

Lighting Design

Installation : Yara - New Store

Project number : LP240579
Customer : SR Electrical Grimsby
Processed by : MJC
Date : 04.03.2024

Project description:

All calculations have been based on the information provided, plus the accompanying drawings and verbal information received.

BT Associates t/a Lumineux take no responsibility for the maintenance regime and can only guarantee light levels at start of life.

Our lighting designs are based on relevant lighting guides in conjunction with best practice. The Lumineux LDT files used to produce this design are specific to the Lumineux fittings included herein. A new lighting design must be produced should an alternative fitting be required. The optics of different fittings are rarely the same even if the lumen output is identical. Using an alternate fitting without a design could make the scheme non-compliant with relevant lighting guides.

Racking installed into an open plan warehouse will drastically alter the lighting requirements both with regard to normal and emergency lighting. A new lighting design is recommended prior to the racking being installed.

Emergency scheme is to be checked and confirmed with local building or fire control officer and ultimately approved by the owner of the building. Any emergency calculations that have been completed have been based on 0.5 lux for open areas and 1 lux for escape routes. In general information with regard to positioning of fire fighting and call points is unknown and hence the design does not consider this requirement. Emergency lighting for High Risk areas should be considered additional to this design.

The absence of an emergency scheme within the design does not indicate one is not required, rather that the brief has suggested that this is either already in existence or will be supplied by another source.

Please ensure that this lighting scheme complies with all your requirements before placing order with our sales team.

A Design based on a 1-4-1 replacement should not be considered to be compliant with current codes of Practice.

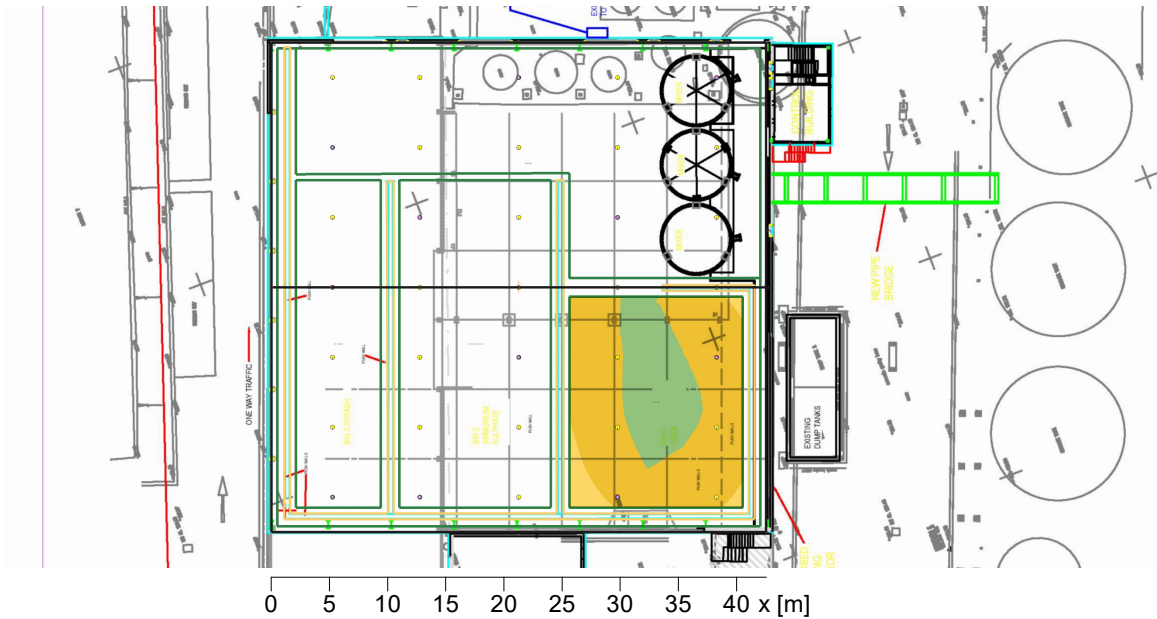
The following values are based on precise calculations performed on calibrated lamps and luminaires, and their configurations, whereby gradual, unavoidable deviations can occur in practice. All guarantee claims are excluded for the specified data.

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

1 Warehouse

1.1 Summary, Warehouse

1.1.1 Result overview, Bin 1 Urea



General

Calculation algorithm used	Average indirect fraction
Height of evaluation surface	0.00 m
Maintenance factor	0.85
Total luminous flux	709215 lm
Total power	5324 W
Total power per area (1784.75 m ²)	2.98 W/m ²

Illuminance

Average illuminance	\bar{E}_m	267 lx
Minimum illuminance	E_{min}	164 lx
Maximum illuminance	E_{max}	342 lx
Uniformity U_o	E_{min}/\bar{E}_m	1:1.63 (0.61)
Diversity U_d	E_{min}/E_{max}	1:2.09 (0.48)

Type No.Make

Lumineux Lighting

- 1 24 x Order No. : !Special
 Luminaire name : 150W LED High Bay - Glass Optic
 Equipment : 1 x Nichia SMD LED 151.2 W / 20229 lm

- 2 11E x Order No. : !Special-M3 -- Emergency Lighting --
 Luminaire name : Emergency LED High Bay - Glass Optic
 Equipment : 1 x Nichia SMD LED 151.2 W / 20229 lm
 Emergency : 500 lm (2.5 %)



Object : Lighting Design
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1 Warehouse

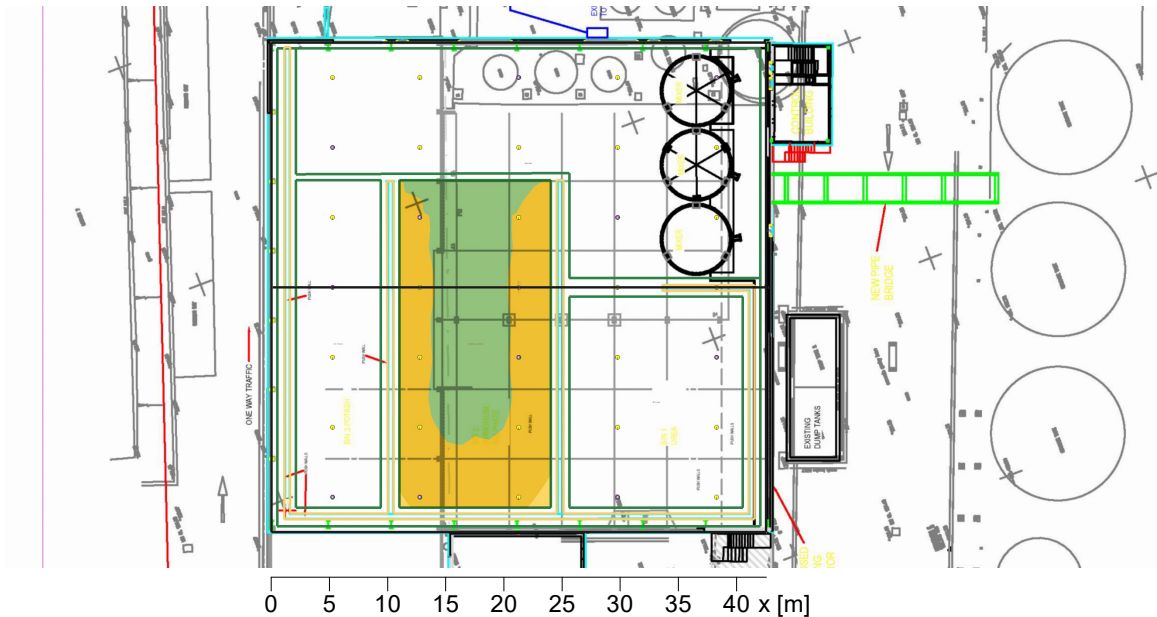
1.1 Summary, Warehouse

1.1.1 Result overview, Bin 1 Urea

3	4E x	Order No.	: 430950 6000K Darwell	-- Emergency Lighting --
		Luminaire name	: 4W Darwell Emergency Bulkhead LiFeP04 E-SEL3 860	
		Equipment	: 1 x LED 4 W / 150 lm	
		Emergency	: 150 lm (100.0 %)	
4	4E x	Order No.	: 430950 6000K Darwell	-- Emergency Lighting --
		Luminaire name	: 4W Darwell Emergency Bulkhead LiFeP04 E-SEL3 860	
		Equipment	: 1 x LED 4 W / 150 lm	
		Emergency	: 150 lm (100.0 %)	

1.1 Summary, Warehouse

1.1.2 Result overview, Bin 2 Amonium Sulfate



General

Calculation algorithm used	Average indirect fraction
Height of evaluation surface	0.00 m
Maintenance factor	0.85
Total luminous flux	709215 lm
Total power	5324 W
Total power per area (1784.75 m ²)	2.98 W/m ²

Illuminance

Average illuminance	\bar{E}_m	287 lx
Minimum illuminance	E_{min}	185 lx
Maximum illuminance	E_{max}	344 lx
Uniformity U_o	E_{min}/\bar{E}_m	1:1.55 (0.64)
Diversity U_d	E_{min}/E_{max}	1:1.86 (0.54)

Type No.Make

Lumineux Lighting

- 1 24 x Order No. : !Special
 Luminaire name : 150W LED High Bay - Glass Optic
 Equipment : 1 x Nichia SMD LED 151.2 W / 20229 lm



- 2 11E x Order No. : !Special-M3 -- Emergency Lighting --
 Luminaire name : Emergency LED High Bay - Glass Optic
 Equipment : 1 x Nichia SMD LED 151.2 W / 20229 lm
 Emergency : 500 lm (2.5 %)

Object : Lighting Design
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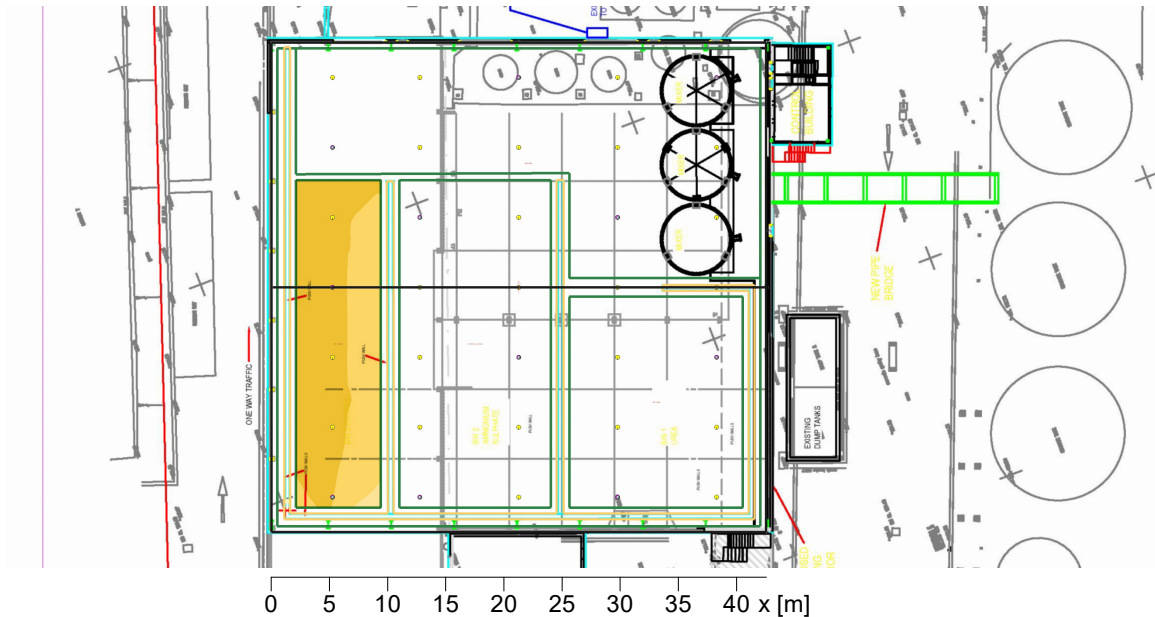
1.1 Summary, Warehouse

1.1.2 Result overview, Bin 2 Amonium Sulfate

3	4E x	Order No.	: 430950 6000K Darwell	-- Emergency Lighting --
		Luminaire name	: 4W Darwell Emergency Bulkhead LiFeP04 E-SEL3 860	
		Equipment	: 1 x LED 4 W / 150 lm	
		Emergency	: 150 lm (100.0 %)	
4	4E x	Order No.	: 430950 6000K Darwell	-- Emergency Lighting --
		Luminaire name	: 4W Darwell Emergency Bulkhead LiFeP04 E-SEL3 860	
		Equipment	: 1 x LED 4 W / 150 lm	
		Emergency	: 150 lm (100.0 %)	

1.1 Summary, Warehouse

1.1.3 Result overview, Bin 3 Potash



General



Calculation algorithm used	Average indirect fraction
Height of evaluation surface	0.00 m
Maintenance factor	0.85
Total luminous flux	709215 lm
Total power	5324 W
Total power per area (1784.75 m ²)	2.98 W/m ²

Illuminance

Average illuminance	\bar{E}_m	227 lx
Minimum illuminance	E_{min}	138 lx
Maximum illuminance	E_{max}	296 lx
Uniformity U_o	E_{min}/\bar{E}_m	1:1.64 (0.61)
Diversity U_d	E_{min}/E_{max}	1:2.14 (0.47)

Type No./Make

Lumineux Lighting

- | | | | |
|---|-------|----------------|---|
| 1 | 24 x | Order No. | : !Special |
|  | | Luminaire name | : 150W LED High Bay - Glass Optic |
| | | Equipment | : 1 x Nichia SMD LED 151.2 W / 20229 lm |
| 2 | 11E x | Order No. | : !Special-M3 -- Emergency Lighting -- |
|  | | Luminaire name | : Emergency LED High Bay - Glass Optic |
| | | Equipment | : 1 x Nichia SMD LED 151.2 W / 20229 lm |
| | | Emergency | : 500 lm (2.5 %) |

Object : Lighting Design
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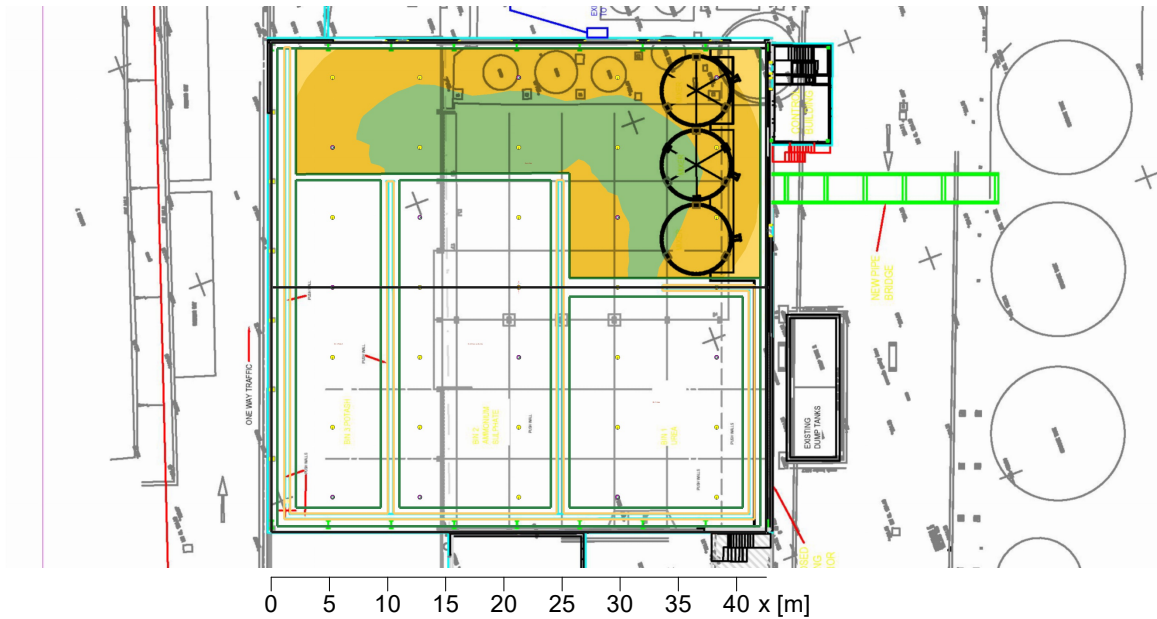
1.1 Summary, Warehouse

1.1.3 Result overview, Bin 3 Potash

3	4E x	Order No.	: 430950 6000K Darwell	-- Emergency Lighting --
		Luminaire name	: 4W Darwell Emergency Bulkhead LiFeP04 E-SEL3 860	
		Equipment	: 1 x LED 4 W / 150 lm	
		Emergency	: 150 lm (100.0 %)	
4	4E x	Order No.	: 430950 6000K Darwell	-- Emergency Lighting --
		Luminaire name	: 4W Darwell Emergency Bulkhead LiFeP04 E-SEL3 860	
		Equipment	: 1 x LED 4 W / 150 lm	
		Emergency	: 150 lm (100.0 %)	

1.1 Summary, Warehouse

1.1.4 Result overview, Open Area



General


Calculation algorithm used	Average indirect fraction
Height of evaluation surface	0.00 m
Maintenance factor	0.85
Total luminous flux	709215 lm
Total power	5324 W
Total power per area (1784.75 m ²)	2.98 W/m ²


Illuminance

Average illuminance	\bar{E}_m	282 lx
Minimum illuminance	E_{min}	151 lx
Maximum illuminance	E_{max}	359 lx
Uniformity U_o	E_{min}/\bar{E}_m	1:1.87 (0.54)
Diversity U_d	E_{min}/E_{max}	1:2.37 (0.42)

Type No. Make

Lumineux Lighting

- 1 24 x  Order No. : !Special
 Luminaire name : 150W LED High Bay - Glass Optic
 Equipment : 1 x Nichia SMD LED 151.2 W / 20229 lm

- 2 11E x  Order No. : !Special-M3 -- Emergency Lighting --
 Luminaire name : Emergency LED High Bay - Glass Optic
 Equipment : 1 x Nichia SMD LED 151.2 W / 20229 lm
 Emergency : 500 lm (2.5 %)

Object : Lighting Design
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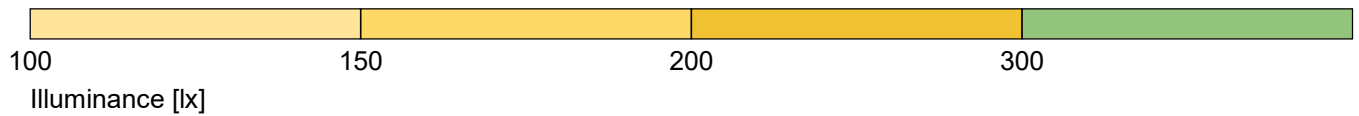
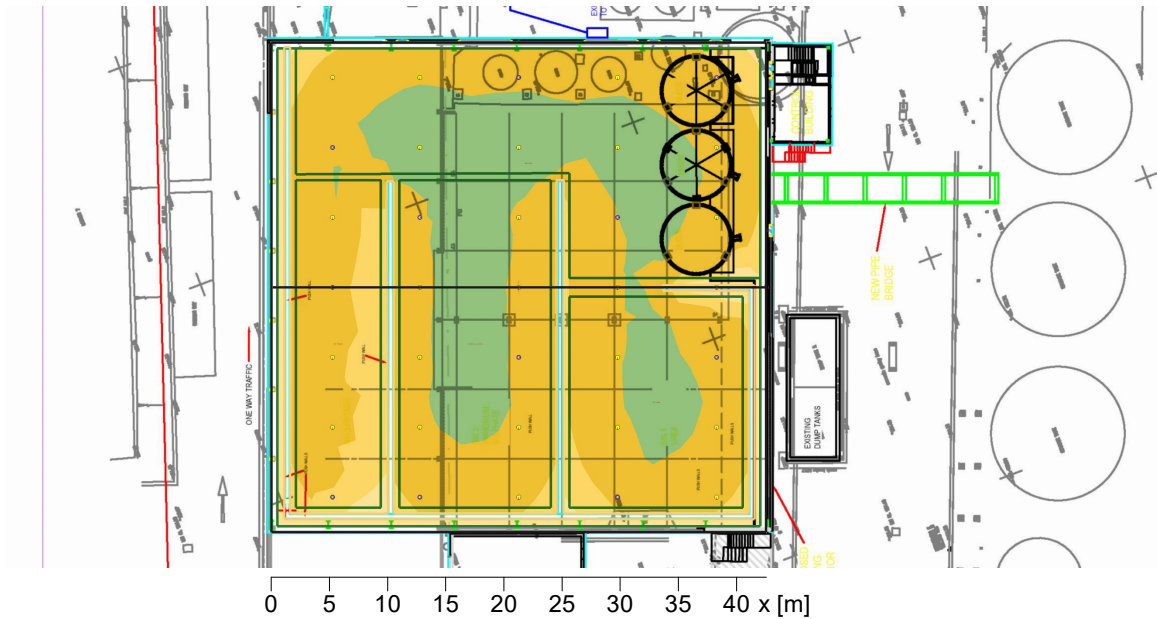
1.1 Summary, Warehouse

1.1.4 Result overview, Open Area

3	4E x	Order No.	: 430950 6000K Darwell	-- Emergency Lighting --
		Luminaire name	: 4W Darwell Emergency Bulkhead LiFeP04 E-SEL3 860	
		Equipment	: 1 x LED 4 W / 150 lm	
		Emergency	: 150 lm (100.0 %)	
4	4E x	Order No.	: 430950 6000K Darwell	-- Emergency Lighting --
		Luminaire name	: 4W Darwell Emergency Bulkhead LiFeP04 E-SEL3 860	
		Equipment	: 1 x LED 4 W / 150 lm	
		Emergency	: 150 lm (100.0 %)	

1.1 Summary, Warehouse

1.1.5 Result overview, Evaluation area 1



General

Calculation algorithm used	Average indirect fraction
Maintenance factor	0.85
Total luminous flux	709215.00 lm
Total power	5324.0 W
Total power per area (1784.75 m ²)	2.98 W/m ² (1.13 W/m ² /100lx)

Evaluation area 1

Reference plane 1.1

	Horizontal	cylindrical
\bar{E}_m	264 lx	89 lx
E_{min}	142 lx	51 lx
$E_{min}/\bar{E}_m (U_o)$	0.54	0.58
$E_{min}/E_{max} (U_d)$	0.41	
E_z/E_h		0.32
Position	0.00 m	1.60 m
$R_{UG} (12.0H \ 8.0H)$	≤ 21.2	

Luminaire :
 (4W Darwell Emergency Bulkhead LiFeP04 E-SEL3 860, 430950 6000K Darwell)

Hints:
 - At least one of the room dimensions has been limited to 12H.

Major surfaces

\bar{E}_m





U_o

Type No./Make

1.1 Summary, Warehouse

1.1.5 Result overview, Evaluation area 1

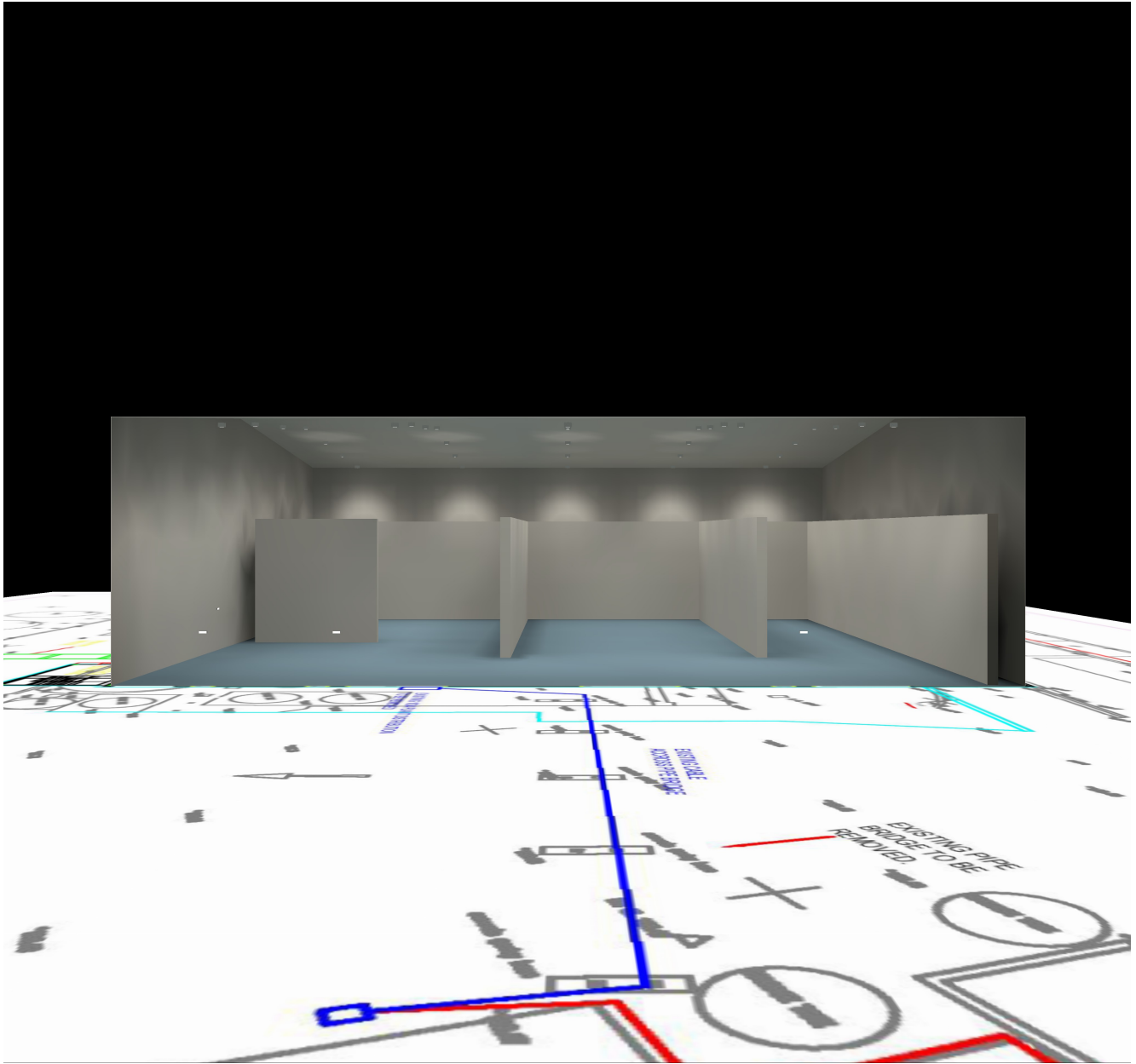
Lumineux Lighting

- | | | | | |
|---|-------|---|----------------|--|
| 1 | 24 x |  | Order No. | : !Special |
| | | | Luminaire name | : 150W LED High Bay - Glass Optic |
| | | | Equipment | : 1 x Nichia SMD LED 151.2 W / 20229 lm |
| 2 | 11E x |  | Order No. | : !Special-M3 -- Emergency Lighting -- |
| | | | Luminaire name | : Emergency LED High Bay - Glass Optic |
| | | | Equipment | : 1 x Nichia SMD LED 151.2 W / 20229 lm |
| | | | Emergency | : 500 lm (2.5 %) |
| 3 | 4E x |  | Order No. | : 430950 6000K Darwell -- Emergency Lighting -- |
| | | | Luminaire name | : 4W Darwell Emergency Bulkhead LiFeP04 E-SEL3 860 |
| | | | Equipment | : 1 x LED 4 W / 150 lm |
| | | | Emergency | : 150 lm (100.0 %) |
| 4 | 4E x |  | Order No. | : 430950 6000K Darwell -- Emergency Lighting -- |
| | | | Luminaire name | : 4W Darwell Emergency Bulkhead LiFeP04 E-SEL3 860 |
| | | | Equipment | : 1 x LED 4 W / 150 lm |
| | | | Emergency | : 150 lm (100.0 %) |

1 Warehouse

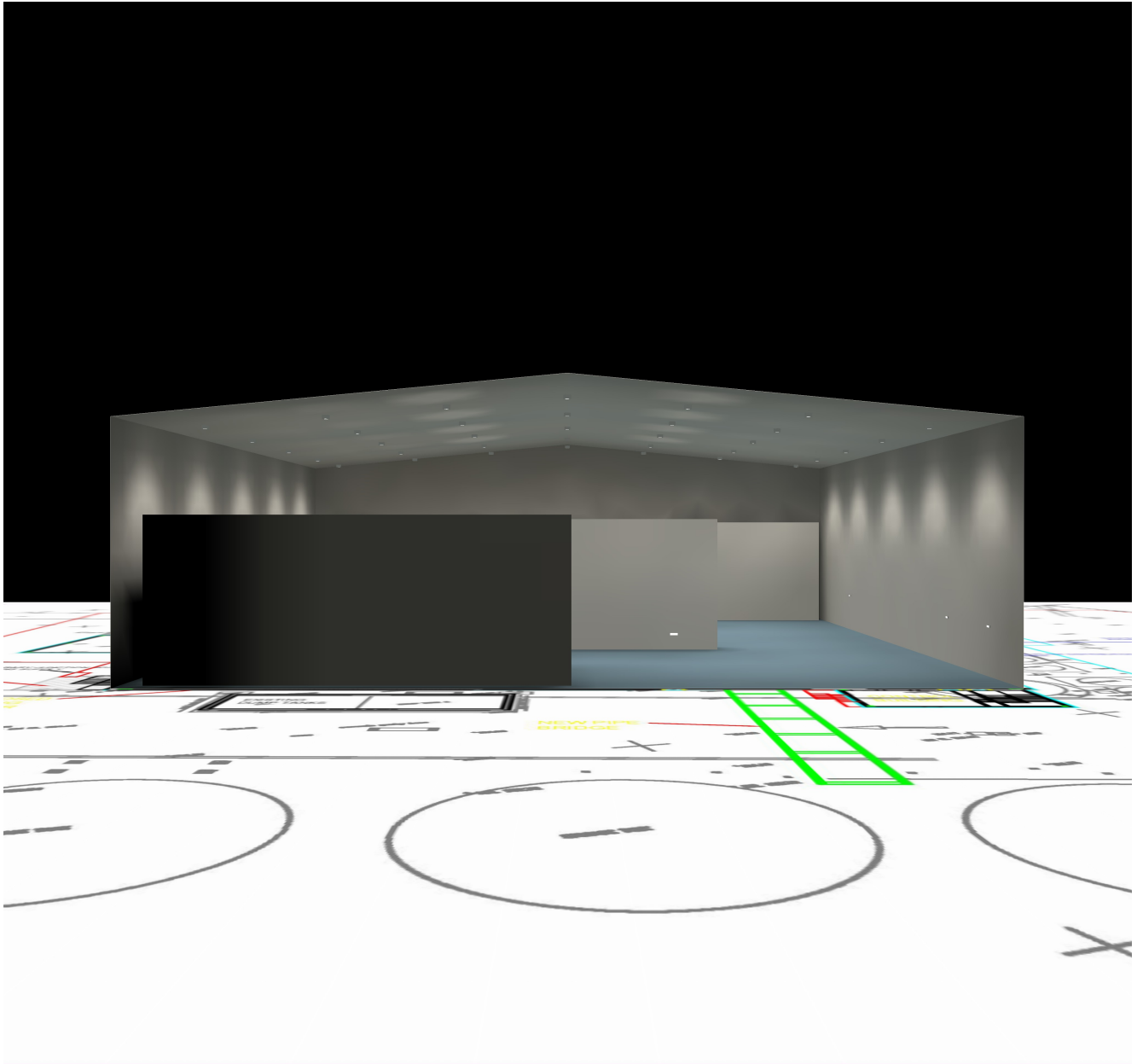
1.2 Calculation results, Warehouse

1.2.1 3D luminance, View from the back



1.2 Calculation results, Warehouse

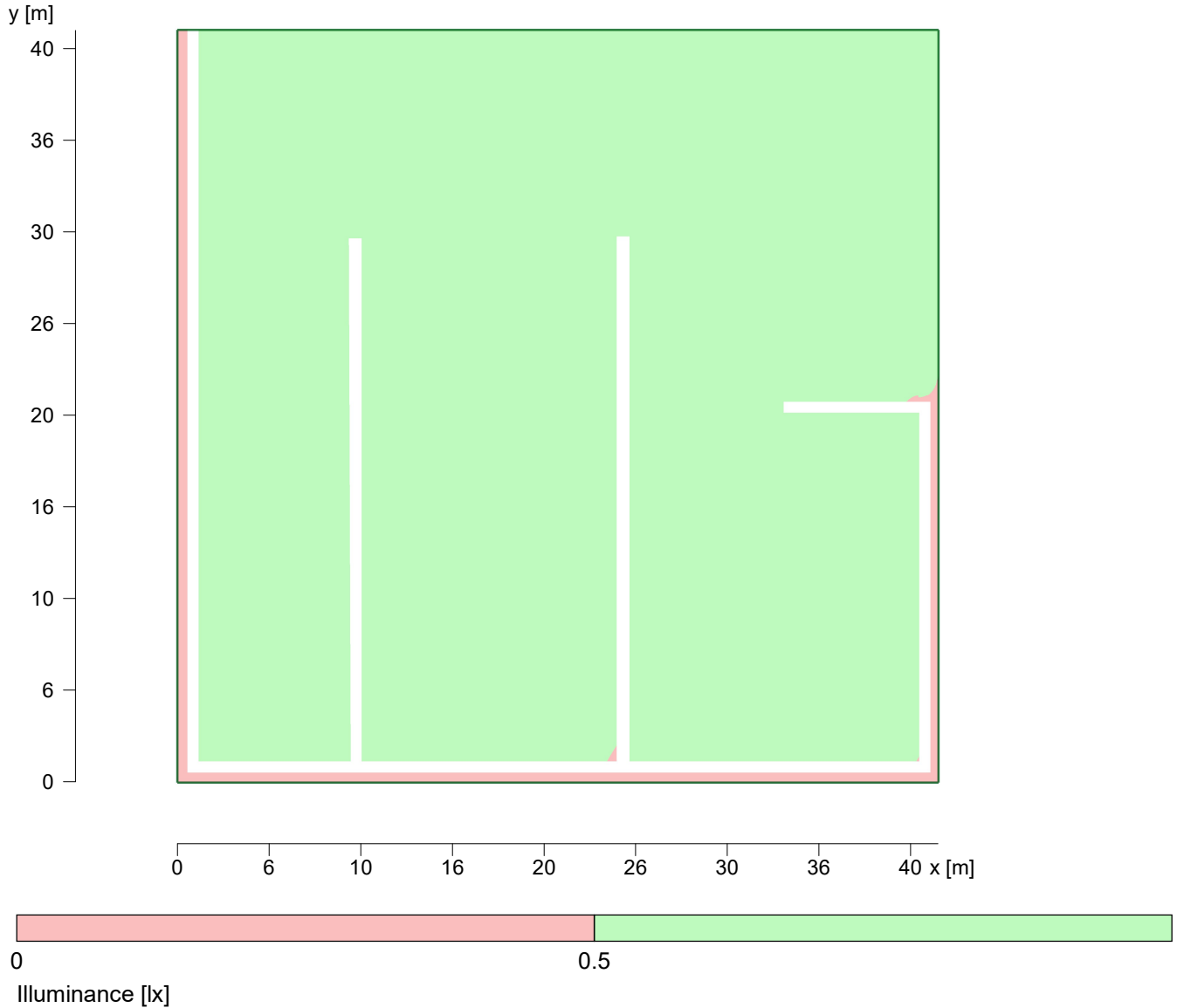
1.2.2 3D luminance, View from the right



1 Warehouse

1.3 Calculation results, Warehouse

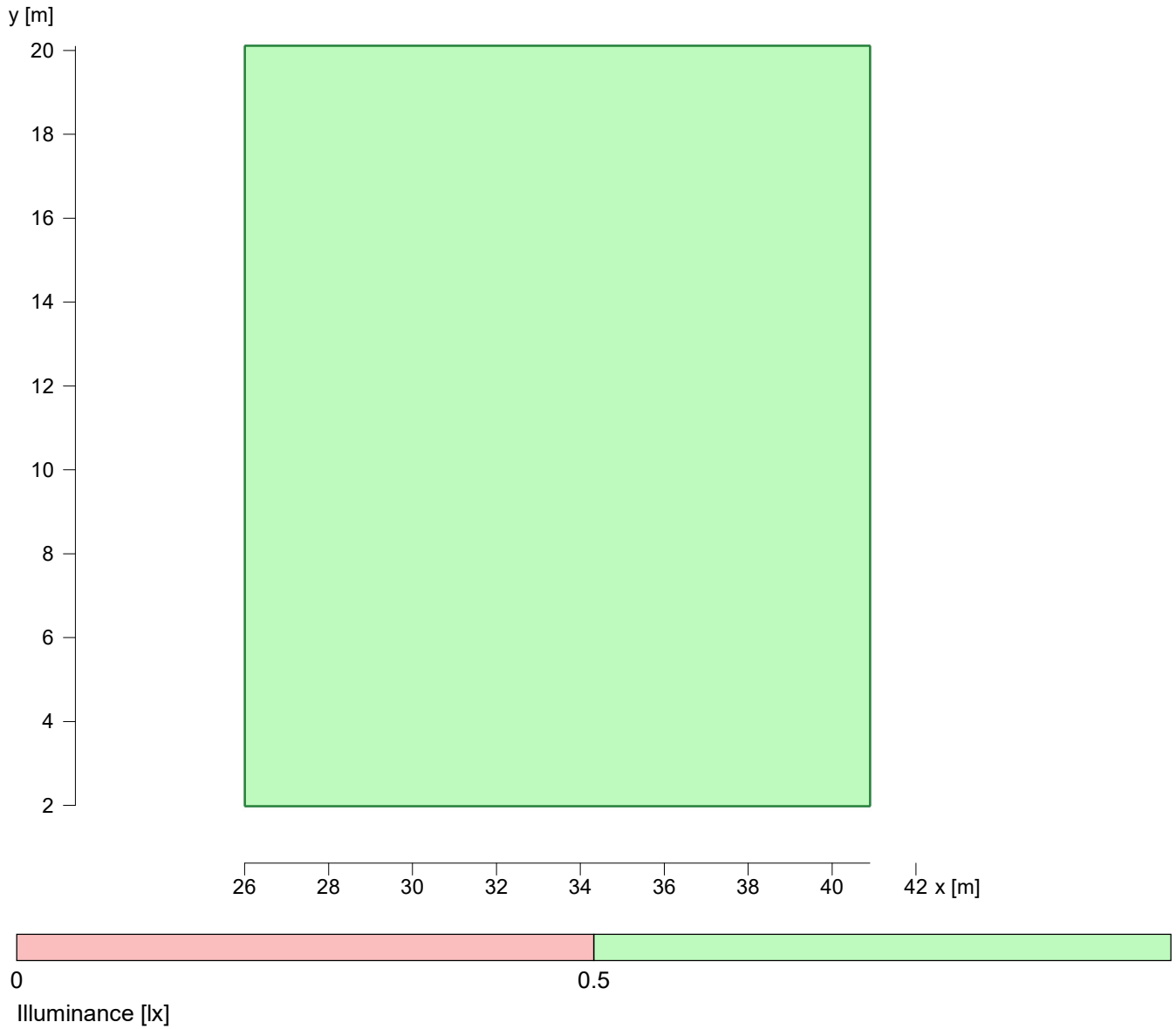
1.3.1 Boundary line, Anti panic area 1.1 (E)



Required minimum illuminance		: 0.5 lx
Minimum illuminance	E _{min}	: 0 lx
Maximum illuminance	E _{max}	: 3.3 lx
Diversity	E _{min} /E _{max}	: --- (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8

1.3 Calculation results, Warehouse

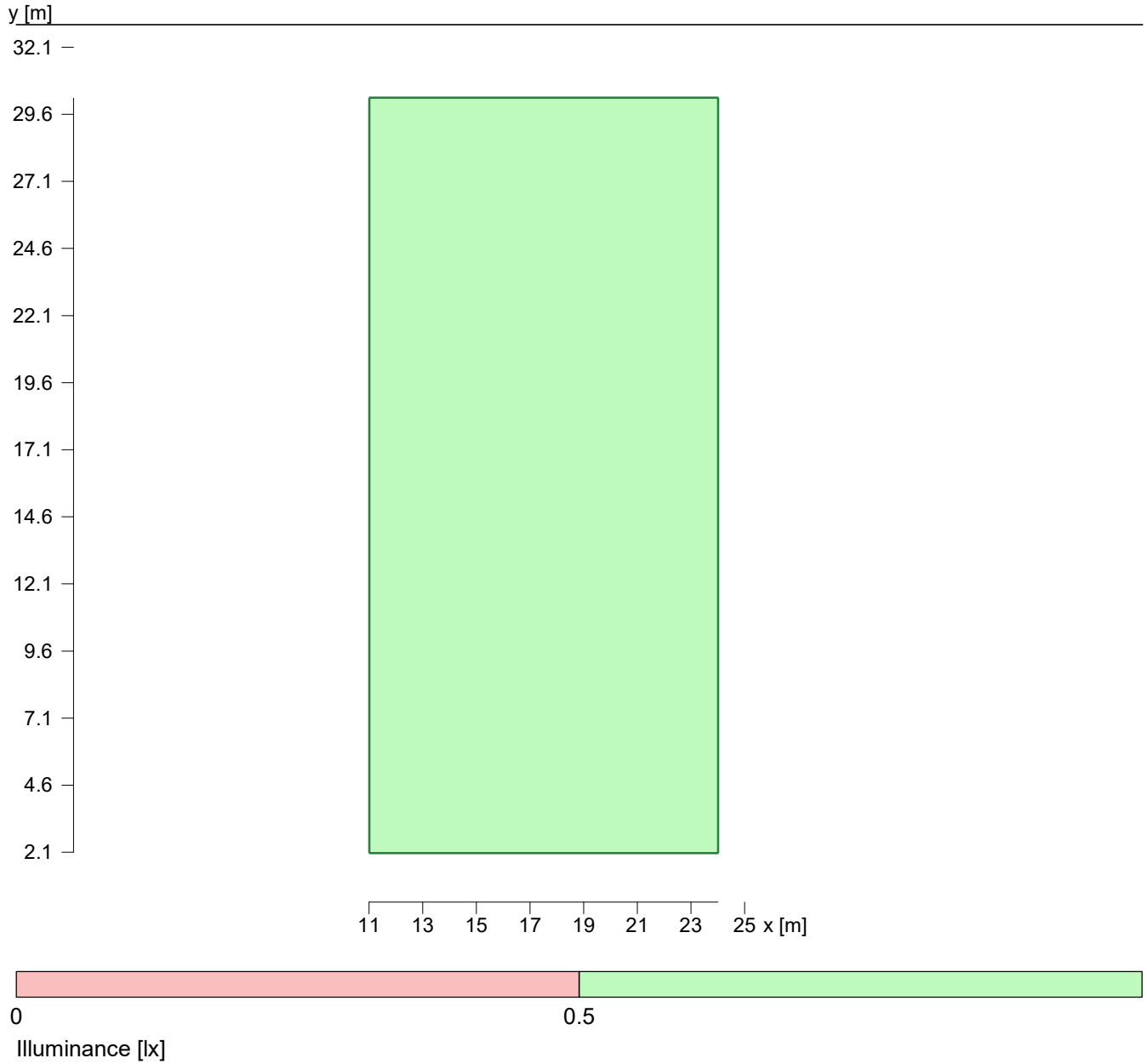
1.3.2 Boundary line, Bin 1 Urea (E)



Required minimum illuminance		: 0.5 lx
Minimum illuminance	E _{min}	: 0.57 lx
Maximum illuminance	E _{max}	: 2 lx
Diversity	E _{min} /E _{max}	: 1 : 3.47 (0.29) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8

1.3 Calculation results, Warehouse

1.3.3 Boundary line, Bin 2 Amonium Sulfate (E)

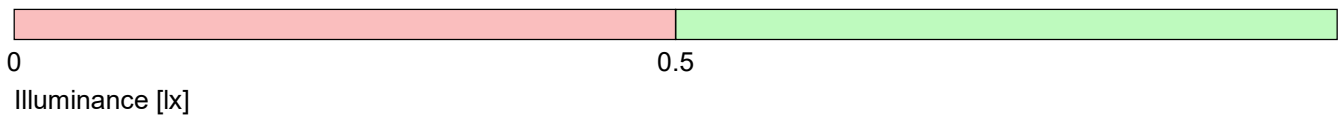
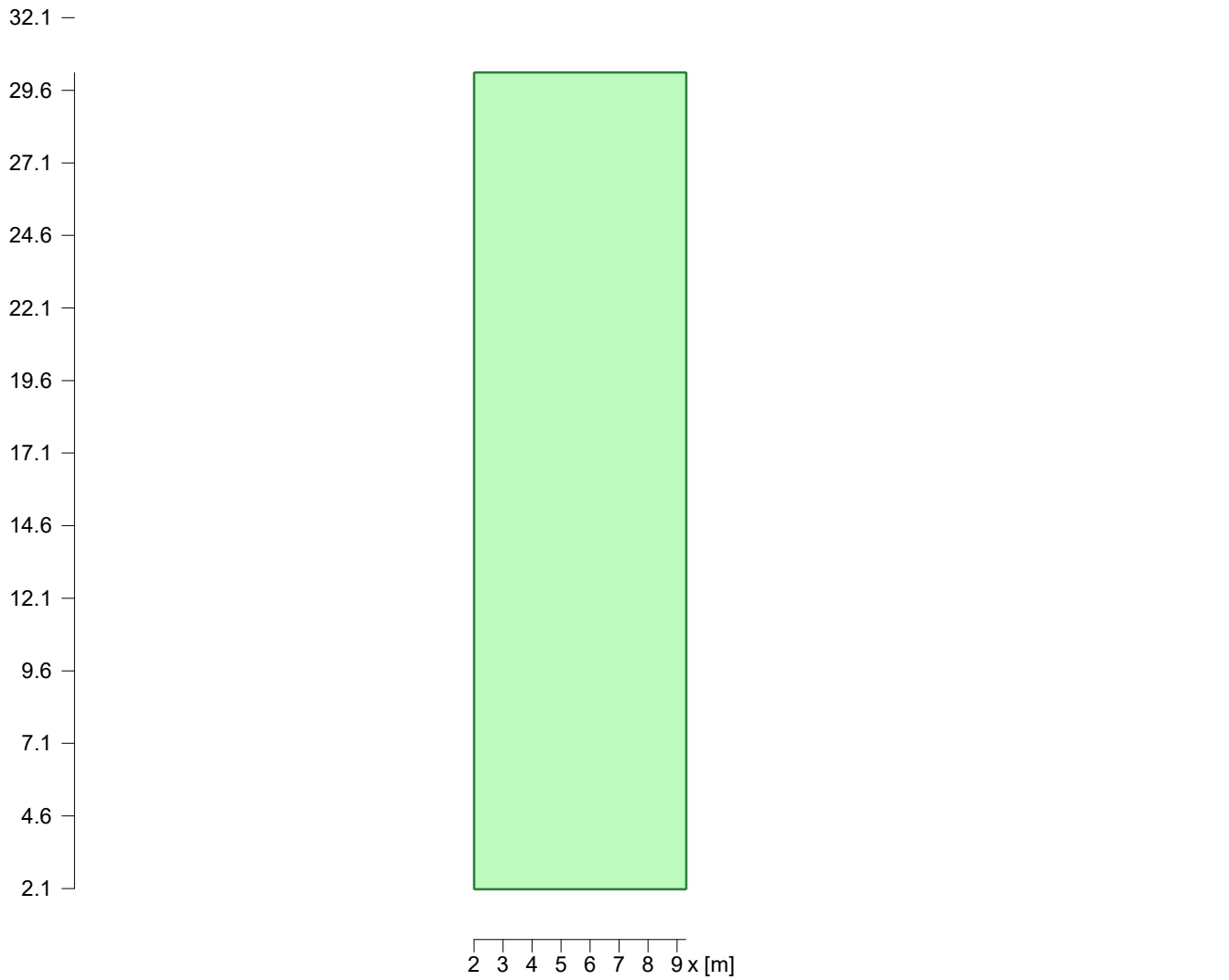


Required minimum illuminance		: 0.5 lx
Minimum illuminance	E _{min}	: 0.52 lx
Maximum illuminance	E _{max}	: 2.2 lx
Diversity	E _{min} /E _{max}	: 1 : 4.20 (0.24) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8

1.3 Calculation results, Warehouse

1.3.4 Boundary line, Bin 3 Potash (E)

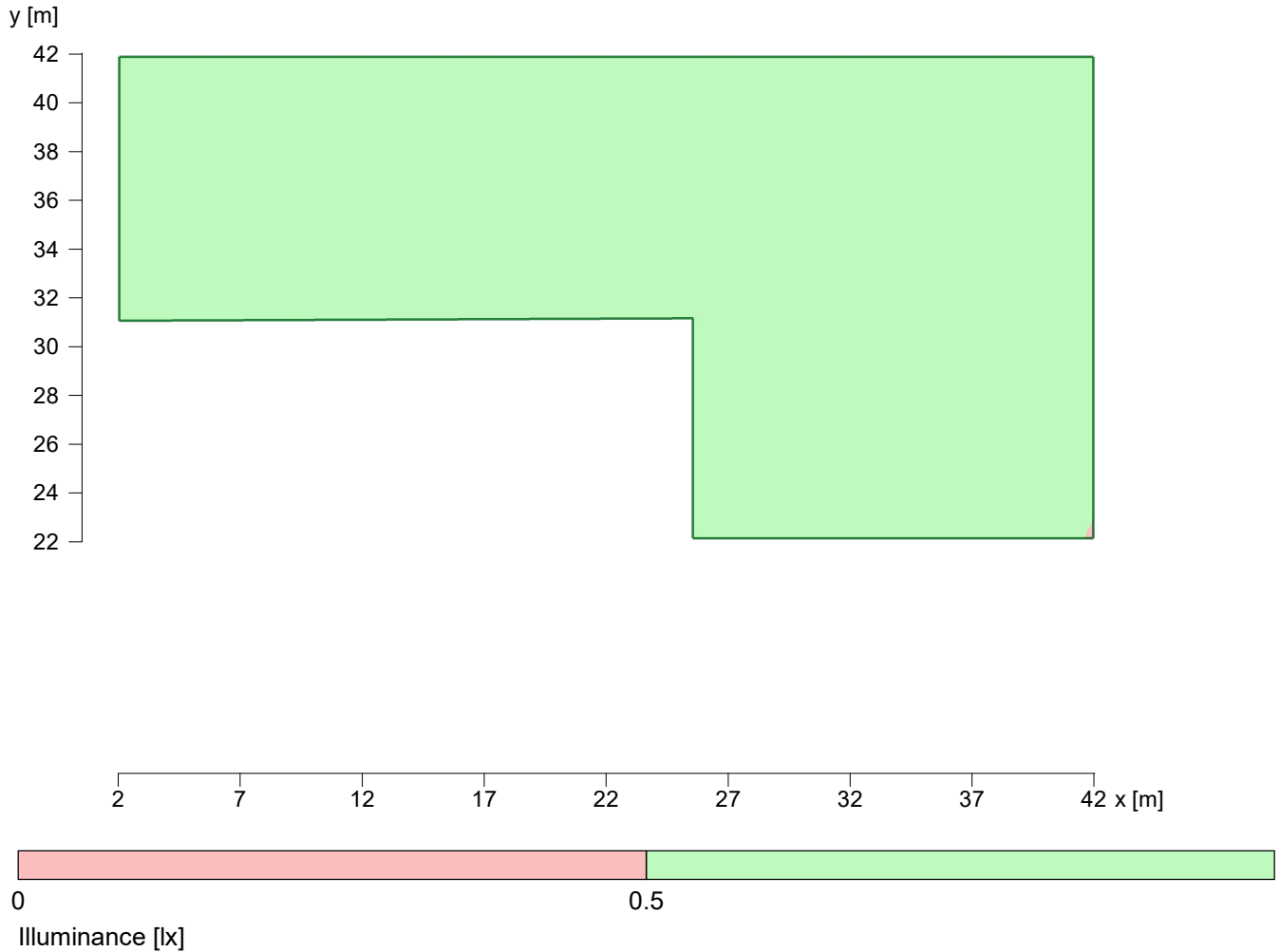
y [m]



Required minimum illuminance		: 0.5 lx
Minimum illuminance	E _{min}	: 0.96 lx
Maximum illuminance	E _{max}	: 2.6 lx
Diversity	E _{min} /E _{max}	: 1 : 2.72 (0.37) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8

1.3 Calculation results, Warehouse

1.3.5 Boundary line, Open Area (E)

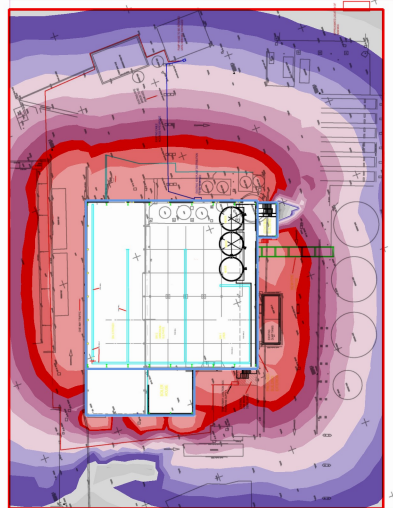


Required minimum illuminance		: 0.5 lx
Minimum illuminance	E _{min}	: 0.35 lx
Maximum illuminance	E _{max}	: 3.3 lx
Diversity	E _{min} /E _{max}	: 1 : 9.45 (0.11) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8

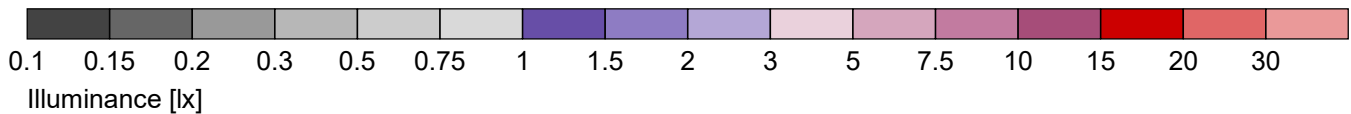
1 External

1.1 Summary, External

1.1.1 Result overview, Evaluation area 1



-0 10 20 30 40 50 60 70 80 90 x [m]



General

Calculation algorithm used	Average indirect fraction
Maintenance factor	0.85
Total luminous flux	185958.00 lm
Total power	1401.0 W
Total power per area (11800.14 m ²)	0.12 W/m ² (1.13 W/m ² /100lx)



Evaluation area 1

Reference plane 1.1

	Horizontal
\bar{E}_m	10.5 lx
E_{min}	0.1 lx
$E_{min}/\bar{E}_m (U_o)$	0.01
$E_{min}/E_{max} (U_d)$	0.00
Position	0.00 m

Type No.Make

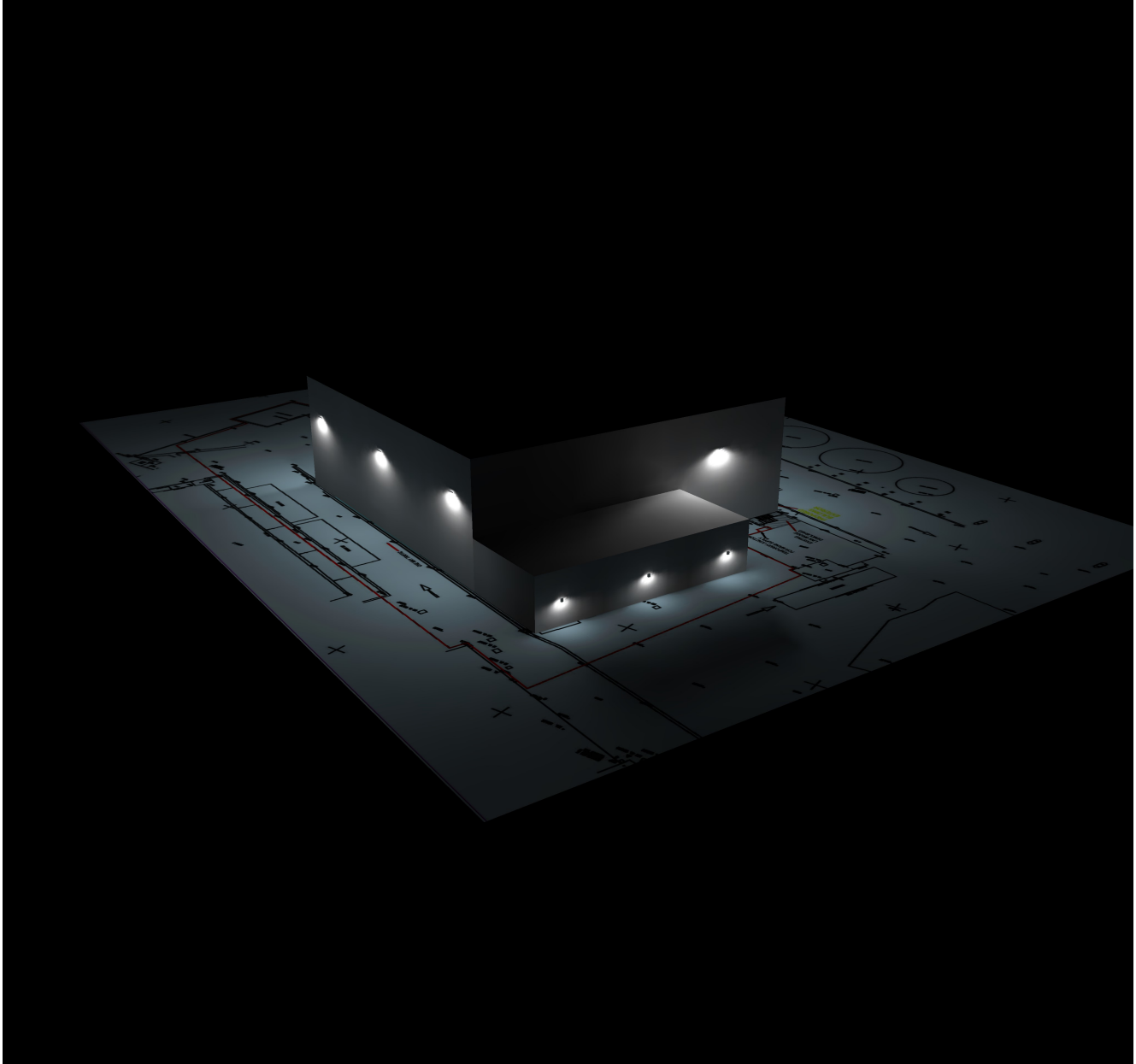
Lumineux Lighting

5	9 x	Order No. : 430473-120 Frankly Plus
		Luminaire name : 150W Frankly Plus Floodlight 840 Asymmetric
		Equipment : 1 x LED 150 W / 19882 lm
6	3 x	Order No. : 430698 (M3_200lm) Hawkrige 18W
		Luminaire name : 18W Hawkrige Wallpack 840
		Equipment : 1 x LED 17 W / 2340 lm

1 External

1.2 Calculation results, External

1.2.1 3D luminance, View 1



1.2 Calculation results, External

1.2.2 3D luminance, View 2

