



Light Up the City

TECHNICAL REQUIREMENTS

Introduction

Heritage Perth is leading a project to create an imaginative and sustainable façade lighting scheme for significant buildings within the city. Using energy efficient equipment, *Light Up the City* will provide a spectacular lighting show that brings important buildings to life at night, helping to reaffirm the Perth's title of 'City of Light'.

In order to achieve improved sustainability, the project has developed a lighting specification which sets out to control both the energy consumption of the system and also avoids proliferation of 'obtrusive light'. If followed to the full, the specification below can lead to efficiencies of up to 500% over conventional façade lighting systems.

The following specification is a benchmark for proposed heritage façade lighting installations around the city. It will ensure an energy-efficient lighting system with minimum obtrusive light from each building.

Specification:

Brightness of Heritage Facades

While it is of the utmost importance to highlight particular features and draw attention to the character and individual qualities of façades, it is equally necessary to discourage the "over-illumination" of heritage buildings and places.

The calculated Exitance (brightness) value across the illuminated building facade shall be no greater than:

- **an average of 10 lumens per square metre (M) in instances where the selected façade is considered to be located within an area of nil or very low ambient light,**

or

- **an average of 50 lumens per square metre (M) in instances where the selected façade is considered to be located within an area of low to medium ambient light,**

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or

- **an average of 100 lumens per square metre (M) in instances where the selected façade is considered to be located within an area of bright ambient light.**

Explanatory Notes:

1. The above average brightness values are considered to be a maximum in each case and applicants may elect to design to a lower brightness if appropriate.
2. Exitance has been selected as the preferred metric for brightness assessment purposes. Exitance (M) = illuminance (E.lux) x reflectance factor of building facade.
3. Designers who are skilled in the night-time interpretation of building facades will appreciate that light-technical results calculated in Exitance (M) already take into consideration the variety of building finishes available in terms of reflectivity, and the many viewing positions that may be available

Service Life & Maintenance

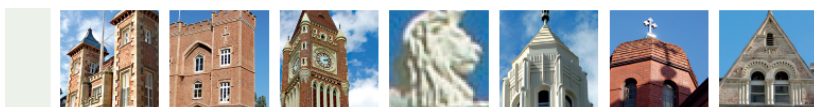
The service life of any lighting system is dependant primarily upon the luminaires' ability to withstand the environmental conditions in which it is installed. To ensure a reasonable service life, appropriate treatment of all materials should be considered. Where conditions are such that electrolytic action may persist, the designer/installer must use similar metals and "copper-free" aluminium. Where luminaires and associated equipment are exposed to the weather, corrosion-resistant materials and combinations of materials shall be used.

- **Design methods and selected equipment must ensure a service life of at least 15 years from the date of commissioning.**

The ultimate success of a lighting installation often depends on upon just how well it is maintained. The functions of any required re-lamping, cleaning, and re-aiming should be considered as a fundamental part of the total design.

- **All schemes will incorporate low maintenance equipment and methods.**

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Obtrusive Light

In order to properly view and fully appreciate the various lighting treatments to heritage facades, it is important to control the effects of obtrusive light, the two forms of which are:-

- Glare - to onlookers, vehicle drivers, and pedestrians
- Unwanted spill-light - to neighbouring buildings and property, into the night sky, onto animal natural habitats and flying insects

Obtrusive light is unnecessary and control measures should be incorporated at design stage. The control of obtrusive light is also part of environmental and sustainable lighting design which is to be encouraged.

- **All lighting designs will comply with AS 4282-1997: “Control of the Obtrusive Effects of Outdoor Lighting”.**

Explanatory Notes:

1. AS 4282 deals in the main with controlling the obtrusive effects of direct light sources such as lamps, luminaires, luminous strip lighting, decorative point sources, and the like.
2. Design limits have been placed on the brightness of the building façades earlier in Section A “Brightness of Building Facades”, with a view to the control of reflected light.

Lighting Energy Density Target

The reduction of electrical power or connected load is an important aspect of any lighting design; however a key element of the Light Up The City program is energy-efficiency. *Energy = power x time*, and savings in energy can be achieved by reducing either the amount of *power* consumed (watt or kilowatts), or by reducing the *time* the power is used (hours).

- **All proposed lighting installation will meet, or fall short of, the maximum allowable lighting energy density target of 0.05 kilowatt-hours per square metre per night of building facade.**

Explanatory Notes:

1. Lighting Energy Density is a function of *system power* (kilowatts) x *nightly run time* (hours) per *area of façade to be illuminated* (square metres).
2. The size of any windows, openings or doors, whether lit or unlit, shall be included in facade area under consideration.

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