

Sustainable Public Lighting Guidelines



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Glossary of terms and abbreviations used in these guidelines

Term Definition

- AR** Active reactor. A control gear for HID lights that reduces energy use by around 20-30% compared to standard lamps.
- CFL** Compact fluorescent lamp
- CIC** The MAV led Customer Innovation Committee (CIC) is the first stage of the Victorian Public Lighting Approvals process. See www.mav.asn.au/cic
- CO₂-e** Carbon dioxide equivalent: the unit of measurement used to compare the relative climate impact of the different greenhouse gases, typically expressed in tonnes as t.CO₂-e
- EDB** Energy distribution business (in the City of Port Phillip these are United Energy and CitiPower)
- GHG** Greenhouse gas (typically in tonnes of CO₂ equivalents)
- HID** High intensity discharge lighting often used for industrial facilities and outdoor lighting, when high levels of light are required to cover large areas
- HPS** High pressure sodium lamp
- LED** Light emitting diode
- MH** Metal halide lamp
- MV** Mercury vapour lamp
- Open Space lighting** External lighting types such as decorative, sportsground, security and feature lighting (non-street lighting)
- PE Cell** Photoelectric cell is a device that is normally incorporated in a luminaire, that detects outside light levels to automatically switch the luminaire on and off.
- T5** Efficient linear fluorescent lamp



1.

Introduction

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

The *City of Port Phillip* is committed to providing sustainable public lighting in public areas and has developed these *guidelines* to guide new installations, replacements and repair programs. All lighting in the *City of Port Phillip* needs to follow these guidelines.

1.1 Purpose of the sustainable public lighting guidelines

The overall aim of these guidelines is to ensure new lighting is energy efficient, well designed and located and meets the Australian Standards for lighting.

These guidelines will be used:

- To inform and guide Council's decision making for public lighting: to decide where and when public lighting is needed, and if so, what sort of lighting should be installed
- To help Council staff, lighting design consultants and others consistently apply sustainable lighting principles to new public lighting installations, replacements and repair programs
- To communicate Council's public lighting minimum efficiency and standard design requirements.

1.2 Objectives for public lighting in *City of Port Phillip*

Public lighting in the *City of Port Phillip* is designed to:

a. Create a safer night time environment for the community

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

b. Embrace Council's commitment to sustainability

Providing better lighting systems will reduce greenhouse gas emissions and encourage public transport patronage

c. Improve the look and feel of the City

Consistent approaches to delivering attractive design

d. Design assets that can be managed over their lifetime

Long lasting, consistent and affordable infrastructure used when and where required.

1.3 Who should use these guidelines?

These guidelines are for both internal Council staff, and external contractors in the following fields:

- Engineers/asset planners and managers
- Landscape architects
- Urban designers/place managers
- Lighting designers
- Developers
- Maintenance staff and contractors

1.4 Using these guidelines

City of Port Phillip staff should use these guidelines when:

- Installing new lighting in a previously unlit area
- Replacing/upgrading lighting in an area.

City of Port Phillip staff can use the guidelines to inform their briefs for lighting design and installation tenders, as well as to assess submitted tenders to ensure they meet the required minimum Australian standards for lighting in different circumstances, and meet *City of Port Phillip's* style and technical specifications. Staff should use the completed checklists to assist with the tender assessment process.

The guidelines should be provided to external lighting design contractors, developers, urban designers and engineers as part of brief documents, to guide their tender submissions for public lighting design and installation. The **appropriate completed checklists should be included as part of tender submissions.**



2.

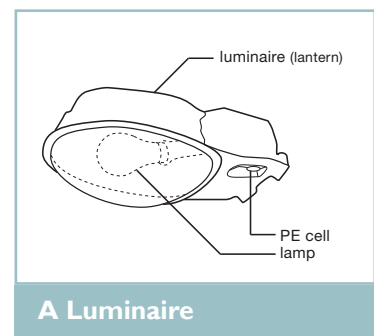
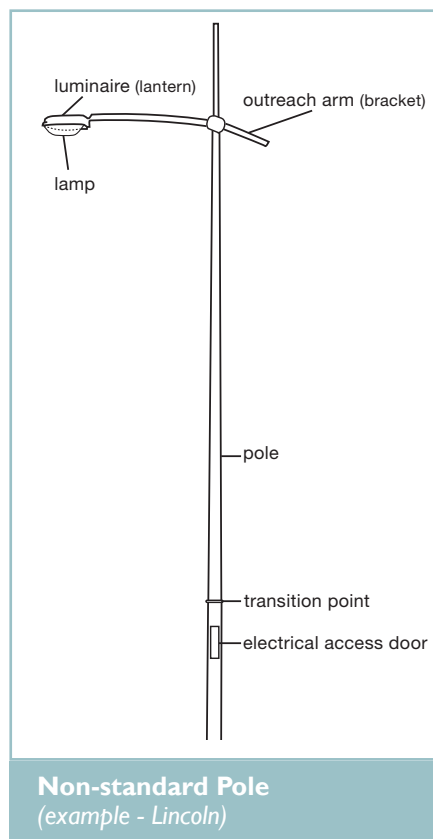
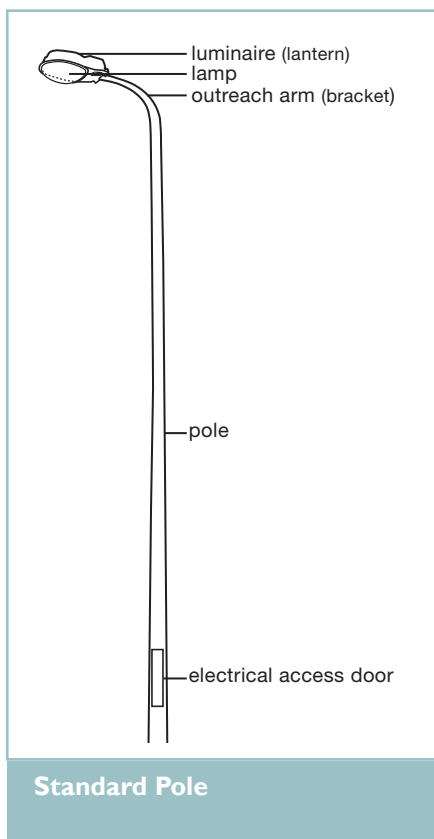
Defining Public Lighting

Public lighting in the *City of Port Phillip* is made up of street lighting and a variety of other external lighting types such as decorative, sportsground, security and feature lighting, collectively referred to as “open space lighting”.

2.1 Street lighting

Street lighting found in residential streets and main roads has standard or non-standard poles, both containing the same basic parts. Lights may also be attached via brackets to power distribution poles.

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, T5, high pressure sodium and 80 watt mercury vapour.

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.

2.2 Open space lighting

In the *City of Port Phillip*, open space lighting includes lighting in parks, pathways and cycleways, sportsgrounds, the foreshore, feature and decorative lighting in precincts and security lighting on buildings.

Figure 3: Different types of public lighting

		
<p>Decorative Lighting <i>Compliments streetscapes and open spaces.</i></p>	<p>Sportsground Lighting <i>Enables recreation in the evenings.</i></p>	<p>Building & Security Lighting <i>Lights surrounding pathways and car parks.</i></p>
		
<p>Feature Lighting <i>Enhances urban landscapes (In ground, top, and Bollard, bottom)</i></p>	<p>Foreshore Lighting <i>Lighting types specific to foreshore areas.</i></p>	<p>Park Lighting <i>Lighting pathways, recreation and BBQ areas.</i></p>

3.

Responsibility for Public Lighting in the City of Port Phillip

Responsibility for management, maintenance and capital projects related to public lighting in the *City of Port Phillip* is split between different Council departments. The following table summarises these areas of responsibility.

Table 1: Responsibility for public lighting

Area	Strategic Management	Maintenance	Capital Projects	Pole & Light Ownership
Parks and open space lighting <i>(generally metered lighting)</i>	Parks and Open Space	Building Maintenance	Parks and Open Space	Council
Foreshore lighting <i>(generally metered lighting)</i>	Parks and Open Space	Building Maintenance	Parks and Open Space	Council
Street lighting – standard unmetered <i>(majority lighting)</i>	Asset Planning	United Energy and CitiPower energy distribution businesses <i>(service charge paid by Council)</i>	Asset Planning	Distributor
Street lighting – non-standard unmetered	Asset Planning	United Energy and CitiPower energy distribution businesses <i>(service charge paid by Council)</i>	Asset Planning	Council
Car park lighting <i>(generally metered lighting)</i>	If attached to a park – Parks and Open Space If attached to a building such as shopping centres, or Council buildings – Asset Planning	Building Maintenance	Parks and Open Space and Asset Planning	Council
Sports facility lighting <i>(generally metered lighting)</i>	Clubs and Recreation jointly	Building Maintenance	Clubs and Recreation jointly <i>(Parks and Open Space contribute to this)</i>	Council
External building lighting <i>(generally metered lighting)</i>	Users/managers of site	Building maintenance	Users/managers of site	Council

4. Responsibility for Approving New Public Lighting in the City of Port Phillip

Public lights in the *City of Port Phillip* are owned and managed by Council and/or either of the Energy Distribution Businesses (EDBs) that operate in the municipality – United Energy or CitiPower. There are three different management structures for public lighting, which are covered in these guidelines.

4.1. Standard unmetered lighting

Most street lighting in the City of Port Phillip is standard, unmetered lighting. The lighting is owned and managed by either United Energy or CitiPower. Council pays a service charge to the distributor to maintain the light and pole over its life.

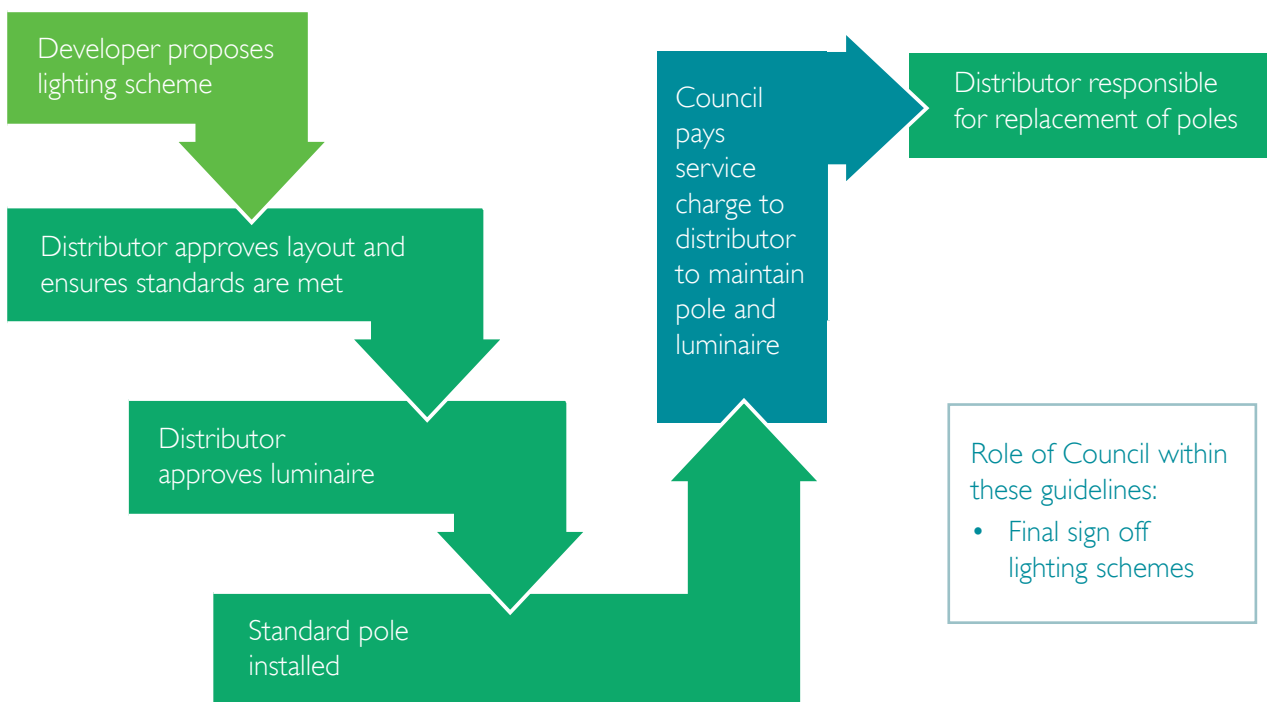
Street lighting often needs to be installed in new residential subdivisions. Developers can propose lighting schemes that then need to be approved by Council. If the developer chooses to use a standard

pole then the distributor needs to approve the pole and luminaire.

For standard unmetered lighting, these guidelines provide:

- guidance when proposing lighting schemes to meet distributor and Council requirements
- council staff with tools to assess new lighting schemes

Figure 4: Ownership and management of standard unmetered lighting



4.2. Non-standard unmetered lighting

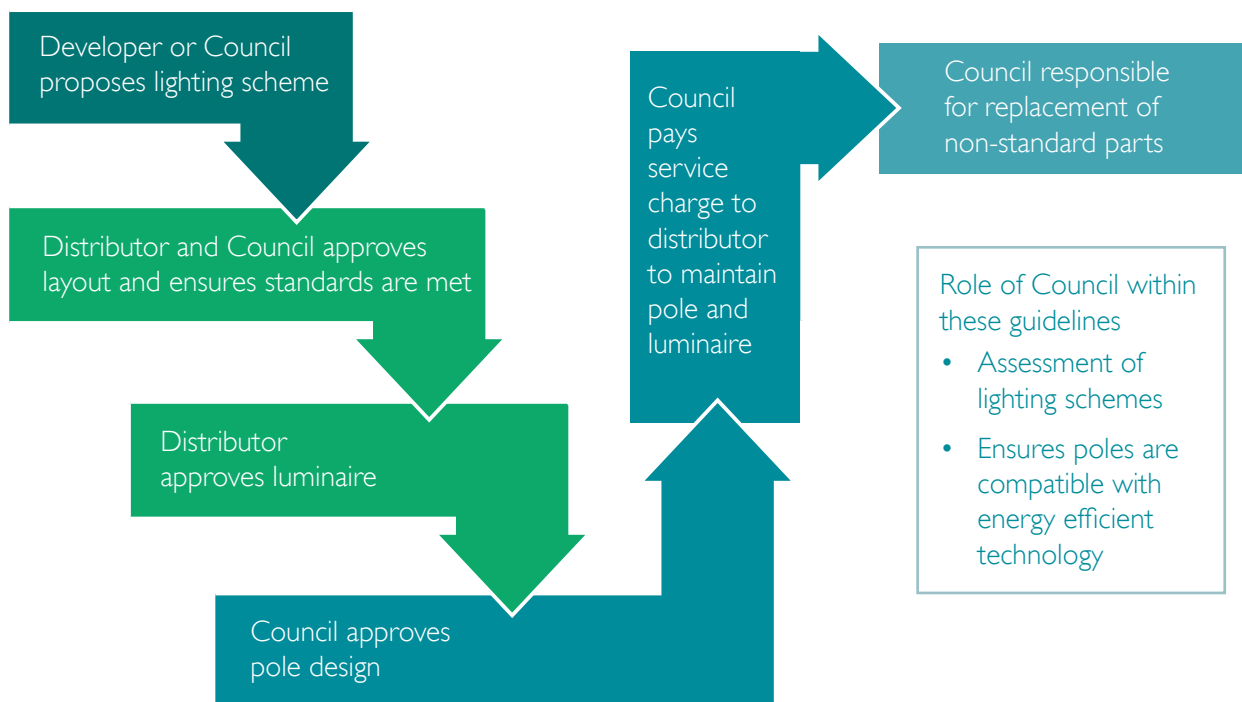
This lighting is owned by Council and managed by the EDB. Council pays a service charge to maintain the light and pole over its life and Council is responsible for purchasing replacement poles and lights.

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 to meet 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



Council does not support the use of non-standard unmetered lighting for new street lighting developments. These lighting assets are significantly more expensive to purchase and maintain and generally less energy efficient than standard assets.

4.3 Metered and off grid lighting

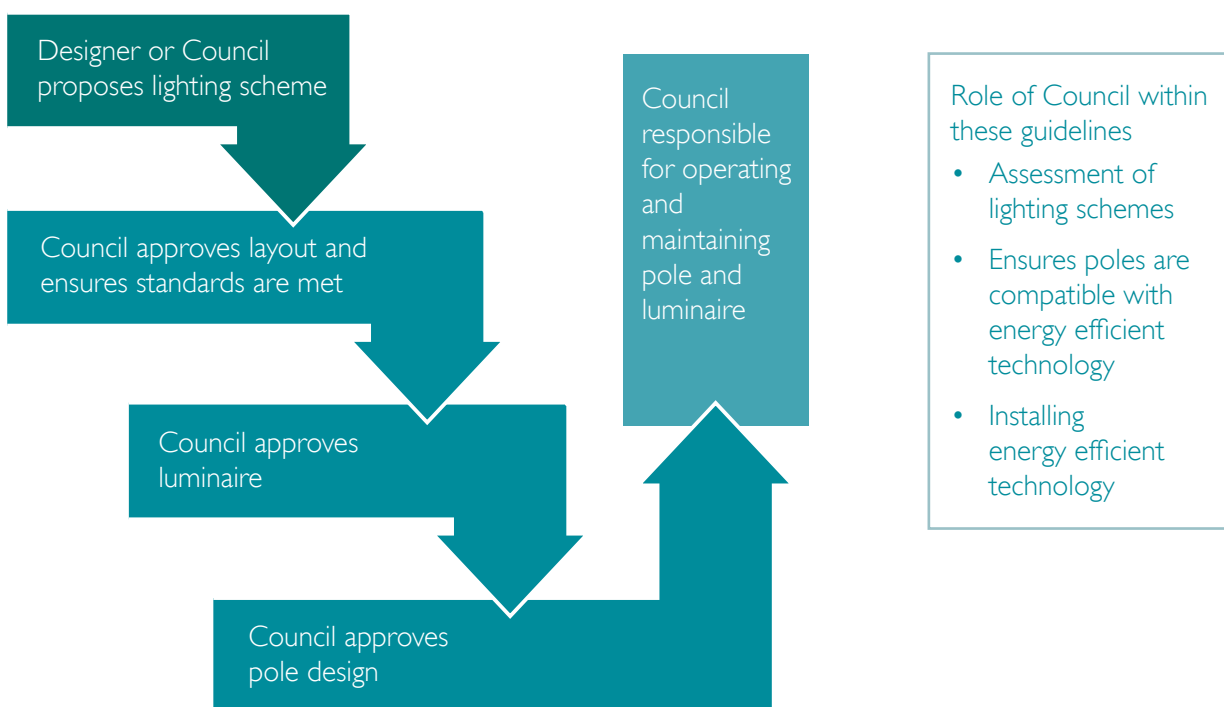
This lighting is owned and managed by Council.

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 Port Phillip (e.g. Beacon Cove) 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



5.

New Public Lighting in the City of Port Phillip – Principles and Process

When planning for public lighting in *City of Port Phillip*, council staff should consider the following principles.

5.1 Guiding principles for sustainable public lighting in the *City of Port Phillip*

All public lighting in the *City of Port Phillip* will consider the following guiding principles:

Making better use of open space	Most people use public space during the day and early evenings. Lighting should support positive evening use and selective all night lighting should be provided only where required.
Assisting walking, cycling, public transport and safe driving	Appropriate lighting will allow for higher visibility and encourage people in Port Phillip to walk, cycle and take public transport.
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 principles of the Crime Prevention through Environmental Design Guidelines.
Reducing greenhouse emissions	Council will install and manage lighting to minimise greenhouse emissions. This will be applied following the hierarchy of first energy avoidance then energy efficiency and finally using renewable energy.
Ensuring economically sustainable assets are installed and managed	Council will choose lighting assets that are easy to install, have low maintenance requirements and are cost effective over the life of the asset.
Protecting habitat value areas	In some cases lighting (or some types of lighting) can be harmful to biodiversity (in particular insects and nocturnal animals).
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 at selective times.

5.2 Design process for the lighting of public spaces

In order to complete a design and to meet these guidelines designers will typically identify the following (in order):

1. Location and purpose/need for lighting (Section 6)
2. Category of lighting (Section 7)
3. Type of light and pole to be used (Section 8) and
4. The method for lighting control (Section 9).

The remainder of this document covers Council's requirements around these four items.

6.

Location and Purpose for Lighting

When selecting appropriate lighting, key questions need to be asked about the location of the lighting, and the use of the area. The first consideration is around the need for any new lighting at all. Reasons that new lighting may not be required include:

- Adequate lighting is already available from an alternate source such as street, public transport zone, car park, building or any other adjacent lighting (in some locations this can reduce the number of new lights installed)
- The area is one where lighting is not recommended (see Table 2)
- Council has identified the lighting purpose as not recommended (such as up-lighting, feature lighting, and daytime recreation areas).

After considering whether lighting is indeed needed, Table 2 demonstrates different considerations for different sites/applications of lighting. Steps to guide the use of the table include:

- Identify the type of site/application for the lighting
- Determine the aim of lighting in the area: for example, aesthetic, to create atmosphere, for safety or to guide preferred usage patterns
- Assess if the area is a 'high risk' security area, or vandalism risk area, based on evidence
- Assess the type of users and usage function, as well as usage patterns for the area, as this may indicate particular lighting controls that can be applied, (see Section 9).



Table 2 provides guidance on how the guiding principles in 5.1 can be applied to different lighting sites and applications.

Table 2: Lighting requirements for specific types of locations in the City of Port Phillip

Sites/Applications	Requirements
General	
Up-lighting/feature lighting of signs, trees, buildings, monuments, art	<p>In general lighting is not appropriate in these locations. However, where it is a high use/important location then minimal lighting with a timer may be used (for example Garden City was upgraded which included parks and open space lighting. In this strategy you could light the beacon but not the trees).</p> <p>Time settings are from dark to 12am and then from 5am to light. Timing may be altered for a specific event.</p>
High risk areas	<p>This includes entertainment precincts and street worker locations. Lighting should be provided all night in these locations at an appropriate standard. Minimum P4 standard is suggested.</p>
Areas of high vandalism	<p>Lights may be installed, subject to trial in the following order:</p> <ul style="list-style-type: none"> • turning lighting off to deter vandalism • using motion sensors • video cameras (including the use of dummy cameras) • increase lighting in accordance with the <i>Crime Prevention through Environmental Design Guidelines</i>
Event lighting	<p>Permanent lighting should not be installed unless continuous use planned. Temporary lighting can be used that utilises similar efficiency requirements as permanent lighting.</p>
Lighting in parks and reserves	
Nature conservation reserves	<p>Lighting is not appropriate as it will disrupt local fauna, including insect fauna. Non-yellow light, up-lighting and lighting with high spill have the most detrimental effect.</p>
Recreation areas including skate parks, basketball courts, BBQs, playgrounds	<p>In general lighting is not appropriate in these locations. However, in high use precincts minimal lighting with a timer may be used (see section 9).</p>
Sports facilities - including bowls, football, soccer, tennis	<p>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 lights should be switched off at 9pm). To avoid light spill to neighbouring properties, 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.</p>

Sites/Applications	Requirements
Lighting for transport – walking, cycling, public transport and vehicles	
Public transport nodes	<p>Lights may be installed with timers linked to operating hours of public transport.</p> <p>Train stations: set timers to turn lights off after 1am and on at 5am.</p> <p>Tram stops: set timers to turn lights off after 1am and on at 5am.</p> <p>Bus stops: set timers to turn the lights off 30 mins after the last service (as bus routes are highly variable simply check the routes and stop times before setting timers), and on 30 mins before the first service.</p> <p>Nightrider bus stops: used on Saturday and Sunday mornings and where there are designated stops lighting may be required from 1am to 6am.</p>
High use walking routes	Lights on high use pathways may be on all night.
Bike paths	Lights may be installed with timers (see Table 5) on commuter routes from public transport nodes. Lights may be installed and run all night for high use pathways that pass through Port Phillip from Melbourne CBD.
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. Care needs to be taken around spill lighting.
Lighting around buildings	
Building security lighting	<p>Lights may be installed with timers directly linked to the operating hours of the building and/or on motion sensors.</p> <p>Motion sensors are suggested for all new security lighting installations.</p>
Urban open space/ hard landscape	Lights may be installed with timers set to the hours of operation of the associated site
Shopping strip lighting schemes – additional lighting to street lighting	Lighting is not considered appropriate if street lighting already exists. Lighting may be considered if the lighting distributor agrees to remove existing street lighting.

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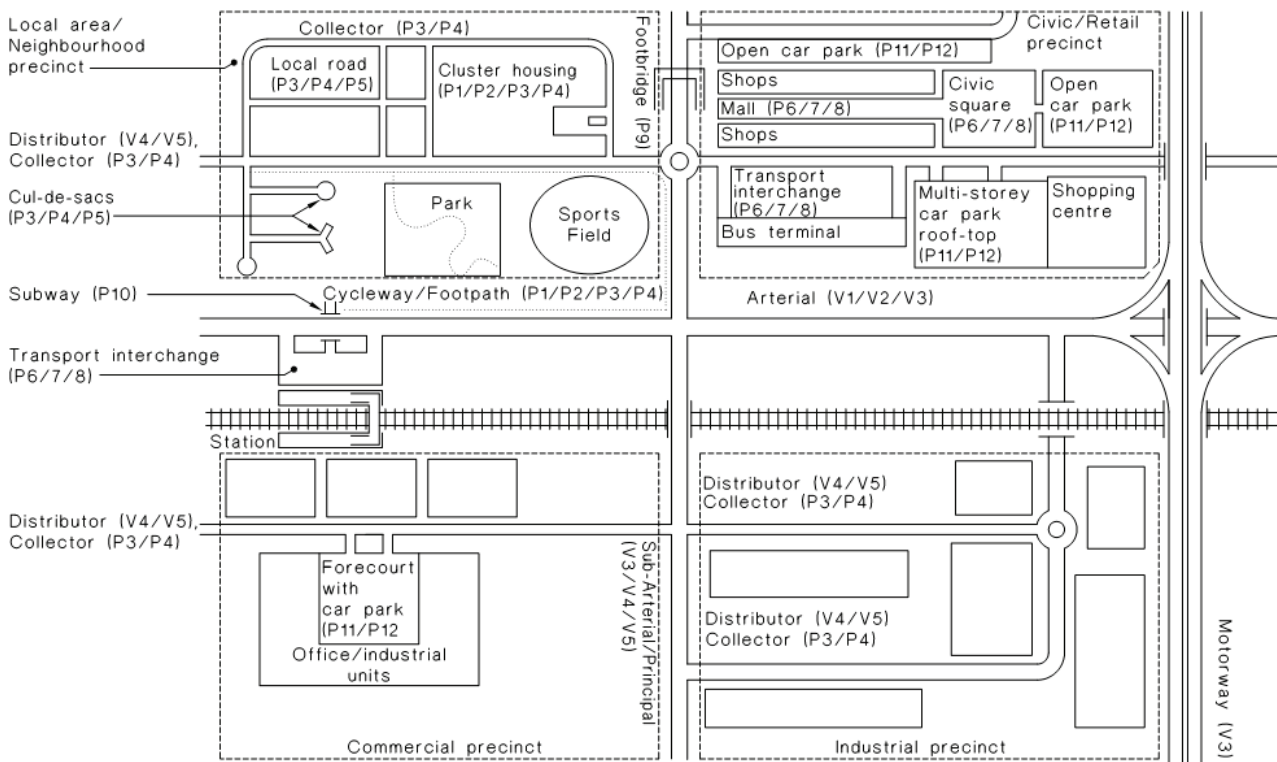
Category of Lighting

7.1 Recommended lighting categories for open space lighting

Public lighting design for open space and roadways is covered in the Australian and New Zealand standards (AS/NZS 1158).

Figure 7 below provides guidance on how to apply different categories for various external lighting applications. Most lighting categories can be chosen simply. Open space lighting for pedestrian and cycleways is more complicated and is discussed further in section 7.2.

Figure 7: Figure 2.1 from AS/NZS 1158.3.1 2005



7.2 Recommended lighting categories of pathways and cycleways

Table 2 of AS/NZS 1158.3.1 outlines the lighting categories for pathways and cycleways. They can be located along local roads, collector, arterial roads, walkways, lanes, park paths and cycle ways.

The following steps should be taken to determine the applicable lighting subcategory for these applications:

1. Assess the level of activity

i.e. high, medium or low. High activity levels would normally be for commuters from high use railway stations to high density housing (e.g. in the centre of Melbourne, and some high use retail precincts). Medium would cover well used commuter or recreation usage. Low would be the majority of other locations in Port Phillip.

2. Determine the risk of crime

Areas adjacent to stations plus isolated unlit paths are potential crime spots.

3. Select the applicable lighting subcategory

- a. Foreshore and Port Melbourne Rail Reserve lighting precincts (peak hours) – Category P2 to P3 recommended
- b. Foreshore and Port Melbourne Rail Reserve lighting precinct (off peak hours) – Category P4 recommended
- c. All other parks and open space (where lit in peak hours) – Category P4 recommended
- d. All other parks and open space (off peak hours) – Off.

Cycleways along arterial roads do not normally require separate lighting. The road must be lit to the applicable level of Category V lighting complying with AS/NZS 1158.1.1. If the footpath is shaded or is separated from the roadway by a wide nature strip or service road the lighting should be at least subcategory P4.

Cycleways along collector/local roads should also be lit to at least subcategory P4. Initial light level readings can be carried out to identify the current lighting level before lighting upgrades are considered.



8.

Choosing a Type of Light and Pole

8.1 Energy efficient lighting

The *City of Port Phillip* has identified minimum energy efficiency standards for all new lighting infrastructure. This is identified using a luminaire system efficacy of no less than 60 lumens per watt.

System efficacy can be calculated by dividing the total light output by the total system energy. For example an 80W Mercury Vapour (MV) uses 95.8W and its light output is 3800 lumens. The system efficacy is 39.67 lumens per watt (3800/95.8). Beware not to use the lamp efficacy which is the lamp watts compared to the energy use.

Table 3 (right) summarises the system efficacy of the main external lighting types.

Table 3: Typical system efficacy of different light types

Existing technology	System Efficacy	Recommendation On use
50W MV	28	✗
80W MV	40	✗
125W MV	44	✗
50W HPS	58	✗
250W MV	48	✗
400W MV	51	✗

The lights above this point would no longer be installed

2x14W T5 fluoro	80	✓
32W CFL	71	✓
70W HPS	70	✓
150W HPS	84	✓
250W HPS	103	✓

8.2 Use of specific light types

There are some specific light types that require special comment. The following table addresses these.

Table 4: Specific light types

Specific light types	Recommendation on usage
Integrated solar lighting	Generally not recommended due to high maintenance costs for panels/batteries. Panels need to be cleaned annually and batteries replaced on a 5-10 year cycle. However, where the cost to install mains electricity is high, solar (or other localised renewable energy) may be viable. In this case a life cycle cost assessment should be made to determine the preferred choice. Use of local generation is typically recommended for larger, centralised systems that are on buildings. This ensures the installations are economic and any maintenance can be carried out at low cost.
Watchmen/spotlights	Watchmen lights are generally inefficient and not recommended for area lighting. Spot lights combined with motion and light sensors can be a useful way to light locations which have inconsistent night time usage.
Recessed ground lights	To be avoided where possible, due to high damage and maintenance costs.
Bollard lighting	Bollard lighting is generally not encouraged. Where it is to be used, bollards with high vandal resistance are required.
LED lighting	Where LED lighting meets the minimum requirements for lumen efficacy and is economically viable it may be used for public lighting. Life cycle costing should be used to strengthen the business case for LEDs which have a long lamp life. Currently other lighting types (such as fluorescent and HPS lighting) have superior lumen efficacy and have a cheaper capital cost.

8.3 Approved decorative lighting poles

The lights shown in Figure 8 below are examples of approved poles and luminaires for decorative lighting applications in the *City of Port Phillip*. Decorative (also called non-standard) poles are not recommended for unmetered street lighting installations.

Figure 8: Approved City of Port Phillip open space and decorative pole options



When selecting a pole, the following design elements should be considered, alongside the guiding principles (outlined in section 5.1)

- The pole **design** should be contemporary, with clean, minimalist lines and no decorative detailing
- The poles should help to de-clutter the landscape, whilst maintaining the required lighting standard
- The pole **colour** should be selected from grey tones – including black, charcoal, silver and galvanized tones
- The **material** and treatment needs to be suitable to the site location, to ensure longevity
- The pole design should allow for a **side-entry luminaire** only
- The **height** of the pole should be more than 6.5m, (which increases pole spacing, thus reducing the required number of lights), unless special site requirements dictate otherwise (for example tree coverage or the risk of light spill)

9.

Control of
Lighting

9.1 Use of timers for public lighting

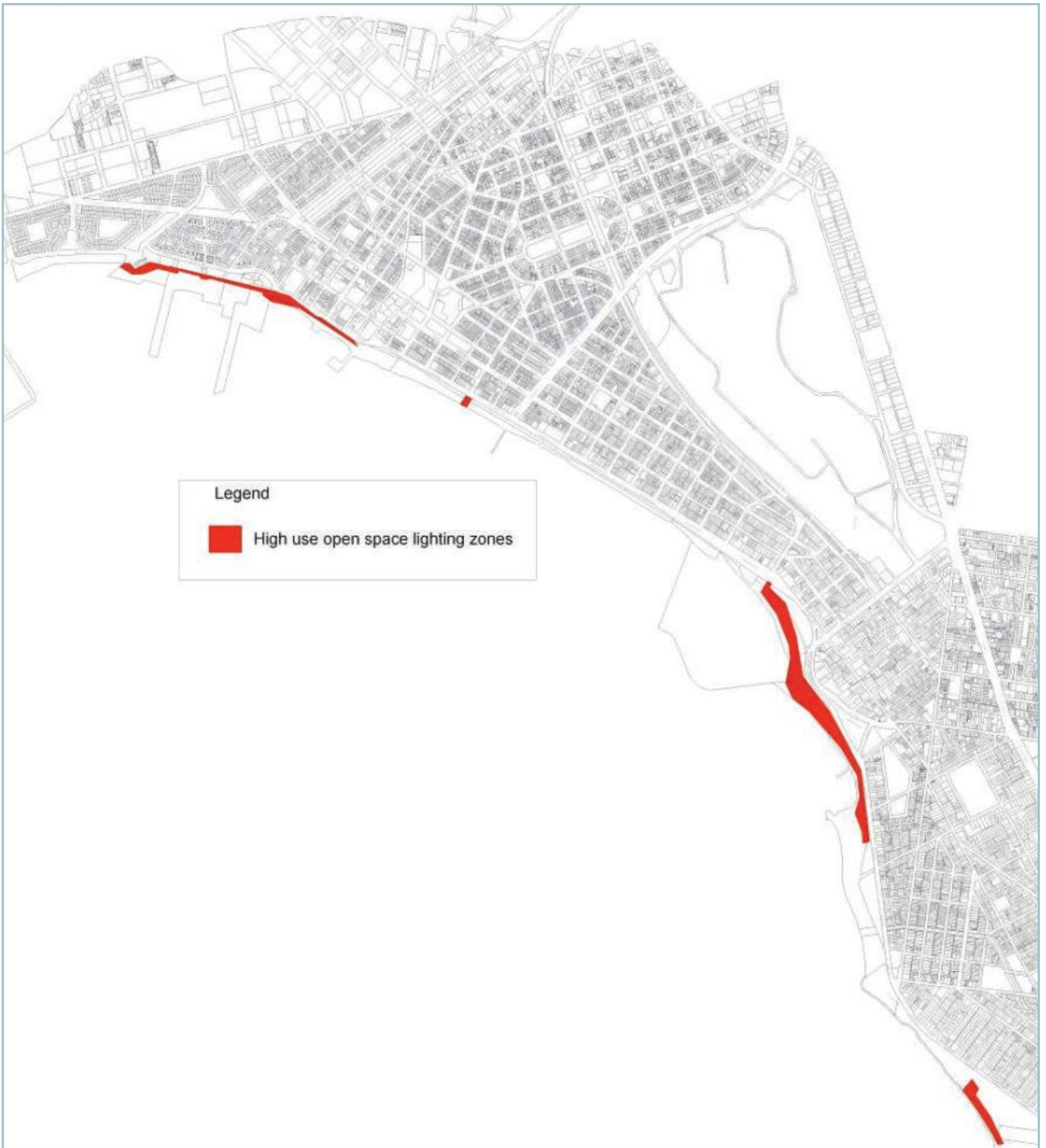
In many of Council's open space areas, lighting does not need to be on all night. This depends on how the area is being used. New applications for lighting will need to specify the intended purpose of the lighting scheme in order to determine settings for timers. Table 5 guides the use of timers in lighting installations, and Figure 9 identifies high use zones for *City of Port Phillip*.

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

Table 5: 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 on at 5am	Switch off at 1am Switch on at 5am	Commuter routes are linked to operation times of public transport and venues. Also see specific public transport types listed in Table 2.
Recreation – exercising, dog walking	Switch off at 11pm Switch on at 5am	Switch off at 12am Switch on at 5am	Activities such as exercising and dog walking usually occur prior to 11pm in winter months and 12am in summer months.
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.
High use open space zones	Dim from Category P2 or P3 to Category P4 after 11pm	Dim from Category P2 or P3 to Category P4 after 1am	Certain locations along the foreshore are used all night. Lighting is recommended to have dimming installed so that out of peak periods the light level can be reduced. Refer to Figure 9 to identify the high use open space zones.

Figure 9: Council high use open space lighting zones



10.

Resources

10.1 Legislation and standards

External standards and references include:

- AS/NZS 1158 2010 Lighting for roads and public spaces. This is the main Australian standard that guides lighting design of roads and open space. All the VicRoads and AustRoads guides below are largely using the data in this standard
- AS 3000:2007: Electrical Installations (known as the wiring rules)
- 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
- VicRoads "Traffic Engineering Manual Volume 1 (1999) and 2 (2001)"
- VicRoads "Cycle Notes" 1999-2007
- AustRoads "Guide to Road Design Part 6A: Pedestrian and Bicycle Paths"
- AustRoads "Guide to Traffic Engineering Part 13: Pedestrians (1995) and Part 14: Bicycles (1999)"
- AustRoads "Pedestrian-Cyclist Conflict minimisation on shared paths and footpaths" (2006)
- AustRoads "Guide to Road Design Part 6A: Pedestrian and bicycle Paths" (2009)
- Victorian Public Lighting Code (2004, ESC Vic).
- "Crime Prevention through Environmental Design Guidelines", http://www.police.vic.gov.au/content.asp?document_id=10444

10.2 Council policy

Council policies and strategies include:

- 2004 – Public Lighting Policy
- 2004 – Lighting Strategy
- 2007 – Toward Zero – Sustainable Environment Strategy
- 2008 – Decorative Street Lighting & Open Space Lighting Sustainability Audit
- 2011 – Sustainable Public Lighting Strategy for Streets and Open Space
- 2011 – Greenhouse Plan.

11.

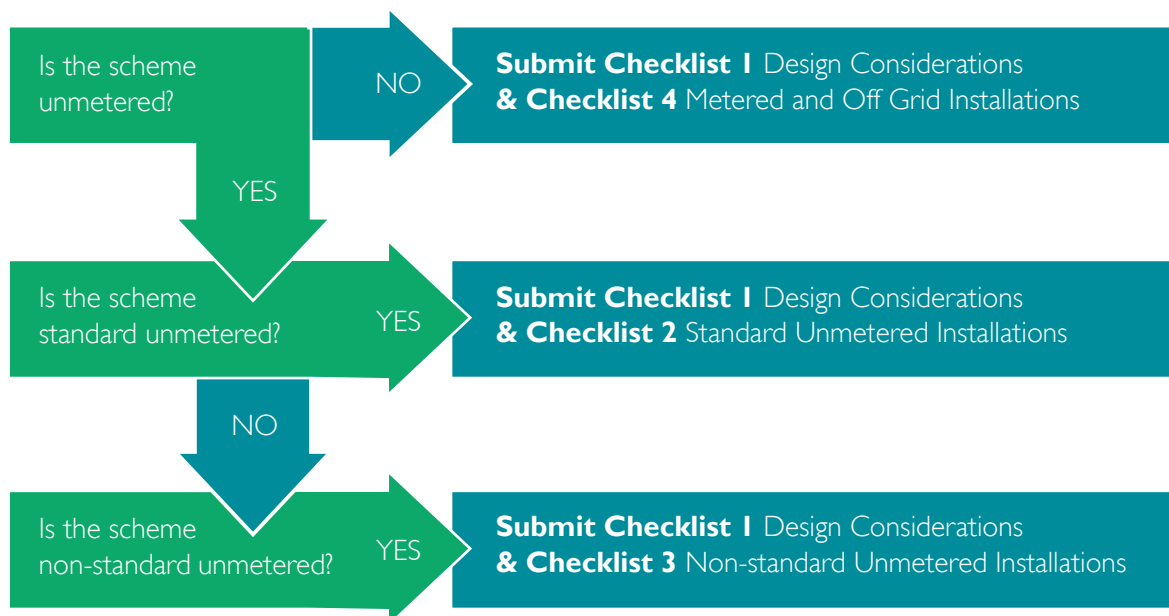
Checklists and Specific Requirements for New Public Lighting

When proposing a new lighting scheme in the *City of Port Phillip*, external contractors are required to submit the relevant checklists as specified in the flow chart below.

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.

Figure 10: User flow chart for new public lighting proposals



Checklist I: 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 *City of Port Phillip* must address the following requirements.

1. Define lighting category

- If there is a need for lighting, has the designer used the correct category i.e. not lighting above the necessary level required for a particular area? (see Section 7 of these guidelines)

By reducing the lighting category by one step (e.g. P3 to P4) the lighting level (and energy consumption) can be reduced by as much as half.

2. Identify the light and pole type

- Is the proposed luminaire energy efficient - at least 60 lumens per Watt? Please detail the system efficacy (see Section 8 for comparison).
- Have Council's preferred pole design considerations been applied? If not, please explain.

3. Lighting control

- Does the lighting control meet the requirements of Section 9 of these guidelines (around the use of timers)?
- What other control devices are considered in the design?

4. Life cycle considerations

- Are long lasting materials being used? Including lamps (whereby 4 years is acceptable and 10-12 years excellent), PE cells and luminaires (at least 20 years) and poles (at least 30 years).
- Can the proposed materials be recycled or reused at end of life? Discuss.

5. Additional information

If the proposed lighting scheme is not aligned with these guidelines, then an application needs to be made to Council identifying a clear need for the variation.

Submissions will be considered more favourably if the following criteria are addressed:

- best practice energy efficiency
- community need
- potential for generation of onsite renewable energy to match lighting energy needs.

Where applications do not follow the requirements set out in these guidelines, applicants may be required to provide

- itemised estimate of annual energy consumption arising from the project
- itemised estimate of annual maintenance costs arising from the project.

Comments

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Internal Use Only

Asset Planning Approval Yes / No

Hold points required during construction Yes / No

Details

Signed

Date.....

Project Manager Approval..... Yes / No

Signed.....

Date.....

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?

See Section 8 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.

- Is the lamp white light?

Light sources providing white light(3000-5000K) provide the best seeing conditions in low light situations (such as parks and residential streets). Yellow light may be used in limited applications (such as major roads and areas where pedestrians are uncommon).

- Are the PE cells electronic?

Electronic PE cells are more accurate, last longer and use less energy than basic thermal D2 cells.

Internal Use Only

Asset Planning Approval Yes / No

Signed Date.....

Project Manager Approval..... Yes / No

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

Checklist 3: Requirements for Non-Standard (Decorative) Unmetered Installations

All new non-standard unmetered installations must address the following requirements. Note these are not to be used in street lighting.

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 a type approved for use (or similar) as a decorative pole by the City of Port Phillip (see Section 8.3)?

Coating systems

- Is the coating finished with a matt paint using Council's preferred colour palette?

- 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

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

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 system have an efficacy of no less than 60 lumens per watt?

This eliminates energy inefficient light types such as the Mercury Vapour (MV), incandescent and halogen lights

Note for Category V lighting HPS lights (with Active Reactor control gear) are recommended as currently the most cost and energy effective¹.

- Is the lamp white light?

Light sources providing white light(3000-5000K) provide the best seeing conditions in low light situations (such as parks and residential streets). Yellow light may be used in limited applications (such as major roads and areas where pedestrians are uncommon).

- Are the PE cells electronic?

Electronic PE cells are more accurate, last longer and use less energy than basic thermal D2 cells.

Internal Use Only

Asset Planning Approval Yes / No

Signed Date.....

Project Manager Approval..... Yes / No

Signed Date.....

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

Checklist 4: Requirements for Metered and Off Grid Installations

All new metered and off grid 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 a type approved for use (or similar) as a decorative pole by the City of Port Phillip (see Section 8.3)?

Coating systems

- Is the coating finished with a matt paint using Council's preferred colour palette?
- 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.

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

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 recommended by the MAV Customer Innovation Committee?

See www.mav.asn.au/cic.

- Does the system have an efficacy of no less than 60 lumens per watt?

This eliminates energy inefficient light types such as the Mercury Vapour (MV), incandescent and halogen lights

Note for Category V lighting HPS lights (with Active Reactor control gear) are recommended as currently the most cost and energy effective².

- Is the lamp white light?

Light sources providing white light (3000-5000K) provide the best seeing conditions in low light situations (such as parks and residential streets). Yellow light may be used in limited applications (such as major roads and areas where pedestrians are uncommon).

- Are the PE cells electronic?

Electronic PE cells are more accurate, last longer and use less energy than basic thermal D2 cells.

Off grid power requirements

- Are all solar panels positioned to avoid overshadowing from nearby buildings, trees and power lines/poles?
- Are the solar panels using a pitch of 30°, facing due north?
- Is the system to be installed by a qualified professional, accredited by the Clean Energy Council?

Internal Use Only

Asset Planning Approval Yes / No

Signed Date.....

Project Manager Approval..... Yes / No

Signed Date.....

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



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