HOARE LEA LIGHTING

Corn Exchange, Manchester

Public Realm Lighting

Hanging Ditch and Fennel Street

DOC-1601711-130617-DLB-LP Corn Exchange Landscape-05B

July 2013

Lighting Design Concept

Audit Sheet

Rev.	Description	Prepared and checked by	Reviewed by	Date by
P01	Provisional Issue	DLB	SD	17.06.13
P02	Alternative Lighting Solutions	DLB	SD	04.07.13
P03	Updated Design	DLB	SD	12.07.13
P04B	All LED design	DLB	SD	19.07.13
P05B	Design notes added	DLB	SD	25.07.13

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1.0 Introduction

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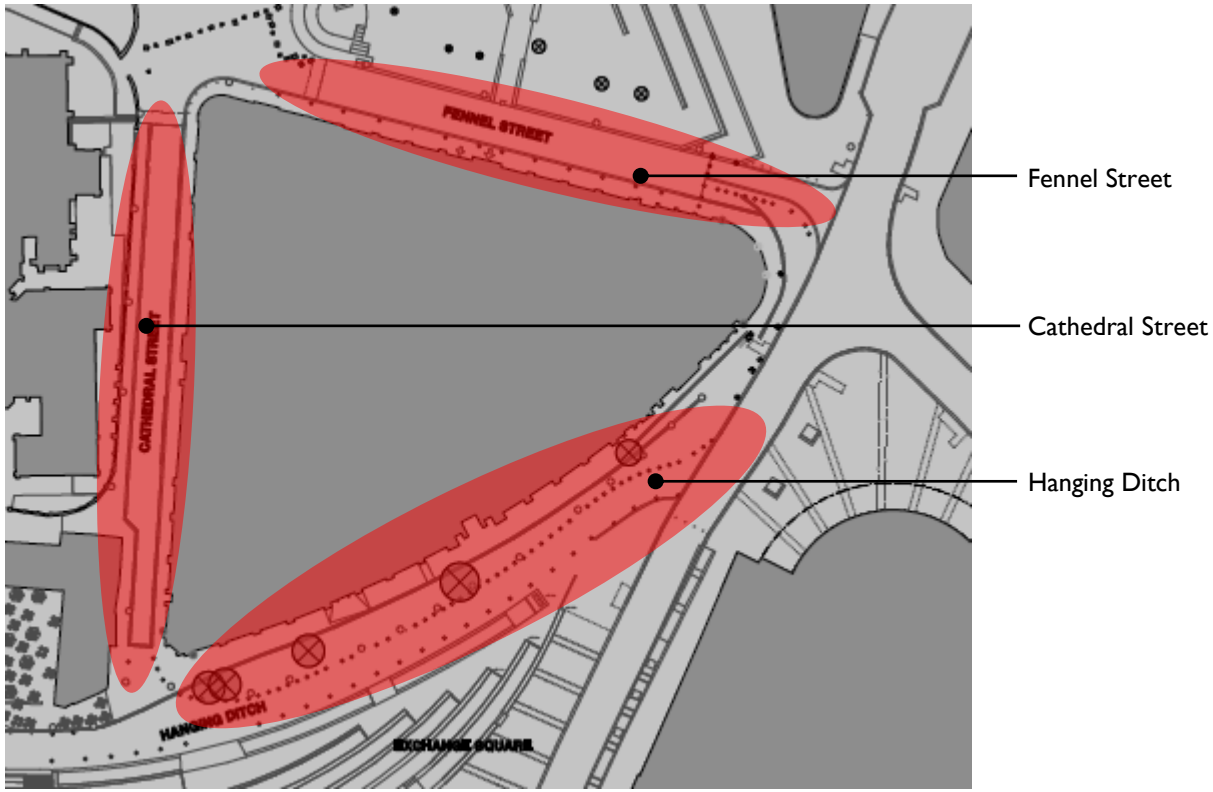

General Calculation Areas

Overview

This document presents the lighting solution utilising LED column mounted luminaires throughout the public realm areas shown.

There is potential of completing the public realm lighting to include Cathedral Street. This design is to shown an example of how this design could be fulfilled. Expanding the design along this area is subject to agreeing the strategy and solution with the Cathedral to provide a design to suit all stakeholders associated with the scope area.

1.0 Introduction





Intent

As part of the decluttering of the landscape, this design aims to limit the number of installation points whilst meeting the light levels required by BS5489.

Whilst providing lighting levels for safe passage around the Corn Exchange, the output of the fittings must impact to a minimum on the façade itself to avoid competing with the facade lighting.

The final solution must also be maintainable and as such access must be ensured to allow man safe equipment and vehicles to access the installation points as necessary.

2.0 Lighting Classes

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Table A.8 **Lighting classes for city and town centres**

Type of traffic	Lighting class			
	Normal traffic flow		High traffic flow	
	E3 [A]	E4 [A]	E3 [A]	E4 [A]
Pedestrian thoroughfare	S2 or P2	S1 or P1	S2 or P2	S1 or P1
Pedestrian only	CE4 or C4	CE3 or C3	CE3 or C3	CE2 or C2
Mixed vehicle and pedestrian with separate footways	CE3 or C3	CE2 or C2	CE2 or C2	CE1 or C1
Mixed vehicle and pedestrian on same surface	CE2 or C2	CE1 or C1	CE1 or C1	CE1 or C1

[A] Environmental zone, as given in ILP GN01 [N5].

BS5489-1:2013 Table A8 – Lighting classes for city and town centres

Table A.7 **Variation of maintained lighting level with S/P ratio of light source**

Values in lux

Lighting class	Benchmark (e.g. R_a < 60 or when S/P ratio of light source is not known or specified)		S/P ratio = 1.2 and $R_a \geq 60$ (e.g. some types of warm white lamp such as metal halide)		S/P ratio = 2 and $R_a \geq 60$ (e.g. some types of cool white compact fluorescent or LED)	
	$\bar{E}$	E_{min}	$\bar{E}$	E_{min}	$\bar{E}$	E_{min}
P1 or S1	15.0	3.0	13.4	2.7	12.3	2.5
P2 or S2	10.0	2.0	8.6	1.7	7.7	1.5
P3 or S3	7.5	1.5	6.3	1.3	5.5	1.1
P4 or S4	5.0	1.0	4.0	0.8	3.4	0.7
P5 or S5	3.0	0.6	2.2	0.4	1.8	0.4
P6 or S6	2.0	0.4	1.4	0.4	1.1	0.4

BS5489-1:2013 Table A7 – Variation of maintained lighting level with S/P ratio of light source

Lighting Classes

Through discussions with MCC, the lighting classes are selected from BS5489-1:2013 Code of practice for the design of road lighting, Part 1: Lighting of roads and public amenity areas.

The lighting level is selected from Table A.8.

The area is classed as E4 (City Centre) with high traffic flow and is a pedestrian thoroughfare

Utilising an LED warm white light source with Ra>80, an S/P ratio of 1.2 has been applied.

Main pedestrian traffic route

S1/P1 class with 1.2 S/P ratio applied

Average Illuminance: 13.4 lux
Minimum Illuminance: 2.7 lux

Adjacent Seating Area

The area adjacent to the traffic route has been selected at one class lower due to the reduced pedestrian traffic flow.

S3/P3 class with 1.2 S/P ratio applied

Average Illuminance: 6.3 lux
Minimum Illuminance: 1.3 lux

3.0 Column Mounted LED Luminaires

3.0 Column Mounted LED Luminaires





Equipment

The current design is based around the following equipment (see note below):

Selux Olivio Floracion System

70W LED with 3500K Colour Temperature

Nominal 4.5m and 5m height to light source

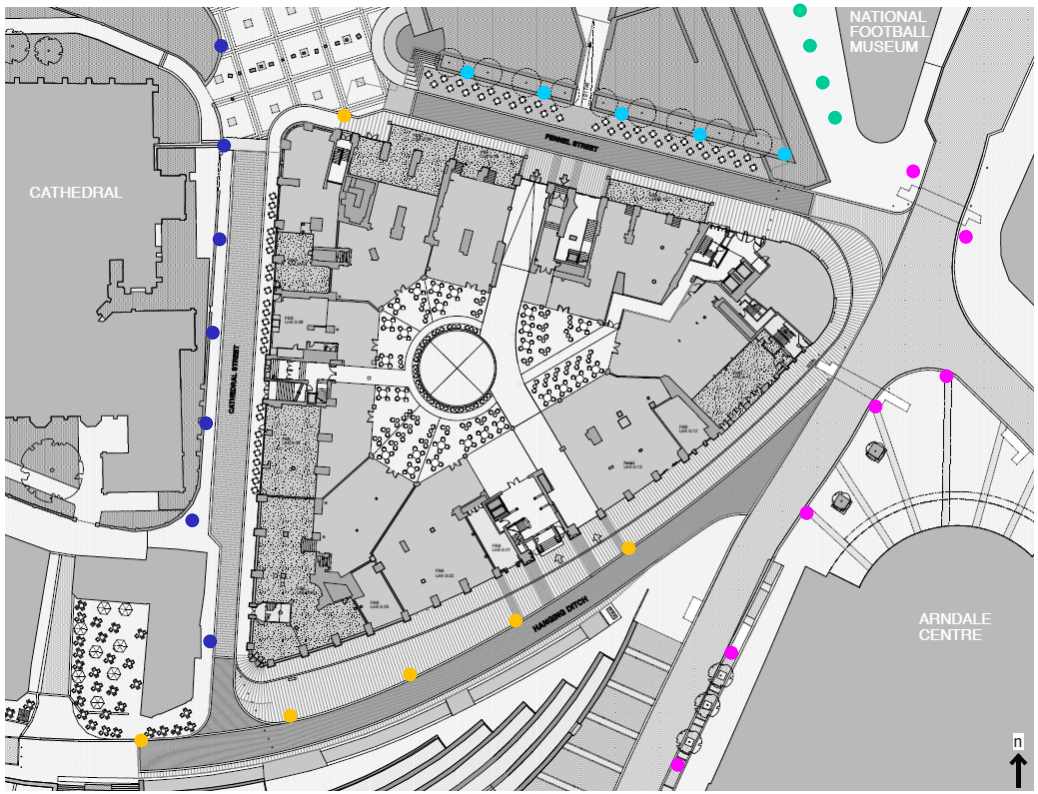
Asymmetric Optic

0.8 Light Source Depreciation Factor (50,000 hours)

0.92 Cleaning Cycle Depreciation Factor
(E4 Location, 5m Mtg Ht, 24month Cleaning Cycle)

Note:
- Final luminaire type to be agreed
- Luminaire and column colour to be agreed with MCC
- Due to the rapid advancement of LED technology, the design is to be updated to use the latest LED option available at that time to reduce energy consumption and maximise efficiency

3.0 Column Mounted LED Luminaires



Approx Luminaire Locations (NTS)

Column Mounted LED Luminaires



4.5 and 5m height above ground level

(4m high column positioned within planting 1m above ground level)

2qty 70W LED

Asymmetric Optic



4.5 and 5m height above ground level

(5m high column)

2qty 70W LED

Asymmetric Optic

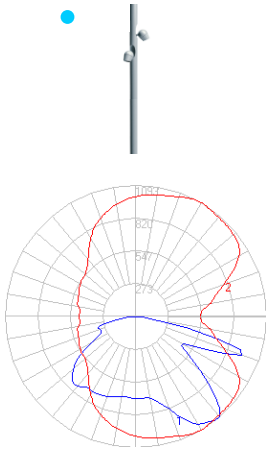
Existing Street and Public Realm Lighting







3.0 Column Mounted LED Luminaires



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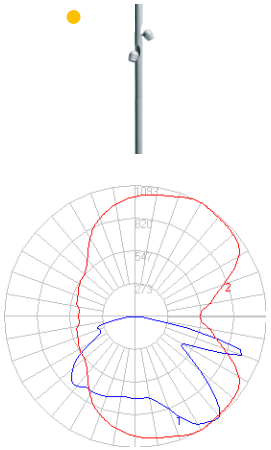
(4m high column positioned within planting 1m above ground level)

2qty 70W LED

Asymmetric Optic



4.5 and 5m height above ground level

(5m high column)

2qty 70W LED

Asymmetric Optic

Typical optical distributions

Column Mounted LED Luminaires

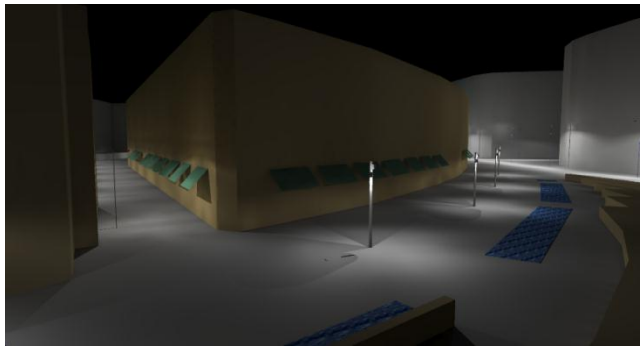
The area is lit using an asymmetric optic in all luminaires.

There are 2 fittings per column (at 4.5m and 5m above ground level) and the fittings are orientated with approximately 90 degrees between luminaires.

Tilt (inclination) angles are 10 degrees to maintain minimum illuminance and uniformity.

Control is to be by photocell integral to each lighting installation location.

3.0 Column Mounted LED Luminaires



Hanging Ditch & Cathedral Street

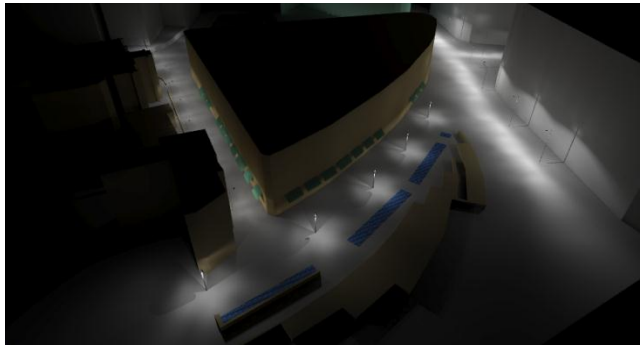


Fennel Street & Cathedral Street

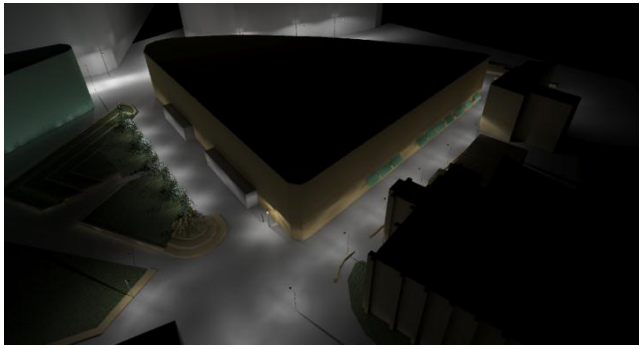
Column Mounted LED Luminaires

These renders show an approximation of light pattern appearance. Please note however that computer generated images produces details of light distribution that the eye does not observe in reality as it compensates for contrast.

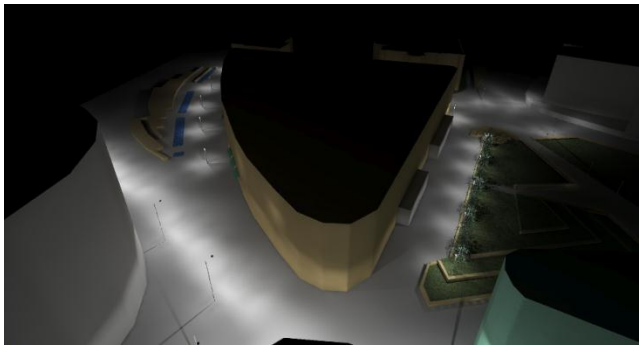
As such, please threat the images as a 'flavour' of the proposed solution.



Hanging Ditch & Cathedral Street

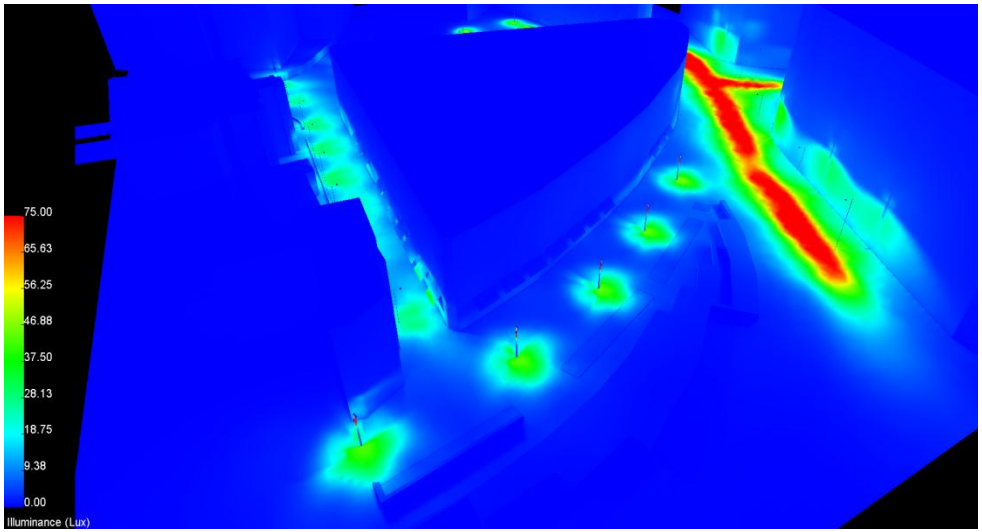


Fennel Street & Cathedral Street

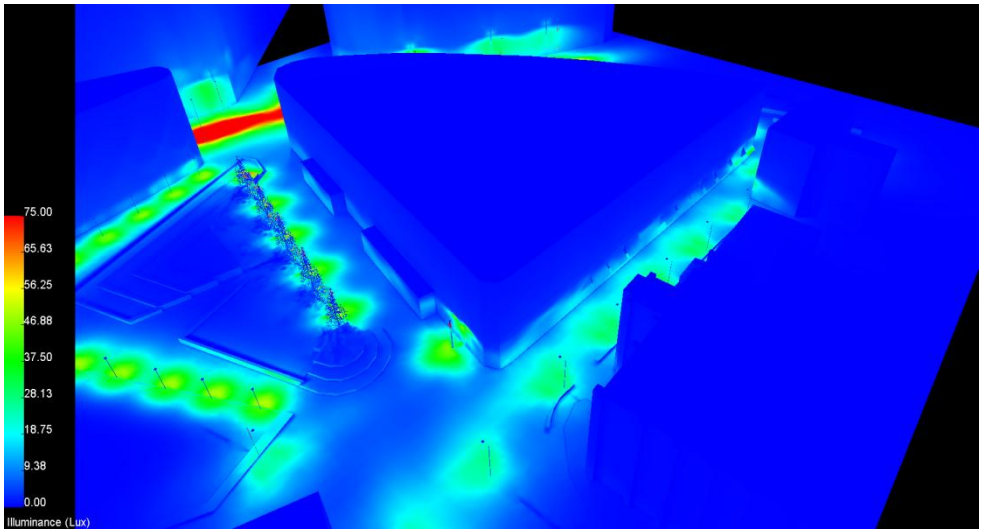


Hanging Ditch & Fennel Street

3.0 Column Mounted LED Luminaires



Hanging Ditch & Cathedral Street



Fennel Street & Cathedral Street

Approximate Lighting Levels

	Average (lux)	Minimum (lux)
Fennel Street	15.3	2.9
Cathedral Street (Existing Lighting)	17.7	5.5
Hanging Ditch	15.9	2.7
Hanging Ditch Seating Area	10.9	1.7

Note – Hanging Ditch Seating Area is lit as a resultant factor of lighting Hanging Ditch. The levels achieved exceed the requirements but cannot be reduced without a detrimental effect to the lighting of Hanging Ditch.

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