



Installation : Stair Cores

Project number : Renslade

Customer :

Processed by : NJ

Date : 28.09.2015

The following values are based on exact calculations on calibrated lamps, luminaires and their arrangement. In practice, gradual divergences can occur.

Guarantee claims for luminaire data are excluded.

JJR Electrical , Unit 11 South Point, Ensign Way, Hamble, Southampton, SO31 4RF



Relux and the luminaire manufacturers accept no liability for consequential damage and damage which is occasioned to the user or to third parties.

Object :
 Installation : Stair Cores
 Project number : Renslade (1)
 Date : 28.09.2015

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Object :
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1 Luminaire data

1.1 Aurora Lighting, AU-DL10218BW/40... (220-240V 18W Round Low...)

1.1.1 Data sheet

Manufacturer: Aurora Lighting

220-240V 18W Round Low Profile LED Downlight

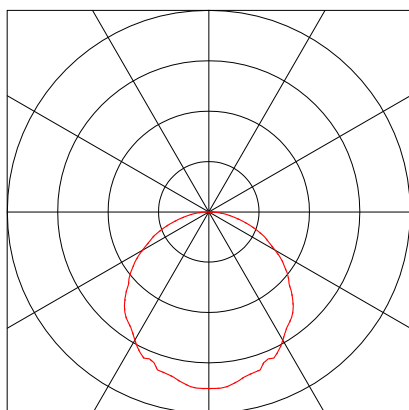
AU-DL10218BW/40

Luminaire data

Luminaire efficiency : 100%
Luminaire efficacy : 60.23 lm/W
Classification : A40 ↓100.0% ↑0.0%
CIE Flux Codes : 47 78 95 100 100
UGR 4H 8H (20%, 50%, 70%)
C0 / C90 : 25.4 / 25.4
Control gear :
System power : 17.7 W
Diameter : 200 mm
Height : 5 mm

Equipped with

Quantity : 1
Designation : LED
Colour : 4000K
Luminous flux : 1066 lm
Colour reproduction : 80



Object :
Installation : Stair Cores
Project number : Renslade (1)
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1 Luminaire data

1.2 ENLITE, EN-BH01BLK/40... (220-240V Polycarbonate I...)

1.2.1 Data sheet

Manufacturer: ENLITE

220-240V Polycarbonate IP66 12W Round LED Bulkhead

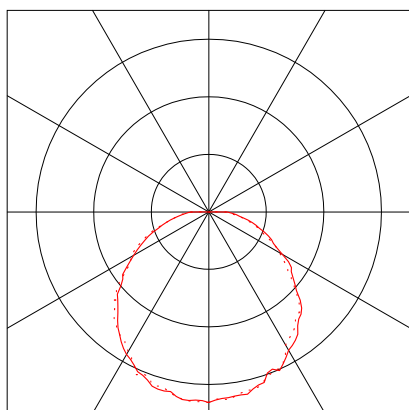
EN-BH01BLK/40

Luminaire data

Absolute Photometry
Luminaire efficacy : 76.17 lm/W
Classification : A40 ↓99.5% ↑0.5%
CIE Flux Codes : 44 74 92 99 101
UGR 4H 8H (20%, 50%, 70%)
C0 / C90 : 23.4 / 23.7
Control gear :
System power : 12.13 W
Diameter : 325 mm
Height : 111 mm

Equipped with

Quantity : 1
Designation : LED
Colour : 4000K
Luminous flux : 924 lm
Colour reproduction : 72.3



Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

1 Luminaire data

1.3 AURORA, EMERGENCY DOWNLIGHT - 3W LED (AU-EMLD2MW)

1.3.1 Data sheet

Manufacturer: AURORA

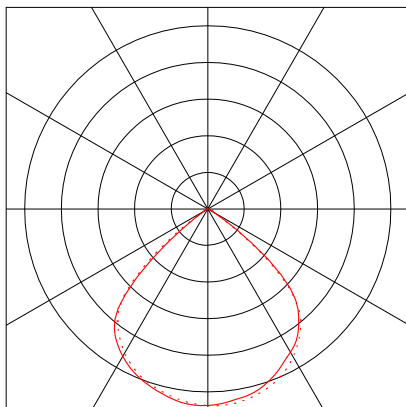
AU-EMLD2MW EMERGENCY DOWNLIGHT - 3W LED

Luminaire data

Luminaire efficiency : 100%
Luminaire efficacy : 30 lm/W
Classification : A60 ↓100.0% ↑0.0%
CIE Flux Codes : 73 99 100 100 100
UGR 4H 8H (20%, 50%, 70%)
C0 / C90 : 31.3 / 30.6
Control gear :
System power : 3.4 W
Diameter : 51 mm
Height : 5 mm

Equipped with

Quantity : 1
Designation : LED
Colour :
Luminous flux : 102 lm

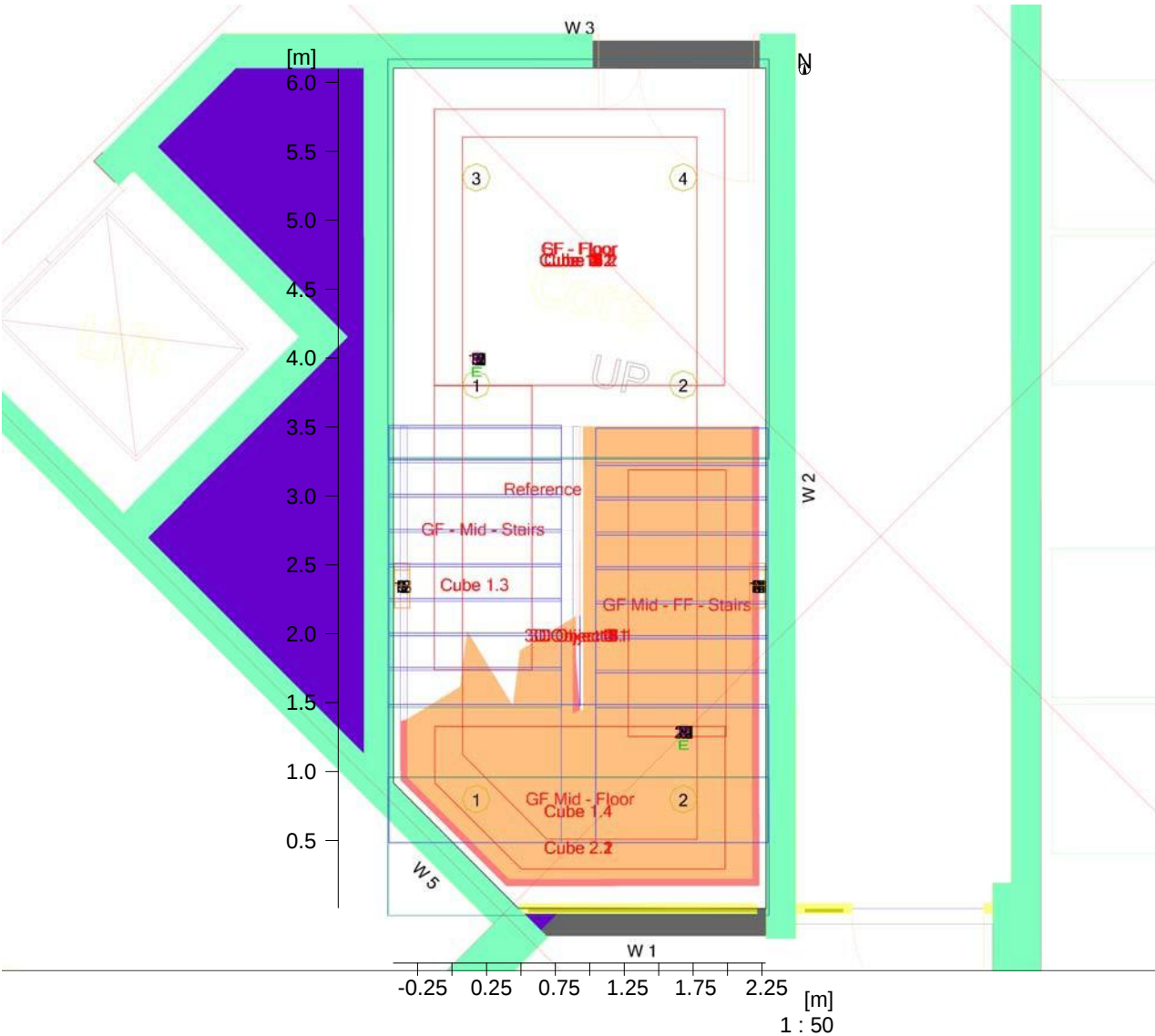


Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

2 Stairs - North Core

2.1 Description, Stairs - North Core

2.1.1 Floor plan



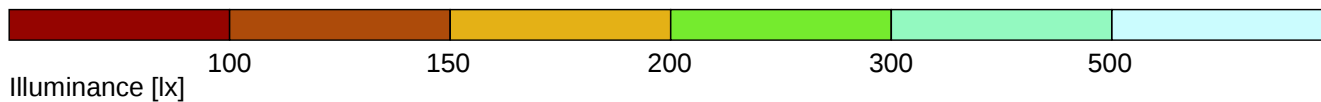
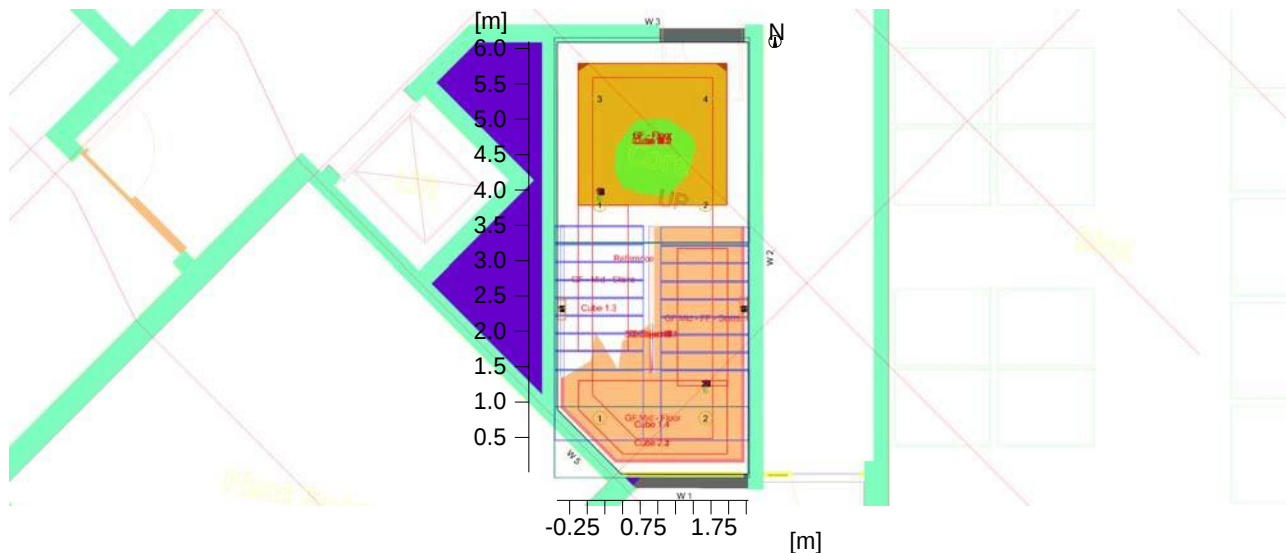
Wall	x	y	Length	Reflectance
1	2.28 m	0.01 m	1.80 m	50.0 %
2	2.27 m	6.10 m	6.09 m	50.0 %
3	-0.43 m	6.09 m	2.70 m	50.0 %
4	-0.42 m	0.92 m	5.17 m	50.0 %
5	0.48 m	0.01 m	1.28 m	50.0 %
Floor				20.0 %
Ceiling				70.0 %
Room height		25.50 m		
Height of reference plane		----		

Object :
Installation :
Project number :
Date :

2 Stairs - North Core

2.2 Summary, Stairs - North Core

2.2.1 Result overview, GF - Floor



General

Calculation algorithm used	Average indirect fraction with light colours
Height of evaluation surface	0.00 m
Maintenance factor	0.80

Total luminous flux of all lamps	78460 lm
Total power	1244.9 W
Total power per area (16.02 m ²)	77.73 W/m ²

Illuminance

Average illuminance	Eav	190 lx
Minimum illuminance	Emin	161 lx
Maximum illuminance	E _{max}	208 lx
Uniformity U _o	Emin/Em	1:1.19 (0.84)
Diversity U _d	Emin/E _{max}	1:1.3 (0.77)

Type No.\Make

1 58 **Aurora Lighting**
 Order No. : 220-240V 18W Round Low Profile LED Downlight
 Luminaire name : AU-DL10218BW/40
 Equipment : 1 x LED / 1066 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

2 Stairs - North Core

2.2 Summary, Stairs - North Core

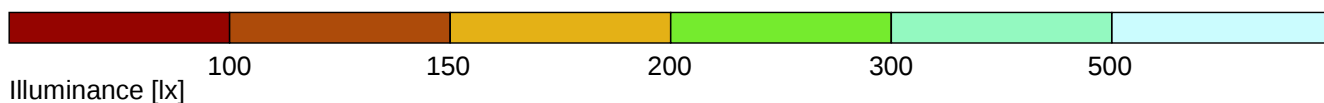
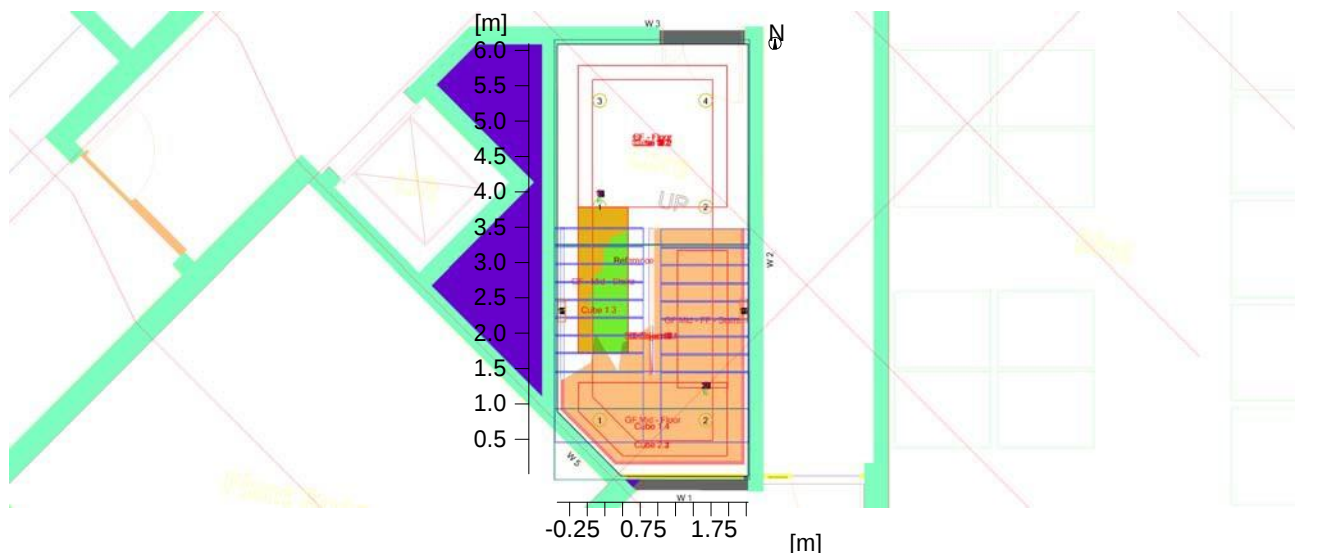
2.2.1 Result overview, GF - Floor

2	18	ENLITE	
		Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K

Object :
 Installation : Stair Cores
 Project number : Renslade (1)
 Date : 28.09.2015

2.2 Summary, Stairs - North Core

2.2.2 Result overview, GF - Mid - Stairs



General

Calculation algorithm used	Average indirect fraction with light colours
Maintenance factor	0.80
Total luminous flux of all lamps	78460 lm
Total power	1244.9 W
Total power per area (16.02 m ²)	77.73 W/m ²

Illuminance

Average illuminance	Eav	200 lx
Minimum illuminance	Emin	171 lx
Maximum illuminance	Emax	229 lx
Uniformity Uo	Emin/Em	1:1.17 (0.86)
Diversity Ud	Emin/Emax	1:1.34 (0.75)

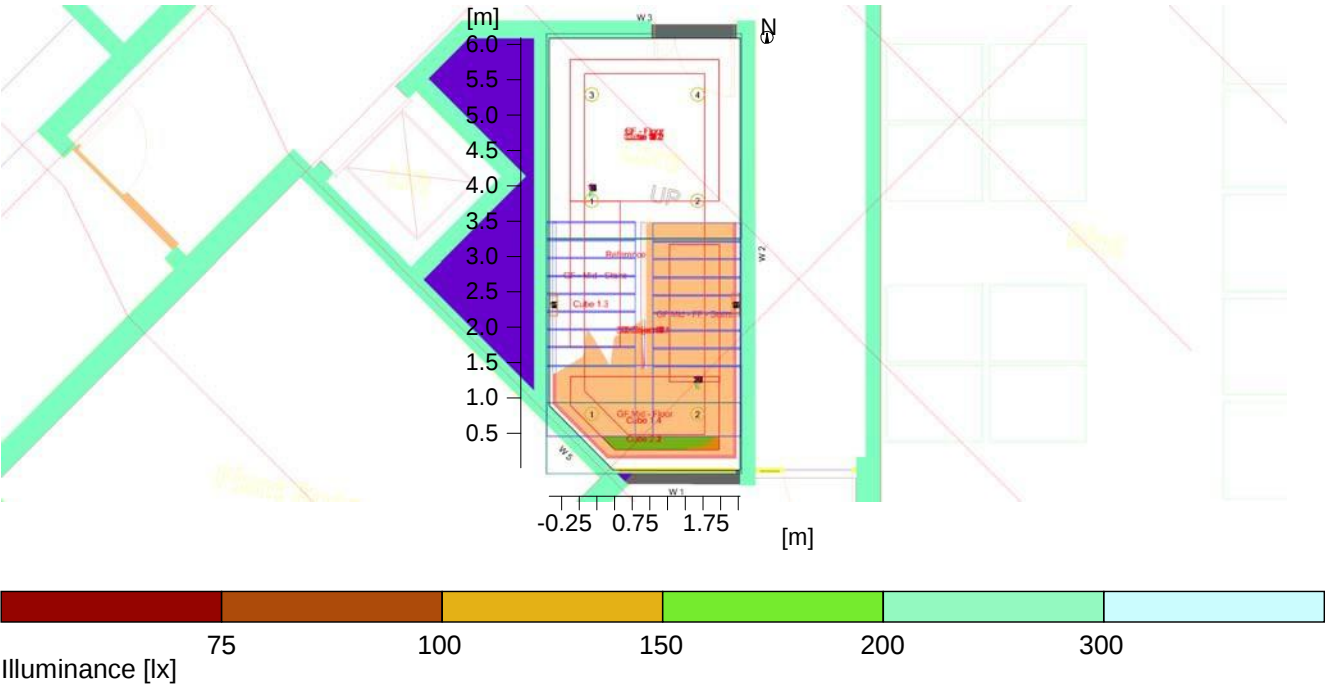
Type No. \ Make

- | | |
|---|--|
| Aurora Lighting | |
| 1 | 58 |
|  | Order No. : 220-240V 18W Round Low Profile LED Downlight
Luminaire name : AU-DL10218BW/40
Equipment : 1 x LED / 1066 lm 4000K |
| ENLITE | |
| 2 | 18 |
|  | Order No. : 220-240V Polycarbonate IP66 12W Round LED Bulkhead
Luminaire name : EN-BH01BLK/40
Equipment : 1 x LED / 924 lm 4000K |

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

2.2 Summary, Stairs - North Core

2.2.3 Result overview, GF Mid - Floor



General

Calculation algorithm used	Average indirect fraction with light colours
Height of evaluation surface	1.31 m
Maintenance factor	0.80
Total luminous flux of all lamps	78460 lm
Total power	1244.9 W
Total power per area (16.02 m²)	77.73 W/m²

Illuminance

Average illuminance	Eav	157 lx
Minimum illuminance	Emin	148 lx
Maximum illuminance	Emax	161 lx
Uniformity Uo	Emin/Em	1:1.06 (0.95)
Diversity Ud	Emin/Emax	1:1.08 (0.92)

Type No. \Make

1	58	Aurora Lighting
		Order No. : 220-240V 18W Round Low Profile LED Downlight
		Luminaire name : AU-DL10218BW/40
		Equipment : 1 x LED / 1066 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

2.2 Summary, Stairs - North Core

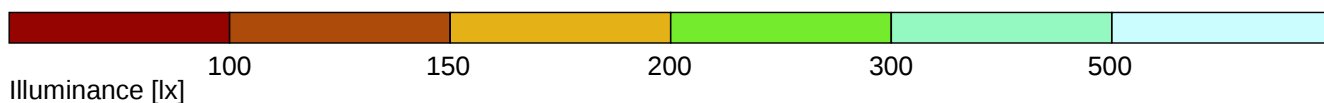
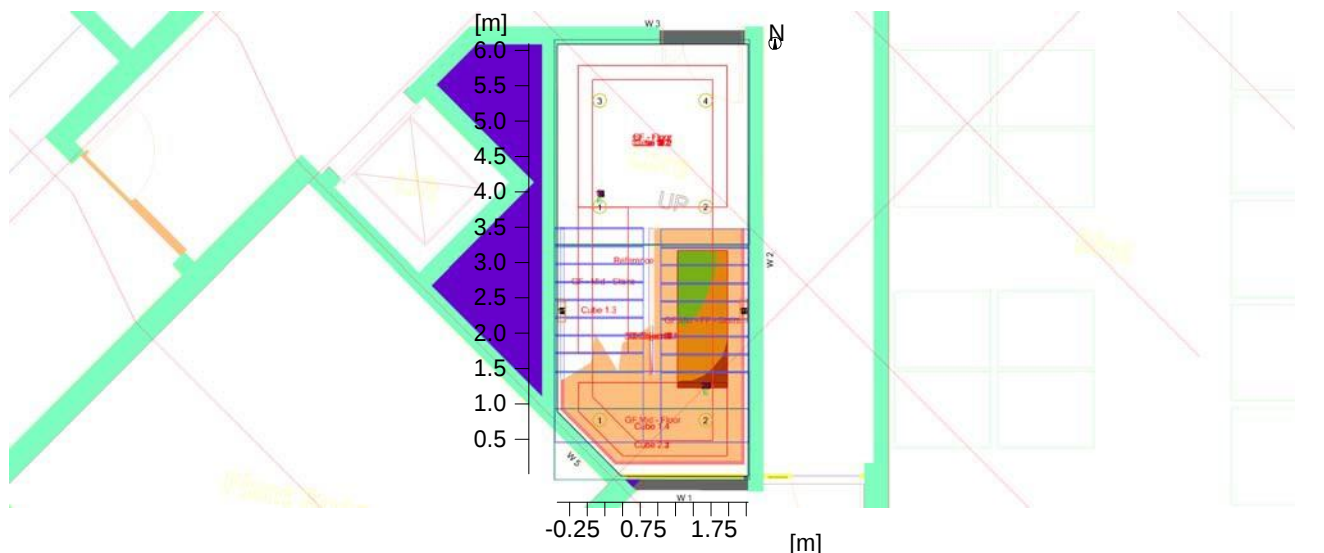
2.2.3 Result overview, GF Mid - Floor

2	18	ENLITE	
		Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K

Object :
 Installation : Stair Cores
 Project number : Renslade (1)
 Date : 28.09.2015

2.2 Summary, Stairs - North Core

2.2.4 Result overview, GF Mid - FF - Stairs



General

Calculation algorithm used	Average indirect fraction with light colours
Maintenance factor	0.80
Total luminous flux of all lamps	78460 lm
Total power	1244.9 W
Total power per area (16.02 m ²)	77.73 W/m ²

Illuminance

Average illuminance	Eav	185 lx
Minimum illuminance	Emin	133 lx
Maximum illuminance	Emax	234 lx
Uniformity Uo	Emin/Em	1:1.4 (0.72)
Diversity Ud	Emin/Emax	1:1.77 (0.57)

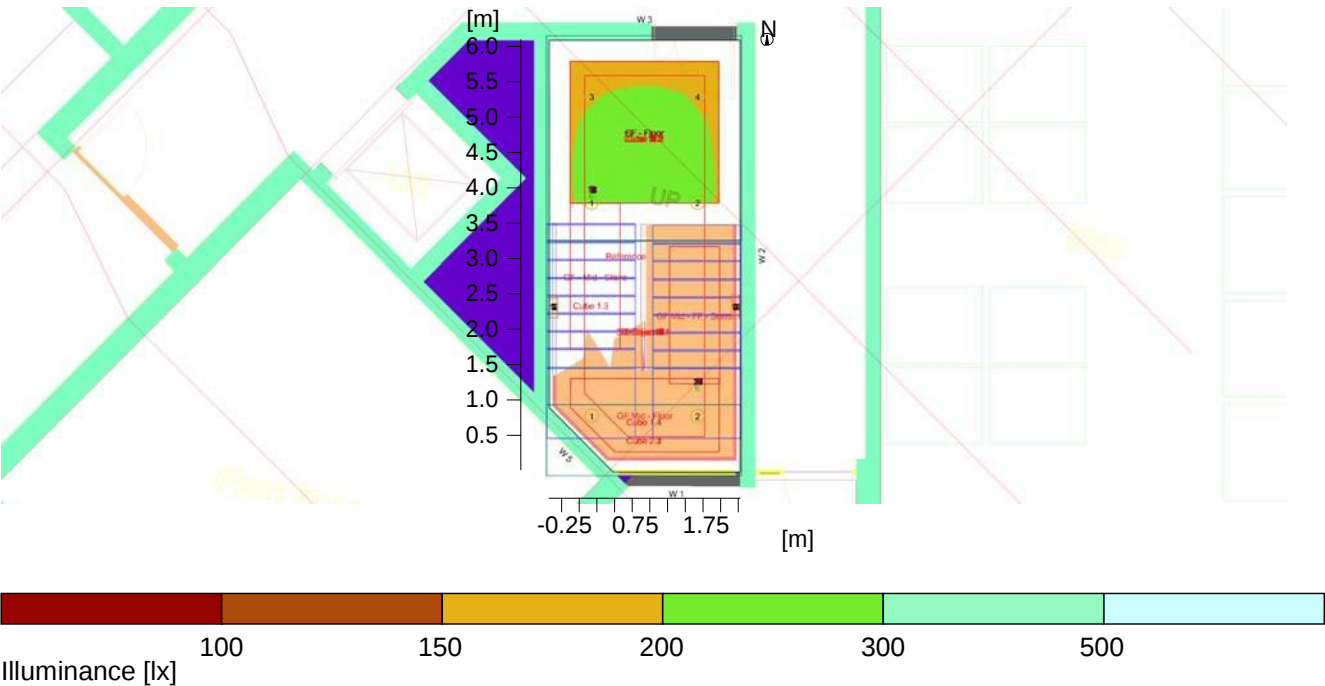
Type No. \ Make

- | | | | |
|---|----|------------------------|--|
| 1 | 58 | Aurora Lighting | |
| | | Order No. | : 220-240V 18W Round Low Profile LED Downlight |
| | | Luminaire name | : AU-DL10218BW/40 |
| | | Equipment | : 1 x LED / 1066 lm 4000K |
| 2 | 18 | ENLITE | |
| | | Order No. | : 220-240V Polycarbonate IP66 12W Round LED Bulkhead |
| | | Luminaire name | : EN-BH01BLK/40 |
| | | Equipment | : 1 x LED / 924 lm 4000K |

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

2.2 Summary, Stairs - North Core

2.2.5 Result overview, FF - Floor



General

Calculation algorithm used	Average indirect fraction with light colours
Height of evaluation surface	2.61 m
Maintenance factor	0.80
Total luminous flux of all lamps	78460 lm
Total power	1244.9 W
Total power per area (16.02 m²)	77.73 W/m²

Illuminance

Average illuminance	Eav	210 lx
Minimum illuminance	Emin	171 lx
Maximum illuminance	Emax	235 lx
Uniformity Uo	Emin/Em	1:1.23 (0.81)
Diversity Ud	Emin/Emax	1:1.37 (0.73)

Type No.\Make

1	58	Aurora Lighting
		Order No. : 220-240V 18W Round Low Profile LED Downlight
		Luminaire name : AU-DL10218BW/40
		Equipment : 1 x LED / 1066 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

2.2 Summary, Stairs - North Core

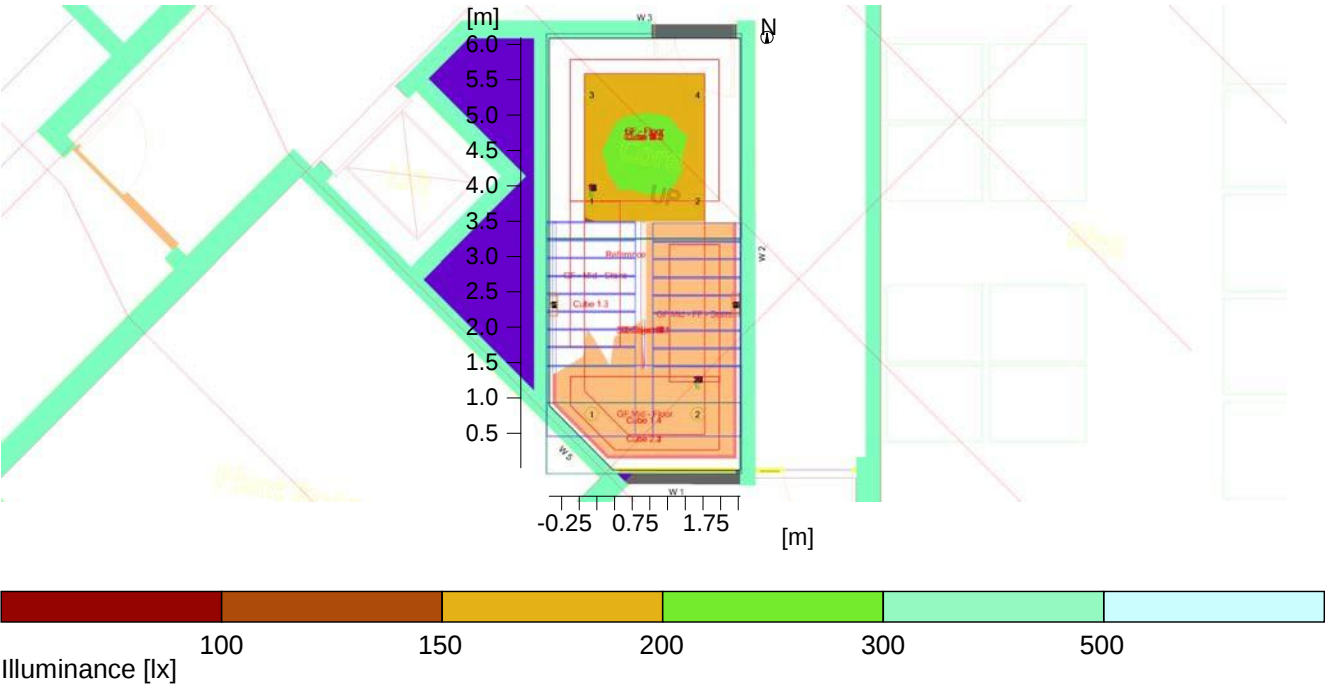
2.2.5 Result overview, FF - Floor

2	18	ENLITE	
		Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

2.2 Summary, Stairs - North Core

2.2.6 Result overview, Evaluation area 1



General

Calculation algorithm used	Average indirect fraction with light colours
Maintenance factor	0.80
Total luminous flux of all lamps	78460 lm
Total power	1244.9 W
Total power per area (16.02 m²)	77.73 W/m² (39.85 W/m²/100lx)

Evaluation area 1

Reference plane 1.1

	Horizontal
Em	195 lx
Emin	174 lx
Emin/Eav (Uo)	0.89
Emin/Emax (Ud)	0.84
Position	0.00 m (rot: 0°/0.05°)

Major surfaces

	Em	Uo
m 1.5 (Ceiling)	80 lx	0.85
m 1.1 (Wall)	150 lx	0.41
m 1.2 (Wall)	157 lx	0.24
m 1.3 (Wall)	154 lx	0.28
m 1.4 (Wall)	171 lx	0.32

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

2.2 Summary, Stairs - North Core

2.2.6 Result overview, Evaluation area 1

Type No.\Make

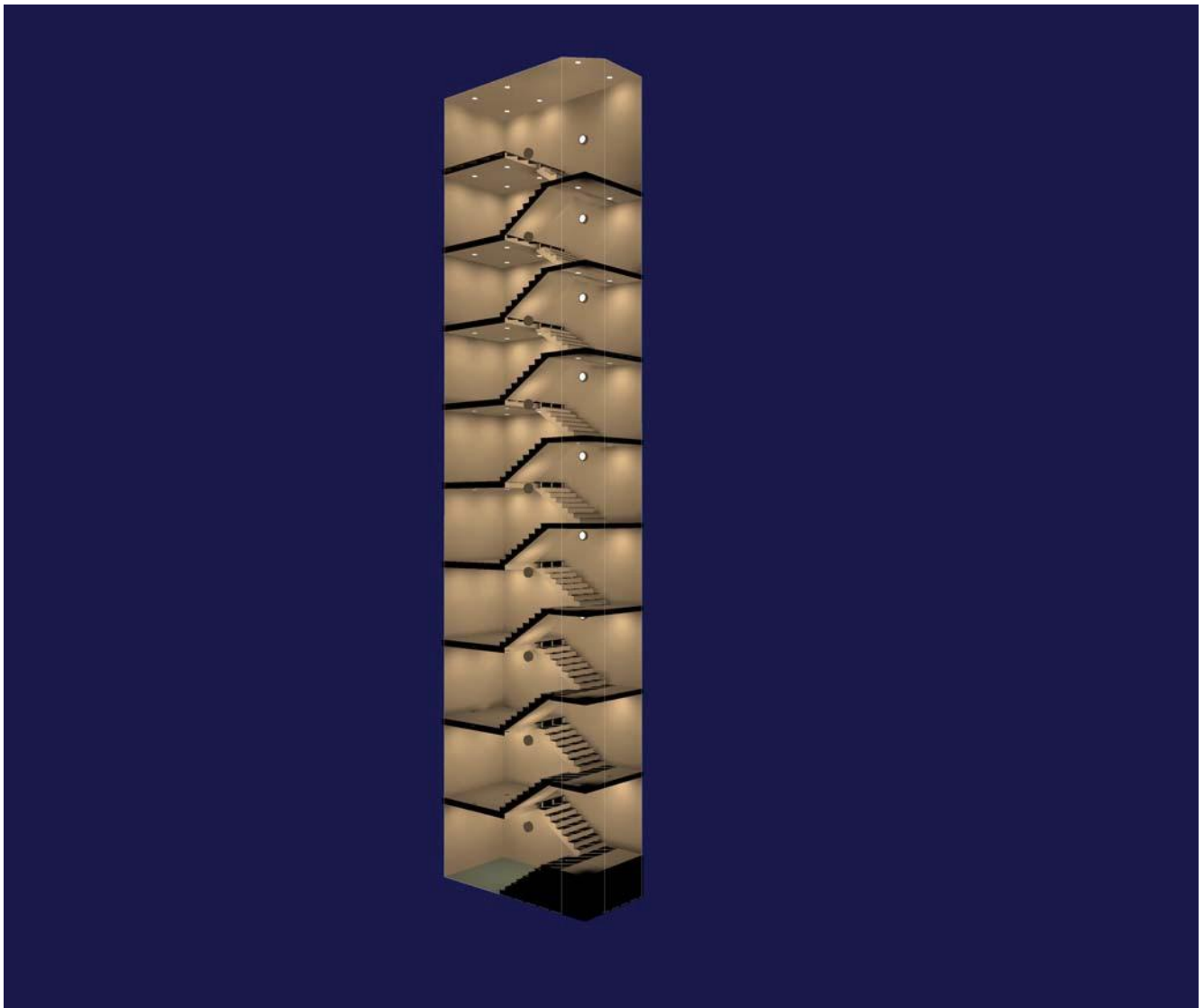
- | | | | |
|---|----|---|---|
| 1 | 58 |  | Aurora Lighting
Order No. : 220-240V 18W Round Low Profile LED Downlight
Luminaire name : AU-DL10218BW/40
Equipment : 1 x LED / 1066 lm 4000K |
| 2 | 18 |  | ENLITE
Order No. : 220-240V Polycarbonate IP66 12W Round LED Bulkhead
Luminaire name : EN-BH01BLK/40
Equipment : 1 x LED / 924 lm 4000K |

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

2 Stairs - North Core

2.3 Calculation results, Stairs - North Core

2.3.1 3D luminance, View 1



Luminance in the scene
Minimum: : 0 cd/m²
Maximum: : 99.7 cd/m²

Object :
 Installation : Stair Cores
 Project number : Renslade (1)
 Date : 28.09.2015

2 Stairs - North Core

2.4 Summary, Stairs - North Core

2.4.1 Result overview (emergency lighting)

Type No.\Make

3 19 **AURORA**
 Order No. : AU-EMLD2MW
 Luminaire name : EMERGENCY DOWNLIGHT - 3W LED
 Equipment : 1 x LED / 102 lm (100.0 %)



Result evaluation area

Calculation algorithm used: Direct component with light colours

Reference planes for emergency lighting:

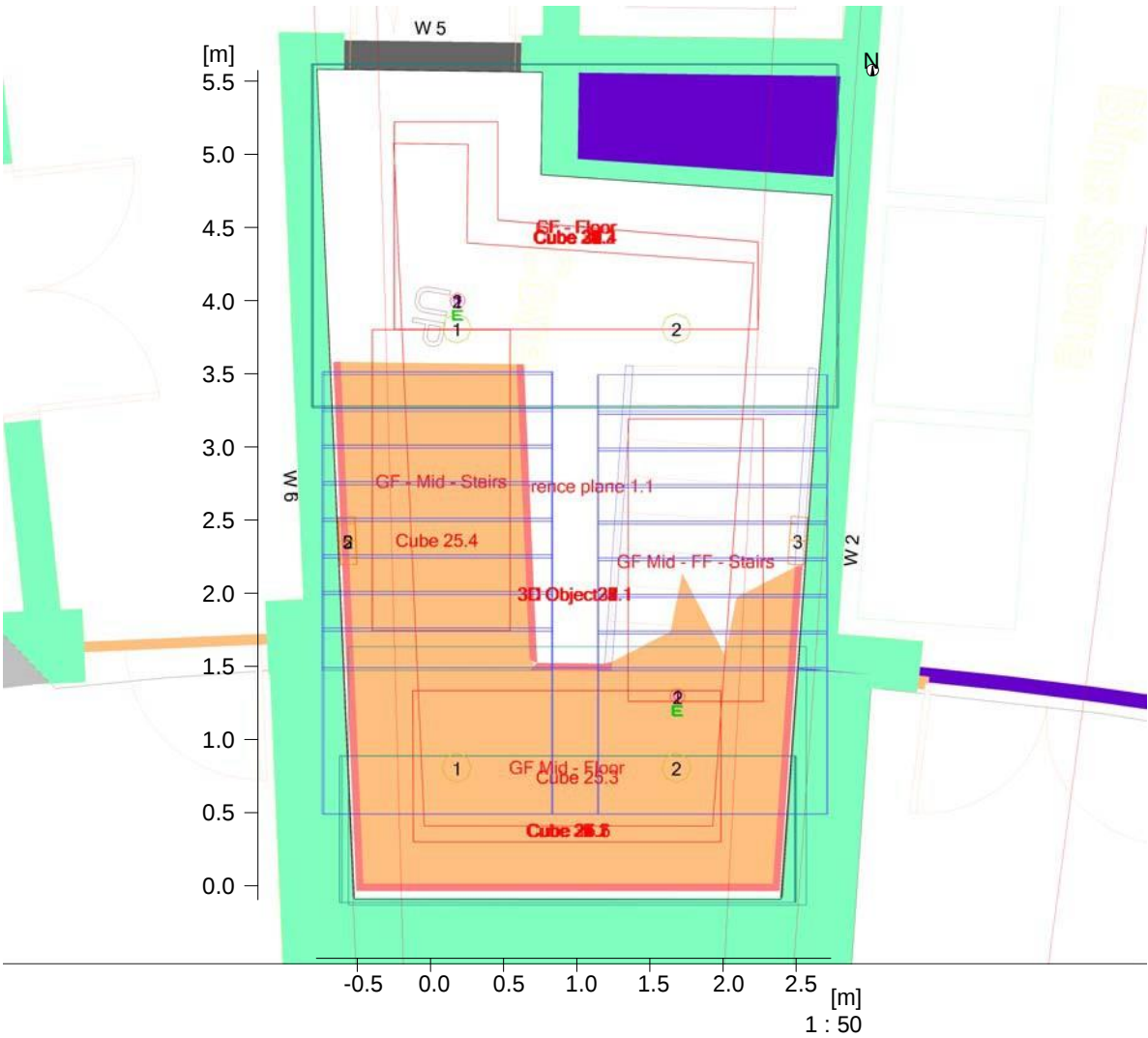
No.	Default[lx]	Emin[lx]	Surface Emax[lx]	Uniformity	Height
GF - Floor					
6	1.0	1.8	10.9	1: 6.09	0.00
GF - Mid - Stairs					
6	1.0	2.7	12.0	1: 4.50	1.31
GF Mid - Floor					
6	1.0	4.5	8.3	1: 1.81	1.31
GF Mid - FF - Stairs					
6	1.0	2.4	14.2	1: 5.96	1.32
FF - Floor					
6	1.0	1.7	11.2	1: 6.49	2.61

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

3 Stairs - South Core

3.1 Description, Stairs - South Core

3.1.1 Floor plan



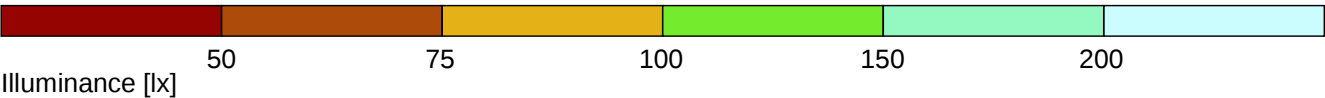
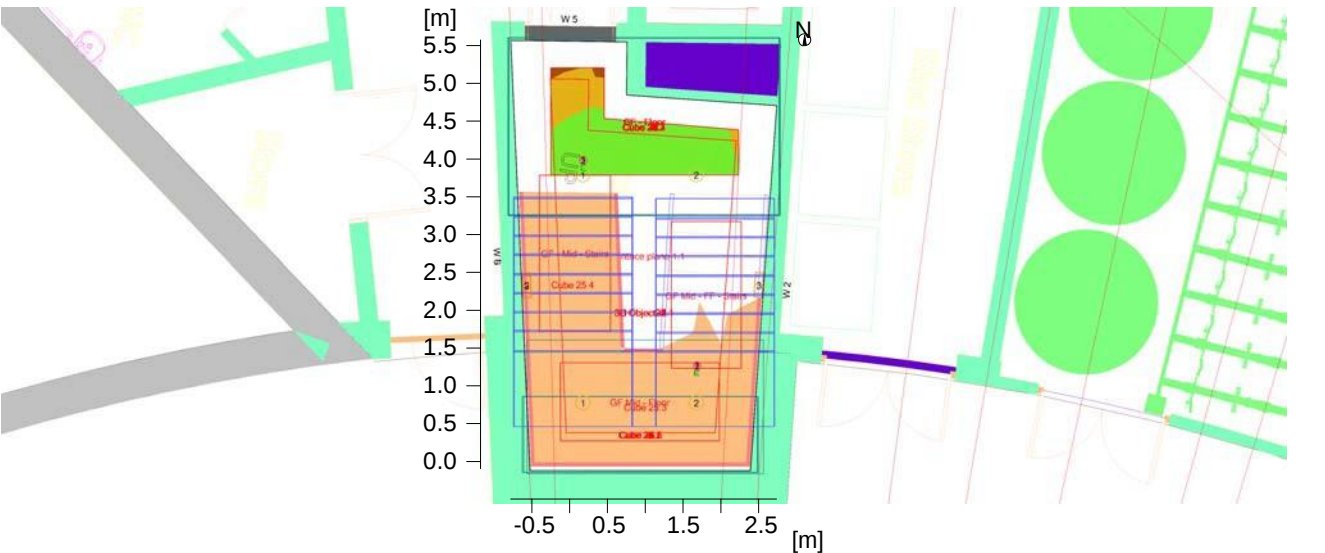
Wall	x	y	Length	Reflectance
1	2.39 m	-0.10 m	2.91 m	50.0 %
2	2.74 m	4.71 m	4.82 m	50.0 %
3	0.75 m	4.85 m	1.99 m	50.0 %
4	0.76 m	5.55 m	0.70 m	50.0 %
5	-0.78 m	5.57 m	1.54 m	50.0 %
6	-0.52 m	-0.09 m	5.67 m	50.0 %
Floor				20.0 %
Ceiling				70.0 %
Room height		25.50 m		
Height of reference plane		----		

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

3 Stairs - South Core

3.2 Summary, Stairs - South Core

3.2.1 Result overview, GF - Floor



General

Calculation algorithm used	Average indirect fraction with light colours
Height of evaluation surface	0.00 m
Maintenance factor	0.80

Total luminous flux of all lamps	56216 lm
Total power	878.8 W
Total power per area (16.79 m²)	52.34 W/m²

Illuminance

Average illuminance	Eav	113 lx
Minimum illuminance	Emin	80 lx
Maximum illuminance	Emax	131 lx
Uniformity Uo	Emin/Em	1:1.41 (0.71)
Diversity Ud	Emin/Emax	1:1.64 (0.61)

Type No. \Make

1	38	Aurora Lighting
		Order No. : 220-240V 18W Round Low Profile LED Downlight
		Luminaire name : AU-DL10218BW/40
		Equipment : 1 x LED / 1066 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

3 Stairs - South Core

3.2 Summary, Stairs - South Core

3.2.1 Result overview, GF - Floor

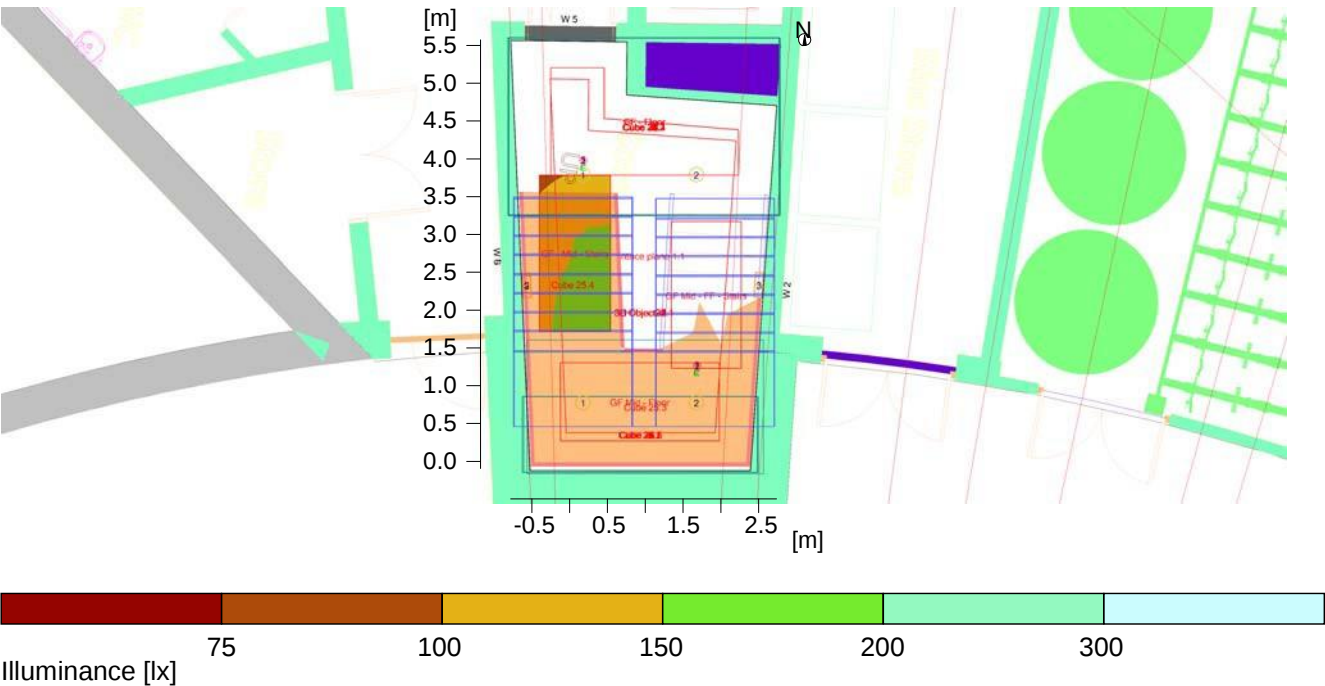
2	17	ENLITE	
		Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K



Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

3.2 Summary, Stairs - South Core

3.2.2 Result overview, GF - Mid - Stairs



General

Calculation algorithm used	Average indirect fraction with light colours
Maintenance factor	0.80
Total luminous flux of all lamps	56216 lm
Total power	878.8 W
Total power per area (16.79 m²)	52.34 W/m²

Illuminance

Average illuminance	Eav	147 lx
Minimum illuminance	Emin	96 lx
Maximum illuminance	Emax	189 lx
Uniformity Uo	Emin/Em	1:1.53 (0.65)
Diversity Ud	Emin/Emax	1:1.98 (0.51)

Type No. \Make

Aurora Lighting

1	38	Order No.	: 220-240V 18W Round Low Profile LED Downlight
		Luminaire name	: AU-DL10218BW/40
		Equipment	: 1 x LED / 1066 lm 4000K

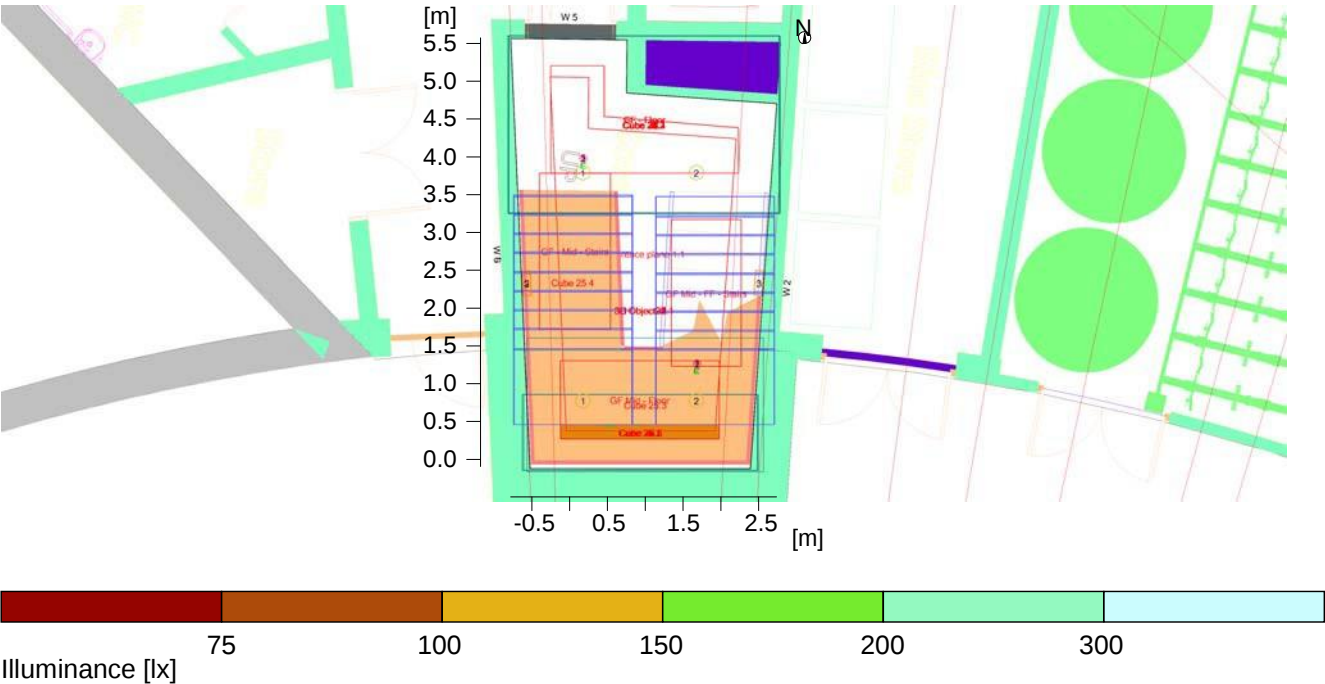
ENLITE

2	17	Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

3.2 Summary, Stairs - South Core

3.2.3 Result overview, GF Mid - Floor



General

Calculation algorithm used	Average indirect fraction with light colours
Height of evaluation surface	1.31 m
Maintenance factor	0.80
Total luminous flux of all lamps	56216 lm
Total power	878.8 W
Total power per area (16.79 m²)	52.34 W/m²

Illuminance

Average illuminance	Eav	141 lx
Minimum illuminance	Emin	129 lx
Maximum illuminance	Emax	147 lx
Uniformity Uo	Emin/Em	1:1.09 (0.92)
Diversity Ud	Emin/Emax	1:1.14 (0.88)

Type No. \Make

1	38	Aurora Lighting
		Order No. : 220-240V 18W Round Low Profile LED Downlight
		Luminaire name : AU-DL10218BW/40
		Equipment : 1 x LED / 1066 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

3.2 Summary, Stairs - South Core

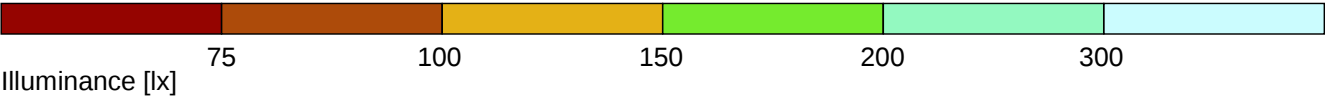
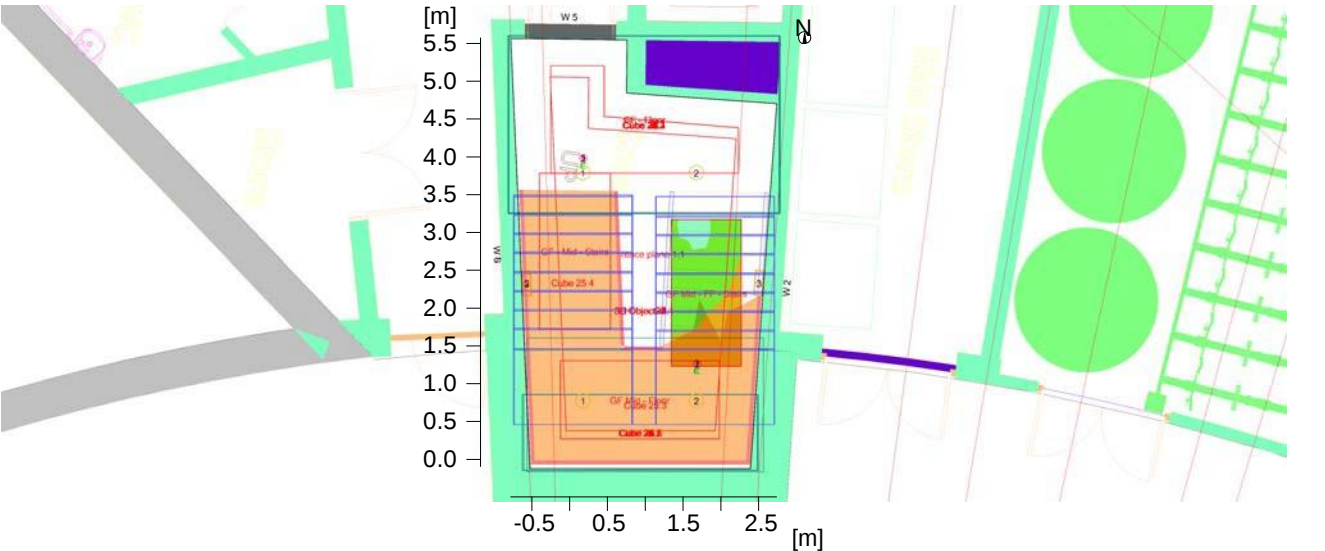
3.2.3 Result overview, GF Mid - Floor

2	17	ENLITE	
		Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

3.2 Summary, Stairs - South Core

3.2.4 Result overview, GF Mid - FF - Stairs



General

Calculation algorithm used	Average indirect fraction with light colours
Maintenance factor	0.80
Total luminous flux of all lamps	56216 lm
Total power	878.8 W
Total power per area (16.79 m²)	52.34 W/m²

Illuminance

Average illuminance	Eav	162 lx
Minimum illuminance	Emin	112 lx
Maximum illuminance	Emax	205 lx
Uniformity Uo	Emin/Em	1:1.44 (0.69)
Diversity Ud	Emin/Emax	1:1.82 (0.55)

Type No. \Make

Aurora Lighting

1	38	Order No.	: 220-240V 18W Round Low Profile LED Downlight
		Luminaire name	: AU-DL10218BW/40
		Equipment	: 1 x LED / 1066 lm 4000K



ENLITE

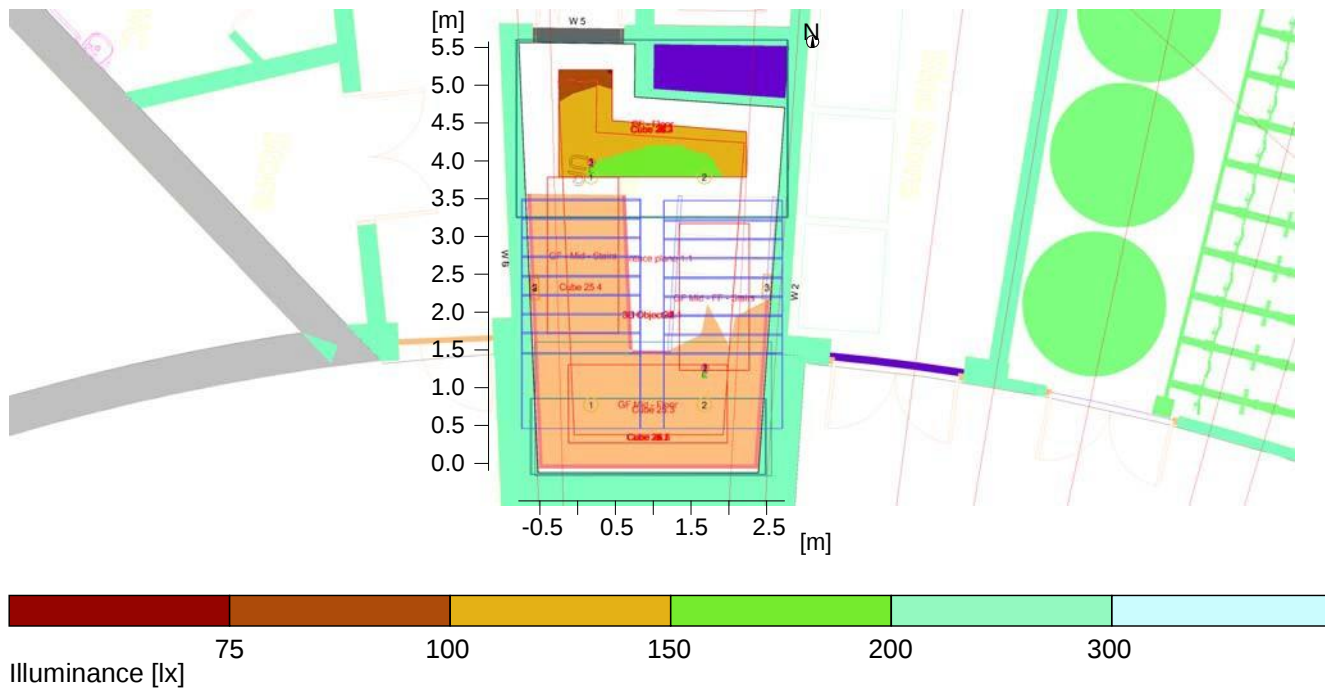
2	17	Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K



Object :
Installation :
Project number :
Date :

3.2 Summary, Stairs - South Core

3.2.5 Result overview, FF - Floor



General

Calculation algorithm used	Average indirect fraction with light colours
Height of evaluation surface	2.61 m
Maintenance factor	0.80

Total luminous flux of all lamps	56216 lm
Total power	878.8 W
Total power per area (16.79 m ²)	52.34 W/m ²

Illuminance

Average illuminance	Eav	136 lx
Minimum illuminance	Emin	94 lx
Maximum illuminance	E _{max}	161 lx
Uniformity U _o	Emin/Em	1:1.45 (0.69)
Diversity U _d	Emin/E _{max}	1:1.71 (0.58)

Type No.\Make

1 38 **Aurora Lighting**
 Order No. : 220-240V 18W Round Low Profile LED Downlight
 Luminaire name : AU-DL10218BW/40
 Equipment : 1 x LED / 1066 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

3.2 Summary, Stairs - South Core

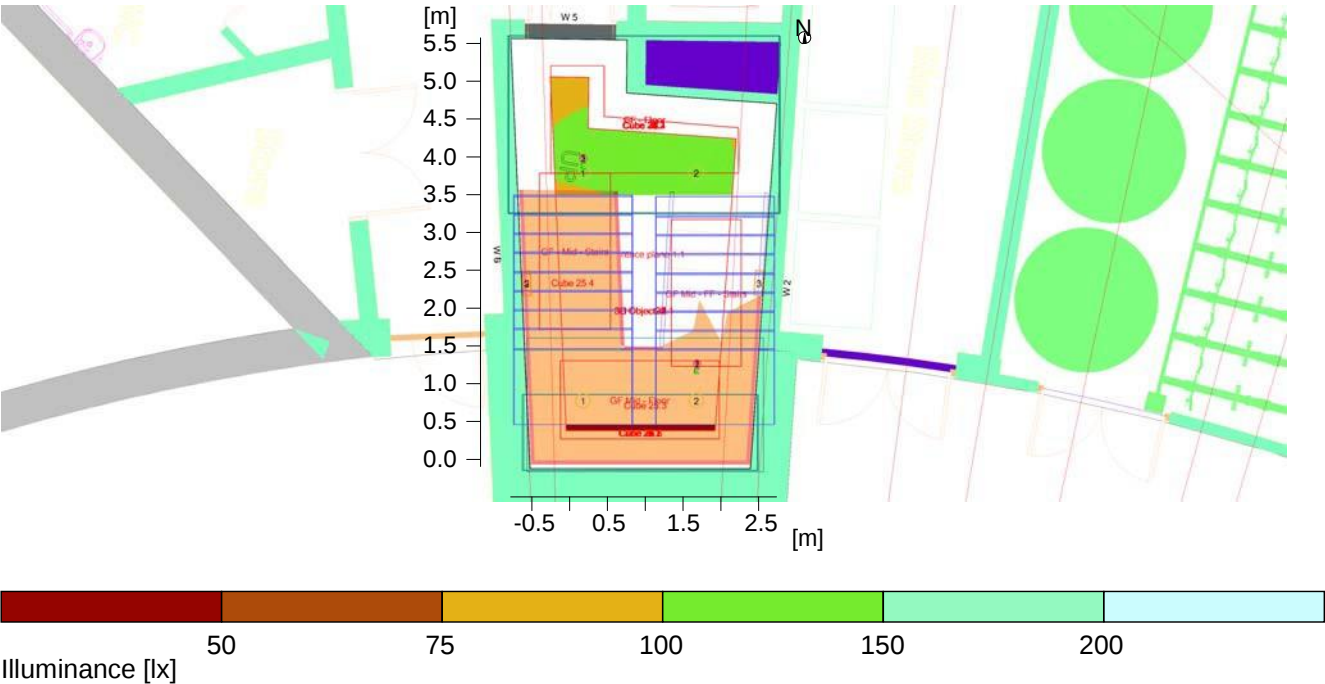
3.2.5 Result overview, FF - Floor

2	17	ENLITE	
		Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

3.2 Summary, Stairs - South Core

3.2.6 Result overview, Evaluation area 1



General

Calculation algorithm used	Average indirect fraction with light colours
Maintenance factor	0.80
Total luminous flux of all lamps	56216 lm
Total power	878.8 W
Total power per area (16.79 m²)	52.34 W/m² (45.93 W/m²/100lx)

Evaluation area 1

Reference plane 1.1

	Horizontal
Em	114 lx
Emin	92 lx
Emin/Eav (Uo)	0.81
Emin/Emax (Ud)	0.71
Position	-0.00 m (rot: 0°/0.03°)

Major surfaces

	Em	Uo
m 1.6 (Ceiling)	43.5 lx	0.66
m 1.1 (Wall)	121 lx	0.39
m 1.2 (Wall)	100 lx	0.38
m 1.3 (Wall)	116 lx	0.24
m 1.4 (Wall)	66.6 lx	0.28
m 1.5 (Wall)	93.1 lx	0.25

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

3.2 Summary, Stairs - South Core

3.2.6 Result overview, Evaluation area 1

Type No.\Make

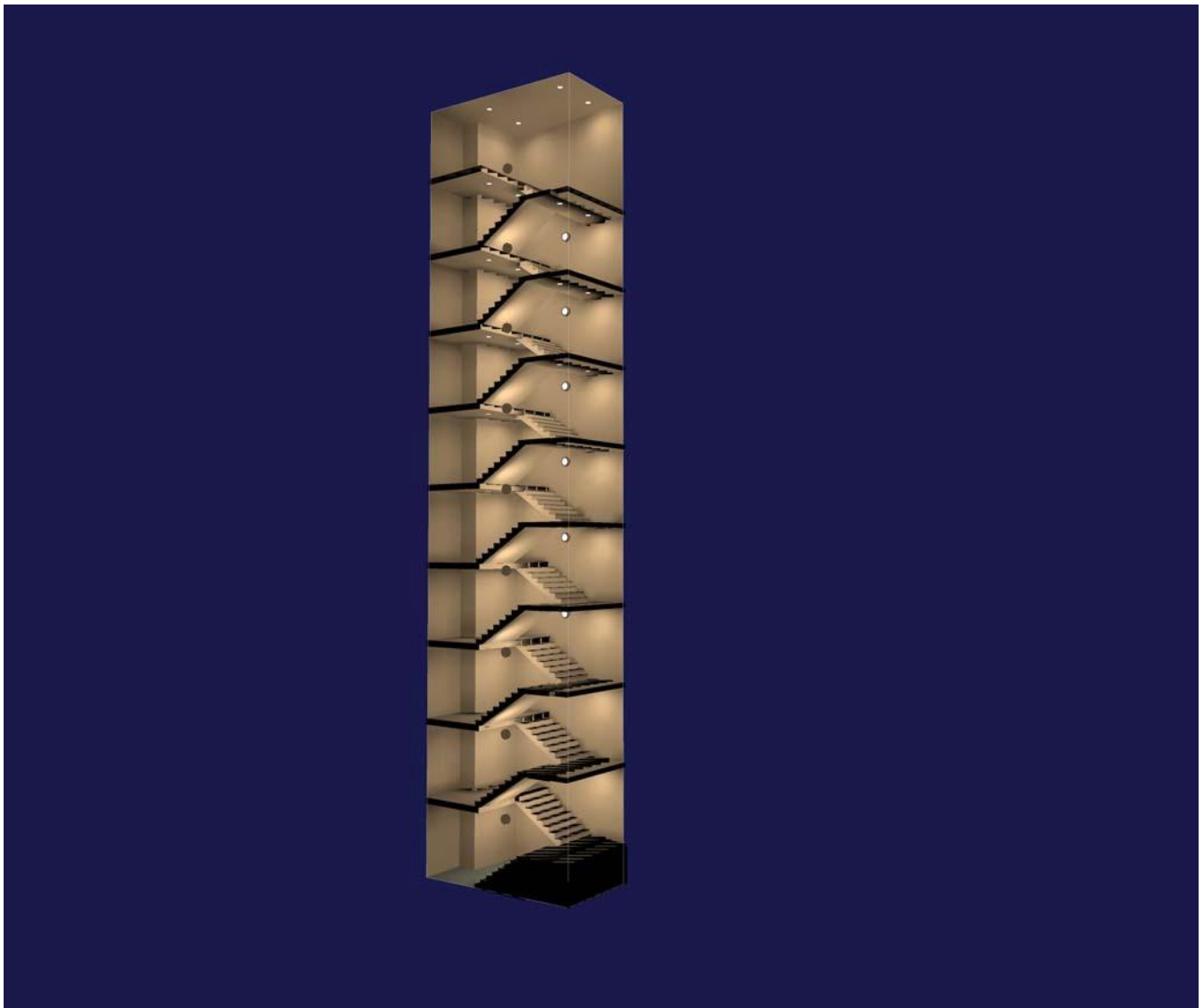
- | | | | |
|---|----|---|---|
| 1 | 38 |  | Aurora Lighting
Order No. : 220-240V 18W Round Low Profile LED Downlight
Luminaire name : AU-DL10218BW/40
Equipment : 1 x LED / 1066 lm 4000K |
| 2 | 17 |  | ENLITE
Order No. : 220-240V Polycarbonate IP66 12W Round LED Bulkhead
Luminaire name : EN-BH01BLK/40
Equipment : 1 x LED / 924 lm 4000K |

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

3 Stairs - South Core

3.3 Calculation results, Stairs - South Core

3.3.1 3D luminance, View 1



Luminance in the scene
Minimum: : 0 cd/m²
Maximum: : 45.2 cd/m²

Object :
 Installation : Stair Cores
 Project number : Renslade (1)
 Date : 28.09.2015

3 Stairs - South Core

3.4 Summary, Stairs - South Core

3.4.1 Result overview (emergency lighting)

Type No.\Make

3 19 **AURORA**
 Order No. : AU-EMLD2MW
 Luminaire name : EMERGENCY DOWNLIGHT - 3W LED
 Equipment : 1 x LED / 102 lm (100.0 %)



Result evaluation area

Calculation algorithm used: Direct component with light colours

Reference planes for emergency lighting:

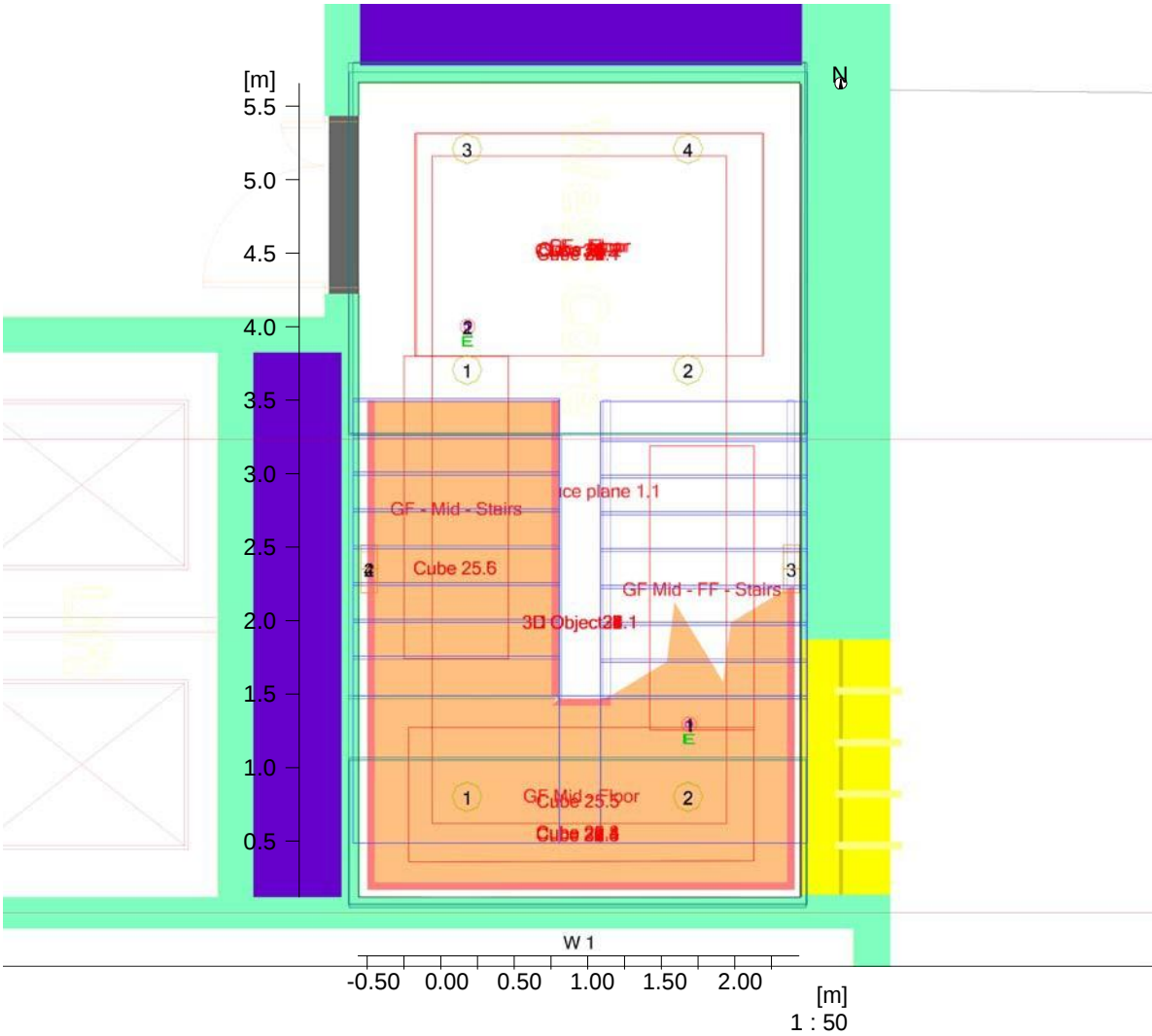
No.	Default[lx]	Emin[lx]	Surface Emax[lx]	Uniformity	Height
GF - Floor					
7	1.0	2.9	10.9	1: 3.79	0.00
GF - Mid - Stairs					
7	1.0	2.1	12.7	1: 6.15	1.31
GF Mid - Floor					
7	1.0	3.0	8.2	1: 2.73	1.31
GF Mid - FF - Stairs					
7	1.0	1.8	14.0	1: 7.66	1.32
FF - Floor					
7	1.0	2.9	11.2	1: 3.87	2.61

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

4 Stairs - West Core

4.1 Description, Stairs - West Core

4.1.1 Floor plan



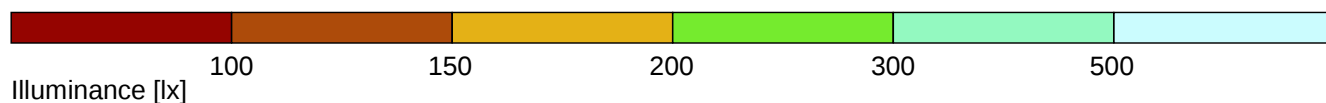
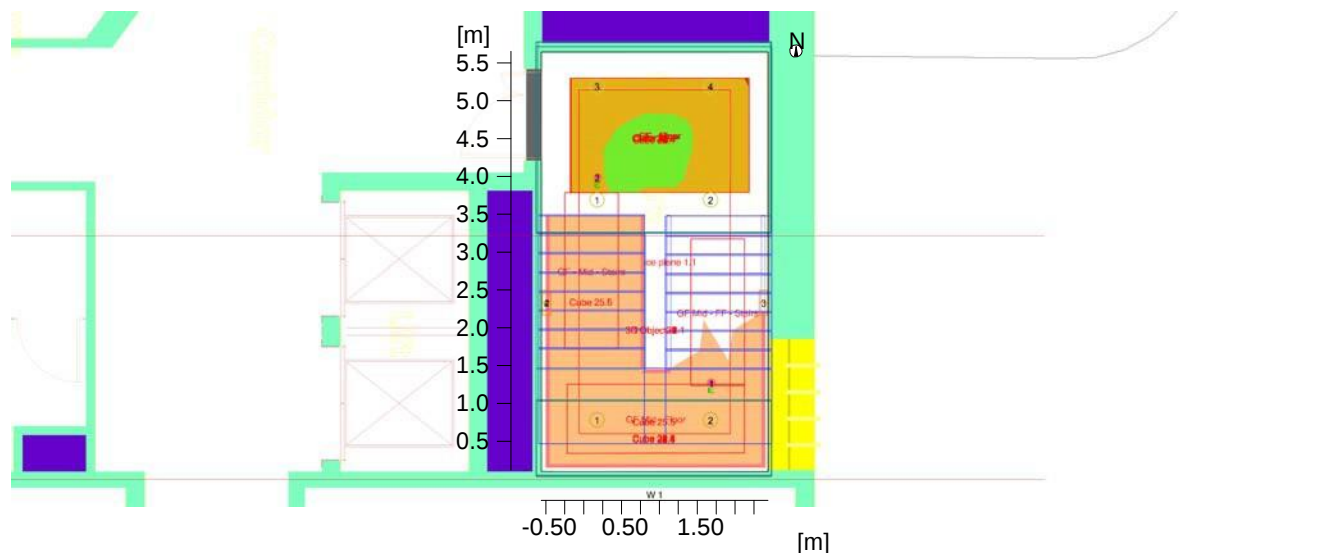
Wall	x	y	Length	Reflectance
1	2.44 m	0.12 m	3.00 m	50.0 %
2	2.44 m	5.65 m	5.54 m	50.0 %
3	-0.56 m	5.65 m	3.00 m	50.0 %
4	-0.56 m	0.12 m	5.53 m	50.0 %
Floor				20.0 %
Ceiling				70.0 %
Room height		30.50 m		
Height of reference plane		----		

Object :
 Installation : Stair Cores
 Project number : Renslade (1)
 Date : 28.09.2015

4 Stairs - West Core

4.2 Summary, Stairs - West Core

4.2.1 Result overview, GF - Floor



General

Calculation algorithm used	Average indirect fraction with light colours
Height of evaluation surface	0.00 m
Maintenance factor	0.80

Total luminous flux of all lamps	94024 lm
Total power	1493.7 W
Total power per area (16.59 m ²)	90.03 W/m ²

Illuminance

Average illuminance	Eav	192 lx
Minimum illuminance	Emin	167 lx
Maximum illuminance	Emax	208 lx
Uniformity Uo	Emin/Em	1:1.15 (0.87)
Diversity Ud	Emin/Emax	1:1.24 (0.81)

Type No. \Make

1	70	Aurora Lighting
		Order No. : 220-240V 18W Round Low Profile LED Downlight
		Luminaire name : AU-DL10218BW/40
		Equipment : 1 x LED / 1066 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

4 Stairs - West Core

4.2 Summary, Stairs - West Core

4.2.1 Result overview, GF - Floor

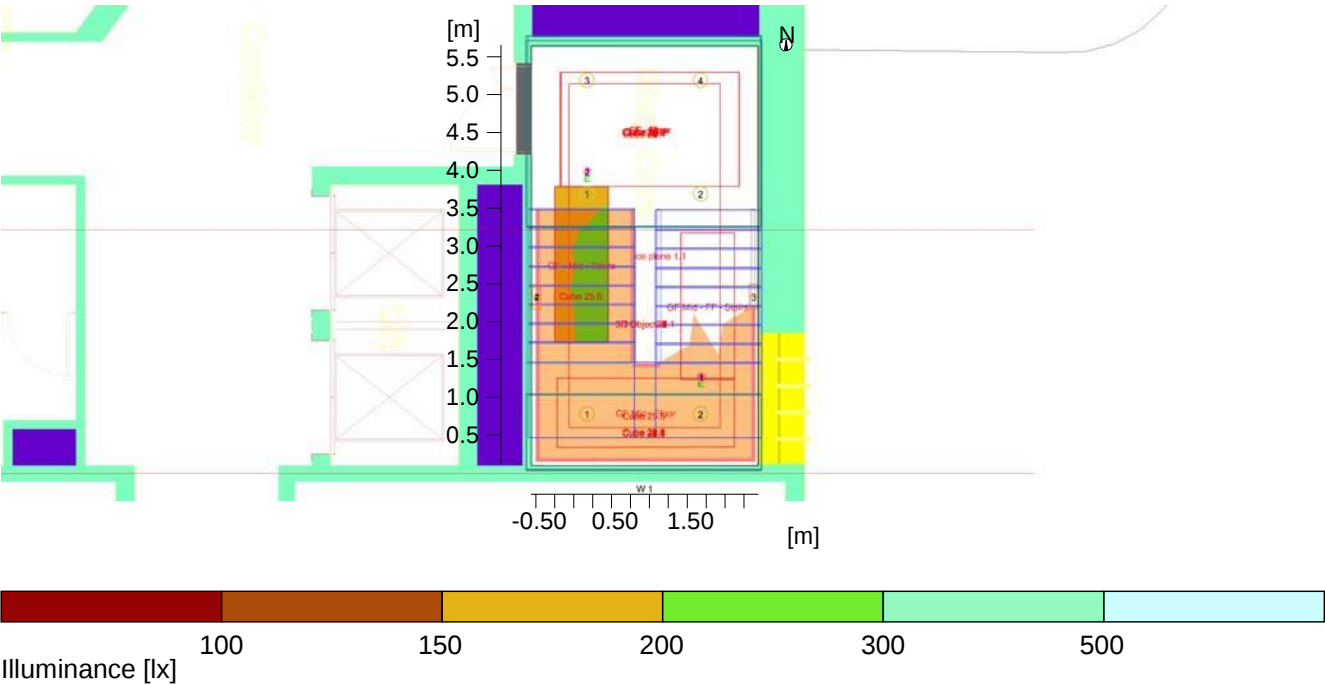
2	21	ENLITE	
		Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K



Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

4.2 Summary, Stairs - West Core

4.2.2 Result overview, GF - Mid - Stairs



General

Calculation algorithm used	Average indirect fraction with light colours
Maintenance factor	0.80
Total luminous flux of all lamps	94024 lm
Total power	1493.7 W
Total power per area (16.59 m²)	90.03 W/m²

Illuminance

Average illuminance	Eav	200 lx
Minimum illuminance	Emin	167 lx
Maximum illuminance	Emax	231 lx
Uniformity Uo	Emin/Em	1:1.2 (0.84)
Diversity Ud	Emin/Emax	1:1.38 (0.73)

Type No. Make

Aurora Lighting

1	70	Order No.	: 220-240V 18W Round Low Profile LED Downlight
		Luminaire name	: AU-DL10218BW/40
		Equipment	: 1 x LED / 1066 lm 4000K

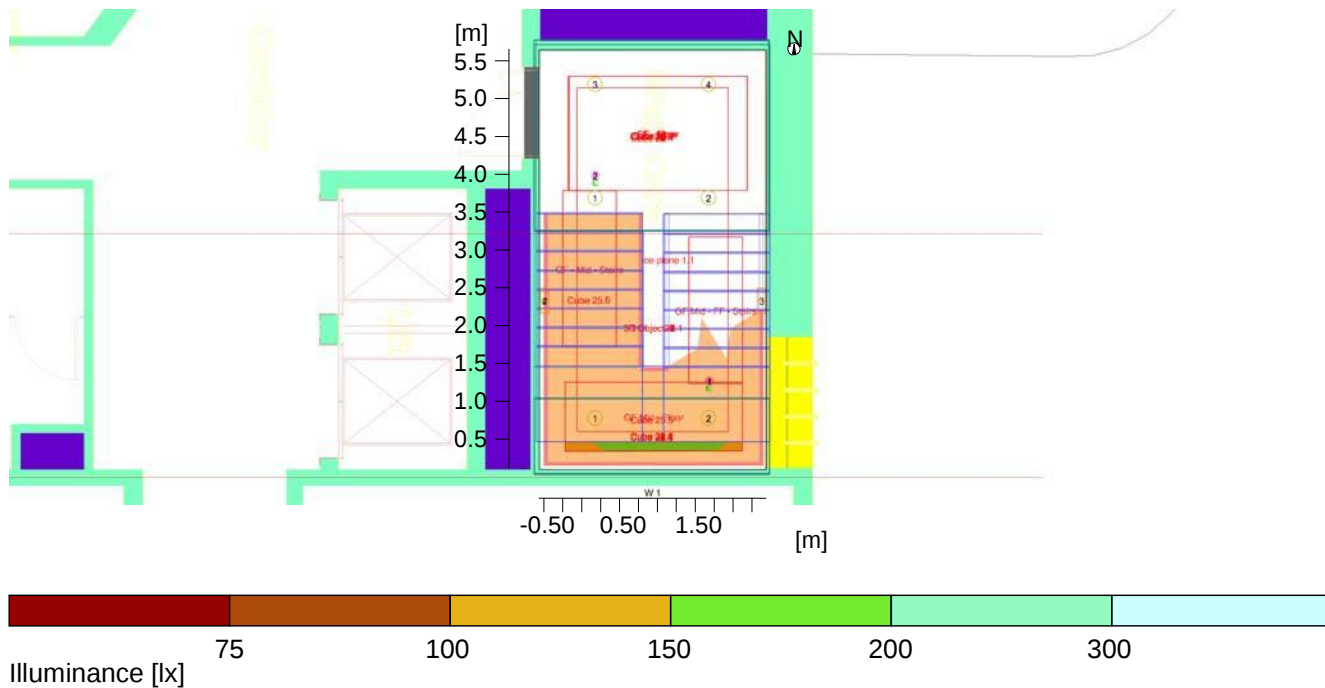
ENLITE

2	21	Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K

Object :
Installation :
Project number :
Date :

4.2 Summary, Stairs - West Core

4.2.3 Result overview, GF Mid - Floor



General

Calculation algorithm used	Average indirect fraction with light colours
Height of evaluation surface	1.31 m
Maintenance factor	0.80

Total luminous flux of all lamps	94024 lm
Total power	1493.7 W
Total power per area (16.59 m ²)	90.03 W/m ²

Illuminance

Average illuminance	Eav	154 lx
Minimum illuminance	Emin	132 lx
Maximum illuminance	E _{max}	161 lx
Uniformity U _o	Emin/Em	1:1.17 (0.86)
Diversity U _d	Emin/E _{max}	1:1.22 (0.82)

Type No.\Make

Aurora Lighting
 Order No. : 220-240V 18W Round Low Profile LED Downlight
 Luminaire name : AU-DL10218BW/40
 Equipment : 1 x LED / 1066 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

4.2 Summary, Stairs - West Core

4.2.3 Result overview, GF Mid - Floor

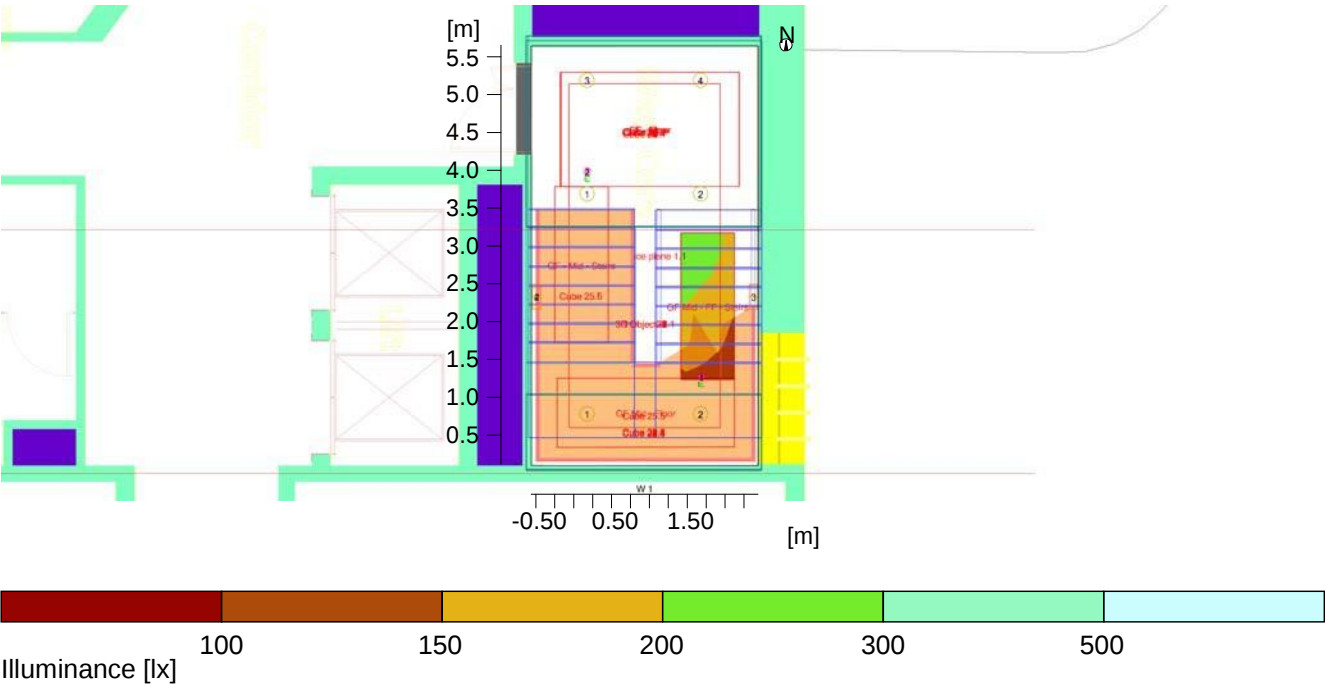
2	21	ENLITE	
		Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K



Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

4.2 Summary, Stairs - West Core

4.2.4 Result overview, GF Mid - FF - Stairs



General		
Calculation algorithm used		Average indirect fraction with light colours
Maintenance factor		0.80
Total luminous flux of all lamps		94024 lm
Total power		1493.7 W
Total power per area (16.59 m²)		90.03 W/m²
Illuminance		
Average illuminance	Eav	180 lx
Minimum illuminance	Emin	129 lx
Maximum illuminance	Emax	232 lx
Uniformity Uo	Emin/Em	1:1.4 (0.72)
Diversity Ud	Emin/Emax	1:1.8 (0.56)

Type No. \Make

- 1

70

Aurora Lighting
Order No. : 220-240V 18W Round Low Profile LED Downlight
Luminaire name : AU-DL10218BW/40
Equipment : 1 x LED / 1066 lm 4000K
- 2

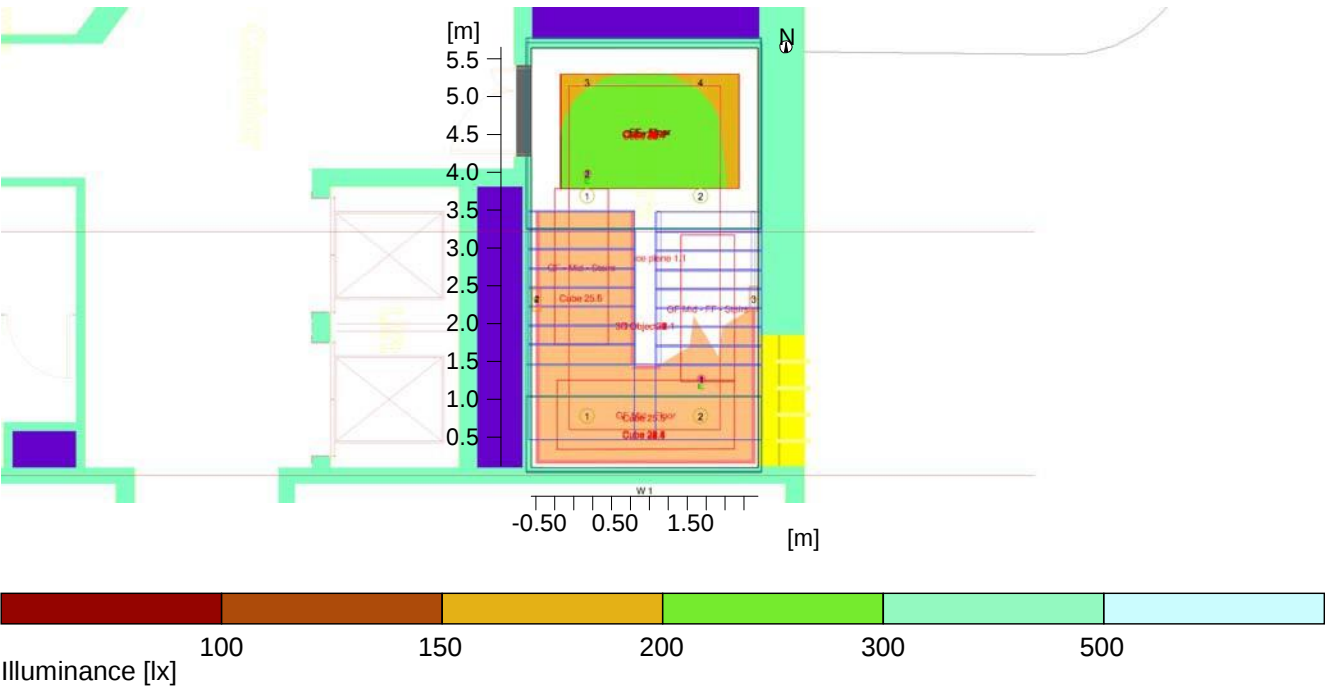
21

ENLITE
Order No. : 220-240V Polycarbonate IP66 12W Round LED Bulkhead
Luminaire name : EN-BH01BLK/40
Equipment : 1 x LED / 924 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

4.2 Summary, Stairs - West Core

4.2.5 Result overview, FF - Floor



General

Calculation algorithm used	Average indirect fraction with light colours
Height of evaluation surface	2.61 m
Maintenance factor	0.80
Total luminous flux of all lamps	94024 lm
Total power	1493.7 W
Total power per area (16.59 m²)	90.03 W/m²

Illuminance

Average illuminance	Eav	216 lx
Minimum illuminance	Emin	183 lx
Maximum illuminance	Emax	236 lx
Uniformity Uo	Emin/Em	1:1.18 (0.85)
Diversity Ud	Emin/Emax	1:1.29 (0.78)

Type No.\Make

1	70	Aurora Lighting
		Order No. : 220-240V 18W Round Low Profile LED Downlight
		Luminaire name : AU-DL10218BW/40
		Equipment : 1 x LED / 1066 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

4.2 Summary, Stairs - West Core

4.2.5 Result overview, FF - Floor

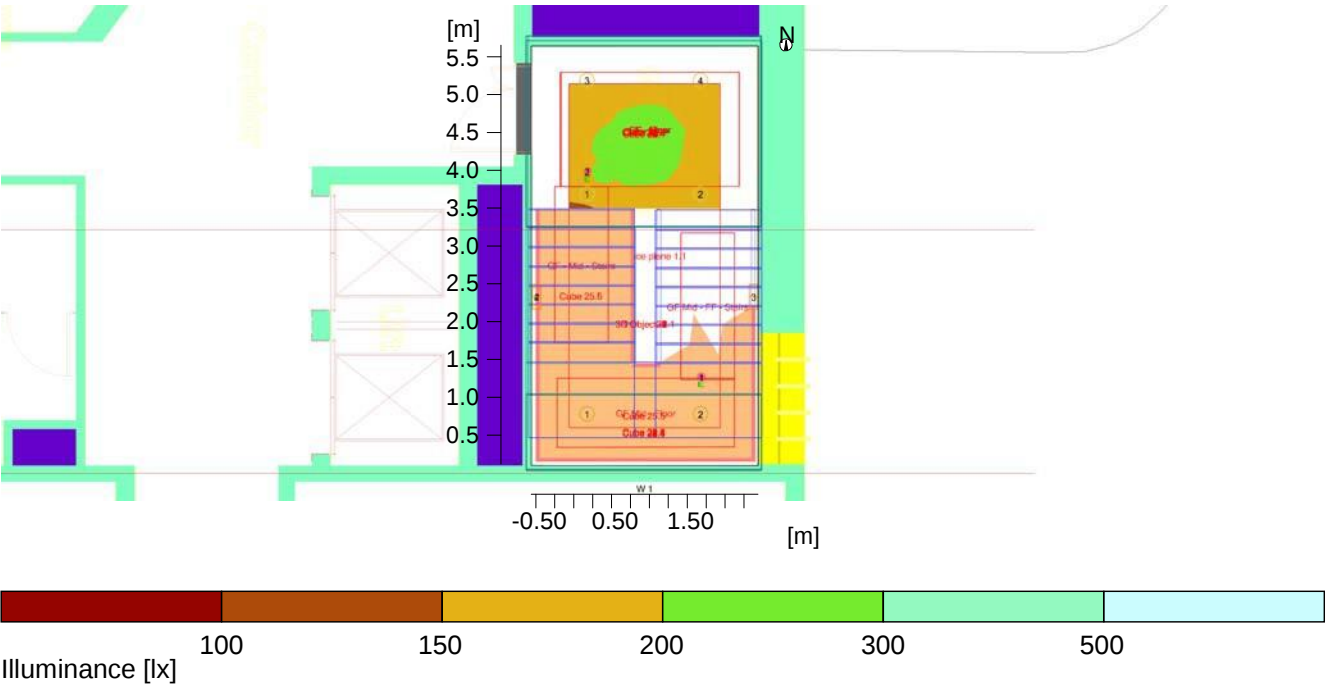
2	21	ENLITE	
		Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K



Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

4.2 Summary, Stairs - West Core

4.2.6 Result overview, Evaluation area 1



General

Calculation algorithm used	Average indirect fraction with light colours
Maintenance factor	0.80
Total luminous flux of all lamps	94024 lm
Total power	1493.7 W
Total power per area (16.59 m²)	90.03 W/m² (46.30 W/m²/100lx)

Evaluation area 1

Reference plane 1.1

	Horizontal
Em	194 lx
Emin	180 lx
Emin/Eav (Uo)	0.92
Emin/Emax (Ud)	0.87
Position	0.00 m (rot: 0°/0.03°)

Major surfaces

	Em	Uo
m 1.5 (Ceiling)	62 lx	0.89
m 1.1 (Wall)	146 lx	0.36
m 1.2 (Wall)	153 lx	0.33
m 1.3 (Wall)	179 lx	0.26
m 1.4 (Wall)	157 lx	0.38

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

4.2 Summary, Stairs - West Core

4.2.6 Result overview, Evaluation area 1

Type No.\Make

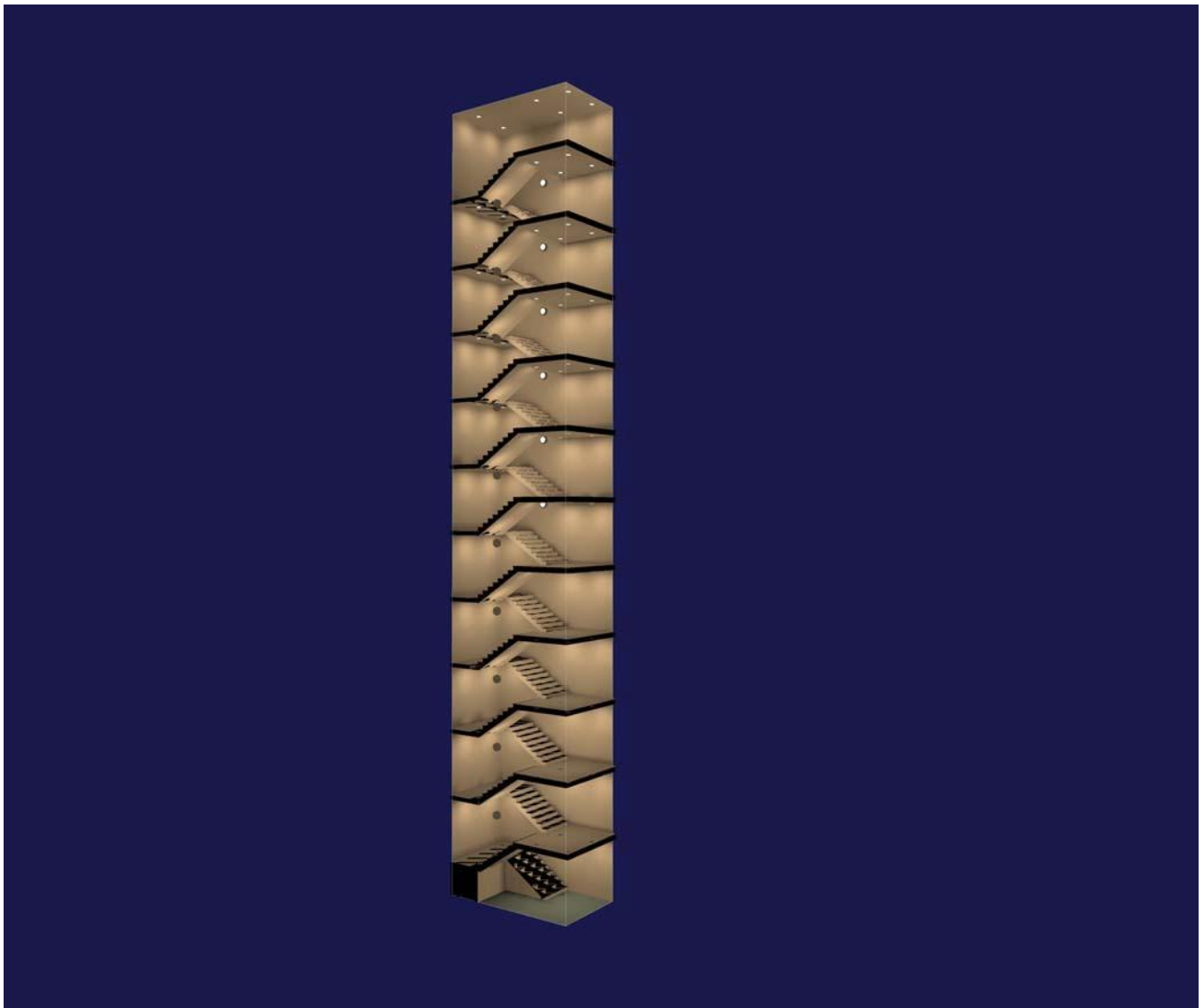
- | | | | |
|---|----|---|---|
| 1 | 70 |  | Aurora Lighting
Order No. : 220-240V 18W Round Low Profile LED Downlight
Luminaire name : AU-DL10218BW/40
Equipment : 1 x LED / 1066 lm 4000K |
| 2 | 21 |  | ENLITE
Order No. : 220-240V Polycarbonate IP66 12W Round LED Bulkhead
Luminaire name : EN-BH01BLK/40
Equipment : 1 x LED / 924 lm 4000K |

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

4 Stairs - West Core

4.3 Calculation results, Stairs - West Core

4.3.1 3D luminance, View 1



Luminance in the scene
Minimum: : 0 cd/m²
Maximum: : 65.4 cd/m²

Object :
 Installation : Stair Cores
 Project number : Renslade (1)
 Date : 28.09.2015

4 Stairs - West Core

4.4 Summary, Stairs - West Core

4.4.1 Result overview (emergency lighting)

Type No.\Make

3 23 **AURORA**
 Order No. : AU-EMLD2MW
 Luminaire name : EMERGENCY DOWNLIGHT - 3W LED
 Equipment : 1 x LED / 102 lm (100.0 %)



Result evaluation area

Calculation algorithm used: Direct component with light colours

Reference planes for emergency lighting:

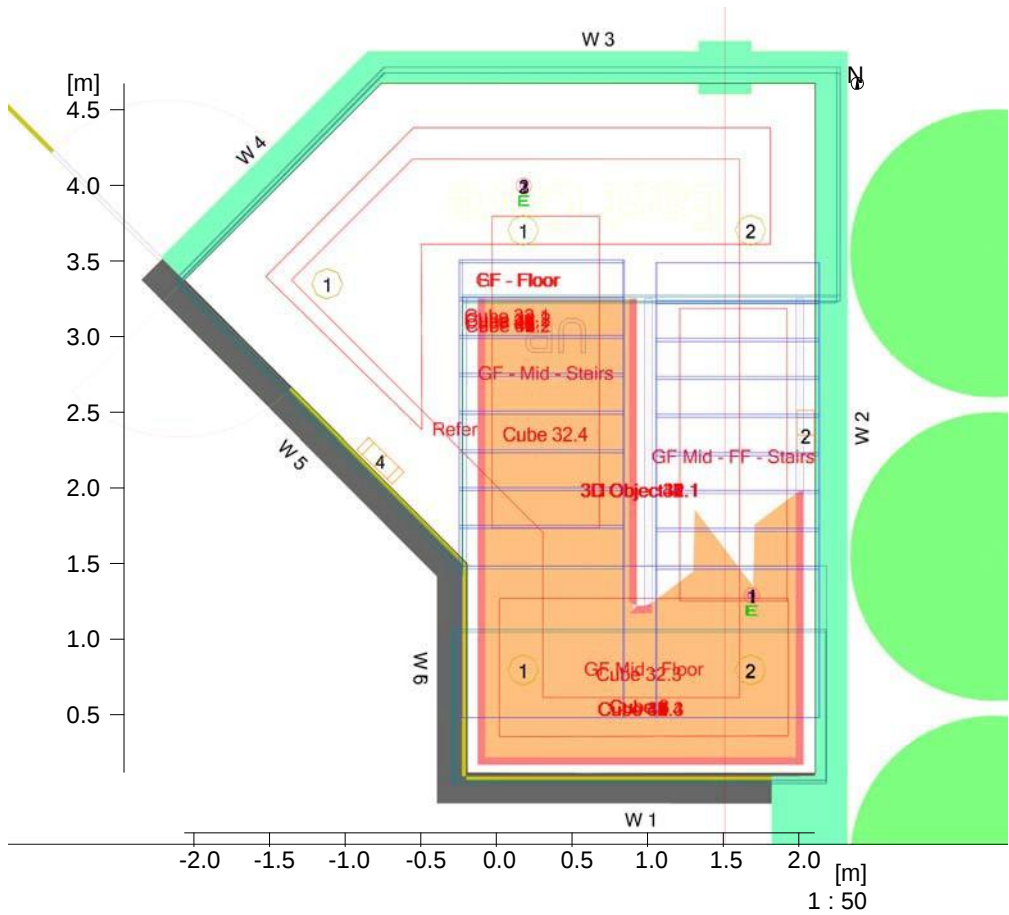
No.	Default[lx]	Emin[lx]	Surface Emax[lx]	Uniformity	Height
GF - Floor					
6	1.0	2.1	10.9	1: 5.07	0.00
GF - Mid - Stairs					
7	1.0	2.4	12.3	1: 5.11	1.31
GF Mid - Floor					
8	1.0	2.8	8.2	1: 2.94	1.31
GF Mid - FF - Stairs					
9	1.0	2.1	14.1	1: 6.68	1.32
FF - Floor					
10	1.0	2.1	11.2	1: 5.26	2.61

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

5 Stairs - East Core

5.1 Description, Stairs - East Core

5.1.1 Floor plan



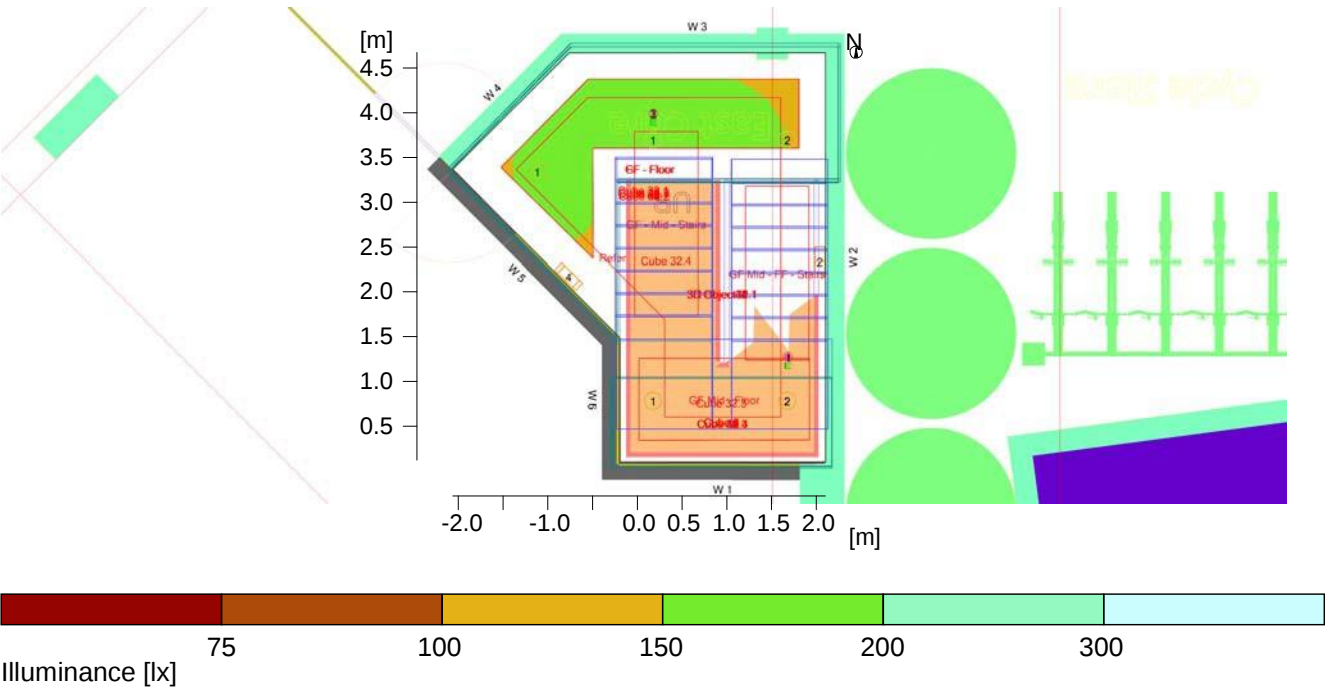
Wall	x	y	Length	Reflectance
1	2.10 m	0.12 m	2.30 m	50.0 %
2	2.10 m	4.67 m	4.55 m	50.0 %
3	-0.76 m	4.67 m	2.86 m	50.0 %
4	-2.06 m	3.37 m	1.84 m	50.0 %
5	-0.19 m	1.50 m	2.64 m	50.0 %
6	-0.19 m	0.12 m	1.38 m	50.0 %
Floor				20.0 %
Ceiling				70.0 %
Room height		30.50 m		
Height of reference plane		----		

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

5 Stairs - East Core

5.2 Summary, Stairs - East Core

5.2.1 Result overview, GF - Floor



General

Calculation algorithm used	Average indirect fraction with light colours
Height of evaluation surface	0.00 m
Maintenance factor	0.80
Total luminous flux of all lamps	81232 lm
Total power	1281.3 W
Total power per area (13.78 m²)	92.98 W/m²

Illuminance

Average illuminance	Eav	173 lx
Minimum illuminance	Emin	147 lx
Maximum illuminance	Emax	190 lx
Uniformity Uo	Emin/Em	1:1.17 (0.85)
Diversity Ud	Emin/Emax	1:1.29 (0.77)

Type No.\Make

1 58		Aurora Lighting
		Order No. : 220-240V 18W Round Low Profile LED Downlight
		Luminaire name : AU-DL10218BW/40
		Equipment : 1 x LED / 1066 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

5 Stairs - East Core

5.2 Summary, Stairs - East Core

5.2.1 Result overview, GF - Floor

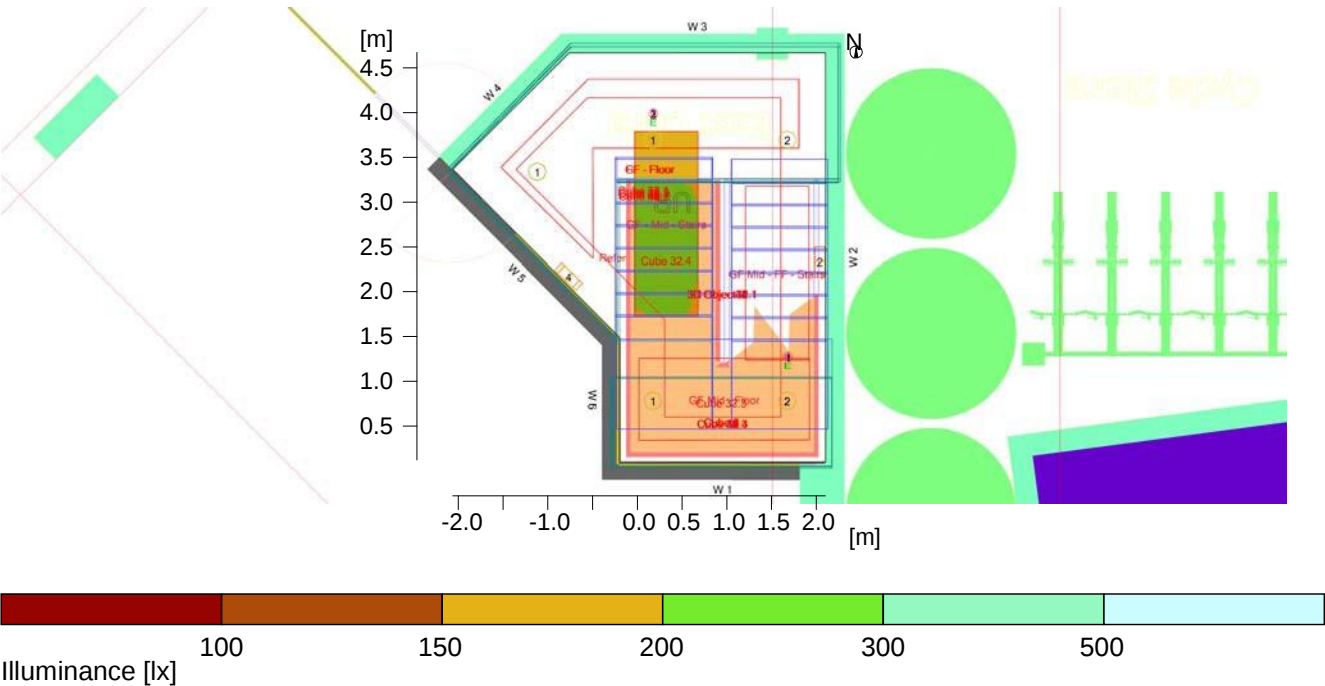
2	21	ENLITE	
		Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K



Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

5.2 Summary, Stairs - East Core

5.2.2 Result overview, GF - Mid - Stairs



General

Calculation algorithm used	Average indirect fraction with light colours
Maintenance factor	0.80
Total luminous flux of all lamps	81232 lm
Total power	1281.3 W
Total power per area (13.78 m²)	92.98 W/m²

Illuminance

Average illuminance	Eav	211 lx
Minimum illuminance	Emin	157 lx
Maximum illuminance	Emax	246 lx
Uniformity Uo	Emin/Em	1:1.34 (0.74)
Diversity Ud	Emin/Emax	1:1.57 (0.64)

Type No. \Make

Aurora Lighting

1	58	Order No.	: 220-240V 18W Round Low Profile LED Downlight
		Luminaire name	: AU-DL10218BW/40
		Equipment	: 1 x LED / 1066 lm 4000K

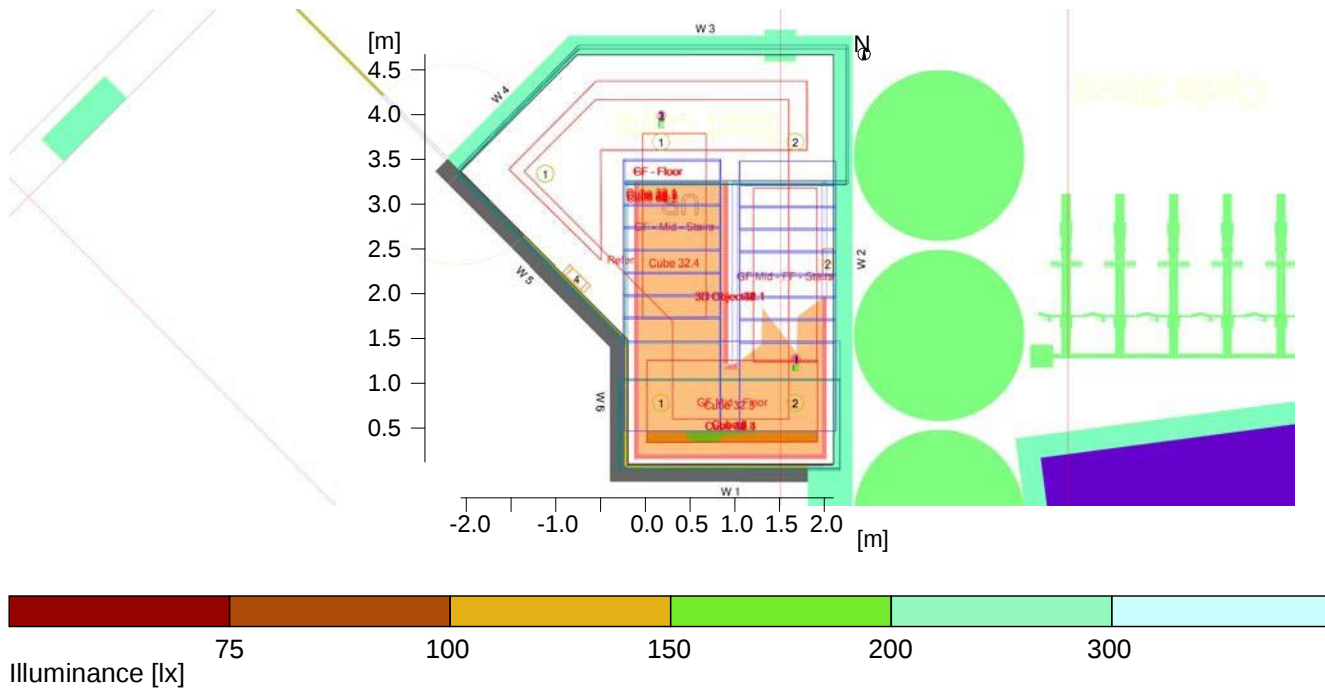
ENLITE

2	21	Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K

Object :
Installation :
Project number :
Date :

5.2 Summary, Stairs - East Core

5.2.3 Result overview, GF Mid - Floor



General

Calculation algorithm used	Average indirect fraction with light colours
Height of evaluation surface	1.31 m
Maintenance factor	0.80

Total luminous flux of all lamps	81232 lm
Total power	1281.3 W
Total power per area (13.78 m ²)	92.98 W/m ²

Illuminance

Average illuminance	Eav	145 lx
Minimum illuminance	Emin	133 lx
Maximum illuminance	E _{max}	156 lx
Uniformity U _o	Emin/Em	1:1.09 (0.92)
Diversity U _d	Emin/E _{max}	1:1.17 (0.85)

Type No.\Make

Aurora Lighting

1	58		Order No. : 220-240V 18W Round Low Profile LED Downlight Luminaire name : AU-DL10218BW/40 Equipment : 1 x LED / 1066 lm 4000K
---	----	---	--

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

5.2 Summary, Stairs - East Core

5.2.3 Result overview, GF Mid - Floor

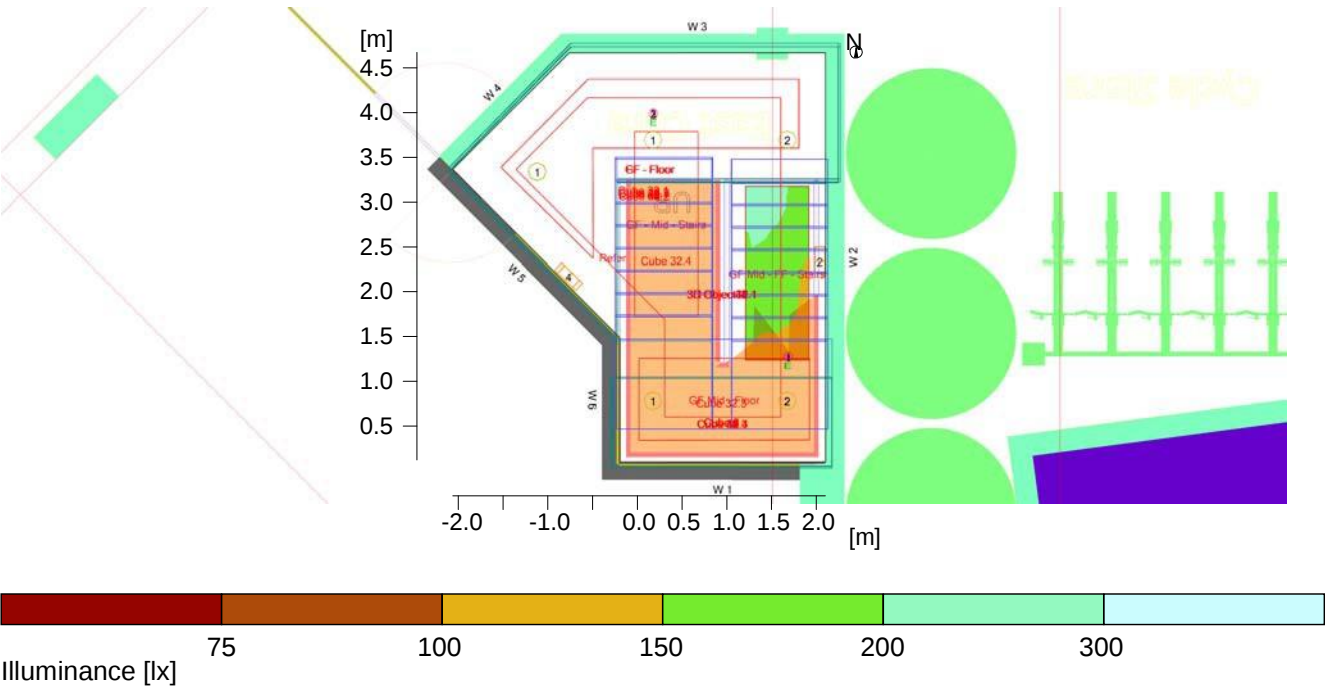
2	21	ENLITE	
		Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K



Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

5.2 Summary, Stairs - East Core

5.2.4 Result overview, GF Mid - FF - Stairs



General		
Calculation algorithm used		Average indirect fraction with light colours
Maintenance factor		0.80
Total luminous flux of all lamps		81232 lm
Total power		1281.3 W
Total power per area (13.78 m²)		92.98 W/m²
Illuminance		
Average illuminance	Eav	173 lx
Minimum illuminance	Emin	126 lx
Maximum illuminance	Emax	233 lx
Uniformity Uo	Emin/Em	1:1.37 (0.73)
Diversity Ud	Emin/Emax	1:1.85 (0.54)

Type No.\Make

Aurora Lighting

- 1

58


- Order No. : 220-240V 18W Round Low Profile LED Downlight
- Luminaire name : AU-DL10218BW/40
- Equipment : 1 x LED / 1066 lm 4000K

ENLITE

- 2

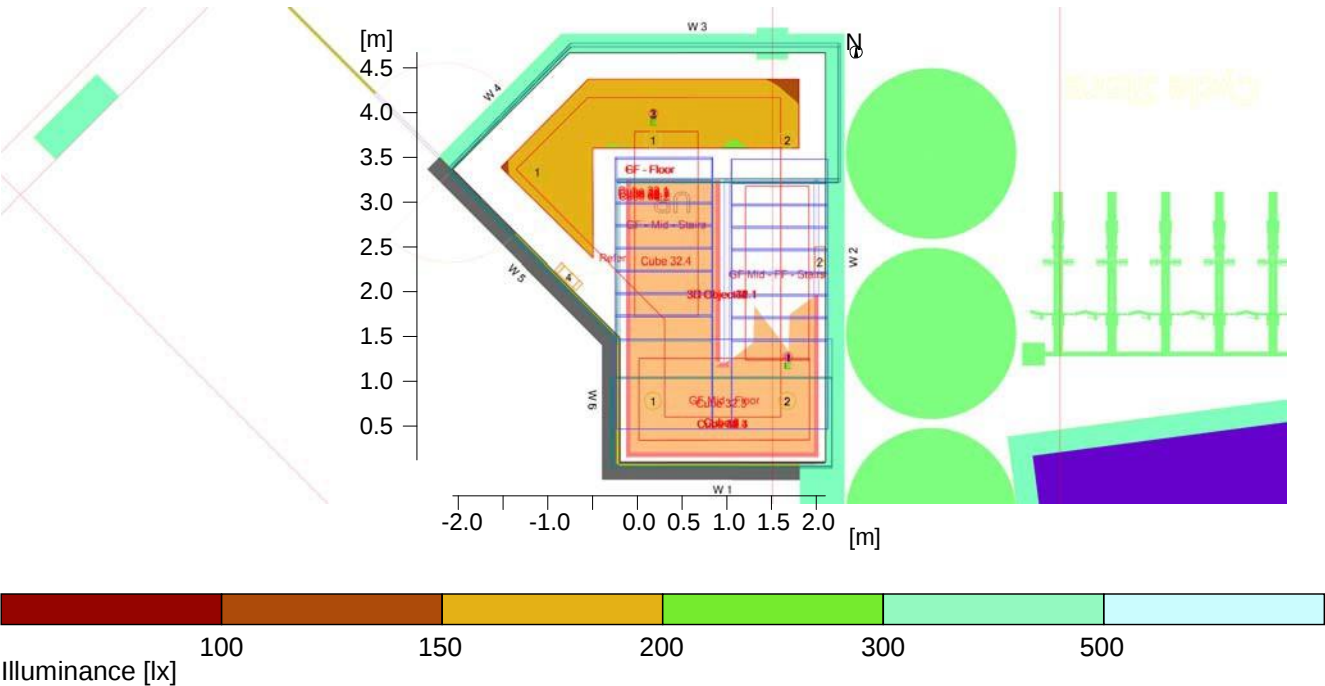
21


- Order No. : 220-240V Polycarbonate IP66 12W Round LED Bulkhead
- Luminaire name : EN-BH01BLK/40
- Equipment : 1 x LED / 924 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

5.2 Summary, Stairs - East Core

5.2.5 Result overview, FF - Floor



General

Calculation algorithm used	Average indirect fraction with light colours
Height of evaluation surface	2.61 m
Maintenance factor	0.80
Total luminous flux of all lamps	81232 lm
Total power	1281.3 W
Total power per area (13.78 m²)	92.98 W/m²

Illuminance

Average illuminance	Eav	188 lx
Minimum illuminance	Emin	161 lx
Maximum illuminance	Emax	204 lx
Uniformity Uo	Emin/Em	1:1.17 (0.86)
Diversity Ud	Emin/Emax	1:1.27 (0.79)

Type No. \Make

Aurora Lighting

1	58	Order No.	: 220-240V 18W Round Low Profile LED Downlight
		Luminaire name	: AU-DL10218BW/40
		Equipment	: 1 x LED / 1066 lm 4000K

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

5.2 Summary, Stairs - East Core

5.2.5 Result overview, FF - Floor

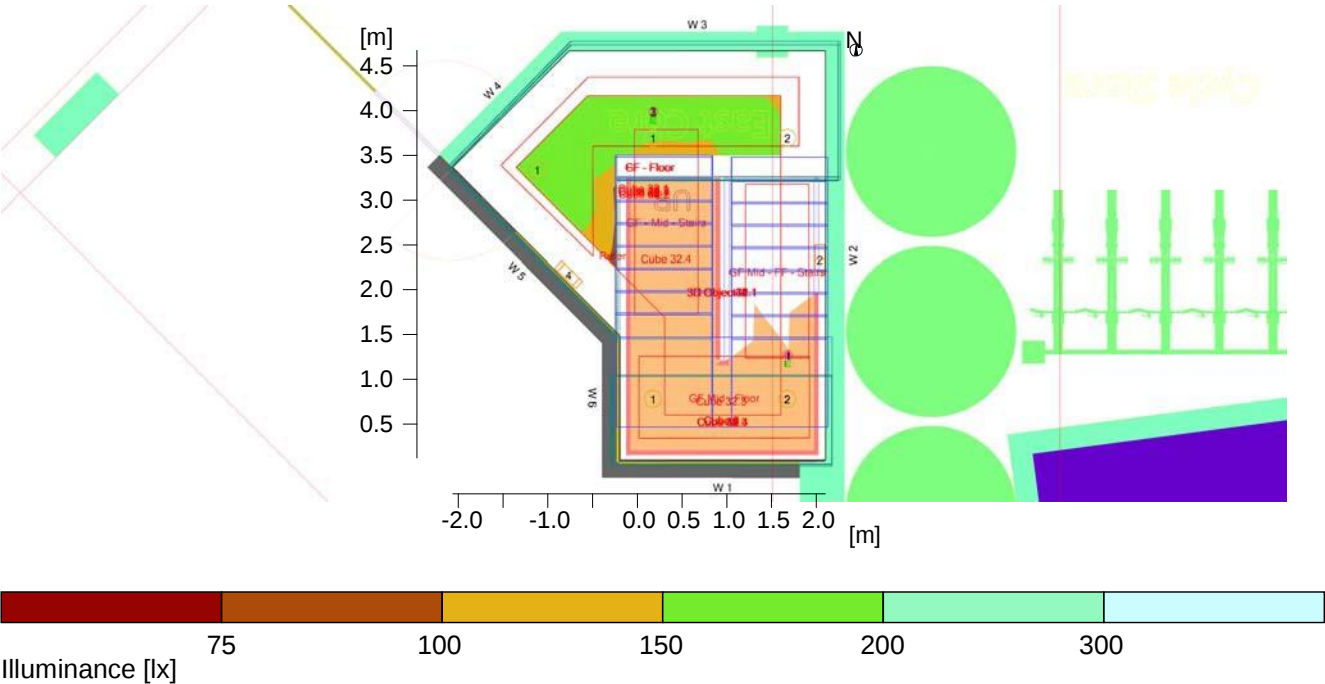
2	21	ENLITE	
		Order No.	: 220-240V Polycarbonate IP66 12W Round LED Bulkhead
		Luminaire name	: EN-BH01BLK/40
		Equipment	: 1 x LED / 924 lm 4000K



Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

5.2 Summary, Stairs - East Core

5.2.6 Result overview, Evaluation area 1



General

Calculation algorithm used	Average indirect fraction with light colours
Maintenance factor	0.80
Total luminous flux of all lamps	81232 lm
Total power	1281.3 W
Total power per area (13.78 m²)	92.98 W/m² (53.25 W/m²/100lx)

Evaluation area 1

Reference plane 1.1

	Horizontal
Em	175 lx
Emin	160 lx
Emin/Eav (Uo)	0.92
Emin/Emax (Ud)	0.85
Position	0.00 m (rot: 0°/0.04°)

Major surfaces

	Em	Uo
m 1.6 (Ceiling)	51 lx	0.86
m 1.1 (Wall)	141 lx	0.41
m 1.2 (Wall)	167 lx	0.25
m 1.3 (Wall)	150 lx	0.03
m 1.4 (Wall)	174 lx	0.20
m 1.5 (Wall)	144 lx	0.20

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

5.2 Summary, Stairs - East Core

5.2.6 Result overview, Evaluation area 1

Type No.\Make

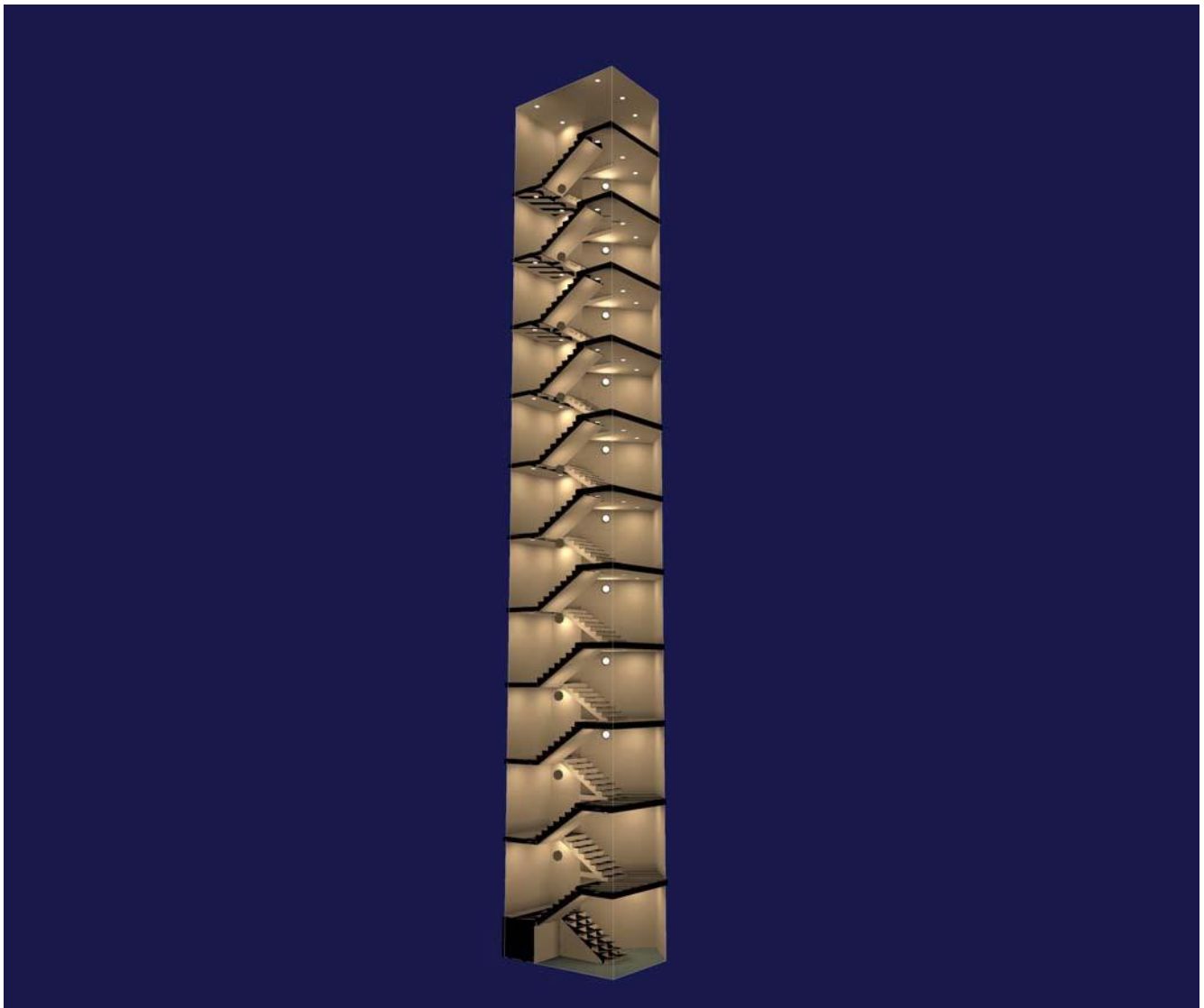
- | Type | No. | Make |
|---|-----|--|
| 1 | 58 | Aurora Lighting |
|  | | Order No. : 220-240V 18W Round Low Profile LED Downlight
Luminaire name : AU-DL10218BW/40
Equipment : 1 x LED / 1066 lm 4000K |
| 2 | 21 | ENLITE |
|  | | Order No. : 220-240V Polycarbonate IP66 12W Round LED Bulkhead
Luminaire name : EN-BH01BLK/40
Equipment : 1 x LED / 924 lm 4000K |

Object :
Installation : Stair Cores
Project number : Renslade (1)
Date : 28.09.2015

5 Stairs - East Core

5.3 Calculation results, Stairs - East Core

5.3.1 3D luminance, View 1



Luminance in the scene
Minimum: : 0 cd/m²
Maximum: : 192 cd/m²

Object :
 Installation : Stair Cores
 Project number : Renslade (1)
 Date : 28.09.2015

5 Stairs - East Core

5.4 Summary, Stairs - East Core

5.4.1 Result overview (emergency lighting)

Type No.\Make

3 23 **AURORA**
 Order No. : AU-EMLD2MW
 Luminaire name : EMERGENCY DOWNLIGHT - 3W LED
 Equipment : 1 x LED / 102 lm (100.0 %)



Result evaluation area

Calculation algorithm used: Direct component with light colours

Reference planes for emergency lighting:

No.	Default[lx]	Emin[lx]	Surface Emax[lx]	Uniformity	Height
GF - Floor					
7	1.0	3.9	10.9	1: 2.75	0.00
GF - Mid - Stairs					
7	1.0	2.9	12.0	1: 4.15	1.31
GF Mid - Floor					
7	1.0	3.5	8.2	1: 2.35	1.31
GF Mid - FF - Stairs					
7	1.0	2.5	13.6	1: 5.40	1.32
FF - Floor					
7	1.0	4.0	11.1	1: 2.78	2.61