Ene-4 Lighting Zoning

POINTS AVAILABLE 1

AIM OF CREDIT

To encourage and recognise lighting designs that make it easy to only light occupied areas.

CREDIT CRITERIA

One point is awarded where:

- All individual or enclosed spaces are individually switched;
- The size of individually switched lighting zones does not exceed 100m² for 95% of the nominated area; and
- Switching is clearly labelled and easily accessible to building occupants.

For the purposes of this credit 'nominated area' is UFA, excluding external covered areas, auditoria, theatre halls, swimming pools and sports halls.

Where the project contains only auditoria, theatre halls, swimming pools and sports halls this credit is 'Not Applicable' and is excluded from the points available used to calculate the Energy Category score.

COMPLIANCE REQUIREMENTS

Where lights are controlled automatically (through motion detectors, light level sensors, user interfaces, BMS interfacing and time switches), these must be connected to a system that will turn off all lighting after hours. Addressable lighting systems can comply if it is shown no zone in the nominated area exceeds 100m².

In order to be deemed 'easily accessible', switches must be located within the functional area, adjacent to the entry points and accessible to users of the space.

DOCUMENTATION: DESIGN RATING

Submit all the evidence and ensure it readily confirms compliance.

☐ Short report

☐ Tender lighting drawings

Where an addressable lighting system is to be installed, the following is also required:

☐ Statement from the electrical or lighting designer or contractor

Where the credit is 'Not Applicable'

☐ Cover letter

Short report prepared by a suitable professional that describes how the Credit Criteria have been met and providing a summary table that lists all separately switched zones and their area, demonstrating that compliant areas jointly account for 95% of the nominated area. Where an addressable lighting system is installed, confirmation is required that no zone exceeds 100m².

Continued >

Ene-4 Lighting Zoning

Tender lighting drawings identifying every enclosed space, the lighting zones, the locations of the luminaires and switches and, where appropriate, any automated control components. The drawings must contain an electrical services legend identifying the various symbols on the drawings.

- Where an addressable lighting system is present, including all addressable switching units highlighted and identified.

Statement from the electrical or lighting designer or contractor confirming that no lighting zone exceeds 100m^2.

Cover Letter stating that the project only contains one or a combination of the following spaces auditoria, theatres, swimming pools and sports halls.

DOCUMENTATION: AS BUILT RATING

Submit all the evidence and ensure it readily confirms compliance.

☐ Short report

☐ As-built lighting drawings

Where an addressable lighting system is to be installed, the following is also required:

☐ Extract(s) from the O&M Manual

Where the credit is 'Not Applicable'

☐ Cover letter

Short report prepared by a suitable professional that describes how the Credit Criteria have been met and providing a summary table that lists all separately switched zones and their area, demonstrating that compliant areas jointly account for 95% of the nominated area. Where an addressable lighting system is installed, confirmation is required that no zone exceeds 100m^2.

As built lighting drawings identifying every enclosed space, the lighting zones, the locations of the luminaires and switches and, where appropriate, any automated control components. The drawings must contain an electrical services legend identifying the various symbols on the drawings.

- Where an addressable lighting system is present, including all addressable switching units highlighted and identified.

Extract(s) from the O&M Manual listing the functionality of the system, and the programmed zones and their areas.

Cover Letter stating that the project only contains one or a combination of the following spaces auditoria, theatres, swimming pools and sports halls.

ADDITIONAL GUIDANCE

Auditoria, theatres, swimming pool and sports buildings are likely to contain spaces other than just the auditorium, theatre hall, swimming pool or sports hall. These other spaces are required to meet the credit criteria in order to achieve this credit.

Ene-4 Lighting Zoning

BACKGROUND

Lighting accounts for between 30% and 60% of the energy consumed in buildings (US EPA, 2004). Furthermore, it is a primary source of heat gains, which may significantly contribute to energy requirements for cooling and ventilation systems (US EPA, 2004). Such excess heat generation and energy use can be reduced considerably by implementing an energy-efficient lighting system.

Traditional lighting systems are commissioned to control lighting based on an 'in/out hours' system, assuming a set occupancy pattern, which is rarely checked (Oppenheim, 2004). This system does not recognise areas that are not occupied which results in a waste of energy and money (Oppenheim, 2004). Segmenting the area into appropriate lighting zones allows for greater control over lighting, which gives occupants the ability to reduce energy consumption and costs by only lighting those areas or zones that are occupied (SEDA, 2000).

Education providers can gain significant benefits from incorporating smaller lighting zones in their buildings. This arises from the fact that significant amounts of people use educational facilities, however, most of the facilities are not continually occupied. As an example, the University of New South Wales is currently incorporating a lighting zoning and sensing system, which will allow them to save over 40% of their lighting expenditure – which has been estimated to save around $1.7 million each year, saving over 27,000 tonnes of greenhouse gases (Sustainability Victoria, 2006).

Another example is the TAFE SA – Tea Tree Gully Campus, which has undertaken extensive lighting and energy works, achieving a 47% reduction in its energy consumption (SEDA, 2006). Finally, the Cadets Mess at Australian Defence Force Academy realised that an inefficient control of the building lighting via time schedules in the building management system was wasting both energy and money. The solution was the installation of a lighting zoning system integrated with a light level controller, and the replacement of inefficient luminaires. This resulted in energy savings of 316,940kWh per annum, cost savings of $28,525 per year and annual reduction of 305 tonnes of CO_2 (Systems Solutions Engineering, 2008).

REFERENCES & FURTHER INFORMATION

- Sustainable Energy Development Authority (SEDA) (2000), *Tenant Energy Management Handbook*, Sydney, Australia, www.nabers.com.au/downloadFile.aspx?file_id=244.
- Defence Energy Efficiency Program (DEEP) [no date], *Case Study: Lighting Controls at ADFA Cadet Mess*, www.eesaustralia.com/__data/page/975/ADFA_Cadet_Mess.pdf.
- Federal Office for Building and Regional Planning (FOBRP) (2001), *Guideline for sustainable building*, Germany.
- Oppenheim D. (2004), 'GEN 61: Best Practice in Lighting – Quality and Sustainability', BEDP Environment Design Guide, Melbourne, Australia.
- Sustainable Energy Development Office (SEDO), Government of Western Australia, www1.sedo.energy.wa.gov.au/.

Ene-4 Lighting Zoning

- Sustainability Victoria (2006), 'Setting up an energy monitoring and reporting system', *in Energy Toolbox*, www.energy-toolbox.vic.gov.au/energy_toolbox/calculating_and_reporting_use/setting_up_an_energy_monitoring_and_reporting_system.html.
- Systems Solutions Engineering Pty. Ltd. [no date], Case Study: *TAFE SA – Tea Tree Gully Campus*, www.syssoleng.com.au/images/Tea%20Tree%20Gully%20Tafe%20Case%20Study.pdf.
- The University of New South Wales [no date], *UNSW Lighting Challenge – Stage 1: Facilities Management*, Energy at UNSW, www.energy.unsw.edu.au/NewsInfoLightingChall.php.
- United States Department of Energy, *EnergySmart Schools*, Building Technologies Program, www.eere.energy.gov/buildings/energysmartschools.
- United States Environment Protection Agency (US EPA) (2004), *Energy Star Building Upgrade Manual*, Washington, USA, www.energystar.gov/index.cfm?c=business.bus_upgrade_manual.

CHANGELOG

Version	Date issued	Changelog
0	-	Tool Release
A	1st March 2010	Major Revision of Credit. Original version has been superseded.