

# Sustainable Public Lighting Guidelines



## 1. Introduction

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Public lighting helps make many of our public spaces more usable and enjoyable for all.

Moonee Valley City Council is committed to providing sustainable public lighting in public areas and has developed these *Sustainable Public Lighting Guidelines* to guide new installations.

These guidelines help decide where and when public lighting is needed, and if so, what sort of lighting should be installed. They assist engineers, landscape architects, urban designers, lighting designers and developers to choose the best lighting schemes for visibility and sustainability. All lighting in Moonee Valley needs to follow these guidelines.

Public lighting in Moonee Valley is designed to:

1. *Make better use of open space*

Allow for public spaces to be used by the community at appropriate times

2. *Create a safer night time environment for the community*

Safety and security is about "good" lighting and not necessarily "more" lighting

3. *Embrace Council's commitment to sustainability*

Providing better lighting systems will reduce greenhouse gas emissions

These guidelines will help lighting installations for public spaces (including parks and reserves), new developments and subdivisions to incorporate energy efficiency principles as set out in the *Sustainable Public Lighting Action Plan 2010*.

As a complement to these guidelines, Council has audited the energy efficiency performance of all public lighting in Moonee Valley and will progressively retrofit existing lights to meet the above objectives.

The aim of these guidelines is to make sure new lighting is sustainable, well designed and located and meets the Australian Standards for lighting.

## 2. Defining public lighting

Public lighting in Moonee Valley is made up of street lighting and a variety of other external lighting types such as decorative, sportsground, security and feature lighting.

### Street lighting

Street lighting found in residential streets and main roads has standard or non-standard poles, both containing the same basic parts.

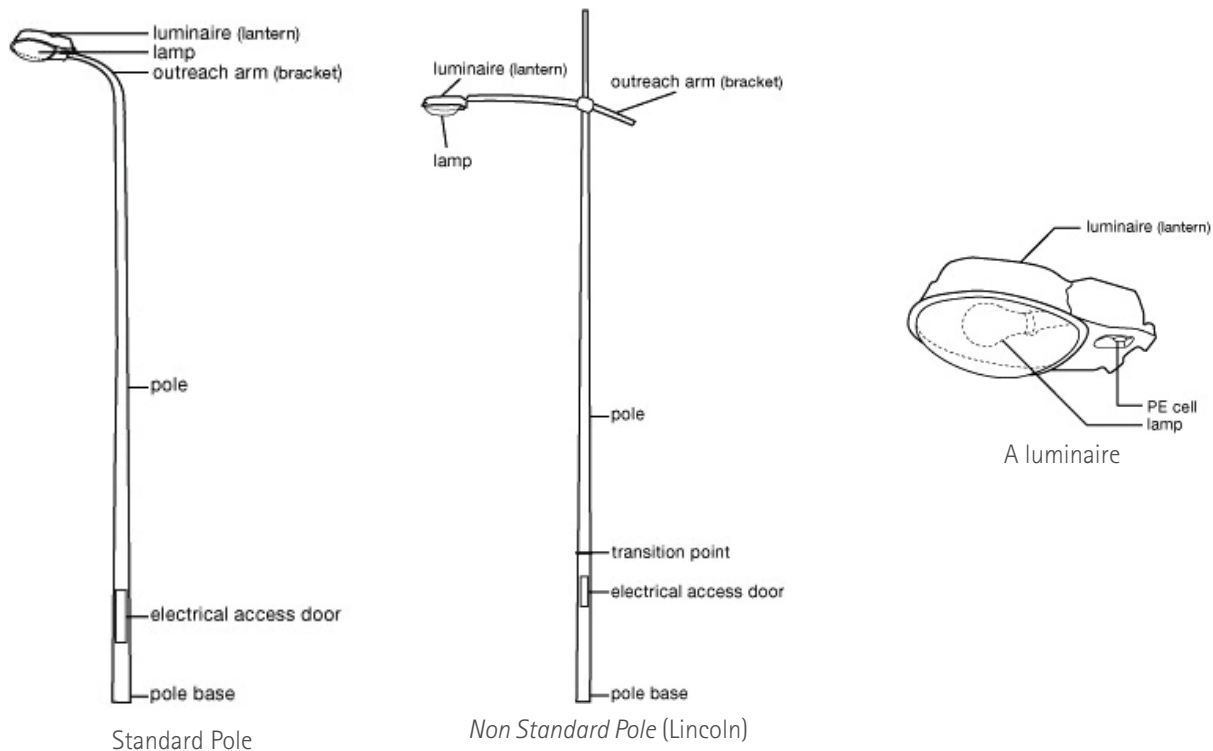


Figure 1: diagrams of street lighting

1. *Luminaire (lantern)* – a device that distributes, filters or transforms the light given by a lamp or lamps and which includes all the items necessary for fixing and protecting these lamps. Examples of luminaires include 80 watt mercury vapour, high pressure sodium and T5.



Figure 2: different types of luminaires

2. *Lamp (globe)* – the lamp emits light and is located within the luminaire (lantern) For example, a T5 luminaire will host two T5 lamps.
3. *Photoelectric (PE) Cell* – a device that is normally incorporated in a luminaire that detects outside light levels to automatically switch the luminaire on and off as required.
4. *Pole*
  - *Base* – the lower section of the pole that is secured to the ground.
  - *Bracket (outreach arm)* – the supporting connection from the pole to the luminaire.

### Decorative lighting

Compliments streetscapes and open spaces.



### Sportsground lighting

Enables recreation in the evenings



### Building and security lighting

Lights surrounding pathways and car parks



### Feature lighting

Enhances urban landscapes



Figure 3: Different types of public lighting

### 3. Responsibility for public lighting in Moonee Valley

Public lights in Moonee Valley are owned and managed by Council and/or the lighting distributor. There are three different lighting types including:

#### 1. Standard unmetered lighting (majority of street lighting in Moonee Valley)

This lighting is owned and managed by the distributor. Council pays a service charge to the distributor to maintain the light and pole over its life.

Street lighting often needs to be installed in new residential subdivisions. Developers propose lighting schemes which then need to be approved by Council. If the developer chooses to use a standard pole then the distributor needs to approve the pole and luminaire.

For standard unmetered lighting, these guidelines provide:

- developers with guidance when proposing lighting schemes so that they can meet distributor and Council requirements
- Council staff with tools to assess new lighting schemes.

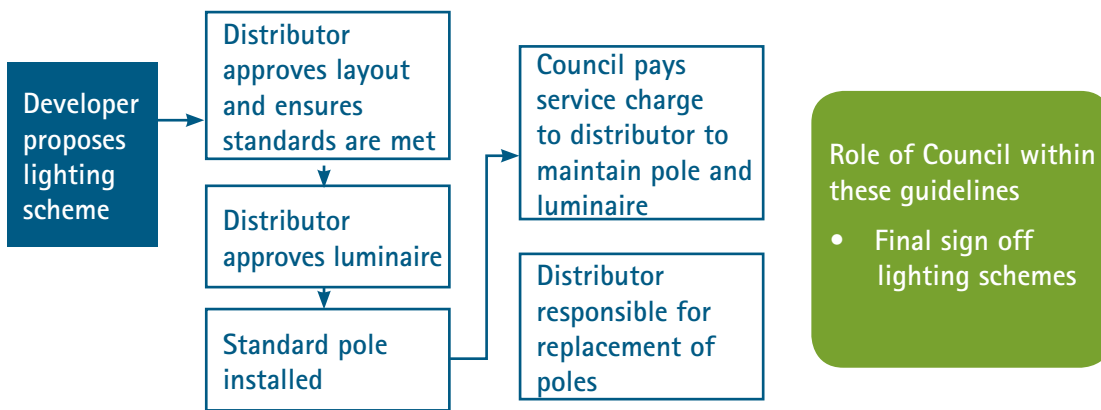


Figure 4: ownership and management of standard unmetered lighting

#### 2. Non-standard unmetered lighting

This lighting is owned by Council and managed by the distributor. Council pays a service charge to maintain the light and pole over its life and Council is responsible for purchasing replacement poles and lights.

This lighting typically occurs in new developments where the developers have requested a non standard pole or where Council installs new decorative street lighting. Council approves the lighting scheme and the pole and the distributor approves the luminaire.

For non-standard unmetered lighting, these guidelines provide:

- developers with guidance when proposing lighting schemes so that they can meet distributor and Council requirements
- developers with specifications for selecting pole and lights to ensure they are energy efficient
- Council staff with tools to assess new lighting schemes.

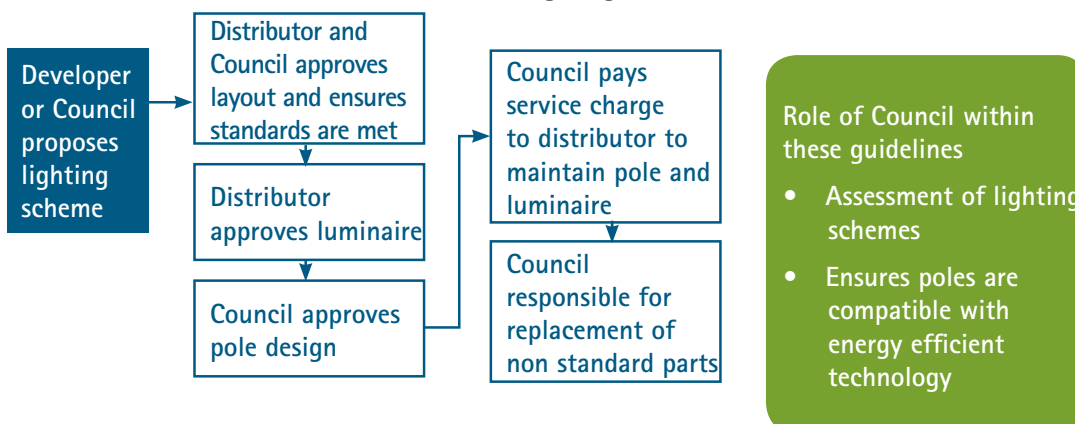


Figure 5: ownership and management of non standard unmetered lighting

### 3. Metered lighting

This lighting is owned and managed by Council.

Commonly sports facilities, car parks and open space reserves are connected to a meter to measure energy taken from the electricity network. Some street lighting in Moonee Valley (e.g. Puckle St) is also metered. These lights can have their own meter or be connected to a building, BBQ or other electrical load.

For metered lighting, these guidelines provide:

- guidance when proposing lighting schemes to meet Council needs
- developers with specifications for selecting pole and lights to ensure they are compatible with energy efficient technology
- Council staff with tools to assess new lighting schemes

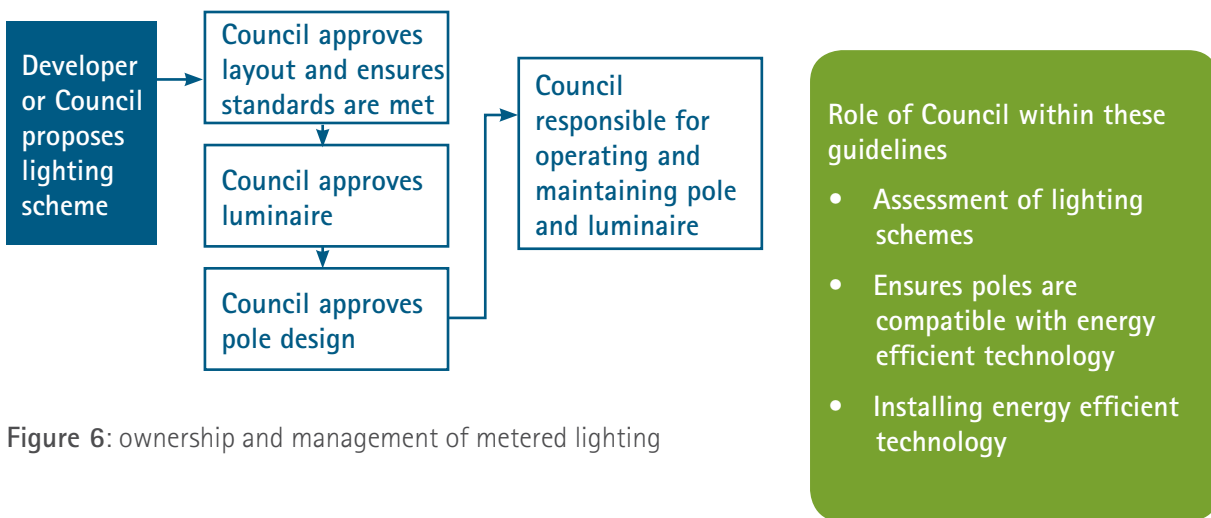


Figure 6: ownership and management of metered lighting

### Summary

Table 1: Summary of ownership and management for public lighting

Type	Pole and Light Ownership	Operation and Maintenance
Standard unmetered lighting	Distributor	Council pays service charge to distributor
Non-standard unmetered lighting	Council	Council pays service charge to distributor
Metered lighting	Council	Council directly maintains

### Legislation

- AS 1158.3.1:2005: Lighting for roads and public spaces - Pedestrian area (Category P) lighting - Performance and design requirements
- AS 3000:2007: Electrical Installations (known as the wiring rules)
- AS/NZS 1158.6:2004: Lighting for roads and public spaces - Luminaries

#### 4. New public lighting in Moonee Valley

All public lighting in Moonee Valley will consider the following guiding principles:

**Table 2:** guiding principles for public lighting in Moonee Valley

No	Guiding principle	More information
1	Making better use of open space	Most people use public space during the day and early evenings. Lighting should support positive evening use but is generally not needed during all hours of the night.
2	Assisting walking, cycling, public transport and driving	Appropriate lighting will allow for higher visibility and encourage people in Moonee Valley to walk, cycle, take public transport and if necessary drive.
3	Showcasing urban features in an effective way	When people are visiting our city, they should see and enjoy our urban features—for example, monuments signs, and public art. Lighting can be an effective way of doing this in key locations.
4	Protecting habitat value areas	In some cases lighting deters native fauna from regular night time foraging and can be harmful to biodiversity.
5	Improving safety	Council will avoid creating a false sense of security by not installing lighting in remote or poorly surveyed locations. Lighting will be discouraged in sites where it promotes inappropriate behaviour after hours in accordance with the <i>Crime Prevention through Environmental Design Guidelines</i> .
6	Reducing greenhouse emissions	Council will install and manage lighting to minimise greenhouse emissions. This will be applied following the hierarchy of energy avoidance, energy efficiency and renewable energy sourcing.

These principles relate to each site in Table 3 below.



**Table 3:** Lighting requirements for specific locations in Moonee Valley

Sites/applications	Requirements
Lighting in parks and reserves	
Regional reserves*	Lights may be installed with timers (see Table 2) in areas of high use. Regional reserves have a higher number of visitors and features that can benefit from lighting.
Nature conservation reserves*	Lighting is not appropriate as it will disrupt local flora and fauna.
Small local reserves*	Lighting is not appropriate as there is little visitation in these reserves after dark.
Playgrounds	Lighting is not appropriate as playground activity is better suited to daylight hours.
Recreation areas including skate parks, basketball courts, BBQs	Lights may be installed with timers (see Table 2).
Sports facilities - inc. bowls, football, soccer, tennis	Lights may be installed with timers directly linked to time of use (operation hours in the lease or planning permit, or if not stipulated then at 9pm). To avoid environmental spill, sports clubs need to comply with AS4282 Obtrusive Lighting Code for Control Measure 1 for built up residential with no surrounding lights or Control measure 2 for sports fields next to commercial precincts.
Lighting for transport – walking, cycling, public transport and vehicles	
Transport nodes*	Lights may be installed with timers linked to operating hours of public transport. <b>Train Station:</b> set timers to turn lights off after 1am and on at 5am. <b>Tram stops:</b> set timers to turn lights off after 1am and on at 5am. <b>Bus stops:</b> set timers to turn the lights off after 11pm and on at 5am <b>Nightrider bus stops:</b> used on Saturday and Sunday mornings and where there are designated stops lighting may be required from 1:00am to 5:00am
Bike paths	Lights may be installed with timers (see Table 2) on popular commuter routes.
Car parks	Lights may be installed with timers set to the hours of operation of the associated site or building
Laneways	Lights may be installed where the laneway provides a logical shortcut for pedestrians.
Lighting around buildings	
Building security lighting	Lights may be installed with timers directly linked to the operating hours of the building and/or on motion sensors. Motion sensors for all new security lighting installations.
Shopping strip lighting schemes – additional lighting to street lighting	Lighting is not considered appropriate if public lighting already exists. Lighting may be considered if the lighting distributor agrees to remove existing public lighting.
General	
Uplighting/feature lighting of signs, trees, buildings, monuments, art	Lights may be installed with timers based on a needs assessment. Timers installed linked to operation hours of the associated site or building. Solar powered lights with minimal maintenance requirements are preferred.

Lights may be installed, subject to trial in the following order:

Areas of high vandalism

- turning lighting off to deter vandalism
- using motion sensors
- video cameras (inc. the use of dummy cameras)
- increase lighting in accordance with the *Crime Prevention through Environmental Design Guidelines*

\*As defined in Open Space Strategy

### Use of timers for public lighting

In many of Council's open space areas, lighting does not need to be on all night. This depends on how the area is being used. New applications for lighting will need to specify the intended purpose of the lighting scheme in order to determine settings for timers. Table 2 guides the use of timers in lighting installations.

Currently timers are only able to be installed on Council owned metered public lighting schemes.

**Table 4:** Use of timers in open space

Open Space Use	Proposed Times		Rationale
	Winter	Summer	
Commuting – journey to work, public transport and cycling	Switch off at 1am	Switch off at 1am	Commuter routes are linked to operation times of public transport and venues.
	Switch on at 5am	Switch on at 5am	
Recreation – exercising, dog walking	Switch off at 11pm	Switch off at 12am	Activities such as exercising and dog walking usually occur prior to 11pm in winter months and 12am in summer months.
	Switch on at 5am	Switch on at 5am	
BBQ, picnics and social gatherings	Switch off at 9pm	Switch off at 10pm	Turning lights off after 10pm will discourage alcohol consumption and encourage people to move elsewhere.



## Requirements for new public lighting in Moonee Valley

Council will support lighting installations that meet these guidelines.

Final approval for additional lighting will be decided after considering proof of need, sustainability and community feedback where necessary.

When proposing a new lighting scheme in Moonee Valley, please submit the relevant checklists as specified in flow chart below:

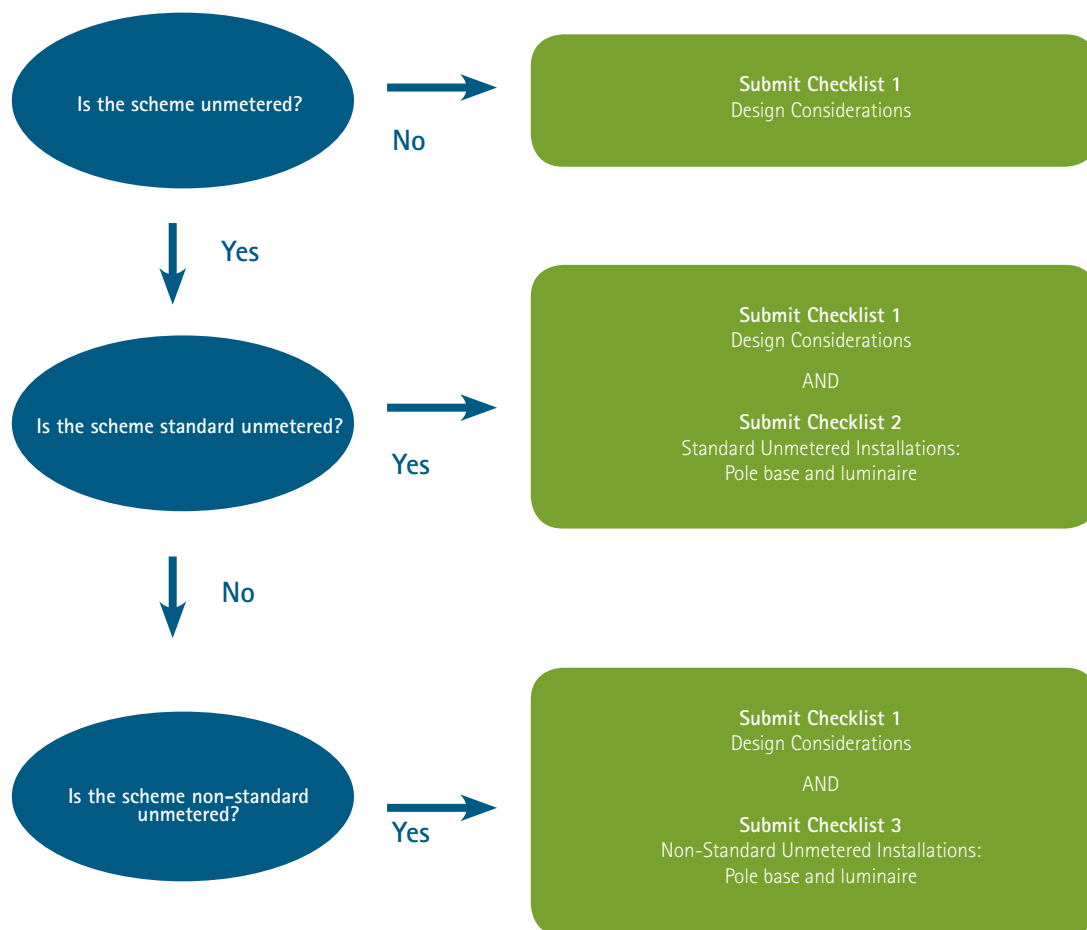


Figure 7: user flowchart for new public lighting proposal

### Please submit checklist/s to:

Moonee Valley City Council

9 Kellaway Avenue Moonee Ponds Victoria 3039

## Checklist 1 – design considerations

Applicant name .....

Site name .....

Site details (intended use of site) .....

.....

.....

Attachments	
	Has a lighting plan been submitted?
	Have 'as built' drawings including details of make and model numbers of lamps been submitted? (To be submitted upon completion of project)

All new lighting installations in Moonee Valley must address the following requirements.

1. Assess the need for lighting	
	Is there a need for lighting according to the Australian Standards?
	If there is a need in the Australian Standards, has the designer used the correct category i.e. not lighting above the necessary level required for a particular area?
	Does the lighting scheme meet requirements of Table 3 of these guidelines?
2. Efficient lighting scheme design	
	Do any timers being installed meet the requirements of Table 4 of these guidelines?
	Does the scheme avoid street light spill and overlap in design?
	Is the proposed luminaire energy efficient?
3. Life cycle considerations	
	Are long lasting materials being used?
	Can the proposed materials be recycled or reused at end of life?



## Checklist 2 – requirements for standard unmetered installations

All new standard unmetered installations must address the following requirements

### Pole design

The following pole requirements are for new public lighting installations categorised under P1-4 of Australian /New Zealand Standard (AS/NZS) 1158.3.1:2005 and AS 3000:2007.

- Is the mounting height for bracket installation no less than 6.5m above ground level?

*Increasing the pole heights, increases pole spacing (particularly when road reserve widths are over 18m). Light numbers can be reduced resulting in reduced maintenance costs, energy costs and greenhouse emissions.*

*Light spill into areas outside road reserves is undesirable and needs to be evaluated in areas that are sensitive to this, including narrow road reserves or laneways and areas of ecological significance. Increasing the pole heights also reduces vandalism.*

- Is the pole design a distributor approved Standard URD design?

- Does the pole allow compatibility for a side entry installation for the light fitting?

*Side entry poles allow for a wider range of light fittings (luminaires) including energy efficient lineal fluorescent luminaires to be fitted.*

*Modular poles with removable outreach arms can allow refitting of a top entry arm to allow side entry lights.*

*For major lighting, where typically higher wattage lighting (e.g. 150W MH/HPS etc.) is used, this recommendation is not relevant because lineal fluorescents do not perform as well at these lighting levels.*

### Coating systems

- Will the pole be coated?

*Uncoated galvanised steel poles aren't recommended for use in marine environments. Exposure forms zinc salts/oxides which lead to early corrosion.*

### Luminaire requirements

The following luminaire requirements and comments are for new public lighting installations categorised under P1-5 of Australian /New Zealand Standard (AS/NZS) 1158.3.1:2005 and AS 3000:2007.

- Have the luminaires been approved by the local distributor?

*Proof can include a copy of the approval letter for luminaire.*

- Does the lamp have an efficacy of no less than 60 lumens per watt after 4 yrs of lamp life?

*See Appendix 1 for more details on the main lighting types and efficacy.*

*This eliminates energy inefficient light types such as the 80W Mercury Vapour (MV).*

*Note for Category V lighting HPS lights are recommended as currently the most cost and energy effective<sup>1</sup>.*

- Does the lamp provide a spectral component that includes blue end light?

*Light sources providing blue end light provide the best seeing conditions in low light situations (such as parks and residential streets).*

- Are the PE cells electronic?

*Electronic PE cells are more accurate, last longer and use less energy than basic thermal D2 cells. For further details of PE cell analysis contact Ironbark Sustainability ([ironbarksustainability.com.au](http://ironbarksustainability.com.au))*

1. Roadway lighting guide to traffic engineering practice part 12, AUSTRROADS.

### Internal use only

Engineering department approval Yes / No

Signed ..... Date .....

Project manager approval Yes / No

Signed ..... Date .....

## Checklist 3 – requirements for non-standard unmetered (decorative) installations

All new standard unmetered installations must address the following requirements

### Pole design

The following pole requirements are for new public lighting installations categorised under P1-4 of Australian /New Zealand Standard (AS/NZS) 1158.3.1:2005 and AS 3000:2007.

- Is the mounting height for bracket installation no less than 6.5m above ground level?
  - *Increasing the pole heights, increases pole spacing. Light numbers can be reduced resulting in reduced maintenance costs, energy costs and greenhouse emissions.*
  - *Light spill into areas outside road reserves is undesirable and needs to be evaluated in areas that are sensitive to this, including narrow road reserves or laneways and areas of ecological significance*
- Is the pole either Lincoln or Standard URD design?
- Is the pole modular in construction with at least three main components – the base, straight pole and bracket arm?
  - *The base and straight pole will be the same across Councils asset base and the bracket can be used to differentiate different design sectors.*
  - *If a section of the pole is damaged, it can easily be replaced, reducing future maintenance costs and material wastage.*
- Does the pole allow compatibility for a side entry installation for the light fitting?
  - *Side entry poles allow for a wider range of light fittings (luminaires) including energy efficient lineal fluorescent luminaires to be fitted.*
  - *Modular poles with removable outreach arms can allow refitting of a top entry arm to allow side entry lights.*
  - *For major lighting, where typically higher wattage lighting (e.g. 150W MH/HPS etc.) is used, this recommendation is not relevant because lineal fluorescents do not perform as well at these lighting levels.*

### Coating systems

- Is the coating finished with a matt paint using the colour 'Sparkling Aluminium'?
- Will the coating system ensure a long service life with reduced maintenance?
  - *A heavy duty zinc protective coating or two pack adhesion promoting primer over a sand blasted, galvanised steel pole to prevent corrosion, followed by two coats of two pack aliphatic polyurethane<sup>2</sup>*
  - *Surface scratches can be repainted with the recommended finishing coat. If rust is present, it must be removed and the affected area repainted in accordance with the recommended method for new poles.*

### Base

- Where the pole is located in parks, gardens and shopping centres, is the base on a rag bolt assembly secured into a reinforced concrete base?
  - *This shall be done in accordance with manufacturer's specifications and local site conditions.*
- Where the pole is located in any other area, is the base of the pole mounted onto a base plate mounted to the pole?
  - *The base plate must be either stainless steel or concreted into the ground for the entire base length to ensure base strength and longevity*

<sup>2</sup>. Examples of products recommended include (Watty) Sigma EP universal primer/Epinaamel primer 250 and Sigadur400/Poly U400 or Dulux 2 Pak Acrathane IF paint for the finishing coats.

### Luminaire requirements

The following luminaire requirements and comments are for new public lighting installations categorised under P1-5 of Australian /New Zealand Standard (AS/NZS) 1158.3.1:2005 and AS 3000:2007.

- Have the luminaires been approved by the local distributor?

*Proof can include a copy of the approval letter for luminaire.*

- Does the lamp have an efficacy of no less than 60 lumens per watt after four years of lamp life?

*This eliminates energy inefficient light types such as the 80W Mercury Vapour (MV).*

*Note for Category V lighting HPS lights are recommended as currently the most cost and energy effective<sup>3</sup>.*

- Does the lamp provide a spectral component that includes blue end light?

*Light sources providing blue end light provide the best seeing conditions in low light situations (such as parks and residential streets).*

- Are the PE cells electronic?

*Electronic PE cells are more accurate, last longer and use less energy than basic thermal D2 cells. For further details of PE cell analysis contact Ironbark Sustainability ([www.ironbarksustainability.com.au](http://www.ironbarksustainability.com.au))*

3. Roadway lighting guide to traffic engineering practice part 12, AUSTRROADS.

#### Internal use only

Engineering department approval Yes / No

Signed \_\_\_\_\_ Date \_\_\_\_\_

Project manager approval Yes / No

Signed \_\_\_\_\_ Date \_\_\_\_\_

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