

Sovereign Business Park Huyton Exterior

Installation : Proposed Lighting Design

Project number : LD2421

Customer : Electric Center, Bolton

Processed by : Will Sheard

Date : 12.09.2023

Project description:

Design based on the information provided and aimed to achieve EN 12464-1.11.2021 or general SLL(CIBSE) guidelines, specified on results overview page for each room/area. Requested levels differ from standard guidelines, we aim to achieve best possible results with the requested levels.

Luminaires:

EX1E (Green Arrow) - Lumo 25W CCT (4000K) Wide Beam Asymmetric Wallpack IP65 Emergency

EX2 (Light/Dark Blue) - Skyline Virtus 100W 4000K Asymmetric Floodlight (Product 11485 switched between 50W/100W as needed).

EX3 (Cyan blue arrow) - Skyline Virtus 200W 4000K Asymmetric Floodlight

EX4 (Red arrow) - Alto 50W 4000K NEMA Streetlight IP66

EX5 (Pink arrow) - Alto 75W 4000K NEMA Streetlight IP66

EX1E are mounted at 2.5m AFFL. All other fittings have been calculated at 8.0m AFFL mounted on walls or columns. Loading areas for the G units achieve above 50 lux in the first 20m. To achieve 50 lux across the entire area output of floodlights would need to increase potentially over lighting the first 20m to approximately 100 lux and lowering uniformity. One area has low uniformity ('Area below F and C units' as part of the Loading Area overview). This is because using floodlighting will dramatically increase the spillage into neighbouring properties, therefore type EX1E has been used to illuminate the first 2.0m of the perimeter as though it is a walkway.

We have also shown day 1 resulting horizontal spillage figures for your consideration and approval.

Full installation, vertical tilt angles and aiming coordinates guidance drawings can be provided on request when an order has been placed.

Aiming coordinates and tilt angles for all floodlights must be confirmed with lighting design department prior to on-site installation day.

Engineer assessment of column capabilities required to understand if it is possible to mount proposed floodlights on the installed columns.

Suitable columns or any additional brackets (if required) are excluded and to be provided by others.

If our proposals are based on Google Maps, photographs or unscaled drawings, results are indicative only and full site survey will be required prior to placing an order.

Please verify usage and target lux levels (specified on results overview page), dimensions, heights and if all areas requiring lighting design are included. Any assumptions made at design stage should be verified prior to ordering and please do not hesitate to contact us if any alterations or additional details required.

Any additional luminaires for the above will be subject to an additional cost.

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.



Luminaire data

BELL Lighting Limited, Lumo 25W CCT (4000K) Wide Be... (!EX1E 11501)

Data sheet

Manufacturer: BELL Lighting Limited

!EX1E 11501 Lumo 25W CCT (4000K) Wide Beam Asymmetric Wallpack IP65 Emergency

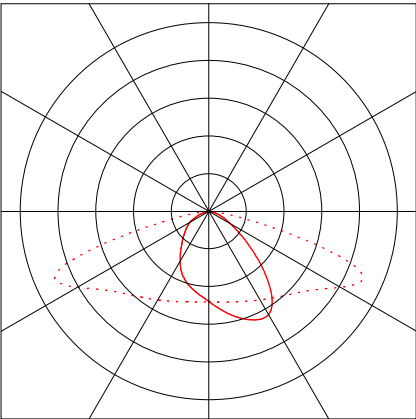
Luminaire data

Luminaire efficiency : 100%
Luminaire efficacy : 134.17 lm/W
Classification : A40 ↓100.0% ↑0.0%
CIE Flux Codes : 40 74 97 100 100
UGR 4H 8H : 25.1 / 35.4
Power : 23 W
Luminous flux : 3086 lm

Equipped with

Quantity : 1
Designation : LED 840
Colour : 4000K
Luminous flux : 3086 lm
Colour reproduction : 80

Dimensions : 238 mm x 119 mm x 212 mm



Emergency Lighting

Light source from normal operation with reduced flux
Luminous flux : 283 lm



Luminaire data

BELL Lighting Limited, Skyline Virtus 100W 4000K Asy... (!EX2 11485)

Data sheet

Manufacturer: BELL Lighting Limited

!EX2 11485 Skyline Virtus 100W 4000K Asymmetric Floodlight

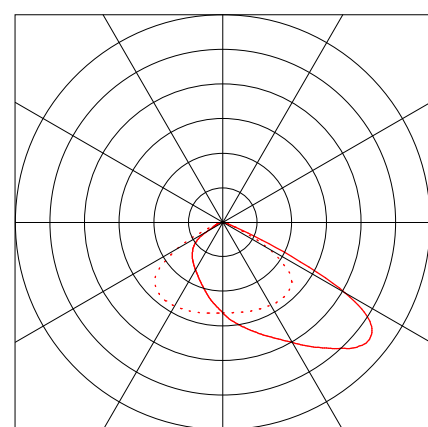
Luminaire data

Luminaire efficiency	: 100%
Luminaire efficacy	: 151.58 lm/W
Classification	: A40 ↓100.0% ↑0.0%
CIE Flux Codes	: 44 88 99 100 100
UGR 4H 8H	: 37.8 / 32.7
Power	: 102 W
Luminous flux	: 15461 lm

Equipped with

Quantity : 1
Designation : LED 840
Colour : 4000K
Luminous flux : 15461 lm
Colour reproduction : 80

Dimensions : 245 mm x 265 mm x 65 mm





Luminaire data

BELL Lighting Limited, Skyline Virtus 200W 4000K Asy... (!EX3 11489)

Data sheet

Manufacturer: BELL Lighting Limited

!EX3 11489 Skyline Virtus 200W 4000K Asymmetric Floodlight

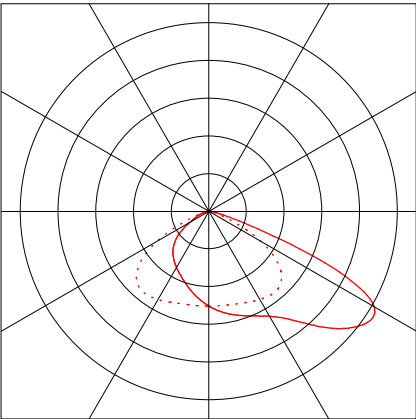
Luminaire data

Luminaire efficiency : 100%
Luminaire efficacy : 152.12 lm/W
Classification : A40 ↓100.0% ↑0.0%
CIE Flux Codes : 41 82 99 100 100
UGR 4H 8H : 39.5 / 33.1
Power : 199.4 W
Luminous flux : 30333 lm

Equipped with

Quantity : 1
Designation : LED 840
Colour : 4000K
Luminous flux : 30333 lm
Colour reproduction : 80

Dimensions : 320 mm x 350 mm x 75 mm





Luminaire data

BELL Lighting Limited, Alto 50W 4000K NEMA Streetlig... (!EX4 11701)

Data sheet

Manufacturer: BELL Lighting Limited

!EX4 11701 Alto 50W 4000K NEMA Streetlight IP66

Luminaire data

Luminaire efficiency

Luminaire efficacy

Classification

CIE Flux Codes

UGR 4H 8H

Power

Luminous flux

: 100%

: 160.63 lm/W

: A30 ↓100.0% ↑0.0%

: 37 72 96 100 100

: 26.3 / 36.9

: 49 W

: 7871 lm

Equipped with

Quantity

Designation

Colour

Luminous flux

Colour reproduction

: 1

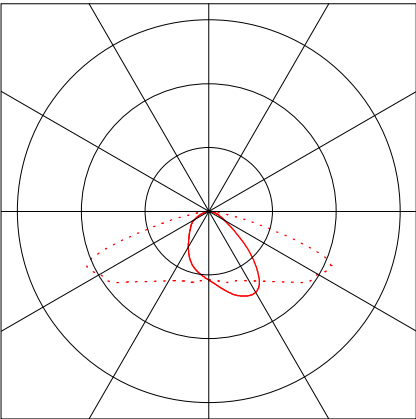
: LED 740

: 4000K

: 7871 lm

: 70

Dimensions : 146 mm x 523 mm x 134 mm





Luminaire data

BELL Lighting Limited, Skyline Virtus 50W 4000K Asym... (!EX2 11485)

Data sheet

Manufacturer: BELL Lighting Limited

!EX2 11485 Skyline Virtus 50W 4000K Asymmetric Floodlight

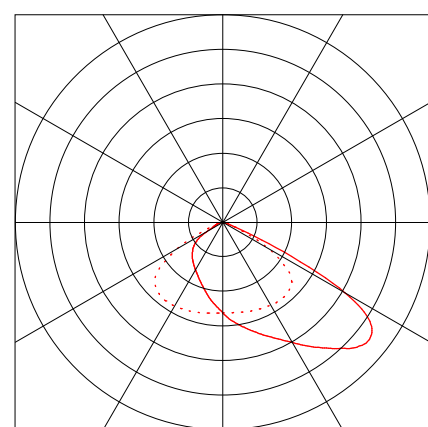
Luminaire data

Luminaire efficiency	: 100%
Luminaire efficacy	: 154.6 lm/W
Classification	: A40 ↓100.0% ↑0.0%
CIE Flux Codes	: 44 88 99 100 100
UGR 4H 8H	: 35.4 / 30.3
Power	: 50.2 W
Luminous flux	: 7761 lm

Equipped with

Quantity : 1
Designation : LED 840
Colour : 4000K
Luminous flux : 7761 lm
Colour reproduction : 80

Dimensions : 245 mm x 265 mm x 65 mm





Luminaire data

BELL Lighting Limited, Alto 75W 4000K NEMA Streetlig... (!EX5 11702)

Data sheet

Manufacturer: BELL Lighting Limited

!EX5 11702 Alto 75W 4000K NEMA Streetlight IP66

Luminaire data

Luminaire efficiency

Luminaire efficacy

Classification

CIE Flux Codes

UGR 4H 8H

Power

Luminous flux

: 100%

: 160.51 lm/W

: A30 ↓100.0% ↑0.0%

: 35 69 95 100 100

: 26.2 / 37.8

: 76 W

: 12199 lm

Equipped with

Quantity

Designation

Colour

Luminous flux

Colour reproduction

: 1

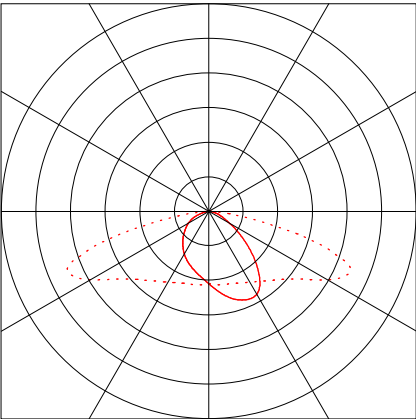
: LED 740

: 4000K

: 12199 lm

: 70

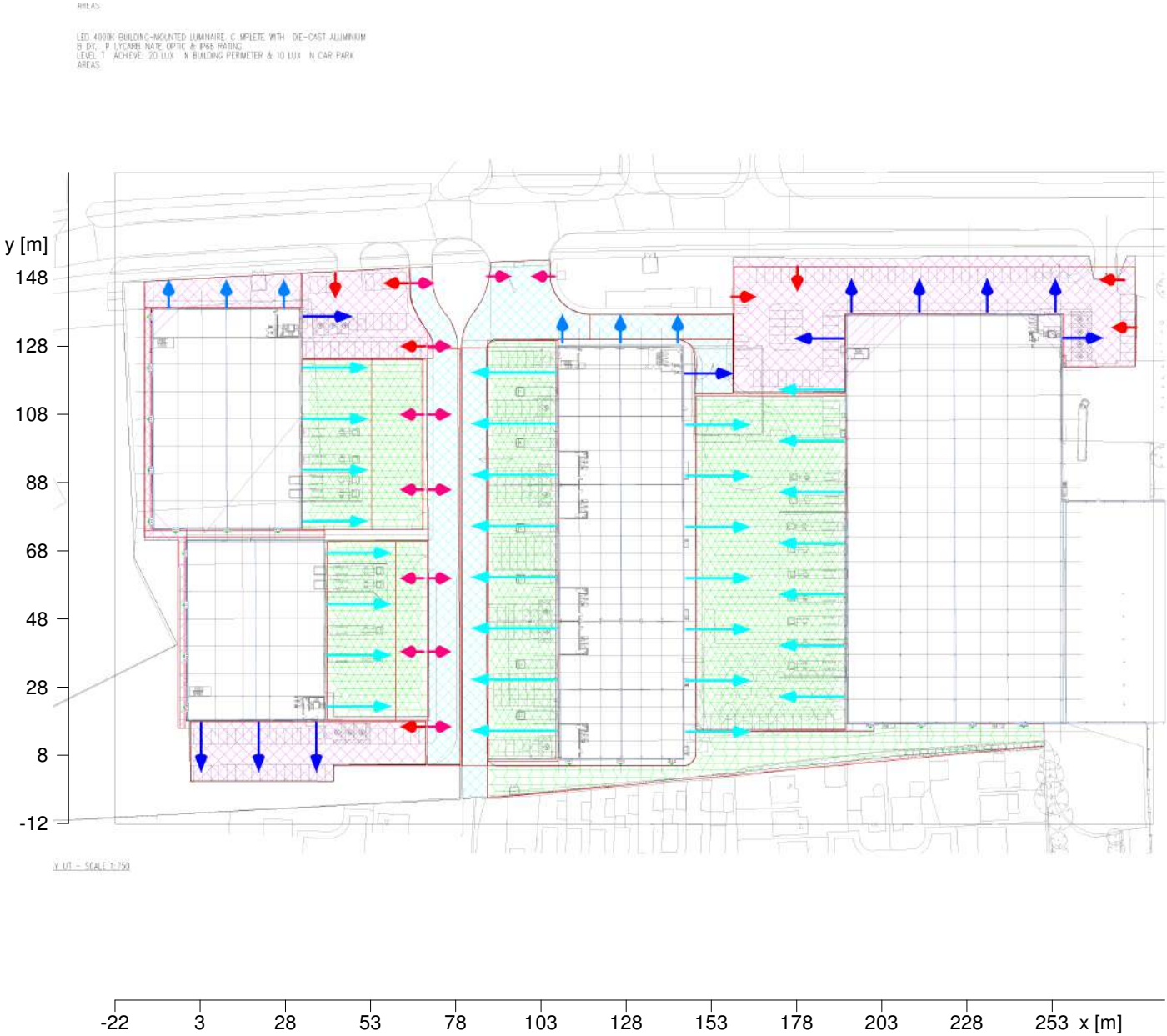
Dimensions : 174 mm x 629 mm x 135 mm



Exterior design layout

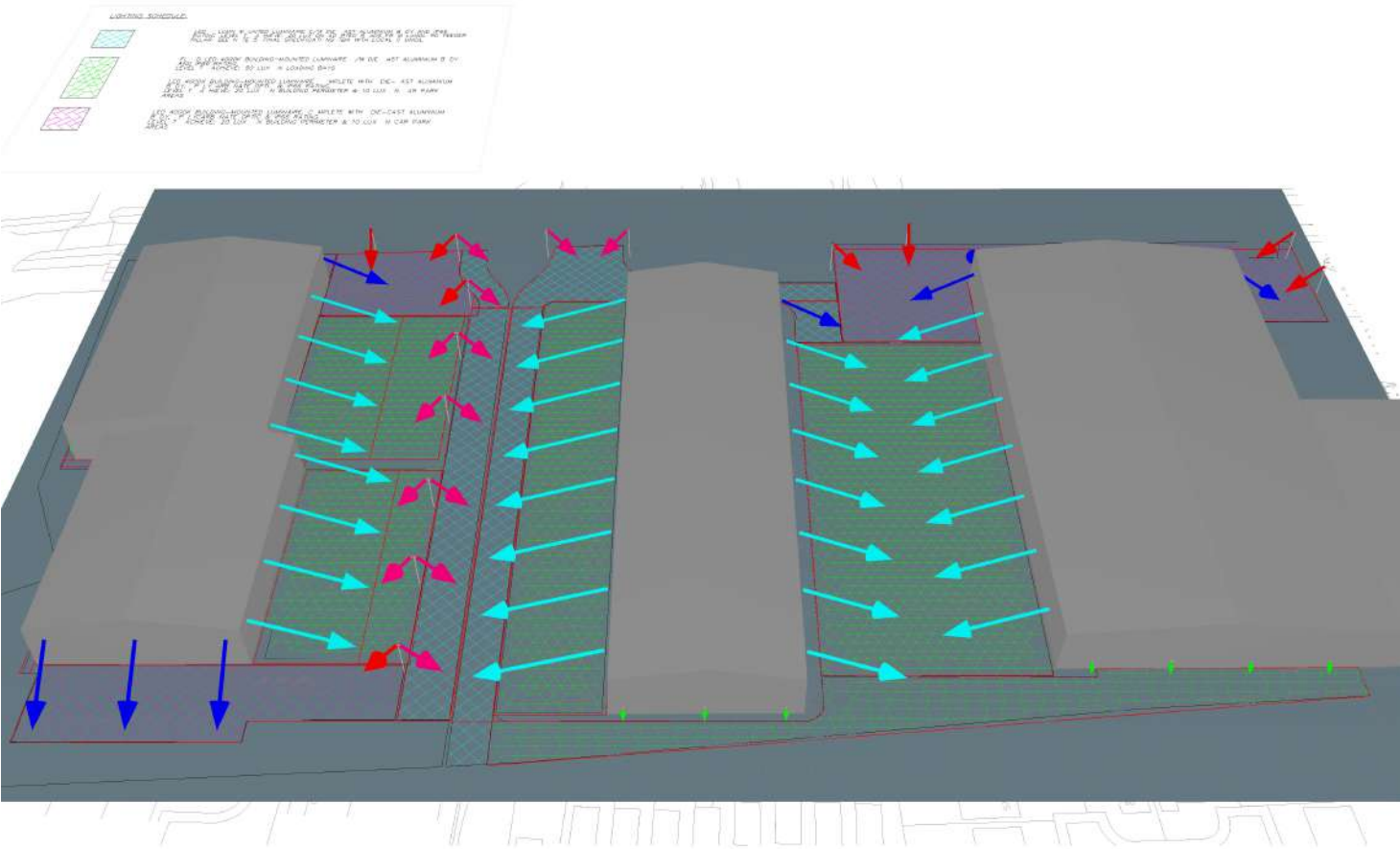
Description, Exterior design layout

Floor plan



Description, Exterior design layout

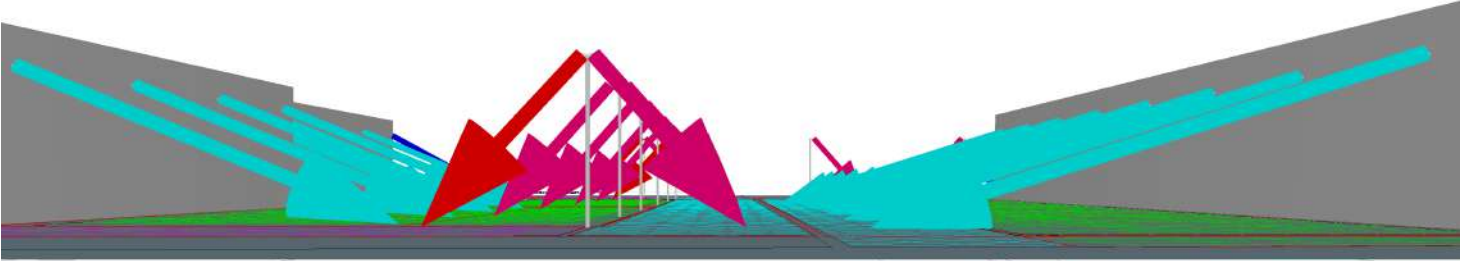
3D view, Visualisation A





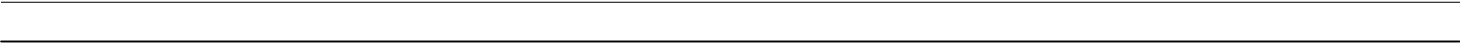
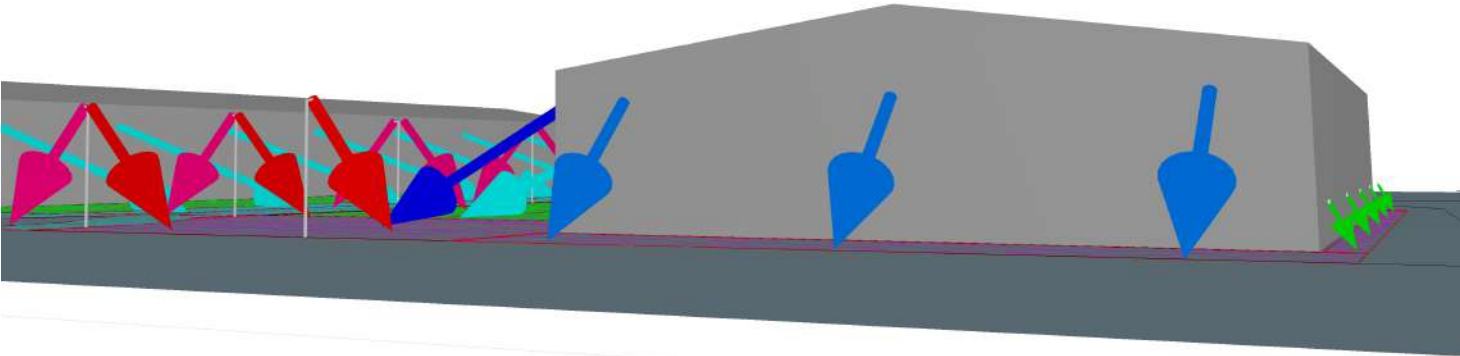
Description, Exterior design layout

3D view, Visualisation B





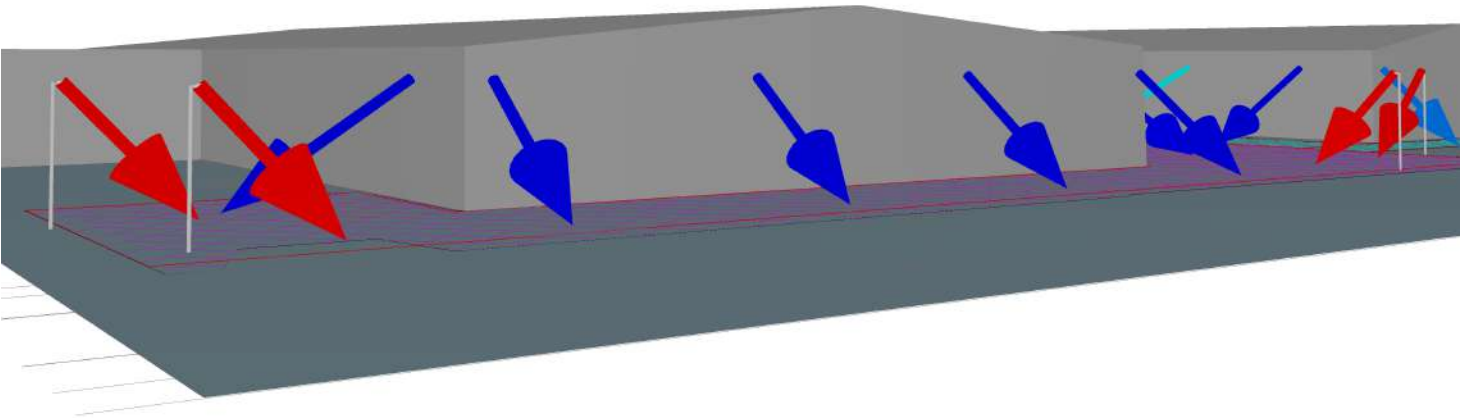
Description, Exterior design layout
3D view, Visualisation C





Description, Exterior design layout

3D view, Visualisation D

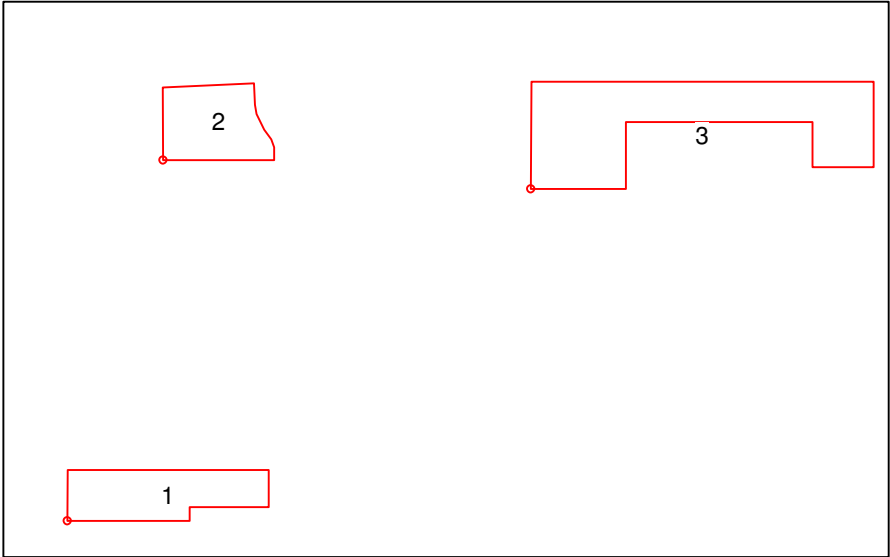




Exterior design layout

Summary, Exterior design layout

Result overview, Carpark overview (1)



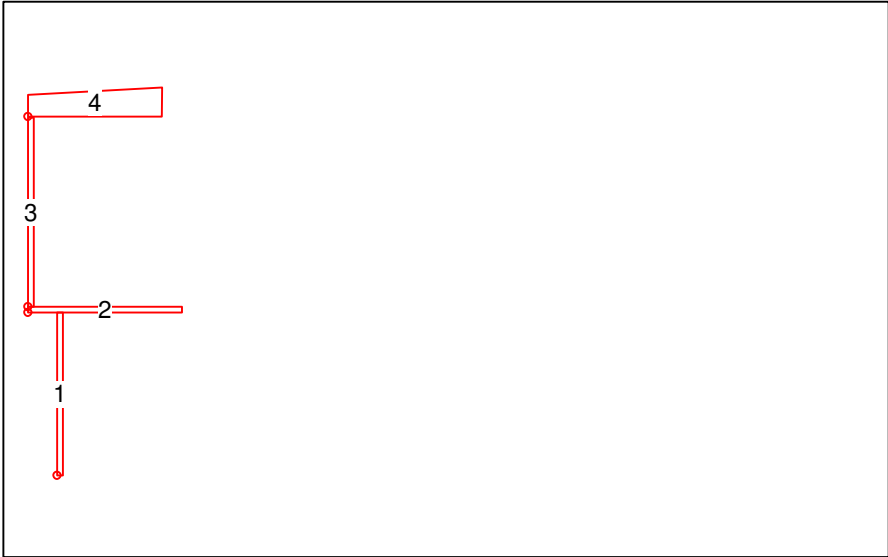
Illuminance

No.	Measuring surface	Grid	$\bar{E}_m$	E_{min}	E_{max}	U_o	U_d
1.1	Unit G2 rear carpark	34 x 8	29 lx	8 lx	93 lx	0.28	0.09
1.2	Unit G1 front carpark	19 x 13	35 lx	16 lx	86 lx	0.46	0.19
1.3	Unit C front carpark	58 x 20	29 lx	10 lx	101 lx	0.33	0.09
Summary			30 lx	8 lx	101 lx	0.27	0.08



Summary, Exterior design layout

Result overview, G unit walkway overview (2)



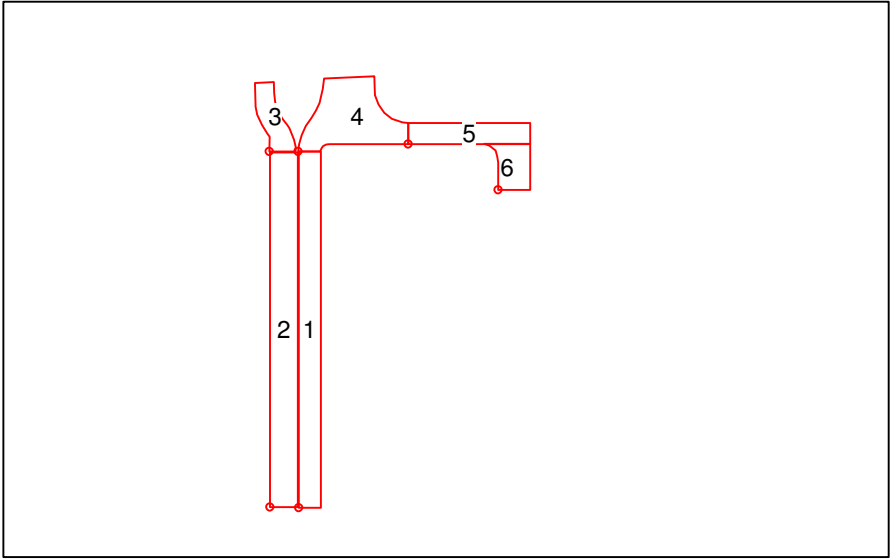
Horizontal illuminance

No.	Measuring surface	Grid	$\bar{E}_m$	E_{min}	E_{max}	U_o	U_d
2.1	G2 Walkway	2 x 28	35 lx	9 lx	103 lx	0.27	0.09
2.2	Walkway between G units	26 x 2	43 lx	10 lx	112 lx	0.23	0.09
2.3	G1 walkway	2 x 32	41 lx	9 lx	110 lx	0.23	0.09
2.4	G1 front area	46 x 10	25 lx	12 lx	51 lx	0.50	0.25
Summary			32 lx	9 lx	112 lx	0.30	0.08



Summary, Exterior design layout

Result overview, Road Overview (3)



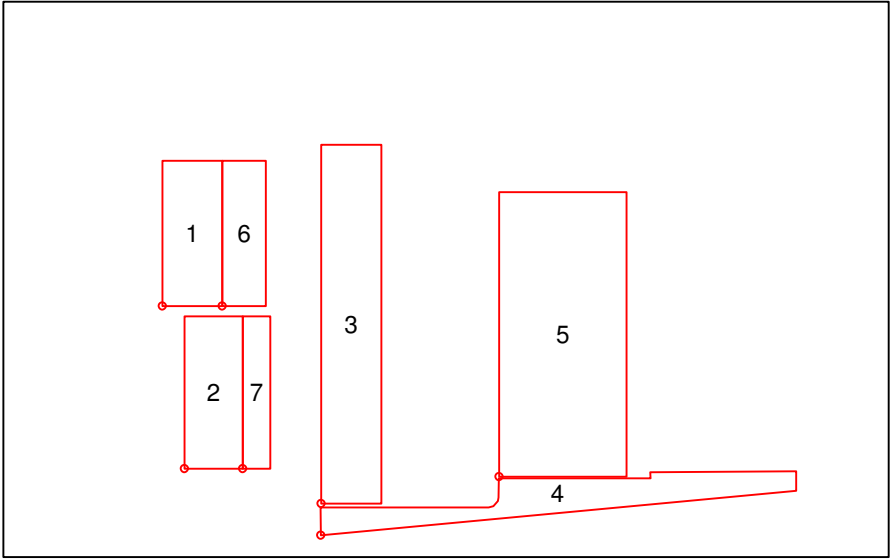
Illuminance

No.	Measuring surface	Grid	$\bar{E}_m$	E_{min}	E_{max}	U_o	U_d
3.1	F unit road	3 x 66	20.5 lx	9.9 lx	24.1 lx	0.48	0.41
3.2	G unit road	4 x 61	38.3 lx	13.4 lx	63.7 lx	0.35	0.21
3.3	Entrance/Exit 1	6 x 11	37.9 lx	24.4 lx	56 lx	0.64	0.44
3.4	Entrance/Exit 2	14 x 18	22.8 lx	13.6 lx	47.9 lx	0.59	0.28
3.5	Road to Unit C	21 x 3	22.2 lx	10.9 lx	39.4 lx	0.49	0.28
3.6	Entry to Unit C loading	7 x 7	33.8 lx	15.9 lx	57.6 lx	0.47	0.28
Summary			28.9 lx	9.9 lx	63.7 lx	0.34	0.15



Summary, Exterior design layout

Result overview, Loading Area Overview (4)



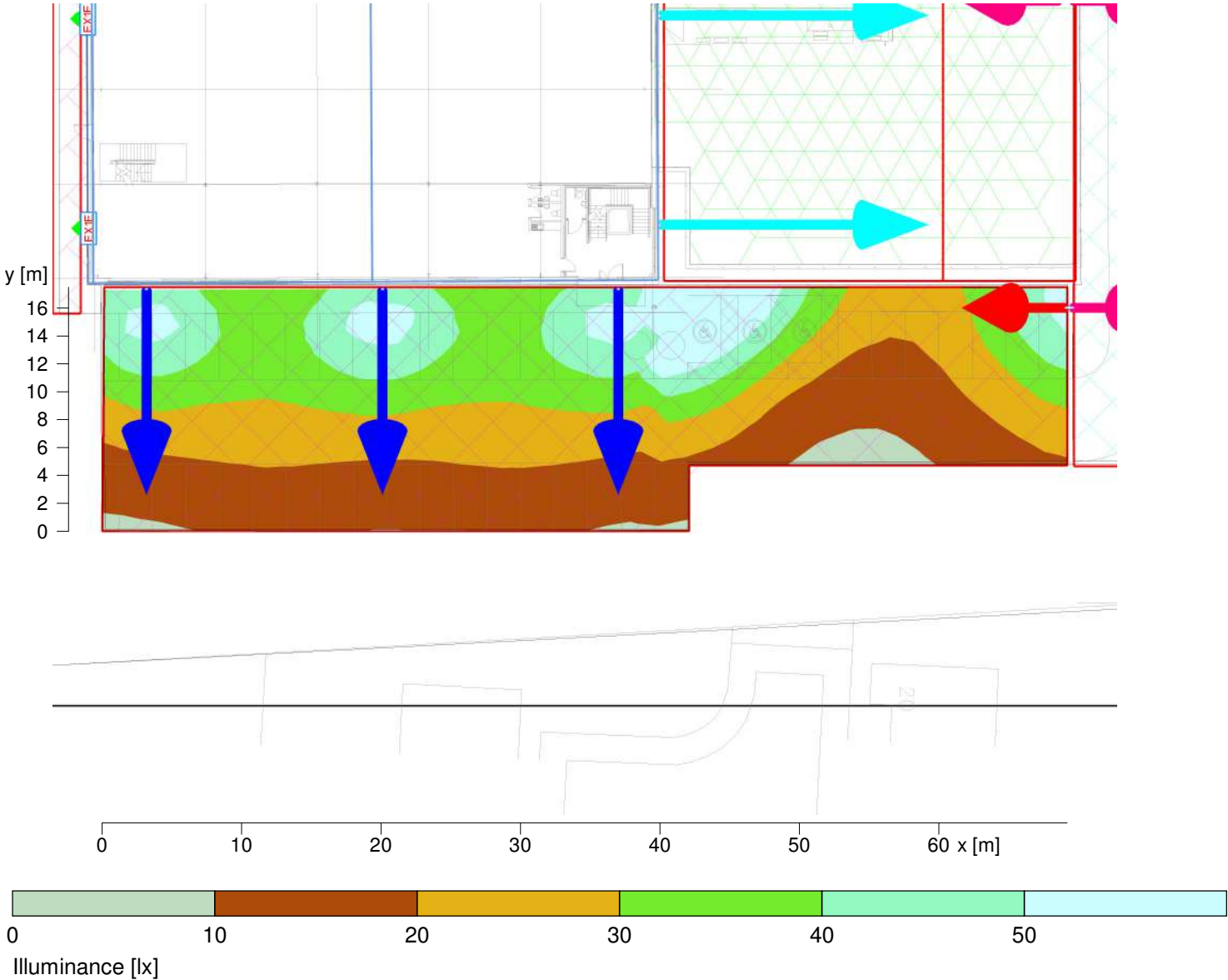
Horizontal illuminance

No.	Measuring surface	Grid	$\bar{E}_m$	E_{min}	E_{max}	U_o	U_d
4.1	Unit G1 Loading 20m	18 x 25	59 lx	21 lx	107 lx	0.36	0.20
4.2	Unit G2 loading 20m	14 x 26	60 lx	26 lx	115 lx	0.44	0.23
4.6	Unit G1 Loading 35m	18 x 25	34 lx	20 lx	63 lx	0.59	0.32
4.7	Unit G2 loading 30m	14 x 26	46 lx	29 lx	67 lx	0.62	0.43
4.3	F Units Loading	10 x 61	53 lx	12 lx	100 lx	0.23	0.12
4.4	Area below F and C units	82 x 6	13 lx	0 lx	98 lx	0.02	0.00
4.5	Unit C Loading	21 x 48	50 lx	15 lx	106 lx	0.30	0.14
Summary			46 lx	0 lx	115 lx	0.01	0.00

Exterior design layout

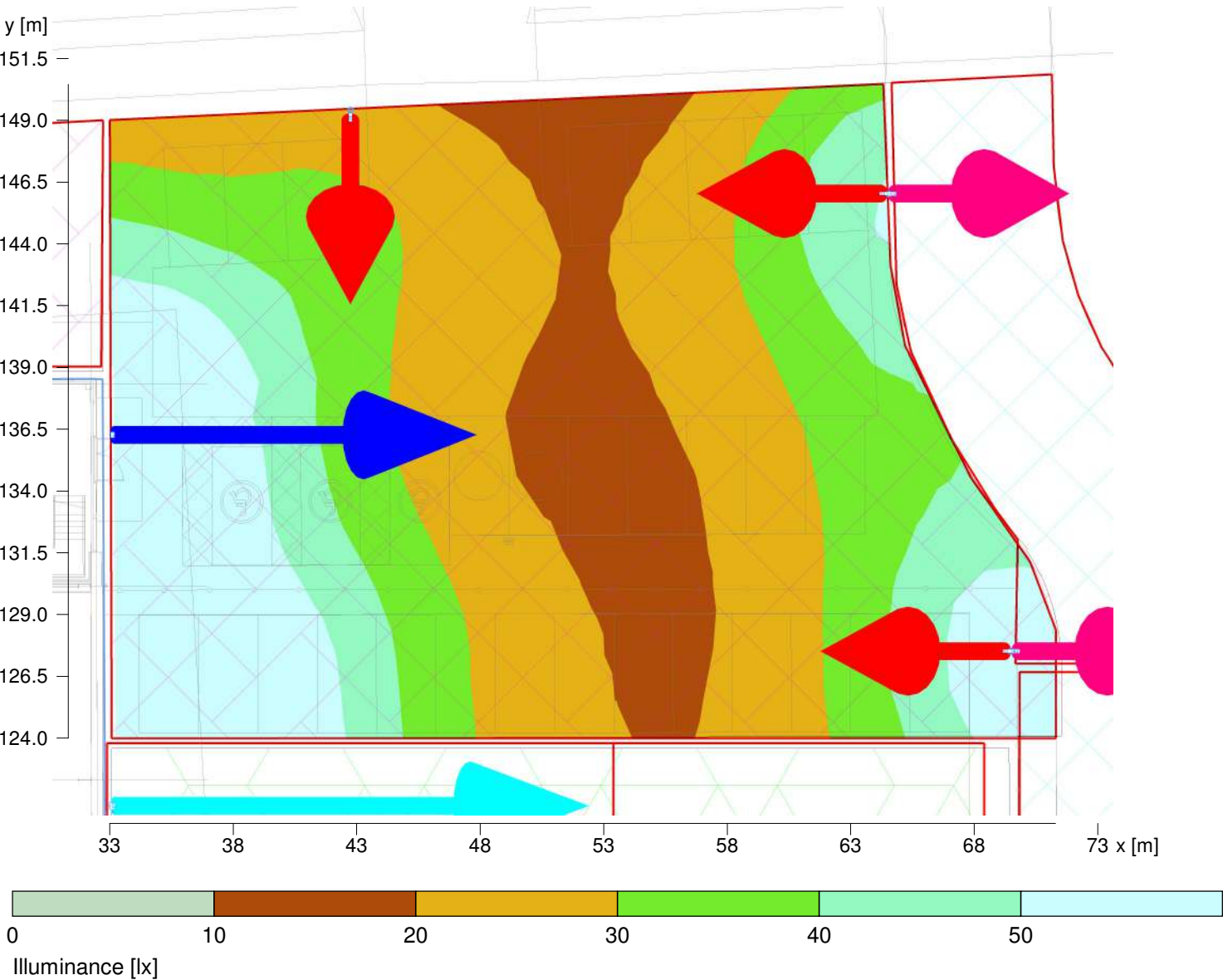
Calculation results, Exterior design layout

Pseudo colours, Unit G2 rear carpark (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 29.2 lx
Minimum illuminance	E_{min}	: 8 lx
Maximum illuminance	E_{max}	: 92.7 lx
Uniformity U_0	$E_{min}/\bar{E}_m$	: 1 : 3.64 (0.28)
Diversity U_d	E_{min}/E_{max}	: 1 : 11.56 (0.09)

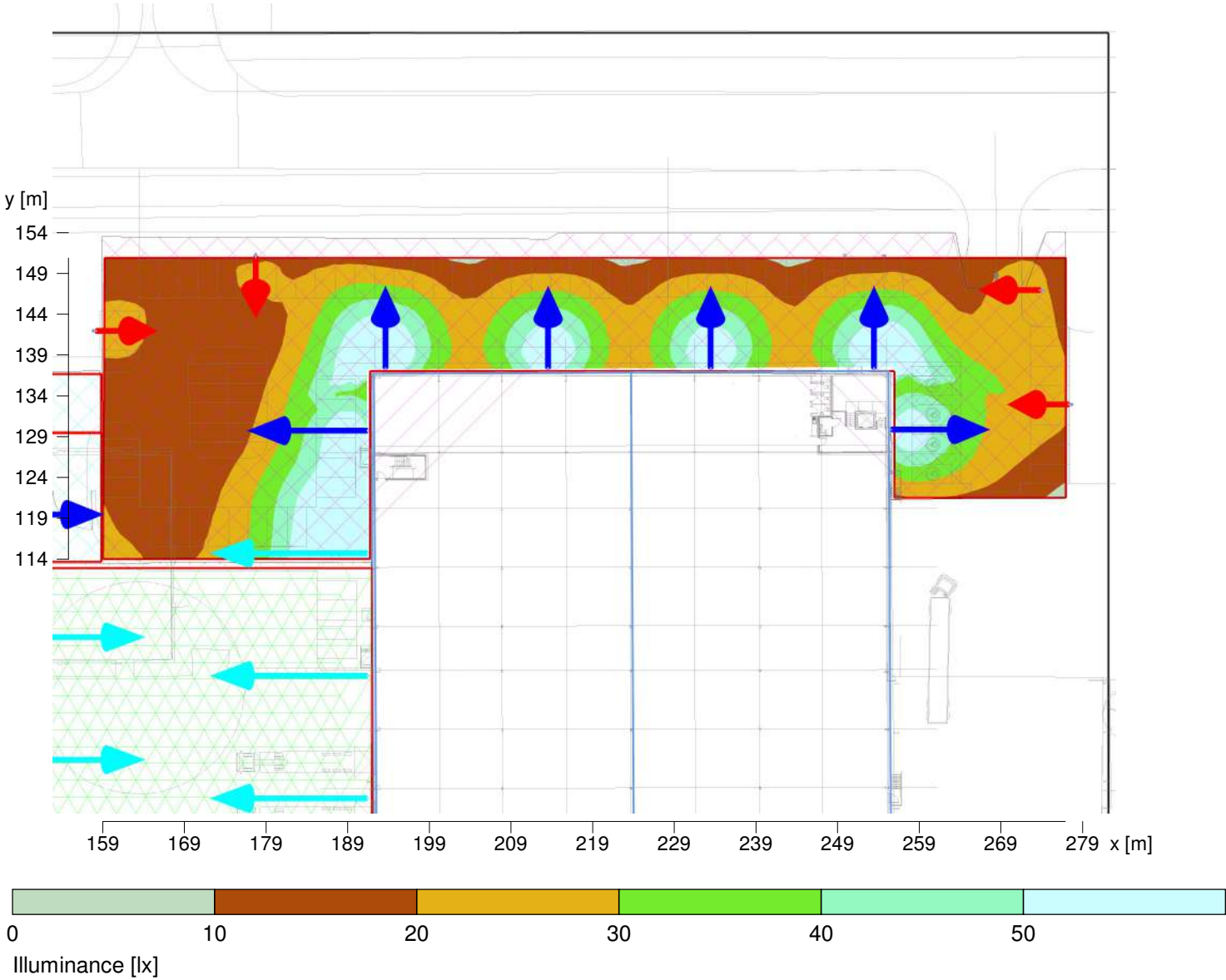
Calculation results, Exterior design layout
Pseudo colours, Unit G1 front carpark (E)



Average illuminance	$\bar{E}_m$	: 34.8 lx
Minimum illuminance	E_{min}	: 15.9 lx
Maximum illuminance	E_{max}	: 85.7 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 2.18 (0.46)
Diversity U_d	E_{min}/E_{max}	: 1 : 5.38 (0.19)

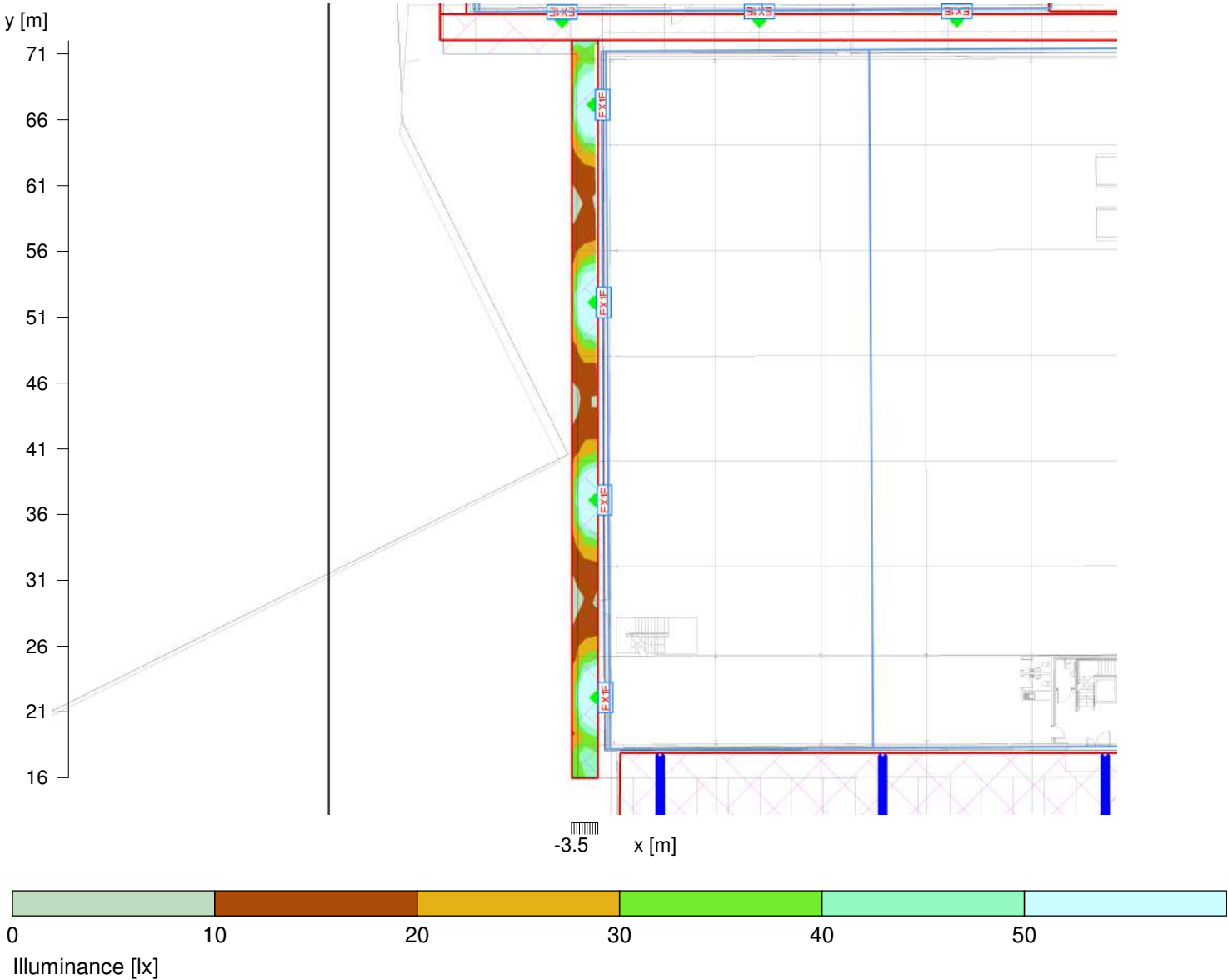
Calculation results, Exterior design layout

Pseudo colours, Unit C front carpark (E)



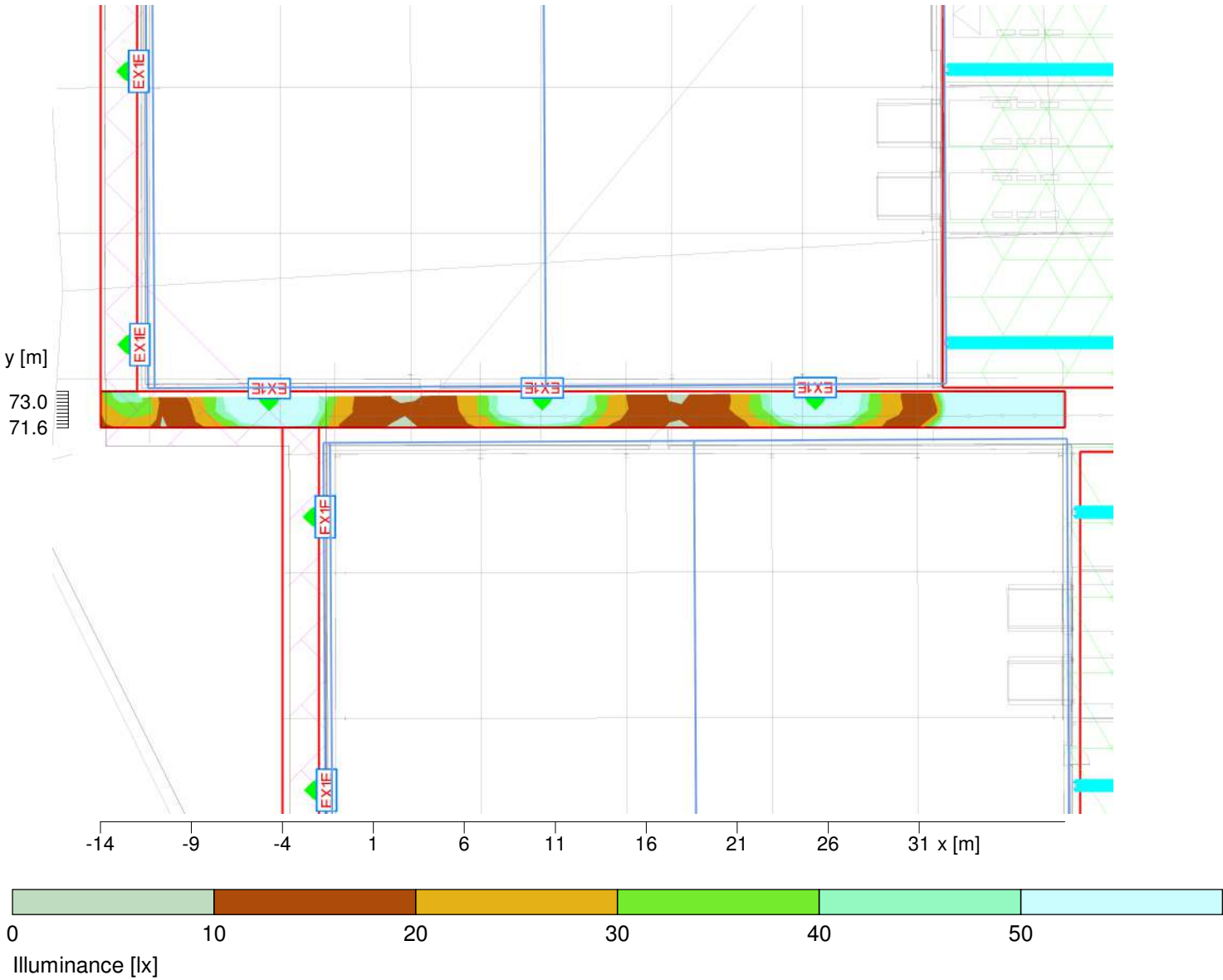
Average illuminance	$\bar{E}_m$	: 29 lx
Minimum illuminance	E_{min}	: 10 lx
Maximum illuminance	E_{max}	: 101 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 3.03 (0.33)
Diversity U_d	E_{min}/E_{max}	: 1 : 10.60 (0.09)

Calculation results, Exterior design layout
Pseudo colours, G2 Walkway (E)





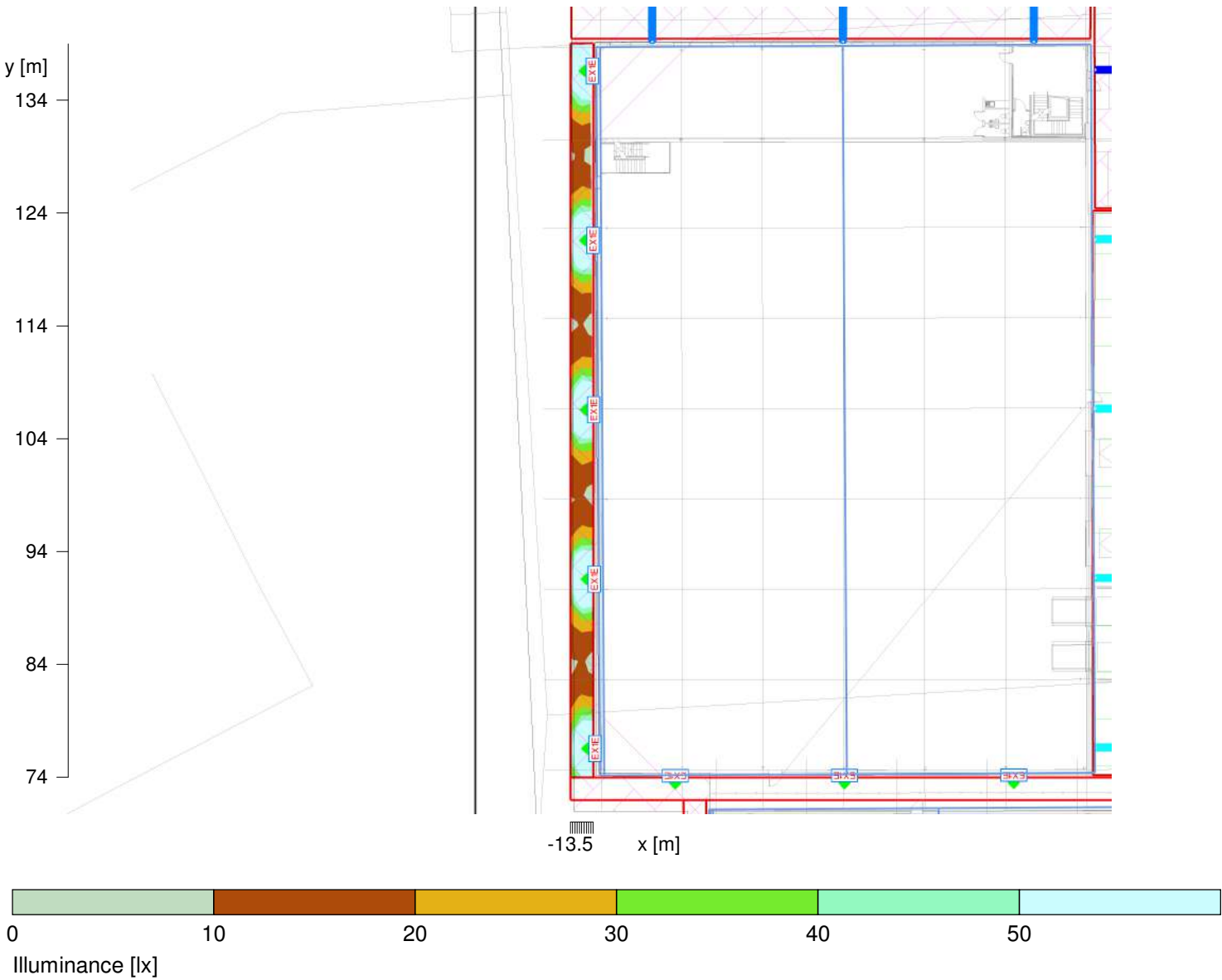
Calculation results, Exterior design layout
Pseudo colours, Walkway between G units (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 43 lx
Minimum illuminance	E_{min}	: 10 lx
Maximum illuminance	E_{max}	: 112 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 4.43 (0.23)
Diversity U_d	E_{min}/E_{max}	: 1 : 11.54 (0.09)

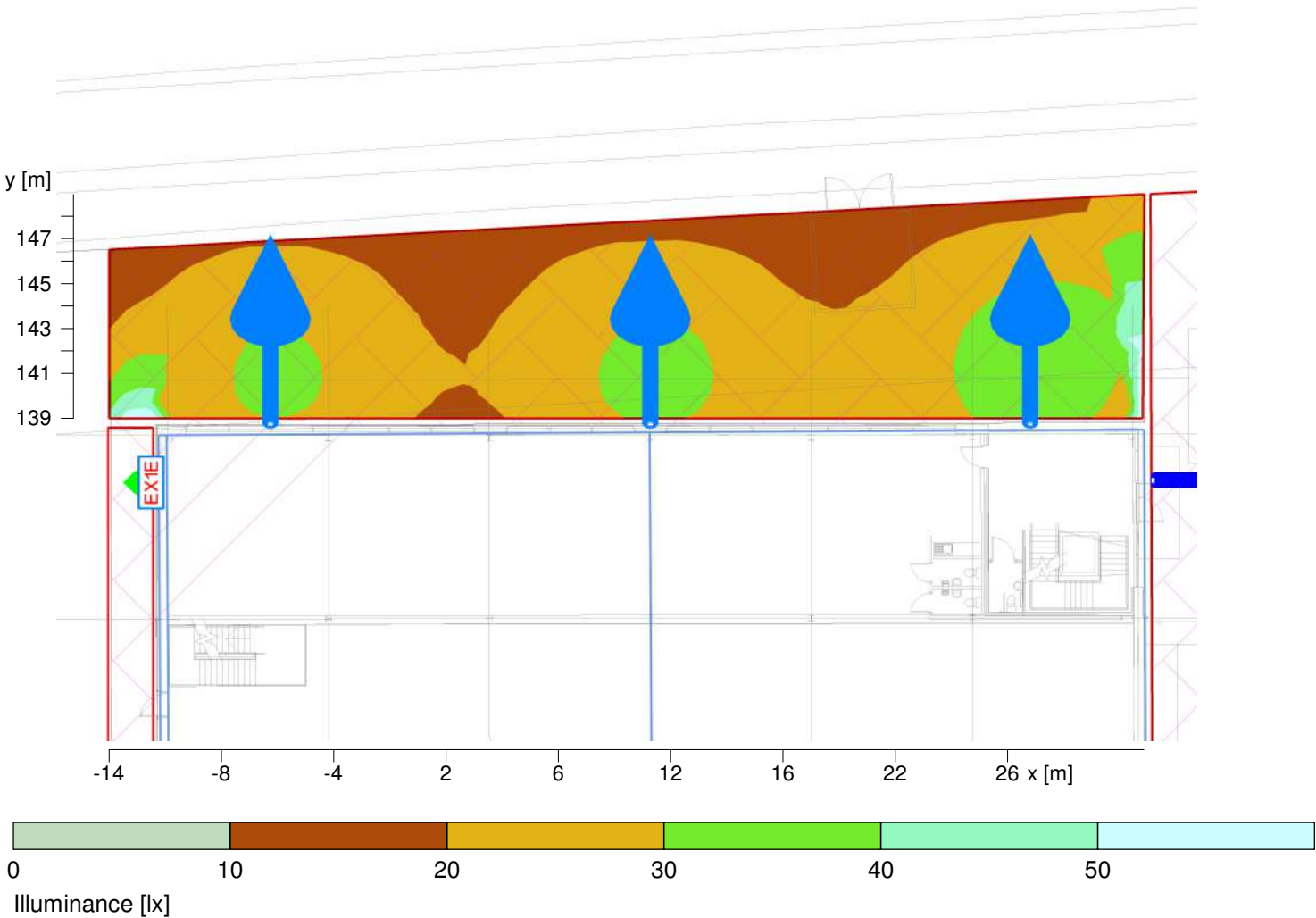
Calculation results, Exterior design layout

Pseudo colours, G1 walkway (E)



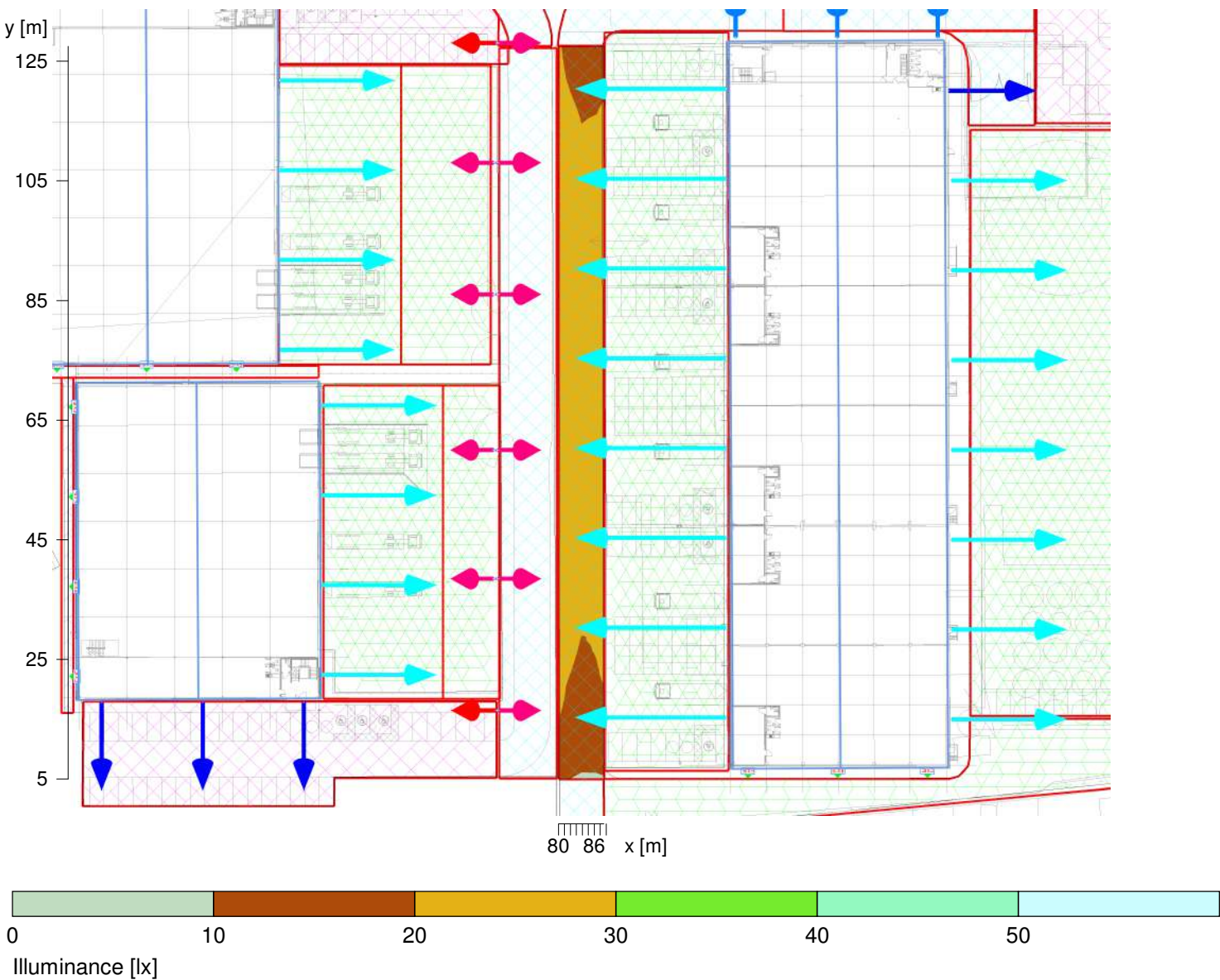
Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 41 lx
Minimum illuminance	E_{min}	: 9 lx
Maximum illuminance	E_{max}	: 110 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 4.30 (0.23)
Diversity U_d	E_{min}/E_{max}	: 1 : 11.60 (0.09)

Calculation results, Exterior design layout
Pseudo colours, G1 front area (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 24.9 lx
Minimum illuminance	E_{min}	: 12.4 lx
Maximum illuminance	E_{max}	: 50.5 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 2.00 (0.50)
Diversity U_d	E_{min}/E_{max}	: 1 : 4.07 (0.25)

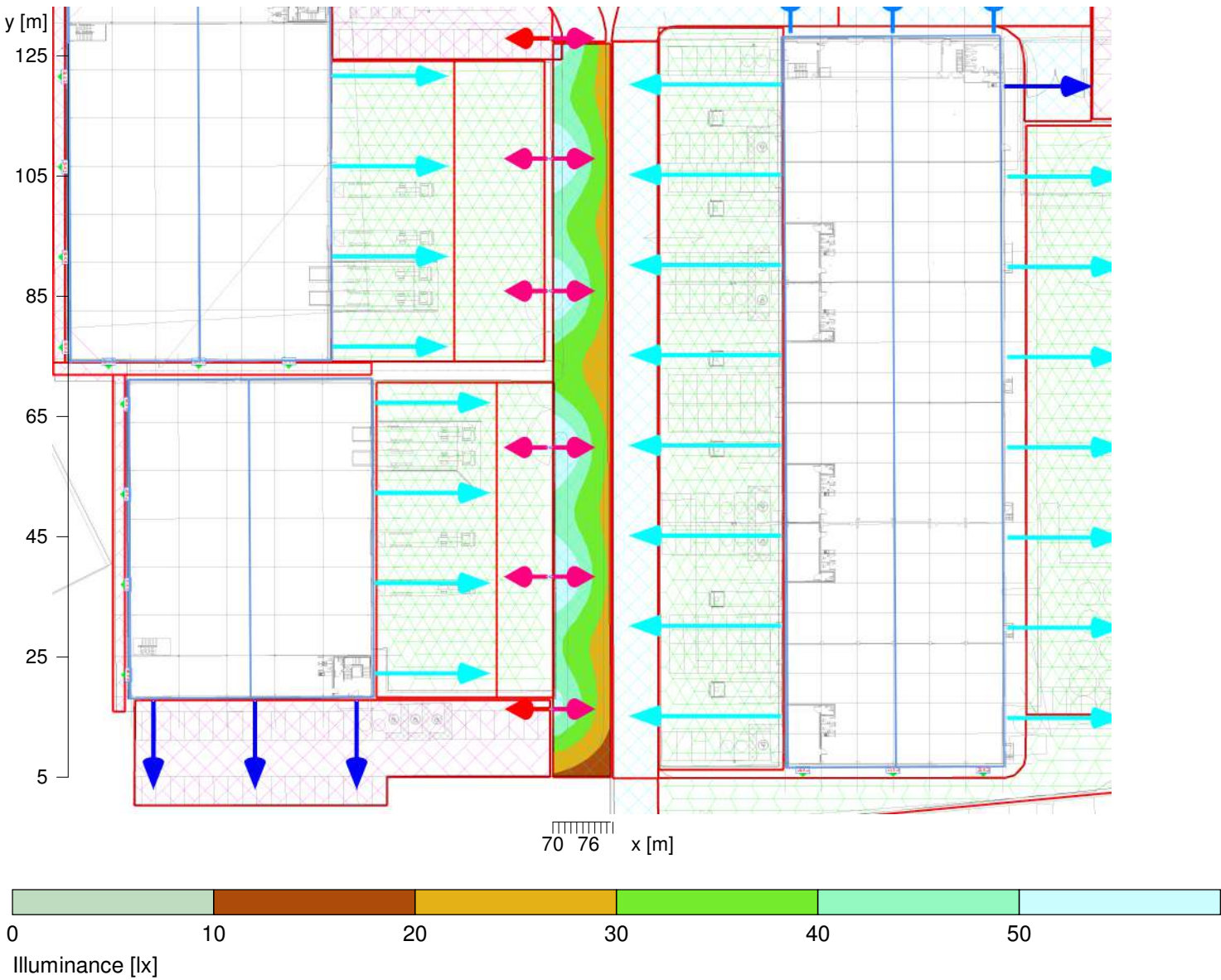
Calculation results, Exterior design layout
Pseudo colours, F unit road (E)



Height reference plane	E_m	: 0.00 m
Average illuminance	E_{min}	: 20.5 lx
Minimum illuminance	E_{max}	: 9.9 lx
Maximum illuminance	E_{min}/E_m	: 24.1 lx
Uniformity U_0	E_{min}/E_{max}	: 1 : 2.08 (0.48)
Diversity U_d		: 1 : 2.44 (0.41)

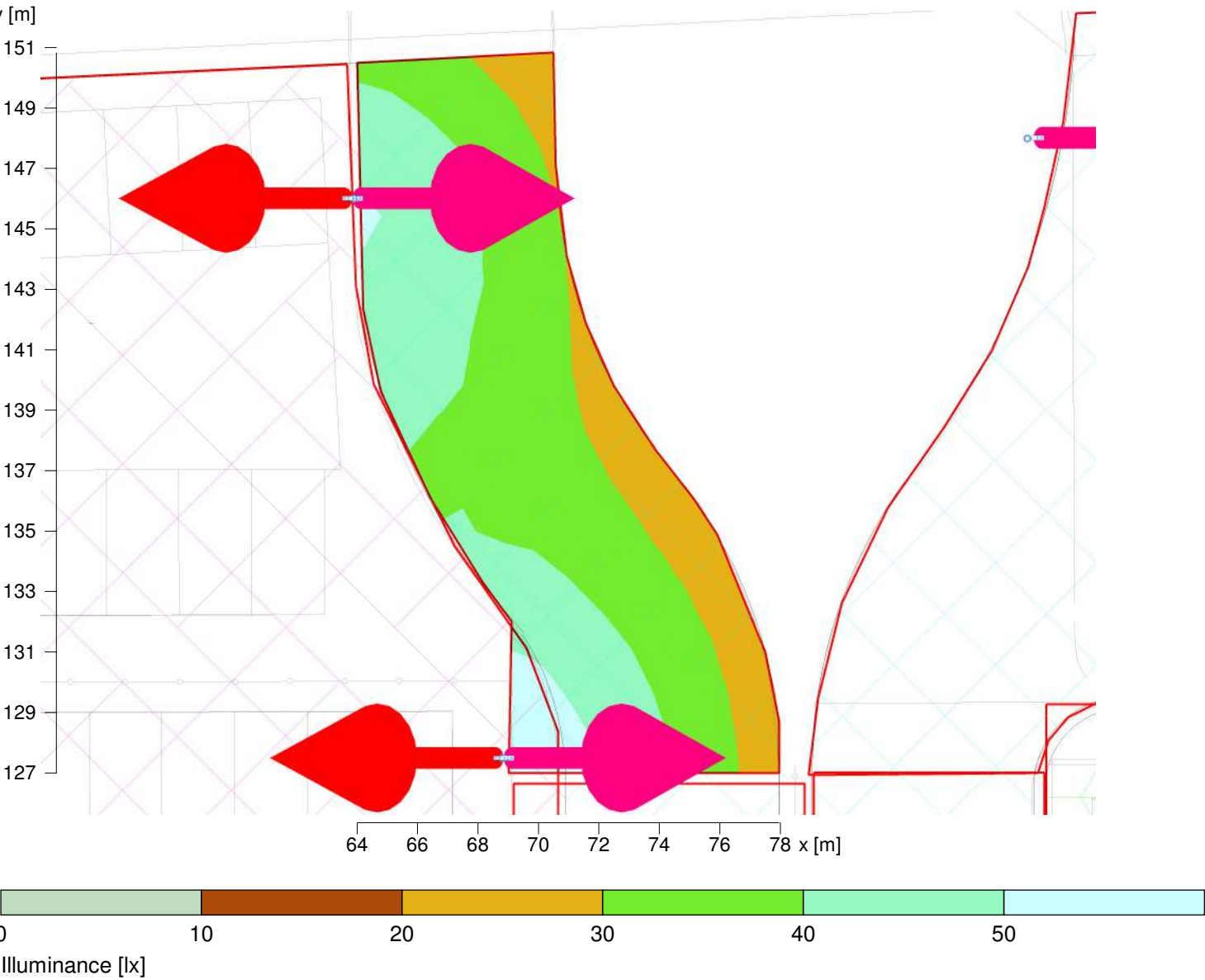
Calculation results, Exterior design layout

Pseudo colours, G unit road (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 38.3 lx
Minimum illuminance	E_{min}	: 13.4 lx
Maximum illuminance	E_{max}	: 63.7 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 2.86 (0.35)
Diversity U_d	E_{min}/E_{max}	: 1 : 4.76 (0.21)

Calculation results, Exterior design layout
Pseudo colours, Entrance/Exit 1 (E)



Height reference plane	$\bar{E}_m$	: 0.00 m
Average illuminance	E_{min}	: 37.9 lx
Minimum illuminance	E_{max}	: 24.4 lx
Maximum illuminance	$E_{min}/\bar{E}_m$	: 56 lx
Uniformity U_0	E_{min}/E_{max}	: 1 : 1.56 (0.64)
Diversity U_d		: 1 : 2.30 (0.44)

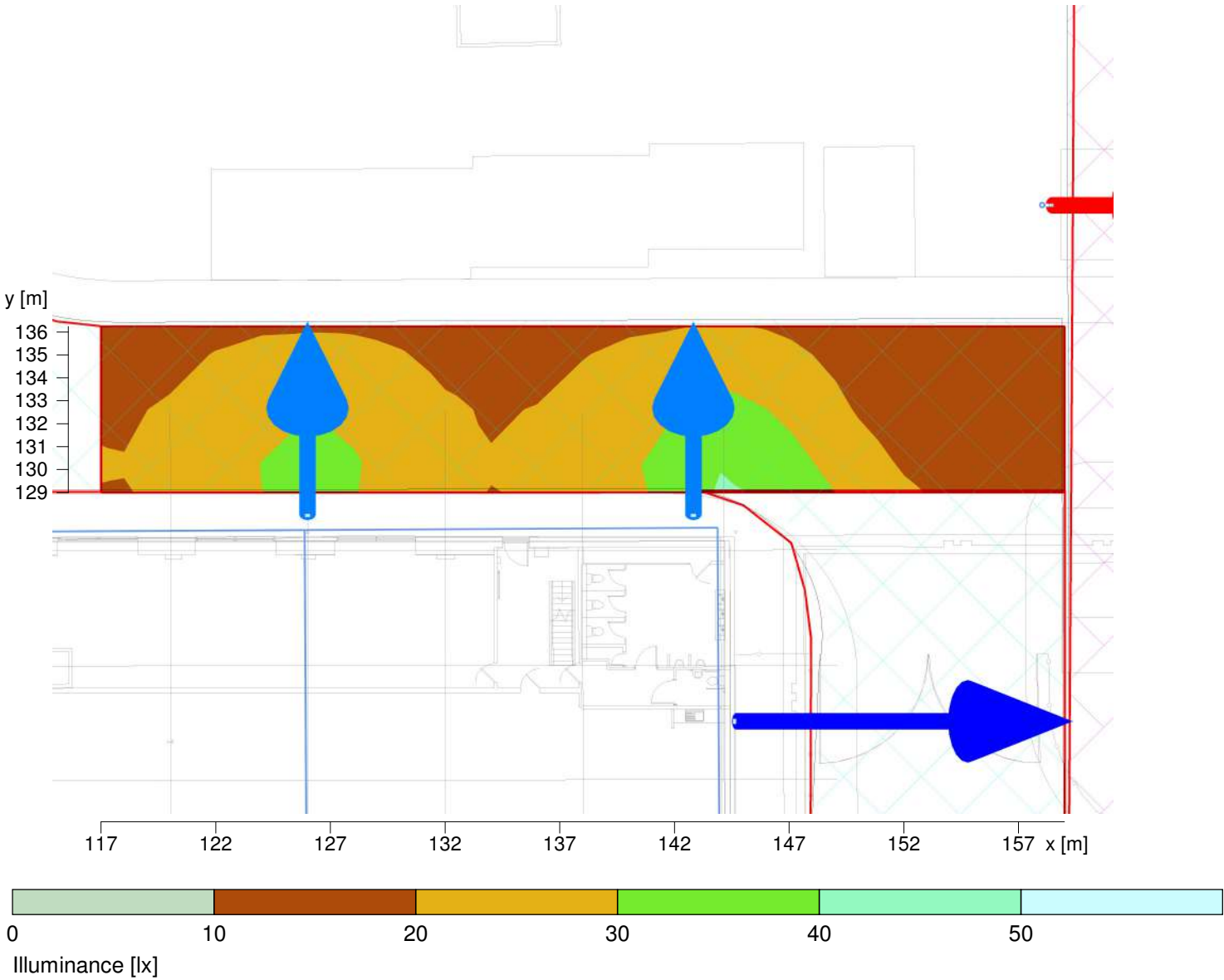
Calculation results, Exterior design layout
Pseudo colours, Entrance/Exit 2 (E)



Height reference plane	$\bar{E}_m$	: 0.00 m
Average illuminance	E_{min}	: 22.8 lx
Minimum illuminance	E_{max}	: 13.6 lx
Maximum illuminance	$E_{min}/\bar{E}_m$	: 47.9 lx
Uniformity U_o	E_{min}/E_{max}	: 1 : 1.68 (0.59)
Diversity U_d		: 1 : 3.54 (0.28)

Calculation results, Exterior design layout

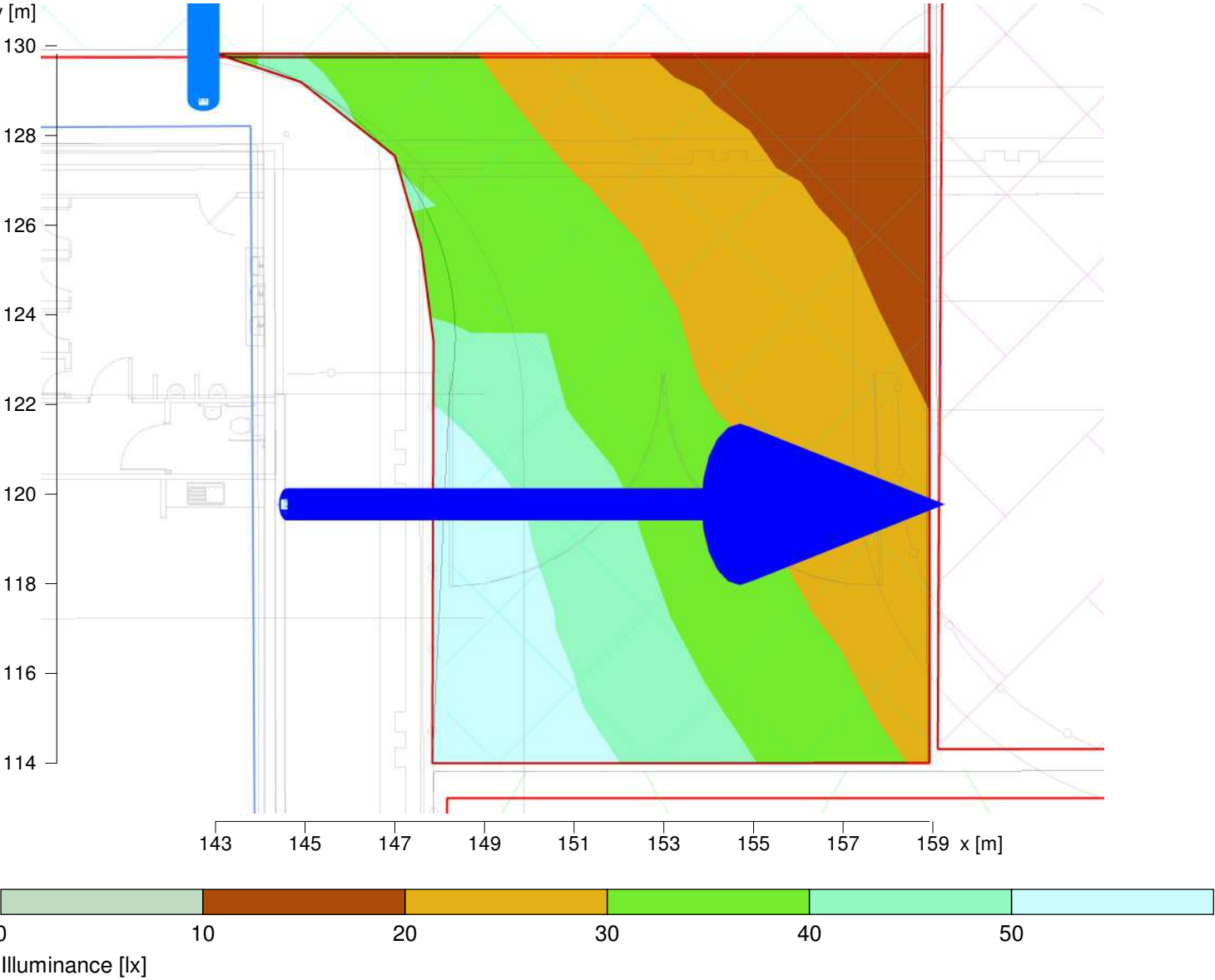
Pseudo colours, Road to Unit C (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 22.2 lx
Minimum illuminance	E_{min}	: 10.9 lx
Maximum illuminance	E_{max}	: 39.4 lx
Uniformity U_0	$E_{min}/\bar{E}_m$	: 1 : 2.05 (0.49)
Diversity U_d	E_{min}/E_{max}	: 1 : 3.63 (0.28)

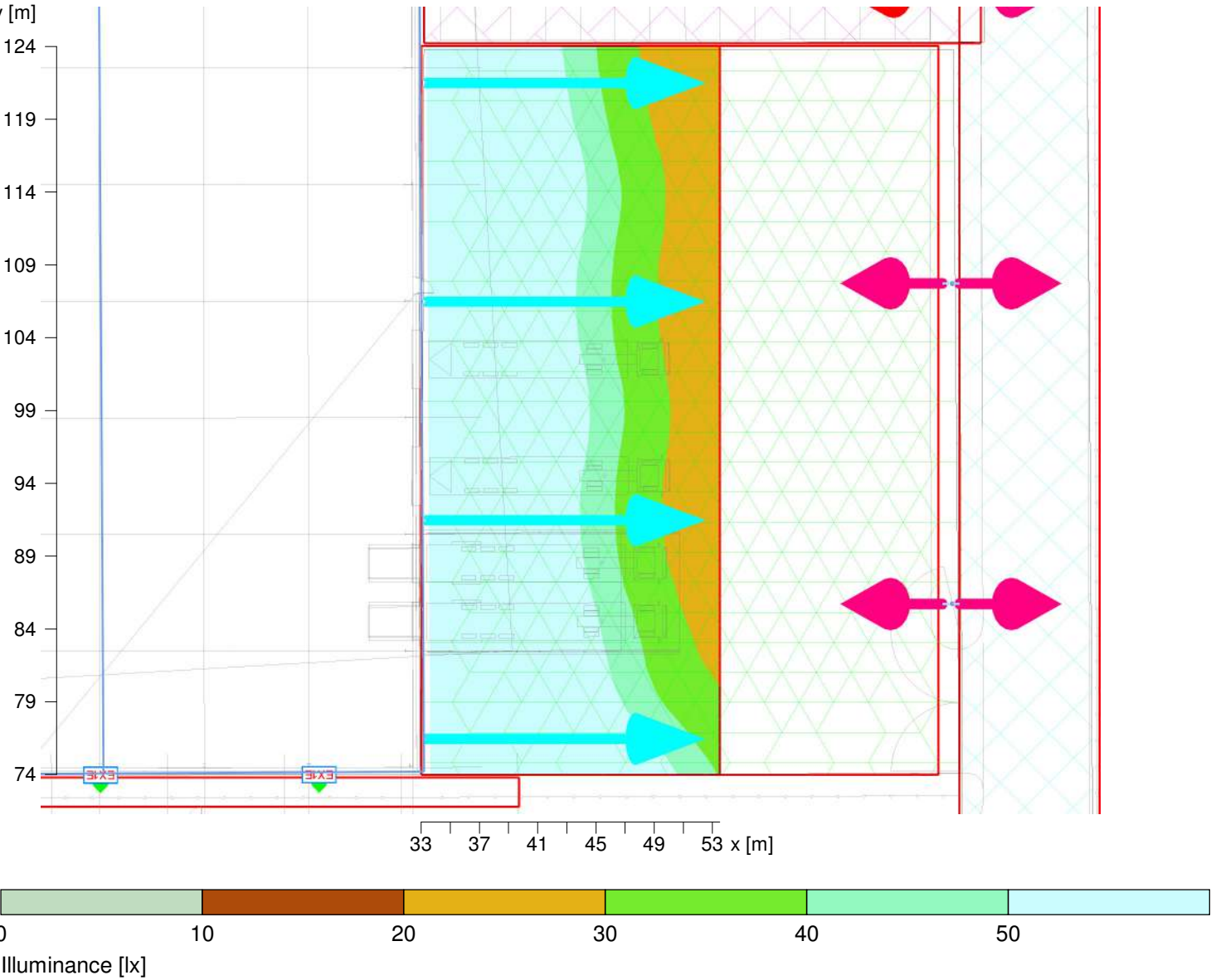
Calculation results, Exterior design layout

Pseudo colours, Entry to Unit C loading (E)



Average illuminance	$\bar{E}_m$	: 33.8 lx
Minimum illuminance	E_{min}	: 15.9 lx
Maximum illuminance	E_{max}	: 57.6 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 2.12 (0.47)
Diversity U_d	E_{min}/E_{max}	: 1 : 3.61 (0.28)

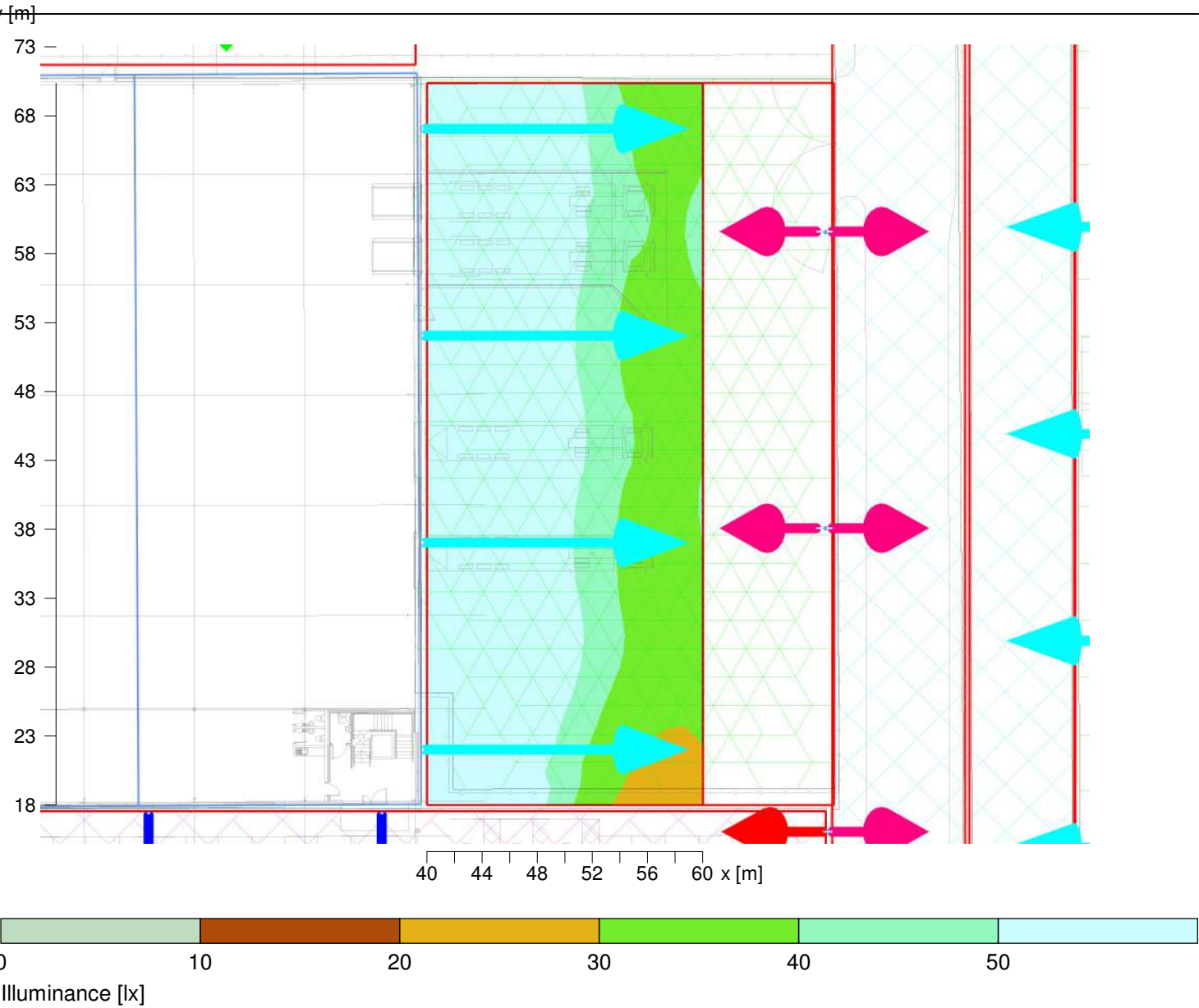
Calculation results, Exterior design layout
Pseudo colours, Unit G1 Loading 20m (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 59 lx
Minimum illuminance	E_{min}	: 21 lx
Maximum illuminance	E_{max}	: 107 lx
Uniformity U_0	$E_{min}/\bar{E}_m$	: 1 : 2.79 (0.36)
Diversity U_d	E_{min}/E_{max}	: 1 : 5.08 (0.20)

Calculation results, Exterior design layout

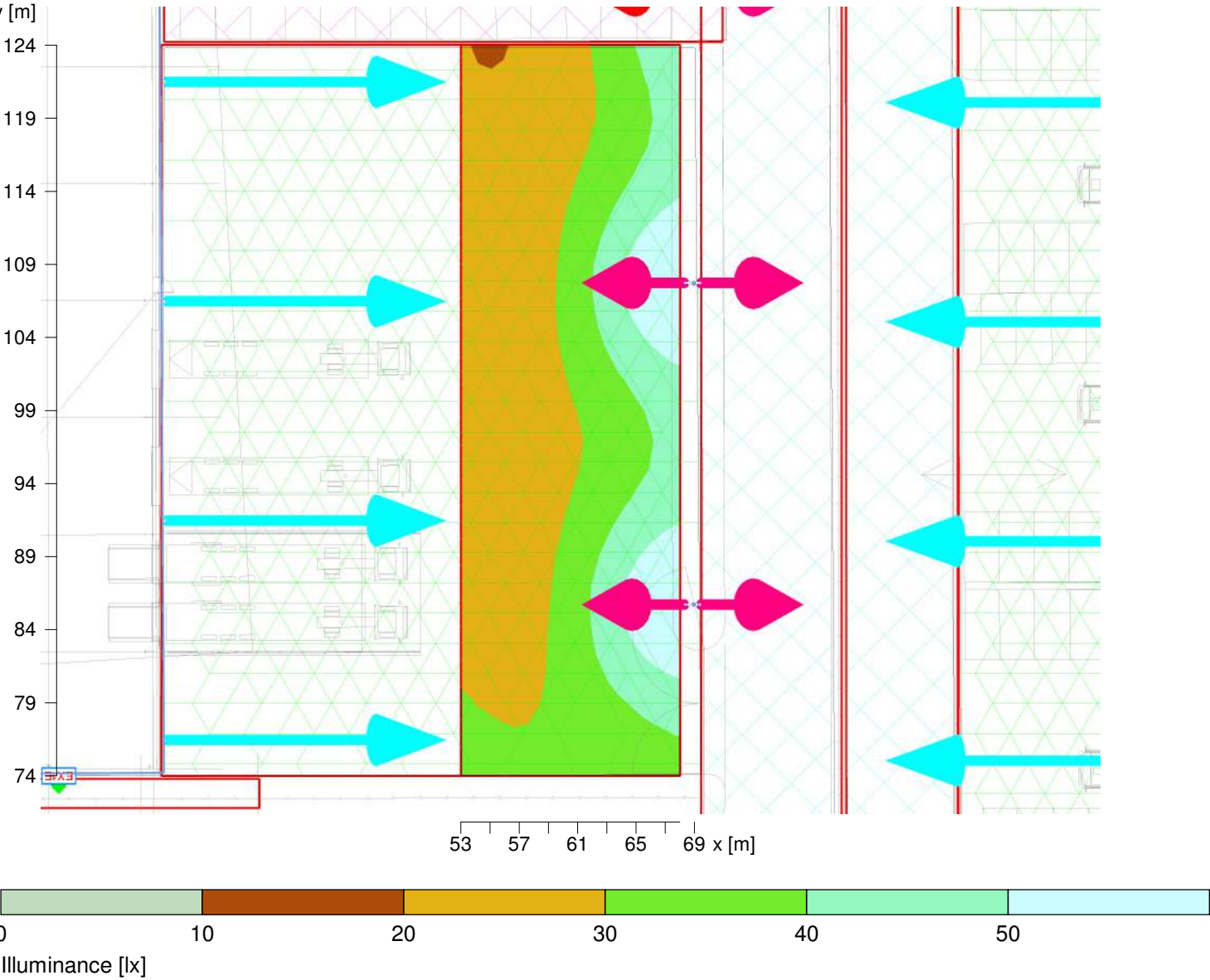
Pseudo colours, Unit G2 loading 20m (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 60 lx
Minimum illuminance	E_{min}	: 26 lx
Maximum illuminance	E_{max}	: 115 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 2.28 (0.44)
Diversity U_d	E_{min}/E_{max}	: 1 : 4.39 (0.23)

Calculation results, Exterior design layout

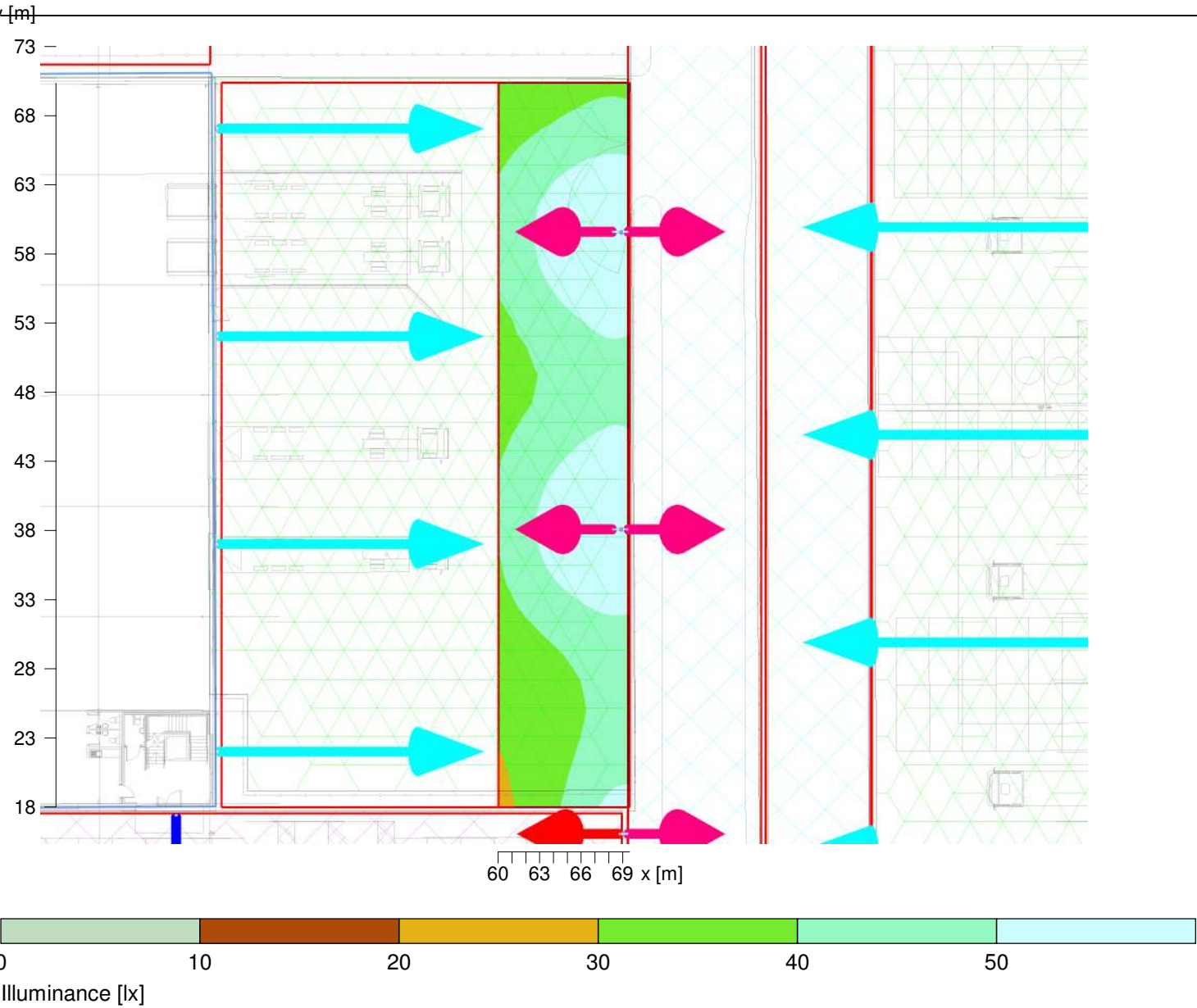
Pseudo colours, Unit G1 Loading 35m (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 33.6 lx
Minimum illuminance	E_{min}	: 19.8 lx
Maximum illuminance	E_{max}	: 62.8 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 1.70 (0.59)
Diversity U_d	E_{min}/E_{max}	: 1 : 3.17 (0.32)

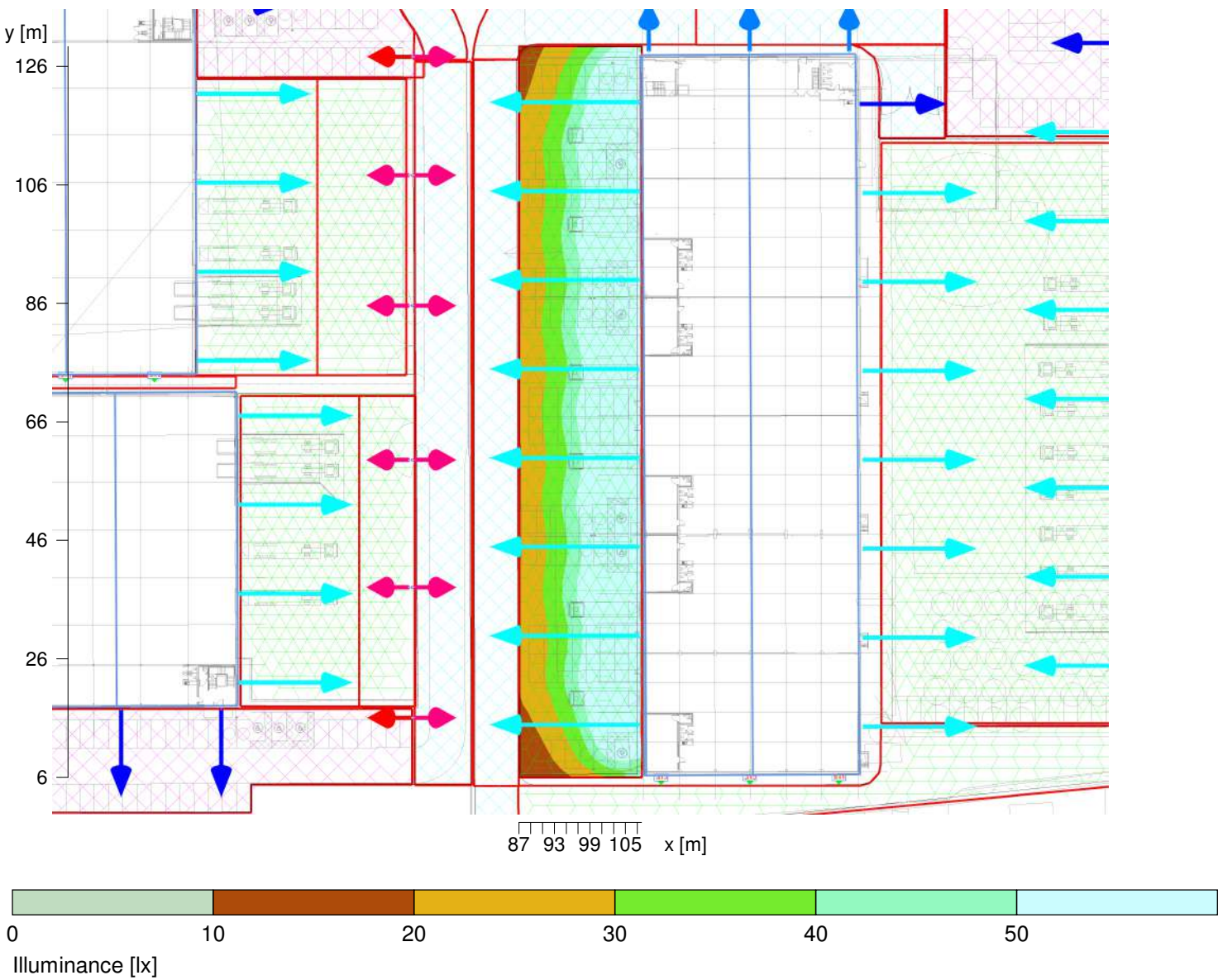
Calculation results, Exterior design layout

Pseudo colours, Unit G2 loading 30m (E)



Height reference plane	$\bar{E}_m$	: 0.00 m
Average illuminance	E_{min}	: 46.4 lx
Minimum illuminance	E_{max}	: 28.8 lx
Maximum illuminance	$E_{min}/\bar{E}_m$	: 66.9 lx
Uniformity U_o	E_{min}/E_{max}	: 1 : 1.61 (0.62)
Diversity U_d		: 1 : 2.33 (0.43)

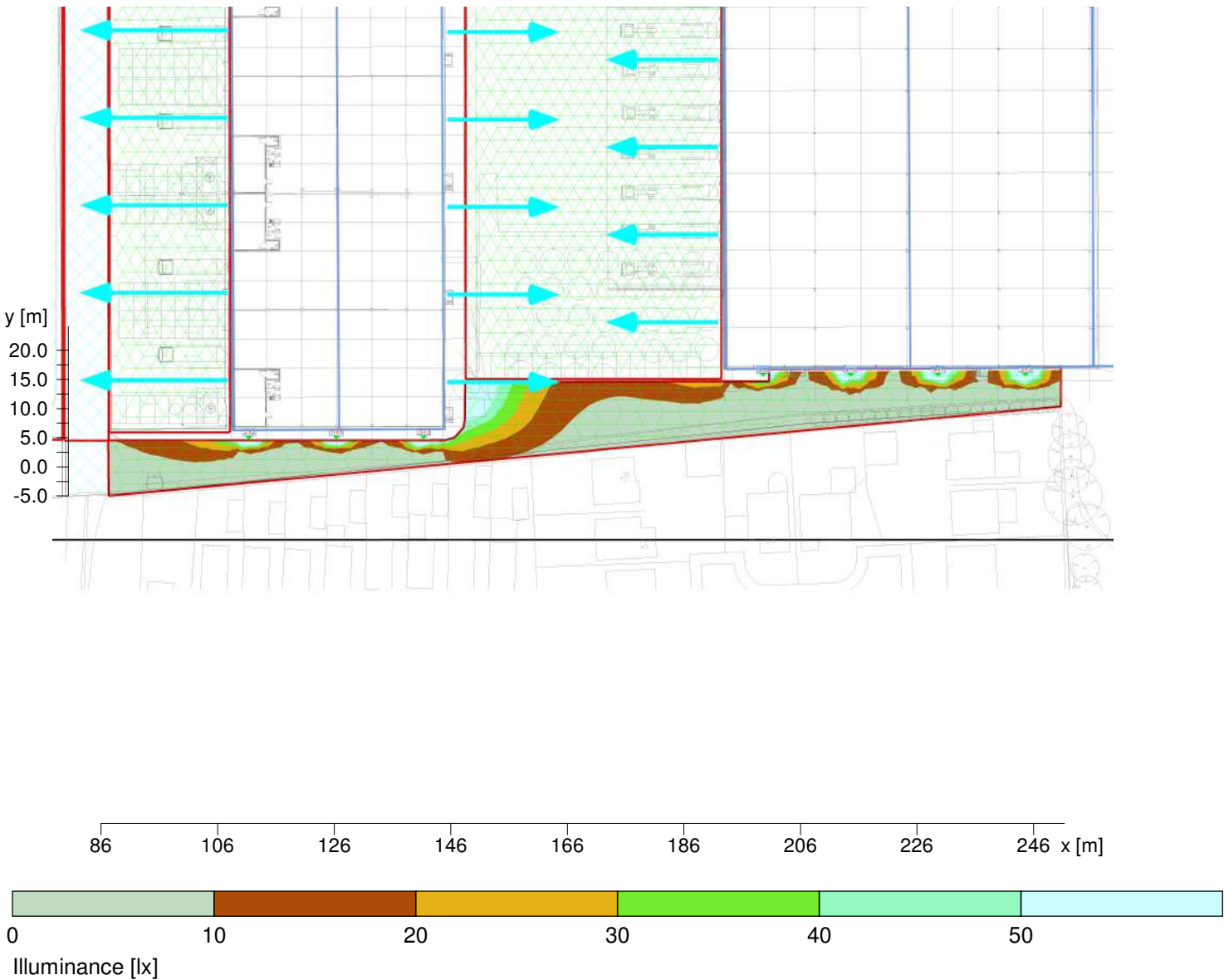
Calculation results, Exterior design layout
Pseudo colours, F Units Loading (E)



Height reference plane
Average illuminance
Minimum illuminance
Maximum illuminance
Uniformity U_0
Diversity U_d

: 0.00 m
: 52.7 lx
: 12 lx
: 99.8 lx
: 1 : 4.38 (0.23)
: 1 : 8.30 (0.12)

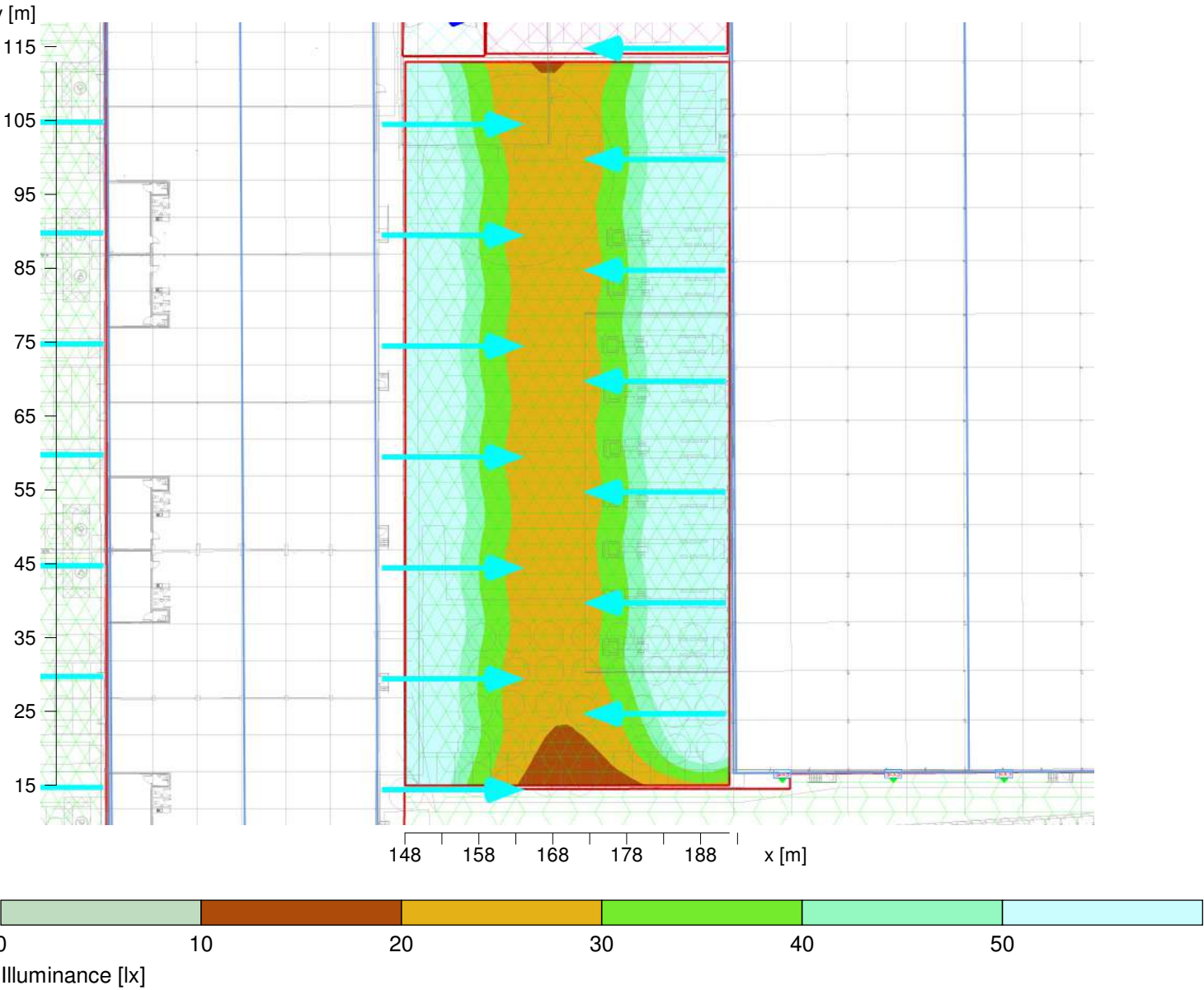
Calculation results, Exterior design layout
Pseudo colours, Area below F and C units (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 12.5 lx
Minimum illuminance	E_{min}	: 0.2 lx
Maximum illuminance	E_{max}	: 98.1 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 54.22 (0.02)
Diversity U_d	E_{min}/E_{max}	: 1 : 424.05 (0.00)

Calculation results, Exterior design layout

Pseudo colours, Unit C Loading (E)



Height reference plane		: 0.00 m
Average illuminance	$\bar{E}_m$	: 50 lx
Minimum illuminance	E_{min}	: 15 lx
Maximum illuminance	E_{max}	: 106 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	: 1 : 3.38 (0.30)
Diversity U_d	E_{min}/E_{max}	: 1 : 7.21 (0.14)



Floor plan

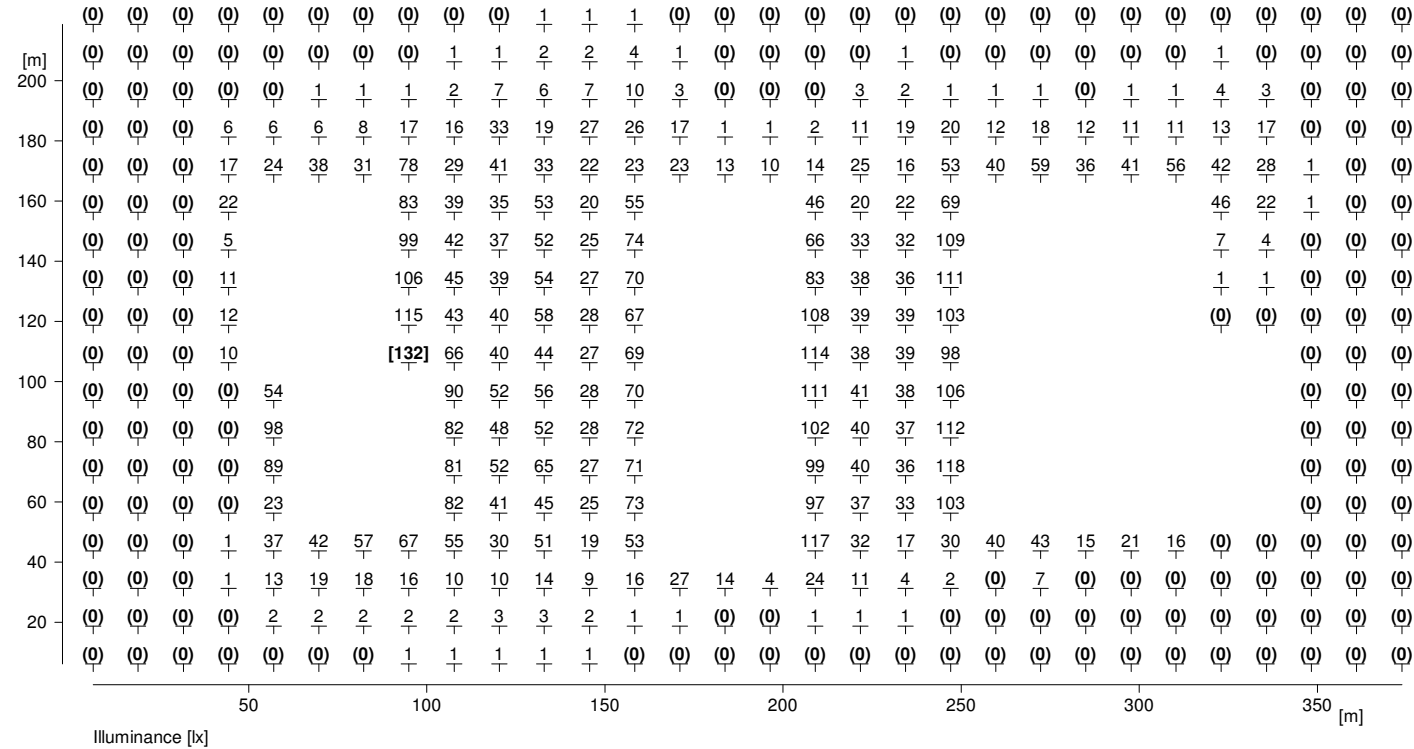




Horizontal Spillage

Calculation results, Horizontal Spillage

Table, Horizontal Spillage (E)



Height reference plane	: 0.00 m
Average illuminance	$\bar{E}_m$: 18 lx
Minimum illuminance	E_{min} : 0 lx
Maximum illuminance	E_{max} : 132 lx
Uniformity U_o	$E_{min}/\bar{E}_m$: ---
Diversity U_d	E_{min}/E_{max} : ---



Boundary line, Horizontal Spillage (E)

