City of Ryde

Lifestyle and opportunity @ your doorstep

Open Space Lighting Policy

Document Version Control

Document Name:	**Open Space Lighting Policy**
CM Reference WORD:	D21/47521
CM Reference PDF:	D21/47620
Document Status:	Approved by Council
Version Number:	Version 1.1
Review Date:	26 November 2021
Owner:	City of Ryde
Endorsed By:	Council on 26 November 2019
Distribution:	Internal & External

Change History

Version	Review Date	Author	Reason for Change
1.0	26/11/2019	Parks Operations	Policy approved by Council
1.1	12/04/2021	Parks Operations	Moved to new policy template

Contents

1. Scope

The policy addresses lighting in Council owned and managed open space parks and reserves. This does not include other areas managed by Council such as roads and lanes, nor private open space. The policy applies to all Officers and Councillors.

2. Purpose

This policy will guide lighting decisions in the City of Ryde open spaces. The policy guides when and where lighting in open space is needed and if so, what type of lighting and illumination level should be used.

3. Principles / Responsibilities

Lighting Assets in City of Ryde

The City of Ryde (CoR) has various types of lighting assets installed within its parks, reserves and sports fields.

The lighting installations are owned and maintained by either the electricity distribution networks (Ausgrid/Endeavour) or by the CoR.

In general, the lighting installations of either authority remain totally separate apart from the point of supply from the distribution network to the CoR installation.

Network lighting installations:

Network lighting installations have their own set of standards including luminaire types and network compliance requirements.

Network lighting installations are designed and installed by an Accredited Service Providers (ASPs) in the appropriate level and class.

Network lighting installations are designed to comply with current lighting standards to Category V (roads) and P (pedestrian). The level of illumination for Category P which includes pathways is determined by the network without consultation with CoR.

Network lighting installations are unmetered. CoR pay an annual fee for this lighting.

CoR lighting installations:

CoR installations are classed as private installations.

As private installations the CoR are free to select suitable lighting fixtures which form part of a CoR Standard Lighting Fixtures suite of lights.

The design and installation of private lighting installations must comply with current lighting and electrical standards but is not bound by network standards in public areas including parks, reserves and streets.

The CoR may determine illumination levels for pedestrian areas (Category P) based on local conditions which usually includes consideration of the level of activity, amenity and risk of crime.

Sports field lighting installations are designed only for training or match play.

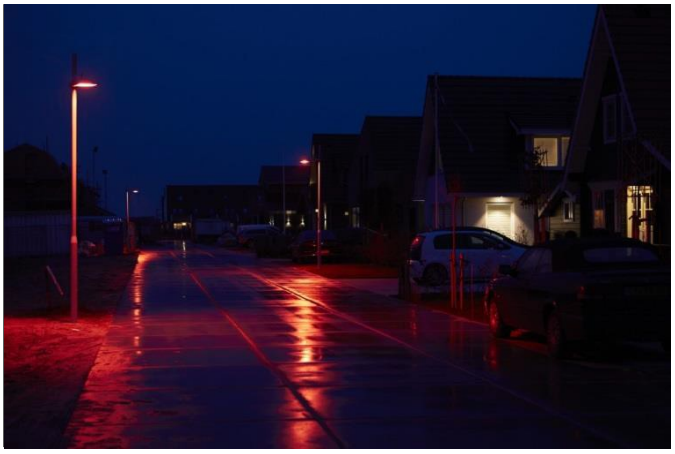
CoR lighting installations are generally metered. Small installations of less than 10 amps single phase load may be unmetered and are referred to as a Special Small Unmetered Services or Permanent Unmetered Services (PUMS).

Current typical lighting installations in the CoR are described in the following table

Lighting Installation	Description	Examples of Lighting Types
Network owned pole-top lights	Installed, owned and maintained by the Network. (with Council financial contribution). Note: The Network will only install lights that it has approved and incorporated within its network standards. Removal of these lights may attract residual value costs payable to the Service Provider by Council	
Council owned decorative pole-top lights	Installed, owned and maintained by CoR.	 

Lighting Installation	Description	Examples of Lighting Types
Council owned solar lights	Installed, owned and maintained by council. These lighting fixtures are either stand-alone or connected to a solar array at adjacent Council owned buildings.	
Council owned bollard lighting	Installed, owned and maintained by Council. These lights are installed along pathways in selected parks. Council is phasing out the use of these lights as they do not meet the policy standards which include requirements for face recognition and minimising vandalism.	

Light Category	Description	Examples of Lighting Types
Sports lights	Council owned and maintained on sports grounds. The sports lighting is only for the field of play. Cut-off style fittings are used to minimise light spill	 
Carpark lights	Some Network owned and some Council owned metered and maintained.	 
Feature/decorative lighting including in-ground lights	Council owned metered and maintained.	 

Light Category	Description	Examples of Lighting Types
Fauna friendly lights	Council owned and maintained – These types of lights will be installed in identified areas where the impacts of lighting on adjacent natural areas requires mitigation.	

Current Situation in Ryde

Passive Recreation Space

Lights:

- Many of the parks in the CoR contain some form of lighting.
- There was no policy that covered lighting in open space.
- Currently there is a mix of Network and Council owned and maintained lights in the CoR
- Many of the old Network owned lights are in locations that would not comply with this policy and will need to be sequentially removed and replaced with Council owned lighting in accordance with the policy where appropriate.
- The majority of passive park lights are pole-top lights, with only a few parks containing bollards style lights.
- Council currently replaces and/or expands park lighting through the Passive Parks Improvements and Expansion program.
- Some lights in CoR parks are connected to the CoR Central Management System (Yotta)

Sporting Facilities and Active Open Space:

- A number of active sporting fields in the CoR have sports floodlights.
- Current lighting for sports grounds meets the Australian Standard AS 2560.2.3-2007 (R2017) Sports Lighting Specific Applications - Lighting for football (all codes) for training and amateur games (for Soccer, Rugby League and Union, Australian Rules, and other minor sports), which calls for an average across the ground of 50 lux for training and 100 lux for games. Lighting is provided on selected fields such as Els Hall Park, Meadowbank Park Netball and Magdala Park at a lighting level of 250 lux for competition matches.
- Provision of sports lighting at the level to allow for competition play at or above 250 lux on other fields would be assessed on a case by case basis.
- Sportsfield lighting has been progressively upgraded to fittings that focus and direct light downwards and that significantly reduce light spill into areas outside of the playing surface
- All new sports lighting will comply with the CoR Open Space Lighting Policy
- Sports lighting in CoR parks are connected to the CoR Central Management System (EState)

Open Space Carparks

- A number of carparks in parks have lighting
- Currently there is a mix of Network and Council owned and maintained lights in these areas
- All new open space carpark lighting will comply with the CoR Open Space Lighting Policy

Shared Cycle / Pedestrian Paths

- These are a number of shared paths that link key routes such as the Ryde River Walk that have some form of lighting
- The majority of these are pole top lights
- There has been little coordination on the type of lighting used

Urban Plazas and Shopping Precincts

- There are a number of urban spaces that have a mixture of Network and Council owned and maintained lighting.
- The majority are pole top lights
- As these spaces are upgraded, new lighting will be installed in accordance with this policy.

Feature Lighting / Aesthetic Lighting

- This type of lighting has been used to emphasise buildings, landscape areas and monuments
- These lights are owned and maintained by Council

Purpose of Lighting

Use of Open Space

- Outdoor lighting is required for the enjoyment and use of open space outside of daylight hours. Council should encourage usage at identified locations and at appropriate times in order to support diverse night time and early morning activity in Ryde and to make best use of our available open space.

- It is not appropriate or desirable to light all open spaces as many parks and reserves are located in quiet residential areas or adjoining natural areas where Council may not want to encourage night time activity. It is however important that appropriate night time options are considered and where appropriate, provided. It should be noted that not all parks can be used for night time activities.

- This draft policy recommends improved lighting of selected open space reserves that meet the policy criteria, to encourage informal recreation use and physical activity and provide access through parks where appropriate. The policy will also provide criteria for minimising impact on wildlife and utilising existing or alternative lighting sources where possible.

Safety

- The correlation between lighting and crime is inconclusive. Although it is a common perception, there is little significant data to support that lighting reduces criminal activity.[1]

[1] Crime Prevention Unit Paper No. 29, Better Street Lighting on Crime and Fear: a review. Ramsay, M and R. Newton, London Home Office, London.

- Lighting can improve perceptions of safety in the community, thereby encouraging use of certain spaces and passive surveillance provided by the presence of others. However Council should also avoid creating false perceptions of safety by not providing lighting in remote or poorly surveyed locations.

- It may be more appropriate to have persons use adjacent streets, where lighting and passive surveillance from associated housing and/or businesses, provides a safer alternative than paths through open space.

- Lighting can be one of a suite of measures used to improve safety, along with the principles of Crime Prevention Through Environmental Design (CPTED) and Safer by Design; however it does not guarantee safe places in and of itself, and may not always be the most appropriate solution.

Movement through Open Space

- Where appropriate, people need adequately lit paths to move through open space outside of daylight hours. Lighting along key routes can encourage and facilitate sustainable transport modes such as walking, cycling and public transport. These key routes may include paths through parks which lead to public transport stops or stations, and shared paths which link into the main movement network and/or commuter paths for pedestrians and cyclists.

- This Policy and accompanying Park Lighting Assessment Criteria are to be used to determine the suitability of parks for lighting.

Presentation of the City

- Quality lighting design can highlight urban features and enhance the look and feel of the city at night. This has reputational and potentially economic benefits to Council as it ties into the night time economy. Feature lighting will have most benefit where it is located in highly visible spaces and connected to city gateways, public art installations or areas of night time activity.

- The design quality and placement of light fixtures also has an impact, and can make a valuable contribution to the aesthetics and amenity of open space.

Impacts of Lighting

Greenhouse Gas Emissions

All lighting requires some energy use. Under the adopted Cities Power Partnership, CoR is looking at a number of strategies to reduce our carbon emissions

The variety of low-energy fixtures using LED and other energy efficient luminaires as well as timers and motion sensors currently on the market provide an opportunity to further reduce emissions associated with new lighting installations. This policy advocates for the use of these types of luminaires where possible.

With the advent of solar lighting with low energy fixtures, Council will look to link these to solar arrays on buildings and where possible look at the installation of batteries to store power where the cost/benefit is acceptable

Impact on Urban Wildlife

Artificial light in open space can disrupt biological rhythms and interfere with the behaviour of nocturnal animals and their prey, thereby effecting biodiversity in the City. This impact must be weighed and minimised when considering lighting in any areas of high environmental value.

The City of Ryde Biodiversity Plan contains a number of strategies for the effective long-term management and viability of remnant vegetation and ecosystems. Where lighting is required, this can be improved through the responsible locating and provision of 'fauna friendly lighting'. Longer wavelength colours have been shown to have less effect on nocturnal fauna.

This type of lighting is to be used to minimise the impact of artificial light spill on fauna species and their habitat. This also includes avoiding lighting where possible, providing only minimum illuminance where required, and using fixtures which minimise uplight or spill in areas of remnant vegetation and riparian habitats.

Light Pollution

Artificial light spill can impact on residents and contribute to sky illuminance, preventing enjoyment of the dark night sky. Spill and glare may be limited by the use of cut-off fixtures which focus light downwards and prevent light from being directed up into the sky. Poorly designed and wrongly installed lights may have the impact of creating increased light pollution in the city.

Life Cycle Costs

Lighting incurs a capital cost at installation, as well as on-going maintenance, energy usage, replacement and disposal costs to Council. Older style lamps and tubes, which used to be used, contained chemicals such as mercury and are considered hazardous waste. New fixtures such as LED can offer substantially longer lamp life, reducing a generation of waste. Full life cycle costs will be considered when choosing fixtures and installing lighting.

Illumination levels

Light should be measured on both the horizontal and vertical planes. The horizontal measurement is known as the horizontal illuminance and is the amount of light that lands on a horizontal surface, such as a tabletop and vertical illuminance describes the illuminance landing on a vertical surface, such as a wall.

Australian Standards

There are basically three sets of Australian Standards used in the selection and design of outdoor lighting installations:

1. ***AS/NZS 1158.3.1:2005. Lighting for roads and public spaces Part 3.1: Pedestrian area (Category P) lighting—Performance and design requirements.***
   This standard provides recommended lighting levels for public spaces based on local conditions. Extracts from AS/NZS 1158.3.1:2005 are shown in **Appendix A**

2. ***AS2560 parts 1 and 2 Sports lighting.***
   This standard is made up of several parts that provide recommended lighting parameters for specific sports such as soccer, tennis, netball etc. Extracts from AS2560 are shown in **Appendix B**

3. ***AS 4282: 2019 Control of the obtrusive effects of outdoor lighting.***
   This standard provides the maximum recommended obtrusive light levels that affect the surrounding areas. Compliance with this standard can dictate the type of lighting installations.

Public spaces

AS 1158 provides recommended illumination levels for Category P (Cat P) areas (Pedestrian).

Note: Roads are illuminated to Category V which requires certified mandatory levels.

The recommended Cat P levels vary according to selection criteria which are determined by CoR based on local site conditions. See Appendix A

Selection criteria:

1. Pedestrian/cycle activity:
   The application of a lighting Category to a lighting installation requires knowledge of the type and frequency of activity. This can be set with regard to the level of usage.

2. Risk of crime:
   The weight of available research suggests that the placement of lighting in parks and open space does not improve safety but does to some extent, decrease the fear of crime.

3. Need to enhance prestige.
   Quality lighting design can highlight urban features and enhance the look and feel of the city at night. This has reputational and potential economic benefits to Council as it ties into the night time economy. Feature lighting will have most benefit where it is located in highly visible spaces and connected to city gateways or areas of night time activity

Lighting levels:

The following light levels should be used as a guide in determining the most suitable light levels for CoR open spaces. The levels are based on the level of activity, reducing the level of crime and improving aesthetics. A full list of lighting levels can be seen in Table 3. Lighting Application.

- Shared pathways outside the CBD commercial areas require a minimum Cat P3.
- Pathways through parks and reserves require a minimum of Cat P3
- Civic squares, CBD pedestrian precincts, transport terminals require Cat P7
- Inner urban shared zones, pathways and streets within the main commercial areas require a minimum of Cat P2.
- Side streets within the CBD areas require a minimum of Cat P3
- Streets within residential areas normally require Cat P4 or P5.

Sports fields lighting

AS2560 parts 1 and 2 Sports Lighting provide recommended light levels for various types of sporting activities. The following is a list of recommended horizontal light levels for common sports played within the CoR. See also Appendix B for extracts from AS2560 parts 2.

1. **Football/soccer all codes**

Training	–	50 lux
Amateur/club matches	–	100 lux
Semi-professional competition	-	200 lux
Professional competition	-	500 lux

2. **Outdoor netball and basketball**

Recreation/training	–	100 lux
Club competition	–	200 lux

3. **Outdoor tennis**

Recreation/residential	–	250 lux
Club competition/commercial (Lessons)	–	350 lux
National competition	–	1000 lux

4. **Outdoor hockey**

Ball training	–	250 lux
Club competition	–	500 lux

5. **Baseball and softball**

		Infield	Outfield
Softball			
Club competition/training	–	250 lux	150 lux
National competition	–	650 lux	450 lux
Baseball			
Club competition/training	–	250 lux	150 lux
AAA	–	750 lux	500 lux
National competition	–	1500 lux	1000 lux

Obtrusive lighting

Obtrusive light levels along boundaries of inhabited buildings should comply with AS 4282:2019.

The maximum recommended vertical illuminance along adjacent boundaries varies according to the use of the lighting installation, existing ambient light levels and the location of building lines.

The requirements of AS 4282 can dictate the method of lighting and lighting types.

Briefly the boundaries considered by AS 4282 are along a 10m setback from the property boundary or at the building boundary if less than 10m from the property boundary.

AS 4282 provides lighting parameters for two time periods i.e. pre-curfew dusk to a time set by CoR and curfew dusk to dawn.

Public lighting including pathways, parks and streets:

Curfew (dusk to dawn)

1. The maximum vertical illuminance along residential boundaries should be less than 1 – 2 lux.
2. For commercial areas the maximum vertical illuminance can rise to 5 lux subject to site conditions.

Pre-Curfew (dusk to curfew)

1. The maximum vertical illuminance along residential boundaries should be less than 10 lux. Note: Although AS 4282 allows a maximum of 10 lux it is strongly recommended to reduce the maximum vertical illuminance to 5 lux where possible.
2. Commercial boundaries should be less than 25 lux.

Sports lighting (non-curfew)

1. The maximum vertical illuminance should be less than 5 – 10 lux from dusk up to the end of the non-curfew period which is normally around 11pm.
2. For commercial areas the maximum vertical illuminance can rise to 25 lux subject to site conditions.

Note: All sports lighting installations must be switched off at the curfew time set by CoR.

Public lighting including pathways, parks and streets:

Network installations:

a. Pathways, reserves and streets are usually lit dusk to dawn by PE cell.

b. Dimming and motion control is currently not available.

CoR installations:

a. Streets, pathways and thoroughfares that are used 24 hours are usually lit dusk to dawn by PE cell.

b. Parks, reserves and areas intended for use during the evening are usually lit dusk to curfew.

c. Parks and reserves that are not to be used at night do not normally require lighting.

d. Switching and monitoring of luminaire status should be provided for all new installation via a Wide Area Network (WAN) and distributed access points.

e. Dimming should be considered for areas having varying levels of activity from dusk to dawn. The benefits of dimming are:
   - increased lamp life,
   - reduced maintenance and
   - lower obtrusive levels.

f. Motion detection can be provided to increase light levels for security and CCTV.

POLICY STATEMENT

Based on the benefits and impacts of lighting discussed above, Council commits to the following key principles to guide lighting decisions for open space in Ryde.

Key Principle	Expected Outcome
Better use of open space	• Allow and encourage use of open space and physical activity at night in appropriate locations and at appropriate times (refer table 3). • Provide fit for purpose lighting which meets the supported night time uses of the space and where alternatives for these uses are not available.
Improved safety	• Enhance safety and the perceptions of safety in those areas appropriate for night time use. • Conduct CPTED and/or park lighting audits to determine measures and design applications which will enhance the safety of a site for users • Do not create false perceptions of safety by lighting remote or poorly surveyed areas. • Encourage the use of streets where lighting and passive surveillance provide a safer alternative. • Only use paths through parks as lit links if it provides the only viable method of transport between streets or is the only link to public transport nodes.
Support sustainable transport modes	• Enable and encourage walking, and access to public transport nodes by only lighting these key routes through open spaces. • Limit lighting of cycling paths to regional bike routes
Enhance the look and feel of the city	• Limit decorative lighting to design features in strategic locations. • Use well-designed and vandal resistant fixtures which contribute to the quality of open space. • Match the style of fitting to the scale and feel of the space being lit.
Reduce greenhouse gas emissions	• Only provide lighting where required according to the key principles of this policy and to meet appropriate luminance for use (refer table 3). • Permit the removal of existing lighting where not required according to the key principles. • Rely on existing light, such as street lighting where adequate. • Prioritise energy efficient light fixtures such as LED fittings for all new lighting. • Investigate the viability of solar arrays and battery systems on park buildings

Protect environmentally sensitive areas	• Avoid provision of lighting in areas of high habitat value or environmental sensitivity, or where deemed necessary, provide 'fauna friendly lighting'.
Key Principle	**Expected Outcome**
Reduce light pollution	• Remove existing lighting where not required. • Use cut-off fixtures that reduce glare and light spill where possible. • Minimise uplighting. • Light only to the standard of luminance required by the use (refer table 3). • Where appropriate use Proximity Sensors and/or Timers
Improve Residential Amenity	• Lighting will be located, designed and constructed in accordance with the relevant Australian Standards.
Minimise life cycle costs	• Minimise on-going capital and maintenance costs and waste by considering whole of life costs for lighting.
Link to existing lighting systems	• Ensure lighting has the ability to link to CoR central management system. • Ensure solar lighting systems have the ability to link to solar arrays in adjacent park buildings

Table 2. Key Principles

What to Light
It is not possible or desirable to light large areas of parks, carparks and landscaped areas for general use. Lighting should be focussed and provided only where it serves the key principles in this policy. Most importantly, it should be fit for purpose; that is, provide a level of illuminance which is suited to the location, park usage and topography of the site and only provided at the times of activity.

Lighting Application by Open Space Use

Public lighting design for open space is covered by the Australian and New Zealand Standard (AS/NZS 1158.3.1:2005 [including all amendments]) and AS 2560.2.3-2007 (R2017) Sports lighting Specific applications - Lighting for football (all codes).

The timing for each open space use may be varied to deal with specific applications, uses and special events.

Open Space Use	Recommended Lighting	Luminaire type	Illuminance Level	Timing
Sports/playing fields	• Light towers shall be installed to provide lighting for training and match play. • The heights of the towers shall satisfy both lighting requirements and local requirements. • The floodlights on these grounds shall provide compliant lighting for both the playing area and obtrusive lighting requirements.	The luminaires shall be type C cut-off where possible. Projector type luminaires should be avoided. Consider the use of LED for all new installations.	50 lux for training 100 lux for amateur matches. 200 lux Semi-professional competition and/or as required. 300+lux as required	The lights shall be switched on and off either remotely via the eState Control system or manually using bypass switches. The eState Control system shall switch off the lights at curfew in both the remote and manual modes. <u>Curfew</u> Organised Sports and Sports Field Lighting: 7am - 11pm 7 days per week as per Council's assessment of Casual, Pre-Season, Seasonal and/or School Use

Open Space Use	Recommended Lighting	Light type	Luminance Level	Timing
Shared paths	• Light 'Regional Routes' only (as identified in the City of Ryde Bicycle Strategy) subject to funding availability. • Generally, do not light paths in environmentally sensitive areas or river corridors. • Where lighting is required, give preference to Fauna Friendly lighting options	Open Space pole top luminaire	Design to Cat P2 or Cat P3. Cat P2 should be used for inner urban areas.	Winter: Dusk to 11.30pm Summer: Dusk to 10.30pm Winter mornings: from 5am until light using PE cells to switch off. Consider dimming as ambient levels increase. Use motion sensors for pathways up to 5am where appropriate.
Pedestrian paths	• Light only in areas of high activity or key connections between destinations such as public transport routes. • Do not light remote locations. • Do not light small residential parks that do not have through pathways. • Do not light playgrounds or picnic areas etc. unless there is a specific requirement.	Open Space pole top luminaire	High activity design to Cat P1-P2 Medium activity design to Cat P2-P3 Low activity design to Cat P3-P4 Use smart controllers, dimming and motion sensing for curfew periods.	Winter: Dusk to 11.30pm Summer: Dusk to 10.30pm Winter mornings: from 5am until light using PE cells to switch off. Consider dimming as ambient levels increase. Use motion sensors for pathways up to 5am where appropriate.

Open Space Use	Recommended Lighting	Light type	Luminance Level	Timing
Passive recreational uses such as dog off-leash areas	• Light in areas where adjacent paths or buildings/pavilions provide opportunity for complementary lighting (either spill or additional). • Do not light remote locations. • Do not light small residential parks.	Pole top luminaire. Pole height and luminaire to be suitable for local site conditions.	P4	Night only: Dusk until 9pm
Outdoor gymnasium and fitness facilities	• Light only where these facilities are in close proximity to each other. • Do not light when these facilities are located throughout a park or along a walkway unless it is a regional walkway such as Ryde River Walk • Associated pathway access shall be lit as required.	Open Space pole top luminaire dedicated for the fitness facility	Minimum Cat P1-P2.	Night: Dusk until 9pm Morning: n/a Exception where equipment is along a regional cycle route such as Ryde RiverWalk
Natural Areas	• Where possible, do not light sites classified as “Natural Areas” under the Natural Areas Generic or a Specific Plan of Management • Do not light except where providing an essential linkage to a commuter network or regional cycle route using “fauna friendly lighting” • Meet policy criteria	Fauna friendly light fittings Low height Open Space pole top luminaire	P4	Night: Dusk until 9pm Morning: n/a Provide dimming and motion sensing.

Open Space Use	Recommended Lighting	Light type	Luminance Level	Timing
Basketball/ multiuse courts	• Same as fitness	n/a	n/a	In nominated locations only Sunrise - 8pm Monday to Saturday and sunrise - 7pm Sunday (subject to regular review by Council).
Tennis Courts	• Light in accordance with Australian Standards	The luminaires shall be cut-off type. Projector type luminaires should avoided. Consider the use of LED for all new installations.	Recreation/ residential– 250 lux Club competition/ commercial – 350 lux (Lessons)	Lighting will be governed by lessees in accordance with the individual centres lease arrangements
BBQ and picnic area	• Do not light; night time activity not encouraged		n/a	n/a
Skateparks	• Do not light when these facilities are located in local parks. • The exception will be Meadowbank Park	Open Space pole top luminaire	Light levels should be suitable for the intended use i.e. if the skate park is used at night the level should be 100-200 lux	Meadowbank Park only: Sunrise - 8pm Monday to Saturday and sunrise - 7pm Sunday (subject to regular review by Council).
Playgrounds	• Light selected locations in accordance with the Children's Play Implementation Plan.	Open Space pole top luminaire	50 lux	Winter: PE cell Dusk to 7pm in playgrounds identified in Children's Play Implementation Plan

Open Space Use	Recommended Lighting	Light type	Luminance Level	Timing
Park Carparks	• Only light carparks that support an ancillary function such as sportsground training and games • Do not light passive park carparks	Open Space pole top luminaire or custom pole top	Design to Cat P11b	Night: 30 minutes after curfew.
Plaza, seating spaces	• Light only gathering spaces in close proximity to night time activity centres or high use paths	Open Space pole top luminaire or custom pole top	Design to Cat P6-P8.	Summer: Dusk to 11.30pm Dim to 5am. Off at dawn Winter: Dusk to 10.30pm Dim to 5am Off at dawn
Public art, signage, and other features	• Light urban/landscape features only in high visibility locations or in high use plaza spaces, such as gateways or activity centres • Specific art installations, monuments, landscape features – according to policy	Feature lighting	Varies, decorative only, no min luminance to be met.	Winter: Dusk to 11.30pm Summer: Dusk to 10.30pm Art installations on a case by case basis
Building entrance eg. pavilions or public toilets	• Provide security lighting on the external perimeter of all buildings	Building mounted luminaire	Design to Cat P7-P8	Dusk to dawn controlled by a PE cell.
Special events	• Provide appropriate lights to facilitate safe entry and exit to special event functions in parks such as festivals, cinema in the park etc.	Lighting type selected to meet specific requirements of the event	Design to Cat P6 to P7	To be instituted as part of event planning procedure.

Table 3. Lighting Application

How to Light
The following considerations will assist Council officers in selecting light fixtures which meet the Policy.

Performance Consideration

Light and pole must meet the highest possible combination of the following factors.

- Be compatible with CoR central management system
- Low energy use
- Long lamp life – Minimum 30,000 hours
- Consider the use of solar powered lights in areas where grid connection is not cost effective
- No toxic waste for disposal
- Consider options for motion sensor lighting for paths in parks
- Have the capacity to have CCTV, Wi-Fi or other facilities fitted or added to the installation
- Ease of access for maintenance
- Vandal resistant
- Low upfront capital cost and/or lower whole of life costs
- Colour rendering must be CRI 80 or higher (of minimum 80 in colour scale).
- Lighting systems must be “Fauna Friendly” when installed near natural areas. (longer wavelength colours have been shown to have less effect on nocturnal fauna)

Design Considerations

Lights in parks should, where possible be connected to a distribution board on a park building. This would allow for future solar/battery expansion.

Pole top lights

- Be compatible with CoR central monitoring system
- Simple, contemporary colours and designs to be used without decorative detailing to minimise intrusion in the landscape. Light and pole colour to match
- Luminaire in all areas to be 4000 to 5000 Kelvin except in areas in that adjoin Natural Areas and that require lighting. In these areas use only Fauna Friendly lighting (longer wavelength colours have been shown to have less effect on nocturnal fauna)

Bollard Lighting

- Avoid use of bollard lights due to vulnerability of vandalism and their inability to deliver appropriate vertical illumination– Sequential replacement of bollard lights with pole top lights will be undertaken within available budgets

Sports Lighting

- Be compatible with CoR central monitoring system
- Access switching technology by sporting and/or other user groups to be in accordance with CoR Park Hire Policy
- Siting of poles carried out to address ease of access for maintenance and servicing of luminaires
- Luminaries to be cut-off low spill design that direct light down
- Lighting to be provided at the required lux level as per current standards (AS2560) to suit the chosen sport at the defined location

Carpark lighting

- Be compatible with CoR central monitoring system
- Siting of poles to maximise safety and to facilitate vehicle circulation in the carpark

Building Entry Lights

- Lights to be attached to the building where possible, not on separate poles, to de-clutter the landscape
- Paths of travel associated with the building are to be lit from the building lights.

Feature Lights

- All feature lights to be compatible with CoR central monitoring system if possible.
- Minimise use of in-ground uplights where possible due to maintenance requirements and light spill
- In ground lights only to be used in hard stand areas. Lights within landscaped areas must be proud of the ground within a vandal resistant cage.
- For custom light features, prioritise robust and low maintenance design

Poles in Parks

- Smart poles in parks adjacent to town centres. Poles to be aluminium and anodised.
- Simple poles elsewhere. Preference is for anodised aluminium, however where not possible, powder coated steel or equivalent is acceptable. Durable and suitable for their context – waterfront / bushland
- Poles that have the versatility to also be fitted with CCTV, Wi-Fi or other operational requirements (provision of additional cabling in the pole, conduits in the ground and/or connection to other poles will be required at installation phase)
- Preferred pole height of between 4m - 6m which is high enough to achieve spacing of poles but still maintain a pedestrian scale in open space.
- Pole height to be consistent throughout the park or route
- Poles to allow for side-entry luminaire, with outreach arm if required
- Siting of poles to be carried out to be least intrusive in the landscape and to adjoining property boundaries.
- Preferred for longevity and structural assessment that the rag bolt assembly sits proud of the surrounding surface on a concrete plinth,
- Preferred colour of poles is to be black to recede into the landscape

Sensors/CCTV/Wi-Fi/Ancillary Add Ons

- Where appropriate make use of motion sensor and centrally controlled timer technology
- To have minimal intrusion into the landscape
- All supporting hardware to be either within the pole or adjacent to pole in a vandal-proof pit
- Ancillary items to be neat, and not extend out from the pole
- All to be colour matched to the pole/light colour including outreach arms

Implementation

The Parks Department will be responsible for the implementation of the Policy through the following actions, in coordination with other relevant sections of Council.

The flow chart below (table 4), will be used to assess the suitability or otherwise of the installation of lighting in the City of Ryde open space areas.

This page is left intentionally blank

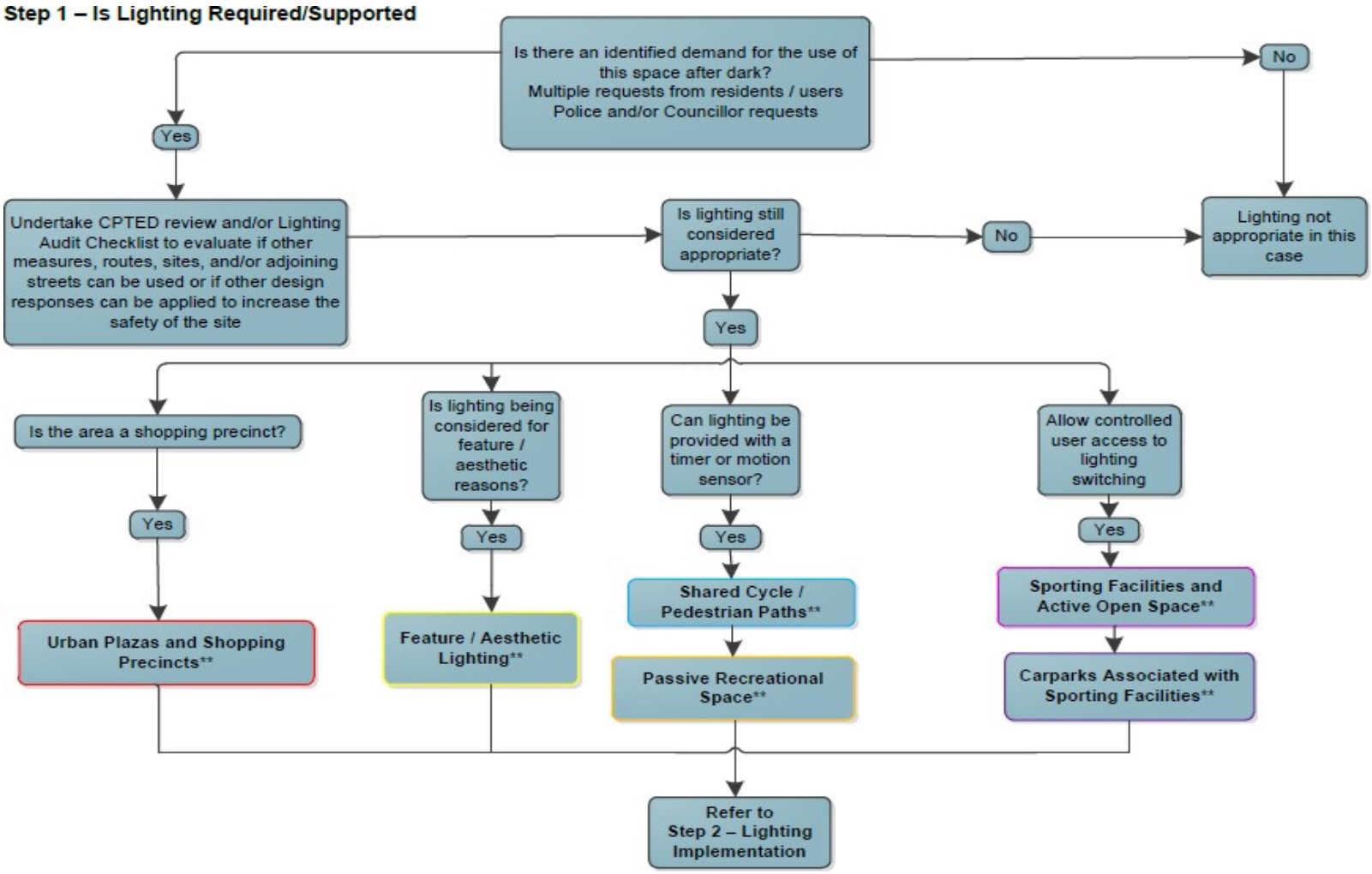


Table 4. Lighting Assessment

Step 2 – Lighting Implementation

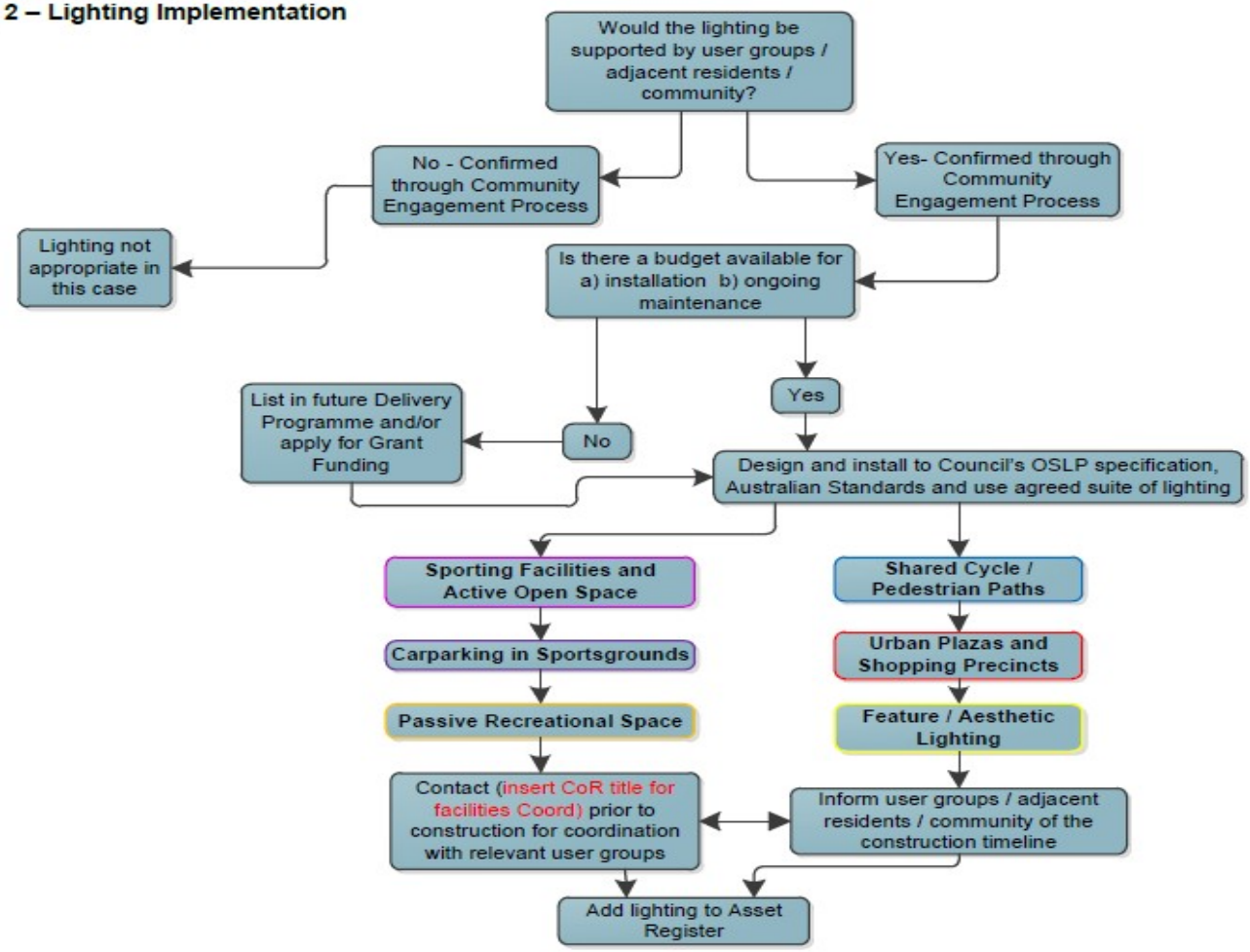


Table 5. Lighting Implementation

Table 6 – Lighting Audit Form

Passive Park Lighting Audit Checklist		Date Audit Conducted	
Name of Park			
Reserve Number / Address			

Lighting Type Requested	TICK
Shared / Pedestrian Pathway	
Feature Aesthetic Lighting	
Passive Recreational Lighting	
Carpark Lighting	

Criteria	**Yes**	**No**	**Comment**
Does the activity/function of the open space support the installation of lighting?			
Is the lighting being considered to address safety concerns?			
In the case of Shared / Pedestrian Pathway lighting, does the pathway link to a transport link/hub such as a bus stop, main road, rail station or is it a Regional Cycleway?			
Does the proposed lighting enable and encourage walking, cycling and public transport by lighting key routes through open spaces?			
Is there any other lit alternative route such as a roadway which could be used instead of the park to access the transport hub?			
Is the lighting supported by user groups/adjoining residents/community?			
Would the proposed lighting cause light spill problems to adjoining residents?			
Would the proposed lighting be detrimental to native fauna or bushland?			

Other Information	
Lighting level required	
Light type being considered	
Time/Motion Sensor lighting required	

The flow chart shown in Table 4 assesses lighting requests based on the following:

Providing Applicable Lighting Where Required

- Assess all lighting requests as per the Key Principles and in accordance with the steps outlined in Table 2.
- Permit the removal of lights in parks that do not meet the policy criteria and/or where they are not required.
- Identify a program of new lighting required to meet the Policy and progressively provide new lights through the applicable delivery programme and using the Standard Unit Rates.
- New lighting would be subject to funding made available through the works bid process and at the CoR standard unit rates.

Retrofit Existing Council Lights

- Progressively retrofit Council-owned lights and replace with energy efficient fixtures through the applicable Council funding programme and at the CoR standard unit rates.
- Where existing lights have reached the end of their life, replace with luminaires which meet the performance and design considerations in this policy.

Converting Network Lights

- Where Network-owned lights in open space reach the end of their useful life and require replacement, liaise with Network to remove or take over under Council ownership and replace lights with luminaires which meet the performance and design considerations in this policy.
- Account for the increased ongoing maintenance costs associated with taking over ownership of these lights, acknowledging the benefits associated with ownership (the ability to use non-standard lights for the CoR “Suite of Lighting Poles and Fittings” which better meet the performance and design expectations for open space).

Planning for New Lighting

Council officers considering new lighting in open spaces will follow the steps below:

1. Determine the purpose and aim of lighting and assess against the key principles and flow chart (refer Tables 4 & 5)
2. Assess lighting requests are appropriate and meet policy requirements (refer and complete Table 6)
3. Assess the type, level and hours of usage are fit for purpose for the location and activity (refer Table 3)
4. Identify the level of luminance to be met (refer Table 3)
5. Assess current light levels (light level reading can be done)
6. For large scale lighting projects such as sports field lighting, engage the services of a professional lighting designer to undertake a photometric analysis to ensure the proposal meets the relevant AS/NZS 1158.4:2015 and or AS 2560.2.3-2007 (R2017) Standard
7. When considering lighting areas adjoining natural areas, liaise with Natural Areas Team to determine feasibility, lighting type and location.
8. Identify fixture options according to specific site, performance and design considerations
9. Design new lighting to meet requirements
10. Convey data on new light assets to Asset Planning and Support Section – applicable CoR reference

Ongoing Monitoring

- Monitor energy use and maintenance costs of open space lights.
- Maintain updated inventory of all lights.

References and Legislation

Australian Standards:

There are basically three sets of Australian Standards used in the selection and design of outdoor lighting installations:

1. AS/NZS 1158.3.1:2005. Lighting for roads and public spaces Part 3.1: Pedestrian area (Category P) lighting—Performance and design requirements. This standard provides recommended lighting levels for public spaces based on local conditions. Extracts from AS/NZS 1158.3.1:2005 are shown in Appendix A

2. AS2560 parts 1 and 2 Sports lighting. This standard is made up of several parts that provide recommended lighting parameters for specific sports such as soccer, tennis, netball etc. Extracts from AS2560 are shown in Appendix B

3. AS 4282: 2019 Control of the obtrusive effects of outdoor lighting. This standard provides the maximum recommended obtrusive light levels that affect the surrounding areas. Compliance with this standard can dictate the type of lighting installations.

RELATED DOCUMENTS

- City of Ryde Integrated Open Space Plan 2012
- City of Ryde Children's Play Implementation Plan
- City of Ryde Sport and Recreation Strategy 2016-2026
- City of Ryde Biodiversity Plan
- City of Ryde Bicycle Strategy
- Ryde River Walk Masterplan - Pedestrian and Cycleway Lighting Issues
- City of Ryde Service Level Agreements
- City of Ryde Asset Management Plan

This policy was adopted by Council on 26 November, 2019 and will be in effect from 26 March, 2020. All previous iterations of this policy are superseded at this time.

4. Attachments

Appendix A: AS/NZS 1158.3.1:2005

Appendix B: AS 2560.2.3-2007 Sports lighting

APPENDIX A

TABLE 2.2

LIGHTING CATEGORIES FOR PATHWAYS (INCLUDING CYCLEWAYS)

1	2	3	4	5	6
Type of pathway		**Selection criteria[a,b]**			**Applicable lighting subcategory**
General description	**Basic operating characteristics**	**Pedestrian/ cycle activity**	**Risk of crime[f]**	**Need to enhance prestige**	
Pedestrian or cycle orientated pathway, e.g. footpaths, including those along local roads[d] and arterial roads[e], walkways, lanes, park paths, cycleways	Pedestrian/cycle traffic only	N/A	High	N/A	P1[c]
		High	Medium	High	P2[c]
		Medium	Low	Medium	P3
		Low	Low	N/A	P4

a) The selection criteria of Columns 3 to 5 should be separately evaluated. The highest level of any of the selection criteria that is deemed appropriate for the pathway will determine the applicable lighting subcategory.

b) Refer to Appendix C for guidance on choosing the applicable level of each selection criteria for the environment and purpose of a lighting scheme.

c) Where there are vertical surfaces of high reflectance (e.g. light coloured walls bordering on an alleyway) alongside the pathway, the next lower lighting subcategory may be selected.

d) Where the footpath is along a local road and subcategory P1 or P2 is selected, the light technical parameters for that subcategory only apply to the formed footpath. Where subcategory P3 or P4 is selected, the light technical parameters apply to the whole road reserve width, including the footpath.

e) Footpaths associated with arterial roads are deemed not to require separate lighting provided that—

(i) the road is lit to at least the applicable level of Category V lighting complying with AS/NZS 1158.1.1; and

(ii) the footpath is unshaded, e.g. there are no substantially continuous building awnings, and the footpath is contiguous with the roadway.

If the footpath is shaded, or is separated from the roadway by an extensive nature strip or a service road, it shall be provided with lighting to at least subcategory P4.

f) The risk levels 'High', 'Medium' and 'Low' correspond to the classifications of the same names in HB 436.

TABLE 2.3

LIGHTING CATEGORIES FOR PUBLIC ACTIVITY AREAS (EXCLUDING CAR PARKS)

1	2	3	4	5	6
Type of area or activity		**Selection criteria[a,b)]**			**Applicable lighting subcategory**
General description	**Basic operating characteristics**	**Night time vehicle movements**	**Risk of crime[c)]**	**Need to enhance prestige**	
Areas primarily for pedestrian use, e.g. city, town, suburban centres, including outdoor shopping precincts, malls, open arcades, town squares, civic centres	Generally pedestrian movement only	N/A	High	High	P6
		Medium	Medium	Medium	P7
		Low	Low	N/A	P8
Transport terminals and interchanges, service areas	Mixed pedestrian and vehicle movement	High	High	High	P6
		Medium	Medium	Medium	P7
		Low	Low	N/A	P8

a) The selection criteria of Columns 3 to 5 should be separately evaluated. The highest level of any of the selection criteria that is deemed appropriate for the area type will determine the applicable lighting subcategory.

b) Refer to Appendix C for guidance on choosing the applicable level of each selection criteria for the environment and purpose of a lighting scheme.

c) The risk levels 'High', 'Medium' and 'Low' correspond to the classifications of the same names in HB 436.

NOTE: See Table 2.5 for lighting categories applicable to outdoor car parks, including roof-top car parks.

TABLE 2.4

LIGHTING CATEGORIES FOR CONNECTING ELEMENTS

Type of area	Applicable lighting subcategory
Steps and stairways, ramps, footbridges, pedestrian ways	P9
Subways, including associated ramps or stairways	P10

NOTE: Subways are listed as a separate subcategory because of a high risk of crime.

TABLE 2.5

LIGHTING CATEGORIES FOR OUTDOOR CAR PARKS (INCLUDING ROOF-TOP CAR PARKS)

1	2	3	4	5
	Selection criteria[a]			
Type of area	Night time vehicle or pedestrian movements	Night time occupancy rates (NTOR)	Risk of crime[b]	Applicable lighting subcategory[c]
Parking spaces, aisles and circulation roadways	High	>75%	High	P11a
	Medium	≥25%, ≤75%	Medium	P11b
	Low	<25%	Low	P11c
Designated parking spaces specifically intended for people with disabilities	N/A	N/A	N/A	P12

[a] The selection criteria of Columns 2 to 4 should be separately evaluated. The highest level of any of the selection criteria that is deemed appropriate for the area type will determine the applicable lighting subcategory.

[b] The risk levels 'High', 'Medium' and 'Low' correspond to the classifications of the same names in HB 436.

[c] Providing a lighting scheme that meets the requirements of more than one subcategory by the use of switching is permitted.

2.5 LIGHT TECHNICAL PARAMETERS

2.5.1 General

The design objectives outlined in Clause 2.3 are formally specified in terms of various light technical parameters. These parameters are divided as follows:

(a) Parameters that relate to the attainment of the required level of lighting performance.

(b) Parameters that limit the adverse effects of the lighting on—

(i) users of the lit space, e.g. pedestrians, vehicle drivers (i.e. by the control of glare);

(ii) night sky viewing conditions, (i.e. by reducing consequent sky glow); and

(iii) occupants of properties that abut the lit area (i.e. by the control of spill light).

NOTE: These are often referred to as 'environmental' parameters.

Details of the applicable parameters are set out in Clauses 2.5.2 and 2.5.3 (the mathematical definitions of these LTPs are located in AS/NZS 1158.2).

The required values for these parameters are specified in Tables 2.6 to 2.9 and are the minimum permissible, except for the parameter U_{E2} for which the values given are the maximum permissible. These requirements are to be met throughout each maintenance cycle over the life of the installation.

The design procedures necessary to determine compliance with the required values of the light technical parameters shall be as specified in Section 3.

TABLE 2.6

VALUES OF LIGHT TECHNICAL PARAMETERS AND PERMISSIBLE LUMINAIRE TYPES FOR ROADS IN LOCAL AREAS AND FOR PATHWAYS

1	2	3	4	5	6
Lighting subcategory	Light technical parameters				Permissible luminaire type (see Table 2.10)
	Average horizontal illuminance[a,b] ($\overline{E}_h$) lux	Point horizontal illuminance[a,b] (E_{Ph}) lux	Illuminance (horizontal) uniformity[c] Cat. P (U_{E2})	Point vertical illuminance[a,b] (E_{Pv}) lux	
P1	7	2	10	2	Type 4 where part of a road reserve or Types 2, 3, 4 or 6 elsewhere
P2	3.5	0.7	10	0.7	
P3[e]	1.75	0.3	10	0.3[d]	
P4[e]	0.85	0.14	10	N/A	
P5[e]	0.5	0.07	10	N/A	

a) These values are maintained.

b) Compliance is achieved by being greater than or equal to the applicable table value.

c) Compliance is achieved by being less than or equal to the applicable table value.

d) The vertical illuminance requirement only applies when subcategory P3 is selected for application to pathways, i.e. it does not apply for local roads.

e) In New Zealand, when the luminaires are to be supported on existing reticulation poles the subcategories P3R and P4R may be designated and the following reduced levels applied:

Subcategory	$\overline{E}_h$	E_{Ph}
P3R	1.25	0.15
P4R	0.7	0.07

Subcategory P5 lighting shall not be chosen for this situation.

NOTES:

1 Validation of the values in Columns 2 to 5 is by calculation, not field measurement. This is particularly relevant to small values in Columns 2, 3 and 5, which will typically be difficult to validate by field measurements.

2 See Section 3 for the design methods and requirements for use in assessing compliance with the specified light technical parameters.

TABLE 2.7

VALUES OF LIGHT TECHNICAL PARAMETERS AND PERMISSIBLE LUMINAIRE TYPES FOR PUBLIC ACTIVITY AREAS (EXCLUDING CAR PARKS)

1	2	3	4	5	6
Lighting subcategory	Light technical parameters				Permissible luminaire type (see Table 2.10)
	Average horizontal illuminance [a,b] ($\overline{E}_h$) lux	Point horizontal illuminance [a,b] (E_{Ph}) lux	Illuminance (horizontal) uniformity [c] Cat. P (U_{E2})	Point vertical illuminance [a,b] (E_{Pv}) lux	
P6	21	7	10	7	Types 2, 3, 4, 5 or 6
P7	14	4	10	4	
P8	7	2	10	2	

a) These values are maintained.

b) Compliance is achieved by being greater than or equal to the applicable table value.

c) Compliance is achieved by being less than or equal to the applicable value.

NOTE: See Section 3 for the design methods and requirements for use in assessing compliance with the specified light technical parameters.

TABLE 2.8

VALUES OF LIGHT TECHNICAL PARAMETERS AND PERMISSIBLE LUMINAIRE TYPES FOR CONNECTING ELEMENTS

1	2	3	4	5	6
Lighting subcategory	Light technical parameters				Permissible luminaire type (see Table 2.10)
	Average horizontal illuminance [a,b,d] ($\overline{E}_h$) lux	Point horizontal illuminance [a,b] (E_{Ph}) lux	Illuminance (horizontal) uniformity [c] Cat. P (U_{E2})	Point vertical illuminance [a,b] (E_{Pv}) lux	
P9	Same as for highest lighting subcategory applying to areas that abut the connecting element but, where forming part of a road or pathway, to be not less than subcategory P8 in Table 2.3.				
P10	35	17.5	10	17.5	Types 3, 4, 5 or 6

a) These values are maintained.

b) Compliance is achieved by being greater than or equal to the applicable table value.

c) Compliance is achieved by being less than or equal to the applicable value.

d) For steps, the requirements assume that the noses of the treads are clearly delineated by a contrasting stripe or other equally effective means. If this does not apply, the illuminance should be at least twice the value specified.

NOTES:

1 It is recommended that the walls of subways be finished in a light colour to facilitate interreflection of light within the space. Such interreflected light may be taken into account in the achievement of the specified light technical parameters.

2 See Section 3 for the design methods and requirements for use in assessing compliance with the specified light technical parameters.

TABLE 2.9

VALUES OF LIGHT TECHNICAL PARAMETERS AND PERMISSIBLE LUMINAIRE TYPES FOR OUTDOOR CAR PARKS (INCLUDING ROOF-TOP CAR PARKS)

1	2	3	4	5	6
Lighting subcategory	Light technical parameters[a]				Permissible luminaire type (see Table 2.5)
	Average horizontal illuminance[a,b] ($\overline{E}_h$) lux	Point horizontal illuminance[a,b] (E_{Ph}) lux	Illuminance (horizontal) uniformity[c] Cat. P (U_{E2})	Point vertical illuminance[a,b] (E_{Pv}) lux	
P11a	14	3	10	3	Types 3, 4, 5 or 6
P11b	7	1.5	10	1.5	
P11c	3.5	0.7	10	—	
P12	—	≥14 and ≥ $\overline{E}_h$[d]	—	—	

a) These values are maintained.

b) Compliance is achieved by being greater than or equal to the applicable table value.

c) Compliance is achieved by being less than or equal to the applicable table value.

d) E_{Ph} shall be determined for each P12 area in the car park and, in each case, it shall be greater than the value stated and greater than the average for the overall car park.

NOTES:

1 See Section 3 for the design methods and requirements for use in assessing compliance with the specified light technical parameters.

Compliance with the light technical parameters in Table 2.9 is based on an open, unoccupied car park, i.e. free of vehicles. However, it is important that the design of the lighting system (e.g. numbers, locations, heights and outputs of the luminaires) be such that adequate light is provided between parked vehicles.

2 Where raised obstructions are present, e.g. to limit vehicle movement in parking areas, these obstructions present potential hazards for pedestrians. Such obstructions should therefore be of such a material, or so finished, as to provide a high visual contrast with the paved surface.

3 See Table 2.8 for the requirements that apply to connecting elements, including steps, ramps and pedestrian crossing points, within car parks.

4 The luminaires should be positioned to highlight physical obstructions or other similar hazards to pedestrian and vehicular traffic.

5 Lighting requirements for indoor car parks are set out in AS 1680.2.1.

APPENDIX B

SPORTS FIELDS Standards Requirements:

Football all codes:

AS 2560.2.3-2007 Sports lighting - Specific applications - Lighting for football - all codes.

Level of play	Maintained average horizontal illuminance[a),b)] ($\bar{E}_{mh}$) lux	Minimum horizontal uniformities[c)]		Maximum glare rating (GR_{max})	Minimum colour rendering index ($R_{a\,min}$)	Maximum uniformity gradient
		(U_1)	(U_2)			
Recreational level						
Touch and tag	50	0.3	N/A	N/A	65	N/A
Amateur level						
Ball and physical training[e)]	50	0.3	N/A	N/A	65	N/A
Club competition and match practice	100	0.5	0.3	50	65	N/A
Semi-professional level						
Ball and physical training[e)]	50	0.3	N/A	N/A	65	N/A
Match practice	100	0.5	0.3	50	65	N/A
Semi-professional competition	200	0.6	0.4	50	65[d)]	N/A
Professional level						
Ball and physical training[e)]	100	0.5	0.3	50	65	N/A
Match practice	200	0.6	0.4	50	65	N/A
Professional competition	500	0.7	0.5	50	65[d)]	20% per 5 m

Netball:

AS 2560.2.4-1986 Guide to sports lighting - Specific recommendations - Lighting for outdoor netball and basket ball

TABLE 1
MINIMUM LIGHTING CRITERIA FOR OUTDOOR NETBALL AND BASKETBALL

Level of play (Note 1)	Minimum service illuminance (Notes 1, 2 and 3) lx	Minimum uniformity ratio (Note 1 and 2)	Minimum CIE general colour rendering index R_a (Note 1 and 4)	Recommended types of floodlight (Note 5)	
				Type	Beam classification
Competition with large spectator galleries	200	0.66	65	B or C	H6-7 V5-6
Recreation or training and competition with few spectators	100	0.5	65	B or C	H6-7 V5-6

Tennis:

AS 2560.2.1 - 2003_Sports lighting – Specific applications – Lighting for outdoor tennis

TABLE 1
LIGHTING CRITERIA

Level of play	Maintained horizontal illuminance* $E_{h\ maint}$		Minimum horizontal uniformities†				Maximum Glare rating GR_{max}	Minimum Colour Rendering Index $R_{a\ min}$
	PPA	TPA	PPA		TPA			
			U_{1min}	U_{2min}	U_{1min}	U_{2min}		
Recreational and residential ‡	250	150	0.6	0.3	0.2	0.1	50	20
Club competition and commercial	350	250	0.6	0.4	0.3	0.2	50	65
International and national	1000	800	0.7	0.5	0.5	0.3	50	65

Hockey

AS 2560.2.7-1994 Guide to sports lighting - Specific recommendations - Outdoor hockey

TABLE 1
RECOMMENDED LIGHTING CRITERIA FOR OUTDOOR HOCKEY

1	2	3	4	5	6	7
Level of play (Note 1)	Type of lighting system (Figures 2 & 3)	Maintenance illuminance (Notes 1, 2 & 3) lx	Minimum uniformity ratio (Notes 1, & 2)	Minimum CIE lamp colour rendering group (Note 4)	Recommended types of floodlight (Note 5)	
					Type	Beam classification
Major grade club, national and international competition	Side (4 + 4 poles)	500	0.7	2	B or C	H5-6 V4-5
	Corner (4 poles)				A or C	2-4(A), H5-6 V2-4
Ball training, junior and minor grade competition	Side (4 + 4 poles)	250	0.6	2	B or C	H5-6 V4-5
	Corner (4 poles)				A or C	2-4(A), H5-6 V2-4
Physical training only	Side	30	0.25	2	B or C	H6-7 V4-5

Baseball

AS 2560.2.6-1994 Guide to sports lighting - - Specific recommendations - Baseball and softball

TABLE 1
RECOMMENDED ILLUMINANCES FOR BASEBALL AND SOFTBALL

1	2	3	4	5	6	7	8
Level of play	Maintenance illuminance, lx				Minimum uniformity ratio (E_{min}/E_{av})		
	Horizontal		Vertical		Horizontal		Vertical infield
	Infield	Outfield	Infield	Outfield	Infield	Outfield	
Baseball:							
International and national	1 500	1 000	1 000	500	0.7	0.5	0.7
AAA	750	500	550	250	0.7	0.5	0.7
Club competition or bat/ball training	250	150	200	75	0.6	0.5	—
Softball:							
International and national	650	450	450	200	0.7	0.5	0.7
Local club competition or bat/ball training	250	150	200	75	0.6	0.5	—