

Lighting Strategy

5.11 ~ Environmental Issues...

Sustainable Design

Cheshire West and Chester is committed to leading by example in terms of sustainability. The lighting strategy within the PRDG has been produced to comply with best practice in sustainable design.

Lighting crosses disciplines within public realm design from urban design to electrical engineering. Sustainable lighting needs to make reference to both, and an appropriate balance must be found between these sometimes conflicting view points.

There are clear benefits to sustainable urban design through the proper application of lighting:

- Helping to redress the balance between the use of cars and more sustainable modes of transport.
- Encouraging more people to live, work and spend their leisure time in urban centres, rather than commuting in from the suburbs.
- Contributing to a reduction in crime and the perception of crime, thereby promoting local communities.
- There are clear benefits in sustaining the local economy.

- It is not only improvements to public / street lighting that are significant, but also the application of architectural lighting, which has been shown to contribute to all of the above.

Correctly applied lighting in a public realm context can play a significant role in addressing these issues during the hours of darkness. This has been demonstrated through academic research and practical application on many projects throughout the UK.

Lighting can contribute significantly to a net reduction in carbon emissions within the context of public realm design; however, lighting still uses energy and therefore the lighting of our public spaces must be undertaken in a responsible and sensitive way. It is no longer acceptable to light the exterior of buildings without a properly considered justification as to why this should be done and what benefits it will bring to the wider community.

Best practice, in terms of energy use and the selection of equipment, should be applied to all schemes. In particular, consideration should be given to the following:

1. Choice of energy efficient sources and control gear.
2. Controls / hours of operation.
3. Use of alternative forms of energy.
4. Longevity of equipment and a reduction of maintenance.
5. Choice of equipment – sustainable sources and disposal.



Eastgate Clock, Chester

Guidelines and Requirements

Before any lighting scheme is implemented it should be able to demonstrate the following;

Public Lighting

1. Only energy efficient light sources should be used, such as Cosmopolis, SON, Ceramic Metal Halide, Fluorescent or LED (providing it can demonstrate an acceptable efficacy to the satisfaction of Cheshire West and Chester lighting engineers).
2. Control gear should use energy efficient technology (e.g. electronic ballasts). Switch start fluorescent gear is not acceptable.
3. The method of switching the scheme on and off should be considered. Control systems and the possible benefits of monitoring should be applied where appropriate. The hours of operation and the need for the entire scheme to run throughout the night should be considered. If appropriate, the facility to shut down elements of the scheme at certain times should be included. Metered supplies are to be fitted with Smart Meters.
4. The lighting class should be identified in compliance with current guidance within the BS / CEN code and current guidance provided by the ILE. Consideration should be given to transition points between new and old schemes to ensure the contrast is appropriate and does not lead to the over lighting of adjacent areas in the future. The lighting class should be maintained at the lowest acceptable level providing it does not

conflict with the wider aims of a public realm scheme – In particular when using white light the lighting class should not be lowered as allowed for within the BS, as this can have a detrimental effect on the perception of brightness – each design should be independently assessed and the class selected in consultation with Cheshire West and Chester Council.

5. The contribution of adjacent or associated architectural schemes, both in terms of actual light and in terms of perceived light contribution, should be considered when selecting lighting classes for public spaces.
6. Schemes replacing existing installations should demonstrate a net reduction in energy use, or provide a justification acceptable to Cheshire West and Chester Council as to why this has not been achieved.

Architectural Schemes

1. Points 1 to 3 above apply.
2. As previously identified, in order for a building to be lit it must be shown to demonstrate a strategic importance in terms of the overall public realm design for the city, as detailed within the PRDG.
3. A contribution to the design of a public space by providing vertical illuminance or helping to define a public space at night; and one of the following;
 - A landmark building aiding legibility and way-finding

- Be of historic interest
- Retail and leisure buildings should contribute to the lit diversity of the night time city. This should be balanced with their surroundings and adjacent buildings, in line with guidance described elsewhere within the PRDG and in the case of the Rows, the Rows management guidance document. Schemes should comply with planning requirement ENV14.
- 4. Only under special circumstances can buildings be lit that do not fully comply with these criteria and then only under the discretion of Chester West and Chester.



Discreet installation is critical for historic buildings, small carefully positioned luminaires do not detract from the architectural detail.

Approvals

All designers should submit to Cheshire West and Chester details of how their scheme will comply with these guidelines. In particular the following information will be required:

- A statement detailing the justification for the inclusion of lighting to buildings within a scheme.
- A statement identifying the lighting class for public spaces and roads.
- A statement regarding control philosophy
- A statement regarding the use of alternative forms of energy
- A statement regarding the lifecycle costs of the scheme including energy efficiency.

It may not be possible or appropriate to allow for special controls or alternative supplies of energy, however the statement should describe why this is the case and what options have been considered.

Light Pollution and Light Nuisance

All schemes must comply with best practice in terms of minimising light pollution and contribution to sky-glow. Light pollution is caused when light is directed above the horizontal and shines into the sky, or strays into locations where it might cause a nuisance to others. The use of cut off lanterns, louvres and cowls along with careful design will ensure a scheme will not contribute to light pollution. The 'Institution of Lighting Engineers Guidance Notes for the Reduction of Light Pollution' offers guidance to avoid light pollution and should be applied to demonstrate best practice.

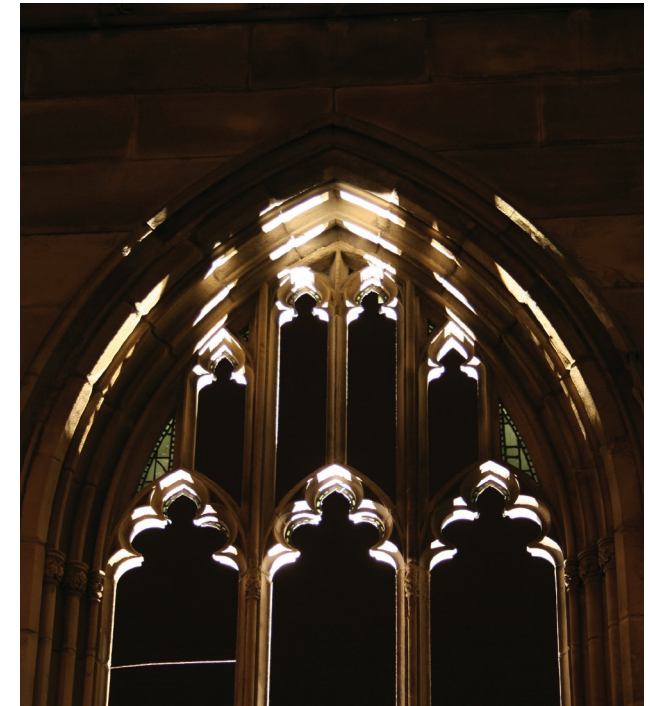
The Clean Neighbourhoods and Environment Act (2005) now makes light nuisance subject to the same criminal law as noise and smells. It applies to "artificial light emitted from premises so as to be prejudicial to health or a nuisance". All luminaires should be specified and positioned to ensure that light does not intrude into adjacent premises. This can be achieved by selecting luminaires with an appropriate photometric performance, careful aiming of luminaires and the application of shielding and louvres. Best practice dictates that all luminaires should be shielded to minimise glare and to ensure that the light source is not directly visible by passers-by or neighbours under normal circumstances. The 'Institution of Lighting Engineers Guidance Notes for the Reduction of Light Pollution' also provides advice on minimising light trespass.

It is important that public lighting, especially when using white light, is not allowed to penetrate residential property due to the biological effects light is known to have on the body clock and sleep cycle. Any public lighting lanterns in residential areas should if necessary be fitted with obtrusive light shields to mitigate this.

Wildlife

Lighting can have a negative impact on wildlife, in particular birds and bats and it is known that light can also affect the behaviour of fish.

All schemes should consider the potential impact on wildlife and if necessary specialist advice should be obtained. The application of best practice regarding light pollution will minimise the impact of urban lighting on birds. Bats are particularly vulnerable to lighting schemes in the vicinity of waterways. 'The Effect of Street Lighting on Bats' published by Urbis Lighting and 'Bats and Lighting in the UK' published by the Bat Conservation Trust both offer advice to minimise the impact of lighting on bats.



Lighting design is as much about shadow as light

Resilience Against Climate Change

All installations must take into account the potential impact of climate change and designers should consider the potential consequences that high winds or flooding, for example, could have on an installation within its design life. In particular it has been identified that some electrical sub-stations supplying Chester are in high risk flood areas. Where possible supply companies should be encouraged to ensure electrical supplies to public lighting are fed from low risk sub-stations ensuring that in the event of flooding, within or around the city, public lighting systems are not immediately lost thereby hampering the emergency services in their response.

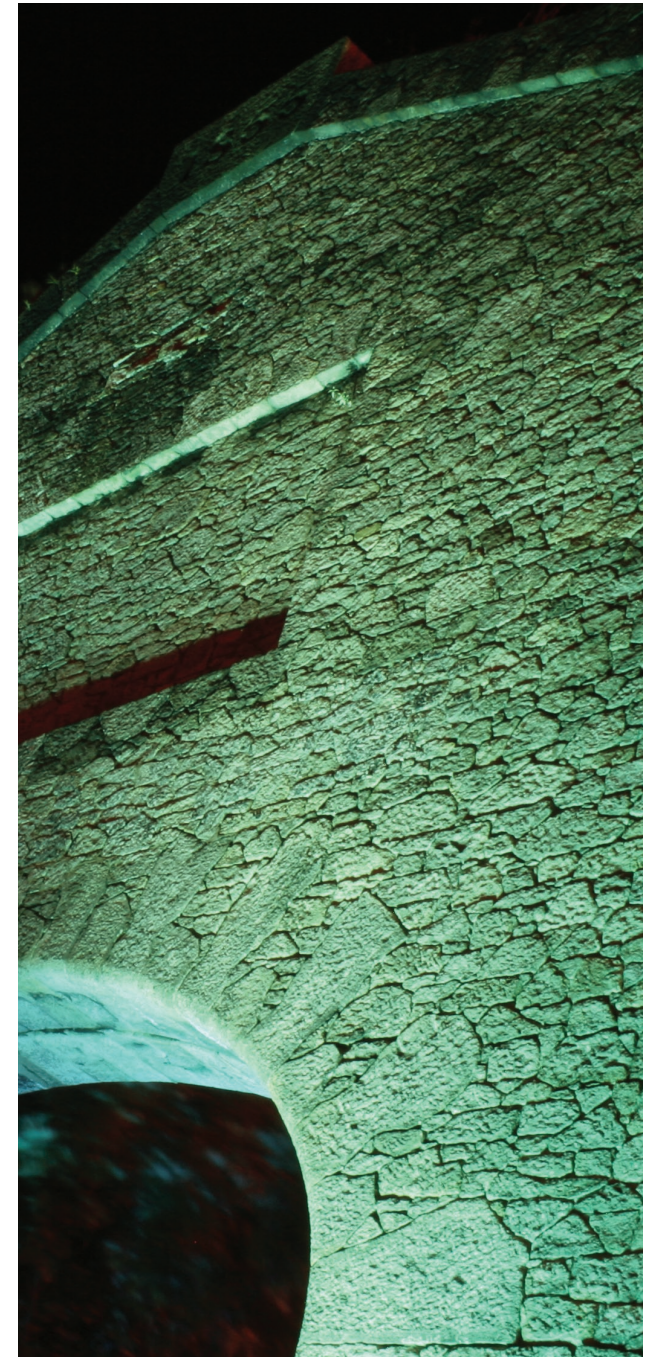


The decision to light a structure should be carefully considered, but once it is lit it can change the way a building is perceived.

Chester Electric Lighting Station

Chester has a fascinating history as a pioneer in the use of hydroelectricity in the generation of power, in particular for street lighting. The generating station still exists and it would be exciting if this could be put back into service to contribute towards a sustainable energy solution for the city.

Considerable work has been undertaken by Cheshire West and Chester Council with regard to the feasibility of restoring this power station and it is hoped that this may yet happen within the lifetime of this document. In particular it is considered to be of tremendous potential for the supply of power to public lighting systems and would be of great benefit to assist Cheshire West and Chester in the reduction of carbon emissions. As energy costs continue to rise along with targets for carbon reduction, the relative cost of bringing this facility back into service will fall, increasing the possibility that this project can be undertaken in the future.



Colour and texture can be created or enhanced by light.