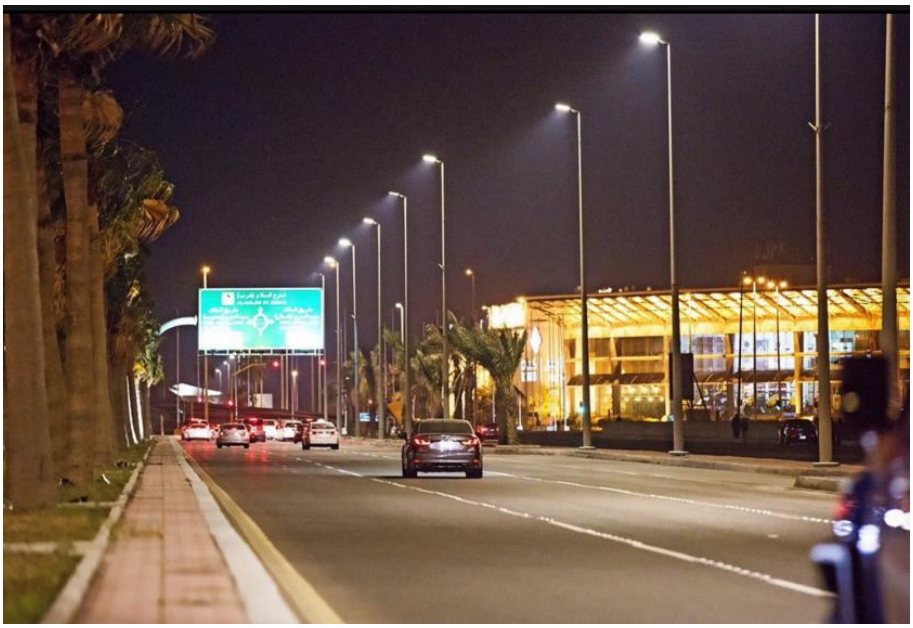

Ramallah City Street Lighting Project

2015/69

Final Report: Documentation of the existing situation for the street lighting and lighting Network design using energy-saving units and its control

March, 2016

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1. Introduction

This project is one of many others in which Ramallah Municipality intends to use energy-saving and environmentally friendly lighting in public spaces of the city. Meanwhile, the municipality is in the process of formulating a computerized database of street lighting in a step forward towards the completion of its databases for infrastructure networks such as sewage system networks and rainwater collection networks.

This project aims to:

1. Develop computerized databases for street lighting
2. Re-evaluate the street lighting in all city streets
3. Reduce the operational cost of street lighting.

When Ziadah Company was assigned as the consultant for this project, the company management assigned the required team of Engineers and surveyors to perform the required tasks. After the team of surveyors collected the required data, electrical engineers have completed the calculations required for lighting the city streets with energy-saving units.

2. Goals and functional requirements

The goals and functional requirements of this project can be summarized as follows:

1. The preparation of computerized databases for street lighting in the city, so as to complete the municipality databases for infrastructure systems such as sewage networks and rainwater collection networks.

2. The preparation of current situation assessment maintains for street lighting in all city streets includes all network elements of poles, lighting units, control panels and manholes.

3. The preparation of the required electrical calculations for street lighting using energy-saving units (LED) and the development of the lighting network in compliance with international codes and standards.

4. The reduction of the operational cost of street lighting through the use of these energy saving and environmentally friendly units.

5. The proposal of a method for managing the network and controlling its operation through the central control technology and the Dimming (reducing the intensity of lighting in specific periods of the night in order to save energy).

3. Work Methodology

The work on this project was divided in two major phases:

1. Survey Works and Assessment of Current Situation
2. The preparation of studies for street lighting using energy-saving and environmentally friendly lighting

Below is a description of the methodology of work in each stage of the project:

1. Survey Works and Assessment of Current Situation

This phase includes the completion of survey works, preparation of survey plans, and required data collection about the existing situation of street lighting of all kinds and their locations including the coordinates of poles (X, Y, Z), the height of the pole, pole type, the type of lighting units, installation method, life span if possible, the lengths of the streets and the distance between the existing street lighting poles, and all necessary relevant information.

As the following table (Table 1) shows the required data to be obtained for each pole / lighting unit in the streets of the city.

Pole Number (street number-pole number)	Coordinates (X,Y)	The height of the pole base from sea level (Z)	Pole type	Pole height	Lighting unit type	situation
Feeding source		Pole Diameter	Installation method			

Table 1: Data to be collected

Practical steps:

• After consultation with the client representatives on the final version of the tables that will illustrate the data collected, it was agreed that the following formula (Table 2) will be the approved version of the tables for each street data.

Road No.: 1 Road Name: Al Itha'a Street

Lighting Unit Number	(X,E)	(Y,N)	Base Elevation	Quarter	Pole Height (m)	Lighting Unit Height (m)	Installation Date	Mounted on SP(Strt. Lighting pole) EP(Electrical pole)	(S) Single/ (D) Double/ (T) Triple	Pole Type	Pole Size	Pole Status B1(Car Crash) B2(Broken	Lighting Unit Type	Lighting Unit Status	Network Type O.H(Over Head)	Network Type U.G(Underground)	Notes
1/ 001																	
1/ 002																	
1/ 003																	

Table 2:Data collected for Each Street in the City

- After the final version of the spreadsheet was approved by the client representatives, the municipal staff provided the consultant with a touristic map of the city to use it as a reference for the streets in terms of names and numbers.
- Then the consultant team started working on the site through a number of teams as follows:
  - Surveying teams defined the locations and coordinates of the poles using survey devices with GPS technology and Total Stations when necessary.
  - Every pole was given a unique number on the survey devices and labels with the same numbers where posted on each pole.
  - The electrical survey teams recorded the numbers given by the survey teams for the poles, and the data regarding each pole was recorded accordingly in the specific table.
  - Each street had its own data table
  - The survey team sent the collected data in tabular forms and AutoCAD drawings to the office as well as the electrical survey teams who also send data in tabular forms.
  - Each street's data is collected separately and illustrated in a specific table form including coordinates and required data making sure the poles of the survey teams matches the poles of the electrical surveying teams
  - The tables are then prepared and sent to the municipal team on weekly stages for evaluation. These tables are sent attached to survey plans

- An electricity technician was assigned by the municipality to accompany the survey team in order to guide them to the specific locations of electrical panels and manholes of the streets lighting network.
- The streets were revisited with the municipal team to ensure the precision of the collected data, as the tables and data submitted were checked in compliance with the existing situation.

2. preparation of studies for street lighting using energy-saving lighting and environmentally friendly stage

In parallel with the latest period of survey works stage, the studies stage for street lighting using energy-saving LED units started in which the work was divided as follows:

• Dialux program was used for lighting calculations.

• Approving Lighting Classes in the streets and their requirements according to European standards (CEN / TR European Committee for Standardization).

• It was agreed with the municipality that lighting units would be of Philips - LED type as a basis for calculations.

• Jaffa Road was presented as a sample for the calculations to standardize the criteria that will be used in the streets of the city.

After that, the streets of the city were classified into many types, the criteria for this classification was the following:

- the street width
- the street components: drive way , pedestrian path/ sidewalks, etc. and their dimensions
- street location (inside the city or outside)

As a result, the table illustrated in appendix (1) was prepared providing the specifications of each street with the requirements of the street lighting requires according to the international standards (CEN/TR European Committee for Standardization)

After that, street lighting calculations were prepared using the Dialux software for each type as described in the detailed lighting calculations report in Appendix No. (3). the table attached in

Appendix No. (2) provide a summary of each street lighting requirements after the calculations and the expected value of the lighting intensity required in each street.

These calculations were turned into AutoCad Drawings including all city streets, these drawings illustrated the following:

• Locations of lighting poles, their types, details of the lighting units and the arm and the spaces between the poles.

• The numbers of poles and their relationship with the electrical panels and electrical feeder circuits.

• Electrical panel's locations, numbers and types (Is it an existing panel that needs upgrading or a new one).

• Street lighting circuits attached to each panel, their number and method of installation (inside flexible PVC corrugated and shock-resistant conduits with bare grounding cable in a trench dedicated to street lighting).

• Lighting network grounding including electrical panels and poles.

4. Problems and Defects

Through our study and field survey of the existing street lighting network in the streets of the city, many defects and problems were found out to be in a dire need for solutions because their existence affects negatively the efficiency and effectiveness of the network. These problems can be summarized as follows:

1) None operating lighting units, this means that the bulbs are out of operation or the Drivers Of these units are damaged.

2) Broken lighting unit covers which leads eventually to the combustion of bulbs since in the winter, the water enters into the units, leading to the combustion of the lamps or the entire units.

3) The installation of lighting units on electricity poles. Most of the sub streets and some neighborhoods are entirely lit this way, the pole location being the reference resulting in irregular distances between poles creating differences in streets lighting intensity on the road surface.

4) Some of the poles are broken or damaged as a result of car collisions with them, and some poles have missing covers for assembly location.

5) Installation of decorative lighting ropes on lighting poles and connecting them directly with the lighting units by means of an electric link breaking the resistance to weather conditions in the units.

6) Most of the lighting panels are rusted and not water-resistant; these units may be with damaged doors or old panels causing it to lose weatherproofing property.

7) Some panels cover large areas which affect the operation of units and their life span as a result of voltage drop, where the increased distances increase the amount of voltage drop, leading to the loss of energy (Power Loses) and affecting the life span of the units and bulbs.

8) the lighting intensity in most of the city streets do not achieve the required lighting levels and international street lighting standards in terms of the intensity of lighting on the surface of the street, intensity of lighting on the sidewalk, the relationship between the average lighting level and the highest and lowest level of illumination on the surface of the street.

9) The absence of a central lighting network control, where each lighting panel control the lighting units associated with it individually (Standalone control) which leads to variation in control (operating schedules) between adjacent streets fed from different control panels .

5. Recommendations and proposals to remedy the problems and requirements of treatment

To avoid defects and problems previously mentioned in the street lighting network, there are a number of recommendations and suggestions that can be applied to avoid them and to develop and increase the efficiency of the street lighting network, which can be summarized in the following points:

1) Conduct periodic maintenance to replace the non-operating lighting units as the damage may be simple only in need of a replacement of bulbs or drivers.

2) The replacement of broken units covers to avoid the combustion of bulbs or units later.

3) The installation of lighting poles independent from electricity network, especially in places in which the distance between the poles vary dramatically resulting in the variation of intensity of light on the surface of the street.

4) Repairing or replacement of damaged lighting poles and covering the assembly locations with missing covers to reduce the possibility of damaging the poles.

5) Avoid connecting decorative lighting ropes on the poles directly with the units and the use of special weatherproof sockets connected to the pole tray assembly as required.

6) Make the necessary maintenance of the lighting panels to deal with rust and water leaks, and make all the necessary adjustments including the panels' ability to accommodate any future additions that may be required within any network management system that may be installed later.

7) Add new lighting panels in the vast spaces that are covered by a single panel so as to minimize the voltage drop and thus reduce losses in the network.

8) Provide numbering for all network components by placing metal stickers on the poles and panels to match the pole number or panel in the street with what is on the Geographic information system (GIS) of the municipality.

9) Replacement of existing traditional lighting units (Metal Halide, HPS, etc..) with energy-saving units of LED type because of its useful life span compared with the traditional units, according to the calculations and new recommendations listed in Appendix No. (2) to provide a lighting

network according to the international standards and less operating energy since these units are energy-saving and environmentally friendly, and the conversion process from conventional units to energy-saving LED units can be divided into several stages:

- Replace the lighting units (Decorative) in the city center with LED lighting units close to the original unit maintaining the pole and position unchanged.

- Based on the municipal budget lighting units in other streets may be converted to LED as a first step, in accordance with the requirements of each street type as in appendix No. (2) Until a new budget is available to abide poles to take into account the recommended distances in appendix No. (2). Then, LED units may be transferred from the old poles to the new ones.

10) Use energy savings systems available by the presence of energy-efficient LED units so as to provide the maximum amount of energy saving in the periods that allow, such as the Dimming feature which allows the unit to operate with less lighting intensity than the maximum value in periods with less movement (as a period after midnight, for example).

11) The use of a central street lighting network control system to facilitate monitoring and control process, data and statistics collection related to the network.

7) Management and control of Street lighting network in the city

One of the main benefits of using energy-saving technologies (LED) in street lighting network systems is to reduce fuel consumption in power plants and reduce greenhouse gas emissions and rates of contamination as well as the possibility of the application of remote control systems in street lighting to rationalize consumption and speedily repair any faults in the lighting networks.

To provide a system for the management of street lighting network in the city and the application of a sophisticated system for remote control in all elements of lighting networks and automatically locate any faults that may occur as soon as possible through continuous monitoring throughout the day systems, it will contribute to improving the performance of street lighting systems and save time and effort in maintenance works and control of the intensity of lighting units, providing more than 30% of the value of consumption. In addition to the use of the astronomical clock in street lighting instead of photovoltaic cells (Photo Cells), through pre-programming of the timing of the lighting and separate them according to the calendar of the city.

As the system provides the right amount of lighting, either manually or automatically according to predefined schedules as needed, it will be possible to turn on or off or dim the lighting of any street in the city where it is possible to run lighting in each area differently depending on the nature of the area and time period, where you can distinguish main streets from city center street lighting, commercial areas sub streets and residential areas. Specific operation can be customized for parks and public spaces.

HOW THE CENTRAL CONTROL SYSTEM WORKS?

- **TURNING THE STREET LIGHTS ON AND OFF**

  The system manage the lighting level of each element (Lighting unit) of the lighting network. The street lighting fixtures switch off and on individually exactly when and where we need them. According to the street lighting network we can choose a pre-programmed schedules, plan a new schedule or manually manage every street lamp.

- **COMMUNICATING THROUGH THE GRID OR THROGH RF TECHNELOGY**

  The system communicates between lighting units and the distribution panel through PLC (Power Line Communication) or through Radio Frequency (RF) waves. And the communication between the distribution panel and the control room conducted by

Ethernet network (IP – Internet Protocol) through Fiber Optics network or through Warless Mobile Communication (GSM/GPRS).

- **DIMMING THE LIGHTS**

  When the pedestrian traffic decreases significantly between 12:00 AM and 5:00 AM, then dimming the lights is the right solution. Dimming considerably reduces energy consumption and CO_ emissions, the system comes with pre-set dimming schedules for specific city areas. This will not only save money, but also reduce light pollution.

- SENSING THE CITY

  Due to the lamp-level control, the street light networks managed by the system are continuously under power. Therefore, there is a large array of sensors and applications that can be added on the existing fixtures and infrastructure, thus transforming the street lighting grid into a smart platform for the future, which is support the municipality intention to make Ramallah as a Smart City.

- **REPORTING & MAINTENANCE SCHEDULING**

  The system servers receive, prioritize and compile information from all over the lighting grid. The system Control Software will provide advanced analytic tools, failure reporting, customizable maintenance planning, automatic daily backups and recovery procedures for a seamless functioning of the system.

CENTRAL CONTROL SYSTEM BENEFITS:

Energy costs are immediately reduced by up to 30% through intelligent ON/OFF switching, targeted progressive dimming and efficient management of the consumption, while overall operational costs come down by around 40% through detailed maintenance and preventive grid interventions based on the system generated reports.

ELECTRICITY BILL SAVING

- by dimming the street lights during periods of low traffic and turning them off when they are not needed.
- by monitoring energy consumption and thus identifying and reducing electricity loss.

MAINTENANCE COST SAVING

- by extending equipment lifetime through dimming.
- by anticipating faults through real time 24/7 grid monitoring.
- by providing accurate malfunction information to the technical department (detailed problem information, exact location).
- by eliminating street lighting network nightly 'blind' inspection and re-assigning resources to more productive tasks.

CENTRAL CONTROL SYSTEM STRUCTURE & COMONENTS:

The central control system for the street lighting network consists of several parts, starting from the lighting fixtures and ends in the control room at the municipality building, the following parts are including in the system:

- **Control through PLC (Power Line Communication)**

  The PLC Control consist of:

  - **PLC Node:**

    This tool use the grid cables (power cables connecting between street lighting poles and the distribution panel) to transfer data and control the lighting unit, which provide a Digital two way communication between the central unit (PLC Coordinator) in the distribution panel and the lighting unit (Unit Driver), where the control achieved using DALI Protocol or any other supported protocol.

  - **PLC Coordinator (In the Distribution Panel):**

    Which is the connection tool between the PLC Nodes inside the lighting units and the Central Control Unit (Concentrator) inside the lighting distribution panel.

- **Control through RF (Radio Frequency)**

  The RF Control consist of:

  - **RF Node:**

    This tool used to to transfer data and control the lighting unit through Radio Frequency Waves, which provide a Digital communication between the central

unit (RF Coordinator) in the distribution panel and the lighting unit (Unit Driver), where the control achieved using DALI Protocol or any other supported protocol.

- **RF Coordinator (In the Distribution Panel):**

  Which is the connection tool between the RF Nodes inside the lighting units and the Central Control Unit (Concentrator) inside the lighting distribution panel.

- **Central Control Unit (Concentrator)**

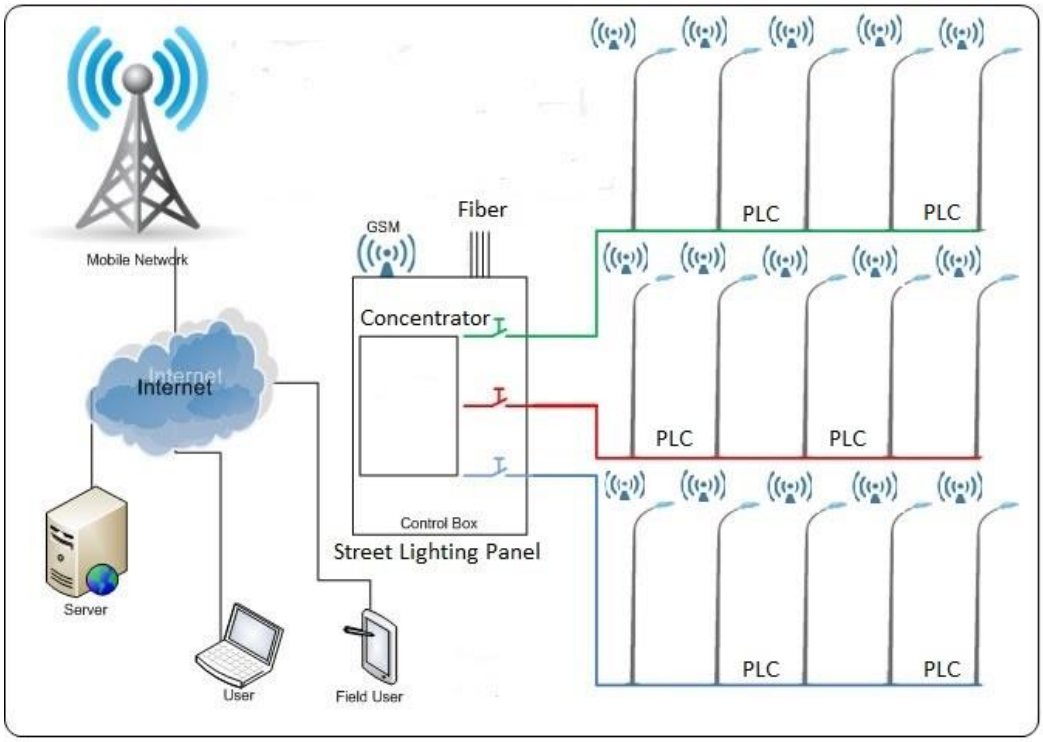
  Which is the central control unit of the system and responsible for connection between lighting panel's controllers (RF or PLC Coordinators) and the central control room, the concentrator has the following features:

  1. Secured remotely control, where this unit can communicate with control center through Fiber Network (IP Communication) or through wireless mobile communication (GSM/GPRS).
  2. The possibility to manual control for all lighting units and its related nodes and drivers.
  3. Local Operation for all connected lighting units by ON/OFF switching, lights dimming, and Units addressing (by giving a unique address for each lighting unit).
  4. The possibility to gather a group of lighting units (Grouping) and to apply a specific control theme on all units within the group.
  5. The possibility to control this Central Unit remotely (the unit has a three control modes: manual , local, remote)
  6. The possibility to connect this unit with a set of inputs and outputs I/O.

- **Central Control Software**

  The software provide a full control for every part of the street lighting network through connection with control units distributed in all parts of the city, through Fiber Optics networks (IP Communication) or through wireless mobile network (GSM/GPRS), the software provides an Online Real Time Monitoring for every part of the system. The software has the following features:

  - Central Control of the lighting network.
  - Smart lighting control, and coordination with sun rise and sun set time.
  - Central unified database to contain all street lighting distribution panels data.
  - Detailed reporting and faults analyses.
  - Continuous Street lighting load analyses 24/7.


Mobile Network
Internet
Server
User
Field User
GSM
Fiber
Concentrator
Control Box
Street Lighting Panel
PLC
PLC
PLC
PLC
PLC
PLC

8. Appendices

Appendix (1): classification of the streets and lighting requirements in every street of the city

Appendix-1 Ramallah Roads Classification and illumination requirments

	Roads Overall Width	Roads Structure	Roadway	Midean	Sidewalks	Lighting Class	Average Luminance L- (Cd/m2) [Minimum Maintained]	Overall Uniformity (Uo) [Minimum]	Longitudinal Uniformity (Ul) [Minimum]	Threshold Incement (TI) [Maximum]	Surround Ratio (SR) [Minimum]	Example (Road name)	Notes
1	3	1x Road way (3m)	√			ME4b	0.75	0.4	0.5	15	0.5		
2	4	1x Road way (4m)	√			ME4b	0.75	0.4	0.5	15	0.5	الثامون	
3	6	1x Road way (6m)	√			ME4b	0.75	0.4	0.5	15	0.5	قلز السابع	
4	8	1x Road way (6m)+ 2x sidewalks (1m)	√		√	ME4a	0.75	0.4	0.6	15	0.5	برلين	
5	9	1x Road way (6m) + 2x sidewalks (1.5m)	√		√	ME4a	0.75	0.4	0.6	15	0.5	اندرومى	
6	10	1x Road way (5m) + 2x sidewalks (2.5m)	√		√	ME4a	0.75	0.4	0.6	15	0.5	المنتزه	
7	12	1x Road way (7m) + 2x sidewalks (2.5m)	√		√	ME4a	0.75	0.4	0.6	15	0.5	سعد صايل	
8	14	1x Road way (9m) + 2x sidewalks (2.5m)	√		√	ME4a	0.75	0.4	0.6	15	0.5	عين مصباح	
9	16	1x Road way (11m) + 2x sidewalks (2.5m)	√		√	ME3a	1	0.4	0.7	15	0.5	الجهاد	
10	18	1x Road way (14m) + 2x sidewalks (2m)	√		√	ME3a	1	0.4	0.7	15	0.5	خليل الوزير	
11	20	2x Road way (6.8m) + 1x Median (1.4m) + 2x sidewalks (2m)	√	√	√	ME3a	1	0.4	0.7	15	0.5	يافا	
12	9	1x Road way (5m) + 2x sidewalks (2m)	√		√	ME3a	1	0.4	0.7	15	0.5	المعارض	Down town
13	14	1x Road way (6.4m) + 2x sidewalks (3.8m)	√		√	ME3a	1	0.4	0.7	15	0.5	الرئيسي	Down town
14	20	2x Road way (6.8m) + 2x sidewalks (3m)	√		√	ME3a	1	0.4	0.7	15	0.5	الاذاعة	No midean
15	22	2x Road way (8m) + 2x sidewalks (2.8m)	√		√	ME3a	1	0.4	0.7	15	0.5	جمال عبد الناصر	No midean
16	26	2x Road way (9m) + 1x Median (1.5m) + 2x sidewalks (3.25m)	√	√	√	ME3a	1	0.4	0.7	15	0.5	القدس/جرالد بارك	
17	30	2x Road way (12m) + 2x sidewalks (2.8m)	√		√	ME3a	1	0.4	0.7	15	0.5	عبد الحميد شومان	

Lighting Classes according to CEN/TR European Committee for Standarization

Appendix (2): proposed street lighting for every street of the city using LED units, and the characteristics of the poles and units

Appendix-2 Proposed Street Lighting for Ramallah Roads (LED Units, Spacing, Poles and Booms)

	Roads Overall Width	Roads Structure	Road way	Midean	Sidewalks	Lighting Class	Average Luminance L- (Cd/m2) [Minimum Maintained]	Pole Height (m)	Poles Spacing (m)	Boom Length (m)	Boom Angel (°)	Unit Power (W)/ Lumen (lm)	Notes	Example (Road name)	Average Luminance L- (Cd/m2) [Achieved]
1	3	1x Road way (3m)	v			ME4b	0.75	8	35	1	5	55/5340	1x1 side		0.79
2	4	1x Road way (4m)	v			ME4b	0.75	8	33	1	5	55/5340	1x1 side	الدامون	0.77
3	6	1x Road way (6m)	v			ME4b	0.75	8	25	1	5	55/5340	1x1 side	فيلز الصانع	0.75
4	8	1x Road way (6m)+ 2x sidewalks (1m)	v		v	ME4a	0.75	8	35	1	5	72/7080	1x1 side	برلين	0.86
5	9	1x Road way (6m) + 2x sidewalks (1.5m)	v		v	ME4a	0.75	8	35	1	5	72/7080	1x1 side	الدار الومي	0.85
6	10	1x Road way (5m) + 2x sidewalks (2.5m)	v		v	ME4a	0.75	10	40	1.5	5	90/8800	1x1 side	المنتزه	0.83
7	12	1x Road way (7m) + 2x sidewalks (2.5m)	v		v	ME4a	0.75	10	40	1.5	5	90/8800	1x1 side	سعد صائل	0.75
8	14	1x Road way (9m) + 2x sidewalks (2.5m)	v		v	ME4a	0.75	10	35	1.5	5	90/8800	1x1 side	عين مصباح	0.79
9	16	1x Road way (11m) + 2x sidewalks (2.5m)	v		v	ME3a	1	10	40	1.5	5	72/7080	2 sides - opposing	الجهاد	1.1
10	18	1x Road way (14m) + 2x sidewalks (2m)	v		v	ME3a	1	10	40	1.5	5	90/8800	2 sides - opposing	خليل الزبر	1.22
11	20	2x Road way (6.8m) + 1x Median (1.4m) + 2x sidewalks (2m)	v	v	v	ME3a	1	10	40	1.5	5	120/12270	2xMidean	بيقا	1.33
12	9	1x Road way (5m) + 2x sidewalks (2m)	v		v	ME3a	1	6	20	0.5	-	44/4100	2 sides - opposing	المعمار هش - وسط البلد	1.96
13	14	1x Road way (6.4m) + 2x sidewalks (3.8m)	v		v	ME3a	1	6	20	0.5	-	44/4100	2 Sides - staggered	الرئيسي - وسط البلد	1.72
14	20	2x Road way (6.8m) + 2x sidewalks (3m)	v		v	ME3a	1	10	40	1.5	5	90/8800	2 sides - opposing	الإذاعة	1.25
15	22	2x Road way (8m) + 2x sidewalks (2.8m)	v		v	ME3a	1	10	40	1.5	5	90/8800	2 sides - opposing	جمال عبد الناصر	1.12
16	26	2x Road way (9m) + 1x Median (1.5m) + 2x sidewalks (3.25m)	v	v	v	ME3a	1	10	40	1.5	5	120/12270	2xMidean	القدس/جرانك بارك	1.2
17	30	2x Road way (12m) + 2x sidewalks (2.8m)	v		v	ME3a	1	10	40	1.5	5	120/12270	2 sides - opposing	عبد الحميد شومان	1.05

Appendix (3): detailed street lighting calculations report

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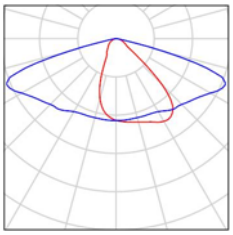
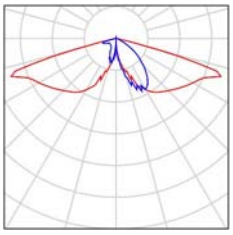
Ramallah - All Roads Lighting Calculations / Luminaire parts list

30 Pieces BRP372 4000K 56LEDs DME
Article No.:
Luminous flux (Luminaire): 12270 lm
Luminous flux (Lamps): 12273 lm
Luminaire Wattage: 121.5 W
Luminaire classification according to CIE: 100
CIE flux code: 44 78 97 100 100
Fitting: 1 x Luxeon T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.

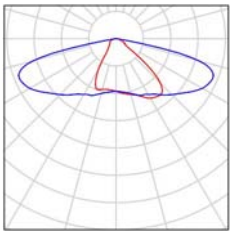


25 Pieces PHILIPS BDP791 FG 40xGRN52/740 OFR4
Article No.:
Luminous flux (Luminaire): 4108 lm
Luminous flux (Lamps): 5200 lm
Luminaire Wattage: 43.8 W
Luminaire classification according to CIE: 100
CIE flux code: 36 71 96 100 79
Fitting: 40 x GRN52/740/- (Correction Factor 1.000).



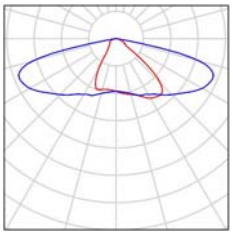
16 Pieces PHILIPS BRP371 24LED DWE
Article No.:
Luminous flux (Luminaire): 5340 lm
Luminous flux (Lamps): 6125 lm
Luminaire Wattage: 55.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



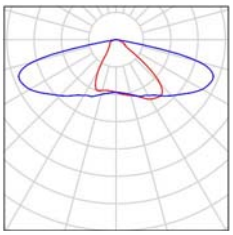
20 Pieces PHILIPS BRP371 32LED DWE
Article No.:
Luminous flux (Luminaire): 7083 lm
Luminous flux (Lamps): 8125 lm
Luminaire Wattage: 72.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



46 Pieces PHILIPS BRP371 40LED DWE
Article No.:
Luminous flux (Luminaire): 8807 lm
Luminous flux (Lamps): 10102 lm
Luminaire Wattage: 89.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



30.03.2016

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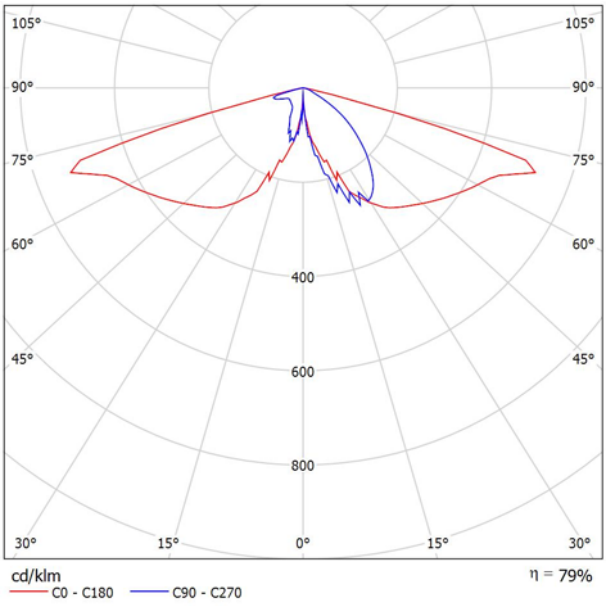
PHILIPS BDP791 FG 40xGRN52/740 OFR4 / Luminaire Data Sheet

Luminous emittance 1:



Luminaire classification according to CIE: 100
CIE flux code: 36 71 96 100 79

Due to missing symmetry properties, no UGR table can be displayed for this luminaire.

Micenas gen2 LED – contemporary interpretation of the historic street lantern
Combining contemporary aesthetics and classical inspiration, Micenas gen2 LED
is an elegant presence in both modern and traditional urban settings. With its

2nd-generation LED module, Micenas gen2 LED ensures a higher light output over
an extended service life and higher energy efficiency. The Eco-designed luminaire has retained its original avant-garde form and provides comfortable

ambiance lighting. The housing has a textured black finish that underlines the
luminaire’s timeless shape, which blends in harmoniously with walls and facades.
And a number of dedicated brackets are available, ensuring the decorative integration of luminaire and pole

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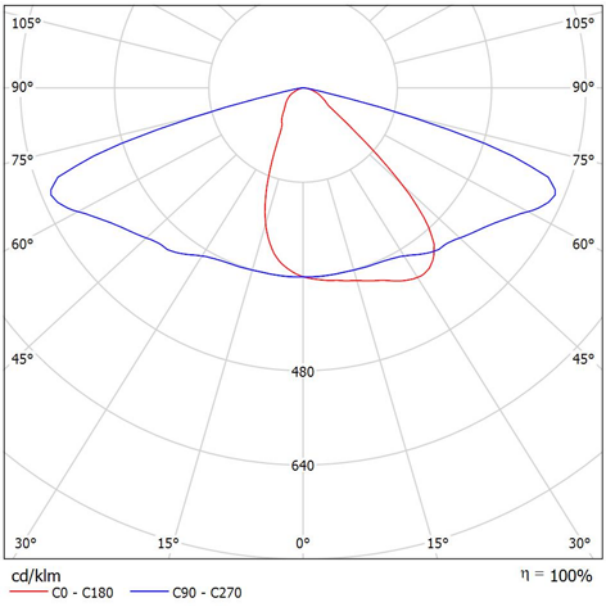
BRP372 4000K 56LEDs DME / Luminaire Data Sheet

See our luminaire catalog for an image of the luminaire.

Luminous emittance 1:



Luminaire classification according to CIE: 100
CIE flux code: 44 78 97 100 100

Due to missing symmetry properties, no UGR table can be displayed for this luminaire.

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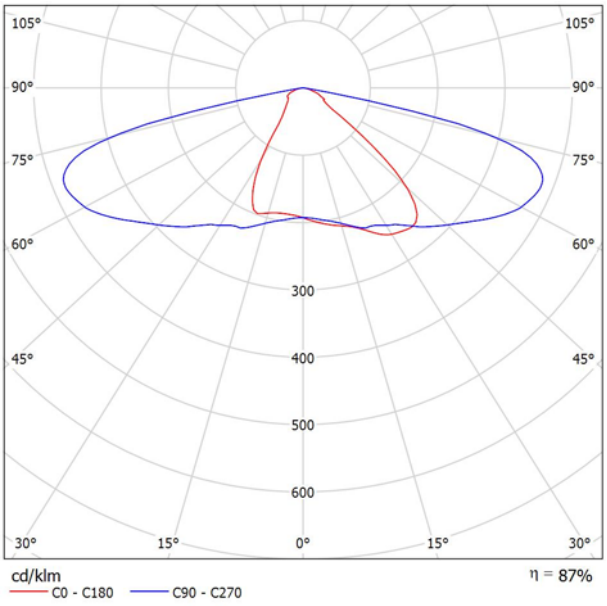
PHILIPS BRP371 40LED DWE / Luminaire Data Sheet

See our luminaire catalog for an image of the luminaire.

Luminous emittance 1:



Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87

Due to missing symmetry properties, no UGR table can be displayed for this luminaire.

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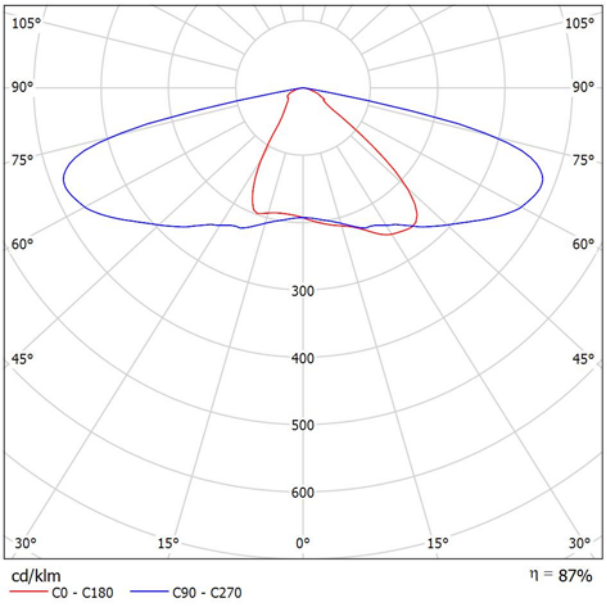
PHILIPS BRP371 32LED DWE / Luminaire Data Sheet

See our luminaire catalog for an image of the luminaire.

Luminous emittance 1:



Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87

Due to missing symmetry properties, no UGR table can be displayed for this luminaire.

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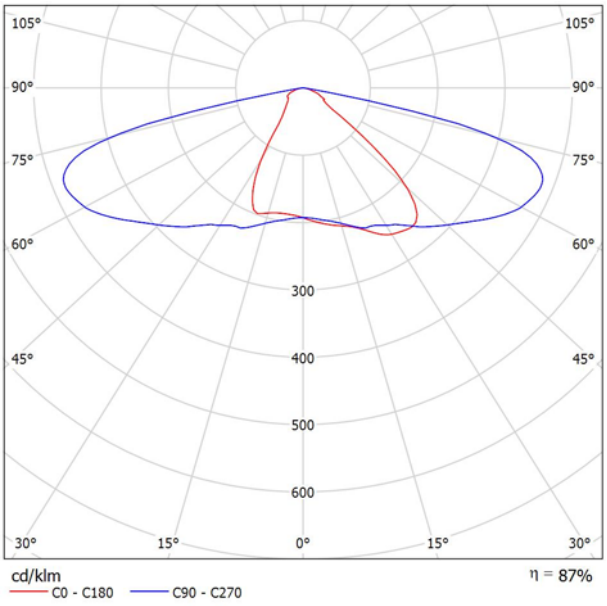
PHILIPS BRP371 24LED DWE / Luminaire Data Sheet

See our luminaire catalog for an image of the luminaire.

Luminous emittance 1:



Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87

Due to missing symmetry properties, no UGR table can be displayed for this luminaire.

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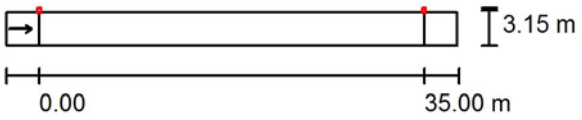
Road 3m / Planning data

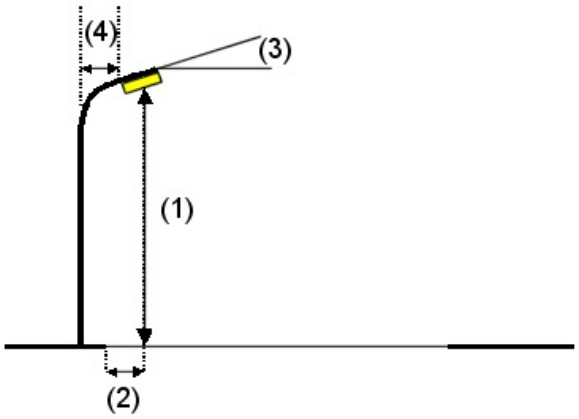
Street Profile

Roadway 1 (Width: 3.000 m, Number of lanes: 1, tarmac: R3, q0: 0.070)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	PHILIPS BRP371 24LED DWE		
Luminous flux (Luminaire):	5340 lm	Maximum luminous intensities	
Luminous flux (Lamps):	6125 lm	at 70°:	594 cd/klm
Luminaire Wattage:	55.0 W	at 80°:	319 cd/klm
Arrangement:	Single row, top	at 90°:	1.59 cd/klm
Pole Distance:	35.000 m	Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.	
Mounting Height (1):	8.000 m		
Height:	7.865 m	No luminous intensities above 95°.	
Overhang (2):	-0.138 m	Arrangement complies with glare index class D.6.	
Boom Angle (3):	5.0 °		
Boom Length (4):	1.000 m		

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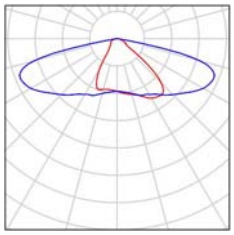
Road 3m / Luminaire parts list

PHILIPS BRP371 24LED DWE
Article No.:
Luminous flux (Luminaire): 5340 lm
Luminous flux (Lamps): 6125 lm
Luminaire Wattage: 55.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



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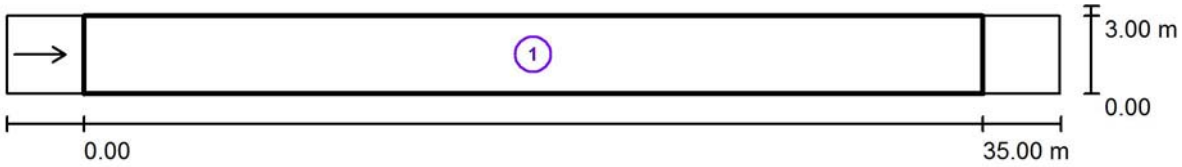
Road 3m / Photometric Results



Light loss factor: 0.80

Scale 1:294

Calculation Field List

1 Valuation Field Roadway 1
Length: 35.000 m, Width: 3.000 m
Grid: 12 x 3 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME4b (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	Ul	TI [%]	SR
Calculated values:	0.79	0.75	0.75	10	0.94
Required values according to class:	≥ 0.75	≥ 0.40	≥ 0.50	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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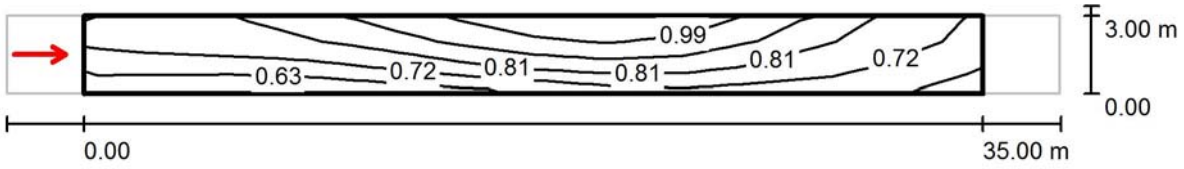
Road 3m / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 294

Grid: 12 x 3 Points
Observer Position: (-60.000 m, 1.500 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	0.79	0.75	0.75	10
Required values according to class ME4b:	≥ 0.75	≥ 0.40	≥ 0.50	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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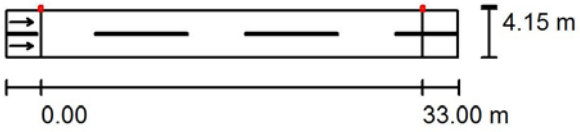
Road 4m (شارع الدامون) / Planning data

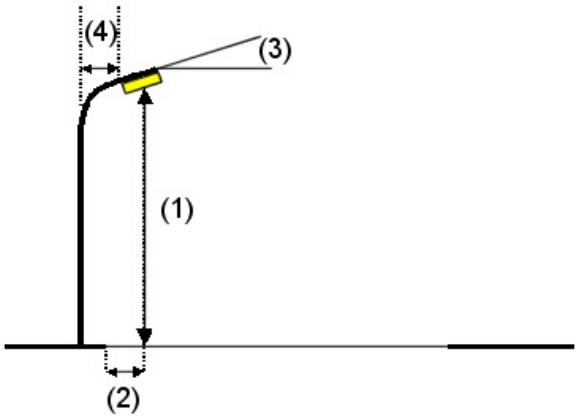
Street Profile

Roadway 1 (Width: 4.000 m, Number of lanes: 2, tarmac: R3, q0: 0.070)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	PHILIPS BRP371 24LED DWE		
Luminous flux (Luminaire):	5340 lm	Maximum luminous intensities	
Luminous flux (Lamps):	6125 lm	at 70°:	594 cd/klm
Luminaire Wattage:	55.0 W	at 80°:	319 cd/klm
Arrangement:	Single row, top	at 90°:	1.59 cd/klm
Pole Distance:	33.000 m	Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.	
Mounting Height (1):	8.000 m		
Height:	7.865 m	No luminous intensities above 95°.	
Overhang (2):	-0.138 m	Arrangement complies with glare index class D.6.	
Boom Angle (3):	5.0 °		
Boom Length (4):	1.000 m		

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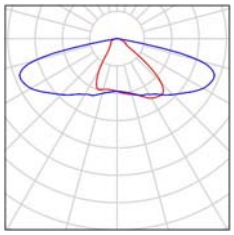
Road 4m (شارع الدامون) / Luminaire parts list

PHILIPS BRP371 24LED DWE
Article No.:
Luminous flux (Luminaire): 5340 lm
Luminous flux (Lamps): 6125 lm
Luminaire Wattage: 55.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



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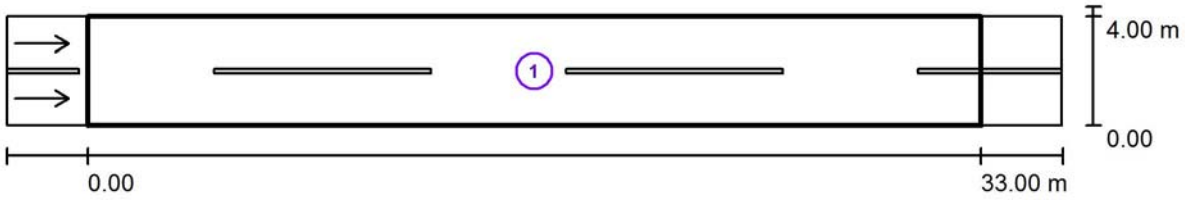
Road 4m (شارع الدامون) / Photometric Results



Light loss factor: 0.80

Scale 1:279

Calculation Field List

1 Valuation Field Roadway 1
Length: 33.000 m, Width: 4.000 m
Grid: 11 x 6 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME4b (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	Ul	TI [%]	SR
Calculated values:	0.77	0.67	0.79	10	0.91
Required values according to class:	≥ 0.75	≥ 0.40	≥ 0.50	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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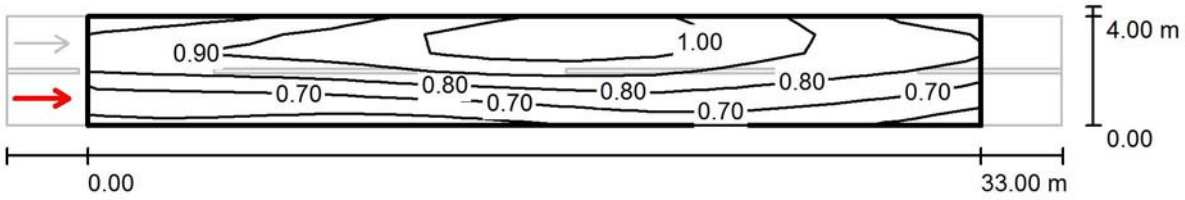
Road 4m (شارع الدامون) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 279

Grid: 11 x 6 Points
Observer Position: (-60.000 m, 1.000 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	0.82	0.71	0.84	10
Required values according to class ME4b:	≥ 0.75	≥ 0.40	≥ 0.50	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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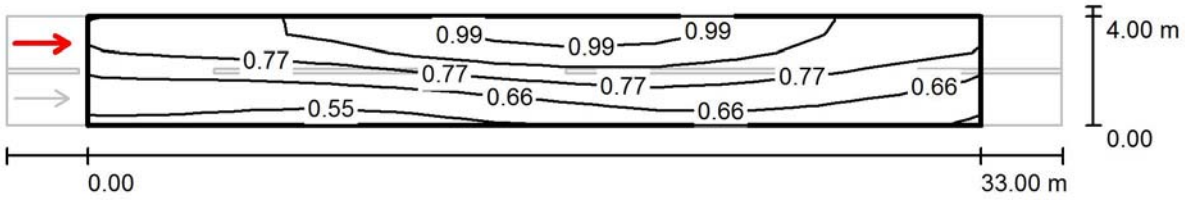
Road 4m (شارع الدامون) / Valuation Field Roadway 1 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 279

Grid: 11 x 6 Points
Observer Position: (-60.000 m, 3.000 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	0.77	0.67	0.79	10
Required values according to class ME4b:	≥ 0.75	≥ 0.40	≥ 0.50	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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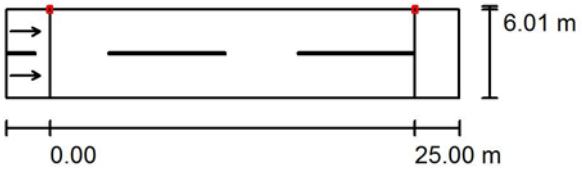
Road 6m (فايز الصايغ) / Planning data

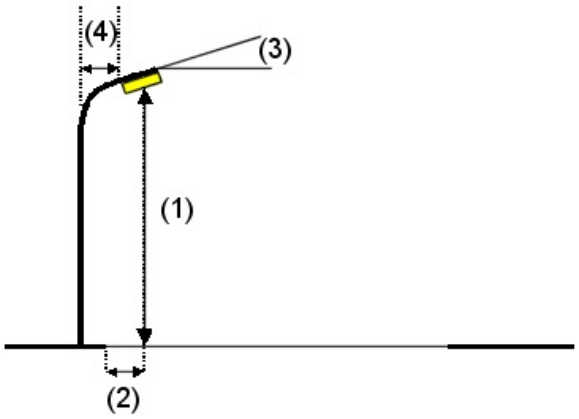
Street Profile

Roadway 1 (Width: 6.000 m, Number of lanes: 2, tarmac: R3, q0: 0.070)

Light loss factor: 0.67

Luminaire Arrangements





Luminaire:	PHILIPS BRP371 24LED DWE		
Luminous flux (Luminaire):	5340 lm	Maximum luminous intensities	
Luminous flux (Lamps):	6125 lm	at 70°:	594 cd/klm
Luminaire Wattage:	55.0 W	at 80°:	319 cd/klm
Arrangement:	Single row, top	at 90°:	1.59 cd/klm
Pole Distance:	25.000 m	Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.	
Mounting Height (1):	8.136 m		
Height:	8.001 m	No luminous intensities above 95°.	
Overhang (2):	0.000 m	Arrangement complies with glare index class D.6.	
Boom Angle (3):	5.0 °		
Boom Length (4):	1.000 m		

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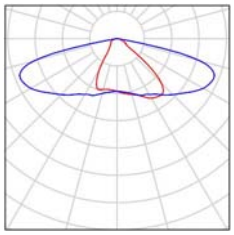
Road 6m (فايز الصايغ) / Luminaire parts list

PHILIPS BRP371 24LED DWE
Article No.:
Luminous flux (Luminaire): 5340 lm
Luminous flux (Lamps): 6125 lm
Luminaire Wattage: 55.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



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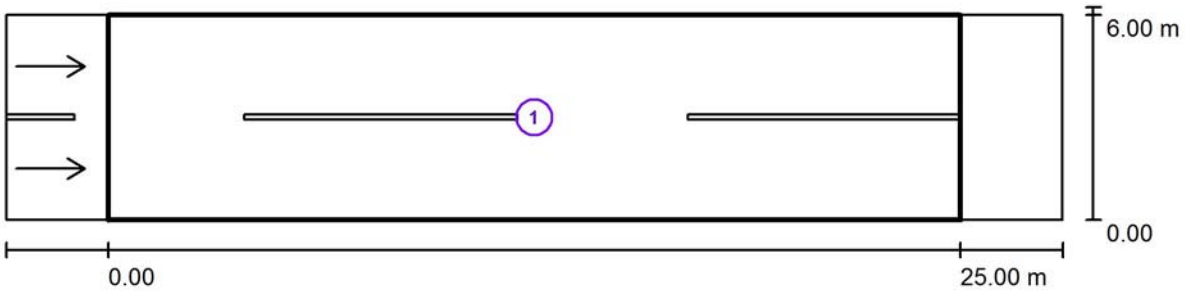
Road 6m (فايز الصايغ) / Photometric Results



Light loss factor: 0.67

Scale 1:222

Calculation Field List

1 Valuation Field Roadway 1
Length: 25.000 m, Width: 6.000 m
Grid: 10 x 6 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME4b (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	Ul	TI [%]	SR
Calculated values:	0.75	0.63	0.87	9	0.79
Required values according to class:	≥ 0.75	≥ 0.40	≥ 0.50	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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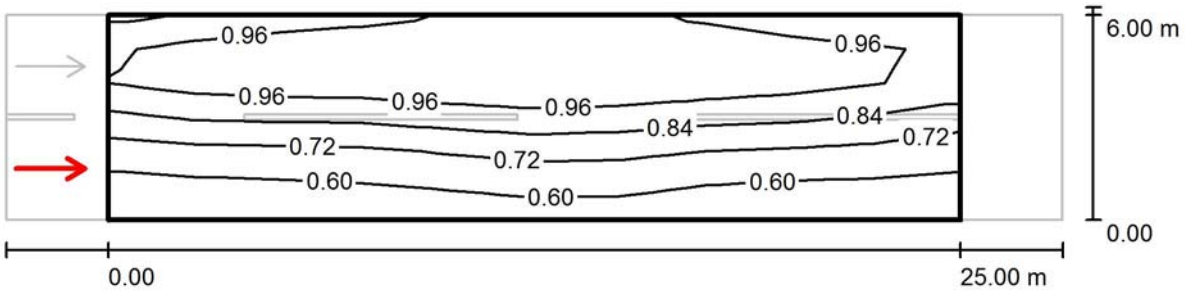
Road 6m (فايز الصايغ) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 222

Grid: 10 x 6 Points
Observer Position: (-60.000 m, 1.500 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	0.83	0.63	0.87	8
Required values according to class ME4b:	≥ 0.75	≥ 0.40	≥ 0.50	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

Ziadah Architects and Engineers

Ramallah, Palestine

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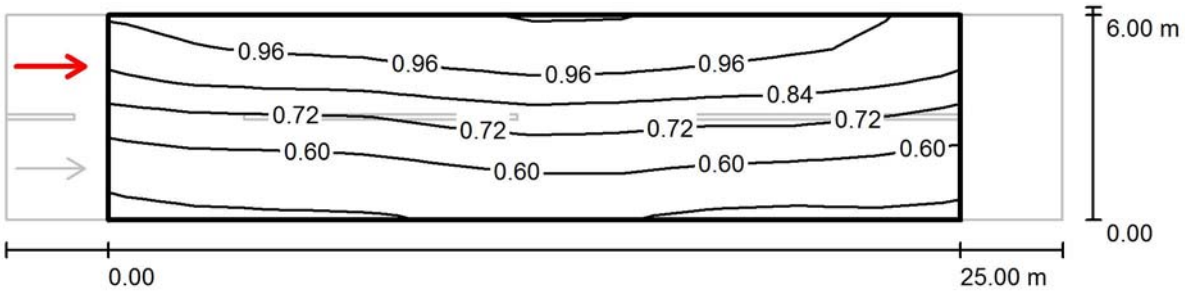
Road 6m (فايز الصايغ) / Valuation Field Roadway 1 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 222

Grid: 10 x 6 Points
Observer Position: (-60.000 m, 4.500 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	0.75	0.63	0.89	9
Required values according to class ME4b:	≥ 0.75	≥ 0.40	≥ 0.50	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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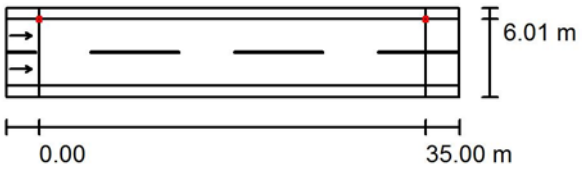
Road 8m (شارع برلين) / Planning data

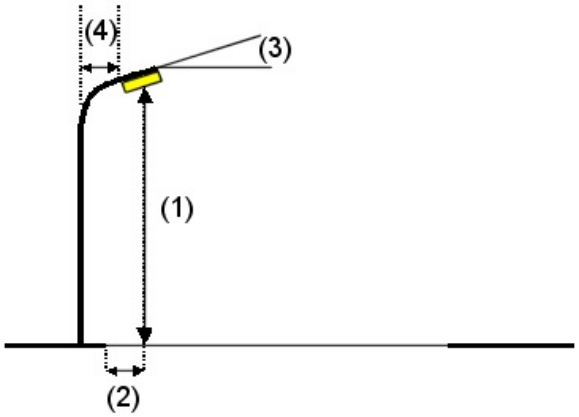
Street Profile

Sidewalk 2 (Width: 1.000 m)
Roadway 1 (Width: 6.000 m, Number of lanes: 2, tarmac: R3, q0: 0.070)
Sidewalk 1 (Width: 1.000 m)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	PHILIPS BRP371 32LED DWE		
Luminous flux (Luminaire):	7083 lm	Maximum luminous intensities	
Luminous flux (Lamps):	8125 lm	at 70°:	594 cd/klm
Luminaire Wattage:	72.0 W	at 80°:	319 cd/klm
Arrangement:	Single row, top	at 90°:	1.59 cd/klm
Pole Distance:	35.000 m	Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.	
Mounting Height (1):	8.000 m		
Height:	7.865 m	No luminous intensities above 95°.	
Overhang (2):	0.000 m	Arrangement complies with glare index class D.6.	
Boom Angle (3):	5.0 °		
Boom Length (4):	1.000 m		

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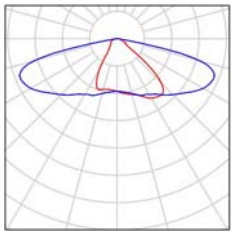
Road 8m (شارع برلين) / Luminaire parts list

PHILIPS BRP371 32LED DWE
Article No.:
Luminous flux (Luminaire): 7083 lm
Luminous flux (Lamps): 8125 lm
Luminaire Wattage: 72.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



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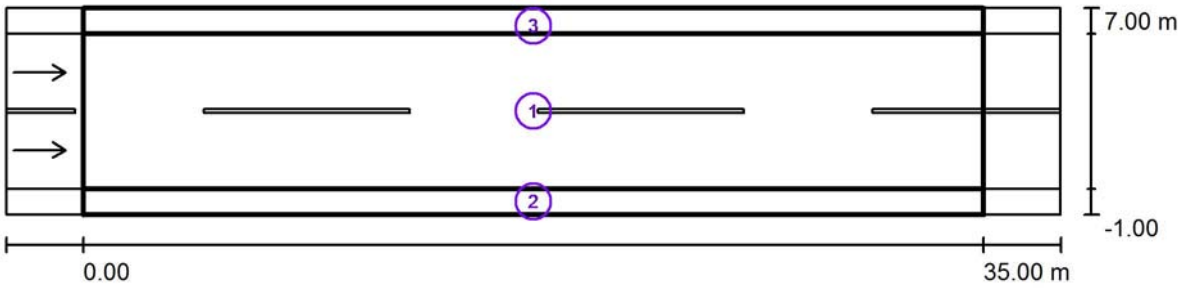
Road 8m (شارع برلين) / Photometric Results



Light loss factor: 0.80

Scale 1:294

Calculation Field List

1 Valuation Field Roadway 1
Length: 35.000 m, Width: 6.000 m
Grid: 12 x 6 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME4a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	UI	TI [%]	SR
Calculated values:	0.86	0.60	0.74	13	0.79
Required values according to class:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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Road 8m (شارع برلين) / Photometric Results

Calculation Field List

2 Valuation Field Sidewalk 1
Length: 35.000 m, Width: 1.000 m
Grid: 12 x 3 Points
Accompanying Street Elements: Sidewalk 1.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	10.04	0.69
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

3 Valuation Field Sidewalk 2
Length: 35.000 m, Width: 1.000 m
Grid: 12 x 3 Points
Accompanying Street Elements: Sidewalk 2.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	10.90	0.41
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

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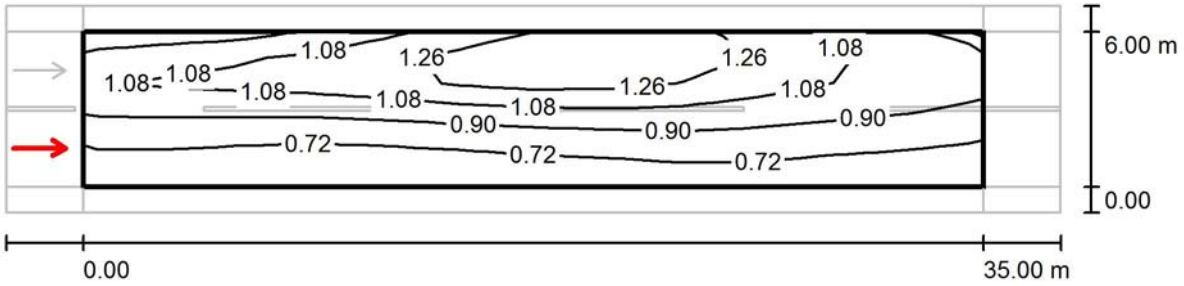
Road 8m (شارع برلين) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 294

Grid: 12 x 6 Points
Observer Position: (-60.000 m, 1.500 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	0.95	0.60	0.85	11
Required values according to class ME4a:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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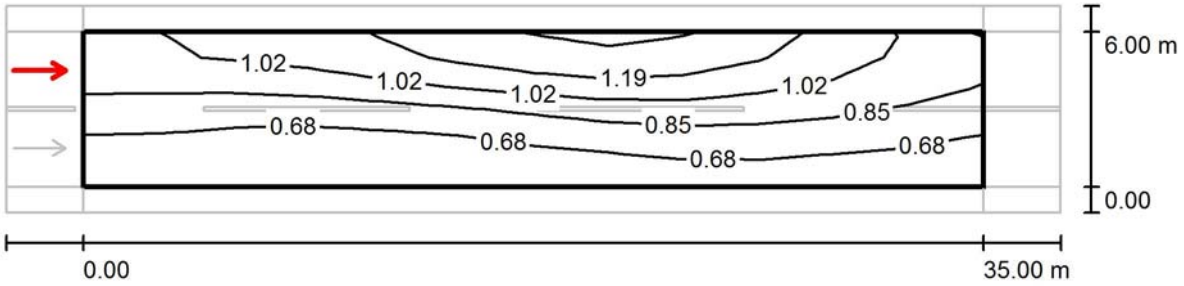
Road 8m (شارع برلين) / Valuation Field Roadway 1 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 294

Grid: 12 x 6 Points
Observer Position: (-60.000 m, 4.500 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	UI	TI [%]
Calculated values:	0.86	0.60	0.74	13
Required values according to class ME4a:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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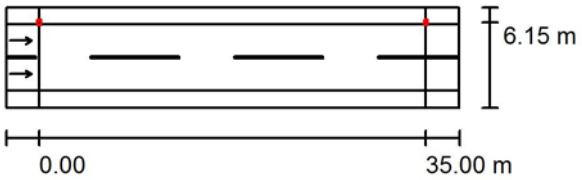
Road 9m (شارع اندراوس) / Planning data

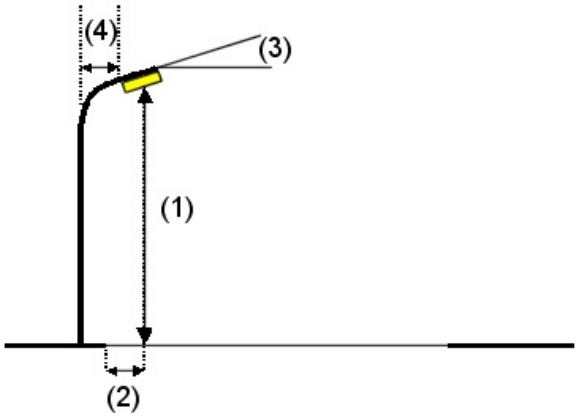
Street Profile

Sidewalk 1 (Width: 1.500 m)
Roadway 1 (Width: 6.000 m, Number of lanes: 2, tarmac: R3, q0: 0.070)
Sidewalk 2 (Width: 1.500 m)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	PHILIPS BRP371 32LED DWE		
Luminous flux (Luminaire):	7083 lm	Maximum luminous intensities	
Luminous flux (Lamps):	8125 lm	at 70°:	594 cd/klm
Luminaire Wattage:	72.0 W	at 80°:	319 cd/klm
Arrangement:	Single row, top	at 90°:	1.59 cd/klm
Pole Distance:	35.000 m	Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.	
Mounting Height (1):	8.000 m		
Height:	7.865 m	No luminous intensities above 95°.	
Overhang (2):	-0.138 m	Arrangement complies with glare index class D.6.	
Boom Angle (3):	5.0 °		
Boom Length (4):	1.000 m		

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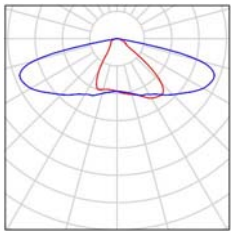
Road 9m (شارع اندراوس) / Luminaire parts list

PHILIPS BRP371 32LED DWE
Article No.:
Luminous flux (Luminaire): 7083 lm
Luminous flux (Lamps): 8125 lm
Luminaire Wattage: 72.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



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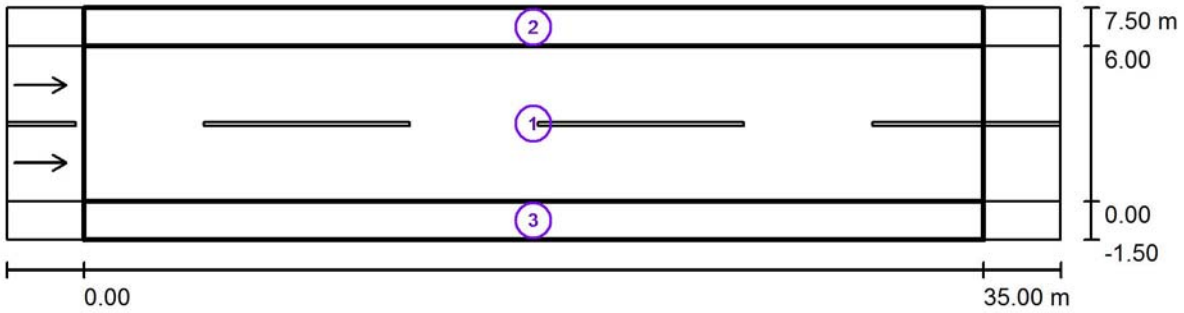
Road 9m (شارع اندراوس) / Photometric Results



Light loss factor: 0.80

Scale 1:294

Calculation Field List

1 Valuation Field Roadway 1
Length: 35.000 m, Width: 6.000 m
Grid: 12 x 6 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME4a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	Ul	TI [%]	SR
Calculated values:	0.85	0.59	0.75	13	0.79
Required values according to class:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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Road 9m (شارع اندراوس) / Photometric Results

Calculation Field List

2 Valuation Field Sidewalk 1
Length: 35.000 m, Width: 1.500 m
Grid: 12 x 3 Points
Accompanying Street Elements: Sidewalk 1.
Selected Lighting Class: CE5 (Not all lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	10.77	0.38
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✗

3 Valuation Field Sidewalk 2
Length: 35.000 m, Width: 1.500 m
Grid: 12 x 3 Points
Accompanying Street Elements: Sidewalk 2.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	9.64	0.71
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

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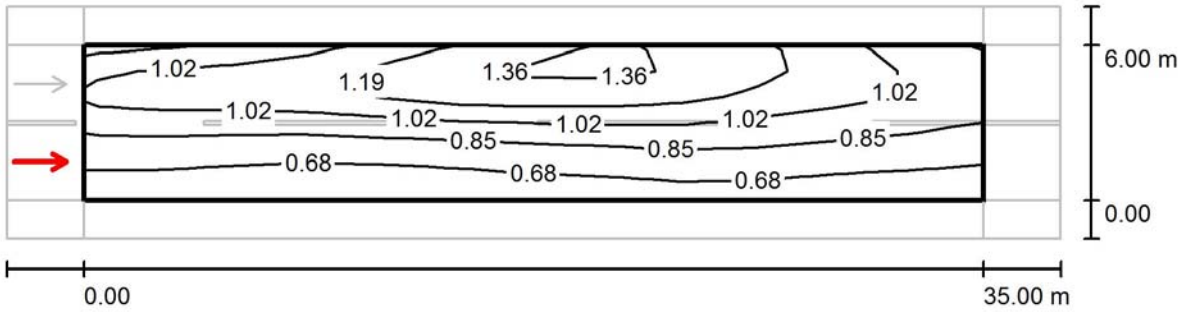
Road 9m (شارع اندراوس) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 294

Grid: 12 x 6 Points
Observer Position: (-60.000 m, 1.500 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	0.94	0.59	0.84	11
Required values according to class ME4a:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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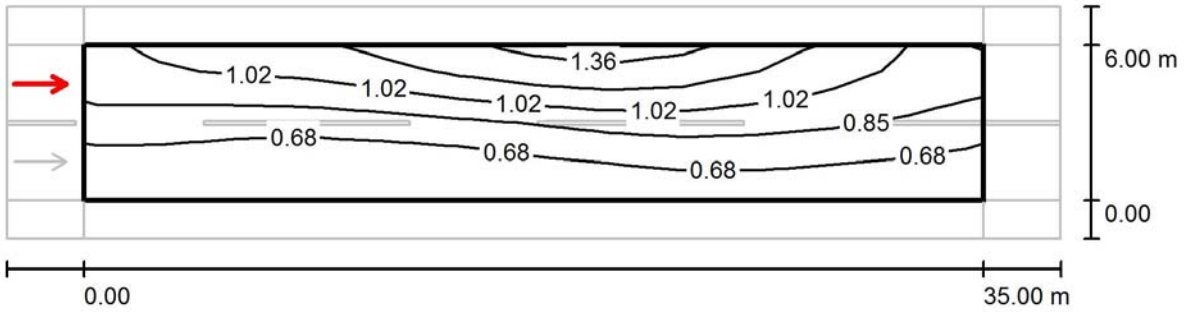
Road 9m (شارع اندراوس) / Valuation Field Roadway 1 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 294

Grid: 12 x 6 Points
Observer Position: (-60.000 m, 4.500 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	UI	TI [%]
Calculated values:	0.85	0.60	0.75	13
Required values according to class ME4a:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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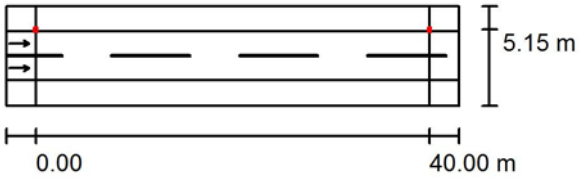
Road 10m (شارع المنتزه) / Planning data

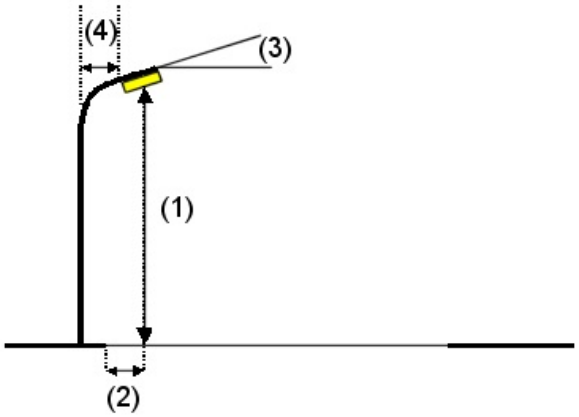
Street Profile

Sidewalk 2 (Width: 2.500 m)
Roadway 1 (Width: 5.000 m, Number of lanes: 2, tarmac: R3, q0: 0.070)
Sidewalk 1 (Width: 2.500 m)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	PHILIPS BRP371 40LED DWE		
Luminous flux (Luminaire):	8807 lm	Maximum luminous intensities	
Luminous flux (Lamps):	10102 lm	at 70°:	594 cd/klm
Luminaire Wattage:	89.0 W	at 80°:	319 cd/klm
Arrangement:	Single row, top	at 90°:	1.59 cd/klm
Pole Distance:	40.000 m	Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.	
Mounting Height (1):	10.000 m		
Height:	9.865 m	No luminous intensities above 95°.	
Overhang (2):	-0.138 m	Arrangement complies with glare index class D.6.	
Boom Angle (3):	5.0 °		
Boom Length (4):	1.500 m		

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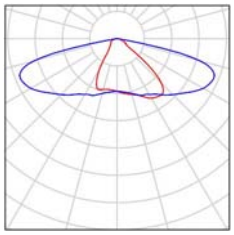
Road 10m (شارع المنتزه) / Luminaire parts list

PHILIPS BRP371 40LED DWE
Article No.:
Luminous flux (Luminaire): 8807 lm
Luminous flux (Lamps): 10102 lm
Luminaire Wattage: 89.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



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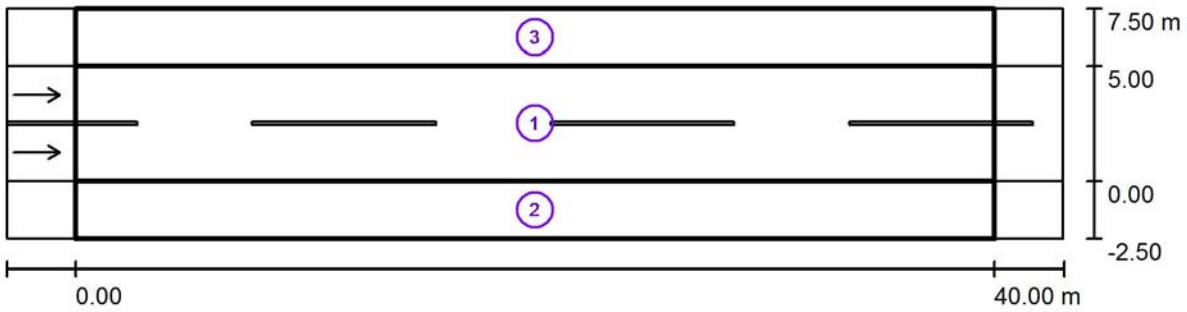
Road 10m (شارع المنتزه) / Photometric Results



Light loss factor: 0.80

Scale 1:329

Calculation Field List

1 Valuation Field Roadway 1
Length: 40.000 m, Width: 5.000 m
Grid: 14 x 6 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME4a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	Ul	TI [%]	SR
Calculated values:	0.83	0.66	0.80	9	0.90
Required values according to class:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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Road 10m (شارع المنتزه) / Photometric Results

Calculation Field List

2 Valuation Field Sidewalk 1
Length: 40.000 m, Width: 2.500 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 1.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	9.67	0.69
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

3 Valuation Field Sidewalk 2
Length: 40.000 m, Width: 2.500 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 2.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	9.06	0.40
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

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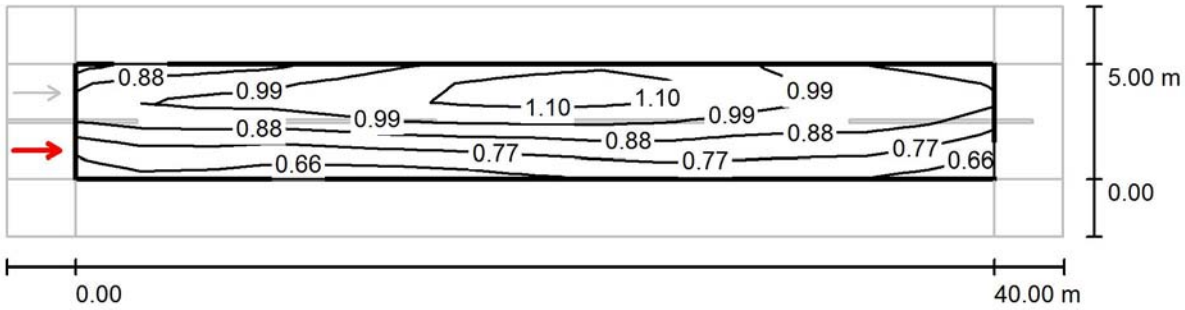
Road 10m (شارع المنتزه) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 6 Points
Observer Position: (-60.000 m, 1.250 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	0.90	0.70	0.85	9
Required values according to class ME4a:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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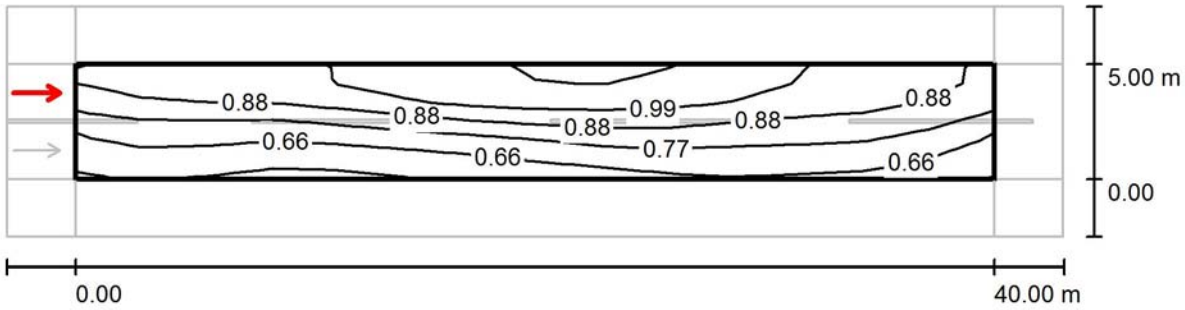
Road 10m (شارع المنتزه) / Valuation Field Roadway 1 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 6 Points
Observer Position: (-60.000 m, 3.750 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	UI	TI [%]
Calculated values:	0.83	0.66	0.80	9
Required values according to class ME4a:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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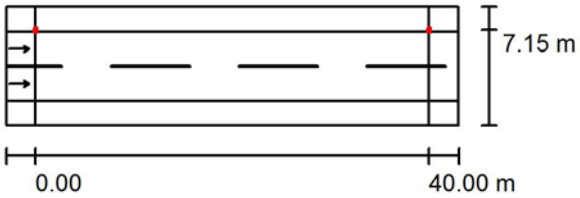
Road 12m (شارع سعد صايل) / Planning data

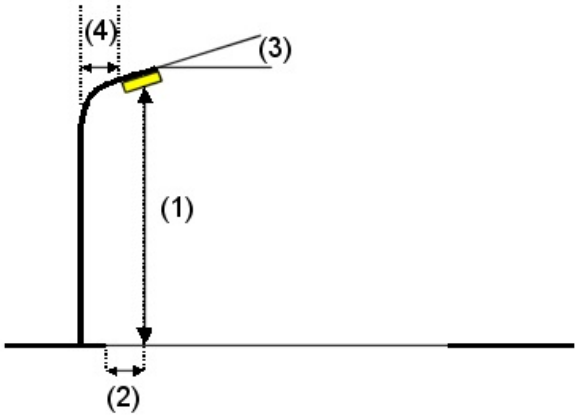
Street Profile

Sidewalk 2 (Width: 2.500 m)
Roadway 1 (Width: 7.000 m, Number of lanes: 2, tarmac: R3, q0: 0.070)
Sidewalk 1 (Width: 2.500 m)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	PHILIPS BRP371 40LED DWE		
Luminous flux (Luminaire):	8807 lm	Maximum luminous intensities	
Luminous flux (Lamps):	10102 lm	at 70°:	594 cd/klm
Luminaire Wattage:	89.0 W	at 80°:	319 cd/klm
Arrangement:	Single row, top	at 90°:	1.59 cd/klm
Pole Distance:	40.000 m	Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.	
Mounting Height (1):	10.000 m		
Height:	9.865 m	No luminous intensities above 95°.	
Overhang (2):	-0.138 m	Arrangement complies with glare index class D.6.	
Boom Angle (3):	5.0 °		
Boom Length (4):	1.500 m		

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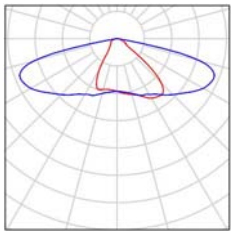
Road 12m (شارع سعد صايل) / Luminaire parts list

PHILIPS BRP371 40LED DWE
Article No.:
Luminous flux (Luminaire): 8807 lm
Luminous flux (Lamps): 10102 lm
Luminaire Wattage: 89.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



30.03.2016

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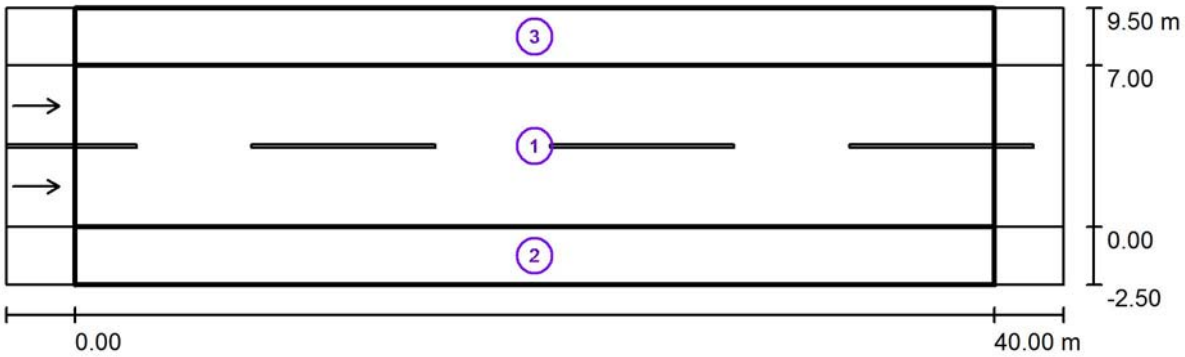
Road 12m (شارع سعد صايل) / Photometric Results



Light loss factor: 0.80

Scale 1:329

Calculation Field List

1 Valuation Field Roadway 1
Length: 40.000 m, Width: 7.000 m
Grid: 14 x 6 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME4a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	UI	TI [%]	SR
Calculated values:	0.75	0.62	0.82	10	0.82
Required values according to class:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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Road 12m (شارع سعد صايل) / Photometric Results

Calculation Field List

2 Valuation Field Sidewalk 1
Length: 40.000 m, Width: 2.500 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 1.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	8.52	0.75
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

3 Valuation Field Sidewalk 2
Length: 40.000 m, Width: 2.500 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 2.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	9.06	0.40
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

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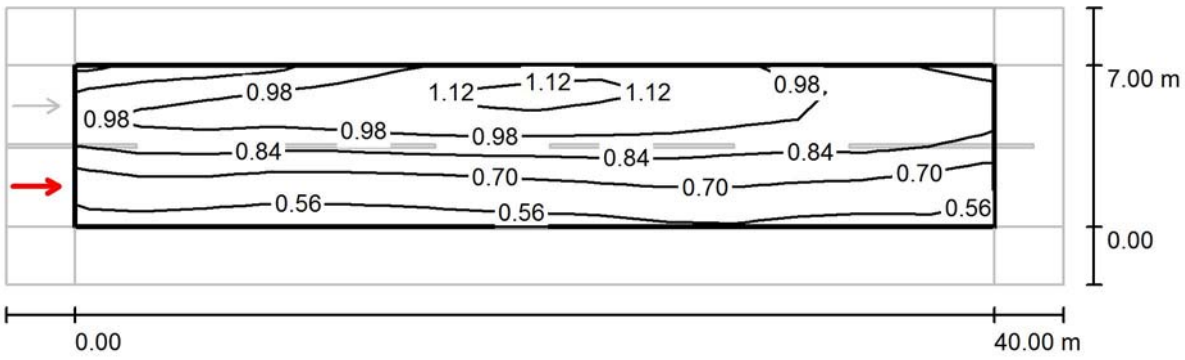
Road 12m (شارع سعد صايل) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 6 Points
Observer Position: (-60.000 m, 1.750 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	0.84	0.62	0.86	9
Required values according to class ME4a:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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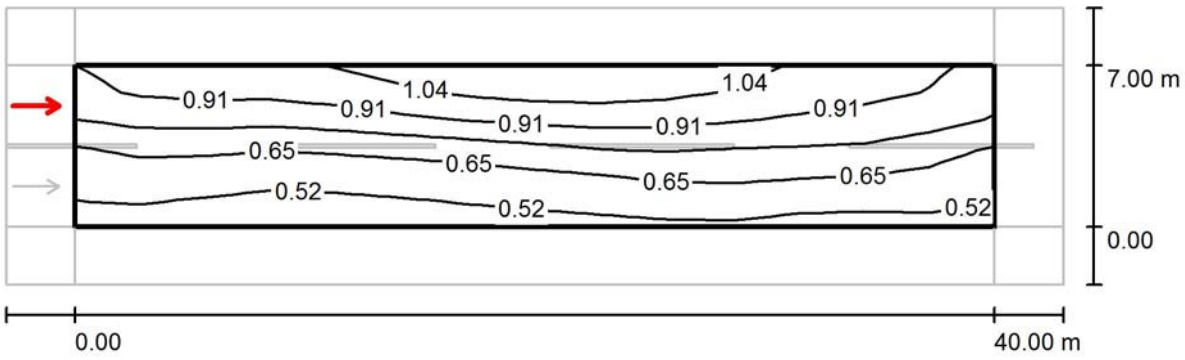
Road 12m (شارع سعد صايل) / Valuation Field Roadway 1 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 6 Points
Observer Position: (-60.000 m, 5.250 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	0.75	0.62	0.82	10
Required values according to class ME4a:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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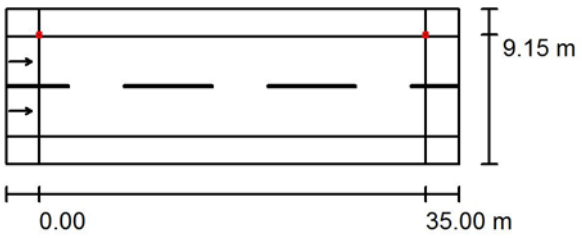
Road 14m (شارع عين مصباح) / Planning data

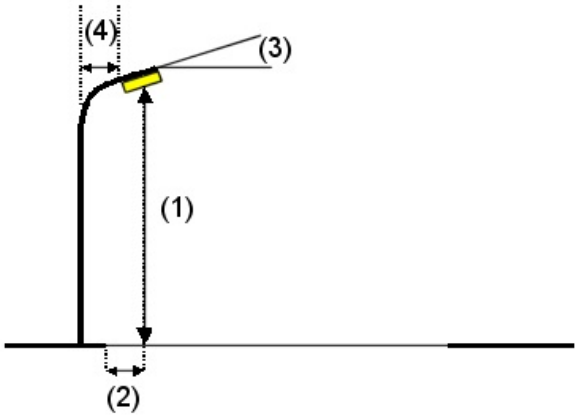
Street Profile

Sidewalk 2	(Width: 2.500 m)
Roadway 1	(Width: 9.000 m, Number of lanes: 2, tarmac: R3, q0: 0.070)
Sidewalk 1	(Width: 2.500 m)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	PHILIPS BRP371 40LED DWE
Luminous flux (Luminaire):	8807 lm
Luminous flux (Lamps):	10102 lm
Luminaire Wattage:	89.0 W
Arrangement:	Single row, top
Pole Distance:	35.000 m
Mounting Height (1):	10.000 m
Height:	9.865 m
Overhang (2):	-0.138 m
Boom Angle (3):	5.0 °
Boom Length (4):	1.500 m

Maximum luminous intensities

at 70°:	594 cd/klm
at 80°:	319 cd/klm
at 90°:	1.59 cd/klm

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

No luminous intensities above 95°.

Arrangement complies with glare index class D.6.

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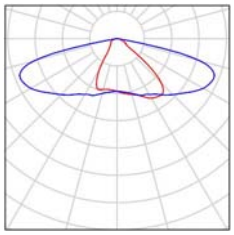
Road 14m (شارع عين مصباح) / Luminaire parts list

PHILIPS BRP371 40LED DWE
Article No.:
Luminous flux (Luminaire): 8807 lm
Luminous flux (Lamps): 10102 lm
Luminaire Wattage: 89.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



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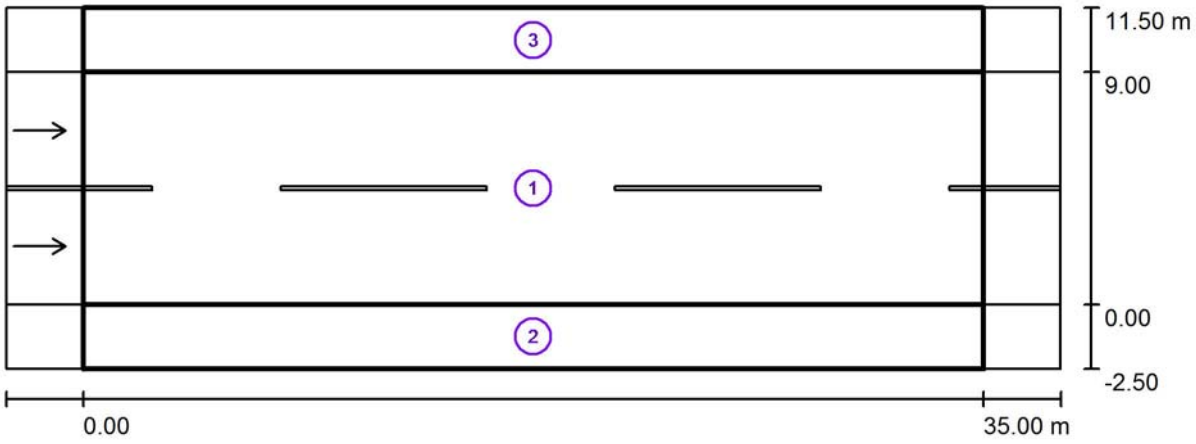
Road 14m (شارع عين مصباح) / Photometric Results



Light loss factor: 0.80

Scale 1:294

Calculation Field List

1 Valuation Field Roadway 1
Length: 35.000 m, Width: 9.000 m
Grid: 12 x 6 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME4a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	UI	TI [%]	SR
Calculated values:	0.79	0.54	0.88	10	0.70
Required values according to class:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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Road 14m (شارع عين مصباح) / Photometric Results

Calculation Field List

2 Valuation Field Sidewalk 1
Length: 35.000 m, Width: 2.500 m
Grid: 12 x 3 Points
Accompanying Street Elements: Sidewalk 1.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	7.91	0.86
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

3 Valuation Field Sidewalk 2
Length: 35.000 m, Width: 2.500 m
Grid: 12 x 3 Points
Accompanying Street Elements: Sidewalk 2.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	10.35	0.49
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

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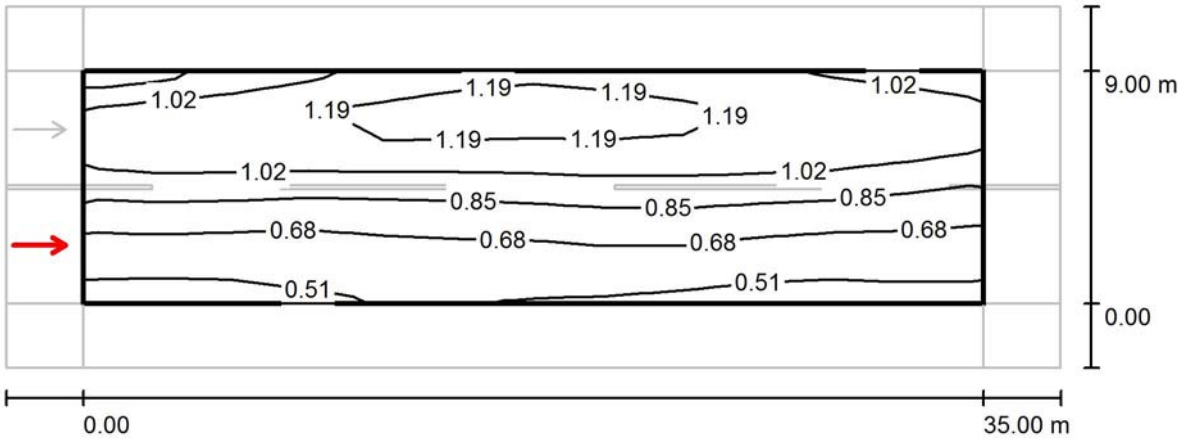
Road 14m (شارع عين مصباح) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 294

Grid: 12 x 6 Points
Observer Position: (-60.000 m, 2.250 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	0.89	0.54	0.89	8
Required values according to class ME4a:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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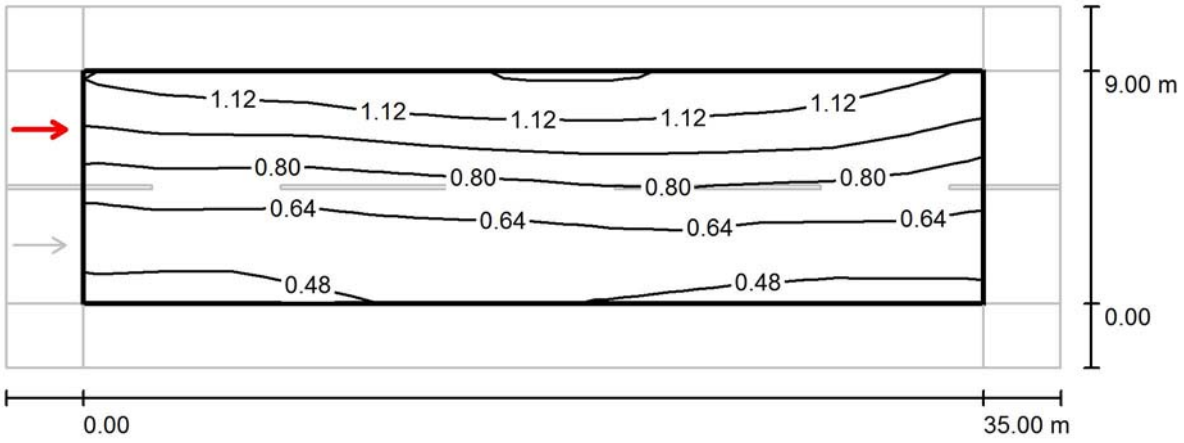
Road 14m (شارع عين مصباح) / Valuation Field Roadway 1 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 294

Grid: 12 x 6 Points
Observer Position: (-60.000 m, 6.750 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	0.79	0.56	0.88	10
Required values according to class ME4a:	≥ 0.75	≥ 0.40	≥ 0.60	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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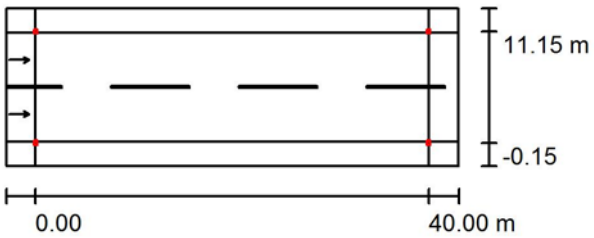
Road 16m (شارع الجهاد) / Planning data

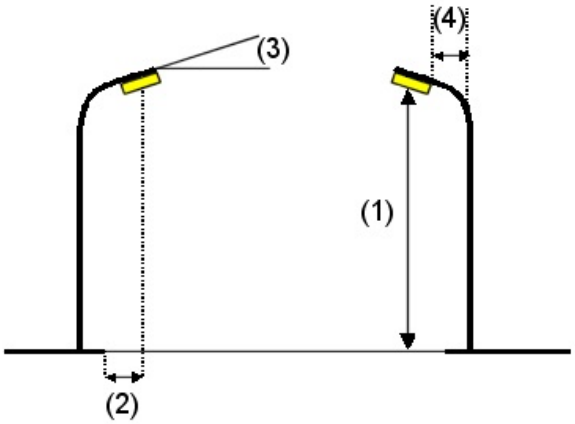
Street Profile

Sidewalk 2 (Width: 2.500 m)
Roadway 1 (Width: 11.000 m, Number of lanes: 2, tarmac: R3, q0: 0.070)
Sidewalk 1 (Width: 2.500 m)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	PHILIPS BRP371 32LED DWE
Luminous flux (Luminaire):	7083 lm
Luminous flux (Lamps):	8125 lm
Luminaire Wattage:	72.0 W
Arrangement:	Double row, opposing
Pole Distance:	40.000 m
Mounting Height (1):	10.000 m
Height:	9.865 m
Overhang (2):	-0.138 m
Boom Angle (3):	5.0 °
Boom Length (4):	1.500 m

Maximum luminous intensities
at 70°: 594 cd/klm
at 80°: 319 cd/klm
at 90°: 1.59 cd/klm
Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.
No luminous intensities above 95°.
Arrangement complies with glare index class D.6.

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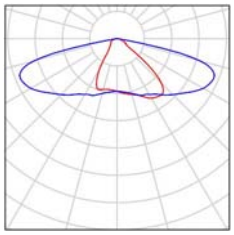
Road 16m (شارع الجهاد) / Luminaire parts list

PHILIPS BRP371 32LED DWE
Article No.:
Luminous flux (Luminaire): 7083 lm
Luminous flux (Lamps): 8125 lm
Luminaire Wattage: 72.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



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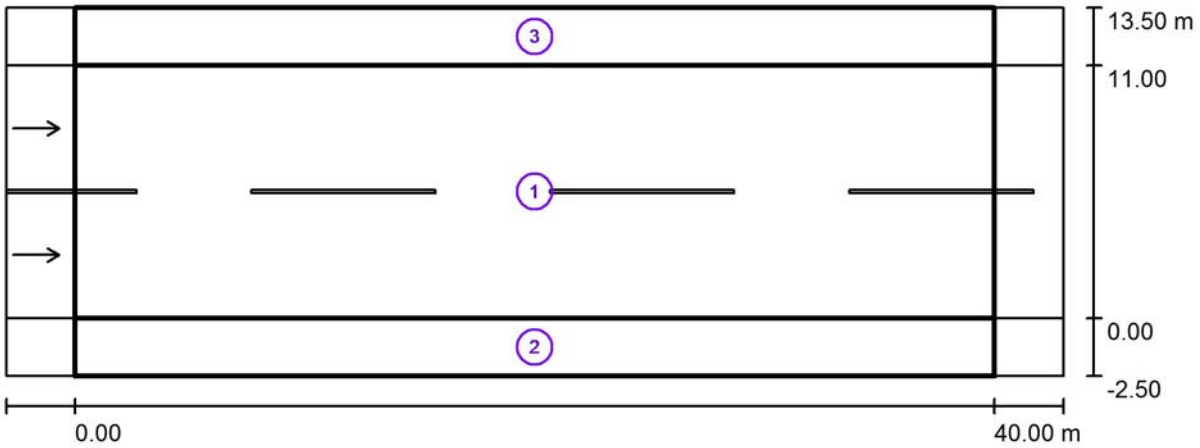
Road 16m (شارع الجهاد) / Photometric Results



Light loss factor: 0.80

Scale 1:329

Calculation Field List

1 Valuation Field Roadway 1
Length: 40.000 m, Width: 11.000 m
Grid: 14 x 6 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME3a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	Ul	TI [%]	SR
Calculated values:	1.10	0.74	0.86	11	0.60
Required values according to class:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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Road 16m (شارع الجهاد) / Photometric Results

Calculation Field List

2 Valuation Field Sidewalk 1
Length: 40.000 m, Width: 2.500 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 1.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	11.29	0.56
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

3 Valuation Field Sidewalk 2
Length: 40.000 m, Width: 2.500 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 2.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	11.29	0.56
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

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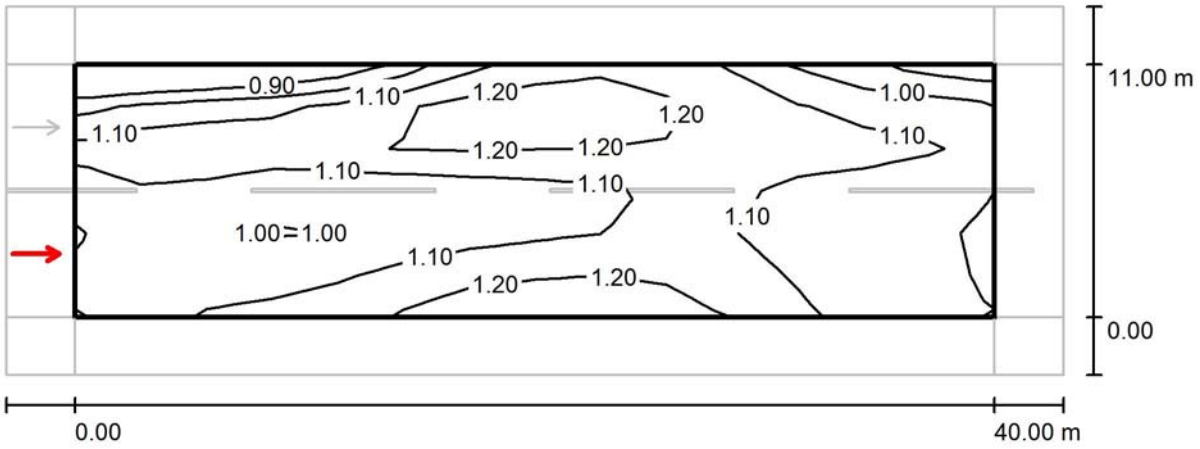
Road 16m (شارع الجهاد) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 6 Points
Observer Position: (-60.000 m, 2.750 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	1.10	0.74	0.86	11
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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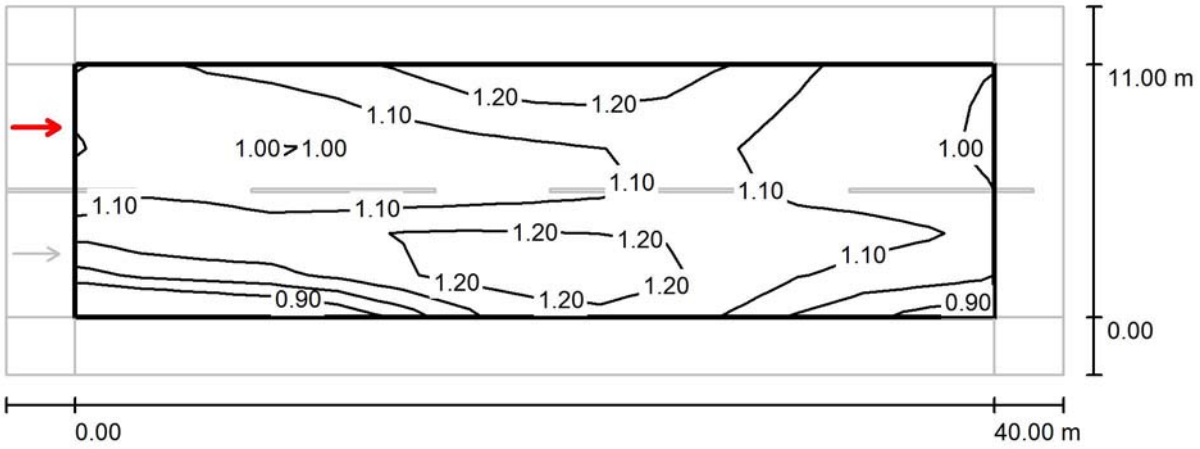
Road 16m (شارع الجهاد) / Valuation Field Roadway 1 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 6 Points
Observer Position: (-60.000 m, 8.250 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	1.10	0.74	0.86	11
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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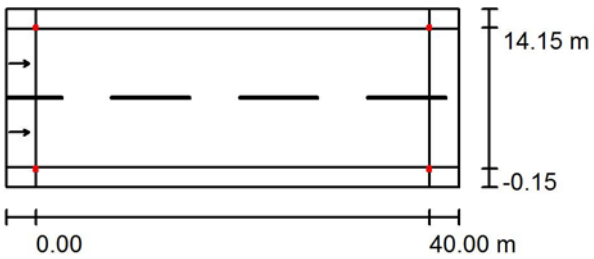
Road 18m (خليل الوزير) / Planning data

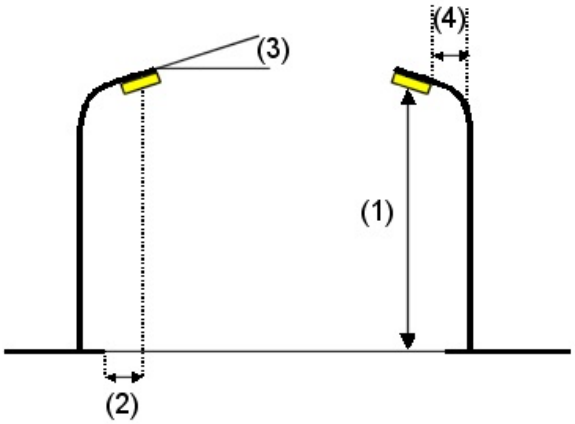
Street Profile

Sidewalk 1 (Width: 2.000 m)
Roadway 1 (Width: 14.000 m, Number of lanes: 2, tarmac: R3, q0: 0.070)
Sidewalk 2 (Width: 2.000 m)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	PHILIPS BRP371 40LED DWE
Luminous flux (Luminaire):	8807 lm
Luminous flux (Lamps):	10102 lm
Luminaire Wattage:	89.0 W
Arrangement:	Double row, opposing
Pole Distance:	40.000 m
Mounting Height (1):	10.000 m
Height:	9.865 m
Overhang (2):	-0.138 m
Boom Angle (3):	5.0 °
Boom Length (4):	1.500 m

Maximum luminous intensities
at 70°: 594 cd/klm
at 80°: 319 cd/klm
at 90°: 1.59 cd/klm
Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.
No luminous intensities above 95°.
Arrangement complies with glare index class D.6.

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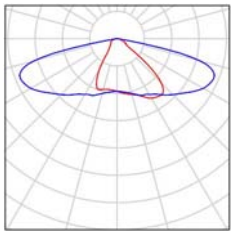
Road 18m (خليل الوزير) / Luminaire parts list

PHILIPS BRP371 40LED DWE
Article No.:
Luminous flux (Luminaire): 8807 lm
Luminous flux (Lamps): 10102 lm
Luminaire Wattage: 89.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



Ziadah Architects and Engineers

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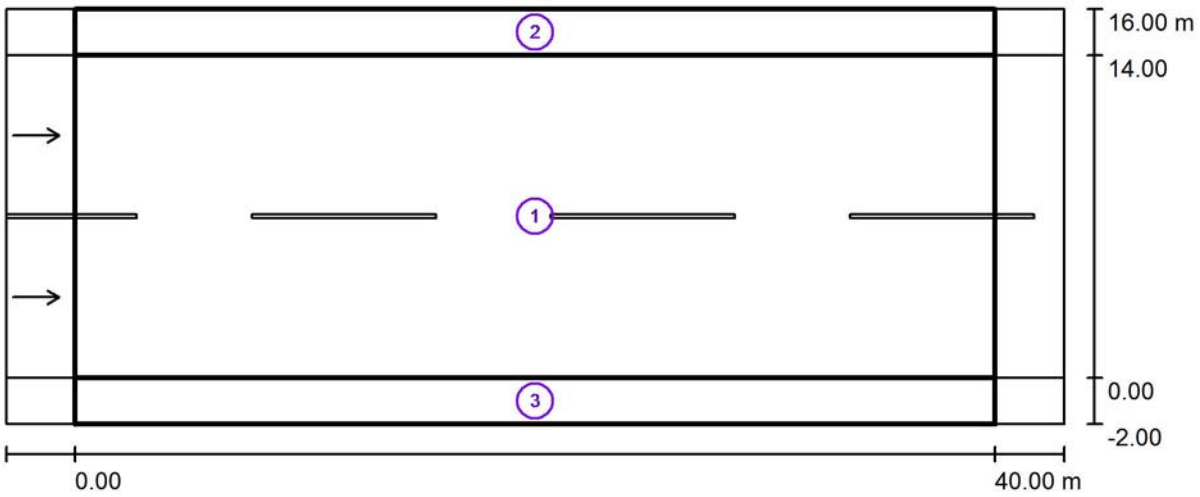
Road 18m (خليل الوزير) / Photometric Results



Light loss factor: 0.80

Scale 1:329

Calculation Field List

1 Roadway 1
Length: 40.000 m, Width: 14.000 m
Grid: 14 x 6 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME3a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	Ul	TI [%]	SR
Calculated values:	1.22	0.68	0.85	11	0.56
Required values according to class:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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Road 18m (خليل الوزير) / Photometric Results

Calculation Field List

2 Valuation Field Sidewalk 1
Length: 40.000 m, Width: 2.000 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 1.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	11.64	0.52
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

3 Valuation Field Sidewalk 2
Length: 40.000 m, Width: 2.000 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 2.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	11.64	0.52
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

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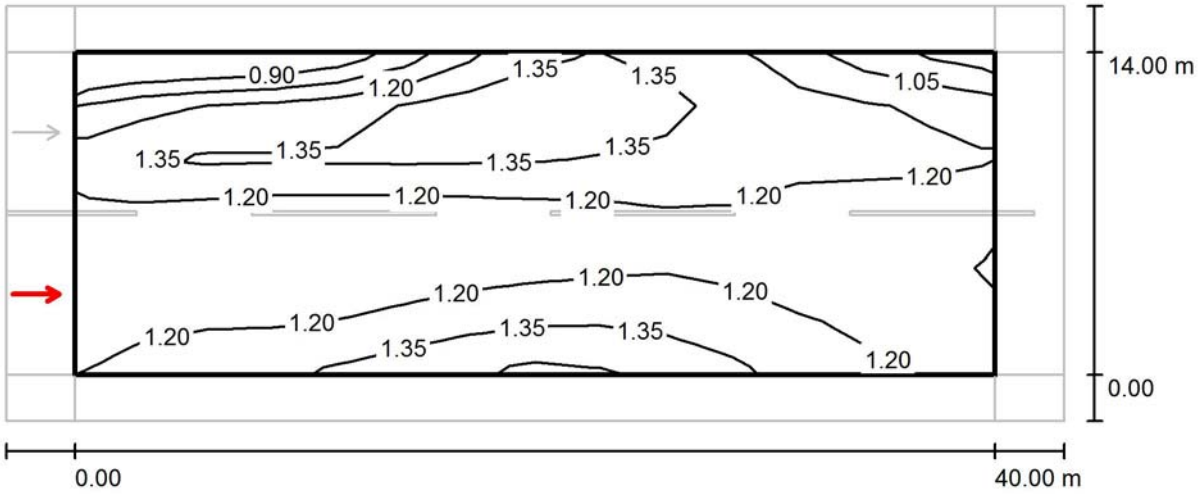
Road 18m (خليل الوزير) / Roadway 1 / Observer 3 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 6 Points
Observer Position: (-60.000 m, 3.500 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	1.22	0.68	0.85	11
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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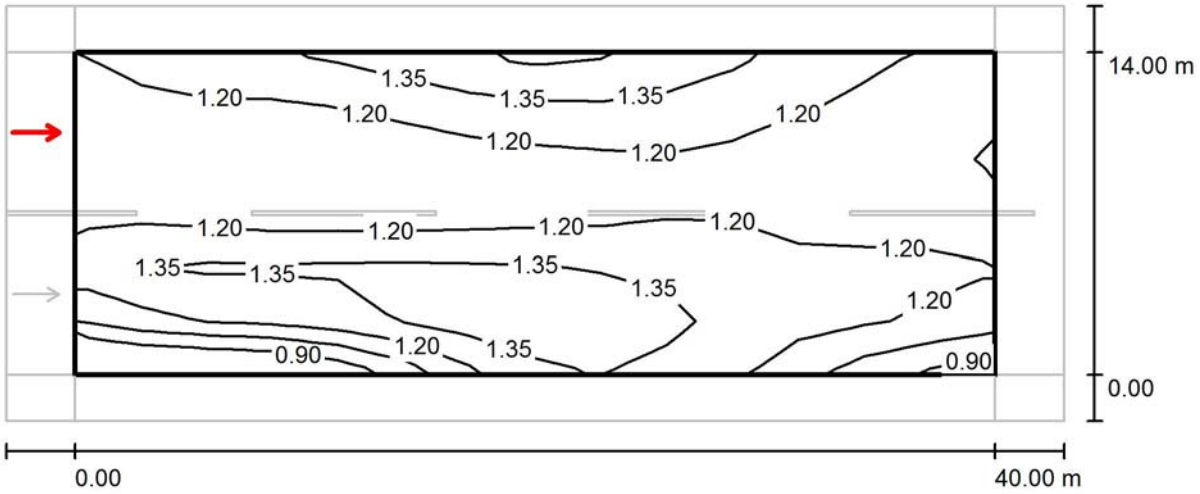
Road 18m (خليل الوزير) / Roadway 1 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 6 Points
Observer Position: (-60.000 m, 10.500 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	UI	TI [%]
Calculated values:	1.22	0.68	0.85	11
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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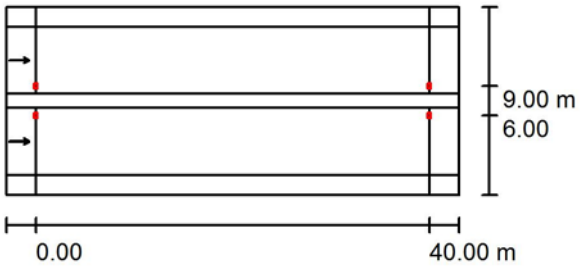
Road 20m (شارع يافا) / Planning data

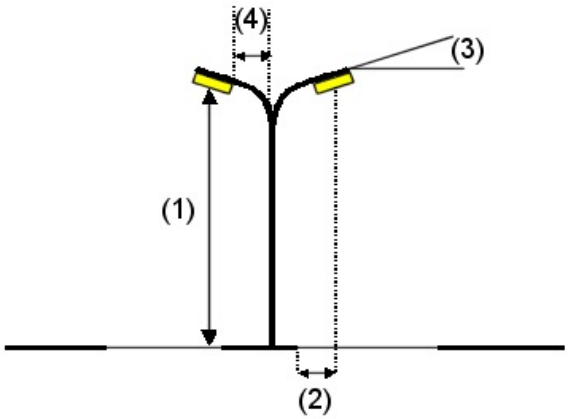
Street Profile

Sidewalk 1	(Width: 2.000 m)
Roadway 2	(Width: 6.800 m, Number of lanes: 1, tarmac: R3, q0: 0.070)
Median 1	(Width: 1.400 m, Height: 0.000 m)
Roadway 1	(Width: 6.800 m, Number of lanes: 1, tarmac: R3, q0: 0.070)
Sidewalk 2	(Width: 2.000 m)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	BRP372 4000K 56LEDs DME		
Luminous flux (Luminaire):	12270 lm	Maximum luminous intensities	
Luminous flux (Lamps):	12273 lm	at 70°:	668 cd/klm
Luminaire Wattage:	121.5 W	at 80°:	64 cd/klm
Arrangement:	on Median	at 90°:	4.30 cd/klm
Pole Distance:	40.000 m	Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.	
Mounting Height (1):	10.000 m		
Height:	9.865 m	No luminous intensities above 95°.	
Overhang (2):	0.812 m	Arrangement complies with luminous intensity class G3.	
Boom Angle (3):	5.0 °	Arrangement complies with glare index class D.6.	
Boom Length (4):	1.500 m		

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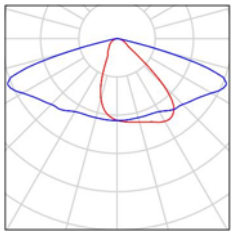
Road 20m (شارع يافا) / Luminaire parts list

BRP372 4000K 56LEDs DME
Article No.:
Luminous flux (Luminaire): 12270 lm
Luminous flux (Lamps): 12273 lm
Luminaire Wattage: 121.5 W
Luminaire classification according to CIE: 100
CIE flux code: 44 78 97 100 100
Fitting: 1 x Luxeon T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



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Road 20m (شارع يافا) / Photometric Results

Light loss factor: 0.80

Scale 1:329

Calculation Field List

1 Valuation Field Roadway 1
Length: 40.000 m, Width: 6.800 m
Grid: 14 x 3 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME3a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	Ul	TI [%]	SR
Calculated values:	1.33	0.63	0.75	10	0.96
Required values according to class:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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Road 20m (شارع يافا) / Photometric Results

Calculation Field List

2 Valuation Field Sidewalk 1
Length: 40.000 m, Width: 2.000 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 1.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	15.36	0.66
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

3 Valuation Field Sidewalk 2
Length: 40.000 m, Width: 2.000 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 2.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	15.36	0.66
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

4 Valuation Field Roadway 2
Length: 40.000 m, Width: 6.800 m
Grid: 14 x 3 Points
Accompanying Street Elements: Roadway 2.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME3a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	UI	TI [%]	SR
Calculated values:	1.33	0.63	0.75	10	0.96
Required values according to class:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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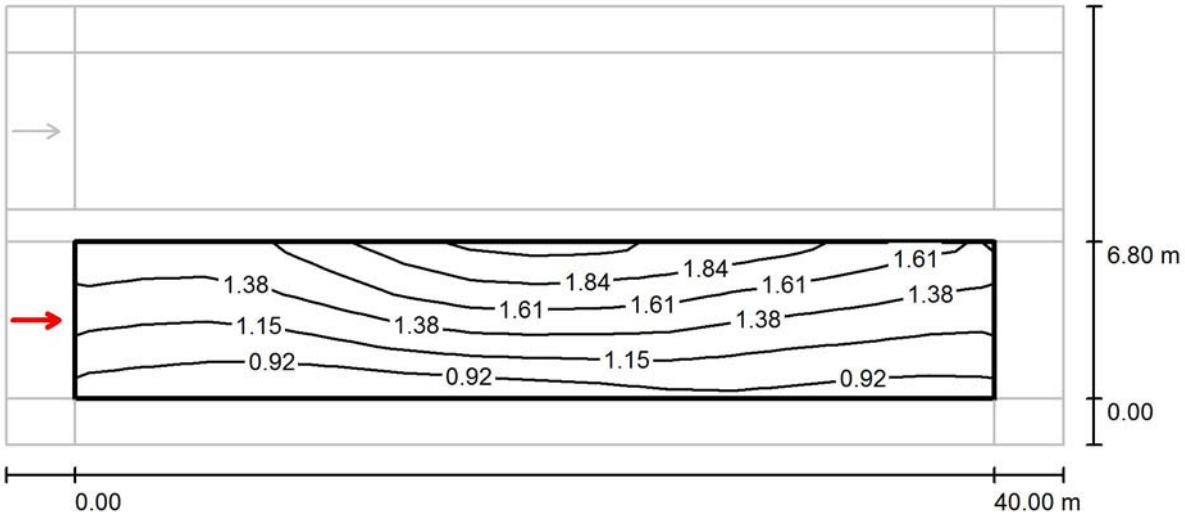
Road 20m (شارع يافا) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 3 Points
Observer Position: (-60.000 m, 3.400 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	Tl [%]
Calculated values:	1.33	0.63	0.75	10
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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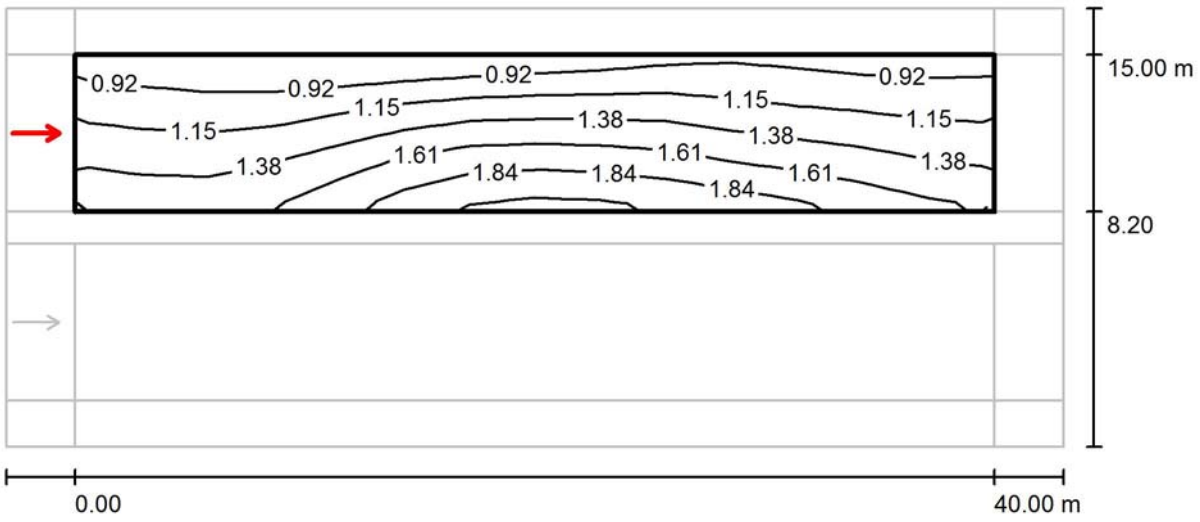
Road 20m (شارع يافا) / Valuation Field Roadway 2 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 3 Points
Observer Position: (-60.000 m, 11.600 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	Tl [%]
Calculated values:	1.33	0.63	0.75	10
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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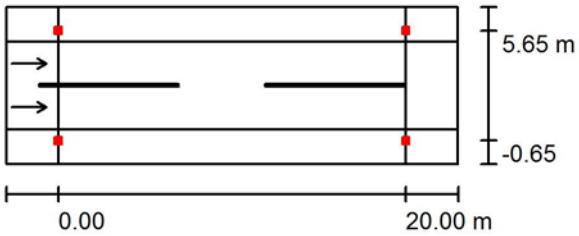
Road 9m (شارع المعارض - وسط البلد) / Planning data

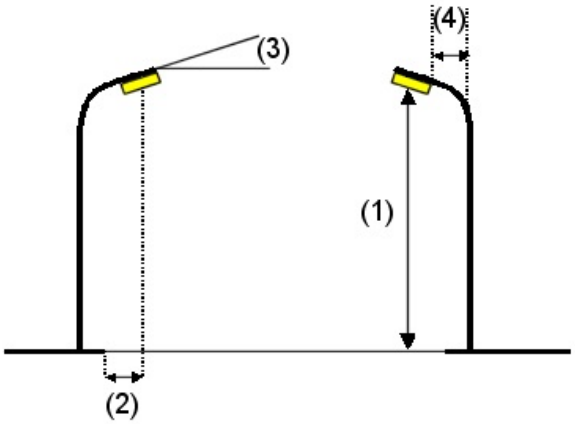
Street Profile

Sidewalk 2 (Width: 2.000 m)
Roadway 1 (Width: 5.000 m, Number of lanes: 2, tarmac: R3, q0: 0.070)
Sidewalk 1 (Width: 2.000 m)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	PHILIPS BDP791 FG 40xGRN52/740 OFR4	
Luminous flux (Luminaire):	4108 lm	Maximum luminous intensities
Luminous flux (Lamps):	5200 lm	at 70°: 525 cd/klm
Luminaire Wattage:	43.8 W	at 80°: 24 cd/klm
Arrangement:	Double row, opposing	at 90°: 1.91 cd/klm
Pole Distance:	20.000 m	Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.
Mounting Height (1):	6.000 m	
Height:	6.417 m	No luminous intensities above 90°.
Overhang (2):	-0.650 m	Arrangement complies with luminous intensity class G3.
Boom Angle (3):	0.0 °	
Boom Length (4):	0.500 m	Arrangement complies with glare index class D.6.

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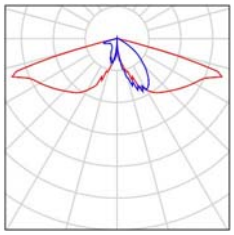
Road 9m (شارع المعارض - وسط البلد) / Luminaire parts list

PHILIPS BDP791 FG 40xGRN52/740 OFR4
Article No.:
Luminous flux (Luminaire): 4108 lm
Luminous flux (Lamps): 5200 lm
Luminaire Wattage: 43.8 W
Luminaire classification according to CIE: 100
CIE flux code: 36 71 96 100 79
Fitting: 40 x GRN52/740/- (Correction Factor 1.000).



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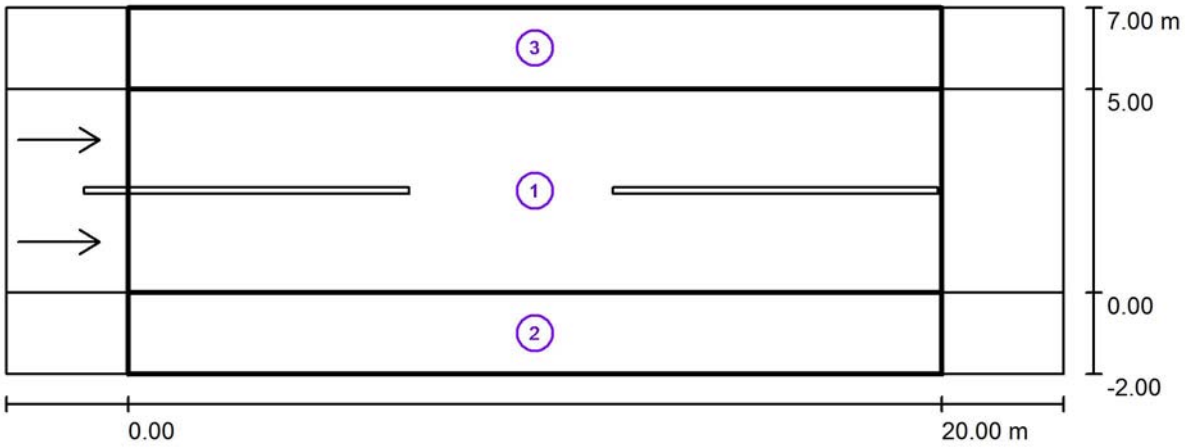
Road 9m (شارع المعارض - وسط البلد) / Photometric Results



Light loss factor: 0.80

Scale 1:186

Calculation Field List

1 Valuation Field Roadway 1
Length: 20.000 m, Width: 5.000 m
Grid: 10 x 6 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME3a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	Ul	TI [%]	SR
Calculated values:	1.96	0.78	0.76	12	0.79
Required values according to class:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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Road 9m (شارع المعارض - وسط البلد) / Photometric Results

Calculation Field List

2 Valuation Field Sidewalk 1
Length: 20.000 m, Width: 2.000 m
Grid: 10 x 3 Points
Accompanying Street Elements: Sidewalk 1.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	23.00	0.74
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

3 Valuation Field Sidewalk 2
Length: 20.000 m, Width: 2.000 m
Grid: 10 x 3 Points
Accompanying Street Elements: Sidewalk 2.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	23.00	0.74
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

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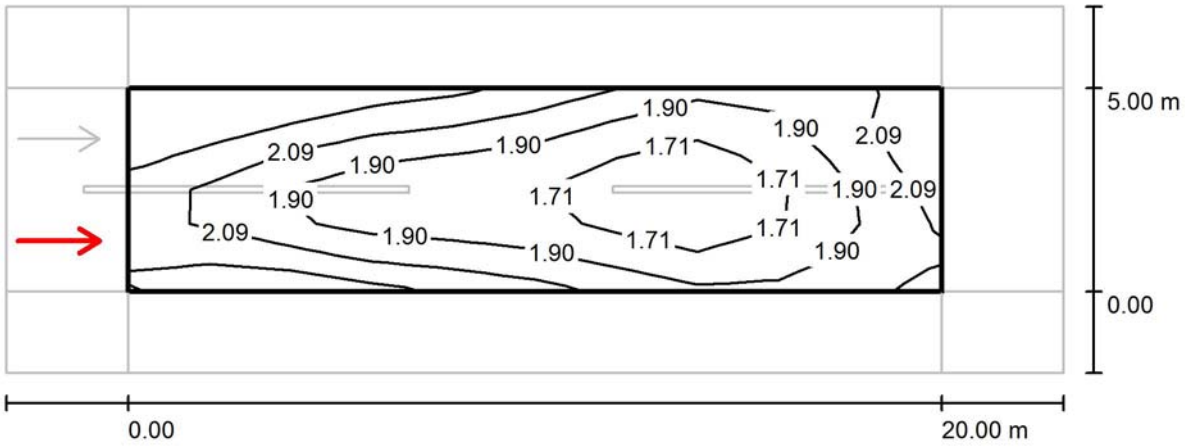
Road 9m (شارع المعارض - وسط البلد) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 186

Grid: 10 x 6 Points
Observer Position: (-60.000 m, 1.250 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	1.96	0.78	0.76	12
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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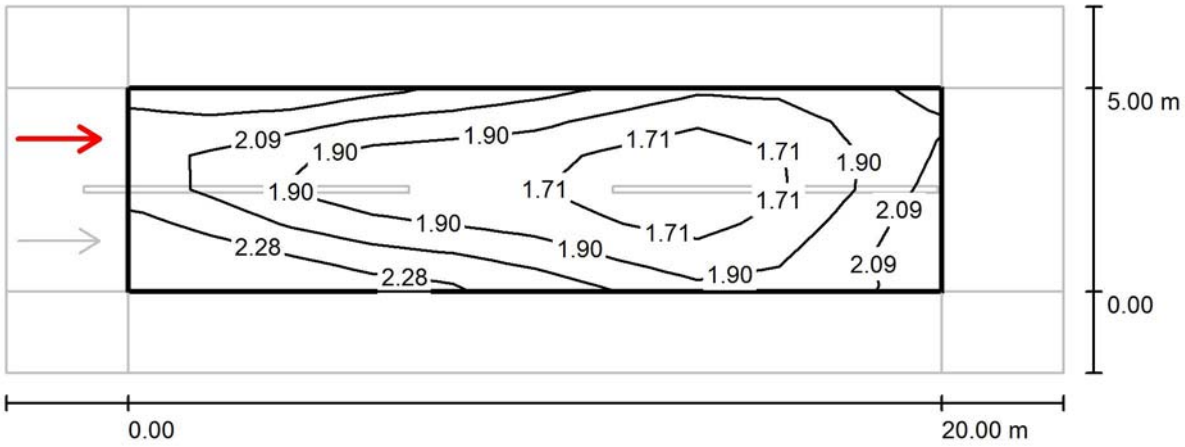
Road 9m (شارع المعارض - وسط البلد) / Valuation Field Roadway 1 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 186

Grid: 10 x 6 Points
Observer Position: (-60.000 m, 3.750 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	1.96	0.78	0.76	12
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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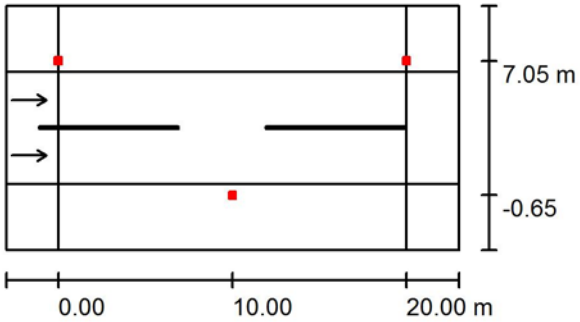
Road 14m (الشارع الرئيسي - وسط البلد) / Planning data

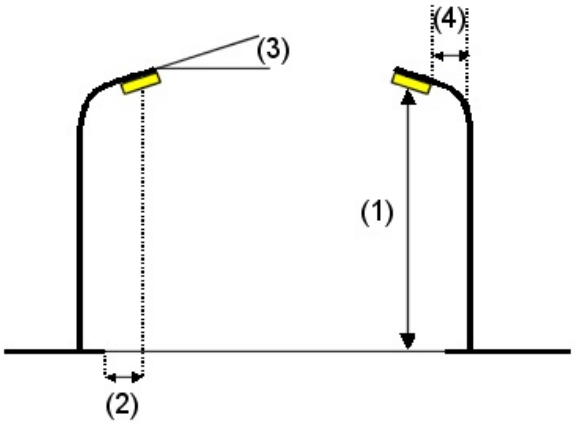
Street Profile

Sidewalk 2 (Width: 3.800 m)
Roadway 1 (Width: 6.400 m, Number of lanes: 2, tarmac: R3, q0: 0.070)
Sidewalk 1 (Width: 3.800 m)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	PHILIPS BDP791 FG 40xGRN52/740 OFR4		
Luminous flux (Luminaire):	4108 lm	Maximum luminous intensities	
Luminous flux (Lamps):	5200 lm	at 70°:	525 cd/klm
Luminaire Wattage:	43.8 W	at 80°:	24 cd/klm
Arrangement:	Double row, with offset	at 90°:	1.91 cd/klm
Pole Distance:	20.000 m	Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.	
Mounting Height (1):	6.000 m		
Height:	6.417 m	No luminous intensities above 90°.	
Overhang (2):	-0.650 m	Arrangement complies with luminous intensity class G3.	
Boom Angle (3):	0.0 °		
Boom Length (4):	0.500 m	Arrangement complies with glare index class D.6.	

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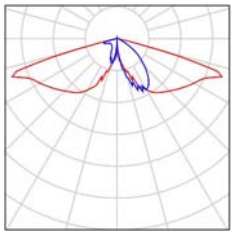
Road 14m (الشارع الرئيسي - وسط البلد) / Luminaire parts list

PHILIPS BDP791 FG 40xGRN52/740 OFR4
Article No.:
Luminous flux (Luminaire): 4108 lm
Luminous flux (Lamps): 5200 lm
Luminaire Wattage: 43.8 W
Luminaire classification according to CIE: 100
CIE flux code: 36 71 96 100 79
Fitting: 40 x GRN52/740/- (Correction Factor 1.000).



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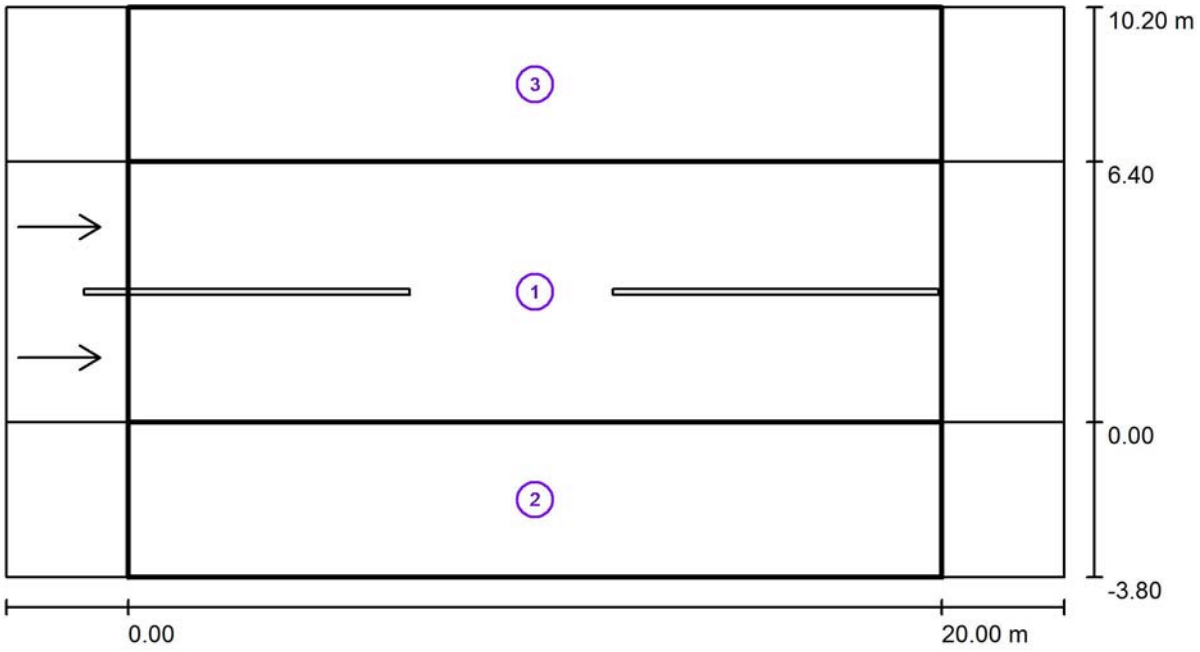
Road 14m (الشارع الرئيسي - وسط البلد) / Photometric Results



Light loss factor: 0.80

Scale 1:186

Calculation Field List

1 Valuation Field Roadway 1
Length: 20.000 m, Width: 6.400 m
Grid: 10 x 6 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME3a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	Ul	TI [%]	SR
Calculated values:	1.72	0.81	0.87	8	0.73
Required values according to class:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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Road 14m (الشارع الرئيسي - وسط البلد) / Photometric Results

Calculation Field List

2 Valuation Field Sidewalk 1
Length: 20.000 m, Width: 3.800 m
Grid: 10 x 3 Points
Accompanying Street Elements: Sidewalk 1.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	17.18	0.60
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

3 Valuation Field Sidewalk 2
Length: 20.000 m, Width: 3.800 m
Grid: 10 x 3 Points
Accompanying Street Elements: Sidewalk 2.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	17.18	0.60
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

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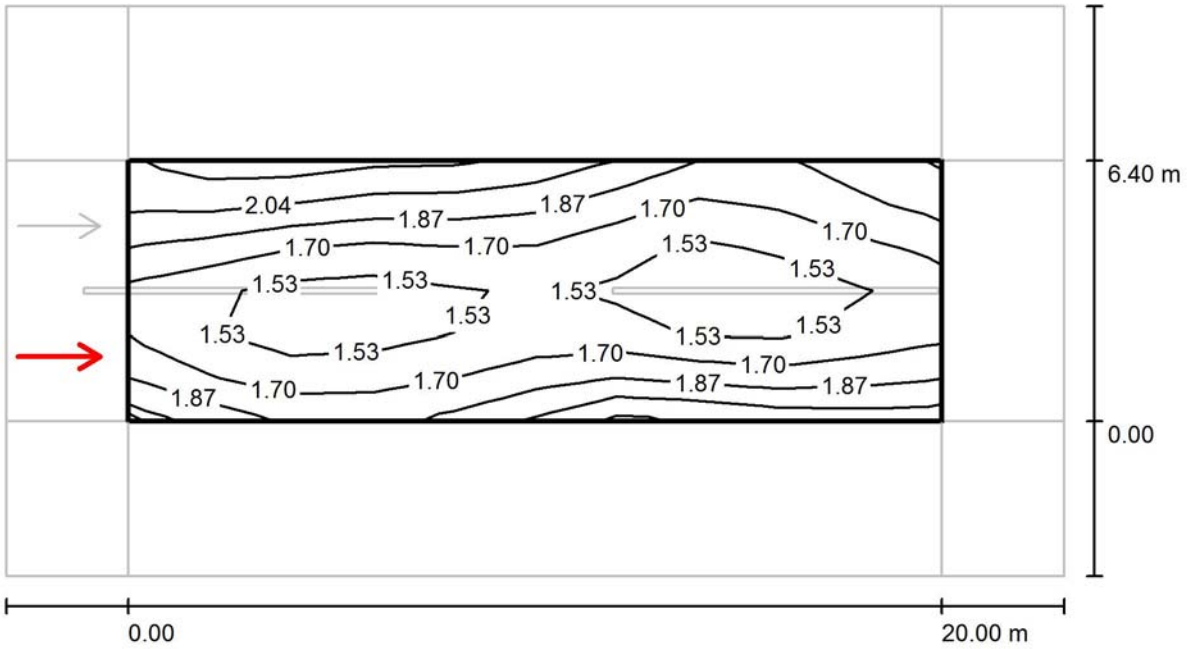
Road 14m (الشارع الرئيسي - وسط البلد) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 186

Grid: 10 x 6 Points
Observer Position: (-60.000 m, 1.600 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	1.72	0.81	0.87	8
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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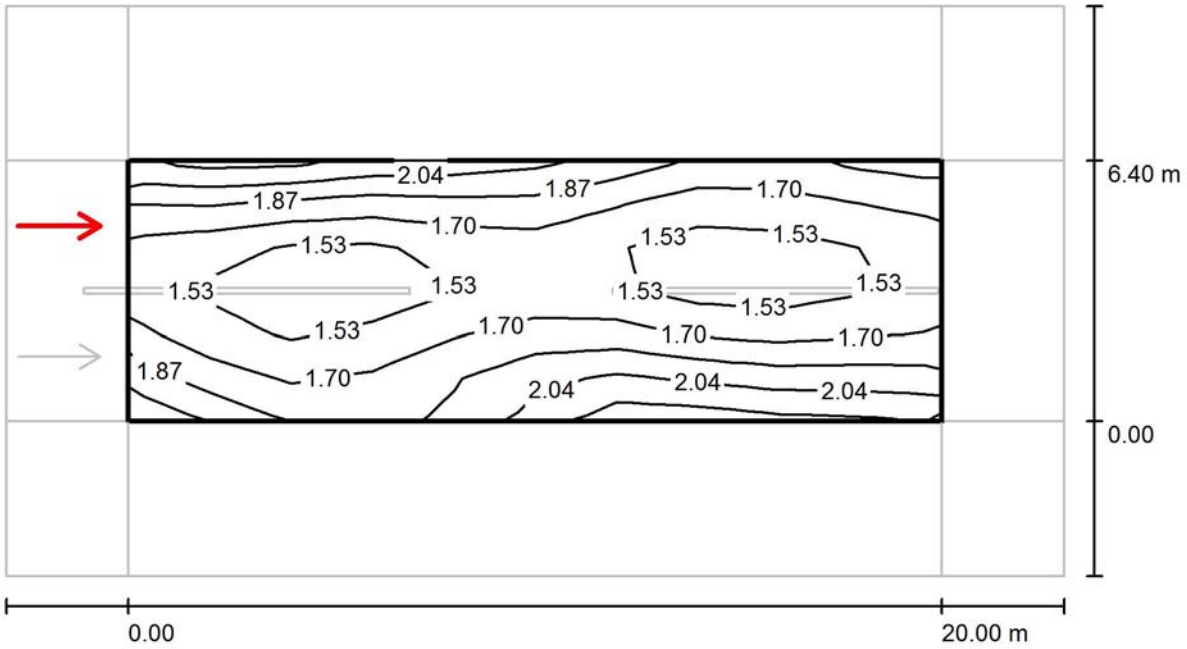
Road 14m (الشارع الرئيسي - وسط البلد) / Valuation Field Roadway 1 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 186

Grid: 10 x 6 Points
Observer Position: (-60.000 m, 4.800 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	Tl [%]
Calculated values:	1.72	0.81	0.87	8
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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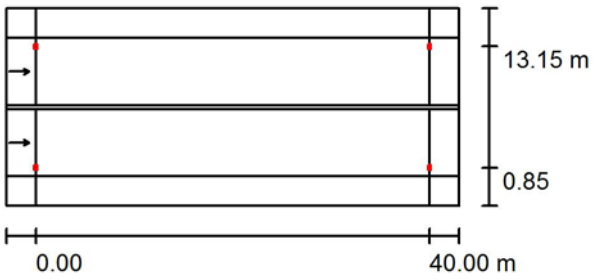
Road 20m (شارع الاذاعة - بدون جزيرة) / Planning data

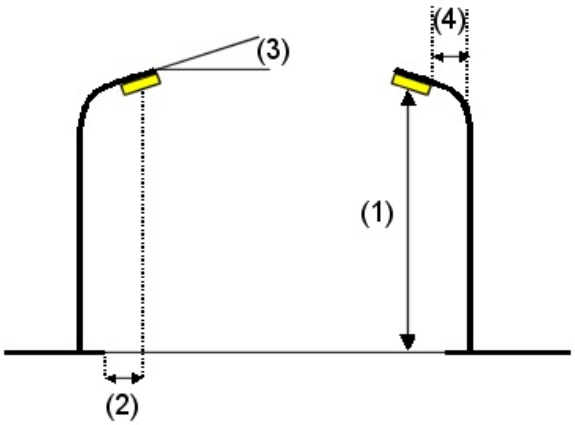
Street Profile

Sidewalk 1	(Width: 3.000 m)
Roadway 2	(Width: 6.800 m, Number of lanes: 1, tarmac: R3, q0: 0.070)
Median 1	(Width: 0.400 m, Height: 0.000 m)
Roadway 1	(Width: 6.800 m, Number of lanes: 1, tarmac: R3, q0: 0.070)
Sidewalk 2	(Width: 3.000 m)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	PHILIPS BRP371 40LED DWE
Luminous flux (Luminaire):	8807 lm
Luminous flux (Lamps):	10102 lm
Luminaire Wattage:	89.0 W
Arrangement:	Double row, opposing
Pole Distance:	40.000 m
Mounting Height (1):	10.000 m
Height:	9.865 m
Overhang (2):	0.862 m
Boom Angle (3):	5.0 °
Boom Length (4):	1.500 m

Maximum luminous intensities

at 70°:	594 cd/klm
at 80°:	319 cd/klm
at 90°:	1.59 cd/klm

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

No luminous intensities above 95°.

Arrangement complies with glare index class D.6.

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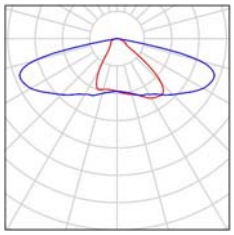
Road 20m (شارع الاذاعة - بدون جزيرة) / Luminaire parts list

PHILIPS BRP371 40LED DWE
Article No.:
Luminous flux (Luminaire): 8807 lm
Luminous flux (Lamps): 10102 lm
Luminaire Wattage: 89.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



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Road 20m (شارع الاذاعة - بدون جزيرة) / Photometric Results

Light loss factor: 0.80

Scale 1:329

Calculation Field List

1 Valuation Field Roadway 1
Length: 40.000 m, Width: 6.800 m
Grid: 14 x 3 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME3a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	Ul	TI [%]	SR
Calculated values:	1.25	0.87	0.84	11	0.83
Required values according to class:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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Road 20m (شارع الاذاعة - بدون جزيرة) / Photometric Results

Calculation Field List

2 Valuation Field Sidewalk 1
Length: 40.000 m, Width: 3.000 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 1.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	10.55	0.44
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

3 Valuation Field Sidewalk 2
Length: 40.000 m, Width: 3.000 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 2.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	10.55	0.44
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

4 Valuation Field Roadway 2
Length: 40.000 m, Width: 6.800 m
Grid: 14 x 3 Points
Accompanying Street Elements: Roadway 2.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME3a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	UI	TI [%]	SR
Calculated values:	1.25	0.87	0.84	11	0.83
Required values according to class:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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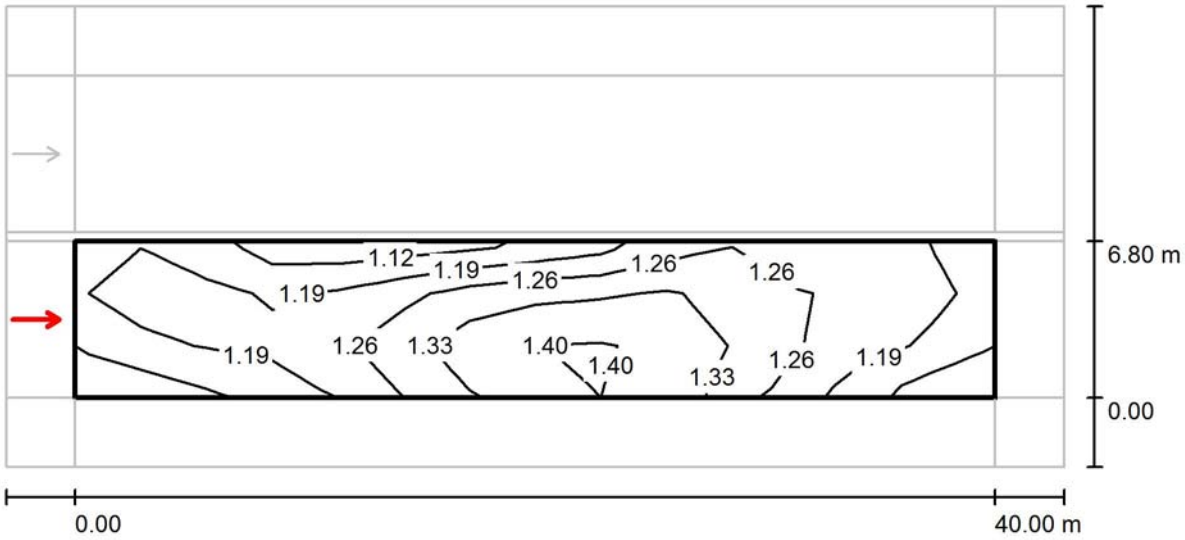
Road 20m (شارع الاذاعة - بدون جزيرة) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 3 Points
Observer Position: (-60.000 m, 3.400 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	1.25	0.87	0.84	11
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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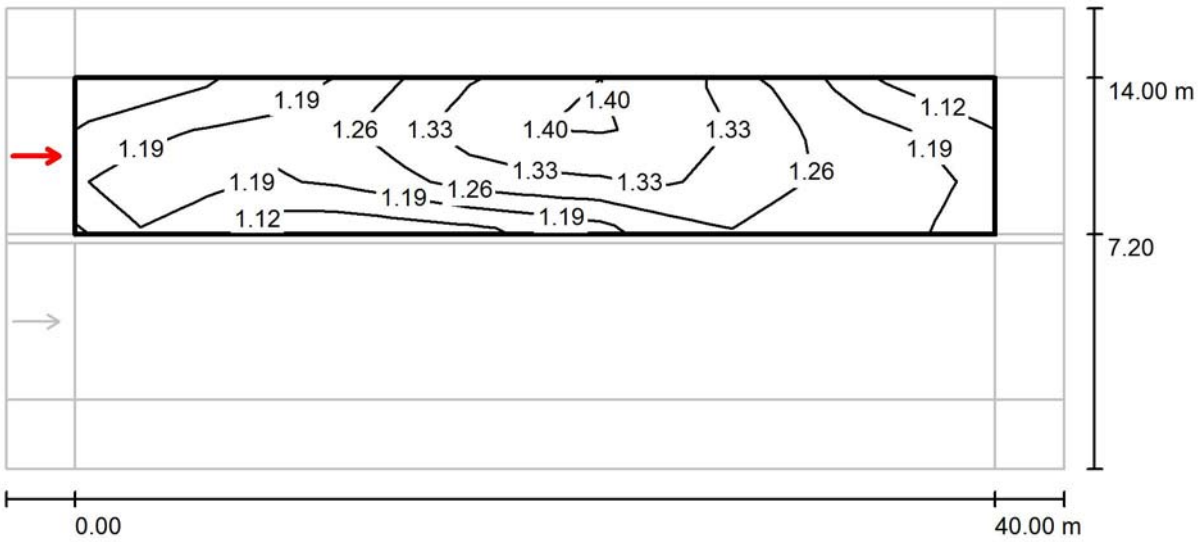
Road 20m (شارع الاذاعة - بدون جزيرة) / Valuation Field Roadway 2 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 3 Points
Observer Position: (-60.000 m, 10.600 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	1.25	0.87	0.84	11
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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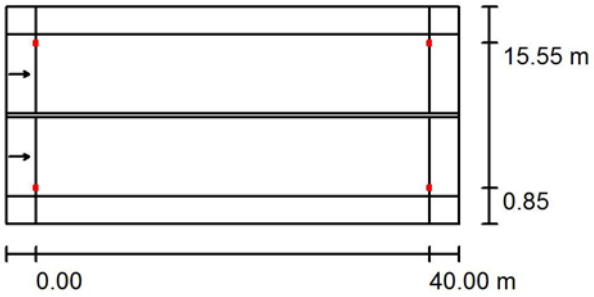
Road 22m (شارع جمال عبد الناصر - بدون جزيرة) / Planning data

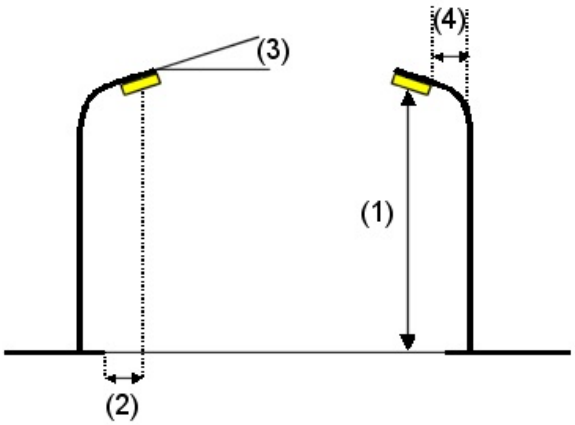
Street Profile

Sidewalk 1	(Width: 2.800 m)
Roadway 2	(Width: 8.000 m, Number of lanes: 1, tarmac: R3, q0: 0.070)
Median 1	(Width: 0.400 m, Height: 0.000 m)
Roadway 1	(Width: 8.000 m, Number of lanes: 1, tarmac: R3, q0: 0.070)
Sidewalk 2	(Width: 2.800 m)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	PHILIPS BRP371 40LED DWE
Luminous flux (Luminaire):	8807 lm
Luminous flux (Lamps):	10102 lm
Luminaire Wattage:	89.0 W
Arrangement:	Double row, opposing
Pole Distance:	40.000 m
Mounting Height (1):	10.000 m
Height:	9.865 m
Overhang (2):	0.862 m
Boom Angle (3):	5.0 °
Boom Length (4):	1.500 m

Maximum luminous intensities
at 70°: 594 cd/klm
at 80°: 319 cd/klm
at 90°: 1.59 cd/klm
Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.
No luminous intensities above 95°.
Arrangement complies with glare index class D.6.

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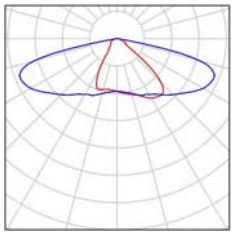
Road 22m (شارع جمال عبد الناصر - بدون جزيرة) / Luminaire parts list

PHILIPS BRP371 40LED DWE
Article No.:
Luminous flux (Luminaire): 8807 lm
Luminous flux (Lamps): 10102 lm
Luminaire Wattage: 89.0 W
Luminaire classification according to CIE: 100
CIE flux code: 38 72 96 100 87
Fitting: 1 x LUXEON T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



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Road 22m (شارع جمال عبد الناصر - بدون جزيرة) / Photometric Results

Light loss factor: 0.80

Scale 1:329

Calculation Field List

1 Valuation Field Roadway 1
Length: 40.000 m, Width: 8.000 m
Grid: 14 x 3 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME3a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	Ul	Tl [%]	SR
Calculated values:	1.12	0.90	0.84	11	0.82
Required values according to class:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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Road 22m (شارع جمال عبد الناصر - بدون جزيرة) / Photometric Results

Calculation Field List

2 Valuation Field Sidewalk 1
Length: 40.000 m, Width: 2.800 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 1.
Selected Lighting Class: CE5 (Not all lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	9.21	0.38
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✗

3 Valuation Field Sidewalk 2
Length: 40.000 m, Width: 2.800 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 2.
Selected Lighting Class: CE5 (Not all lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	9.21	0.38
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✗

4 Valuation Field Roadway 2
Length: 40.000 m, Width: 8.000 m
Grid: 14 x 3 Points
Accompanying Street Elements: Roadway 2.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME3a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	UI	TI [%]	SR
Calculated values:	1.12	0.90	0.84	11	0.82
Required values according to class:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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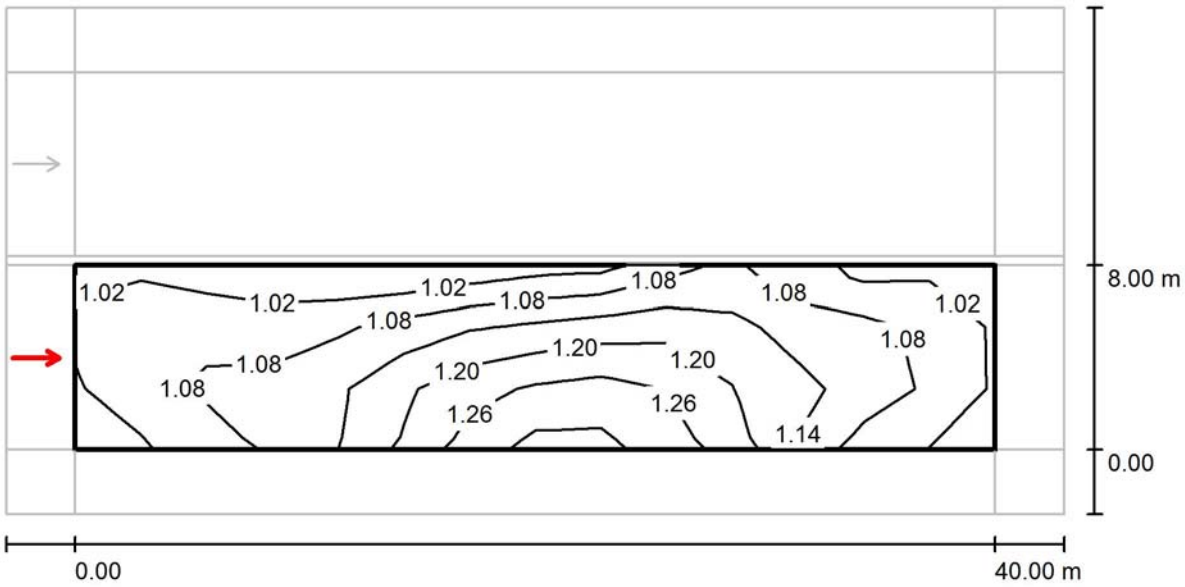
Road 22m (شارع جمال عبد الناصر - بدون جزيرة) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 3 Points
Observer Position: (-60.000 m, 4.000 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	1.12	0.90	0.84	11
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

30.03.2016

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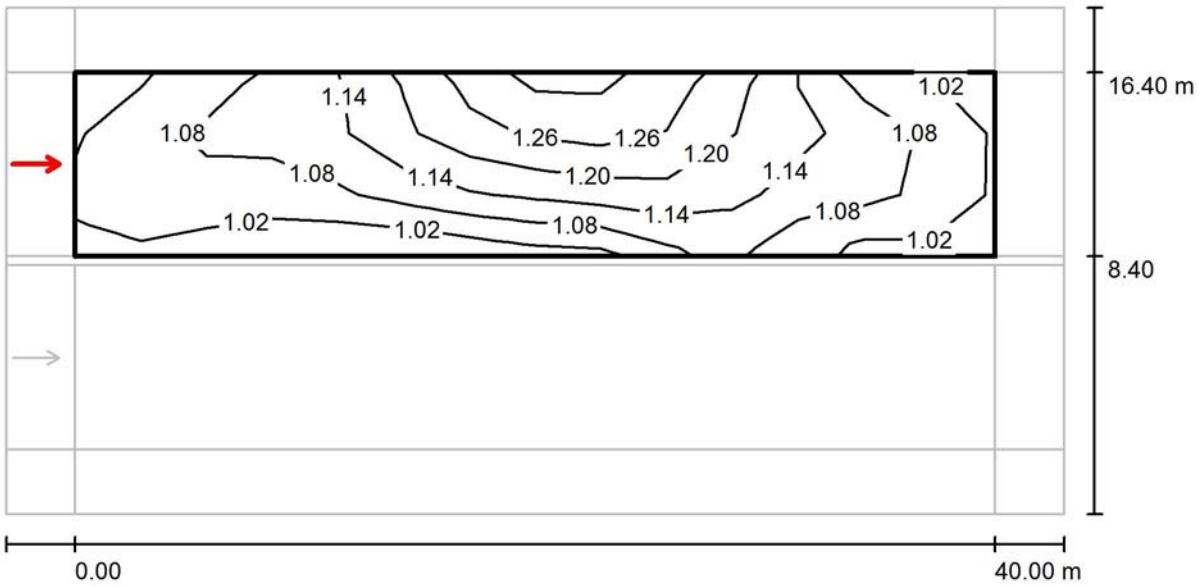
Road 22m (شارع جمال عبد الناصر - بدون جزيرة) / Valuation Field Roadway 2 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 3 Points
Observer Position: (-60.000 m, 12.400 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	1.12	0.90	0.84	11
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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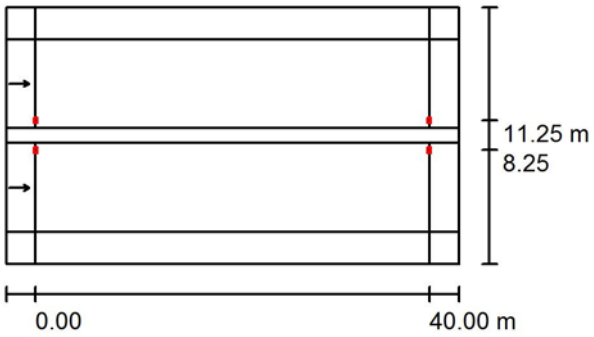
Road 26m (شارع القدس / جراند بارك) / Planning data

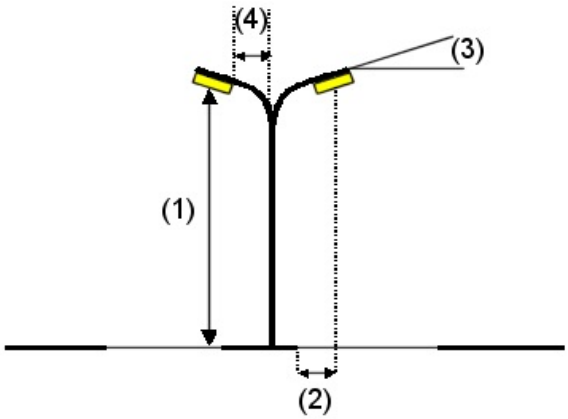
Street Profile

Sidewalk 1	(Width: 3.250 m)
Roadway 2	(Width: 9.000 m, Number of lanes: 1, tarmac: R3, q0: 0.070)
Median 1	(Width: 1.500 m, Height: 0.000 m)
Roadway 1	(Width: 9.000 m, Number of lanes: 1, tarmac: R3, q0: 0.070)
Sidewalk 2	(Width: 3.250 m)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	BRP372 4000K 56LEDs DME		
Luminous flux (Luminaire):	12270 lm	Maximum luminous intensities	
Luminous flux (Lamps):	12273 lm	at 70°:	668 cd/klm
Luminaire Wattage:	121.5 W	at 80°:	64 cd/klm
Arrangement:	on Median	at 90°:	4.30 cd/klm
Pole Distance:	40.000 m	Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.	
Mounting Height (1):	10.000 m		
Height:	9.865 m	No luminous intensities above 95°.	
Overhang (2):	0.812 m	Arrangement complies with luminous intensity class G3.	
Boom Angle (3):	5.0 °	Arrangement complies with glare index class D.6.	
Boom Length (4):	1.500 m		

30.03.2016

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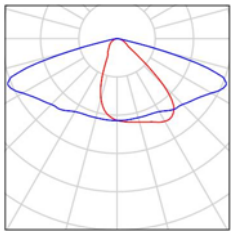
Road 26m (شارع القدس / جراند بارك) / Luminaire parts list

BRP372 4000K 56LEDs DME
Article No.:
Luminous flux (Luminaire): 12270 lm
Luminous flux (Lamps): 12273 lm
Luminaire Wattage: 121.5 W
Luminaire classification according to CIE: 100
CIE flux code: 44 78 97 100 100
Fitting: 1 x Luxeon T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



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Road 26m (شارع القدس / جراند بارك) / Photometric Results

Light loss factor: 0.80

Scale 1:329

Calculation Field List

1 Valuation Field Roadway 1
Length: 40.000 m, Width: 9.000 m
Grid: 14 x 3 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME3a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	Ul	TI [%]	SR
Calculated values:	1.20	0.58	0.80	11	0.87
Required values according to class:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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Road 26m (شارع القدس / جراند بارك) / Photometric Results

Calculation Field List

2 Valuation Field Sidewalk 1
Length: 40.000 m, Width: 3.250 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 1.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	10.83	0.71
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

3 Valuation Field Sidewalk 2
Length: 40.000 m, Width: 3.250 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 2.
Selected Lighting Class: CE5 (All lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	10.83	0.71
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✓

4 Valuation Field Roadway 2
Length: 40.000 m, Width: 9.000 m
Grid: 14 x 3 Points
Accompanying Street Elements: Roadway 2.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME3a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	UI	TI [%]	SR
Calculated values:	1.20	0.58	0.80	11	0.87
Required values according to class:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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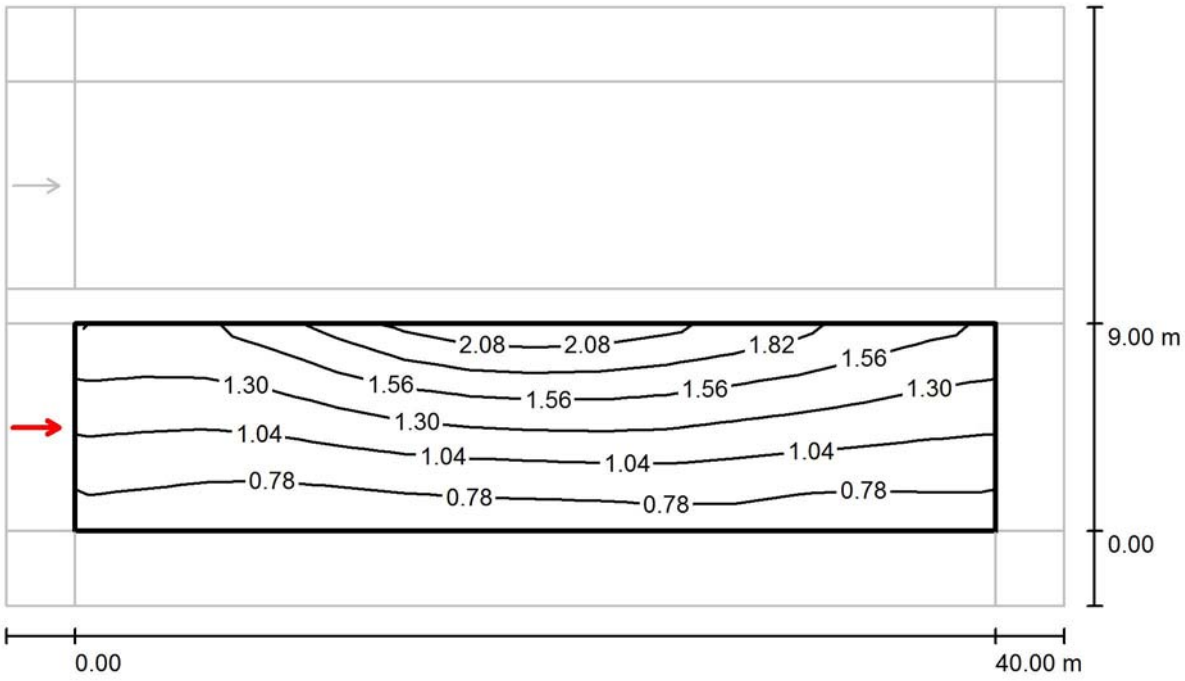
Road 26m (شارع القدس / جراند بارك) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 3 Points
Observer Position: (-60.000 m, 4.500 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	1.20	0.58	0.80	11
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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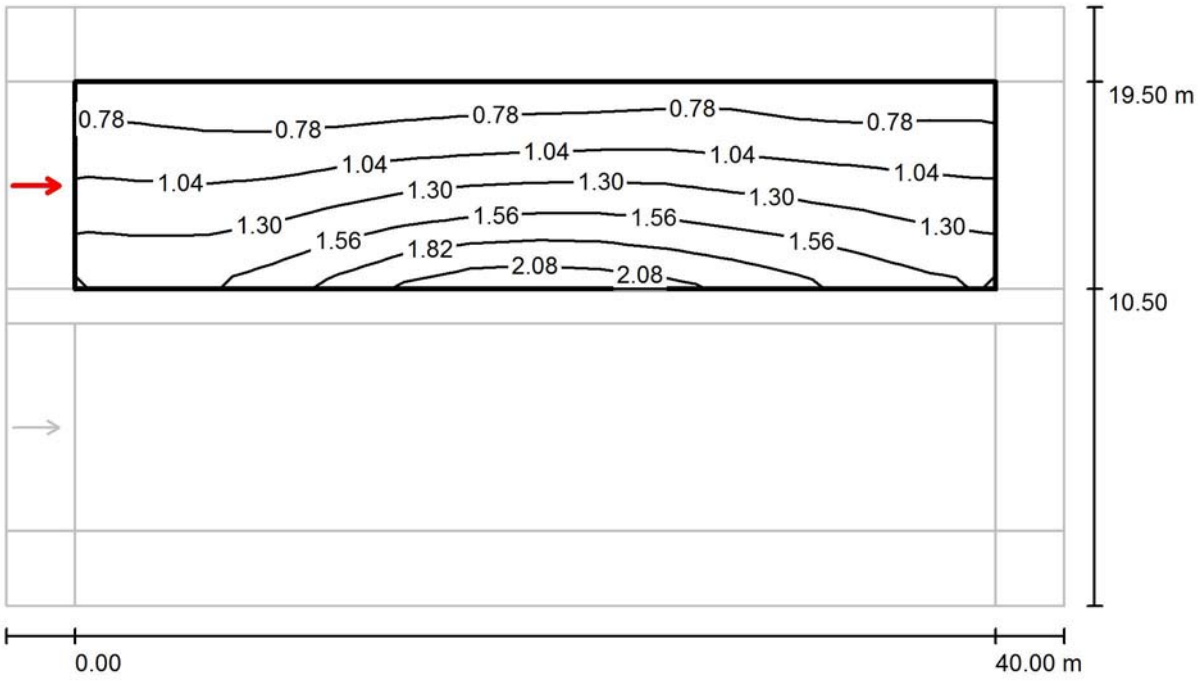
Road 26m (شارع القدس / جراند بارك) / Valuation Field Roadway 2 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 3 Points
Observer Position: (-60.000 m, 15.000 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	Ul	TI [%]
Calculated values:	1.20	0.58	0.80	11
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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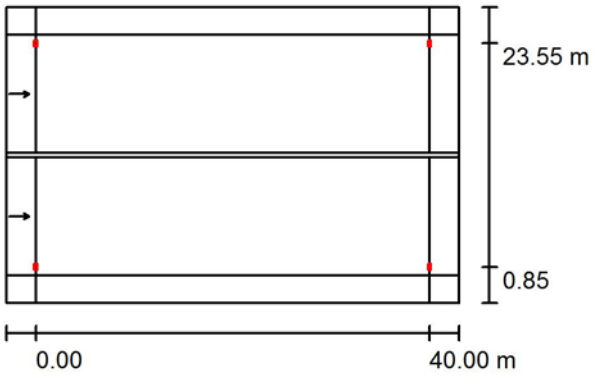
Road 30m (شارع عبد الحميد شومان) / Planning data

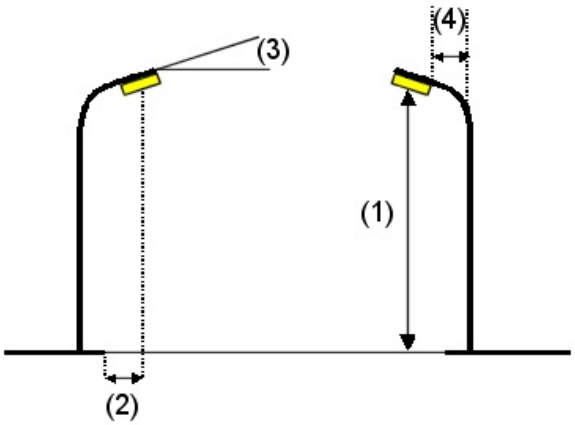
Street Profile

Sidewalk 1	(Width: 2.800 m)
Roadway 2	(Width: 12.000 m, Number of lanes: 1, tarmac: R3, q0: 0.070)
Median 1	(Width: 0.400 m, Height: 0.000 m)
Roadway 1	(Width: 12.000 m, Number of lanes: 1, tarmac: R3, q0: 0.070)
Sidewalk 2	(Width: 2.800 m)

Light loss factor: 0.80

Luminaire Arrangements





Luminaire:	BRP372 4000K 56LEDs DME	
Luminous flux (Luminaire):	12270 lm	Maximum luminous intensities
Luminous flux (Lamps):	12273 lm	at 70°: 668 cd/klm
Luminaire Wattage:	121.5 W	at 80°: 64 cd/klm
Arrangement:	Double row, opposing	at 90°: 4.30 cd/klm
Pole Distance:	40.000 m	Any direction forming the specified angle from the downward vertical, with
Mounting Height (1):	10.000 m	the luminaire installed for use.
Height:	9.865 m	No luminous intensities above 95°.
Overhang (2):	0.862 m	Arrangement complies with luminous intensity class
Boom Angle (3):	5.0 °	G3.
Boom Length (4):	1.500 m	Arrangement complies with glare index class D.6.

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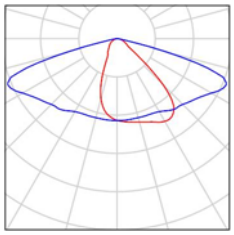
Road 30m (شارع عبد الحميد شومان) / Luminaire parts list

BRP372 4000K 56LEDs DME
Article No.:
Luminous flux (Luminaire): 12270 lm
Luminous flux (Lamps): 12273 lm
Luminaire Wattage: 121.5 W
Luminaire classification according to CIE: 100
CIE flux code: 44 78 97 100 100
Fitting: 1 x Luxeon T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



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Road 30m (شارع عبد الحميد شومان) / Photometric Results

Light loss factor: 0.80

Scale 1:329

Calculation Field List

1 Valuation Field Roadway 1
Length: 40.000 m, Width: 12.000 m
Grid: 14 x 3 Points
Accompanying Street Elements: Roadway 1.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME3a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	Ul	TI [%]	SR
Calculated values:	1.05	0.62	0.82	11	0.69
Required values according to class:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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Road 30m (شارع عبد الحميد شومان) / Photometric Results

Calculation Field List

2 Valuation Field Sidewalk 1
Length: 40.000 m, Width: 2.800 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 1.
Selected Lighting Class: CE5 (Not all lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	9.88	0.32
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✗

3 Valuation Field Sidewalk 2
Length: 40.000 m, Width: 2.800 m
Grid: 14 x 3 Points
Accompanying Street Elements: Sidewalk 2.
Selected Lighting Class: CE5 (Not all lighting performance requirements are met.)

	E_{av} [lx]	U0
Calculated values:	9.88	0.32
Required values according to class:	≥ 7.50	≥ 0.40
Fulfilled/Not fulfilled:	✓	✗

4 Valuation Field Roadway 2
Length: 40.000 m, Width: 12.000 m
Grid: 14 x 3 Points
Accompanying Street Elements: Roadway 2.
tarmac: R3, q0: 0.070
Selected Lighting Class: ME3a (All lighting performance requirements are met.)

	L_{av} [cd/m²]	U0	UI	TI [%]	SR
Calculated values:	1.05	0.62	0.82	11	0.69
Required values according to class:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15	≥ 0.50
Fulfilled/Not fulfilled:	✓	✓	✓	✓	✓

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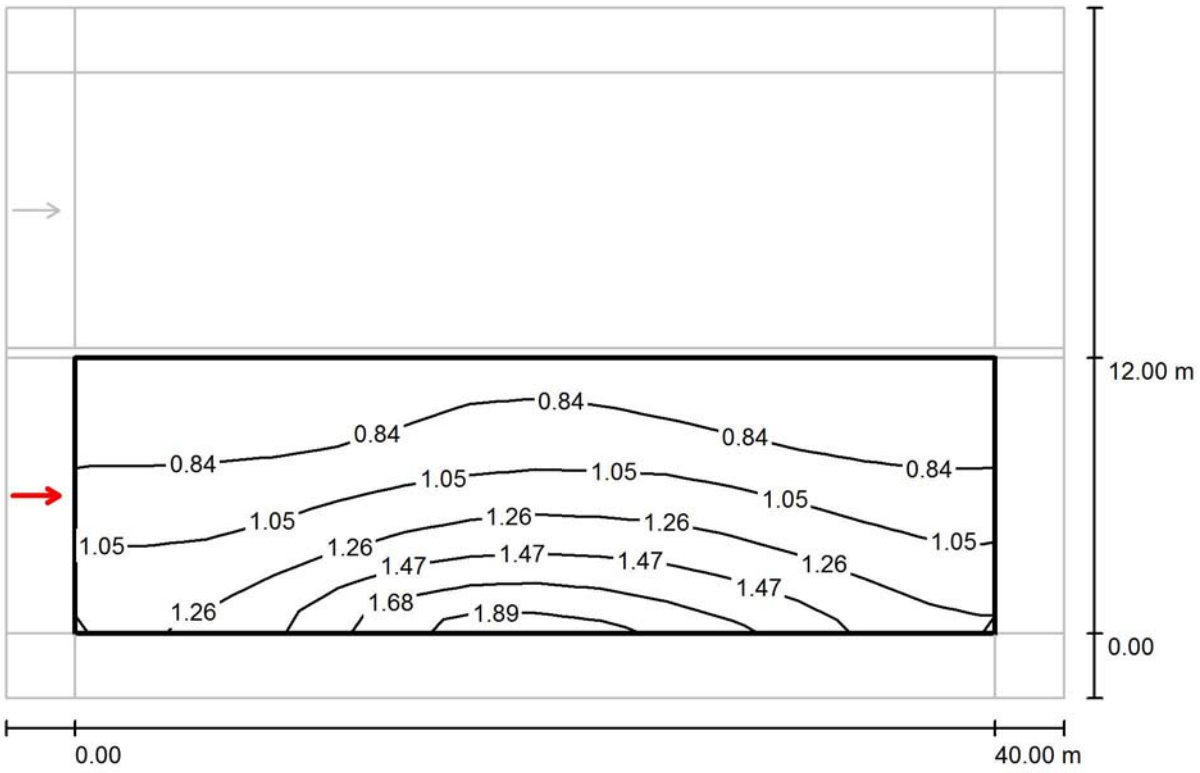
Road 30m (شارع عبد الحميد شومان) / Valuation Field Roadway 1 / Observer 1 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 3 Points
Observer Position: (-60.000 m, 6.000 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	UI	TI [%]
Calculated values:	1.05	0.62	0.82	11
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓

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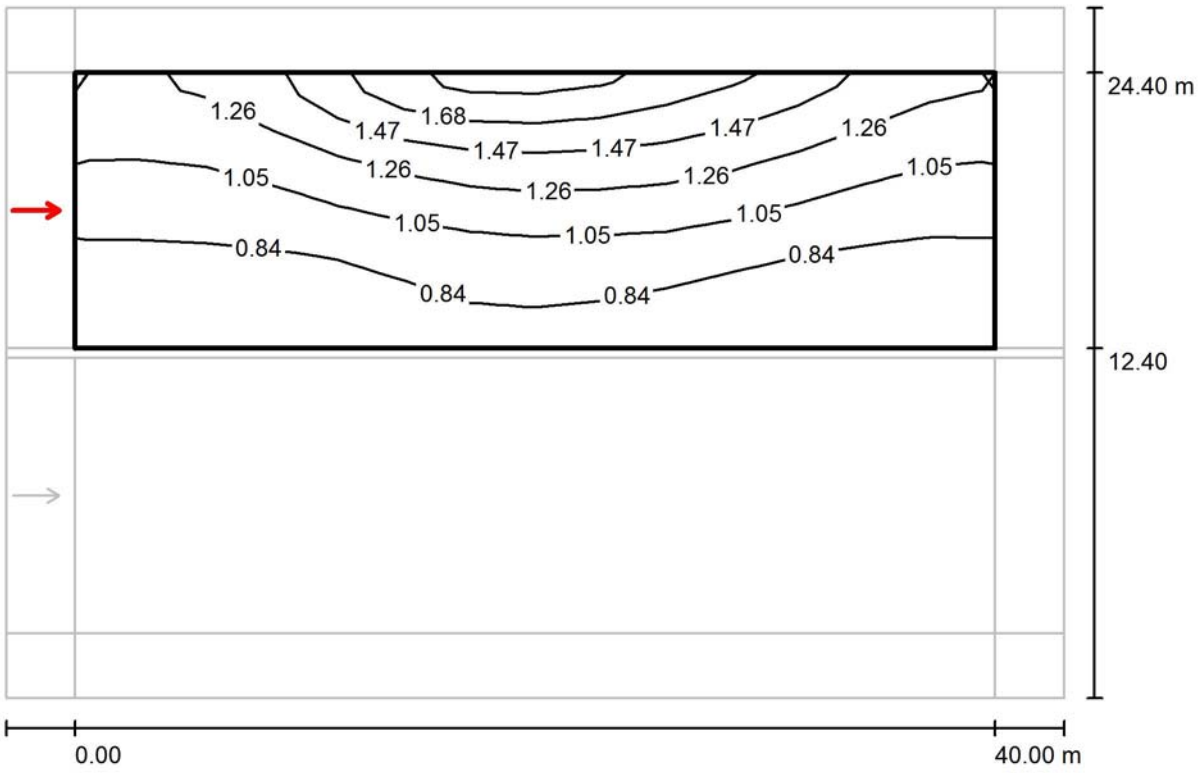
Road 30m (شارع عبد الحميد شومان) / Valuation Field Roadway 2 / Observer 2 / Isolines (L)



Values in Candela/m², Scale 1 : 329

Grid: 14 x 3 Points
Observer Position: (-60.000 m, 18.400 m, 1.500 m)
tarmac: R3, q0: 0.070

	L_{av} [cd/m²]	U0	UI	TI [%]
Calculated values:	1.05	0.62	0.82	11
Required values according to class ME3a:	≥ 1.00	≥ 0.40	≥ 0.70	≤ 15
Fulfilled/Not fulfilled:	✓	✓	✓	✓