Chester Road

Advertising Scheme - Spill Light Modelling

Job No:	P3002496
Doc No:	BDP-RP-0001
Rev:	P6
Date:	30/01/2024

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Document Control

Revision	Description	Issued by	Date	Reviewed
P1	DRAFT	GK	27/02/2020	CL
P2	ISSUE FOR INFORMATION	GK	13/03/2020	CL
P3	ISSUE FOR INFORMATION - REVISED SCHEME ASSESSMENT	NM	29/04/2022	CL
P4	ISSUE FOR INFORMATION - REVISED SCHEME ASSESSMENT	NM	06/05/2022	CL
P5	ISSUE FOR INFORMATION - REVISED SCHEME ASSESSMENT	NM	08/02/2023	CL
P6	ISSUE FOR INFORMATION - REVISED SCHEME ASSESSMENT	KN	30/01/2024	NM

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Date 30/01/2024

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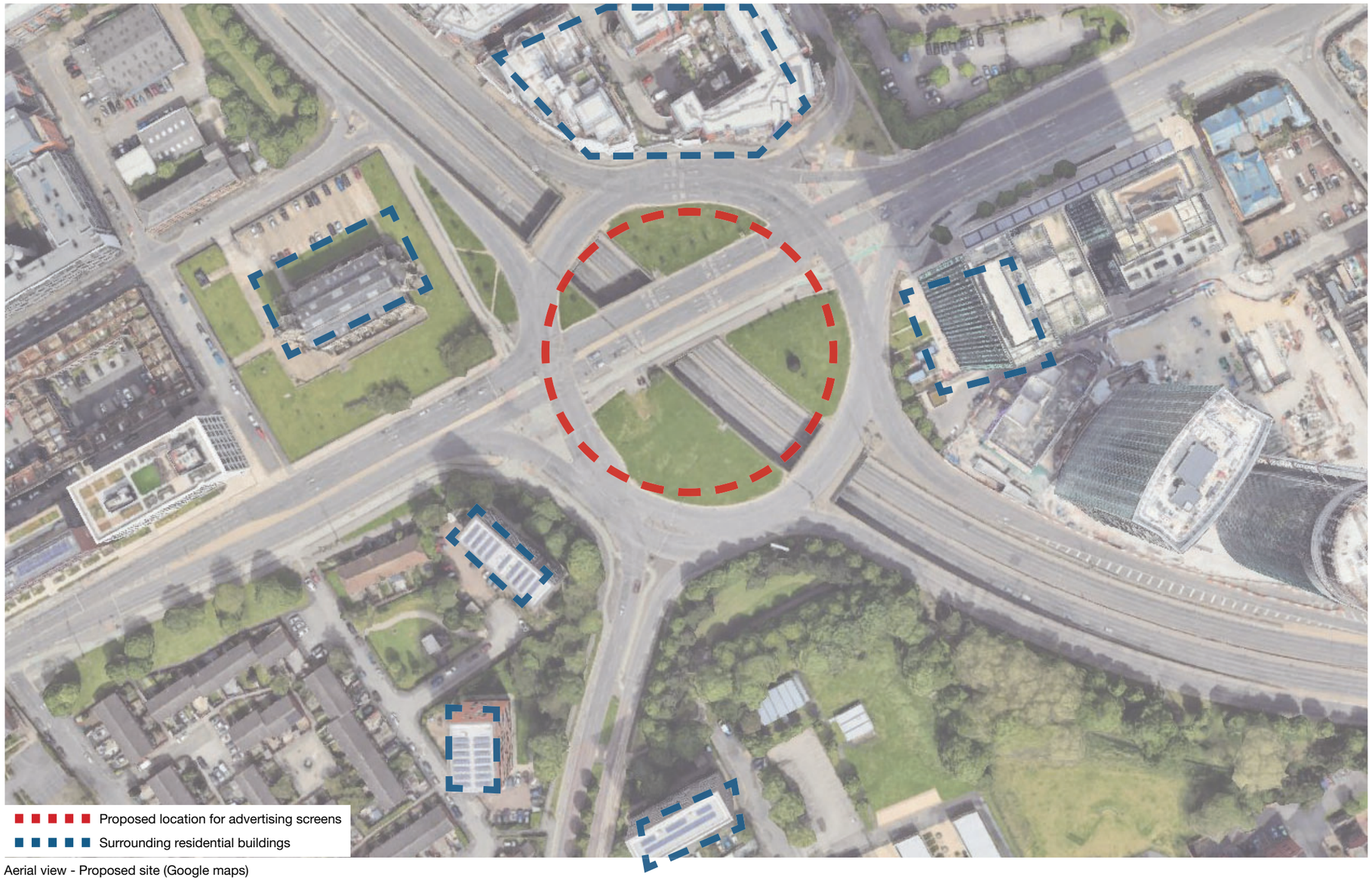
1. Introduction

This document has been prepared for Ocean Outdoor to provide initial assessment of the spill lighting impact of the proposed advertising screens to the surrounding residential buildings.

The site is located at the junction of Chester Road with Mancunian Way (A57M).

The map shows location of the roundabout (red) and the surrounding buildings (blue) under assessment that have been identified as residential.

The report details light spill results for the latest signage design from SimpsonHaugh (SHA) planning design 12th January 2024.



Aerial view - Proposed site (Google maps)

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2. Site Context

<u>ILP Environmental Zone Classification:</u>

Exterior illuminance criteria are 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 'Note 01/20, Guidance notes for the reduction of obtrusive light - 2021' and requires knowledge of the local area.

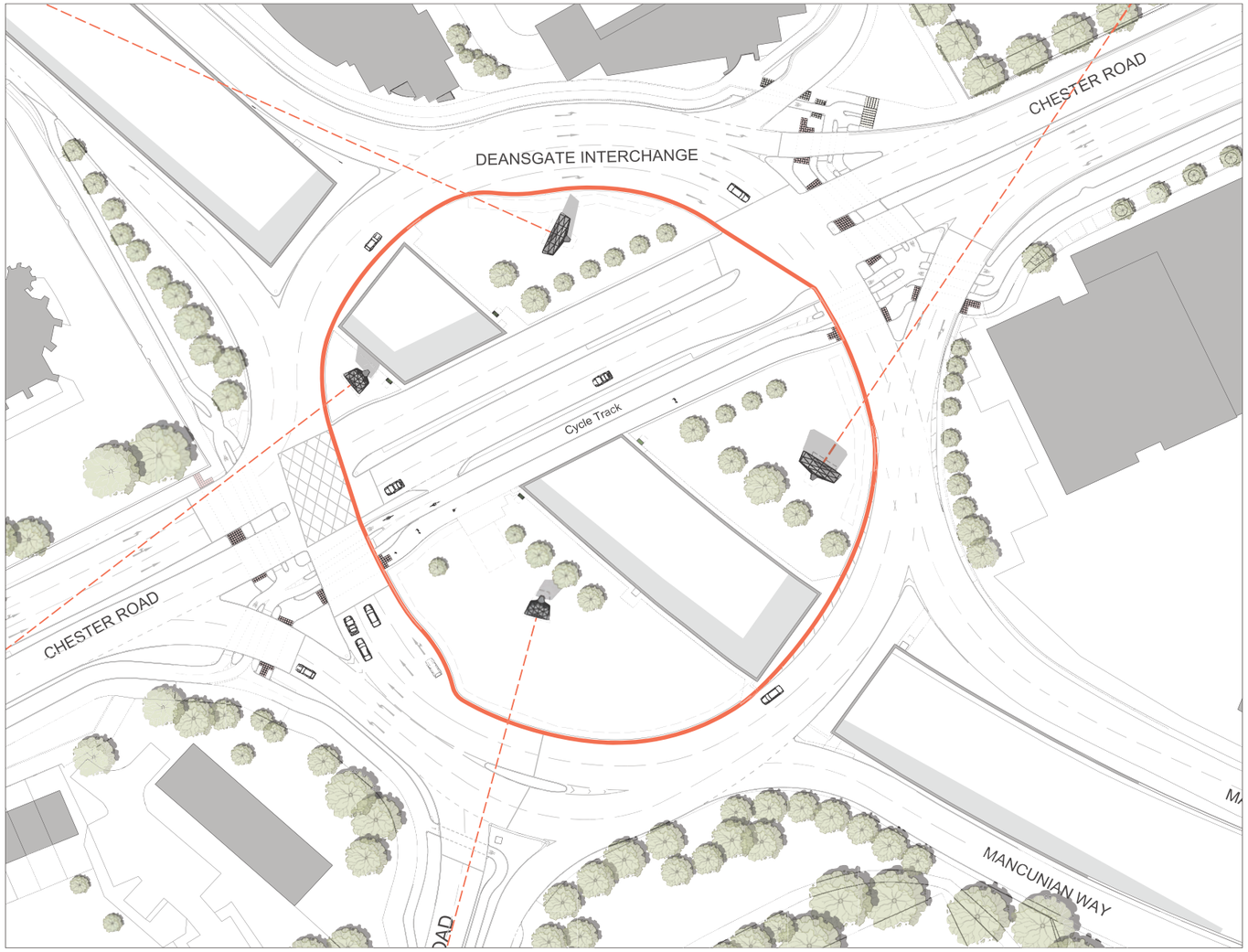
It has been identified that the Chester Road roundabout site is in a central city area with extensive commercial and residential units, adjacent to busy roads with high mast lighting and high volumes of motorised traffic, therefore significant light pollution and sky glow is already present.

On this basis, the Chester Road roundabout site has been classified as **E4**:

E4 represents areas of 'high district brightness: Town/city centres with high levels of night time activity'.

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 1 - Environmental zone descriptions



Proposed site plan (provided by SHA)

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3. Media Screen Lighting Calculations

3.1 Calculation assumptions

The calculation has been created in DIALux Evo lighting calculation software, using the photometric information provided by Daktronics to simulate the performance of the media screens. The media screen design and layout has been provided by SHA.

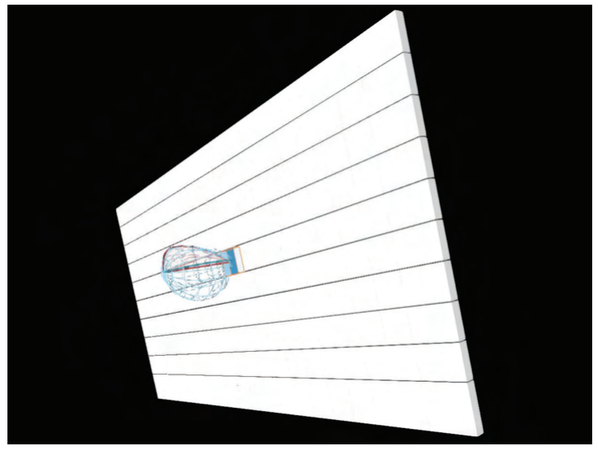
Media screen assumptions:

- Size of each LED module is 144mm x108mm
- Light source output: 2848 lumens per LED module
- 10 degrees tilt of the screen towards ground plane
- LOR (Light Output Ratio): 100%

Landscape screen 10 x 20 modules
Portrait screen 16 x 9 modules

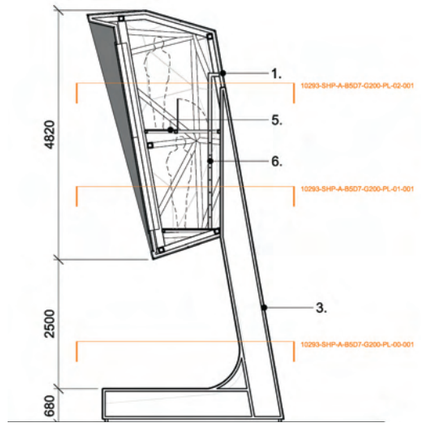
Additional assumptions:

- Ground/floor reflectance value: 20%
- Maintenance Factor: 0.70 (approximate)
- Calculations do not take into account spill light from the surroundings (e.g. street lighting)
- Screen locations based on SimpsonHaugh ‘P02’ site plan (10293-SHP-A-G200-SK-XX-019) and model provided.

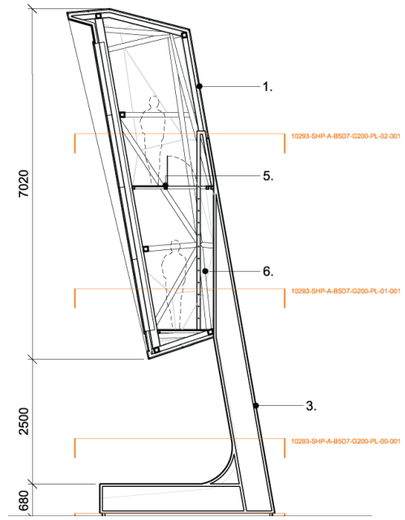


Example photometric light distribution of media screen LED module

Landscape sign



Portrait sign



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3. Media Screen Lighting Calculations

3.2 Results & Observations

The below table summarises the maximum illuminance found on the surrounding building facades when the screens are dimmed for use during the hours of darkness.

Target criteria
Maximum vertical illuminance on residential buildings –
25lux pre-curfew,
5lux post-curfew.

(ILP - Guidance Note 01/20, Guidance notes for the reduction of obtrusive light', curfew time determined by local authority)

Both sets of results have been calculated with the screen output reduced to achieve a maximum luminance of 300cd/m2.

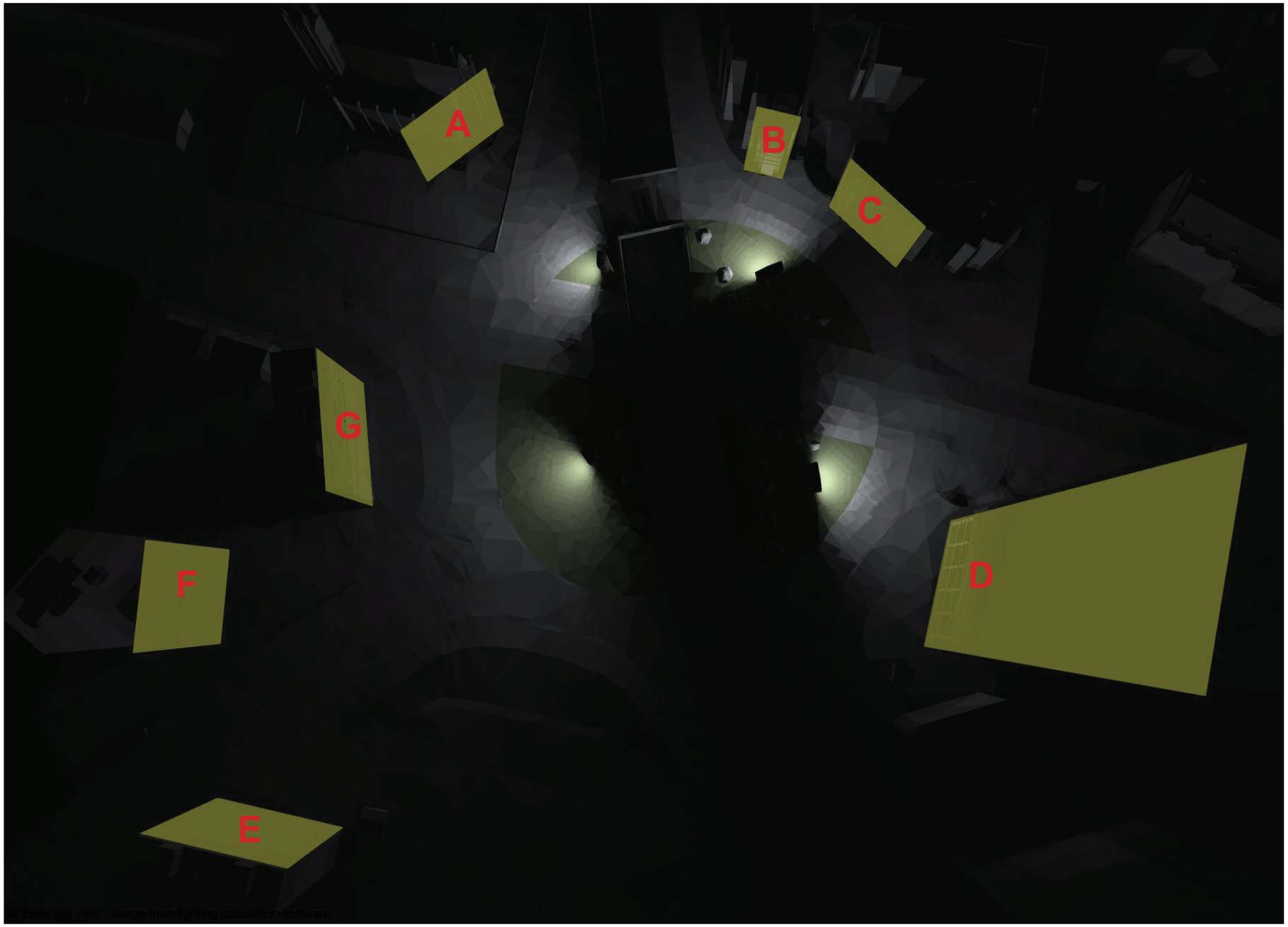
(Requirement from - ILP – PLG05 The brightness of illuminated advertisements, illuminated surface over 10m2)

There are two sets of results;

1. **Reduced output** pre curfew.
2. **Reduced output** post curfew.

Calculation Surface	**1. Reduced output 300cd/m2** Hours of darkness **Pre-curfew max 25lux** Max illuminance, lux Pass / Fail	**2. Reduced output 300cd/m2** Hours of darkness **Post-curfew max 5lux** Max illuminance, lux Pass / Fail
A	1.6	1.6
B	5.8	5.8
C	2.6	2.6
D	3.7	3.7
E	0.3	0.3
F	0.4	0.4
G	1.4	1.4

Table 2 - Illuminance results



3D birds eye view - image from lighting calculation software

3. Media Screen Lighting Calculations

3.3 Results & Observations

Reduced output results.

Please refer to the next section of the report for detailed calculation surface results.

Calculation Surface	**1. Reduced output 300cd/m2** Hours of darkness **Pre-curfew max 25lux** Max illuminance, lux Pass / Fail	**2. Reduced output 300cd/m2** Hours of darkness **Post-curfew max 5lux** Max illuminance, lux Pass / Fail
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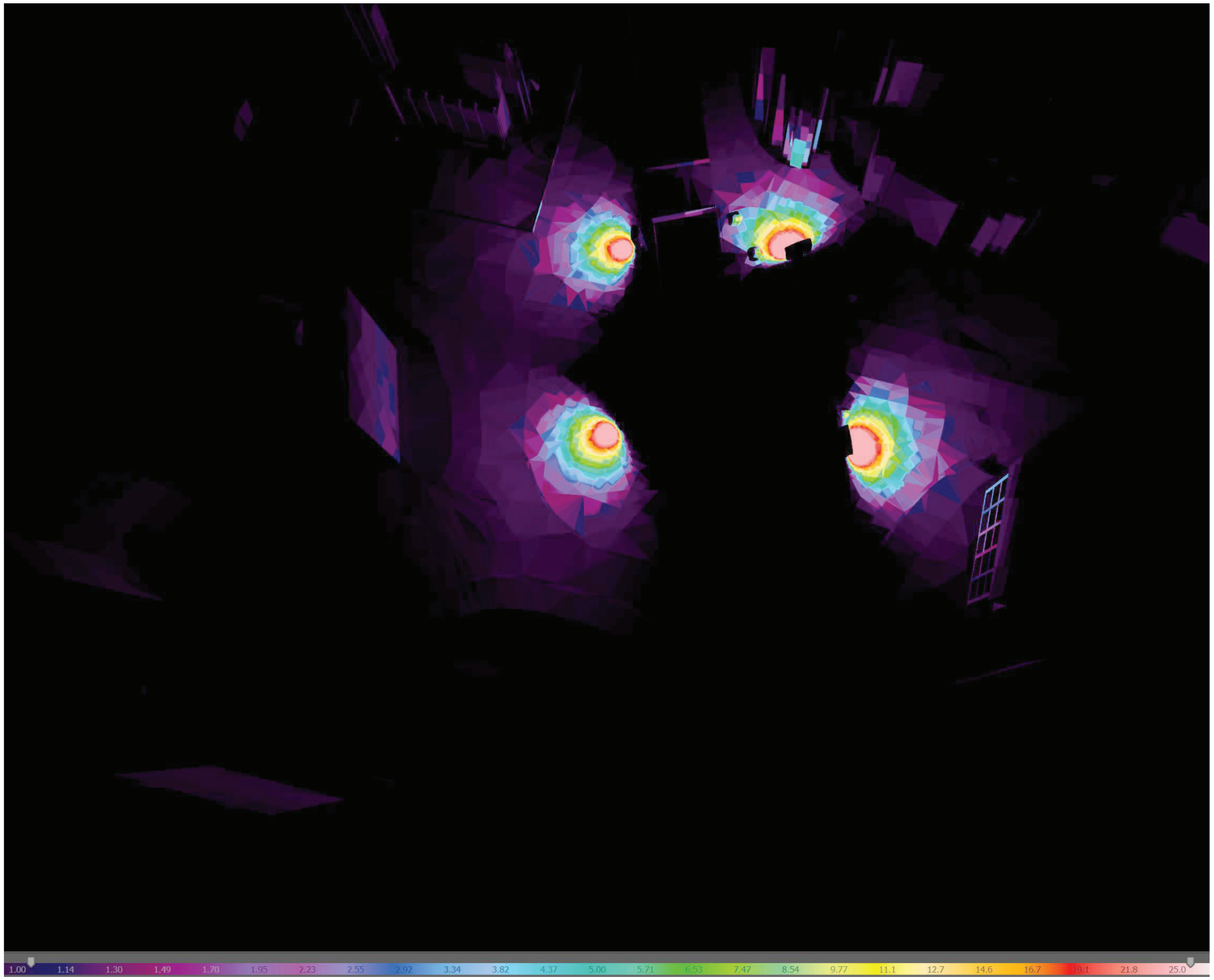
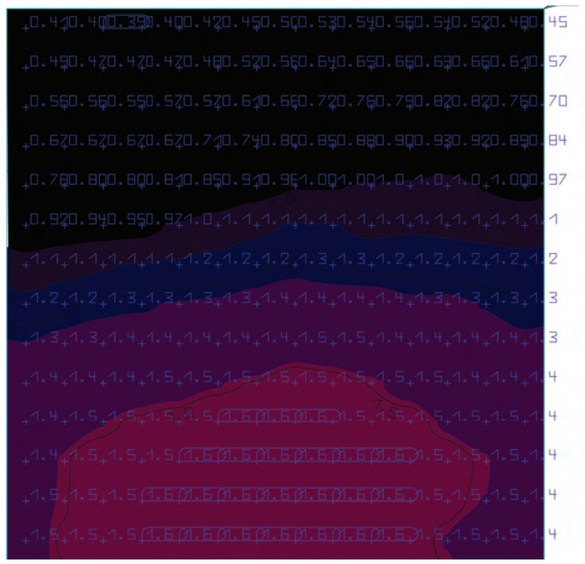


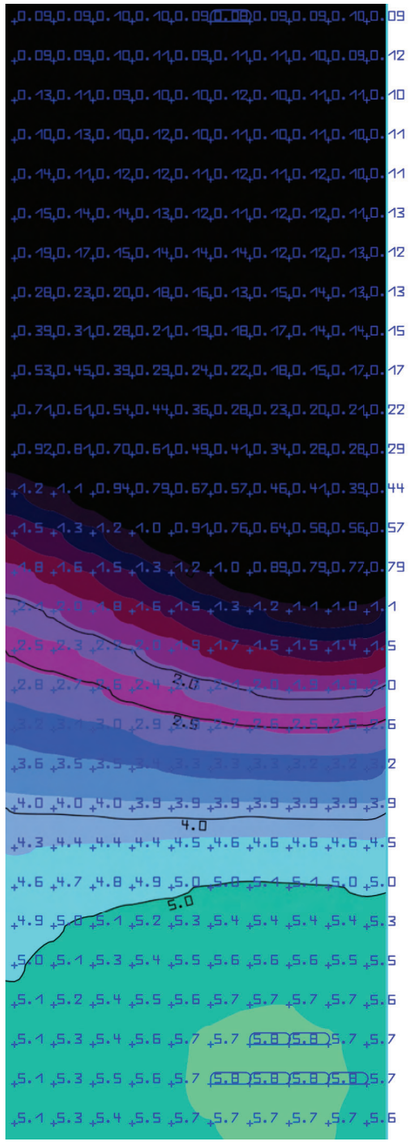
Illuminance results - lux

3. Media Screen Lighting Calculations

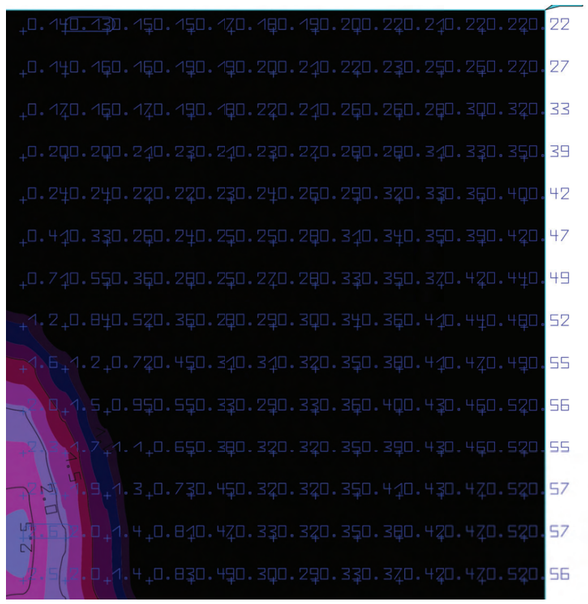
3.3 Calculation surface results - Reduced output



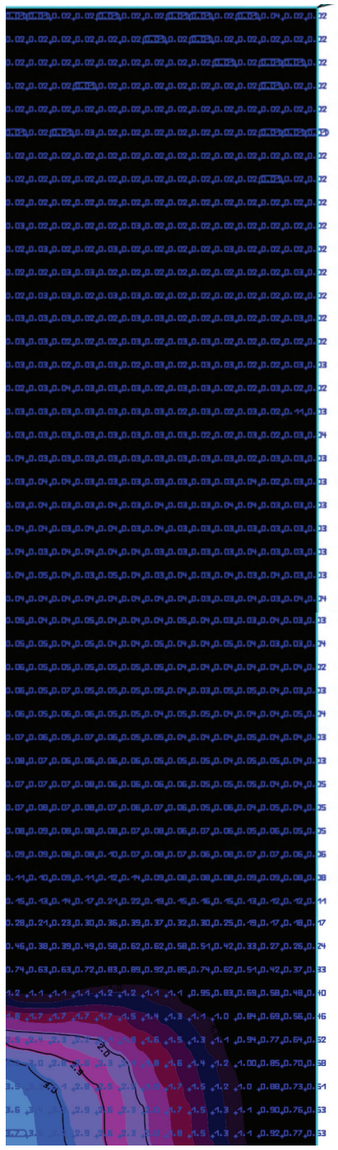
Residential building A



Residential building B



Residential building C



Residential building D

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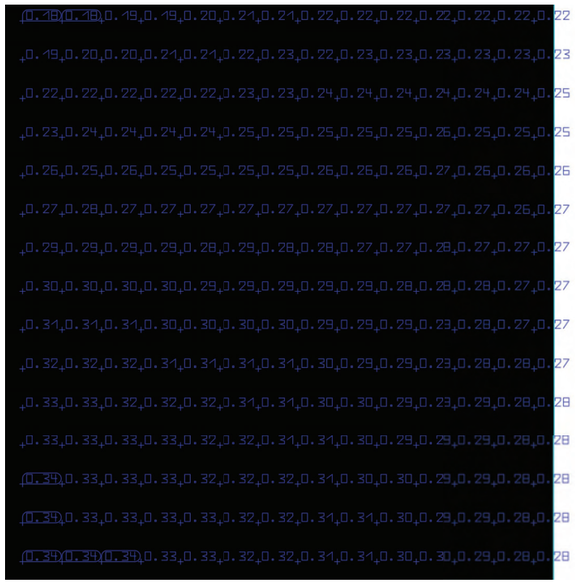
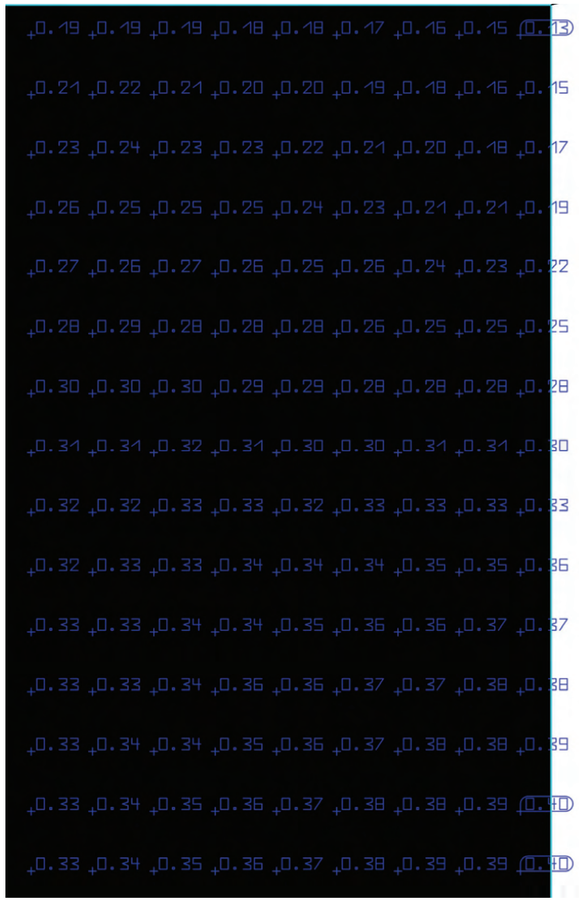
3. Media Screen Lighting Calculations

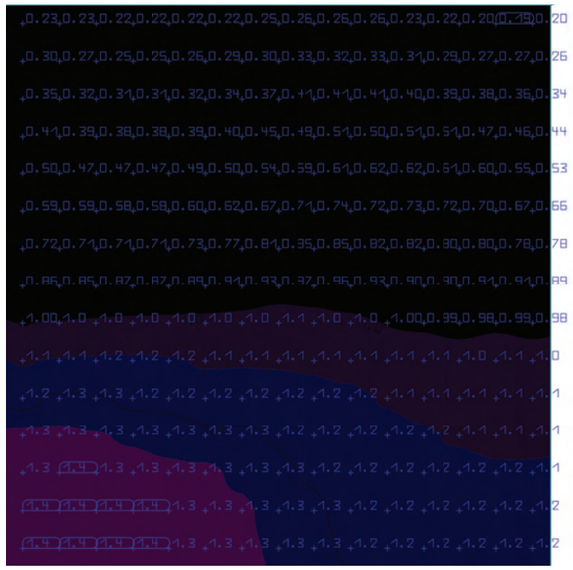
3.3 Calculation surface results - Reduced output



Residential building E



Residential building F



Residential building G

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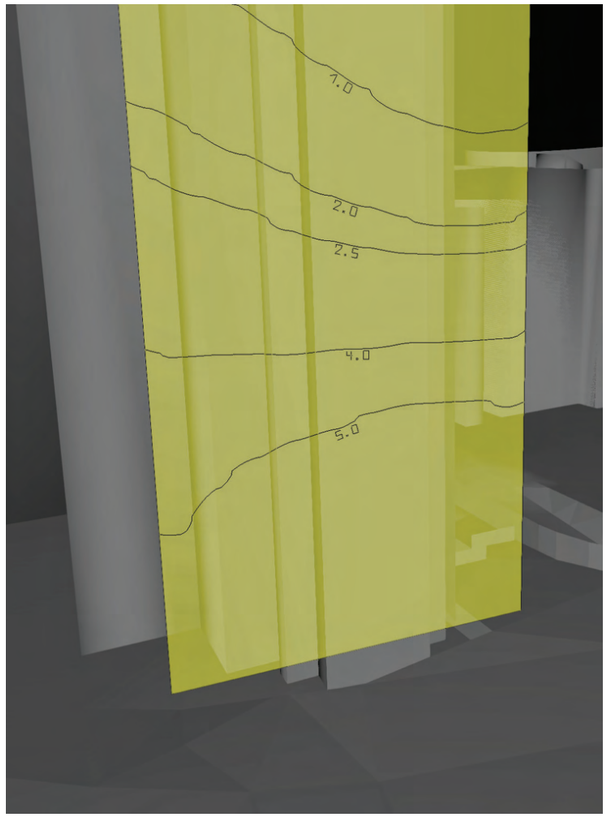
4. Conclusion

A reduction in the screen luminance is required during the hours-of-darkness. This should be an automated process daylight linked to ambient light levels.

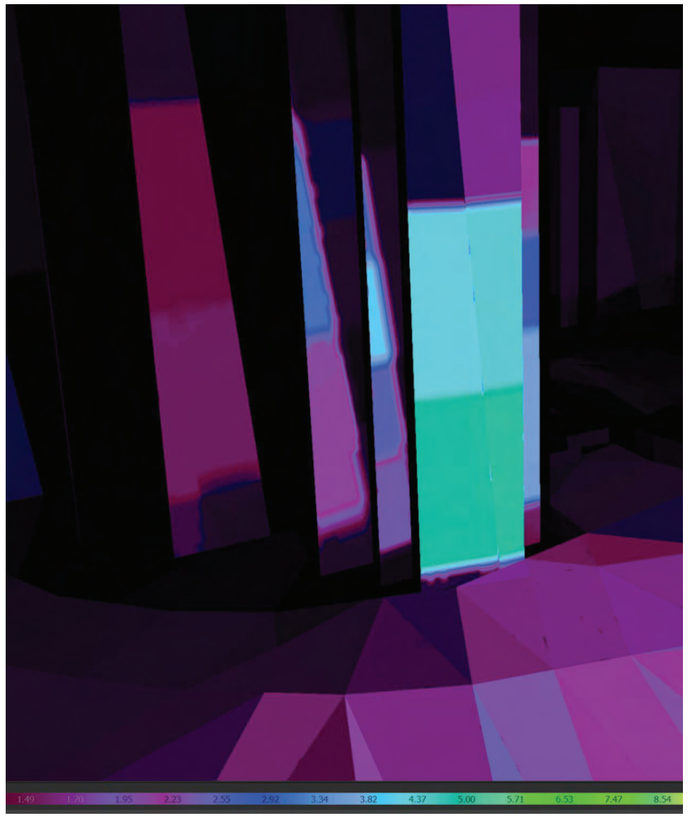
When the screen outputs are reduced to meet hours-of-darkness requirements they do not exceed the maximum illuminance requirements for surrounding buildings (dwellings).

The Building ‘B’ calculation surface has exceeded the 5lux requirement for post curfew by 0.8lux. Compliance is achieved as this illuminance level (which is found within a zone from ground level up to 6m) falls on an area of the building facade with no windows (sensitive receptors), dwelling windows are set backwards and meet the <5lux illuminance requirement.



Building B calculation surface (Yellow) - taken from lighting software

Street view with false colour overlay



Building B false colour isometric view - taken from lighting software

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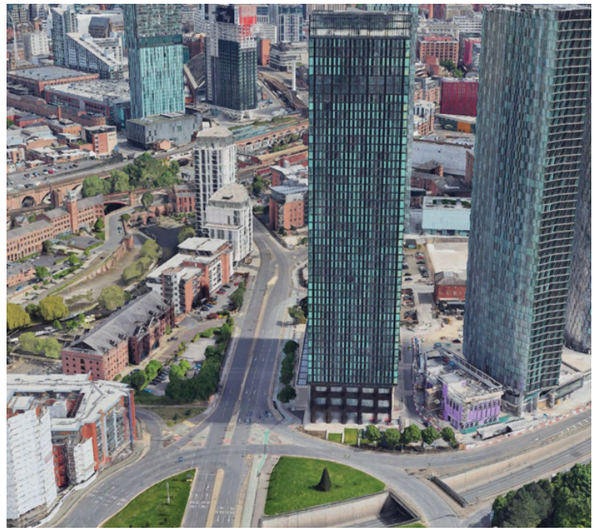
5. Appendix

5.1 Neighbouring residential buildings

Building A

Building B

Building C



Building D

Building E

Building F

Building G

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