



THG

KING STREET TOWNHOUSE SPECIALIST LIGHTING DESIGN

Lighting Report for Planning

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INTRODUCTION

Scope & Overview

This document presents a concept lighting proposal for the facades of THG's King Street Townhouse.

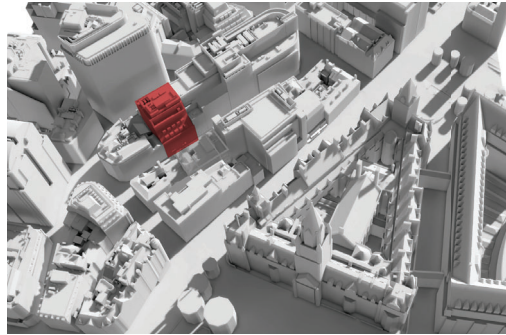
The report details a lighting strategy for both Kennedy Street and Booth Street which enhances the evening and night time appearance of the street, sensitively highlights the architecture whilst mitigating light spill.

Illumination of the built environment shapes the perception of night time experience during the hours of darkness. Quality architectural lighting enhances the cultural value and attractiveness of the surroundings and enhances the perception of brightness which increases the general feeling of safety.

Within this report, performance guidelines and limitations will be identified in accordance with relevant British Standards and best practice guidance documents.

The main drivers of the lighting design are:

- Aesthetic appeal. The design will meet the aesthetic aspirations of the client, celebrate the architecture, enhance the prestige of the building and increase their attractiveness and commercial value.
- Low light pollution. The facade lighting must not cause nuisance to neighbouring buildings. Spill light into the sky is to be minimised.
- Contextual sensitivity. The design should be sympathetic to the historic architecture. The placement of luminaires and associated wiring is to minimise impact to the building structure.
- Sustainability. The design will use the latest luminaire technology and controls to minimise energy use and create an easily maintainable installation



Site Context



Street View - Kennedy Street Facade



Street View - Booth Street Facade



Existing Facade Lighting - Kennedy Street Facade



Existing Facade Lighting - Booth Street Facade

CONCEPT OVERVIEW

Booth Street Facade Lighting Treatment

Existing facade lighting is large, insensitively mounted and doesn't produce a good lit effect. The proposal is for it to be removed. Where possible light sources will be located on ledges. Where this is not possible small dimension luminaires will be used to minimise visibility of the fitting.

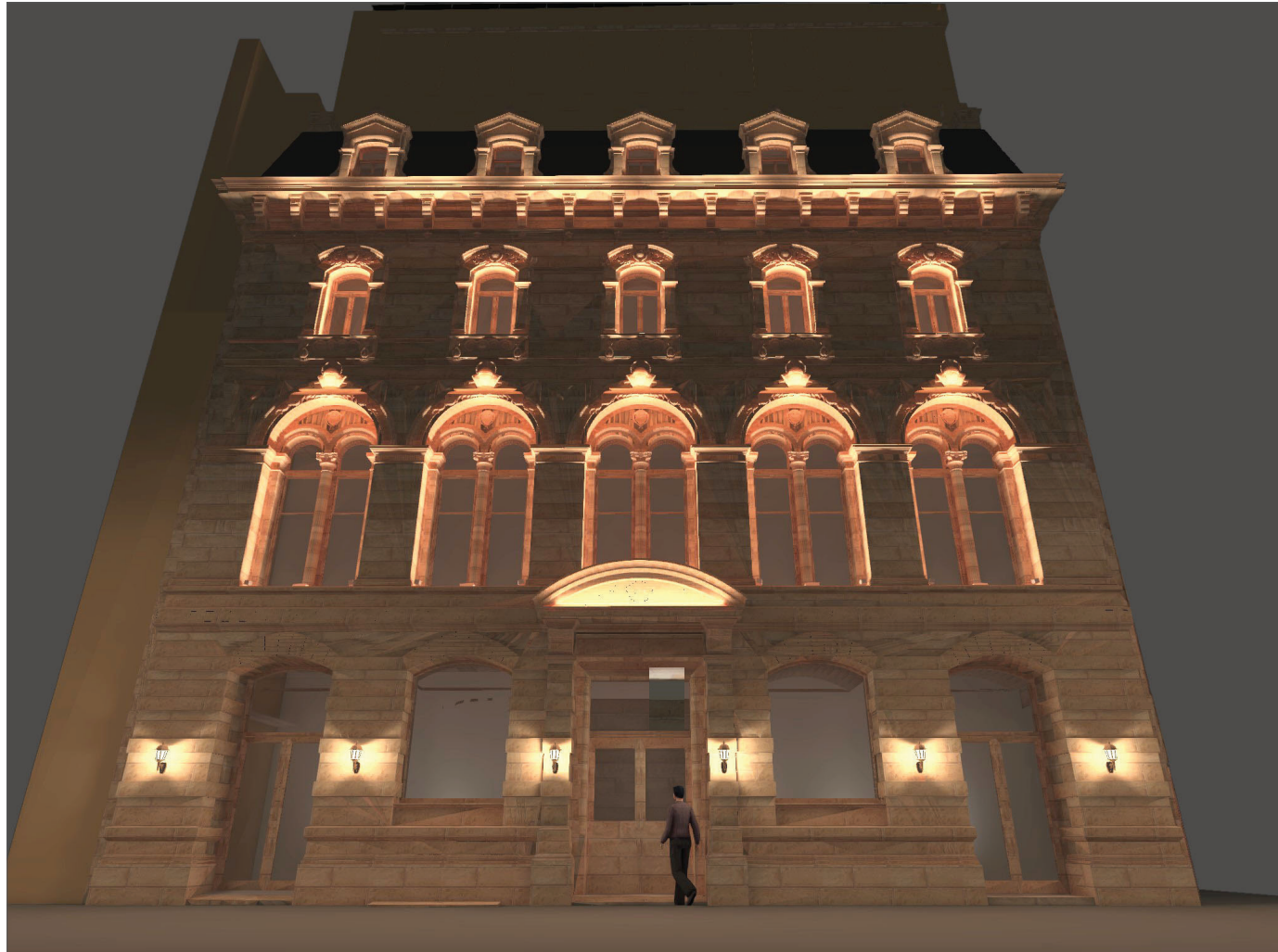
The lighting concept for the lowest portion of the facade is to create a subtle wash of light onto the street level facade detail and enhance light levels to the immediate paved area. A wall light/pendant feature is proposed either side of the entrance, this will likely be a bespoke 'coach light' style fitting. Accent illumination is also proposed to the pediment detail of the canopy which is not currently lit.

The upper facade lighting concept is to highlight window reveal detail as well as protruding stone detail with close offset linear uplights. High level linear uplights will also highlight the cornice.

Spill light from street lighting onto the facade is unsightly. To create a blank canvas to realise this facade design we propose spill light shields are added to the two existing street light columns that are located in front of the building.



Entrance canopy ornamental pediment detail



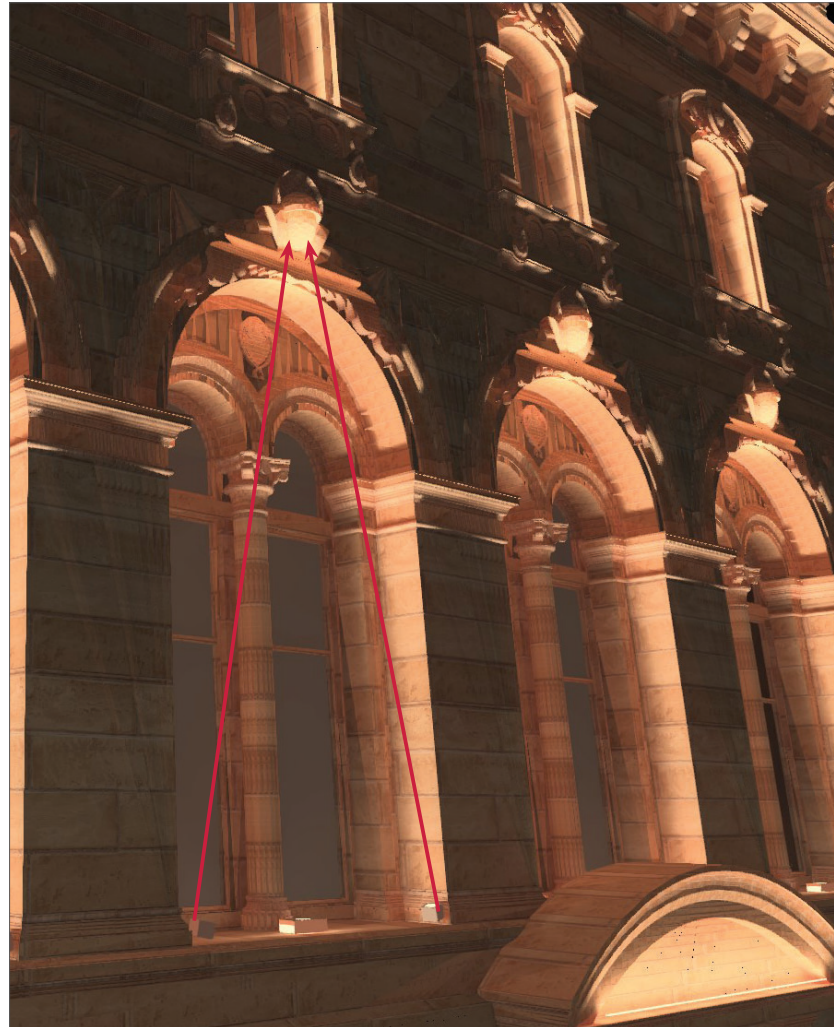
Booth Street Elevation - Lighting Software 3D View

CONCEPT OVERVIEW

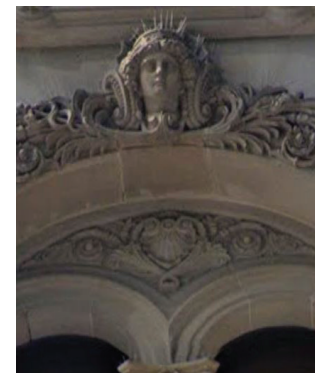
Booth Street Facade Lighting Treatment



Booth Street Elevation - Lighting Software 3D View



Booth Street Elevation - Lighting Software 3D View - Narrow beam mini projectors to highlight sculpted keystones.



Keystone face detail.

TECHNICAL DESCRIPTION

Booth Street Facade Lighting Strategy

Lighting Treatment & Luminaires

1. Illumination to window reveals from ledge mounted luminaires.
2. Illuminate window surrounds with ledge mounted uplight with precise wide optics.
3. Accent illumination to stonework face detail from ledge mounted narrow beam mini projectors.
4. Uplight to canopy detail from ledge mounted LED strip

Quality of Light

White light shall be specified. Colour temperatures shall be within the warm white range (2700K - 3000K) and shall be selected according to the materials lit.

Luminaire selection

The size of lighting equipment shall be minimised where possible. Where luminaires are not concealed from view they shall be finished with the appropriate RAL colour to reduce their visual impact.

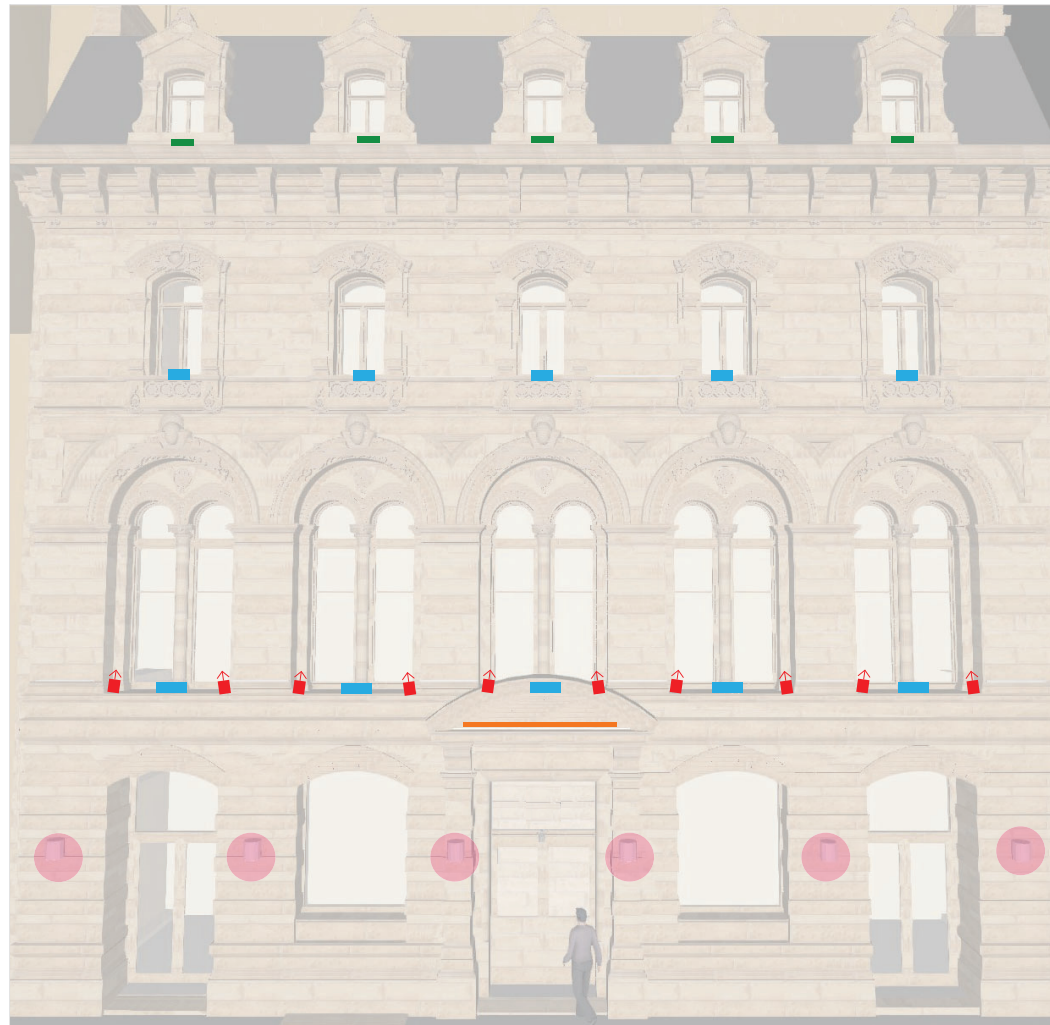
Luminaire specification is to be finalised following detailed mock ups.

Wiring

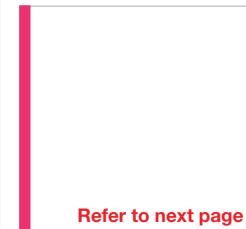
Cabling shall be considerably designed to minimise the visual impact. Cabling routes shall be determined at the next stage of design.

Luminaire Fixation

Fixation methods which are sympathetic to the building fabric are to be explored at the next stage of design.



Booth Street - Facade Lighting Mark-Ups



Indicative Luminaire Typologies

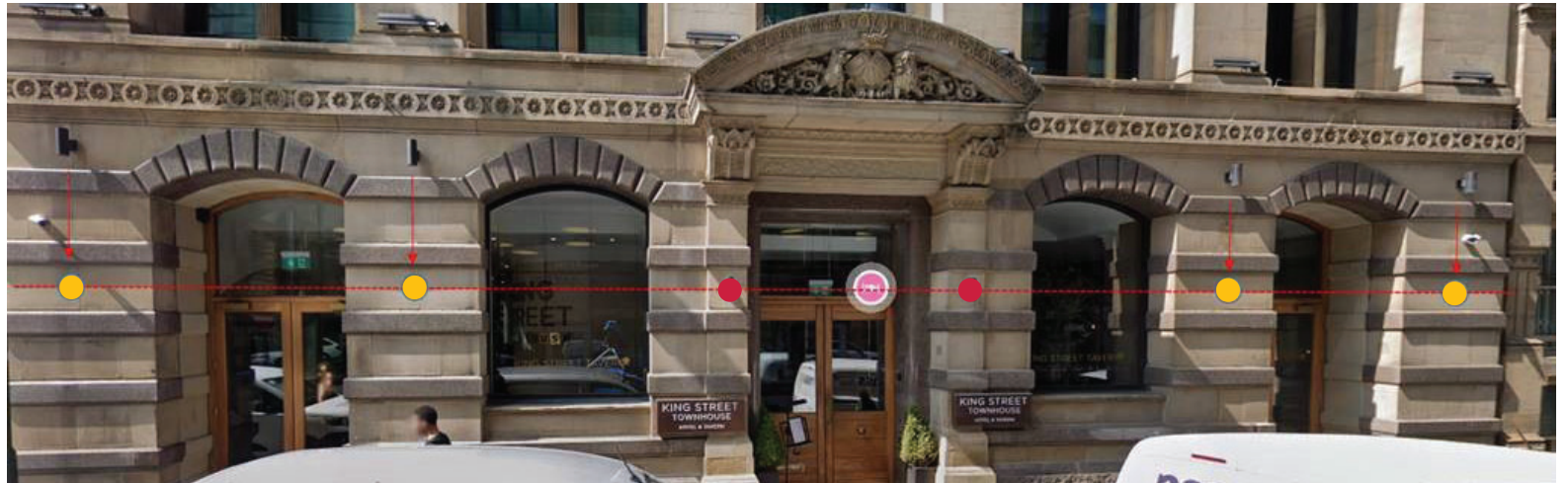
TECHNICAL DESCRIPTION

Booth Street Facade Lighting Strategy

To give the lower facade and entrance subtle street presence new wall lights and an external entrance luminaire is proposed. To create a consistent luminaire datum which is sensitive to the facade detailing, lowering of four existing wall lights proposed.

The style of the luminaires will be chosen to compliment the heritage facade and interior fittings. A luminaire images shown are indicative.

The two wall lights located by the entrance could be combined with illuminated signage.



Precedent 'Coach' style luminaire images



Indicative luminaire types - Wall lights

CONCEPT OVERVIEW

Kennedy Street Facade Lighting Treatment

The proposal for this facade is to re-use all the existing lighting locations and replace the luminaires to improve the lit effect. New luminaires will be introduced around ground level doors and high level crown to enhance the decoration detail and enhance street level illumination.

The lit effect and luminaires types used will complement the THG properties located opposite on Kennedy Street.



Facade Elevation - Lighting Software 3D View

TECHNICAL DESCRIPTION

Kennedy Street Lighting Strategy

Lighting Treatment & Luminaires

1. a - To highlight the entrance pilasters and canopy detail wall mounted luminaires with a combination of wide beam uplight and narrow (controlled) beam downlight.
1. b - Illumination to the window pilasters and stonework detail from wall mounted luminaires with single direction controlled distribution.
2. Close offset linear uplight to emphasise the surface texture of the facade crown.
3. Uplight with precise optics to highlight distinctive architectural cornice details and enhance the verticality of the pilasters.

Quality of Light

White light shall be specified. Colour temperatures shall be within the warm white range (2700K - 3000K) and shall be selected according to the materials lit.

Luminaire selection

The size of lighting equipment shall be minimised where possible. Where luminaires are not concealed from view they shall be finished with the appropriate RAL colour to reduce their visual impact.

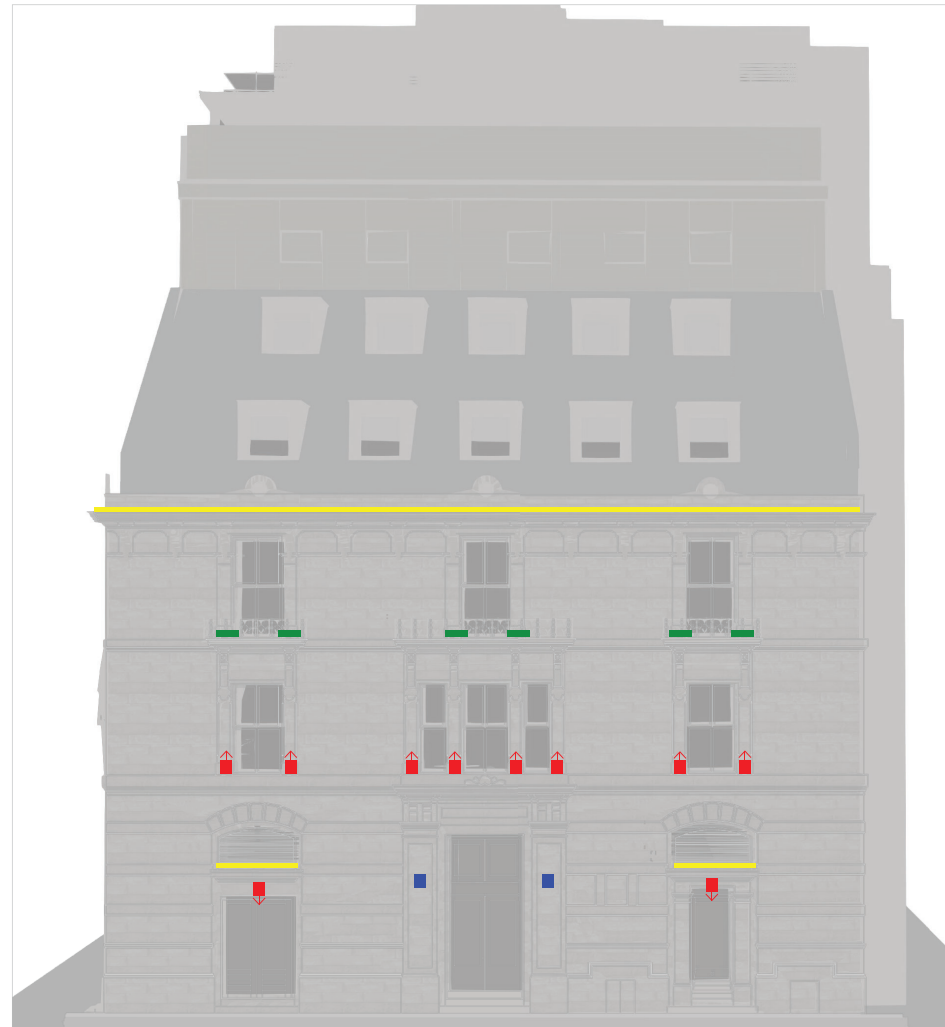
Luminaire specification is to be finalised following detailed mock ups.

Wiring

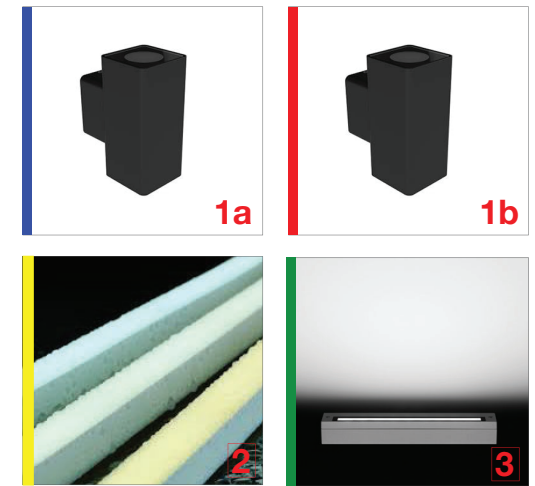
Cabling shall be considerably designed to minimise the visual impact. Cabling routes shall be determined at the next stage of design.

Luminaire Fixation

Fixation methods which are sympathetic to the building fabric are to be explored at the next stage of design.



Kennedy Street Elevation Lighting Mark-Ups



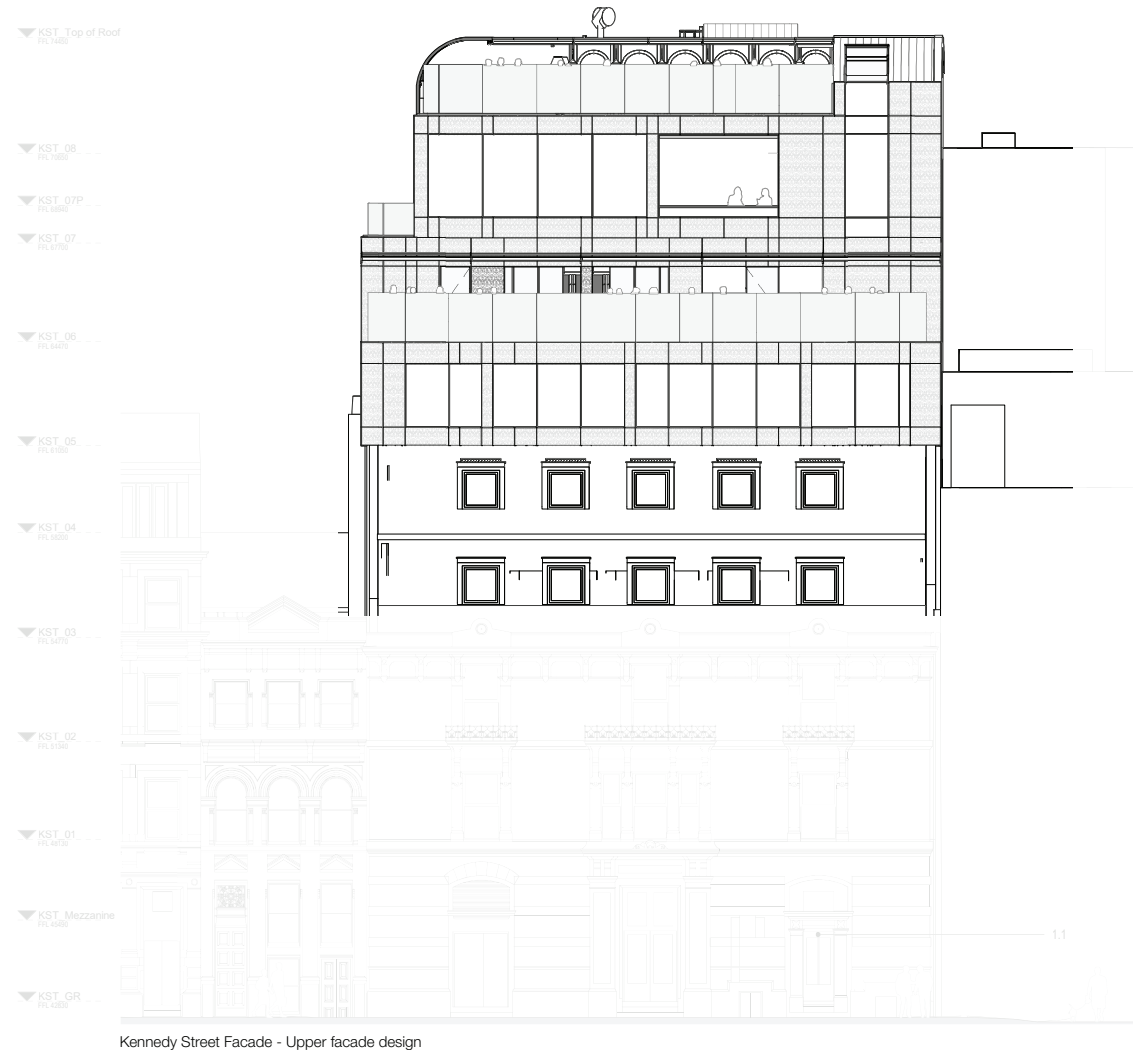
Indicative Luminaire Typologies

CONCEPT OVERVIEW

Upper Facade and Roof Terrace Lighting Treatment

No facade lighting is proposed to the upper facade.

The roof terrace with retractable roof system shall be illuminated with low level/floor mounted luminaires and to low light levels to create an intimate, discrete and high-quality atmosphere. The intention is to create negligible visibility of light sources from street level. The approach will permit unobtrusive views across the surrounding skyline.



TECHNICAL APPENDIX

Design Objectives

Performance objectives & design parameters

The design objectives of each lighting scheme may be summarised as:

- Provide general exterior lighting to the areas defined within the area of scope agreed with the client
- To limit light pollution and light trespass to neighbouring properties
- Provide effective lighting control to ensure illuminance levels are suitable for the activities taking place while also maximising light source life, and minimising energy consumption and maintenance.
- Provide a cost effective, sustainable and energy efficient system, in terms of initial capital costs and continuing operational use.
- Select light source types for their efficacy, colour rendition and longevity to provide an efficient lighting solution with a predictable maintenance regime.
- Utilise light source types appropriate for the character and function of each space while retaining a coherent, rationalised illumination system in terms of lit effect and equipment installed.

British Standards, Codes of Practice and Best Practice professional guidance publications will form the parameters of the lighting installation:

- ILP Guidance Notes for the Reduction of Obtrusive Light GN01/20
- LG6 The Exterior Environment, CIBSE 2016
- BS EN 12464-2:2014 Light and lighting - Lighting of work places. Outdoor work places
- SLL Lighting Handbook, 2018

Illuminance criteria & light levels

It is important to select light levels appropriate for the task taking place. British Standards and CIBSE guidance all stipulate appropriate light levels however where there an option to select a level from more than one document, the lower light level should typically be sought.

Exterior illuminance criteria as set out in BS EN 5489-1:2013 is dependant upon the district brightness where the lighting is to be deployed. The district brightness is determined according to criteria set out in ILP publication Guidance Notes for the Reduction of Obtrusive Light and requires knowledge of the local area.

Lighting controls & dimming

A lighting control system shall be provided to enable appropriate illumination levels to be controlled to meet the design intent. This shall also result in energy savings, minimisation of operational hours and therefore reduced running and maintenance costs for the life of the system.

Control of exterior lighting is to be linked to the hours of darkness and time of day. This shall be through the utilisation of a photocell unit and timeclock. All exterior lighting shall be switched off during hours of daylight and switched on at dusk. Luminaires may be switched off at a predetermined curfew time according to the planning conditions and Client's requirements.

LED technology has made it possible to vary external light levels via dimming. This approach helps to minimise energy consumption and also reduces disturbance to residents and wildlife. The opportunity to use these technologies should be investigated and reviewed during the design of any new lighting installation or the replacement of existing lighting systems.

Time clock control

Facade lighting operation is proposed up to 2am, at this time luminaires will be switched off. This aligns with the proposed terrace operation times. A reduced output dimming level can be programmed between 11pm & 2am.

Access and Maintenance (CDM)

For the facade lighting installations it is envisaged that MEWP access would be utilised for scheduled maintenance. Further detail shall be developed at the next stage of the design.

TECHNICAL APPENDIX

Light Pollution

Reduction of Light Pollution

The following explanation and advice is taken from the Institution of Lighting Professionals, Guidance Notes for the Reduction of Obtrusive Light GN01:2020:

Light Pollution

Light pollution, or obtrusive light, can create serious physiological and ecological problems. It takes various forms:

- Sky glow: the brightening of the night sky above our towns and cities.
- Glare: the uncomfortable brightness of a light source in contrast to the background.
- Light Trespass: the spilling of light beyond the boundary of the property on which the light source is located.
- Light Ingress: the passage of light into buildings from an external source(s). Obtrusive light is a nuisance to both humans and wildlife; it is a waste of energy and contributes to greenhouse gas emissions. The problems of unnecessary, obtrusive light can and should be reduced or eliminated at the design stage.

During the design phase of a lighting installation, consideration of the following measures to reduce the occurrence of obtrusive light is taken.

Luminaire Technology

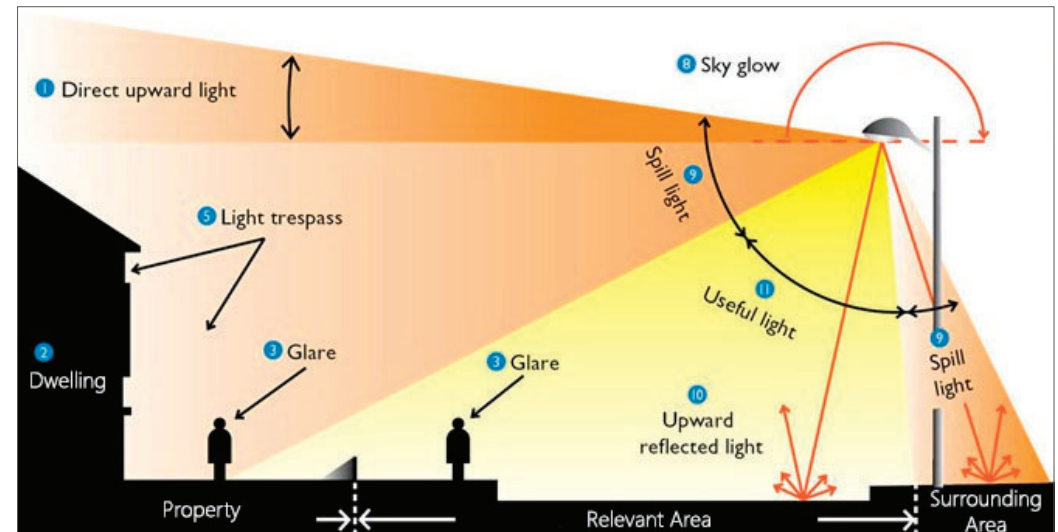
When specifying luminaires, careful consideration is given to minimising upward light and the use of optical units with precise light intensity distribution: thus ensuring that spill and glare are minimised. The lighting scheme is designed to have minimal impact on the surrounding environment. Lighting is only installed where a visual task requires it for safety, comfort and well-being. Light levels are kept to the minimum levels needed to meet the requirements. Luminaires with a controlled light distribution ought to be specified in order to ensure that light falls only where it is required. A combination of lighting controls and precise optics will help minimise any impact on the surrounding environment.

Optical control

Using luminaires with good optical control will be crucial in minimising the impact of artificial lighting on the surrounding ecology. Internal reflectors, collimators and louvres all help to focus light on to the intended task area. Flat glass lenses are recommended over curved or bowl lenses to avoid light spill above the horizontal. If required, back-shields can be employed as barrier to stop unwanted light spill.

Luminaire Positioning and Aiming

Except in specific locations, where it is desired that elements of the design are uplift for aesthetic reasons, all general lighting luminaires are positioned to avoid uplighting where possible. Where practical, directional luminaires are utilised to enable the precise projection of light. Proper commissioning will ensure directional luminaires perform as intended.



Light Pollution Explained

TECHNICAL APPENDIX

Technical Considerations - Light Pollution

Environmental Zones

The Institution of Lighting Professionals, Guidance Notes for the Reduction of Obtrusive Light (GN01:2020) provides guidance according to the location of the project.

The King Street Townhouse property falls within Environmental Zone E4 'Town/City centres with high levels of night-time activity'. Refer to Table 1 opposite for details. These principles have been applied during the design of this lighting scheme.

ILP Design Guidance

The following limitations may be supplemented or replaced by a local planning authority's own planning guidance for exterior lighting installations. As lighting design is not as simple as it may seem, you are advised to consult and/or work with a professional lighting designer before installing any exterior lighting. See Table 2.

1. Upward Light Ratio – Some lighting schemes will require the deliberate and careful use of upward light, e.g. ground recessed luminaires, ground mounted floodlights, festive lighting, to which these limits cannot apply. However, care should always be taken to minimise any upward waste light by the proper application of suitably directional luminaires and light controlling attachments.
Guidance Notes for the Reduction of Obtrusive Light GN01:2011
2. Light Intrusion (into Windows) – These values are suggested maxima and need to take account of existing light intrusion at the point of measurement. In the case of road lighting on public highways where building façades are adjacent to the lit highway, these levels may not be obtainable. In such cases where a specific complaint has been received, the Highway Authority should endeavour to reduce the light intrusion into the window down to the post curfew value by fitting a shield, replacing the luminaire, or by varying the lighting level.

3. Luminaire Intensity – This applies to each luminaire in the potentially obtrusive direction, outside of the area being lit. The figures given are for general guidance only and for some sports lighting applications with limited mounting heights, may be difficult to achieve.
4. Building Luminance – This should be limited to avoid over lighting, and related to the general district brightness. In this reference building luminance is applicable to buildings directly illuminated as a night-time feature as against the illumination of a building caused by spill light from adjacent luminaires or luminaires fixed to the building but used to light an adjacent area.

Table 1: Environmental zone descriptions in ILP guidance		
Category	Lighting environment	Examples
E0	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Intrinsically dark landscapes	National parks, areas of outstanding national beauty, etc
E2	Low district brightness areas	Rural, small village or relatively dark urban locations
E3	Medium district brightness areas	Small town centres or urban locations
E4	High district brightness areas	Town/city centres with high levels of night-time activity
UNESCO United Nations Educational, Scientific and Cultural Organization IDA International Dark Sky Association		

Table 2: ILP numerical guidance on obtrusive light						
Obtrusive light limitations for exterior lighting installations						
Environmental Zone	Sky glow ULR (Max %)	Light trespass into windows E (lux)		Source intensity I (kcd)		Building Luminance pre-curfew
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average L (cd/m²)
E0	0	0	0	0	0	0
E1	0	2	1*	2.5	0	0
E2	2.5	5	1	7.5	0.5	5
E3	5.0	10	2	10	1.0	10
E4	15.0	25	5	25	2.5	25
*	From public road lighting installations only.					
ULR	Upward light ratio of the installation, i.e. the proportion of light from the total installation that goes directly into the sky.					
E	Vertical illuminance in lux on nearby domestic windows.					
I	Light intensity in kilo-candelas in a potentially obtrusive direction, outside of the area being lit. The ILP guidelines state that these figures are for general guidance only and for some sports lighting applications with limited mounting heights may be difficult to achieve.					
L	Luminance in candelas per m². This guideline is intended to apply to buildings that are deliberately floodlit at night. L is a measure of how bright the building appears.					

APPENDIX INFORMATION

Illuminance & Luminance - Booth Street Facades

The lighting design strategy has been developed to minimise the impact to existing neighbouring properties as demonstrated below.

The following images are exported from the lighting software and show both the illuminance (lx) and luminance (cd/m2) of the building's façade.



View from lighting software showing the illuminance (lx)

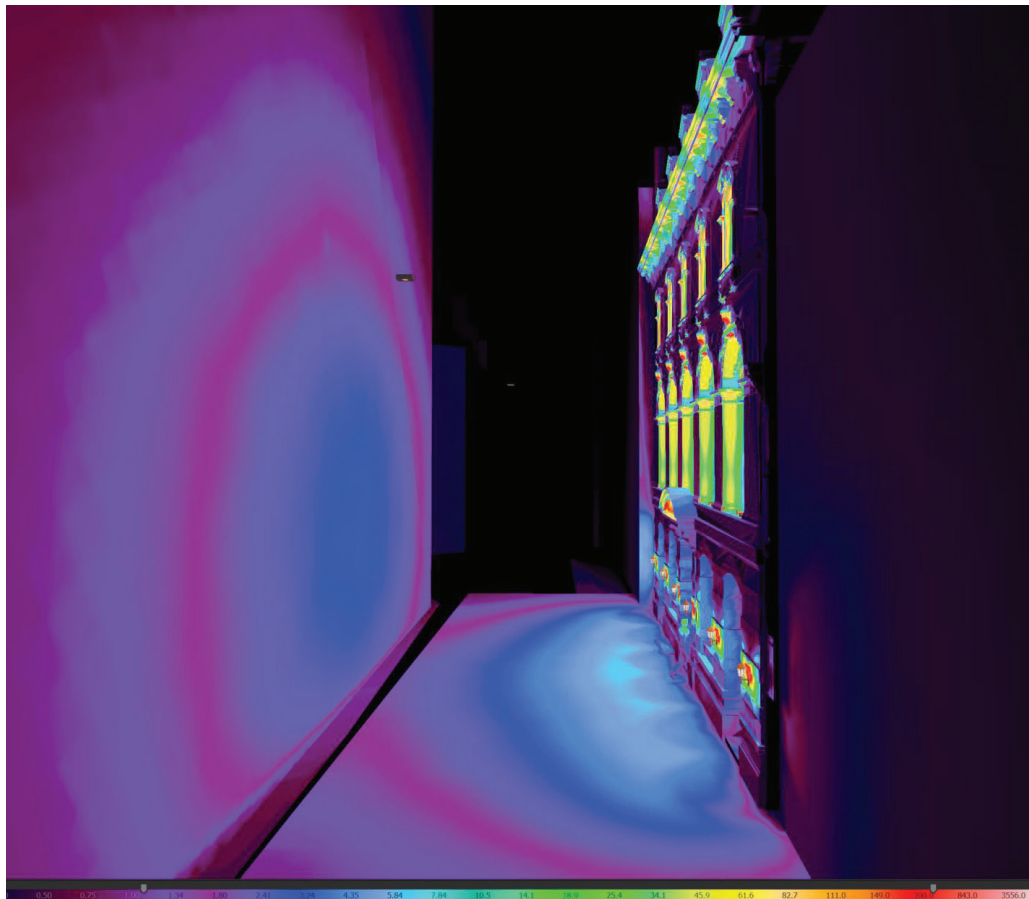


View from lighting software showing the luminance (cd/m2)

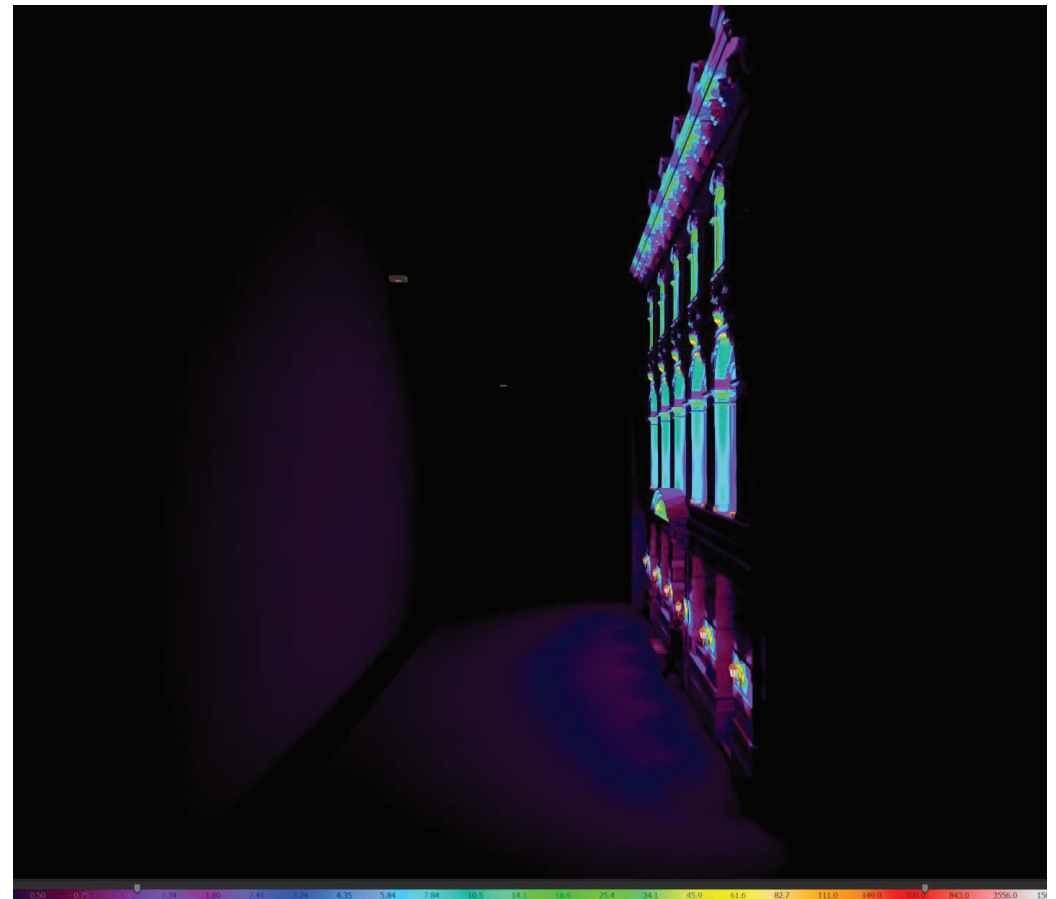
APPENDIX INFORMATION

Illuminance & Luminance - Booth Street impact assessment

The following images are exported from the lighting software and indicate spill light onto neighbouring buildings.



View from lighting software showing the illuminance (lx)

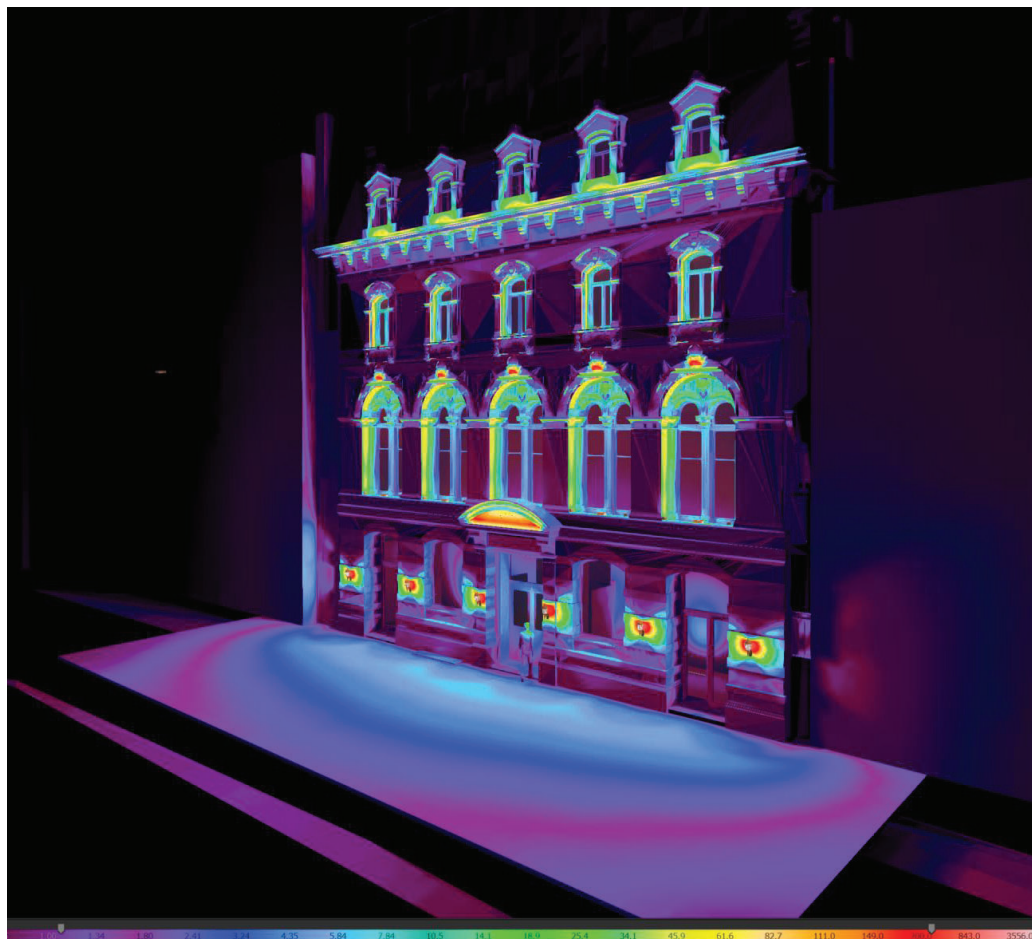


View from lighting software showing the luminance (cd/m2)

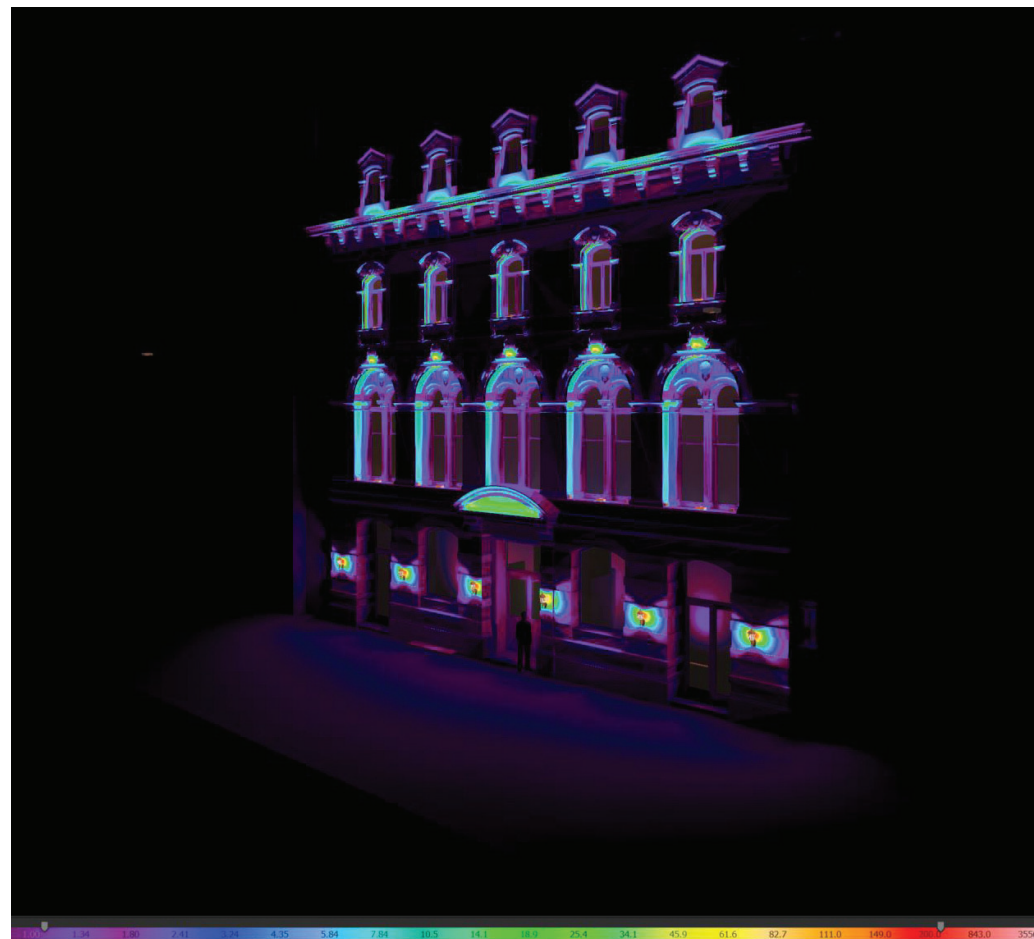
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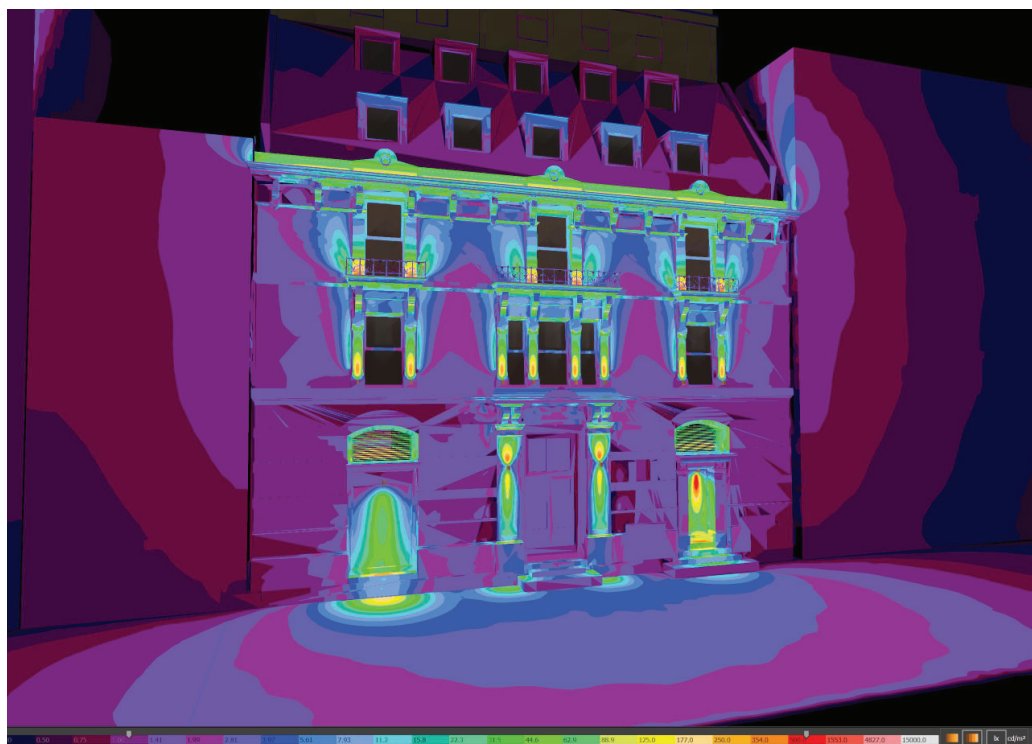
View from lighting software showing the luminance (cd/m2)

TECHNICAL APPENDIX

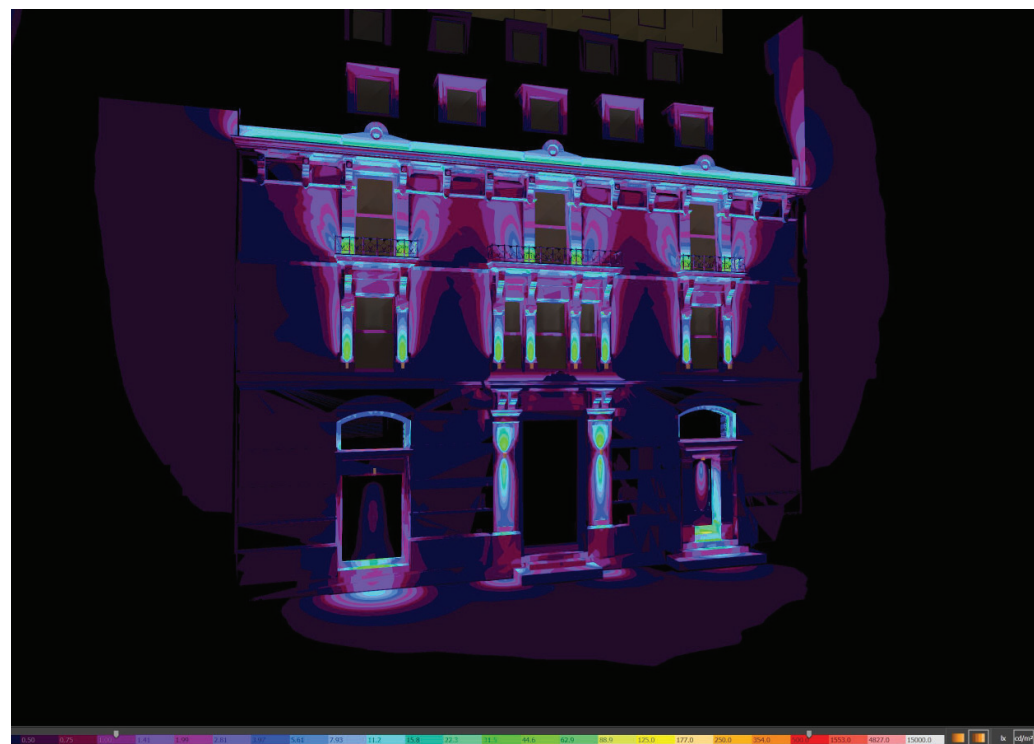
Illuminance & Luminance - Kennedy Street Facades

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View from lighting software showing the illuminance (lx)

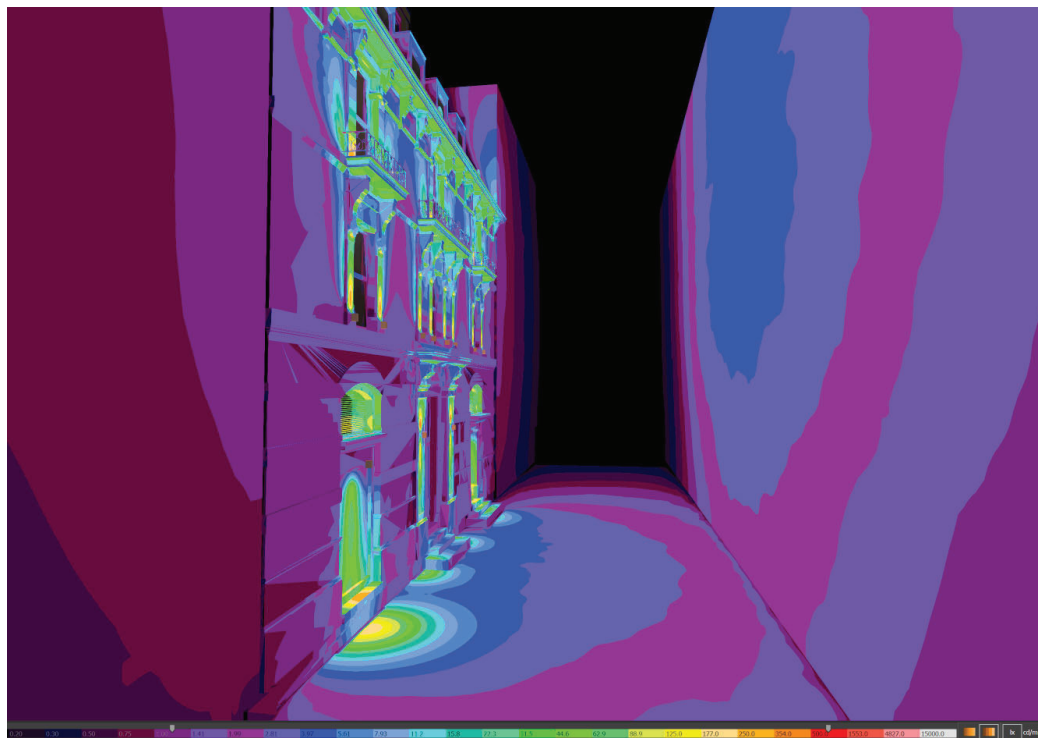


View from lighting software showing the luminance (cd/m2)

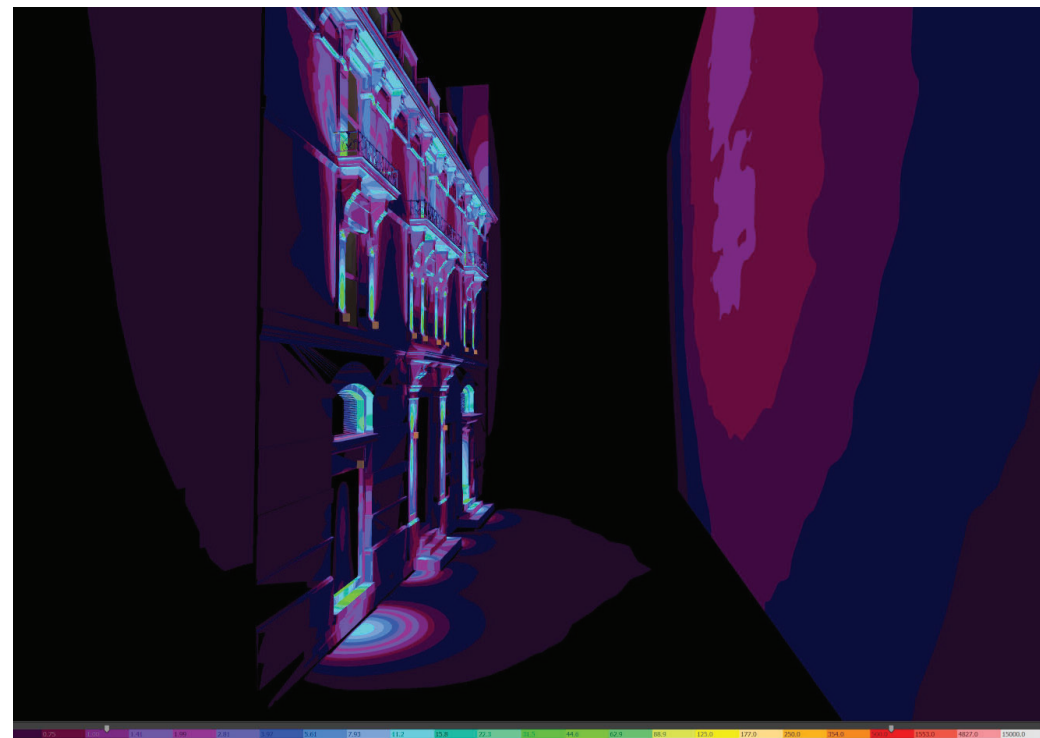
TECHNICAL APPENDIX

Illuminance & Luminance - Kennedy Street impact assessment

The following images are exported from the lighting software and indicate spill light onto neighbouring buildings.



View from lighting software showing the illuminance (lx)



View from lighting software showing the luminance (cd/m2)



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