

External Artificial Lighting



Colchester Borough Council

Planning Guidance Note 2012



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Foreword

Colchester Borough Council is increasingly aware of the rising number of proposals that include external artificial lighting, often in sensitive locations, and the need to consider their impact on the environment in the determination of planning applications. This guidance note is intended to provide advice and guidance to applicants contemplating a lighting scheme or proposal on which factors will be taken into account by the Council in determining planning applications for such schemes. It is based on the information currently available from a range of organisations that are actively interested or involved in lighting matters.

The guidance note acknowledges the technical nature of lighting schemes and the requirement for expertise in selecting and installing a system. Reputable manufacturers, installers and suppliers of such systems should be prepared to provide appropriate technical specifications to demonstrate that their product not only maintains the levels of illumination required for the intended use, but also does so with the minimum level of obtrusive light.

This guidance note is based on *External Artificial Lighting Supplementary Planning Guidance* published by Huntingdonshire District Council and contains technical information taken from *Guidance Notes For The Reduction Of Obtrusive Light* published by The Institution of Lighting Professionals, and is produced with their kind permission.

1.0 Introduction

1.1 This guidance note has been produced in order that those proposing external artificial lighting schemes (referred to as lighting schemes), either as part of a development proposal or as a planning application in its own right, may have a clearer understanding of the planning and technical issues involved.

1.2 Lighting usually only becomes a problem where it is excessive, poorly designed, badly installed or poorly maintained. The Local Planning Authority (LPA) will consider the positive benefits to be gained from any lighting proposal, particularly for safety of movement, security of property, extension of working practices, extension of sporting and leisure activities, advertising of commercial enterprises and enhancing the amenity value of important buildings and settlements. The LPA will seek to balance the need for any such proposal against the impact it may have on the environment in terms of obtrusive light.

1.3 This guidance note sets out the criteria that will be taken into account when the Council, as LPA, assesses and determines proposals which include external artificial lighting. The criteria will be applicable to lighting schemes for a range of development proposals including recreational facilities, commercial and retail developments and highway schemes.

1.4 This guidance note also shows what an applicant will need to provide in terms of technical information in order that the Council may have sufficient information to determine proposed lighting schemes. Also identified are the various conditions that the LPA may apply to a lighting scheme when granting planning permission.

1.5 Appendices to this guidance note provide standards for lighting, additional information relating to lighting for sports facilities, useful contacts for further advice and a glossary of terms.

2.0 The Issues Relating to Obtrusive Light

2.1 It is recognised that there is an increasing demand for artificial lighting for various reasons, including safety, crime prevention and leisure activities. The increased use, often in situations where it is badly designed or excessive, has seen a rise in the number of complaints about obtrusive light received by local authorities. This combination of circumstances has raised the profile of obtrusive light as an environmental issue.

2.2 Obtrusive light is generally a consequence of poorly designed, poorly installed or insensitive lighting schemes. The three main problems associated with obtrusive light are:

Sky glow - the brightening of the night sky seen around urban areas, caused by a scattering of artificial light by dust particles and water droplets in the sky;

Glare - the uncomfortable brightness of a light source when viewed against a darker background; and

Light trespass – light spilling beyond the boundary of the property on which a light is located.

2.3 Each of the three types presents very different problems for the general public and the environment as a whole.

- **Sky glow** is the result of wasteful and ill-directed lighting and reduces the ability of people to see the natural night sky. This is a problem found not only in urban areas but also in rural areas where dark skies at night are one of the special and intrinsic qualities of the rural landscape. Artificial lighting can also destroy local character by introducing a suburban feel into rural areas.
- **Disability glare** and insensitive lighting can have serious implications for motorists who may become distracted or blinded by glaring lights spilling out on to the highway. Bright or inappropriate lighting in the countryside can also have severe ecological implications. Obtrusive light in rural locations can affect the natural diurnal rhythms amongst a wide range of animals and plants.
- **Light trespass** is a common problem and can intrude on the residential amenity in both urban and rural settings, causing stress and anxiety for those affected.

In addition to these specific problems, obtrusive light represents a waste of energy, resources and money.

2.4 Whilst recognising the environmental problems associated with artificial lighting, the Council also appreciates the role of lighting in road safety, extending sport and leisure opportunities and, in some circumstances, reducing crime.

- The safety and security of the general public is of the utmost importance and this guidance note does not suggest that lighting should not be allowed as part of a new development. What this guidance note does suggest is that lighting should be carefully directed and sensitively designed so as to reduce obtrusiveness.
- In appropriate locations extension of sporting and leisure activities, helping locate commercial enterprises and enhancing amenity value may be considered beneficial.

- The LPA will seek to balance the need for any such proposal against any negative impacts.
- Although lighting may reduce the fear of crime it may not necessarily reduce crime and could encourage anti-social behavior.

2.5 With the increasing demand for lighting the number of complaints regarding obtrusive light has risen. The general public is now far better informed about the environment. This combination of circumstances has raised the profile of obtrusive light and artificial light is now defined as a statutory nuisance in the *Clean Neighbourhoods and Environment Act 2005*.

2.6 Manufacturers and installers of external artificial lighting systems should be prepared to provide appropriate technical specifications to demonstrate that their product provides only the appropriate amount of light required at the appropriate times so it is not obtrusive. Installation contractors should be fully conversant with the relevant guidance regarding optimum installation to prevent environmentally friendly schemes from becoming obtrusive.

2.7 This guidance note clarifies what the Council, as LPA, will take into account when considering proposals for lighting. It also sets out what information the applicant will need to provide in support of such a proposal.

3.0 Planning Policy Context

National Policy

3.1 Central government guidance on lighting and planning is contained in the National Planning Policy Framework (NPPF) which came into force from 27 March 2012. Paragraph 7 of the NPPF defines Sustainable Development, which is the core principle of planning, setting out that there are three dimensions to sustainable development: economic, social and environmental. Part of the environmental dimension of sustainable development is clearly stated to include contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to minimise pollution.

3.2 Pollution is defined within the NPPF as including:
“Anything that affects the quality of land, air, water or soils, which might lead to an adverse impact on human health, the natural environment or general amenity. Pollution can arise from a range of emissions, including smoke, fumes, gases, dust, steam, odour, noise and light.”

3.3 Perhaps most importantly with regard to light pollution, paragraph 125 of the NPPF also states that “By encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation”.

3.4 Obtrusive light was made a Statutory Nuisance under the *Clean Neighbourhoods and Environment Act 2005*. The Council can take action against sources of intrusive light where these are shown to be causing a nuisance, for example a domestic floodlight shining into a window in a neighbouring dwelling. In addition, conditions imposed on any planning consent for lighting must ensure that adequate control can be enforced. It is acknowledged that many lighting installations which may cause obtrusive light do not require planning permission or do not fall under the Act as a statutory nuisance.

Local Policy

3.5 Core Strategy Policies

PR2 – People-friendly Streets. This policy promotes high quality design and safer streets. Lighting and CCTV are considered important aspects of maintaining these principles after dark.

UR2 – Built Design and Character. This policy echoes the need for considered and appropriate design. Whilst it does not specifically mention of the role of lighting, we consider that the statements within the policy provide control over the quality of lighting in the public realm.

3.6 Development Policy

DP1. This is our policy for the control of design and amenity. It identifies the need to protect public and residential amenity from light pollution among the many other threats to quality of life.

3.7 Town Centre Lighting Strategy

Colchester has adopted a lighting strategy for the town centre that deals with routes and general illumination as well as the more dramatic lighting of significant architectural features.

3.8 Where obtrusive lighting is beyond the controls of the Council (whether this be through planning controls or environmental health legislation), the Council will aim to discourage such schemes by appropriate guidance and informal approaches to seek solutions.

4.0 Will your Lighting Scheme Require Planning Permission?

4.1 On most dwellings artificial light is not classed as development, but the associated structures and installation may occasionally be development requiring planning permission, especially if they are substantial and affect the external appearance of the dwelling. Planning permission is not required for the carrying out of maintenance, improvement or other alterations of any building works, which affect only the interior of the building or do not materially affect the external appearance of the building. Most work involving lighting, particularly of the householder DIY type, will fall within this category, for example home security lights. Furthermore, temporary lighting schemes may not require planning permission.

However, planning permission is normally required for:

- Lights mounted on poles or other similar structures or if the structures and installation are substantial and affect the external appearance of the dwelling.
- External lighting proposed as part of an industrial or commercial scheme.
- New lighting structures or works which are integral to other development requiring planning permission.
- Illuminated advertisements.

However, the installation of a lighting scheme of such nature and scale that it would represent an engineering operation and typically be undertaken by specialist lighting engineers (Building Regulations now require specialist installation of lighting schemes) could be deemed "development" and as such is likely to require planning permission. Large-scale lighting installations such as the floodlighting of a football stadium or public tennis courts are clearly a form of development, which comes within this statutory definition and would require planning permission. For listed buildings, listed building consent is required for lighting schemes if it is deemed that the lighting attachment would affect the historic fabric of the building or where the character of the building would be materially affected by the lighting. A useful guide *External Lighting for Historic Buildings* (2007) is available from English Heritage.

4.2 The Council would advise prospective applicants to check whether planning permission is required with Planning Officers before installing any lighting scheme. When checking with the Council prospective applicants will need to confirm the nature and extent of the scheme proposed, i.e. the number of lights and their likely output, the height of the lighting columns (if applicable) and the area to be lit, to enable the officer to provide informed advice.

5.0 General Factors to be taken into Consideration

5.1 The Council has identified a number of factors that will be taken into consideration in the determination of planning applications for proposals that include lighting. These are:

5.2 The Location of the Proposal in Relation to Neighbouring Uses

The LPA has identified the following environmental zones against which impacts of external artificial lighting will be judged:

EZ 1: Intrinsically dark landscapes. Lighting proposals that are near enough to significantly affect areas of nature conservation importance, e.g. Sites of Special Scientific Interest, National Nature Reserves and County Wildlife Sites, will only be permitted in exceptional circumstances. External artificial lighting can have severe implications for the natural diurnal rhythms in a range of animals and plants and therefore sites which are deemed important in terms of their provision of wildlife should not be affected.

EZ 2: Low district brightness areas. Significant lighting proposals within the open countryside and small villages will only be permitted if the applicant can demonstrate to the LPA that the scheme proposed is the minimum needed for security and/or working purposes and that it reduces the potential for obtrusive light from glare, light trespass and sky glow to an acceptable level. Artificial lighting in the open countryside can have a demonstrable effect on 'dark skies', one of the special qualities of the rural landscape.

EZ 3: Medium district brightness areas. Significant lighting proposals in large villages or other urban locations will only be permitted if the applicant can demonstrate to the LPA that the scheme proposed minimises the potential obtrusive light from glare, light trespass and sky glow to an acceptable level. Obtrusive light can have a significant impact on the amenity of residential areas in towns and villages.

EZ 4: High district brightness areas. Significant lighting proposals in the town centre where there are high levels of night-time activity will only be permitted if the applicant can demonstrate to the LPA that the scheme proposed minimises the potential obtrusive light from glare, light trespass and sky glow to an acceptable level.

The Institution of Lighting Professionals has provided guidance on acceptable levels of illumination for specific environmental zones, which relate to the areas we have identified above. The LPA will require any applications for lighting schemes to adhere to the following guidance for the relevant environmental zone (see Appendix 1, *Obtrusive Light Limitations for External Lighting Installations*).

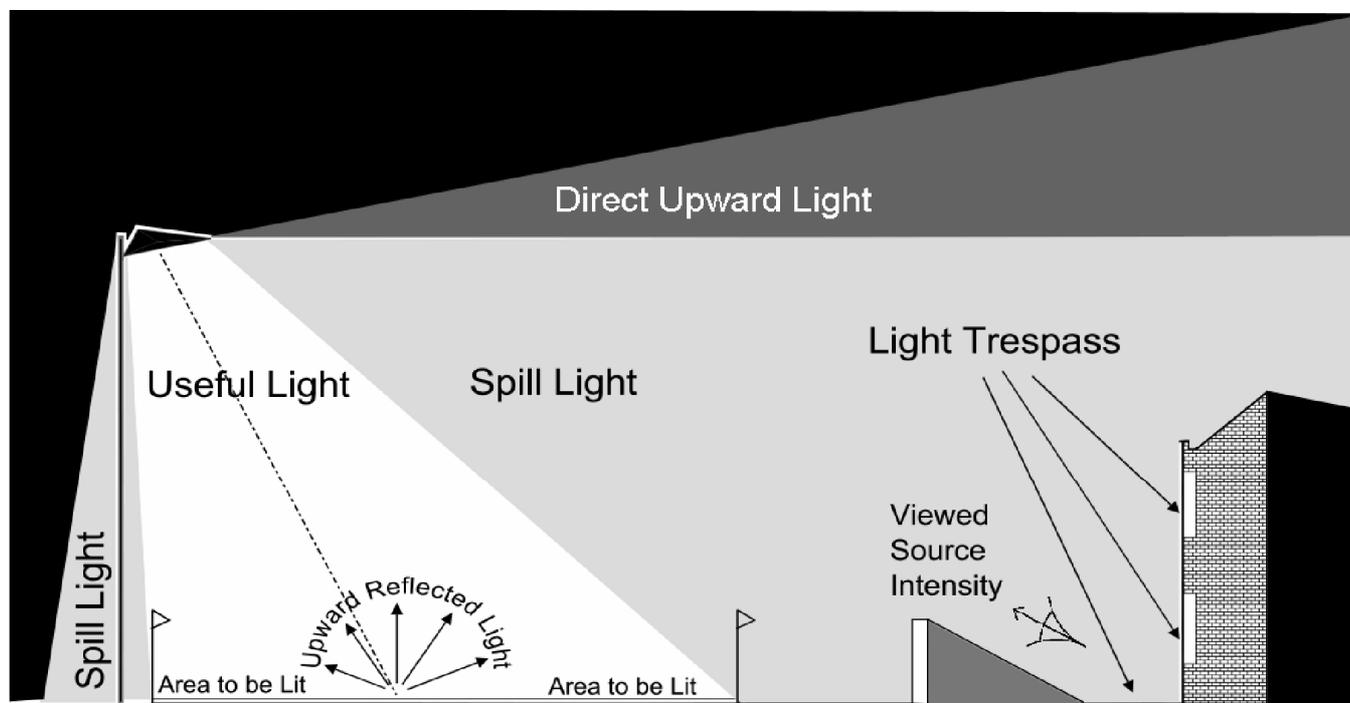
It should be noted that where an area to be lit lies on the boundary of two zones the obtrusive light limitation values used should be those applicable to the darkest zone.

5.3 The Nature of the Use of the Lighting Proposed

For all lighting proposals, the applicant will identify the purpose and use of the lights, the potential users of the lighting scheme (e.g. for recreation facilities) and the hours the lights will be in operation (summer and winter). Hours of operation will be expected to be kept to a minimum, which will reduce the impact on the environment.

5.4 The Design of the Lighting Proposed

To achieve the necessary minimisation of obtrusive light the applicant should adhere to the following general principles taken from the Institution of Lighting Professionals *Guidance Notes for the Reduction of Obtrusive Light*.

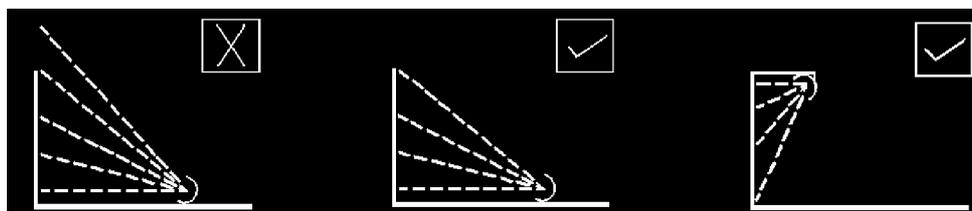


Do not over-light. This is a major cause of obtrusive light and a waste of energy.

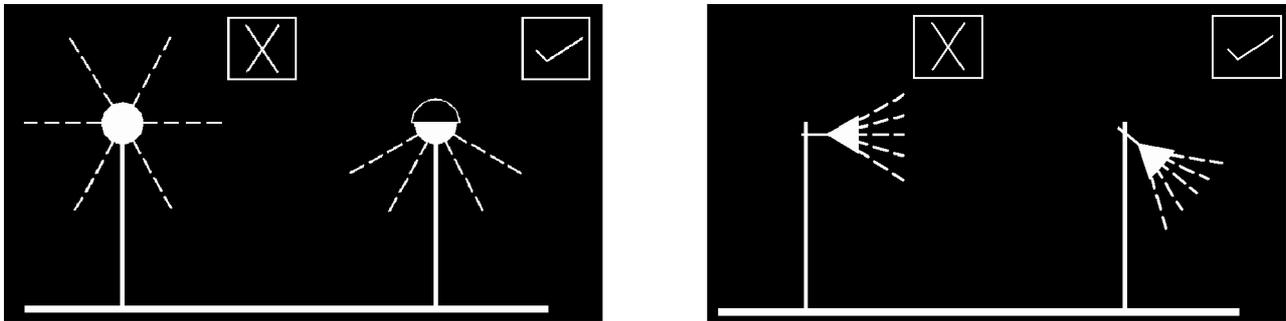
Lighting should be designed to the correct standard for the task, taking into account cost, energy use, colour rendering and the purpose of the lighting scheme required. All lighting schemes should meet British Standards.

Dim or switch off lights when the task is finished.

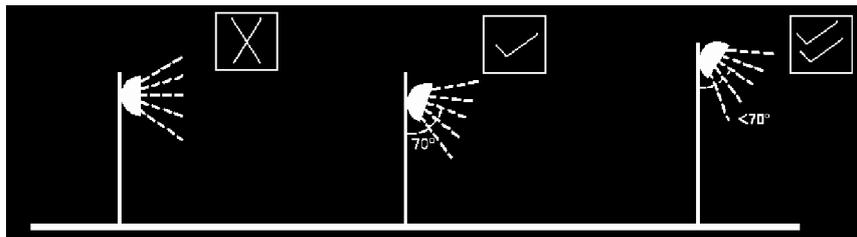
Lighting should be directed downwards wherever possible to illuminate its target (see image below). If there is no alternative to up-lighting, then the use of shields and baffles will help reduce spill light to a minimum. Up-lighting is a particularly bad form of obtrusive light and contributes to sky glow.



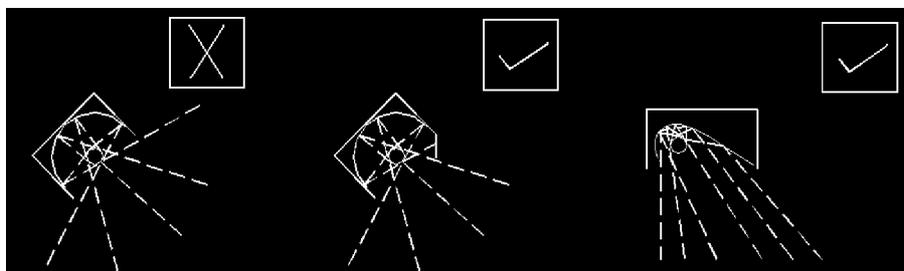
Lighting should be designed to minimise the spread of light near to, or above the horizontal (see images below). Any light that shines above the horizontal line of the light adds to the sky glow effect.



Ensure the main beam angle of all proposed lights directed towards any potential observer is kept below 70 degrees (see image below). It should be noted that the higher the mounting height, the lower the main beam angle could be. This will help reduce the effect of glare and light spill on neighbouring dwellings, passing motorists, pedestrians, etc. Lighting should be directed to minimise and preferably avoid light spillage onto neighbouring properties.



Wherever possible, use floodlights for sports facilities and other installation with asymmetric, or double-asymmetric, beams that permit the front glazing to be kept at or near parallel to the surface being lit (see image below).



5.5 The Installation of Lighting

The visual impact of the lighting installation when viewed during daylight hours can be as important as its effects at night. Therefore the design, including associated infrastructure, needs to be carefully considered to ensure that visual intrusion is minimised.

6.0 Specific Factors to be taken into Consideration for Various Land Uses

6.1 Different development proposals will warrant more specific guidance. The LPA will take the following guidance into account when assessing external artificial lighting proposals. These extracts are based on the Department of the Environment and the Countryside Commission publication *Lighting in the countryside: Towards good practice*, 1997 (this publication is available online from the following website: www.communities.gov.uk).

6.2 Residential Development

- Consider whether lighting is required at all and where it will be most effective.
- Consider using Passive Infrared (PIR) sensors for house lights so that they are only on when needed.
- Keep lighting of new residential areas in balance with that of the area as a whole and lighting on adjacent road junctions.
- Consider views from the surrounding countryside and avoid a line of lights defining the edge of the village.

6.3 Advertisement Control

- Acceptable lighting levels for illuminated signs are given in *Brightness of Illuminated Advertisements – Technical Report Number 5* (2001) produced by The Institution of Lighting Professionals. All advertisement applications should conform to the recommendations set out in this report.
- Position promotional lighting/signs so that they are not visible from open countryside, i.e. concentrate at public entrances to buildings.
- Consider timing of lights – avoid any lights being left on during the day and turn off all lights after working hours.
- ‘Sky beams’ and ‘upward laser displays’ will be treated as advertisements and controlled as such.
- Lighting shall be so positioned that users of the highway are not hindered by dazzle or glare.
- For further information on signage and lighting shop fronts refer to the *Colchester Borough Council Shop Front Design Guide*.

6.4 Commercial Developments

- Avoid use of lights simply to create a ‘presence’ at night. Consider leaving only essential lights on through the night. Lighting should be switched off when buildings are unoccupied.

- Concentrate lights where they are needed and establish a clear hierarchy, with minimum lighting around the outer, perimeter of the complex.
- Reduce the scale of street/road lighting and consider height and spacing of lights in relation to buildings, if other requirements like visibility, glare, etc. permit it.
- Position promotional lighting/signs so that they are not visible from open countryside, i.e. concentrate at public entrances to buildings.

6.5 Farms and Market Garden Centres

- To reduce light spillage mount lights below the roof height of buildings and direct light downwards to where it is needed.
- Avoid use of sensors that can be tripped by animals.
- As far as possible, position lights so that they are shielded by buildings and are not visible from the surrounding countryside.
- The potential impact of light from glasshouses will be considered as part of the planning application.
- Use timer controls to avoid all-night lighting.

6.6 Decorative Building Lighting and Public Art

- Keep lighting understated and aim to enhance rather than swamp architectural character.
- Ensure light is directed only at the structure, re-siting lights and using baffles and shielding where possible.
- Minimise up-lighting where it distorts architectural detailing.
- Consider the use of timing controls to ensure that buildings and artworks will only be lit during the evenings when they will be appreciated by the public. Switching off decorative lights late at night will reduce sky glow and save energy.
- Consider the choice of surface materials being illuminated. The reflectance value may be high, causing reflected light to generate excessive sky glow.
- Where public art consists of lighting effects in their own right, the Council will have regard to the intensity of the light, its impact beyond the public realm space to which it relates and other guidance contained within this document.

6.7 Lighting Railway Stations and Road/Rail Interchanges

- Design the lights for the station as a whole, balancing the need for lighting in different areas and considering the impact of light in views from the surrounding countryside.

- Concentrate on lighting to enhance the architectural character of the station building rather than on creating an 'urban' level of light on the platform and in the station forecourt.
- Direct car park and security floodlights downwards and to where the light is required.
- Lighting shall be so positioned that users of the highway are not hindered by dazzle or glare.

6.8 Petrol Filling Stations

- Canopy lights should be positioned to avoid light spill from the sides of the canopy.
- Avoid the use of dish diffusers, which cause additional glare.
- Reduce lighting or avoid it during daylight hours.
- Integrate design for promotional signage with that of the canopy.
- Avoid lighting internal fascia around canopy.
- Design and position signs so that they are visible only from the carriageway and not from the surrounding landscape.
- Consider a reduction in lighting during the night, leaving only essential lights on. Lighting should be switched off when buildings are unoccupied.

6.9 Road Junctions and Accesses

- All designs for road junctions and accesses must meet British Standards.
- Keep number of columns to a minimum - a single column may be sufficient on small roundabouts.
- Consider colour of lighting columns in relation to surrounding landscape.
- Use the most efficient lighting possible in terms of cost, energy use and colour rendering whilst meeting British Standards.
- Use of horizontal cut-off luminaires which emit less than 1.0% upward light.
- Carry out a visual appraisal and design lighting scheme to minimise visual intrusion of light at night and day.

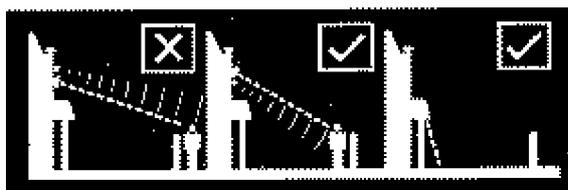
6.10 Rural Car Parks

- Direct lighting downwards and design equipment to control levels of light spill and glare.

- Site lighting equipment carefully, making use of the backdrop provided by any existing vegetation, and introduce new planting within the car park to help integrate the lighting structures and minimise the visual impact of both equipment and lighting.
- Use new hedgerows or tree planting to help minimise the impact of car park lights around the car park boundaries.
- All vegetation needs to be maintained and trimmed once it has been established otherwise it will block out the light.
- Rural car parks need not necessarily be lit, but where they are the lighting should be switched off when they are closed. Public car park lighting should cease when the car park is closed, or when street lighting is switched off, whichever is later.

6.11 Security Lighting

- Passive infrared detectors should control lighting. Avoid sensors that can be tripped by road or footway users. See image below.



- A 150W (2000 lumen) tungsten halogen lamp is more than adequate for domestic security lighting. Lamps of higher intensity create too much light, more glare and darker shadows. For all-night lighting at low brightness use a compact fluorescent porch light of 9W (600 lumen).
- Lighting should be directed down to illuminate its target and mounted below the property boundary height so as to reduce light spill.
- Develop an integrated approach to security lighting, balancing levels of light with other lighting in and around the site to avoid glare and light spill as well as dark spots.

6.12 Sports Facilities

- Design lighting to be as directional as possible using the minimum number of lights required, thereby reducing light pollution.
- Consider the colour of lighting poles; light colours should be used if lights are generally seen against the sky, dark if there is a backdrop of vegetation.
- For facilities that are occasionally used, the use of tokens to control the switching on of floodlights can ensure that the lights are only used when required.

- (Additional information is given in Appendix 3, *Guidance for Lighting Schemes for Outdoor Sports Facilities*)

7.0 Information Required

7.1 In addition to the information normally required for a planning application, any proposal including significant external artificial lighting should be accompanied by the following:-

- Lighting designs for the proposed installations.
- Lighting levels, luminaire details, lamp type, wattage, control systems and proposed hours when the lighting will be switched on.
- A statement setting out why a lighting scheme is required, the proposed users, and the frequency and length of use in terms of hours of illumination (see paragraph 5.4).
- A statement confirming compliance with the Institution of Lighting Professionals *Obtrusive Light Limitations for Exterior Lighting Installations*, including sky glow, light trespass, source intensity and, where applicable, building luminance.

All new street lighting for roads to be adopted should comply with Essex County Council specifications.

In addition, applications for major developments including significant external artificial lighting should be accompanied by a technical report undertaken by competent persons that demonstrates that all lighting of the development (including sky glow, light trespass, source intensity and building luminance) fully complies with the Institution of Lighting Professionals *Obtrusive Light Limitations for Exterior Lighting Installations* for the relevant environmental zone. It should include the following information, in addition to that listed above:-

- A map of the lighting levels over the application site, extending 100m outside of the site boundary.
- A survey showing existing landscape features, together with proposed landscaping features to mitigate the impacts of the proposed lighting.
- Height and spacing of lighting columns.

7.2 Any proposal for the display of illuminated advertisements should be accompanied by that information normally required for any other planning proposal and additionally the information set out below:-

- Details of the proposed location, positioning and dimensions of the sign face.
- The sign face maximum luminance in candelas per square metre.
- The number, size and type of light sources and details of the sign face materials.
- The type of illumination – internal or external; static or intermittent.
- Details of the make and catalogue number of any luminaires/floodlights.
- Size, type and number of lamps fitted within any luminaire or floodlight.

- The mounting height of the luminaires/floodlights specified.
- The location and orientation of the luminaires/floodlights.

Provision of this information may require professional advice and potential advisors can be found in Appendix 4, *Useful Addresses and Contacts*. For significant lighting schemes professional advice from a lighting manufacturer or from a qualified lighting engineer is recommended.

8.0 Types of Planning Conditions Applied

8.1 Where the Council grants planning consent for a development proposal it may impose conditions controlling the lighting scheme provided. These are likely to include:-

For major development, the provision of a validation report undertaken by competent persons that demonstrates that all lighting of the development (including resultant sky glow, light trespass, source intensity and building luminance) fully complies with the figures and advice specified in this guidance note for the relevant zone.

For minor development, we would wish to ensure that any lighting of the development (including resultant sky glow, light trespass, source intensity and building luminance) fully complies with the figures and advice specified in this guidance note for the relevant zone.

Illuminated signs

We would normally wish to ensure that any externally illuminated sign shall comply with the guidelines in the current Institution of Lighting Professionals *Guidance TR5 Brightness of Illuminated Advertisements*.

They may also cover:

- Limiting the time of the lighting;
- Limiting the light levels to a designed uniformity;
- Specifying lamps, luminaires and columns;
- Specifying the need for full horizontal cut-off;
- The design, height and position/angle of the lighting;
- The retention of screening vegetation;
- The use of planting and bunding to contain lighting effects;
- Prohibiting floodlighting;
- The future maintenance of the lighting schemes and post-installation checks in accordance with the original design and planning approval; and
- In exceptional circumstances, the granting of temporary planning permission to enable a review of lighting impacts after installation

These conditions will be applied as necessary by the LPA to help reduce obtrusive light from new proposals, particularly glare and spillage, in order to protect wildlife and residential amenity.

Appendix 1 - Obtrusive Light Limitations for External Lighting Installations

The following information is taken from the Institution of Lighting Professionals *Guidance Notes for the Reduction of Obtrusive Light*.

Environmental Zone	Sky Glow ULR [Max %] ⁽¹⁾	Light Trespass (into Windows) Ev [Lux] ⁽²⁾		Source Intensity I [candelas] ⁽³⁾		Building Luminance Pre-curfew ⁽⁴⁾
		Pre- curfew	Post- curfew	Pre- curfew	Post- curfew	Average, L [cd/m ²]
E1	0	2	0 (1*)	2,500	0	0
E2	2.5	5	1	7,500	500	5
E3	5.0	10	2	10,000	1,000	10
E4	15.0	25	5	25,000	2,500	25

ULR = **Upward Light Ratio of the Installation** is the maximum permitted percentage of luminaire flux for the total installation that goes directly into the sky.

Ev = **Vertical Illuminance in Lux** and is measured flat on the glazing at the centre of the window.

I = **Light Intensity in Candelas (cd)**

L = **Luminance in Candelas per square metre (cd/m²)**

Curfew = **The time after which stricter requirements (for the control of obtrusive light) will apply;** often a condition of use of lighting applied by the Local Planning Authority. If not otherwise stated - 23.00hrs is suggested.

* = From public road lighting installations only

- (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.
- (2) **Light Trespass (into Windows)** – These values are suggested maxima and need to take account of existing light trespass at the point of measurement. In the case of road lighting on public highways where building facades 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 trespass into the window down to the after curfew value by fitting a shield, replacing the luminaire, or by varying the lighting level.
- (3) **Source Intensity** – This applies to each source 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.

Appendix 2 - Relevant Publications for Lighting Standards

British Standards:	BS 5489 & BS EN 13201-1:2003	Road Lighting
	BS EN 12193 BS EN 12464	Light & Lighting - Sports Lighting Lighting of work places – Outdoor work places
CIBSE/SLL:	SLL	Code for Lighting (2006)
	SLL FF07	Environmental Considerations for Exterior Lighting (2003)
	LG01	The Industrial Environment (1989)
	LG04	Sports Lighting (2006)
	LG06	The Outdoor Environment (1992)
CIE Publications:	001	Guidelines for Minimising Urban Sky Glow near Astronomical Observatories (1980)
	017.4	International Lighting Vocabulary (1987)
	083	Guide for Lighting of Sports Events for Colour Television and Film Systems (1989)
	094	Guidance for Floodlighting (1993)
	115	Recommendations for the Lighting of Roads for Motor and Pedestrian Traffic (2010)
	126	Guidelines for Minimising Sky Glow (1997)
	129	Guide for Lighting Exterior Work Areas (1998)
	136	Guide to the Lighting of Urban Areas (2000)
	150	Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting (2003)
	154	The Maintenance of outdoor lighting systems (2003)
Countryside Commission/DOE		Lighting in the Countryside: Towards good practice (1997) (www.communities.gov.uk)
Defra		Statutory Nuisance from Insects and Artificial Light (Sections 101-103 of the Clean Neighbourhoods and Environment Act 2005).
		Road Lighting and the Environment (1993)
ILP Publications:		Towards Understanding Skyglow (2007) (joint ILP/CfDS publication)
		Outdoor Lighting Guide (2005)
	TR05	Brightness of Illuminated Advertisements (2001)
	TR24	A Practical Guide to the Development of a Public Lighting Policy for Local Authorities (1999)
	GP02	Lasers, Festive Lighting and Entertainments Code (1995)
	GP09	Lighting the Environment (1995) (joint ILP/CIBSE publication)
	GN01	Guidance Notes for the Reduction of Obtrusive Light (2011)
	GN02	Domestic Security Lighting - Friend or Foe? (2005)
		Joint Code of Practice for the installation, maintenance and removal of seasonal decorations (2005)
CfDS		The CfDS Handbook: Blinded by the Light - A Handbook on Light Pollution
		CfDS Information Sheets
IESNA	TM-15-07 (R)	Luminaire Classification System for Outdoor luminaires

CfDS = Campaign for Dark Skies
 CIBSE = Chartered Institution of Building Services Engineers
 CIE = International Commission on Illumination
 CLG = Department of Communities and Local Government
 ILP = The Institution of Lighting Professionals
 SLL = Society of Light and Lighting

Appendix 3 - Guidance for Lighting Schemes for Outdoor Sports Facilities

Sport plays an increasingly important role in the everyday lives of people today. There is now a greater need for more sports facilities provided to better specification levels than existing facilities and many older facilities are also being refurbished to improved specification levels. Most new sports facilities now have outdoor play areas, which to meet the demands of the modern consumer need to be open both during the daytime and the evening. Therefore, new sports facilities are almost always accompanied by artificial lighting schemes. Whilst recognising the advantages that lighting can bring in making more effective use of recreational facilities, the Council is also conscious that such proposals can have an adverse environmental impact in terms of obtrusive light.

This guidance note only gives a brief background to the nature of artificial lighting for sports facilities and the Council would advise the applicant to refer to more technical guidance from The Chartered Institution of Building Services Engineers (CIBSE), *Lighting Guide 4: Sports Lighting* (2006). Lighting Schemes for sports facilities require considerable technical expertise. Reputable manufacturers and suppliers of lighting schemes should be prepared to provide appropriate technical specifications to demonstrate that their product not only maintains the levels of illumination required for the intended use, but also does so with the minimum of visual intrusion or obtrusive light.

Specific Guidance on Design and Illumination

Most sporting facilities require lighting of a uniform level over the whole playing area. This is normally best provided by downward facing lights mounted on columns. The Institution of Lighting Engineers recommends that the most effective way of achieving this and preventing light spillage into surrounding areas is to use floodlights with an asymmetric beam that, while producing the main beam at around 60-70 degrees, permits the front glass to be kept horizontal. The upper limits to the beam will also need to be specified depending on circumstances but should normally not exceed 70 degrees from the downward vertical.

Different sporting activities require different light levels on the playing surface. Sports such as hockey, with a fast moving small ball, require a much higher level of illumination than, for example, netball. It is usually the case that the higher level at which a sport is played, for example, county or national standard, the higher the level of illumination required. Training or more informal use may be undertaken with a lower level of illumination. Sport England provides advice on lighting in its design guidance for some individual sports and refers to CIBSE *Lighting Guide 4: Sports Lighting* (2006).

Some sports facilities such as golf driving ranges present particular difficulties for floodlighting. Most sites tend to be in open countryside and have floodlights aimed either horizontally or slightly above the horizontal plane to enable players to follow the flight of the ball. These lights, which are often of considerable intensity and with a wide beam, can cause inconvenience to neighbours and can be a safety hazard; particularly where dazzle affects highway users. Golf driving range lights are probably one of the most polluting forms of floodlighting in that they invariably illuminate a much larger area than is required. The only circumstances where a horizontal beam of this nature may be permitted are where the natural landform or a permanent natural or manmade landscape feature can effectively contain the light.

Careful consideration needs to be given to the positioning and height of lighting columns if an even light distribution over the playing surface is to be achieved whilst maintaining light spillage into adjacent property to a level below that indicated in Appendix 1. Floodlighting columns may vary in height from around 5m to 25m depending upon the type of illumination required and the area to be lit. The higher the lighting columns, the easier it is to ensure that the beam is directed downwards as indicated above, and to minimise light spillage to surrounding areas. A judgment in all cases will need to be made on the visual impact of the lighting columns during daylight hours as well as the impact of the floodlighting system when in use.

Floodlighting systems can utilise a number of different light sources each with its own particular characteristics in terms of colour rendering, operating costs and the amount of glare produced. The type of light source will need to be carefully matched with the level of illumination required and the height and positioning of columns, the visual impact of which will be a material planning consideration. It is also essential that the fittings are sufficiently robust to ensure that the carefully aimed lamps necessary to minimise light spillage outside the floodlit site are not knocked out of alignment by high winds or the weight of snow.

In coming to a decision on the merits of a particular proposal, the Council will take into account the use of the facility and the likely benefits to the general public. By definition, floodlighting allows sports facilities to be used for longer hours and throughout the winter. Floodlights must be operational for long hours to justify their initial capital cost and provide for the community's needs. The English Sports Council recommends a curfew time of 10pm for floodlighting, although this may be extended in exceptional circumstances in non-sensitive areas. Planning conditions setting a curfew time may be applied. For facilities that are used occasionally, the use of tokens to switch on the floodlights can ensure that the lights are only on when required.

Consideration will be given to the relationship between the use of the facility and the interests of conservation, amenity and safety. Where the impact of a proposal is considered to be unacceptable, or cannot be mitigated through ameliorative measures, the protection of those recognised interests will prevail.

Appendix 4 - Useful Addresses and Contacts

<p>British Astronomical Association</p> <p>Burlington House, Piccadilly, London W1J 0DU</p> <p>Tel: 0207 734 4145</p>	<p>British Standards Institution</p> <p>389 Chiswick High Road, London W4 4AL</p> <p>Tel: 020 8996 9001</p>	<p>Campaign for Dark Skies</p> <p>Regional Information Officer (Essex) James Abbott 1 Waterfall Cottages, Park Road, Rivenhall, Witham CM8 3PR</p>
<p>www.britastro.org</p>	<p>www.bsi.org.uk</p>	<p>www.britastro.org/dark-skies</p>
<p>Ch. Institute of Building Services Engineers (Lighting Division)</p> <p>222 Balham High Road, London SW12 9BS</p> <p>Tel: 020 8675 5211</p> <p>www.cibse.org</p>	<p>Council for the Protection of Rural England</p> <p>128 Southwark Street, London SE1 0SW</p> <p>Tel: 020 7981 2800</p> <p>www.cpre.org.uk</p>	<p>International Commission on Illumination (CIE)</p> <p>Central Bureau, Kegelgasse 27, 1030 Vienna, Austria</p> <p>Tel: +43 1 714 31870</p> <p>www.cie.co.at</p>
<p>International Dark-Sky Association</p> <p>3223 North First Avenue, Tucson AZ 85719</p> <p>Tel: +1 (520) 293 3198</p> <p>www.darksky.org</p>	<p>Institution of Lighting Professionals</p> <p>Regent House, Regent Place, Ruby CV21 2PN</p> <p>Tel: 01788 576492</p> <p>www.theilp.org.uk</p>	<p>Lighting Industry Federation</p> <p>Ground Floor, Westminster Tower, 3 Albert Embankment, London SE1 7SL</p> <p>Tel: 0207 793 3020</p> <p>www.lif.co.uk</p>
<p>Sport England</p> <p>Third Floor, Victoria House, Bloomsbury Square, London WC1B 4SE</p> <p>Tel: 08458 508508</p> <p>www.sportengland.org</p>		

Appendix 5 - Glossary of Terms Used in External Lighting

The definitions and explanations given in this glossary are intended to help readers to understand the guidance.

Asymmetrical beam – floodlights giving a fan-shaped lighting pattern – available in wide, medium and narrow beams.

Beam angle – the angle formed by the centre of the beam of light from a lamp relative to the vertical. When light is emitted from a lamp it forms a cone from the light source. The shape of this cone will depend on the reflector design in the lamp.

Candela – the unit of luminous intensity of a light source in a given direction.

Front glazing – The front face of the lighting unit through which the light passes.

Glare – the discomfort or impairment of vision, which is experienced when part of the visual field is excessively bright in relation to the general surroundings. Direct glare normally occurs when the viewer can see the light source.

Illumination – the process of lighting an object or surface.

Light trespass – any light which illuminates beyond that which needs to be lit, particularly into residential areas or properties, often perceived to be a nuisance.

Lumen – the unit of luminous flux (light) emitted by a light source or falling on a surface.

Luminaire – formerly known as a lighting fitting. The apparatus which controls the distribution of flux from a lamp or lamps, and which includes all the components necessary for fixing and protecting the lamps and for connecting them to the local supply circuit. Floodlights and some other luminaires retain their individual names.

Luminance – a term which expresses the intensity of the light emitted in a given direction by unit area of a luminous or reflecting surface. It is the physical equivalent of what is subjectively called brightness. The unit most commonly used is the candela per square metre.

Luminous flux – the light emitted by a source or received by surface. The unit is the lumen (lm).

Luminous intensity – the power of a source or illuminate surface to emit light in a given direction. The unit is the candela (cd).

Lux – a measurement of illumination. One lux equals one lumen per square metre.

Main beam angle/horizontal cut-off – a term applied to a luminaire. The angle measured from the downward vertical upwards to the first line of sight at which the lamp(s) or surface of high brightness is no longer visible. This angle is usually measured from the downward vertical or, for a floodlight, from the beam axis. Horizontal cut-off refers to the limiting of light above an imaginary line at horizontals with the luminaire.

Mounting height – the vertical distance between the luminaire and the ground or floor.

Obtrusive light – any light, which illuminates areas beyond that which needs to be lit, that causes nuisance or glare, disturbs wildlife or causes light pollution, including sky glow. The extent to which it is perceived as being a nuisance will often depend on the background light from other sources and the intensity of the light.

Sky glow – a phenomenon where light, usually from a major light source such as an urban area or industrial/recreational floodlight installation, is seen, often from many miles distant, as a glow in the sky. Some of the light is reflected from the illuminated surfaces, although most is emitted directly skyward from poorly designed lighting systems. Sky glow resulting from poorly designed systems is particularly noticeable in dark landscapes where there are few other light sources.