

WILLIAMS LIGHTING CONSULTANTS LTD

TECHNICAL NOTE

Sign Face Luminance Assessment

Banking Hub Modular Unit, Dawson Street, Heywood

Project	WLC1572, Banking Hub Modular Unit, Dawson Street, Heywood
Client	NCR Atleos
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Subject	Assessment of the illuminated signage face luminance of the modular Banking Hub unit, in response to the local planning authority's request for the surface luminance (cd/m ²) of the installation
Related documents	NCR Atleos, Heywood Dawson Street (Site 032) Banking Cabin Installation: Elevations; Site Plan with Cabin Location; Architectural Floor Plan (Original, 18.02.26)

1. Introduction

Williams Lighting Consultants Ltd. (WLC) has been instructed by NCR Atleos to assess the luminance of the externally illuminated signage at the proposed Banking Hub, Dawson Street, Heywood, in response to the local planning authority's request for sign face luminance (cd/m²).

The signage is illuminated by surface-mounted LED wall luminaires positioned above each sign face. As no photometric data (IES/LDT) is available for the selected luminaires, the assessment has been undertaken from first principles using conservative engineering assumptions. A worst case calculation, independent of the assumed light distribution, has also been undertaken to demonstrate the maximum achievable average sign face luminance.

2. Assessment Criteria

The applicable guidance is the Institution of Lighting Professionals (ILP) Professional Lighting Guide PLG05, The Brightness of Illuminated Advertisements, which sets maximum luminance limits for illuminated advertisements according to the illuminated area of the sign and the environmental zone of the site.

The site is a retail car park at Dawson Street, Heywood and falls within Environmental Zone E3 (medium district brightness, urban built up area). The long elevation sign face is 15.1m² and the end elevation sign face is 9.0m², placing both

within the 5 to 20m² area band. The applicable PLG05 maximum night-time luminance for Environmental Zone E3 is therefore 300cd/m².

3. Installation Details

Parameter	Value
Luminaires	3no. surface-mounted LED wall luminaires in total
Luminous flux per luminaire	3,400lm
Long elevation (front)	2no. luminaires; face 7.20m wide × 2.56m high overall, graphic face 7.20m × 2.10m = 15.1m ² (per elevation drawing)
End elevation (side)	1no. luminaire (central); face 4.30m wide × 2.56m high overall, graphic face 4.30m × 2.10m = 9.0m ² (per elevation drawing)
Sign surface	Printed vinyl graphics on powder-coated steel cladding, matte (diffuse) finish; white and teal areas

4. Methodology

The sign face has been treated as a diffuse (Lambertian) reflector, with luminance determined from:

$$L = E_{\rho} / \pi$$

where L = surface luminance (cd/m²), E = illuminance (lux) and ρ = surface reflectance.

Average illuminance is calculated from:

$$E = \Phi UF / A$$

where Φ is the installed luminous flux, UF is the utilisation factor and A is the illuminated sign face area.

A utilisation factor of 0.5 has been adopted for the expected case, reflecting a luminaire mounted immediately above and directed onto the sign face, where approximately half of the emitted flux is incident on the face and the remainder is lost to spill and upward light. The worst case adopts a utilisation factor of 1.0, representing all emitted flux reaching the face, which cannot physically be exceeded.

Reflectance values of 0.7 (white) and 0.3 (teal) have been adopted for the matte printed finish.

5. Calculation

5.1 Long Elevation

The long (front) elevation carries two luminaires over a 15.1m² graphic face (7.20m wide × 2.10m high), the highest installed flux per unit area of the assessed faces, and therefore governs the assessment.

Worst case (upper limit), assuming 100% of the luminaire flux is incident on the face, which physically cannot be exceeded regardless of the actual light distribution:

- E (maximum possible) = $6,800\text{lm} \div 15.1\text{m}^2 = 450\text{lux}$
- L (maximum possible, white areas) = $450 \times 0.7 \div \pi = 100\text{cd/m}^2$ average

Expected case, utilisation factor 0.5:

- E (average) = $6,800 \times 0.5 \div 15.1 = 225\text{lux}$
- L (average, white areas) = $225 \times 0.7 \div \pi = 50\text{cd/m}^2$
- L (average, teal areas) = $225 \times 0.3 \div \pi = 21\text{cd/m}^2$

5.2 End Elevation

The end (side) elevation carries a single central luminaire over a 9.0m² graphic face (4.30m wide × 2.10m high).

Worst case (upper limit):

- E (maximum possible) = $3,400\text{lm} \div 9.0\text{m}^2 = 377\text{lux}$
- L (maximum possible, white areas) = $377 \times 0.7 \div \pi = 84\text{cd/m}^2$ average

Expected case, utilisation factor 0.5:

- E (average) = $3,400 \times 0.5 \div 9.0 = 188\text{lux}$
- L (average, white areas) = $188 \times 0.7 \div \pi = 42\text{cd/m}^2$
- L (average, teal areas) = $188 \times 0.3 \div \pi = 18\text{cd/m}^2$

The end elevation luminance is lower than the long elevation in both the expected and worst case.

6. Results

Metric	Calculated value	PLC05 E3 limit
Long elevation, average luminance (expected)	50cd/m ²	300cd/m ²
Long elevation, average luminance (worst case upper limit)	100cd/m ²	300cd/m ²
End elevation, average luminance (expected)	42cd/m ²	300cd/m ²

Metric	Calculated value	PLG05 E3 limit
End elevation, average luminance (worst case upper limit)	84cd/m ²	300cd/m ²

All calculated luminance values, including the worst case, are below the PLG05 maximum luminance of 300cd/m² for Environmental Zone E3.

7. Assumptions

- Luminaire luminous flux is taken from the manufacturer's published output of 3,400lm per fitting.
- Sign dimensions are taken from the NCR Atleos elevation drawings.
- Surface reflectance values of 0.7 (white) and 0.3 (teal) have been adopted for the matte printed finish.
- A utilisation factor of 0.5 is adopted for the expected case, with the luminaire mounted directly above and directed onto the sign face; the worst case adopts a utilisation factor of 1.0.
- The worst case calculation assumes all emitted light reaches the sign face and therefore represents the maximum achievable average luminance.
- Luminaire quantity and arrangement are assumed to be two fittings to the long elevation and one fitting to the end elevation.

8. Conclusion

The calculated sign face luminance is comfortably below the PLG05 night-time limit of 300cd/m² for Environmental Zone E3. The governing long elevation is predicted to achieve an average luminance of approximately 50cd/m². Even under the worst case assumption that all emitted light reaches the sign face, the calculated average luminance of 100cd/m² remains well within the applicable limit.

On this basis, the proposed externally illuminated signage is considered compliant with PLG05.