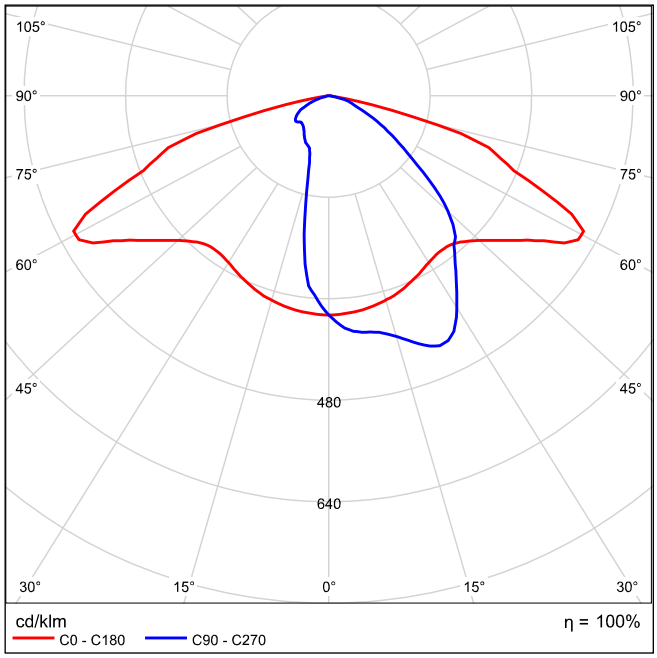
LUG LIGHT FACTORY 130222.5L132.031 3932_3_2 URBINO 16 LED 740 O4 1xLED 4000K

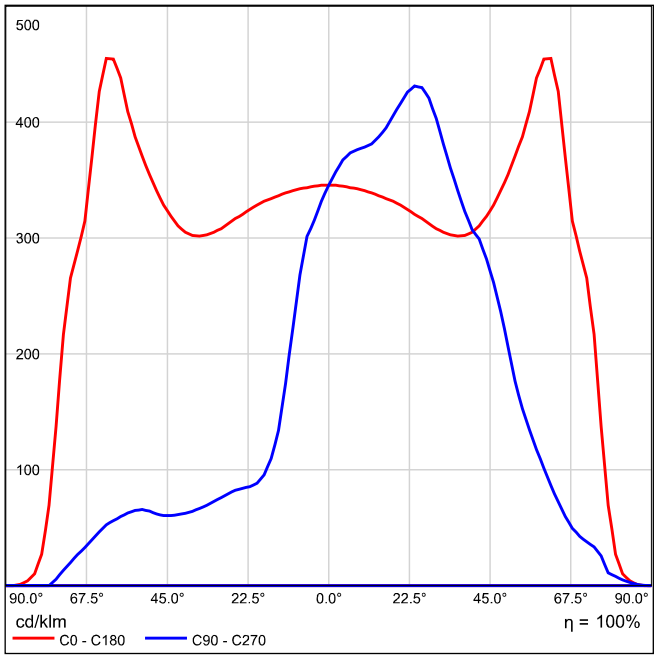
See our luminaire catalog for an image of the luminaire.

Light output ratio: 100%
Luminaire luminous flux: 3750 lm
Power: 39.0 W
Luminous efficacy: 96.2 lm/W

Luminous emittance 1 / Polar LDC

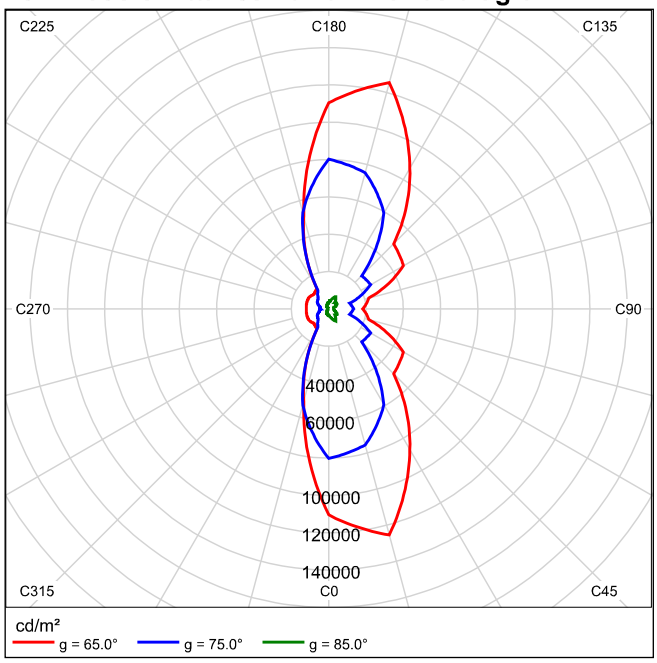


Luminous emittance 1 / Linear LDC



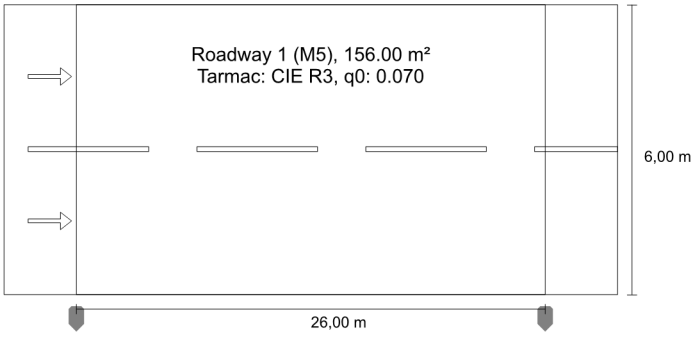
It is not possible to generate a cone diagram, as the light distribution is asymmetrical.

Luminous emittance 1 / Luminance diagram



It is not possible to generate a UGR diagram, as the light distribution is asymmetrical.

Quadro 4 - L1-54 - L1-55 height 8m/width 6m according to EN 13201:2015



Results for valuation fields
Maintenance factor: 0.80

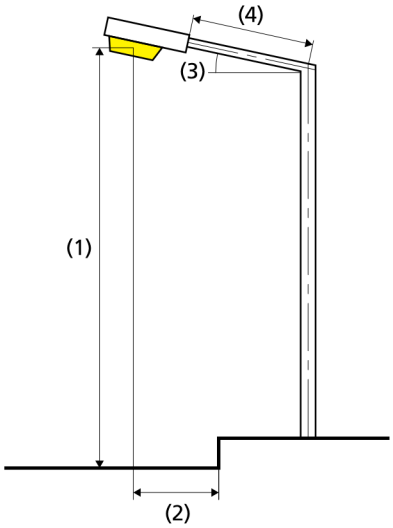
Roadway 1 (M5)

Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.51	✓ 0.56	✓ 0.76	✓ 6	✓ 0.59

Results for energy efficiency indicators

Power density indicator (Dp)	0.028 W/lxm²
Energy consumption density	
Arrangement: 3932_3_2 URBINO 16 LED 740 O4 (156.0 kWh/yr)	1.0 kWh/m² yr

LUG LIGHT FACTORY 130222.5L132.031 3932_3_2 URBINO 16 LED 740 O4



Lamp:	1xLED 4000K
Luminous flux (luminaire):	3750.00 lm
Luminous flux (lamp):	3750.00 lm
Operating Hours	
4000 h:	100.0 %, 39.0 W
W/km:	1482.0
Arrangement:	single side bottom
Pole distance:	26.000 m
Boom inclination (3):	5.0°
Boom length (4):	0.000 m
Light centre height (1):	8.000 m
Light overhang (2):	-0.500 m

ULR:	0.00
ULOR:	0.00
Maximum luminous intensities	
at 70°:	359 cd/klm
at 80°:	83.8 cd/klm
at 90°:	2.65 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.3

Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 10 x 6 Points

Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.51	✓ 0.56	✓ 0.76	✓ 6	✓ 0.59

Assigned Observer (2):

Observer	Position [m]	Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15
Observer 1	(-60.000, 1.500, 1.500)	0.51	0.57	0.76	6
Observer 2	(-60.000, 4.500, 1.500)	0.55	0.56	0.79	4

Roadway 1 (M5)

Horizontal illuminance [lx]

5.500	9.41	7.90	6.58	5.91	**5.41**	**5.41**	5.91	6.58	7.90	9.41
4.500	12.2	9.53	7.24	6.28	6.04	6.04	6.28	7.24	9.53	12.2
3.500	14.1	10.6	7.66	6.52	6.45	6.45	6.52	7.66	10.6	14.1
2.500	15.0	11.1	7.88	6.66	6.42	6.42	6.66	7.88	11.1	15.0
1.500	16.0	11.7	7.89	6.53	6.25	6.25	6.53	7.89	11.7	16.0
0.500	**16.2**	11.6	7.65	6.29	6.01	6.01	6.29	7.65	11.6	**16.2**
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

Em [lx]	Emin [lx]	Emax [lx]	g1	g2
8.84	5.41	16.2	0.613	0.334

Observer 1

Luminance with dry roadway [cd/m²]

5.500	0.33	0.30	**0.29**	0.31	0.32	0.33	0.33	**0.29**	0.31	0.33
4.500	0.42	0.36	0.33	0.36	0.39	0.41	0.38	0.35	0.39	0.43
3.500	0.49	0.42	0.38	0.42	0.48	0.52	0.45	0.44	0.47	0.51
2.500	0.56	0.49	0.44	0.51	0.59	0.61	0.53	0.51	0.54	0.58
1.500	0.65	0.58	0.55	0.65	0.72	0.71	0.63	0.58	0.64	0.67
0.500	0.74	0.67	0.65	0.76	**0.85**	0.80	0.72	0.65	0.70	0.75
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.51	0.29	0.85	0.569	0.341

Luminance with new lamp [cd/m²]

5.500	0.41	0.37	**0.36**	0.39	0.39	0.41	0.41	0.37	0.39	0.41
4.500	0.52	0.45	0.41	0.45	0.48	0.52	0.48	0.44	0.49	0.54
3.500	0.61	0.53	0.47	0.53	0.60	0.65	0.56	0.55	0.58	0.64
2.500	0.70	0.61	0.55	0.64	0.74	0.76	0.67	0.64	0.68	0.73
1.500	0.82	0.73	0.69	0.81	0.91	0.89	0.79	0.73	0.79	0.83
0.500	0.93	0.84	0.81	0.95	**1.06**	1.00	0.90	0.82	0.87	0.93
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.64	0.36	1.06	0.569	0.341

Observer 2

Luminance with dry roadway [cd/m²]

5.500	0.34	**0.31**	**0.31**	0.33	0.33	0.35	0.34	**0.31**	0.32	0.34
4.500	0.44	0.39	0.36	0.40	0.42	0.45	0.41	0.38	0.41	0.45
3.500	0.53	0.46	0.42	0.48	0.54	0.57	0.49	0.47	0.49	0.55
2.500	0.62	0.56	0.53	0.60	0.67	0.68	0.59	0.55	0.59	0.62
1.500	0.74	0.67	0.64	0.74	0.82	0.78	0.69	0.63	0.69	0.73
0.500	0.74	0.67	0.65	0.78	**0.88**	0.82	0.73	0.66	0.71	0.76
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.55	0.31	0.88	0.564	0.353

Luminance with new lamp [cd/m²]

5.500	0.42	**0.39**	**0.39**	0.41	0.42	0.44	0.43	**0.39**	0.40	0.43
4.500	0.55	0.49	0.44	0.50	0.53	0.56	0.51	0.48	0.52	0.56
3.500	0.67	0.58	0.53	0.60	0.67	0.71	0.61	0.59	0.62	0.68
2.500	0.78	0.70	0.66	0.75	0.83	0.85	0.73	0.69	0.73	0.77
1.500	0.92	0.84	0.80	0.93	1.02	0.98	0.86	0.79	0.86	0.91
0.500	0.92	0.84	0.82	0.98	**1.10**	1.03	0.91	0.83	0.88	0.95
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

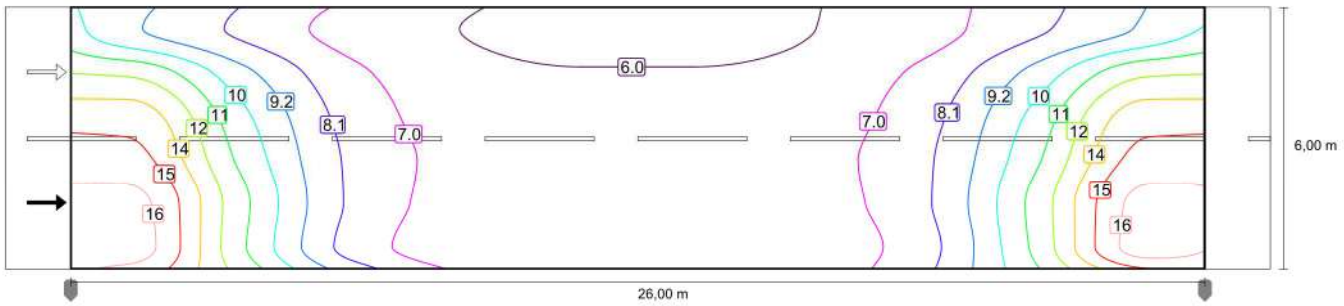
Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.69	0.39	1.10	0.564	0.353

Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 10 x 6 Points

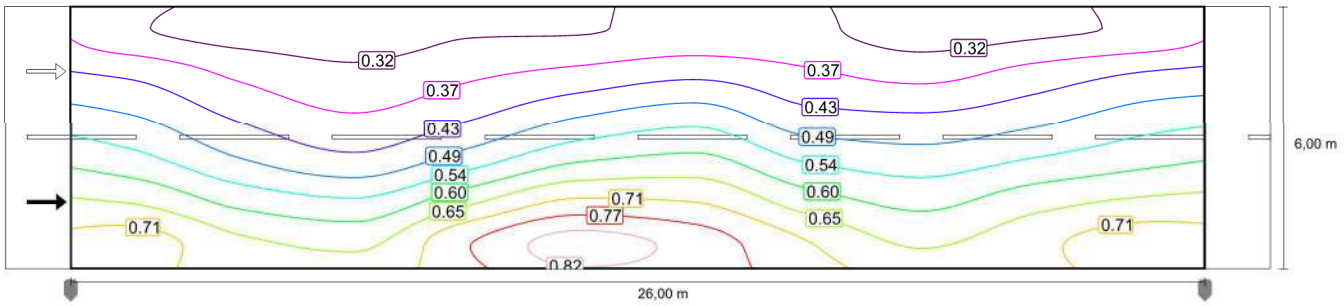
Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	UI ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.51	✓ 0.56	✓ 0.76	✓ 6	✓ 0.59

Horizontal illuminance

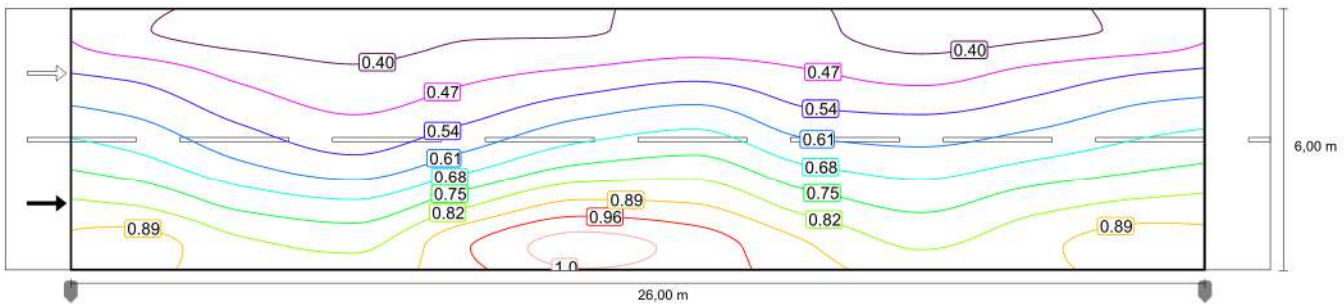


Observer 1

Luminance with dry roadway

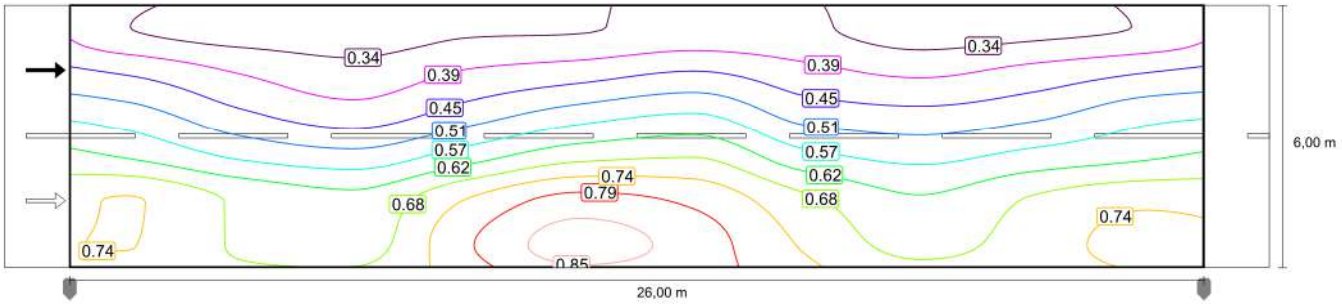


Luminance with new lamp

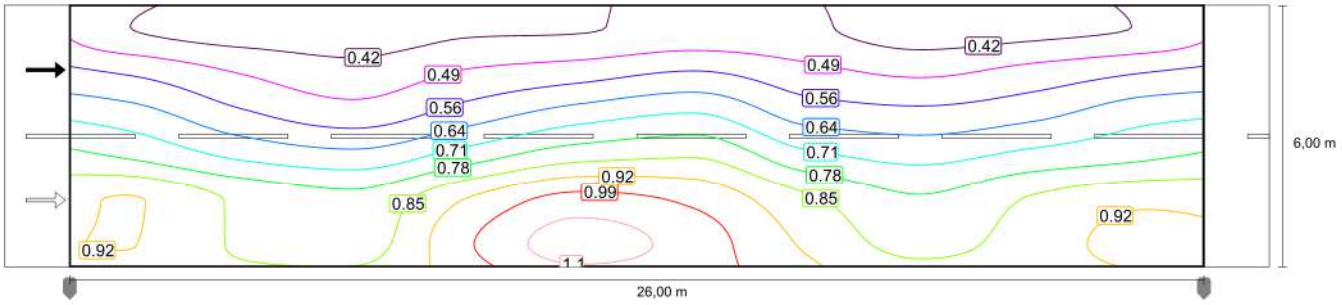


Observer 2

Luminance with dry roadway



Luminance with new lamp

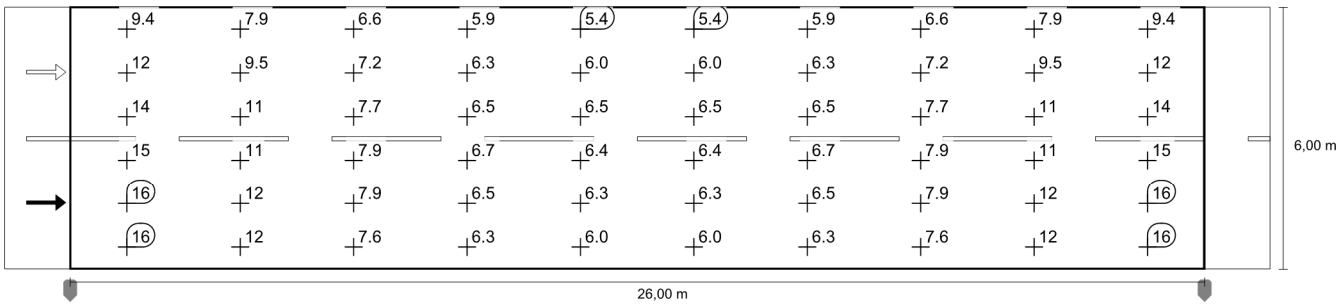


Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 10 x 6 Points

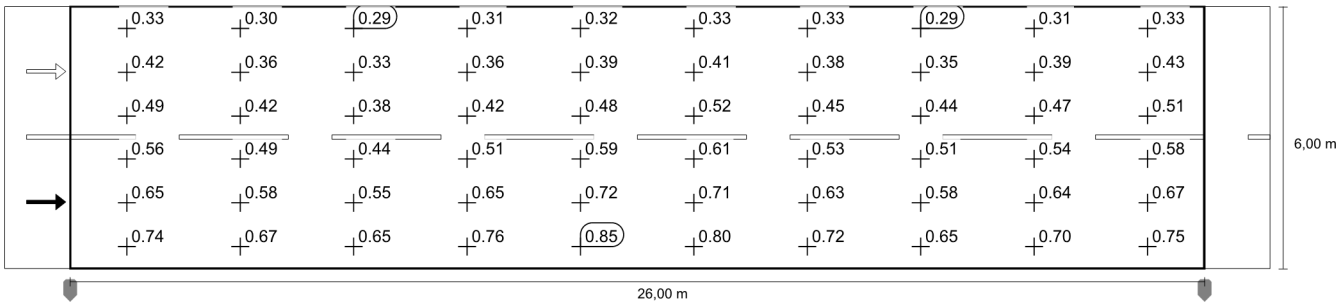
Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.51	✓ 0.56	✓ 0.76	✓ 6	✓ 0.59

Horizontal illuminance

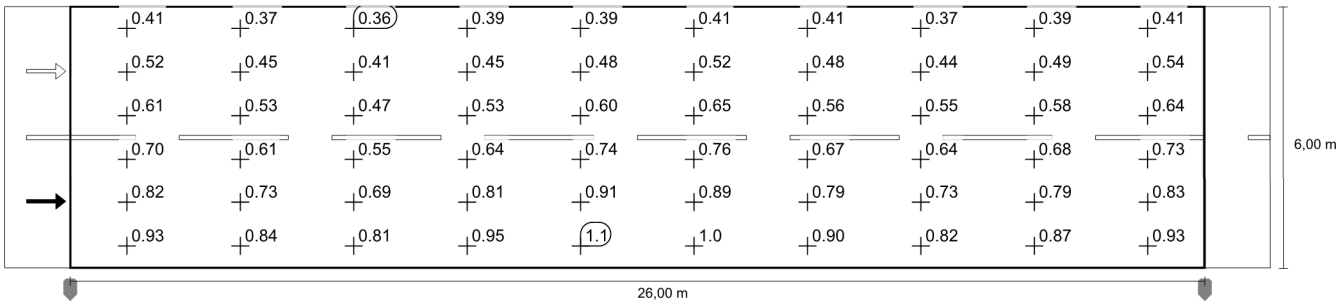


Observer 1

Luminance with dry roadway

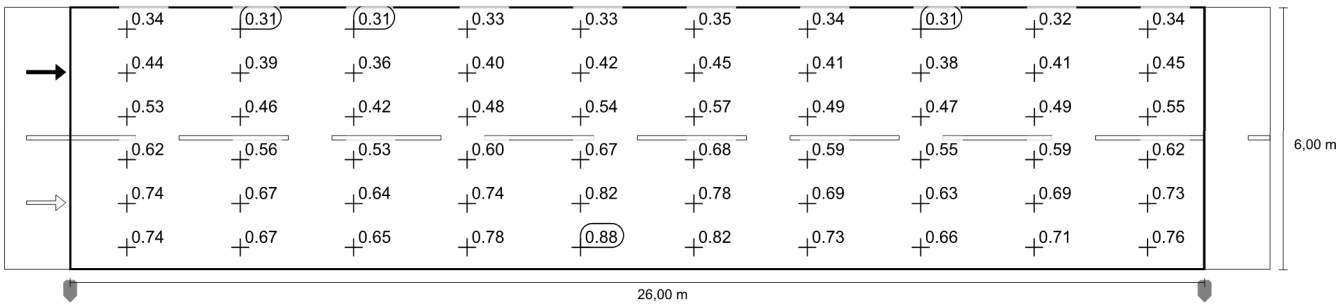


Luminance with new lamp

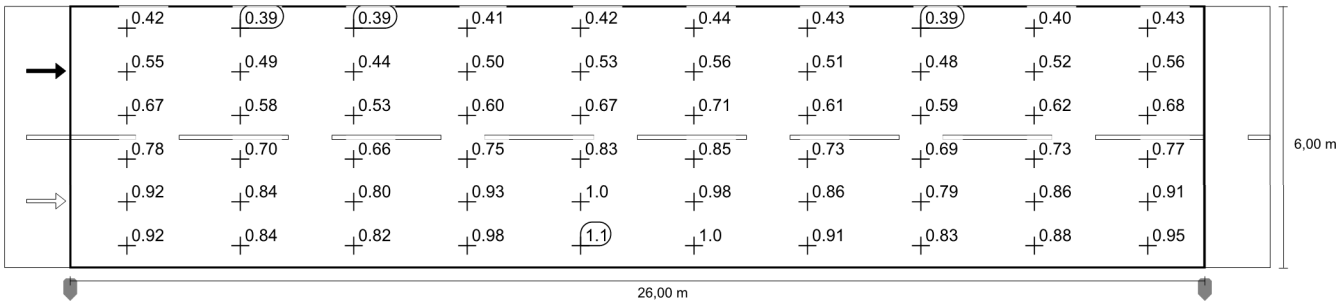


Observer 2

Luminance with dry roadway



Luminance with new lamp



Date:
01.06.2018

PG48_14_06_2018_Municipality MONTECORICE_Q6

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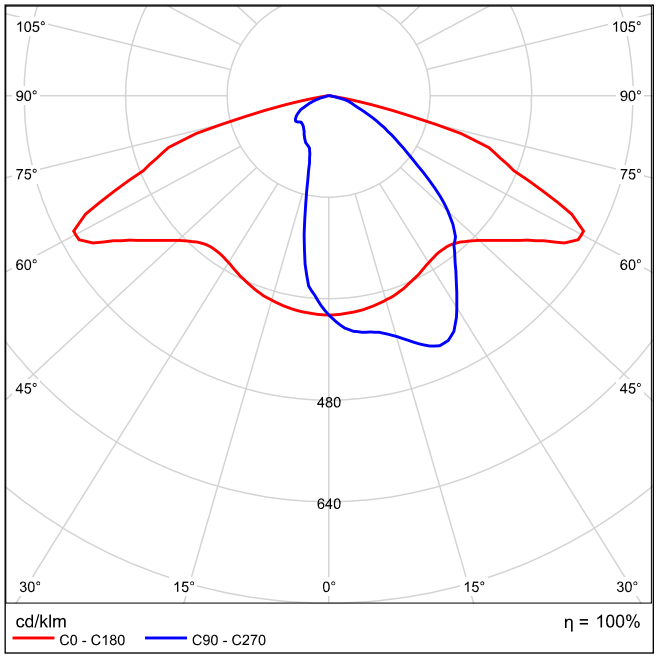
LUG LIGHT FACTORY 130222.5L071.031 3932_1 URBINO 36 LED 740 O4 1xLED 4000K

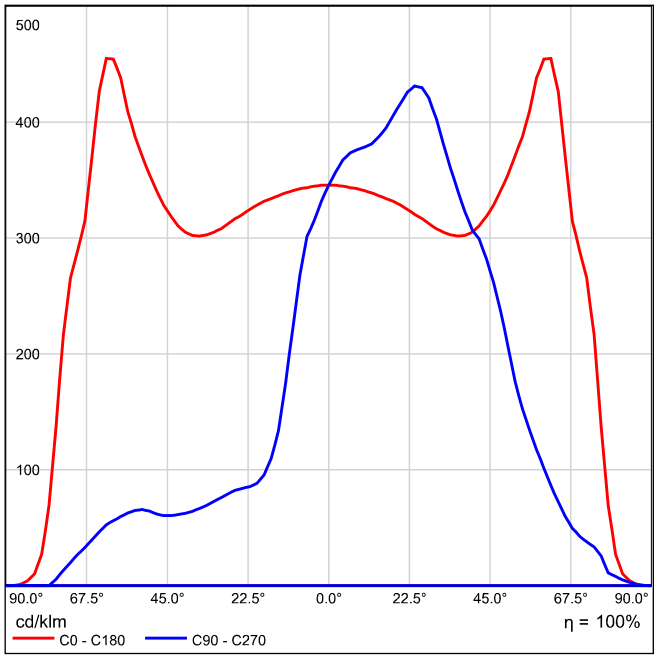
See our luminaire catalog for an image of the luminaire.

Light output ratio: 100%
Luminaire luminous flux: 9500 lm
Power: 80.0 W
Luminous efficacy: 118.7 lm/W

Luminous emittance 1 / Polar LDC

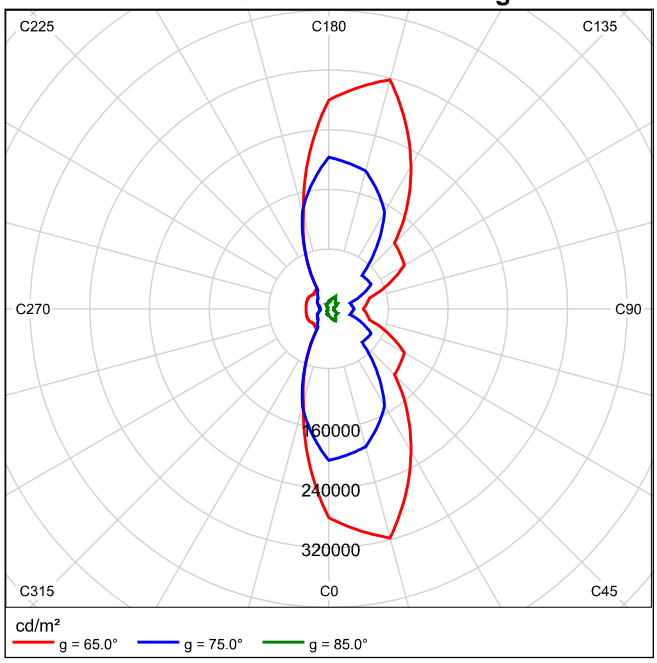


Luminous emittance 1 / Linear LDC



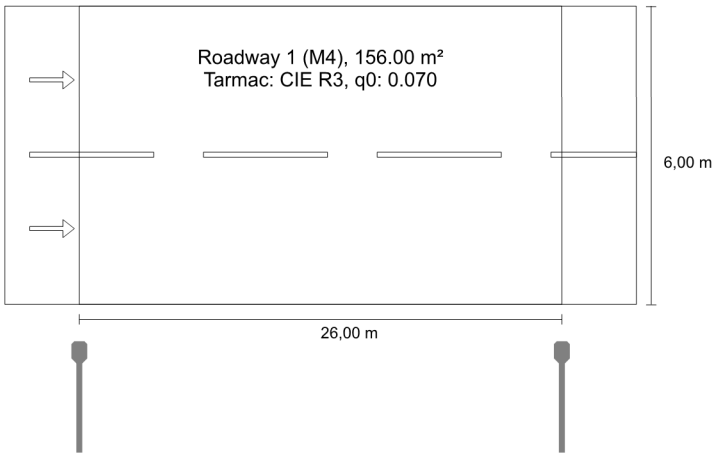
It is not possible to generate a cone diagram, as the light distribution is asymmetrical.

Luminous emittance 1 / Luminance diagram

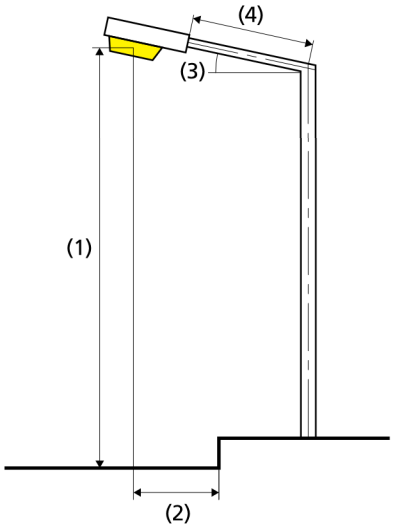


It is not possible to generate a UGR diagram, as the light distribution is asymmetrical.

Quadro 6 - L1-25 - L1-26 height 8m/width 6m according to EN 13201:2015



LUG LIGHT FACTORY 130222.5L071.031 3932_1 URBINO 36 LED 740 O4



Results for valuation fields
Maintenance factor: 0.80

Roadway 1 (M4)

Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	Ul ≥ 0.60	TI [%] ≤ 15	EIR ≥ 0.30
✓ 1.20	✓ 0.57	✓ 0.79	✓ 8	✓ 0.62

Results for energy efficiency indicators

Power density indicator (Dp)	0.024 W/lxm²
Energy consumption density	
Arrangement: 3932_1 URBINO 36 LED 740 O4 (320.0 kWh/yr)	2.1 kWh/m² yr

Lamp:	1xLED 4000K
Luminous flux (luminaire):	9500.00 lm
Luminous flux (lamp):	9500.00 lm
Operating Hours	
4000 h:	100.0 %, 80.0 W
W/km:	3040.0
Arrangement:	single side bottom
Pole distance:	26.000 m
Boom inclination (3):	10.0°
Boom length (4):	2.000 m
Light centre height (1):	8.000 m
Light overhang (2):	-1.000 m

ULR:	0.00
ULOR:	0.00
Maximum luminous intensities	
at 70°:	403 cd/klm
at 80°:	134 cd/klm
at 90°:	15.6 cd/klm
Luminous intensity class:	G*2

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

Arrangement complies with glare index class D.0

Roadway 1 (M4)

Maintenance factor: 0.80
Grid: 10 x 6 Points

Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	Ul ≥ 0.60	TI [%] ≤ 15	EIR ≥ 0.30
✔ 1.20	✔ 0.57	✔ 0.79	✔ 8	✔ 0.62

Assigned Observer (2):

Observer	Position [m]	Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	Ul ≥ 0.60	TI [%] ≤ 15
Observer 1	(-60.000, 1.500, 1.500)	1.20	0.59	0.79	8
Observer 2	(-60.000, 4.500, 1.500)	1.30	0.57	0.80	5

Roadway 1 (M4)

Horizontal illuminance [lx]

5.500	23.5	19.4	15.8	14.1	**13.6**	**13.6**	14.1	15.8	19.4	23.5
4.500	29.1	22.8	17.3	15.0	14.9	14.9	15.0	17.3	22.8	29.1
3.500	32.6	25.0	18.3	15.7	15.6	15.6	15.7	18.3	25.0	32.6
2.500	35.4	26.6	19.0	16.1	15.5	15.5	16.1	19.0	26.6	35.4
1.500	38.6	28.4	19.2	16.0	15.3	15.3	16.0	19.2	28.4	38.6
0.500	**39.0**	28.2	18.8	15.5	14.8	14.8	15.5	18.8	28.2	**39.0**
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

Em [lx]	Emin [lx]	Emax [lx]	g1	g2
21.3	13.6	39.0	0.639	0.348

Observer 1

Luminance with dry roadway [cd/m²]

5.500	0.82	0.73	0.72	0.76	0.79	0.80	0.75	**0.71**	0.75	0.83
4.500	1.00	0.88	0.80	0.86	0.94	0.96	0.88	0.82	0.93	1.03
3.500	1.15	1.00	0.89	1.00	1.11	1.17	1.03	0.98	1.08	1.19
2.500	1.30	1.13	1.04	1.20	1.33	1.37	1.22	1.19	1.27	1.37
1.500	1.54	1.38	1.29	1.48	1.63	1.61	1.41	1.36	1.50	1.56
0.500	1.77	1.59	1.52	1.81	**2.00**	1.86	1.67	1.55	1.67	1.78
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
1.20	0.71	2.00	0.592	0.354

Luminance with new lamp [cd/m²]

5.500	1.02	0.91	0.90	0.95	0.99	1.00	0.93	**0.88**	0.93	1.03
4.500	1.26	1.10	1.00	1.07	1.17	1.20	1.10	1.03	1.17	1.29
3.500	1.43	1.24	1.12	1.25	1.38	1.46	1.29	1.23	1.35	1.48
2.500	1.63	1.41	1.30	1.49	1.67	1.72	1.52	1.48	1.58	1.71
1.500	1.93	1.72	1.61	1.84	2.04	2.02	1.76	1.69	1.87	1.96
0.500	2.22	1.99	1.90	2.26	**2.50**	2.33	2.09	1.93	2.09	2.23
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
1.49	0.88	2.50	0.592	0.354

Observer 2

Luminance with dry roadway [cd/m²]

5.500	0.85	0.77	0.76	0.80	0.82	0.84	0.79	**0.74**	0.78	0.85
4.500	1.06	0.94	0.86	0.94	1.01	1.04	0.94	0.88	0.97	1.07
3.500	1.23	1.08	1.00	1.11	1.24	1.27	1.11	1.07	1.16	1.26
2.500	1.45	1.31	1.23	1.35	1.52	1.51	1.33	1.27	1.36	1.46
1.500	1.75	1.58	1.51	1.74	1.87	1.78	1.57	1.49	1.65	1.71
0.500	1.86	1.71	1.65	1.98	**2.15**	1.98	1.77	1.63	1.74	1.87
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
1.30	0.74	2.15	0.567	0.343

Luminance with new lamp [cd/m²]

5.500	1.06	0.96	0.95	1.00	1.03	1.05	0.99	**0.92**	0.97	1.07
4.500	1.33	1.17	1.08	1.18	1.26	1.30	1.17	1.10	1.22	1.34
3.500	1.54	1.35	1.25	1.39	1.55	1.59	1.39	1.34	1.45	1.58
2.500	1.82	1.64	1.54	1.69	1.90	1.89	1.66	1.59	1.70	1.82
1.500	2.19	1.98	1.89	2.17	2.34	2.22	1.97	1.86	2.06	2.14
0.500	2.33	2.13	2.06	2.47	**2.69**	2.47	2.21	2.03	2.18	2.34
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

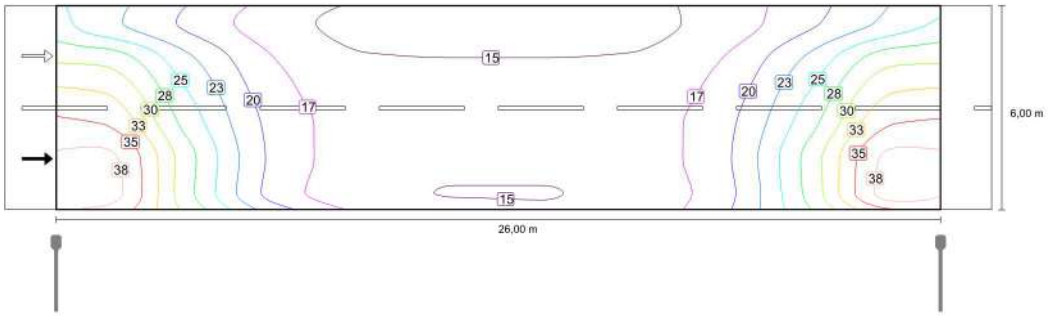
Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
1.63	0.92	2.69	0.567	0.343

Roadway 1 (M4)

Maintenance factor: 0.80
Grid: 10 x 6 Points

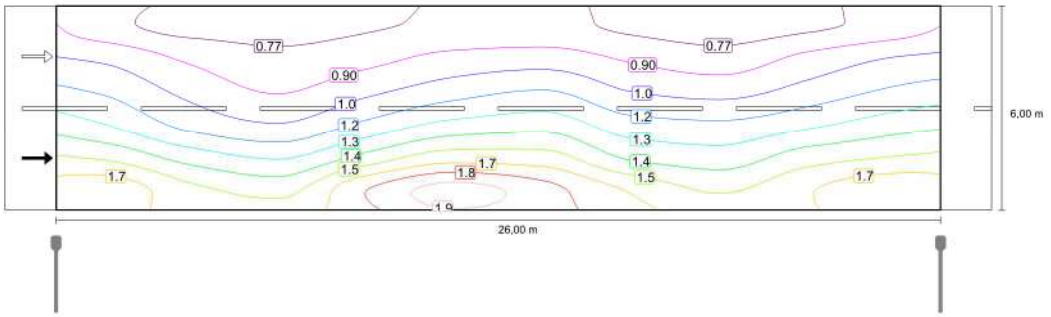
Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	Ul ≥ 0.60	TI [%] ≤ 15	EIR ≥ 0.30
✓ 1.20	✓ 0.57	✓ 0.79	✓ 8	✓ 0.62

Horizontal illuminance

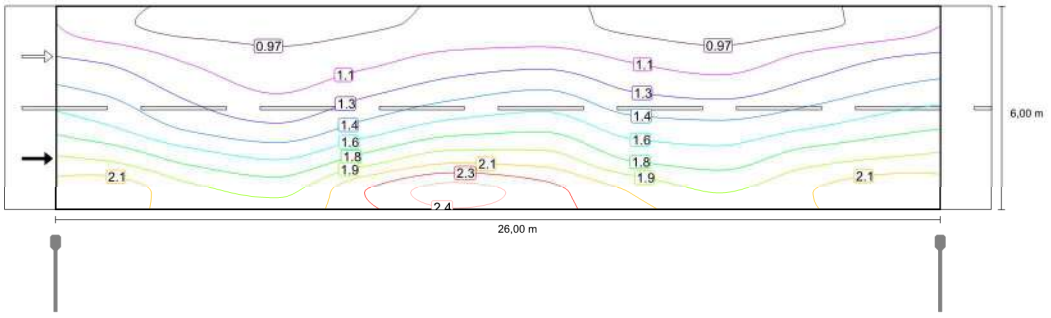


Observer 1

Luminance with dry roadway

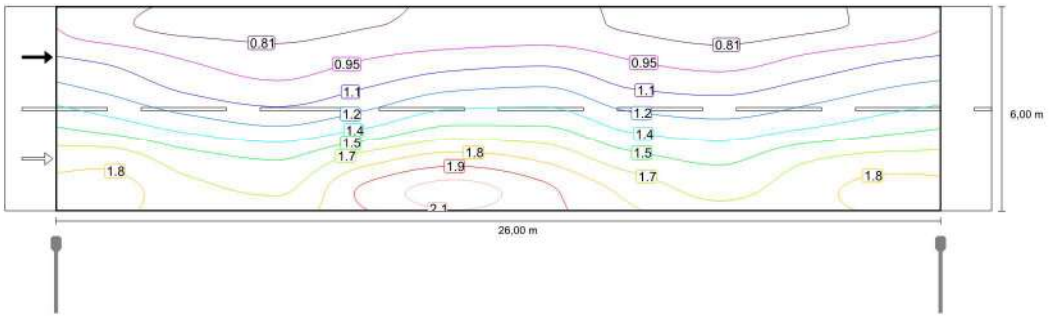


Luminance with new lamp

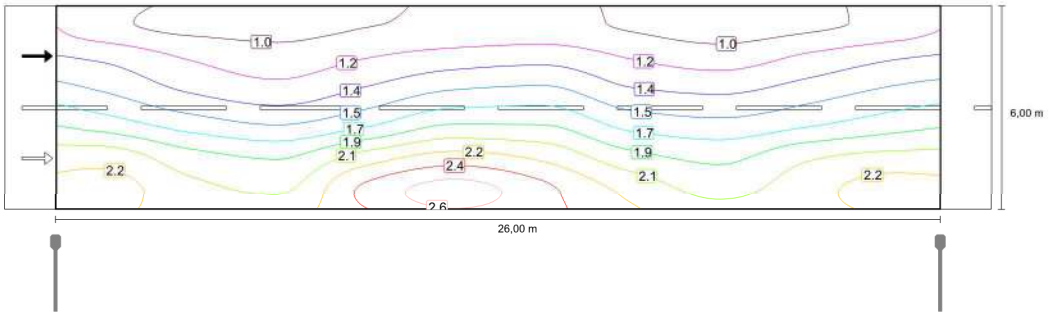


Observer 2

Luminance with dry roadway



Luminance with new lamp

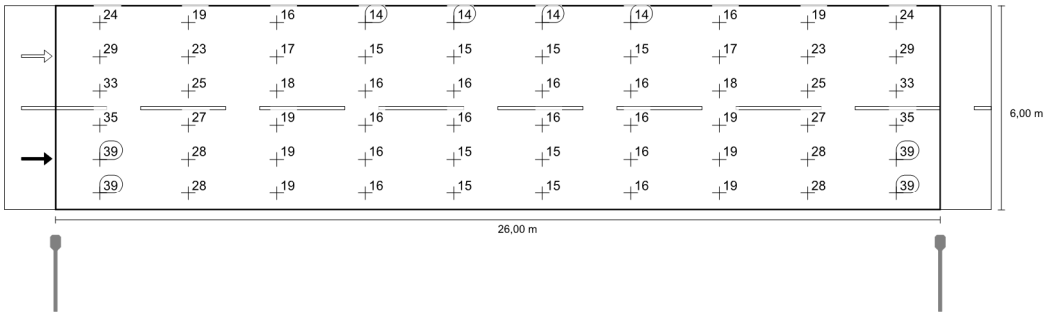


Roadway 1 (M4)

Maintenance factor: 0.80
Grid: 10 x 6 Points

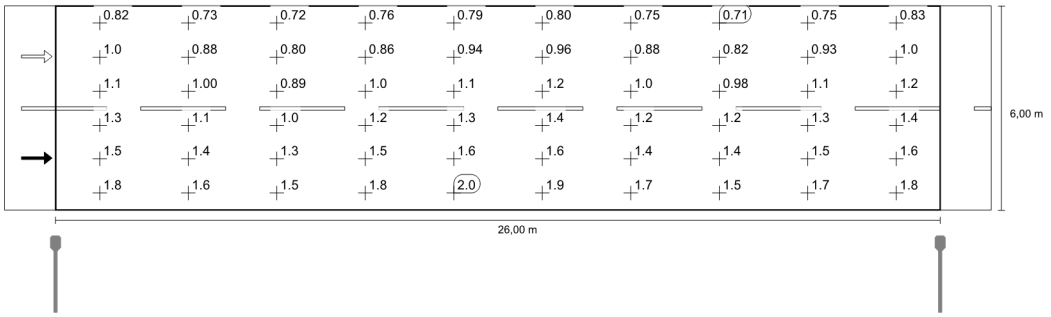
Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	Ul ≥ 0.60	TI [%] ≤ 15	EIR ≥ 0.30
✓ 1.20	✓ 0.57	✓ 0.79	✓ 8	✓ 0.62

Horizontal illuminance

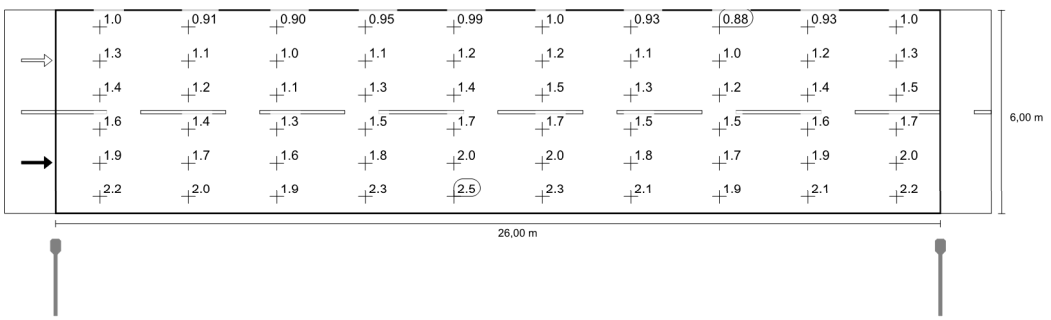


Observer 1

Luminance with dry roadway

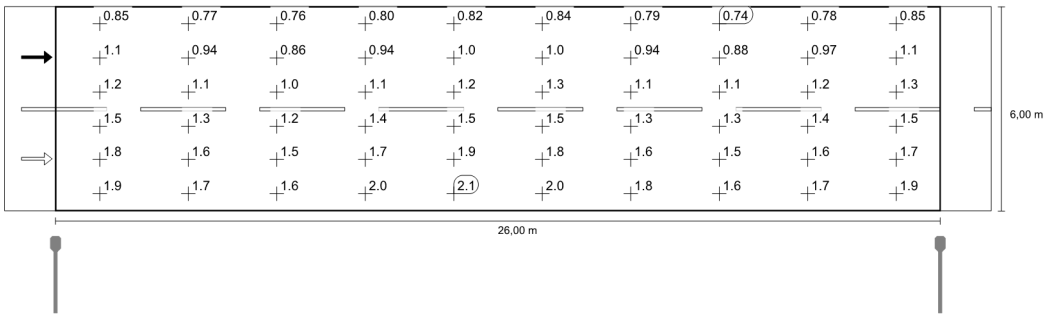


Luminance with new lamp

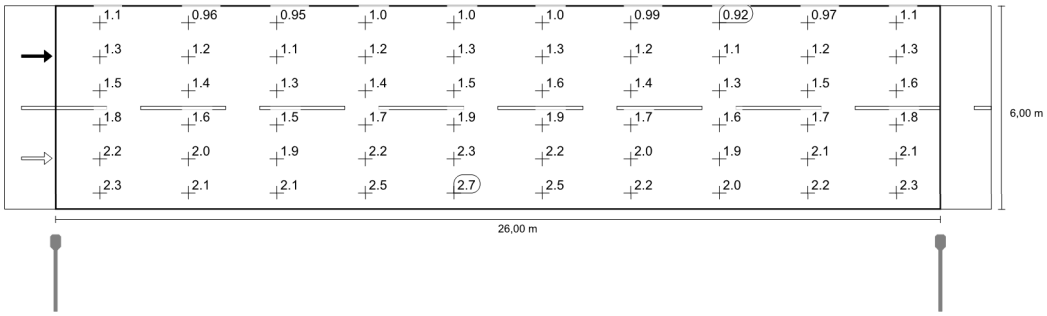


Observer 2

Luminance with dry roadway



Luminance with new lamp



Date:
01.06.2018

PG48_14_06_2018_Municipality MONTECORICE_Q7

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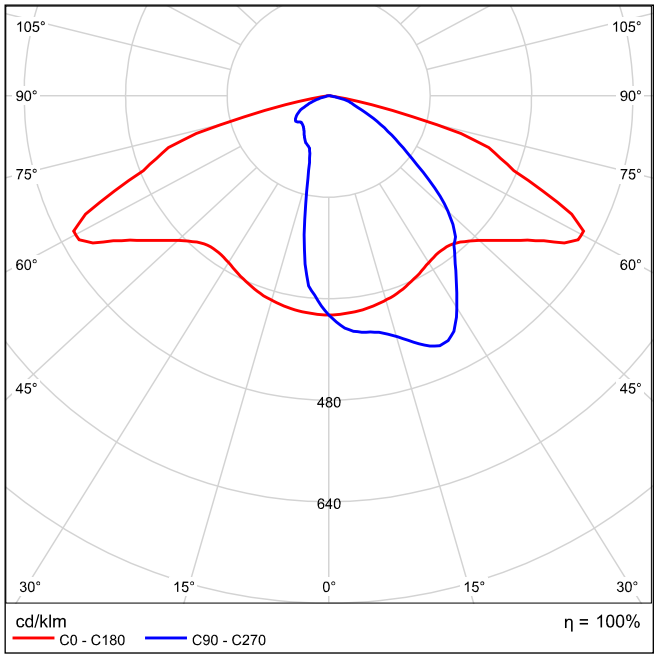
LUG LIGHT FACTORY 130222.5L132.031 3932_3_2 URBINO 16 LED 740 O4 1xLED 4000K

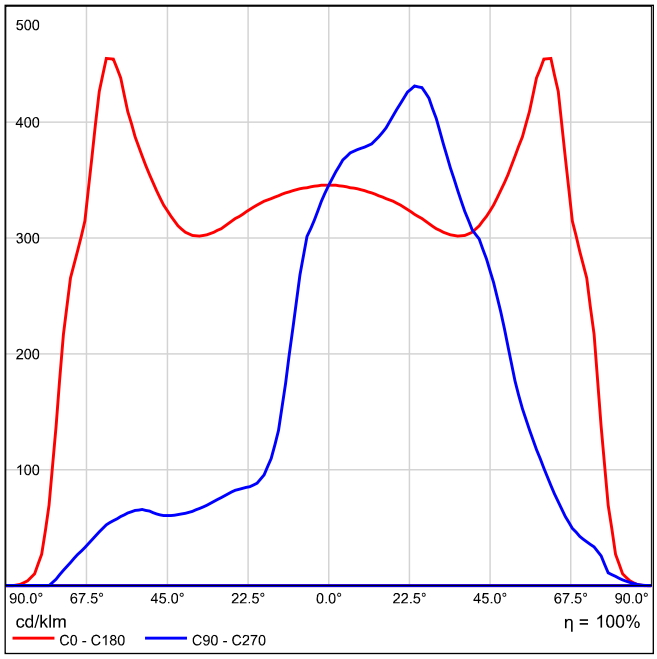
See our luminaire catalog for an image of the luminaire.

Light output ratio: 100%
Luminaire luminous flux: 3750 lm
Power: 39.0 W
Luminous efficacy: 96.2 lm/W

Luminous emittance 1 / Polar LDC

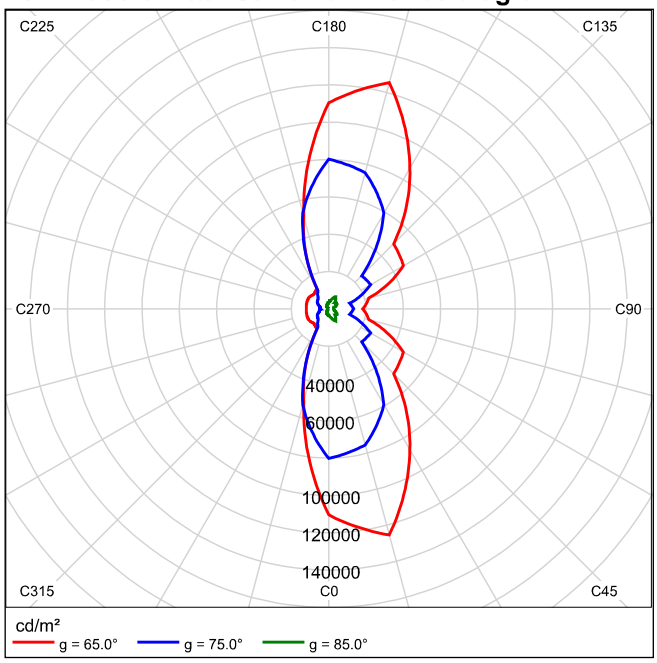


Luminous emittance 1 / Linear LDC



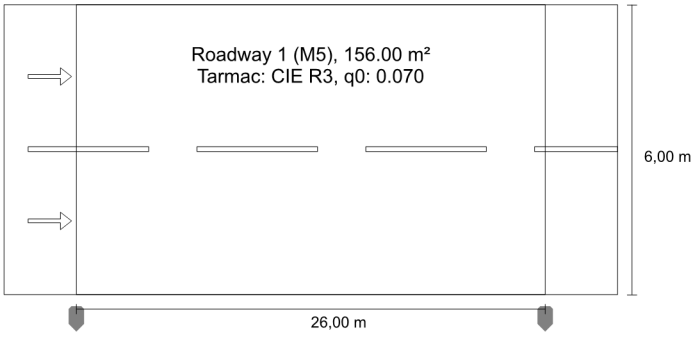
It is not possible to generate a cone diagram, as the light distribution is asymmetrical.

Luminous emittance 1 / Luminance diagram



It is not possible to generate a UGR diagram, as the light distribution is asymmetrical.

Quadro 7 - L1-54 - L1-55 height 8m/width 6m according to EN 13201:2015



Results for valuation fields
Maintenance factor: 0.80

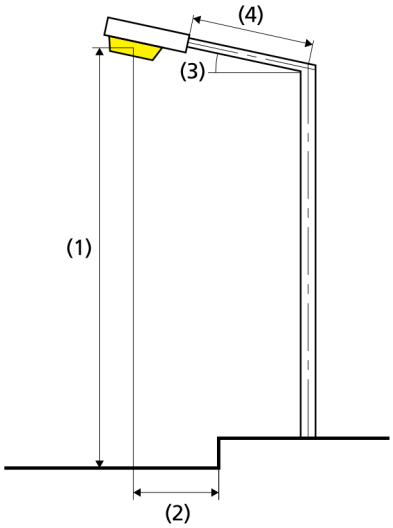
Roadway 1 (M5)

Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.51	✓ 0.56	✓ 0.76	✓ 6	✓ 0.59

Results for energy efficiency indicators

Power density indicator (Dp)	0.028 W/lxm²
Energy consumption density	
Arrangement: 3932_3_2 URBINO 16 LED 740 O4 (156.0 kWh/yr)	1.0 kWh/m² yr

LUG LIGHT FACTORY 130222.5L132.031 3932_3_2 URBINO 16 LED 740 O4



Lamp:	1xLED 4000K
Luminous flux (luminaire):	3750.00 lm
Luminous flux (lamp):	3750.00 lm
Operating Hours	
4000 h:	100.0 %, 39.0 W
W/km:	1482.0
Arrangement:	single side bottom
Pole distance:	26.000 m
Boom inclination (3):	5.0°
Boom length (4):	0.000 m
Light centre height (1):	8.000 m
Light overhang (2):	-0.500 m

ULR:	0.00
ULOR:	0.00
Maximum luminous intensities	
at 70°:	359 cd/klm
at 80°:	83.8 cd/klm
at 90°:	2.65 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.3

Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 10 x 6 Points

Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✔ 0.51	✔ 0.56	✔ 0.76	✔ 6	✔ 0.59

Assigned Observer (2):

Observer	Position [m]	Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15
Observer 1	(-60.000, 1.500, 1.500)	0.51	0.57	0.76	6
Observer 2	(-60.000, 4.500, 1.500)	0.55	0.56	0.79	4

Roadway 1 (M5)

Horizontal illuminance [lx]

5.500	9.41	7.90	6.58	5.91	**5.41**	**5.41**	5.91	6.58	7.90	9.41
4.500	12.2	9.53	7.24	6.28	6.04	6.04	6.28	7.24	9.53	12.2
3.500	14.1	10.6	7.66	6.52	6.45	6.45	6.52	7.66	10.6	14.1
2.500	15.0	11.1	7.88	6.66	6.42	6.42	6.66	7.88	11.1	15.0
1.500	16.0	11.7	7.89	6.53	6.25	6.25	6.53	7.89	11.7	16.0
0.500	**16.2**	11.6	7.65	6.29	6.01	6.01	6.29	7.65	11.6	**16.2**
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

Em [lx]	Emin [lx]	Emax [lx]	g1	g2
8.84	5.41	16.2	0.613	0.334

Observer 1

Luminance with dry roadway [cd/m²]

5.500	0.33	0.30	**0.29**	0.31	0.32	0.33	0.33	**0.29**	0.31	0.33
4.500	0.42	0.36	0.33	0.36	0.39	0.41	0.38	0.35	0.39	0.43
3.500	0.49	0.42	0.38	0.42	0.48	0.52	0.45	0.44	0.47	0.51
2.500	0.56	0.49	0.44	0.51	0.59	0.61	0.53	0.51	0.54	0.58
1.500	0.65	0.58	0.55	0.65	0.72	0.71	0.63	0.58	0.64	0.67
0.500	0.74	0.67	0.65	0.76	**0.85**	0.80	0.72	0.65	0.70	0.75
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.51	0.29	0.85	0.569	0.341

Luminance with new lamp [cd/m²]

5.500	0.41	0.37	**0.36**	0.39	0.39	0.41	0.41	0.37	0.39	0.41
4.500	0.52	0.45	0.41	0.45	0.48	0.52	0.48	0.44	0.49	0.54
3.500	0.61	0.53	0.47	0.53	0.60	0.65	0.56	0.55	0.58	0.64
2.500	0.70	0.61	0.55	0.64	0.74	0.76	0.67	0.64	0.68	0.73
1.500	0.82	0.73	0.69	0.81	0.91	0.89	0.79	0.73	0.79	0.83
0.500	0.93	0.84	0.81	0.95	**1.06**	1.00	0.90	0.82	0.87	0.93
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.64	0.36	1.06	0.569	0.341

Observer 2

Luminance with dry roadway [cd/m²]

5.500	0.34	**0.31**	**0.31**	0.33	0.33	0.35	0.34	**0.31**	0.32	0.34
4.500	0.44	0.39	0.36	0.40	0.42	0.45	0.41	0.38	0.41	0.45
3.500	0.53	0.46	0.42	0.48	0.54	0.57	0.49	0.47	0.49	0.55
2.500	0.62	0.56	0.53	0.60	0.67	0.68	0.59	0.55	0.59	0.62
1.500	0.74	0.67	0.64	0.74	0.82	0.78	0.69	0.63	0.69	0.73
0.500	0.74	0.67	0.65	0.78	**0.88**	0.82	0.73	0.66	0.71	0.76
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.55	0.31	0.88	0.564	0.353

Luminance with new lamp [cd/m²]

5.500	0.42	**0.39**	**0.39**	0.41	0.42	0.44	0.43	**0.39**	0.40	0.43
4.500	0.55	0.49	0.44	0.50	0.53	0.56	0.51	0.48	0.52	0.56
3.500	0.67	0.58	0.53	0.60	0.67	0.71	0.61	0.59	0.62	0.68
2.500	0.78	0.70	0.66	0.75	0.83	0.85	0.73	0.69	0.73	0.77
1.500	0.92	0.84	0.80	0.93	1.02	0.98	0.86	0.79	0.86	0.91
0.500	0.92	0.84	0.82	0.98	**1.10**	1.03	0.91	0.83	0.88	0.95
m	**1.300**	**3.900**	**6.500**	**9.100**	**11.700**	**14.300**	**16.900**	**19.500**	**22.100**	**24.700**

Grid: 10 x 6 Points

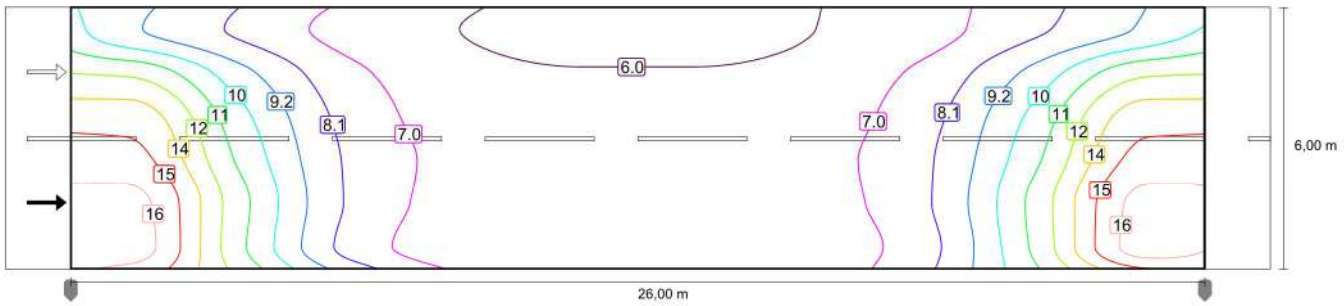
Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.69	0.39	1.10	0.564	0.353

Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 10 x 6 Points

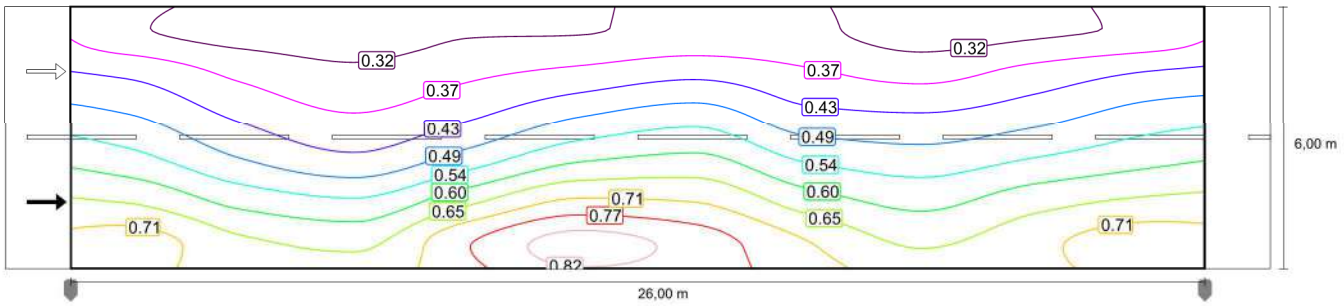
Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	UI ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.51	✓ 0.56	✓ 0.76	✓ 6	✓ 0.59

Horizontal illuminance

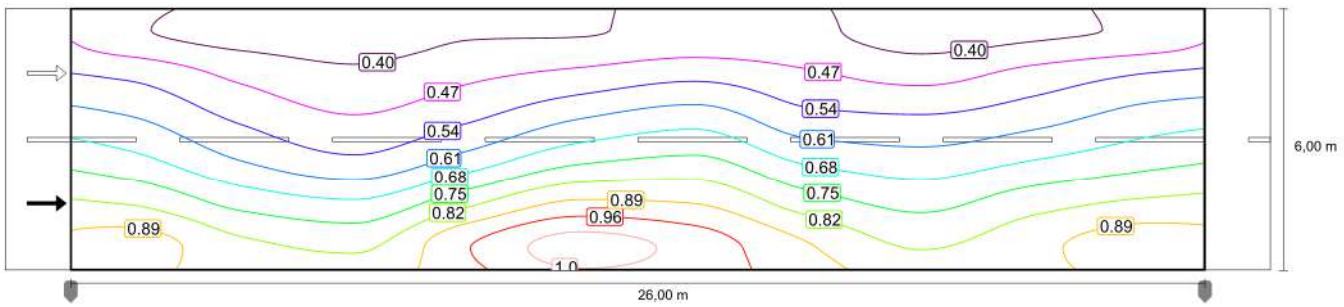


Observer 1

Luminance with dry roadway

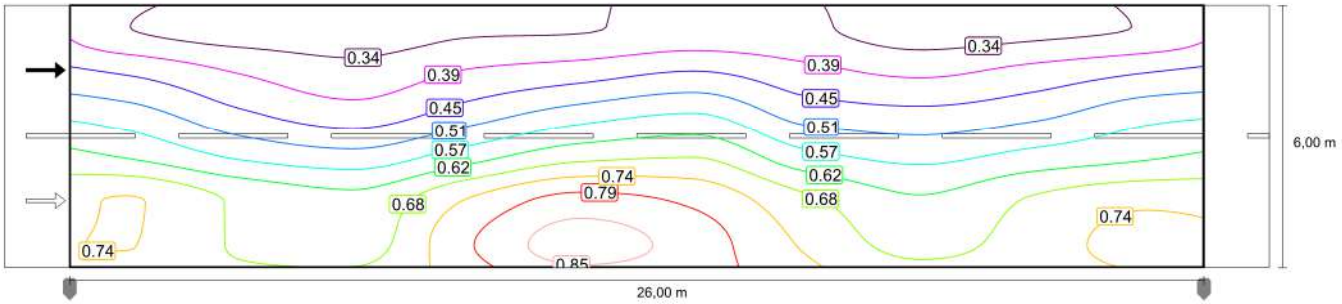


Luminance with new lamp

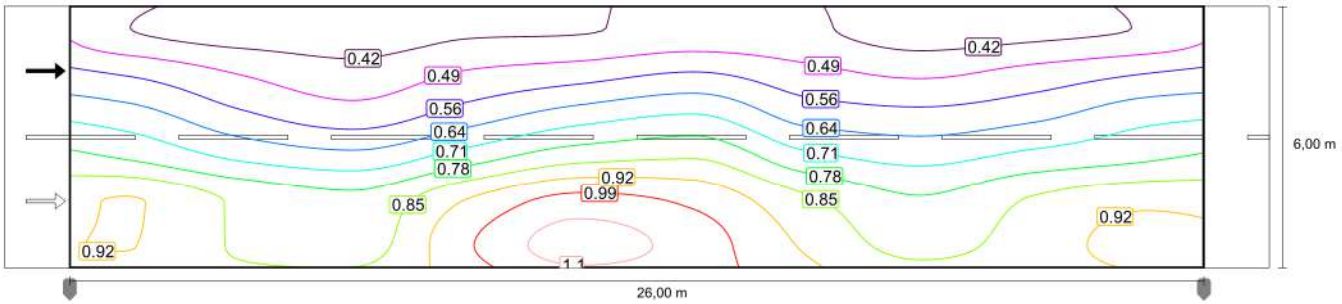


Observer 2

Luminance with dry roadway



Luminance with new lamp

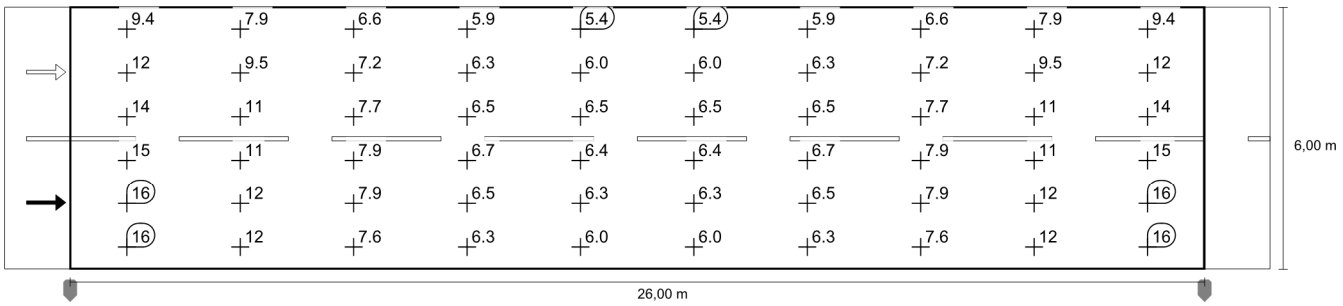


Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 10 x 6 Points

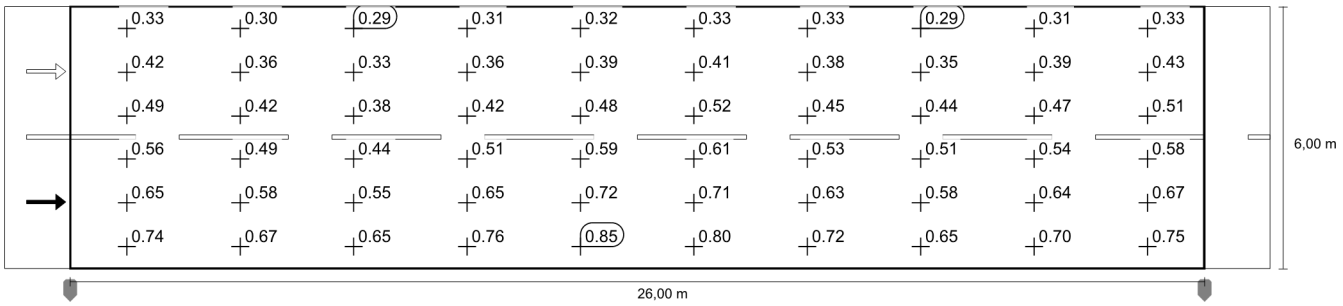
Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.51	✓ 0.56	✓ 0.76	✓ 6	✓ 0.59

Horizontal illuminance

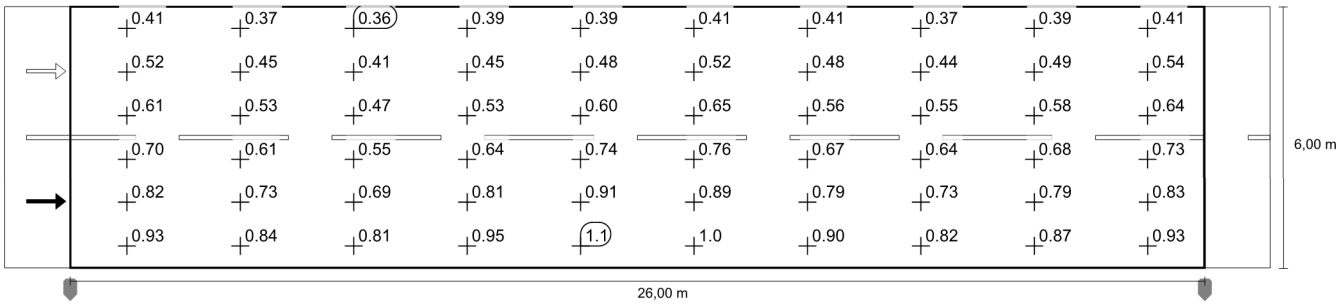


Observer 1

Luminance with dry roadway

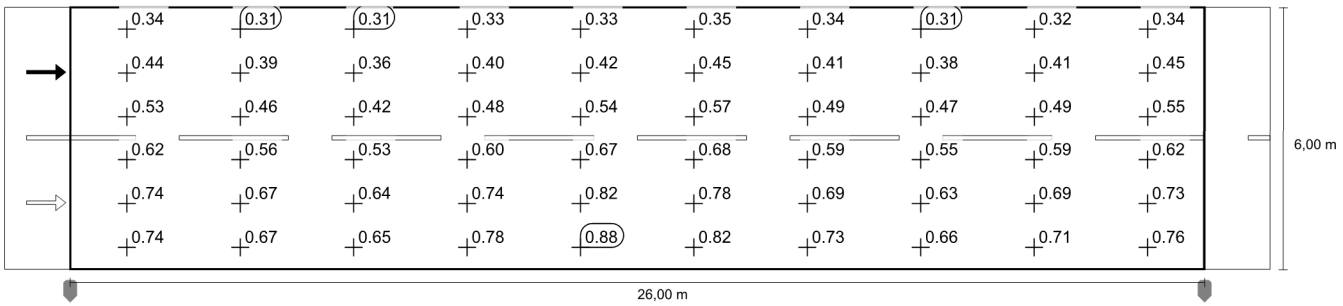


Luminance with new lamp

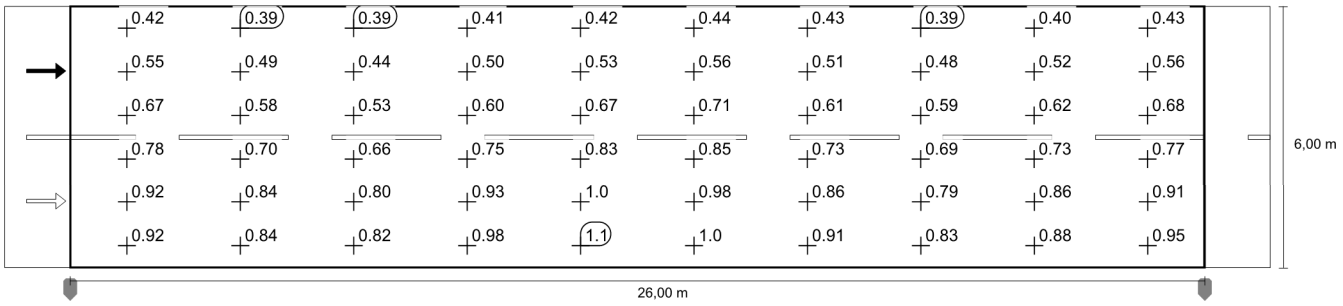


Observer 2

Luminance with dry roadway



Luminance with new lamp



Date:
01.06.2018

PG48_14_06_2018_Municipality MONTECORICE_Q10

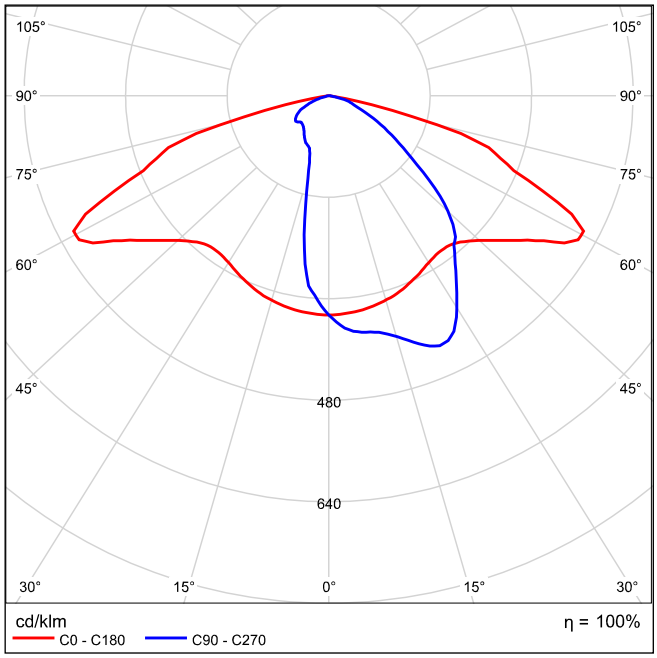
Table of contents

LUG LIGHT FACTORY 130222.5L132.031 3932_3_2 URBINO 16 LED 740 O4 1xLED 4000K

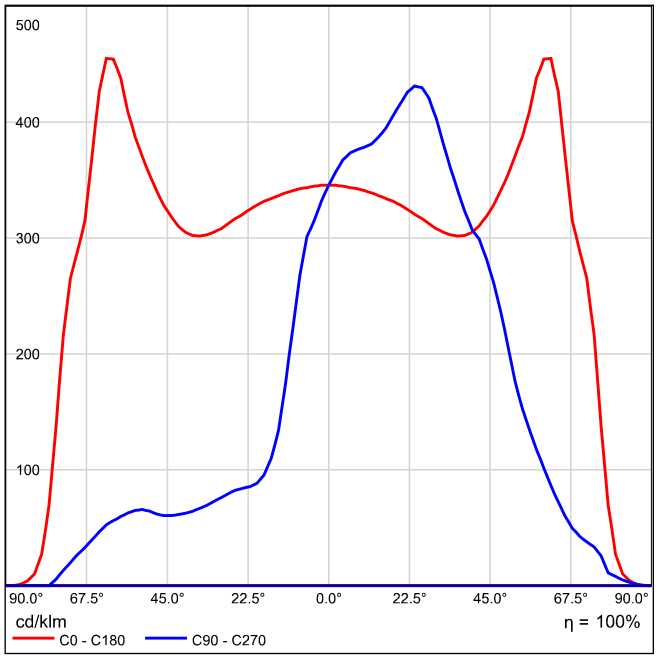
See our luminaire catalog for an image of the luminaire.

Light output ratio: 100%
Luminaire luminous flux: 3750 lm
Power: 39.0 W
Luminous efficacy: 96.2 lm/W

Luminous emittance 1 / Polar LDC

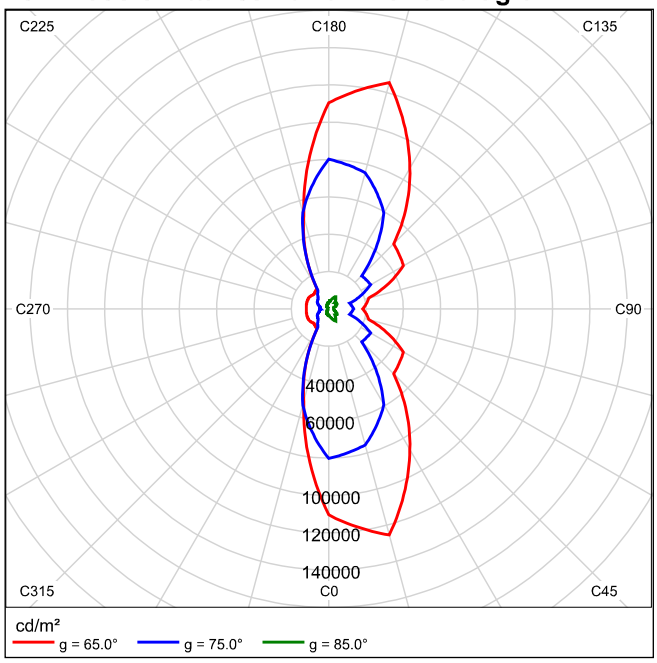


Luminous emittance 1 / Linear LDC



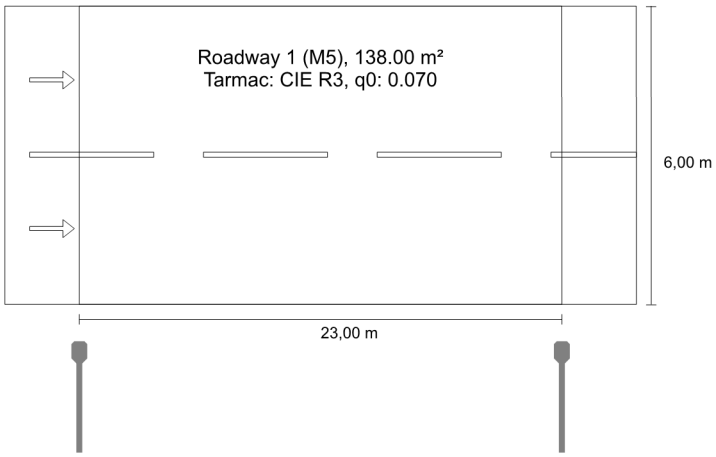
It is not possible to generate a cone diagram, as the light distribution is asymmetrical.

Luminous emittance 1 / Luminance diagram

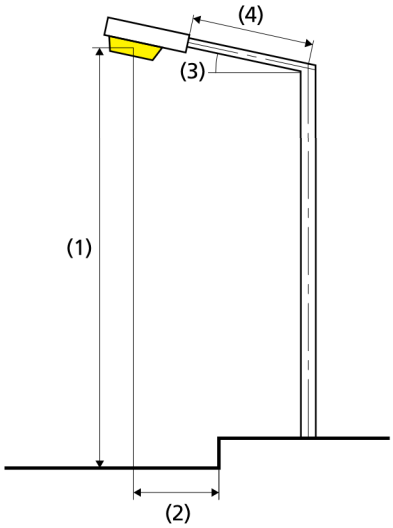


It is not possible to generate a UGR diagram, as the light distribution is asymmetrical.

Quadro 10 - L1-22 - L1-23 height 7m/width 6m according to EN 13201:2015



LUG LIGHT FACTORY 130222.5L132.031 3932_3_2 URBINO 16 LED 740 O4



Results for valuation fields
Maintenance factor: 0.80

Roadway 1 (M5)

Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	UI ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.53	✓ 0.58	✓ 0.83	✓ 6	✓ 0.62

Results for energy efficiency indicators

Power density indicator (Dp)	0.030 W/lxm²
Energy consumption density	
Arrangement: 3932_3_2 URBINO 16 LED 740 O4 (156.0 kWh/yr)	1.1 kWh/m² yr

Lamp:	1xLED 4000K
Luminous flux (luminaire):	3750.00 lm
Luminous flux (lamp):	3750.00 lm
Operating Hours	
4000 h:	100.0 %, 39.0 W
W/km:	1677.0
Arrangement:	single side bottom
Pole distance:	23.000 m
Boom inclination (3):	10.0°
Boom length (4):	2.000 m
Light centre height (1):	8.000 m
Light overhang (2):	-1.000 m

ULR:	0.00
ULOR:	0.00
Maximum luminous intensities	
at 70°:	403 cd/klm
at 80°:	134 cd/klm
at 90°:	15.6 cd/klm
Luminous intensity class:	G*2

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

Arrangement complies with glare index class D.1

Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 10 x 6 Points

Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.53	✓ 0.58	✓ 0.83	✓ 6	✓ 0.62

Assigned Observer (2):

Observer	Position [m]	Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15
Observer 1	(-60.000, 1.500, 1.500)	0.53	0.60	0.86	6
Observer 2	(-60.000, 4.500, 1.500)	0.58	0.58	0.83	4

Roadway 1 (M5)

Horizontal illuminance [lx]

5.500	9.78	8.50	7.29	6.55	**6.50**	**6.50**	6.55	7.29	8.50	9.78
4.500	12.0	9.96	8.00	7.18	7.00	7.00	7.18	8.00	9.96	12.0
3.500	13.4	11.0	8.55	7.51	7.37	7.37	7.51	8.55	11.0	13.4
2.500	14.5	11.7	8.96	7.74	7.39	7.39	7.74	8.96	11.7	14.5
1.500	15.7	12.5	9.14	7.71	7.27	7.27	7.71	9.14	12.5	15.7
0.500	**15.9**	12.4	8.99	7.56	7.07	7.07	7.56	8.99	12.4	**15.9**
m	**1.150**	**3.450**	**5.750**	**8.050**	**10.350**	**12.650**	**14.950**	**17.250**	**19.550**	**21.850**

Grid: 10 x 6 Points

Em [lx]	Emin [lx]	Emax [lx]	g1	g2
9.50	6.50	15.9	0.684	0.408

Observer 1

Luminance with dry roadway [cd/m²]

5.500	0.36	0.35	0.34	0.34	0.35	0.34	**0.32**	**0.32**	0.33	0.36
4.500	0.44	0.41	0.38	0.39	0.41	0.40	0.38	0.36	0.41	0.44
3.500	0.50	0.47	0.45	0.46	0.49	0.48	0.45	0.44	0.48	0.51
2.500	0.56	0.54	0.53	0.55	0.59	0.56	0.53	0.54	0.56	0.58
1.500	0.68	0.66	0.64	0.67	0.70	0.65	0.60	0.63	0.67	0.68
0.500	0.78	0.75	0.77	**0.83**	0.82	0.77	0.72	0.72	0.75	0.78
m	**1.150**	**3.450**	**5.750**	**8.050**	**10.350**	**12.650**	**14.950**	**17.250**	**19.550**	**21.850**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.53	0.32	0.83	0.597	0.383

Luminance with new lamp [cd/m²]

5.500	0.45	0.43	0.42	0.42	0.44	0.43	**0.40**	**0.40**	0.42	0.45
4.500	0.55	0.51	0.47	0.49	0.51	0.50	0.48	0.46	0.51	0.55
3.500	0.63	0.58	0.56	0.57	0.62	0.60	0.56	0.55	0.60	0.64
2.500	0.70	0.67	0.66	0.69	0.73	0.70	0.66	0.68	0.70	0.73
1.500	0.85	0.82	0.80	0.84	0.87	0.81	0.75	0.78	0.83	0.85
0.500	0.98	0.94	0.96	**1.04**	1.03	0.96	0.91	0.90	0.94	0.98
m	**1.150**	**3.450**	**5.750**	**8.050**	**10.350**	**12.650**	**14.950**	**17.250**	**19.550**	**21.850**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.67	0.40	1.04	0.597	0.383

Observer 2

Luminance with dry roadway [cd/m²]

5.500	0.38	0.36	0.35	0.35	0.37	0.36	0.34	**0.33**	0.35	0.37
4.500	0.47	0.44	0.41	0.42	0.44	0.43	0.41	0.39	0.43	0.46
3.500	0.54	0.52	0.50	0.51	0.55	0.53	0.49	0.48	0.51	0.53
2.500	0.64	0.62	0.60	0.63	0.66	0.62	0.57	0.59	0.61	0.63
1.500	0.77	0.75	0.75	0.78	0.79	0.73	0.67	0.70	0.74	0.75
0.500	0.82	0.80	0.83	**0.90**	0.87	0.82	0.76	0.75	0.79	0.83
m	**1.150**	**3.450**	**5.750**	**8.050**	**10.350**	**12.650**	**14.950**	**17.250**	**19.550**	**21.850**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.58	0.33	0.90	0.575	0.372

Luminance with new lamp [cd/m²]

5.500	0.47	0.45	0.44	0.44	0.46	0.45	0.43	**0.42**	0.43	0.46
4.500	0.58	0.55	0.52	0.53	0.56	0.54	0.51	0.48	0.54	0.58
3.500	0.67	0.64	0.62	0.64	0.68	0.66	0.61	0.60	0.64	0.67
2.500	0.81	0.78	0.75	0.79	0.83	0.77	0.72	0.73	0.76	0.79
1.500	0.96	0.94	0.94	0.98	0.98	0.92	0.84	0.87	0.92	0.93
0.500	1.03	1.00	1.04	**1.12**	1.09	1.03	0.95	0.94	0.99	1.03
m	**1.150**	**3.450**	**5.750**	**8.050**	**10.350**	**12.650**	**14.950**	**17.250**	**19.550**	**21.850**

Grid: 10 x 6 Points

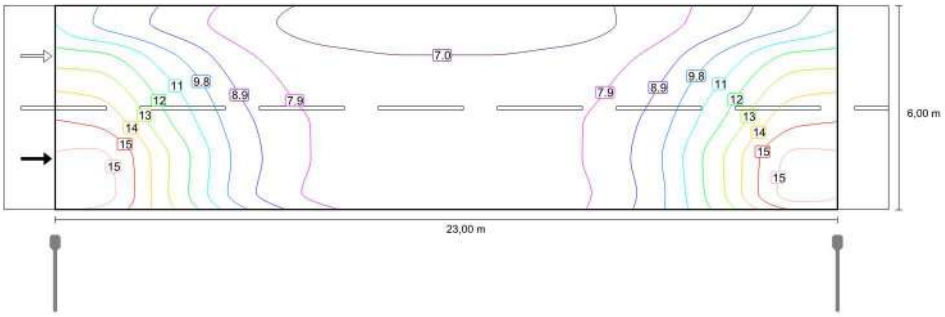
Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.73	0.42	1.12	0.575	0.372

Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 10 x 6 Points

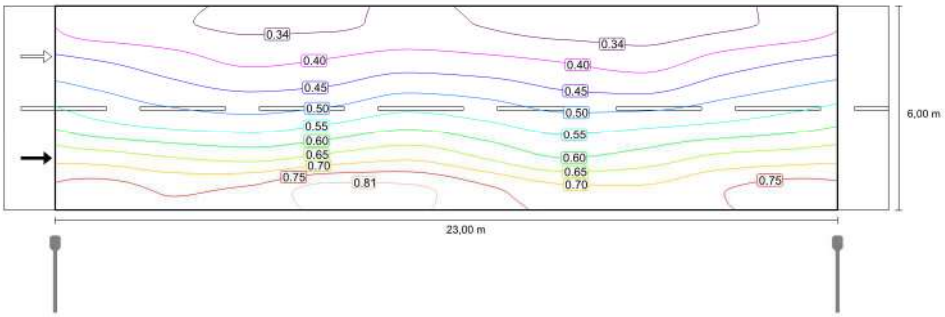
Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.53	✓ 0.58	✓ 0.83	✓ 6	✓ 0.62

Horizontal illuminance

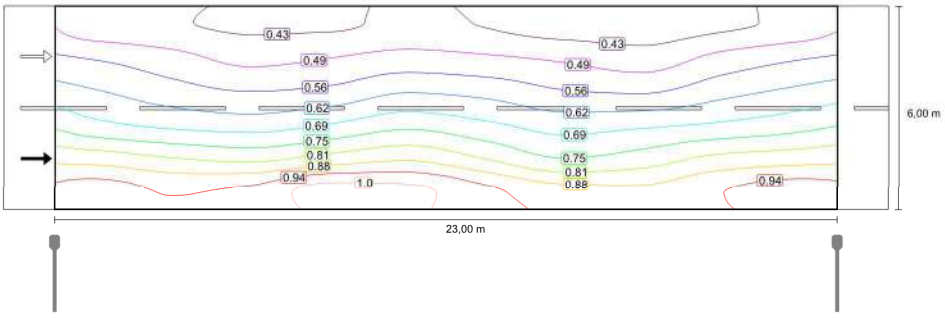


Observer 1

Luminance with dry roadway

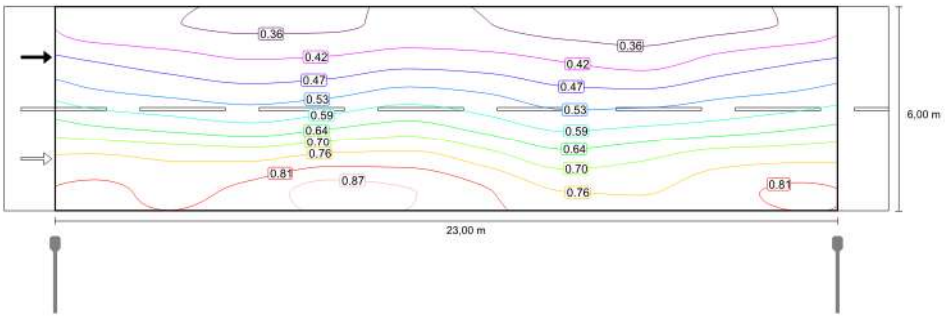


Luminance with new lamp

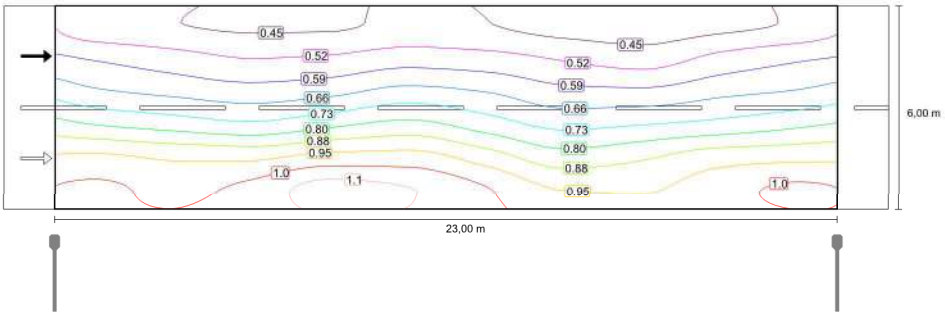


Observer 2

Luminance with dry roadway



Luminance with new lamp

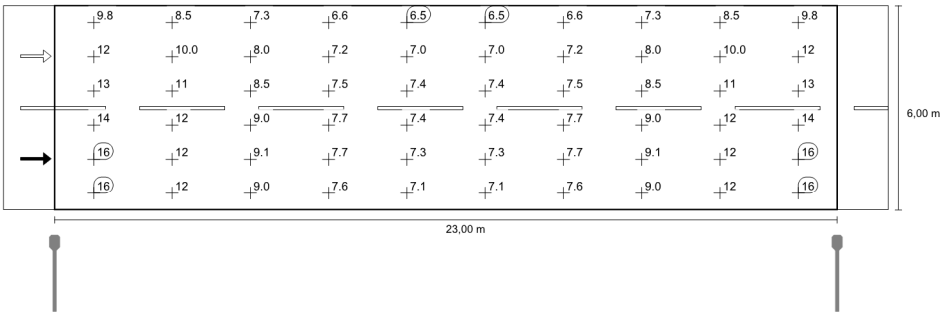


Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 10 x 6 Points

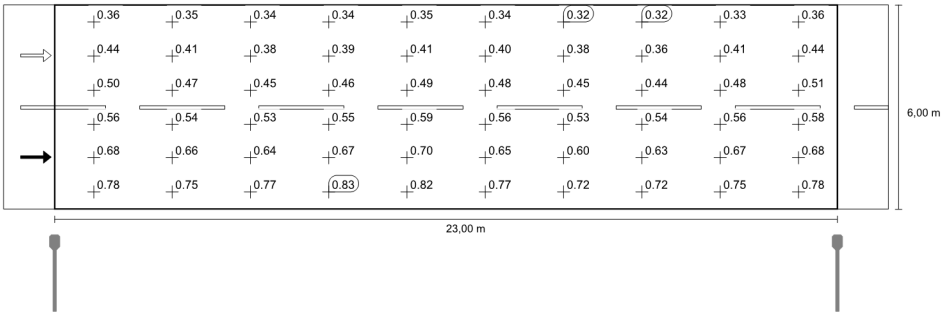
Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	UI ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✔ 0.53	✔ 0.58	✔ 0.83	✔ 6	✔ 0.62

Horizontal illuminance

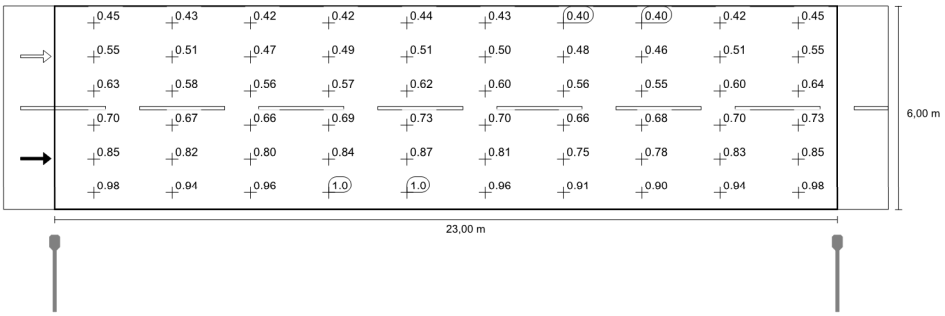


Observer 1

Luminance with dry roadway

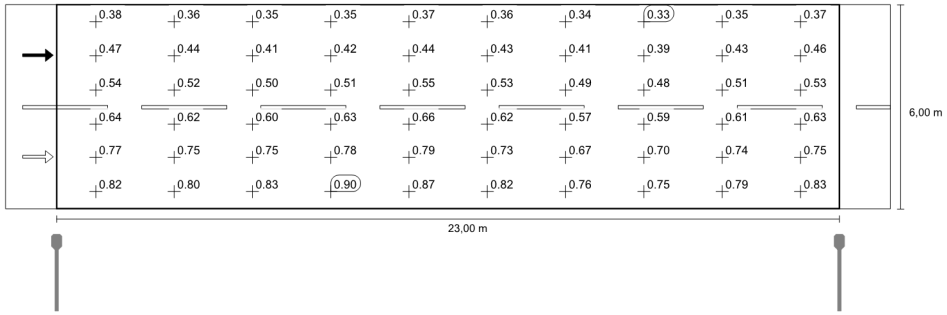


Luminance with new lamp

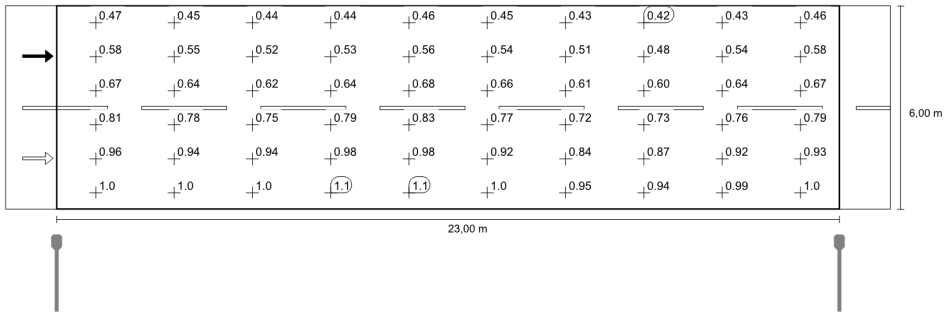


Observer 2

Luminance with dry roadway



Luminance with new lamp



Date:
01.06.2018

PG48_14_06_2018_Municipality MONTECORICE_Q12

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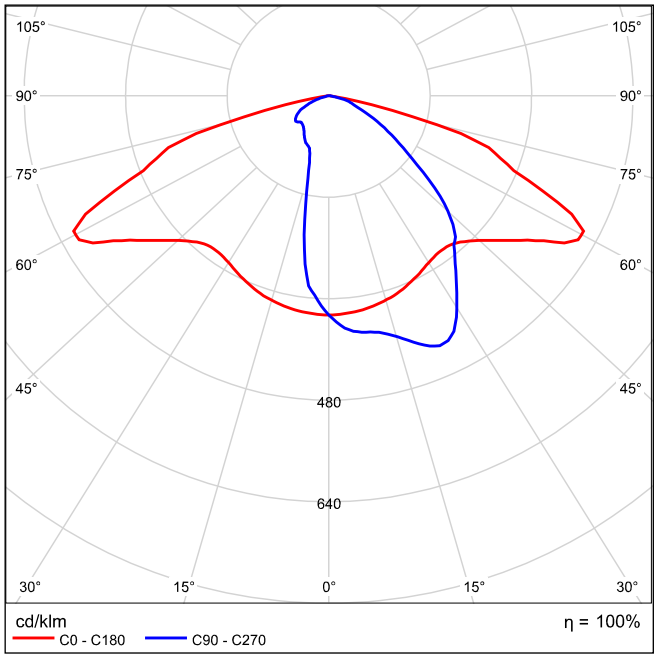
LUG LIGHT FACTORY 130222.5L132.031 3932_3_2 URBINO 16 LED 740 O4 1xLED 4000K

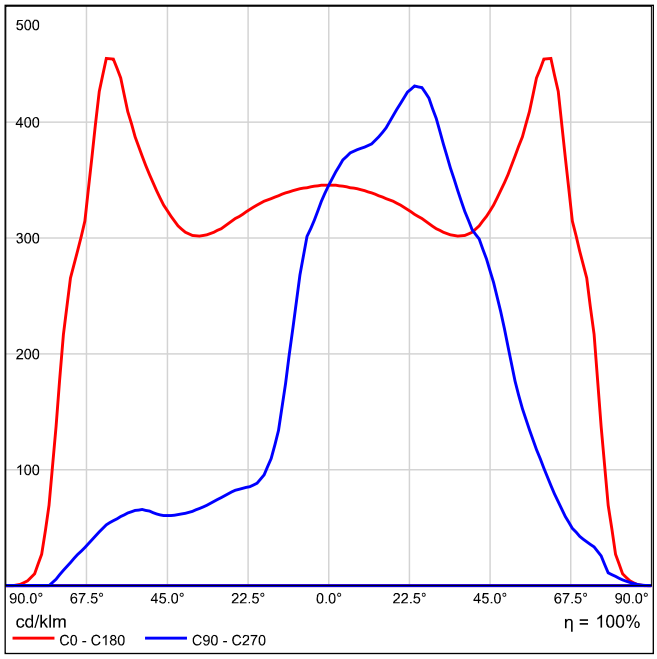
See our luminaire catalog for an image of the luminaire.

Light output ratio: 100%
Luminaire luminous flux: 3750 lm
Power: 39.0 W
Luminous efficacy: 96.2 lm/W

Luminous emittance 1 / Polar LDC

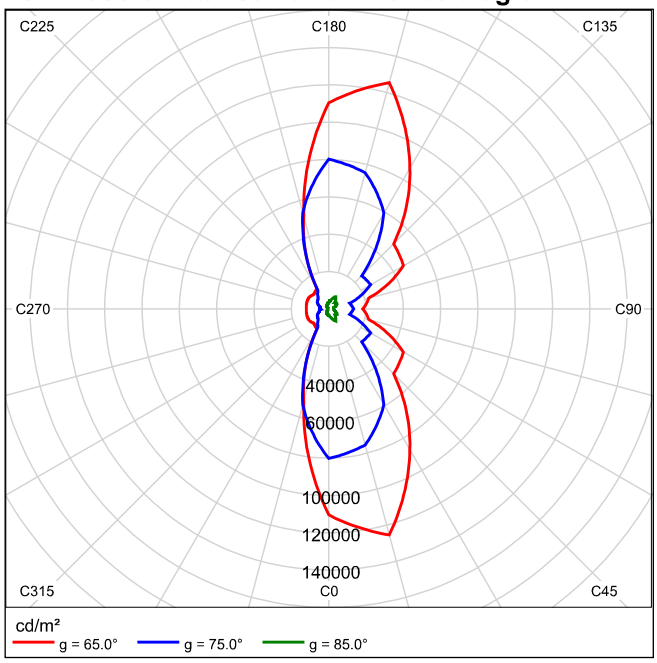


Luminous emittance 1 / Linear LDC



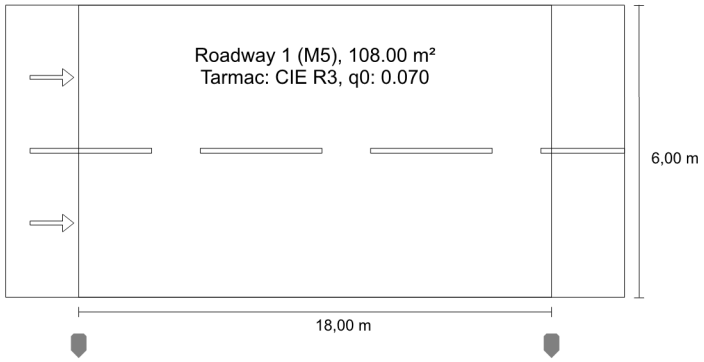
It is not possible to generate a cone diagram, as the light distribution is asymmetrical.

Luminous emittance 1 / Luminance diagram

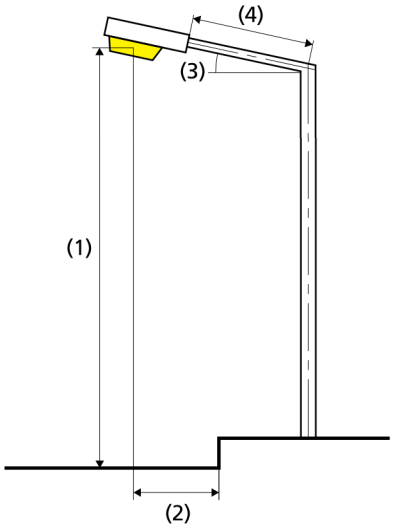


It is not possible to generate a UGR diagram, as the light distribution is asymmetrical.

Quadro 12 - L1-13 - L1-14 height 7m/width 6m according to EN 13201:2015



LUG LIGHT FACTORY 130222.5L132.031 3932_3_2 URBINO 16 LED 740 O4



Results for valuation fields

Maintenance factor: 0.80

Roadway 1 (M5)

Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.72	✓ 0.52	✓ 0.85	✓ 6	✓ 0.55

Results for energy efficiency indicators

Power density indicator (Dp)	0.027 W/lxm²
Energy consumption density	
Arrangement: 3932_3_2 URBINO 16 LED 740 O4 (156.0 kWh/yr)	1.4 kWh/m² yr

Lamp:	1xLED 4000K
Luminous flux (luminaire):	3750.00 lm
Luminous flux (lamp):	3750.00 lm
Operating Hours	
4000 h:	100.0 %, 39.0 W
W/km:	2184.0
Arrangement:	single side bottom
Pole distance:	18.000 m
Boom inclination (3):	10.0°
Boom length (4):	0.000 m
Light centre height (1):	7.000 m
Light overhang (2):	-1.000 m

ULR:	0.00
ULOR:	0.00
Maximum luminous intensities	
at 70°:	403 cd/klm
at 80°:	134 cd/klm
at 90°:	15.6 cd/klm
Luminous intensity class:	G*2

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

Arrangement complies with glare index class D.1

Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 10 x 6 Points

Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.72	✓ 0.52	✓ 0.85	✓ 6	✓ 0.55

Assigned Observer (2):

Observer	Position [m]	Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15
Observer 1	(-60.000, 1.500, 1.500)	0.72	0.54	0.88	6
Observer 2	(-60.000, 4.500, 1.500)	0.79	0.52	0.85	4

Roadway 1 (M5)

Horizontal illuminance [lx]

5.500	10.9	10.0	9.38	**8.92**	8.98	8.98	**8.92**	9.38	10.0	10.9
4.500	14.3	12.7	11.2	10.2	9.97	9.97	10.2	11.2	12.7	14.3
3.500	17.3	14.9	12.5	11.3	10.7	10.7	11.3	12.5	14.9	17.3
2.500	19.0	16.4	13.3	11.8	11.2	11.2	11.8	13.3	16.4	19.0
1.500	20.8	17.7	14.0	11.9	11.1	11.1	11.9	14.0	17.7	20.8
0.500	**21.8**	18.1	14.0	11.7	10.8	10.8	11.7	14.0	18.1	**21.8**
m	**0.900**	**2.700**	**4.500**	**6.300**	**8.100**	**9.900**	**11.700**	**13.500**	**15.300**	**17.100**

Grid: 10 x 6 Points

Em [lx]	Emin [lx]	Emax [lx]	g1	g2
13.2	8.92	21.8	0.674	0.409

Observer 1

Luminance with dry roadway [cd/m²]

5.500	0.44	0.42	0.43	0.44	0.45	0.42	0.40	0.40	**0.39**	0.43
4.500	0.57	0.55	0.51	0.52	0.53	0.51	0.48	0.49	0.52	0.56
3.500	0.69	0.67	0.61	0.62	0.63	0.60	0.59	0.59	0.64	0.68
2.500	0.79	0.79	0.75	0.75	0.77	0.72	0.71	0.72	0.75	0.79
1.500	0.96	0.96	0.92	0.93	0.90	0.86	0.84	0.90	0.92	0.95
0.500	1.15	1.17	**1.18**	1.15	1.09	1.05	1.01	1.04	1.09	1.12
m	**0.900**	**2.700**	**4.500**	**6.300**	**8.100**	**9.900**	**11.700**	**13.500**	**15.300**	**17.100**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.72	0.39	1.18	0.545	0.334

Luminance with new lamp [cd/m²]

5.500	0.55	0.53	0.53	0.55	0.56	0.53	0.50	0.50	**0.49**	0.53
4.500	0.71	0.69	0.64	0.65	0.66	0.64	0.60	0.61	0.65	0.70
3.500	0.86	0.84	0.77	0.78	0.79	0.76	0.74	0.74	0.80	0.85
2.500	0.99	0.99	0.93	0.94	0.96	0.91	0.88	0.90	0.94	0.99
1.500	1.20	1.20	1.15	1.17	1.13	1.07	1.05	1.13	1.15	1.18
0.500	1.43	1.47	**1.48**	1.44	1.36	1.31	1.26	1.30	1.36	1.39
m	**0.900**	**2.700**	**4.500**	**6.300**	**8.100**	**9.900**	**11.700**	**13.500**	**15.300**	**17.100**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.91	0.49	1.48	0.545	0.334

Observer 2

Luminance with dry roadway [cd/m²]

5.500	0.45	0.44	0.45	0.46	0.47	0.44	0.42	**0.41**	**0.41**	0.44
4.500	0.60	0.58	0.55	0.55	0.56	0.54	0.52	0.51	0.54	0.58
3.500	0.74	0.73	0.69	0.68	0.70	0.66	0.64	0.63	0.68	0.73
2.500	0.87	0.89	0.85	0.85	0.86	0.80	0.78	0.80	0.83	0.86
1.500	1.10	1.12	1.09	1.08	1.04	0.97	0.94	1.00	1.02	1.04
0.500	1.23	1.28	**1.29**	1.25	1.18	1.13	1.09	1.11	1.16	1.20
m	**0.900**	**2.700**	**4.500**	**6.300**	**8.100**	**9.900**	**11.700**	**13.500**	**15.300**	**17.100**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.79	0.41	1.29	0.520	0.319

Luminance with new lamp [cd/m²]

5.500	0.57	0.55	0.56	0.57	0.59	0.55	0.52	0.52	**0.51**	0.55
4.500	0.75	0.73	0.68	0.69	0.70	0.68	0.64	0.64	0.68	0.73
3.500	0.93	0.91	0.86	0.85	0.87	0.82	0.80	0.78	0.85	0.91
2.500	1.09	1.11	1.06	1.06	1.07	1.00	0.98	1.00	1.04	1.07
1.500	1.37	1.40	1.36	1.35	1.30	1.21	1.17	1.25	1.27	1.30
0.500	1.54	1.60	**1.61**	1.56	1.48	1.42	1.37	1.39	1.45	1.50
m	**0.900**	**2.700**	**4.500**	**6.300**	**8.100**	**9.900**	**11.700**	**13.500**	**15.300**	**17.100**

Grid: 10 x 6 Points

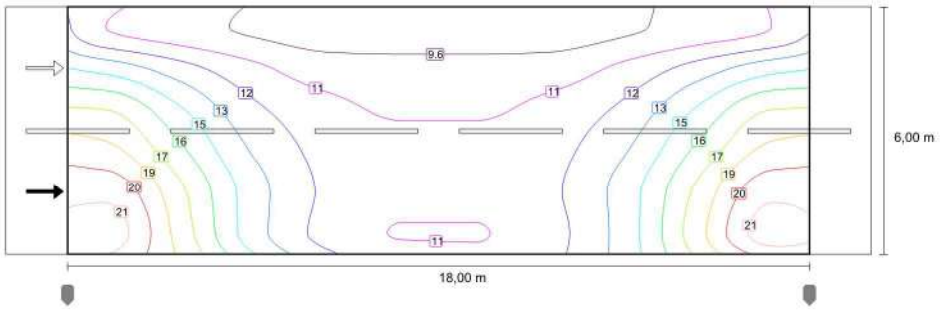
Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.99	0.51	1.61	0.520	0.319

Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 10 x 6 Points

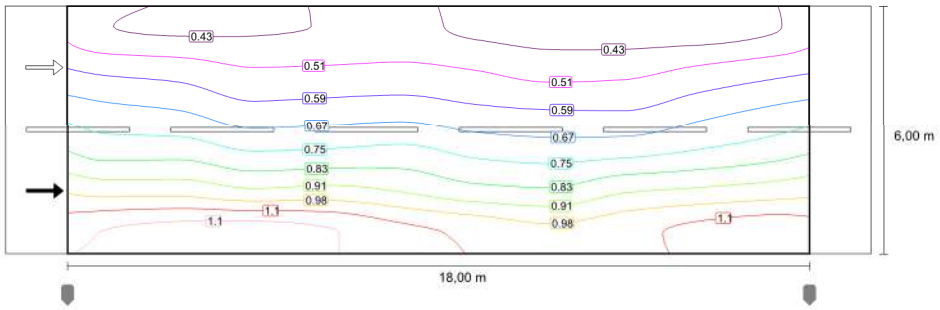
Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.72	✓ 0.52	✓ 0.85	✓ 6	✓ 0.55

Horizontal illuminance

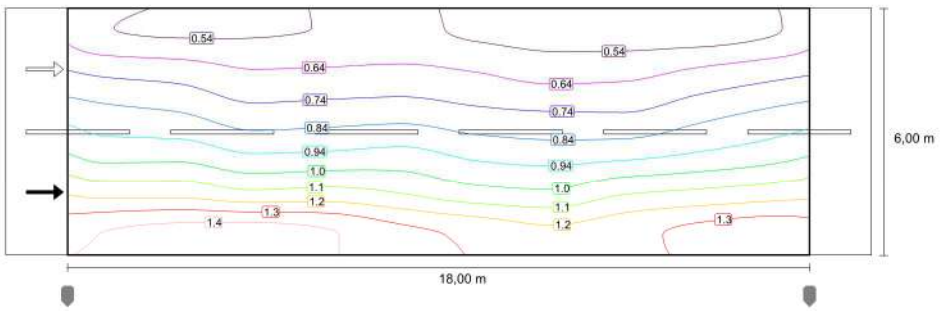


Observer 1

Luminance with dry roadway

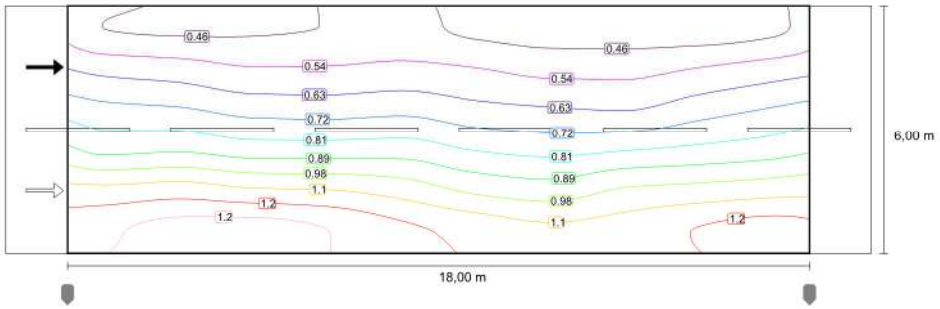


Luminance with new lamp

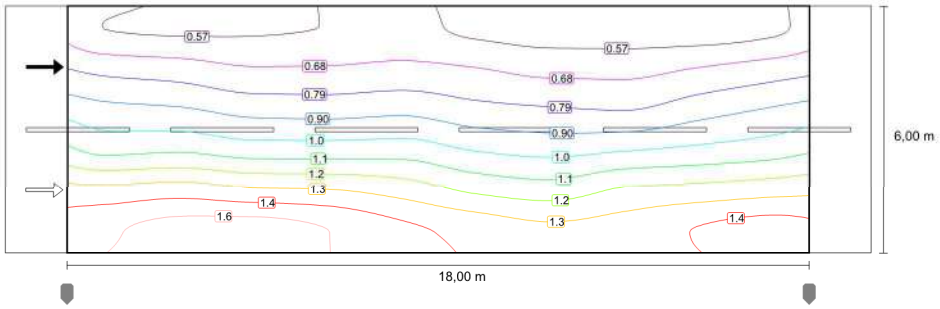


Observer 2

Luminance with dry roadway



Luminance with new lamp

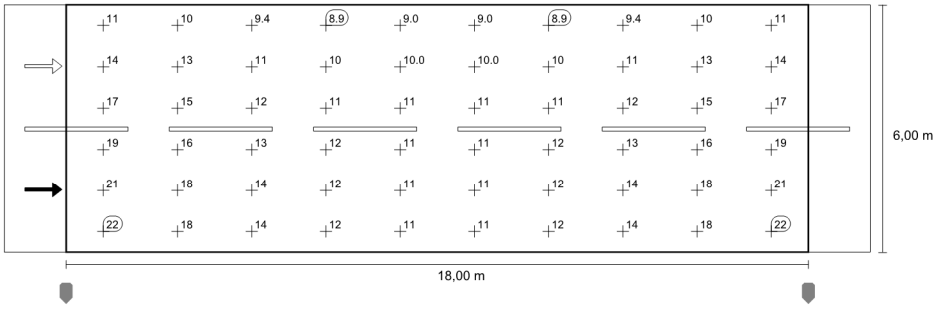


Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 10 x 6 Points

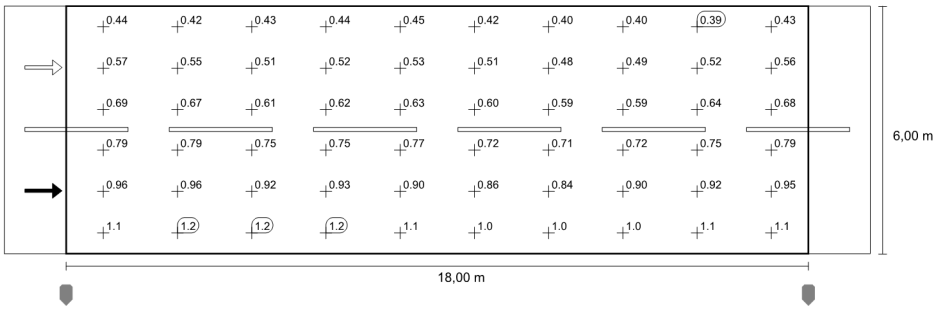
Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	UI ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.72	✓ 0.52	✓ 0.85	✓ 6	✓ 0.55

Horizontal illuminance

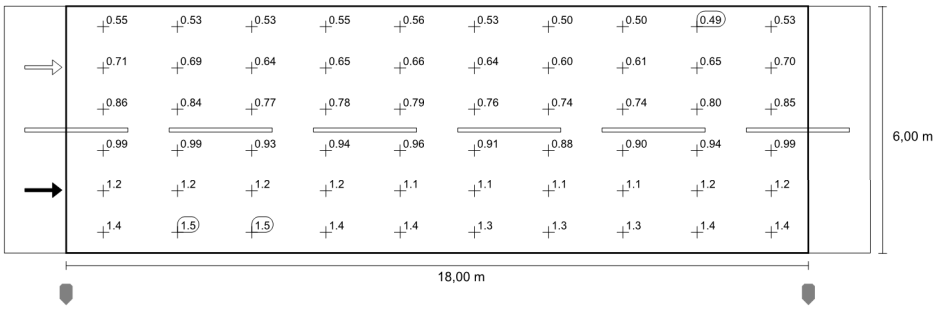


Observer 1

Luminance with dry roadway

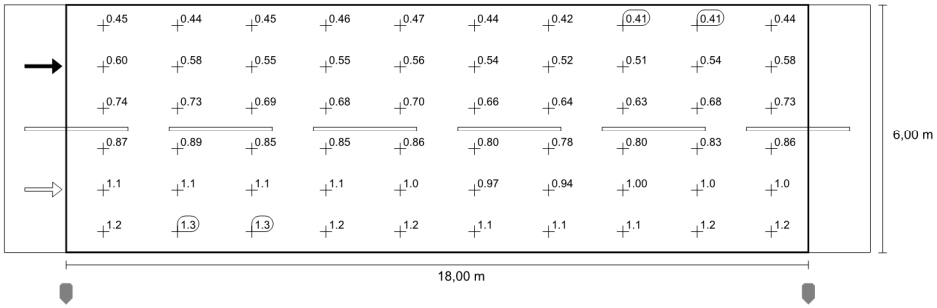


Luminance with new lamp

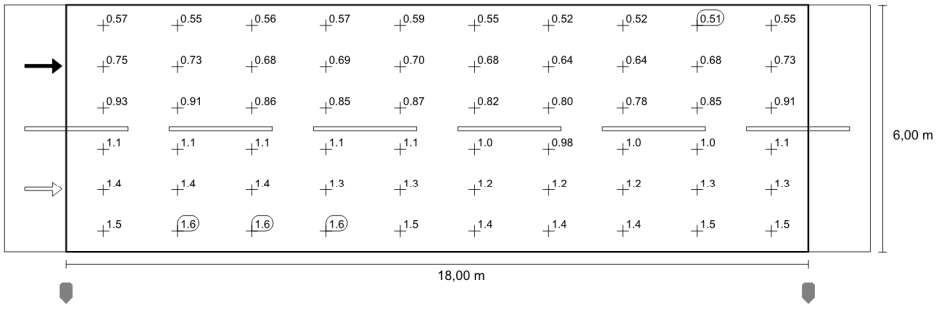


Observer 2

Luminance with dry roadway



Luminance with new lamp



Date:
01.06.2018

PG48_14_06_2018_Municipality MONTECORICE_Q17

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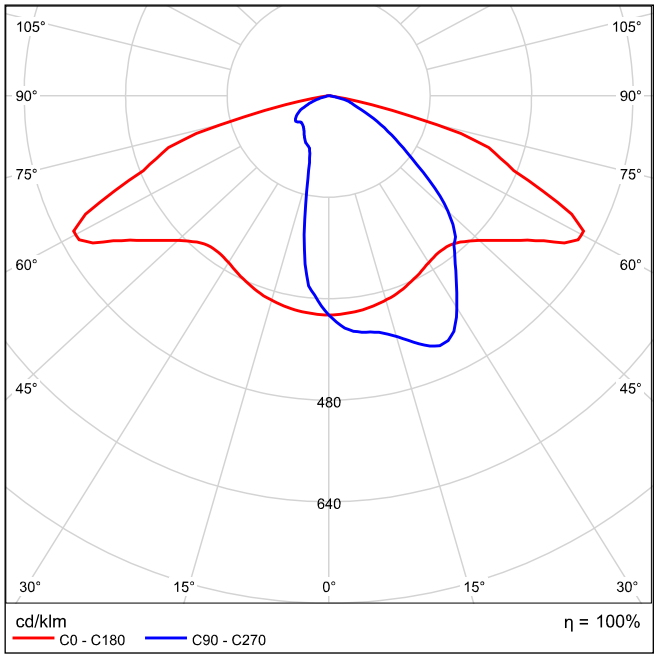
LUG LIGHT FACTORY 130222.5L071.031 3932_1 URBINO 36 LED 740 O4 1xLED 4000K

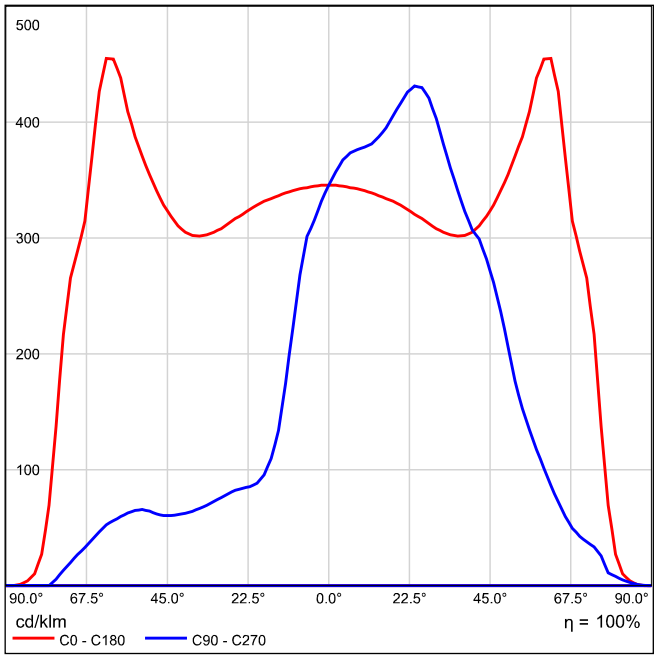
See our luminaire catalog for an image of the luminaire.

Light output ratio: 100%
Luminaire luminous flux: 9500 lm
Power: 80.0 W
Luminous efficacy: 118.7 lm/W

Luminous emittance 1 / Polar LDC

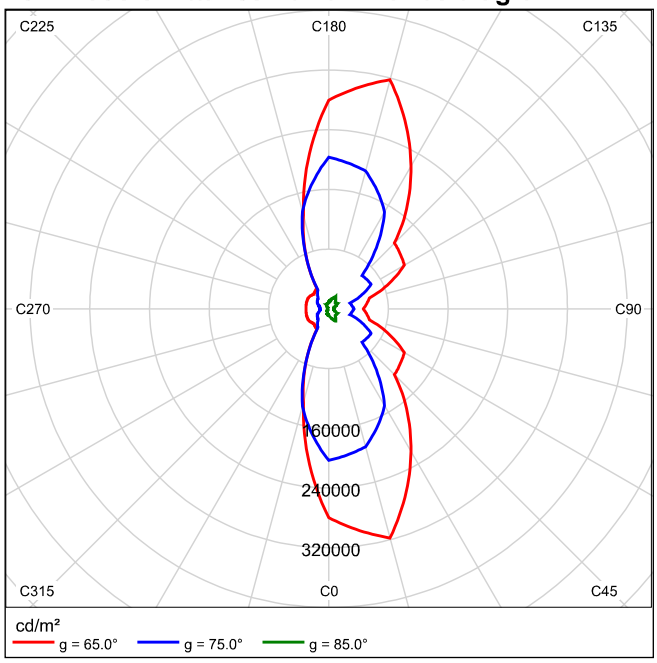


Luminous emittance 1 / Linear LDC



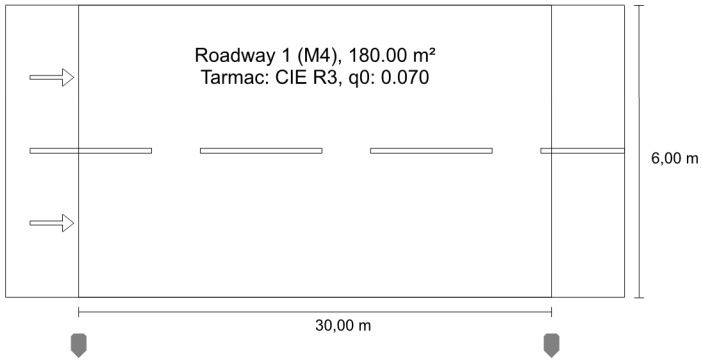
It is not possible to generate a cone diagram, as the light distribution is asymmetrical.

Luminous emittance 1 / Luminance diagram

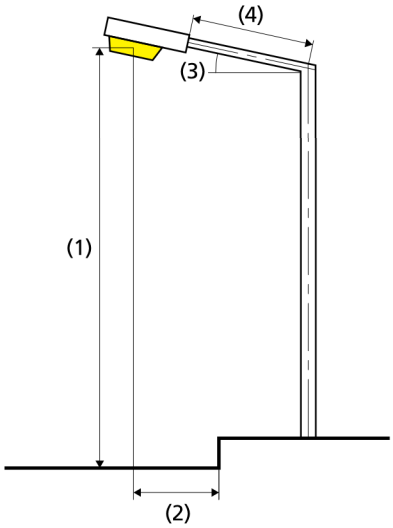


It is not possible to generate a UGR diagram, as the light distribution is asymmetrical.

Quadro 17 - L1-53 - L1-54 height 8m/width 6m according to EN 13201:2015



LUG LIGHT FACTORY 130222.5L071.031 3932_1 URBINO 36 LED 740 O4



Results for valuation fields

Maintenance factor: 0.80

Roadway 1 (M4)

Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	Ul ≥ 0.60	TI [%] ≤ 15	EIR ≥ 0.30
✓ 1.10	✓ 0.49	✓ 0.60	✓ 11	✓ 0.55

Results for energy efficiency indicators

Power density indicator (Dp)	0.022 W/lxm²
Energy consumption density	
Arrangement: 3932_1 URBINO 36 LED 740 O4 (320.0 kWh/yr)	1.8 kWh/m² yr

Lamp:	1xLED 4000K
Luminous flux (luminaire):	9500.00 lm
Luminous flux (lamp):	9500.00 lm
Operating Hours	
4000 h:	100.0 %, 80.0 W
W/km:	2640.0
Arrangement:	single side bottom
Pole distance:	30.000 m
Boom inclination (3):	10.0°
Boom length (4):	0.000 m
Light centre height (1):	7.000 m
Light overhang (2):	-1.000 m

ULR:	0.00
ULOR:	0.00
Maximum luminous intensities	
at 70°:	403 cd/klm
at 80°:	134 cd/klm
at 90°:	15.6 cd/klm
Luminous intensity class:	G*2

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

Arrangement complies with glare index class D.0

Roadway 1 (M4)

Maintenance factor: 0.80
Grid: 10 x 6 Points

Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	Ul ≥ 0.60	TI [%] ≤ 15	EIR ≥ 0.30
✔ 1.10	✔ 0.49	✔ 0.60	✔ 11	✔ 0.55

Assigned Observer (2):

Observer	Position [m]	Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	Ul ≥ 0.60	TI [%] ≤ 15
Observer 1	(-60.000, 1.500, 1.500)	1.10	0.51	0.60	11
Observer 2	(-60.000, 4.500, 1.500)	1.20	0.49	0.70	7

Roadway 1 (M4)

Horizontal illuminance [lx]

5.500	22.1	17.8	13.5	11.1	**8.71**	**8.71**	11.1	13.5	17.8	22.1
4.500	30.0	21.6	15.4	12.1	9.78	9.78	12.1	15.4	21.6	30.0
3.500	37.2	24.3	16.5	13.1	10.3	10.3	13.1	16.5	24.3	37.2
2.500	41.5	26.4	17.5	13.4	10.4	10.4	13.4	17.5	26.4	41.5
1.500	45.9	28.1	17.6	13.1	10.3	10.3	13.1	17.6	28.1	45.9
0.500	**48.2**	28.1	17.3	12.6	10.1	10.1	12.6	17.3	28.1	**48.2**
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**

Grid: 10 x 6 Points

Em [lx]	Emin [lx]	Emax [lx]	g1	g2
20.1	8.71	48.2	0.433	0.181

Observer 1

Luminance with dry roadway [cd/m²]

5.500	0.70	0.62	**0.56**	0.57	0.59	0.63	0.71	0.65	0.67	0.71
4.500	0.96	0.72	0.65	0.65	0.71	0.78	0.86	0.83	0.84	0.98
3.500	1.17	0.85	0.73	0.76	0.84	0.94	1.10	1.01	1.02	1.24
2.500	1.32	0.96	0.84	0.89	1.02	1.20	1.38	1.23	1.27	1.43
1.500	1.47	1.10	1.03	1.12	1.30	1.58	1.71	1.46	1.55	1.61
0.500	1.66	1.30	1.27	1.40	1.68	**2.14**	2.05	1.76	1.68	1.79
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
1.10	0.56	2.14	0.511	0.264

Luminance with new lamp [cd/m²]

5.500	0.88	0.78	**0.71**	**0.71**	0.74	0.79	0.89	0.82	0.84	0.89
4.500	1.20	0.90	0.81	0.81	0.89	0.97	1.07	1.03	1.05	1.23
3.500	1.47	1.06	0.91	0.94	1.05	1.18	1.37	1.26	1.28	1.55
2.500	1.65	1.20	1.05	1.11	1.27	1.50	1.72	1.54	1.59	1.78
1.500	1.84	1.37	1.29	1.40	1.62	1.97	2.13	1.83	1.94	2.01
0.500	2.08	1.63	1.58	1.75	2.10	**2.67**	2.56	2.20	2.09	2.24
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
1.38	0.71	2.67	0.511	0.264

Observer 2

Luminance with dry roadway [cd/m²]

5.500	0.72	0.64	**0.59**	**0.59**	0.63	0.67	0.75	0.68	0.69	0.72
4.500	0.98	0.77	0.70	0.70	0.77	0.84	0.92	0.88	0.87	1.00
3.500	1.23	0.92	0.80	0.85	0.93	1.07	1.19	1.07	1.07	1.29
2.500	1.38	1.08	1.00	1.05	1.15	1.38	1.53	1.32	1.34	1.47
1.500	1.64	1.30	1.24	1.32	1.57	1.85	1.88	1.57	1.62	1.70
0.500	1.70	1.41	1.42	1.58	1.91	**2.36**	2.22	1.86	1.73	1.85
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
1.20	0.59	2.36	0.495	0.251

Luminance with new lamp [cd/m²]

5.500	0.90	0.79	**0.74**	**0.74**	0.78	0.84	0.94	0.85	0.86	0.90
4.500	1.23	0.96	0.87	0.87	0.97	1.05	1.15	1.10	1.08	1.25
3.500	1.54	1.14	0.99	1.06	1.16	1.34	1.49	1.33	1.33	1.61
2.500	1.73	1.35	1.25	1.31	1.44	1.73	1.91	1.65	1.68	1.84
1.500	2.05	1.62	1.54	1.66	1.97	2.32	2.35	1.96	2.03	2.12
0.500	2.13	1.76	1.77	1.98	2.39	**2.95**	2.77	2.32	2.16	2.31
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**

Grid: 10 x 6 Points

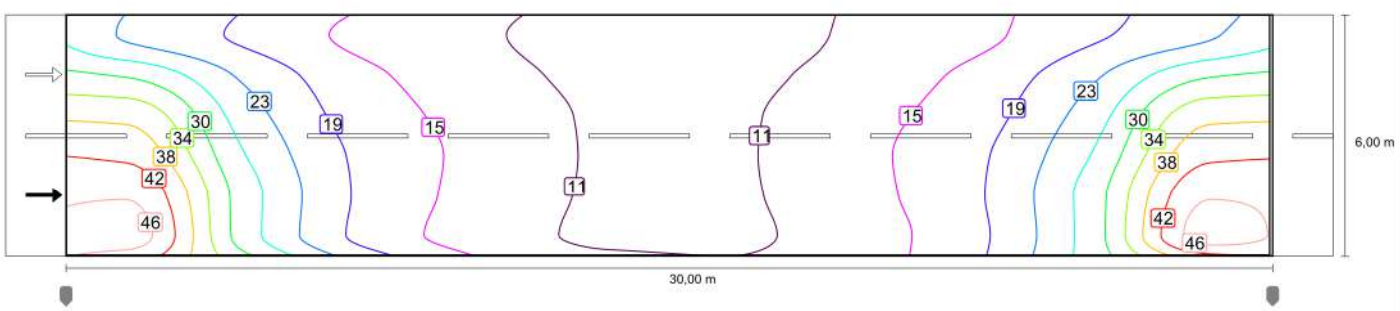
Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
1.50	0.74	2.95	0.495	0.251

Roadway 1 (M4)

Maintenance factor: 0.80
Grid: 10 x 6 Points

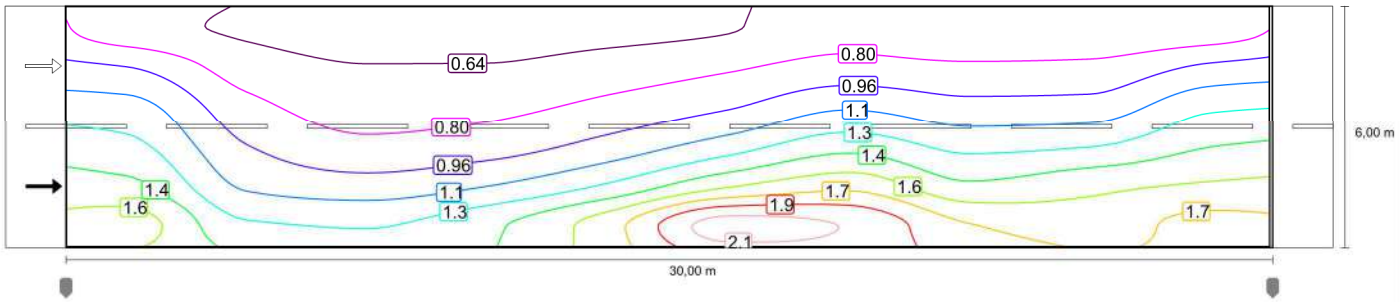
Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	Ul ≥ 0.60	TI [%] ≤ 15	EIR ≥ 0.30
✓ 1.10	✓ 0.49	✓ 0.60	✓ 11	✓ 0.55

Horizontal illuminance

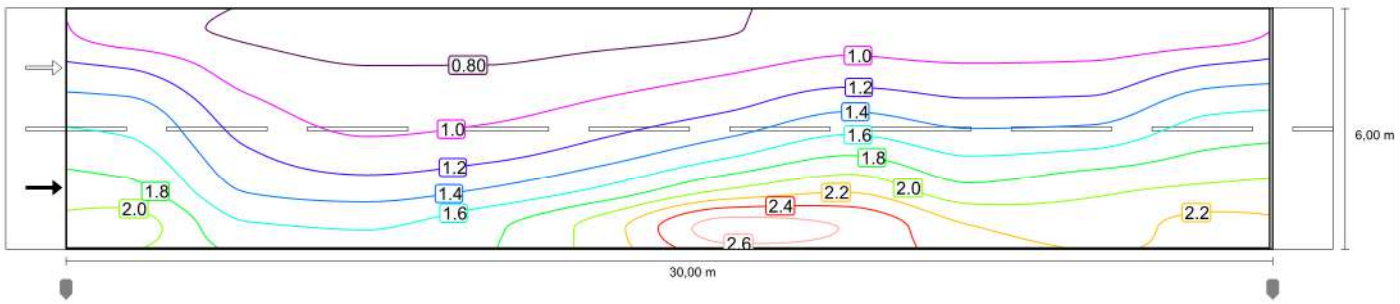


Observer 1

Luminance with dry roadway

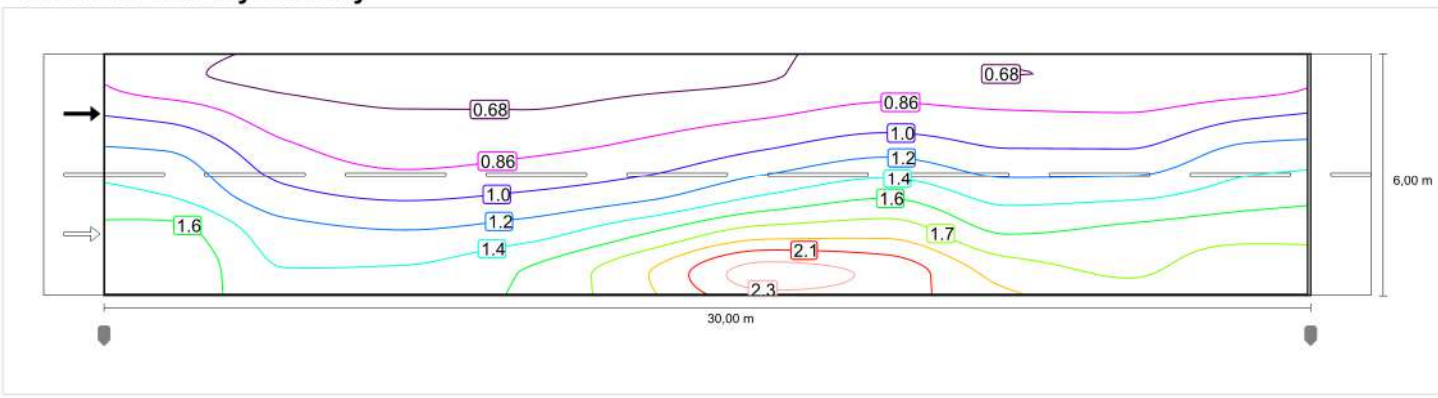


Luminance with new lamp

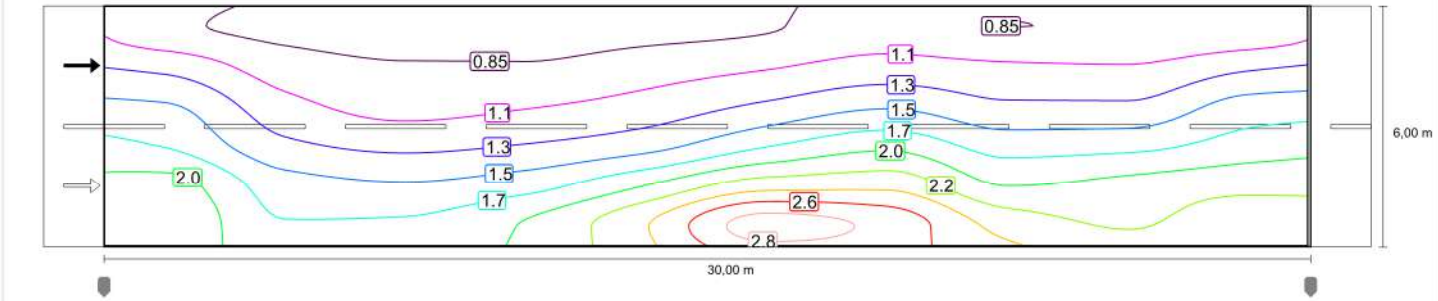


Observer 2

Luminance with dry roadway



Luminance with new lamp

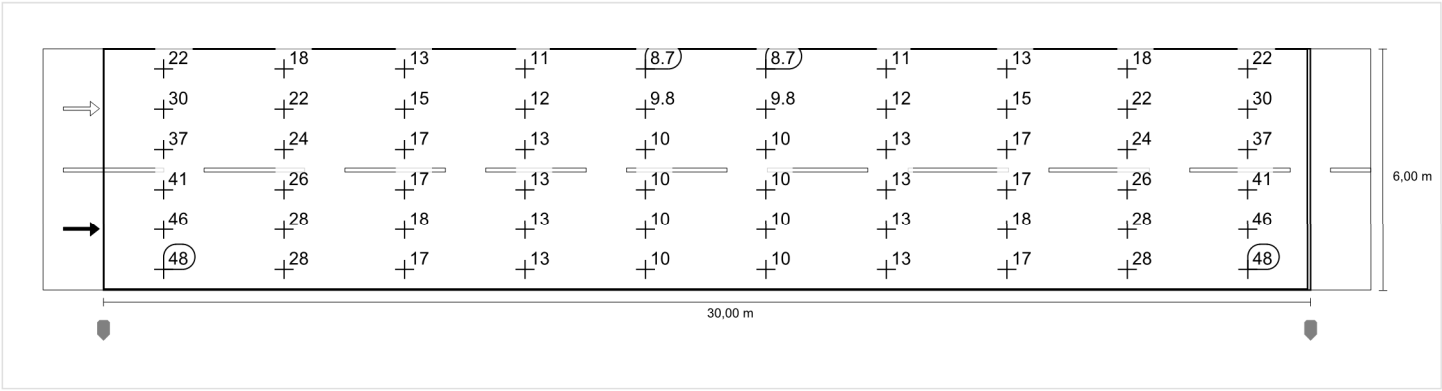


Roadway 1 (M4)

Maintenance factor: 0.80
Grid: 10 x 6 Points

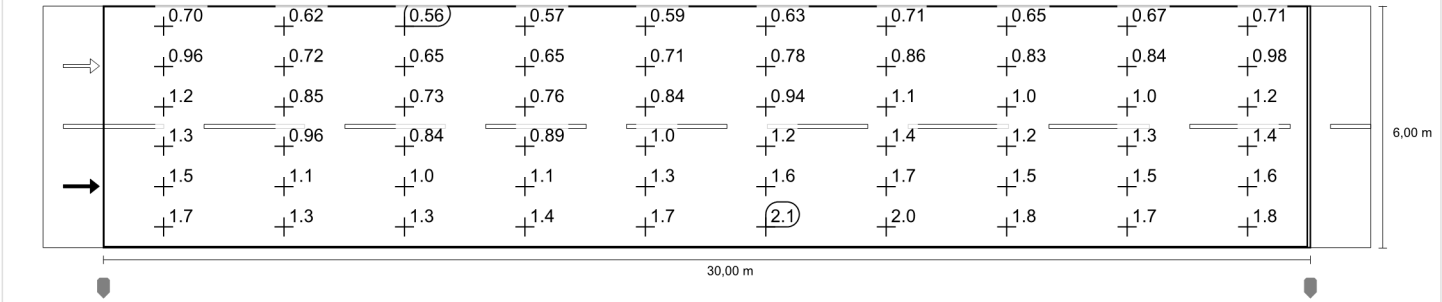
Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	Ul ≥ 0.60	TI [%] ≤ 15	EIR ≥ 0.30
✓ 1.10	✓ 0.49	✓ 0.60	✓ 11	✓ 0.55

Horizontal illuminance

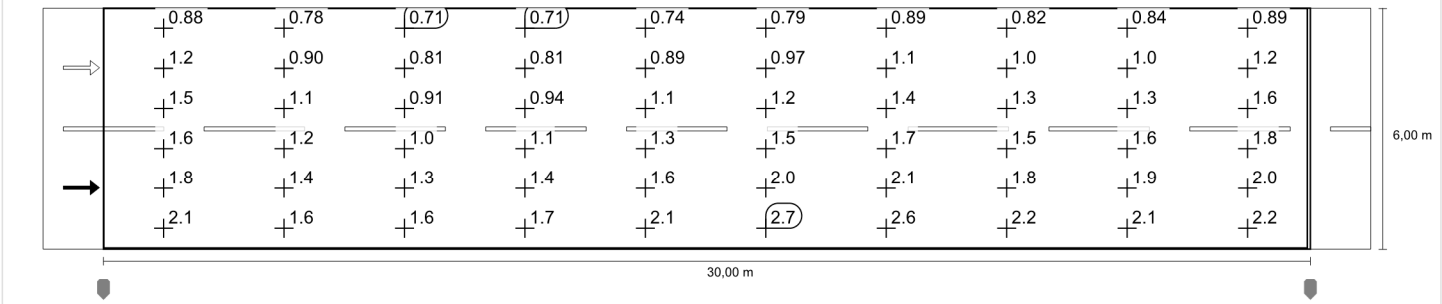


Observer 1

Luminance with dry roadway

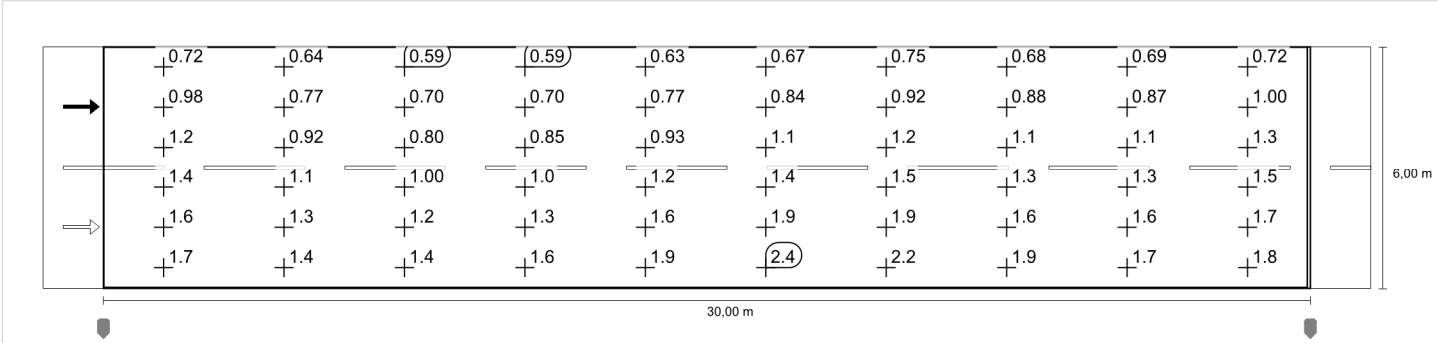


Luminance with new lamp

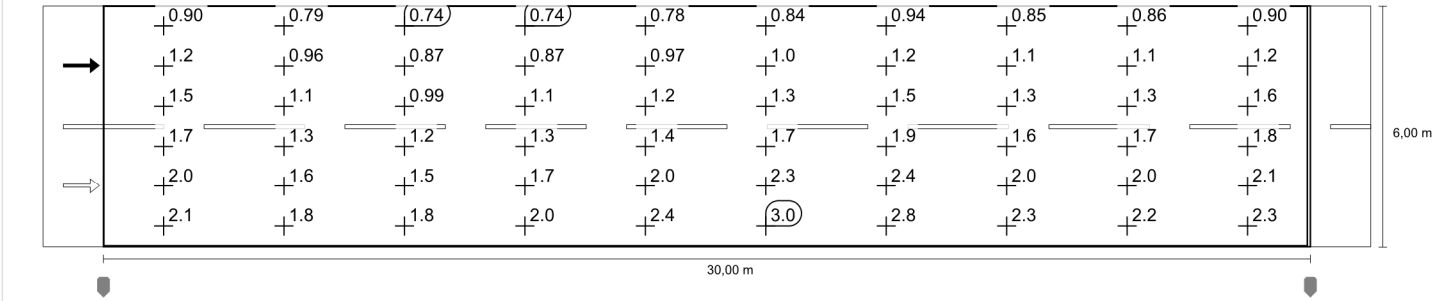


Observer 2

Luminance with dry roadway



Luminance with new lamp



Date:
01.06.2018

PG48_14_06_2018_Municipality MONTECORICE_Q18

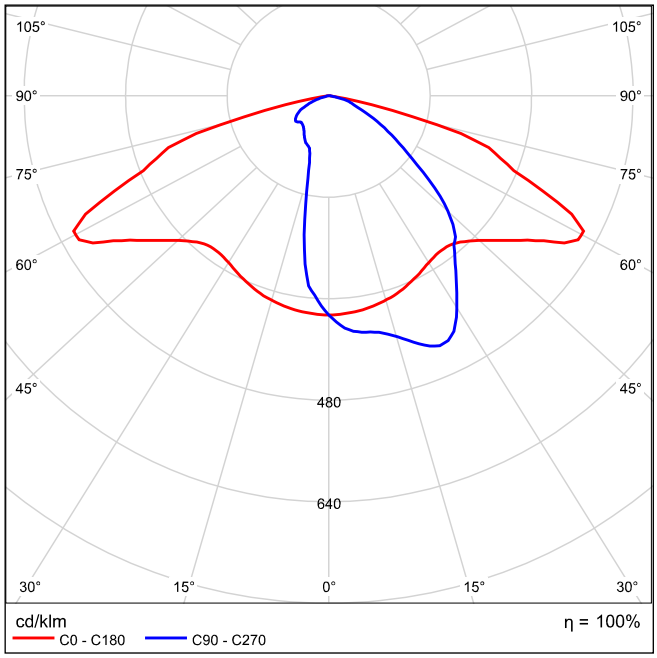
Table of contents

LUG LIGHT FACTORY 130222.5L071.031 3932_1 URBINO 36 LED 740 O4 1xLED 4000K

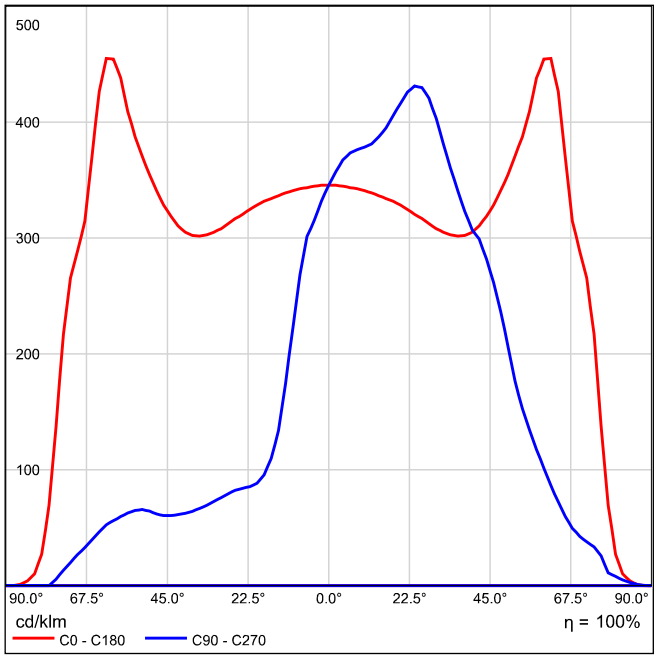
See our luminaire catalog for an image of the luminaire.

Light output ratio: 100%
Luminaire luminous flux: 9500 lm
Power: 80.0 W
Luminous efficacy: 118.7 lm/W

Luminous emittance 1 / Polar LDC



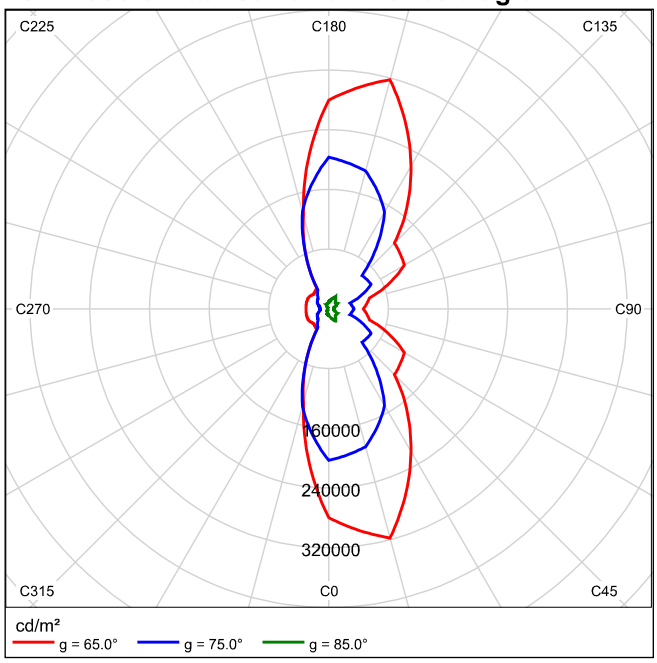
Luminous emittance 1 / Linear LDC



It is not possible to generate a cone diagram, as the light distribution is asymmetrical.

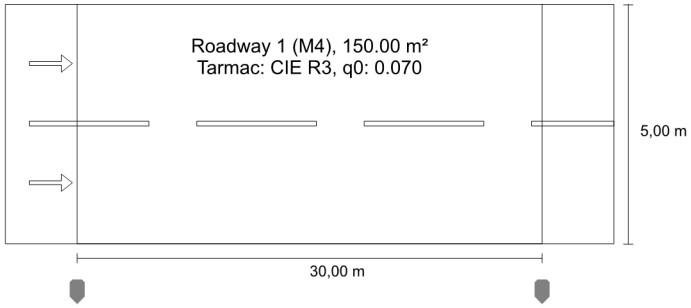
LUG LIGHT FACTORY 130222.5L071.031 3932_1 URBINO 36 LED 740 O4 1xLED 4000K / LUG LIGHT FACTORY - 3932_1 URBINO 36 LED 740 O4 (1xLED 4000K)

Luminous emittance 1 / Luminance diagram



It is not possible to generate a UGR diagram, as the light distribution is asymmetrical.

Quadro 18 - L1-24 - L1-25 height 8m/width 5m according to EN 13201:2015



Results for valuation fields
Maintenance factor: 0.80

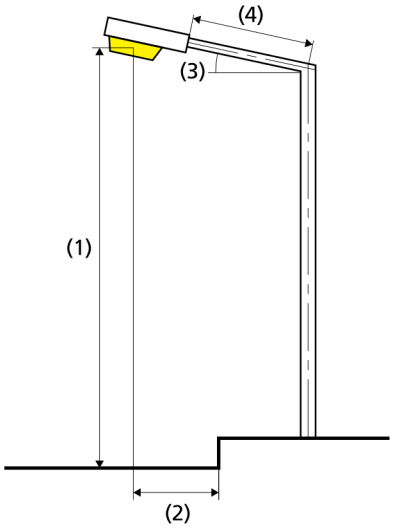
Roadway 1 (M4)

Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	Ul ≥ 0.60	TI [%] ≤ 15	EIR ≥ 0.30
✓ 1.05	✓ 0.57	✓ 0.66	✓ 9	✓ 0.55

Results for energy efficiency indicators

Power density indicator (Dp)	0.029 W/lxm²
Energy consumption density	
Arrangement: 3932_1 URBINO 36 LED 740 O4 (320.0 kWh/yr)	2.1 kWh/m² yr

LUG LIGHT FACTORY 130222.5L071.031 3932_1 URBINO 36 LED 740 O4



Lamp:	1xLED 4000K
Luminous flux (luminaire):	9500.00 lm
Luminous flux (lamp):	9500.00 lm
Operating Hours	
4000 h:	100.0 %, 80.0 W
W/km:	2640.0
Arrangement:	single side bottom
Pole distance:	30.000 m
Boom inclination (3):	15.0°
Boom length (4):	0.000 m
Light centre height (1):	8.000 m
Light overhang (2):	-1.000 m

ULR:	0.00
ULOR:	0.00
Maximum luminous intensities	
at 70°:	446 cd/klm
at 80°:	190 cd/klm
at 90°:	41.9 cd/klm
Luminous intensity class:	G*1

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

Arrangement complies with glare index class D.0

Roadway 1 (M4)

Maintenance factor: 0.80
Grid: 10 x 6 Points

Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	Ul ≥ 0.60	TI [%] ≤ 15	EIR ≥ 0.30
✔ 1.05	✔ 0.57	✔ 0.66	✔ 9	✔ 0.55

Assigned Observer (2):

Observer	Position [m]	Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	Ul ≥ 0.60	TI [%] ≤ 15
Observer 1	(-60.000, 1.250, 1.500)	1.05	0.58	0.66	9
Observer 2	(-60.000, 3.750, 1.500)	1.14	0.57	0.69	7

Roadway 1 (M4)

Horizontal illuminance [lx]

4.583	26.7	19.4	13.7	11.5	11.1	11.1	11.5	13.7	19.4	26.7
3.750	29.1	20.8	14.4	11.8	11.2	11.2	11.8	14.4	20.8	29.1
2.917	31.9	22.3	14.9	11.9	11.2	11.2	11.9	14.9	22.3	31.9
2.083	34.8	23.4	15.0	11.8	11.2	11.2	11.8	15.0	23.4	34.8
1.250	**35.6**	23.6	15.0	11.7	11.0	11.0	11.7	15.0	23.6	**35.6**
0.417	33.6	22.0	13.6	10.5	**10.0**	**10.0**	10.5	13.6	22.0	33.6
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**

Grid: 10 x 6 Points

Em [lx]	Emin [lx]	Emax [lx]	g1	g2
18.2	10.0	35.6	0.553	0.282

Observer 1

Luminance with dry roadway [cd/m²]

4.583	0.89	0.70	**0.61**	0.68	0.76	0.80	0.75	0.71	0.79	0.92
3.750	0.97	0.78	0.67	0.74	0.86	0.90	0.88	0.83	0.89	1.01
2.917	1.08	0.85	0.74	0.83	0.98	1.06	1.01	0.95	1.04	1.15
2.083	1.22	0.99	0.85	0.94	1.17	1.28	1.15	1.06	1.19	1.28
1.250	1.33	1.11	1.00	1.15	1.43	1.52	1.34	1.18	1.30	1.37
0.417	1.38	1.21	1.11	1.25	1.58	**1.65**	1.41	1.24	1.30	1.40
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
1.05	0.61	1.65	0.582	0.372

Luminance with new lamp [cd/m²]

4.583	1.11	0.88	**0.77**	0.84	0.95	1.00	0.93	0.89	0.99	1.15
3.750	1.22	0.98	0.84	0.93	1.07	1.13	1.10	1.04	1.12	1.27
2.917	1.35	1.07	0.93	1.04	1.23	1.33	1.26	1.19	1.30	1.44
2.083	1.53	1.24	1.07	1.18	1.46	1.59	1.44	1.33	1.48	1.60
1.250	1.66	1.38	1.25	1.44	1.79	1.90	1.67	1.48	1.62	1.71
0.417	1.72	1.51	1.39	1.56	1.97	**2.06**	1.77	1.56	1.62	1.75
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
1.32	0.77	2.06	0.582	0.372

Observer 2

Luminance with dry roadway [cd/m²]

4.583	0.92	0.74	**0.65**	0.72	0.81	0.86	0.80	0.76	0.82	0.94
3.750	1.02	0.83	0.73	0.81	0.93	0.97	0.94	0.88	0.93	1.06
2.917	1.16	0.96	0.83	0.92	1.10	1.17	1.08	1.00	1.09	1.20
2.083	1.32	1.10	0.99	1.12	1.32	1.41	1.24	1.13	1.26	1.34
1.250	1.48	1.28	1.16	1.32	1.63	1.67	1.44	1.25	1.37	1.46
0.417	1.43	1.29	1.20	1.35	1.71	**1.75**	1.50	1.29	1.34	1.44
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**

Grid: 10 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
1.14	0.65	1.75	0.571	0.372

Luminance with new lamp [cd/m²]

4.583	1.15	0.93	**0.81**	0.90	1.02	1.08	1.00	0.94	1.02	1.17
3.750	1.27	1.04	0.91	1.01	1.17	1.22	1.18	1.10	1.17	1.32
2.917	1.45	1.20	1.04	1.15	1.38	1.46	1.35	1.26	1.36	1.50
2.083	1.65	1.38	1.24	1.40	1.65	1.77	1.55	1.41	1.57	1.67
1.250	1.85	1.60	1.45	1.64	2.03	2.09	1.80	1.56	1.71	1.82
0.417	1.79	1.61	1.50	1.69	2.14	**2.18**	1.87	1.61	1.67	1.80
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**

Grid: 10 x 6 Points

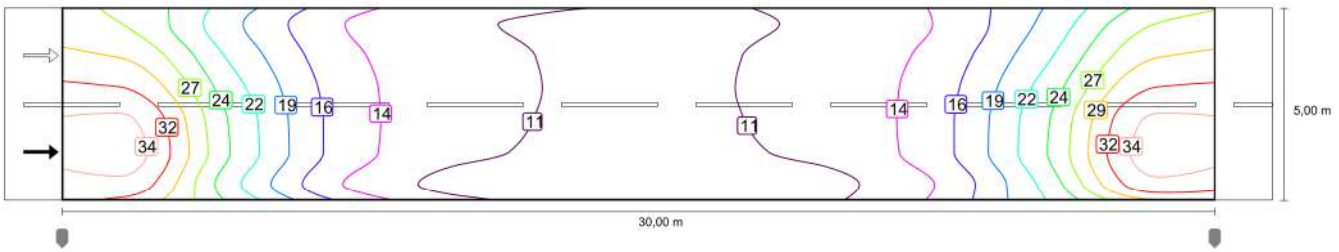
Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
1.42	0.81	2.18	0.571	0.372

Roadway 1 (M4)

Maintenance factor: 0.80
Grid: 10 x 6 Points

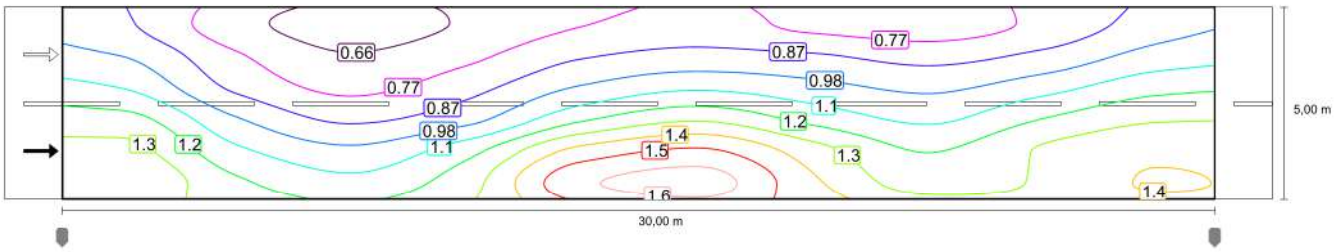
Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	UI ≥ 0.60	TI [%] ≤ 15	EIR ≥ 0.30
✓ 1.05	✓ 0.57	✓ 0.66	✓ 9	✓ 0.55

Horizontal illuminance

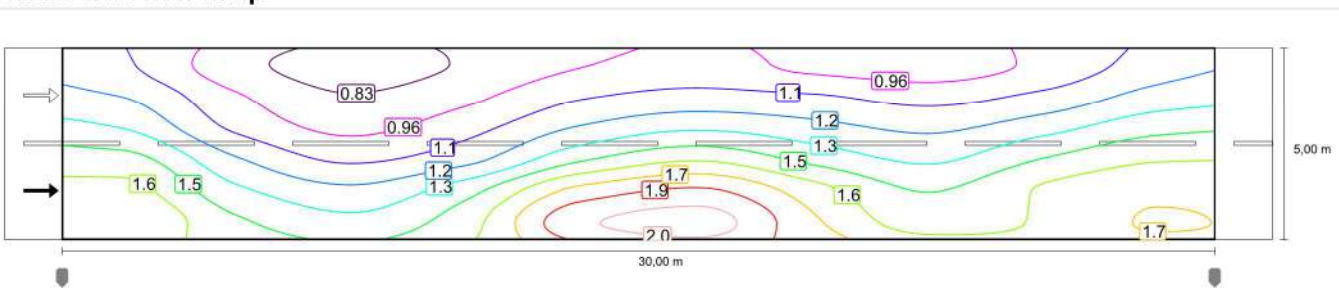


Observer 1

Luminance with dry roadway

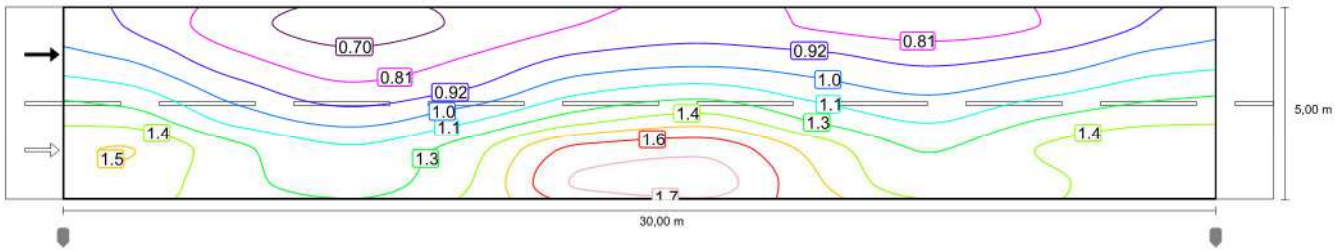


Luminance with new lamp

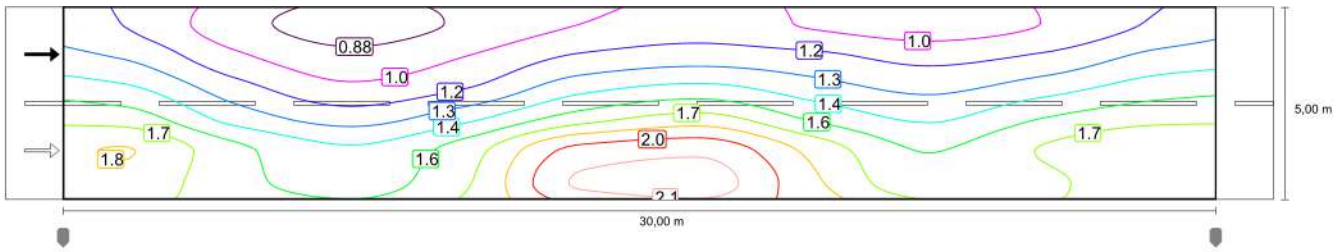


Observer 2

Luminance with dry roadway



Luminance with new lamp

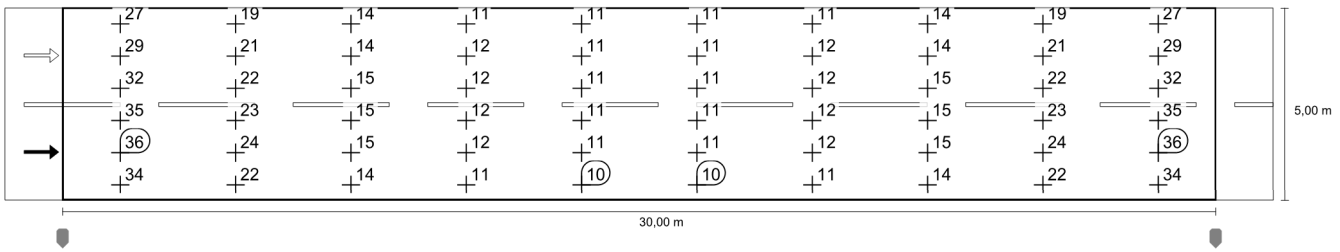


Roadway 1 (M4)

Maintenance factor: 0.80
Grid: 10 x 6 Points

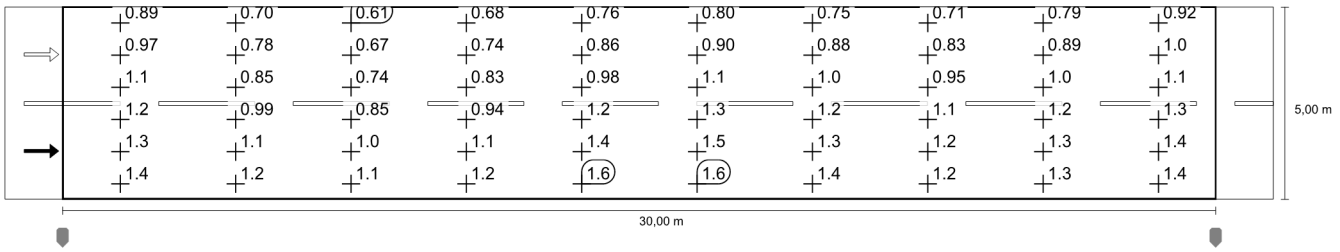
Lm [cd/m²] ≥ 0.75	Uo ≥ 0.40	Ul ≥ 0.60	TI [%] ≤ 15	EIR ≥ 0.30
✓ 1.05	✓ 0.57	✓ 0.66	✓ 9	✓ 0.55

Horizontal illuminance

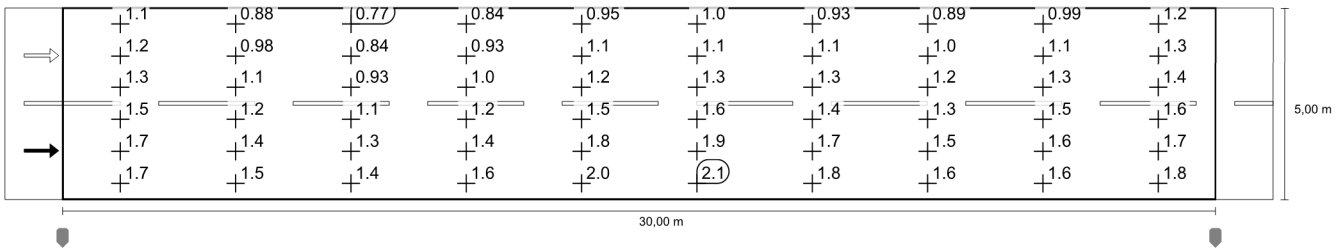


Observer 1

Luminance with dry roadway

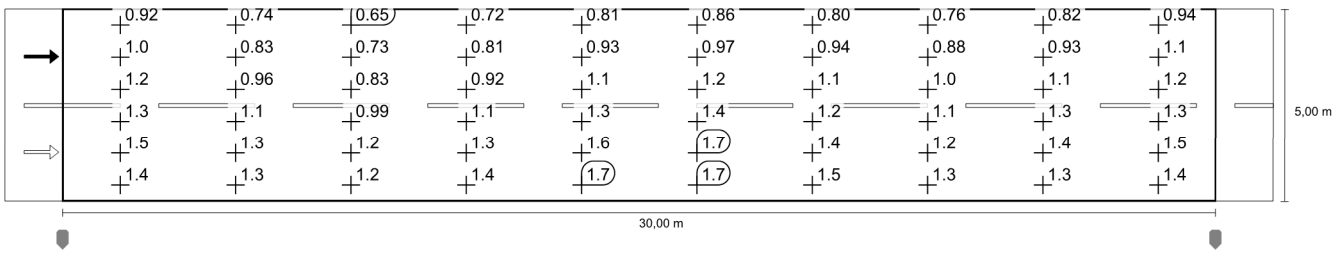


Luminance with new lamp

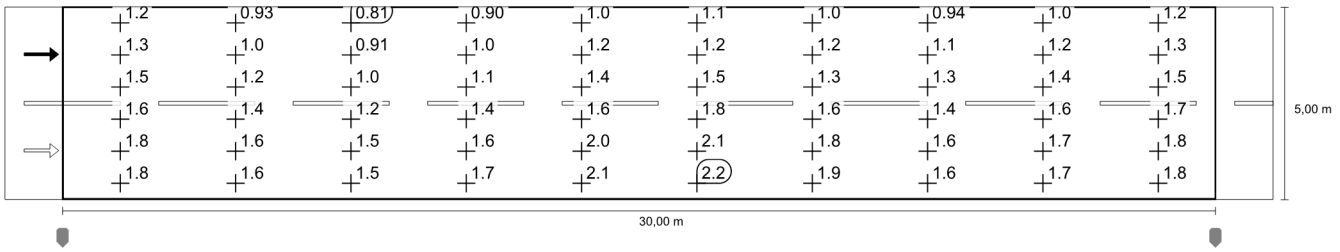


Observer 2

Luminance with dry roadway



Luminance with new lamp



Date:
01.06.2018

PG48_14_06_2018_Municipality MONTECORICE_Q19

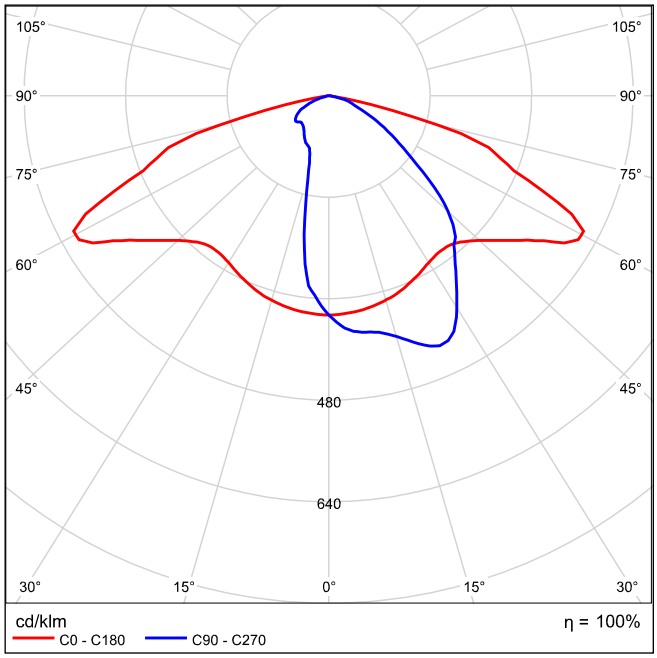
Table of contents

LUG LIGHT FACTORY 130222.5L071.031 3932_1 URBINO 36 LED 740 O4 1xLED 4000K

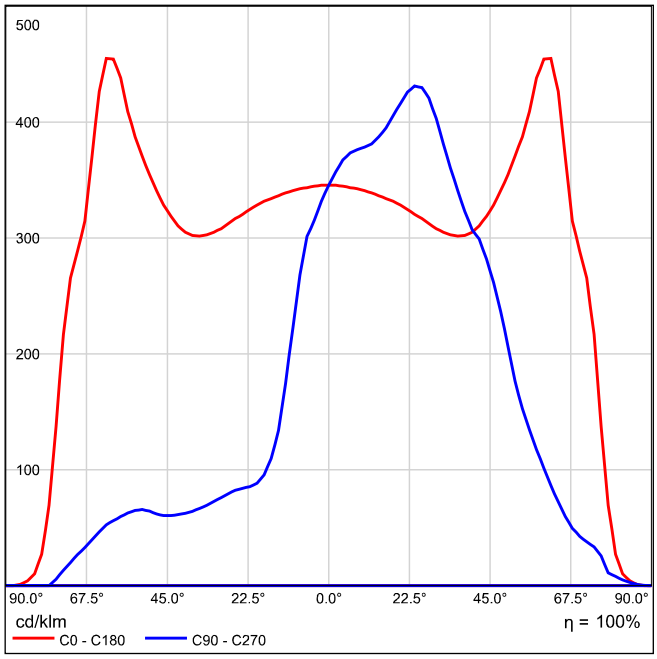
See our luminaire catalog for an image of the luminaire.

Light output ratio: 100%
Luminaire luminous flux: 9500 lm
Power: 80.0 W
Luminous efficacy: 118.7 lm/W

Luminous emittance 1 / Polar LDC

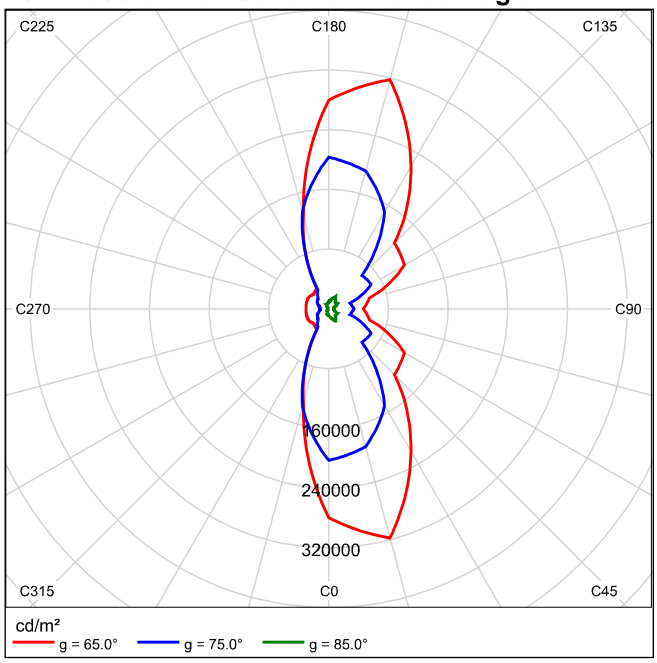


Luminous emittance 1 / Linear LDC



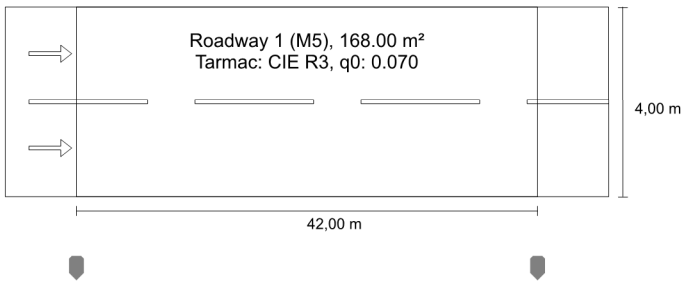
It is not possible to generate a cone diagram, as the light distribution is asymmetrical.

Luminous emittance 1 / Luminance diagram



It is not possible to generate a UGR diagram, as the light distribution is asymmetrical.

Quadro 19 - L1-19 - L1-20 height 8m/width 4m according to EN 13201:2015



Results for valuation fields
Maintenance factor: 0.80

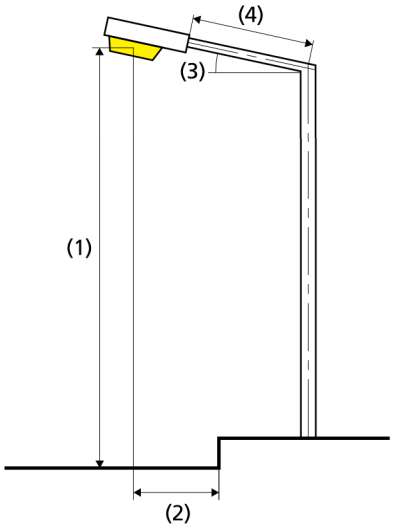
Roadway 1 (M5)

Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.76	✓ 0.49	✓ 0.42	✓ 11	✓ 0.71

Results for energy efficiency indicators

Power density indicator (Dp)	0.036 W/lxm²
Energy consumption density	
Arrangement: 3932_1 URBINO 36 LED 740 O4 (320.0 kWh/yr)	1.9 kWh/m² yr

LUG LIGHT FACTORY 130222.5L071.031 3932_1 URBINO 36 LED 740 O4



Lamp:	1xLED 4000K
Luminous flux (luminaire):	9500.00 lm
Luminous flux (lamp):	9500.00 lm
Operating Hours	
4000 h:	100.0 %, 80.0 W
W/km:	1920.0
Arrangement:	single side bottom
Pole distance:	42.000 m
Boom inclination (3):	15.0°
Boom length (4):	0.000 m
Light centre height (1):	8.000 m
Light overhang (2):	-1.500 m

ULR:	0.00
ULOR:	0.00
Maximum luminous intensities	
at 70°:	446 cd/klm
at 80°:	190 cd/klm
at 90°:	41.9 cd/klm
Luminous intensity class:	G*1

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

Arrangement complies with glare index class D.0

Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 14 x 6 Points

Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.76	✓ 0.49	✓ 0.42	✓ 11	✓ 0.71

Assigned Observer (2):

Observer	Position [m]	Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15
Observer 1	(-60.000, 1.000, 1.500)	0.76	0.49	0.42	11
Observer 2	(-60.000, 3.000, 1.500)	0.81	0.50	0.47	9

Roadway 1 (M5)

Horizontal illuminance [lx]

3.667	27.1	19.2	12.7	9.48	7.42	5.15	3.94	3.94	5.15	7.42	9.48	12.7	19.2	27.1
3.000	29.1	20.3	13.2	9.65	7.43	5.18	3.87	3.87	5.18	7.43	9.65	13.2	20.3	29.1
2.333	31.4	21.6	13.6	9.74	7.41	5.18	3.79	3.79	5.18	7.41	9.74	13.6	21.6	31.4
1.667	33.8	22.5	13.8	9.77	7.39	5.15	3.68	3.68	5.15	7.39	9.77	13.8	22.5	33.8
1.000	**35.0**	22.8	13.8	9.73	7.33	5.09	3.55	3.55	5.09	7.33	9.73	13.8	22.8	**35.0**
0.333	34.3	22.2	13.2	9.30	7.03	4.86	**3.35**	**3.35**	4.86	7.03	9.30	13.2	22.2	34.3
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**	**31.500**	**34.500**	**37.500**	**40.500**

Grid: 14 x 6 Points

Em [lx]	Emin [lx]	Emax [lx]	g1	g2
13.2	3.35	35.0	0.254	0.096

Observer 1

Luminance with dry roadway [cd/m²]

3.667	0.80	0.59	0.44	0.42	0.40	**0.37**	**0.37**	0.47	0.59	0.70	0.71	0.68	0.75	0.86
3.000	0.86	0.63	0.46	0.43	0.42	0.41	0.42	0.52	0.69	0.78	0.81	0.77	0.83	0.93
2.333	0.91	0.66	0.49	0.47	0.47	0.46	0.47	0.60	0.80	0.92	0.91	0.86	0.93	1.02
1.667	0.98	0.69	0.50	0.50	0.52	0.55	0.56	0.68	0.94	1.09	1.02	0.94	1.04	1.09
1.000	1.02	0.72	0.53	0.53	0.57	0.63	0.68	0.84	1.13	1.27	1.15	1.01	1.11	1.14
0.333	1.01	0.72	0.56	0.58	0.66	0.73	0.78	0.96	1.32	**1.43**	1.26	1.08	1.12	1.15
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**	**31.500**	**34.500**	**37.500**	**40.500**

Grid: 14 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.76	0.37	1.43	0.487	0.260

Luminance with new lamp [cd/m²]

3.667	1.00	0.73	0.55	0.52	0.50	0.47	**0.46**	0.58	0.74	0.87	0.89	0.85	0.94	1.07
3.000	1.07	0.78	0.58	0.54	0.53	0.51	0.53	0.65	0.86	0.97	1.01	0.97	1.04	1.16
2.333	1.14	0.82	0.61	0.58	0.58	0.57	0.58	0.74	1.00	1.15	1.13	1.07	1.17	1.27
1.667	1.22	0.86	0.63	0.62	0.65	0.68	0.71	0.85	1.18	1.36	1.28	1.17	1.30	1.37
1.000	1.28	0.90	0.66	0.66	0.72	0.78	0.85	1.05	1.41	1.59	1.44	1.27	1.39	1.43
0.333	1.26	0.90	0.69	0.73	0.83	0.91	0.98	1.21	1.65	**1.78**	1.57	1.35	1.40	1.43
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**	**31.500**	**34.500**	**37.500**	**40.500**

Grid: 14 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.95	0.46	1.78	0.487	0.260

Observer 2

Luminance with dry roadway [cd/m²]

3.667	0.82	0.61	0.46	0.43	0.42	**0.40**	0.41	0.50	0.64	0.73	0.75	0.71	0.76	0.87
3.000	0.87	0.65	0.49	0.47	0.47	0.44	0.46	0.57	0.74	0.84	0.85	0.80	0.84	0.94
2.333	0.93	0.68	0.51	0.50	0.52	0.53	0.54	0.65	0.88	0.99	0.95	0.88	0.96	1.03
1.667	1.00	0.73	0.55	0.54	0.57	0.62	0.65	0.80	1.02	1.17	1.07	0.96	1.07	1.11
1.000	1.05	0.76	0.59	0.61	0.68	0.73	0.77	0.96	1.26	1.36	1.21	1.04	1.13	1.16
0.333	1.03	0.75	0.59	0.64	0.75	0.84	0.89	1.07	1.43	**1.52**	1.32	1.12	1.14	1.16
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**	**31.500**	**34.500**	**37.500**	**40.500**

Grid: 14 x 6 Points

Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
0.81	0.40	1.52	0.500	0.266

Luminance with new lamp [cd/m²]

3.667	1.02	0.76	0.58	0.54	0.53	**0.51**	**0.51**	0.62	0.80	0.92	0.93	0.88	0.96	1.09
3.000	1.09	0.81	0.61	0.59	0.58	0.55	0.57	0.72	0.92	1.05	1.06	1.00	1.05	1.18
2.333	1.16	0.85	0.64	0.63	0.65	0.66	0.67	0.81	1.10	1.24	1.19	1.10	1.20	1.29
1.667	1.25	0.91	0.68	0.68	0.72	0.77	0.82	1.00	1.27	1.47	1.34	1.21	1.34	1.39
1.000	1.31	0.94	0.74	0.77	0.84	0.91	0.96	1.19	1.58	1.70	1.52	1.30	1.42	1.45
0.333	1.29	0.94	0.74	0.80	0.93	1.05	1.12	1.33	1.79	**1.90**	1.65	1.40	1.42	1.45
m	**1.500**	**4.500**	**7.500**	**10.500**	**13.500**	**16.500**	**19.500**	**22.500**	**25.500**	**28.500**	**31.500**	**34.500**	**37.500**	**40.500**

Grid: 14 x 6 Points

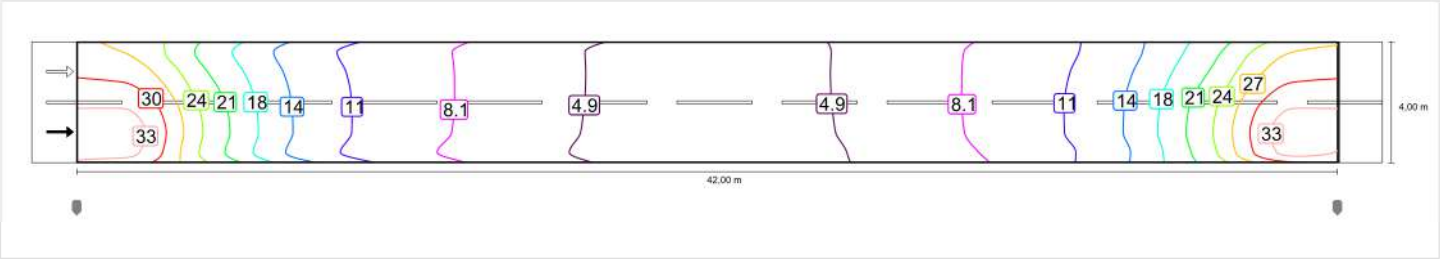
Lm [cd/m²]	Lmin [cd/m²]	Lmax [cd/m²]	g1	g2
1.01	0.51	1.90	0.500	0.266

Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 14 x 6 Points

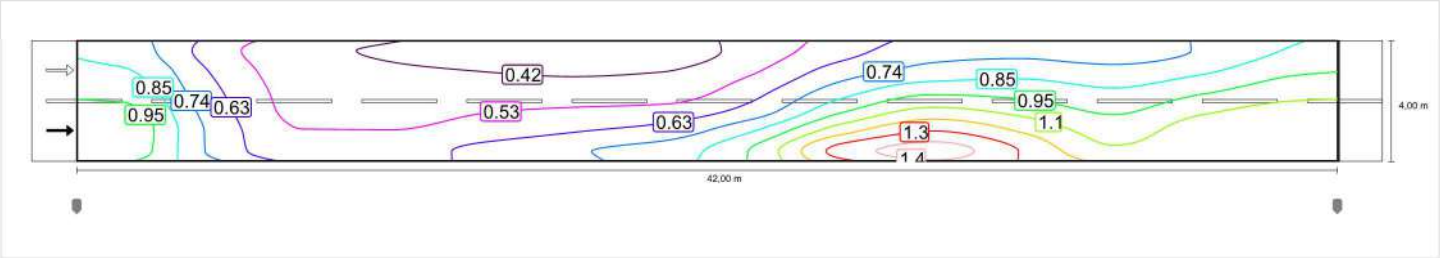
Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	UI ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.76	✓ 0.49	✓ 0.42	✓ 11	✓ 0.71

Horizontal illuminance

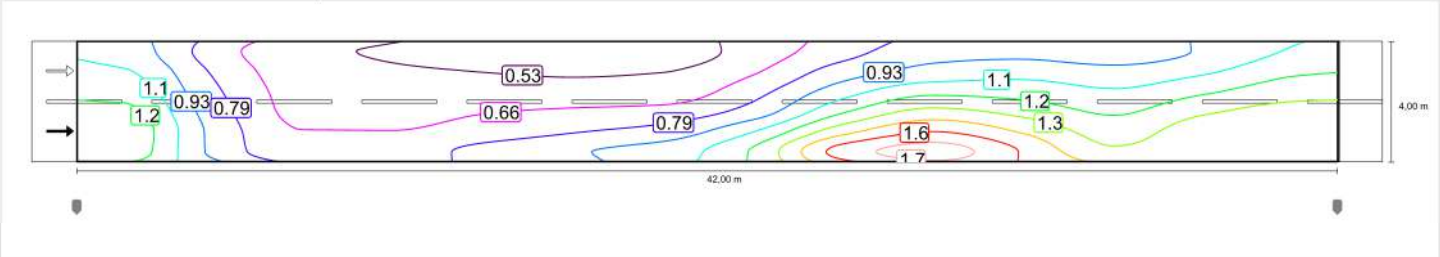


Observer 1

Luminance with dry roadway

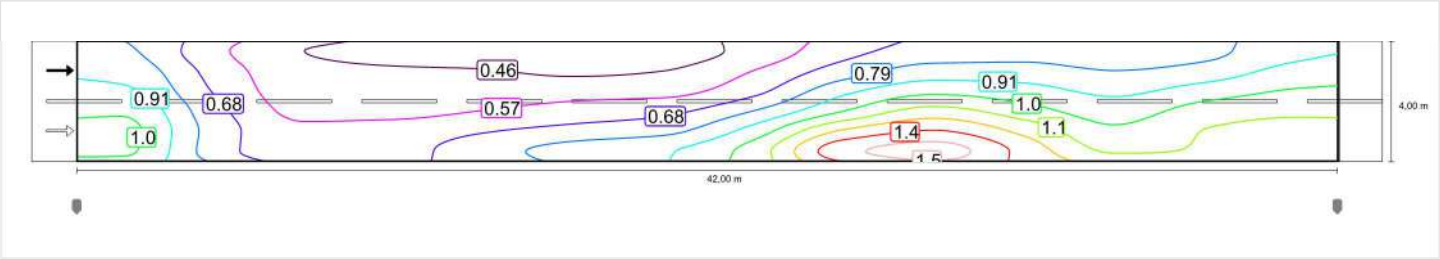


Luminance with new lamp

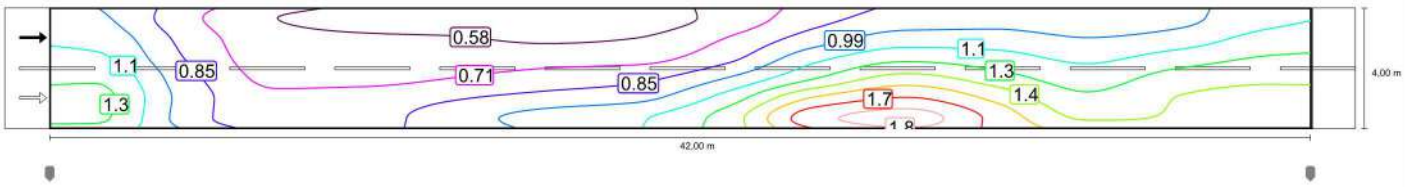


Observer 2

Luminance with dry roadway



Luminance with new lamp

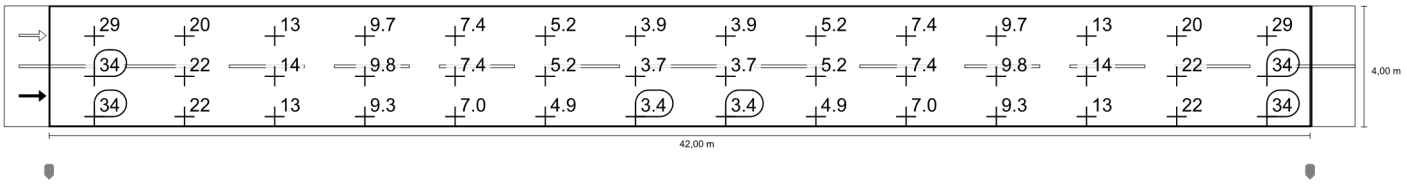


Roadway 1 (M5)

Maintenance factor: 0.80
Grid: 14 x 6 Points

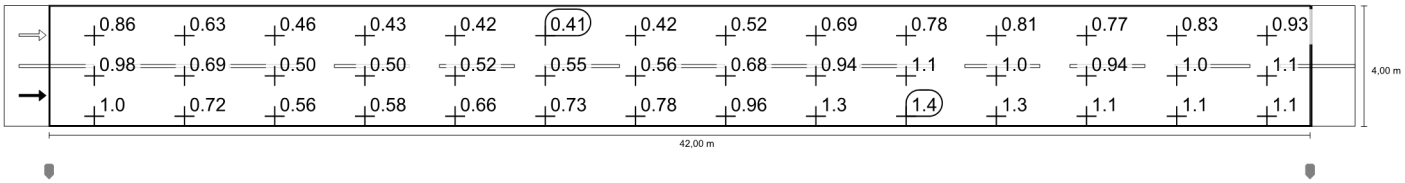
Lm [cd/m²] ≥ 0.50	Uo ≥ 0.35	Ul ≥ 0.40	TI [%] ≤ 15	EIR ≥ 0.30
✓ 0.76	✓ 0.49	✓ 0.42	✓ 11	✓ 0.71

Horizontal illuminance

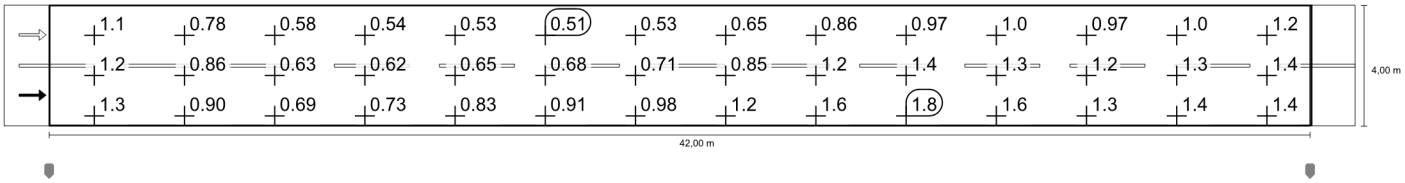


Observer 1

Luminance with dry roadway

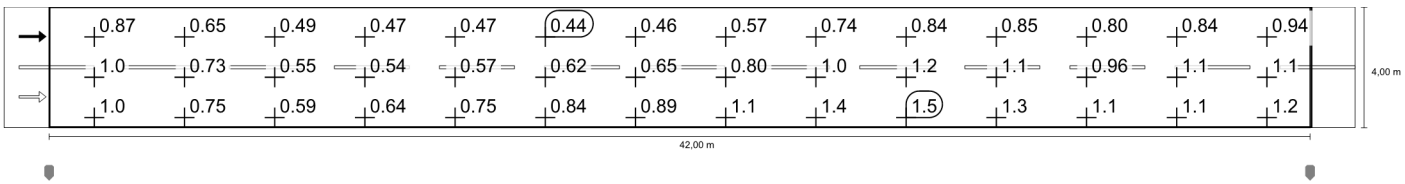


Luminance with new lamp



Observer 2

Luminance with dry roadway



Luminance with new lamp