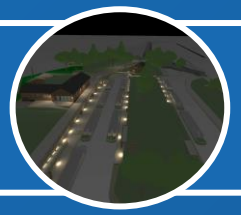


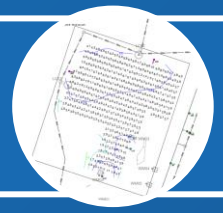
TREVOR BASIN

LIGHTING DESIGN PROPOSAL

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CONTENTS


Site Overview 1-6


Calculation Results 7-14


Control Strategy 15-16


Visual Renders 17-26

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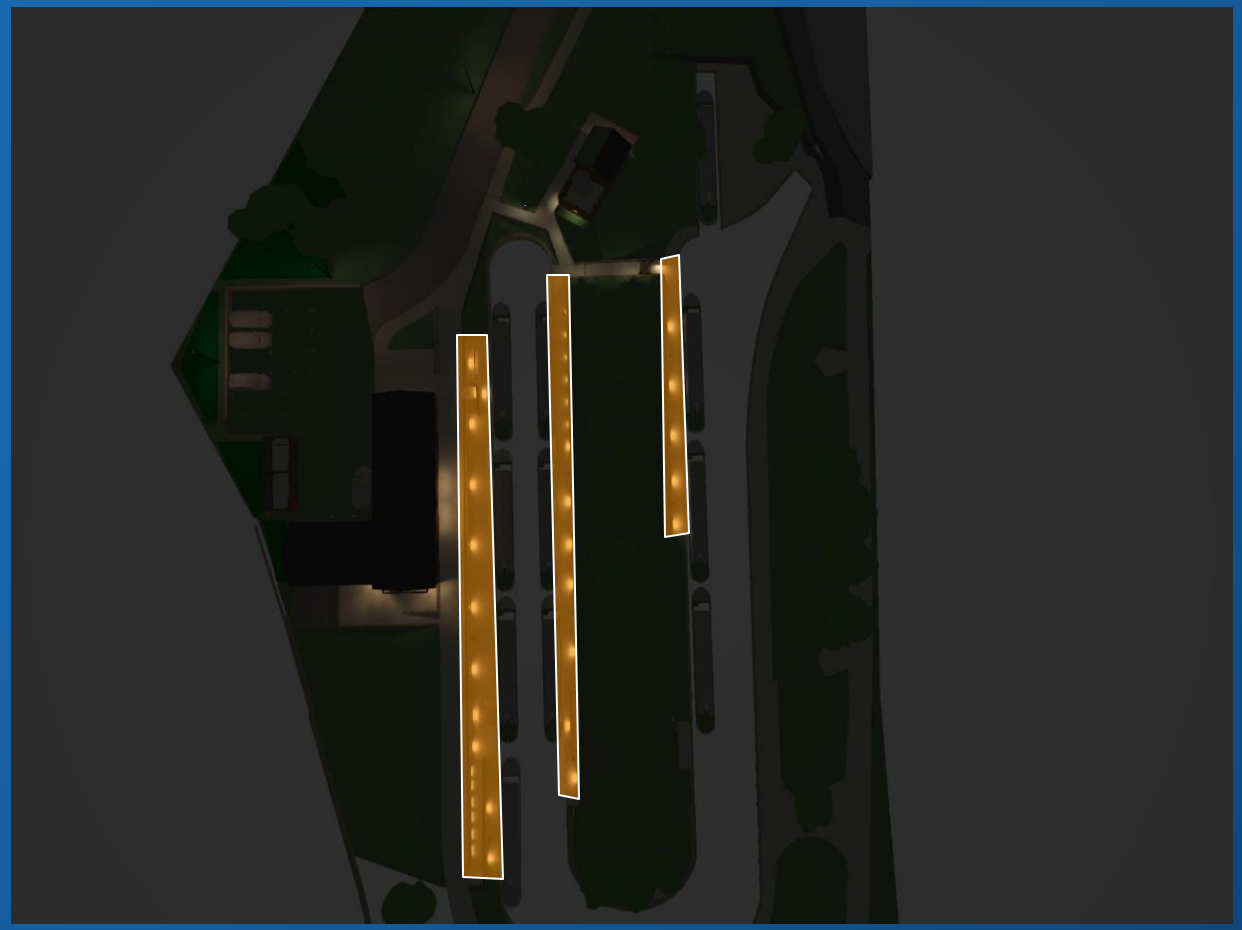
SITE OVERVIEW – LIGHTING ETHOS

The proposed lighting design takes into consideration the site constraints; which include safety, ecology and environmental sensitivity.

The lighting levels and luminaire locations for the quaysides have been carefully designed in accordance with relevant British Standards, to address the safety concerns relating to uneven footpaths, ensuring suitable levels of light, required for the safe operation of the site. Whilst mitigating the potential effects of light on ecological receptors as well as dark skies.

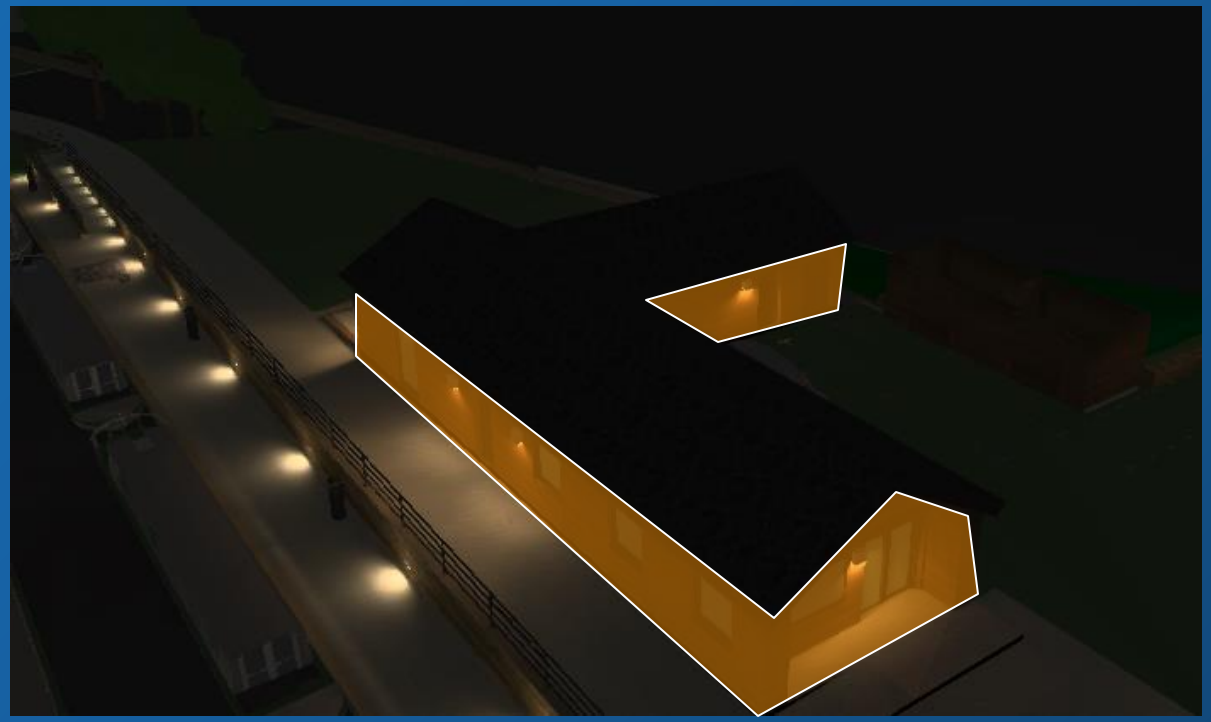
Lighting of the quaysides has been designed to comply with BS EN 12464-2:2014 (Lighting of outdoor work places), and lighting in areas away from the canal has been designed to comply with the minimum lighting recommendations set out in BS 5489-1:2020 (Lighting of roads and public amenity areas).

SITE OVERVIEW - QUAYSIDES



- Wall recessed low-level lighting that lights edge of quayside
- Compliant to British lighting standards
- Assists with wayfinding and hazard detection
- Accentuate archeological feature

SITE OVERVIEW – HIRE BOAT BUSINESS PREMISES



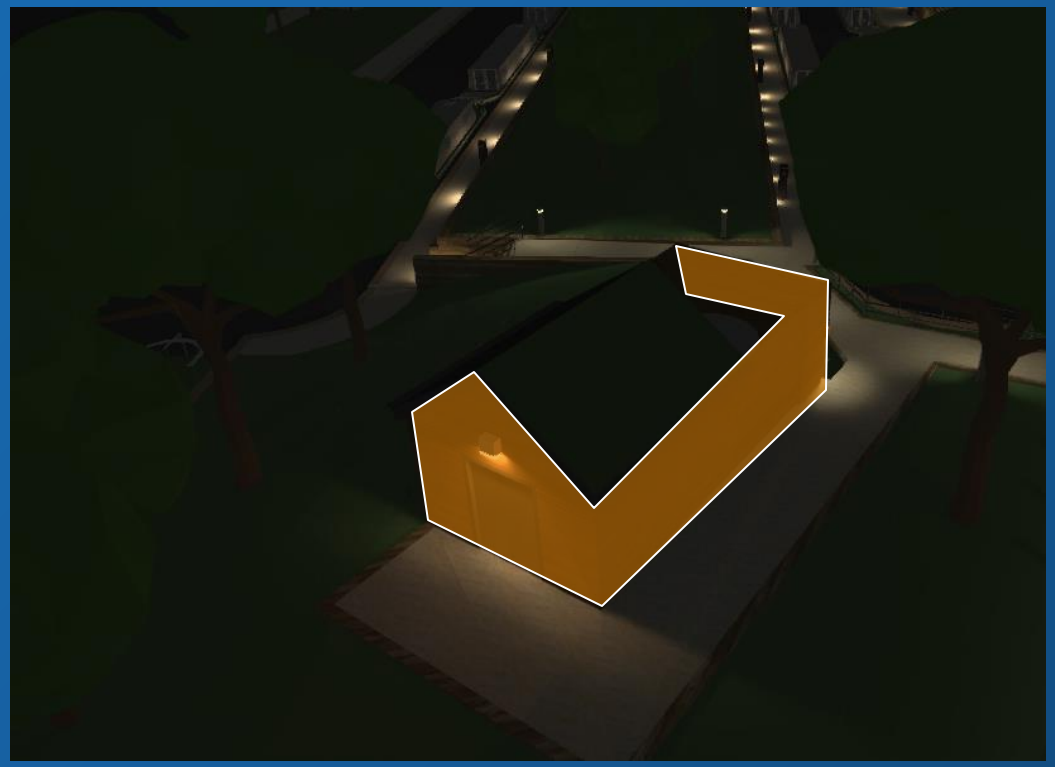
- Wall-mounted bulkheads
- Highlight building thresholds
- Assist with navigational task

SITE OVERVIEW – BOLLARD PATH



- Discreet bollard lighting
- Delineate the path
- Aiming away from the building to assist with sight lines and minimising glare
- Lit to a road lighting standard to due to context and placement

SITE OVERVIEW – FUEL STORAGE



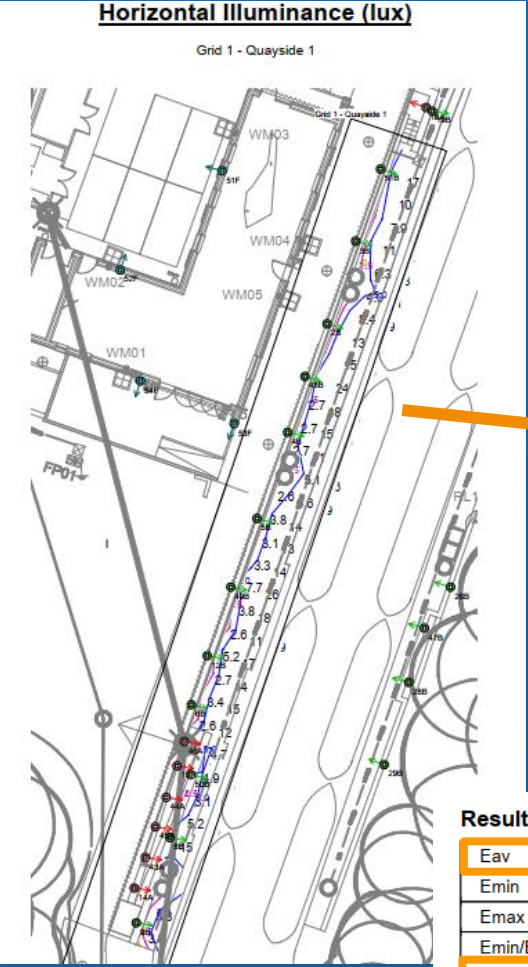
- Elegant façade downlights to elevate fuel shed
- Highlight building threshold
- Deter visitors from accessing

SITE OVERVIEW – ROAD/CAR PARK



- Column-mounted road lighting
- Compliant to British lighting standards
- Safe (vehicular) navigation to and from Trevor Basin
- Low lighting levels to comply with ecological constraints as well as not detract from feature lighting

CALCULATION RESULTS





Results

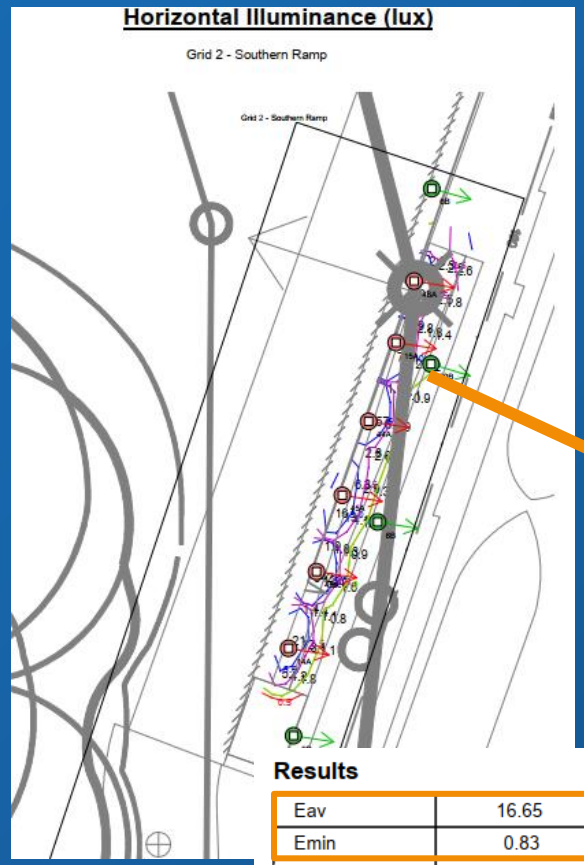
Eav	11.23
Emin	2.75
Emax	21.55
Emin/Emax	0.13
Emin/Eav	0.25

BS EN 12464-2:2014
EN 12464-2:2014 (E)

Table 5.4 — Canals, locks and harbours

Ref. no.	Type of area, task or activity	$\bar{E}_m$ lx	U_o –	R_{GL} –	R_a –	Specific requirements
5.4.1	Waiting quays at canals and locks	10	0,25	50	20	
5.4.2	Gangways and passages exclusively for pedestrians	10	0,25	50	20	

CALCULATION RESULTS





Results

Eav	16.65
Emin	0.83
Emax	342.44
Emin/Emax	0.00
Emin/Eav	0.05

BRITISH STANDARD

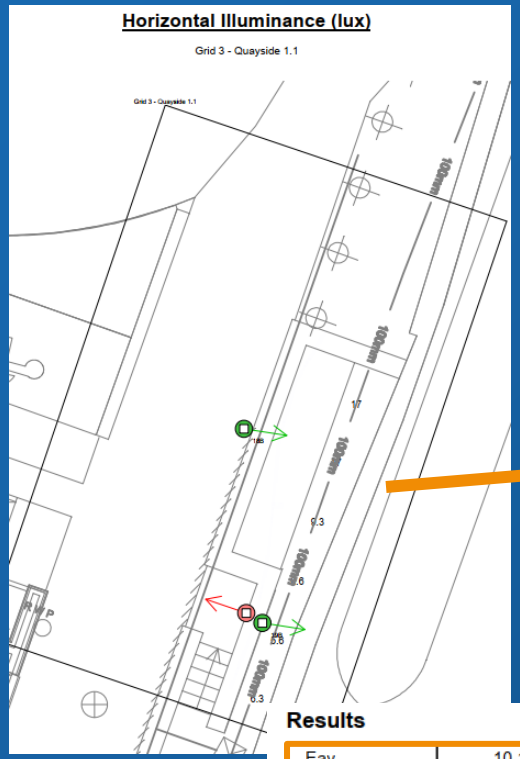
Table A.5 — *Lighting classes for subsidiary roads*

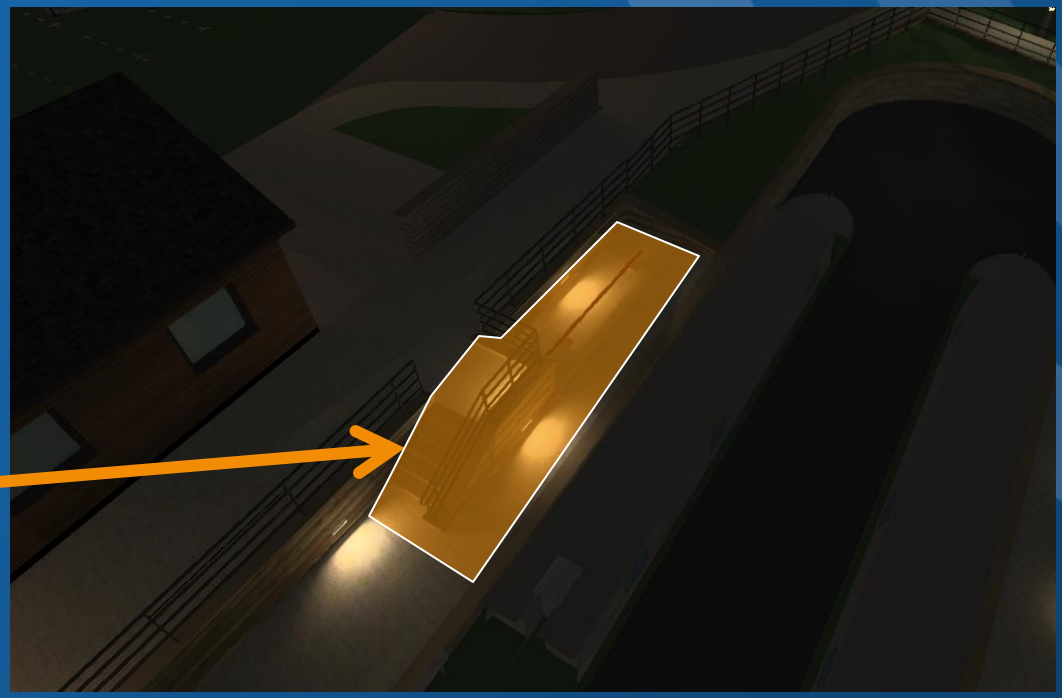
Traffic flow	E1 to E4 [4]
	Pedestrian and cyclists only
Busy [8]	P5
Normal [9]	P5
Quiet [10]	P6

P Classes

Class	Horizontal Illuminance (lux)			
	Horizontal Illuminance		Additional requirement if facial recognition is necessary	
	$\bar{E}$	E_{min}	$E_{v,min}$ lux	$E_{sc,min}$ lux
P1	15.0	3.0	5.0	5.0
P2	10.0	2.0	3.0	2.0
P3	7.50	1.5	2.5	1.5
P4	5.00	1.0	1.5	1.0
P5	3.00	0.6	1.0	0.6
P6	2.00	0.4	0.6	0.2

CALCULATION RESULTS





Results

Eav	10.11
Emin	5.40
Emax	17.33
Emin/Emax	0.31
Emin/Eav	0.53

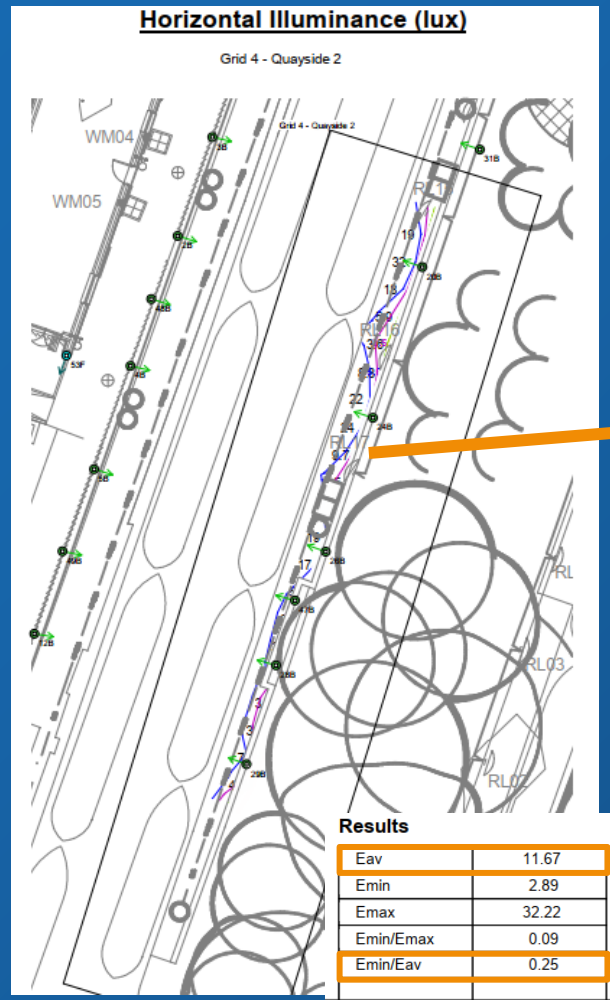
BS EN 12464-2:2014
EN 12464-2:2014 (E)

Table 5.4 — Canals, locks and harbours

Ref. no.	Type of area, task or activity	$\bar{E}_m$ lx	U_o –	R_{GL} –	R_a –	Specific requirements
5.4.1	Waiting quays at canals and locks	10	0,25	50	20	
5.4.2	Gangways and passages exclusively for pedestrians	10	0,25	50	20	

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CALCULATION RESULTS





Results

Eav	11.67
Emin	2.89
Emax	32.22
Emin/Emax	0.09
Emin/Eav	0.25

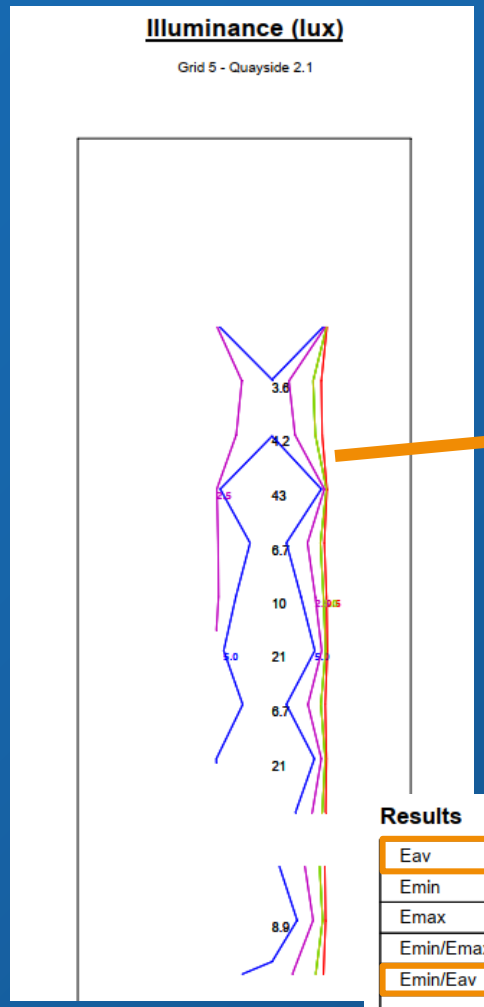
BS EN 12464-2:2014
EN 12464-2:2014 (E)

Table 5.4 — Canals, locks and harbours

Ref. no.	Type of area, task or activity	$\bar{E}_m$ lx	U_o –	R_{GL} –	R_a –	Specific requirements
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5.4.2	Gangways and passages exclusively for pedestrians	10	0,25	50	20	

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CALCULATION RESULTS





Results

Eav	14.22
Emin	3.57
Emax	43.32
Emin/Emax	0.08
Emin/Eav	0.25

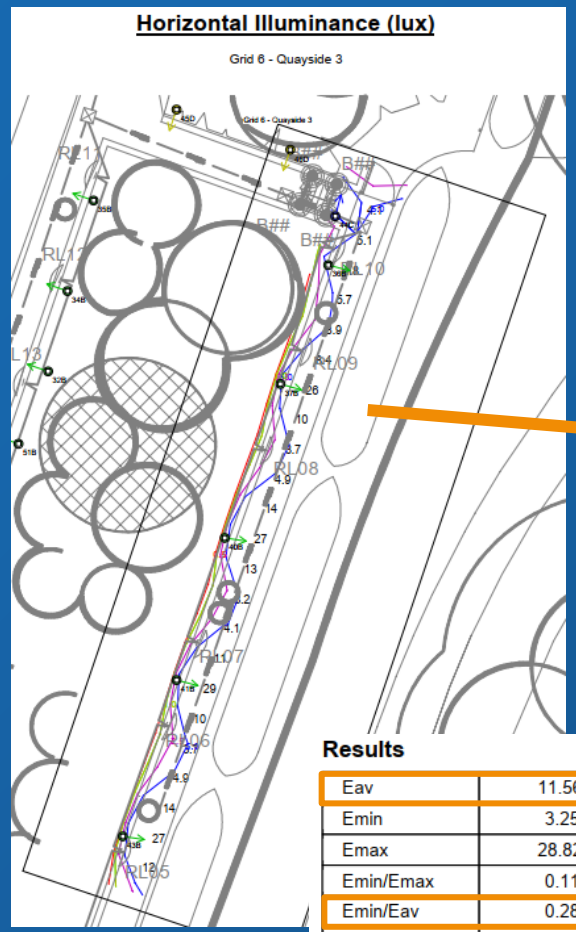
BS EN 12464-2:2014
EN 12464-2:2014 (E)

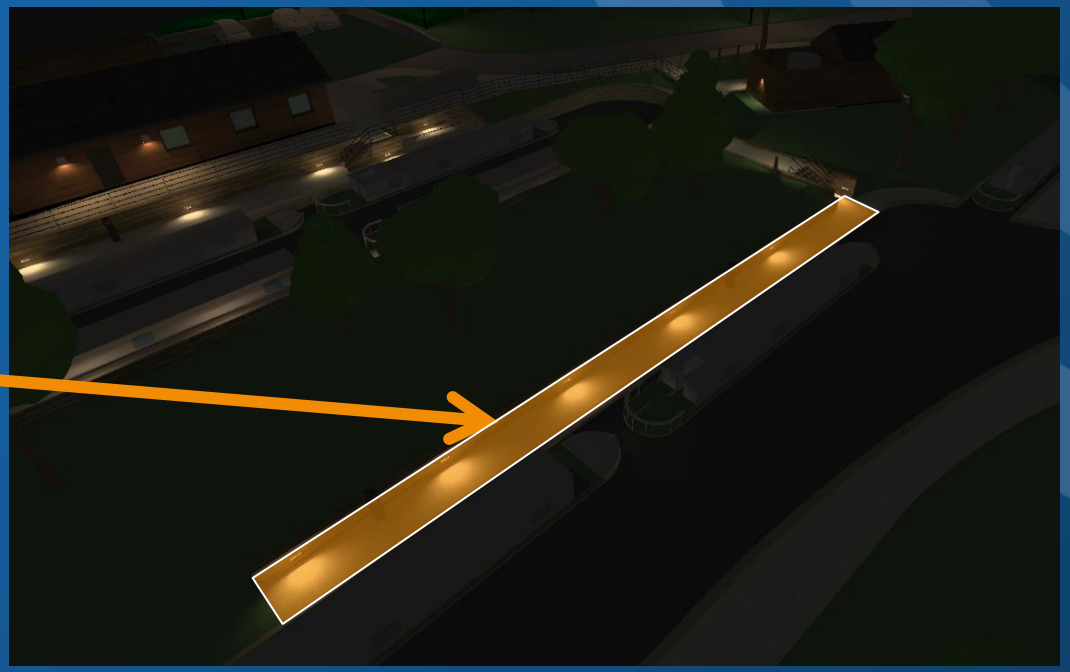
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Ref. no.	Type of area, task or activity	$\bar{E}_m$ lx	U_o –	R_{GL} –	R_a –	Specific requirements
5.4.1	Waiting quays at canals and locks	10	0,25	50	20	
5.4.2	Gangways and passages exclusively for pedestrians	10	0,25	50	20	

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CALCULATION RESULTS





Results

Eav	11.56
Emin	3.25
Emax	28.82
Emin/Emax	0.11
Emin/Eav	0.28

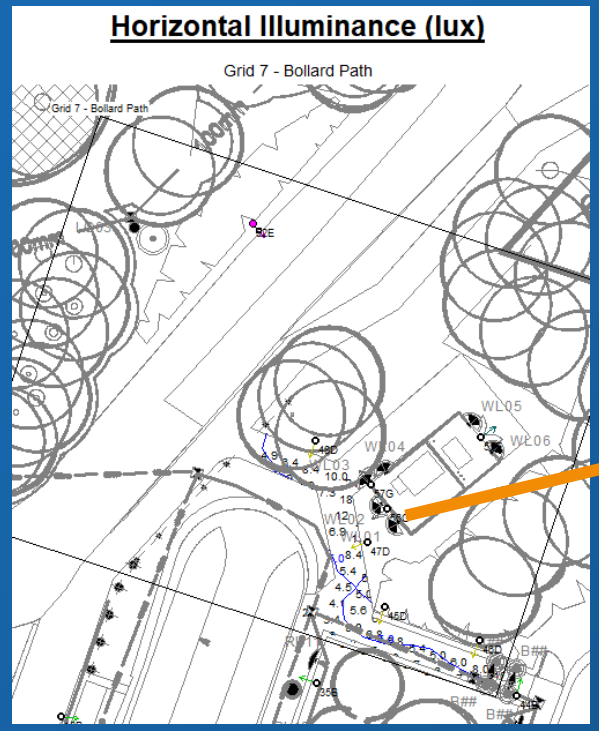
BS EN 12464-2:2014
EN 12464-2:2014 (E)

Table 5.4 — Canals, locks and harbours

Ref. no.	Type of area, task or activity	$\bar{E}_m$ lx	U_o –	R_{GL} –	R_a –	Specific requirements
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5.4.2	Gangways and passages exclusively for pedestrians	10	0,25	50	20	

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CALCULATION RESULTS





Results

Eav	6.28
Emin	2.19
Emax	23.69
Emin/Emax	0.09
Emin/Eav	0.35

BRITISH STANDARD

Table A.5 — *Lighting classes for subsidiary roads*

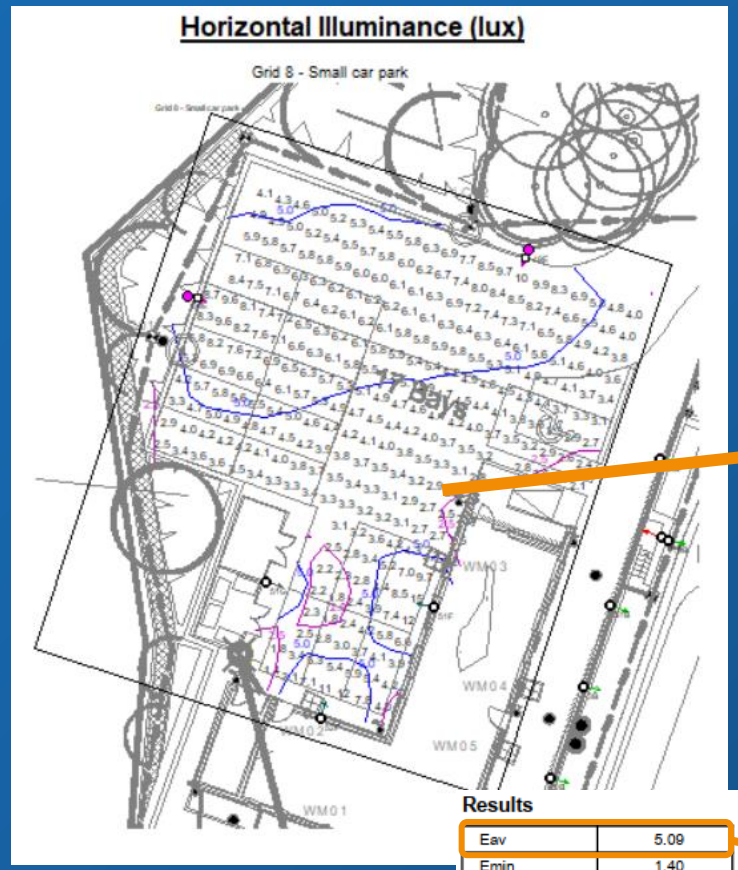
Traffic flow	
	E1 to E4[a]
	Pedestrian and cyclists only
Busy [e]	P5
Normal [c]	P5
Quiet [f]	P6

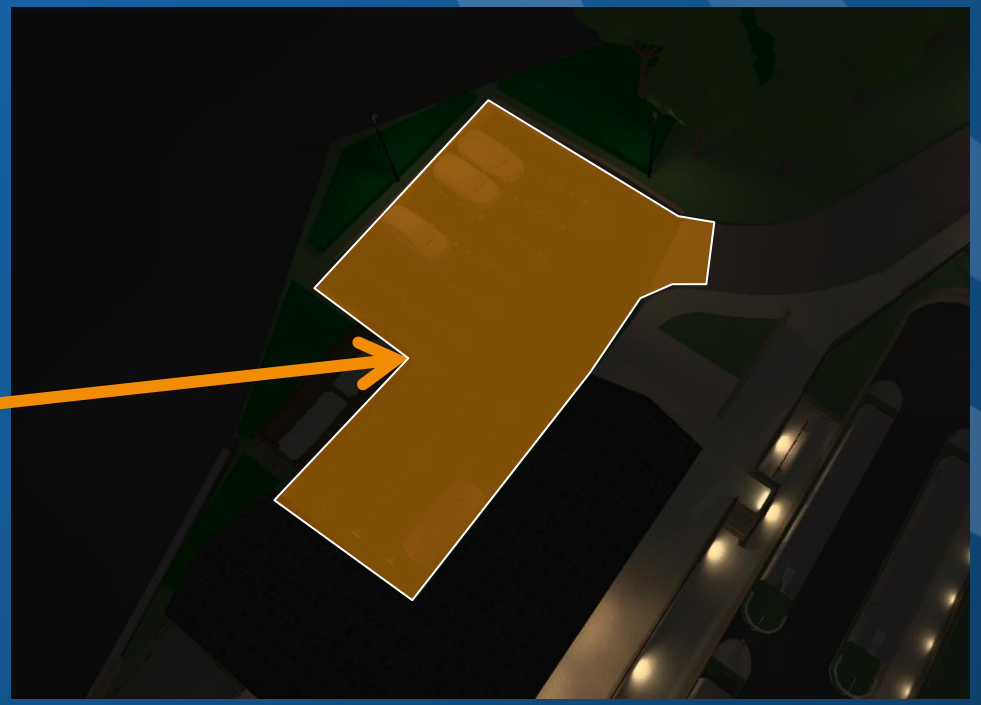
P Classes

Class	Horizontal Illuminance (lux)			
	Horizontal Illuminance		Additional requirement if facial recognition is necessary	
	$\bar{E}$	E_{min}	$E_{v,min}$ lux	$E_{sc,min}$ lux
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P2	10.0	2.0	3.0	2.0
P3	7.50	1.5	2.5	1.5
P4	5.00	1.0	1.5	1.0
P5	3.00	0.6	1.0	0.6
P6	2.00	0.4	0.6	0.2

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CALCULATION RESULTS





Results	
Eav	5.09
Emin	1.40
Emax	15.35
Emin/Emax	0.09
Emin/Eav	0.28

NOTE 2 Table 4 is extrapolated from BS EN 12464-2:2014, Table 5.9.

Table 4 — *Maintained lighting levels for outdoor car parks*

Type of area and usage	$\bar{E}$	U_o
	Values in lux	
Light traffic, e.g. parking areas of shops, terraced and apartment houses; cycle parks	5	0.25
Medium traffic, e.g. parking areas of department stores, office buildings, plants, sports and multipurpose building complexes	10	0.25
Heavy traffic, e.g. parking areas of major shopping centres, major sports and multipurpose sports and building complexes	20	0.25

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CONTROL STRATEGY

- Building-mounted lighting
  - Timeclock – on/off
  - Hire Boat Business Premises dimmed to 25%
  - Fuel storage dimmed to 70%
- Bollards
  - Time clock in feeder pillar
  - Power reducer
  - PIR option
  - Dimmed to 25%
- Street lighting
  - Photocell – on/off
- Wall-recessed lighting
  - Time clock in feeder pillar – on/off
  - Quayside recessed dimmed at variable levels
- Sloped Ramp and Staircase recessed dimmed at 30%

INDICITIVE ENERGY CALCULATIONS

	100%	10%	15%	20%	25%	30%	40%	60%	70%						Total Wattage	
Linear LED Strip	**6W**		0.9W			1.8W						1 x 0.9W = 0.9W	4 x 1.8W = 7.2W		8.1	
Wall Recessed	**20.4W**	2.4W		4.08W	5.1W			12.2W		5 x 2.4 = 12W	3 x 5.1 = 15.3W	10 x 4.08 = 4.8W	10 x 12.2 = 122W		154.1	
Wall Recessed	**5.8W**						2.3W					1 x 2.3 = 2.3W			2.3	
Bollard	**6.5W**				1.6W							4 x 1.6W = 6.4W			6.4	
Street Lighting	**5.8W**											4 x 5.8W = 23.2W			23.2	
Building Bulkhead	**13.5W**				3.38W				9.45W			6 x 3.38W = 20.28	1 x 9.45W = 9.45W		29.73	
Building Bulkhead	**5W**								3.5W			3 x 3.5W = 10.5W			10.5W	
															223.83	**W**

VISUAL RENDERS



Overview of site

VISUAL RENDERS



Looking south along quaysides

VISUAL RENDERS



Looking down southern ramp

VISUAL RENDERS



Plan view of site

VISUAL RENDERS



Northern staircase viewpoint

VISUAL RENDERS



Bollard path

VISUAL RENDERS



View of Quaysides

VISUAL RENDERS



View of car park

VISUAL RENDERS



View of car park looking northwards