

Ref: 1254004-04

BY E-MAIL

21 November 2025

Aimi Macfarlane
McDonald's Restaurants Limited
11-59 High Road
East Finchley
London
N2 8AW

Dear Aimi,

Re: McDonald's Buck Barn – Illuminated Signage Lighting Assessment

As requested, please find below assessment of the proposed illuminated signage at McDonald's Buck Barn, in accordance with national guidelines. This document shall be read in conjunction with Strenger drawing Ref: SK-01 Residential Receptor Location Plan.

This assessment has involved the following:

- setting out the illuminated signage proposals;
- setting out the relevant policy, standards and guidance;
- defining a suitable environmental zone classification;
- defining suitable luminance criteria in accordance with national guidelines and planning regulations;
- comparison of the proposed levels of luminance against the criteria;
- defining suitable illuminance criteria in accordance with national guidelines;
- comparison of the calculated levels of illuminance against the criteria; and
- forming conclusions.

Author Pen Profile

My name is Dan Cramond, I have over 20 years' experience of technical input for environmental assessment. I hold a BEng (Hons) degree in Mechanical Engineering, the Lighting Education Trust (LET) Lighting Diploma and the Institute of Acoustics (IOA) post-graduate Diploma in Acoustics & Noise Control. I am a Lighting Consultant specialising in the environmental assessment of artificial lighting, and I am Director of Strenger Ltd, registered at Clavering House, Newcastle upon Tyne.

I established Strenger Ltd in 2015 and have acted as lighting consultant for a wide range of clients on a range of schemes; including, waste, power generation (incl' nuclear), oil & gas, industrial, commercial, residential, sports facilities and transportation schemes. I have a broad experience of large-scale projects, including those falling under EIA regulations, Critical National Infrastructure and Nationally Significant Infrastructure Projects and have acted as technical expert representing local authorities for such projects. I have specific experience of undertaking lighting assessments for illuminated signage on behalf of clients such as, Costa Coffee, LIDL UK, Mollies, Enterprise Rent-A-Car and Marriott Hotels. I am currently acting as Lighting Consultant for the Proposed Advertisement.

Technical Concepts

ILP Environmental Zone

ILP Guidance Note 01/21: The Reduction of Obtrusive Light sets out a series of environmental zones for classifying lighting assessment study areas based on their surroundings type e.g. rural, suburban etc., and the lighting environment e.g. low district brightness, medium district brightness etc. Based on the surroundings type and lighting environment, an environmental zone can be selected, from Zone E0 to Zone E4. The obtrusive light limits associated with the relevant environmental zone(s) are then adopted for assessment purposes.

Lighting curfew

A lighting curfew is an agreed time, beyond which, a lighting installation is subject to more stringent environmental control, generally as agreed with the local planning authority (LPA). Such controls may take the form of switching the lighting installation off in its entirety, switching the lighting installation off in part, dimming the lighting installation, or the implementation of smart lighting controls. Lighting curfews are generally best suited to facilities where a specific activity requiring artificial lighting ceases at a specific time e.g. a floodlit sports pitch, or a supermarket. However, in many cases, particularly 24-hour operations there is no clear change in activities requiring artificial lighting. In such cases, LPAs seldom impose a lighting curfew per se. However, for the sake of robustness in assessing obtrusive light, it is usual to adopt the ILP post-curfew obtrusive light criteria beyond a certain time. Where this time is not imposed by the LPA, 23:00 hours is generally adopted for general exterior lighting and between 00:00 – 05:00 hours for media installations.

Vertical Illuminance ('Light intrusion')

This occurs as a result of light spill falling on to a receptor, generally onto a residential property window (hence the term 'light intrusion') but equally could be any light-sensitive human receptor. It is assessed in terms of the amount of light falling on a surface i.e. illuminance (E) and is measured in lux. Where the receptor is a residential window, the level of perpendicular illuminance is measured in the vertical plane, to give the vertical illuminance (E – lux).

Luminance ('Glow')

This is the amount of light emanating from a surface, either by means of reflected light off the surface, or directly from a light source itself e.g. internally illuminated signage. In the case of reflected light, luminance is a function of the light falling on a surface (illuminance) and the light reflectance properties associated with the reflecting surface.

Summary

Strenger Ltd was requested by McDonald's Restaurants Limited to undertake a lighting assessment of proposed illuminated signage at a proposed McDonald's restaurant, Buck Barn Crossroads, Worthing Road, West Grinstead, Horsham (hereon in, the 'Proposed Advertisement'). The assessment has been produced in view of addressing the reason for a non-valid submission as set out in the non-validation letter, as follows:

- *'Please provide a lighting statement. Lighting details of the spread of light and the operating hours for your externally illuminated text sign.'*

Illuminated Signage Details

The signs which this assessment relates to are as follows:

SIGN-01 Single 55" Samsung OHF digital display at FGL +687 mm

- 840 mm x 1,367 mm (portrait) digital display.

SIGN-02, SIGN-03, SIGN-04 Double 55" Samsung OHF digital display at FGL +687 mm

- 1,573 mm x 1,367 mm ('landscape') digital display.

SIGN-05 Totem sign bounding Worthing Road

- 1,920 mm x 12,000 mm (portrait) totem sign.

Proposed Hours of Operation

The proposed hours of operation for the illuminated signage will be aligned with the proposed restaurant opening hours.

For the sake of this assessment, it has been assumed that any lighting curfew relating to the illuminated signage will be aligned with the restaurant opening hours.

Legislation

The Town and Country Planning (Control of Advertisements) (England) Regulations 2007

Illumination requirements in the form of luminance limits are set out within Part 2 Paragraph 2 of the regulations. However, based on research undertaken by the CIE, the limits advised are not considered suitable for all lighting environmental zones; this is now recognised within national guidelines for England & Wales.

Clean Neighbourhoods and Environment Act (CNEA), 2005

Light pollution was introduced within the Clean Neighbourhoods and Environment Act 2005 ('CNEA 2005') as a form of statutory nuisance under the Environmental Protection Act 1990 (the 'EPA 1990') which was amended in 2006 to include the following nuisance definition:

"(fb) artificial light emitted from premises so as to be prejudicial to health or a nuisance;"

Guidance produced in Sections 101 to 103 of the CNEA 2005 by the Department of Environment, Food and Rural Affairs (DEFRA) in April 2006 extends the duty on local authorities to ensure their areas are checked periodically for existing and potential sources of statutory nuisances including nuisances arising from artificial lighting. Local authorities must take reasonable steps to investigate complaints of such nuisances from artificial light. Once satisfied that a statutory nuisance exists or may occur or recur, local authorities must issue an abatement notice (in accordance with section 80(2) of the EPA 1990, requiring that the nuisance cease or be abated within a set timescale.

Although light was described as having the potential to cause statutory nuisance in the CNEA 2005, no prescriptive limits or rules were set for impact assessment purposes. The Guidance Notes for the Reduction of Obtrusive Light produced by the ILP has, therefore, been referred to for the purposes of this assessment.

Guidance produced by DEFRA, Statutory Nuisance from Insects & Artificial Light (2006) on s101 to s103 of the CNEA has also been referred to which places a duty on local authorities to ensure that their areas are checked periodically for existing and potential sources of statutory nuisances - including nuisances arising from artificial lighting. Local authorities must take reasonable steps to investigate complaints of such nuisances from artificial light. Once satisfied that a statutory nuisance exists or may occur or recur, local authorities must issue an abatement notice (in accordance with s80(2) of the EPA 1990), requiring that the nuisance cease or be abated within a set timescale.

Policy

National Planning Policy

National Planning Policy Framework, 2024

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans can provide for housing and other development in a sustainable manner. The NPPF states that the purpose of the planning system is to contribute to the achievement of sustainable development, including the provision of homes, commercial development and supporting infrastructure in a sustainable manner. With regard to artificial lighting, the NPPF states the following:

'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: ...c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'

Guidance

International Guidance

Commission Internationale De L'Eclairage 150: Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations, 2017 (CIE-150)

The purpose of CIE-150: Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations, 2017 is to help formulate guidelines for assessing the environmental impacts of outdoor lighting and to give recommended limits for relevant lighting parameters to contain the obtrusive effects of outdoor lighting within tolerable levels. As the obtrusive effects of outdoor lighting are best controlled initially by appropriate design, the guidance given is primarily applicable to new installations; however, some advice is also provided on remedial measures which may be taken for existing installations. This Guide refers to the potentially adverse effects of outdoor lighting on both natural and man-made environments for people in most aspects of daily life, from residents, sightseers, transport users to environmentalists and astronomers.

National Guidance

Institution of Lighting Professionals (ILP) PLG 05/23 - The Brightness of Illuminated Advertisement Including Digital Displays, 2023

This document has been prepared on behalf of the ILP Technical Committee, for study and application. The document reports on current knowledge and experience within the specific fields of light and lighting described and is intended to be used by the ILP membership and other interested parties.

Lighting guidance issued by the ILP is recognised as the authority document when it comes to assessing illuminated advertisements by Local Planning Authority planning officers, planning inspectors, lighting professionals and advertising industry planning professionals. It is also specifically referenced in government guidance. It is the only authoritative lighting guidance in the United Kingdom on which those involved in the planning process.

Institution of Lighting Professionals (ILP) GN 01/21 Guidance Note for the Reduction of Obtrusive Light, 2021

The ILP has proposed obtrusive lighting guidance and criteria for local authorities with a recommendation that these are incorporated at the local plan level. This ILP Guidance Note defines various forms of light pollution and describes a series of environmental zones. The document provides suitable criteria against which the effects of artificial lighting can be assessed.

Institution of Lighting Professionals (ILP) PLG 04 - Guidance on Undertaking Environmental Lighting Impact Assessments, 2013

The aim of the Guidance on Undertaking Environmental Lighting Impact Assessments (ILP PLG04:2013) is to outline good practice in lighting design and provide practical guidance on production and assessment of lighting impacts within new developments.

The document was produced following the publication of the NPPF in April 2012 and the importance of lighting design being part of a planning application, this document aims to:

- provide an explanation of, and guidance on, the process for producing a lighting assessment;
- prompt the lighting designer on important aspects of specific projects which should be used to remove or minimise potential environmental problems; and
- look at the overall processes and evaluation procedures regarding lighting which are considered to be relevant.

Criteria

ILP PLG 05/23 - The Brightness of Illuminated Advertisements Including Digital Displays has been adopted for defining suitable criteria for the illuminated signage associated with the Proposed Advertisement.

In order to define suitable luminance criteria for the proposed illuminated signage, it is first necessary to define the environmental zone for which the Proposed Advertisement site falls within, in accordance with ILP GN 01/21 Guidance Notes for the Reduction of Obtrusive Light. In doing so, this effectively defines the 'background luminance' of the general lighting environment; in combination with appropriate luminance limits for the illuminated signage, this ensures that an environmentally acceptable contrast luminance is achieved i.e. the illuminated signage would be in fitting with its surroundings.

ILP Environmental Zone Classification

The ILP has developed an environmental zone classification system for the categorisation of areas with regard to suitable obtrusive light limits. The environmental zone classifications are reproduced in Table 1.

Table 1: ILP Environmental Zone Classification			
Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Rural	Low district brightness (SQM 15 to 20)	Sparsely inhabited rural areas, village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity

Determination of ILP Environmental Zone

The Proposed Advertisement site lies in a rural area with a relatively low district brightness. Based on the site surroundings, it is considered that ILP Environmental Zone E2 would be the most appropriate classification for the purposes of this assessment. Such a classification would ensure that when illuminated, the Proposed Advertisement is in fitting with its surroundings and ensure that the existing nightscape is suitably preserved.

Luminance ('glow') Limits

In accordance with ILP PLG 05/23, the maximum allowable values of luminance anywhere on the surface of an advertisement during pre-curfew hours of darkness are set out below in Table 2 according to the ILP environmental zone classification.

Table 2 is derived from research undertaken by the panel members, members of Outsmart and an understanding of research being undertaken by the Commission International De L'Eclairage (CIE), through their technical committee TC4-58 investigating the effects of colourful dynamic lighting (including digital displays) on the day and night-time environment and the controls that need to be followed to mitigate any adverse impact.

Light Technical Parameter	Table 2: Maximum sign luminance (L_s) cd/m^2				
	Environmental Zone				
Sign surface area	E0	E1	E2	E3	E4
0 to < 5 m^2	0	25	200	300	300
5 to < 20 m^2	0	0	200	300	300
$\geq 20 \text{ m}^2$	0	0	100	200	300

If the installation is required to operate within the post-curfew period within Environmental Zones E2 to E4 inclusive, then the target criteria shall be 50% of the pre-curfew level.

Based on the previously stated dimensions, criteria relating to an illuminated area of up to 20 m^2 per illuminated sign are considered applicable to the application. As can be seen in Table 2, the maximum permitted recommended luminance for an illuminated area of up to 20 m^2 within ILP Environmental Zone E2 is 200 cd/m^2 .

For daytime operation of the illuminated signage, the levels of luminance will be in accordance with the maximum permitted recommended daytime levels of luminance as set out in ILP PLG 05/23. The level of daytime luminance will be actively controlled using a photocell. The photocell control would be overridden by a 365-day programmable timer clock at the start of Civil Twilight, at which point the level of luminance for the illuminated signage would reduce to the required 'night-time' luminance limit.

Vertical Illuminance ('light intrusion') Limits

In accordance with ILP GN 01/21, the maximum allowable pre-curfew and post-curfew levels of 'light intrusion' are set out below in Table 3 according to the ILP environmental zone classification.

Table 3: Maximum values of 'light intrusion' (vertical illuminance – lux)						
Light Technical Parameter	Application Conditions	Environmental Zone				
		E0	E1	E2	E3	E4
Illuminance in the vertical plane (E_v)	Pre-curfew	n/a	2 lx	5 lx	10 lx	25 lx
	Post-curfew	n/a	< 0.1 lx	1 lx	2 lx	5 lx

As can be seen in Table 3, the maximum permitted recommended level of 'light intrusion' within ILP Environmental Zone E2 is 5 lux during pre-curfew hours.

Assessment

Luminance ('glow')

As a result of significant intervening screening (existing & proposed), coupled with their low mounting height, the digital displays are not expected to be viewable from residential properties or from the highway. Therefore, a luminance limit of 700 cd/m² is proposed for the digital displays, which corresponds with the minimum luminance required for the menu to be viewable.

However, the totem will be viewable from highway receptors and possibly in part from residential receptors. Accordingly, a 200 cd/m² luminance limit is proposed for the totem. Based on the implementation of the 200 cd/m² luminance limit, this would be compliant with the luminance limits as set out in national guidelines.

Vertical Illuminance ('light intrusion')

Based on the approximate method to calculate illuminance at a point facing a sign as set out in Appendix 2 of ILP PLG 05/23, the levels of 'light intrusion' to surrounding properties have been predicted and are set out in Table 4 below. The assessed receptors are set out in Strenger Drawing Ref: SK-01 Residential Receptor Location Plan.

Table 4: Predicted 'Light Intrusion' Levels (E – lux)			
Sign	RES-01	RES-02	RES-03
SIGN-01	0	0	0
SIGN-02	0	0	0
SIGN-03	0	0	0
SIGN-04	0	0	0
SIGN-05A	0.043	0	0
SIGN-05B	0	0.003	0.063
Total	0.043	0.003	0.063

The levels of 'light intrusion' from the illuminated signage associated with the Proposed Advertisement have been predicted at surrounding residential receptors. The resultant levels of 'light intrusion' are set out in Table 5 against the ILP pre-curfew 'light intrusion' criterion of 5 lux for ILP Environmental Zone E2. Each receptor has been assigned a PASS / FAIL outcome accordingly.

Table 5: 'Light Intrusion' Assessment			
Receptor	'Light Intrusion' Criterion (E - lux)	Predicted 'Light Intrusion' (E - lux)	Outcome
RES-01	5	0.043	PASS
RES-02	5	0.003	PASS
RES-03	5	0.063	PASS

As can be seen from Table 5 above, the predicted levels of 'light intrusion' at residential receptors from illuminated signage associated with the Proposed Advertisement are compliant with the ILP pre-curfew 'light intrusion' criterion of 5 lux for ILP Environmental Zone E2.

Conclusions

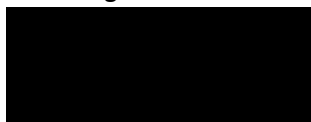
It has been demonstrated that the Proposed Advertisement is compliant with national guidelines for the control of obtrusive light relating to illuminated advertisements. By demonstrating compliance with the ILP national guidelines, it is ensured that the impact of artificial lighting on local amenity is suitably limited, consistent with the requirements of The Town and Country Planning (Control of Advertisements) (England) Regulations 2007 and the NPPF.

Specifically, the viewable illuminated signage is compliant with the luminance limits as set out in ILP PLG 05/23: The Brightness of Illuminated Advertisements Including Digital Displays and the illuminance limits as set out in ILP GN 01/21: The Reduction of Obtrusive Light.

Therefore, by means of controlled application of such artificial light sources in accordance with national guideline values, it has been demonstrated that with regard to luminance contrast ratio and 'light intrusion', the applicable illuminated signage would be in fitting with its surroundings and ensure that the existing nightscape is suitably preserved.

Should you have any queries regarding the above then please do not hesitate to contact the undersigned.

Yours sincerely
for **Strenger Ltd**



Dan Cramond
Managing Director