Ironbark Sustainability

Port Pirie Regional Council

Public Lighting Guidelines FINAL DRAFT

Port Pirie Regional Council

Prepared for
Port Pirie Regional Council

Version	Author	Date	Description of changes
V0a	Keith Harwood/Martina Povolni	10/9/2021	First draft
V0b	Keith Harwood	9/11/2021	Second draft
V1a	Keith Harwood	26/6/2022	Final draft
V1b	Keith Harwood	4/5/2022	Addition of maps
V1c	Keith Harwood	9/11/2023	Update to Council naming conventions

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Ironbark has been operating since 2005 and brings together a wealth of technical and financial analysis, maintenance and implementation experience in the areas of building energy and water efficiency, public lighting and data management. We pride ourselves on supporting our clients to achieve real action regarding the sustainable management of their operations.

Our Mission
The Ironbark mission is to achieve real action on sustainability for councils and their communities.

Ironbark are a certified B Corporation. We have been independently assessed as meeting the highest standards of verified social and environmental performance, public transparency, and legal accountability to balance profit and purpose.

Contents

1. Glossary 6

2. Introduction 8

2.1 Objectives of Public Lighting in Port Pirie Regional Council....8
2.2 Purpose of the Public Lighting Guidelines....9
2.3 Policy Context....9
2.4 Who Should Use These Guidelines....9
2.5 Using These Guidelines....10
2.6 Guidelines Review Period....10

3. Definition of Public Lighting 11

3.1 Open Space Lighting....11
3.2 External Building Lighting....11
3.3 Aesthetic Lighting External....11
3.4 Street lighting....12
3.5 Sports Lighting....13

4. Responsibility for Public Lighting in Council 14

5. New Public Lighting – Principles and Process 15

5.1 Guiding Principles for Public Lighting....15
5.2 Design Process for the Lighting of Public Spaces....16
5.3 Smart Lighting....16

6. Determining whether Lighting should be provided 18

7. Determining the Lighting Requirements 19

7.1 Assigning Lighting Categories Using the Standard....19
7.2 Recommended Lighting Categories for Specific Site Types....20

8. Determining the Site Type and Site-Specific Considerations 21

8.1 Control of Light Pollution....24

9. Determining the Luminaire and Pole Type 30

9.1 Requirements for Unmetered Public Lighting Assets....30
9.2 Requirements for Metered Public Lighting Assets....31
9.3 Requirements for Sports Lighting Assets....32
9.4 Solar Lighting....33

10. Approval Process for New Public Lighting 34

DRAFT

10.1 Unmetered Lighting 34
10.2 Metered Lighting 34
10.3 Aesthetic Lighting 35
10.4 Updating Asset Registers 36
10.4.1 Unmetered Lighting 36
10.4.2 Metered Lighting 36

11. Complaints/Requests Procedures 37
11.1 Requests for New Lighting (Existing Lighting) 37
11.2 Requests for New Lighting (No Existing Lighting) 37
11.3 Requests for Removal of Lighting 37
11.4 Complaints About Over-Lighting or Light Spill 38
11.5 Complaints About Shading of Lighting by Trees 38

12. Maintenance Procedures 39
12.1 Unmetered Assets 39
12.2 Metered Assets 41

13. Checklists and Specific Requirements for New Public Lighting 42
13.1 Checklist 1 – Design Considerations 43
13.2 Checklist 2 – Requirements for Standard Unmetered Installations 45
13.3 Checklist 3 – Requirements for Metered Installations 46

14. Appendix 1: Destination and Civic Parks 49

Tables

Table 1: Responsibility for unmetered public lighting 14
Table 2: Guiding principles for installation of public lighting 15
Table 3: Site-specific lighting category requirements 20
Table 4: Lighting requirements for specific types of locations within Port Pirie Regional Council 21
Table 5: Requirements for unmetered assets 30
Table 6: Requirements for metered assets 31
Table 7: Requirements for sports lighting assets 32
Table 8: Overview of repair and maintenance processes for unmetered asset types 40
Table 9: Summary of checklists required for submission with lighting proposals 42

DRAFT

Figures

Figure 1: Diagrams of street lighting 13
Figure 2: Figure 2.1 from AS/NZS 1158.3.1 2005 19
Figure 3: Approval process for standard unmetered lighting installations 34
Figure 4: Approval process for metered lighting installations 35
Figure 5: Memorial Park 49
Figure 6: Pasminco Park 50
Figure 7: Woodward Park 51
Figure 8: Solomontown Beach and Skate Park 52

DRAFT

1. Glossary

Term	Definition
CCT	Correlated colour temperature describes the colour of a light source, and is measured in degrees Kelvin (K). Blue-white lamps have a high colour temperature (e.g. 4000K). Yellow lamps have a low colour temperature, (e.g. 2000K)
CRI	Colour rendering describes the degree to which natural colours can be perceived under different kinds of artificial light. It is measured on a colour rendering index (CRI). A CRI of 100 indicates that colours are depicted accurately. A CRI of less than 30 indicates colours are distorted and difficult to recognise. A CRI of 80 or above provides an acceptable standard for outdoor lighting.
Decorative lighting	Refer to 'non-standard'
DNSP	Distribution Network Service Provider, also known as Energy Distribution Business (EDB), also known as distributor.
HPS	High pressure sodium lamps or luminaires
IK rating	Measure of protection against mechanical impact (vandalism)
IP rating	Measure of protection against ingress by water and solid objects
IoT	IoT (internet of things) involves extending internet connectivity beyond standard devices, such as desktops, laptops, smartphones and tablets, to any range of traditionally *dumb* or non-internet-enabled physical devices and everyday objects such as street lights. Embedded with technology, these devices can communicate and interact over the internet, and they can be remotely monitored and controlled.
Lamp	The light bulb in a luminaire
LED	Light emitting diode
Luminaire	The light source (lamp or LED module), fitting and control gear of the light
LER	The luminaire efficacy rating (LER) is a measure of the efficiency with which a luminaire converts electrical energy into light, measured in lumens per watt
Non-standard lighting	Lighting that is typically not held in stock by DNSPs, sometimes also referred to as 'decorative' (typically found in URD areas)
Standard lighting	Lighting that is typically held in stock by DNSPs, and is found on their list of products approved for use
Street lighting	Street lighting found in residential streets and main roads

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URD	Underground Residential Distribution (URD) is the standard means by which new street lighting schemes are deployed in new developments. This involves an underground power supply with dedicated light poles and differs from traditional approaches with an overhead power supply with luminaires being mounted on distribution poles.
UWLR	Upward waste light ratio (UWLR) is a measure of the light output of the luminaire that is emitted above the horizontal

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2. Introduction

Public lighting is made up of street lighting and a variety of other external lighting types such as pathway, sportsground, security and feature lighting. Public lighting helps make many public spaces safer, more usable and enjoyable for all.

Port Pirie Regional Council (Council) is committed to providing consistent and sustainable lighting in public areas and has developed these Public Lighting Guidelines to guide:

- new installations
- replacements and upgrade programs; and
- maintenance processes.

2.1 Objectives of Public Lighting in Port Pirie Regional Council

Public lighting in within Council is designed to:

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

   Safety is about "adequate" lighting and not necessarily "more" lighting

2. ***Improve the look and the feel of the city***

   Consistent approaches to delivering attractive lighting

3. ***Make better use of open space***

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

4. ***Consist of assets that can be managed over their lifetime***

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

5. ***Embrace Council's commitment to environmental sustainability and zero net emissions target***

   Providing better lighting systems will help to protect local fauna and reduce greenhouse gas emissions

Public lighting should be installed and managed with a view to ensure:

- supporting appropriate use of public spaces
- best practice asset management
- environmental sustainability
- financial responsibility
- the municipality becomes a city that is "technology ready"

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2.2 Purpose of the Public Lighting Guidelines

These Guidelines define the following:

Where, when and what: 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.

Consistency: help Council staff, lighting design consultants and others consistently apply sustainable lighting principles and standard design requirements to new public lighting installations, replacements and repair programs and maintenance.

2.3 Policy Context

These Guidelines have been designed to comply with all relevant Australian laws and legislation, and to comply with and complement the following standards, policies, codes and strategies.

External references:

- AS/NZS 1158 Lighting for roads and public spaces
- AS 4100 Steel Structures
- AS 4282 Control of the Obtrusive Effects of Outdoor Lighting
- ANSI C136.41-2013 (Dimming receptacles)
- Crime Prevention Through Environmental Design Guidelines - https://bit.ly/2WA6ACE

Council plans, policies and strategies:

- Community Plan 2020-2025
- Asset Management Strategy
- Strategic Asset Management Plan
- Port Pirie Parks Strategy 2016
- Street Lighting Policy

2.4 Who Should Use These Guidelines

These Guidelines should be used by internal Council staff, and any external contractors with a formal role in the design and management of public lighting in Council, including:

- engineers
- asset planners and managers
- landscape architects
- urban designers
- place managers
- lighting designers
- developers

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- maintenance staff and contractors

All public lighting – excluding private lighting and lighting on Department of Infrastructure and Transport roads – in Port Pirie Regional Council must follow these Guidelines.

2.5 Using These Guidelines

Council staff should use these Guidelines when:

- installing new lighting in a previously unlit area
- replacing/upgrading/modifying existing lighting in an area
- considering the potential removal of existing lighting

Council staff can use the Guidelines to inform 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 Council's style and technical specifications. Staff should use the completed checklists (refer to Section 13) 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 (refer to Section 13) should be included as part of tender submissions.

2.6 Guidelines Review Period

These Guidelines will be reviewed and updated periodically to reflect the latest technology and best practice asset management procedures.

The next review and update of these Guidelines is scheduled for late-2024and will have a focus on integrating learnings from the previous 24 months in relation to smart lighting and smart cities trials across the municipality.

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3. Definition of Public Lighting

Public lighting are assets used to provide night-time lighting of the public realm including open space lighting, external building lighting, aesthetic lighting, streets and road lighting, and outdoor sports lighting.

3.1 Open Space Lighting

Open space lighting includes a wide variety of outdoor lighting assets including:

- Park lights and other pole-mounted open space lights
    - pedestrian path lighting
    - plaza/square lighting
    - wayfinding lighting (bollards and in-ground path markers)
    - Jetties and Boat Ramps
- Shared path lighting
    - On-street
    - Off-street
- Council car park lighting
    - retail centre car parks
    - public facility or recreation reserve car parks

3.2 External Building Lighting

External building lighting relates to any lighting that is attached to the outside of a Council building. This includes:

- Perimeter lighting
- External building entrance lighting

3.3 Aesthetic Lighting External

Aesthetic lighting relates to lighting that does not serve a functional purpose and instead focuses on creating a sense of place. This includes

- building façade lighting
- up-lighting
- lighting related to sculptures and public art
- decorative/ornamental/ambient lighting for gateways and activity centres.

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3.4 Street lighting

Street lighting can be found in residential streets, laneways and main roads and has a variety of pole types, each containing the same basic parts.

Typical infrastructure that is required for street lighting includes the following:

Luminaire (lantern) – A device that distributes, filters or transforms the light given by a light source and which includes all the items necessary protecting the light source and connecting it to the pole, bracket or other structure.

Light source/Lamp – The light source (a lamp or globe in a traditional luminaire, or LED chips) emits light and is located within the luminaire (lantern). Examples of light sources include high pressure sodium (HPS), metal halide (MH) and light emitting diode (LED).

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. PE Cells can now be used to house IoT technology, allowing street lights to be remotely controlled and monitored.

Pole - Used to elevate the luminaires, poles are typically made of steel, aluminium, wood or concrete. Components of a pole include:

- 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 (this can also be used in other mounting arrangements such as wall mounted luminaires)
- Electrical access door – provides access to internal wiring and fuses

Stobie Pole – A type of pole that consists of a concrete core with two outer steel beams connected by bolts to ensure strength. SA Power Networks uses the Stobie pole as the standard method of support for overhead distribution lines. Because of this fact, the majority of Council's unmetered street lights are mounted on Stobie poles.

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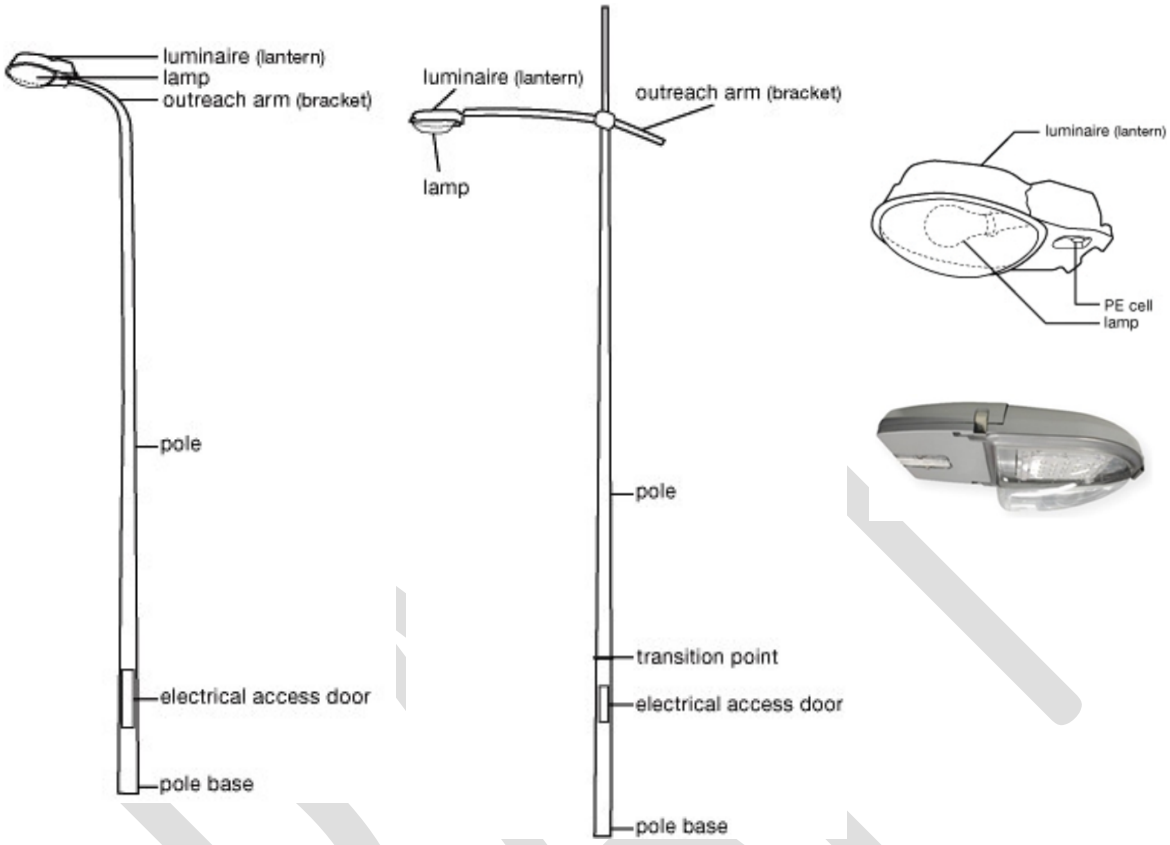
Figure 1 presents some example images of street lighting.



Standard URD pole **Non-standard URD pole** **Luminaire**

Figure 1: Diagrams of street lighting

3.5 Sports Lighting

Sports lighting includes lighting of fields and public spaces for professional and amateur sporting activities. For Port Pirie, this relates specifically to sports lighting provided by Council at the Sports Precinct (soccer, baseball and AFL). Sports lighting at any other site is the responsibility of the relevant sporting clubs. This includes funding, operating, and maintaining the sports lights.

4. Responsibility for Public Lighting in Council

Responsibility for the design, management, maintenance and capital projects related to public lighting is split between different Council's Asset Department and SA Power Networks. For Council's metered lighting assets, Council owns the assets and the Assets Department is responsible for all planning, operational, maintenance and renewal tasks as well dealing with requests from the public for new lighting.

For Council's unmetered street lighting assets, Table 1 summarises the areas of responsibility which are split between Council and SA Power Networks

Table 1: Responsibility for unmetered public lighting

Tariff Type	Planning and Design	Operation and Maintenance	Asset Renewal (like for like replacement) and Capital Works	Pole & Light Ownership
EO (Energy Only)*	Council owned– not limited by SAPN approvals	Council – SAPN maintain database only – can be metered or unmetered	Council	Council
CLER*	Council – SAPN approved lights	SAPN – limited to outage management, cleaning, PE cells and lamps for non-LEDs– can engage SAPN for warranty management	Council	Council owns the luminaire and the infrastructure supporting the luminaire
PLC*	Council – SAPN approved lights	SAPN	Council	Light – Council (beneficial)
TFI*	Council (tariff more suited to developers)– SAPN approved lights	SAPN	Council funded and vested to SAPN	SAPN
SAPN*	Council – SAPN approved lights	SAPN	SAPN funded and owned	SAPN

*There are 5 tariff types under which SA Power Networks classifies unmetered street lighting assets. Further detail about each of these tariff types can be found within the Public Lighting Tariff Manual published by SA Power Networks. At the time of writing, the June 2021 version of the Manual was referenced.

5. New Public Lighting – Principles and Process

When planning for new public lighting Council staff should apply the following principles and process.

5.1 Guiding Principles for Public Lighting

For all new public lighting in Port Pirie Regional Council area the guiding principles outlined in Table 2 will need to be considered.

Table 2: Guiding principles for installation of public lighting

Improving safety
Lighting is a valuable tool in contributing to the safety of the public realm at night but needs to be considered as part of a wholistic approach to designing for safety. Whilst the illumination of roadways, pedestrian crossings and traffic management devices will invariably improve safety, lighting in off-street spaces can have the opposite effect if factors such as passive surveillance are not considered. 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.
Showcasing urban features in an effective way
When people are visiting the Council area they should see and enjoy urban features; for example, monuments, signs, gateways, activity centres and public art. Lighting can be an effective way of undertaking this in key locations at selective times.
Assisting walking, cycling, public transport and safe driving
Appropriate lighting will allow for higher visibility and encourage people within Port Pirie Regional Council to walk, cycle and take public transport.
Making better use of public spaces
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.
Ensuring economically sustainable assets are installed and managed
At the scoping stage, a high-level business case analysis should be conducted to ensure that only lighting assets that are easy to install, are long lasting, have low maintenance requirements and are cost effective over the life of the asset are deployed. All lights and parts need to be commercially available in Australia with preference for Australian design and lighting suppliers.

Protecting habitat values
Lighting (or some types of lighting) can be harmful to biodiversity (in particular insects and nocturnal animals) and people. Lighting should be avoided in areas of high habitat value but if necessary, lighting should incorporate controls and techniques that are designed to minimize harmful impacts (see Section 8.1).
Reducing carbon emissions
Council acknowledges the impact of climate change and is committed to creating a cooler, climate resilient city with a low carbon footprint. Installing the most energy efficient lighting technologies available and using smart technologies (e.g. light sensors, timers and dimmers) will assist in minimising carbon emissions

5.2 Design Process for the Lighting of Public Spaces

To ensure that public lighting is designed and installed in compliance with these Guidelines, designers should use the following step-by-step decision-making process to determine if, when, where, and how lighting should be installed:

- **Step 1:** Determine whether lighting (or additional lighting) should be provided (Section 6)
- **Step 2:** Determine the lighting requirements (Section 7)
- **Step 3:** Determine site type and site-specific considerations (Section 8)
- **Step 4:** Determine the luminaire and pole type (Section 9)
- **Step 5:** Follow the appropriate approval process for new lighting (Section 10)

Each of these steps is described in the relevant sections.

5.3 Smart Lighting

Smart city approaches are being used by local governments worldwide to provide better services for local communities. Smart city infrastructure:

1. gathers data from smart devices and sensors
2. shares data via smart communications system
3. creates valuable information & services

A number of attributes mean that lighting assets are an ideal component within a smart city, these attributes include:

- Its physical location high on a pole means there is good ability for clear communication
- Its ubiquitous presence anywhere that there are reasonable densities of people means the light can reinforce the network where the need for data is greatest
- The presence of power at the light means that connecting the smart networks communication device to electricity is easy

A smart light can be used as a relay for other information (in a smart grid network). This increases the effectiveness of the entire network and can reinforce and improve the way the

network operates. Alternatively, street lighting communications devices can be part of a standalone street lighting control network, without reference to other smart networks within a city.

Other smart city technologies can be installed as part of new smart lighting infrastructure including:

i. temperature

ii. air quality

iii. pedestrian and traffic counting

iv. CCTV

v. Wi-Fi and other telecommunications

vi. voltage

Council is committed to becoming a city that is "technology ready". We are in the process of developing detail of the approaches to including smart lighting and smart city functionality within the municipality. For Council's public lighting infrastructure, smart cities opportunities are:

- Leveraging its ubiquity to create a backbone for a Council-wide smart cities network
- Using smart enabled public lighting to reduce energy use via adaptive programming that increases and decreases light levels as it is needed
- Using smart enable public lighting to improve maintenance procedures via automated fault reporting and lifecycle tracking

The Guidelines will be updated to include Council's approaches to including smart lighting and smart city functionality once these have been developed.

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6. Determining whether Lighting should be provided

Please note that this section does not apply to aesthetic lighting.

The first step of the decision-making process is to establish the need for lighting. A lighting upgrade may be appropriate in the following cases:

- Road Safety – the new lighting is required to support the installation/operation of a traffic control device
- Community Safety – the new lighting will increase community safety
- Enhance public spaces – the new lighting will increase outdoor activity, particularly in activity centres
- Transport – the new lighting supports Council's objectives to improve accessibility for pedestrian and cyclists

Council officers will consider the above objectives to assess and prioritise upgrades.

Lighting upgrades are not appropriate in the following cases:

- adequate lighting is already provided (i.e. the lighting already complies with the category determined in Step 2 – see Section 7)
- the area is one where lighting is not permitted or generally not recommended (refer to Section 0 for details)
- the provision of lighting would result in unreasonable ecological impact to fauna
- an area does not have sufficient natural (passive) surveillance looking into the space from houses facing the space or passing vehicular and pedestrian traffic
- an area/pathway leads to a dead end or otherwise unsafe area with little natural (passive) surveillance
- activity or traffic is so low that the capital cost of a lighting installation would not be justified
- lack of infrastructure in order to provide lighting without unreasonable capital cost
- the area cannot support the required infrastructure e.g. is there space to install light poles; do tree roots present difficulties to running underground wiring; etc.

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7. Determining the Lighting Requirements

Once the need to light has been established in accordance with Section 6, the second step of the decision-making process should determine the required lighting category (light level).

7.1 Assigning Lighting Categories Using the Standard

A framework for selecting the appropriate lighting category for a given type of open space or road is provided in the Australian and New Zealand Standard Lighting for Roads and Public Spaces (AS/NZS 1158).

Figure 2.1 from AS/NZS 1158.3.1 summarises what categories may apply to different space types (copied as Figure 2 below). In most situations, the appropriate lighting category can be determined by application of the following process:

1. Define the function and how busy the road/space is via consultation with relevant Council staff
2. Match the definition of the road/space with the guidance provided by:
    1. the Australian Standard (AS/NZS 1158 series)
    2. lighting schemes in similar roads/spaces in other local government areas
3. Assign the most appropriate lighting subcategory to the road/space

Under certain circumstances a lighting category that differs to that determined by application of AS/NZS 1158 may be appropriate. These exceptions are outlined in Section 7.2.

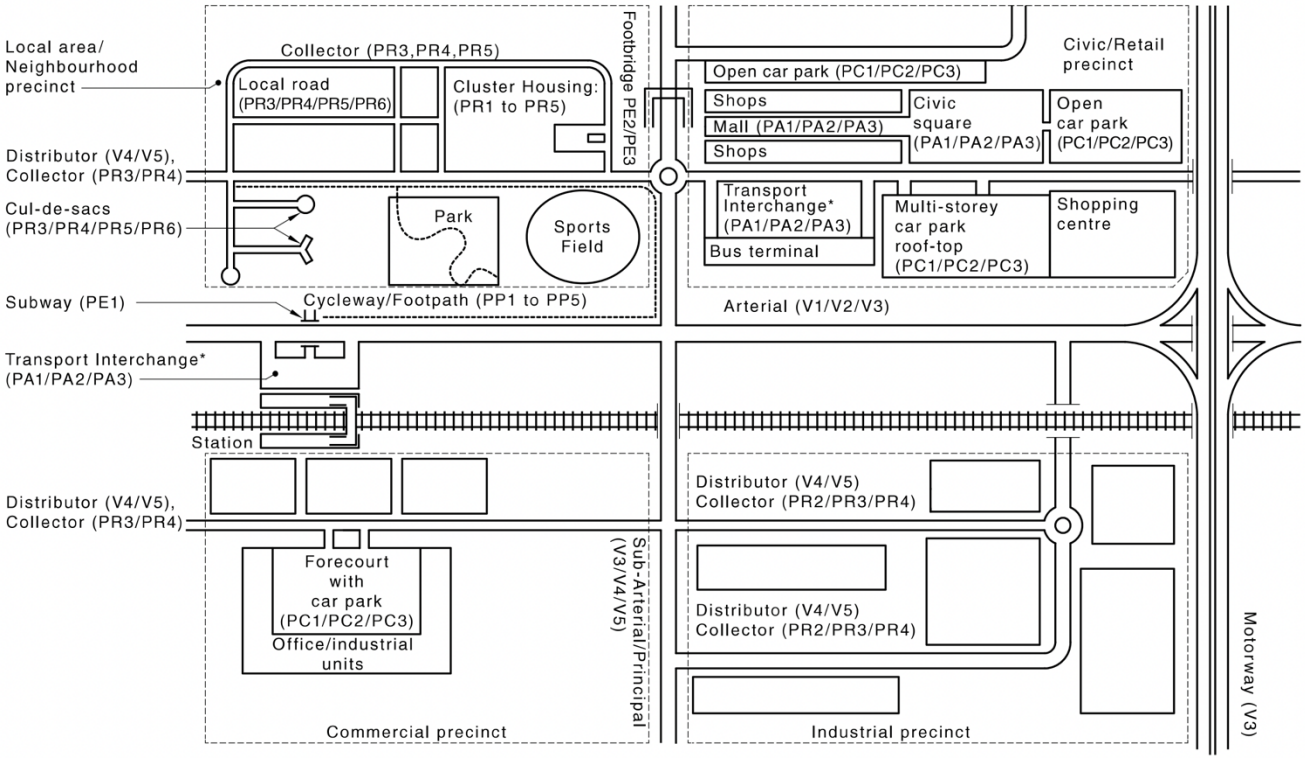

Figure 2: Figure 2.1 from AS/NZS 1158.3.1 2005

7.2 Recommended Lighting Categories for Specific Site Types

The site types or specific locations presented in Table 3 are areas where lighting categories other than those that may be specified by strict application of AS/NZS 1158 shall apply.

Table 3: Site-specific lighting category requirements

Site/Application	Desirable Minimum Lighting Category	Additional Information
Destination and Civic Parks (refer to Appendix 1 for details of specific sites)	PP3 during peak periods PP5 for off-peak periods	Category PP2 may be considered
Sport lighting	Refer to relevant peak sporting body guidelines and/or Australian Standards for relevant sports.	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.
Shared Paths	PP3 during peak periods	Category PP2 may be considered

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8. Determining the Site Type and Site-Specific Considerations

Once the need for public lighting and the lighting category have been established, the third step of the decision-making process should determine the site type and any site-specific considerations such as:

- the aim of lighting in the area: for example, aesthetic, to create atmosphere, for safety or to guide preferred usage patterns
- whether the area is a 'high risk' security area, or vandalism risk area, based on evidence
- 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

Table 4 provides supplementary guidance on how public lighting (in accordance with Australian Standards) is to be implemented having regard for on site-specific considerations within Port Pirie Regional Council. Guiding principles in Section 5.1 can be applied to different lighting sites and applications.

Table 4: Lighting requirements for specific types of locations within Port Pirie Regional Council

Site/Application	Requirements	Controls[1] (e.g. dimming, switching, sensors)

Destination and Civic Parks (refer to Appendix 1 for details of specific sites)	• light only paths and thoroughfares through parks, not lawns (with the exception lighting lawns for recreational purposes)
	• avoid lighting dead-ended paths, unless the path provides access to a facility within the park that is used during night time hours
	• for BBQs, gazebos etc. lighting should not be installed
	• lighting should typically only be considered for park areas of high use under the following circumstances:
	  ○ if there is a thoroughfare for pedestrians/cyclists
	  ○ if it promotes night time physical activity \
		If lighting is installed, dimming and timers can be used to turn lights off or down when usage levels drop off or no longer exist, or where activity is no longer desired after certain hours
		Dimming and switching will be implemented on a case-by-case basis based on activity levels and crime

[1] Where controls such as dimming or switching are implemented, consideration should be given to the need for public signage alerting the public to when lights will be turned off or dimmed.

Site/Application	Requirements	Controls[1] (e.g. dimming, switching, sensors)
Community and corridor parks	Lighting should not be considered for community and corridor parks Lighting in these spaces is not appropriate for the following reasons: • There is little visitation in these reserves after dark (e.g. for Local/Neighbourhood Parks, Linear and House Front Reserves) • Lighting is not appropriate as activity is better suited to daylight hours (e.g. for playgrounds)	N/A
Nature Reserves	Lighting should typically not be considered for nature reserves as it may disrupt local flora and fauna If lighting is deemed necessary based on specific circumstances (e.g. for toilet blocks or shelters) , the use of a lower CCT (around 3000K) is required to ensure a lower impact on local fauna. In addition, the following should be considered (in order of preference): 1. lights with site-specific optics (to minimise light spill) or baffles and the use of dimming and switching after hours of use 2. Bollards or solar path markers • The design solutions outlined in Section 8.1 to control light pollution should be considered when selecting luminaire and pole types in nature reserves	If lighting is installed, use dimming and timers to turn lights off or down when usage levels drop off or no longer exist, or where activity is no longer desired after certain hours.
Skate Parks	• for skate parks, lighting will be considered if demand exists	Switching shall be utilised in higher density residential areas to discourage late night use. In other areas, all night lighting can be considered on a case-by-case basis.
Playgrounds	• Generally, lighting is not appropriate as playground activity is better suited to daylight hours	In instances where lighting is considered necessary dimming and switching shall be utilised based on a site specific assessment.

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Site/Application	Requirements	Controls[1] (e.g. dimming, switching, sensors)
External building lighting	External building lighting may be considered if the building is adjacent to and/or within: 1. a Council car park (e.g. lighting on the building provides light for the car park) 2. a Council footpath or shared path, including a path to a Council building (e.g. lighting on the building provides light for the path that leads to the building entry or lighting on the building provides light for shared path that runs adjacent to the building) 3. a Council public art project In addition, external building lighting may be considered as a method to deter vandalism and/or enhance security.	Controls to be applied depending on the nature of the adjacent public space (e.g. car park) as well as the hours of operation of the building.
Car parks	Lights may be installed where night time activity is present e.g. activity centres, sports facilities. Consideration should be given to lighting any pedestrian linkages to the facility/precinct that the car park services	Lights may be installed with timers set to the hours of operation of the associated site or building or dimmers set to the usage levels of the car park over the course of the night
Retail centre lighting schemes – additional lighting to street lighting	• additional lighting will not be considered appropriate if unmetered street lighting already exists • where place-making/urban renewal is planned for a retail centre, Council will explore options to remove existing unmetered street lighting and install metered lighting.	For metered connection points, dimming is encouraged where usage patterns allow, or where activity is not desired after certain hours. Switching off is not recommended for shopping strip lighting
Aesthetic lighting (e.g. uplighting/feature lighting, catenary lighting and lighting of signs, trees, buildings, monuments, art)	• lighting may be installed with timers based on a needs assessment	Timers are to be installed linked to operation hours of the associated site or building

Site/Application	Requirements	Controls[1] (e.g. dimming, switching, sensors)

Areas of high vandalism	• lighting may be installed, subject to trial in the following order:
	  ○ turning lighting off to deter vandalism
	  ○ using motion sensors
	  ○ increase lighting in accordance with the Crime Prevention through Environmental Design Guidelines	

Sports lighting (applies to sports precinct only)	• Lighting may be installed where demand exists	Switching is managed via the cloud/mobile network.
Boat Ramps and Jetties	• Lighting may be installed where demand exists	Sensors will be considered to ensure light is delivered only when it is needed.
Shared paths	• Lighting maybe installed where demand exists	If lighting is installed, dimming and timers can be used to turn lights off or down when usage levels drop off or no longer exist, or where activity is no longer desired after certain hours. Activity sensors will be considered to ensure light is delivered only when it is needed

8.1 Control of Light Pollution

The inappropriate or excessive use of artificial light – known as light pollution – can have serious environmental consequences for humans, wildlife, and our climate. Components of light pollution include:

- Glare – excessive brightness that causes visual discomfort
- Skyglow – brightening of the night sky over inhabited areas
- Light trespass – light falling where it is not intended or needed
- Clutter – bright, confusing and excessive groupings of light sources

This excess light, or wasted energy, is:

- increasing operational costs via higher electricity bills
- endangering ecosystems

- altering biochemical or circadian rhythms

Taking steps to reduce light pollution doesn't mean living in the dark - it's about making light more efficient and beneficial. Light pollution can be controlled in the following ways in order of effectiveness:

1. Avoid lighting where it is not needed	Lighting is not always a necessary component of the built environment. Consider whether night-time usage is desired and/or prioritise areas of environmental importance and apply restrictions to lighting.
2. Avoid over-lighting	Do not over-light. Over lighting is a major cause of light pollution. Recommended lighting levels exist for most outdoor lighting applications. Consultation of relevant Standards should be carried out to ensure suitable lighting levels are applied.
3. Switch off or dim lights during periods when lighting is not required.	Most people use public space during the day and early evenings. Lighting should support positive evening use and all-night lighting should be provided only where required. Where switching lights off is deemed unreasonable, consideration of changes to usage patterns over time should be carried out, with opportunities to dim lighting levels applied wherever viable.
4. Reduce or eliminate light spill	Wherever possible, direct light downwards, not upwards, to illuminate the target area.

Table 4 in this Section of the Guidelines provides guidance on where lighting is not needed and how to apply dimming and switching when lighting is no longer needed during night time hours; Section 7 provides guidance on appropriate lighting levels; and Section 9 makes reference to the requirement that new lights should have a maximum upward waste light spill ratio of less than one per cent.

The following section provides guidance on acceptable solutions to further control light pollution. These solutions should be considered during the design process of any new lighting scheme and are of particular importance to any lighting schemes in or around areas of environmental importance such as nature reserves.

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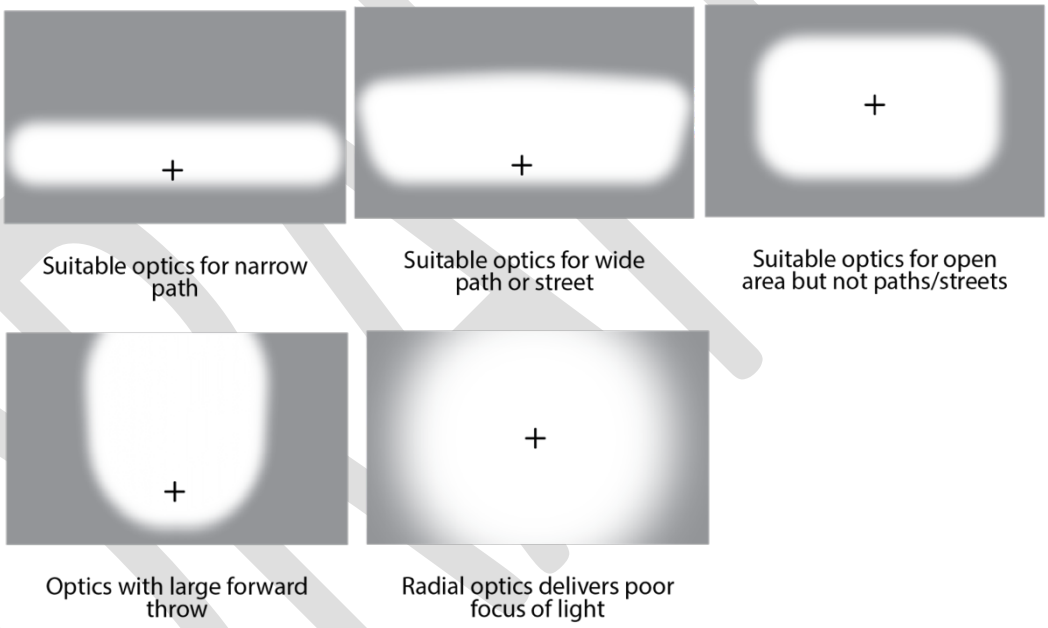
Solution	Description	Examples	Limitations
Choose appropriate optics configurations	Luminaires with a range of optics configurations should be selected. LED technology provides the ability to direct lighting where it is needed via adjustments to the individual optics of each LED chip. This provides options during the design phase to reduce light spill beyond the area that needs to be illuminated. Each space will be unique so any number of optic configurations may need to be employed to minimise light spill.	• Most LED fixtures available today will offer a range of optics options. Examples of common optics configurations and their suitable applications are provided below.	• The majority of luminaires designed for unmetered street lighting applications do not offer variations in their optics configurations.



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Solution	Description	Examples	Limitations
Use lower luminaire mounting heights	During the design phase of a new lighting scheme, an emphasis should be placed on lowering mounting heights to a scale that minimizes the spill and scatter of artificial lighting into areas that do not need to be lit.	• Pole heights should allow for luminaires to be mounted at heights below tree canopies and fauna movement infrastructure. • Pole heights should allow for luminaires to be mounted at heights that allow surrounding barriers (buildings, trees etc) to block light spill into areas where it is not needed.	• High pole mounting heights paired with higher powered luminaires will typically result in less poles and luminaires being used and consequently lower energy and maintenance costs.

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Solution	Description	Examples	Limitations
Consider low-output in-ground lighting	Where it is determined that there is a need for lighting but the environmental importance/impacts preclude the installation of typical lighting, but some form of delineation is still desired, then the use of in-ground path markers may be considered. Bollard lights are not to be considered because of their susceptibility to vandalism	• Where in-ground path lighting is selected, 'cat eye' style lights shall be used to minimize the visibility of the lights from above.	• Whilst it is not possible for these lighting types to achieve compliance with Australian Standards (AS/NZS 1158) they are still able to provide a basic illumination of a pathway whilst minimizing light spill into areas of environmental importance.

'Cat eye' style ground-lights shall be used to minimize the visibility of the lights from above.

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Solution	Description	Examples	Limitations
Configure pole location to direct light onto the design area	**Minimise pole set-back:** The setback of a light pole from the design area shall be kept to a minimum (but no less than 1.0m for bicycle paths). This will ensure less back spill and make the shielding of back spill easier if it is required.	• In most cases, it is desirable for the luminaire to 'overhang' into the area that is intended to be lit. This can be done by placing the pole within, or otherwise as close to, the design area as possible.	• Pole set back must be considered in conjunction with the potential dangers of pole proximity to moving traffic
	Increase outreach: Where the pole set-back is not able to be minimized due to the physical constraints of a site, longer bracket arms should be used to position the luminaires closer to/over the design area.	• Pole outreach arms can be used to extend the 'overhang' of a luminaire into the area that is intended to be lit.	• Torque created by longer outreach arms may limit the achievable overhang for certain poles.

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9. Determining the Luminaire and Pole Type

Once the need for lighting, as well as the lighting category and any site-specific requirements have been established in accordance with Sections 6, 7 and 8, the fourth step of the decision-making process should determine the luminaire and pole type.

The number of poles should be rationalised and kept to a minimum (e.g. sharing poles with other function ie power lines, signage etc.) to eliminate clutter as well as allowing variation for key sites.

9.1 Requirements for Unmetered Public Lighting Assets

Unmetered lighting installations must meet the requirements outlined in Table 5.

Table 5: Requirements for unmetered assets

Feature	Requirement
Luminaires	
SA Power Networks approval	Must be approved as a standard fitting by SA Power Networks unless on Energy Only (EO) tariff Note: no new decorative luminiaires are to be installed.
CCT	Preferred = 4000K Note that Council would prefer SA Power Networks to offer a colour temperature range between 3000K to 4250K. Currently only ~4000K LED street lights are approved for use
"Smart City" compatibility	Must include a 7-pin NEMA base wired as per the requirements of ANSI C136.41-2013 to a variable output control gear (for dimming/brightening)
Entry type	Must be side entry
Energy efficiency	Must have a minimum luminaire efficacy rating (LER) of 100 lumens per watt
Poles	
Mounting height	Must have a mounting height of not less than 5.5m
Surface finish	Must be uncoated galvanised steel
Entry type	Must be side entry
SA Power Networks approval	Must be approved as a standard pole by SA Power Networks SA Power Networks approved non-standard or "decorative" poles are not permitted

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9.2 Requirements for Metered Public Lighting Assets

Metered lighting installations must meet the requirements outlined in

Table 6.

Table 6: Requirements for metered assets

Feature	Recommended requirement
Luminaires	
Design	Luminaire design should be contemporary, with clean, minimalist lines and no decorative detailing
Surface finish	A galvanised finish or black colour paint if located in the city centre is required. If a paint finish is used, then this must be matte black and must use a durable method of coating (e.g. a heavy-duty zinc protective powder coating)
Protection against dust/water ingress and mechanical impact	Must have minimum IP65 (ingress) and IK06 (mechanical impact) ratings
Energy efficiency	Must have minimum LER of 100 lm/w
Upward Waste Light Ratio (UWLR)	Must have maximum UWLR of less than 1%
Minimisation of glare	Must comply with glare requirements of AS/NZS 1158
CCT	Preferred = 4000K Acceptable colour temperature range (only applies in special circumstances) = 3000K to 4250K
Colour rendering index (CRI)	Must have minimum CRI = 80
Entry type	Must be side entry
Compliance with relevant standards	Must comply with requirements of SA/SNZ TS 1158.6
"Smart City" compatibility	Must include a 7-pin NEMA base wired as per the requirements of ANSI C136.41-2013 to a variable output DALI 2.0 control gear (for dimming/brightening)
Design life	Must have minimum design life of 20 years
Poles	
Design	Pole design should be contemporary, with clean, minimalist lines and no decorative detailing. Where appropriate, poles should share function with other assets to minimise visual clutter. This includes the use of lighting poles for signage and banners.
Surface finish	A galvanised finish or black colour paint if located in the city centre is required If a paint finish is used, then this must be matte black and must use a durable method of coating (e.g. a heavy-duty zinc protective powder coating)
Compliance with relevant standards	Must comply with AS 4100
Entry type	Must support side entry luminaires

Feature	Recommended requirement
Mounting height	Luminaire mounting height of any pole should be of an appropriate scale for the space it is in, with a minimum height of 5.5m unless existing tree canopies dictate a lower mounting height.
Offset from pathways	Where the purpose of lighting is to illuminate a pathway, the minimum offset of the pole from the pathway shall be 0.5m for pedestrian paths and 1.0m for bike paths.
Design life	Must have minimum design life of 35 years

9.3 Requirements for Sports Lighting Assets

Sport lighting installations must meet the requirements outlined in Table 7.

Table 7: Requirements for sports lighting assets

Feature	Recommended requirement
Luminaires	
Design	N/A
Surface finish	A galvanised finish is preferred for minimal maintenance.
Protection against dust/water ingress and mechanical impact	Must have minimum IP65 (ingress) and IK06 (mechanical impact) ratings
Technology	Must be LED.
Energy efficiency	Must have minimum LER of 100 lm/w
Upward Waste Light Ratio (UWLR)	Must be Type C or D (shoebox) as per the design guidelines of AS 4282
Minimisation of glare	
CCT	In the range of 4500-6000K. Refer to AS2560
Colour rendering index (CRI)	Must have minimum CRI = 80. Refer to AS2560
Compliance with relevant standards	Must comply with requirements of IEC 60598-2-5 Particular requirements - Floodlights
"Smart City" compatibility (Tennis only)	Must include a variable output control gear (for dimming/brightening) and enable curfew switching.
Design life	Must have minimum design life of 20 years
Poles	
Design	Pole design should be contemporary, with clean, minimalist lines and no decorative detailing
Surface finish	A galvanised finish is preferred for minimal maintenance.
Compliance with relevant standards	Must comply with AS 4100
Mounting height	Consideration should be given to the surrounding space to minimise the obtrusive effects of unwanted light spill
Design life	Must have minimum design life of 35 years

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9.4 Solar Lighting

The installation of solar lighting is generally not supported by Council (due to higher capital and maintenance costs) but may be considered in circumstances where connection to the grid is not considered viable

Grid connected solar lighting will not be considered.

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10. Approval Process for New Public Lighting

Public lighting is generally owned and managed by Council and/or the Distribution Network Service Provider (DNSP) that operates in the municipality – SA Power Networks. There are two different management structures for the approval of new public lighting, which are discussed in Sections 10.1 and 10.2.

Council may also consider aesthetic or feature lighting under special circumstances. The approval and management of such lighting is discussed in Section 10.3.

10.1 Unmetered Lighting

Most street lighting is standard unmetered lighting. Most unmetered standard lighting is owned and managed by SA Power Networks and Council pays a service charge to SA Power Networks to maintain the light and pole over its life.

Figure 3 describes the process whereby Council has oversight of the design/preparation phase and SA Power Networks has control of the installation, commissioning and ongoing management of the asset.

The Checklists referenced in Figure 3 are found in Section 13.

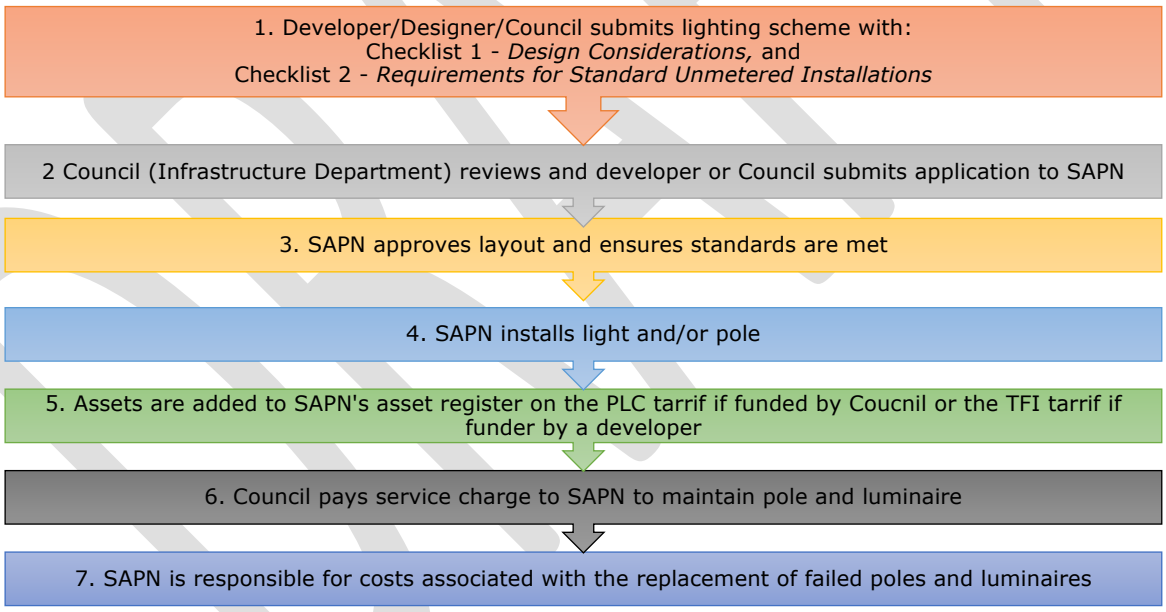

Figure 3: Approval process for standard unmetered lighting installations

10.2 Metered Lighting

Metered 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. These lights can have their own meter or be connected to a building, BBQ or other electrical load (which has its own meter).

Figure 4 describes the process whereby Council has oversight of the design/preparation phase as well as the installation, commissioning and ongoing management of the asset.

The Checklists referenced in Figure 4 are found in Section 13.

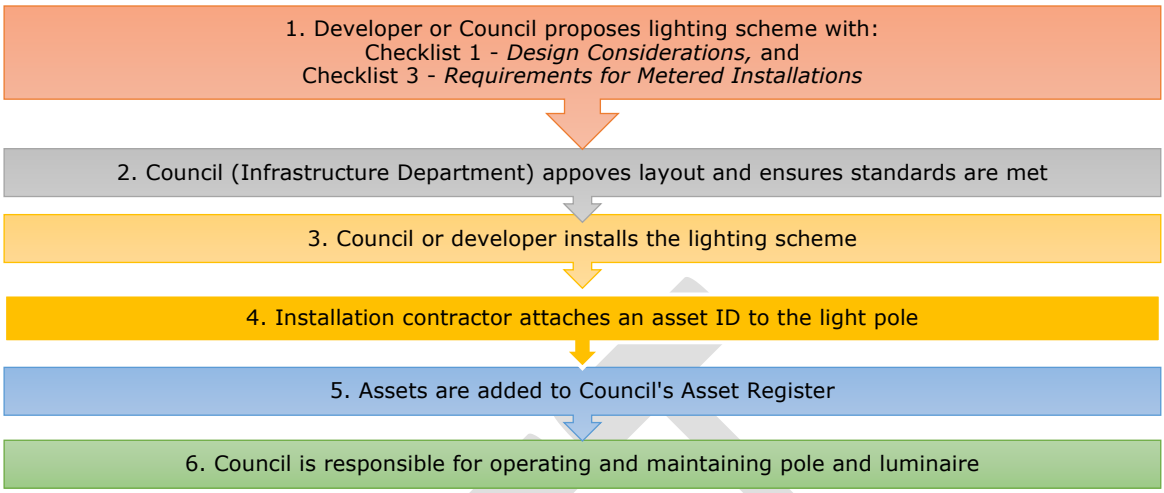

Figure 4: Approval process for metered lighting installations

10.3 Aesthetic Lighting

Council may consider the approval of aesthetic lighting. Aesthetic lighting is typically metered and is not installed for the purposes of maintaining functional lighting levels in an area. Examples of aesthetic lighting may include uplighting, feature lighting, façade lighting and bud lighting.

Where aesthetic lighting is public (i.e. proposed by Council), it may be considered where the installation:

- contributes to place making
- highlights prominent public artwork (e.g. wall murals)
- assists with reducing vandalism and/or increasing public safety

All aesthetic lighting needs to be balanced against potential maintenance issues of Council assets. Tree bud lighting for example may be damaged by tree-pruning processes or cause damage to the tree via strangulation.

Where aesthetic lighting is private (i.e. proposed by a private entity but to be installed in the public realm), it may be considered and approved by Council where the installation:

- is not being installed on public assets where maintenance of that asset might be affected (i.e. trees)
- is temporary and can easily be removed
- does not impact negatively on existing functional lighting
- contributes to place making
- is to be installed, operated and maintained by the person/body making the request
- does not require the installation of any permanent supporting infrastructure
- does not cause any safety issues

10.4 Updating Asset Registers

10.4.1 Unmetered Lighting

For unmetered street lighting assets, SA Power Networks maintains an asset register that includes a range of information such as location, lamp wattage, lamp type, pole ID and commission date.

Council is provided with access to an online portal through which it can download up to date asset registers at any time. Data is accessed on an as needs basis to ensure only the latest data is used.

When new lighting is installed or existing lighting is upgraded, SA Power Networks will arrange for the assets register to be updated.

10.4.2 Metered Lighting

For metered assets, Council maintains an asset register of its public lighting. This includes the following pieces of data:

- Luminaire type and manufacturer
- Luminaire colour
- Luminaire condition rating
- Luminaire faults
- Lamp type
- Lamp wattage
- Pole type and manufacturer
- Pole material
- Pole colour
- Pole condition rating
- Pole faults
- Pole base type
- Pole base condition rating
- Pole base faults
- Overview photo
- Location (GPS co-ordinates)
- Mounting Height
- Switching (PE cell, timer etc)
- Timer settings
- ID number
- Site Name

In order to maintain an up to date asset register, all new or recently upgraded lighting assets are entered into the register via information provided from field workers to the Asset Planning Co-ordinator.

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11. Complaints/Requests Procedures

The following procedures will be applied to the assessment of complaints and/or requests received by Council in relation to public lighting.

All complaints and/or requests received by Council in relation to public lighting need to be considered in conjunction with Council's Complaints Handling Procedure.

11.1 Requests for New Lighting (Existing Lighting)

Where Council receives requests for the installation of additional lighting in areas where lighting already exists, the request will be assessed using the following process:

1. Undertake initial site inspections to determine number and type of lighting assets within the area. If the initial inspection determines there are insufficient lighting assets in the area move on to step two.
2. On-site light level analysis utilising a high-quality light meter to determine the existing levels of lighting
3. comparison of existing lighting levels against the requirements of the relevant Australian Standard for lighting in the given location
4. report developed detailing the outcomes of the analysis including advice on whether additional lighting is or is not merited

Based on this analysis, a final decision will be made as to the merits of the request.

For sports lighting and off-street path lighting, Asset Department will be responsible for all requests for new lighting. For street lighting, pedestrian crossings and traffic management devices Assets Department will be responsible for all requests for new lighting.

11.2 Requests for New Lighting (No Existing Lighting)

Where Council receives requests for the installation of lighting in locations where there is currently no lighting, such requests will be assessed on a case-by-case basis.

Assessment of requests will consider (but are not limited to) the existence of a legitimate need for lighting and the viability of installing lighting from a cost and infrastructure perspective (refer to Sections 5 and 6).

Where a genuine need is identified and provision of lighting is considered viable, lighting will be provided in accordance with these Guidelines (refer to Sections 8 to 9).

11.3 Requests for Removal of Lighting

Where Council receives requests for the removal of existing lighting, such requests will be assessed on a case-by-case basis. Typically, the removal of existing lighting will only be

considered if the function of a space has changed and the existing lighting has become redundant.

11.4 Complaints About Over-Lighting or Light Spill

Where Council receives complaints about over lighting or light spill into properties from existing lighting, the request will be assessed using the following process:

- Undertake a desktop assessment to model lighting levels against the requirements of the AS 4282 *Control of the Obtrusive Effects of Outdoor Lighting*
-
- If the desktop assessment is not conclusive, then conduct a site inspection with a lux meter to determine lighting levels at the effected property.
- Report developed detailing the outcomes of the analysis including advice on whether light spill control is or is not merited

Based on the above analysis a final decision will be made as to the merits of the complaint. Should a complaint be deemed valid, the issue may be resolved in several ways including those listed below:

- installing a different luminaire (lower output or more directional photometrics)
- relocating the luminaire
- dimming the luminaire using smart lighting technology
- removing the luminaire
- exploring other site specific treatments

11.5 Complaints About Shading of Lighting by Trees

Where Council receives complaints about shading of lighting by trees, the complaint will be assessed using the following process:

- On-site analysis utilising a high-quality light meter to determine the existing levels of lighting 40 metres on either side of the tree
- Comparison of existing lighting levels against the requirements of the AS/NZS 1158
- Report development detailing the outcomes of the analysis including advice on whether tree pruning or tree/light relocation should be investigated further. Priority will be placed on modifying existing lights or installing new lights before tree pruning is considered.

12. Maintenance Procedures

12.1 Unmetered Assets

Unmetered public lighting is mostly maintained and repaired by SA Power Networks, but this is not always the case. Different unmetered asset types fall under different processes for maintenance and repair.

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Table 8: Overview of repair and maintenance processes for unmetered asset types

Tariff Type	Description	Maintenance	Repair
EO (Energy Only)	Customer funds and retains ownership of all public lighting equipment and maintenance responsibilities	Council is responsible for all maintenance	Council is responsible for all repair and replacement
CLER	Customer funds all public lighting assets SA Power Networks maintains assets over their life	If LED, SA Power Networks will maintain the (LED) luminaire by cleaning and testing the luminaire at appropriate intervals and replace failed photoelectric cells. All other maintenance is the responsibility of Council	Council is responsible for repair and replacement. Council has the option to engage SA Power Networks to undertake warranty management and other luminaire repair or replacement related services
PLC	Customer funds the luminaire installation or upgrade, which SA Power Networks installs. SA Power Networks funds the installation and upgrade of infrastructure. SA Power Networks maintains assets over their life.	Maintenance includes cleaning, testing and inspection at appropriate intervals.	Repair includes replacement of luminaire components
TFI	Lighting luminaire / infrastructure is transferred ('gifted' or 'vested') to SA Power Networks	Maintenance includes cleaning, testing and inspection at appropriate intervals.	Repair includes replacement of luminaire components
SAPN/SLUOS	Applies where SA Power Networks has previously funded a non-LED luminaire upgrade or new installation. Under the SLUoS Tariff, SA Power Networks will operate and maintain, repair and/or replace the luminaire and its supporting infrastructure	Maintenance includes cleaning, replacement of luminaire components, testing and inspection at appropriate intervals.	Repair includes replacement of luminaire components

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12.2 Metered Assets

Metered public lighting assets in Port Pirie Regional Council are maintained and repaired by Council. This includes the following maintenance and asset management activities:

- Regular (every 6 months) audits to test for the operation and condition of lighting assets followed by repairs to fix any assets that are not working.
- Regular (every 6 months) testing and adjustments of timeclocks (where installed)
- Regular (every 5 years) audits to assess the condition of lighting assets in order to identify structural faults (rust, pole lean etc.)
- Recording of all maintenance and repair work carried out in order to identify assets/sites with reoccurring issues and thus better inform asset renewal.
- The upkeep of an asset register to record the location, characteristics, condition and maintenance history of each metered public lighting asset
- The installation of identification plates (with unique ID and Council phone number) on metered light poles to assist the public and Council in reporting and identifying faults.

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13. Checklists and Specific Requirements for New Public Lighting

Council will support lighting installations that meet these Guidelines.

When proposing a new public lighting scheme in Port Pirie Regional Council, please submit the relevant checklists as specified in Table 9.

Table 9: Summary of checklists required for submission with lighting proposals

Installation Type	Requirement
Unmetered installation	Submit checklist 1 and 2
Metered installation	Submit checklist 1 and 3

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13.1 Checklist 1 – Design Considerations

All new public lighting installations must address the following requirements.

Council's Infrastructure Department will review completed checklists.

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 luminaires been submitted (to be submitted upon completion of project)?

All new lighting installations in Port Pirie Regional Council must address the following requirements:

✓	**Needs assessment, site-specific requirements and lighting category selection**
	Is there a need for lighting according to the AS/NZS 1158 and Section 6 of Council's Public Lighting Guidelines 2019?
	Does the lighting scheme meet any site-specific requirements outlined in Table 4, Section 8 of Council's Public Lighting Guidelines 2022 (including application of controls)?
	Has the design used the correct lighting category (i.e. not lighting above the necessary level required for a particular area) as per AS/NZS 1158 and Sections 7.1 and 7.2 (where applicable) of Council's Public Lighting Guidelines 2022?
✓	**Life cycle considerations**
	Can the proposed materials (luminaires and poles) be recycled or reused at end of life?

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.

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

Internal Use Only

Infrastructure Department Approval **Yes / No**

Signed

Date

Project Manager Approval **Yes / No**

Signed

Date

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13.2 Checklist 2 – Requirements for Standard Unmetered Installations

All new standard unmetered installations must address the following requirements.

The Infrastructure Department will be responsible for all requests for new unmetered lighting. A SLUOS tariff is preferred for all new unmetered lighting.

Pole design		**Luminaire requirements**	
☐	**Is the mounting height for bracket installation no less than 5.5m 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.	☐	**Does the lamp provide a colour temperature at or near 4000K?** Whilst 4000K is preferred in most cases, an allowable range of 3000K to 4250K exists. For areas of environmental importance or night time retail/dining, a colour temperature closer to 3000K should be considered.
		☐	**Are the PE cell bases compatible with 7-PIN NEMA PE Cells and are drivers dimmable?** This ensures future proofing for use of smart lighting controls.
☐	**Is the pole approved as a standard URD pole by SA Power Networks?**	☐	**Does the luminaire have an efficacy of no less than 100 lumens per watt?**
☐	**Is the pole side entry?**	☐	**Are the luminaires approved as standard fittings by SA Power Networks?** Proof can include a copy of the approval letter for luminaire.
Pole coating systems			
☐	**Will the pole be unfinished galvanized steel?** Uncoated galvanised steel is the only permitted pole finish for standard street lighting installations		

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Infrastructure Department Approval **Yes / No**

Signed

Date

Project Manager Approval **Yes / No**

Signed

Date

13.3 Checklist 3 – Requirements for Metered Installations

All new metered installations must meet the following requirements.

The Infrastructure Department will be responsible for all requests for new metered lighting.

Pole design		**Luminaire requirements**	
☐	**Is the mounting height for brackets at least 5.5m and in keeping with the surrounding environment?** Consider existing and future tree canopies, building awnings and existing lighting infrastructure. Increasing the pole height increases pole spacing and thus reduce the required pole and luminaire quantities. This needs to be balanced, however, with the features of the surrounding environment. Light spill into areas the design area 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	☐	**Does the luminaire comply with the requirements of SA/SNZ TS 1158.6?**
		☐	**Is the luminaire contemporary, with clean, minimalist lines and no decorative detailing?**
		☐	**Is the luminaire side entry?**
☐	**If the pole is adjacent to a pathway, is it offset from the pathway by a minimum of 0.5m for pedestrian paths or 1.0m for bike paths?**	☐	**Does the luminaire have an efficacy of not less than 100 lumens per watt?**
☐	**Is the pole contemporary, with clean, minimalist lines and no decorative detailing?**	☐	**Does the lamp provide a colour temperature at or near 4000K?** Whilst 4000K is preferred in most cases, an allowable range of 3000K to 4250K exists. For areas of environmental importance or night time retail/dining, a colour temperature closer to 3000K should be considered.
☐	**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.	☐	**Does the luminaire have a minimum IK06 rating and minimum IP65 rating?**

DRAFT

Pole design		Luminaire requirements	
	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 fitting standard energy efficient LED luminaires in the future should a move away from non-standard fittings be desired. Modular poles with removable outreach arms can allow refitting of a top entry arm to allow side entry lights.	☐	**Does the luminaire have an upwards light spill ratio of no greater than 1%?**
☐	**Have alternative options (e.g. buildings) for mounting of luminaires being considered to reduce visual clutter AND/OR have options to utilise new pole infrastructure for other uses (e.g. signage, banners) being considered?**	☐	**A galvanised finish is preferred. However, if a paint finish is desired, is the coating finished with one of Council's approved list of luminaire colours?** Councils current approved list includes matte black only.
		☐	**Does the luminaire have a colour rendering index (CRI) of not less than 80?**
Pole Coating systems A galvanised finish is considered lowest maintenance and is therefore preferred.		☐	**Does the luminaire feature a 7-pin NEMA base wired as per the requirements of ANSI C136.41-2013 to a variable output control gear?** This ensures future-proofing for use of smart lighting controls.
☐	**Will the coating system be powder coated, ensuring a long service life with reduced maintenance?** If rust is present, it must be removed and the affected area repainted in accordance with the recommended method for new poles.	☐	**Does the luminaire comply with glare limits specified in AS/NZS 1158?**

DRAFT

Pole design		Luminaire requirements
☐	**If a paint finish is desired, is the coating finished with one of Council's approved list of pole colours?** Councils current approved list includes matte black.	
☐	**Is the pole compliant with AS 4100?**	

Internal Use Only

Infrastructure Department Approval **Yes / No**

Signed

Date

Project Manager Approval **Yes / No**

Signed

Date

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14. Appendix 1: Destination and Civic Parks

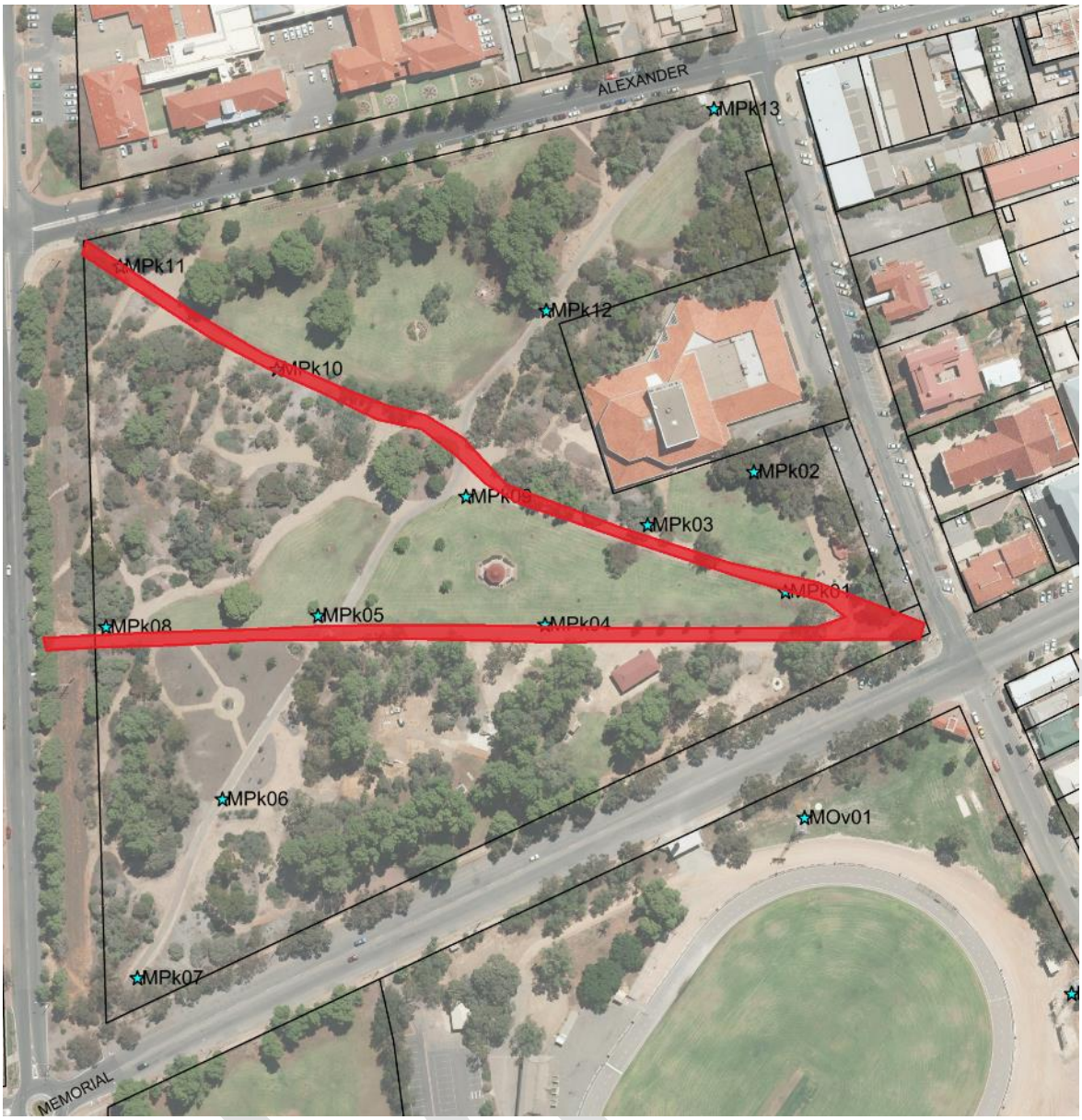

Figure 5: Memorial Park

Figure 6: Pasminco Park

Figure 7: Woodward Park

Figure 8: Solomontown Beach and Skate Park

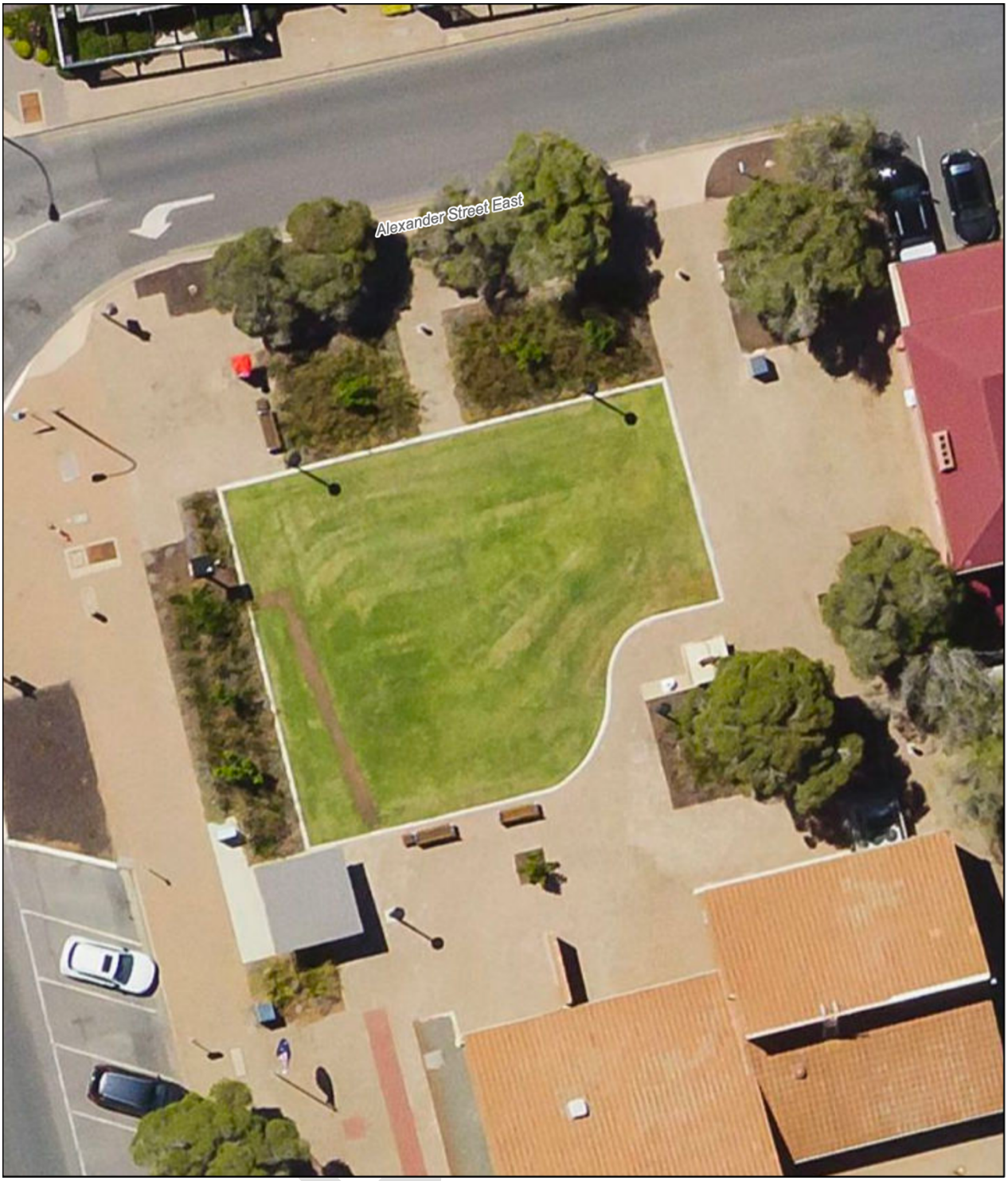

Figure 9: City Park

Figure 10: Crystal Brook Adelaide Square