

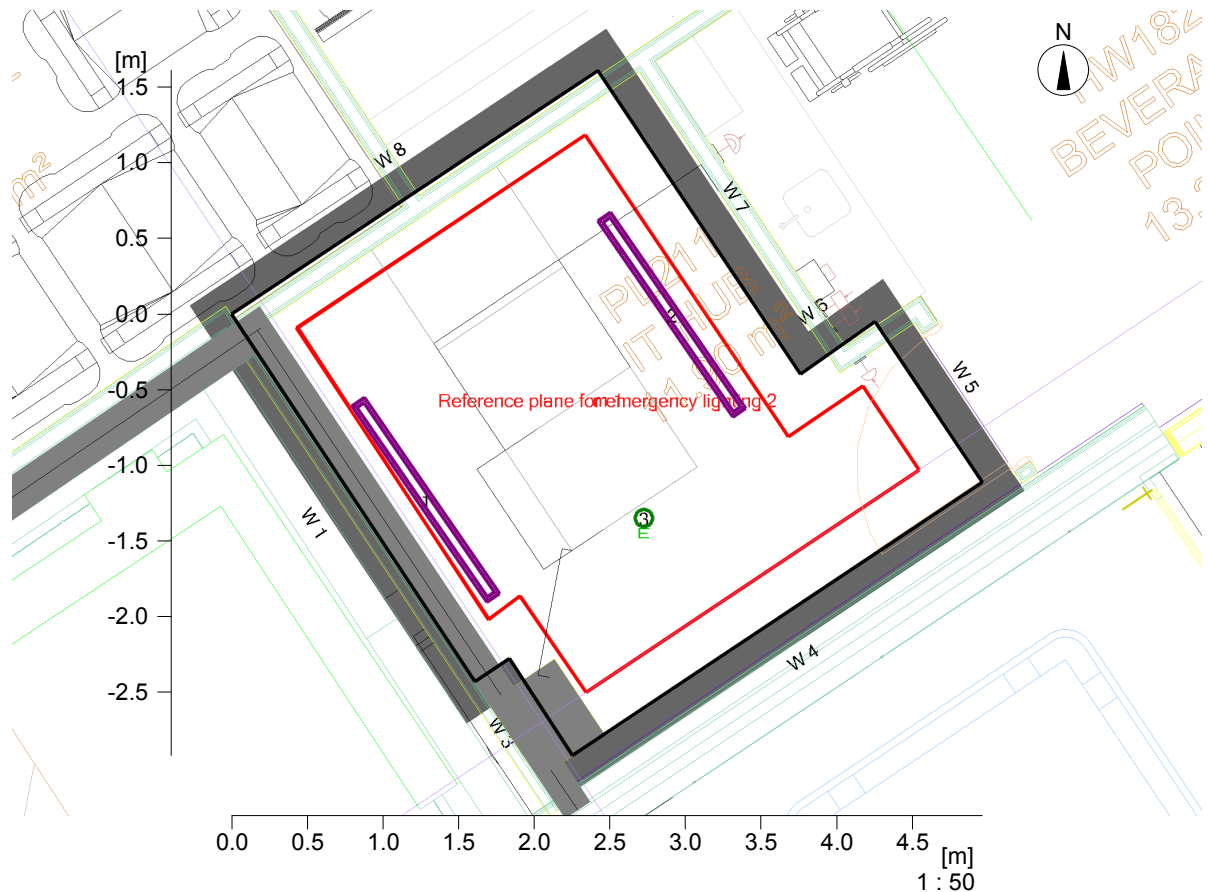
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



13 PL211 - IT HUB

13.1 Description, PL211 - IT HUB

13.1.1 Floor plan



Wall	x	y	Length	Reflectance
1	31.96 m	43.99 m	2.91 m	50.0 %
2	32.19 m	44.15 m	0.27 m	50.0 %
3	32.60 m	43.51 m	0.76 m	50.0 %
4	35.31 m	45.31 m	3.26 m	50.0 %
5	34.60 m	46.37 m	1.28 m	50.0 %
6	34.11 m	46.03 m	0.60 m	50.0 %
7	32.77 m	48.03 m	2.41 m	50.0 %
8	30.35 m	46.42 m	2.91 m	50.0 %
Floor				20.0 %
Ceiling				70.0 %
Room height		3.90 m		
Height of reference plane		----		

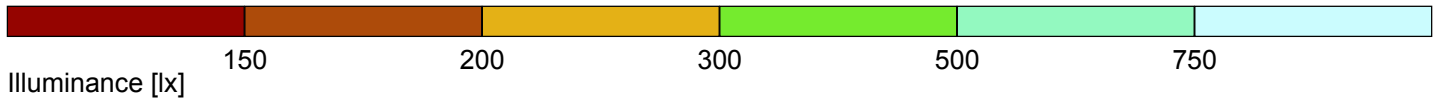
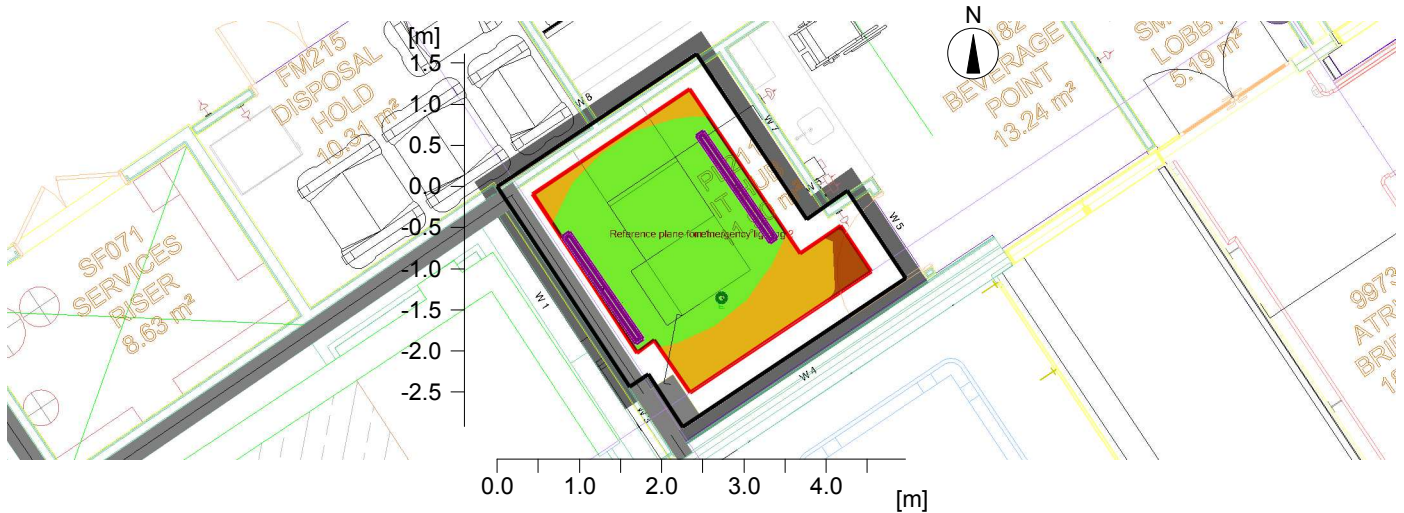
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



13 PL211 - IT HUB

13.2 Summary, PL211 - IT HUB

13.2.1 Result overview, Measuring area 1



General

Calculation algorithm used : High indirect fraction
 Height of evaluation surface : 0.00 m
 Maintenance factor : 0.80

Total luminous flux of all lamps : 10950 lm
 Total power : 82 W
 Total power per area (11.27 m²) : 7.28 W/m²

Illuminance

Average illuminance : Eav 342 lx
 Minimum illuminance : Emin 241 lx
 Maximum illuminance : Emax 389 lx
 Uniformity U_o : Emin/Em 1:1.42 (0.71)
 Diversity U_d : Emin/Emax 1:1.61 (0.62)

Type No.\Make

Glamox Luxo Lighting
 6 2 Order No. : li40-1500 LED 5500 840 PC
 Luminaire name : D3 - i40 | i40 LED
 Equipment : 1 x LED 840 41 W / 5475 lm

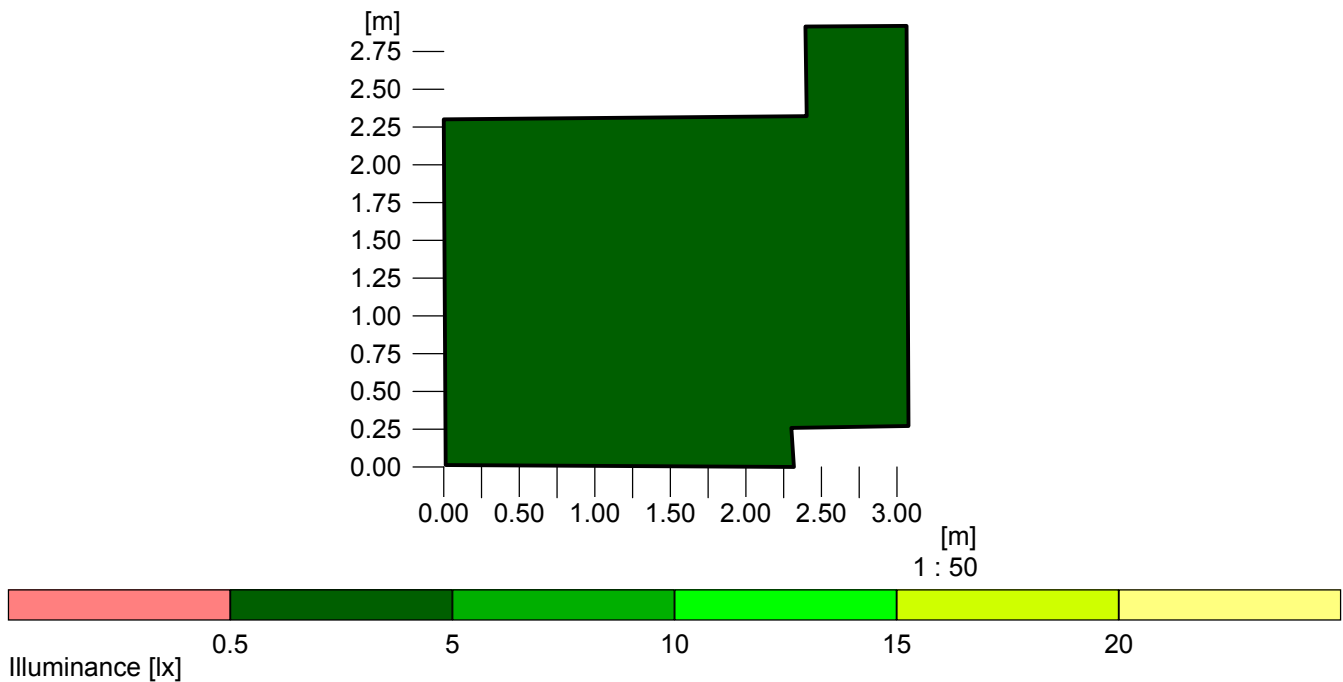
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



13 PL211 - IT HUB

13.3 Calculation results, PL211 - IT HUB

13.3.1 Boundary line, Reference plane for emergency lighting 2 (E)



Required minimum illuminance	:	0.5 lx
Minimum illuminance	E _{min}	: 1.6 lx
Maximum illuminance	E _{max}	: 3.1 lx
Uniformity	E _{min} /E _{max}	: 1 : 2.01 (0.50) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8


Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



13.3 Summary, PL211 - IT HUB

13.3.2 Result overview (emergency lighting)

Type No.\Make

15	1	GLAMOX	
		Order No.	: IXYLUX LD3
		Luminaire name	: H1S - XYLUX LD3
		Equipment	: 1 x LED 2.5 W / 130 lm (100.0 %)

Result evaluation area

Calculation algorithm used: Direct component
 Maintenance factor: 0.8

Reference planes for emergency lighting:

No.	Default[lx]	Emin[lx]	Surface Emax[lx]	Uniformity	Height
Reference plane for emergency lighting 2					
2	0.5	1.6	3.1	1: 2.01	0.00

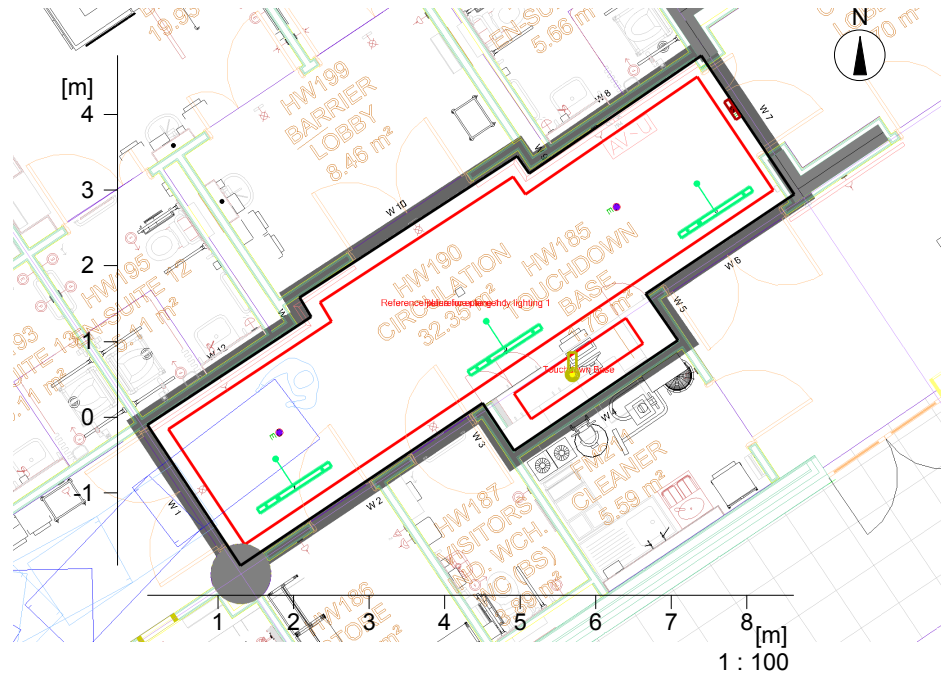
Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



14 HW190 - CIRCULATION

14.1 Description, HW190 - CIRCULATION

14.1.1 Floor plan



Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



14 HW190 - CIRCULATION

14.1 Description, HW190 - CIRCULATION

14.1.1 Floor plan

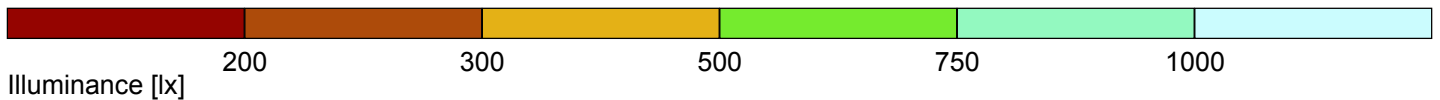
Wall	x	y	Length	Reflectance
1	12.14 m	41.29 m	2.23 m	50.0 %
2	15.34 m	43.43 m	3.85 m	50.0 %
3	15.75 m	42.80 m	0.75 m	50.0 %
4	17.92 m	44.26 m	2.61 m	50.0 %
5	17.49 m	44.88 m	0.75 m	50.0 %
6	19.46 m	46.19 m	2.36 m	50.0 %
7	18.23 m	48.02 m	2.20 m	50.0 %
8	15.95 m	46.47 m	2.76 m	50.0 %
9	15.79 m	46.69 m	0.28 m	50.0 %
10	12.92 m	44.83 m	3.43 m	50.0 %
11	13.07 m	44.57 m	0.30 m	50.0 %
12	10.91 m	43.14 m	2.59 m	50.0 %
Floor				20.0 %
Ceiling				70.0 %
Room height		2.70 m		
Height of reference plane		0.00 m		

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019

14 HW190 - CIRCULATION

14.2 Summary, HW190 - CIRCULATION

14.2.1 Result overview, Touchdown Base



General

Calculation algorithm used	High indirect fraction
Height of evaluation surface	0.75 m
Height of luminaire plane	2.70 m
Maintenance factor	0.80

Total luminous flux of all lamps	13679 lm
Total power	139 W
Total power per area (22.31 m ²)	6.23 W/m ²

Illuminance

Average illuminance	Eav	537 lx
Minimum illuminance	Emin	328 lx
Maximum illuminance	Emax	645 lx
Uniformity U _o	Emin/Em	1:1.64 (0.61)
Diversity U _d	Emin/Emax	1:1.97 (0.51)

Type No.\Make

1	1	Glamox Luxo Lighting
		Order No. : !D70-R155 LED 2100 840 SM
		Luminaire name : A2 - D70-R155
		Equipment : 1 x LED 840 19 W / 1931 lm

Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



14 HW190 - CIRCULATION

14.2 Summary, HW190 - CIRCULATION

14.2.1 Result overview, Touchdown Base

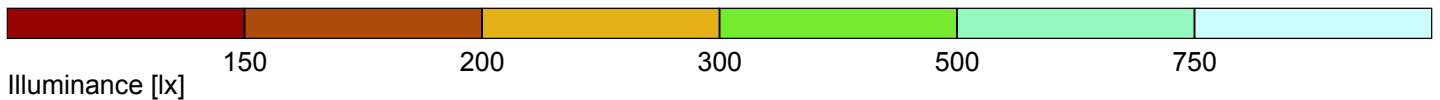
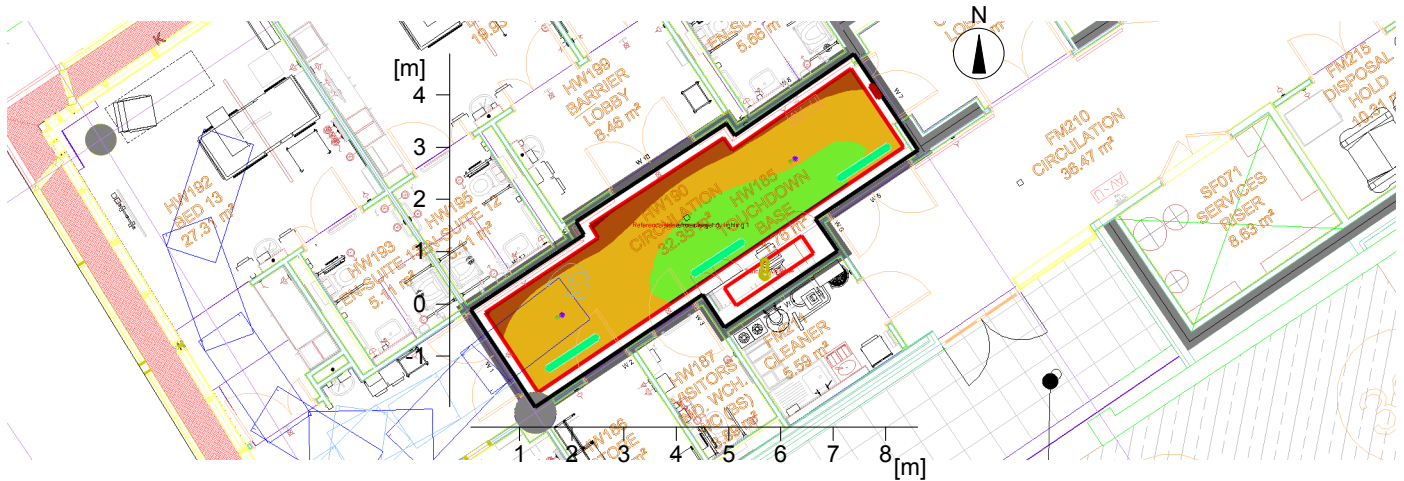
5	3	Order No.	: !C80-RR1128 LED 3700 840 ASY HI
		Luminaire name	: E2 - C80-RR
		Equipment	: 1 x LED 840 40 W / 3916 lm

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



14.2 Summary, HW190 - CIRCULATION

14.2.2 Result overview, Evaluation area 1



General

Calculation algorithm used	High indirect fraction
Height of luminaire plane	2.70 m
Maintenance factor	0.80
Total luminous flux of all lamps	13679 lm
Total power	139.0 W
Total power per area (22.31 m ²)	6.23 W/m ² (2.28 W/m ² /100lx)

Evaluation area 1

Reference plane 1.1

	Horizontal
Em	273 lx
Emin	154 lx
Emin/Eav (Uo)	0.56
Emin/Emax (Ud)	0.35
Position	0.00 m

Type No.\Make

1	1	Glamox Luxo Lighting
		Order No. : ID70-R155 LED 2100 840 SM
		Luminaire name : A2 - D70-R155
		Equipment : 1 x LED 840 19 W / 1931 lm

Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



14.2 Summary, HW190 - CIRCULATION

14.2.2 Result overview, Evaluation area 1

5	3	Order No.	: !C80-RR1128 LED 3700 840 ASY HI
		Luminaire name	: E2 - C80-RR
		Equipment	: 1 x LED 840 40 W / 3916 lm

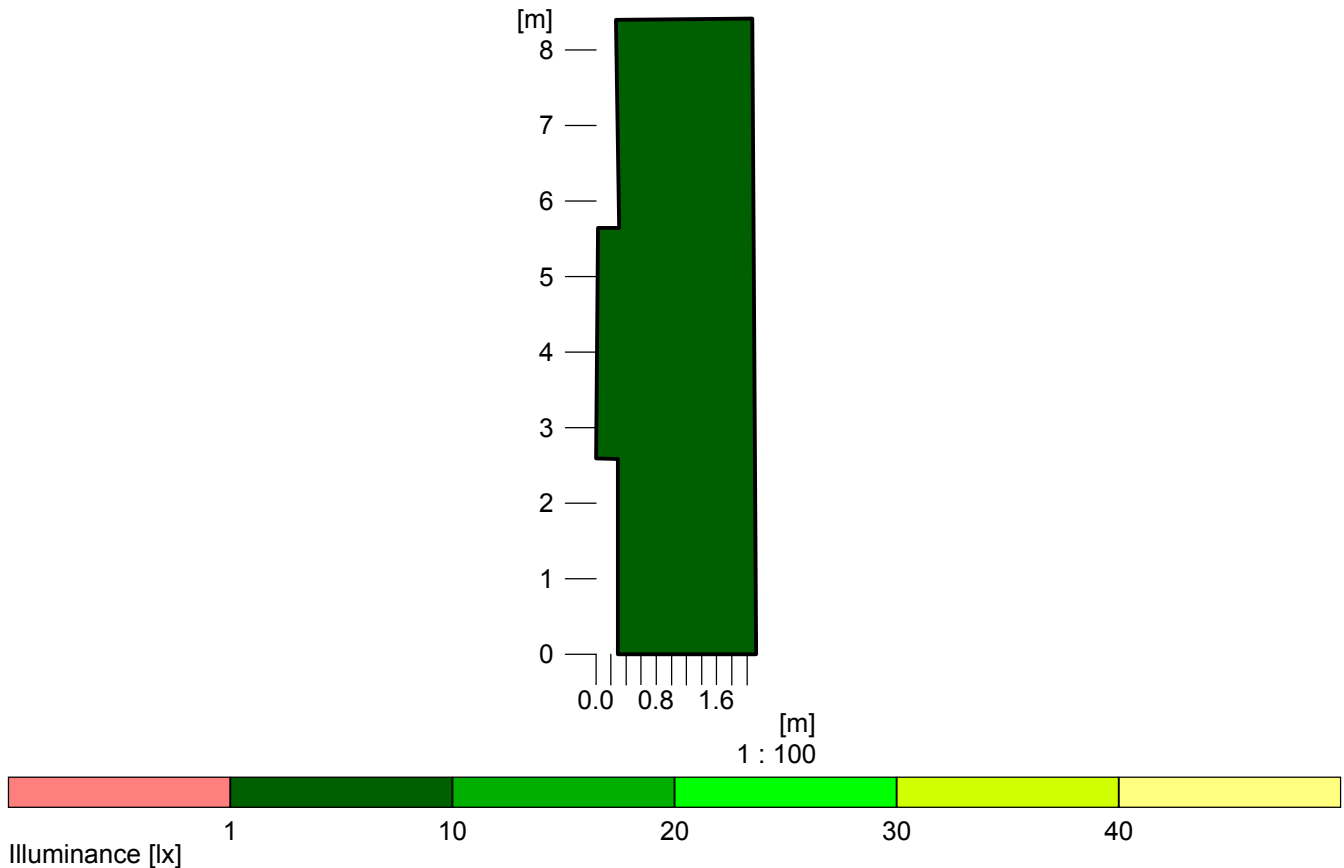
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



14 HW190 - CIRCULATION

14.3 Calculation results, HW190 - CIRCULATION

14.3.1 Boundary line, Reference plane for emergency lighting 1 (E)



Required minimum illuminance	:	1 lx
Minimum illuminance	E _{min}	: 1.2 lx
Maximum illuminance	E _{max}	: 8 lx
Uniformity	E _{min} /E _{max}	: 1 : 6.42 (0.16) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8



Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



14.3 Summary, HW190 - CIRCULATION

14.3.2 Result overview (emergency lighting)

Type No.\Make

		Glamox Luxo Lighting	
4	1	Order No.	: !E80-R 10X26 DOWN LED E1
		Luminaire name	: H3 - E80
		Equipment	: 1 x LED E80 2 W / 12 lm (10.0 %)
		GLAMOX	
11	2	Order No.	: !H2 - M1008 LR4 550 ES - GLAMOX.eld
		Luminaire name	: H2 - XYLUX LR4
		Equipment	: 1 x LED 1.65 W / 160 lm (100.0 %)

Result evaluation area

Calculation algorithm used: Direct component
 Maintenance factor: 0.8

Reference planes for emergency lighting:

No.	Default[lx]	Emin[lx]	Surface Emax[lx]	Uniformity	Height
Reference plane for emergency lighting 1					
1	1.0	1.2	8.0	1: 6.42	0.00

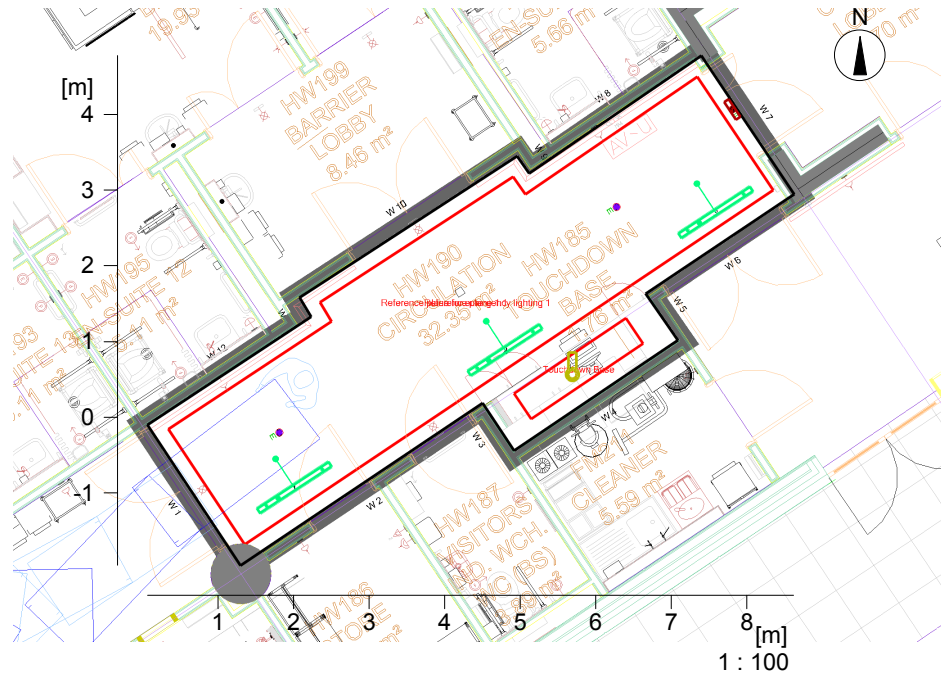
Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



15 HW190 - CIRCULATION (A8 off)

15.1 Description, HW190 - CIRCULATION (A8 off)

15.1.1 Floor plan



Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



15 HW190 - CIRCULATION (A8 off)

15.1 Description, HW190 - CIRCULATION (A8 off)

15.1.1 Floor plan

Wall	x	y	Length	Reflectance
1	12.14 m	41.29 m	2.23 m	50.0 %
2	15.34 m	43.43 m	3.85 m	50.0 %
3	15.75 m	42.80 m	0.75 m	50.0 %
4	17.92 m	44.26 m	2.61 m	50.0 %
5	17.49 m	44.88 m	0.75 m	50.0 %
6	19.46 m	46.19 m	2.36 m	50.0 %
7	18.23 m	48.02 m	2.20 m	50.0 %
8	15.95 m	46.47 m	2.76 m	50.0 %
9	15.79 m	46.69 m	0.28 m	50.0 %
10	12.92 m	44.83 m	3.43 m	50.0 %
11	13.07 m	44.57 m	0.30 m	50.0 %
12	10.91 m	43.14 m	2.59 m	50.0 %
Floor				20.0 %
Ceiling				70.0 %
Room height		2.70 m		
Height of reference plane		0.00 m		

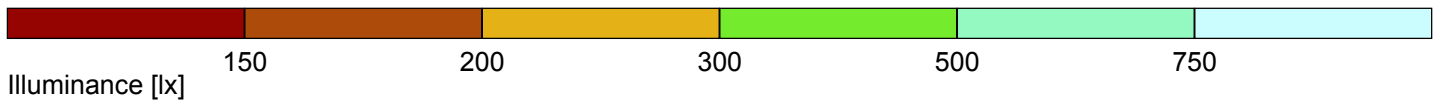
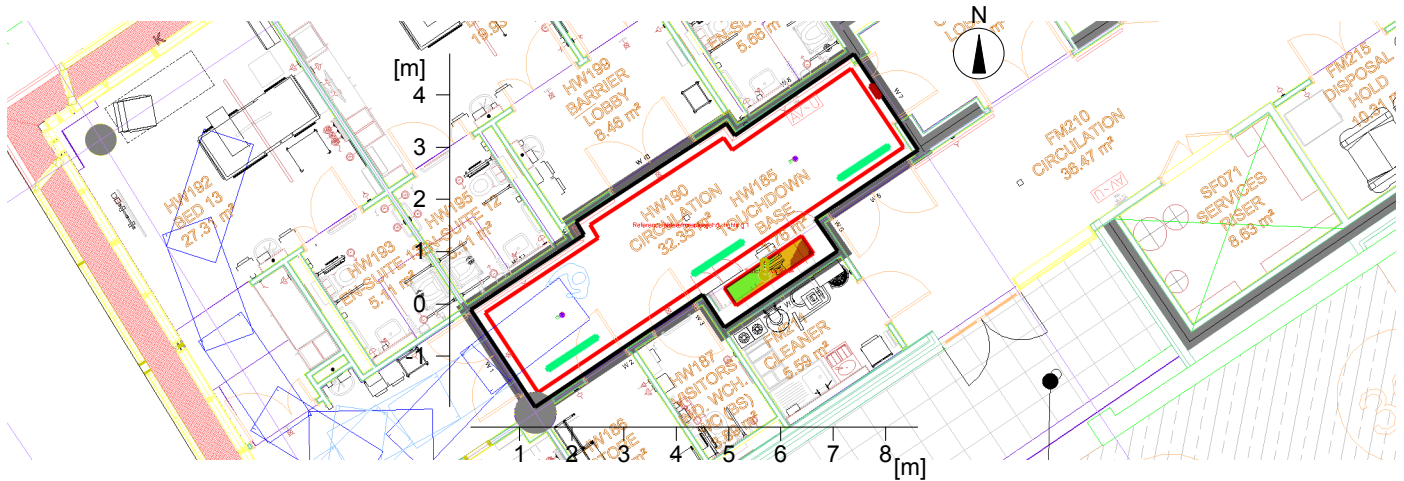
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



15 HW190 - CIRCULATION (A8 off)

15.2 Summary, HW190 - CIRCULATION (A8 off)

15.2.1 Result overview, Touchdown Base



General

Calculation algorithm used	High indirect fraction
Height of evaluation surface	0.75 m
Height of luminaire plane	2.70 m
Maintenance factor	0.80

Total luminous flux of all lamps	11748 lm
Total power	120 W
Total power per area (22.31 m ²)	5.38 W/m ²

Illuminance

Average illuminance	Eav	271 lx
Minimum illuminance	Emin	136 lx
Maximum illuminance	Emax	363 lx
Uniformity U _o	Emin/Em	1:2 (0.5)
Diversity U _d	Emin/Emax	1:2.68 (0.37)

Type No.\Make

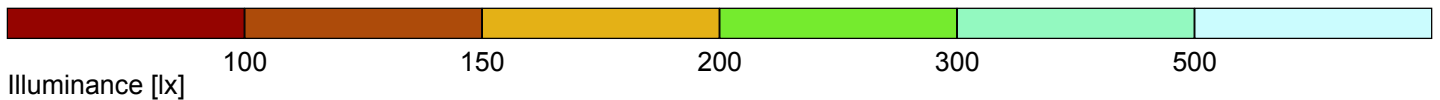
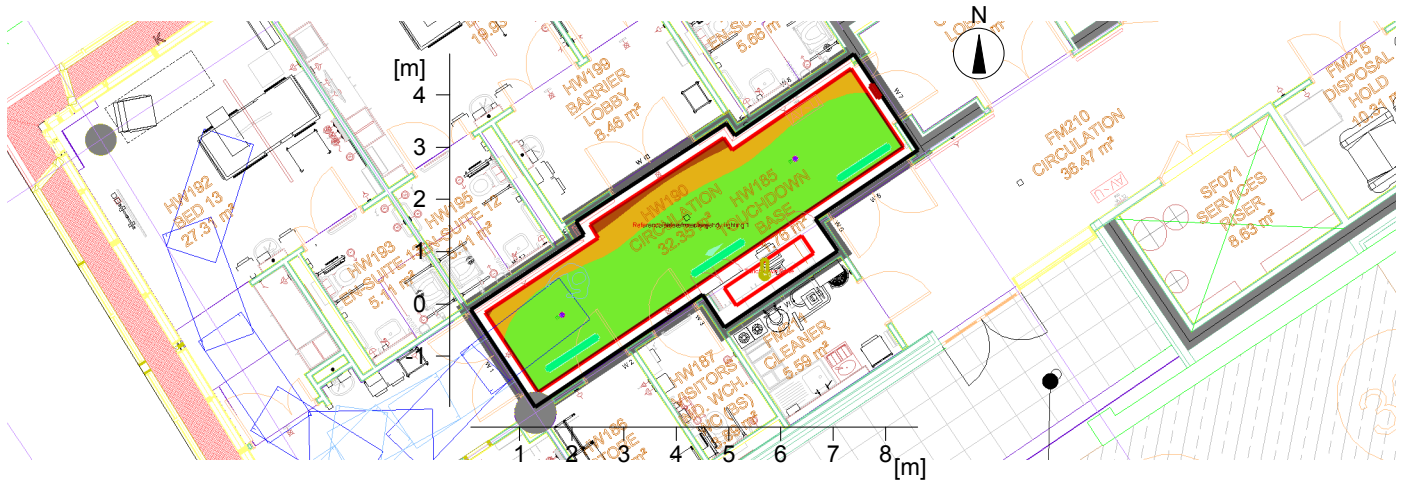
Glamox Luxo Lighting	
5	3
Order No.	: IC80-RR1128 LED 3700 840 ASY HI
Luminaire name	: E2 - C80-RR
Equipment	: 1 x LED 840 40 W / 3916 lm

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



15.2 Summary, HW190 - CIRCULATION (A8 off)

15.2.2 Result overview, Evaluation area 1



General

Calculation algorithm used	High indirect fraction
Height of luminaire plane	2.70 m
Maintenance factor	0.80
Total luminous flux of all lamps	11748 lm
Total power	120.0 W
Total power per area (22.31 m ²)	5.38 W/m ² (2.25 W/m ² /100lx)

Evaluation area 1

Reference plane 1.1

	Horizontal
Em	239 lx
Emin	152 lx
Emin/Eav (Uo)	0.64
Emin/Emax (Ud)	0.50
Position	0.00 m

Type No.\Make

Glamox Luxo Lighting	
5	3
Order No.	: IC80-RR1128 LED 3700 840 ASY HI
Luminaire name	: E2 - C80-RR
Equipment	: 1 x LED 840 40 W / 3916 lm

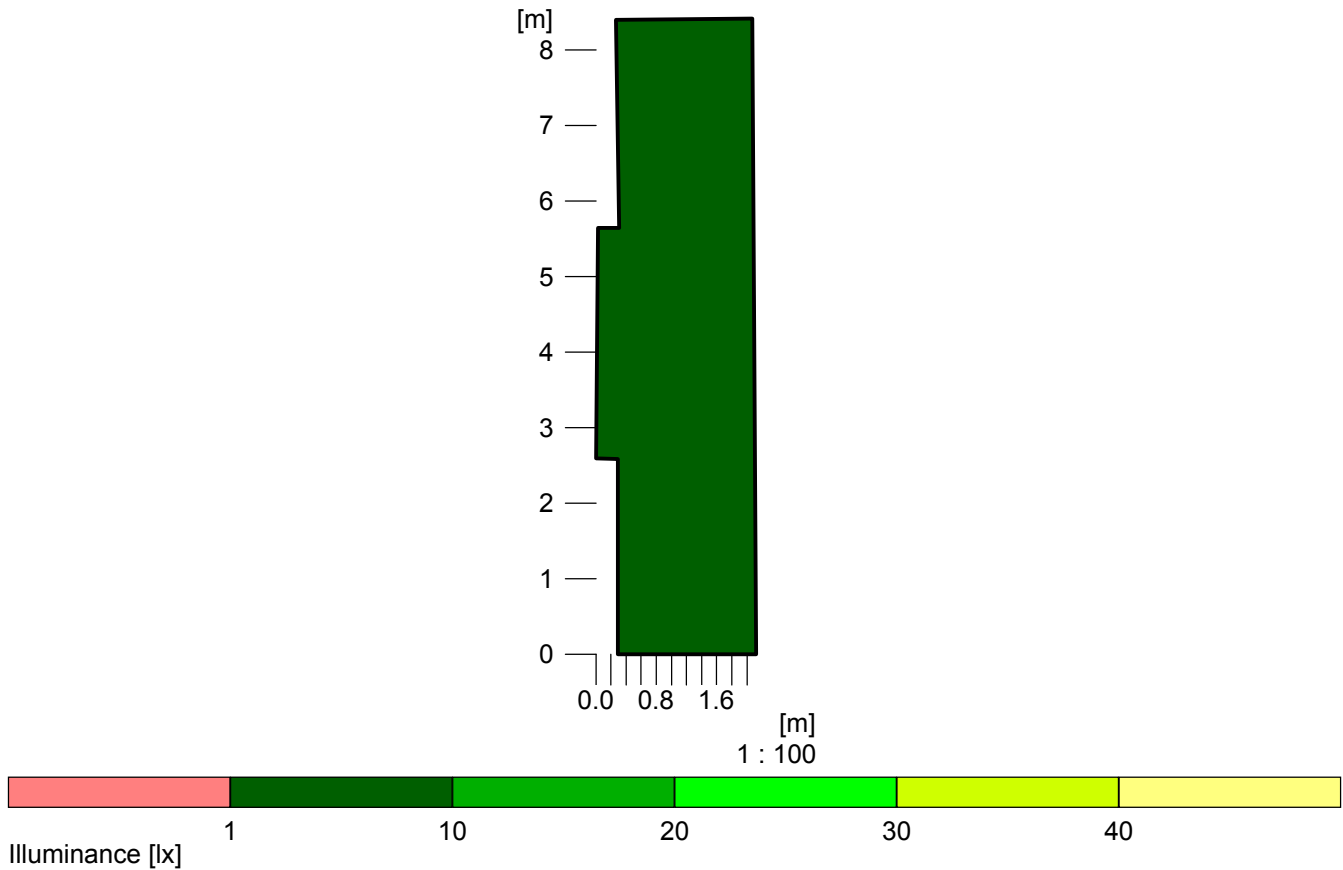
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



15 HW190 - CIRCULATION (A8 off)

15.3 Calculation results, HW190 - CIRCULATION (A8 off)

15.3.1 Boundary line, Reference plane for emergency lighting 1 (E)



Required minimum illuminance		: 1 lx
Minimum illuminance	E _{min}	: 1.2 lx
Maximum illuminance	E _{max}	: 8 lx
Uniformity	E _{min} /E _{max}	: 1 : 6.42 (0.16) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



15.3 Summary, HW190 - CIRCULATION (A8 off)

15.3.2 Result overview (emergency lighting)

Type No.\Make

		Glamox Luxo Lighting	
4	1	Order No.	: !E80-R 10X26 DOWN LED E1
		Luminaire name	: H3 - E80
		Equipment	: 1 x LED E80 2 W / 12 lm (10.0 %)
		GLAMOX	
11	2	Order No.	: !H2 - M1008 LR4 550 ES - GLAMOX.eld
		Luminaire name	: H2 - XYLUX LR4
		Equipment	: 1 x LED 1.65 W / 160 lm (100.0 %)

Result evaluation area

Calculation algorithm used: Direct component
 Maintenance factor: 0.8

Reference planes for emergency lighting:

No.	Default[lx]	Emin[lx]	Surface Emax[lx]	Uniformity	Height
Reference plane for emergency lighting 1					
1	1.0	1.2	8.0	1: 6.42	0.00

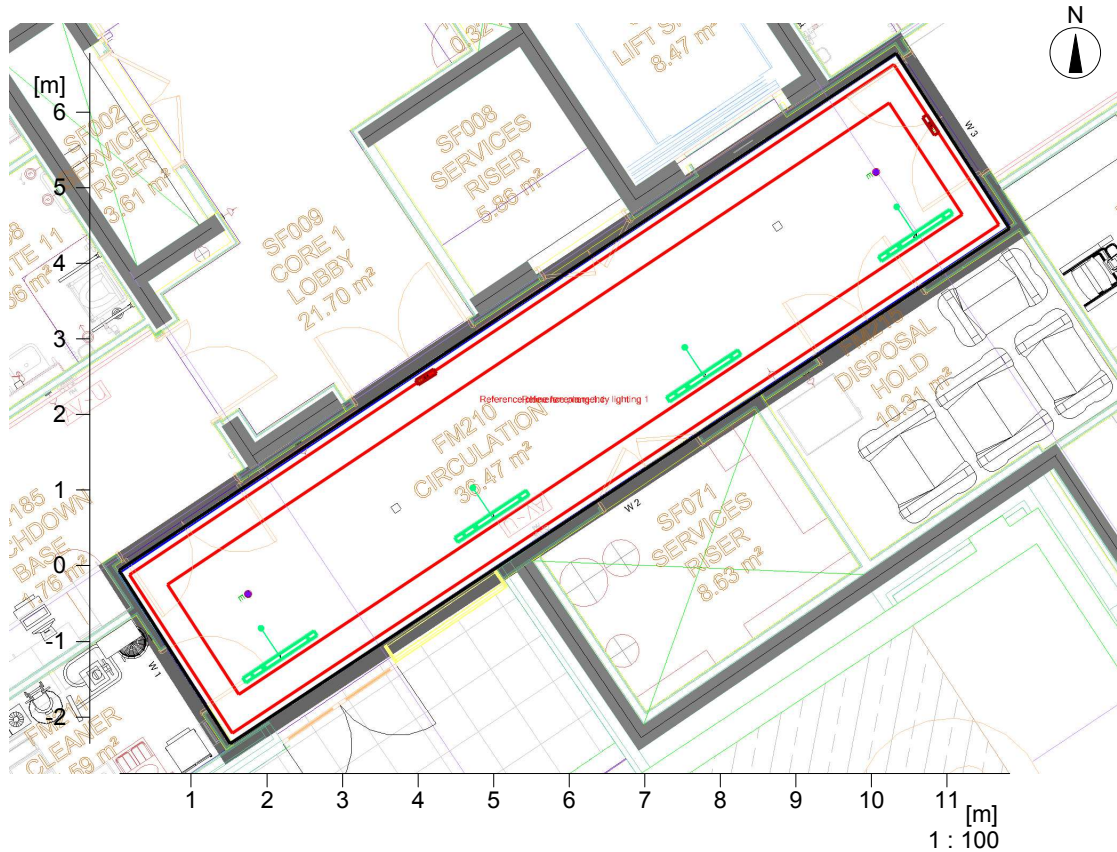
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



16 HW210 - CIRCULATION

16.1 Description, HW210 - CIRCULATION

16.1.1 Floor plan



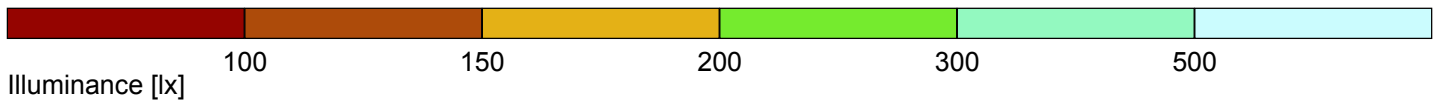
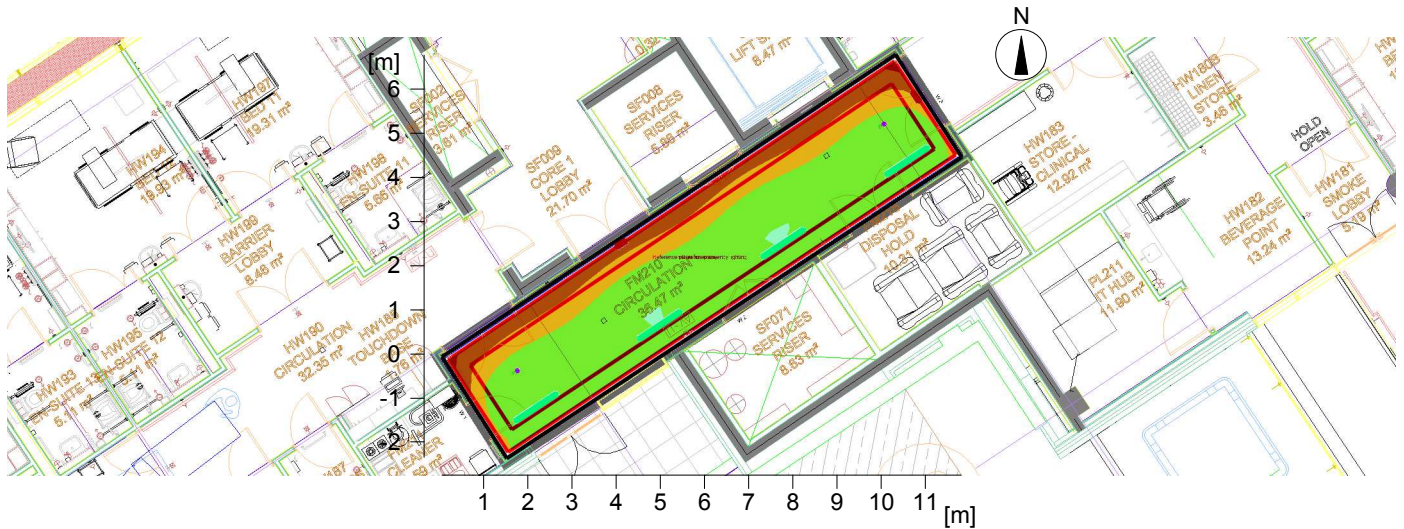
Wall	x	y	Length	Reflectance
1	19.30 m	42.55 m	2.72 m	50.0 %
2	29.60 m	49.36 m	12.34 m	50.0 %
3	28.10 m	51.67 m	2.76 m	50.0 %
4	17.83 m	44.84 m	12.33 m	50.0 %
Floor				20.0 %
Ceiling				70.0 %
Room height		2.70 m		
Height of reference plane		0.00 m		

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019

16 HW210 - CIRCULATION

16.2 Summary, HW210 - CIRCULATION

16.2.1 Result overview, Evaluation area 1



General

Calculation algorithm used	High indirect fraction
Height of luminaire plane	2.70 m
Maintenance factor	0.80
Total luminous flux of all lamps	15664 lm
Total power	160.0 W
Total power per area (33.50 m ²)	4.78 W/m ² (2.06 W/m ² /100lx)

Evaluation area 1

Reference plane 1.1

	Horizontal
Em	231 lx
Emin	97 lx
Emin/Eav (Uo)	0.42
Emin/Emax (Ud)	0.32
Position	0.00 m

Type No. Make

Glamox Luxo Lighting	
5	4
Order No.	: IC80-RR1128 LED 3700 840 ASY HI
Luminaire name	: E2 - C80-RR
Equipment	: 1 x LED 840 40 W / 3916 lm

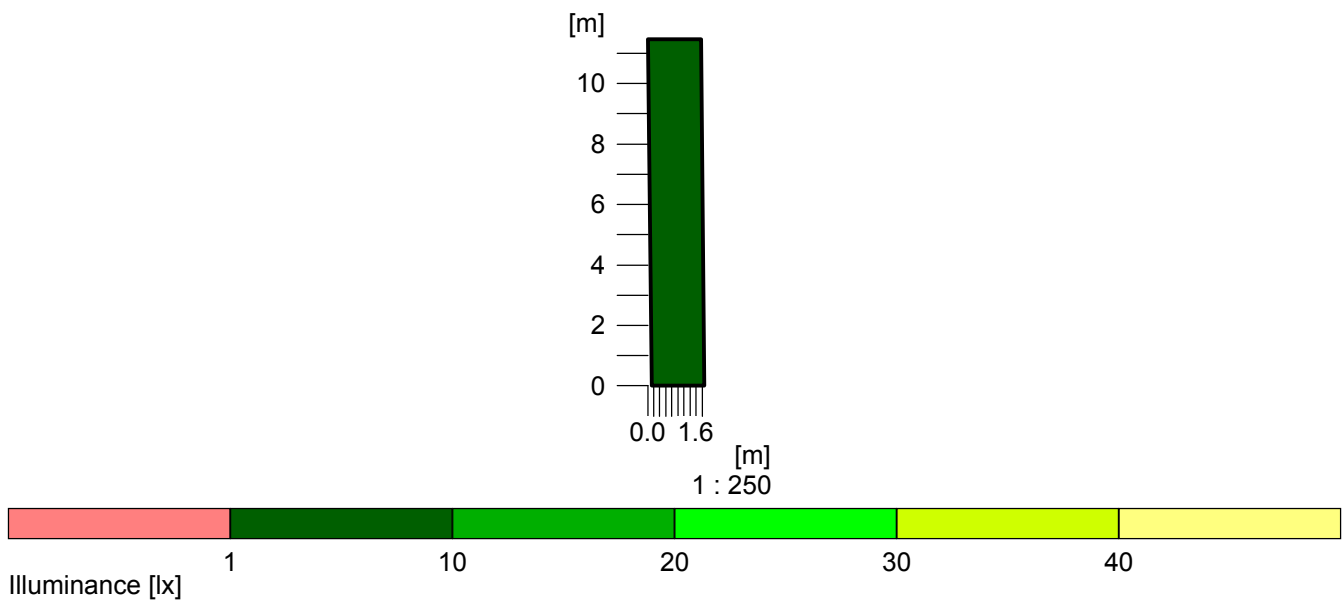
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



16 HW210 - CIRCULATION

16.3 Calculation results, HW210 - CIRCULATION

16.3.1 Boundary line, Reference plane for emergency lighting 1 (E)



Required minimum illuminance		: 1 lx
Minimum illuminance	E _{min}	: 1 lx
Maximum illuminance	E _{max}	: 6.7 lx
Uniformity	E _{min} /E _{max}	: 1 : 6.80 (0.15) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



16.3 Summary, HW210 - CIRCULATION

16.3.2 Result overview (emergency lighting)

Type No.\Make

		Glamox Luxo Lighting	
4	2	Order No.	: !E80-R 10X26 DOWN LED E1
		Luminaire name	: H3 - E80
		Equipment	: 1 x LED E80 2 W / 12 lm (10.0 %)
		GLAMOX	
11	2	Order No.	: !H2 - M1008 LR4 550 ES - GLAMOX.eld
		Luminaire name	: H2 - XYLUX LR4
		Equipment	: 1 x LED 1.65 W / 160 lm (100.0 %)

Result evaluation area

Calculation algorithm used: Direct component
 Maintenance factor: 0.8

Reference planes for emergency lighting:

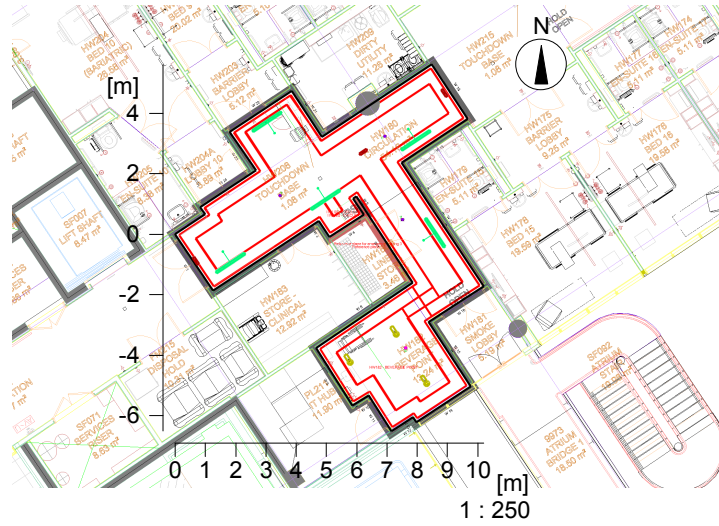
No.	Default[lx]	Emin[lx]	Surface Emax[lx]	Uniformity	Height
Reference plane for emergency lighting 1					
1	1.0	1.0	6.7	1: 6.80	0.00

Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019

17 HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.1 Description, HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.1.1 Floor plan



Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



17 HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.1 Description, HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.1.1 Floor plan

Wall	x	y	Length	Reflectance
1	29.51 m	50.01 m	2.25 m	50.0 %
2	33.00 m	52.31 m	4.18 m	50.0 %
3	33.35 m	51.78 m	0.63 m	50.0 %
4	34.49 m	52.52 m	1.36 m	50.0 %
5	34.14 m	53.05 m	0.64 m	50.0 %
6	34.24 m	53.12 m	0.13 m	50.0 %
7	36.10 m	50.27 m	3.40 m	50.0 %
8	32.91 m	48.11 m	3.85 m	50.0 %
9	34.11 m	46.21 m	2.25 m	50.0 %
10	34.65 m	46.54 m	0.63 m	50.0 %
11	35.40 m	45.36 m	1.40 m	50.0 %
12	36.11 m	45.82 m	0.85 m	50.0 %
13	36.22 m	45.66 m	0.20 m	50.0 %
14	38.02 m	46.84 m	2.15 m	50.0 %
15	36.63 m	48.97 m	2.54 m	50.0 %
16	38.45 m	50.15 m	2.17 m	50.0 %
17	35.74 m	54.23 m	4.90 m	50.0 %
18	37.92 m	55.68 m	2.62 m	50.0 %
19	36.73 m	57.49 m	2.16 m	50.0 %
20	33.11 m	55.09 m	4.35 m	50.0 %
21	32.11 m	56.61 m	1.82 m	50.0 %
22	30.06 m	55.25 m	2.46 m	50.0 %
23	30.93 m	53.99 m	1.54 m	50.0 %
24	29.08 m	52.76 m	2.22 m	50.0 %
25	29.25 m	52.54 m	0.28 m	50.0 %
26	28.25 m	51.87 m	1.20 m	50.0 %
Floor				20.0 %
Ceiling				70.0 %
Room height		2.70 m		
Height of reference plane		---		

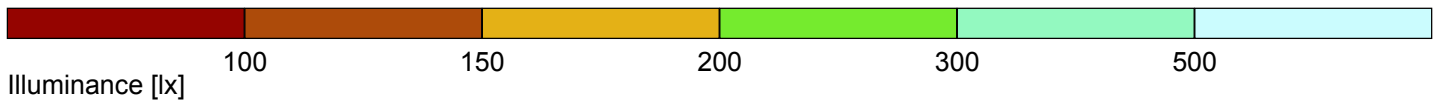
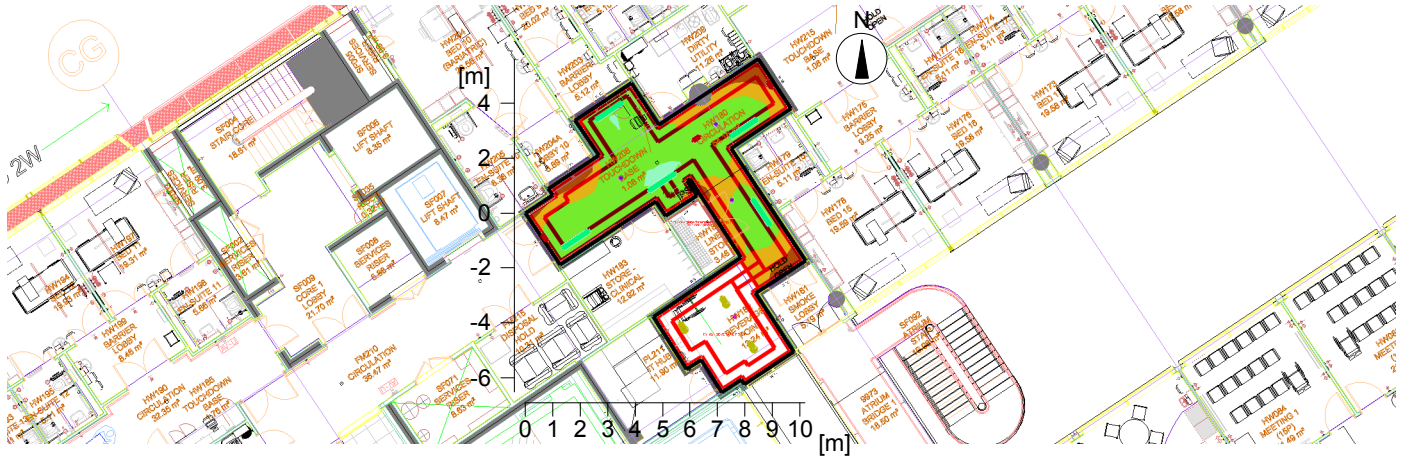
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



17 HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.2 Summary, HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.2.1 Result overview, HW180 - CIRCULATION



General


Calculation algorithm used : High indirect fraction
 Height of evaluation surface : -0.00 m
 Height of luminaire plane : 2.70 m
 Maintenance factor : 0.80

Total luminous flux of all lamps : 25373 lm
 Total power : 257 W
 Total power per area (50.89 m²) : 5.05 W/m² (2.14 W/m²/100lx)

Illuminance

Average illuminance : Eav : 235 lx
 Minimum illuminance : Emin : 162 lx
 Maximum illuminance : Emax : 312 lx
 Uniformity U_o : Emin/Em : 1:1.45 (0.69)
 Diversity U_d : Emin/Emax : 1:1.92 (0.52)

Type No.\Make

1  3
Glamox Luxo Lighting
 Order No. : !D70-R155 LED 2100 840 SM
 Luminaire name : A2 - D70-R155
 Equipment : 1 x LED 840 19 W / 1931 lm

Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



17 HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.2 Summary, HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.2.1 Result overview, HW180 - CIRCULATION

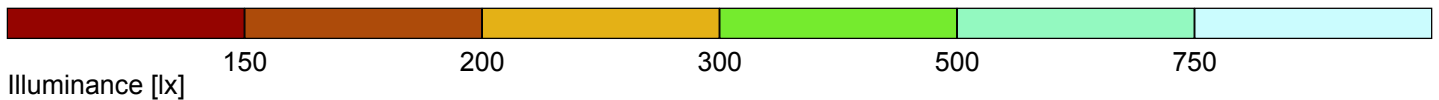
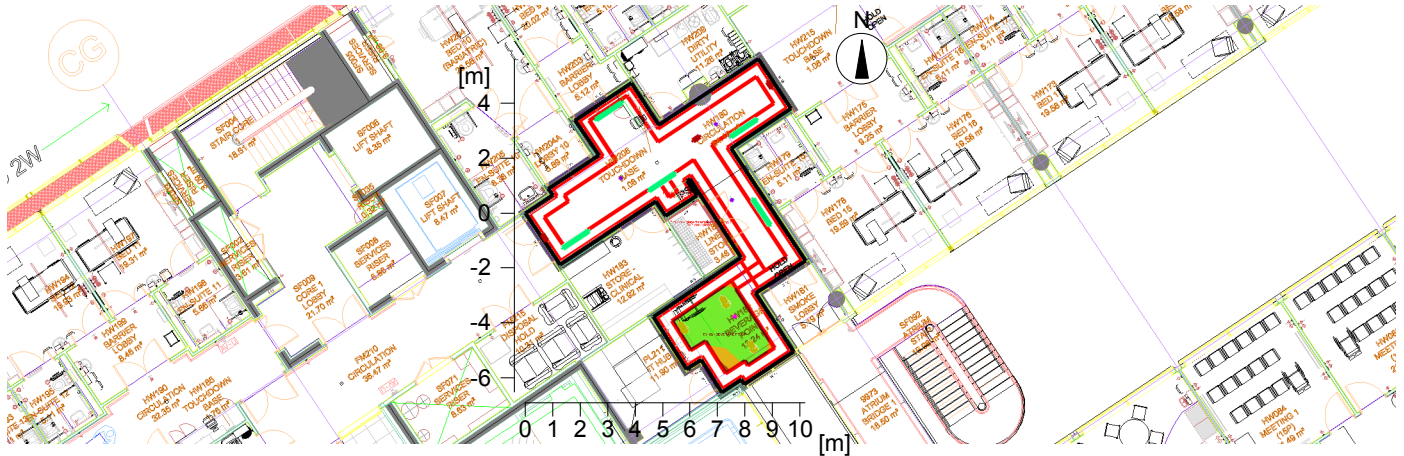
5	5	Order No.	: !C80-RR1128 LED 3700 840 ASY HI
		Luminaire name	: E2 - C80-RR
		Equipment	: 1 x LED 840 40 W / 3916 lm

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



17.2 Summary, HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.2.2 Result overview, HW182 - BEVERAGE POINT



General

Calculation algorithm used	High indirect fraction
Height of evaluation surface	0.75 m
Height of luminaire plane	2.70 m
Maintenance factor	0.80

Total luminous flux of all lamps	25373 lm
Total power	257 W
Total power per area (50.89 m ²)	5.05 W/m ²

Illuminance

Average illuminance	Eav	367 lx
Minimum illuminance	Emin	266 lx
Maximum illuminance	Emax	454 lx
Uniformity U _o	Emin/Em	1:1.38 (0.73)
Diversity U _d	Emin/Emax	1:1.7 (0.59)

Type No.\Make

1	3	Glamox Luxo Lighting
		Order No. : !D70-R155 LED 2100 840 SM
		Luminaire name : A2 - D70-R155
		Equipment : 1 x LED 840 19 W / 1931 lm



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Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



17.2 Summary, HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.2.2 Result overview, HW182 - BEVERAGE POINT

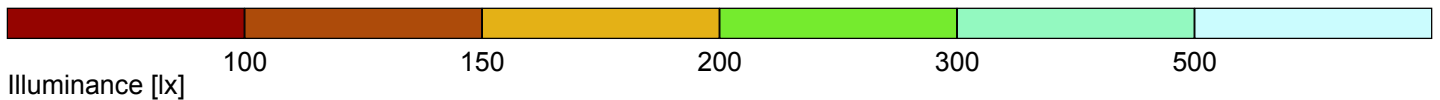
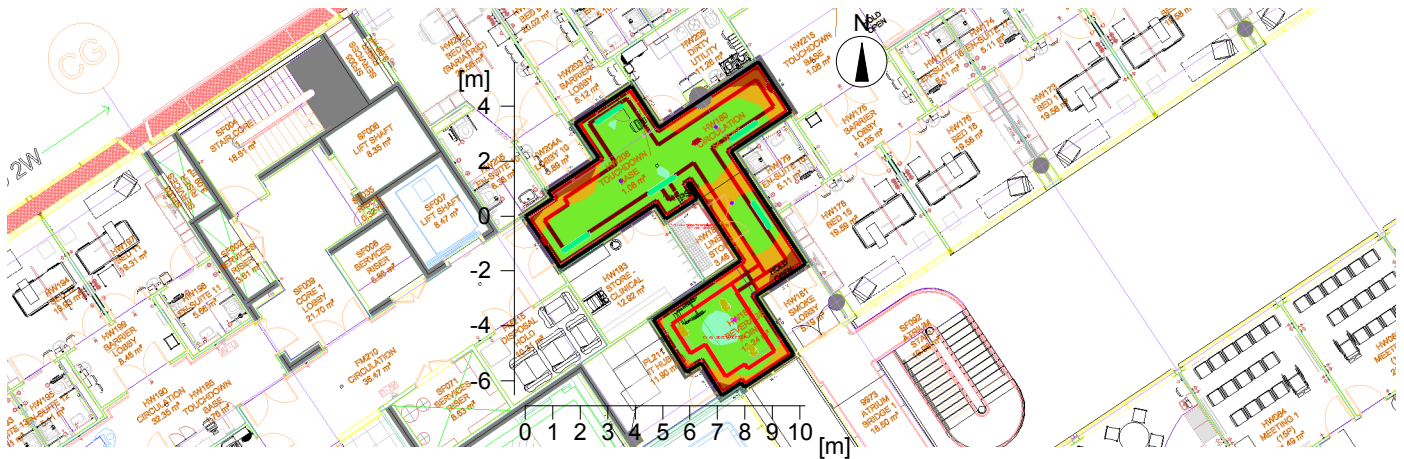
5	5	Order No.	: !C80-RR1128 LED 3700 840 ASY HI
		Luminaire name	: E2 - C80-RR
		Equipment	: 1 x LED 840 40 W / 3916 lm

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



17.2 Summary, HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.2.3 Result overview, Evaluation area 1



General

Calculation algorithm used	High indirect fraction
Height of luminaire plane	2.70 m
Maintenance factor	0.80
Total luminous flux of all lamps	25373 lm
Total power	257.0 W
Total power per area (50.89 m ²)	5.05 W/m ² (2.05 W/m ² /100lx)

Evaluation area 1

Reference plane 1.1

	Horizontal
Em	247 lx
Emin	170 lx
Emin/Eav (Uo)	0.69
Emin/Emax (Ud)	0.53
Position	0.00 m

Type No.\Make

1	3	Glamox Luxo Lighting
		Order No. : ID70-R155 LED 2100 840 SM
		Luminaire name : A2 - D70-R155
		Equipment : 1 x LED 840 19 W / 1931 lm

Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



17.2 Summary, HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.2.3 Result overview, Evaluation area 1

5	5	Order No.	: !C80-RR1128 LED 3700 840 ASY HI
		Luminaire name	: E2 - C80-RR
		Equipment	: 1 x LED 840 40 W / 3916 lm

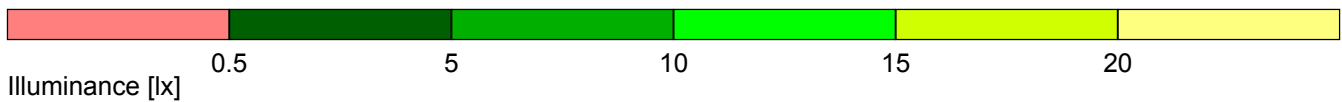
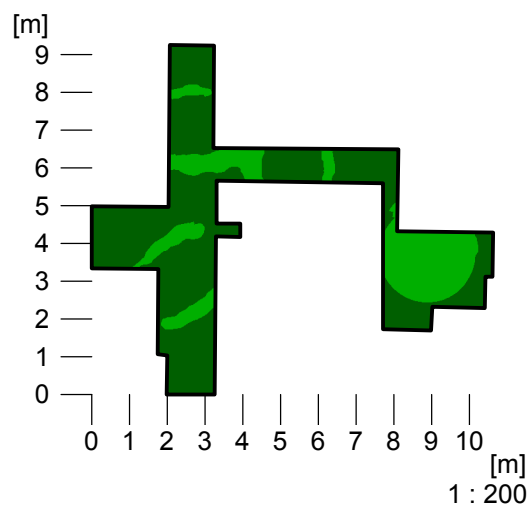
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



17 HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.3 Calculation results, HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.3.1 Boundary line, Reference plane for emergency lighting 3 (E)



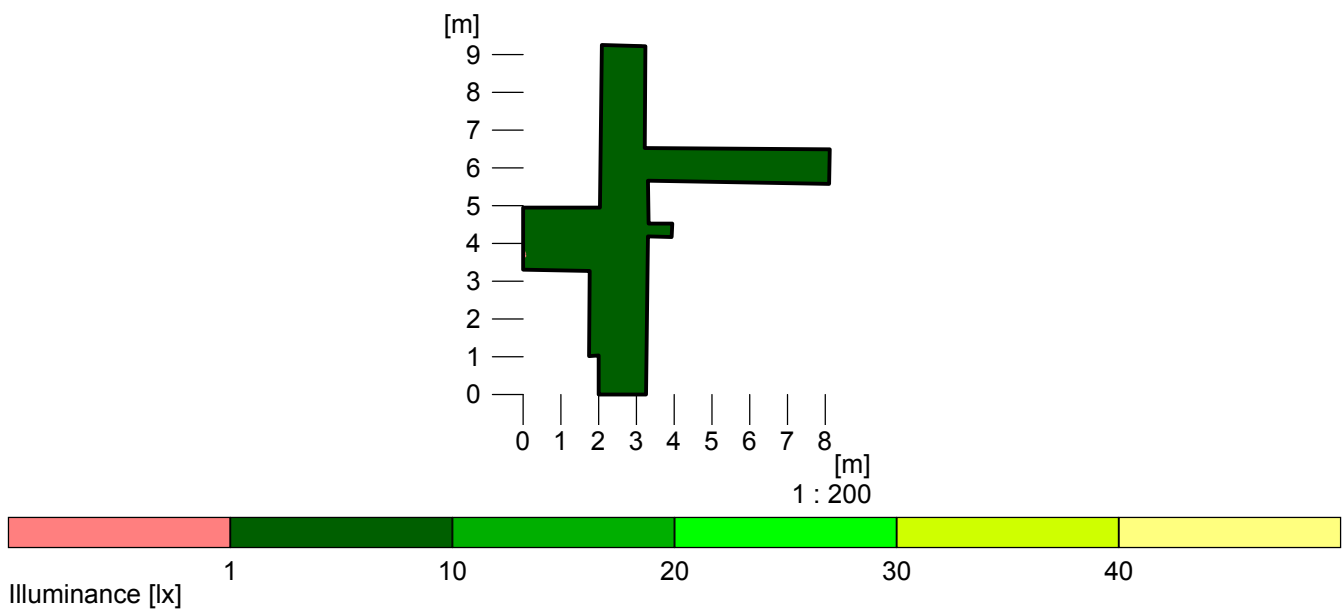
Required minimum illuminance		: 0.5 lx
Minimum illuminance	Emin	: 1 lx
Maximum illuminance	Emax	: 8.9 lx
Uniformity	Emin/Emax	: 1 : 9.33 (0.11) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



17.3 Calculation results, HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.3.2 Boundary line, HW180 - CIRCULATION (E)



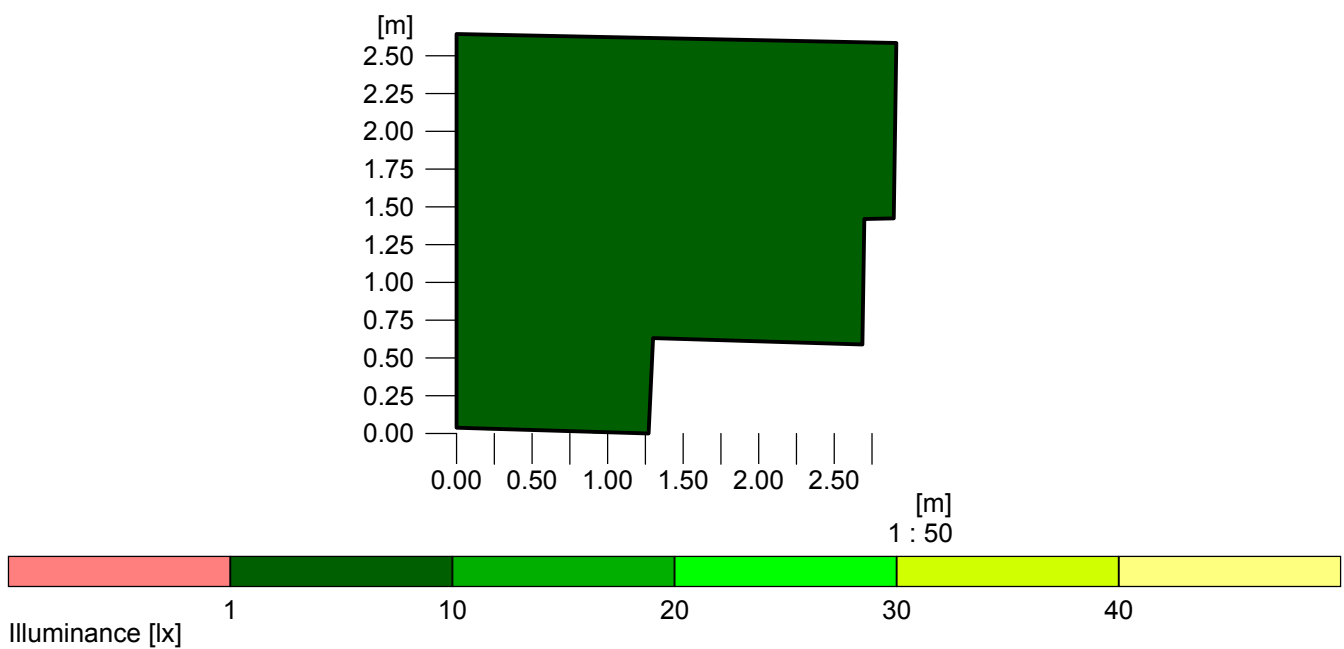
Required minimum illuminance	:	1 lx
Minimum illuminance	E _{min}	: 1 lx
Maximum illuminance	E _{max}	: 8.4 lx
Uniformity	E _{min} /E _{max}	: 1 : 8.82 (0.11) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



17.3 Calculation results, HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.3.3 Boundary line, HW182 - BEVERAGE POINT (E)



Required minimum illuminance		: 1 lx
Minimum illuminance	E _{min}	: 2.3 lx
Maximum illuminance	E _{max}	: 8.9 lx
Uniformity	E _{min} /E _{max}	: 1 : 3.90 (0.26) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8




Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



17.3 Summary, HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.3.4 Result overview (emergency lighting)

Type No.\Make

		Glamox Luxo Lighting	
4	3	Order No.	: !E80-R 10X26 DOWN LED E1
		Luminaire name	: H3 - E80
		Equipment	: 1 x LED E80 2 W / 12 lm (10.0 %)
		GLAMOX	
10	1	Order No.	: !XYLUX LR
		Luminaire name	: H1 - XYLUX LR
		Equipment	: 1 x LED 1.71 W / 150 lm (100.0 %)
11	3	Order No.	: !H2 - M1008 LR4 550 ES - GLAMOX.eld
		Luminaire name	: H2 - XYLUX LR4
		Equipment	: 1 x LED 1.65 W / 160 lm (100.0 %)

Result evaluation area

Calculation algorithm used: Direct component
 Maintenance factor: 0.8

Reference planes for emergency lighting:

No.	Default[lx]	Emin[lx]	Surface Emax[lx]	Uniformity	Height
Reference plane for emergency lighting 3					
3	0.5	1.0	8.9	1: 9.33	0.00

Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



17.3 Summary, HW180 - CIRCULATION/ HW182 - BEVERAGE POINT

17.3.4 Result overview (emergency lighting)

HW180 - CIRCULATION

3	1.0	1.0	8.4	1: 8.82	0.00
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HW182 - BEVERAGE POINT

6	1.0	2.3	8.9	1: 3.90	0.00
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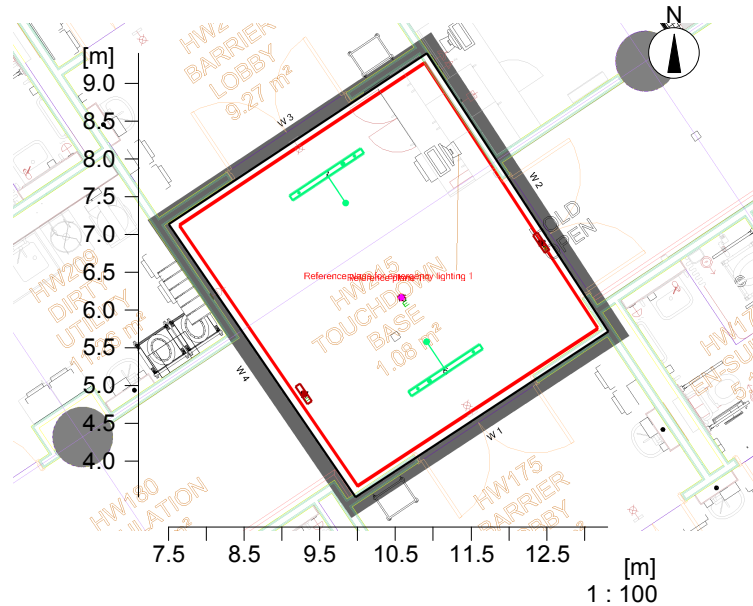
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



18 HW215 - TOUCHDOWN BASE

18.1 Description, HW215 - TOUCHDOWN BASE

18.1.1 Floor plan



Wall	x	y	Length	Reflectance
1	41.56 m	57.59 m	3.99 m	50.0 %
2	39.16 m	61.27 m	4.39 m	50.0 %
3	35.75 m	59.01 m	4.09 m	50.0 %
4	38.22 m	55.40 m	4.37 m	50.0 %
Floor				20.0 %
Ceiling				70.0 %
Room height		2.70 m		
Height of reference plane		0.00 m		

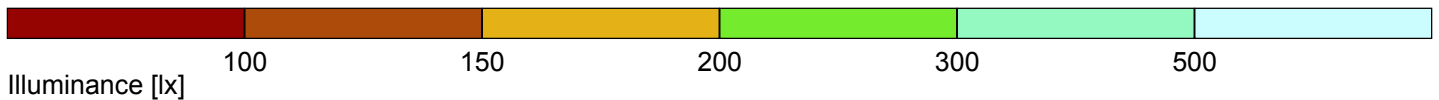
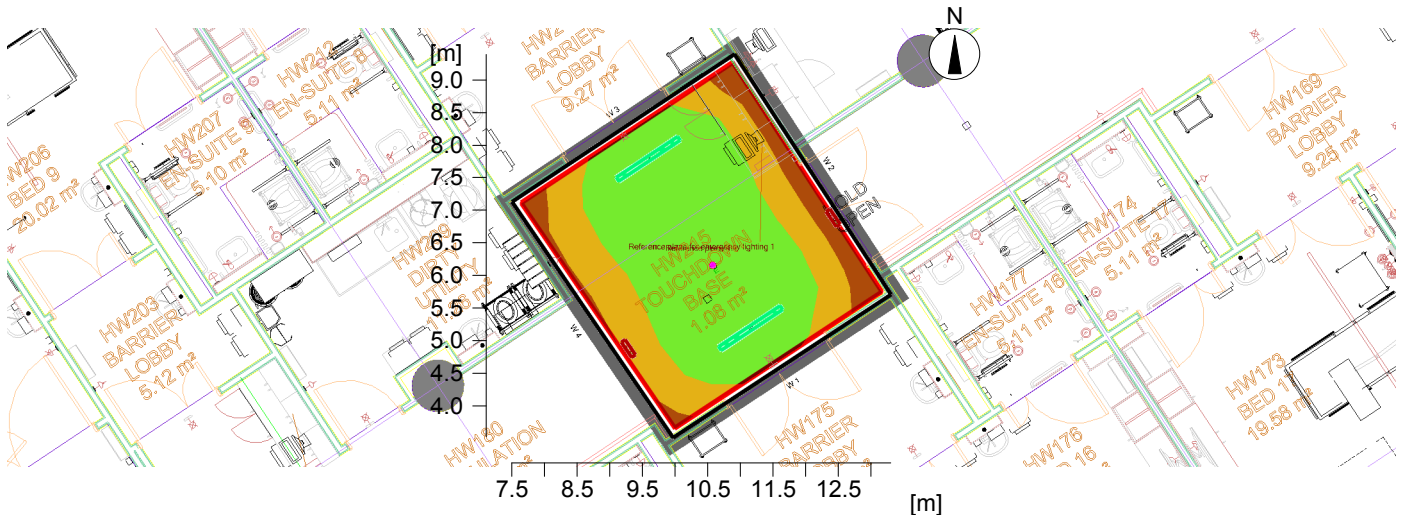
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



18 HW215 - TOUCHDOWN BASE

18.2 Summary, HW215 - TOUCHDOWN BASE

18.2.1 Result overview, Evaluation area 1



General

Calculation algorithm used	High indirect fraction
Height of luminaire plane	2.70 m
Maintenance factor	0.80
Total luminous flux of all lamps	7832 lm
Total power	80.0 W
Total power per area (17.71 m ²)	4.52 W/m ² (2.04 W/m ² /100lx)

Evaluation area 1 Reference plane 1.1

	Horizontal
Em	221 lx
Emin	106 lx
Emin/Eav (Uo)	0.48
Emin/Emax (Ud)	0.38
Position	0.00 m

Type No.\Make

Glamox Luxo Lighting	
5	2
Order No.	: IC80-RR1128 LED 3700 840 ASY HI
Luminaire name	: E2 - C80-RR
Equipment	: 1 x LED 840 40 W / 3916 lm

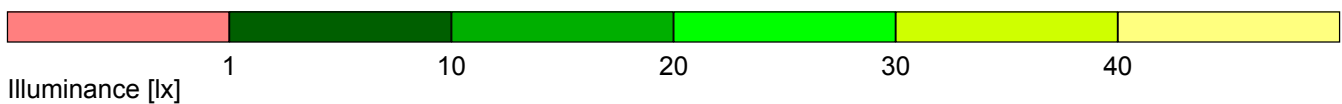
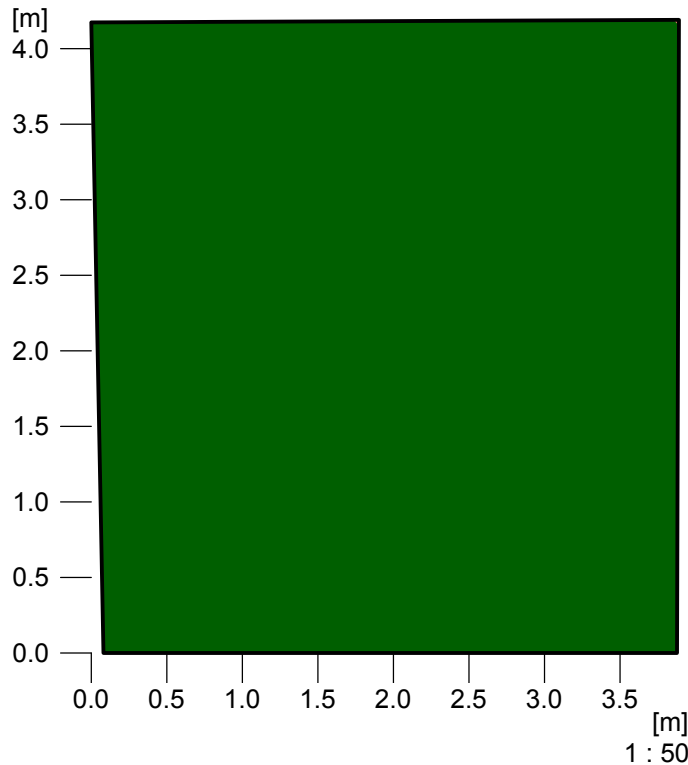
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



18 HW215 - TOUCHDOWN BASE

18.3 Calculation results, HW215 - TOUCHDOWN BASE

18.3.1 Boundary line, Reference plane for emergency lighting 1 (E)



Required minimum illuminance		: 1 lx
Minimum illuminance	E _{min}	: 1 lx
Maximum illuminance	E _{max}	: 8.9 lx
Uniformity	E _{min} /E _{max}	: 1 : 9.26 (0.11) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8



Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



18.3 Summary, HW215 - TOUCHDOWN BASE

18.3.2 Result overview (emergency lighting)

Type No.\Make

		Glamox Luxo Lighting	
4	2	Order No.	: !E80-R 10X26 DOWN LED E1
		Luminaire name	: H3 - E80
		Equipment	: 1 x LED E80 2 W / 12 lm (10.0 %)
		GLAMOX	
10	1	Order No.	: !XYLUX LR
		Luminaire name	: H1 - XYLUX LR
		Equipment	: 1 x LED 1.71 W / 150 lm (100.0 %)

Result evaluation area

Calculation algorithm used: Direct component
 Maintenance factor: 0.8

Reference planes for emergency lighting:

No.	Default[lx]	Emin[lx]	Surface Emax[lx]	Uniformity	Height
Reference plane for emergency lighting 1					
1	1.0	1.0	8.9	1: 9.26	0.00

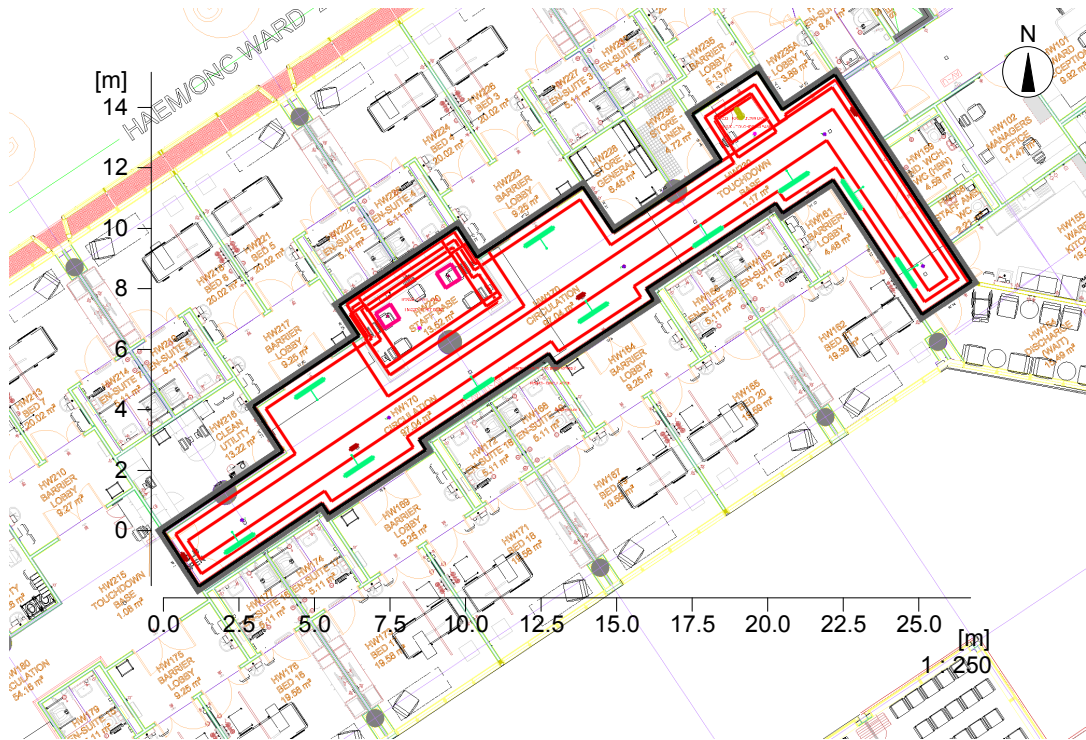
Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



19 HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.1 Description, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.1.1 Floor plan



Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



19 HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.1 Description, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.1.1 Floor plan

Wall	x	y	Length	Reflectance
1	41.46 m	58.01 m	2.17 m	50.0 %
2	45.53 m	60.74 m	4.91 m	50.0 %
3	45.75 m	60.40 m	0.41 m	50.0 %
4	48.95 m	62.51 m	3.83 m	50.0 %
5	48.74 m	62.85 m	0.40 m	50.0 %
6	53.03 m	65.69 m	5.14 m	50.0 %
7	53.26 m	65.36 m	0.41 m	50.0 %
8	56.48 m	67.47 m	3.85 m	50.0 %
9	56.25 m	67.83 m	0.42 m	50.0 %
10	60.53 m	70.65 m	5.13 m	50.0 %
11	60.75 m	70.33 m	0.39 m	50.0 %
12	62.42 m	71.42 m	1.99 m	50.0 %
13	65.36 m	66.99 m	5.32 m	50.0 %
14	66.99 m	68.07 m	1.96 m	50.0 %
15	62.48 m	74.89 m	8.18 m	50.0 %
16	60.74 m	73.74 m	2.09 m	50.0 %
17	59.92 m	74.99 m	1.50 m	50.0 %
18	57.77 m	73.59 m	2.57 m	50.0 %
19	58.74 m	72.07 m	1.80 m	50.0 %
20	55.15 m	69.69 m	4.30 m	50.0 %
21	54.14 m	71.19 m	1.81 m	50.0 %
22	50.65 m	68.86 m	4.20 m	50.0 %
23	50.00 m	69.87 m	1.20 m	50.0 %
24	46.10 m	67.28 m	4.68 m	50.0 %
25	46.76 m	66.28 m	1.20 m	50.0 %
26	43.26 m	63.95 m	4.20 m	50.0 %
27	44.23 m	62.47 m	1.78 m	50.0 %
28	40.27 m	59.82 m	4.77 m	50.0 %
Floor				20.0 %
Ceiling				70.0 %
Room height		2.70 m		
Height of reference plane		0.00 m		

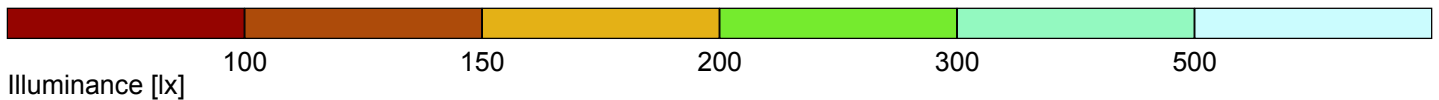
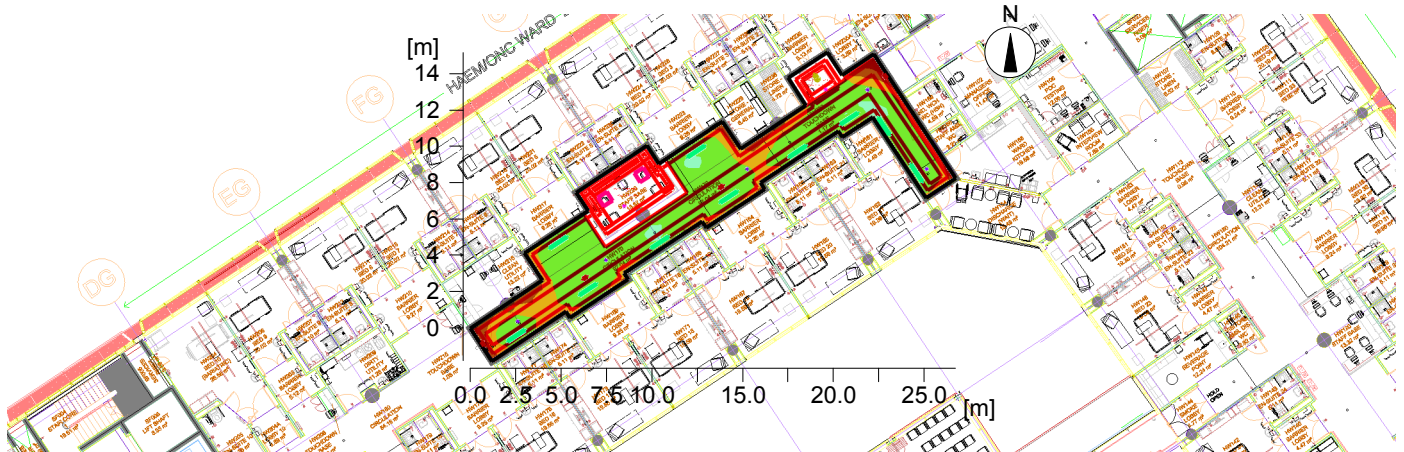
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



19 HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.2 Summary, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.2.1 Result overview, HW170 - CIRCULATION



General

Calculation algorithm used	High indirect fraction
Height of evaluation surface	0.00 m
Maintenance factor	0.80
Total luminous flux of all lamps	49239 lm
Total power	481 W
Total power per area (107.52 m ²)	4.47 W/m ² (1.90 W/m ² /100lx)

Illuminance

Average illuminance	Eav	235 lx
Minimum illuminance	Emin	121 lx
Maximum illuminance	Emax	341 lx
Uniformity U _o	Emin/Em	1:1.94 (0.52)
Diversity U _d	Emin/Emax	1:2.81 (0.36)

Type No.\Make

1	1	Glamox Luxo Lighting
		Order No. : ID70-R155 LED 2100 840 SM
		Luminaire name : A2 - D70-R155
		Equipment : 1 x LED 840 19 W / 1931 lm

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Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019




19 HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.2 Summary, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.2.1 Result overview, HW170 - CIRCULATION

3 2 Order No. : !C90-R600x600 LED 4000 840 MP
 Luminaire name : B1 - C90-R
Equipment : 1 x LED 840 31 W / 4074 lm

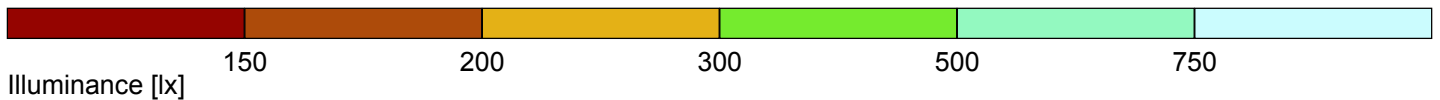
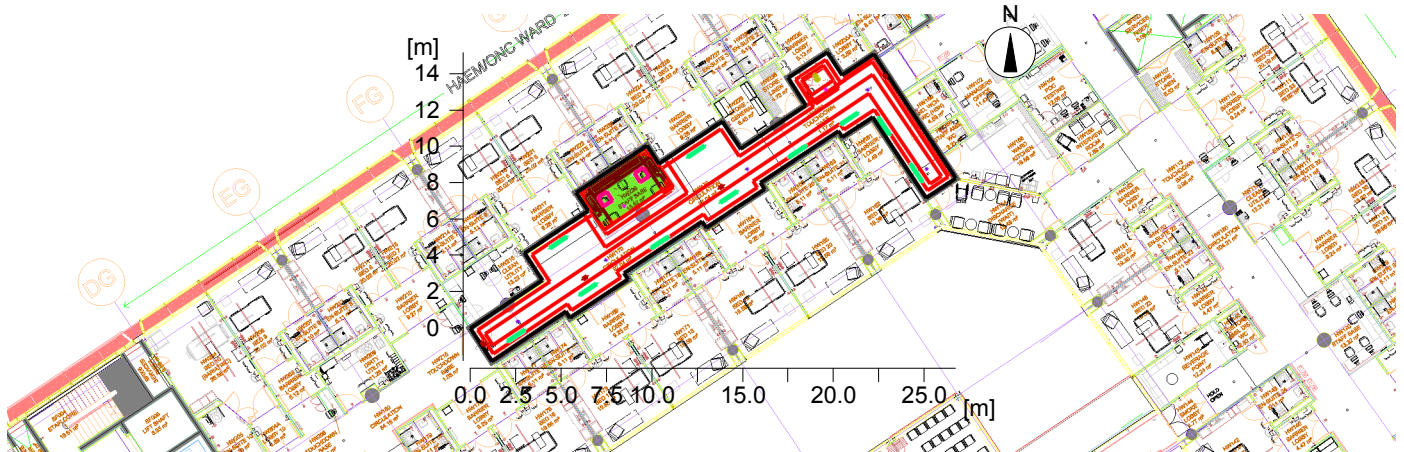
5 10 Order No. : !C80-RR1128 LED 3700 840 ASY HI
 Luminaire name : E2 - C80-RR
Equipment : 1 x LED 840 40 W / 3916 lm

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



19.2 Summary, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.2.2 Result overview, HW220 - STAFF BASE



General

Calculation algorithm used : High indirect fraction
 Height of evaluation surface : 0.75 m
 Maintenance factor : 0.80

Total luminous flux of all lamps : 49239 lm
 Total power : 481 W
 Total power per area (107.52 m²) : 4.47 W/m²

Illuminance

Average illuminance : Eav 359 lx
 Minimum illuminance : Emin 217 lx
 Maximum illuminance : Emax 517 lx
 Uniformity U_o : Emin/Em 1:1.66 (0.6)
 Diversity U_d : Emin/Emax 1:2.38 (0.42)

Type No.\Make


1 1 **Glamox Luxo Lighting**
 Order No. : ID70-R155 LED 2100 840 SM
 Luminaire name : A2 - D70-R155
 Equipment : 1 x LED 840 19 W / 1931 lm


Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



19.2 Summary, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.2.2 Result overview, HW220 - STAFF BASE

3 2 Order No. : !C90-R600x600 LED 4000 840 MP
 Luminaire name : B1 - C90-R
Equipment : 1 x LED 840 31 W / 4074 lm

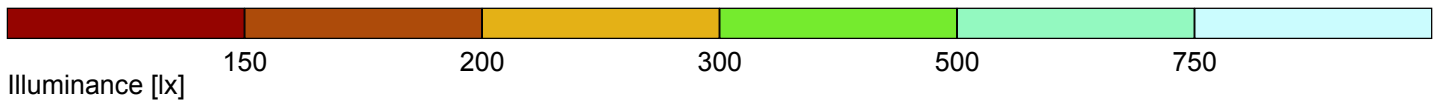
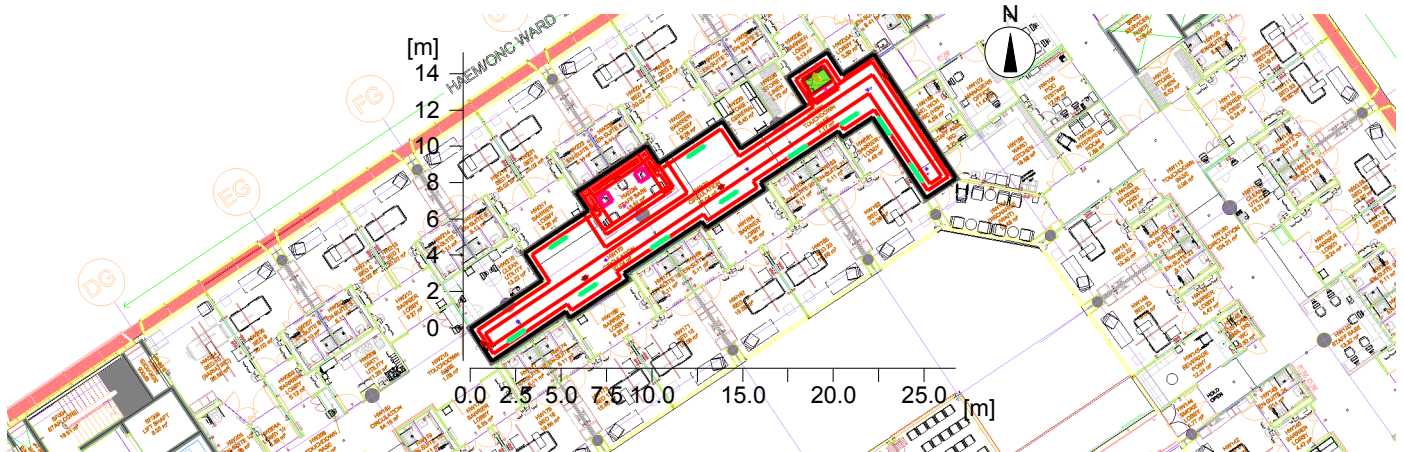
5 10 Order No. : !C80-RR1128 LED 3700 840 ASY HI
 Luminaire name : E2 - C80-RR
Equipment : 1 x LED 840 40 W / 3916 lm

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



19.2 Summary, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.2.3 Result overview, HW230 - TOUCHDOWN BASE



General

Calculation algorithm used	High indirect fraction
Height of evaluation surface	0.75 m
Maintenance factor	0.80

Total luminous flux of all lamps	49239 lm
Total power	481 W
Total power per area (107.52 m ²)	4.47 W/m ²

Illuminance

Average illuminance	Eav	314 lx
Minimum illuminance	Emin	266 lx
Maximum illuminance	Emax	331 lx
Uniformity U _o	Emin/Em	1:1.18 (0.85)
Diversity U _d	Emin/Emax	1:1.24 (0.8)

Type No.\Make

1	1	Glamox Luxo Lighting
		Order No. : ID70-R155 LED 2100 840 SM
		Luminaire name : A2 - D70-R155
		Equipment : 1 x LED 840 19 W / 1931 lm

Glamox Ltd


Unit 3 Capital Business Park, Manor Way, Borehamwood, Hertfordshire WD6 1GW


Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



19.2 Summary, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.2.3 Result overview, HW230 - TOUCHDOWN BASE

3 2 Order No. : !C90-R600x600 LED 4000 840 MP
 Luminaire name : B1 - C90-R
Equipment : 1 x LED 840 31 W / 4074 lm

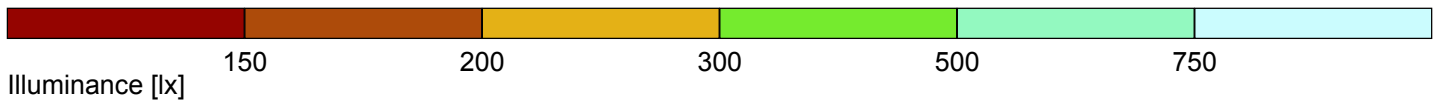
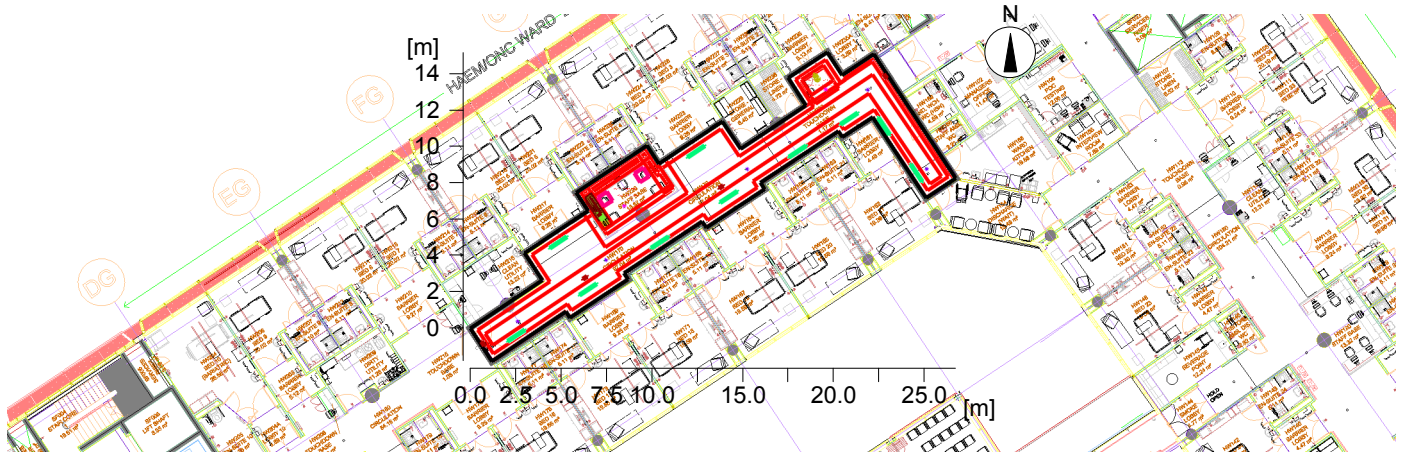
5 10 Order No. : !C80-RR1128 LED 3700 840 ASY HI
 Luminaire name : E2 - C80-RR
Equipment : 1 x LED 840 40 W / 3916 lm

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



19.2 Summary, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.2.4 Result overview, Desk 1



General

Calculation algorithm used : High indirect fraction
 Height of evaluation surface : 0.75 m
 Maintenance factor : 0.80

Total luminous flux of all lamps : 49239 lm
 Total power : 481 W
 Total power per area (107.52 m²) : 4.47 W/m²

Illuminance

Average illuminance : Eav : 348 lx
 Minimum illuminance : Emin : 216 lx
 Maximum illuminance : Emax : 481 lx
 Uniformity U_o : Emin/Em : 1:1.61 (0.62)
 Diversity U_d : Emin/Emax : 1:2.22 (0.45)

Type No.\Make

1 1 **Glamox Luxo Lighting**
 Order No. : ID70-R155 LED 2100 840 SM
 Luminaire name : A2 - D70-R155
 Equipment : 1 x LED 840 19 W / 1931 lm

Glamox Ltd


Unit 3 Capital Business Park, Manor Way, Borehamwood, Hertfordshire WD6 1GW


Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



19.2 Summary, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.2.4 Result overview, Desk 1

3 2 Order No. : !C90-R600x600 LED 4000 840 MP
 Luminaire name : B1 - C90-R
Equipment : 1 x LED 840 31 W / 4074 lm

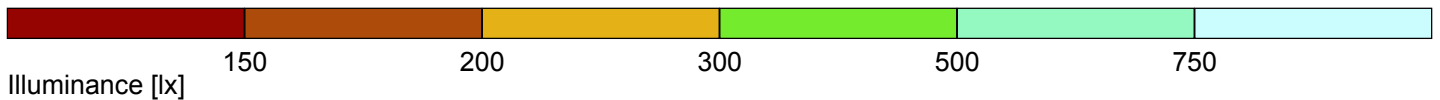
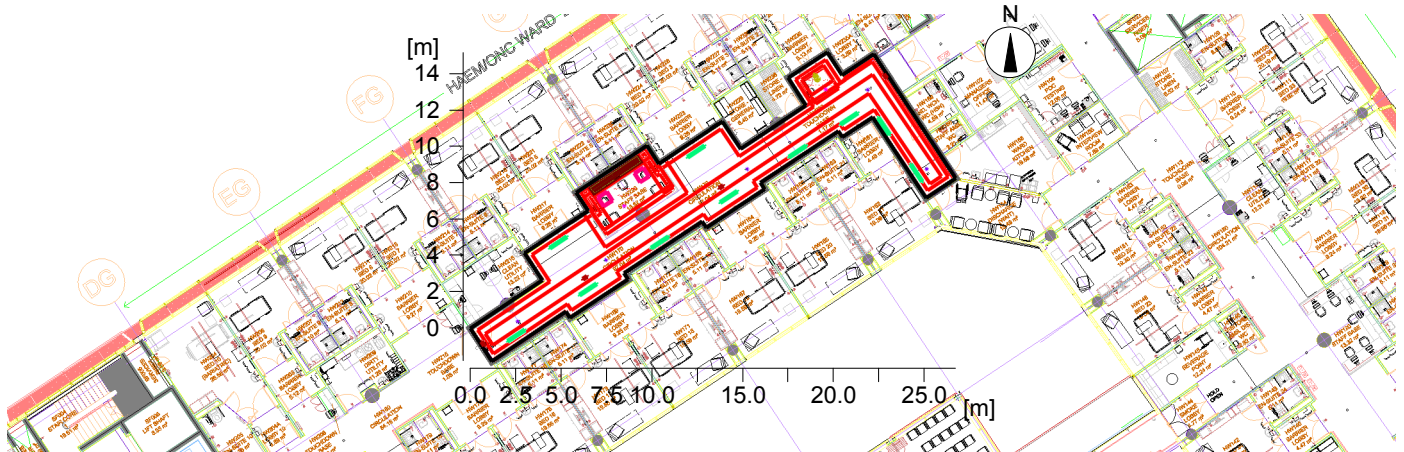
5 10 Order No. : !C80-RR1128 LED 3700 840 ASY HI
 Luminaire name : E2 - C80-RR
Equipment : 1 x LED 840 40 W / 3916 lm

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



19.2 Summary, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.2.5 Result overview, Desk 2



General

Calculation algorithm used : High indirect fraction
 Height of evaluation surface : 0.75 m
 Maintenance factor : 0.80

Total luminous flux of all lamps : 49239 lm
 Total power : 481 W
 Total power per area (107.52 m²) : 4.47 W/m²

Illuminance

Average illuminance : Eav : 375 lx
 Minimum illuminance : Emin : 255 lx
 Maximum illuminance : Emax : 470 lx
 Uniformity U_o : Emin/Em : 1:1.47 (0.68)
 Diversity U_d : Emin/Emax : 1:1.84 (0.54)

Type No.\Make


1 1 **Glamox Luxo Lighting**
 Order No. : ID70-R155 LED 2100 840 SM
 Luminaire name : A2 - D70-R155
 Equipment : 1 x LED 840 19 W / 1931 lm


Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



19.2 Summary, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.2.5 Result overview, Desk 2

3 2 Order No. : !C90-R600x600 LED 4000 840 MP
 Luminaire name : B1 - C90-R
Equipment : 1 x LED 840 31 W / 4074 lm

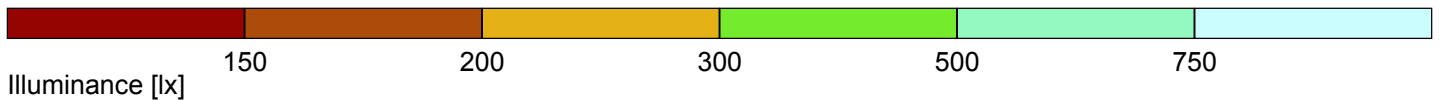
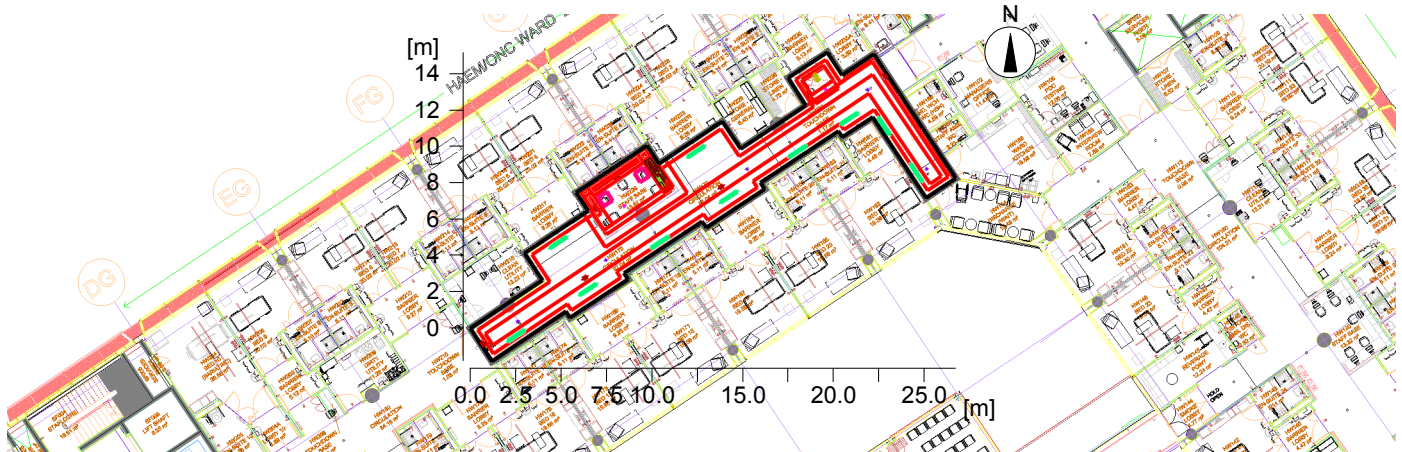
5 10 Order No. : !C80-RR1128 LED 3700 840 ASY HI
 Luminaire name : E2 - C80-RR
Equipment : 1 x LED 840 40 W / 3916 lm

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



19.2 Summary, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.2.6 Result overview, Desk 3



General

Calculation algorithm used : High indirect fraction
 Height of evaluation surface : 0.75 m
 Maintenance factor : 0.80

Total luminous flux of all lamps : 49239 lm
 Total power : 481 W
 Total power per area (107.52 m²) : 4.47 W/m²

Illuminance

Average illuminance : Eav : 341 lx
 Minimum illuminance : Emin : 212 lx
 Maximum illuminance : Emax : 478 lx
 Uniformity U_o : Emin/Em : 1:1.61 (0.62)
 Diversity U_d : Emin/Emax : 1:2.25 (0.44)

Type No.\Make

1 1 **Glamox Luxo Lighting**
 Order No. : ID70-R155 LED 2100 840 SM
 Luminaire name : A2 - D70-R155
 Equipment : 1 x LED 840 19 W / 1931 lm

Glamox Ltd


Unit 3 Capital Business Park, Manor Way, Borehamwood, Hertfordshire WD6 1GW


Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



19.2 Summary, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.2.6 Result overview, Desk 3

3 2 Order No. : !C90-R600x600 LED 4000 840 MP
 Luminaire name : B1 - C90-R
Equipment : 1 x LED 840 31 W / 4074 lm

5 10 Order No. : !C80-RR1128 LED 3700 840 ASY HI
 Luminaire name : E2 - C80-RR
Equipment : 1 x LED 840 40 W / 3916 lm

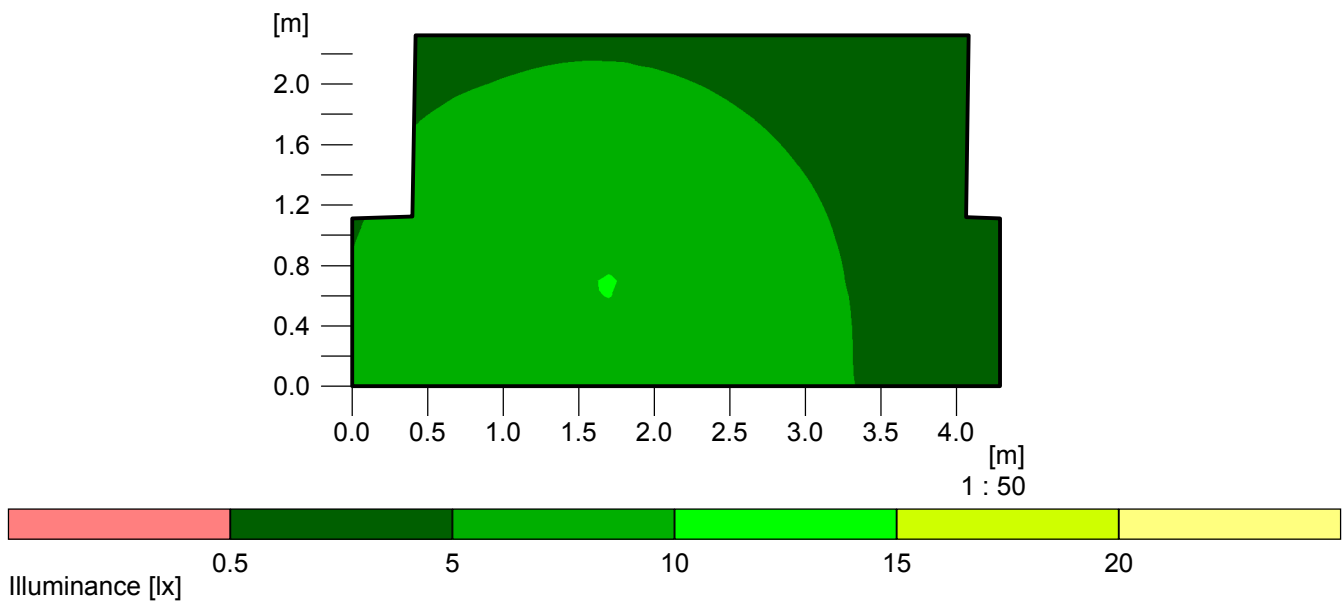
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



19 HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.3 Calculation results, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.3.1 Boundary line, HW220 - STAFF BASE (E)



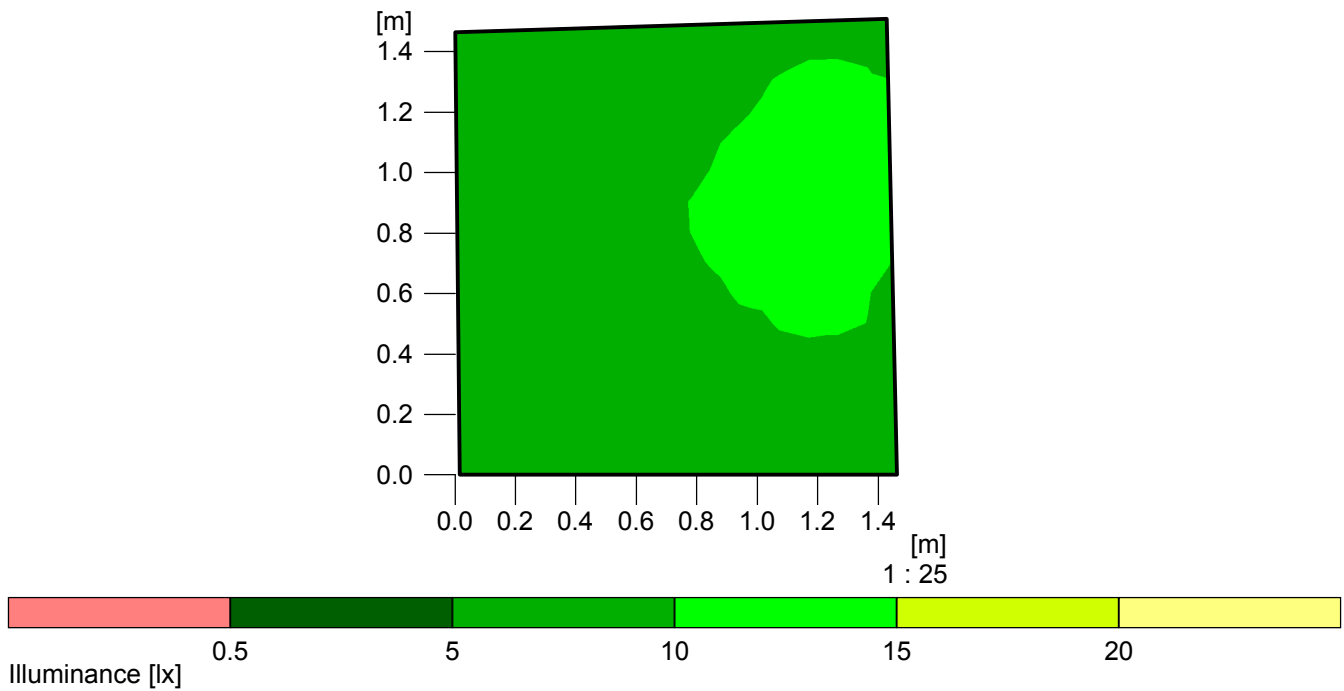
Required minimum illuminance	:	0.5 lx
Minimum illuminance	E _{min}	: 1.5 lx
Maximum illuminance	E _{max}	: 10 lx
Uniformity	E _{min} /E _{max}	: 1 : 6.67 (0.15) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



19.3 Calculation results, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN B

19.3.2 Boundary line, HW230 - TOUCHDOWN BASE (E)



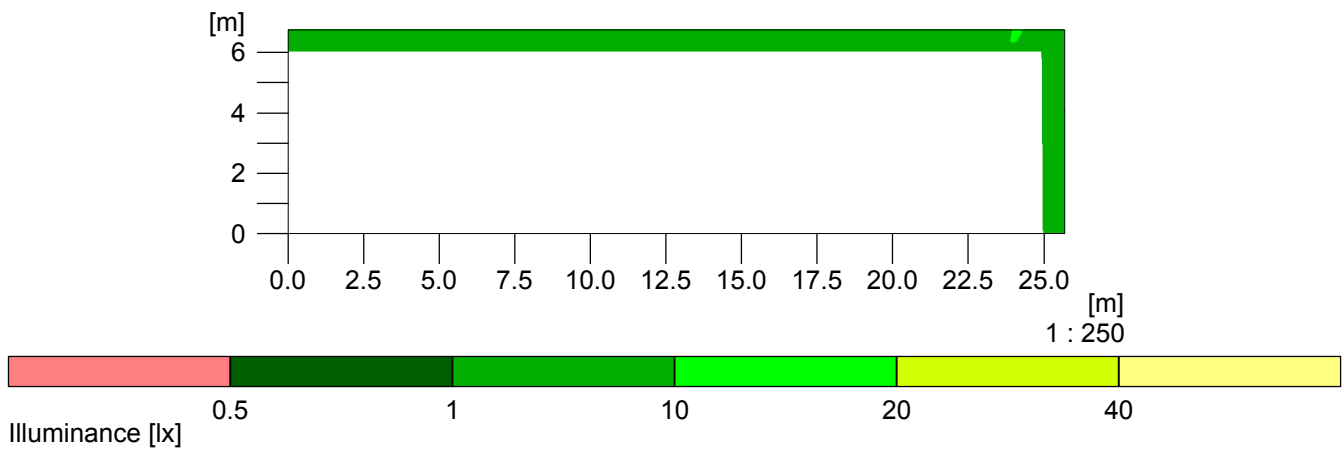
Required minimum illuminance		: 0.5 lx
Minimum illuminance	E _{min}	: 5.3 lx
Maximum illuminance	E _{max}	: 11 lx
Uniformity	E _{min} /E _{max}	: 1 : 2.00 (0.50) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



19.3 Calculation results, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN B

19.3.3 Boundary line, Escape route 1 (E)



Required minimum illuminance (central axis)	:	1 lx
Minimum illuminance (central axis)	E _{min}	: 1.7 lx
Maximum illuminance (central axis)	E _{max}	: 11 lx
Uniformity	E _{min} /E _{max}	: 1 : 6.24 (0.16) (Threshold value 1:40)
Minimum illuminance	E _{min}	: 1.5 lx
Maximum illuminance	E _{max}	: 12 lx
Uniformity	E _{min} /E _{max}	: 1 : 8.41 (0.12) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8

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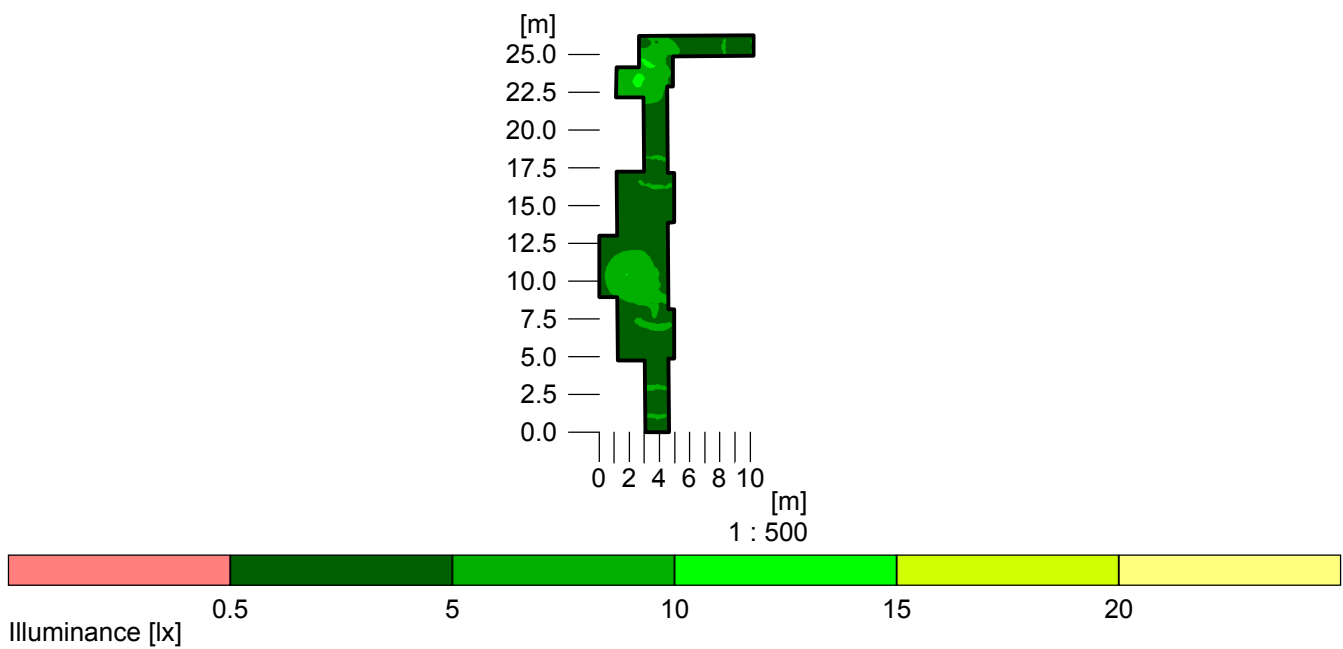
Unit 3 Capital Business Park, Manor Way, Borehamwood, Hertfordshire WD6 1GW

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



19.3 Calculation results, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN B

19.3.4 Boundary line, Reference plane for emergency lighting 2 (E)



Required minimum illuminance	:	0.5 lx
Minimum illuminance	E _{min}	: 0.6 lx
Maximum illuminance	E _{max}	: 12 lx
Uniformity	E _{min} /E _{max}	: 1 : 20.70 (0.05) (Threshold value 1:40)
Height	:	0 m
Calculation algorithm used	:	Direct component
Maintenance factor	:	0.8




Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



19.3 Summary, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.3.5 Result overview (emergency lighting)

Type No.\Make

		Glamox Luxo Lighting	
4	4	Order No.	: !E80-R 10X26 DOWN LED E1
		Luminaire name	: H3 - E80
		Equipment	: 1 x LED E80 2 W / 12 lm (10.0 %)
		GLAMOX	
10	2	Order No.	: !XYLUX LR
		Luminaire name	: H1 - XYLUX LR
		Equipment	: 1 x LED 1.71 W / 150 lm (100.0 %)
11	5	Order No.	: !H2 - M1008 LR4 550 ES - GLAMOX.eld
		Luminaire name	: H2 - XYLUX LR4
		Equipment	: 1 x LED 1.65 W / 160 lm (100.0 %)

Result evaluation area

Calculation algorithm used: Direct component
 Maintenance factor: 0.8

Reference planes for emergency lighting:

No.	Default[lx]	Emin[lx]	Surface Emax[lx]	Uniformity	Height
HW220 - STAFF BASE					
3	0.5	1.5	10.1	1: 6.67	0.00

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



19.3 Summary, HW170 - CIRCULATION/ HW220 - STAFF BASE/ HW230 - TOUCHDOWN BASE

19.3.5 Result overview (emergency lighting)

HW230 - TOUCHDOWN BASE

4 0.5 5.3 10.7 1: 2.00 -0.00

Reference plane for emergency lighting 2

2 0.5 0.6 12.2 1: 20.75 0.00

Escape routes:

No.	Default[lx]	Emin[lx]	Central axis Emax[lx]	Uniformity	Emin[lx]	Surface Emax[lx]	Height
Escape route 1							
1	1.0	1.7	10.6	1: 6.15	1.5	12.2	1: 8.41 0.00

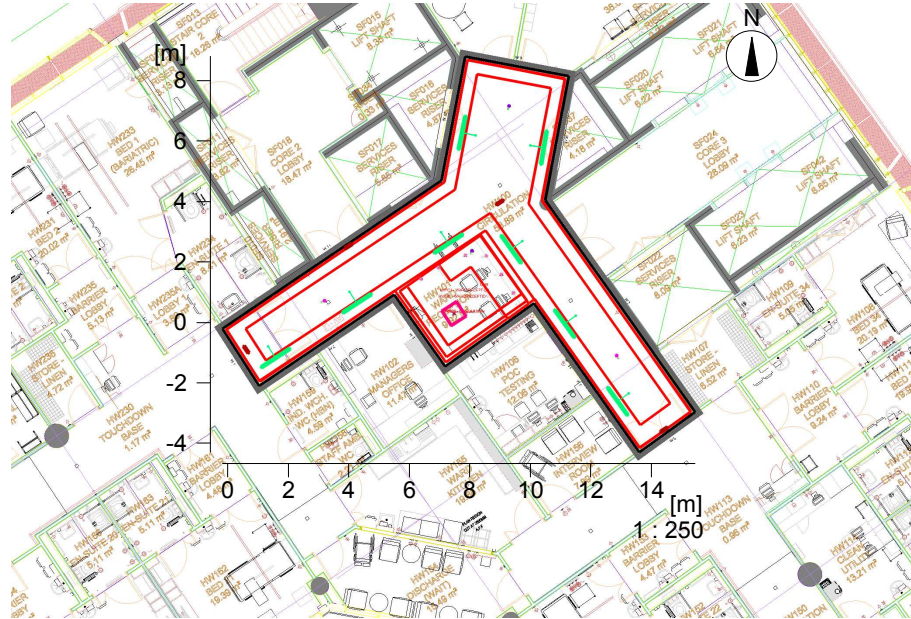
Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



20 HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.1 Description, HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.1.1 Floor plan



Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



20 HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.1 Description, HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.1.1 Floor plan

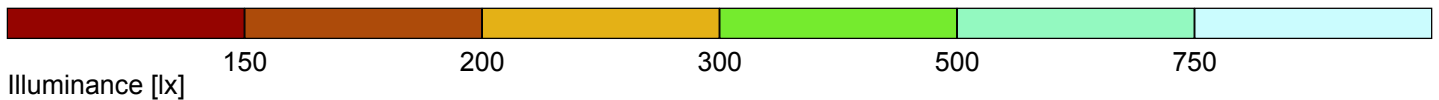
Wall	x	y	Length	Reflectance
1	63.88 m	72.69 m	2.24 m	50.0 %
2	68.34 m	75.70 m	5.38 m	50.0 %
3	70.03 m	73.33 m	2.91 m	50.0 %
4	72.96 m	75.41 m	3.60 m	50.0 %
5	76.44 m	70.50 m	6.02 m	50.0 %
6	78.28 m	71.82 m	2.27 m	50.0 %
7	73.33 m	78.82 m	8.57 m	50.0 %
8	74.11 m	82.92 m	4.17 m	50.0 %
9	70.69 m	83.56 m	3.48 m	50.0 %
10	69.90 m	79.47 m	4.17 m	50.0 %
11	62.67 m	74.58 m	8.73 m	50.0 %
Floor				20.0 %
Ceiling				70.0 %
Room height		2.70 m		
Height of reference plane		0.00 m		

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019

20 HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.2 Summary, HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.2.1 Result overview, HW100 - CIRCULATION



General

Calculation algorithm used	High indirect fraction
Height of evaluation surface	0.00 m
Height of luminaire plane	2.70 m
Maintenance factor	0.80

Total luminous flux of all lamps	38402 lm
Total power	387 W
Total power per area (67.08 m ²)	5.77 W/m ² (2.01 W/m ² /100lx)

Illuminance

Average illuminance	Eav	287 lx
Minimum illuminance	Emin	141 lx
Maximum illuminance	Emax	509 lx
Uniformity U _o	Emin/Em	1:2.04 (0.49)
Diversity U _d	Emin/Emax	1:3.62 (0.28)

Type No.\Make

3	1	Glamox Luxo Lighting
		Order No. : !C90-R600x600 LED 4000 840 MP
		Luminaire name : B1 - C90-R
		Equipment : 1 x LED 840 31 W / 4074 lm


Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019




20 HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.2 Summary, HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.2.1 Result overview, HW100 - CIRCULATION

5 8 Order No. : !C80-RR1128 LED 3700 840 ASY HI
 Luminaire name : E2 - C80-RR
Equipment : 1 x LED 840 40 W / 3916 lm

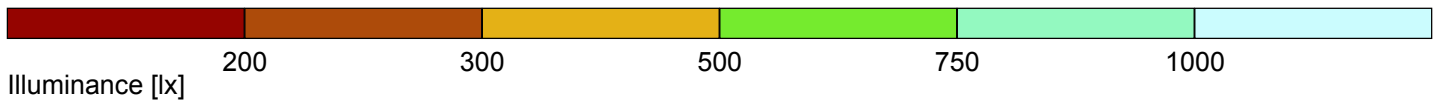
18 6 **Luxonic**
 Order No. : !MICRO/L/6W/DIMPC/N/WH/840
Luminaire name : A10 - EXURBIA MICRO L
Equipment : 1 x LED 6 W / 500 lm

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



20.2 Summary, HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.2.2 Result overview, HW101 - WARD RECEPTION



General

Calculation algorithm used	High indirect fraction
Height of evaluation surface	0.75 m
Height of luminaire plane	2.70 m
Maintenance factor	0.80

Total luminous flux of all lamps	38402 lm
Total power	387 W
Total power per area (67.08 m ²)	5.77 W/m ²

Illuminance

Average illuminance	Eav	600 lx
Minimum illuminance	Emin	410 lx
Maximum illuminance	Emax	948 lx
Uniformity U _o	Emin/Em	1:1.46 (0.68)
Diversity U _d	Emin/Emax	1:2.31 (0.43)

Type No.\Make


3	1	Glamox Luxo Lighting
		Order No. : !C90-R600x600 LED 4000 840 MP
		Luminaire name : B1 - C90-R
		Equipment : 1 x LED 840 31 W / 4074 lm


Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



20.2 Summary, HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.2.2 Result overview, HW101 - WARD RECEPTION

5 8 Order No. : !C80-RR1128 LED 3700 840 ASY HI
 Luminaire name : E2 - C80-RR
Equipment : 1 x LED 840 40 W / 3916 lm

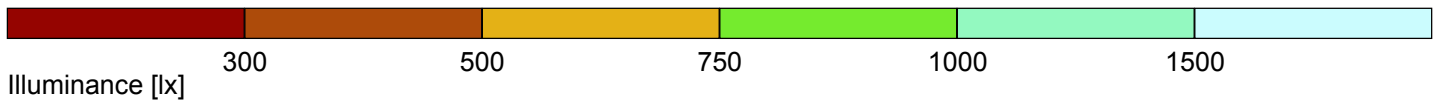
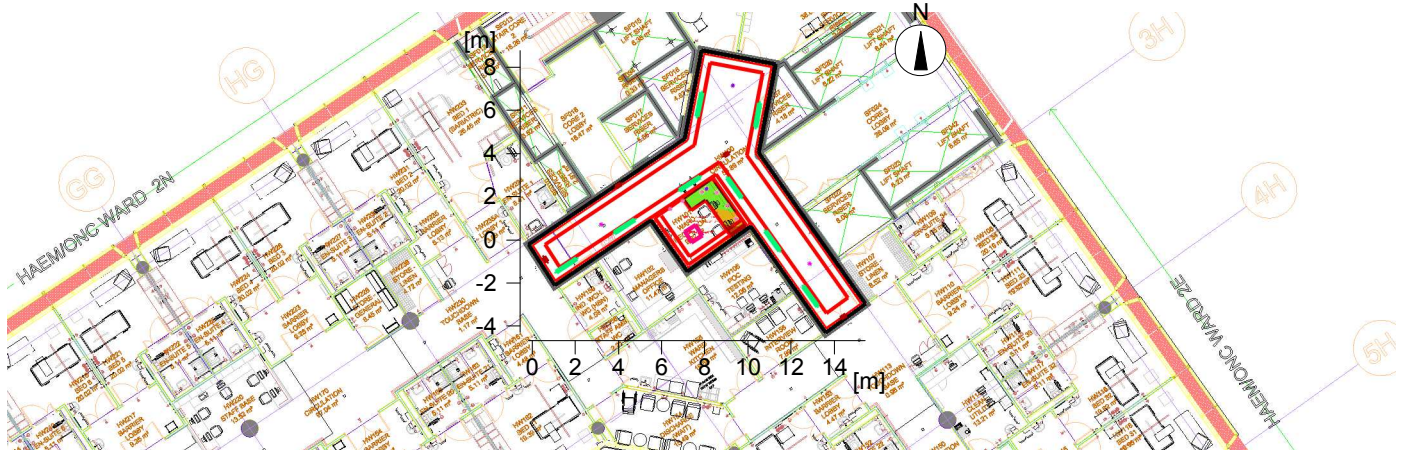
18 6 **Luxonic**
 Order No. : !MICRO/L/6W/DIMPC/N/WH/840
Luminaire name : A10 - EXURBIA MICRO L
Equipment : 1 x LED 6 W / 500 lm

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



20.2 Summary, HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.2.3 Result overview, Desk



General

Calculation algorithm used	High indirect fraction
Height of evaluation surface	0.75 m
Height of luminaire plane	2.70 m
Maintenance factor	0.80

Total luminous flux of all lamps	38402 lm
Total power	387 W
Total power per area (67.08 m ²)	5.77 W/m ²

Illuminance

Average illuminance	Eav	775 lx
Minimum illuminance	Emin	516 lx
Maximum illuminance	Emax	951 lx
Uniformity U _o	Emin/Em	1:1.5 (0.67)
Diversity U _d	Emin/Emax	1:1.84 (0.54)

Type No.\Make


3	1	Glamox Luxo Lighting
		Order No. : IC90-R600x600 LED 4000 840 MP
		Luminaire name : B1 - C90-R
		Equipment : 1 x LED 840 31 W / 4074 lm


Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



20.2 Summary, HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.2.3 Result overview, Desk

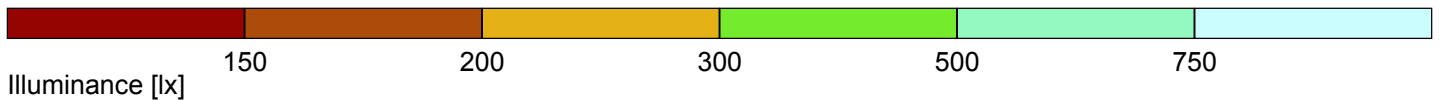
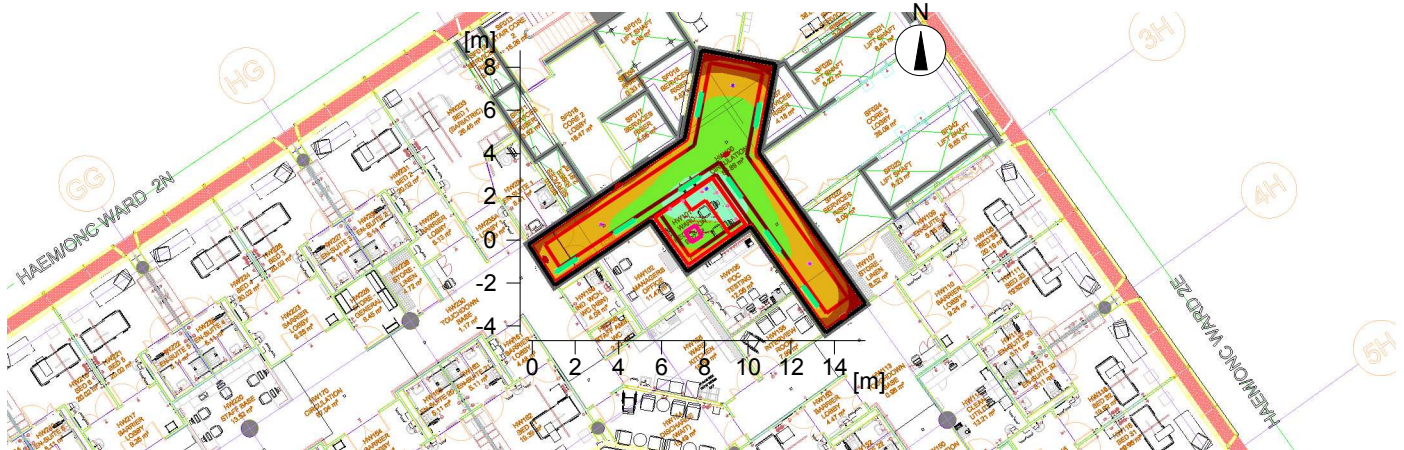
5 8 Order No. : !C80-RR1128 LED 3700 840 ASY HI
 Luminaire name : E2 - C80-RR
Equipment : 1 x LED 840 40 W / 3916 lm

18 6 **Luxonic**
 Order No. : !MICRO/L/6W/DIMPC/N/WH/840
Luminaire name : A10 - EXURBIA MICRO L
Equipment : 1 x LED 6 W / 500 lm

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019

20.2 Summary, HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.2.4 Result overview, Evaluation area 1



General

Calculation algorithm used	High indirect fraction
Height of luminaire plane	2.70 m
Maintenance factor	0.80
Total luminous flux of all lamps	38402 lm
Total power	387.0 W
Total power per area (67.08 m ²)	5.77 W/m ² (1.73 W/m ² /100lx)

Evaluation area 1

Reference plane 1.1

	Horizontal
Em	333 lx
Emin	160 lx
Emin/Eav (Uo)	0.48
Emin/Emax (Ud)	0.22
Position	0.00 m

Type No.\Make


3	1	Glamox Luxo Lighting
		Order No. : IC90-R600x600 LED 4000 840 MP
		Luminaire name : B1 - C90-R
		Equipment : 1 x LED 840 31 W / 4074 lm


Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



20.2 Summary, HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.2.4 Result overview, Evaluation area 1

5 8 Order No. : !C80-RR1128 LED 3700 840 ASY HI
 Luminaire name : E2 - C80-RR
Equipment : 1 x LED 840 40 W / 3916 lm

18 6 **Luxonic**
 Order No. : !MICRO/L/6W/DIMPC/N/WH/840
Luminaire name : A10 - EXURBIA MICRO L
Equipment : 1 x LED 6 W / 500 lm

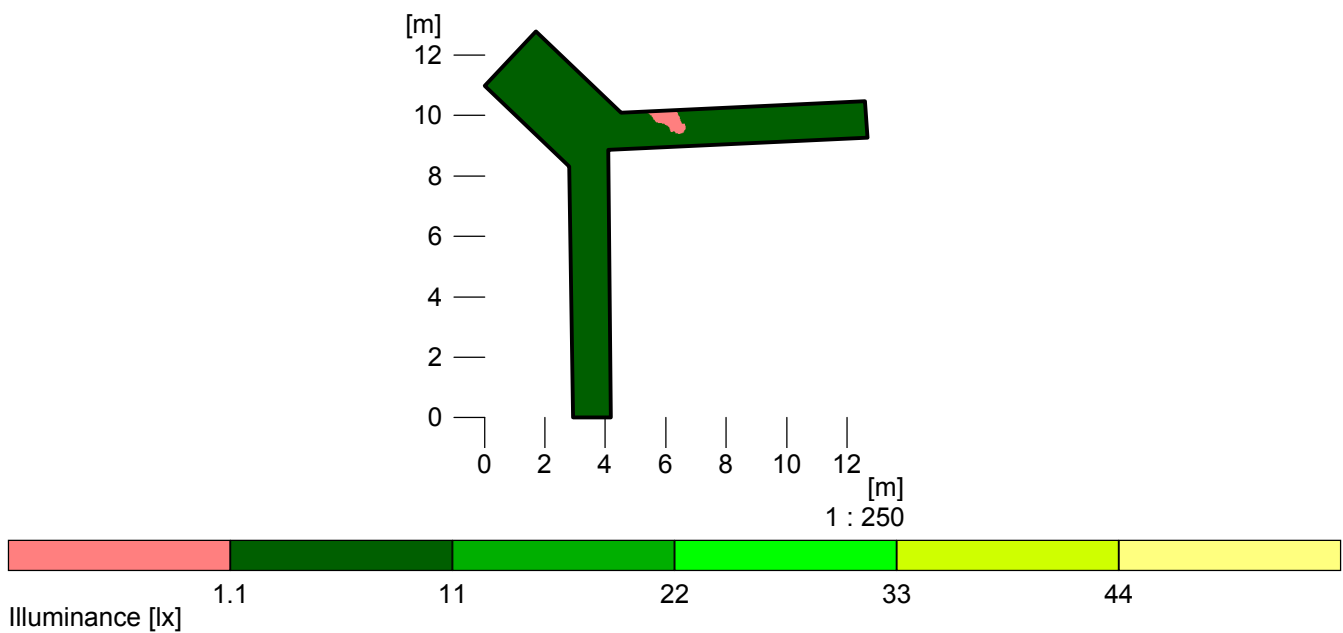
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



20 HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.3 Calculation results, HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.3.1 Boundary line, HW100 - CIRCULATION (E)



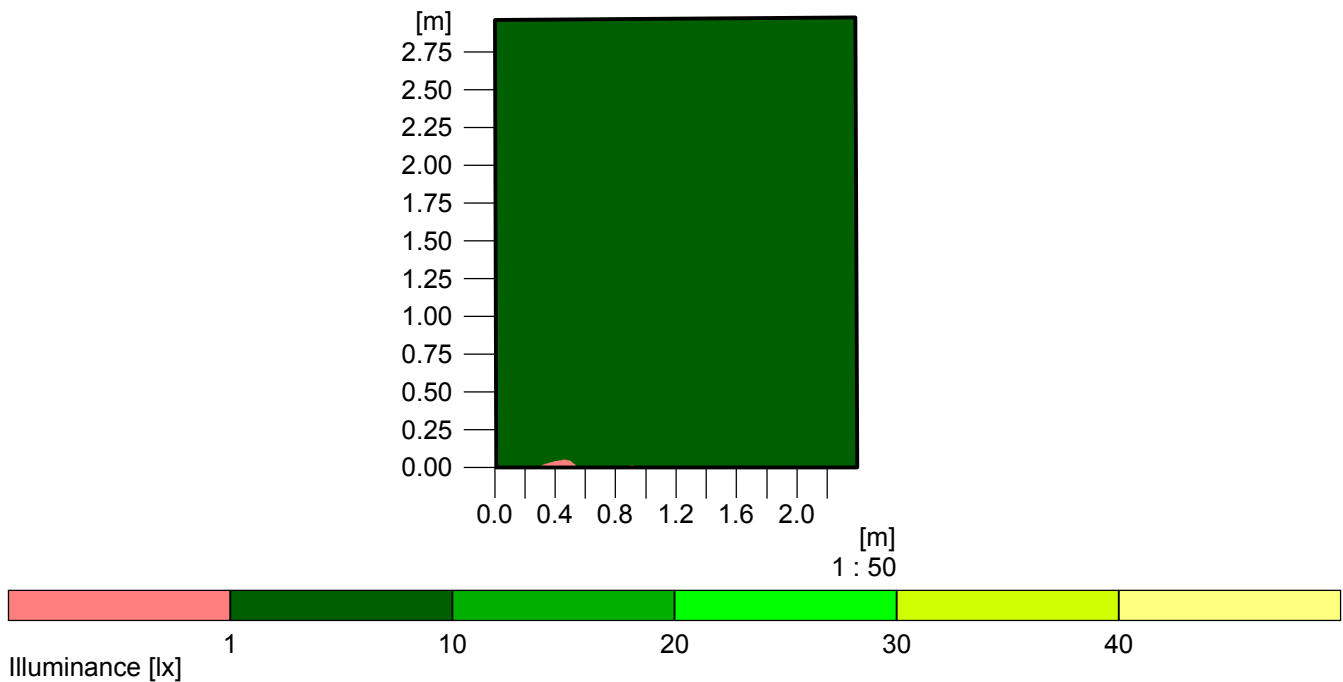
Required minimum illuminance	:	1.1 lx
Minimum illuminance	E _{min}	: 1 lx
Maximum illuminance	E _{max}	: 9 lx
Uniformity	E _{min} /E _{max}	: 1 : 9.02 (0.11) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8

Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



20.3 Calculation results, HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.3.2 Boundary line, HW101 - WARD RECEPTION (E)



Required minimum illuminance		: 1 lx
Minimum illuminance	E _{min}	: 1 lx
Maximum illuminance	E _{max}	: 7.4 lx
Uniformity	E _{min} /E _{max}	: 1 : 7.67 (0.13) (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8




Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



20.3 Summary, HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.3.3 Result overview (emergency lighting)

Type No.\Make

		Glamox Luxo Lighting	
4	4	Order No.	: !E80-R 10X26 DOWN LED E1
		Luminaire name	: H3 - E80
		Equipment	: 1 x LED E80 2 W / 12 lm (10.0 %)
		GLAMOX	
10	2	Order No.	: !XYLUX LR
		Luminaire name	: H1 - XYLUX LR
		Equipment	: 1 x LED 1.71 W / 150 lm (100.0 %)
11	2	Order No.	: !H2 - M1008 LR4 550 ES - GLAMOX.eld
		Luminaire name	: H2 - XYLUX LR4
		Equipment	: 1 x LED 1.65 W / 160 lm (100.0 %)

Result evaluation area

Calculation algorithm used: Direct component
 Maintenance factor: 0.8

Reference planes for emergency lighting:

No.	Default[lx]	Emin[lx]	Surface Emax[lx]	Uniformity	Height
HW100 - CIRCULATION					
2	1.1	1.0	9.0	1: 9.02	0.00

Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



20.3 Summary, HW100 - CIRCULATION/ HW101 - WARD RECEPTION

20.3.3 Result overview (emergency lighting)

HW101 - WARD RECEPTION

2	1.0	1.0	7.4	1:	7.67	0.00
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Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



21 HW154 - DISCHARGE (WAIT)

21.1 Description, HW154 - DISCHARGE (WAIT)

21.1.1 Floor plan



Object : Lighting Calculations (23)
Installation : UCLH Proton Beam Therapy Centre
Project number : 870068
Date : 21.08.2019



21 HW154 - DISCHARGE (WAIT)

21.1 Description, HW154 - DISCHARGE (WAIT)

21.1.1 Floor plan

Wall	x	y	Length	Reflectance
1	65.76 m	66.39 m	0.59 m	50.0 %
2	66.00 m	66.56 m	0.29 m	50.0 %
3	66.75 m	65.43 m	1.35 m	50.0 %
4	71.15 m	64.63 m	4.47 m	50.0 %
5	72.24 m	65.41 m	1.34 m	50.0 %
6	72.46 m	65.12 m	0.36 m	50.0 %
7	72.90 m	65.43 m	0.54 m	50.0 %
8	71.77 m	67.07 m	1.99 m	50.0 %
9	67.08 m	67.98 m	4.78 m	50.0 %
10	65.44 m	66.89 m	1.96 m	50.0 %
Floor				20.0 %
Ceiling				70.0 %
Room height		2.70 m		
Height of reference plane		0.00 m		

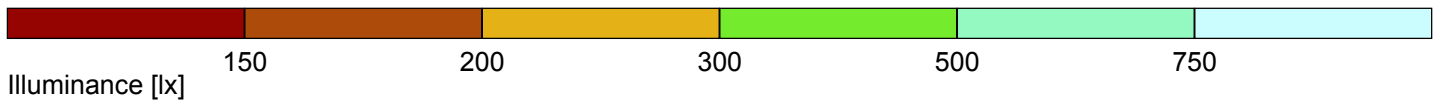
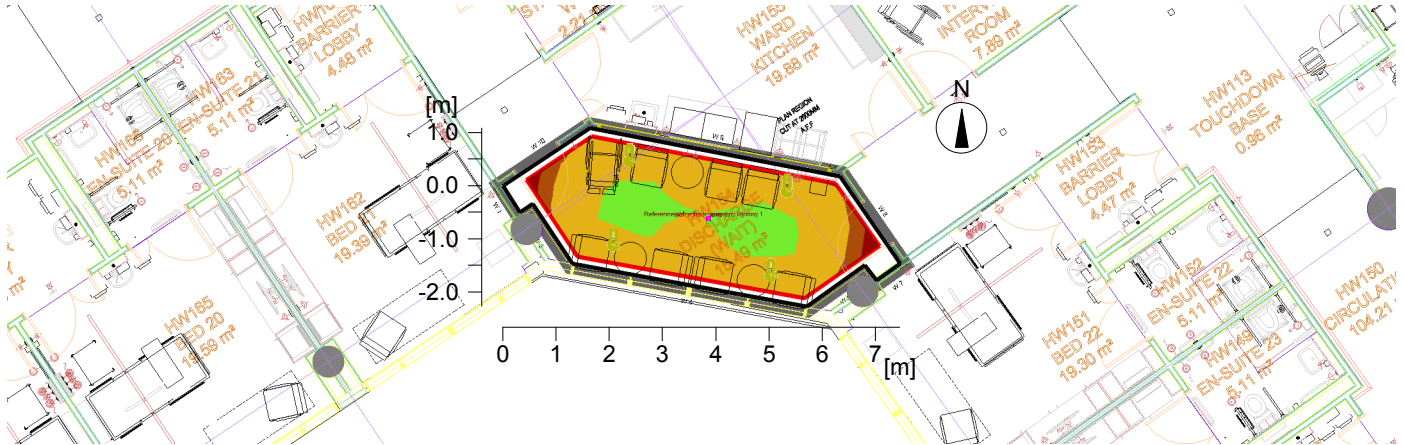
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



21 HW154 - DISCHARGE (WAIT)

21.2 Summary, HW154 - DISCHARGE (WAIT)

21.2.1 Result overview, Evaluation area 1



General

Calculation algorithm used	High indirect fraction
Height of luminaire plane	2.70 m
Maintenance factor	0.80
Total luminous flux of all lamps	7724 lm
Total power	76.0 W
Total power per area (15.31 m ²)	4.96 W/m ² (1.79 W/m ² /100lx)

Evaluation area 1

Reference plane 1.1

	Horizontal
Em	277 lx
Emin	216 lx
Emin/Eav (Uo)	0.78
Emin/Emax (Ud)	0.66
Position	0.00 m

Type No.\Make

1	4	Glamox Luxo Lighting
		Order No. : ID70-R155 LED 2100 840 SM
		Luminaire name : A2 - D70-R155
		Equipment : 1 x LED 840 19 W / 1931 lm



Glamox Ltd

Unit 3 Capital Business Park, Manor Way, Borehamwood, Hertfordshire WD6 1GW

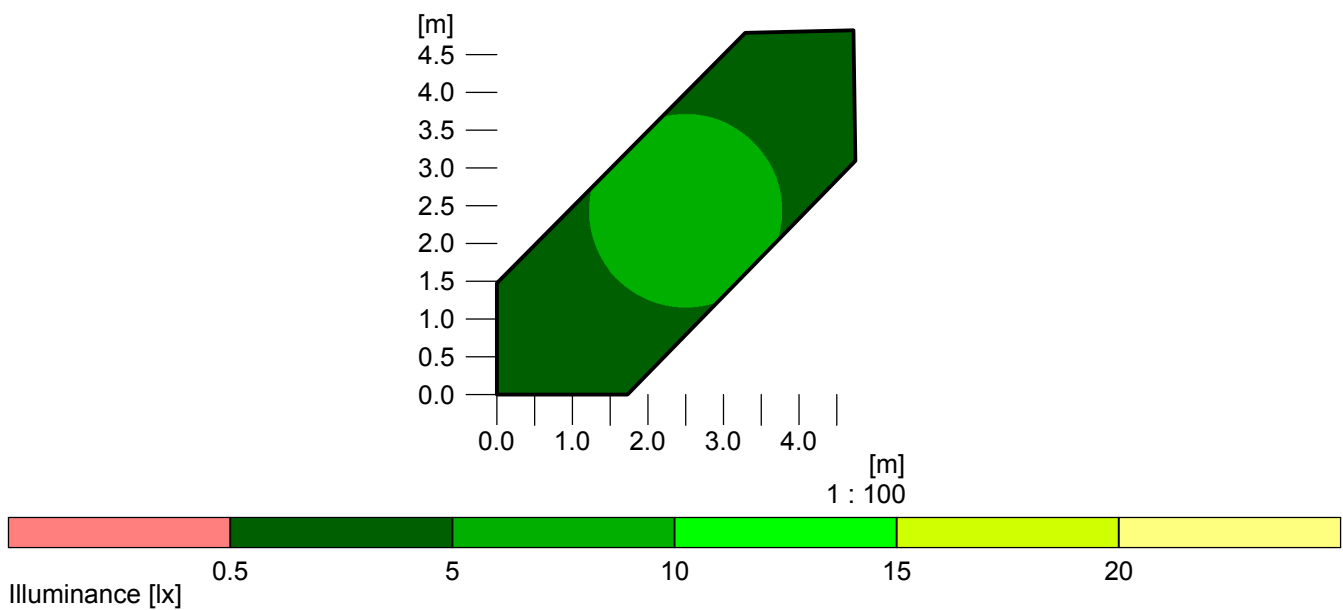
Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



21 HW154 - DISCHARGE (WAIT)

21.3 Calculation results, HW154 - DISCHARGE (WAIT)

21.3.1 Boundary line, Reference plane for emergency lighting 1 (E)



Required minimum illuminance	:	0.5 lx
Minimum illuminance	E _{min}	: 0.6 lx
Maximum illuminance	E _{max}	: 9 lx
Uniformity	E _{min} /E _{max}	: 1 : 15.10 (0.07) (Threshold value 1:40)
Height	:	0 m
Calculation algorithm used	:	Direct component
Maintenance factor	:	0.8


Object : Lighting Calculations (23)
 Installation : UCLH Proton Beam Therapy Centre
 Project number : 870068
 Date : 21.08.2019



21.3 Summary, HW154 - DISCHARGE (WAIT)

21.3.2 Result overview (emergency lighting)

Type No.\Make

10	1	GLAMOX	
		Order No.	: IXYLUX LR
		Luminaire name	: H1 - XYLUX LR
		Equipment	: 1 x LED 1.71 W / 150 lm (100.0 %)

Result evaluation area

Calculation algorithm used: Direct component
 Maintenance factor: 0.8

Reference planes for emergency lighting:

No.	Default[lx]	Emin[lx]	Surface Emax[lx]	Uniformity	Height
Reference plane for emergency lighting 1					
1	0.5	0.6	9.0	1: 15.15	0.00