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TECHNICAL SUBMITTAL – No18
External Lighting Calculations
Document Ref: 63073-ABE-ZZ-XX-TS-E-0018

Project:	Echo St		
A&B Contract No:	8889	Date:	26.03.2026
Engineers:	Jordan Thompson		Rev.C05 Updated inline with comments

Proposal:

Please see attached Lighting Calculations to suit layout proposals.

Installation : Echo St

Project number :

Customer : A&B Engineering

Processed by : Dave Wood

Date : 16.12.2025

Project description:

We have the pleasure in attaching our Lighting Design for the aforementioned project for your approval. Illuminance and uniformity levels are shown for your approval with calculations having been carried out as per the information, drawings and / or specifications details provided. Please check to confirm that all details are correct, especially dimensions of the room(s) and fitting specification to ensure these are as required. In the absence of a written specification areas will be illuminated to the recommended standards according to their primary function. Areas are generally to be open without any obstructions above the working plane unless otherwise advised.

Where applicable the design conforms to the latest recommendations and guidelines. If conformity to LG7 is to be proved with exact figure, we may need to add or change the luminaire types. We have used common design parameters for ceiling heights and reflectance's of room surfaces- (wall 50% ceiling 70% floor 20%) as well as maintenance factors (LED light source up to 0.9), in our calculations unless details were provided otherwise.

Please note that it is the installers responsibility to check and confirm TP(a) and TP(b) requirements as per Building Regulations Approved Document B Fire Safety 2006 with amendments 2010-2013. Compliant luminaires will generally be proposed dependant on the application and / or area type. Should the product specified by us be subsequently replaced with an inferior / non compliant product type - any liability and / or cost incurred for subsequent remedial work required would be the responsibility of the client.

Emergency lighting will be designed to the recommended guidelines set out in BS5266. Provision for High Risk areas will be made ONLY where obvious and / or those identified by the client. It is the responsibility of the Purchaser / Installer to ensure that the design complies with local fire and health and safety regulations. In the event that the design is not found to comply we will adjust the design in consultation with the customer to ensure that it does comply with such regulations. Please be aware of the Part L2 requirements and check that conformity has been met where required.

The following calculations are based on manufacturer lamp / luminaire data however, in practice gradual divergencies can occur. Specific site conditions (such as ambient temperature) can also effect the performance of luminaires and any such adverse conditions should be detailed prior to calculations being carried out to ensure adequate provision has been made for these.

Whilst every effort will be made to adhere to the written or product specification provided, it is always the responsibility of the customer to ensure that any design scheme, specification and / or product supplied satisfies fully and complies with the end users requirements and is suitable for the installation - If unsure of any suggested fittings it is advisable to order samples in advance following values are based on exact calculations on calibrated lamps, luminaires and their arrangement. In practice, gradual divergencies can occur.

The following values are based on precise calculations performed on calibrated lamp 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.

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.



UKLD LIGHTING DESIGN

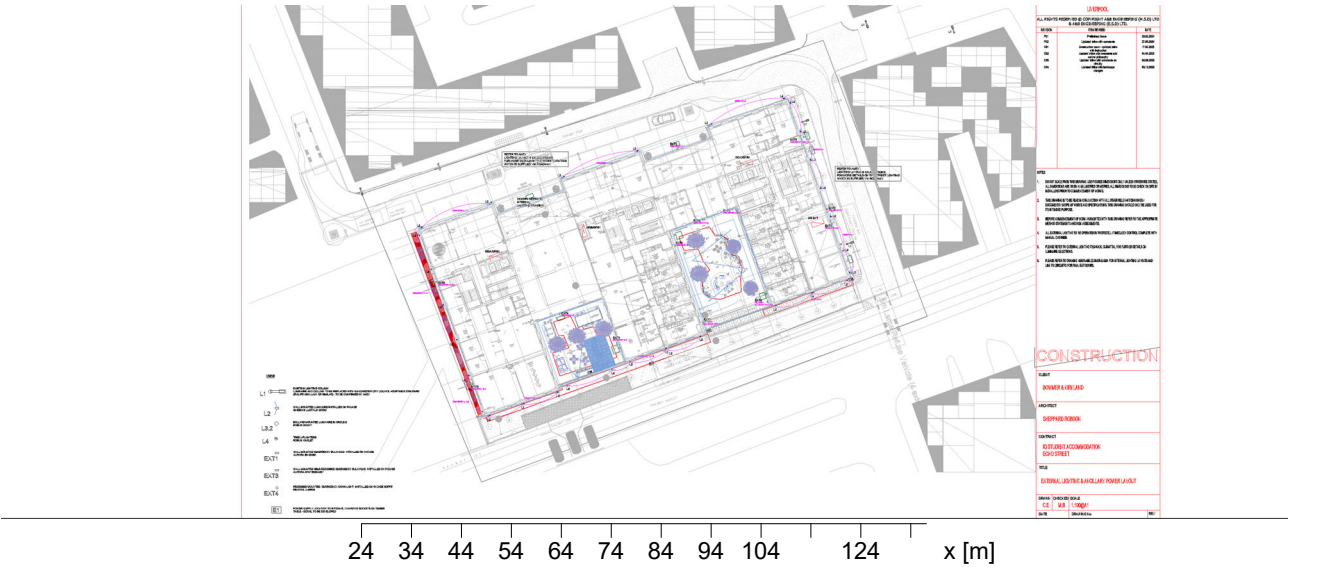
Object :
Installation : Echo St
Project number :
Date : 16.12.2025



1 Exterior 1

1.2 Summary, Exterior 1, Light scene 1(C)

1.2.1 Result overview, Perimeter Path 1



General

Calculation algorithm used	Average indirect fraction
Height of evaluation surface	0.00 m
Maintenance factor	0.80
Total luminous flux	140620 lm
Total power	1385.4 W
Total power per area (5831.77 m²)	0.24 W/m² (1.37 W/m²/100lx)

Illuminance

Average illuminance	$\bar{E}_m$	17.4 lx
Minimum illuminance	E_{min}	7.6 lx
Maximum illuminance	E_{max}	32.5 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	1:2.29 (0.44)
Diversity U_d	E_{min}/E_{max}	1:4.28 (0.23)

Type No. Make

Lucitalia S.r.L.

1	28 x	Order No.	: GH1013.ECFT300EN
		Luminaire name	: Modo 16W 3000 K 107° x 104°
		Equipment	: 2 x LEDX0102-30KC00-0450-6G / 983.5 lm

ROBUS

2	7 x	Order No.	: RKG0730SS-13
		Luminaire name	: KINGLET 7.5W LED In-ground Light IP67 3000K Brushed Chrome
		Equipment	: 1 x LED 7.4 W / 988 lm

Object :
Installation : Echo St
Project number :
Date : 16.12.2025

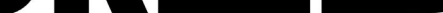


1 Exterior 1

1.2 Summary, Exterior 1, Light scene 1(C)

1.2.1 Result overview, Perimeter Path 1

5	21 x		Order No. : RHF0730-25 Luminaire name : HAWFINCH Garden Spike 7W LED, Die-cast Aluminium, Dark Grey Equipment : 1 x LED 8.6 W / 528 lm
1	47 x		Order No. : RMU767-30/670 Luminaire name : Vegas COB Equipment : 1 x LED COB Strip Light 7.63 W / 670 lm
3	15E x		Aurora Order No. : EN-EMBH/EN-EMBH -- Emergency Lighting -- Luminaire name : Emergency Bulkhead 3W Maintained Emergency Bulkhead with Manual Test Function Equipment : 1 x LED 3 W / 150 lm Emergency : 147 lm (98.0 %)
4	50 x		HISPEC Order No. : HSSL/FESTOON Luminaire name : 110V Festoon Single 5W head Equipment : 1 x LED 5.1 W / 500 lm
7	8 x		iGuzzini Order No. : SS91-15_K54H Luminaire name : Walky LED: Square optic assembly 180x180mm AL optic Warm White 220÷240Vac - 5.8W 506lm - 3000K Equipment : 1 x LED / 4.8W 5.8 W / 1100 lm

The logo for UKLD Lighting Design features the letters 'UKLD' in a large, bold, black sans-serif font. The 'U' has a small orange square above its top left corner. The 'K' has a small orange square above its top right corner. The 'L' has a small orange square above its top right corner. The 'D' has a small orange square above its top right corner. The words 'LIGHTING DESIGN' are written in a smaller, orange, sans-serif font, positioned between the 'K' and the 'D'.

Object :
Installation : Echo St
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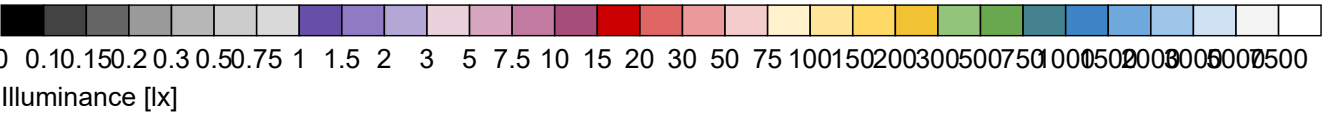
1.2 Summary, Exterior 1, Light scene 1(C)

1.2.2 Result overview, Perimeter Path 2

5	21 x		Order No. : RHF0730-25 Luminaire name : HAWFINCH Garden Spike 7W LED, Die-cast Aluminium, Dark Grey Equipment : 1 x LED 8.6 W / 528 lm
1	47 x		Order No. : RMU767-30/670 Luminaire name : Vegas COB Equipment : 1 x LED COB Strip Light 7.63 W / 670 lm
3	15E x		Aurora Order No. : EN-EMBH/EN-EMBH -- Emergency Lighting -- Luminaire name : Emergency Bulkhead 3W Maintained Emergency Bulkhead with Manual Test Function Equipment : 1 x LED 3 W / 150 lm Emergency : 147 lm (98.0 %)
4	50 x		HISPEC Order No. : HSSL/FESTOON Luminaire name : 110V Festoon Single 5W head Equipment : 1 x LED 5.1 W / 500 lm
7	8 x		iGuzzini Order No. : SS91-15_K54H Luminaire name : Walky LED: Square optic assembly 180x180mm AL optic Warm White 220÷240Vac - 5.8W 506lm - 3000K Equipment : 1 x LED / 4.8W 5.8 W / 1100 lm

1.2 Summary, Exterior 1, Light scene 1(C)

1.2.3 Result overview, Perimeter path 3



General

Calculation algorithm used	Average indirect fraction
Height of evaluation surface	0.00 m
Maintenance factor	0.80
Total luminous flux	140620 lm
Total power	1385.4 W
Total power per area (5831.77 m²)	0.24 W/m² (1.41 W/m²/100lx)

Illuminance

Average illuminance	$\bar{E}_m$	16.8 lx
Minimum illuminance	E_{min}	8.3 lx
Maximum illuminance	E_{max}	39.5 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	1:2.04 (0.49)
Diversity U_d	E_{min}/E_{max}	1:4.78 (0.21)

Type No. Make

Lucitalia S.r.L.

1	28 x	Order No.	: GH1013.ECFT300EN
		Luminaire name	: Modo 16W 3000 K 107° x 104°
		Equipment	: 2 x LEDX0102-30KC00-0450-6G / 983.5 lm

ROBUS

2	7 x	Order No.	: RKG0730SS-13
		Luminaire name	: KINGLET 7.5W LED In-ground Light IP67 3000K Brushed Chrome
		Equipment	: 1 x LED 7.4 W / 988 lm

Object :
Installation : Echo St
Project number :
Date : 16.12.2025



1.2 Summary, Exterior 1, Light scene 1(C)

1.2.3 Result overview, Perimeter path 3

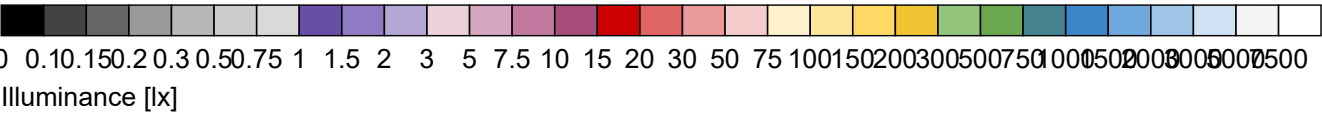
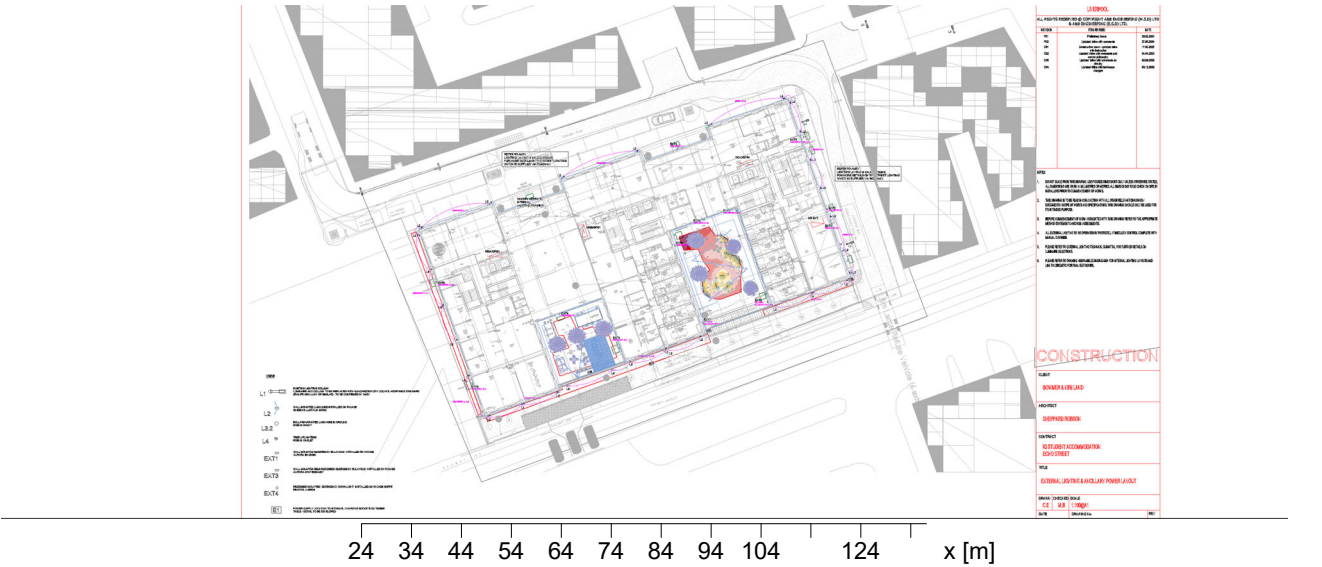
5	21 x		Order No. : RHF0730-25 Luminaire name : HAWFINCH Garden Spike 7W LED, Die-cast Aluminium, Dark Grey Equipment : 1 x LED 8.6 W / 528 lm
1	47 x		Order No. : RMU767-30/670 Luminaire name : Vegas COB Equipment : 1 x LED COB Strip Light 7.63 W / 670 lm
3	15E x		Aurora Order No. : EN-EMBH/EN-EMBH -- Emergency Lighting -- Luminaire name : Emergency Bulkhead 3W Maintained Emergency Bulkhead with Manual Test Function Equipment : 1 x LED 3 W / 150 lm Emergency : 147 lm (98.0 %)
4	50 x		HISPEC Order No. : HSSL/FESTOON Luminaire name : 110V Festoon Single 5W head Equipment : 1 x LED 5.1 W / 500 lm
7	8 x		iGuzzini Order No. : SS91-15_K54H Luminaire name : Walky LED: Square optic assembly 180x180mm AL optic Warm White 220÷240Vac - 5.8W 506lm - 3000K Equipment : 1 x LED / 4.8W 5.8 W / 1100 lm

Object :
Installation : Echo St
Project number :
Date : 16.12.2025



1.2 Summary, Exterior 1, Light scene 1(C)

1.2.4 Result overview, East Courtyard



General		
Calculation algorithm used	Average indirect fraction	
Height of evaluation surface	0.00 m	
Maintenance factor	0.80	
Total luminous flux	140620 lm	
Total power	1385.4 W	
Total power per area (5831.77 m²)	0.24 W/m²	

Illuminance		
Average illuminance	$\bar{E}_m$	81 lx
Minimum illuminance	E_{min}	21 lx
Maximum illuminance	E_{max}	345 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	1:6.88 (0.26)
Diversity U_d	E_{min}/E_{max}	1:29.3 (0.03)

Type No. Make

Lucitalia S.r.L.

1	28 x	Order No.	: GH1013.ECFT300EN
		Luminaire name	: Modo 16W 3000 K 107° x 104°
		Equipment	: 2 x LEDX0102-30KC00-0450-6G / 983.5 lm

ROBUS

2	7 x	Order No.	: RKG0730SS-13
		Luminaire name	: KINGLET 7.5W LED In-ground Light IP67 3000K Brushed Chrome
		Equipment	: 1 x LED 7.4 W / 988 lm

Object :
Installation : Echo St
Project number :
Date : 16.12.2025



1.2 Summary, Exterior 1, Light scene 1(C)

1.2.4 Result overview, East Courtyard

5 21 x  Order No. : RHF0730-25
Luminaire name : HAWFINCH Garden Spike 7W LED, Die-cast Aluminium, Dark Grey
Equipment : 1 x LED 8.6 W / 528 lm

1 47 x  Order No. : RMU767-30/670
Luminaire name : Vegas COB
Equipment : 1 x LED COB Strip Light 7.63 W / 670 lm

Aurora

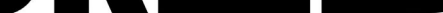
3 15E x  Order No. : EN-EMBH/EN-EMBH -- Emergency Lighting --
Luminaire name : Emergency Bulkhead 3W Maintained Emergency Bulkhead with Manual Test Function
Equipment : 1 x LED 3 W / 150 lm
Emergency : 147 lm (98.0 %)

HISPEC

4 50 x  Order No. : HSSL/FESTOON
Luminaire name : 110V Festoon Single 5W head
Equipment : 1 x LED 5.1 W / 500 lm

iGuzzini

7 8 x  Order No. : SS91-15_K54H
Luminaire name : Walky LED: Square optic assembly 180x180mm AL optic Warm White 220÷240Vac - 5.8W 506lm - 3000K
Equipment : 1 x LED / 4.8W 5.8 W / 1100 lm

The logo for UKLED LIGHTING DESIGN. It features the letters 'UKLED' in a large, bold, black sans-serif font. The 'U' has a small orange square above its top left corner. The 'L' has a small orange square above its top right corner. The 'E' has a small orange square above its top right corner. The 'D' has a small orange square above its top right corner. To the right of 'UKLED', the words 'LIGHTING DESIGN' are written in a smaller, orange, sans-serif font.

Object :
Installation : Echo St
Project number :
Date : 16.12.2025



1.2 Summary, Exterior 1, Light scene 1(C)

1.2.5 Result overview, West Courtyard

5 21 x  Order No. : RHF0730-25
Luminaire name : HAWFINCH Garden Spike 7W LED, Die-cast Aluminium, Dark Grey
Equipment : 1 x LED 8.6 W / 528 lm

1 47 x  Order No. : RMU767-30/670
Luminaire name : Vegas COB
Equipment : 1 x LED COB Strip Light 7.63 W / 670 lm

Aurora

3 15E x  Order No. : EN-EMBH/EN-EMBH -- Emergency Lighting --
Luminaire name : Emergency Bulkhead 3W Maintained Emergency Bulkhead with Manual Test Function
Equipment : 1 x LED 3 W / 150 lm
Emergency : 147 lm (98.0 %)

HISPEC

4 50 x  Order No. : HSSL/FESTOON
Luminaire name : 110V Festoon Single 5W head
Equipment : 1 x LED 5.1 W / 500 lm

iGuzzini

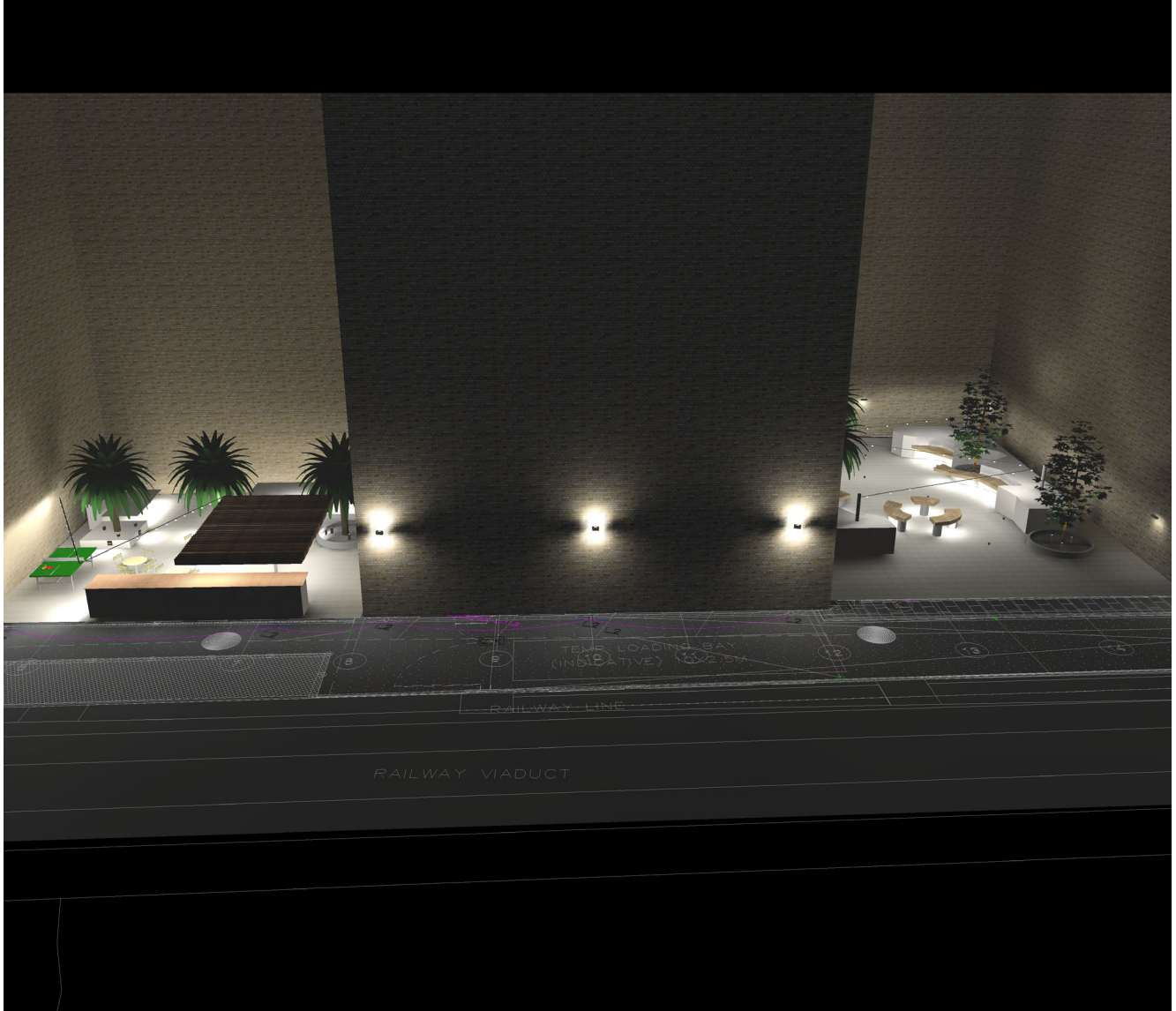
7 8 x  Order No. : SS91-15_K54H
Luminaire name : Walky LED: Square optic assembly 180x180mm AL optic Warm White 220÷240Vac - 5.8W 506lm - 3000K
Equipment : 1 x LED / 4.8W 5.8 W / 1100 lm

Object :
Installation : Echo St
Project number :
Date : 16.12.2025

1 Exterior 1

1.3 Calculation results, Exterior 1, Light scene 1(C)

1.3.1 3D luminance, View 1



Luminance in the scene

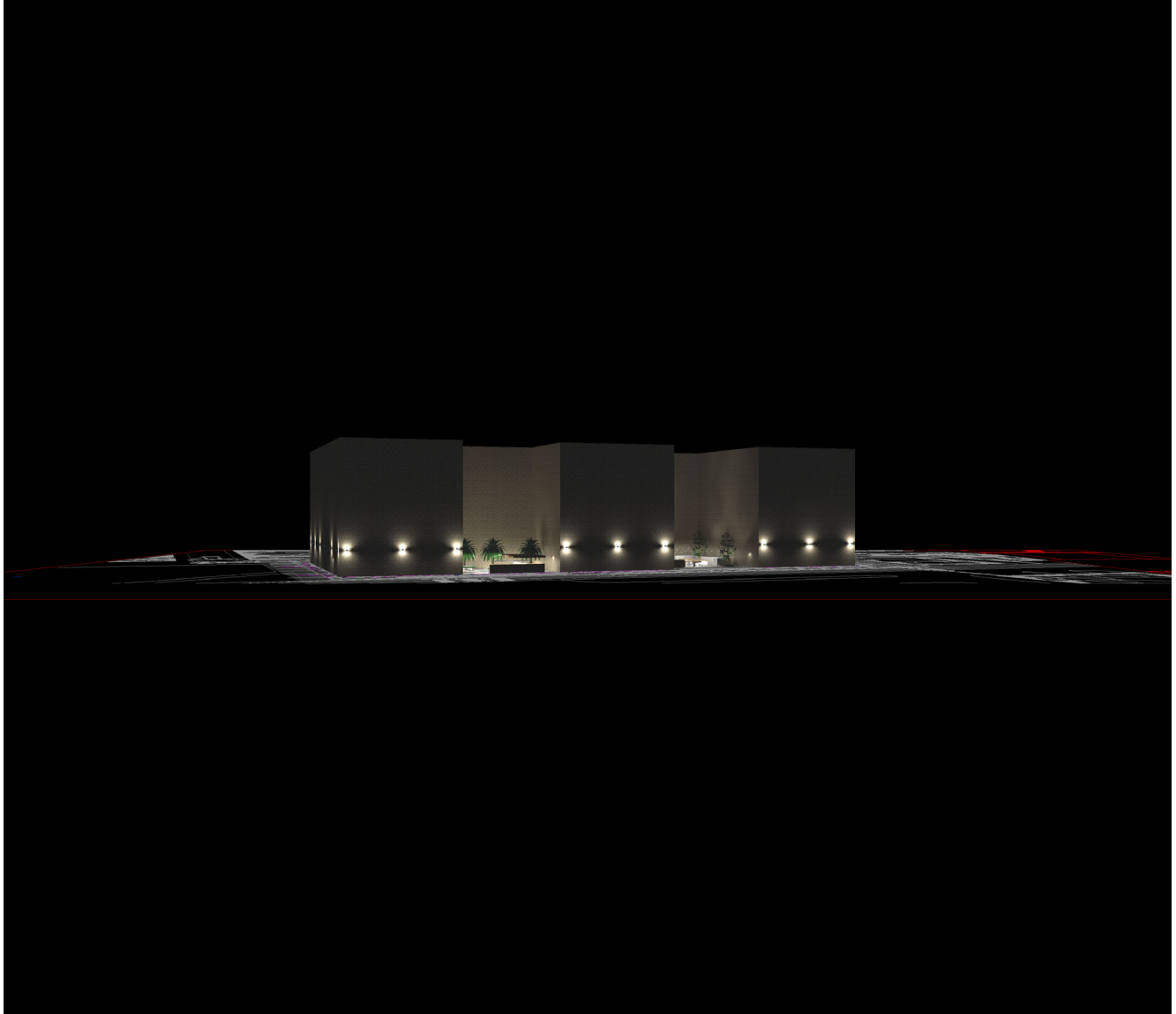
Minimum: : 0 cd/m²
Maximum: : 567 cd/m²

Object :
Installation : Echo St
Project number :
Date : 16.12.2025



1.3 Calculation results, Exterior 1, Light scene 1(C)

1.3.2 3D luminance, View from the front



Luminance in the scene

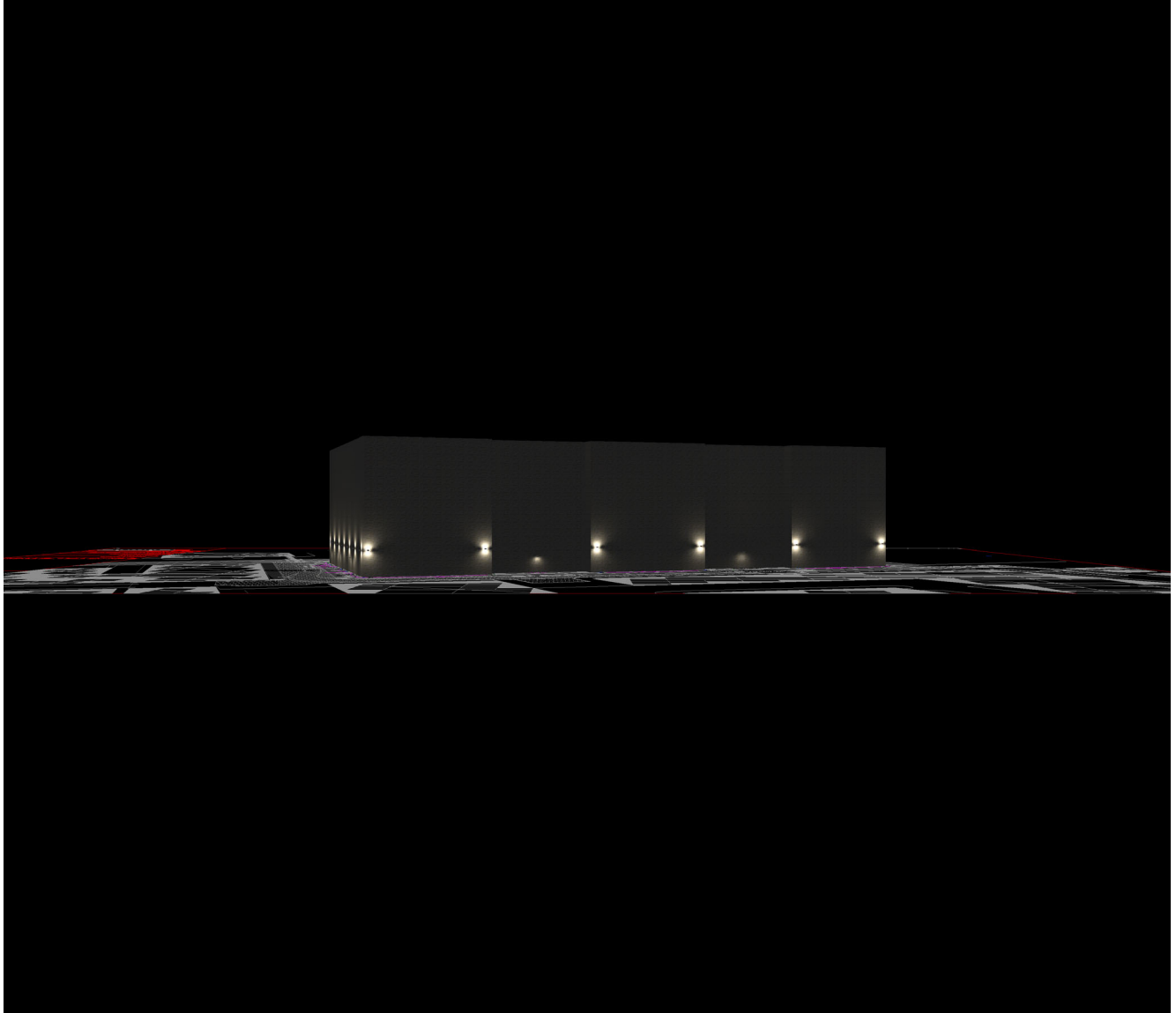
Minimum: : 0 cd/m²
Maximum: : 567 cd/m²

Object :
Installation : Echo St
Project number :
Date : 16.12.2025



1.3 Calculation results, Exterior 1, Light scene 1(C)

1.3.3 3D luminance, View from the back



Luminance in the scene

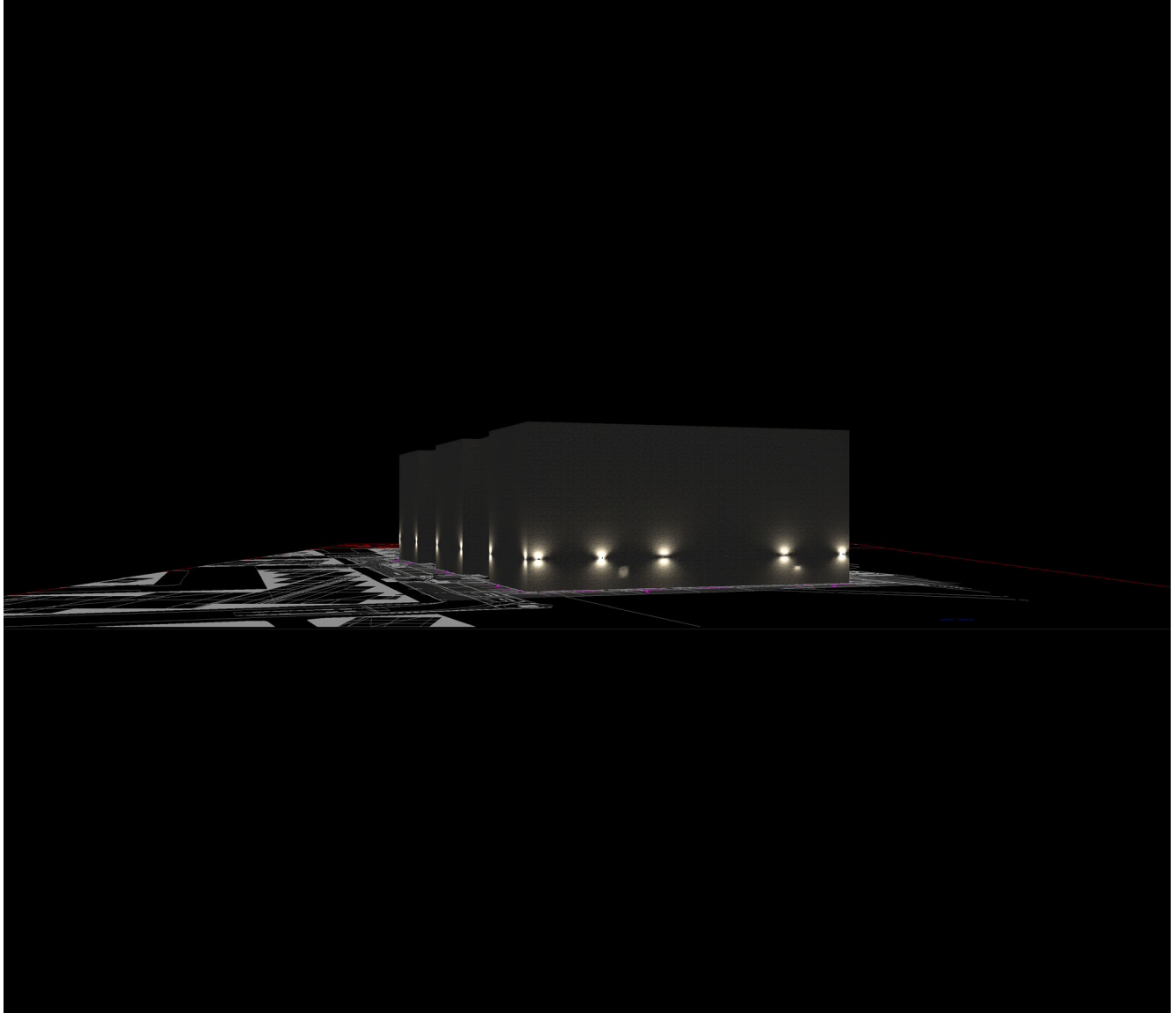
Minimum: : 0 cd/m²
Maximum: : 567 cd/m²

Object :
Installation : Echo St
Project number :
Date : 16.12.2025



1.3 Calculation results, Exterior 1, Light scene 1(C)

1.3.4 3D luminance, View from the left



Luminance in the scene

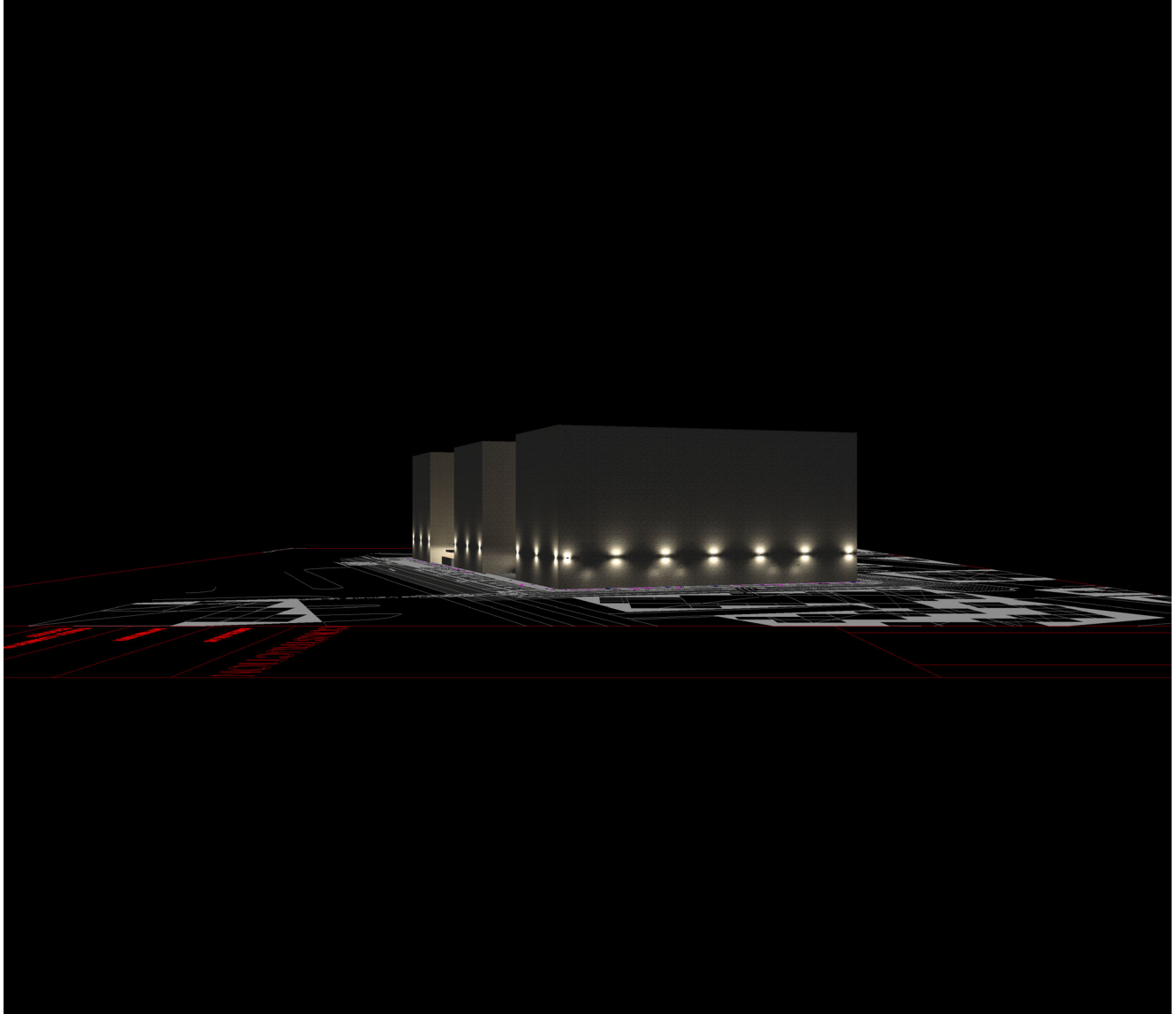
Minimum: : 0 cd/m²
Maximum: : 567 cd/m²

Object :
Installation : Echo St
Project number :
Date : 16.12.2025



1.3 Calculation results, Exterior 1, Light scene 1(C)

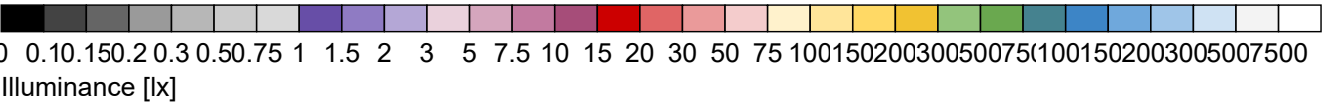
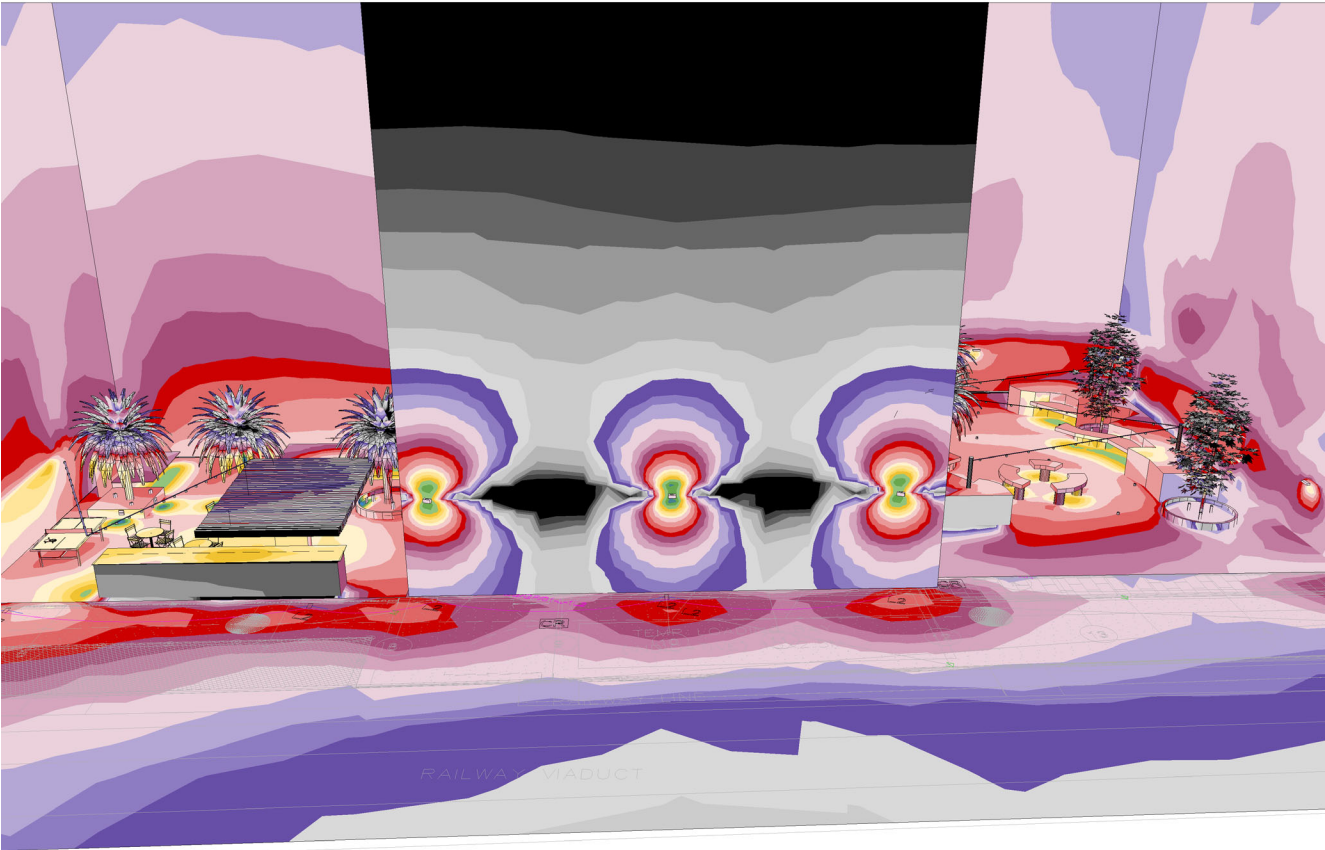
1.3.5 3D luminance, View from the right



Luminance in the scene
Minimum: : 0 cd/m²
Maximum: : 567 cd/m²

1.3 Calculation results, Exterior 1, Light scene 1(C)

1.3.6 3D pseudo colours, View 1 (E)



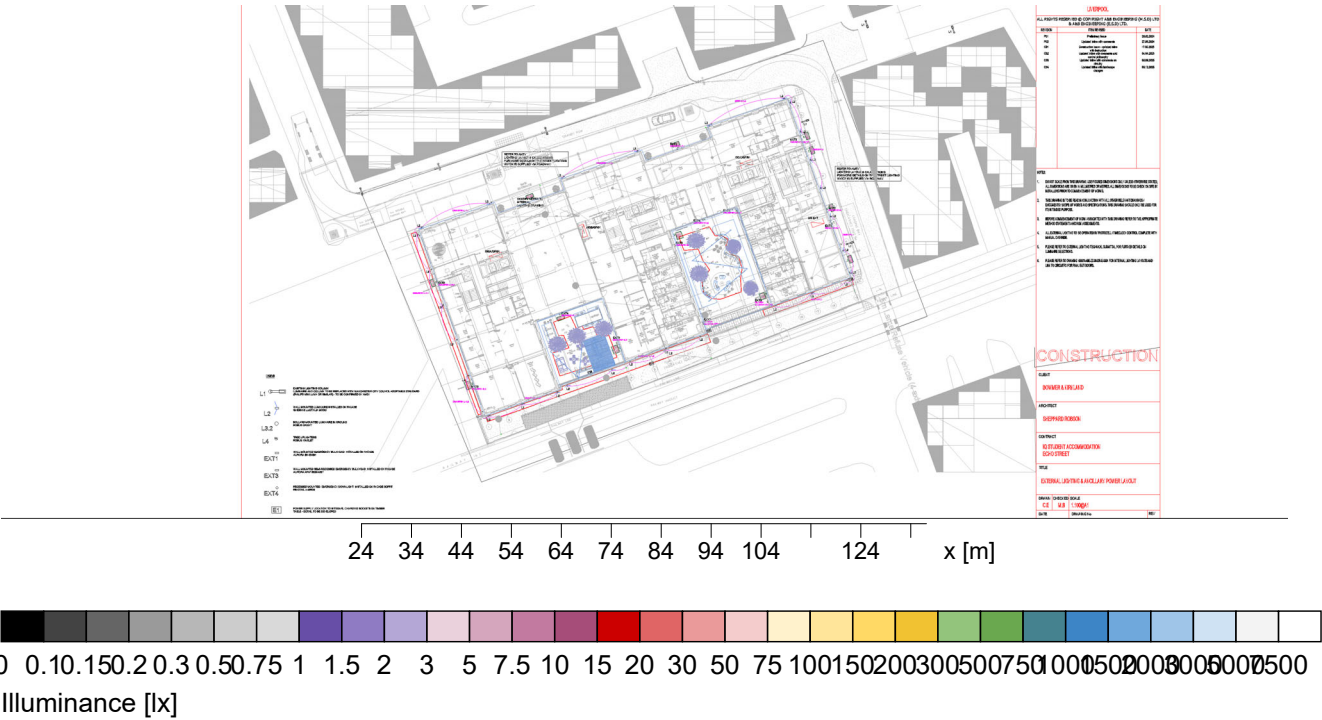
Object :
Installation : Echo St
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Date : 16.12.2025



1 Exterior 1

1.4 Summary, Exterior 1, Light scene 1(C)

1.4.1.1 Result overview (emergency lighting)



General

Calculation algorithm used : Direct component
Maintenance factor : 0.8
Height (phot centre) : 2.17 m
Maximum I : 71 cd <= 500 cd

Anti panic area:

No.	Emin [lx]	Surface Emax [lx]	Ud
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Anti panic area 1

Calculation field: 1.27m x 1.56m (5 x 6 pts), Height = 0.00m

1	2.06 lx >= 0.5 lx	9.97 lx >= 1 : 40	1: 4.85
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Anti panic area 2

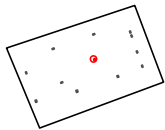
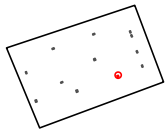
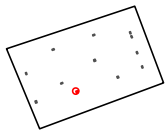
Calculation field: 1.1m x 1.25m (6 x 6 pts), Height = 0.00m

2	2.37 lx >= 0.5 lx	10.75 lx >= 1 : 40	1: 4.53
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Anti panic area 3

Calculation field: 1.4m x 1.29m (6 x 6 pts), Height = 0.00m

3	2.33 lx >= 0.5 lx	10.31 lx >= 1 : 40	1: 4.43
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Object :
Installation : Echo St
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1 Exterior 1

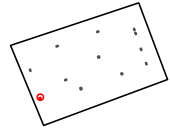
1.4 Summary, Exterior 1, Light scene 1(C)

1.4.1.1 Result overview (emergency lighting)

Anti panic area 4

Calculation field: 1.14m x 1.59m (5 x 6 pts), Height = 0.00m

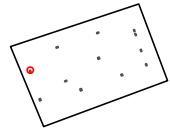
4	1.99 lx	8.49 lx	1: 4.26
	≥ 0.5 lx		$\geq 1 : 40$



Anti panic area 5

Calculation field: 0.76m x 1.49m (4 x 6 pts), Height = 0.00m

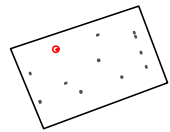
5	2.45 lx	7.52 lx	1: 3.06
	≥ 0.5 lx		$\geq 1 : 40$



Anti panic area 6

Calculation field: 0.76m x 1.49m (4 x 6 pts), Height = 0.00m

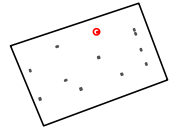
6	3.63 lx	10.07 lx	1: 2.77
	≥ 0.5 lx		$\geq 1 : 40$



Anti panic area 7

Calculation field: 0.76m x 1.49m (4 x 6 pts), Height = 0.00m

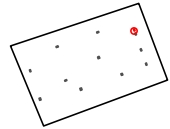
7	2.73 lx	7.80 lx	1: 2.85
	≥ 0.5 lx		$\geq 1 : 40$



Anti panic area 8

Calculation field: 0.76m x 1.49m (4 x 6 pts), Height = 0.00m

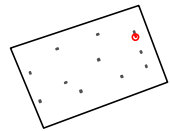
8	3.78 lx	9.64 lx	1: 2.55
	≥ 0.5 lx		$\geq 1 : 40$



Anti panic area 9

Calculation field: 0.76m x 1.49m (4 x 6 pts), Height = 0.00m

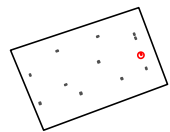
9	4.06 lx	10.45 lx	1: 2.57
	≥ 0.5 lx		$\geq 1 : 40$



Anti panic area 10

Calculation field: 0.76m x 1.49m (4 x 6 pts), Height = 0.00m

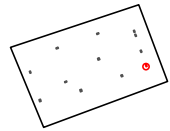
10	4.28 lx	11.62 lx	1: 2.71
	≥ 0.5 lx		$\geq 1 : 40$



Anti panic area 11

Calculation field: 0.76m x 1.49m (4 x 6 pts), Height = 0.00m

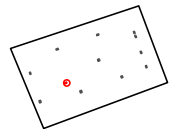
11	3.35 lx	10.29 lx	1: 3.07
	≥ 0.5 lx		$\geq 1 : 40$



Anti panic area 12

Calculation field: 0.76m x 1.49m (4 x 6 pts), Height = 0.00m

12	2.85 lx	7.90 lx	1: 2.77
	≥ 0.5 lx		$\geq 1 : 40$



Type No.\Make

Object :
Installation : Echo St
Project number :
Date : 16.12.2025



1 Exterior 1

1.4 Summary, Exterior 1, Light scene 1(C)

1.4.1.1 Result overview (emergency lighting)

Aurora

3	15E x	Order No.	: EN-EMBH/EN-EMBH	-- Emergency Lighting --
		Luminaire name	: Emergency Bulkhead 3W Maintained Emergency Bulkhead with Manual Test Function	
		Equipment	: 1 x LED 3 W / 150 lm	
		Emergency	: 147 lm (98.0 %)	
		Maintenance factor:	0.80	