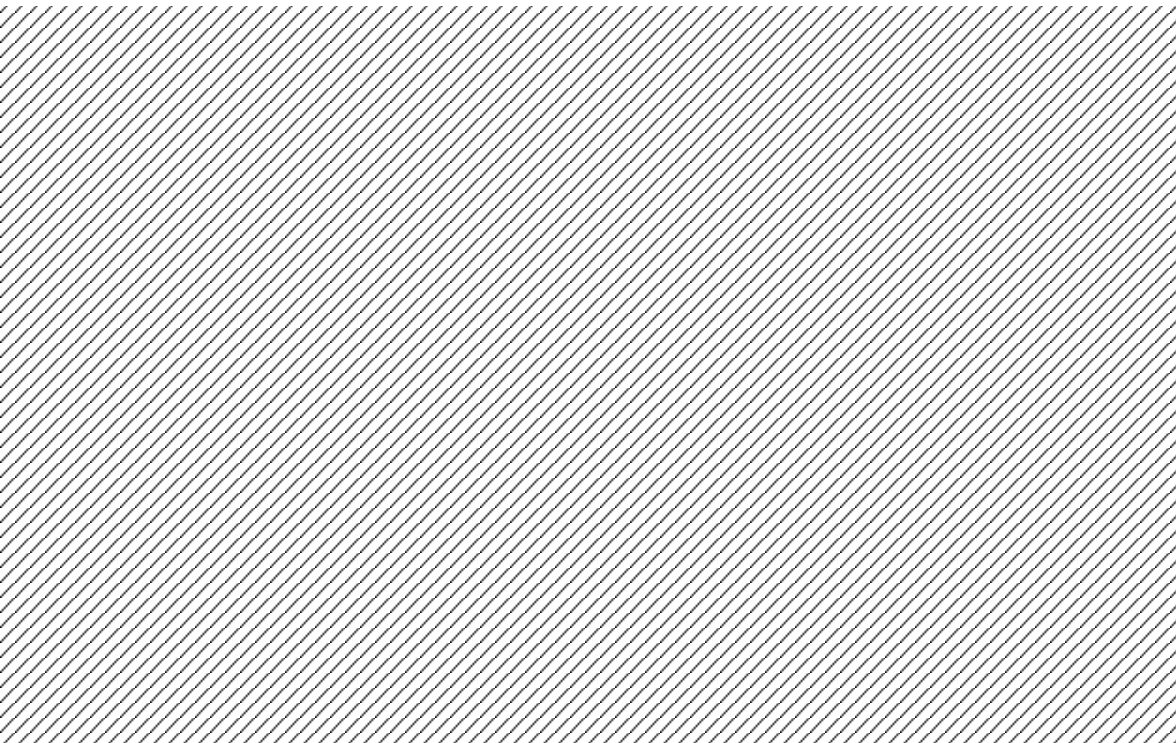




**Lighting of Tbilisi-Sagarejo-Bakurtsikhe road - Two lane
interchange ramps Q2, Q4 on bridge - with Izylum
luminaires**

Object

Tbilisi-Sagarejo-Bakurtsikhe road - Two lane interchange ramps Q2, Q4 on bridge

Date

15.03.2020

Object

Tbilisi-Sagarejo-Bakurtsikhe road - Two lane interchange ramps Q2, Q4 on bridge

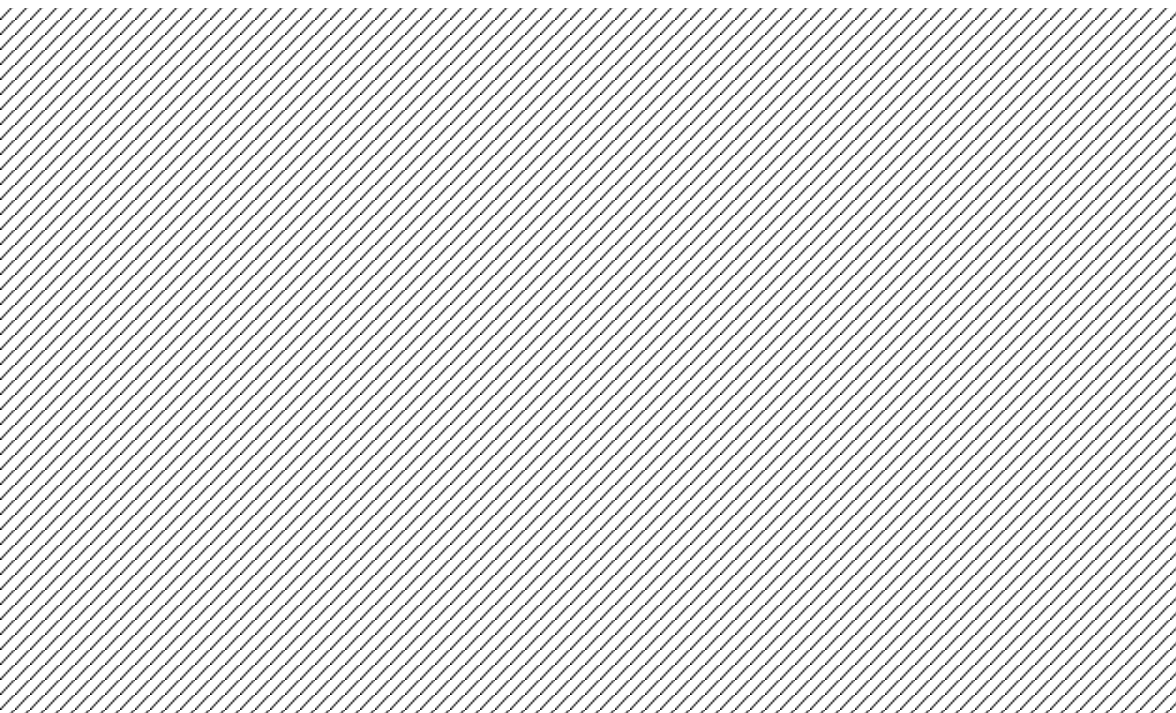
Content

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Product data sheets

Schröder - IZYLUM 2 5302 Flat glass - 40 LH351C@800mA NW 740 230V 00-53-404 449232 (1x 40 LH351C@800mA NW 740 230V 00-53-404)	5
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Summary (according to EN 13201:2015)	7
Roadway (M3)	10



Description

Lighting calculations of road lighting of Tbilisi-Sagarejo-Bakurtsikhe road - Two lane interchange ramps Q2, Q4 on bridge - with Izylum luminaires

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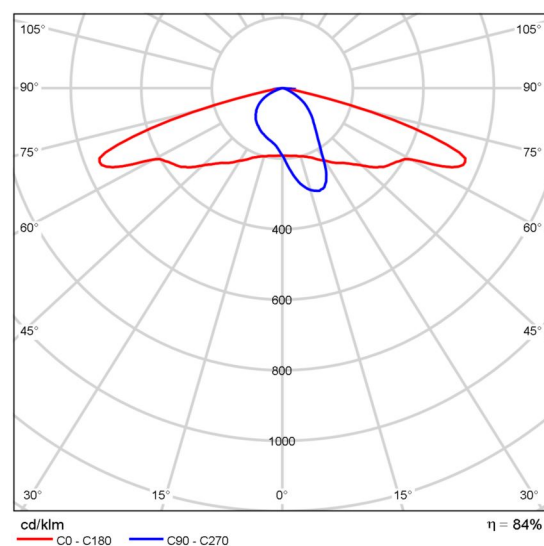
T +380 352 521611, 250613
F +380 352 250613
pbukanov@schreder.com

Product data sheet

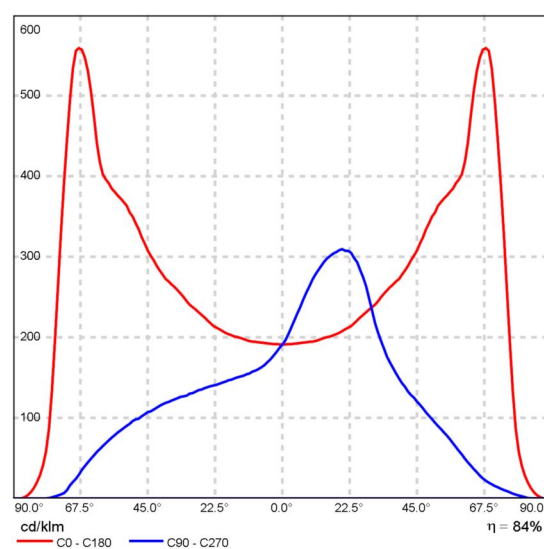
SCHREDER IZYLUM 2 5302 Flat glass - 40 LH351C@800mA NW 740 230V 00-53-404 449232



Article No.	449232
P	101.0 W
Φ_{Lamp}	14949 lm
$\Phi_{\text{Luminaire}}$	12542 lm
η	83.90 %
Luminous efficacy	124.2 lm/W
CCT	4000 K
CRI	70



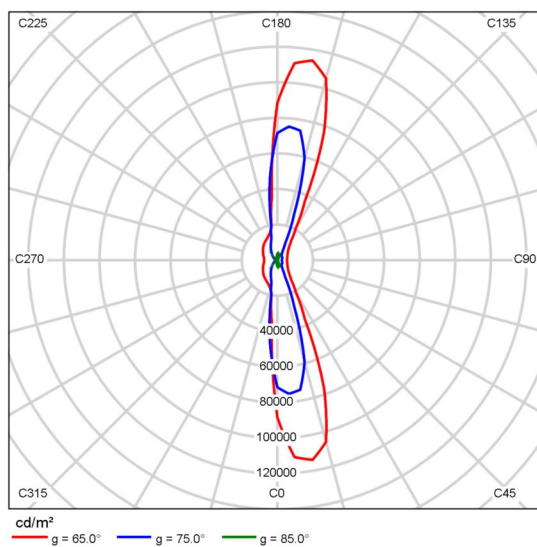
Polar LDC



Linear LDC

Product data sheet

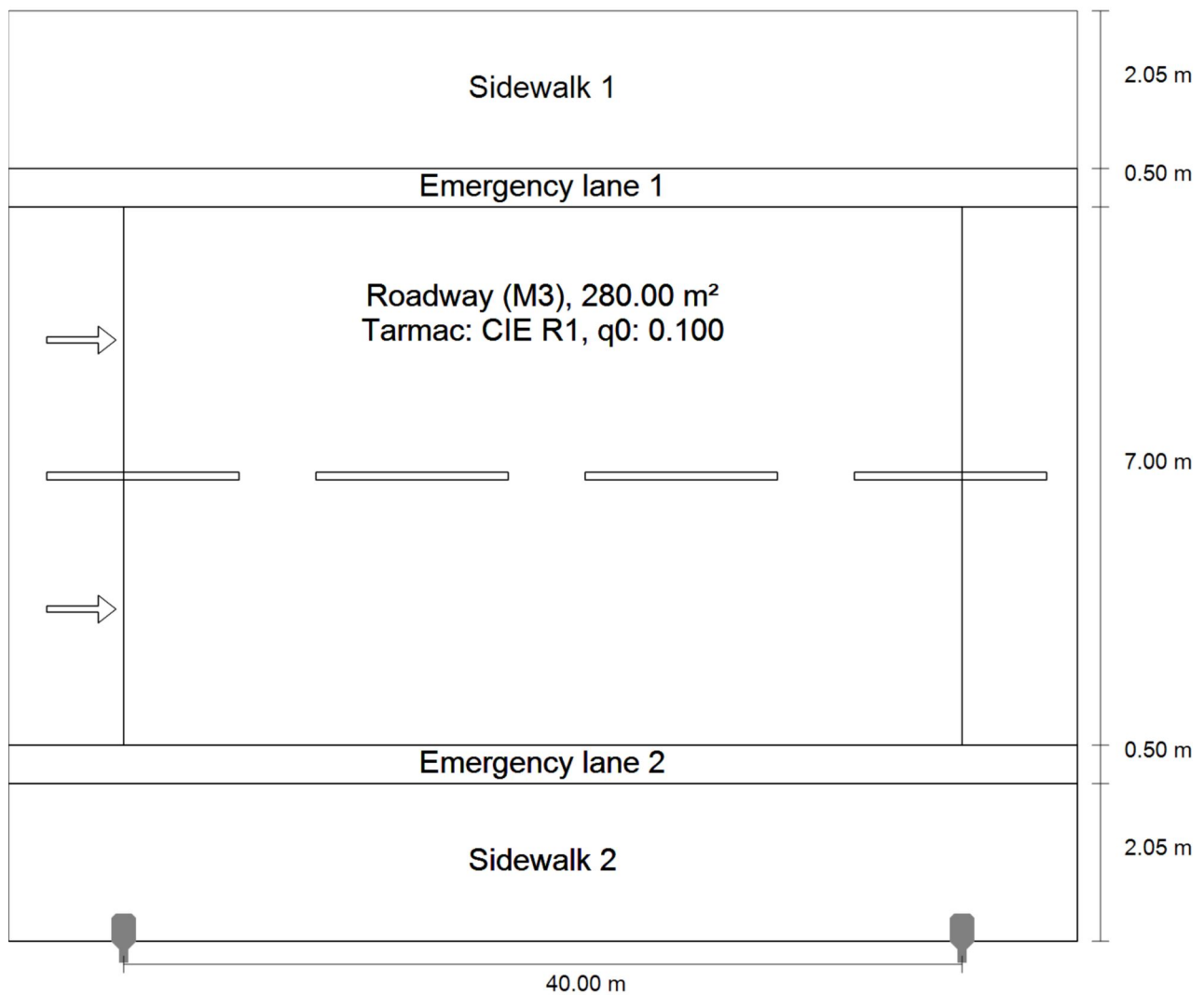
SCHREDER IZYLUM 2 5302 Flat glass - 40 LH351C@800mA NW 740 230V 00-53-404 449232



Luminance diagram

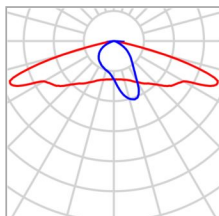
Tbilisi-Sagarejo-Bakurtsikhe road - Two lane interchange ramps Q2, Q4 on bridge · Альтернатива 1

Summary (according to EN 13201:2015)



Tbilisi-Sagarejo-Bakurtsikhe road - Two lane interchange ramps Q2, Q4 on bridge · Альтернатива 1

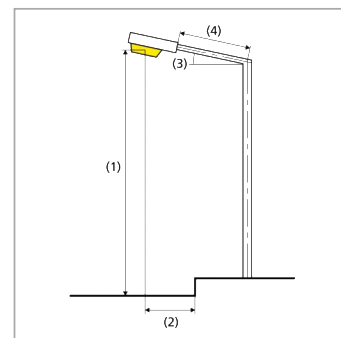
Summary (according to EN 13201:2015)



Manufacturer	SCHREDER	P	101.0 W
Article No.	449232	Φ_{Lamp}	14949 lm
Article name	IZYLUM 2 5302 Flat glass - 40 LH351C@800mA NW 740 230V 00-53-404 449232	$\Phi_{\text{Luminaire}}$	12542 lm
Fitting	1x 40 LH351C@800mA NW 740 230V 00-53-404	η	83.90 %

IZYLUM 2 5302 Flat glass - 40 LH351C@800mA NW 740 230V 00-53-404 449232 (single side bottom)

Pole distance	40.000 m
(1) Light spot height	8.000 m
(2) Light point overhang	-2.450 m
(3) Boom inclination	30.0°
(4) Boom length	0.373 m
Annual operating hours	4000 h: 100.0 %, 101.0 W
Consumption	2525.0 W/km
ULR / ULOR	0.01 / 0.00
Max. luminous intensities	$\geq 70^\circ$: 839 cd/klm
Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.	$\geq 80^\circ$: 667 cd/klm $\geq 90^\circ$: 65.3 cd/klm
Luminous intensity class	-



Tbilisi-Sagarejo-Bakurtsikhe road - Two lane interchange ramps Q2, Q4 on bridge · Альтернатива 1

Summary (according to EN 13201:2015)

The luminous intensity values in [cd/klm] for calculation of the luminous intensity class refer to the luminaire luminous flux according to EN 13201:2015.

Glare index class	D.0
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Results for valuation fields

	Symbol	Calculated	Target	Check
Roadway (M3)	L_{av}	1.40 cd/m ²	≥ 1.00 cd/m ²	✓
	U_o	0.55	≥ 0.40	✓
	U_l	0.68	≥ 0.60	✓
	TI	15 %	≤ 15 %	✓
	R_{EI}	0.67	≥ 0.30	✓

A maintenance factor of 0.80 was used for calculating for the installation.

Results for energy efficiency indicators

	Symbol	Calculated	Consumption
Tbilisi-Sagarejo-Bakurtsikhe road - Two lane interchange ramps Q2, Q4 on bridge	D_p	0.025 W/lx*m ²	-
IZYLUM 2 5302 Flat glass - 40 LH351C@800mA NW 740 230V 00-53-404 449232 (single side bottom)	D_e	1.4 kWh/m ² yr	404.0 kWh/yr

Tbilisi-Sagarejo-Bakurtsikhe road - Two lane interchange ramps Q2, Q4 on bridge · Альтернатива 1

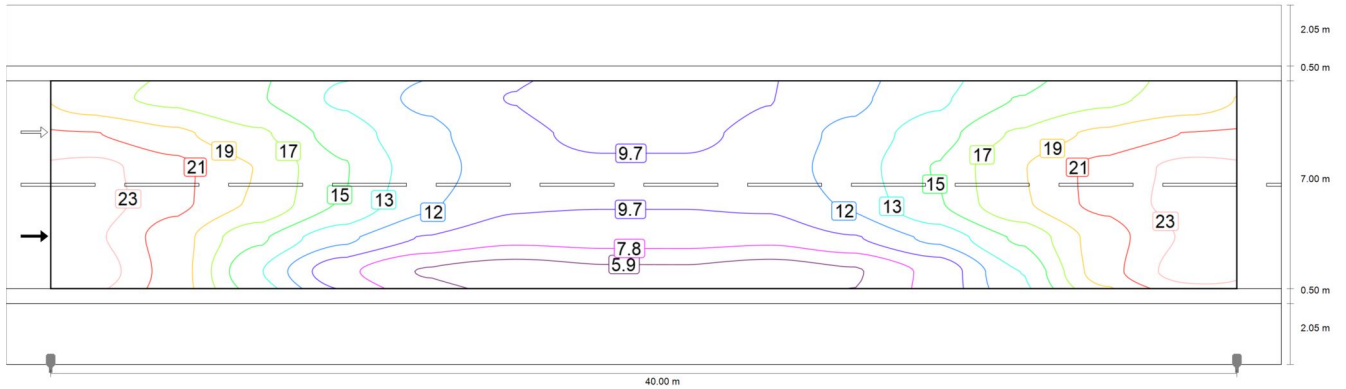
Roadway (M3)

Results for valuation field

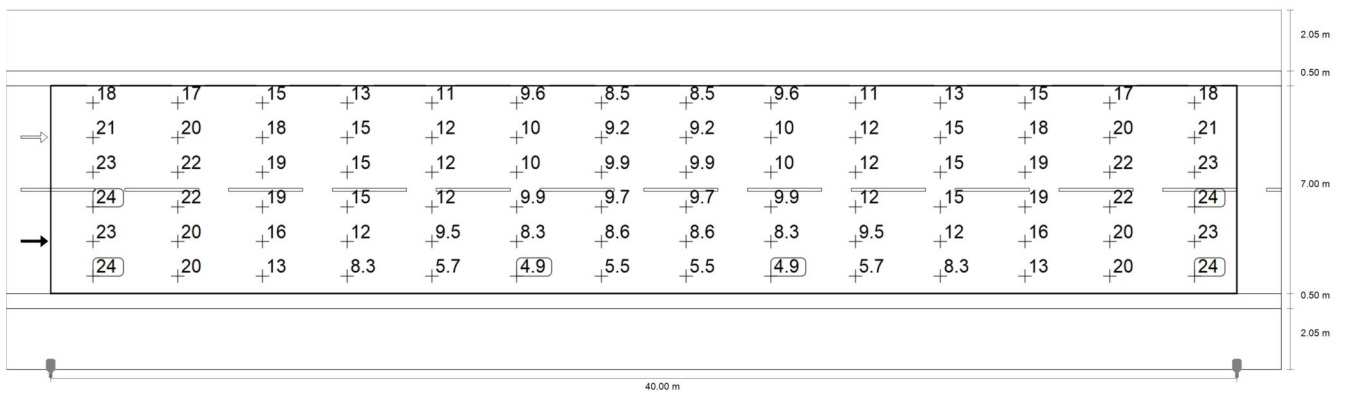
	Symbol	Calculated	Target	Check
Roadway (M3)	L_{av}	1.40 cd/m ²	≥ 1.00 cd/m ²	✓
	U_o	0.55	≥ 0.40	✓
	U_l	0.68	≥ 0.60	✓
	TI	15 %	≤ 15 %	✓
	R_{EI}	0.67	≥ 0.30	✓

Results for observer

	Symbol	Calculated	Target	Check
Observer 1 Position: -60.000 m, 4.300 m, 1.500 m	L_{av}	1.40 cd/m ²	≥ 1.00 cd/m ²	✓
	U_o	0.55	≥ 0.40	✓
	U_l	0.68	≥ 0.60	✓
	TI	15 %	≤ 15 %	✓
Observer 2 Position: -60.000 m, 7.800 m, 1.500 m	L_{av}	1.44 cd/m ²	≥ 1.00 cd/m ²	✓
	U_o	0.56	≥ 0.40	✓
	U_l	0.72	≥ 0.60	✓
	TI	11 %	≤ 15 %	✓



Maintenance value, horizontal illuminance [lx] (Iso-illuminance curves)

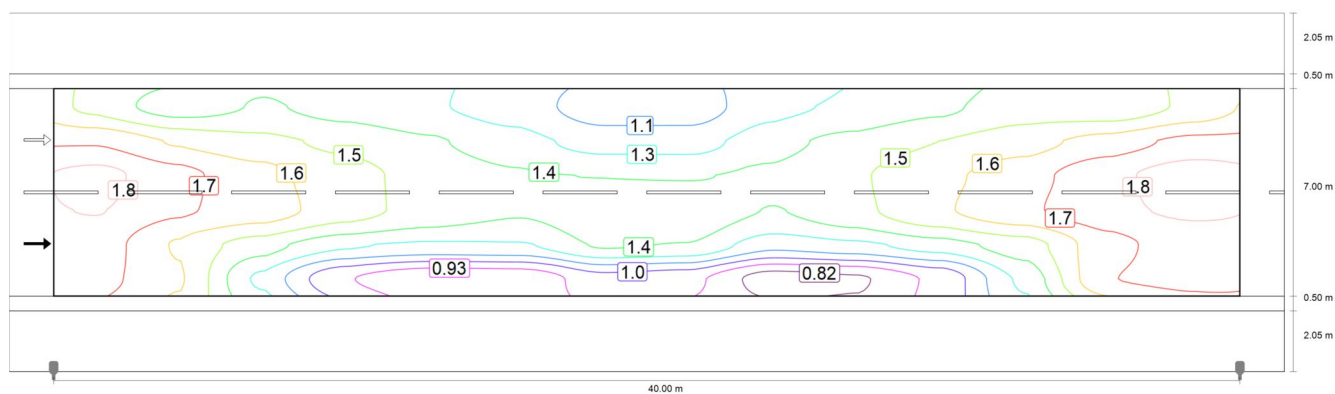


Maintenance value, horizontal illuminance [lx] (Value grid)

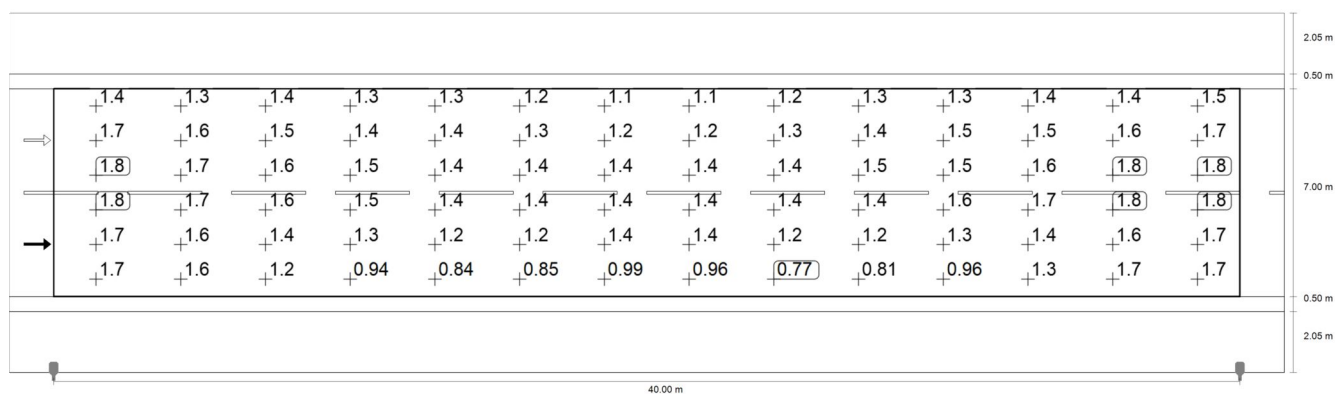
m	1.429	4.286	7.143	10.000	12.857	15.714	18.571	21.429	24.286	27.143	30.000	32.857	35.714	38.571
8.967	17.94	16.85	15.45	13.11	11.13	9.60	8.51	8.51	9.60	11.13	13.11	15.45	16.85	17.94
7.800	21.09	19.57	17.53	14.53	12.06	10.25	9.23	9.23	10.25	12.06	14.53	17.53	19.57	21.09
6.633	23.47	21.58	19.05	15.43	12.46	10.49	9.91	9.91	10.49	12.46	15.43	19.05	21.58	23.47
5.467	23.71	21.57	18.85	15.18	11.90	9.94	9.74	9.74	9.94	11.90	15.18	18.85	21.57	23.71
4.300	23.19	20.05	15.66	12.03	9.52	8.26	8.56	8.56	8.26	9.52	12.03	15.66	20.05	23.19
3.133	23.86	20.21	13.49	8.30	5.71	4.93	5.54	5.54	4.93	5.71	8.30	13.49	20.21	23.86

Maintenance value, horizontal illuminance [lx] (Value chart)

	E_{av}	E_{min}	E_{max}	g_1	g_2
Maintenance value, horizontal illuminance	14.3 lx	4.93 lx	23.9 lx	0.346	0.207



Observer 1: Maintenance value, luminance with dry roadway [cd/m²] (Iso-illuminance curves)

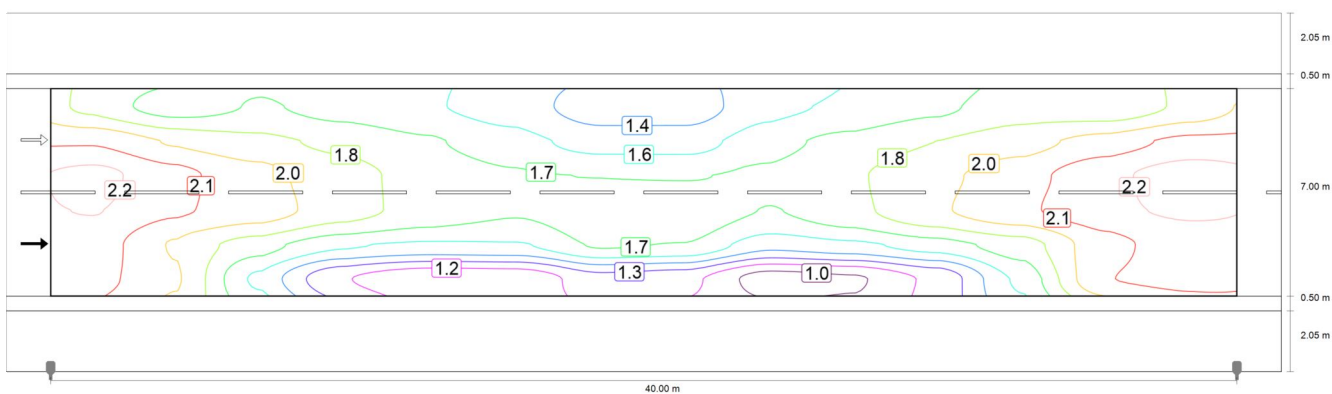


Observer 1: Maintenance value, luminance with dry roadway [cd/m²] (Value grid)

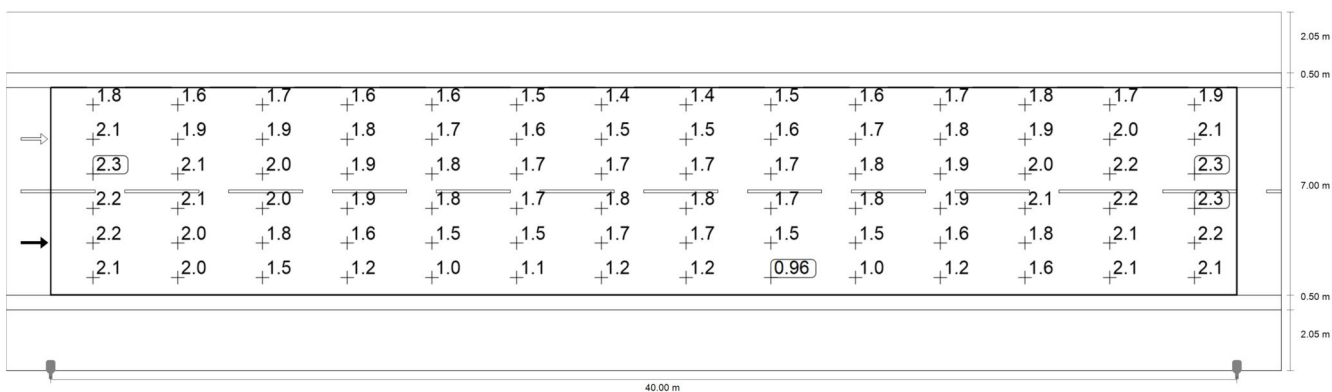
m	1.429	4.286	7.143	10.000	12.857	15.714	18.571	21.429	24.286	27.143	30.000	32.857	35.714	38.571
8.967	1.44	1.31	1.37	1.31	1.26	1.20	1.09	1.09	1.21	1.27	1.33	1.42	1.39	1.49
7.800	1.67	1.56	1.50	1.44	1.37	1.29	1.21	1.21	1.32	1.39	1.47	1.53	1.62	1.71
6.633	1.82	1.71	1.61	1.51	1.43	1.37	1.36	1.35	1.37	1.45	1.54	1.64	1.76	1.84
5.467	1.79	1.70	1.63	1.51	1.43	1.37	1.42	1.42	1.35	1.44	1.56	1.66	1.76	1.80
4.300	1.73	1.56	1.41	1.27	1.23	1.24	1.37	1.35	1.18	1.22	1.30	1.41	1.64	1.73
3.133	1.71	1.58	1.23	0.94	0.84	0.85	0.99	0.96	0.77	0.81	0.96	1.27	1.68	1.71

Observer 1: Maintenance value, luminance with dry roadway [cd/m²] (Value chart)

	L _{av}	L _{min}	L _{max}	g ₁	g ₂
Observer 1: Maintenance value, luminance with dry roadway	1.40 cd/m ²	0.77 cd/m ²	1.84 cd/m ²	0.547	0.418



Observer 1: Luminance with new installation [cd/m²] (Iso-illuminance curves)

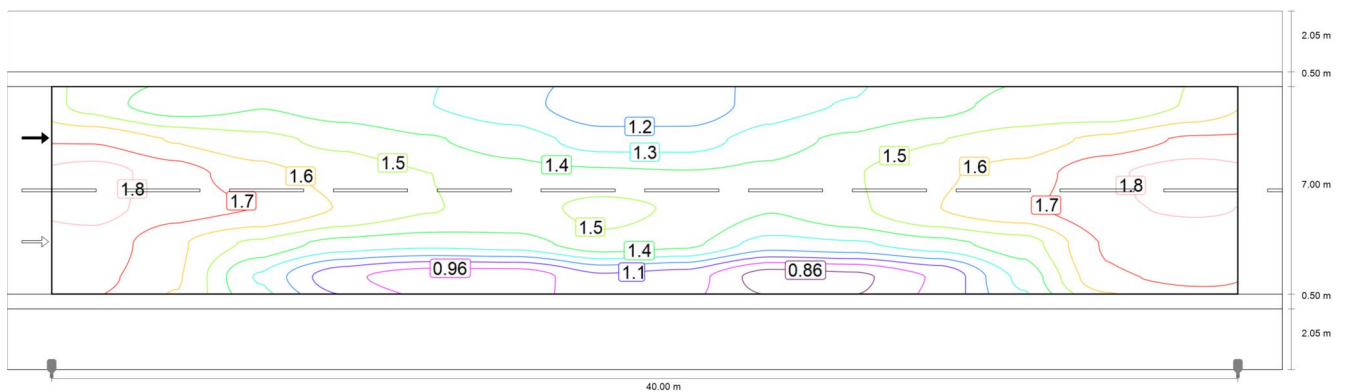


Observer 1: Luminance with new installation [cd/m²] (Value grid)

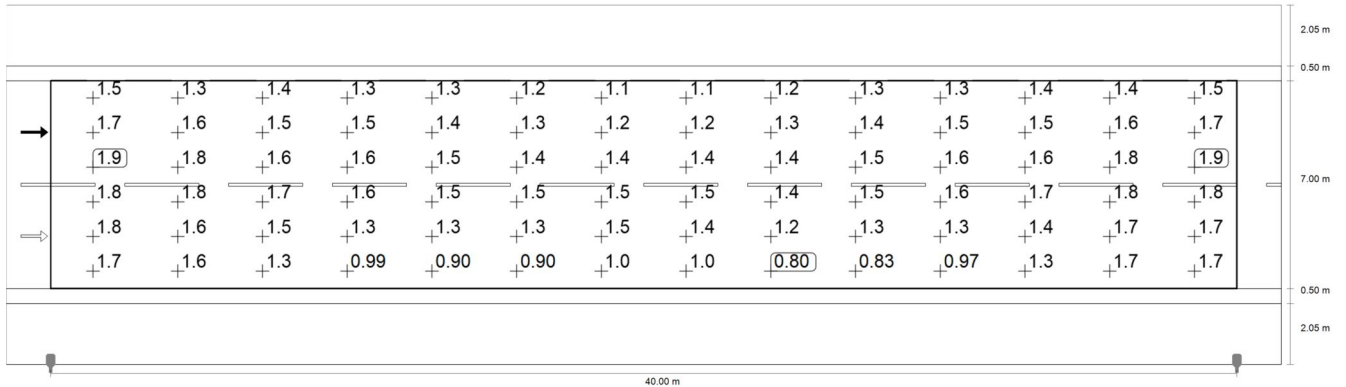
m	1.429	4.286	7.143	10.000	12.857	15.714	18.571	21.429	24.286	27.143	30.000	32.857	35.714	38.571
8.967	1.80	1.63	1.71	1.64	1.58	1.50	1.37	1.37	1.52	1.59	1.67	1.78	1.74	1.86
7.800	2.09	1.95	1.87	1.80	1.72	1.62	1.51	1.51	1.65	1.74	1.83	1.91	2.02	2.14
6.633	2.27	2.14	2.02	1.89	1.78	1.71	1.70	1.69	1.72	1.81	1.93	2.05	2.20	2.30
5.467	2.24	2.12	2.03	1.89	1.78	1.71	1.78	1.78	1.69	1.80	1.94	2.07	2.20	2.26
4.300	2.16	1.95	1.76	1.58	1.54	1.55	1.72	1.69	1.47	1.53	1.63	1.77	2.06	2.16
3.133	2.14	1.98	1.53	1.17	1.05	1.06	1.24	1.20	0.96	1.01	1.19	1.59	2.10	2.13

Observer 1: Luminance with new installation [cd/m^2] (Value chart)

	L_{av}	L_{min}	L_{max}	g_1	g_2
Observer 1: Luminance with new installation	1.76 cd/m^2	0.96 cd/m^2	2.30 cd/m^2	0.547	0.418



Observer 2: Maintenance value, luminance with dry roadway [cd/m^2] (Iso-illuminance curves)

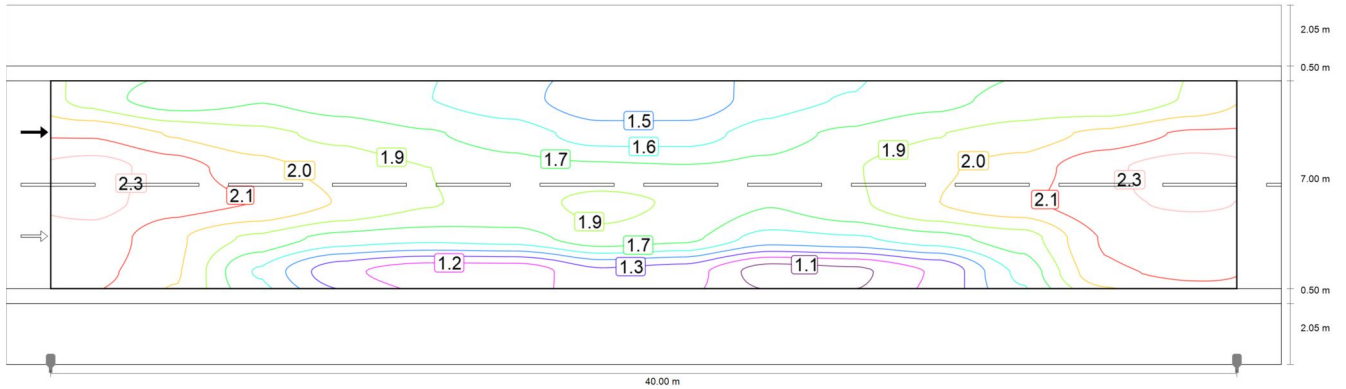


Observer 2: Maintenance value, luminance with dry roadway [cd/m²] (Value grid)

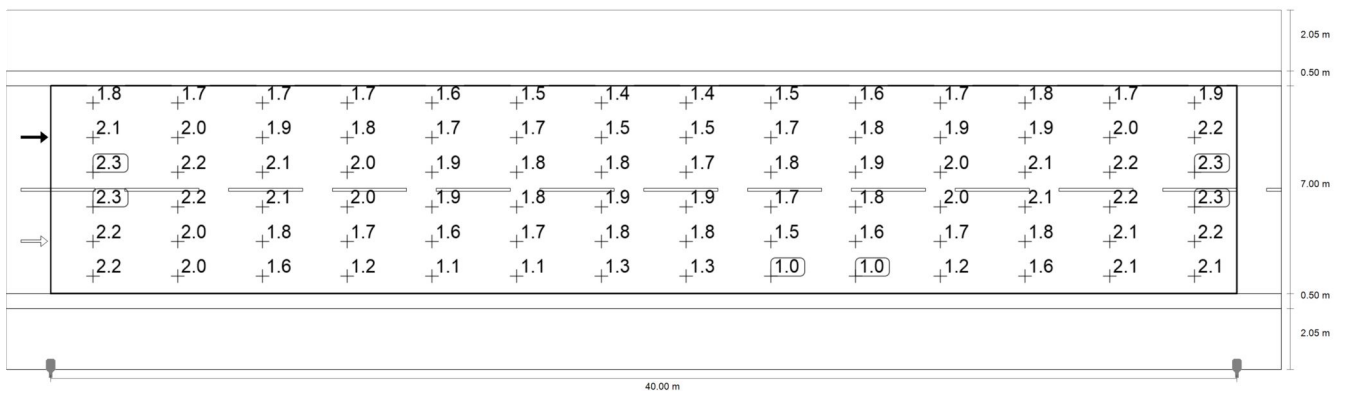
m	1.429	4.286	7.143	10.000	12.857	15.714	18.571	21.429	24.286	27.143	30.000	32.857	35.714	38.571
8.967	1.45	1.32	1.38	1.32	1.28	1.21	1.11	1.10	1.22	1.29	1.35	1.43	1.39	1.50
7.800	1.69	1.59	1.52	1.46	1.40	1.34	1.23	1.23	1.33	1.41	1.49	1.54	1.62	1.72
6.633	1.85	1.75	1.64	1.56	1.49	1.43	1.41	1.40	1.41	1.48	1.58	1.65	1.79	1.86
5.467	1.84	1.76	1.70	1.59	1.50	1.46	1.52	1.48	1.39	1.47	1.60	1.68	1.79	1.82
4.300	1.77	1.62	1.47	1.34	1.31	1.34	1.46	1.42	1.23	1.27	1.35	1.44	1.72	1.74
3.133	1.73	1.61	1.27	0.99	0.90	0.90	1.05	1.01	0.80	0.83	0.97	1.30	1.68	1.72

Observer 2: Maintenance value, luminance with dry roadway [cd/m²] (Value chart)

	L _{av}	L _{min}	L _{max}	g ₁	g ₂
Observer 2: Maintenance value, luminance with dry roadway	1.44 cd/m²	0.80 cd/m²	1.86 cd/m²	0.558	0.432



Observer 2: Luminance with new installation [cd/m²] (Iso-illuminance curves)



Observer 2: Luminance with new installation [cd/m²] (Value grid)

m	1.429	4.286	7.143	10.000	12.857	15.714	18.571	21.429	24.286	27.143	30.000	32.857	35.714	38.571
8.967	1.82	1.65	1.72	1.65	1.60	1.52	1.38	1.38	1.53	1.61	1.69	1.78	1.74	1.88
7.800	2.11	1.99	1.90	1.83	1.75	1.67	1.54	1.54	1.67	1.76	1.86	1.92	2.03	2.15
6.633	2.32	2.19	2.05	1.95	1.86	1.78	1.77	1.75	1.76	1.85	1.97	2.06	2.23	2.33
5.467	2.30	2.20	2.13	1.99	1.87	1.83	1.90	1.85	1.74	1.84	2.00	2.09	2.23	2.28
4.300	2.22	2.02	1.84	1.68	1.64	1.67	1.82	1.77	1.54	1.58	1.68	1.81	2.15	2.18
3.133	2.16	2.01	1.58	1.24	1.12	1.13	1.31	1.26	1.00	1.04	1.22	1.63	2.10	2.15

Observer 2: Luminance with new installation [cd/m²] (Value chart)

	L _{av}	L _{min}	L _{max}	g ₁	g ₂
Observer 2: Luminance with new installation	1.80 cd/m²	1.00 cd/m²	2.33 cd/m²	0.558	0.432

