

One Park Place, Manchester External Lighting



QA

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Created by	David Corrigan			

Approvals

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Title	Director			
Date of Issue	29/09/2023			
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1.0 Introduction

Futureserv have been commissioned by Benjamin Property Ltd to develop an External Lighting Strategy for the new residential-led mixed use scheme, One Park Place.

This documents provides a Lighting Strategy for external lighting at ground floor and level 15 external terrace.

2.0 Development Proposals

The development shall consist of Demolition of existing building and erection of a part 25 and part 15 storey residential building comprising 154 units with ground floor commercial units (Use Class E), associated residents amenity space, cycle parking, substation, servicing, and associated landscaping works.



Typical residential floor plan



3.0 Appendix A

Ground Floor Lighting Calculations

One Park Place

Installation : Level 00

Project number : L6150

Customer :

Processed by : DC

Date : 19.09.2023

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.

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1 Luminaire data

1.1 LIGMAN, JET 39 Ceiling luminaires (JE-80031-W-8040)

1.1.1 Data sheet

Manufacturer: LIGMAN

JE-80031-W-8040

JET 39 Ceiling luminaires

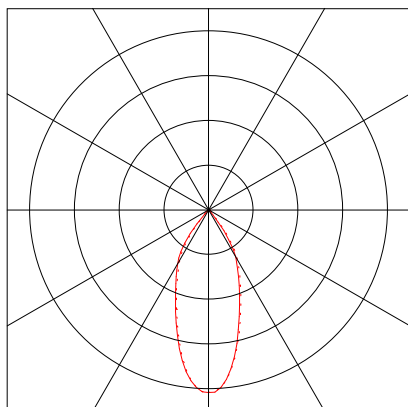
Luminaire data

Absolute Photometry
Luminaire efficacy : 105.57 lm/W
Classification : A70 ↓100.0% ↑0.0%
CIE Flux Codes : 96 99 100 100 100
UGR 4H 8H : 19.8 / 20.9
Power : 14 W
Luminous flux : 1478 lm

Dimensions : Ø65 mm x 1 mm

Equipped with

Quantity : 1
Designation : 1 COB 4000K
Colour :



1 Luminaire data

1.2 LIGMAN, JET 35 Surface facade ... (JE-30341-W-M-8040)

1.2.1 Data sheet

Manufacturer: LIGMAN

JE-30341-W-M-8040

JET 35 Surface facade luminaires

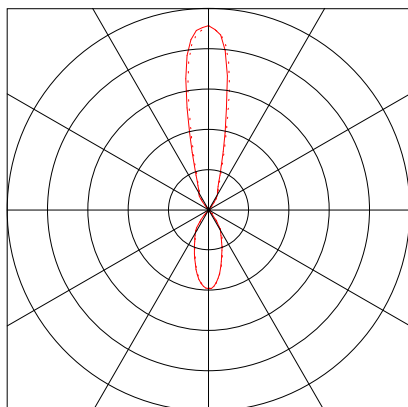
Luminaire data

Absolute Photometry
Luminaire efficacy : 114.37 lm/W
Classification : C74 ↓47.9% ↑52.1%
CIE Flux Codes : 96 99 100 48 100
UGR 4H 8H : 15.2 / 16.3
Power : 27 W
Luminous flux : 3088 lm

Equipped with

Quantity : 1
Designation : 1&1 COB 4000K
Colour :

Dimensions : Ø65 mm x 1 mm



1 Luminaire data

1.3 DW Windsor, Kirium Bulkhead-3k-Med... (Kirium Bulkhead...)

1.3.1 Data sheet

Manufacturer: DW Windsor

Kirium Bulkhead -16LED-4k-300mA-12W-Frosted-Medium

Luminaire data

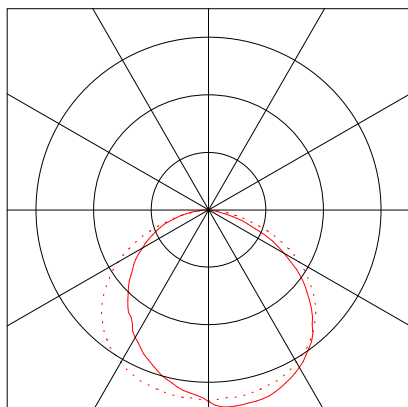
Luminaire efficiency : 100%
Luminaire efficacy : 149.25 lm/W
Classification : A40 ↓100.0% ↑0.0%
CIE Flux Codes : 47 80 97 100 100
UGR 4H 8H : 62.0 / 63.7
Power : 12 W
Luminous flux : 1791 lm

Dimensions : Ø1 mm x 1 mm

Kirium Bulkhead-3k-Medium

Equipped with

Quantity : 1
Designation : 16 x 4k LED
Colour :
Luminous flux : 1791 lm



1 Luminaire data

1.4 ARCLUCE, SOUL180 4K Clear glass H=3500 (S6617)

1.4.1 Data sheet

Manufacturer: ARCLUCE

S6617 SOUL180 4K Clear glass H=3500

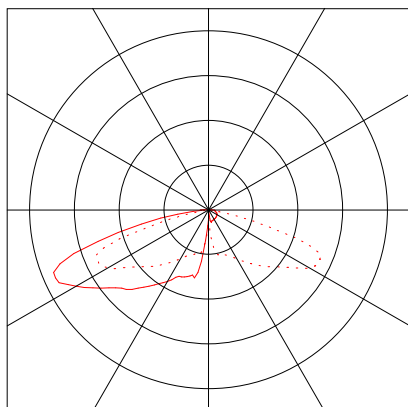
Luminaire data

Luminaire efficiency : 100%
Luminaire efficacy : 70.37 lm/W
Classification : A20 ↓99.6% ↑0.4%
CIE Flux Codes : 21 56 95 100 100
UGR 4H 8H : 31.4 / 32.9
Power : 27 W
Luminous flux : 1900 lm

Equipped with

Quantity : 1
Designation : S6614_700mA
Colour : 4000
Luminous flux : 1900 lm
Colour reproduction : 80

Dimensions : Ø180 mm x 130 mm



1 Luminaire data

1.5 Kingfisher Lighting, Cinep (10w Cinep side flex 3000k (1m))

1.5.1 Data sheet

Manufacturer: Kingfisher Lighting

10w Cinep side flex 3000k (1m)

Cinep

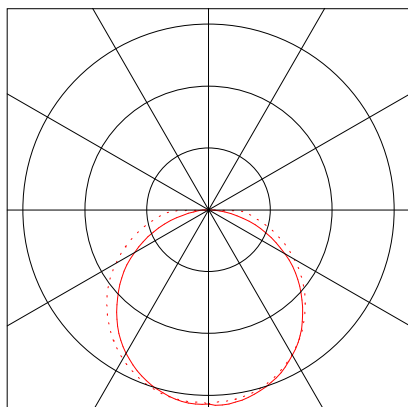
Luminaire data

Luminaire efficiency : 100%
Luminaire efficacy : 50 lm/W
Classification : A40 ↓100.0% ↑0.0%
CIE Flux Codes : 43 74 92 100 100
UGR 4H 8H : 24.6 / 27.6
Power : 10 W
Luminous flux : 500 lm

Equipped with

Quantity : 1
Designation :
Colour :
Luminous flux : 500 lm

Dimensions : 15 mm x 980 mm x 1 mm



1 Luminaire data

1.6 DW Windsor, Daytona 8LED 4k... (Daytona 8LED 4k A2 450...)

1.6.1 Data sheet

Manufacturer: DW Windsor

Daytona 8LED 4k A2 450mA UMSUG 42 0010 0000 100

Daytona 8LED 4k

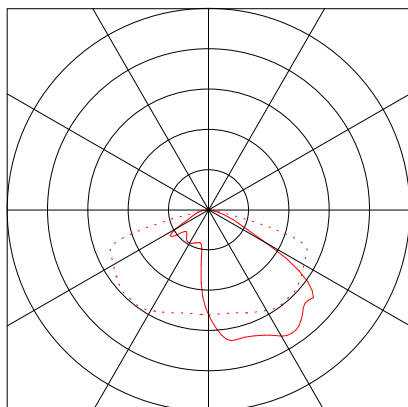
Luminaire data

Luminaire efficiency : 100%
Luminaire efficacy : 176.9 lm/W
Classification : A30 ↓100.0% ↑0.0%
CIE Flux Codes : 37 75 98 100 100
UGR 4H 8H : 19.1 / 23.4
Power : 10 W
Luminous flux : 1769 lm

Equipped with

Quantity : 1
Designation : 8x4k
Colour :
Luminous flux : 1769 lm

Dimensions : 459 mm x 562 mm x 170 mm



1 Luminaire data

1.7 LIGMAN, JET 31 Surface facade I... (JE-30351-VW-8040)

1.7.1 Data sheet

Manufacturer: LIGMAN

JE-30351-VW-8040

JET 31 Surface facade luminaires

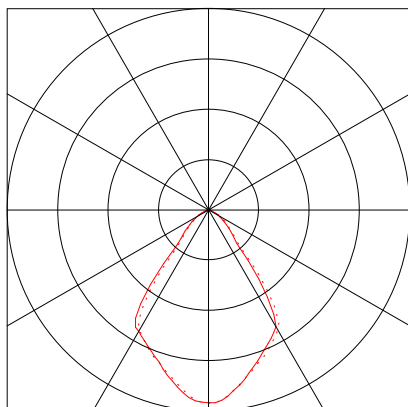
Luminaire data

Absolute Photometry
Luminaire efficacy : 102.93 lm/W
Classification : A60 ↓100.0% ↑0.0%
CIE Flux Codes : 80 96 100 100 100
UGR 4H 8H : 24.9 / 25.5
Power : 14 W
Luminous flux : 1441 lm

Equipped with

Quantity : 1
Designation : 1 COB 4000K
Colour :

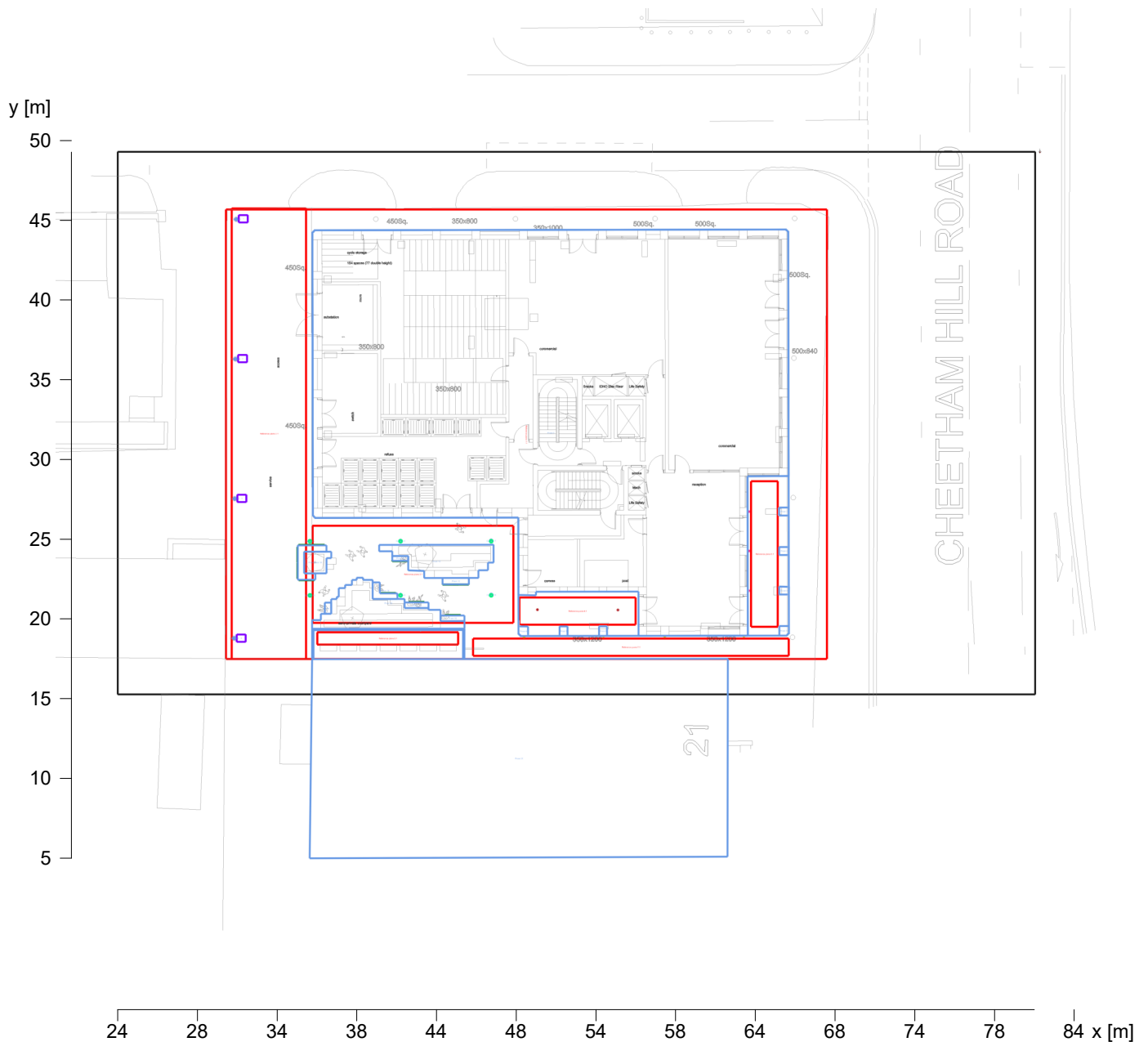
Dimensions : Ø65 mm x 1 mm



2 Exterior 1

2.1 Description, Exterior 1

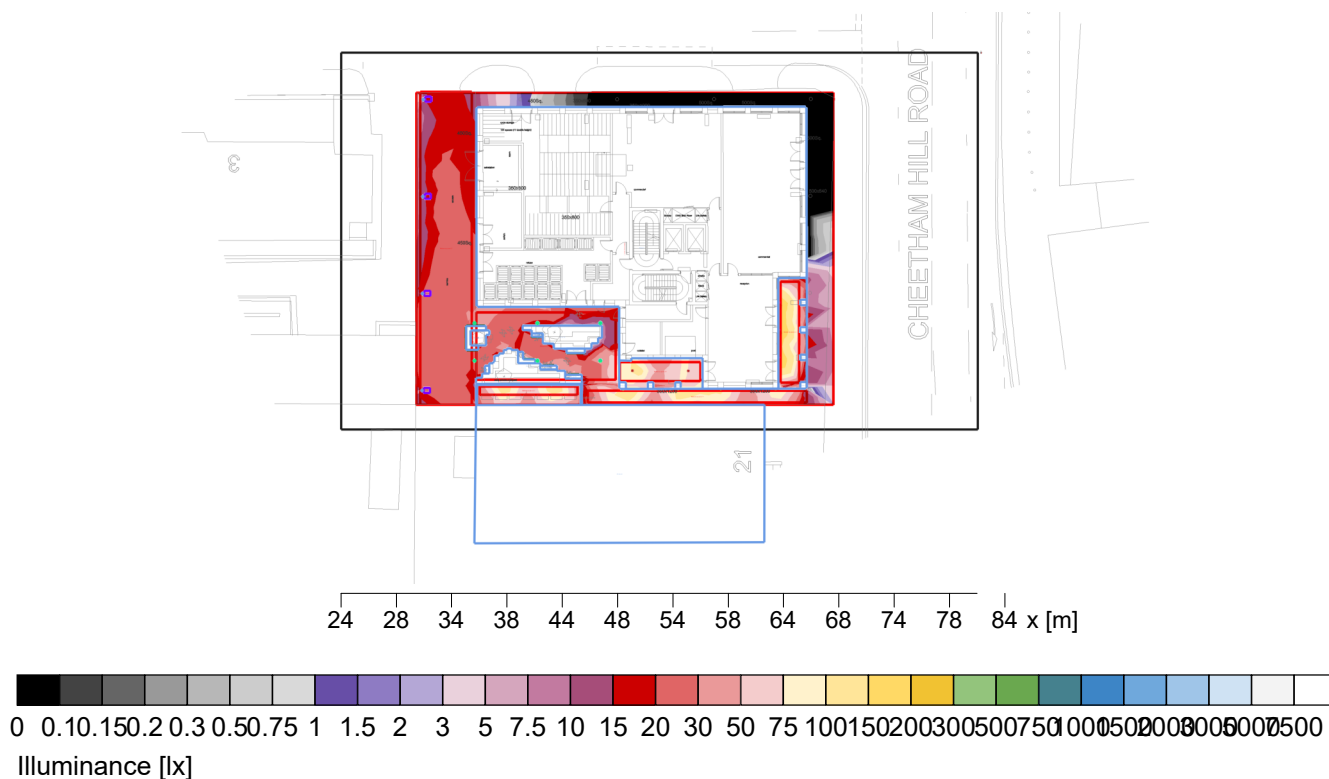
2.1.1 Floor plan



2 Exterior 1

2.2 Summary, Exterior 1

2.2.1 Result overview, Evaluation area 1



General

Calculation algorithm used
 Maintenance factor

Average indirect fraction
 0.80

Total luminous flux
 Total power
 Total power per area (1060.47 m²)

45542.00 lm
 501.0 W
 0.47 W/m² (1.23 W/m²/100lx)

Evaluation area 1

Reference plane 1.1

Horizontal
 $\bar{E}_m$ 38.4 lx
 E_{min} 0 lx
 $E_{min}/\bar{E}_m (U_o)$ 0.00
 $E_{min}/E_{max} (U_d)$ 0.00
 Position 0.00 m

Type No. Make

- | | | | | |
|---|-----|---|----------------|------------------------------------|
| 1 | 2 x |  | LIGMAN | |
| | | | Order No. | : JE-80031-W-8040 |
| | | | Luminaire name | : JET 39 Ceiling luminaires |
| | | | Equipment | : 1 x 1 COB 4000K 14 W / 1478 lm |
| 2 | 3 x |  | Order No. | : JE-30341-W-M-8040 |
| | | | Luminaire name | : JET 35 Surface facade luminaires |
| | | | Equipment | : 1 x 1&1 COB 4000K 27 W / 3088 lm |

2 Exterior 1

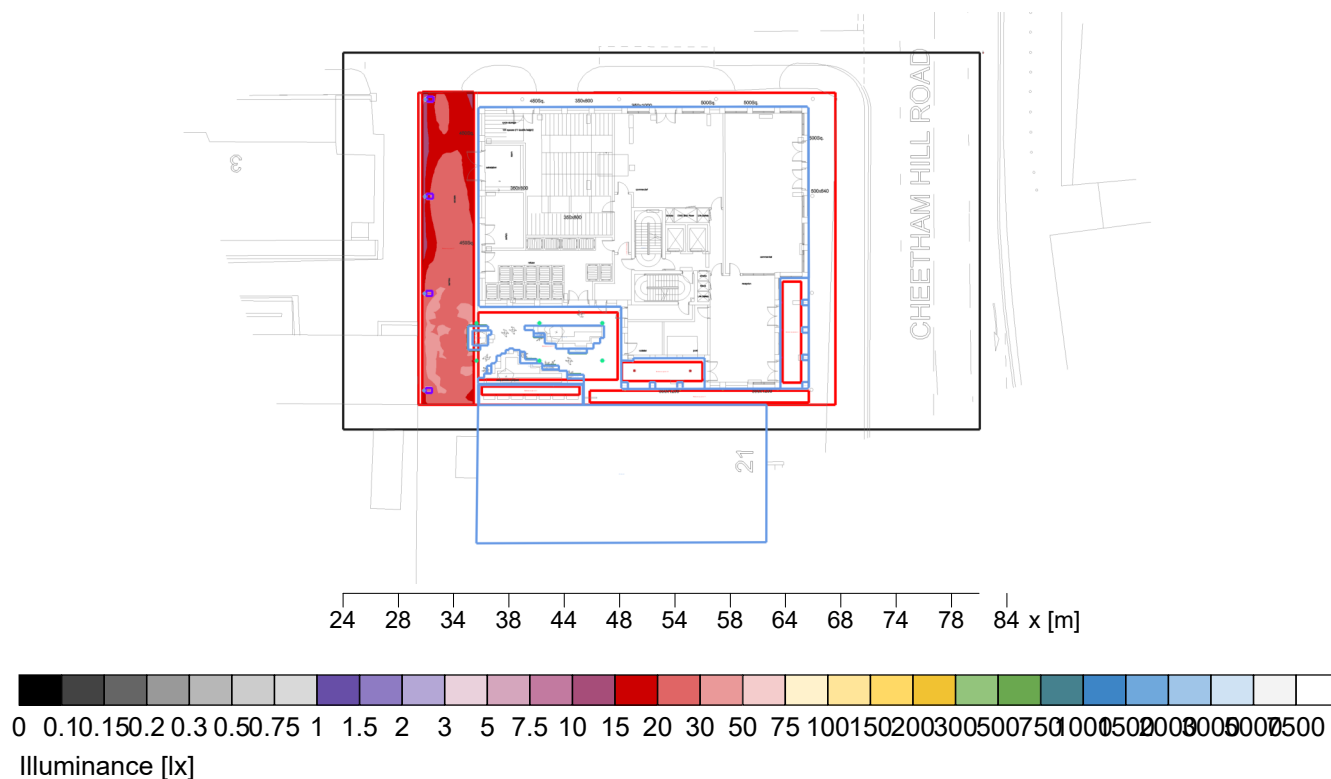
2.2 Summary, Exterior 1

2.2.1 Result overview, Evaluation area 1

7	4 x		Order No. : JE-30351-VW-8040 Luminaire name : JET 31 Surface facade luminaires Equipment : 1 x 1 COB 4000K 14 W / 1441 lm
3	2 x		DW Windsor Order No. : Kirium Bulkhead -16LED-4k-300mA-12W-Frosted-Medium Luminaire name : Kirium Bulkhead-3k-Medium Equipment : 1 x 16 x 4k LED 12 W / 1791 lm
6	4 x		Order No. : Daytona 8LED 4k A2 450mA UMSUG 42 0010 0000 100 Luminaire name : Daytona 8LED 4k Equipment : 1 x 8x4k 10 W / 1769 lm
4	6 x		ARCLUCE Order No. : S6617 Luminaire name : SOUL180 4K Clear glass H=3500 Equipment : 1 x S6614_700mA 27 W / 1900 lm
5	11 x		Kingfisher Lighting Order No. : 10w Cinep side flex 3000k (1m) Luminaire name : Cinep Equipment : 1 x 10 W / 500 lm

2.2 Summary, Exterior 1

2.2.2 Result overview, Access Road



General

Calculation algorithm used
 Maintenance factor

Average indirect fraction
 0.80

Total luminous flux

2000.00 lm

Total power

40.0 W

Total power per area (131.20 m²)

0.30 W/m² (1.31 W/m²/100lx)

Access Road

Reference plane 2.1

Horizontal
 $\bar{E}_m$ 23.2 lx
 E_{min} 11.9 lx
 $E_{min}/\bar{E}_m (U_o)$ 0.51
 $E_{min}/E_{max} (U_d)$ 0.22
 Position 0.00 m

Major surfaces

M 2.5 (Ceiling) $\bar{E}_m$ 0 lx

U_o

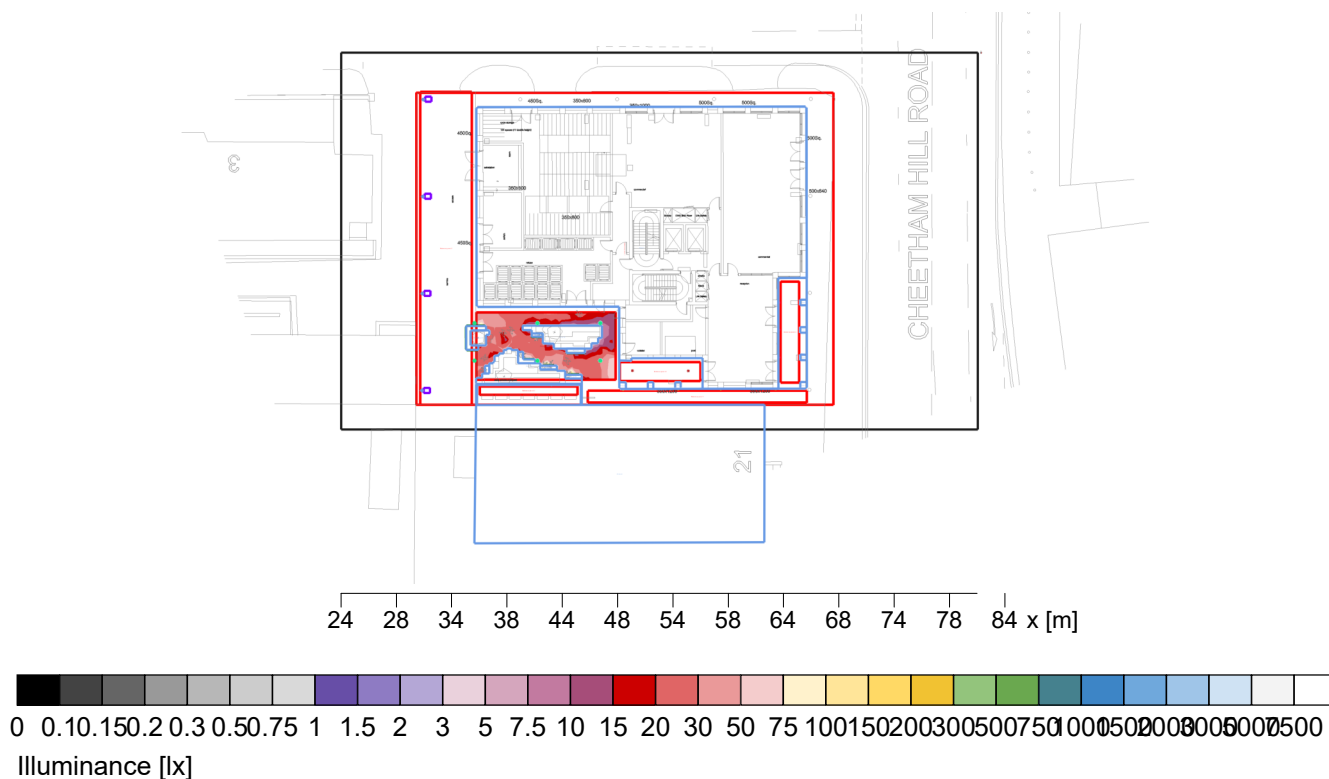
Type No. Make

Kingfisher Lighting

5 4 x
 Order No. : 10w Cinep side flex 3000k (1m)
 Luminaire name : Cinep
 Equipment : 1 x 10 W / 500 lm

2.2 Summary, Exterior 1

2.2.3 Result overview, Courtyard



General

Calculation algorithm used
 Maintenance factor

Average indirect fraction
 0.80

Total luminous flux

4500.00 lm

Total power

90.0 W

Total power per area (76.54 m²)

1.18 W/m² (4.69 W/m²/100lx)

Courtyard

Reference plane 3.1

Horizontal
 $\bar{E}_m$ 25.1 lx
 E_{min} 8.8 lx
 $E_{min}/\bar{E}_m (U_o)$ 0.35
 $E_{min}/E_{max} (U_d)$ 0.10
 Position 0.00 m

Major surfaces

M 3.5 (Ceiling) $\bar{E}_m$ 0 lx

U_o

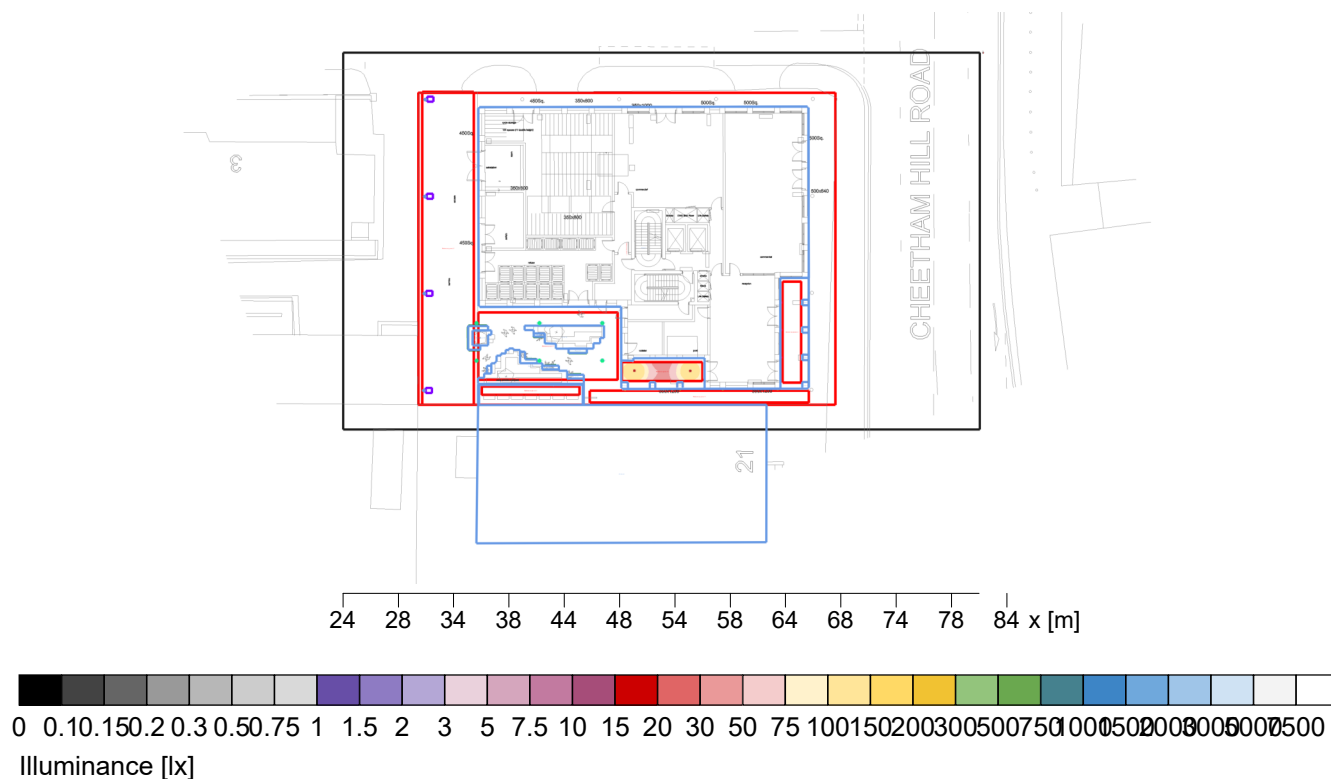
Type No. Make

Kingfisher Lighting

5 9 x
 Order No. : 10w Cinep side flex 3000k (1m)
 Luminaire name : Cinep
 Equipment : 1 x 10 W / 500 lm

2.2 Summary, Exterior 1

2.2.4 Result overview, Secondary Entrance



General

Calculation algorithm used
 Maintenance factor

Average indirect fraction
 0.80

Secondary Entrance

Reference plane 4.1

Horizontal
 $\bar{E}_m$: 89 lx
 E_{min} : 39.4 lx
 $E_{min}/\bar{E}_m (U_o)$: 0.44
 $E_{min}/E_{max} (U_d)$: 0.27
 Position : 0.00 m

Major surfaces

M 4.5 (Ceiling) : $\bar{E}_m$: 0 lx

U_o

Type No. Make

- | | | | |
|------|-----|----------------|------------------------------------|
| | | LIGMAN | |
| 1 | 2 x | Order No. | : JE-80031-W-8040 |
| | | Luminaire name | : JET 39 Ceiling luminaires |
| | | Equipment | : 1 x 1 COB 4000K 14 W / 1478 lm |
|
 | | | |
| 2 | 3 x | Order No. | : JE-30341-W-M-8040 |
| | | Luminaire name | : JET 35 Surface facade luminaires |
| | | Equipment | : 1 x 1&1 COB 4000K 27 W / 3088 lm |

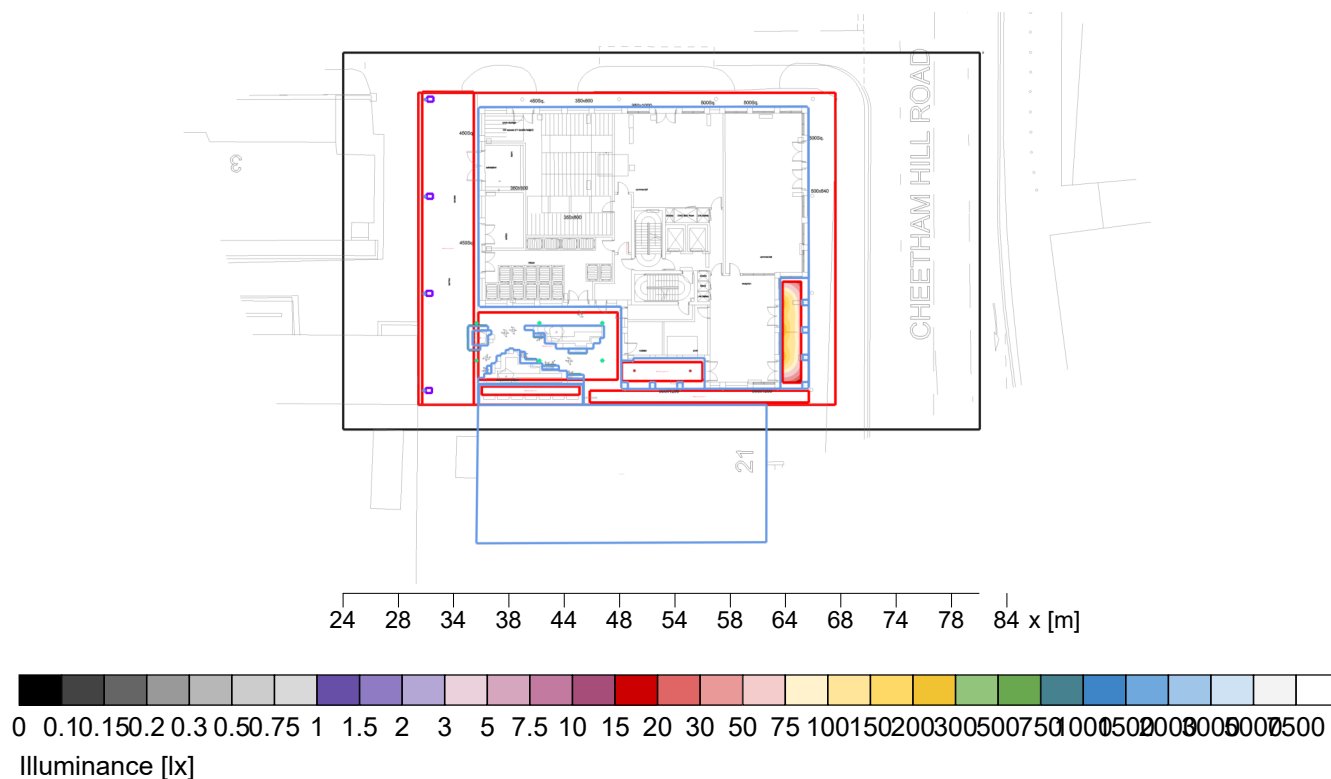
2.2 Summary, Exterior 1

2.2.4 Result overview, Secondary Entrance

7	4 x		Order No. : JE-30351-VW-8040 Luminaire name : JET 31 Surface facade luminaires Equipment : 1 x 1 COB 4000K 14 W / 1441 lm
3	2 x		DW Windsor Order No. : Kirium Bulkhead -16LED-4k-300mA-12W-Frosted-Medium Luminaire name : Kirium Bulkhead-3k-Medium Equipment : 1 x 16 x 4k LED 12 W / 1791 lm
6	4 x		Order No. : Daytona 8LED 4k A2 450mA UMSUG 42 0010 0000 100 Luminaire name : Daytona 8LED 4k Equipment : 1 x 8x4k 10 W / 1769 lm
4	6 x		ARCLUCE Order No. : S6617 Luminaire name : SOUL180 4K Clear glass H=3500 Equipment : 1 x S6614_700mA 27 W / 1900 lm
5	11 x		Kingfisher Lighting Order No. : 10w Cinep side flex 3000k (1m) Luminaire name : Cinep Equipment : 1 x 10 W / 500 lm

2.2 Summary, Exterior 1

2.2.5 Result overview, Front Entrance



General

Calculation algorithm used
 Maintenance factor

Average indirect fraction
 0.80

Front Entrance

Reference plane 5.1

Horizontal
 $\bar{E}_m$ 106 lx
 E_{min} 18 lx
 $E_{min}/\bar{E}_m (U_o)$ 0.17
 $E_{min}/E_{max} (U_d)$ 0.08
 Position 0.00 m

Major surfaces

M 5.5 (Ceiling) $\bar{E}_m$ 0 lx

U_o

Type No. Make

- | | | | |
|---|-----|----------------|------------------------------------|
| | | LIGMAN | |
| 1 | 2 x | Order No. | : JE-80031-W-8040 |
| | | Luminaire name | : JET 39 Ceiling luminaires |
| | | Equipment | : 1 x 1 COB 4000K 14 W / 1478 lm |
| 2 | 3 x | Order No. | : JE-30341-W-M-8040 |
| | | Luminaire name | : JET 35 Surface facade luminaires |
| | | Equipment | : 1 x 1&1 COB 4000K 27 W / 3088 lm |

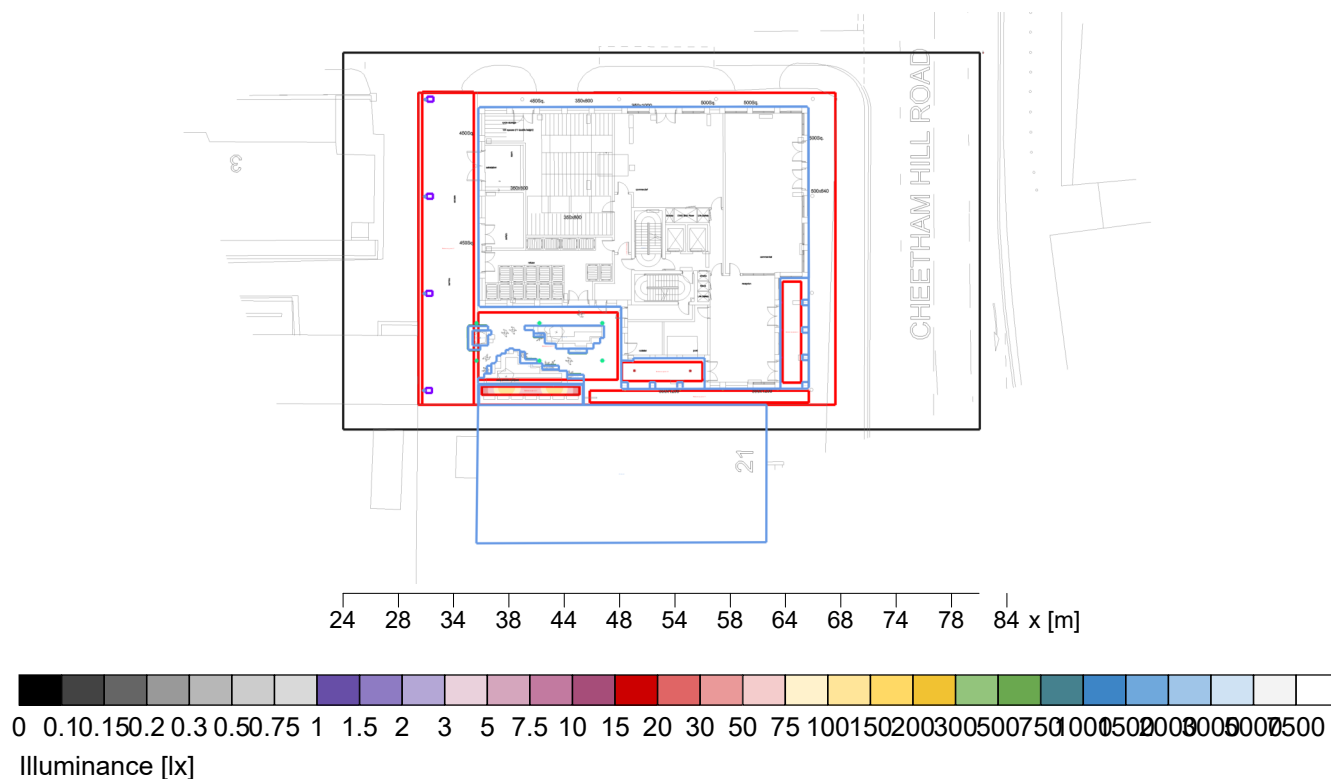
2.2 Summary, Exterior 1

2.2.5 Result overview, Front Entrance

7	4 x		Order No. : JE-30351-VW-8040 Luminaire name : JET 31 Surface facade luminaires Equipment : 1 x 1 COB 4000K 14 W / 1441 lm
3	2 x		DW Windsor Order No. : Kirium Bulkhead -16LED-4k-300mA-12W-Frosted-Medium Luminaire name : Kirium Bulkhead-3k-Medium Equipment : 1 x 16 x 4k LED 12 W / 1791 lm
6	4 x		Order No. : Daytona 8LED 4k A2 450mA UMSUG 42 0010 0000 100 Luminaire name : Daytona 8LED 4k Equipment : 1 x 8x4k 10 W / 1769 lm
4	6 x		ARCLUCE Order No. : S6617 Luminaire name : SOUL180 4K Clear glass H=3500 Equipment : 1 x S6614_700mA 27 W / 1900 lm
5	11 x		Kingfisher Lighting Order No. : 10w Cinep side flex 3000k (1m) Luminaire name : Cinep Equipment : 1 x 10 W / 500 lm

2.2 Summary, Exterior 1

2.2.6 Result overview, Plant Compound



General

Calculation algorithm used
 Maintenance factor

Average indirect fraction
 0.80

Plant Compound

Reference plane 6.1

Horizontal
 $\bar{E}_m$ 80.4 lx
 E_{min} 32.8 lx
 $E_{min}/\bar{E}_m (U_o)$ 0.41
 $E_{min}/E_{max} (U_d)$ 0.25
 Position 0.00 m

Major surfaces

M 6.5 (Ceiling) $\bar{E}_m$ 0 lx

U_o

Type No. Make

- | | | | |
|---|-----|----------------|------------------------------------|
| 1 | 2 x | LIGMAN | |
| | | Order No. | : JE-80031-W-8040 |
| | | Luminaire name | : JET 39 Ceiling luminaires |
| | | Equipment | : 1 x 1 COB 4000K 14 W / 1478 lm |
| 2 | 3 x | | |
| | | Order No. | : JE-30341-W-M-8040 |
| | | Luminaire name | : JET 35 Surface facade luminaires |
| | | Equipment | : 1 x 1&1 COB 4000K 27 W / 3088 lm |

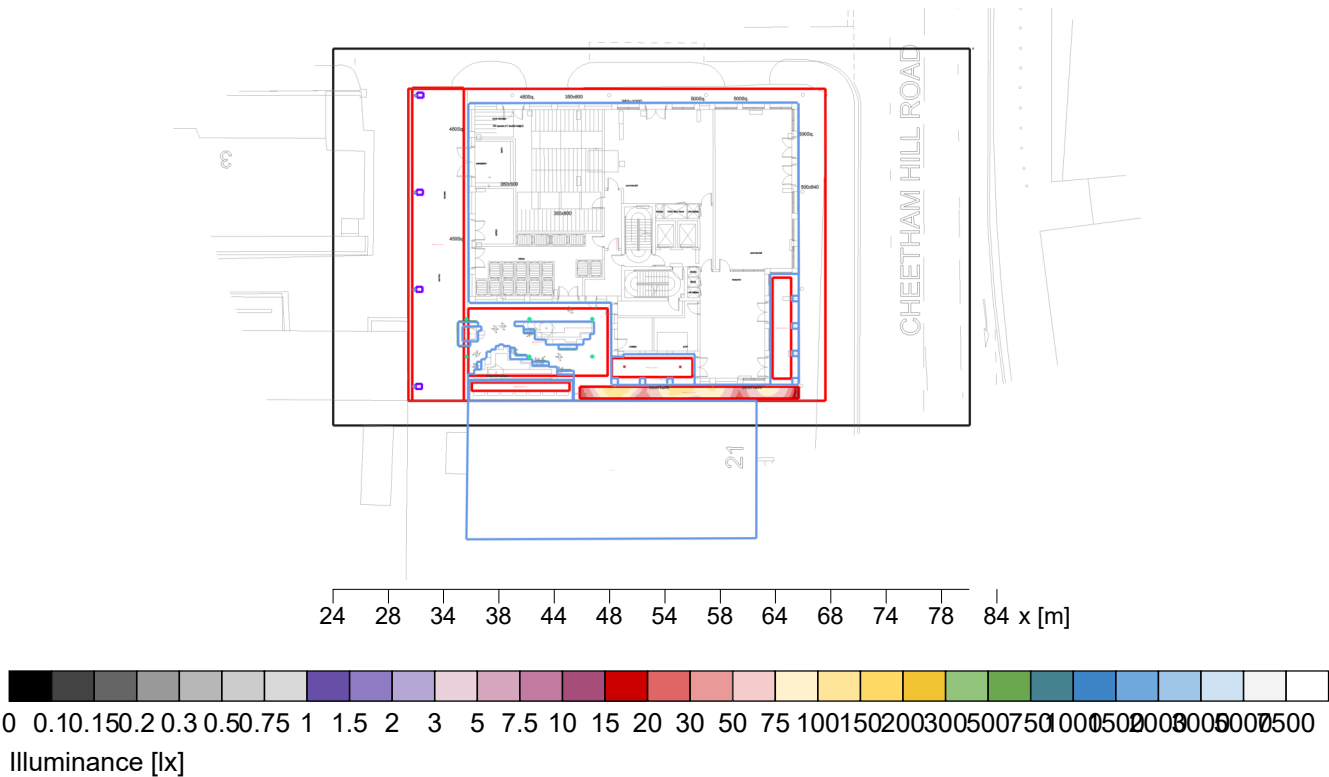
2.2 Summary, Exterior 1

2.2.6 Result overview, Plant Compound

7	4 x		Order No. : JE-30351-VW-8040 Luminaire name : JET 31 Surface facade luminaires Equipment : 1 x 1 COB 4000K 14 W / 1441 lm
3	2 x		DW Windsor Order No. : Kirium Bulkhead -16LED-4k-300mA-12W-Frosted-Medium Luminaire name : Kirium Bulkhead-3k-Medium Equipment : 1 x 16 x 4k LED 12 W / 1791 lm
6	4 x		Order No. : Daytona 8LED 4k A2 450mA UMSUG 42 0010 0000 100 Luminaire name : Daytona 8LED 4k Equipment : 1 x 8x4k 10 W / 1769 lm
4	6 x		ARCLUCE Order No. : S6617 Luminaire name : SOUL180 4K Clear glass H=3500 Equipment : 1 x S6614_700mA 27 W / 1900 lm
5	11 x		Kingfisher Lighting Order No. : 10w Cinep side flex 3000k (1m) Luminaire name : Cinep Equipment : 1 x 10 W / 500 lm

2.2 Summary, Exterior 1

2.2.7 Result overview, Alleyway



General

Calculation algorithm used
Maintenance factor

Average indirect fraction
0.80

Alleyway

$\bar{E}_m$
 E_{min}
 $E_{min}/\bar{E}_m (U_o)$
 $E_{min}/E_{max} (U_d)$
Position

Reference plane 7.1

Horizontal
73.3 lx
8.5 lx
0.12
0.06
0.00 m

Major surfaces

M 7.5 (Ceiling)

$\bar{E}_m$
0 lx

U_o

Type No. Make

- 1

2 x



LIGMAN
Order No. : JE-80031-W-8040
Luminaire name : JET 39 Ceiling luminaires
Equipment : 1 x 1 COB 4000K 14 W / 1478 lm
- 2

3 x



Order No. : JE-30341-W-M-8040
Luminaire name : JET 35 Surface facade luminaires
Equipment : 1 x 1&1 COB 4000K 27 W / 3088 lm

2.2 Summary, Exterior 1

2.2.7 Result overview, Alleyway

7 4 x Order No. : JE-30351-VW-8040
 Luminaire name : JET 31 Surface facade luminaires
 Equipment : 1 x 1 COB 4000K 14 W / 1441 lm

DW Windsor
 3 2 x Order No. : Kirium Bulkhead -16LED-4k-300mA-12W-Frosted-Medium
 Luminaire name : Kirium Bulkhead-3k-Medium
 Equipment : 1 x 16 x 4k LED 12 W / 1791 lm

6 4 x Order No. : Daytona 8LED 4k A2 450mA UMSUG 42 0010 0000 100
 Luminaire name : Daytona 8LED 4k
 Equipment : 1 x 8x4k 10 W / 1769 lm

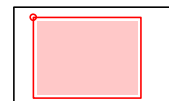
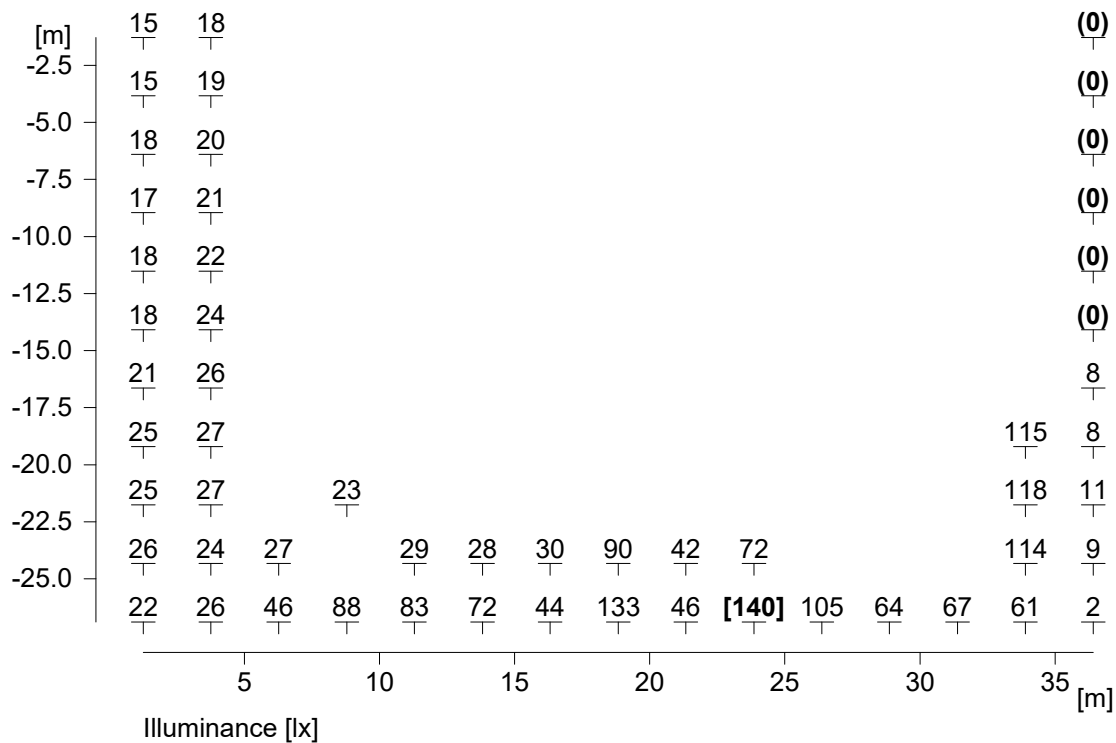
ARCLUCE
 4 6 x Order No. : S6617
 Luminaire name : SOUL180 4K Clear glass H=3500
 Equipment : 1 x S6614_700mA 27 W / 1900 lm

Kingfisher Lighting
 5 11 x Order No. : 10w Cinep side flex 3000k (1m)
 Luminaire name : Cinep
 Equipment : 1 x 10 W / 500 lm

2 Exterior 1

2.3 Calculation results, Exterior 1

2.3.1 Table, Reference plane 1.1 (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 38 lx
Minimum illuminance	E_{min}	: 0 lx
Maximum illuminance	E_{max}	: 140 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 13174.52 (0.00)
Diversity U_d	E_{min}/E_{max}	: 1 : 47971.42 (0.00)

Object : One Park Place
 Installation : Level 00
 Project number : L6150
 Date : 19.09.2023

2.3 Calculation results, Exterior 1

2.3.2 Table, Reference plane 2.1 (E)

[m]	(11.9)	18.1	20.5	20	18.7	17.3	15.9	14
27.5	13.4	18.7	21.2	20.6	19.3	18	16.6	14.7
	13.5	18.4	21.1	20.7	19.6	18.5	17.4	15.6
	13.4	18.3	20.7	20.7	19.7	18.8	17.8	16.5
	13.6	17.9	20.3	20.5	19.8	19	18.1	17
25.0	13.6	17.4	19.8	20.3	19.7	19.3	18.6	17.4
	13.1	17	19.4	20	19.7	19.5	19	17.9
	12.9	16.6	18.9	19.7	19.8	19.8	19.4	18.3
	13.2	16.6	18.8	19.6	19.8	19.9	19.6	18.6
22.5	13.1	16.9	19.3	20	20.1	20.1	19.7	18.7
	13.9	17.6	20	20.6	20.5	20.2	19.8	18.7
	14.4	18.3	20.8	21.3	20.8	20.4	19.8	18.6
	14.8	19.2	21.7	21.9	21.2	20.6	19.8	18.6
	15.4	20	22.5	22.5	21.7	20.9	20	18.7
20.0	15.7	20.6	23.1	23.1	22.2	21.3	20.4	19
	15.2	21.3	24	23.5	22.6	21.7	20.7	19.1
	15.3	21.4	24	23.8	22.9	21.9	20.9	19.4
	15.8	21.1	23.8	23.6	22.8	22	21.1	19.6
17.5	15.6	20.7	23.3	23.4	22.8	22.1	21.2	19.8
	15.1	20	22.9	23.2	22.8	22.3	21.5	20.2
	14.8	19.1	22.3	23.1	22.9	22.7	22	20.7
	14.7	18.6	21.3	22.8	23.1	23.2	22.6	21.2
15.0	14.2	18.1	20.9	22.6	23.2	23.6	23.4	22.1
	13.8	17.9	20.5	22.1	23.7	24.3	24.2	22.9
	14.9	18.3	21	22.5	24.2	25.1	25.1	23.4
	15.7	19	21.7	22.7	24.6	25.7	25.8	23.9
12.5	17.5	21	22.6	23.4	24.1	26.3	26.7	25.1
	18.8	23	24.4	24.2	24.1	26.9	27.5	26.5
	19.8	24.6	26.9	25.9	24.8	26.5	28.8	28
	20.9	26.5	28.9	28.5	26.3	27.3	25.3	23.8
	20.9	27.2	30.6	29	25.6	25.5	24.5	22.4
10.0	24.2	29.3	32.6	25.2	25.4	26.2	26.3	23.5
	27.1	32.4	31.4	26.1	26.9	28.6	30.5	28.5
	29.2	32.4	28.9	27	28.1	29.7	32.6	33.4
	29.8	34.1	29.2	27.3	27.4	30	33	35.5
7.5	28	28.6	28.6	28.2	26.2	23.4	25.6	53.6
	29.9	31.6	30.7	32.6	28.9	26.8	29.2	
	30	35.8	31.6	26.2	27	24	23.7	



Part1

Height reference plane	: 0.00 m
Average illuminance	$\bar{E}_m$: 23.2 lx
Minimum illuminance	E_{min} : 11.9 lx
Maximum illuminance	E_{max} : 53.6 lx
Uniformity U_o	$E_{min}/\bar{E}_m$: 1 : 1.96 (0.51)
Diversity U_d	E_{min}/E_{max} : 1 : 4.52 (0.22)

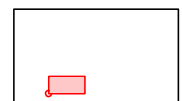
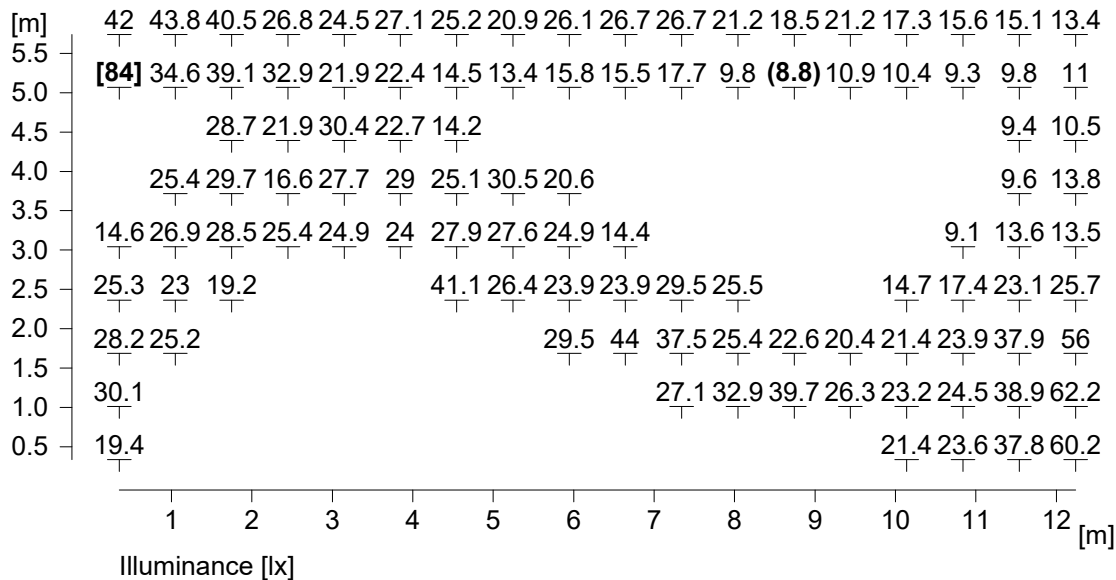
2.3 Calculation results, Exterior 1

2.3.2 Table, Reference plane 2.1 (E)



2.3 Calculation results, Exterior 1

2.3.3 Table, Reference plane 3.1 (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 25.1 lx
Minimum illuminance	E_{min}	: 8.8 lx
Maximum illuminance	E_{max}	: 84 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 2.85 (0.35)
Diversity U_d	E_{min}/E_{max}	: 1 : 9.54 (0.10)

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2.3.4 Table, Reference plane 4.1 (E)

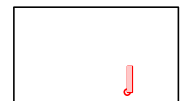


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2.3 Calculation results, Exterior 1

2.3.5 Table, Reference plane 5.1 (E)

	51	50	45	38	30	21		
	68	65	60	52	41	30		
	90	83	74	64	53	39		
[m]	119	106	91	76	63	49		
8	158	136	111	89	71	56		
	196	164	129	100	78	61		
	218	181	139	106	82	64		
7	220	184	142	107	82	64		
	203	175	140	109	83	63		
	179	160	136	111	87	64		
6	164	150	132	112	91	65		
	165	151	133	113	91	65		
	181	162	138	112	88	66		
	206	177	143	112	86	66		
5	224	188	146	111	86	68		
	[227]	189	146	112	87	69		
	217	184	145	111	85	67		
	195	171	140	112	87	65		
4	172	156	136	112	89	66		
	161	149	132	113	91	65		
	165	151	133	112	90	65		
3	184	163	137	111	87	64		
	207	177	141	109	84	66		
	221	184	142	109	85	67		
	214	179	139	107	84	66		
2	187	159	127	100	79	63		
	148	129	108	88	72	57		
	111	102	89	76	64	49		
1	84	80	72	64	53	40		
	64	63	59	51	41	31		
	48	48	44	37	29	22		
	32	31	29	25	20	(18)		
	0.2	0.4	0.6	0.8	1.0	1.2	1.4	.



Height reference plane	: 0.00 m
Average illuminance	$\bar{E}_m$: 106 lx
Minimum illuminance	E_{min} : 18 lx
Maximum illuminance	E_{max} : 227 lx
Uniformity U_o	$E_{min}/\bar{E}_m$: 1 : 5.85 (0.17)
Diversity U_d	E_{min}/E_{max} : 1 : 12.55 (0.08)

Object : One Park Place
 Installation : Level 00
 Project number : L6150
 Date : 19.09.2023

2.3 Calculation results, Exterior 1

2.3.6 Table, Reference plane 6.1 (E)

[m]	34	39	44	50	58	66	75	85	97	107	117	123	128	131	130	124	116	107	98	90	82	74	67	61	57	55	53	54	57	60	66
0.60	35	40	45	51	58	66	76	85	96	106	114	121	126	127	126	121	114	105	96	89	81	73	66	61	57	55	53	54	56	60	65
0.50																															
0.40	35	40	45	51	58	66	74	83	93	103	111	117	121	123	121	116	109	101	93	86	78	71	65	60	56	54	53	53	55	59	64
0.30																															
0.20	36	40	44	50	57	64	72	81	89	98	105	111	115	116	115	111	104	97	89	82	75	69	63	58	55	53	52	52	54	57	62
0.10	35	39	43	49	55	61	69	77	85	92	99	104	108	108	107	104	98	91	84	78	72	66	61	56	53	51	50	51	52	55	59
						1						2						3						4						5	
Illuminance [lx]																															



Part1

Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 80 lx
Minimum illuminance	E_{min}	: 33 lx
Maximum illuminance	E_{max}	: 131 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 2.45 (0.41)
Diversity U_d	E_{min}/E_{max}	: 1 : 4.00 (0.25)

2.3 Calculation results, Exterior 1

2.3.6 Table, Reference plane 6.1 (E)

72	80	88	98	106	115	123	128	[131]	130	125	118	108	97	86	75	66	58	50	43	37	(33)
71	79	87	97	106	113	120	125	128	127	123	115	106	96	86	76	67	58	51	44	39	34
69	77	85	93	102	110	116	120	123	122	118	112	103	94	84	75	66	58	51	45	39	35
67	74	82	89	97	104	110	116	117	116	113	107	99	91	81	73	65	57	50	44	39	35
64	70	77	85	92	98	105	108	109	109	105	100	94	86	78	70	62	55	49	43	38	34
				6					7					8	[m]						



Part2

2.3 Calculation results, Exterior 1

2.3.7 Table, Reference plane 7.1 (E)

[m]	23	30	34	42	55	63	77	88	99	97	105	112	119	124	122	110	139	134	130	123	110	111	102	93	80	66	58	41	44	53	60		
0.8	24	29	33	41	49	57	74	84	87	95	102	108	115	120	117	106	130	124	118	115	108	94	87	86	73	60	51	50	47	55	58		
0.6	23	29	32	37	46	53	67	74	85	91	98	104	109	113	115	130	119	115	109	106	99	88	81	71	65	53	45	45	49	52	58		
0.4	23	25	30	34	42	48	61	70	78	85	94	100	103	107	108	118	117	103	99	92	90	83	72	61	50	46	39	38	42	47	55		
0.2	23	24	27	31	37	43	56	66	73	80	86	91	97	100	101	107	105	101	88	83	80	73	61	50	40	31	33	33	37	43	50		
											2											4											6
Illuminance [lx]																																	



Part1

Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 73 lx
Minimum illuminance	E_{min}	: 9 lx
Maximum illuminance	E_{max}	: 142 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 8.59 (0.12)
Diversity U_d	E_{min}/E_{max}	: 1 : 16.62 (0.06)

2.3 Calculation results, Exterior 1

2.3.7 Table, Reference plane 7.1 (E)

68	77	74	81	90	98	103	112	[142]	139	133	128	122	117	116	117	116	109	100	76	79	85	92	99	104	107	107	102	96	88	80	73	66
64	66	73	79	87	93	98	103	128	127	126	121	115	109	108	109	108	102	95	89	79	84	90	95	100	102	102	98	92	85	78	71	65
59	64	70	76	83	88	92	96	116	116	113	110	107	102	100	100	97	93	87	83	84	81	86	91	94	96	95	92	87	82	76	69	63
60	65	67	73	78	83	87	102	104	104	102	99	95	90	88	88	85	82	78	76	78	80	82	86	88	90	89	86	82	77	72	66	60
57	61	66	71	73	77	80	91	92	92	90	88	84	80	76	72	70	69	68	70	72	75	78	80	82	83	83	80	77	72	67	62	57
						8							10													12						



Part2

2.3 Calculation results, Exterior 1

2.3.7 Table, Reference plane 7.1 (E)

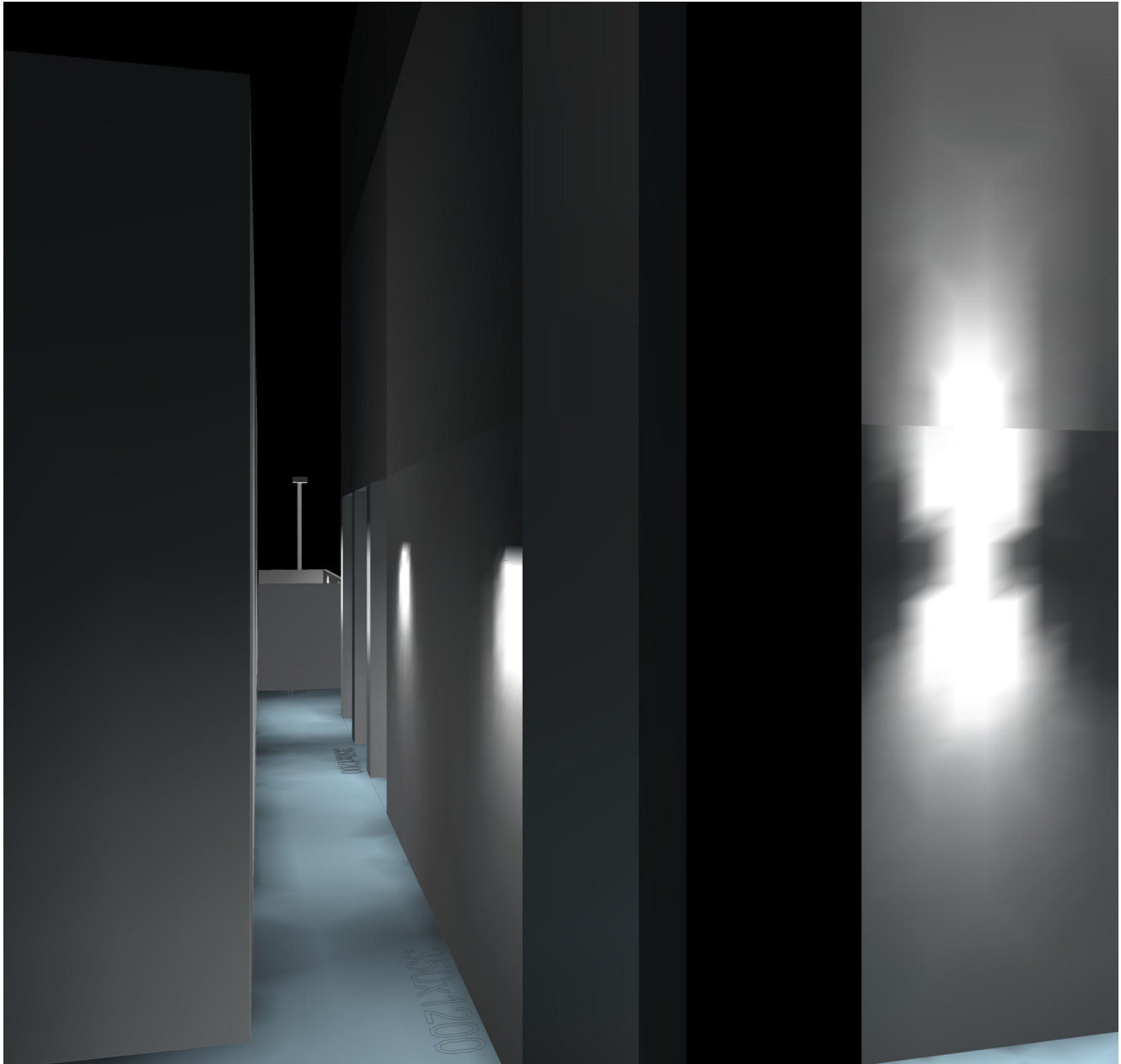
59	53	44	35	33	36	43	50	55	59	65	71	78	85	92	97	99	98	96	91	84	78	71	65	58	50	39	28	17	(9)
59	52	42	34	30	34	42	49	54	59	64	70	76	82	87	91	93	92	91	86	80	74	68	62	56	47	36	27	17	14
57	49	40	32	28	32	39	47	53	58	62	67	72	77	81	84	85	85	83	80	75	70	64	59	52	43	33	24	17	14
54	45	37	30	26	29	35	43	50	55	60	64	68	72	75	77	78	76	73	69	65	60	55	47	38	29	21	15	13	
49	40	32	26	23	26	31	38	46	52	56	60	63	66	69	70	71	71	69	67	63	59	55	49	41	33	25	18	15	13
14					16					18 [m]																			



Part3

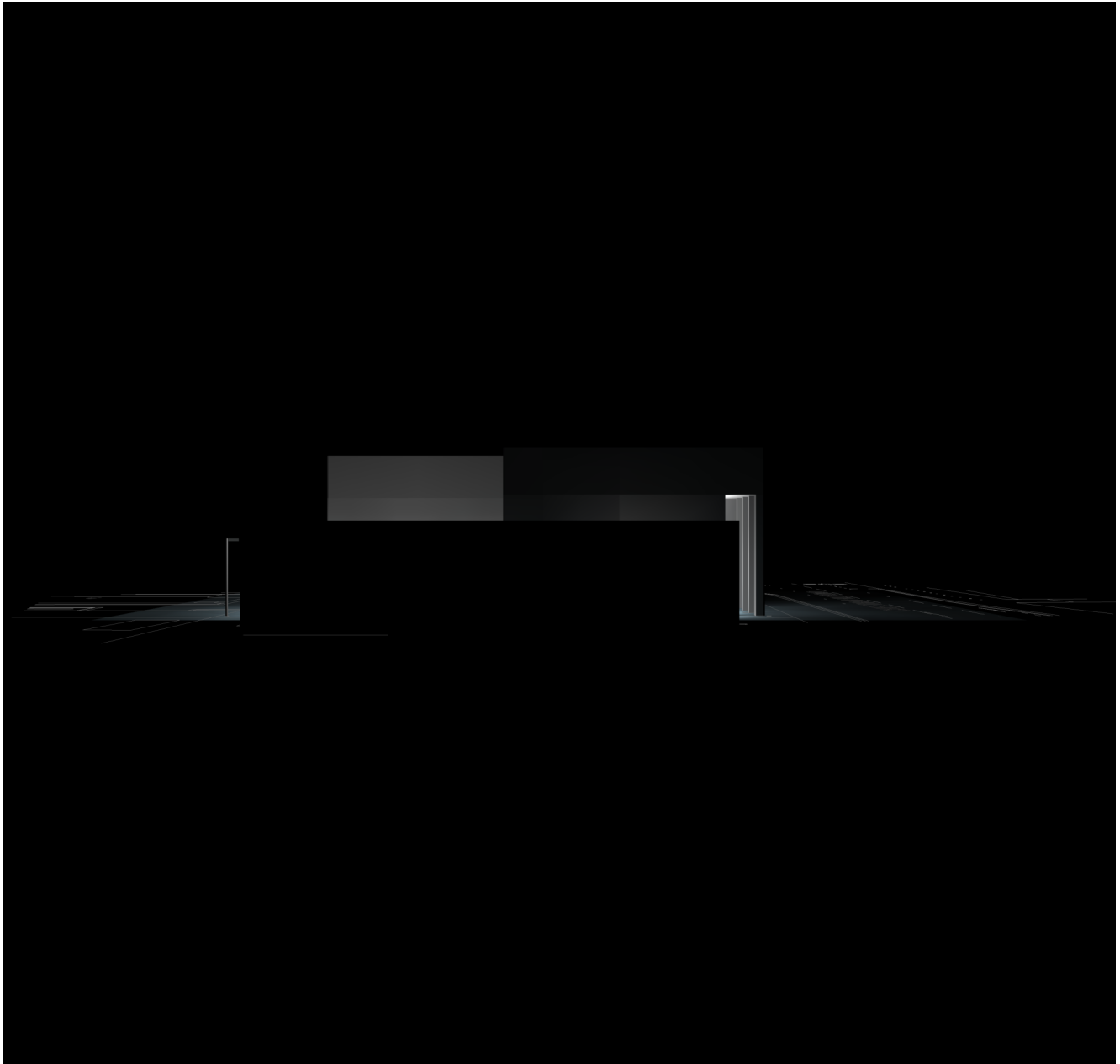
2.3 Calculation results, Exterior 1

2.3.9 3D luminance, View 1



2.3 Calculation results, Exterior 1

2.3.10 3D luminance, View from the front



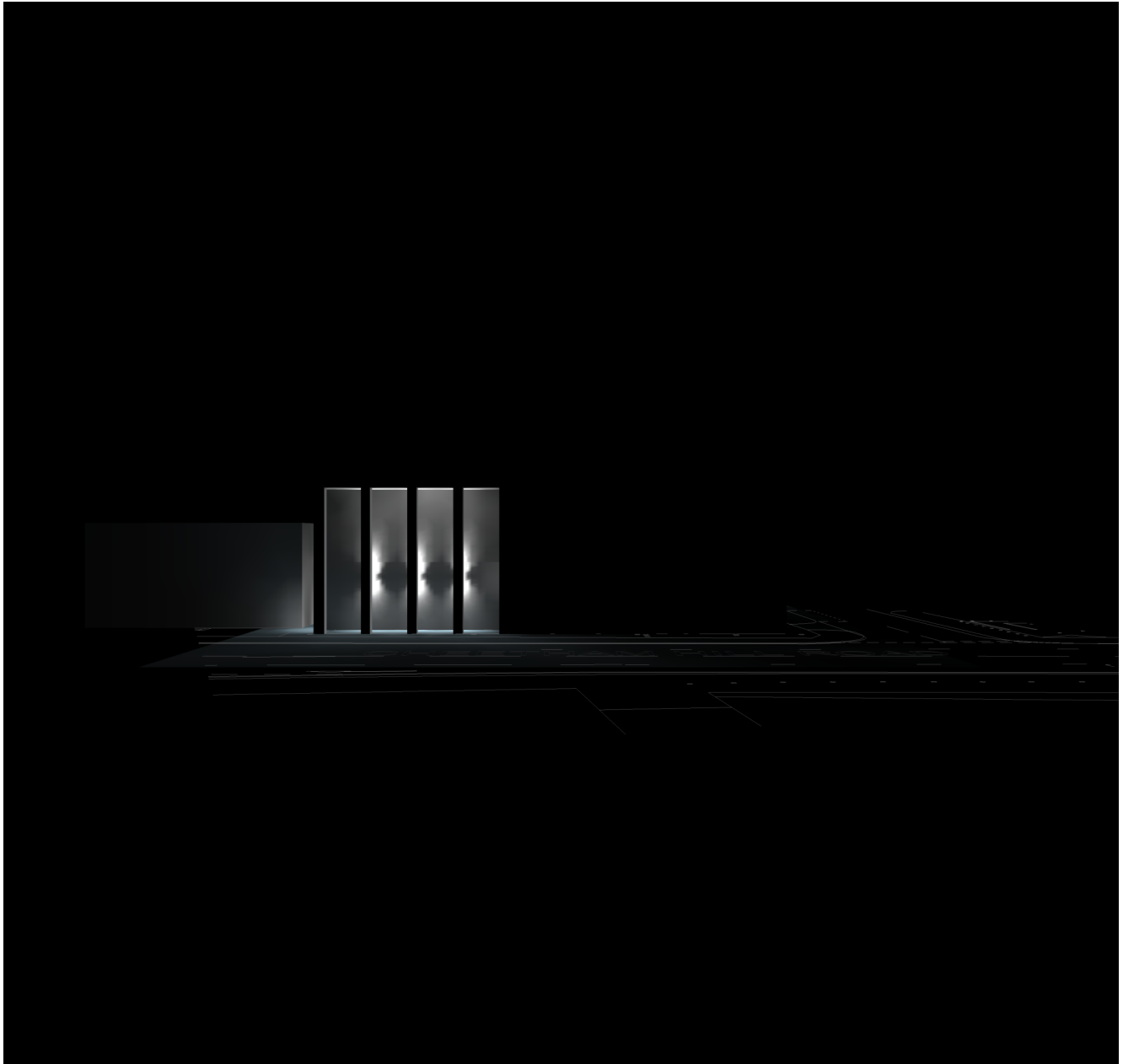
2.3 Calculation results, Exterior 1

2.3.11 3D luminance, View from the left



2.3 Calculation results, Exterior 1

2.3.12 3D luminance, View from the right





4.0 Appendix B

Level 15 External Lighting Calculations

One Park Place

Installation : Level 15

Project number : L6150

Customer :

Processed by : DC

Date : 20.09.2023

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.

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Object : One Park Place
Installation : Level 15
Project number : L6150
Date : 20.09.2023

1 Luminaire data

1.1 DW Windsor, PHAROLA BOLLARD :- ACRYL SATINE... (PHA NW N)

1.1.1 Data sheet

Manufacturer: DW Windsor

PHA NW N PHAROLA BOLLARD :- ACRYL SATINE GLAZING

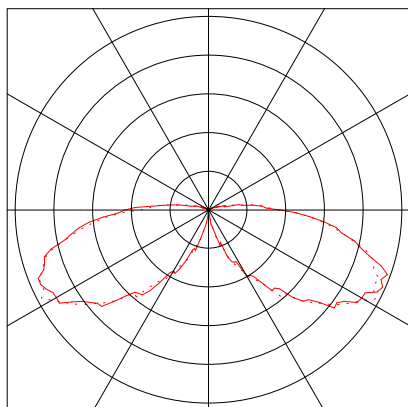
Luminaire data

Luminaire efficiency : 100%
Luminaire efficacy : 65.42 lm/W
Classification : A11 ↓91.7% ↑8.3%
CIE Flux Codes : 12 42 77 92 100
UGR 4H 8H : 26.6 / 31.2
Power : 12 W
Luminous flux : 785 lm

Equipped with

Quantity : 1
Designation : 4 x LUXEON
Tx 4K LED
Colour :
Luminous flux : 785 lm

Dimensions : 89 mm x 89 mm x 200 mm



Object : One Park Place
Installation : Level 15
Project number : L6150
Date : 20.09.2023

1 Luminaire data

1.2 DW Windsor, Garda 3LED Asym... (Garda 300 - 3LED -4k- ...)

1.2.1 Data sheet

Manufacturer: DW Windsor

Garda 300 - 3LED -4k- 4W- Asymmetric-

Garda 3LED Asym

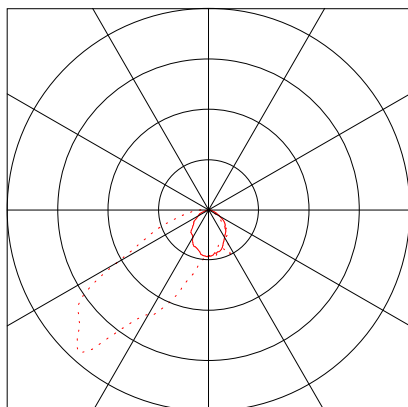
Luminaire data

Luminaire efficiency : 100%
Luminaire efficacy : 61 lm/W
Classification : A30 ↓99.2% ↑0.8%
CIE Flux Codes : 36 74 94 99 100
UGR 4H 8H : 23.6 / 30.9
Power : 4 W
Luminous flux : 244 lm

Equipped with

Quantity : 1
Designation : 3x 4K LED 4W
Colour :
Luminous flux : 244 lm

Dimensions : 25 mm x 300 mm x 30 mm



1 Luminaire data

1.3 Kingfisher Lighting, Cinep (10w Cinep side flex 3000k (1m))

1.3.1 Data sheet

Manufacturer: Kingfisher Lighting

10w Cinep side flex 3000k (1m)

Cinep

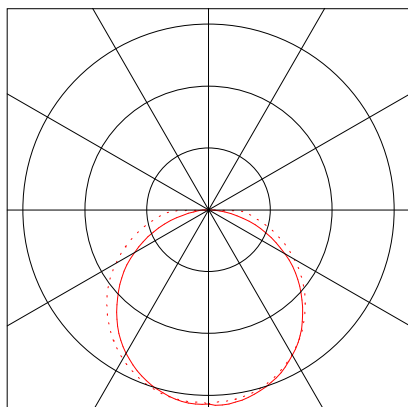
Luminaire data

Luminaire efficiency : 100%
Luminaire efficacy : 50 lm/W
Classification : A40 ↓100.0% ↑0.0%
CIE Flux Codes : 43 74 92 100 100
UGR 4H 8H : 24.6 / 27.6
Power : 10 W
Luminous flux : 500 lm

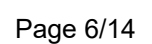
Equipped with

Quantity : 1
Designation :
Colour :
Luminous flux : 500 lm

Dimensions : 15 mm x 980 mm x 1 mm



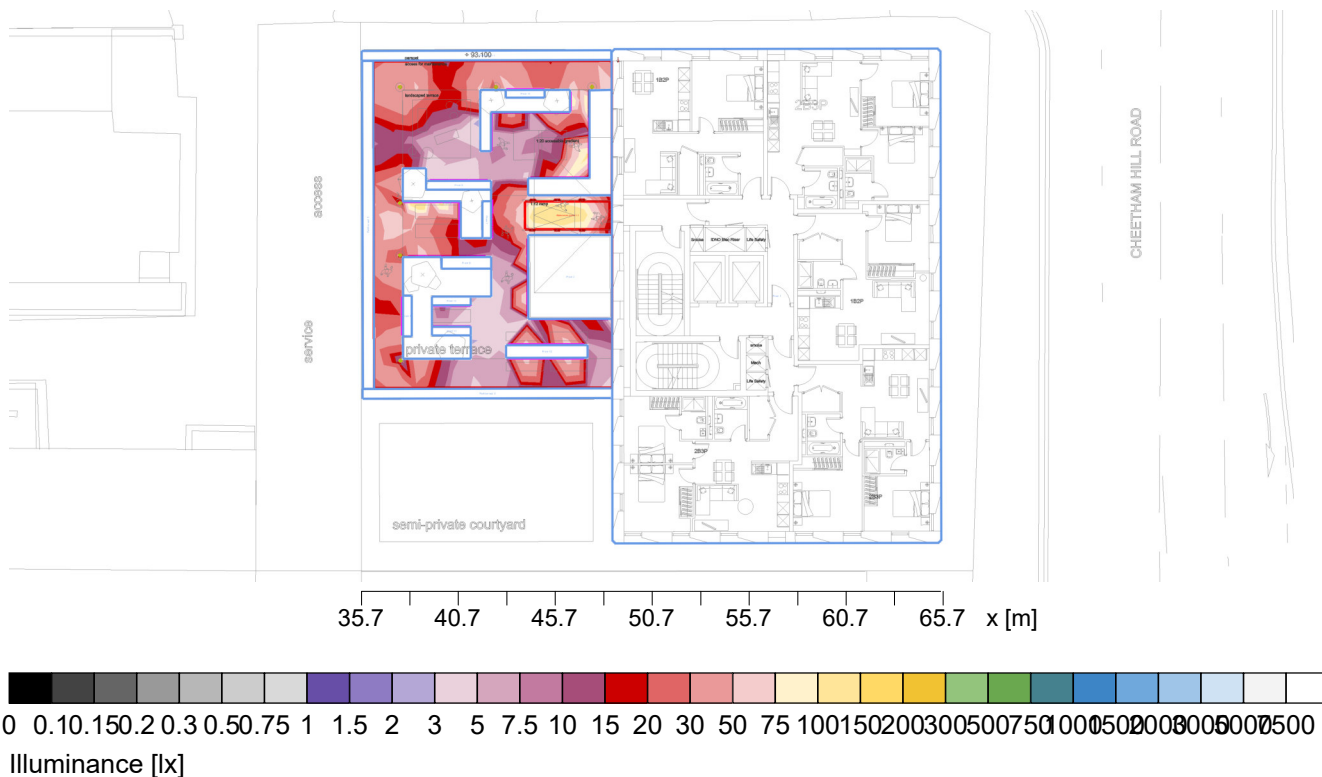
2.1.1 Floor plan



2 Exterior 1

2.2 Summary, Exterior 1

2.2.1 Result overview, Evaluation area 1



General

Calculation algorithm used
 Maintenance factor

Average indirect fraction
 0.80

Total luminous flux
 Total power
 Total power per area (206.53 m²)

32674.00 lm
 626.0 W
 3.03 W/m² (10.96 W/m²/100lx)

Evaluation area 1

Reference plane 1.1

Horizontal
 $\bar{E}_m$ 27.7 lx
 E_{min} 3.8 lx
 $E_{min}/\bar{E}_m (U_o)$ 0.14
 $E_{min}/E_{max} (U_d)$ 0.03
 Position 0.00 m

Type No. Make

DW Windsor

1 6 x
 Order No. : PHA NW N
 Luminaire name : PHAROLA BOLLARD :- ACRYL SATINE GLAZING
 Equipment : 1 x 4 x LUXEON Tx 4K LED 12 W / 785 lm

2 6 x
 Order No. : Garda 300 - 3LED -4k- 4W- Asymmetric-
 Luminaire name : Garda 3LED Asym
 Equipment : 1 x 3x 4K LED 4W 4 W / 244 lm

2 Exterior 1

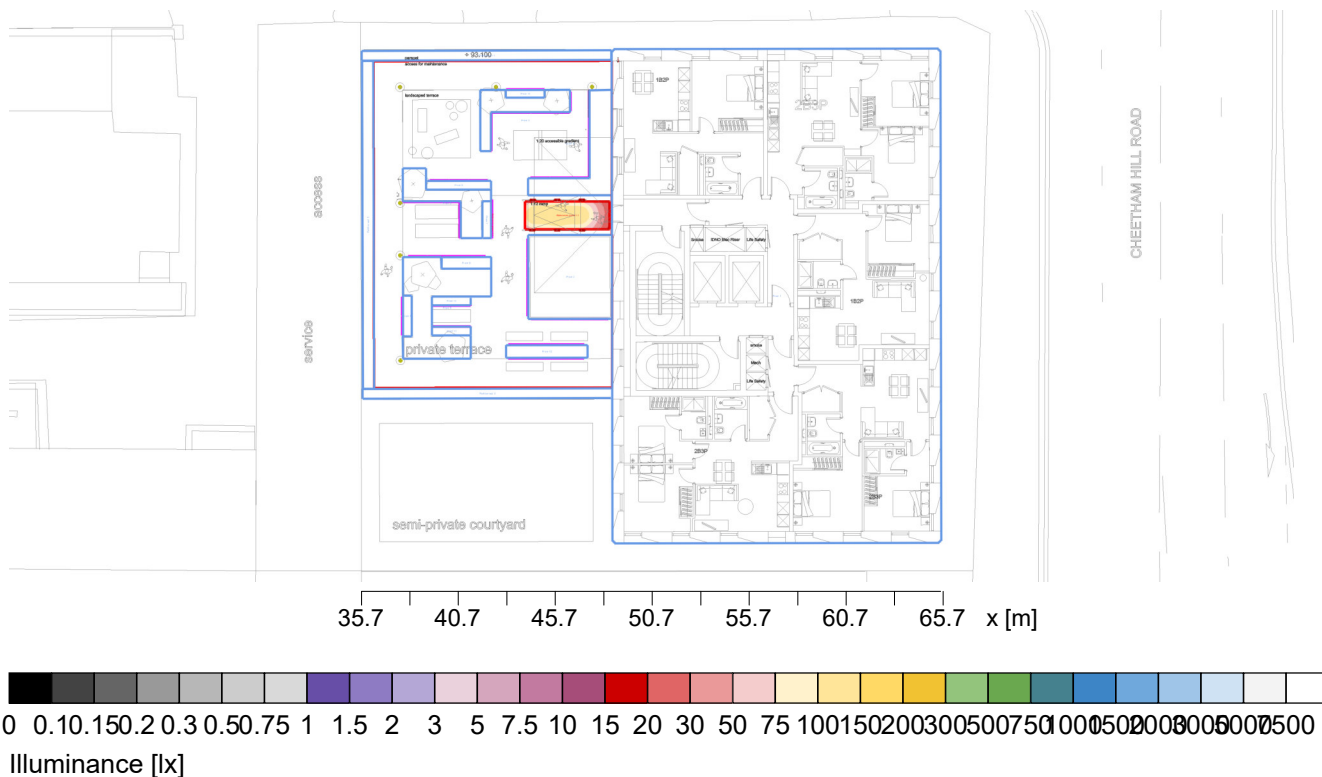
2.2 Summary, Exterior 1

2.2.1 Result overview, Evaluation area 1

		Kingfisher Lighting	
3 53 x		Order No.	: 10w Cinep side flex 3000k (1m)
		Luminaire name	: Cinep
		Equipment	: 1 x 10 W / 500 lm

2.2 Summary, Exterior 1

2.2.2 Result overview, Ramp



General

Calculation algorithm used
 Maintenance factor

Average indirect fraction
 0.80

Ramp

Reference plane 2.1

Horizontal
 $\bar{E}_m$ 94 lx
 E_{min} 21 lx
 $E_{min}/\bar{E}_m (U_o)$ 0.22
 $E_{min}/E_{max} (U_d)$ 0.15
 Position 0.00 m

Major surfaces

M 2.5 (Ceiling) $\bar{E}_m$ 0 lx

U_o

Type No. Make

DW Windsor

1 6 x
 Order No. : PHA NW N
 Luminaire name : PHAROLA BOLLARD :- ACRYL SATINE GLAZING
 Equipment : 1 x 4 x LUXEON Tx 4K LED 12 W / 785 lm

2 6 x
 Order No. : Garda 300 - 3LED -4k- 4W- Asymmetric-
 Luminaire name : Garda 3LED Asym
 Equipment : 1 x 3x 4K LED 4W 4 W / 244 lm

2.2 Summary, Exterior 1

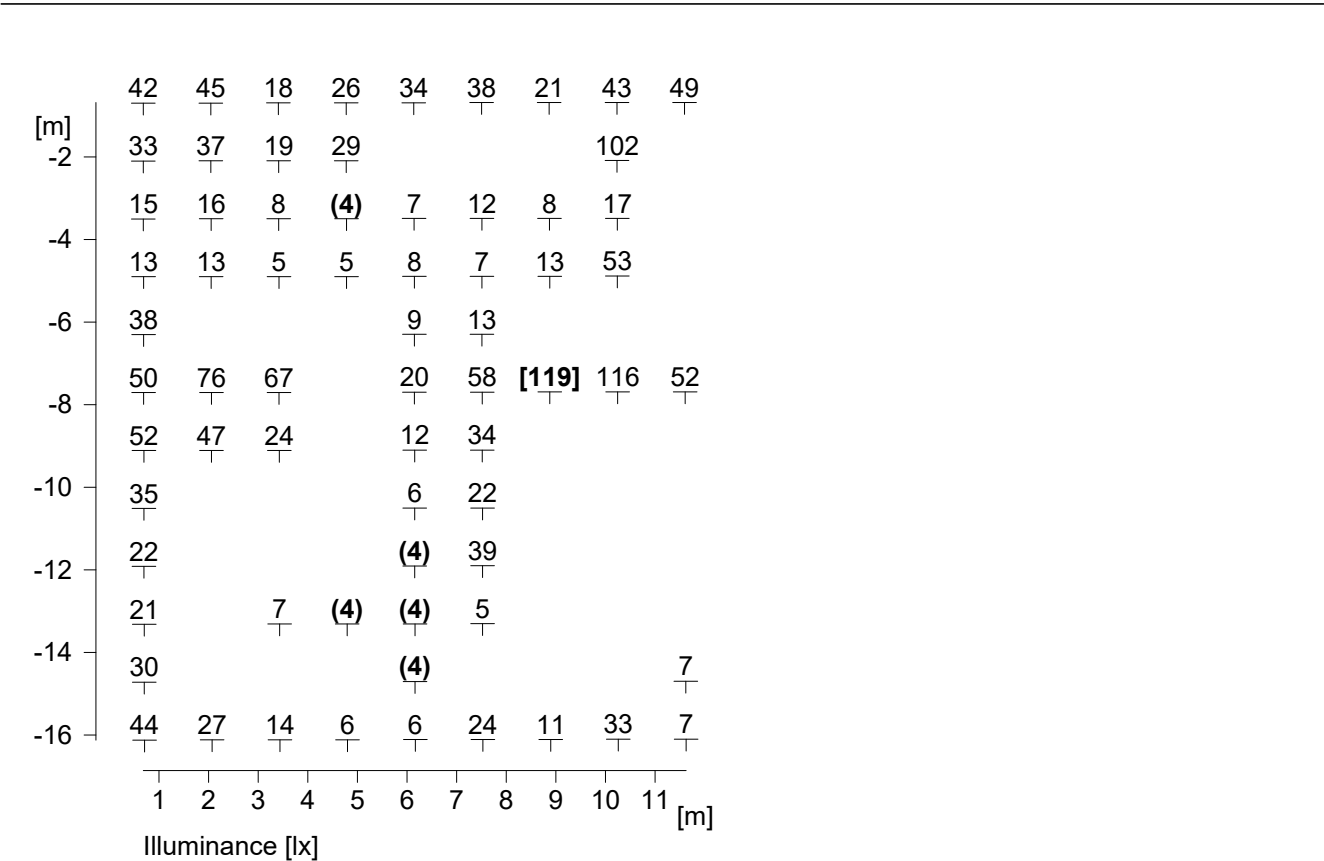
2.2.2 Result overview, Ramp

		Kingfisher Lighting	
3 53 x		Order No.	: 10w Cinep side flex 3000k (1m)
		Luminaire name	: Cinep
		Equipment	: 1 x 10 W / 500 lm

2 Exterior 1

2.3 Calculation results, Exterior 1

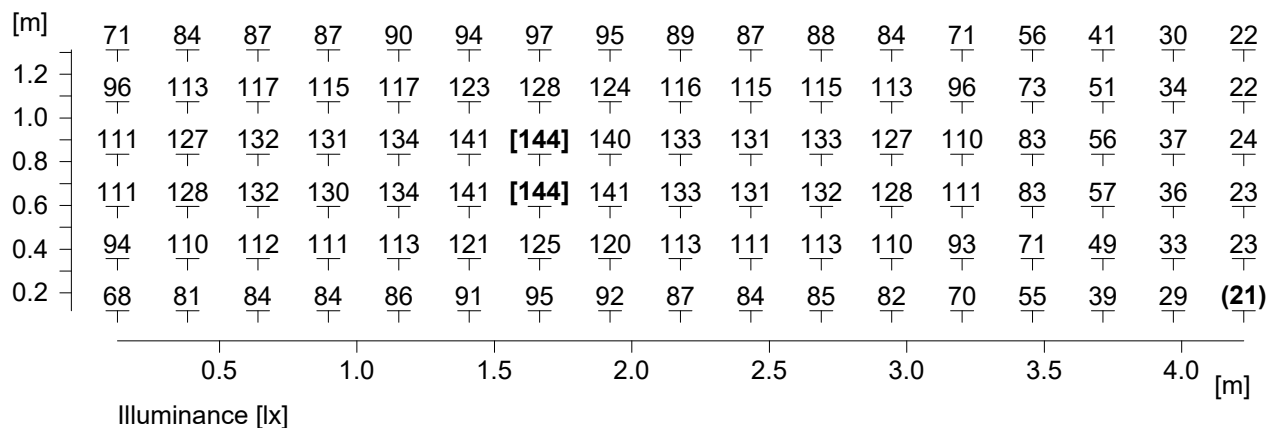
2.3.1 Table, Reference plane 1.1 (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 28 lx
Minimum illuminance	E_{min}	: 4 lx
Maximum illuminance	E_{max}	: 119 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 7.21 (0.14)
Diversity U_d	E_{min}/E_{max}	: 1 : 31.03 (0.03)

2.3 Calculation results, Exterior 1

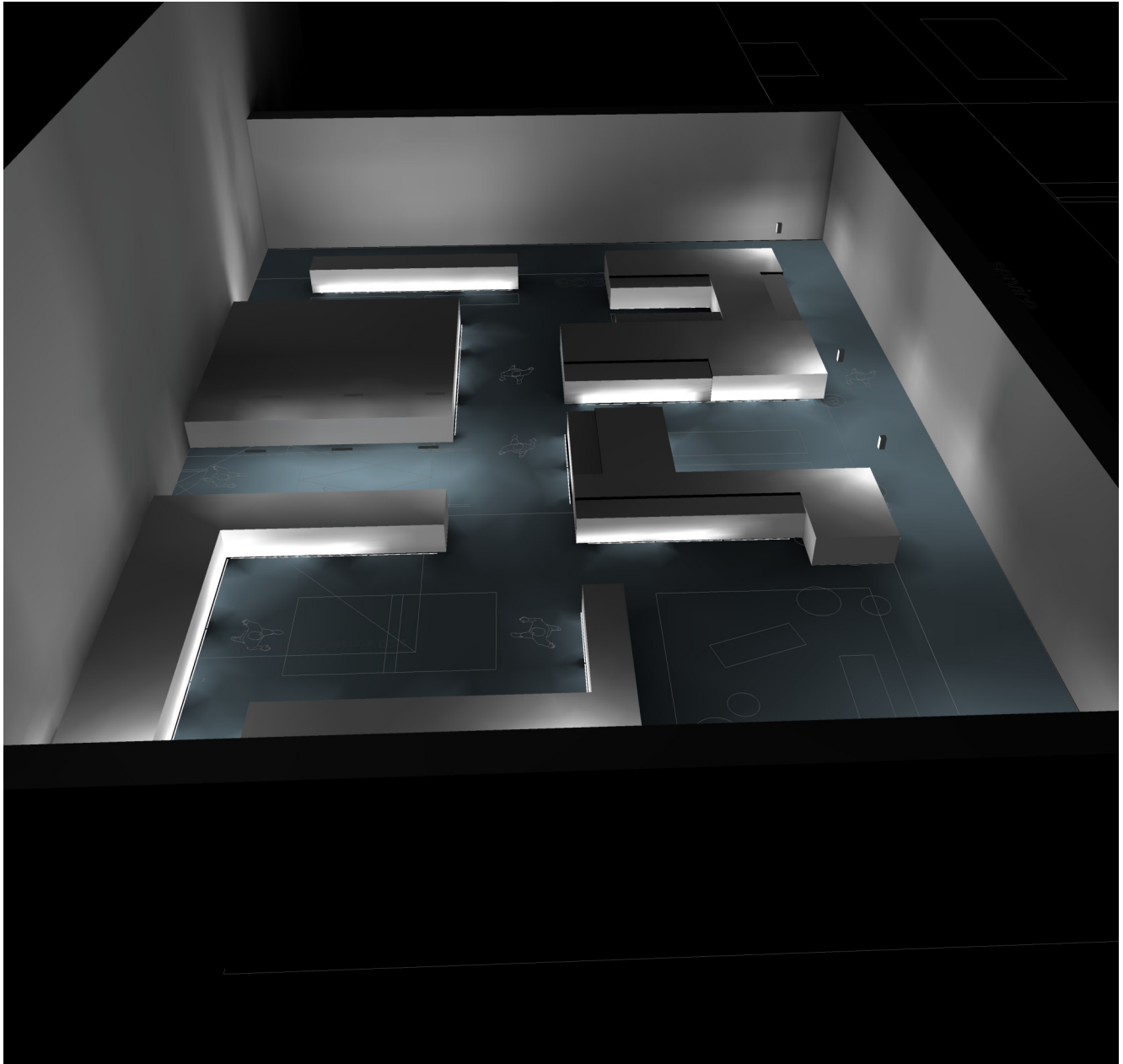
2.3.2 Table, Reference plane 2.1 (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 94 lx
Minimum illuminance	E_{min}	: 21 lx
Maximum illuminance	E_{max}	: 144 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 4.46 (0.22)
Diversity U_d	E_{min}/E_{max}	: 1 : 6.86 (0.15)

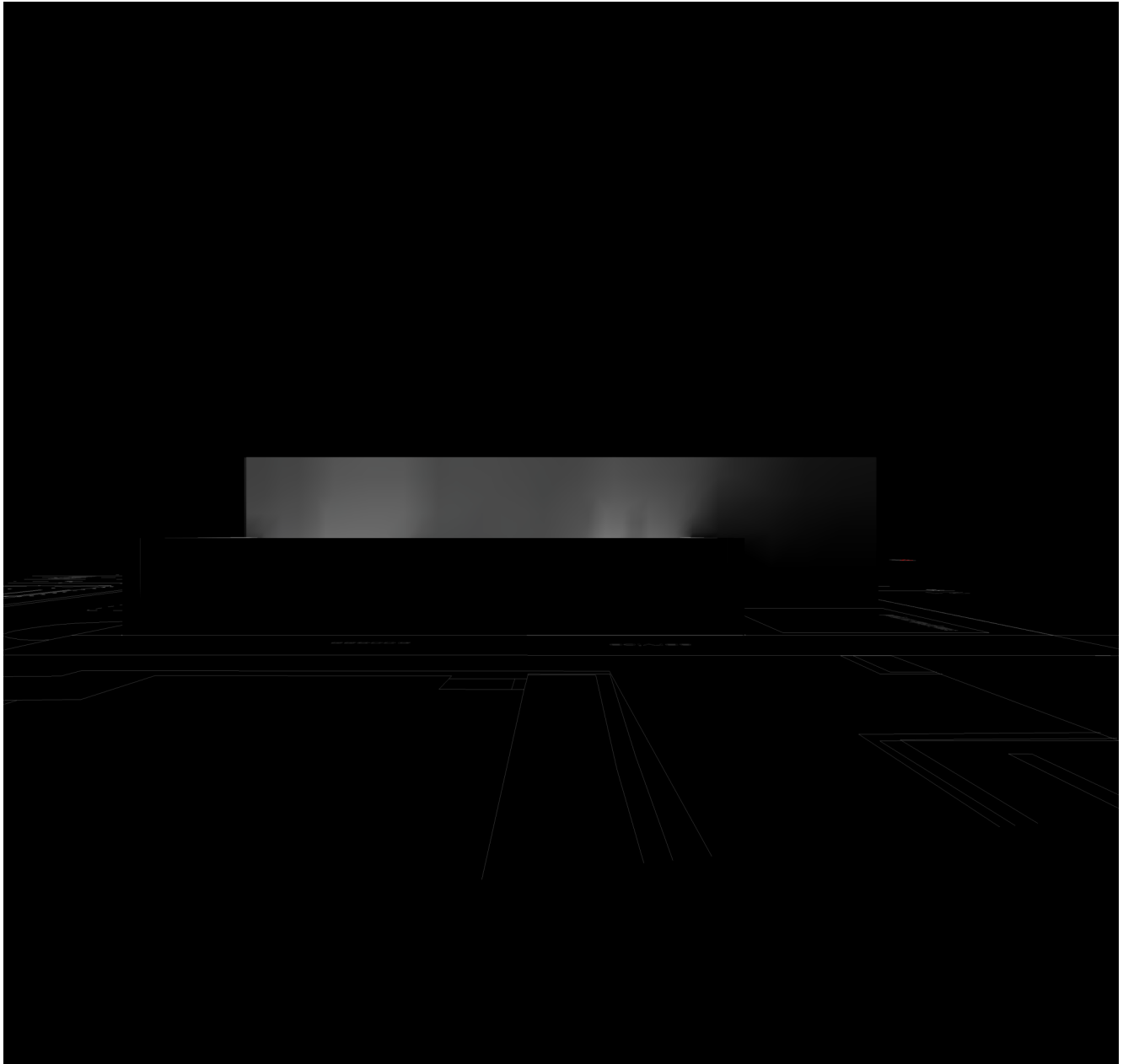
2.3 Calculation results, Exterior 1

2.3.3 3D luminance, View 1



2.3 Calculation results, Exterior 1

2.3.5 3D luminance, View from the left





5.0 Appendix C

External Lighting Drawing

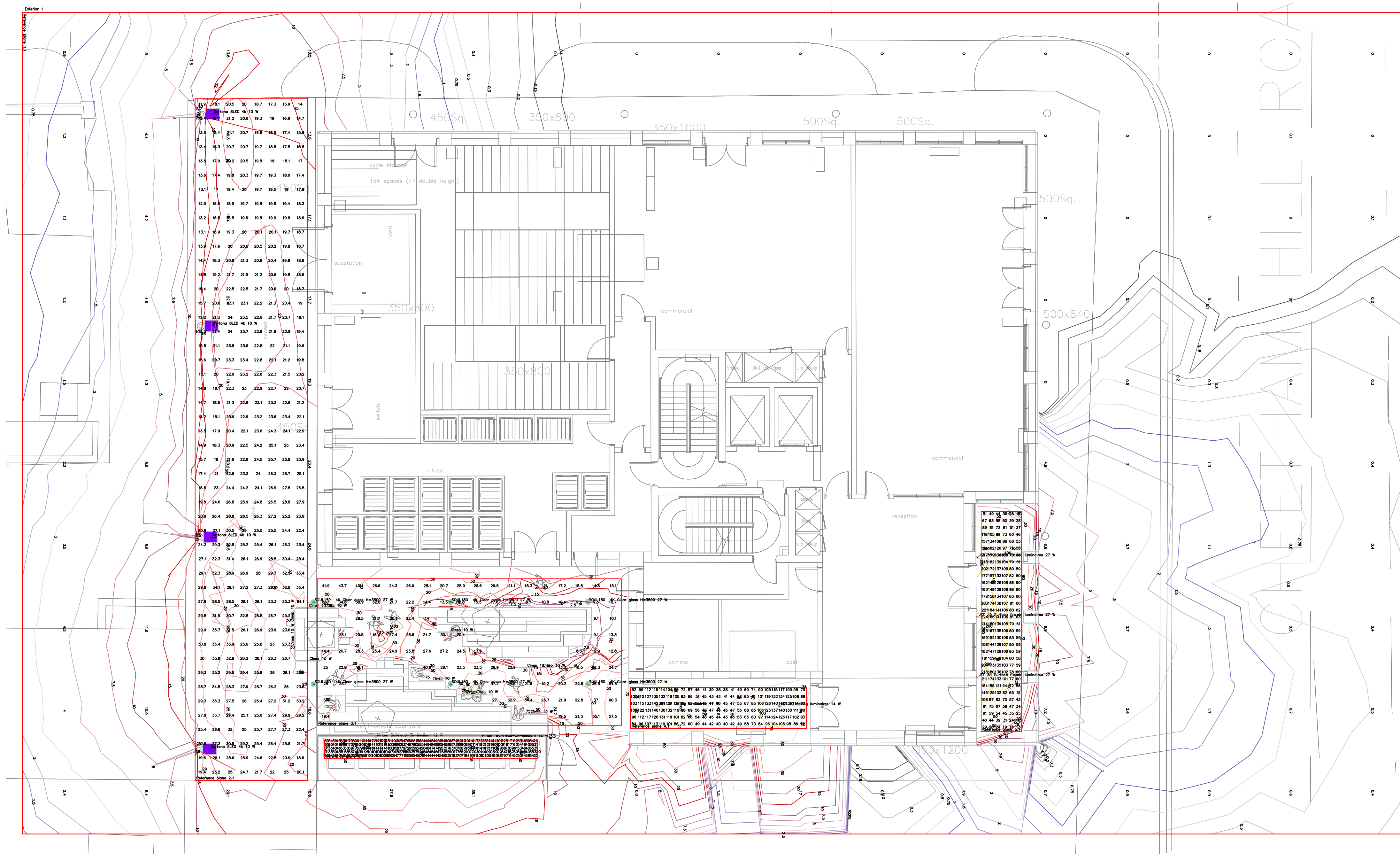


EXTERNAL LIGHTING SCHEDULE – LEVEL 00

Symbol	Quantity	Article number	Article name	Equipment
			JET 39 Ceiling luminaires	1x1 COB 400K 14 W
		JE-30341-W-M-8040	JET 35 Surface facade luminaires	1x1x1 COB 4000K 27 W
		Kiriium Bulkhead -18LED-4k-300mA-12W -Frosted-Medium	Kiriium Bulkhead-3k-Medium	1x16 x 4k LED 12 W
		Daytona BLEd 4k A2 450mA UMSG 42 0010 0000 100	Daytona BLEd 4k	1x8x4k 10 W
		S6617	SQUL180 4K Clear glass H=3500	1xS6614_700mA 27 W
		10w Cinop side flex 3000K (1m)	Cinop	1x 10 W

EXTERNAL LIGHTING SCHEDULE – LEVEL 15

Symbol	Quantity	Article number	Article name	Equipment
		JE-80031-W-8040	JET 39 Ceiling luminaires	1x1 COB 4000K 14 W
		JE-30341-W-M-8040	JET 35 Surface facade luminaires	1x1x1 COB 4000K 27 W
		Kirium Bulkhead -16LED-4k-300mA-12W -Frosted-Medium	Kirium Bulkhead-3k-Medium	1x1x6 4k LED 12 W
		Daytona 8LED 4k A2 4500mA USMUG 42 0010 0000 100	Daytona 8LED 4k	1x8x4k 10 W
		S6617	SQUL180 4K Clear glass H=3500	1xS6614_700mA 27 W
		10w Cinop side flex 3000K (1m)	Cinop	1x 10 W



Revisions				
Index	Description	Drawn & Chk by	Rev'd by	Date
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Architect

hodder+partners

Client

Benjamin Property Ltd

STAGE 2

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Project Title

PARK PLACE
MANCHESTER

Drawing Title

ELECTRICAL SERVICES TYPICAL EXTERNAL LIGHTING LAYOUT

Project No 6150

Drawn & Checked by DC

Reviewed by MT

Date SEPTEMBER 2023

Scale 1:100

Drawing No. 6150-FUT-XX-XX-DR-E-9701 Rev. P01