studio 29

the language of light

0184 - KINGS CROSS BRIDGE 2

Lighting Design Information

Planning Information
15/02/2021

KINGS CROSS BRIDGE 2

The Brief

The new bridge across the Regents Canal connects the South to the North-West within the Kings Cross Estate with a pedestrian only footbridge. The distinctive architectural style provides an aesthetically pleasing and functional solution to help pedestrians move with ease and increase footfall to the area.

One of the key aspects to the new bridge design is the integrated lighting to be used at night. Lighting is integrated into the bridge to allow pedestrians to cross safely and with ease. It also illuminates the structure of the bridge to celebrate the architecture and enhance the pleasant atmosphere around the Kings Cross area.

The lighting design has been carefully considered and thoroughly mocked-up by Studio 29 to ensure a seamless solution which provides a pleasant walkway across the canal whilst ensuring minimal impact on surrounding environment.

The key lighting objectives for the bridge include:

- A creative lighting scheme which compliments and highlights the architectural structure
- A functional design providing safe egress across the bridge with light levels complying to the relevant lighting guidelines.
- Integration of lighting control to create different lighting scenes and the potential to interact with the public. The lighting controls should also allow the lighting to switch on and off at set times.
- A carefully designed scheme which considers the surrounding environment and existing wildlife
- A lighting scheme that integrates fully with the bridge minimising visible cables and infrastructure
- A flexible lighting scheme which can be used for day to day lighting but also can offer an enhanced scheme for special occasions and site wide events.
- Lighting which entices people to walk across the bridge, increasing footfall and allowing people to feel safe

Planning Approval of Reserved Matters Granted
Bridge 2
King’s Cross Central
London
N1C 4AA
Prior to the operation of the bridge hereby approved, full details of the proposed lighting scheme, confirming that no blue lighting shall be used on the underside, shall be submitted to and approved in writing by the Local Planning Authority. The approved lighting scheme should be implemented in accordance with the approved details.
Reason: In order to protect and conserve the waterway setting and wildlife habitats in accordance with the requirements of the London Plan (2016) and Policies A3 and CC2 of the London Borough of Camden Local Plan 2017.

KINGS CROSS BRIDGE 2

The Proposed Lighting Scheme

The lighting to Kings Cross Bridge 2 aims to create a visually exciting and safe route for the public to cross with ease between Granary Square and Kings Cross. The lighting scheme celebrates the form and structure of the bridge by discreetly integrating lighting and ensuring a sensitive design which has minimal impact on the surrounding canal and wildlife.

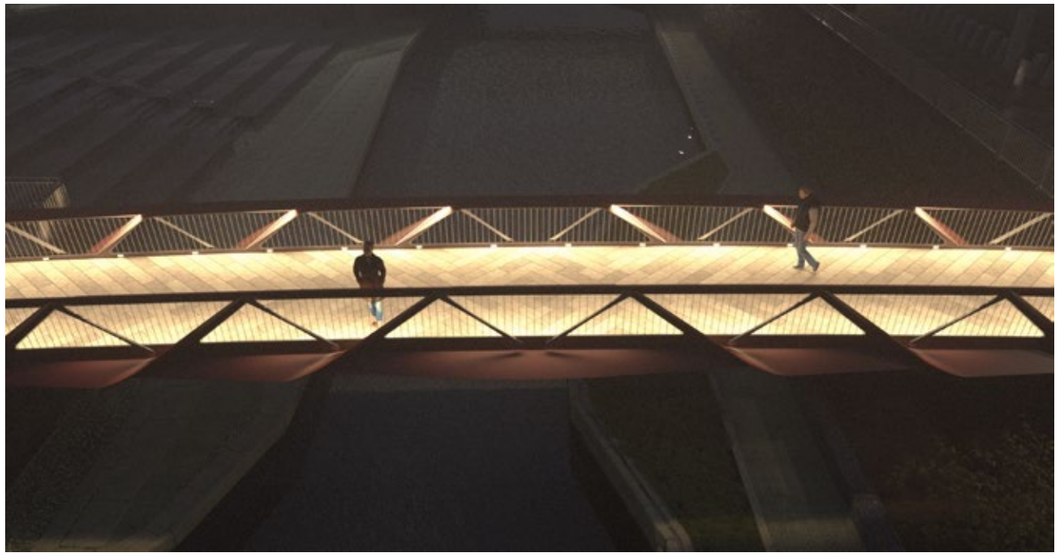
The lighting design to the bridge consists of three main elements
1) Low level recessed lights within the up-stand to illuminate the deck - this contributes to a safe light level in a visually interesting way
2) Linear lighting under the handrail on the internal side to provide a uniform level of light to the deck
3) Linear lighting integrated under the handrail on the outside to illuminate the structure to highlight the bridge shape and form

The lighting will be white and colour change which allows for multiple scenes to be created. A white light will be for everyday use with a coloured lighting for special events. The geometric forms and soft curves are illuminated to create a lighting scheme which is both visually striking and complementary to the architecture.

In order for the lighting design to meet with the objectives from the brief numerous different elements have been considered. Fittings have been carefully selected and undergone numerous mock-ups to to ensure the best fittings for the job have been selected. The locations of the fittings has been carefully evaluated to provide discreet locations which provide suitable lighting to deck and structure whilst minimising any light spill. The fittings are all RGBW fittings allowing for both white light everyday and colour change. White light will be used for the day to day lighting scheme with coloured light for special occasions or events. To ensure the bat flight path is not harmed no blue light will be used at all throughout any of the lighting schemes. Lighting colour palettes will be carefully selected which compliment the colour of bridge and provide a warm and welcoming pathway across.

The light fittings will all be fully controllable allowing the fittings to be dimmed to a suitable level which will provide a pleasant atmosphere and minimise any light spill whilst still maintaining suitable light levels to allow pedestrians to walk with ease. The use of a control system allows the lighting to be switched on and off at set times to avoid unnecessary use of lighting. It is proposed the lighting will come on one hour after sunset and reduce to a lower level at 11pm, which will then be able to rise to slightly higher light levels as people cross it with the use of presence detector sensors. The lighting will all be set to suitable levels depending on the time of day. No lighting will be on during daylight hours to reduce unnecessary energy and light pollution.

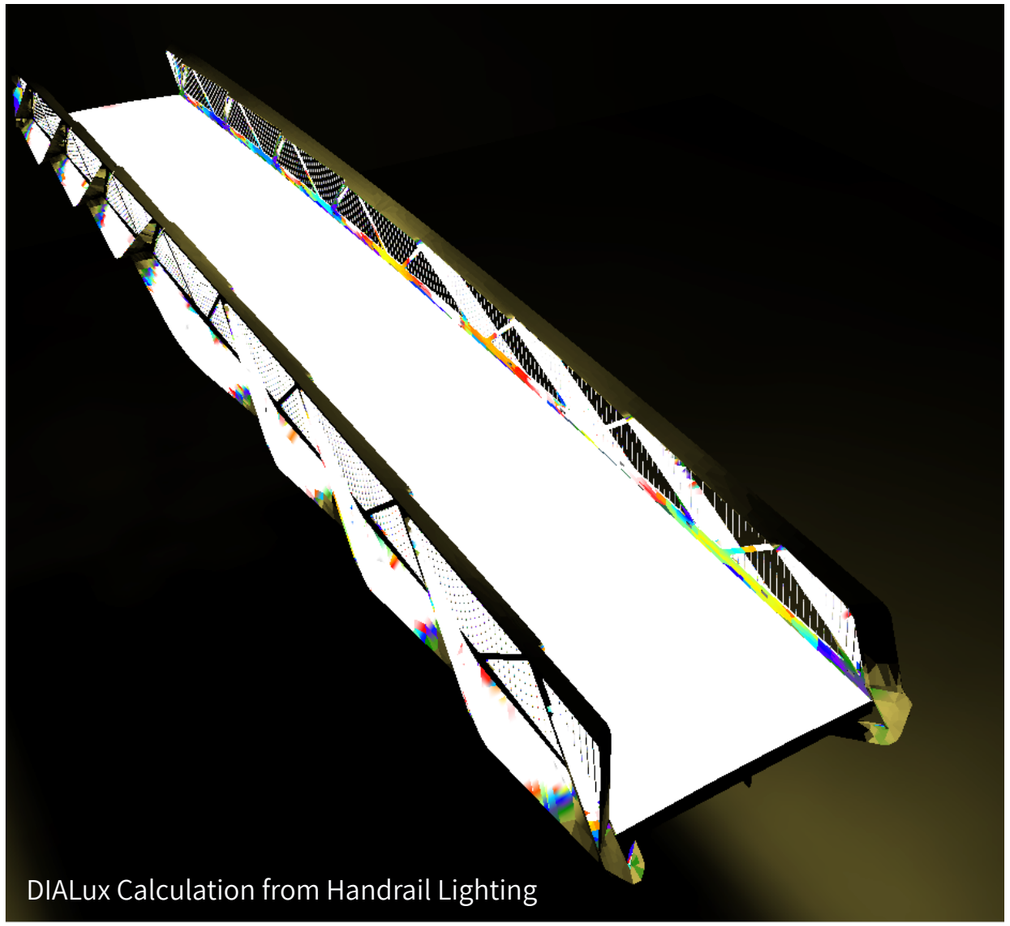
All lighting is energy efficient with long life LED sources which have a minimal power consumption and are low maintenance. All cabling will be kept as discreet as possible to minimise visibility and not to impact on the aesthetics of the bridge. Calculations have been undertaken using lighting software to measure the lighting to the bridge deck to ensure compliance and also to ensure suitable positioning and dimming of luminaires to minimise any light spill.



KINGS CROSS BRIDGE 2

Handrail Lighting Design - Internal Lighting

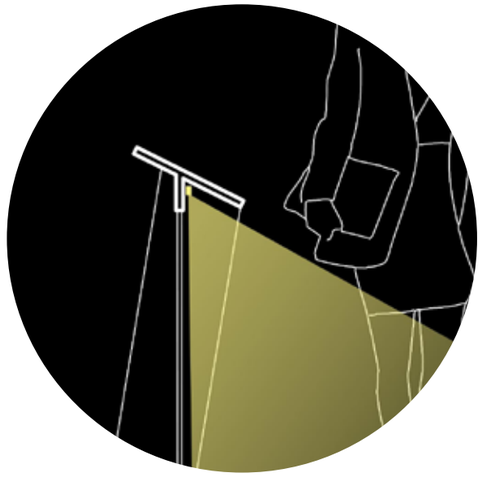
It is proposed linear LED is discreetly located under the internal side of the handrail to direct light in the correct orientation towards the deck and avoiding spill light into the canal.
The size and orientation of the fittings limit direct views with no direct upward light. The luminaire can be controlled in small increments and therefore can be dimmed to find the correct balance between the handrail lighting and deck lighting. The linear ED provides the base lighting to the deck providing a uniform light level aiding with safe passage. The lighting control allows for colour change settings for special events, which can reflect what is taking place across the Kings Cross Estate. The LED fitting has a low energy consumption and long lifespan and is designed for an outdoor environment.



DIALux Calculation from Handrail Lighting

False Colours

15 lux	9lux	4 lux
13 lux	7.5 lux	2 lux
11 lux	6 lux	0 lux



Linear LED located under the handrail to light the bridge deck

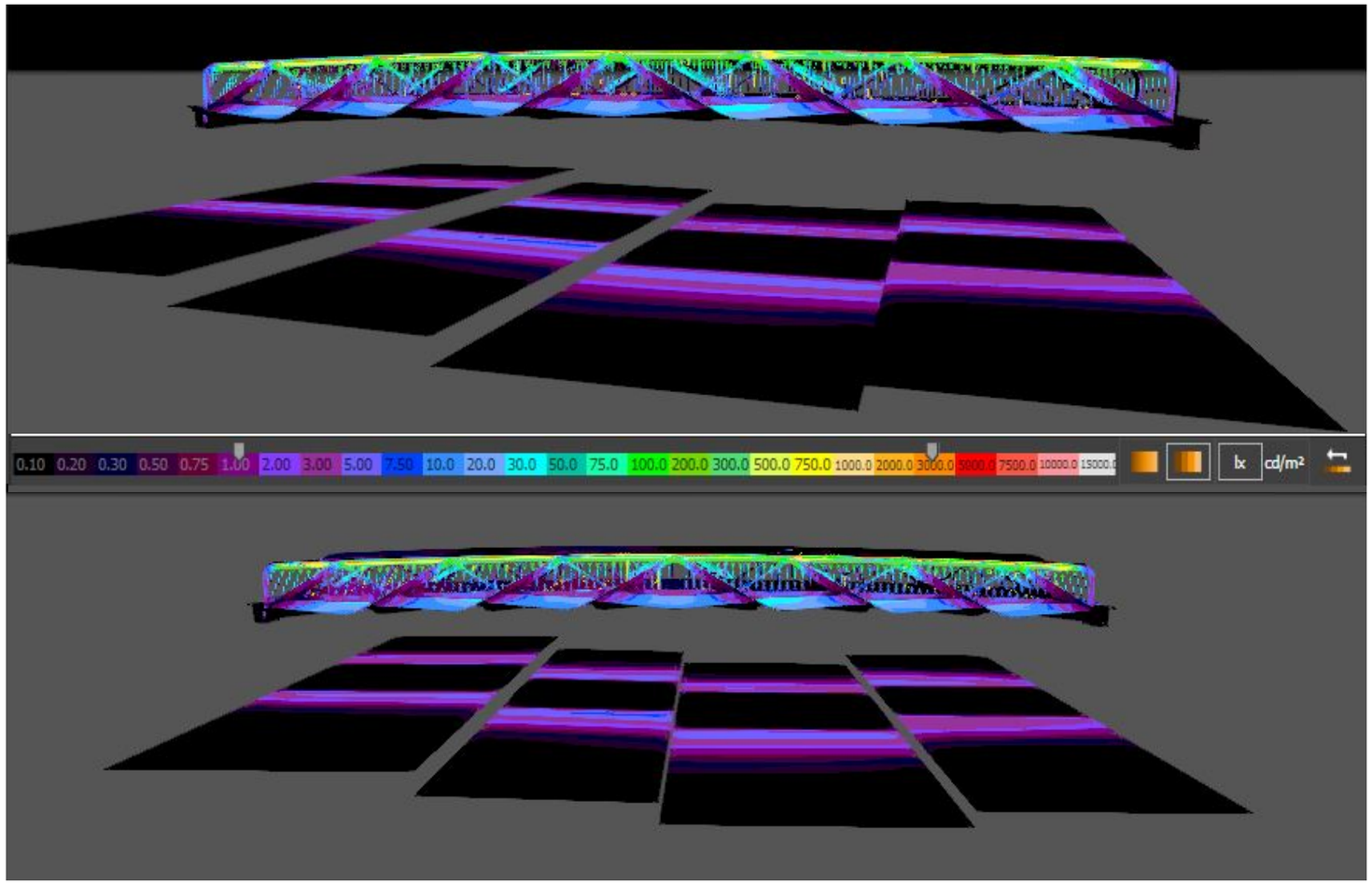
RGBW Flexible Linear LED

KINGS CROSS BRIDGE 2

Handrail Lighting Design - External Lighting

To illuminate the outside of the bridge structure, linear lighting will be located under the handrail on the outer face and directed back towards the bridge structure to minimise light spill towards the waters surface. The position of the luminaire has undergone numersous mock-ups and it is concluded this is the most suitable position to effectively illuminate the architecture highlighting its unique shape whilst limiting spill light onto the canal and minimising upward light. The lighting on the outside will be dimmed down to 50% to provide a gentle glow to the structure and a low level of illumination on the tow paths. All the lighting on the scheme is fully controllable and will be commissioned on site during night hours to ensure a careful balance of light is achieved.

DIALux Model Showing Minimal Light Spill From the Linear LED Under the Handrail



Intended Light Distribution from the Linear LED Under the Handrail

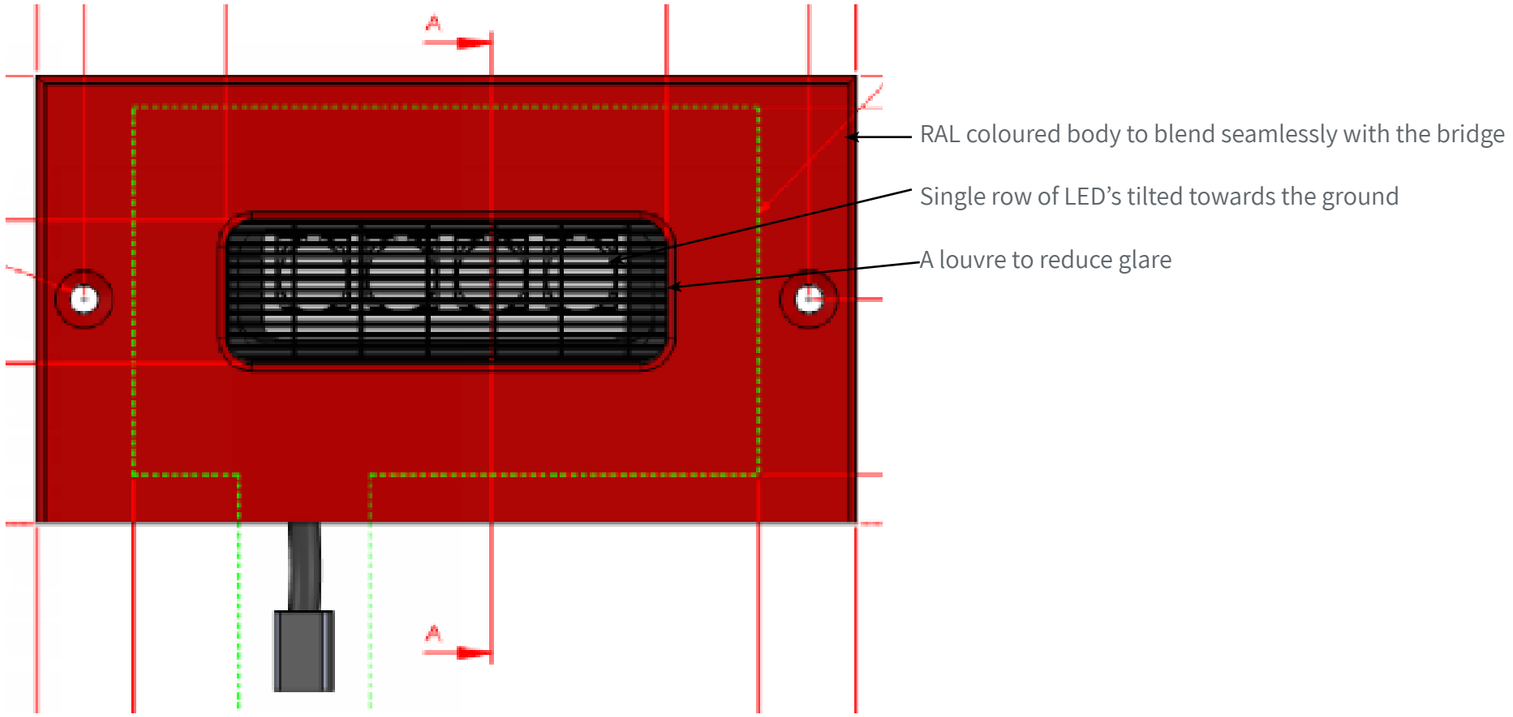
KINGS CROSS BRIDGE 2

Internal Low Level Deck Lights

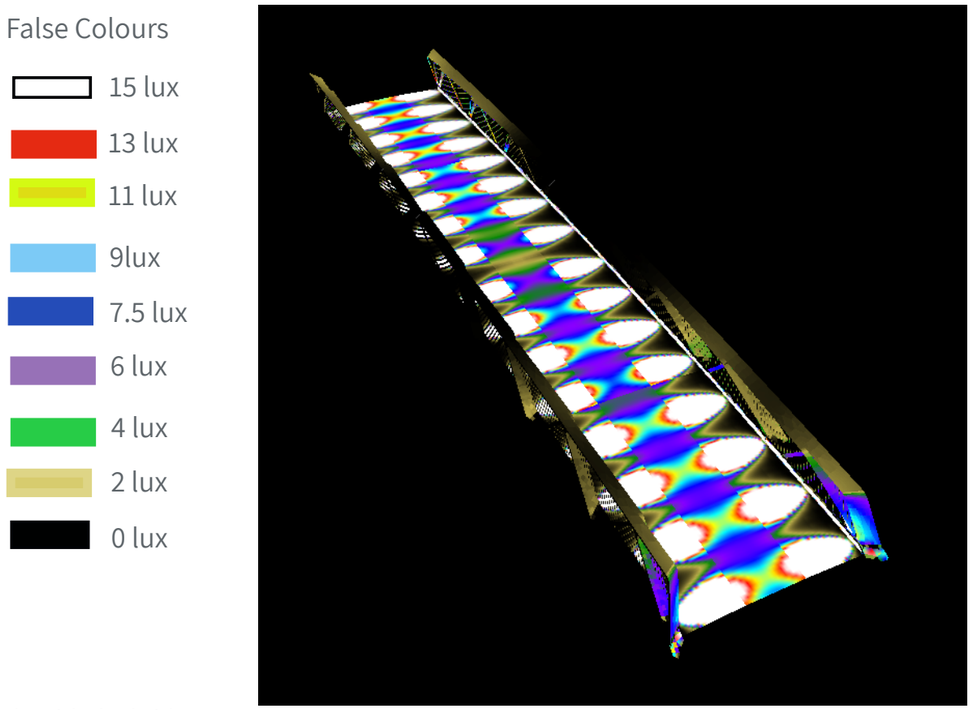
Low level lights are recessed into the up-stand of the bridge deck. These fittings have been custom designed to ensure light is only directed onto the deck surface with minimal glare. Multiple mock-ups have been undertaken with various beam angles, outputs and louvers to ensure adequate light levels for compliance but minimise any upward light pollution or spill light. The integration of a louvre and a single row of LED's tilted downwards towards the deck ensure that glare is minimal and all light is directed where required.

The fittings are located at set intervals, two per truss structure, and have a 40 degree round beam distribution, to create a geometric pattern of light across the deck. These lights provide visual interest and a consistent rhythm to the deck encouraging pedestrian flow across the bridge. The lights are RGBW therefore have the ability to be white for every day use and colour change for special occasions and events.

Presence sensors are located at either end of the bridge to activate the deck lights. This will be particularly advantageous late night, so the light levels can be further reduced, minimising energy consumption until activated and the lighting increases for a period of time to ensure safe crossing.



Deck Light Luminaire



DIALux Showing the Deck Light Beam Distribution Across the Bridge Deck

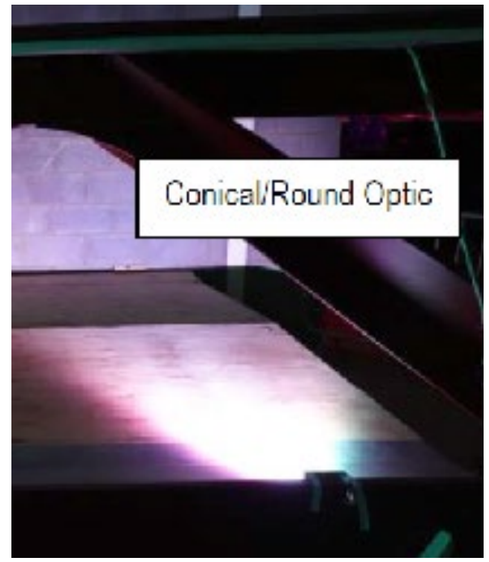


Photo of round beamed luminaire

KINGS CROSS BRIDGE 2

Compliance Requirements

The bridge lighting scheme has been designed to comply with the British Standards guidelines and provides a suitable level of light without compromising the original design intent.

The linear lighting under the handrail on the internal elevation will achieve the minimum 15 lux required, whilst the low level deck lights will supplementary to achieve an average illuminance of 30 lux. The use of lighting control and scene-setting ensures that the lit effect between the three light sources will be balanced to provide the required lux levels

Daily hours of operation will be from Sunset to Sunrise, with white light only.

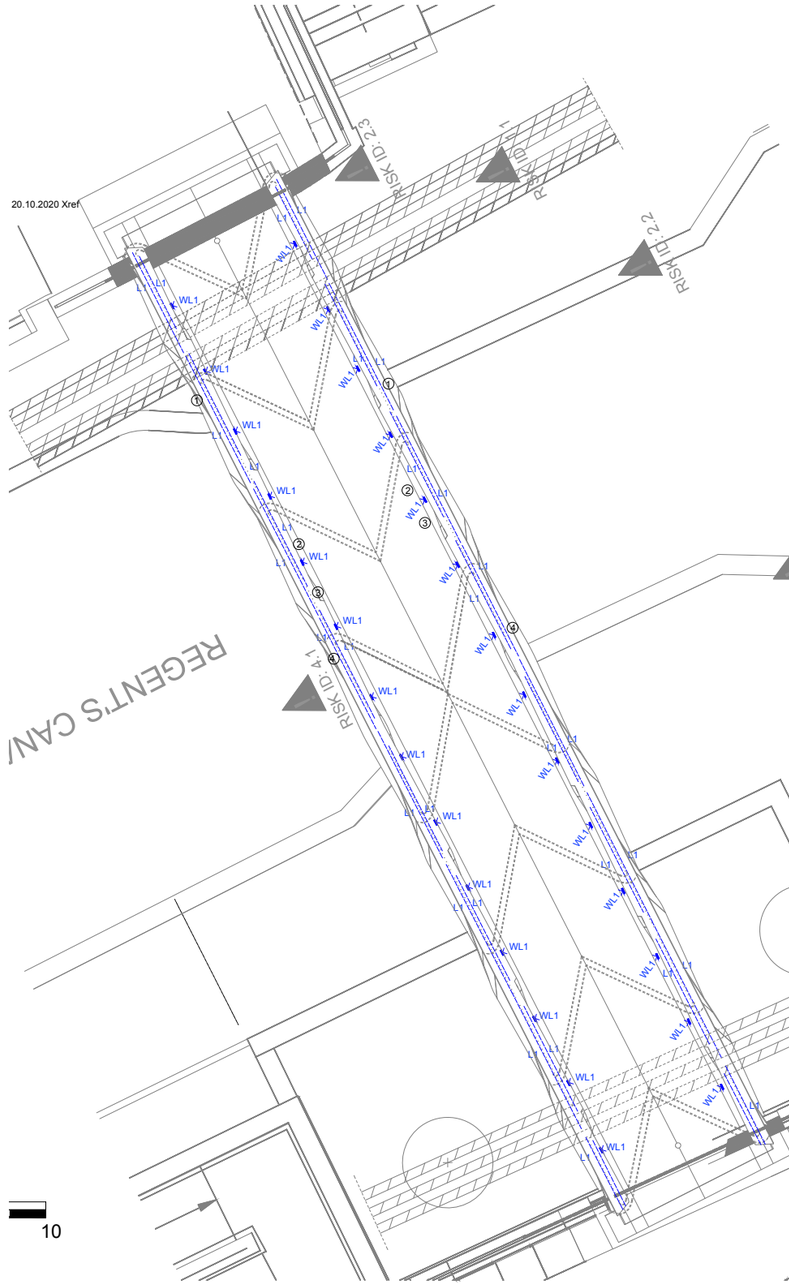
Table 4 **Maintained lighting levels for subways, footbridges, stairways and ramps**

Values in lux

Type	Day		Night	
	$\bar{E}$	E_{min}	$\bar{E}$	E_{min}
Subways				
• open [A)]	—	—	50	25
• enclosed [B)]	350	150	100	50
Footbridges				
• open [A)]	—	—	30	15
• enclosed [B)]	350	150	100	50
Stairways/ramps				
• open [A)]	—	—	30	15
• enclosed [B)]	350	150	100	50

A) "Open" equates to major daylight penetration.
B) For "enclosed" areas emergency lighting might be needed. It is essential that it is installed if the area forms part of an escape route from a shopping centre, car park or transport interchange.

BS 5489-1 Table 4 - Footbridge Lighting



studio 29

The Boathouse
The Embankment
London
SW15 1LB

+44 (0)20 8780 9006
info@studio29lighting.com

studio29lighting.com