

Millers Lane

Installation : Public Park and Urban Realm

Project number : E25103

Customer : Moloney Fox Consulting Engineers

Processed by : MDC

Date : 16.09.2025

Project description:

The following values are based on precise calculations performed on calibrated lamps and luminaires, and their configurations, whereby gradual, unavoidable deviations can occur in practice. All guarantee claims are excluded for the specified data.

This exclusion of liability applies irrespective of the legal grounds for both damages and consequential damages suffered by users and third parties.

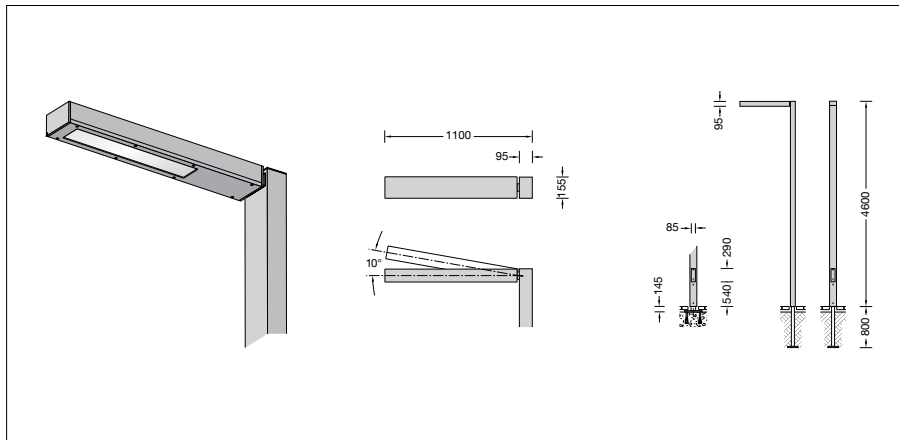
BEGA**88 977**

Light building element



Project · Reference number

Date



Product data sheet

Application

Light building element with flat beam light distribution.

Dark Sky

The light of this luminaire is directed evenly and highly efficiently onto the surface to be illuminated. No light is emitted into the upper half-space of the luminaire.

Inrush current

Inrush current: 5 A / 100 μ s

Maximum number of luminaires of this type per miniature circuit breaker:

B 10A: 56 luminaires

B 16A: 90 luminaires

C 10A: 56 luminaires

C 16A: 90 luminaires

Lamp

Module connected wattage 18.8 W

Luminaire connected wattage 21.5 W

Rated temperature $t_a = 25^\circ\text{C}$

Ambient temperature $t_{a\text{ max}} = 60^\circ\text{C}$

88 977 K4

Module designation 4x LED-0147/840

Colour temperature 4000 K

Colour rendering index CRI > 80

Module luminous flux 4040 lm

Luminaire luminous flux 2694 lm

Luminaire luminous efficiency 125,3 lm/W

88 977 K3

Module designation 4x LED-0147/830

Colour temperature 3000 K

Colour rendering index CRI > 80

Module luminous flux 3920 lm

Luminaire luminous flux 2614 lm

Luminaire luminous efficiency 121,6 lm/W

Product description

The luminaire consists of aluminium profiles, cast aluminium and stainless steel
BEGA Unidure® coating technology
Safety glass with optical structure
Silicone gasket

Reflector made of pure anodised aluminium
Attack angle adjustable 0° or 10°

Fixing of the light building element with anchorage unit **71 140** or screw-on base

70 833 for bolting onto a foundation (see accessories)

With inserted door made of die cast aluminium
Square door latch (wrench size 8 mm)

Connection box 70 629

for through-wiring – for 2 cables up to

5×10^3 with two fuses Neozed D 01 · 6 A

BEGA Ultimate Driver®

LED power supply unit

220-240 V $\sim$ 0/50-60 Hz

DC 176-264 V

DALI-controllable

Number of DALI addresses: 1

Basic insulation is provided between the mains and control cables

BEGA Thermal Control®

Temporary thermal regulation to protect temperature-sensitive components without switching off the luminaire

Safety class I

Protection class IP 65

Dust-tight and protection against water jets

Impact strength IK07

Protection against mechanical

impacts < 2 joule

– Safety mark

CE – Conformity mark

Wind catching area: 0.89 m²

Weight: 38.0 kg

This product contains light sources of energy efficiency class(es) C

Service life · Ambient temperature

Rated temperature $t_a = 25^\circ\text{C}$

LED psu: > 50,000 h

LED module: > 200,000 h (L 80 B 50)

100,000 h (L 90 B 50)

Ambient temperature max. $t_a = 60^\circ\text{C}$ (100 %)

LED psu: 50,000 h

LED module: 149,000 h (L 80 B 50)

Lighting technology

Luminaire data for the DIALux lighting design program for outdoor lighting, street lighting and indoor lighting, as well as luminaire data in EULUMDAT and IES format are available on the BEGA website at www.bega.com.

Ratio of luminous flux

Luminous flux upper half-space 0 %

Luminous flux lower half-space 100 %

BUG rating according to IES TM-15-07:

1 – 0* – 1

CEN Flux Code according to EN 13032-2:

41 – 79 – 97 – 100 – 100

* The measured value above 90° including stray light (reflection on the luminaire housing) is U1. However, the luminaire does not emit direct light upwards - due to the upper luminous flux component (less than 0.5%), the value U0 is assigned. Further information on request.

Article No. 88 977

LED colour temperature optionally 4000 K or 3000 K

4000 K – Article number + **K4**

3000 K – Article number + **K3**

Colour graphite or silver

graphite – article number

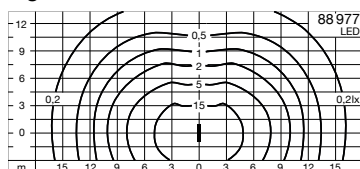
silver – article number + **A**

Accessories

71 140 Anchorage unit

70 833 Screw-on base

A separate instructions for use can be provided upon request.

Light distribution

BEGA**84 690**

Bollard head



Project · Reference number

Date

Product data sheet

Application

Bollard head with shielded light with four-sided light exit.
For usage in the modular system bollard range.

Product description

Luminaire made of cast aluminium,
aluminium and stainless steel
BEGA Unidure® coating technology
Borosilicate glass
Suitable for bollard tube 160 x 160 mm
Silicone gasket
Connecting cable X05BQ-F 5 G 1 mm²
Cable length 1,2 m
BEGA Ultimate Driver®
Complies with flicker requirements in
accordance with IEEE 1789,
DIN IEC/TR 63158, DIN IEC/TR 61547-1
LED power supply unit
220-240 V ~ 0/50-60 Hz
DC 176-276 V
DALI-controllable
Number of DALI addresses: 1
Basic insulation is provided between the mains
and control cables
BEGA Thermal Control®
Temporary thermal regulation to protect
temperature-sensitive components without
switching off the luminaire
Safety class I
Protection class IP 65
Dust-tight and protection against water jets
Impact strength IK10
Protection against mechanical
impacts < 20 joule
 – Safety mark
 – Conformity mark
Weight: 2.9 kg
This product contains light sources of energy
efficiency class(es) D

Lamp

Module connected wattage	16.4 W
Luminaire connected wattage	19 W
Rated temperature	$t_a = 25\text{ °C}$
Ambient temperature	$t_{a\text{ max}} = 50\text{ °C}$

84 690 K3

Module designation	4x LED-0697/830
Colour temperature	3000 K
Colour rendering index	CRI > 80
Module luminous flux	2760 lm
Luminaire luminous flux	449 lm
Luminaire luminous efficiency	23,6 lm/W

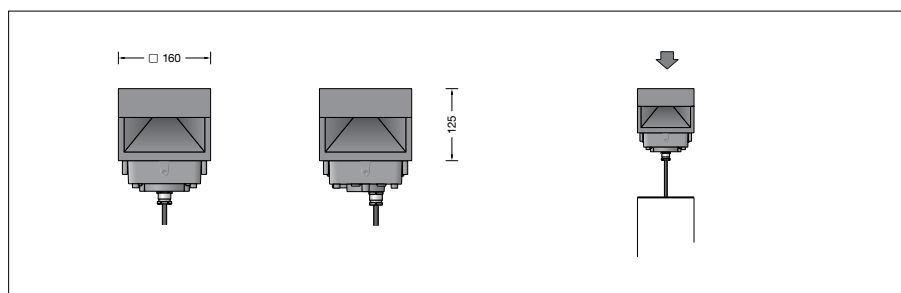
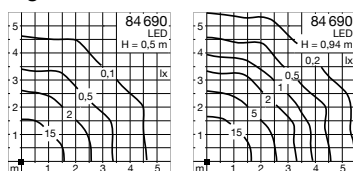
84 690 K4

Module designation	4x LED-0697/840
Colour temperature	4000 K
Colour rendering index	CRI > 80
Module luminous flux	2800 lm
Luminaire luminous flux	455 lm
Luminaire luminous efficiency	23,9 lm/W

Emergency lighting

In combination with bollard tubes with integrated emergency lighting battery the luminaire luminous flux during emergency operation reads 225 lm.

Light distribution



Service life · Ambient temperature

Rated temperature $t_a = 25\text{ °C}$	
LED psu:	> 50,000 h
LED module:	> 200,000 h (L 80 B 50)
	100,000 h (L 90 B 50)

Ambient temperature max. $t_a = 50\text{ °C}$ (100 %)	
LED psu:	50,000 h
LED module:	130,000 h (L 80 B 50)

Lighting technology

Luminaire data for the DIALux lighting design program for outdoor lighting, street lighting and indoor lighting, as well as luminaire data in EULUMDAT and IES format are available on the BEGA website at www.bega.com.

Inrush current

Inrush current: 1.2 A / 46 μ s
Maximum number of luminaires of this type per miniature circuit breaker:

B 10 A:	50 luminaires
B 16 A:	80 luminaires
C 10 A:	50 luminaires
C 16 A:	80 luminaires

Ratio of luminous flux

Luminous flux upper half-space	0,6 %
Luminous flux lower half-space	99,4 %

BUG rating according to IES TM-15-07:

1-1-1

CEN Flux Code according to EN 13032-2:

11-41-86-99-100-0-2-26-1

Article No. 84 690

LED colour temperature optionally 3000 K or 4000 K

3000 K – Article number + **K3**

4000 K – Article number + **K4**

Colour graphite or silver

graphite – article number

silver – article number + **A**

BEGA**84 002**

Bollard tube

Project · Reference number

Date

Product data sheet

Application

Bollard tube 160 x 160 mm
with mounting plate for bolting onto a
foundation or an anchorage unit.
For usage in the modular system bollard range.

Product description

Bollard tube made of aluminium
BEGA Unidure® coating technology
Mounting plate made of cast aluminium
Colour graphite or silver
Mounting plate for bolting onto a foundation or
to an anchorage unit
Mounting plate with two pitch circles:
ø 70 mm, 3 elongated holes 7 mm wide
ø 100 mm, 3 elongated holes 9 mm wide
Bollard tube can be aligned around 360°
on the mounting plate
Connection box 71 084
for through-wiring for 2 cables up to 7 x 6²
Terminal connection L1 · L2 · L3 · N · PE
2 connecting terminals for connecting DALI
control cables
Fuse terminal with micro fuse
6,3A slow ø 5 x 20 mm
Protection class IP 65
dust-tight and protected against water jets only
in combination with mounted bollard head or
closing head
Impact strength IK10
Protection against mechanical
impacts < 20 joule
CE – Conformity mark
Weight: 5.2 kg

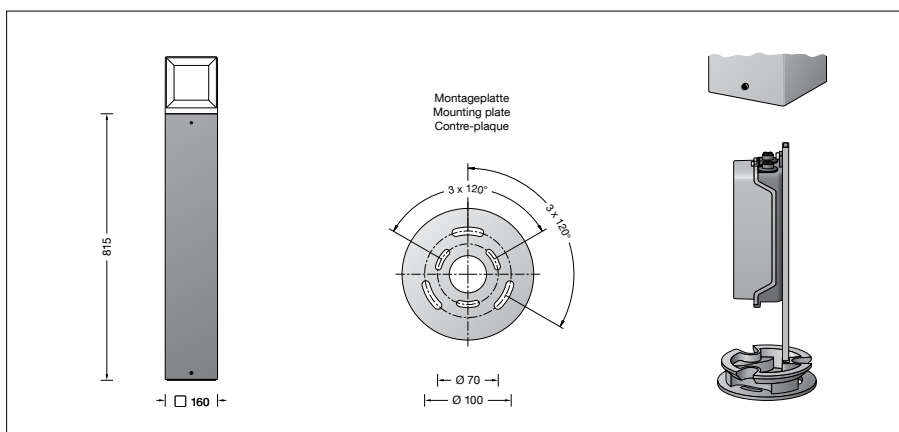
Accessories

70 895 Anchorage unit
Anchorage unit with mounting flange made
of galvanised steel. Total length 400 mm.
3 stainless steel fixing screws M8.
Pitch circle ø 100 mm.

See the separate instructions for use.

Article No. 84 002

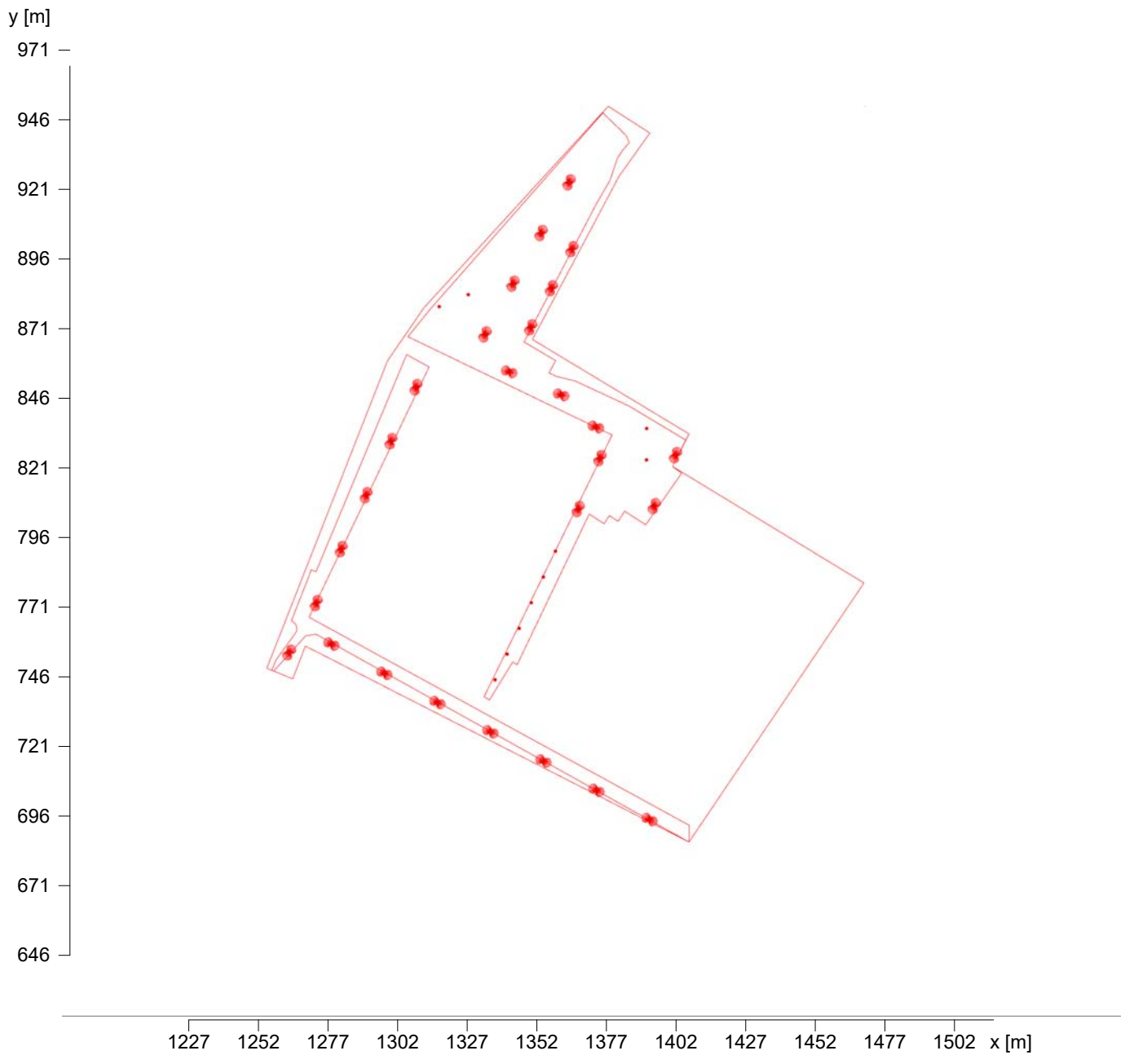
Colour graphite or silver
graphite – article number
silver – article number + **A**



1 Exterior 1

1.1 Description, Exterior 1

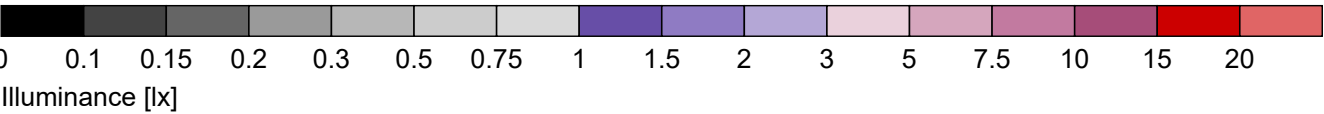
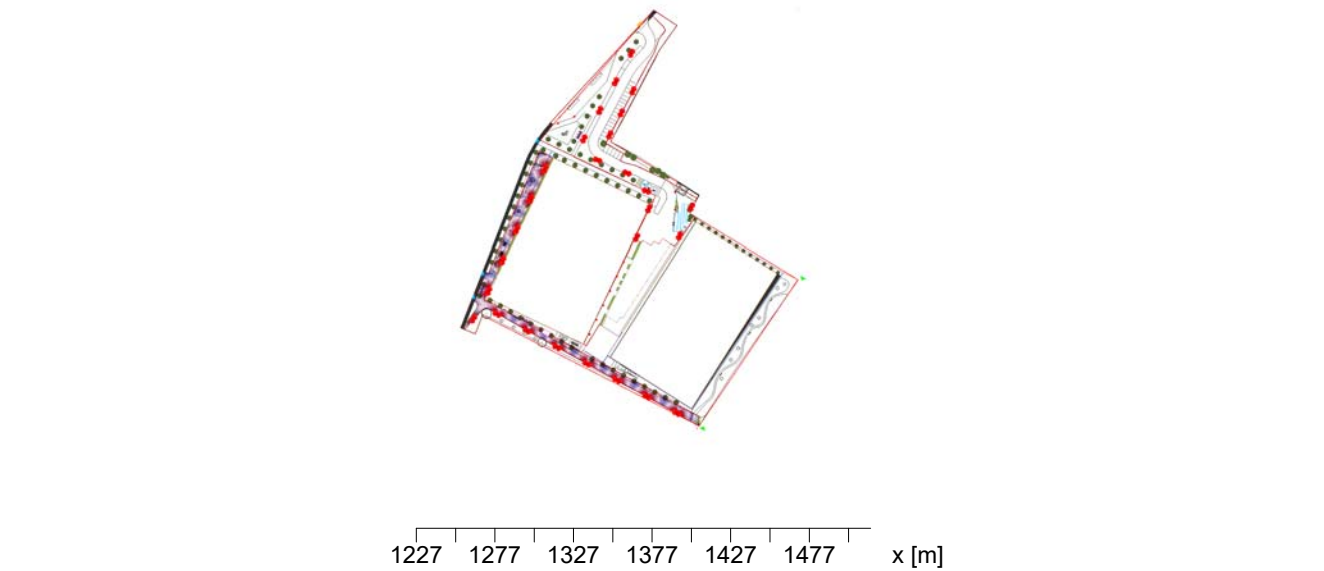
1.1.1 Floor plan



1 Exterior 1

1.2 Summary, Exterior 1

1.2.1 Result overview, Measuring area 1



General

Calculation algorithm used	Average indirect fraction
Height of evaluation surface	0.00 m
Maintenance factor	0.80
Total luminous flux	75058 lm
Total power	794 W
Total power per area (24721.29 m²)	0.03 W/m²

Illuminance

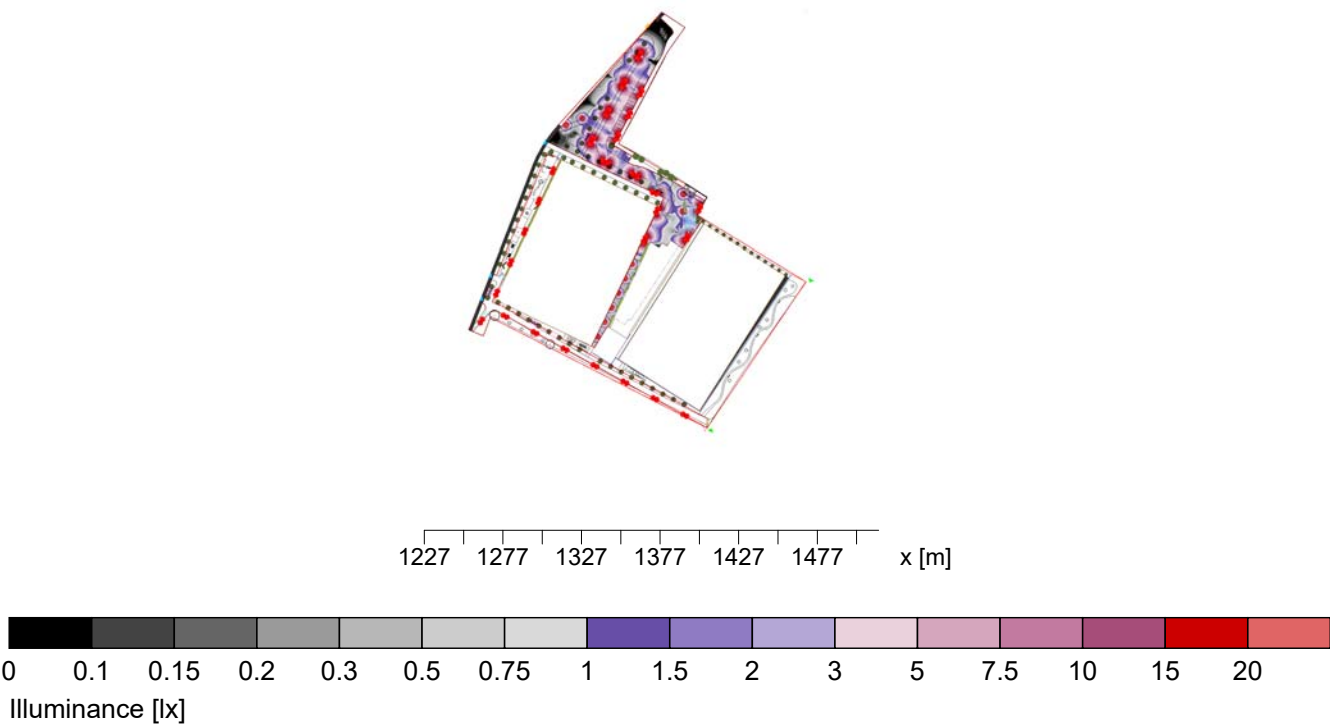
Average illuminance	$\bar{E}_m$	7.2 lx
Minimum illuminance	E_{min}	0 lx
Maximum illuminance	E_{max}	25.2 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	1:203 (0)
Diversity U_d	E_{min}/E_{max}	1:712 (0)

Type No.Make

		BEGA	
1	27 x	Order No.	:
		Luminaire name	: 88977K3
		Equipment	: 1 x LED 18,8W 22 W / 2614 lm
2	10 x	Order No.	:
		Luminaire name	: 84690K3
		Equipment	: 1 x LED 16,4W 20 W / 448 lm

1.2 Summary, Exterior 1

1.2.2 Result overview, Measuring area 2



General	
Calculation algorithm used	Average indirect fraction
Height of evaluation surface	0.00 m
Maintenance factor	0.80
Total luminous flux	75058 lm
Total power	794 W
Total power per area (24721.29 m²)	0.03 W/m²

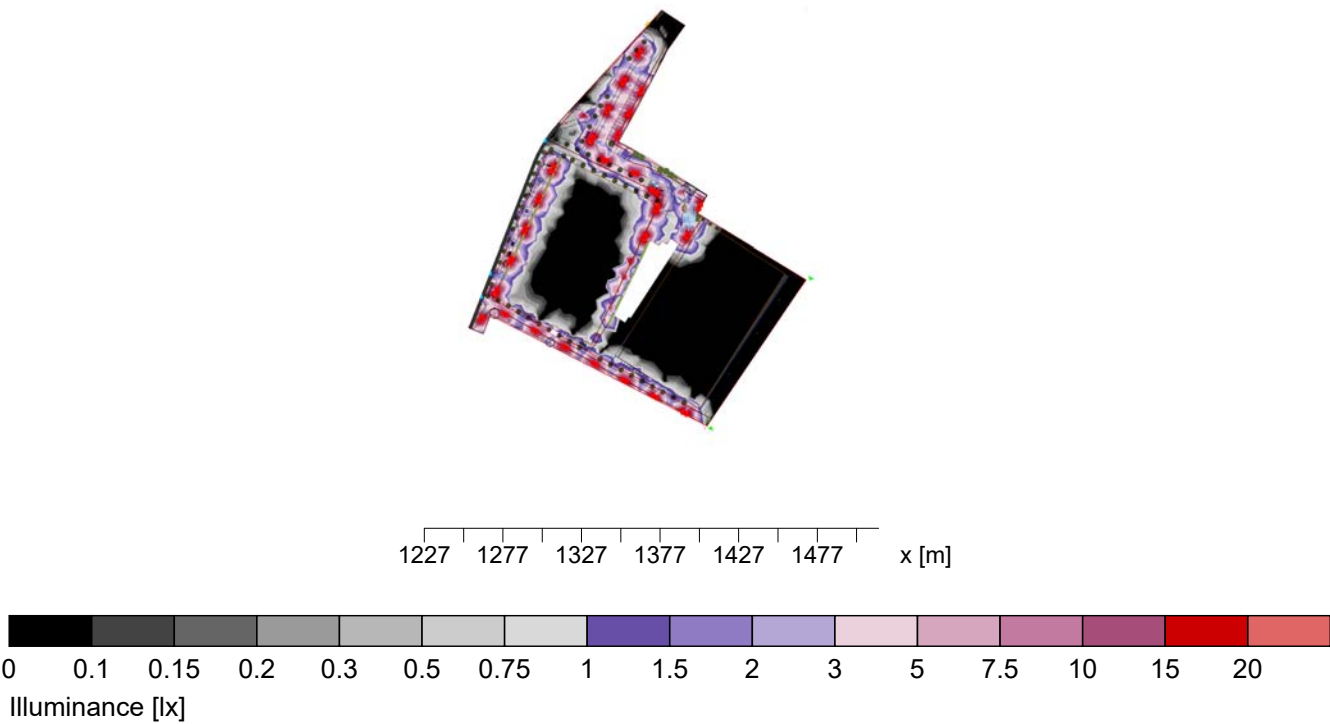
Illuminance		
Average illuminance	$\bar{E}_m$	5 lx
Minimum illuminance	E_{min}	0 lx
Maximum illuminance	E_{max}	28.8 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	1:433 (0)
Diversity U_d	E_{min}/E_{max}	1:2500 (0)

Type No.\Make

		BEGA	
1	27 x	Order No.	:
		Luminaire name	: 88977K3
		Equipment	: 1 x LED 18,8W 22 W / 2614 lm
2	10 x	Order No.	:
		Luminaire name	: 84690K3
		Equipment	: 1 x LED 16,4W 20 W / 448 lm

1.2 Summary, Exterior 1

1.2.3 Result overview, Evaluation area 1



General	
Calculation algorithm used	Average indirect fraction
Maintenance factor	0.80
Total lamp luminous flux	75058.00 lm
Luminaire luminous flux	75057.84 lm
Total power	794.0 W
Total power per area (24721.30 m²)	0.03 W/m² (1.66 W/m²/100lx)

Evaluation area 1	Reference plane 1.1
	Horizontal
$\bar{E}_m$	1.94 lx
E_{min}	0 lx
$E_{min}/\bar{E}_m (U_o)$	---
$E_{min}/E_{max} (U_d)$	---
Position	0.00 m

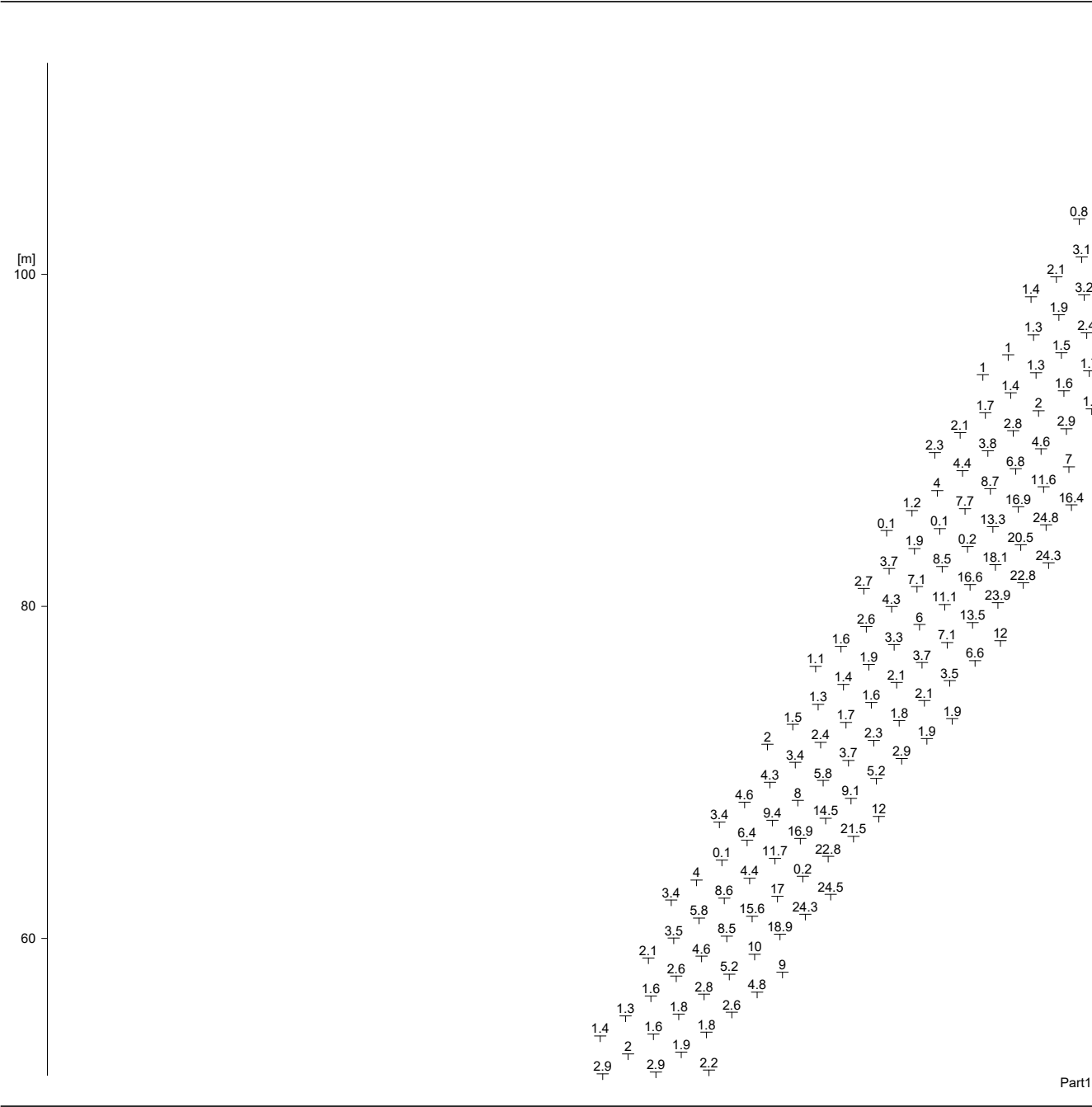
Type No.Make

1		27 x	BEGA	
		Order No.	:	
		Luminaire name	:	88977K3
		Equipment	:	1 x LED 18,8W 22 W / 2614 lm
2		10 x		
		Order No.	:	
		Luminaire name	:	84690K3
		Equipment	:	1 x LED 16,4W 20 W / 448 lm

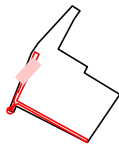
1 Exterior 1

1.3 Calculation results, Exterior 1

1.3.1 Table, Measuring area 1 (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 7.2 lx
Minimum illuminance	E_{min}	: 0 lx
Maximum illuminance	E_{max}	: 25.2 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 203.42 (0.00)

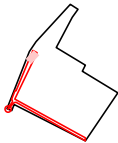


1 Exterior 1

1.3 Calculation results, Exterior 1

1.3.1 Table, Measuring area 1 (E)

			0.8		
	1		1.2		
		1.7		2.1	1.9
	2.1		3.1	3.4	2.6
		3.9		5.5	5.1
1.7	2.1		7.5	9	6.4
	3.1	8.6	14	12.2	
(0)		5.7	15.6	21.6	
	0.1	5		21.9	22.8
3.6		4	0.2	22.4	
	7.9	15.9	24.4		
5.3		14.4	23.9		
	7.8	18.1			
4.3		9.5	15.9		
	5	8.8			
2.7		4.7			
	2.6				
1.8		2.2			
	1.8				
2.3					
3.9					
	4.6				
8.9					



Part2

1

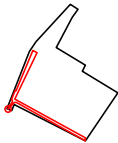
Exterior 1

1.3

Calculation results, Exterior 1

1.3.1

Table, Measuring area 1 (E)



Part3

1

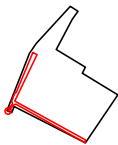
Exterior 1

1.3

Calculation results, Exterior 1

1.3.1

Table, Measuring area 1 (E)



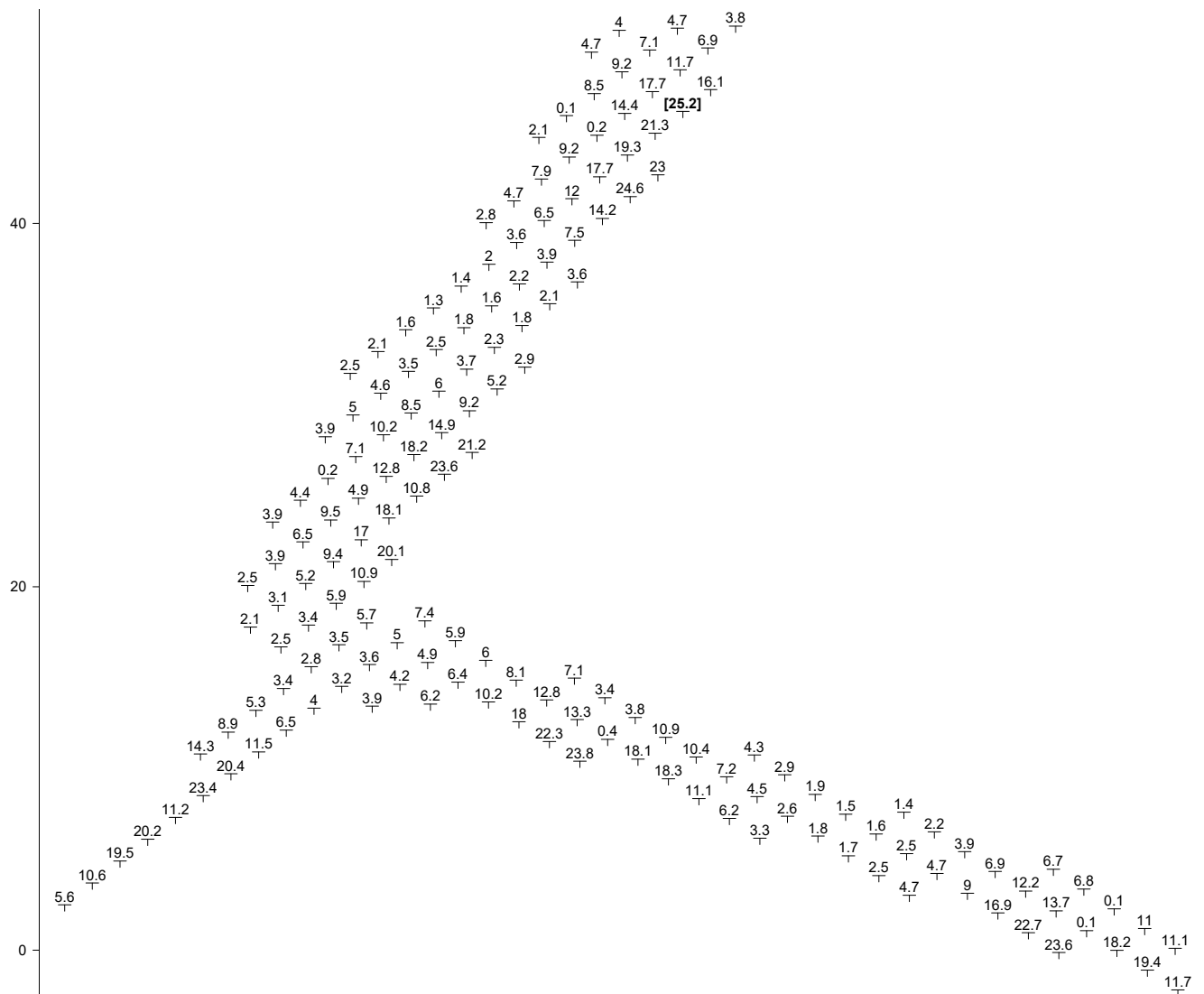
Part4

Object : Millers Lane
Installation : Public Park and Urban Realm
Project number : E25103
Date : 16.09.2025

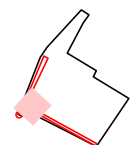
1 Exterior 1

1.3 Calculation results, Exterior 1

1.3.1 Table, Measuring area 1 (E)



Part5

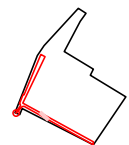
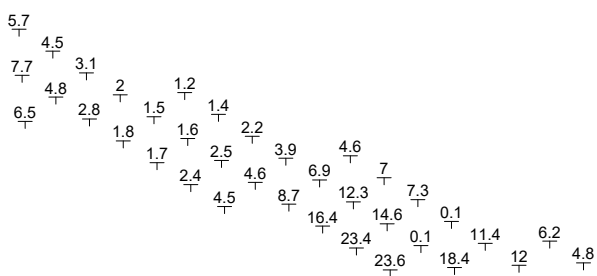


Object : Millers Lane
Installation : Public Park and Urban Realm
Project number : E25103
Date : 16.09.2025

1 Exterior 1

1.3 Calculation results, Exterior 1

1.3.1 Table, Measuring area 1 (E)



Part6

1

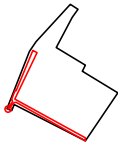
Exterior 1

1.3

Calculation results, Exterior 1

1.3.1

Table, Measuring area 1 (E)

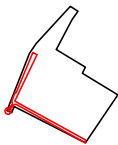


Part7

1 Exterior 1

1.3 Calculation results, Exterior 1

1.3.1 Table, Measuring area 1 (E)



Part8

Object : Millers Lane
Installation : Public Park and Urban Realm
Project number : E25103
Date : 16.09.2025

1 Exterior 1

1.3 Calculation results, Exterior 1

1.3.1 Table, Measuring area 1 (E)

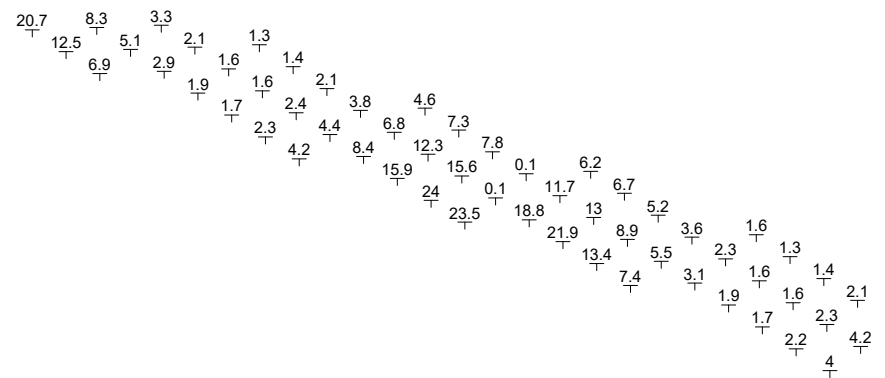
Part9

Object : Millers Lane
Installation : Public Park and Urban Realm
Project number : E25103
Date : 16.09.2025

1 Exterior 1

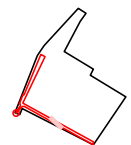
1.3 Calculation results, Exterior 1

1.3.1 Table, Measuring area 1 (E)



60

80

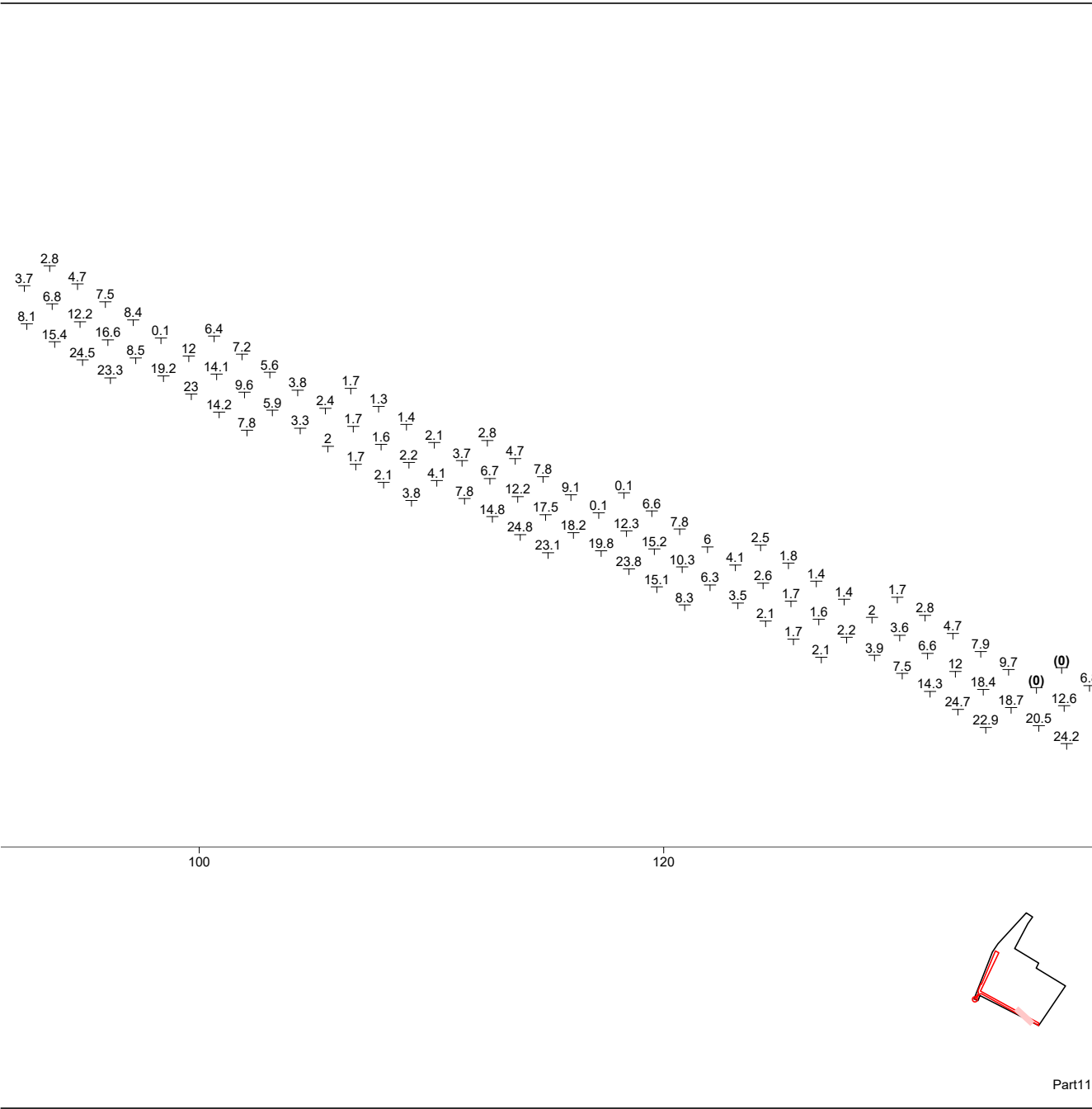


Part10

1 Exterior 1

1.3 Calculation results, Exterior 1

1.3.1 Table, Measuring area 1 (E)

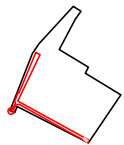
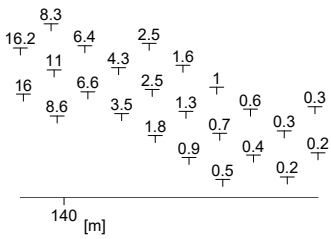


Object : Millers Lane
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1 Exterior 1

1.3 Calculation results, Exterior 1

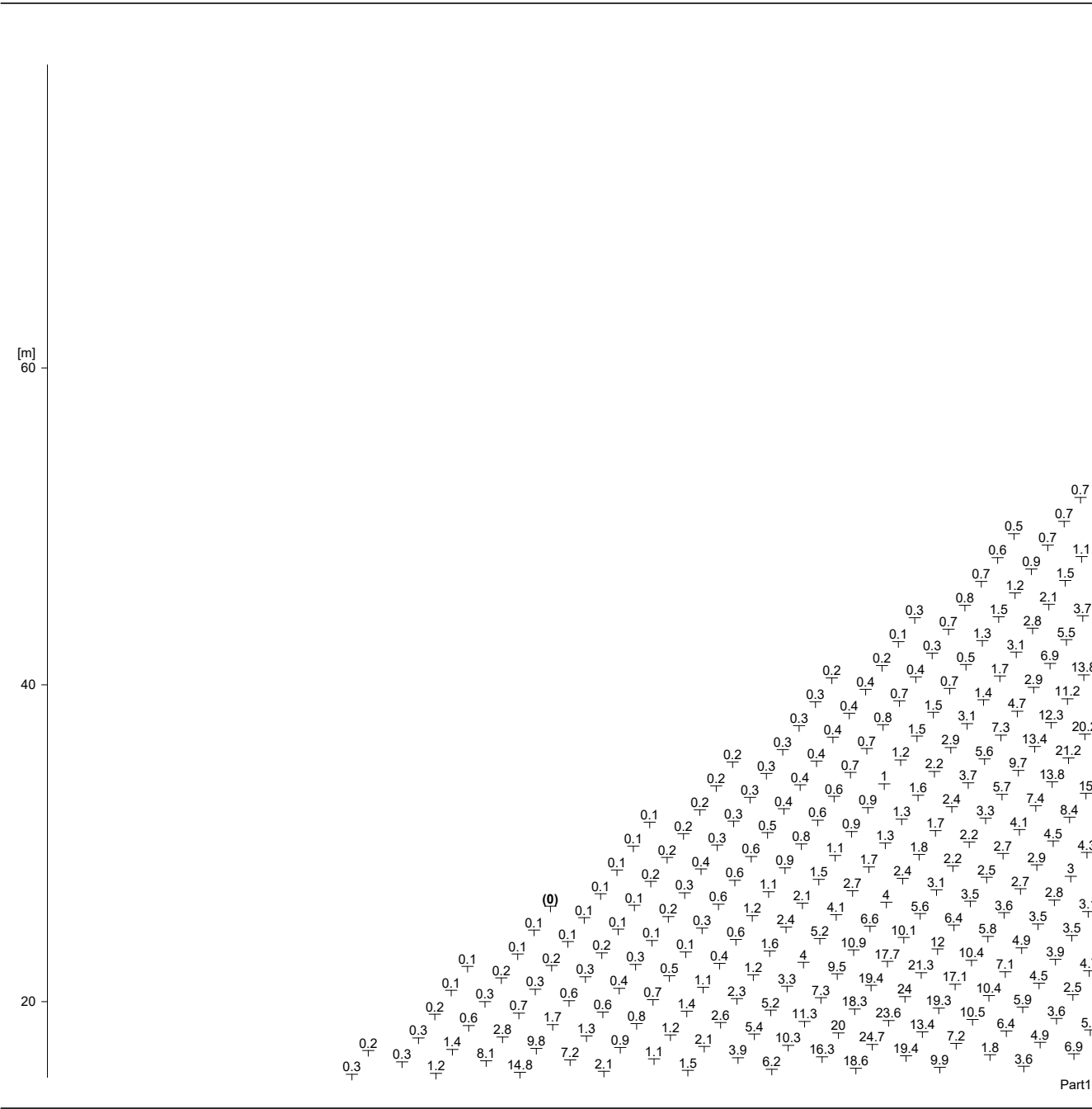
1.3.1 Table, Measuring area 1 (E)



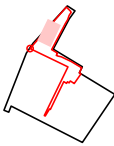
Part12

1.3 Calculation results, Exterior 1

1.3.2 Table, Measuring area 2 (E)

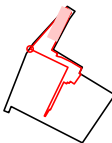
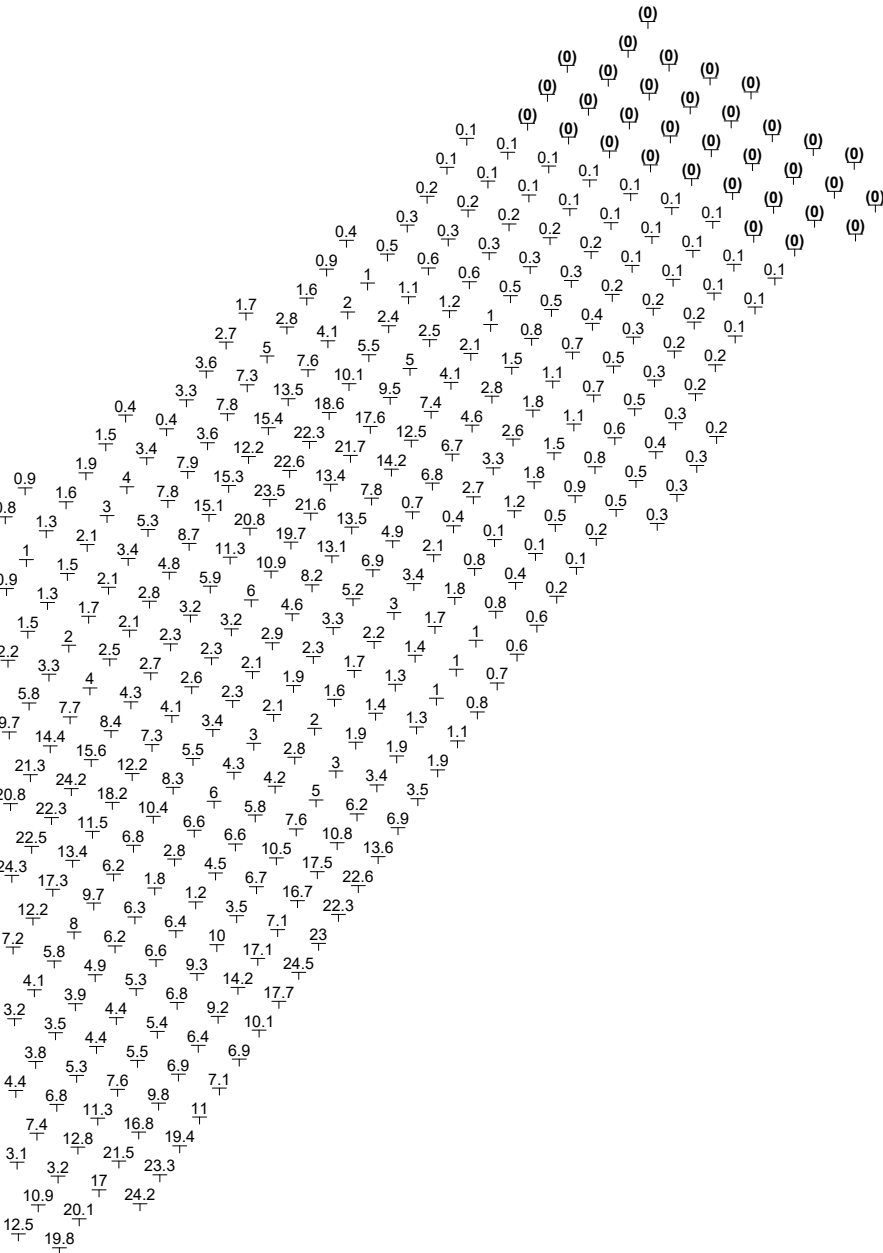


Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 5 lx
Minimum illuminance	E_{min}	: 0 lx
Maximum illuminance	E_{max}	: 28.8 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 433.34 (0.00)



1.3 Calculation results, Exterior 1

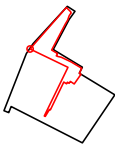
1.3.2 Table, Measuring area 2 (E)



Part2

1.3 Calculation results, Exterior 1

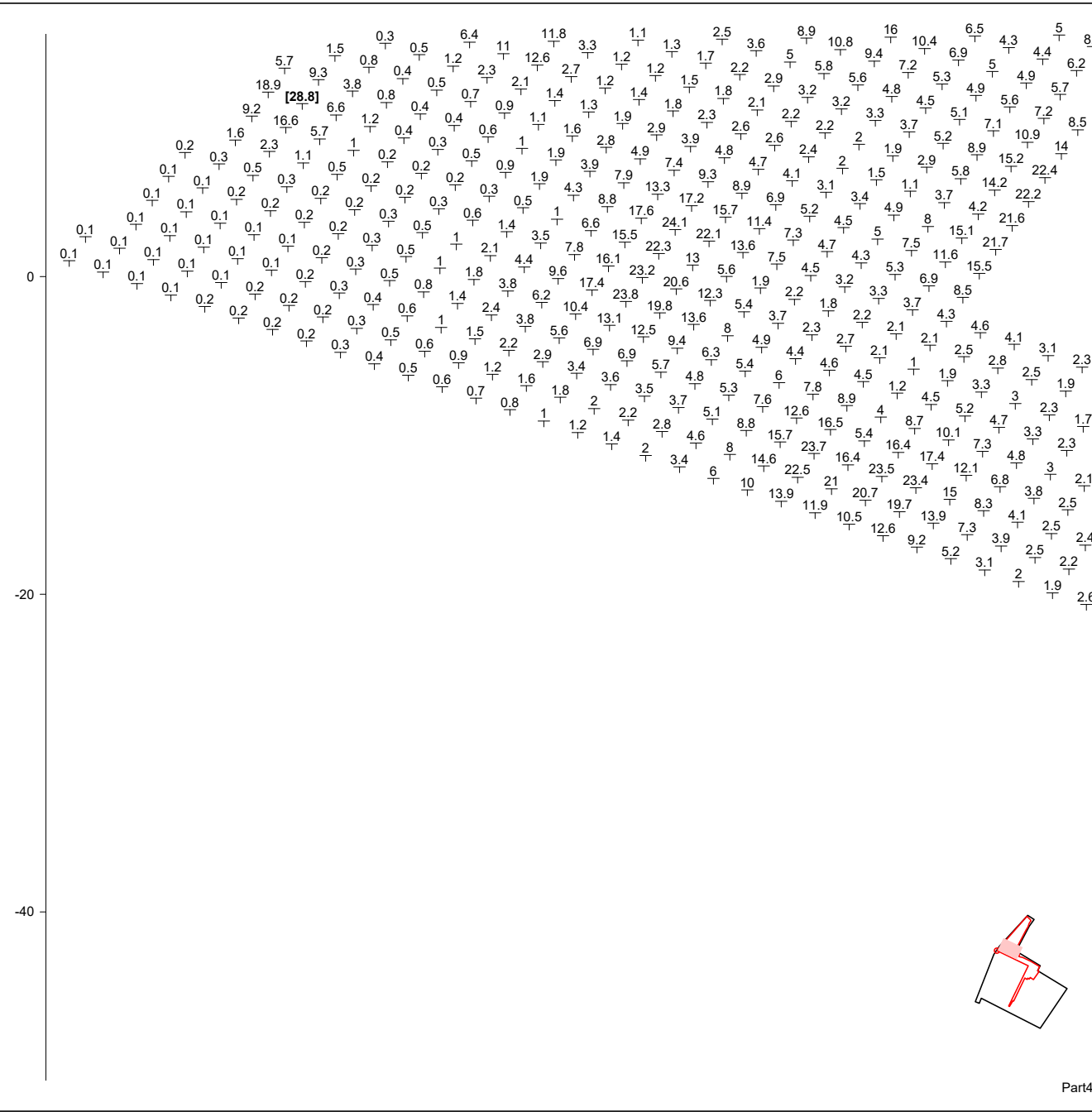
1.3.2 Table, Measuring area 2 (E)



Part3

1.3 Calculation results, Exterior 1

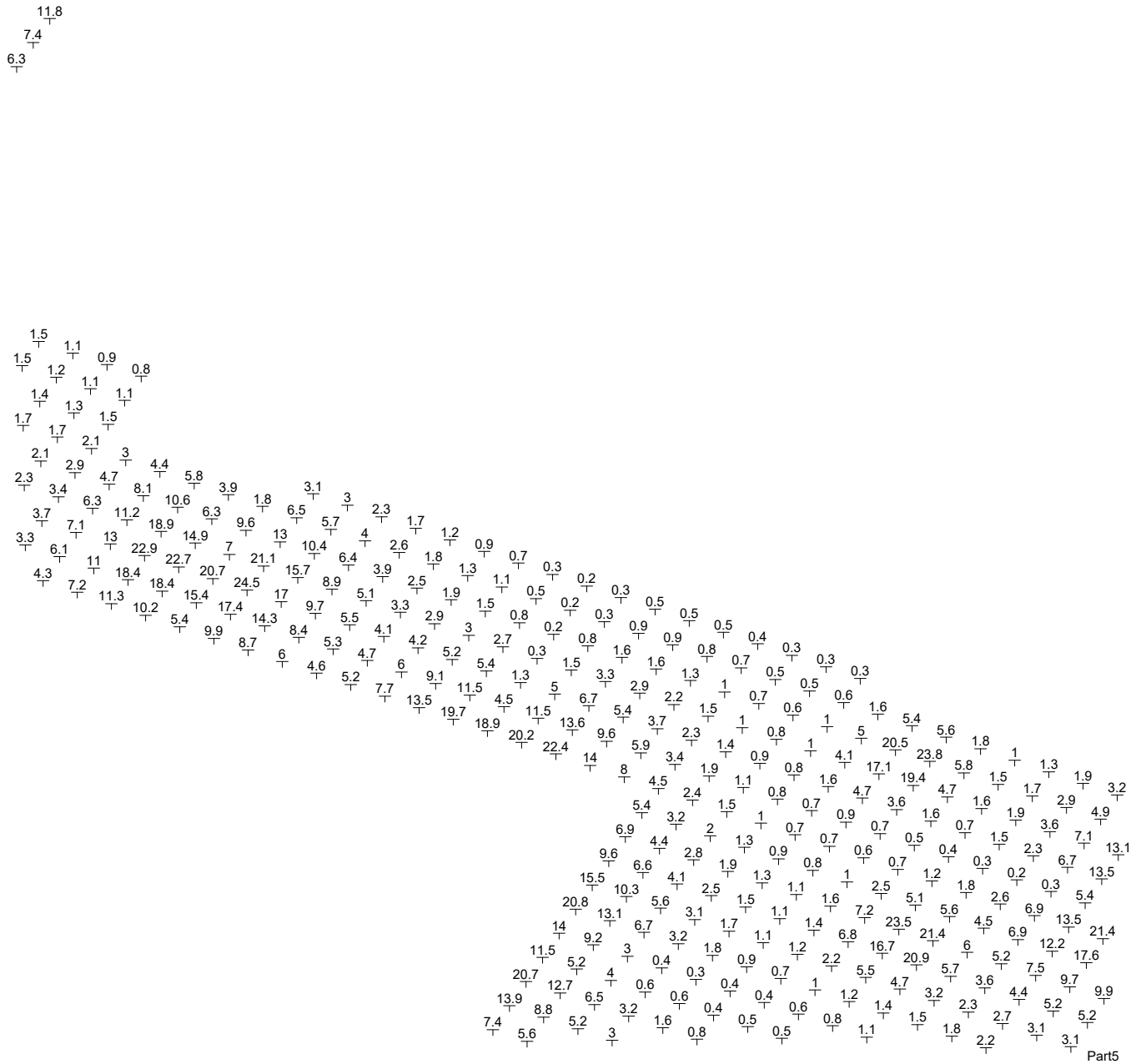
1.3.2 Table, Measuring area 2 (E)



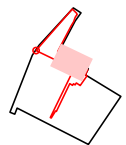
Object : Millers Lane
Installation : Public Park and Urban Realm
Project number : E25103
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1.3 Calculation results, Exterior 1

1.3.2 Table, Measuring area 2 (E)



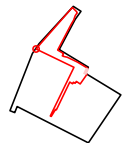
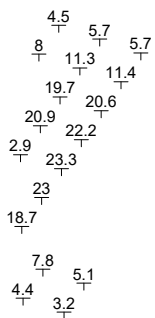
Part5



Object : Millers Lane
Installation : Public Park and Urban Realm
Project number : E25103
Date : 16.09.2025

1.3 Calculation results, Exterior 1

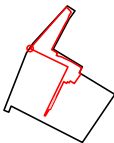
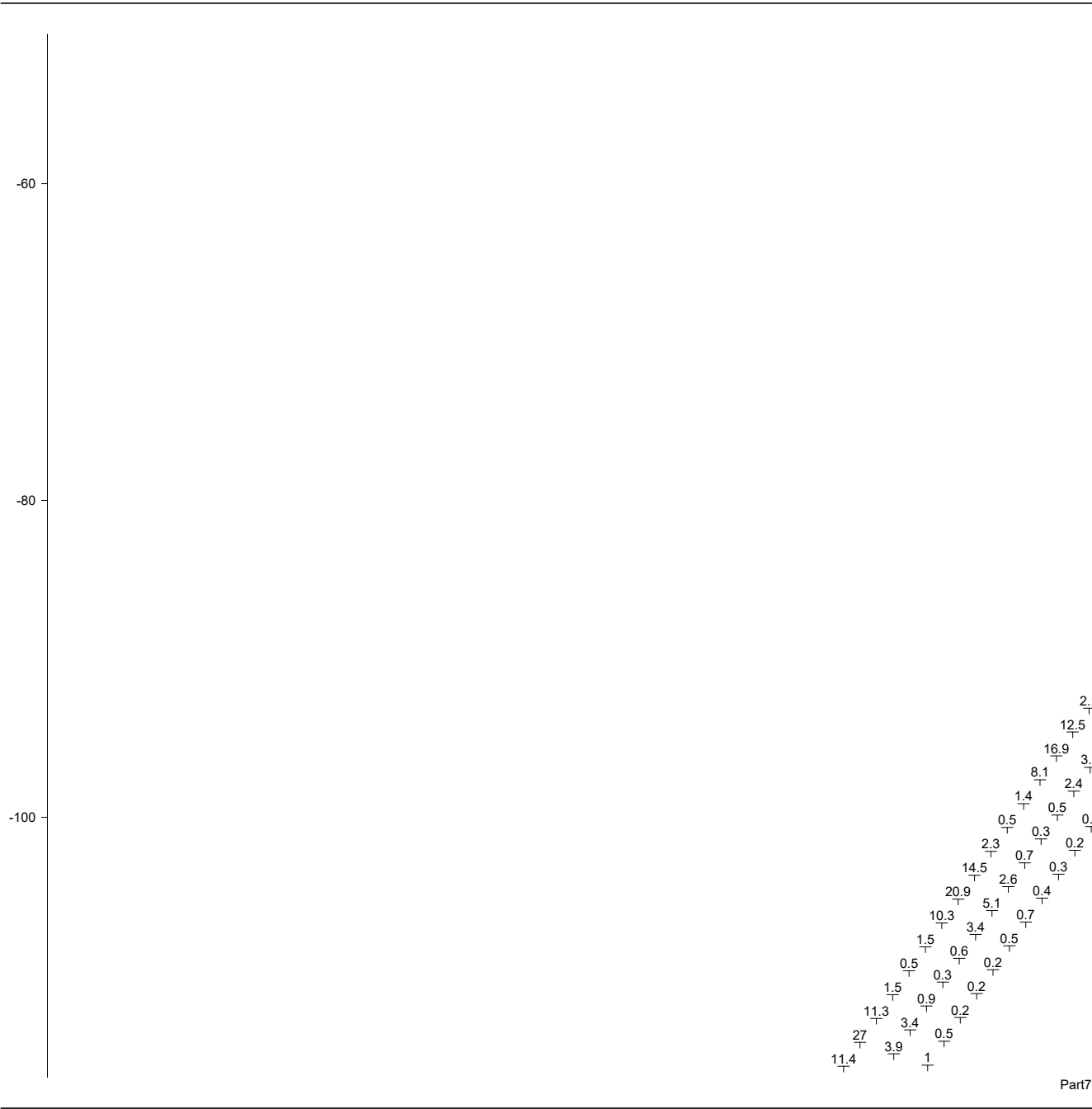
1.3.2 Table, Measuring area 2 (E)



Part6

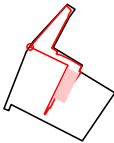
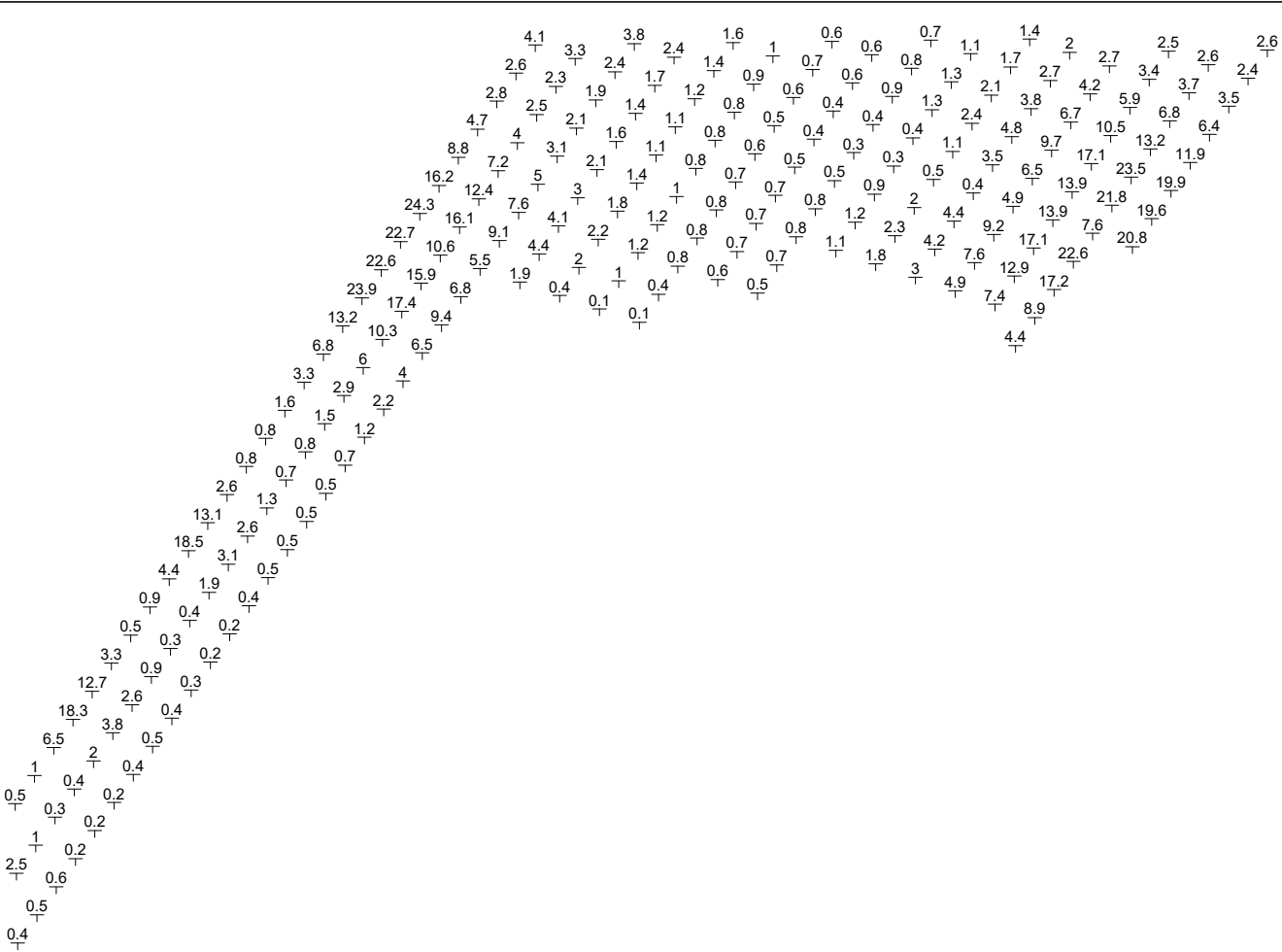
1.3 Calculation results, Exterior 1

1.3.2 Table, Measuring area 2 (E)



1.3 Calculation results, Exterior 1

1.3.2 Table, Measuring area 2 (E)



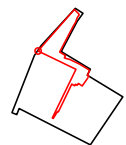
Part8

Object : Millers Lane
Installation : Public Park and Urban Realm
Project number : E25103
Date : 16.09.2025

1.3 Calculation results, Exterior 1

1.3.2 Table, Measuring area 2 (E)

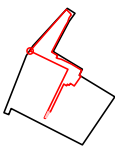
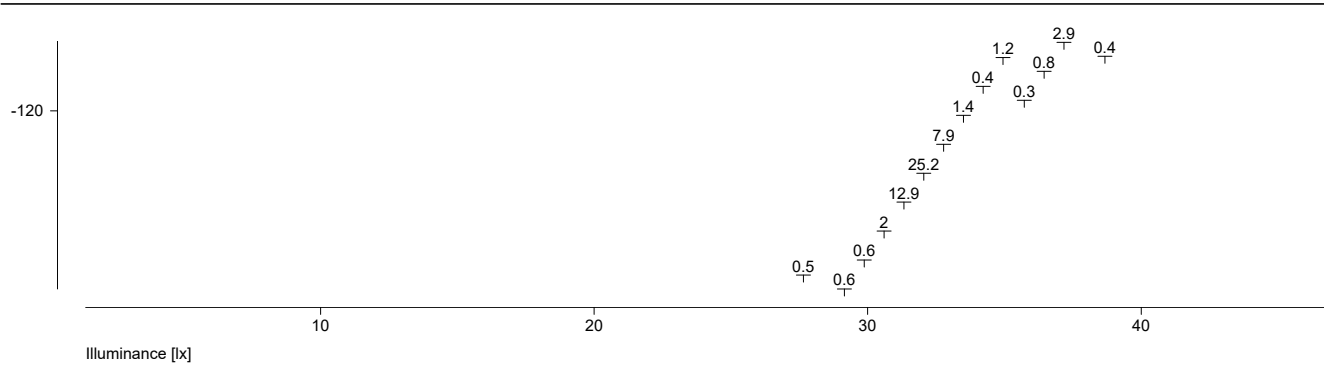
2.2



Part9

1.3 Calculation results, Exterior 1

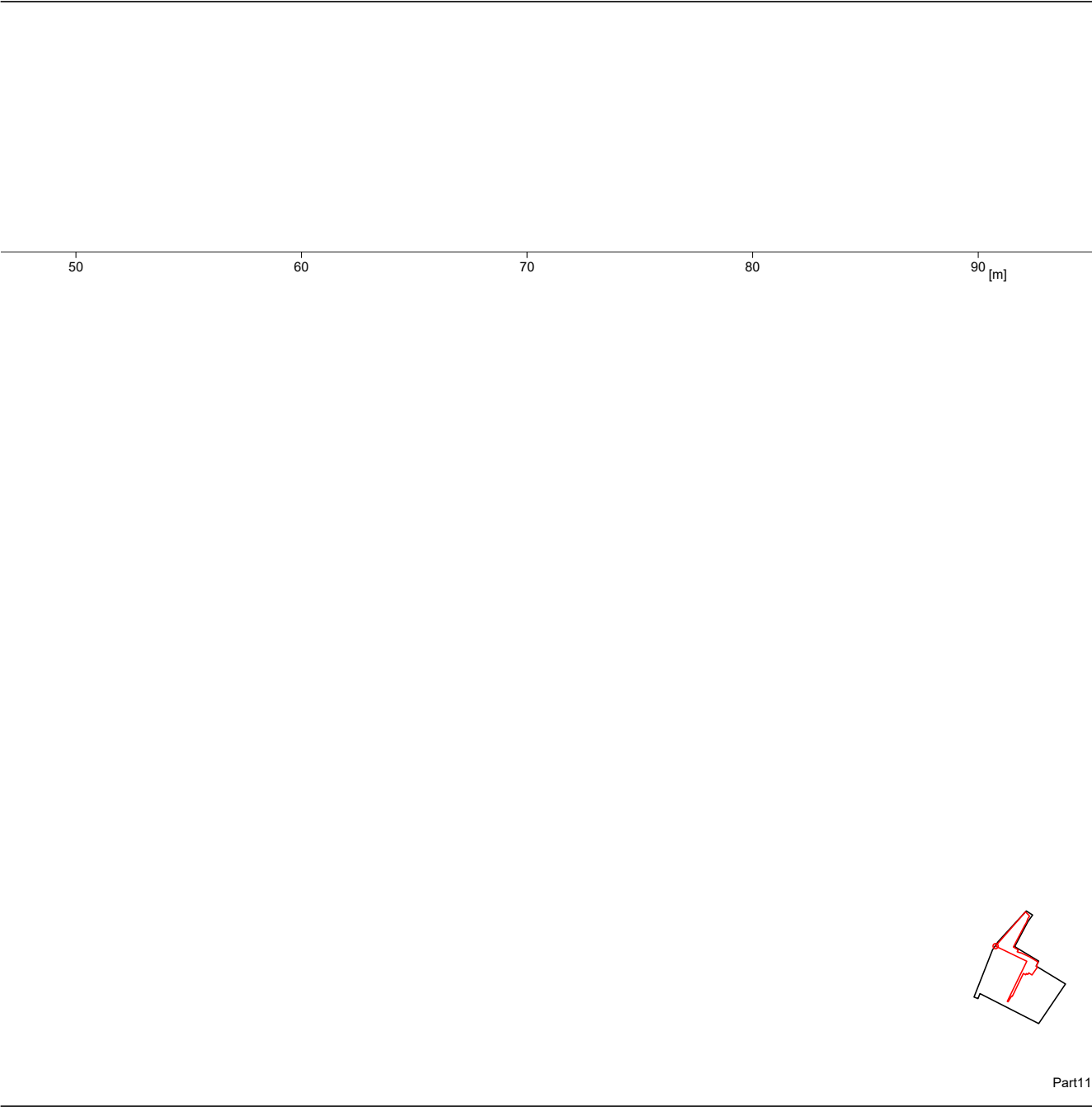
1.3.2 Table, Measuring area 2 (E)



Part10

1.3 Calculation results, Exterior 1

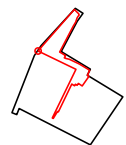
1.3.2 Table, Measuring area 2 (E)



Object : Millers Lane
Installation : Public Park and Urban Realm
Project number : E25103
Date : 16.09.2025

1.3 Calculation results, Exterior 1

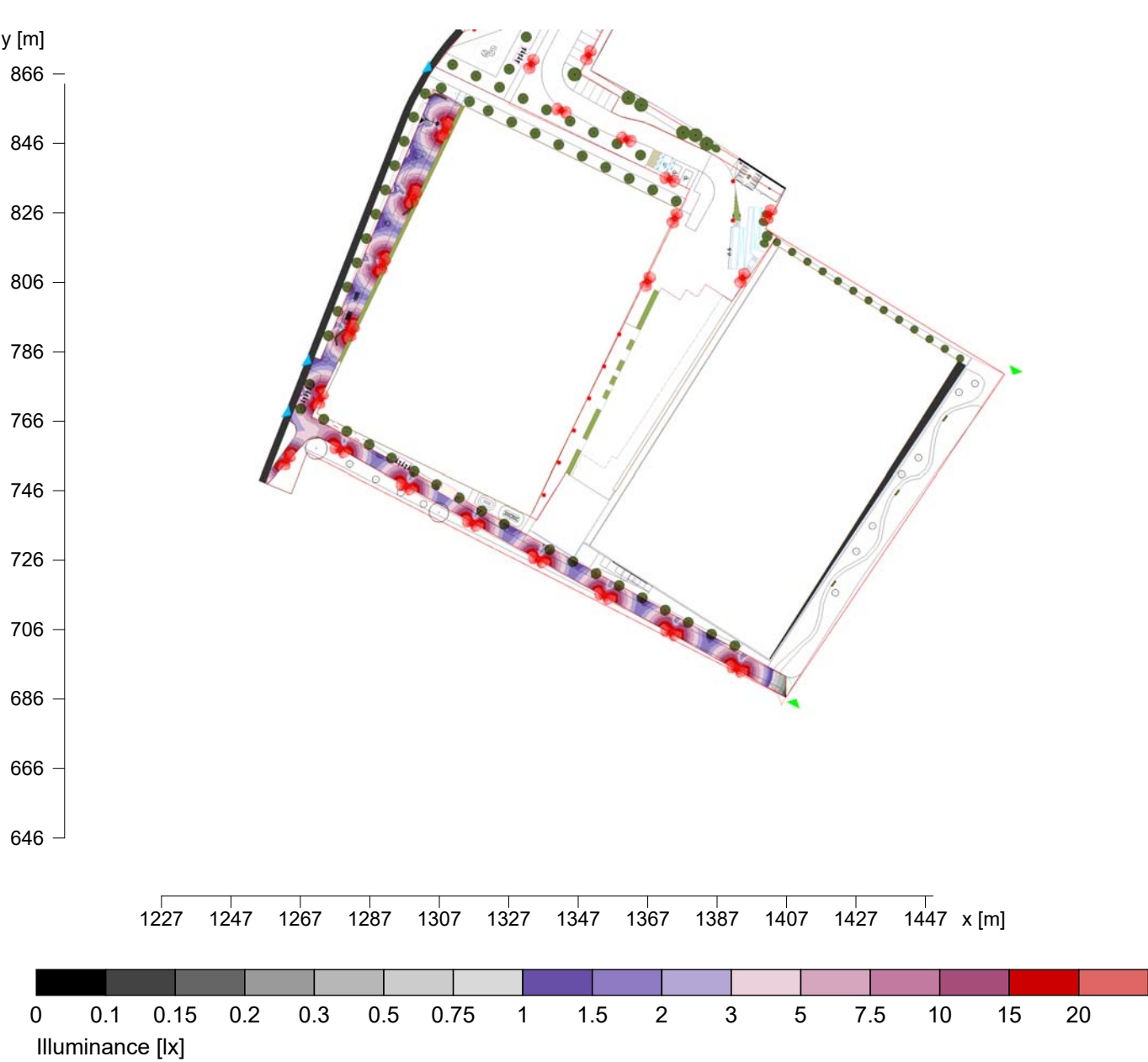
1.3.2 Table, Measuring area 2 (E)



Part12

1.3 Calculation results, Exterior 1

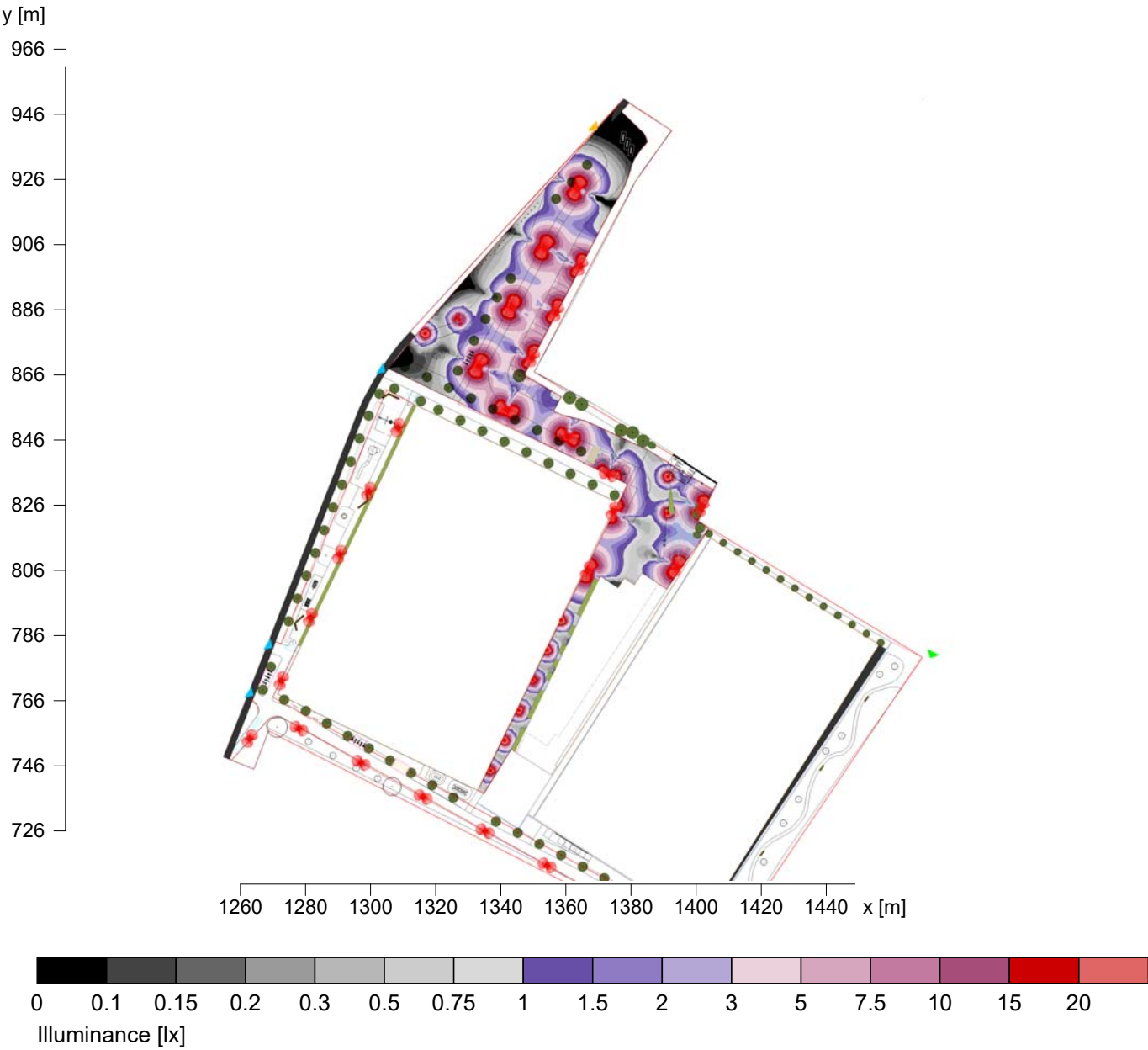
1.3.3 Pseudo colours, Measuring area 1 (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 7.2 lx
Minimum illuminance	E_{min}	: 0 lx
Maximum illuminance	E_{max}	: 25.2 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 203.42 (0.00)

1.3 Calculation results, Exterior 1

1.3.4 Pseudo colours, Measuring area 2 (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 5 lx
Minimum illuminance	E_{min}	: 0 lx
Maximum illuminance	E_{max}	: 28.8 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 433.34 (0.00)

1 Exterior 1

1.4 Calculation results, Exterior 1

1.4.1 3D luminance (Real-time rendering), Variable view 1

