BAB VI

KESIMPULAN DAN SARAN

6.1. Kesimpulan

1. Dari hasil perhitungan Distribusi Penerangan Rata-rata (L_{AVR}) dan Nilai Ambang Batas Silau (TI) menggunakan lampu Philips BRP371 LED93/NW 90W 220-240 V DM MP1 CT dengan lumen sebesar 9300 lm, dan jarak serta tinggi tiang penerangan lampu jalan yang ada sekarang, dapat ditarik kesimpulan bahwa kualitas lampu penerangan jalan di Jalan Diponegoro Kecamatan Parakan, Kabupaten temanggung, Jawa Tengah belum memenuhi standar CIE.
2. Lampu penerangan jalan di Jalan Diponegoro Kecamatan Parakan, Kabupaten Temanggung, Jawa tengah yang tidak memenuhi standar perhitungan CIE (0,5 – 2 cd/m^2) antara lain adalah lampu nomor 1, 5, 6, 10, 11, 13, 16, 23, 24, 25, 26, 27, 31, 32. Begitu juga hasil perhitungan Nilai Ambang Batas Silau (TI) pada Jalan Diponegoro Kecamatan Parakan, Kabupaten Temanggung, Jawa Tengah dapat ditarik kesimpulan bahwa tidak semua lampu penerangan jalan memenuhi standar CIE (10-20%). Lampu yang tidak memenuhi standar CIE (10-20%) adalah lampu nomor 2, 5, 6, 7, 8, 9, 11, 13, 20, 23, 24, 25, 26, 32.

6.2. Saran

1. Sebelum memasang tiang Penerangan Jalan Umum (PJU), sebaiknya dilakukan survey terhadap bagaimana keadaan jalan di sana, termasuk lebar jalan. Jika

lebar jalan sepanjang jalan yang akan dipasang PJU sama, sebaiknya PJU dipasang dengan tinggi, jarak antar tiang, dan jenis lampu yang sama.

2. Untuk PJU di Jalan Diponegoro Kecamatan Parakan, Kabupaten Temanggung, Jawa Tengah, sebaiknya menggunakan alternatif keempat yaitu mengubah spasi dan tinggi tiang lampu atau bisa juga menggunakan alternatif keenam yaitu mengganti jenis lampu jalan dibeberapa titik tiang lampu jalan, mengatur ulang tinggi lampu di beberapa tempat dan menambah jumlah tiang lampu Penerangan Jalan Umum. Kedua alternatif itu dipilih karena kedua alternatif itulah yang memiliki hasil paling bagus diantara yang lain.
3. Dengan evaluasi dan masukan dari Tugas Akhir ini diharapkan dapat bermanfaat dan dapat membantu meningkatkan kualitas Penerangan Jalan Umum khususnya di Jalan Diponegoro Kecamatan Parakan, Kabupaten Temanggung, Jawa Tengah.

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PHILIPS

Lighting

CitySoul gen2 LED Large

BRP531 GRN106-/740 I DM FG CO GR D9 60S

CitySoul gen2 Large - LED GreenLine 10600 lm - Distribution medium - Flat glass

CitySoul gen2 LED is one of the most versatile and inspirational urban street lighting families designed by Philips to date. This highly efficient range delivers excellent lighting levels whilst also providing the right ambiance for all urban application areas, from the outskirts of the city right through to the city center. By evolving the modularity of the CitySoul family and adding new innovations like the Lyre and the Accent bracket, Philips has made this range the ideal toolbox for every urban context. The design is flatter, completely round, and the transitions with the spigot and bracket entirely flush, thereby giving your cityscape a coherent, elegant and discreet identity. Designed around its LED engine, CitySoul gen2 LED is highly efficient and easy to maintain. It comes in two sizes and is suitable for side-entry, post-top, catenary and suspended mounting.

Product data

General Information	
Number of light sources	64 pcs
Lamp family code	GRN106 [LED GreenLine 10600 lm]
Light source color	740 neutral white
Light source replaceable	Yes
Number of gear units	1 unit
Driver/power unit/transformer	Power supply unit with DALI interface
Driver included	Yes
Optical cover/lens type	Flat glass
Luminaire light beam spread	180°

Embedded control	-
Control interface	DALI
Light regulation	Dimming via external communication DALI
Electrical circuit protection	-
Connection	-
Cable	-
Protection class IEC	Safety class I
Parts color	Cover painted
Coating	-
Glow-wire test	Temperature 650 °C, duration 30 s

CitySoul gen2 LED Large

Flammability mark	-
CE mark	CE mark
ENEC mark	ENEC mark
Warranty period	5 years
Optic type outdoor	Distribution medium
Constant light output	No
Spare parts available	Yes
Number of products on MCB of 16 A type B	11
Photobiological risk	Risk group 1
RoHS mark	RoHS mark
WEEE mark	-
Light source engine type	LED
Serviceability class	Class A, luminaire is equipped with serviceable parts (when applicable): LED board, driver, control units, surge protection device, optics, front cover and mechanical parts
Product family code	BRP531 [CitySoul gen2 Large]

Light Technical

Upward light output ratio	0.03
Standard tilt angle posttop	0°
Standard tilt angle side entry	0°

Operating and Electrical

Input Voltage	220 to 240 V
Input Frequency	50 to 60 Hz
Control signal voltage	1-10 V DC
Inrush current	53 A
Inrush time	0.3 ms
Power Factor (Min)	0.8

Controls and Dimming

Dimmable	Yes

Mechanical and Housing

Housing Material	Aluminum
Reflector material	-
Optic material	Polymethyl methacrylate
Optical cover/lens material	Polymethyl methacrylate
Fixation material	Aluminum
Mounting device	Side-entry for diameter 60 mm
Optical cover/lens shape	Convex lens
Optical cover/lens finish	Mask (anti-glare)

Overall length	735 mm
Overall width	628 mm
Overall height	106 mm
Effective projected area	0.029 m²

Approval and Application

Ingress protection code	IP66 [Dust penetration-protected, jet-proof]
Mech. impact protection code	IK08 [5 J vandal-protected]
Surge Protection (Common/Differential)	Luminaire surge protection level until 6 kV differential mode and 8 kV common mode

Initial Performance (IEC Compliant)

Initial luminous flux (system flux)	10697 lm
Luminous flux tolerance	+/-10%
Initial LED luminaire efficacy	157 lm/W
Init. Corr. Color Temperature	4000 K
Init. Color Rendering Index	>70
Initial chromaticity	(0.38,0.37) SDCM<5
Initial input power	68 W
Power consumption tolerance	+/-10%

Over Time Performance (IEC Compliant)

Driver failure rate at 5000 h	0.15 %
Useful life L80B10	100000 h

Application Conditions

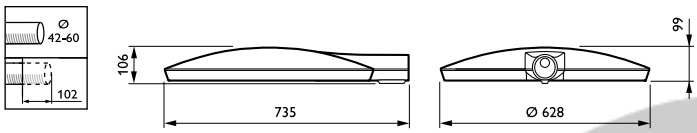
Ambient temperature range	-20 to +50 °C
Average ambient temperature	35 °C
Maximum dim level	20%

Product Data

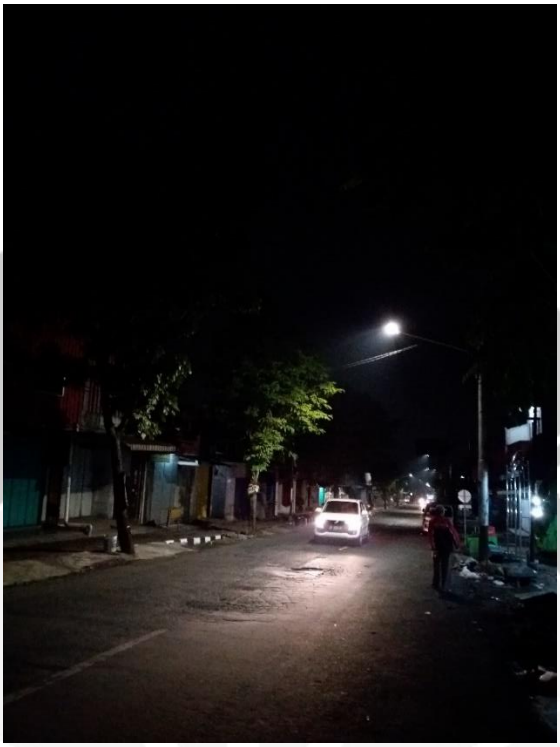
Full product code	871869661340500
Order product name	BRP531 GRN106-/740 I DM FG CO GR D9 60S
EAN/UPC - Product	8718696613405
Order code	910505016880
Numerator - Quantity Per Pack	1
Numerator - Packs per outer box	1
Material Nr. (12NC)	910505016880
Net Weight (Piece)	18.000 kg

CitySoul gen2 LED Large

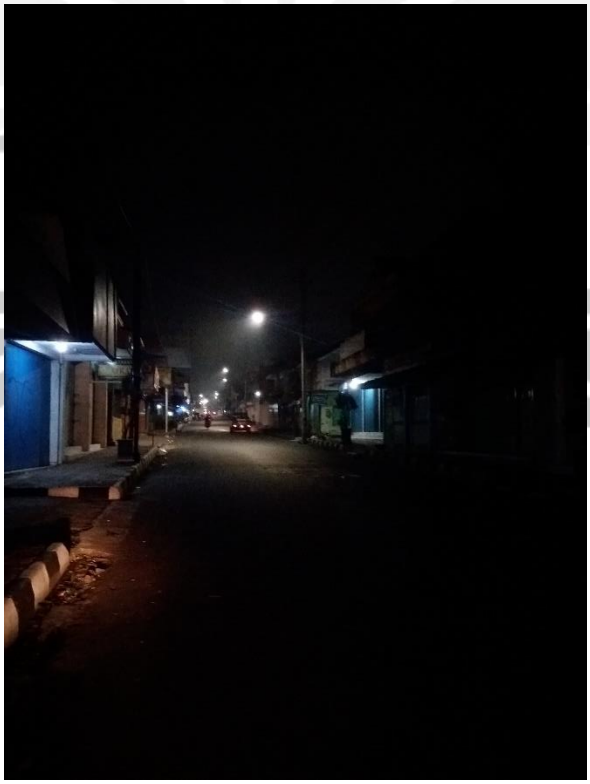
Dimensional drawing



CitySoul gen2 BGP/BPP/BRP/BSP/BVP530/531



Gambar Keadaan Lokasi pada Malam Hari



Gambar Kondisi Jalan yang Gelap Akibat Jauhnya Spasi Tiang Lampu

Gambar Lokasi Kurangnya Penyebaran Cahaya Lampu

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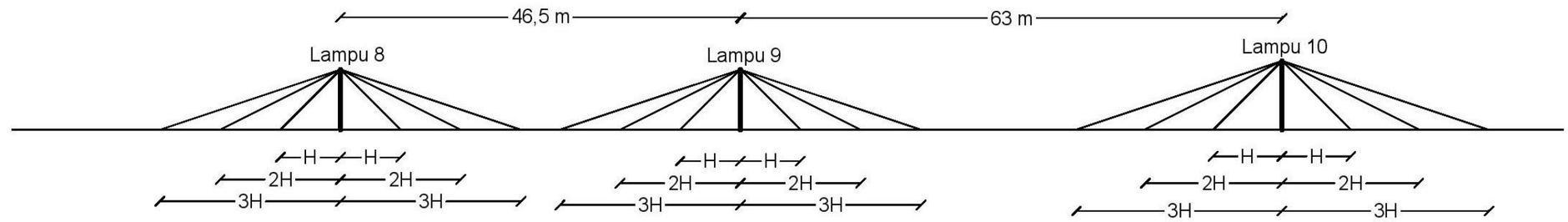

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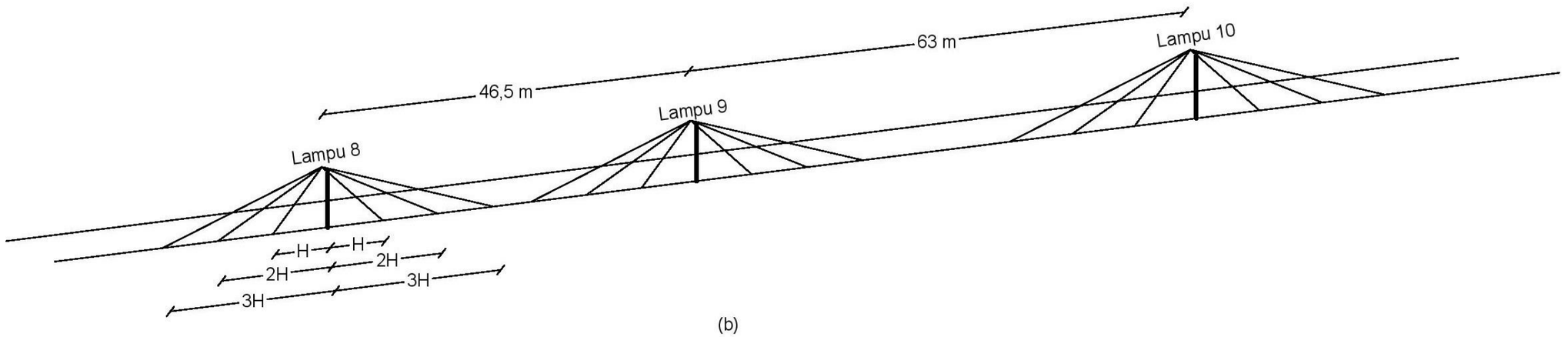
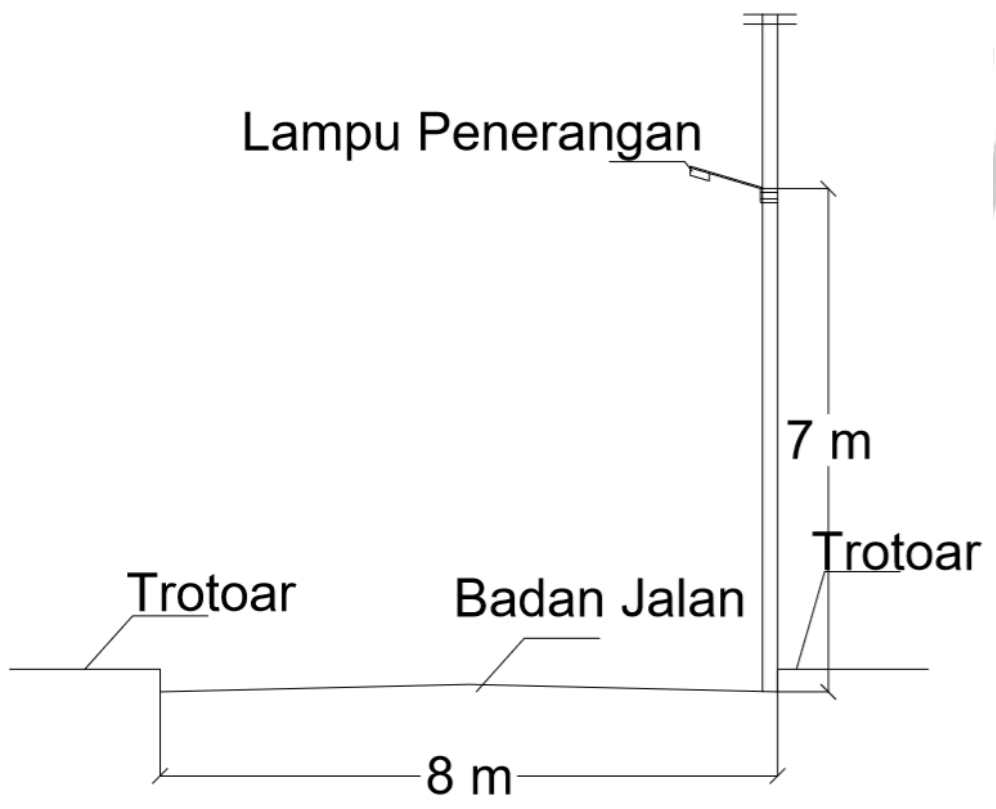


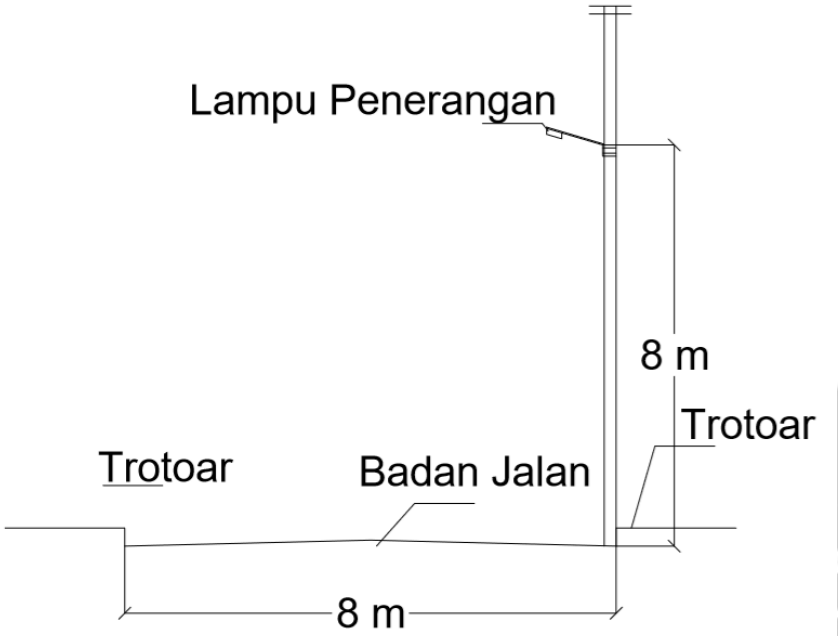
(b)

Gambar (a) Potongan Memanjang dan (b) Potongan Melintang Pencahayaan Lampu 8, Lampu 9, dan Lampu 10

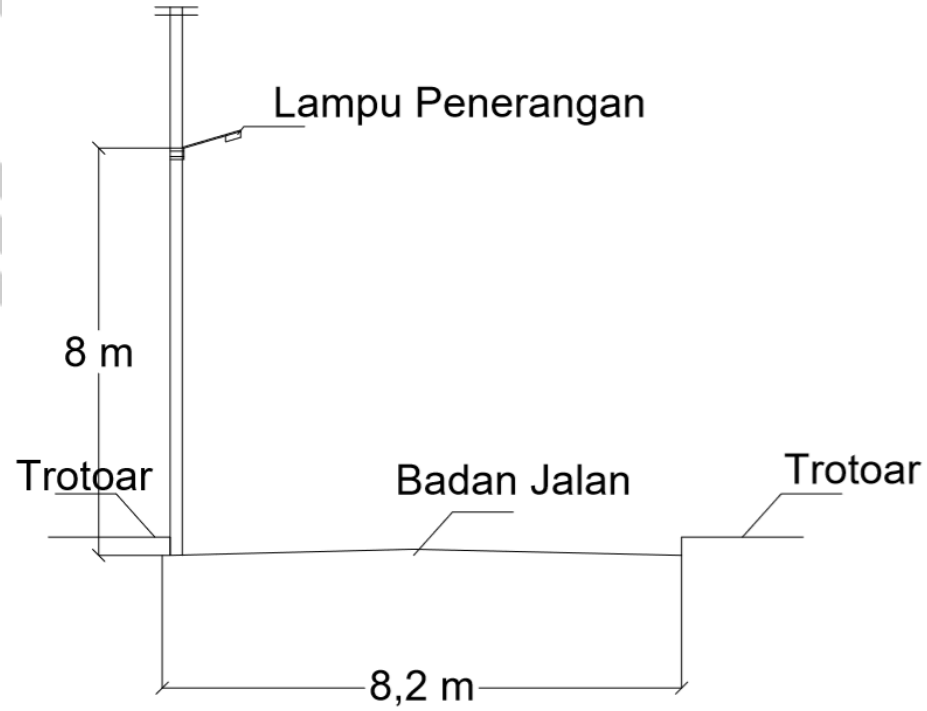
Gambar Tampak Samping Lampu Penerangan 1



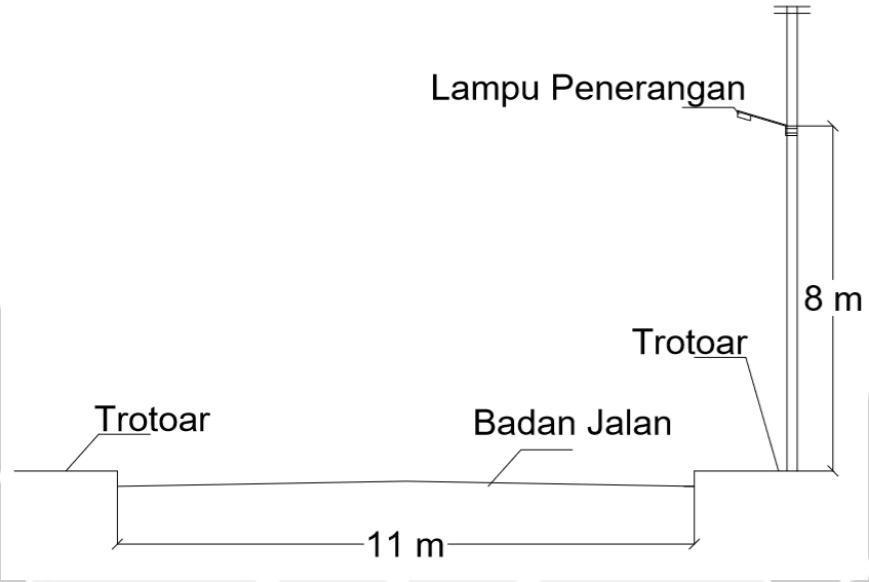
Gambar Tampak Samping Lampu Penerangan 9



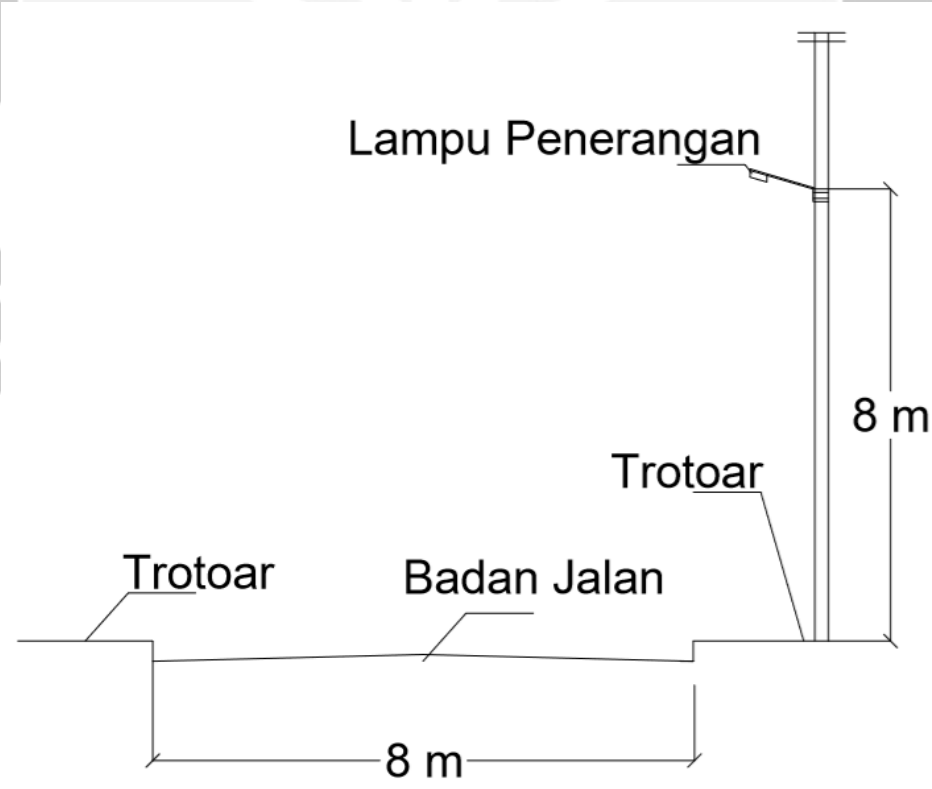
Gambar Tampak Samping Lampu Penerangan 10



Gambar Tampak Samping Lampu Penerangan 12



Gambar Tampak Samping Lampu Penerangan 31



Gambar Tampak Samping Lampu Penerangan 34

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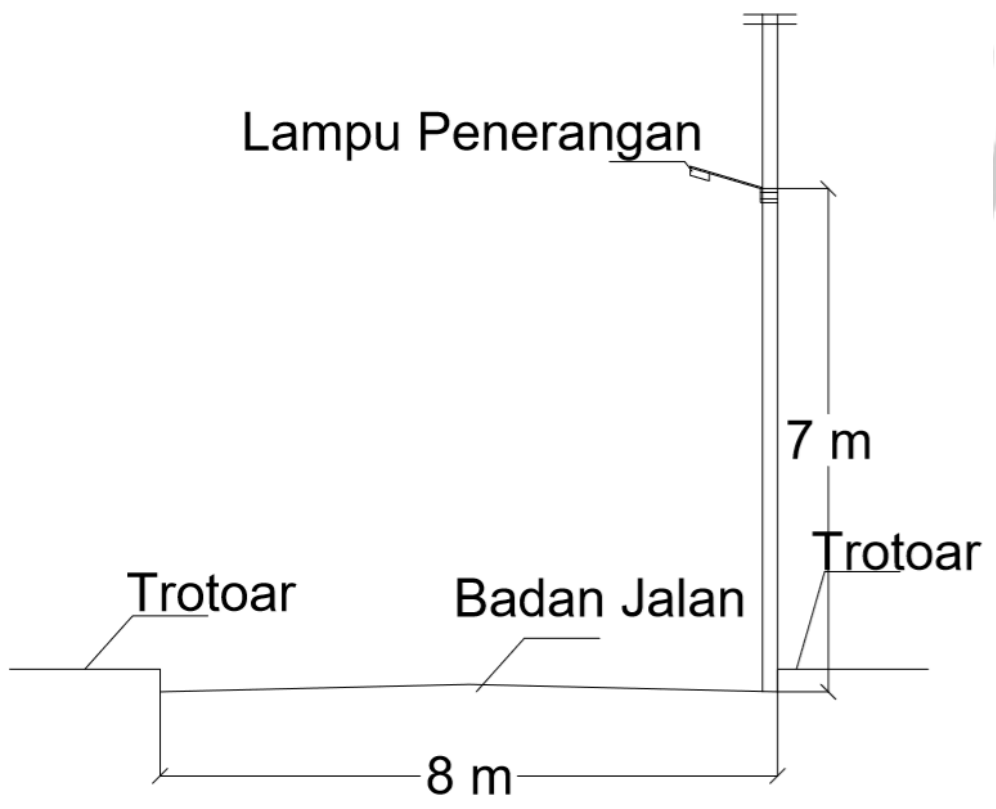
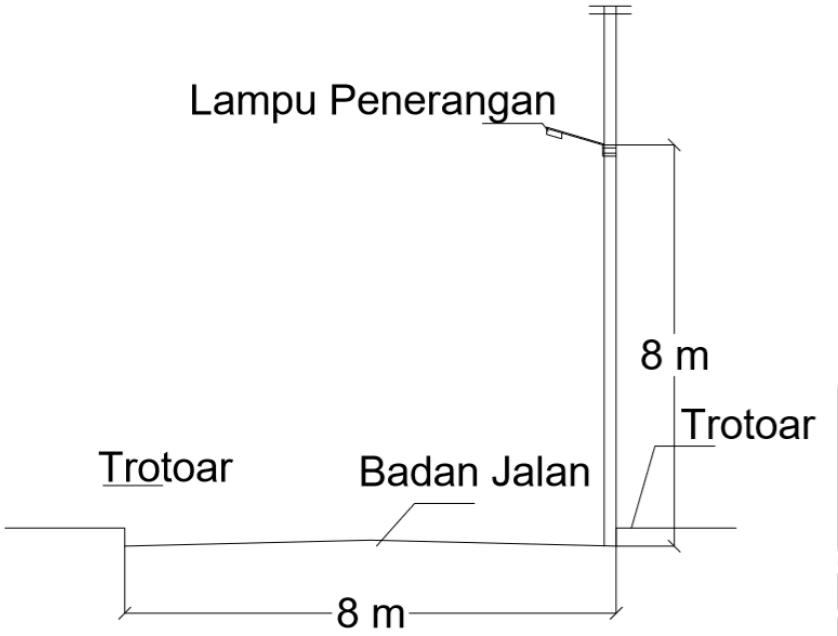
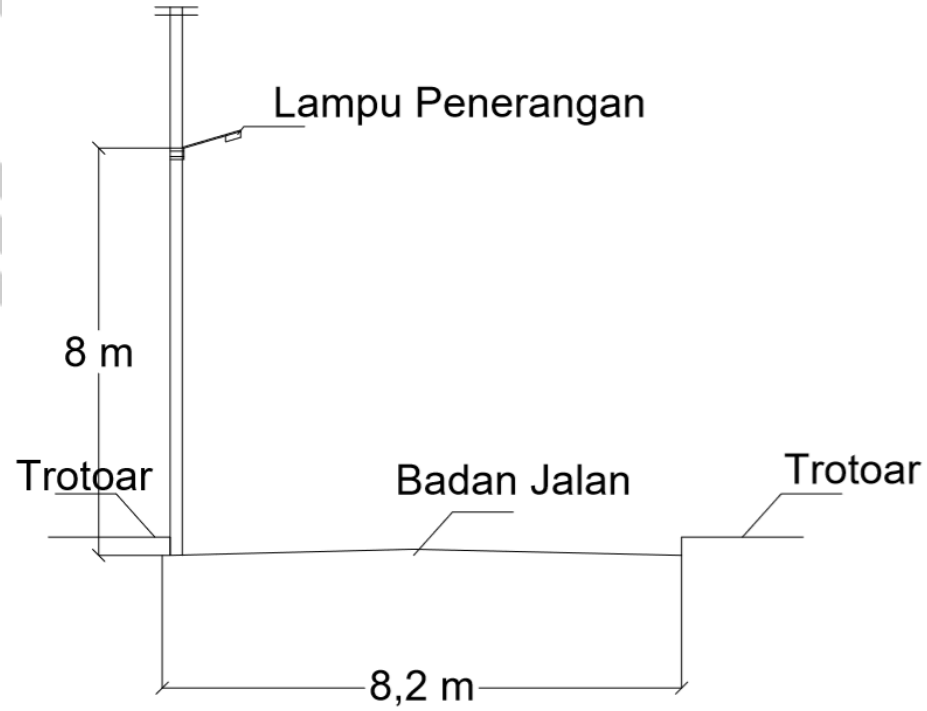
Gambar Tampak Samping Lampu Penerangan 1



Gambar Tampak Samping Lampu Penerangan 9



Gambar Tampak Samping Lampu Penerangan 10



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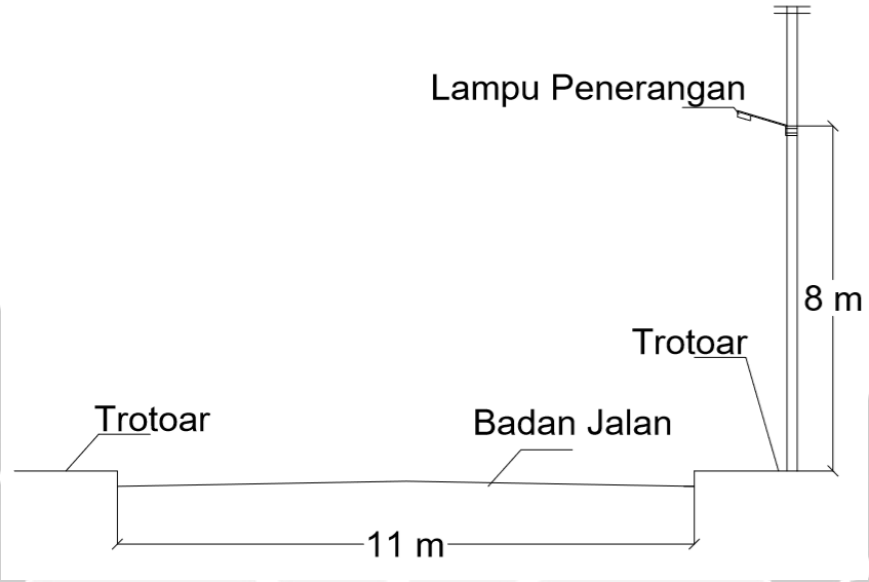

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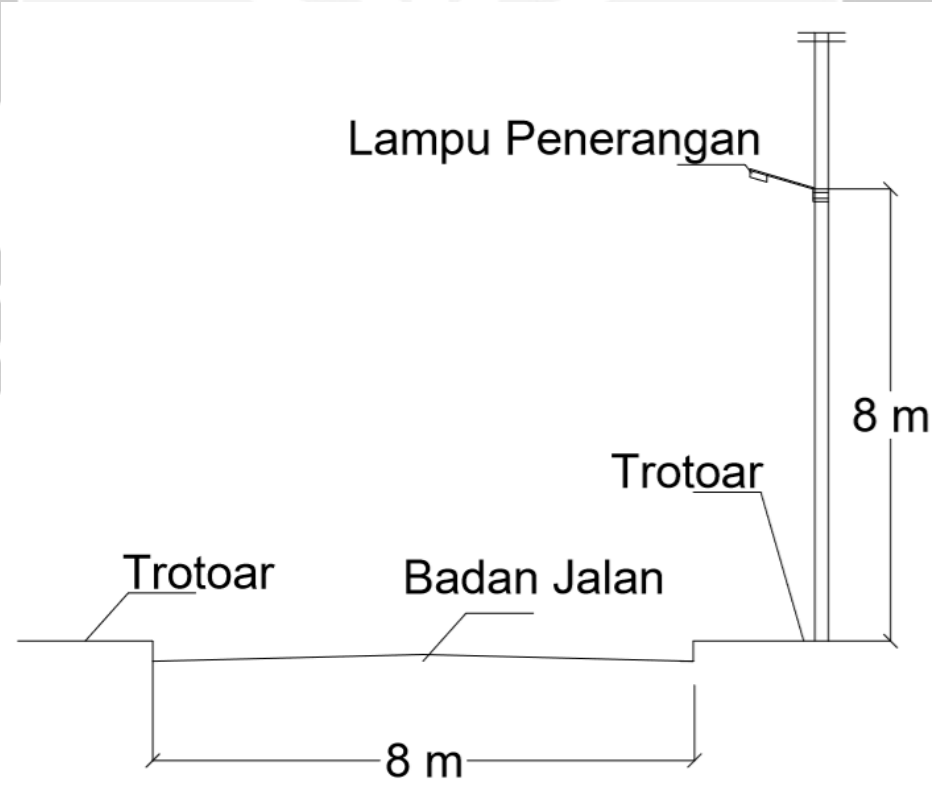

Gambar Tampak Samping Lampu Penerangan 34

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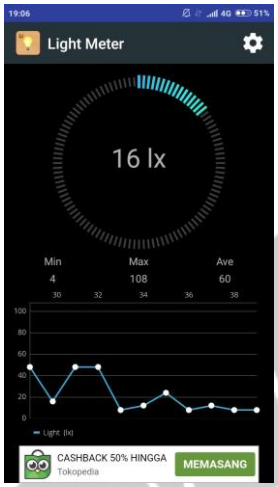
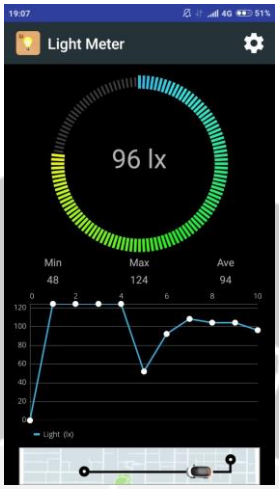
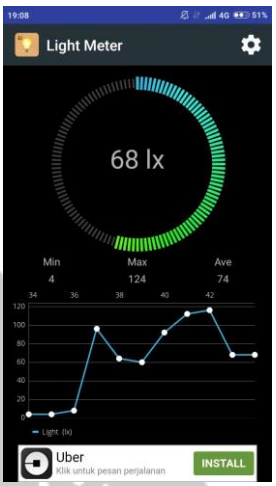
LAMPIRAN

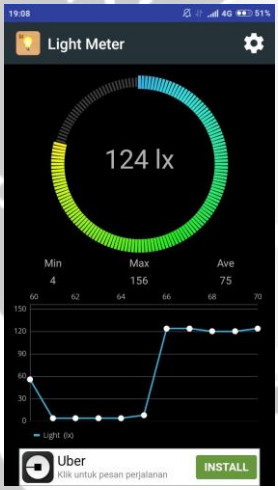
DATA LUX LAMPU MENGGUNAKAN LUX METER

Tiang lampu	Lux
1	16
2	96
3	68
4	124
5	84
6	72
7	76
8	72
9	184
10	64
11	64
12	60
13	44
14	8
15	56
16	8
17	8
18	8
19	92
20	20
21	156
22	52
23	80
24	80
25	84
26	172
27	36
28	124
29	156
30	160
31	76
32	192
33	104
34	76
35	96


Light Meter
16 lx
Min
Max
Ave
4
108
60
CASHBACK 50% HINGGA
Tokopedia
MEMASANG


Light Meter
96 lx
Min
Max
Ave
48
124
94


Light Meter
68 lx
Min
Max
Ave
4
124
74
Uber
Klik untuk pesan perjalanan
INSTALL


Light Meter
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Min
Max
Ave
4
156
75
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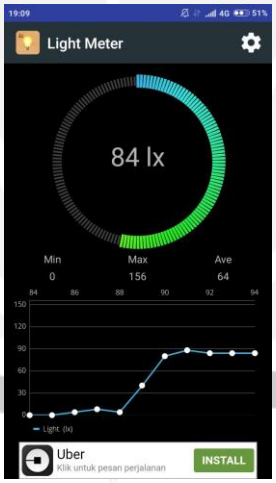
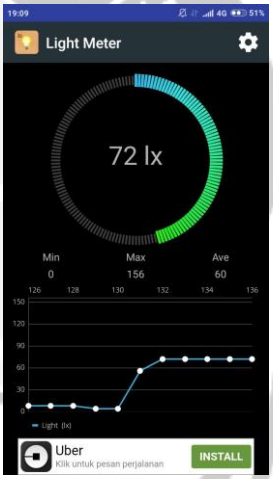
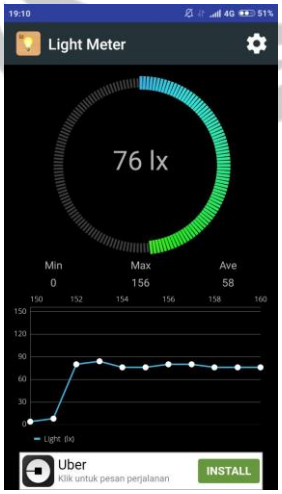
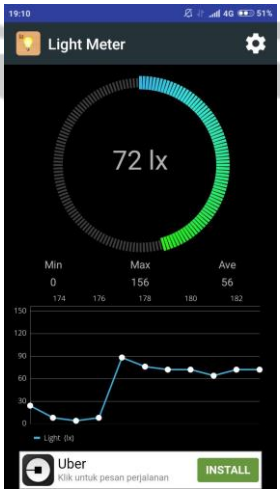
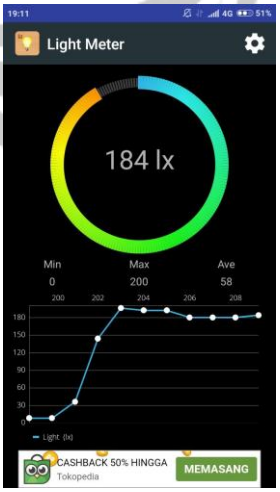
Klik untuk pesan perjalanan
INSTALL


Light Meter
84 lx
Min
Max
Ave
0
156
64
Uber
Klik untuk pesan perjalanan
INSTALL

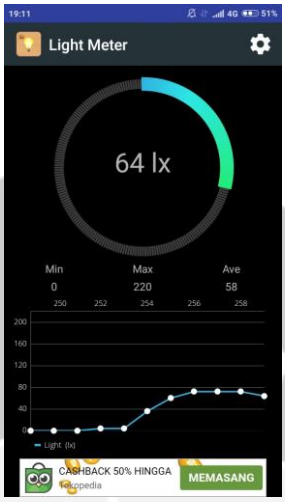

Light Meter
72 lx
Min
Max
Ave
0
156
60
Uber
Klik untuk pesan perjalanan
INSTALL

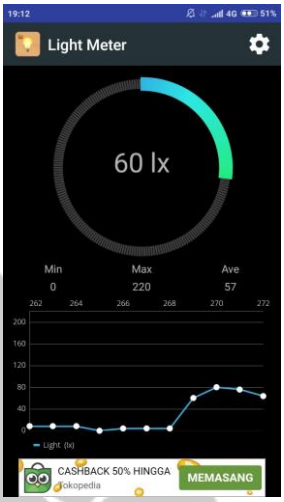

Light Meter
76 lx
Min
Max
Ave
0
156
58
Uber
Klik untuk pesan perjalanan
INSTALL


Light Meter
72 lx
Min
Max
Ave
0
156
56
Uber
Klik untuk pesan perjalanan
INSTALL


Light Meter
184 lx
Min
Max
Ave
0
200
58
CASHBACK 50% HINGGA
Tokopedia
MEMASANG


Light Meter
64 lx
Min
0
Max
220
Ave
60
CASHBACK 50% HINGGA
Tokopedia
MEMASANG


Light Meter
64 lx
Min
0
Max
220
Ave
58
CASHBACK 50% HINGGA
MEMASANG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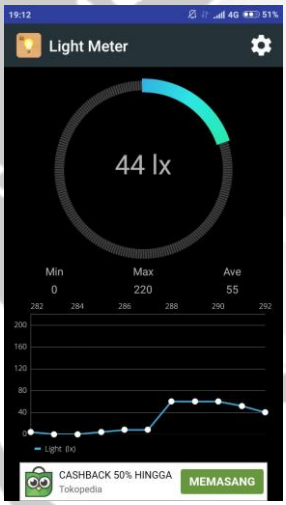
Max
220
Ave
57
CASHBACK 50% HINGGA
Tokopedia
MEMASANG


Light Meter
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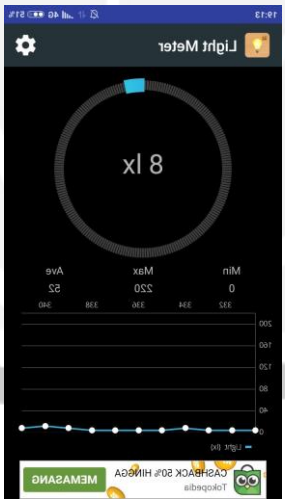
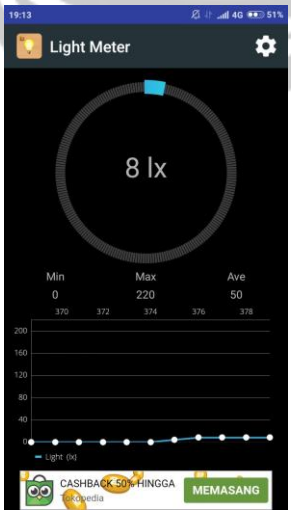
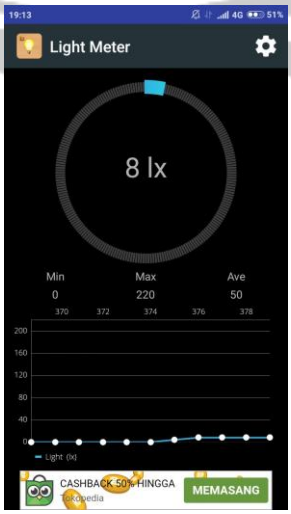
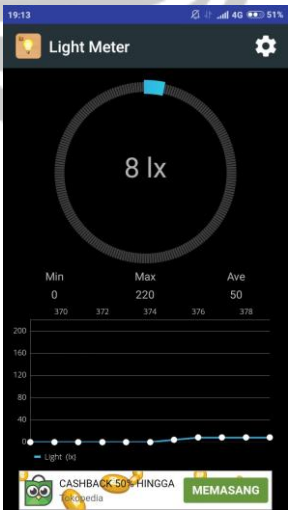
Min
0
Max
220
Ave
55
CASHBACK 50% HINGGA
Tokopedia
MEMASANG

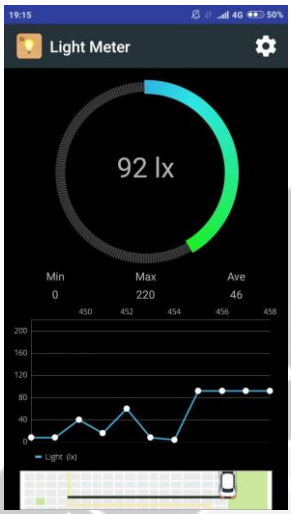

Light Meter
8 lx

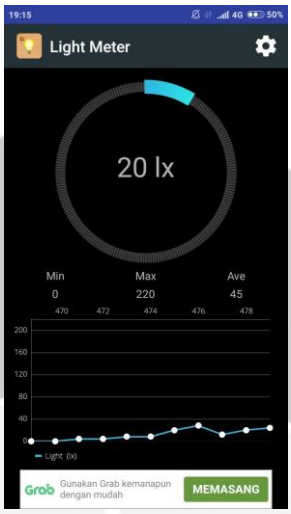

Light Meter
56 lx
Min
0
Max
220
Ave
51
CASHBACK 50% HINGGA
Tokopedia
MEMASANG


Light Meter
8 lx
Min
0
Max
220
Ave
50
CASHBACK 50% HINGGA
Tokopedia
MEMASANG

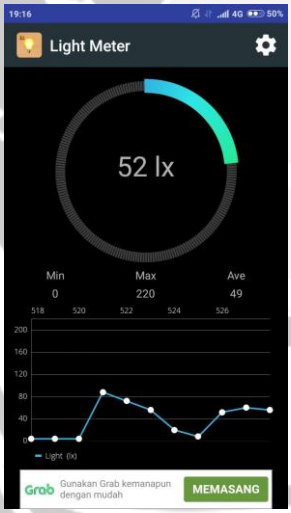

Light Meter
8 lx
Min
0
Max
220
Ave
50
CASHBACK 50% HINGGA
Tokopedia
MEMASANG

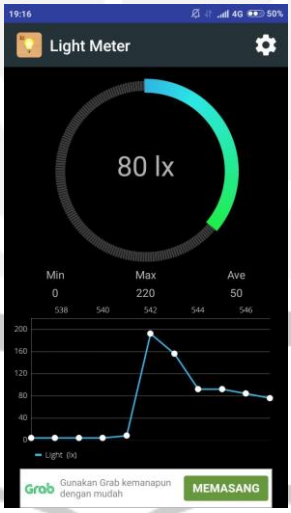

Light Meter
8 lx
Min
0
Max
220
Ave
50
CASHBACK 50% HINGGA
Tokopedia
MEMASANG

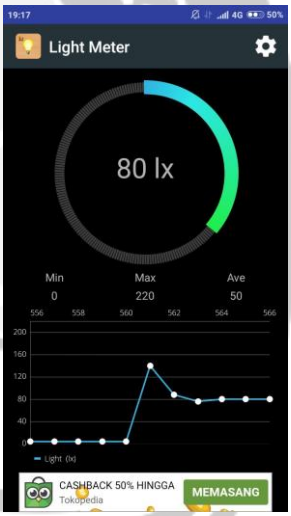

Light Meter
92 lx
Min
0
Max
220
Ave
46
Light (lx)

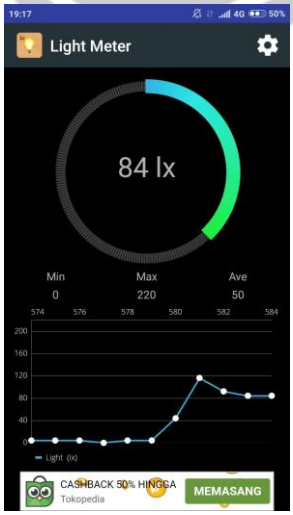

Light Meter
20 lx
Min
0
Max
220
Ave
45
Light (lx)
Grab
Gunakan Grab kemanapun dengan mudah
MEMASANG

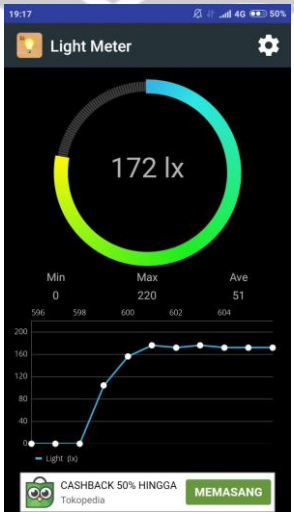

Light Meter
156 lx
Min
0
Max
220
Ave
48
Light (lx)
Grab
Gunakan Grab kemanapun dengan mudah
MEMASANG

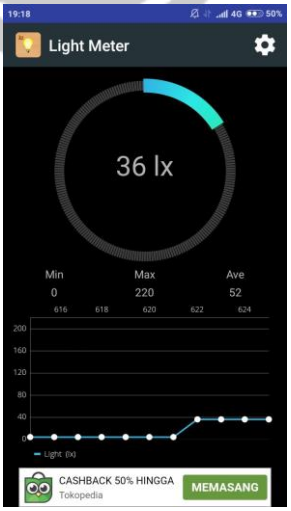

Light Meter
52 lx
Min
0
Max
220
Ave
49
Light (lx)
Grab
Gunakan Grab kemanapun dengan mudah
MEMASANG

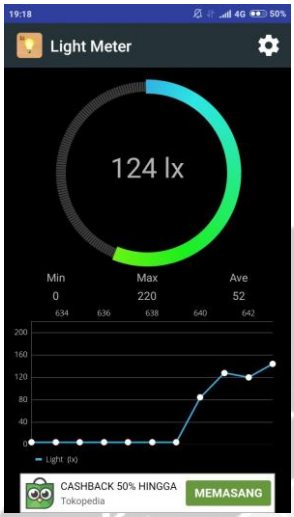

Light Meter
80 lx
Min
0
Max
220
Ave
50
Light (lx)
Grab
Gunakan Grab kemanapun dengan mudah
MEMASANG

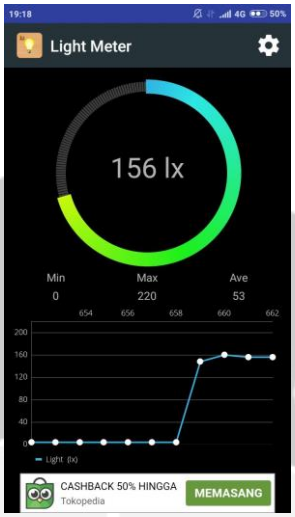

Light Meter
80 lx
Min
0
Max
220
Ave
50
Light (lx)
CASHBACK 50% HINGGA
Tokopedia
MEMASANG

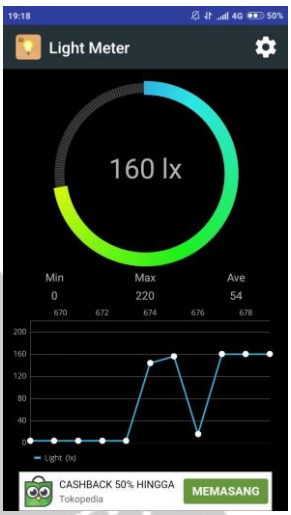

Light Meter
84 lx
Min
0
Max
220
Ave
50
Light (lx)
CASHBACK 50% HINGGA
Tokopedia
MEMASANG


Light Meter
172 lx
Min
0
Max
220
Ave
51
Light (lx)
CASHBACK 50% HINGGA
Tokopedia
MEMASANG

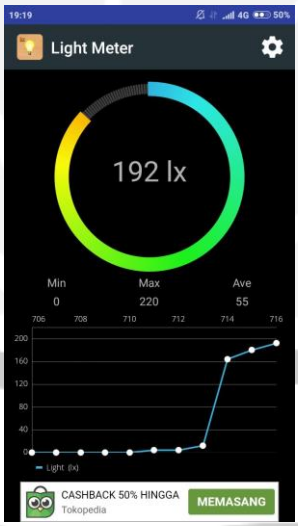

Light Meter
36 lx
Min
0
Max
220
Ave
52
Light (lx)
CASHBACK 50% HINGGA
Tokopedia
MEMASANG

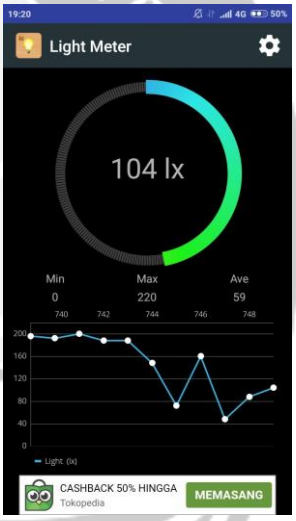

Light Meter
124 lx
Min
0
Max
220
Ave
52
CASHBACK 50% HINGGA
Tokopedia
MEMASANG

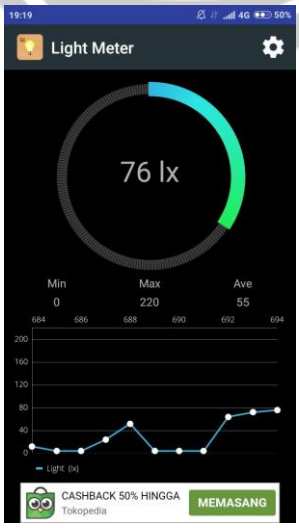

Light Meter
156 lx
Min
0
Max
220
Ave
53
CASHBACK 50% HINGGA
Tokopedia
MEMASANG

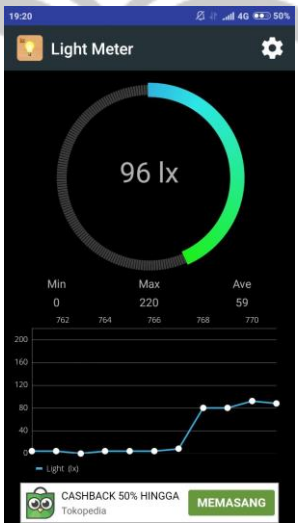

Light Meter
160 lx
Min
0
Max
220
Ave
54
CASHBACK 50% HINGGA
Tokopedia
MEMASANG


Light Meter
76 lx
Min
0
Max
220
Ave
55
CASHBACK 50% HINGGA
Tokopedia
MEMASANG


Light Meter
192 lx
Min
0
Max
220
Ave
55
CASHBACK 50% HINGGA
Tokopedia
MEMASANG


Light Meter
104 lx
Min
0
Max
220
Ave
59
CASHBACK 50% HINGGA
Tokopedia
MEMASANG


Light Meter
76 lx
Min
0
Max
220
Ave
55
CASHBACK 50% HINGGA
Tokopedia
MEMASANG


Light Meter
96 lx
Min
0
Max
220
Ave
59
CASHBACK 50% HINGGA
Tokopedia
MEMASANG

PHILIPS

Lighting

SON-T

SON-T 150W E E40 1SL

High Pressure Sodium lamp with clear tubular outer bulb

Product data

General Information	
Cap-Base	E40 [E40]
Operating Position	UNIVERSAL [Any or Universal (U)]
Life to 5% Failures (Nom)	12000 h
Life to 20% Failures (Nom)	20000 h
Life to 50% Failures (Nom)	28000 h
System Description	External Ignitor

Light Technical	
Color Code	220 [CCT of 2000K]
Luminous Flux (Rated) (Min)	13500 lm
Luminous Flux (Rated) (Nom)	15000 lm
Lumen Maintenance 2000 h (Min)	90 %
Lumen Maintenance 2000 h (Nom)	95 %
Lumen Maintenance 5000 h (Min)	85 %
Lumen Maintenance 5000 h (Nom)	90 %
Correlated Color Temperature (Nom)	2000 K
Luminous Efficacy (Rated) (Nom)	98 lm/W
Color Rendering Index (Max)	25
Color Rendering Index (Nom)	-

Operating and Electrical	
Power (Rated) (Nom)	147.0 W
Lamp Current (EM) (Nom)	1.8 A
Ignition Supply Voltage (Max)	198 V
Ignition Peak Voltage (Max)	2800 V
Re-Ignition Time (Min) (Max)	180 s
Ignition Time (Max)	5 s
Voltage (Max)	115 V
Voltage (Min)	85 V
Voltage (Nom)	100 V

Controls and Dimming	
Dimmable	Yes
Run-Up Time 90% (Max)	5 min

Mechanical and Housing	
Bulb Finish	Clear
Cap-Base Information	-

Approval and Application	
Energy Efficiency Label (EEL)	A+
Mercury (Hg) Content (Nom)	20.4 mg
Energy Consumption kWh/1000 h	162 kWh

Luminaire Design Requirements	
Bulb Temperature (Max)	450 °C
Cap-Base Temperature (Max)	250 °C

SON-T

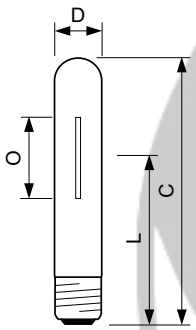
Product Data	
Full product code	872790090671400
Order product name	SON-T 150W E E40 1SL
EAN/UPC - Product	8727900906714
Order code	928487100097
Numerator - Quantity Per Pack	1

Numerator - Packs per outer box	12
Material Nr. (12NC)	928487100097
Net Weight (Piece)	0.149 kg

Warnings and Safety

- Control gear must include end-of-life protection (IEC60662, IEC 62035)
- A lamp breaking is extremely unlikely to have any impact on your health. If a lamp breaks, ventilate the room for 30 minutes and remove the parts, preferably with gloves. Put them in a sealed plastic bag and take it to your local waste facilities for recycling. Do not use a vacuum cleaner.

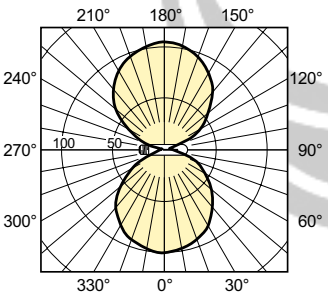
Dimensional drawing



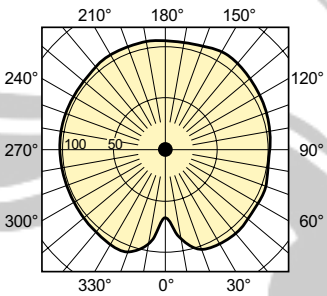
SON-T 150W E E40

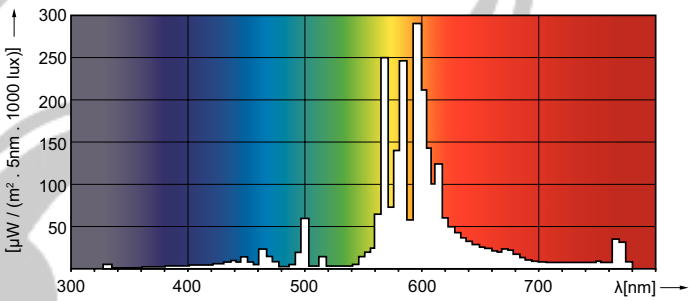
Product	D (max)	O	L	C (max)
SON-T 150W E E40 1SL	47 mm	58 mm	132 mm	209 mm

Photometric data



SON-T

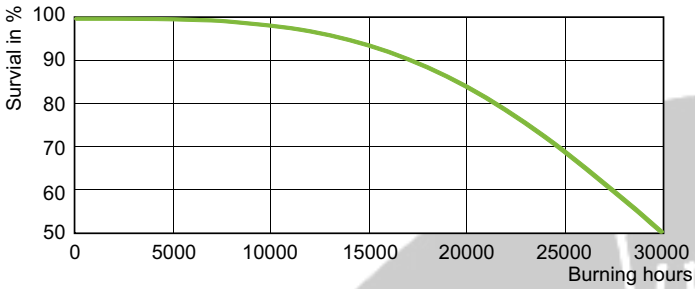




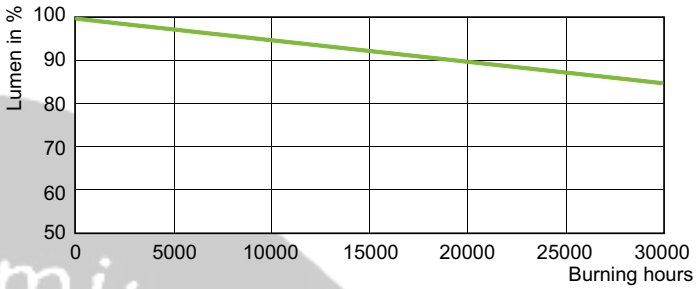
SON-T

SON-T

Lifetime



SON-T 100 W - 400 W Life Expectancy



SON-T 150 W - 400 W Lumen Maintenance