

DRAFT WAVERLEY CREATIVE LIGHTING STRATEGY 2017 - 2027

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prepared by

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Waverley Council

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IT IS MORE AND MORE IMPORTANT TO MAKE THE CITIES INVITING, SO WE
CAN MEET OUR FELLOW CITIZENS FACE TO FACE AND EXPERIENCE DIRECTLY
THROUGH OUR SENSES.

- JAN SEHL

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Glossary

Accent	Where light is used to emphasise or highlight objects.
Colour rendering	The effect of a light source on the colour appearance of an object.
Correlated colour temperature	The absolute temperature of a black body radiator whose chromaticity most nearly resembles that of the light source being considered. Unit: Kelvin.
Efficacy	A factor which quantifies the effectiveness of a luminaire in converting electrical power to light.
Glare	The discomfort or impairment of vision experienced when parts of the field of view are excessively bright.
Illuminance	The luminous flux arriving at a surface divided by the area of the illuminated surface. Unit: lux
Lamp	Complete light source unit.
Luminaire	Complete lighting units consisting of lamp, control gear (if required), reflector and housing.
Lumen	Unit of luminous flux used to describe a quantity of light emitted by a source or received by a surface. Unit: lumens
Luminance	The physical quantity corresponding to the brightness of a surface in a specified direction. Unit: cd/m2
Watt	Unit of electrical power

EXECUTIVE SUMMARY

1. Executive Summary

1.1 Strategy Initiative

The Waverley Creative Lighting Strategy has been developed in response to the Council vision to create “a memorable application of light that integrates social gathering, public health and safety, sustainability and economic vitality into the urban environment”.

1.2 Purpose

The Strategy establishes an overall vision for the night-time journey and sets technical and design parameters for the creation of a holistic, sustainable and legible night-time environment that is vibrant and engaging after dark.

The strategy promotes a connected, inviting and memorable environment that supports active movement and use of Waverley’s public spaces at night time. It celebrates sense of place and the unique identity of each area within the overall Waverley LGA whilst maintaining a consistent visual language.

As well as the functional approach to lighting, the Strategy recognises light as a significant contributor to the precinct’s quality, as a means of artistic expression and as a contributor to character of each area

The strategy provides a framework for the implementation of lighting initiatives over a ten year period setting priorities and assisting in the transition of asset management to the Council and in the preparation of funding.

1.3 Structure and Approach

A Three Tier Approach will be applied to the lighting strategy to provide a level of consistency and visual connection as well as being used to define a legible night scape. The three tiers consist of:

1. Base lighting for orientation and safe movement
2. Architectural, urban and landscape lighting components to enhance the pedestrian experience and support pedestrian amenity
3. Lighting interventions which are site specific installations.

INTRODUCTION

2. Introduction

2.1 Strategy Scope

The Strategy encompasses the design direction for street lighting, public space and public area lighting for the Waverley Council public domain. It also provides direction for private developments that have an implication on the public domain in order to achieve a consistent visual outcome.

Detailed design direction has been applied to the three key areas of Bondi Junction, Bondi Beach and the Coastal Walk from Bondi Beach to Waverley Cemetery.

The Strategy Scope may be expanded at a future time to provide detailed design direction for additional precincts. In this instance the steps outlined in 2.3 Methodology are to be followed.

2.2 Lighting Aspirations

Bondi Junction, Bondi Beach and the Coastal Walk each have unique opportunities and challenges with diverse characters and landscapes. The lighting strategies of the Creative Lighting Strategy aim to provide a holistic approach addressing both the functional and experiential aspirations of the project.

Functional

Public lighting is an essential community service that aims to provide pedestrians, cyclists and vehicles with a safe and comfortable visual environment at night. Lighting is also a contributing factor in reducing people’s perception and fear of crime by addressing issues of facial recall, contrast ratio, glare, colour recognition and materiality, night time population and overall atmosphere.

Experiential

Lighting plays a pivotal role in the pedestrian journey at night in promoting distinct, unique, engaging and joyful experiences that encourage increased night-time patronage. Light in public places should create a memorable statement that celebrates the identity and sense of place in a way that provides recognisable connections across the LGA.

2.3 Methodology

The Creative Lighting Strategy for Bondi Junction, Bondi Beach and the Coastal Walk has been informed by the following process:



1. Precedent Study and Site Investigation

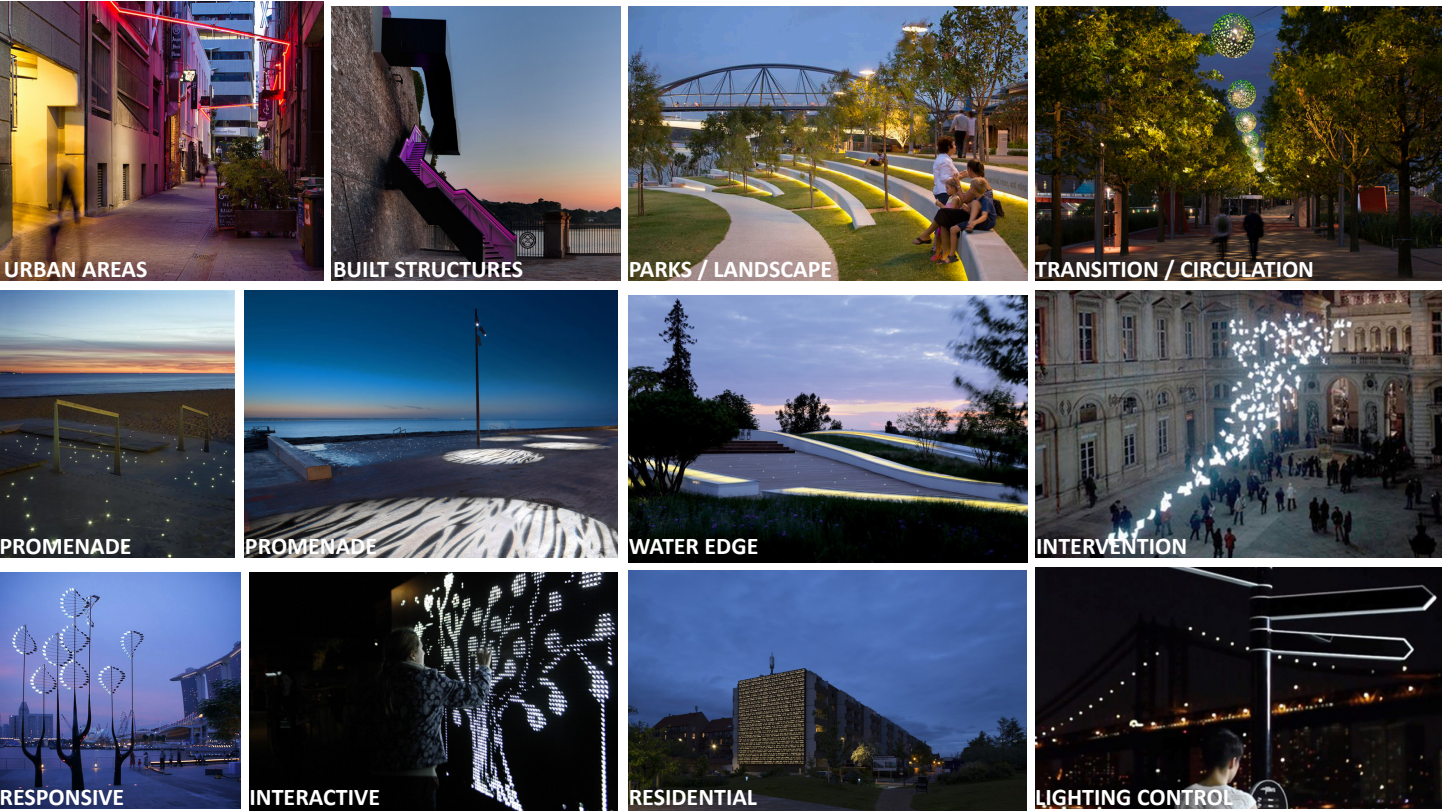
A precedent and benchmarking study was carried out to inform and inspire the detailed lighting design direction. The benchmark projects and precedent studies are used as a guide of best practice, to assess the application of new technologies, to ensure relevancy, and achieve the appropriate balance between various, often competing requirements.

A site investigation was undertaken to assess:

- Existing night time environment and atmosphere;
- Opportunities for improvement, intervention and activation;
- Existing illuminance levels;
- Existing user behaviour and subsequent key connections, nodes and destinations.

The following space types were assessed:

The Strategy addresses the identified outcomes of this study.



2. Place Strategy

A Place Strategy was developed to provide a framework and direction for the Creative Lighting Strategy by establishing a clear vision, night-time journey and strategic approach for each key area. The following framework was used to explore the appropriate lighting strategies for key locations within each of the site areas.

1. Identification of the types of ‘places’ within each site through spatial explorations including through spaces and dwell spaces.
2. Identification of key user groups who utilise those spaces and their potential needs.
3. Identification of how each space should be utilised after hours and for what duration. Consideration may be given to seasonal variations such as winter vs summer and weekend versus weekday use.

Key character drivers, objectives and strategies were developed for each area in the context of the overall place vision.

The following key objectives were identified for Bondi Junction, Bondi Beach and the Bondi to Clovelly Walk:

- Increase activity and enhance character at street level to enliven the street;
- Assist in increasing the sense of safety for pedestrians and users at night and encouraging users to stay longer;
- Provide strategic direction for under awning lighting to improve the quality of light at street level;
- Supporting key connections between transit modes;
- Artistic and cultural expression including support of temporary events;
- Lighting as a catalyst for after hours activation;
- Treating unattractive or inactive areas creatively;
- Interface with residential areas;
- Activation of key mall spaces including Oxford Street Mall and Waverley Mall;
- Enhance access and visibility into parks at night time to enable use after hours and increased passive surveillance;
- Creating unique experiences in key locations;
- Showcasing the character of each area responding to cultural stories and community values;
- Increasing visitation to the Coastal Walk during winter months when there are less daylight values available.

This investigation provided a framework and positioning strategy to inform the lighting hierarchy and strategic approach to the relevant lighting applications.

3. Ideation Workshop

An ideation workshop was carried out with key Council stakeholders to identify the role of the Creative Lighting Strategy within the framework of the Council policies, documents, and aspirations for the LGA. The outcome of the workshop established the functional and experiential aspirations of the Creative Lighting Strategy and provided direction for the key concepts and key lighting directions within this document.

4. Creative Lighting Strategy

The Creative Lighting Strategy was developed in conjunction with Waverley Council in consideration of the above findings.

5. Future Strategy Updates

The Creative Lighting Strategy has been structured in a way to allow adaptation of the design implementation to respond to changes in technology, site conditions and changing social context to ensure the document remains relevant through provision of clear aspirations and objectives.

In the event that detailed design direction for another key area in the LGA is to be incorporated as a new chapter in the document it is important that an assessment is made in keeping with the methodology carried out for areas already included in the document:

1. Carry out precedent study and site investigation;
2. Carry out additional place strategy for this area and ensure this aligns with the aspirations and objectives of the existing study;
3. Carry out an ideation workshop with relevant stakeholders;
4. Review this against over-arching aspirations, principles and vision already set out in this document;
5. Devise a new chapter for the Strategy based on the above process.

2.4 User

The Strategy is intended to be used by Waverley Council, developers, designers, planners, business owners involved in lighting works within the Waverley LGA.

2.5 Council Document Framework

The following Waverley Council Documents are applicable to design of the public domain.

Council-wide Strategies

- Waverley Local Environment Plan
- Waverley Development Control Plan
- Community Strategic Plan
- Economic Development Strategy
- Events Policy
- Public Art Policy and Strategy
- People Places Movement Study (Draft)
- Commercial Activity in Public Spaces (Draft)

Precinct Design Guides

- Waverley Creative Lighting Strategy (Draft)
- Bondi Junction Complete Streets
- Campbell Parade Streetscape Upgrade
- West Oxford St Precinct Plan
- Bondi Junction Evening, Culture and Entertainment Strategy (Draft)
- Plans of Management

Delivery

- PDTM – materials and design details
- Village Centre Plans (detailed design, consultation and construction)
- Street/ park upgrade plans
- Public art commissions
- Event Plans
- Development Applications
- S94 contributions
- VPAs
- Operational Plan (Capital Works schedule)
- Grant funding

2.6 Implementation

Each lighting project undertaken in the Waverley LGA should follow the guidelines set out below:

- 1 Read the Creative Lighting Strategy and identify the relevant lighting tier and lighting approach that applies to the area. Review chapters 6, 7 and 8 for specific vision and design direction as applicable;
- 2 Study benchmark projects and integrate best practice and new technologies into project;
- 3 Refer to the Waverley Public Domain Technical Manual for the current approved luminaires types for Tier 1 and Tier 2 elements that are applicable and the associated installation details. If the project relates to a Tier 3 ‘Lighting Intervention’ specialist equipment could be required to meet the design and technical requirements of the installation. In this instance proposed fittings should be included in concept documentation for the review and approval of the Council;
- 4 Resolve any initial design issues with the Council’s Urban Design Team and ensure compliance with stakeholder requirements including Ausgrid, property owners and users and relevant Australian Standards;
- 5 Create concept documentation with visualisation for council approval in line with this document and all other relevant Council documents. Include any statements relating to the impact of the design in the context of adjacent areas;
- 7 Conduct mock-ups or site trials as required;
- 6 Following approval, finalise documentation for procurement purposes in line with site specific objectives for the project. Consult with Waverley Council for specific procurement documentation requirements.

2.7 Related Council Strategies

Waverley Council have developed multiple strategic documents that relate to this Creative Lighting Strategy in identifying high level aims for LGA and the specific areas of Bondi Junction, Bondi Beach and the Coastal Walk.

Waverley LGA Planning Controls:

- Waverley Local Environment Plan 2012
- Waverley Development Control Plan 2012

Waverley LGA Strategic Context

- Waverley Economic Development Strategy 2015 – 2020
- Play Space Strategy 2014 – 2029
- Bondi Road Corridor Transport Study (Draft)
- Waverley Public Art Strategy
- Waverley’s People Movement and Places (Draft)
- Waverley Public Domain Technical Manual
- Bondi Junction – Heartbeat of the East 2016 - 2030
- Bondi Junction Complete Streets Project 2013
- Bondi Junction: Pedestrian and Public Life Study 2017 (Draft)
- Bondi Junction: Evening, Culture and Entertainment Strategy 2017 (Draft)
- Bondi Junction Vision Community and Stakeholder Engagement. UTS 2014
- Bondi Park, Beach and Pavilion Plan of Management 2014 - 2024
- Campbell Parade Streetscape Upgrade 2016
- Aboriginal and Historical Archaeological Assessment - Bondi Pavilion, Bondi Beach, NSW
- Bondi Pavilion and surroundings Conservation Management Plan (Draft)
- Local Village Centres Public Domain Improvement Plan 2006



Precedent Image: Bondi Beach

ViSION



3. The Vision

Memorable lighting to enhance the character area and enable a legible, vibrant and engaging experience after dark.

Lighting, holistically applied, whilst unique to each Waverley character area, should consider the journey and experience of not only vehicles, but in particular cyclists and pedestrians in the creation of a night time environment. Lighting is to integrate social gathering, public health and safety, sustainability and economic vitality into the urban environment providing a legible night-time environment that is vibrant and engaging after dark.



LIGHTING PRINCIPLES



4. Lighting Principles

Guiding principles for the creation and implementation of the lighting master plan.

A Legible Nightscape

A layered lighting scheme to give structure and safety in the night environment and in intuitive wayfinding.

- A tiered lighting solution appropriate to site considerations;
- Consistent design approaches and luminaire types;
- Creation of focal points to guide people through each character area.

The Personalities of Waverley

A lighting solution that expresses the character of Waverley and the unique areas within.

- Creation of unique identities for each area within the wider context of the LGA;
- Activation and enlivenment of the evening environment;
- Varied lighting settings or modes to respond to the use of the space at different time of the evening and across different seasons;
- Specifically tailored interactive or responsive lighting elements as appropriate and fitting for each area to engage the community;
- Adaptability and flexibility of the lighting schemes.

A Pedestrian Metropolis

The creation of a pedestrian focused public domain that is engaging and encourages increased evening patronage.

- Creation of distinct and unique experiences throughout the user journey engaging both locals and tourists alike;
- Installations that are interactive, emotive, whimsical, inspirational and that promote joy and celebration of place;
- Use of light to tell stories and highlight meaningful cultural installations, natural features or heritage buildings that can contribute to the character of Waverley and its key destinations.
- Creation of memorable lighting statements and landmarks to serve as a vehicle for promotion, for attracting tourism, engaging with locals to encourage ‘lingering’ and increasing night-time patronage;
- Lighting to extend the usable hours of the public domain into the evening, encouraging active movement, improving night time visibility, enabling passive surveillance, safety and increasing access and usability of public places after dark;
- Lighting to improve access and visibility to create usable connections.

Visual Impact

Lighting solutions that consider both the day time and night time impact of the infrastructure.

- Consideration is to be given to the daytime impact of new lighting structures in particular in regards to pole design and scale;
- Lighting near the waters edge is to consider vistas looking out and should respect the natural environment enhancing form without impacting wildlife;
- Consideration is to be given to the timing of the installation elements to suit the site location and requirements;
- Sculptural elements from night time installations may contribute to the day time user experience; this should be considered in the design and development of the sculpture/ artwork;
- Where lighting is used to enhance heritage structures, luminaire selection and installation should be sympathetic to the structure and heritage fabric and should be integrated where possible with minimal impact;
- Luminaires selection to be visually unobtrusive at night time, promoting maximum glare control and visual comfort.

Sustainability

Providing an energy efficient and appropriate lighting solution.

- Selection of appropriate luminaire types and light sources to minimise energy consumption, maximise efficiency and obtain low maintenance expenses whilst considering their qualitative spectral properties and other technical requirements to suit the relevant application;
- Use of an appropriate and flexible lighting control system that facilitates various moods and is adaptable to cater for events, community and tourist use, interactive interfacing, creating a distinctive interplay of light levels, and adjustments and changes in future use and function;
- Use of time switches, motion sensors and photo sensors to control lighting when and where appropriate;
- Lighting equipment, mounting details and aiming to ensure the minimisation of spill light and impact on the evening environment;
- Photovoltaic cells may be used to provide energy for lighting elements where appropriate to maximise energy efficiency and minimise environmental impact;
- Consideration of luminaire selection and lighting design on sensitive environmental issues to mitigate the impact on flora and fauna and surrounding residential properties.

APPLICATION



5. Application

A three tier lighting approach is to be used to build a suitable night time environment that supports pedestrian amenity. A suite of lighting equipment provides the building blocks of each tier for a consistent lighting language.

5.1 A tiered lighting solution

To ensure a legible night time environment, a tiered lighting solution is to be utilised that is suitable for the location and project objectives and that responds to both the functional and experiential aspirations.

Each application requires the consideration of a ‘Tier 1’ base lighting element to ensure orientation and safe movement from a functional perspective. These elements provide a consistent backdrop which allows other ‘non-standard’ lighting elements to stand out.

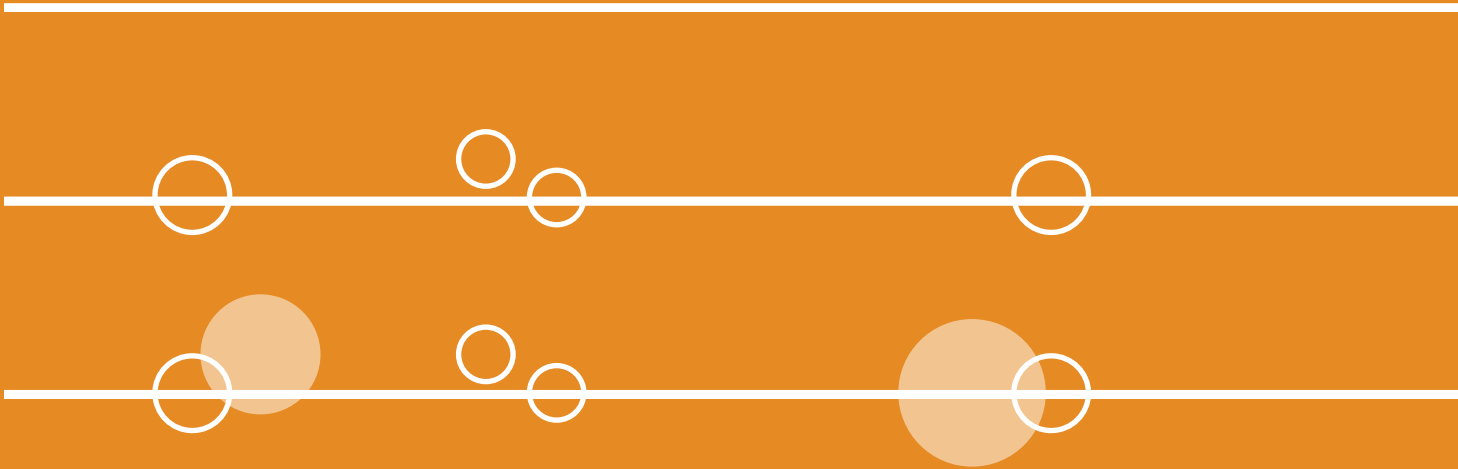
Tailored to the environment, ‘Tier 2’ lighting elements increase pedestrian amenity, provide more focused design opportunities and enhance the experience of the night-time environment.

Unique and site specific ‘Tier 3’ lighting interventions add elements of surprise, engagement, wonder or reflection to create a unique site experience.

Tier 1 is the **Base Lighting**.
This provides the base level of light for functional movement for streets, pedestrian pathways and cycleways.

Tier 2 is the **Amenity Lighting**.
This provides enhanced lighting to support the pedestrian experience to village/ commercial streets, malls, plazas, selected parks, the coastal walk and coastal perimeter areas. Lighting elements are to be layered to provide both functional and experience lighting. Tier 1 elements may form part of this strategy for the streetscape where applicable however should not be used for the coastal walk and coastal perimeter areas.

Tier 3 are the **Lighting Interventions**.
These are site specific installations at key locations that celebrate a unique sense of place or character, assist in activating the space, or assist in wayfinding. Lighting interventions may be overlaid on Tier 1 and Tier 2 elements where applicable.



5.1.1 Applying a Lighting Tier

In applying a lighting tier it is important to consider the context of the site in the overall night time lighting structure, it's location and proximity to urban development, commercial areas and residential areas and its function in the night time environment.

Tier 3 lighting are site specific installations and have been specifically identified within each area of the Strategy. Refer to chapter 6, 7 and 8 for relevant areas.

How to apply a lighting tier for a street?

Streetscape lighting should provide a consistent visual language across the LGA providing an integrated solution that reduces visual clutter and responds to the needs of vehicles, pedestrians and cyclists. In key commercial, retail, food and beverage areas, or key pedestrian movement corridors, the lighting response should support pedestrian amenity and a vibrant night time experience. The atmosphere should be one of welcome, warmth and safety.

Within the streetscape, streets perform various roles in the vehicular, cyclist and pedestrian journey. Whilst larger streets on the perimeter of a precinct may focus on vehicles and cyclists, village streets that form the central hub and support food and beverage, retail and pedestrian connections require an enhanced pedestrian quality to encourage active use and active movement in the evening. When classifying a street it is important to consider:

- Does it form part of a key movement corridor?
- Is it in close proximity to transport hub?
- Is it in close proximity to food and beverage or retail?
- Is it close proximity to residential areas?
- Is it in close proximity to pedestrian focused areas including malls?
- What is the desired level of activation in the evening?

If the street forms part of or is in close proximity to an active public area, it will require a different lighting response to a street in a residential area.

A street type will determine the suitable lighting tier and will also assist in identifying the most suitable illuminance level. Refer to 5.1.2 Selecting a light level.

General Street

Definition: General streets are typically located on the perimeter of a commercial area and do not form part of a key pedestrian connection or active food/ beverage and retail destination. The desired level of activation in the evening is low. These streets are not classified as a neighbourhood street due to their proximity to urban areas. The function of a general street is to provide a functional and consistent backdrop to the street and footpath for safe movement.

Lighting Tier Elements: Predominately MFP, pedestrian crossing, cycleway treatment. Lighting Tier elements of retail frontages, under awning lighting, connecting element lighting, wayfinding signage, bus shelter lighting may be applied where required.

Lighting Tier: Tier 1. Tier 2 as required.

Village/ Commercial Street

Definition: Village/ Commercial Streets support food and beverage, retail and major pedestrian connections. As such their desired level of activation in the evening is high and there is a strong requirement for pedestrian amenity. The function of a village/ commercial street is to enhance the pedestrian journey and experience encouraging after hours trade and lively activity.

Lighting Tier Elements: MFP, pedestrian pole, pedestrian crossing lighting, cycleway treatment, facade and alfresco lighting, retail frontages, under awning lighting, connecting element lighting, wayfinding signage, bus shelter lighting, seating and urban structures, tree and plant lighting, monument, artwork and sculptural lighting, **Lighting Tier:** Tier 1 as a base layer. Tier 2 lighting enhancement.

Laneway

Definition: A laneway is located in close proximity to a commercial area and is a narrow, often single lane low traffic street. Laneways may be considered an urban laneway where desired evening activation is low or an active laneway where desired evening activation is high or the laneway forms a key pedestrian route. In both laneway types it is important to consider pedestrian amenity and perception of safety with lighting used to reduce dark alcoves and allow facial recognition.

Lighting Tier Elements: Facade and alfresco, retail frontages, under awning lighting, catenary lighting, seating and urban structure lighting, monument, artwork and sculpture lighting.

Urban Laneway Lighting Tier: Tier 2 lighting enhancement. This may be combined with Tier 1 elements where Tier 2 lighting alone is not creating safe movement.

Active Laneway Lighting Tier: Tier 3. This may be combined with Tier 1 and Tier 2 elements where Tier 3 lighting alone is not creating safe movement.

Neighbourhood Street

Definition: A neighbourhood Street forms part of a residential area. The desired level of activation in the evening is low.

Lighting Tier Elements: Ausgrid Pole

Lighting Tier: Tier 1

How to apply a lighting tier for a mall or pedestrian area?

As a pedestrian focused area the lighting approach should focus on enhancing the pedestrian journey, assisting in wayfinding and orientation and providing a vibrant and active night time atmosphere that draws people to certain districts and encourages them to gather and linger.

The lighting approach should distinguish the mall or pedestrian area from the general streetscape with a different atmosphere and stronger focus on pedestrian amenity. Lighting should be provided to main passageways with modulation to the lighting levels to perimeter and seating areas using light and shade to provide an engaging environment and assist in defining focal points.

Lighting should be integrated into the urban fabric and landscape of the space and should respond to the character or history of the site. Lighting of trees, benches, facades, street level food, beverage and retail, public art and catenary lighting are encouraged rather than uniform ground illumination only.

Lighting Tier Elements: Typically Tier 3 lighting intervention. In other pedestrian areas pedestrian pole, cycleway treatment, facade and alfresco, retail frontages, under awning lighting, wayfinding signage, catenary lighting, seating and urban structures, tree and plant lighting, monument, artwork and sculpture lighting.

Lighting Tier: In most instances Tier 3 is suitable for malls and pedestrian areas with a site specific installation. In large malls or pedestrian areas, Tier 1 and Tier 2 elements may also be applicable. In smaller malls or pedestrian areas, and in areas where Tier 3 has not been identified as part of the Strategy, Tier 2 elements are to be used to provide the functional and experiential lighting.

How to apply a lighting tier for a park?

Park lighting requires a considered approach that allows safe movement along main through pathways and the street perimeter pathways to increase pedestrian sense of comfort. For local parks, lighting should focus on enhancing the streetscape experience for pedestrians through lighting of elements along the footpath such as trees, benches or public art to reduce the perceived darkness of these areas in the general streetscape.

For larger parks with a key pedestrian thoroughfare, lighting should focus on the main entries, street perimeter and main pathways and path surrounds. A consistently bright lighting strategy should not be used, rather a varied lighting approach is recommended using light and shade to provide a comfortable pedestrian experience. Lighting to any key pathways should be extended off the pathway to provide greater comfort by extending visual access.

Opportunities for after hours play in the winter months until 9pm should also be considered for playground areas designed for older children. This may be supported with interactive or sculptural public art as identified in the public art Strategy. Suitability of playground lighting is to be assessed on a case by case basis by Waverley Council.

Lighting Tier Elements: Pedestrian pole, cycleway treatment, seating and urban structures, tree and plant lighting, monument, artwork and sculptural lighting. **Lighting Tier:** Tier 1 for pathway lighting. Tier 2 lighting enhancement for park perimeter and main entries.

Specific design direction has been applied to Bondi Beach Park due to its relationship with coastal areas.

[illegible]

5.1.2 Selecting a Light Level

Lighting levels set the base requirements providing horizontal illuminance on the floor surface, however the quality of light, colour of light, luminaire distribution and atmosphere created are important for the overall perception of space and pedestrian comfort.

Setting quantitative ‘lighting levels’ for the functional lighting applications in accordance with the relevant Australian Standards, include consideration of a range of factors including volume of pedestrian and vehicle use, crime statistics and the importance of enhancing the area.

Pedestrian safety and amenity is also to be considered as when there are concerns about safety, there is a tendency to over-light; however too much light can be as detrimental as too little lighting. To assist in the creation of a safe night-time environment, the atmosphere that needs to be created should be one of welcome, warmth and safety. People need to be able to move with ease and confidence. This can be achieved in part by successful lighting design that illuminates the designated areas correctly and in part by the overall urban context, please management and area policing.

Safety is not guaranteed by the achievement of a particular illuminance requirement. People’s perceptions of safety are much more governed by night-time population and activity of an area as well as issues such as facial and colour recognition, contrast ratio, glare and the overall atmosphere created.

Use of light should be considered holistically with other aspects rather than solely light levels on the walking surface to aid in reducing the fear of crime and increasing the perception of safety. By good design that embraces light and shade and subtle contrasts, it is more likely to achieve a safe design solution than the mere distribution of light across the ground. Based on the relevant Australian Standards, the following lighting levels are to be considered in the design of future lighting projects and upgrades.

The final lighting level is to be agreed with Waverley Council following an assessment of the specific area and it’s surrounds.

- Considerations include:
- Desired night time use;
 - Level of use;
 - Type of activity (vehicular, pedestrian, shared);
 - Desired character as defined in this Strategy;
 - Site specific issues governing people’s perception of safety.

Refer to Section 6, Section 7 and Section 8 for area specific information in each area.

Roadways	V1	P1	P2	P3	P4	P5	P6	P7	P8	P9
General Streets										
Campbell Parade										
Village/ Commercial Streets										
Laneways										
Neighbourhood low Activity										
Neighbourhood Med/ High Activity										
Pedestrian and Shared										
Cycleways										
Malls										
Coastal Walk Pathways										
Major Park Pathways										
Pocket Parks										
Stairs and Connecting Elements										



5.1.3 Selecting Timing

The ‘hours of operation’ of a lighting installation are to respond to the functional use of the space and the intended night time atmosphere as guided by Waverley Council.

Typically lighting is to be automatically activated at dusk and de-activated at dawn.

A static lighting control approach often results in a consistently high lighting level which is unnecessary and inefficient in terms of energy use and adversely impact neighbouring residents and wildlife. In certain sites a dynamic lighting control approach may be used to reduce the lighting level or switch off certain lighting elements outside of peak use times to provide a lower level of light for safe passage.

This is particularly important to the Coastal Walk where higher lighting levels may be required at peak hours of use in the early morning and early evening but may not be required to the same level for the other hours of the night. Refer to Chapter 8 for further information.

5.1.4 Selecting a light colour temperature

A coherent use of light colour temperature should be considered across all areas for visual consistency. Light colour temperature can assist in visual differentiation of areas with different functions such as vehicular and pedestrian zones.

White light (2500K to 4500K) is considered suitable for use in the public domain as it renders objects and people in their true forms. Vehicular focused areas are to generally use 4000K whilst pedestrian focused areas are generally to use 3000K to create a warm and welcoming environment.

Where light is applied to a material or texture a warm white light (2500 - 3000K) or cool white light (3000K - 4000k) may be considered to suit the surrounding environment, object or area being lit and function of the object or area being lit.

A warm white colour temperature of 3000K is to be provided to the Coastal Walk and all Coastal Perimeter areas to reduce any potential penetration of light into the water.

Tier 3 lighting provides designers with the opportunity to introduce coloured lighting, to enhance the installation.

Refer to Chapter 6, Chapter 7 and Chapter 8 for area specific information in each area.

5.1.5 Selecting a luminaire; the lighting suite

It is important that a standard suite of light fittings is established for the tier 1 elements to provide a consistent visual language and identity of the Waverley LGA area as well as assist in reducing capital costs and maintenance costs. Specific tier 2 elements including marker lighting and tree lighting also form part of the standard luminaire suite. The use of a standard luminaire suite would provide a practical and cost effective way for Council to manage and maintain public lighting.

Refer to Waverley Council’s Public Domain Technical Manual for technical information.

It is recognised that other tier 2 lighting elements and tier 3 lighting installations may require a non-standard luminaire to achieve the design intent. The performance criteria as outlined in the following chapter is to guide the selection of these light fittings. The final fitting selection is to be approved by Waverley Council.

5.1.6 Lighting impact on flora and fauna

It is important that in the selection of the above elements and in the application of the lighting tiers, that consideration is given to the impact of lighting on plants and animals in their natural habitat.

The following are to be considered to minimise the impact on flora:

- Placing of luminaires should avoid the damaging of tree roots with locations chosen accordingly.
- Placement of luminaires needs to avoid the use of heavy machinery in sensitive areas; hand digging and water jet trenching may be considered.

Whilst artificial lighting can assist and facilitate foraging for some animal species due to higher concentration of insects (being attracted by night-time lighting), it can cause a negative impact to other species.

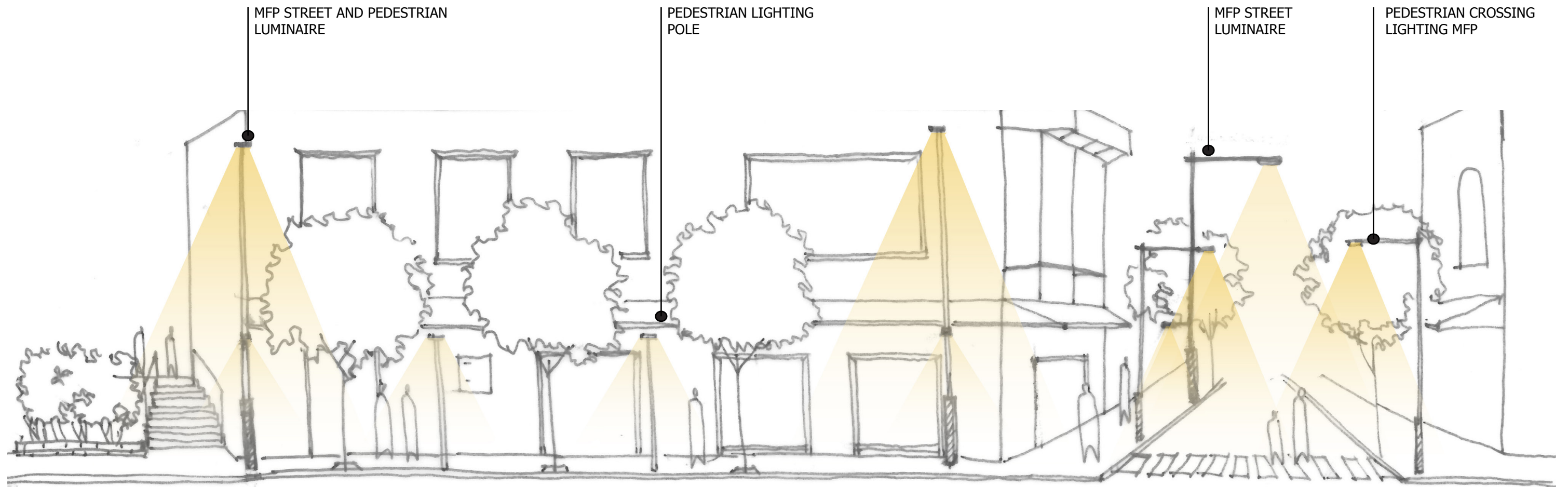
The following are to be considered to minimise impact on fauna:

- Lighting design approach is to minimise upwards light and contribution to sky glow. Lighting in coastal areas should be concealed, integrated and localised to avoid light trespass and preserve the night time environment and reduce potential impact on flight paths of birds and bats.
- Light intensity is to be considered to respond to animal vision under low light level conditions. Lighting levels should therefore be reduced when a high lighting level is not required. Certain lighting elements may also be switched off outside of peak use times when not required for functional lighting.
- Generally animals have a different spectral sensitivity than humans thus selection of light sources is to consider a warm white light with reduced blue and UV wavelengths. This assists in reducing the risk of disturbance of vision and in reducing the influence on animal circadian rhythm and overall biology.
- Use of shields, louvres and low brightness fixtures where appropriate.
- Lighting that causes flashing or intermittent lighting beams should be shielded to minimise their impact.

For all works along the Coastal Walk and Coastal Perimeter zones, a site specific risk assessment and environmental impact assessment is required to be undertaken during the design development phase of each project.

5.2 Tier 1: Base Lighting Elements

The Tier 1 Base Lighting elements provide the base level of light for functional movement and provides a consistent foundation of light for streets, laneways, pedestrian pathways, cycle routes and transit areas.



5.2.1 Street Lighting

The street lighting solution is to be suitable for the scale, function and level of use in order to support the night time hierarchy, wayfinding and language of the streetscape.

The multi-function pole (MFP) is a Council initiative aimed to reduce visual street scape clutter by integrating services and to provide a consistent lighting aesthetic. The multi-function pole is to be used on **General streets** and **Village/ Commercial streets** within Waverley Council LGA for a consistent identity.

Neighbourhood streets in residential areas have a different streetscape language to the more public and larger scale commercial and gateway streets. As such the MFP is not suitable for these streets and the Ausgrid assets are to remain.

The MFP may be configured to integrate a range of services. For the Tier 1 **General** and **Village/ Commercial street** application the MFP provides general street lighting, pedestrian lighting and where applicable may be scaled to support pedestrian crossing lighting.

MFP Street Lighting Luminaire

Pole Height: 9m
Light Source: LED Lighting
Colour Temperature: 4000K
CRI: RA70
Minimum IP rating: IP65
Minimum IK rating: IK04
Lighting Control: Dimmable
Optical Controls: In sensitive areas where the MFP may be located in close proximity to residential areas above commercial sites, rear spill light louvres should be provided to limit the impact of the light source.

In areas where high colour rendering is critical for activation and safety, such as Campbell Parade which requires a high quality light , a supplementary or replacement may be considered.

MFP Pedestrian Lighting Luminaire

The pedestrian luminaire aims to provide a human scale of lighting in pedestrian focused areas where the MFP is located and where under awning lighting may not be possible. The pedestrian luminaire may be mounted to the MFP if spacing is suitable.

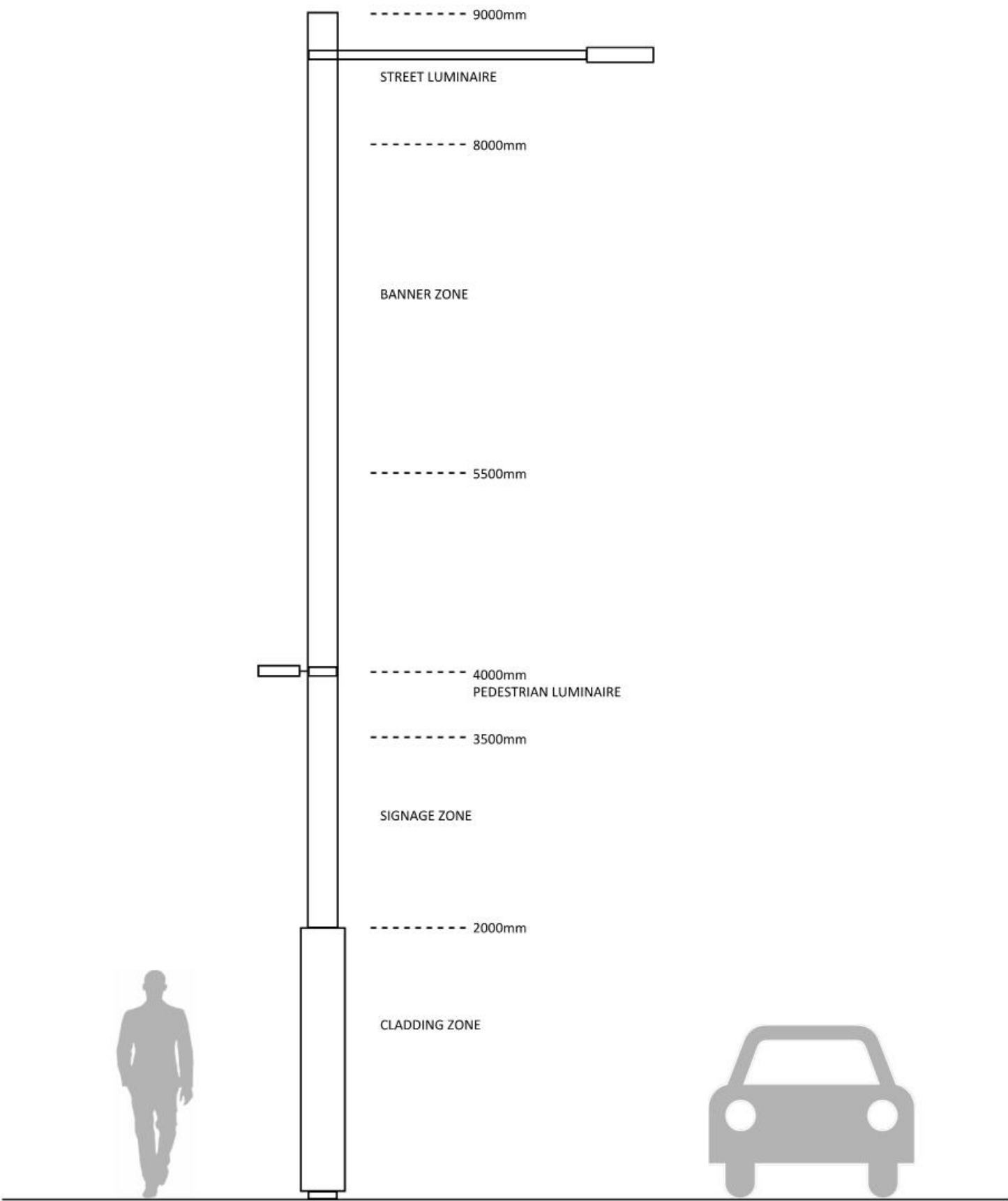
Mounting Height: 4m
Light Source: LED
Lighting Colour Temperature: 3000K
Minimum CRI: RA90 for pedestrian focused areas
Minimum IP rating: IP65
Minimum IK rating: IK04
Lighting Control: Dimmable

Where the pedestrian luminaire cannot be mounted to the MFP or due to spacing additional pedestrian luminaires are required, the fitting is to be mounted on a slim intermediate 4m pole.

In urban laneways the MFP street luminaire may be wall mounted if this is required for functional lighting. Typically Tier 2 and Tier 3 elements are to be used in these applications.

The multi-function pole may be used in conjunction with pedestrian lighting poles, awning lighting and additional street lighting typologies outlined in the next section of this report.

Refer to Section 6, Section 7and Section 8 for street specific information. Refer to Waverley Council’s Public Domain Technical Manual for technical information.



5.2.2 Pedestrian Crossing

Pedestrian crossings recognise the need for pedestrian safety and the relationship of pedestrians and vehicles. Vertical illuminance is paramount for pedestrian safety in these areas.

Pedestrian crossing lighting should be provided with a dedicated luminaire in the same family as the street lighting MFP pole on either side of the crossing in accordance with AS/NZS1158.4.

Pole Height: 6m – 8m with outreach arm angled to suit the size and type of pedestrian crossing

Light Source: LED

Lighting Colour Temperature: 3000k or 4000K (Selected to suit surrounding CCT)

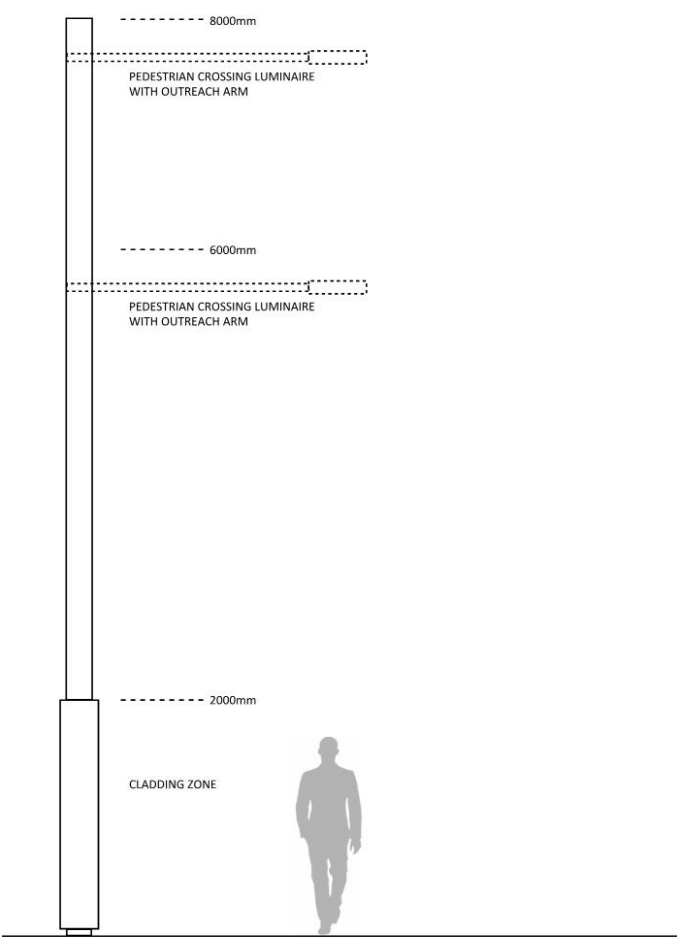
Minimum CRI: RA70

Location: Poles to be located not closer than 3m to the kerb and should be located to align with AS1158.4.

Minimum IP rating: IP65

Minimum IK Rating: IK04

Lighting Control: Dimmable



5.2.3 Pedestrian Lighting Pathways

The pedestrian lighting pole aims to provide a human scale of lighting in pedestrian focused areas that do not form part of the streetscape such as to malls or major park pathways. The luminaire should provide lighting to not only the path but the path surrounds to increase pedestrian comfort.

Pole Height: 4m

Light Source: LED

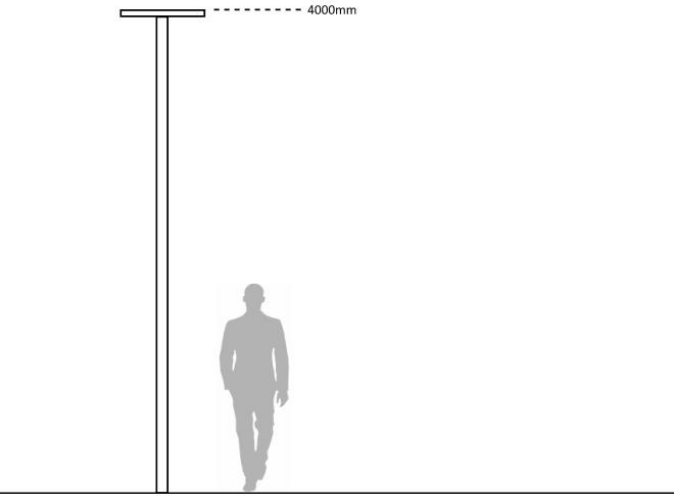
Lighting Colour Temperature: 3000K

Minimum CRI: RA90 for pedestrian focused areas

Minimum IP rating: IP65

Minimum IK Rating: IK04

Lighting Control: Dimmable



5.2.4 Cycleway Lighting

Lighting for pedestrians and cyclists at night is vital to encourage active movement by providing a feeling of safety and reinforcing way-finding and legibility.

Dedicated cycle zones may form part of a street typology or pedestrian/ cycle mall. Cycleways require visual differentiation from the general surroundings to ensure rider safety.

For general streets, village/ commercial streets and neighbourhood streets, the general streetscape lighting is to be designed to provide sufficient illuminance. In key instances this may be used in conjunction with an integrated glowing or reflective element. The glowing or reflective element is to reflect the day time image in the night environment by expressing the lane lines and bike graphics that provide visual separation during the day. A solar paint, reflective tape or LED marker is to be considered for this application.

General Streets

Where cycleways form part of a general street, lighting is to be provided from the MFP pole and may be in conjunction with an integrated glowing or reflective element .

Pole Height: 9m
Light Source: LED
Lighting Colour Temperature: 4000K
Minimum CRI: RA70
Minimum IP rating: IP65
Minimum IK Rating: IK04
Lighting Control: Dimmable
(Refer to Parks and Malls for integrated glowing or reflective element parameters.)

Village/ Commercial Streets

Where cycleways form part of a village/ commercial street, lighting is to be provided from either the MFP the pedestrian pole and may be in conjunction with an integrated glowing or reflective element.

Pole Height: 4m
Light Source: LED
Lighting Colour Temperature: 3000K
Minimum CRI: RA90
Minimum IP rating: IP65
Minimum IK rating: IK04
Lighting Control: Dimmable
(Refer to Parks and Malls for integrated glowing or reflective element parameters.)

Neighbourhood Streets

Where cycleway form part of a neighbourhood street, lighting is to be provided from the Ausgrid pole and may be in conjunction with an integrated glowing or reflective element.

Shared Paths, Parks and Malls

Where cycleways form part of a shared path with pedestrians, or form part of a park or pedestrian only area such as a mall sufficient general lighting is to be provided in the design solution. In addition to this in key locations where is it important to provide visual separation for rider safety and wayfinding, an integrated glowing element may be provided to define the path.

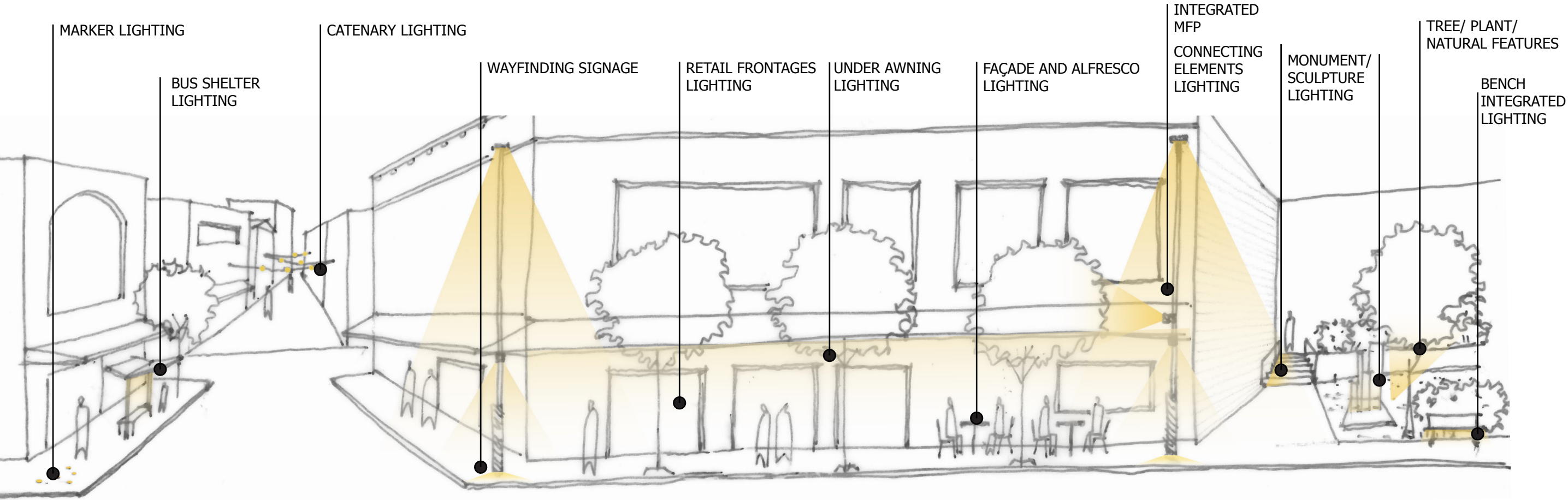
In smaller parks or pedestrian areas where a dedicated pole light may not be suitable, an integrated glowing element may be provided to define the path. This is to be assessed with Waverley Council on a case by case basis.

Light Source: Photo luminescent paint, reflective material, LED marker light or similar
Reference Projects/ Technology:
1. ‘The Starry Night’ Cycle Path by Daan Roosegaarde, Netherlands
2. Cycleway by TPA Instytut Badan Technicznych, Libzbark Warminski, Poland
3. N329 Pilot Project of Smart Highways in the Netherlands by Heijmans and design firm Studio Roosegaarde
4. Luna Road Glo solar paint
5. TraxEyes photo luminescent road studs in the Clyne Valley for Swansea City Council



5.3 Tier 2: Amenity Lighting Elements

Amenity lighting provides enhanced lighting to support the pedestrian experience to village/ commercial streets, malls, plazas, selected parks, the coastal walk and coastal perimeter areas. Amenity lighting elements provide a typical approach to specific urban or natural structures that may be adopted where the elements repeat. The typical approaches set out in this section of the document allow for area specific variation (e.g. catenary lighting may be used in different plazas, however the 'look' of the suspended catenary fitting may change. Where this occurs the light source and distribution should be the same to provide a consistent outcome). Lighting elements are to be layered to provide both functional and experience lighting. Tier 1 elements may form part of this strategy for the streetscape where applicable however should not be used for the coastal walk and coastal perimeter areas.



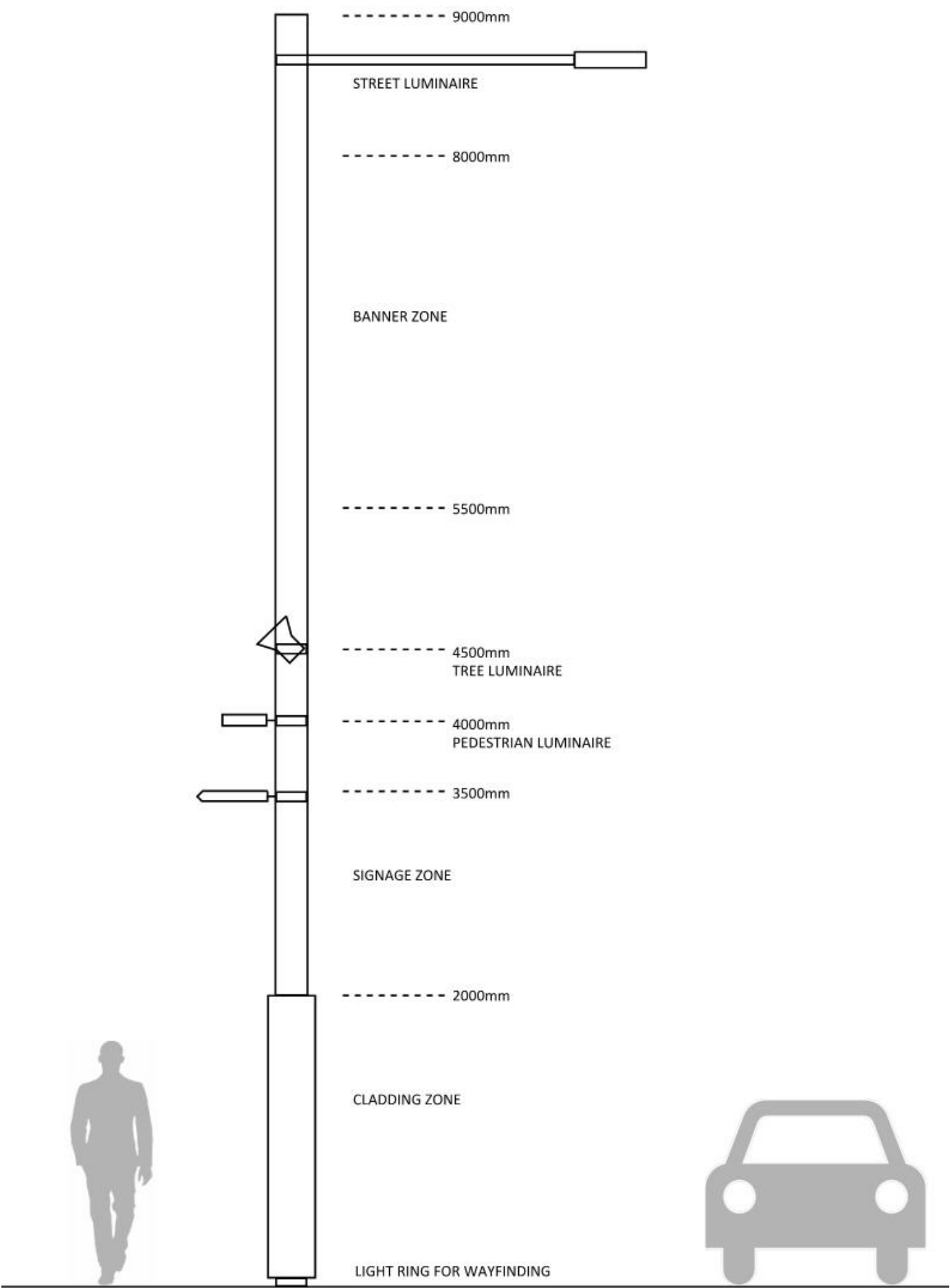
5.3.1 Integration of amenity lighting with the MFP

Amenity lighting elements may be integrated into the MFP where possible and as required in locations where the MFP is located. This initiative aims to reduce visual streetscape clutter by integrating services.

Suitable lighting elements for integration include:

- Integrated ring of light for wayfinding
- Backlit or digital street signage
- Pedestrian luminaire (Base lighting element)
- Tree luminaire
- Street luminaire (Base lighting element)

Refer to the following guidelines for the criteria and intent pertaining to each of these amenity lighting elements.



5.3.2 Façade Lighting and Alfresco Dining Lighting

Subtle and well-considered architectural façade lighting assists in the legibility and atmosphere of the night time environment and streetscape when used in key locations. It is important to not light all buildings as this detracts from the overall effect and purpose. Key facades are highlighted in Section 6, Section 7 and Section 8 of this document where façade lighting is considered suitable in enhancing the overall lighting strategy.

- Light Source:** LED
Colour Temperature Façade Lighting: 2700K – 4000K to suit material and surrounding environment
Minimum CRI Façade Lighting: RA80
Colour Temperature Alfresco Dining: 2700K – 3000K to create sense of warmth and ambiance
Minimum CRI Alfresco Dining: RA90 for rendering of human skin.
Minimum IP rating: IP65
Minimum IK rating: IK04
Lighting Control: Dimmable
Installation: External lighting fixtures are to be integrated with the architecture of the building where possible and the daytime appearance of the luminaires is not to be visually imposing.

The following design considerations are to be considered:

- Lighting is to be appropriate to highlight certain architectural features of a building. Floodlighting entire facades or over illumination of business premises for promotional purposes is not supported.

- General commercial buildings are to have a low key approach to lighting so as to not compete with landmark buildings.
- Dark recesses in building facades affect the perception of safety within the streetscape of the public domain. Adequate lighting should be provided to these areas as an integrated part of the building scheme.
- Where retro-fitting existing buildings and structures consultation is to be carried out with adjoining business owners and residents. Where a building or structure is of a heritage nature, consultation with a Heritage Officer is required.
- For new buildings and structures the lighting is to meet these requirements. Refer to additional requirements in the DCP Controls and DA Conditions.

Alfresco dining activates the streetscape and encourages a welcoming and exciting atmosphere. Lighting to alfresco dining spaces falls within the private domain, however the following guidelines are to be followed by business owners.

- Warm white local table lighting is encouraged;
- Floodlighting is not supported;
- Lighting should be soft, warm light.

5.3.3 Retail Frontages (Internal Lighting)

Activation of retail frontages forms part of the strategy to enhance the night time experience of the streetscape and mall spaces. Lighting should focus on highlighting merchandise or internal surfaces rather than floodlighting and may be used to create a visual hierarchy. Luminaires should be located in a manner to reduce glare and reflections on the window surfaces to provide a considered lighting quality to the adjacent streetscape.

- Light Source:** LED
Colour Temperature: 3000K – 4000K. Colour may be used in specific instances if deemed appropriate
Minimum CRI: RA85

(Note: Luminaire selection and design by individual tenant)

The brightness of all light sources, luminous surfaces and lit surfaces that are visible from the street, including digital and internally lit signage and billboards, should be of an appropriate candela/square meter to suit the surrounding environment.

Consideration is to be given to night-time control to reduce or turn-off shopfront lighting after 2am if the establishment or retail shop is not open.



5.3.4 Under Awning Walkway Lighting

Awnings provide a transition from the private to the public domain and vice versa. Despite being attached to private buildings they extend into and affect the public domain. Under awning lighting forms part of the vision for the streetscape in commercial areas and have been considered in the overall lighting strategy for each street. To see if under awning lighting applies to your project area, refer to the specific street design direction in Section 7, Section 8 or Section 9 in this report.

All private lighting related designs that interface with the public domain are to be submitted to the Council for review and development consent.

- Light Source: LED
- Lighting Colour Temperature: 3000K
- Minimum CRI: RA80
- Minimum IP rating: IP55
- Minimum IK Rating: IK04

Illuminance Requirements: Lighting may be required below awnings to supplement existing street lighting and ‘spill’ lighting from shopfronts and other ground floor uses to achieve the required lighting level. Lighting is to be in line with the light level requirements as the street or pedestrian area the awning is covering; however with a minimum P3 category to be achieved. Spill lighting from streetlights is to be considered.

Installation: Lighting must be recessed into the awning and be integral to the awning’s structure and form. All associated wiring and conduits are to be completely concealed. Light fittings should be readily accessible to

support their regular maintenance.
Lighting Control and Use: The Council may impose conditions on any awning lighting requiring it to be switched on or off between certain hours.

Refer to the latest DCP and DA conditions for further requirements.

5.3.5 Connecting Elements Lighting

Handrail lighting aims to provide integrated lighting into urban infrastructure for low level, focused functional lighting where other lighting elements do not provide necessary lighting levels or there is concern with maintaining vistas in coastal areas. Handrail lighting is appropriate to use in both urban and coastal settings including ;

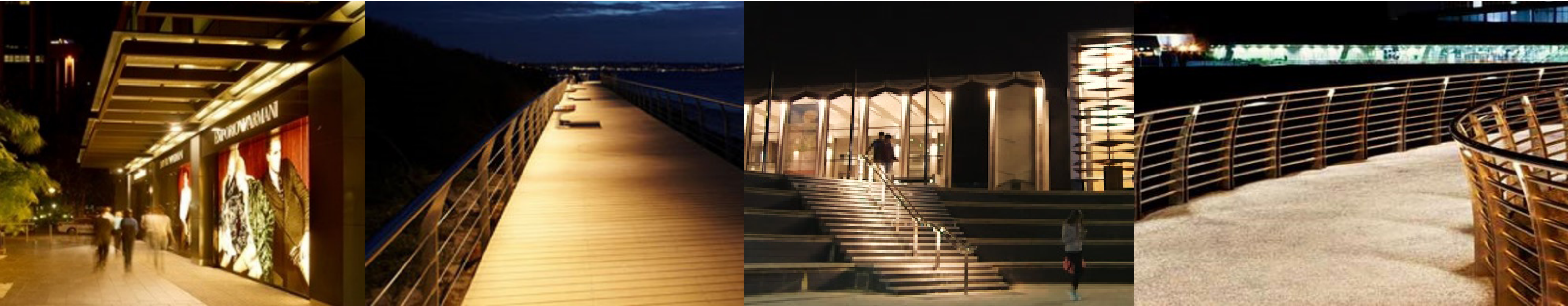
- Stair lighting;
- Pedestrian Connections;
- Urban pedestrian pathways;
- Coastal walkways;
- Bridges

- Light Source: LED
- Lighting Colour Temperature: 3000K
- Minimum CRI: RA80
- Minimum IP rating: IP65
- Minimum IK Rating: IK04

Distribution: Symmetric for centre handrail/ Asymmetric for single handrail to minimise spill light.

Urban Infrastructure Upgrade: Waverley Council Standard Handrail to be implemented. Handrail to be 38mm – 45mm diameter hollow tube with maximum wall thickness of 5mm to accommodate luminaire installation.

Lighting Control: Where used on the coastal walk lighting is to be dimmable and set to a low base level. This level may increase when presence is detected.



5.3.6 Wayfinding Signage

Providing legible wayfinding signage that translates from day time to night time is critical in encouraging active movement and increasing usability and legibility of the LGA area in the evening. Wayfinding signage addresses Waverley Council owned signs and not advertising or retail signage.

Luminous wayfinding signage provides a consistent visual language that is recognisable within the LGA and provides clear guidance to pedestrians, cyclists and motorists alike in locating transport hubs, locating main buildings or key destinations. Lighting is to be integrated within the signage element to provide a glowing surface that is legible. Light may be used to define a word, or graphic as required.

Luminous wayfinding signage may be integrated into the MFP where located at key junctions in either a backlit or digital format. Smart wayfinding signage may be considered in the long term for Bondi Junction and Bondi Beach that is live and active providing times to destinations, weather information, beach conditions, traffic conditions.

A ring of light may be integrated into the base of the MFP at key junctions with the colour programmed to assist in wayfinding and orientation. The integrated ring of light may also change colour for specific events.

In coastal areas, wayfinding initiatives such as marker lighting, lighting of identifiable cultural icons and use of lighting typologies and lighting interventions are used in place of signage elements due to the linear journey

and importance of maintaining vistas. Both at Ben Buckler Park and the Waverley Cemetery junction with Randwick Council the existing signs are to be treated in a subtle and integrated manner suitable to the environment. Refer to Section 8 of this document for further information

5.3.7 Bus Shelter Lighting

The urban design of the bus shelter is to be characterised as open and transparent to support an environment where commuters feel comfortable waiting. Lighting is to provide sufficient vertical lighting within the shelter itself. In urban and commercial areas, it would be considered appropriate to light urban and/or natural features in close proximity to increase visual depth in the surrounding environment. This assists in increasing the perception of safety. This would not be suitable in residential areas.

In conjunction with the built form, an integrated lighting solution is to support a unique, recognisable Waverley LGA identity. Lighting may be integrated within the structural beams in a location that reduces glare. A glass roof structure may be considered suitable to reflect an open and transparent environment.

The user experience is to be enhanced by a lighting installation that is responsive to the seasonal or environment. This may be through a seasonal response with the lighting changing from cool white in the summer to warm white in the winter.

The user experience should not be dominated by advertising signage. Digital and internally lit signage shall be of an appropriate brightness so as to not dominate the space. Advertising signage may be dimmed after dark to suit the environmental conditions.

Smart wayfinding signage may be integrated within the bus shelter such as live timetables, maps, directions.

Light Source: LED
Light Colour Temperature: 2400K to 4000K
Minimum IP rating: IP65
Minimum IK rating: IK08
Lighting Control: Dimmable and Colour Tuneable

Once a solution is tested and found to be successful, this should be rolled out across the Waverley LGA.

Whilst the above is a longer term vision, in the short term lighting should be integrated into all bus stops with a consistent approach across the LGA. In urban areas lighting should also be provided to urban or natural features in close proximity to increase visual depth in the surrounding environment as outlined above.



5.3.8 Catenary Lighting

Catenary lighting is a high tension suspended cable lighting system that is to be used to differentiate a space from the surrounding environment, create a unique character to a space, or create a more intimate and informal atmosphere.

- Light Source:** LED
- Colour Temperature:** 3000K – 4000K to suit surrounding environment
- Minimum IP rating:** IP65
- Minimum IK Rating:** IK04
- Distribution:** To suit the design solution. Spill light to be appropriately controlled or aimed.
- Installation:** Cable suspension system is to be building mounted. The installation should provide minimal visual impact and should be concealed and respective of building fabric. Approval is to be sought with building owners.
- In the event that catenary lighting cannot be building mounted, consult with Waverley Council for approval of pole mount and locations. Large diameter poles are not supported.
- Lighting Control:** Dimmable

The light source is to meet the above requirements however the form, layout and design of the catenary object is at the discretion of the designer and should change from area to area to respond to the site specific identity. The design is subject to the approval of the Council.

5.3.9 Seating and Urban Structures

Lighting integrated within seating elements and urban structures adds an intimate pedestrian scale to the general streetscape that signifies a place to gather, reflect, linger and relax. Within a larger context such as a park or pedestrian mall, local lighting within the urban fabric creates a focal point and enhances the night time atmosphere in an informal, playful way. It can be used as a directional tool to draw people to certain areas, and can assist in creating visual depth.

Lighting is to be concealed and seamlessly integrated into the structure to minimise vandalism or damage to the luminaires in such a publicly accessible location. Typically, luminaires for this function are small with remote control gear. All associated control gear and electrical equipment is to be located in an area that allows for future maintenance but that is not accessible to the general public.

- Light Source:** LED
- Colour Temperature:** 3000K – 4000K to suit materiality and surrounding environment
- Minimum IP rating:** IP65 to IP68 to suit installation location and detail
- Minimum IK rating:** IK04
- Lighting Control:** Dimmable



5.3.10 Tree and Plant Lighting

Used within parks or along pedestrian pathways or promenades, tree and plant lighting can assist in enhancing pedestrian amenity and increasing the perception of safety. Tree lighting increases the perception of brightness through lit vertical surfaces contributing to the overall atmosphere. As a lit element a tree or plant can act as a visual marker to define a space or an edge. Light and contrast of the lit foliage can be used to enhance drama and express natural textures.

Where a tall tree is located in close proximity to an MFP pole, the luminaire may be mounted to the pole at a height of 4500mm to ensure this is above the pedestrian level lighting for an integrated solution. In this application the fitting should be aimed and locked into position.

- Light Source:** LED
- Colour Temperature:** 3000K – 4000K to suit foliage type. (coloured lighting is not deemed suitable for general tree and plant lighting).
- Minimum IP rating:** IP65 pole mounted/ IP68 in-ground
- Distribution Tree:** Wide flood for general coverage. In-ground luminaires should have an internal gimbal or adjustment to place light where it is required and reduce upwards spill light. Use of louvres or lenses are to be used to direct light and reduce glare.
- Distribution Plant:** General diffused to enhance foliage pending installation detail.
- Installation:** Luminaires are generally to be located on adjacent poles (tree only) or in ground. In ground lighting should be directed towards the tree trunk and underside of the canopy to minimise upward spill light. An arborist is to be consulted where luminaire positioning effects

tree roots or branches. If planting is located in close proximity to an urban structure, lighting may be integrated in this structure pending approval from Waverley Council. Suitable drainage is to be provided to in-ground luminaires in accordance with the manufacturers instructions.

Lighting Control: Dimmable and lighting to deciduous trees must be controlled via a seasonal timer to turn lights off when the tree is bare.

5.3.11 Lighting other Natural Features

Lighting to natural features is to celebrate the texture and forms of these elements through a lighting approach that expresses light and dark, contrast and shadows.

In lighting natural features, particularly coastal rocks, it is important to consider the light source colour temperature and colour rendering as these will affect the visual perception of the materials, specifically the sandstone walls. Under some light sources sandstone can appear quite green. Typically a warm to cool white light are recommended with a CRI90 or above, however it is recommended that varying CRI indexes are tested on-site prior to installation to account for upgrades in LED technology.

- Light Source:** LED
- Colour Temperature:** 3000K – 4000K
- Minimum CRI:** RA90
- Minimum IP rating:** IP68
- Minimum IK rating:** IK04
- Lighting Control:** Dimmable

Luminaires are not to be fixed directly to any natural features and should be located in a concealed location. The location should consider vistas and views from all surrounding locations particularly from residential blocks or adjacent pedestrian pathways. Luminaire locations and optics are to be considered to ensure the natural surfaces are expressed and not visually flattened by the light. The luminaires should be suitable for a salt environment.



5.3.12 Marker Lighting

Marker luminaires are to provide a glowing surface in the ground thus are required to have a diffused surface with no visibility of the light source within. As this light does not provide functional lighting, but acts as a visual marker, the visual comfort is of greater importance than the lumen output.

Visually the size of the luminaire should suit the scale of the environment. It is generally recommended to be within 30mm – 50mm diameter.

Due to the in-ground coastal location, the luminaire is required to have an IP67/ IP68 rating with a corrosion resistant finish. The luminaire should be flush mounted in the urban fabric in a seamless manner. In some locations as identified in the ‘Lighting Interventions’ the marker lighting is to be activated to create a ‘sparkle’.

- Light Source:** LED
- Colour Temperature:** 3000K
- Minimum IP rating:** IP68
- Distribution:** Diffused
- Lighting Control:** Non-Dimmable

5.3.13 Monuments, Artwork and Sculptures

Lighting of monuments, artworks and sculptures provides reference points in the user journey and creates visual interest. Lighting may be used to draw attention to monuments of cultural significance such as the surf lifesaving clubs in Bondi Beach and may bring joy to the night environment through lighting of art and sculpture.

Lighting should be used with purpose to key areas rather than applied to all monuments, artworks and sculptures. These guidelines may be applicable to existing local artworks in the Bondi Beach area, local monuments, and as a future provision for sculptures in Hunter Sculpture Park.

The lighting installations should minimise glare and glare sources; lighting is not to distract but enhance artwork. Mounting of luminaires is not to affect viewing of the monument, artwork or sculpture.

For new installations, or where the artist/ sculptor/ architect is know, collaboration and dialogue is encouraged to ensure the lighting is appropriate to the artists intent.

- The following are not supported:
- General floodlighting
 - Artwork mounted luminaires (unless luminaires form part of the artwork)
 - Strobing or flashing lighting

- Light Source:** LED
- Colour Temperature:** White light of appropriate colour temperature to enhance natural colour, materiality and texture. Coloured light may only be used in specific circumstances in consultation with Waverley Council.
- Minimum IP rating:** IP65 - IP68 to suit installation location
- Lighting Control:** Dimmable

Lighting to monuments, artworks and sculptures are to work in harmony with the design direction for the ‘Lighting Interventions’ outlined in this document.

Specific lighting direction has been provided for monuments, artworks and sculptures that have been identified as suitable locations for lighting interventions. Refer Section 6, Section 7 and Section 8.



BØNDi JUNCTION

6. Bondi Junction

6.1 The Vision

An active, vibrant and thriving destination that is the nucleus of the east.

Light reveals the character of the precinct, connecting the users' journey between key nodes and providing moments of surprise. The locals and tourists are engaged with the night environment and encouraged to linger. A welcoming and warm atmosphere increases accessibility and sense of safety.



6.2 Key Character Drivers Bondi Junction

Bondi Junction, the heartbeat of the east

Bringing people together from all over the eastern suburbs, and from further afield to live, work and connect.

Movement and Exchange; **Bold** and *fast* paced, Bondi Junction is a diverse place of intersection, movement and exchange.

Contrast and Juxtaposition; Its built form is a **juxtaposition** of different architectural **eras** and **scales**. It is home to diverse lifestyles, from health and well being through to leisure and entertainment, from the grass roots through to status driven brands.

Dual Personality- **daily commercial and destinational;** its **big**, brash and **loud** yet localised. It’s a place known for fashion and style, for nightlife (in places) and for daily convenience and employment.

6.3 Key Strategies Bondi Junction

1. Oxford Street Mall arrival statement and meeting place
2. Strengthen the connections between Bondi Junction train station and its surrounds
3. Prepare Grosvenor Lane for future retail activations
4. Support a positive ambiance in the Spring Street food and beverage precinct
5. Support improved connections Under Syd Einfeld Drive to the north
6. Encourage civic activations in the forecourt for Waverley Library including ambient lighting of the landscape
7. Showcase the history of Norman Lee Place & the Boot Factory
8. Support alternative cycling routes to Oxford St Mall
9. Create arrival statements for Bondi Junction at Fingleton Reserve & Oxford Street and Bronte Road gateways
10. Connect Waverley Mall with evening cinema trade including consideration of tree lighting to enhance ambiance
11. Support evening food offers on Bronte Road
12. Explore the opportunity for a larger scale public art work and lighting installation in Gray Street
13. Treat parks and gathering spaces within Bondi Junction positively
14. Consider recent works at Brisbane St Plaza as part of the overall lighting strategy.
15. Highlight key public seating areas at
 - Parklet installation on Spring Street;
 - Waverley Mall and Oxford Street Mall
 - Bus stop waiting areas i.e. corner of Bronte Rd & Gray St and Grafton St
 - Seating adjacent to Tea Gardens Hotel
16. Enhance visibility into Eora Park and consider lighting of trees, seating and artwork.



6.4 Tier 1: Base Lighting. The Streetscape and Pedestrian Paths

Objective

Provide a consistent base layer of lighting to the streetscape that is visually integrated, provides a legible family of luminaires and activates the street at a human scale.

Design Approach

The base layer of light is to improve the night time environment providing the functional requirements for safe movement of all users. The solution will vary pending the street type, scale, function and level of use. The street types have been defined as **general streets**, **village/ commercial streets** and **neighbourhood streets**. In addition to commercial streets, there are a series of commercial urban laneways that are to have a similar approach to a commercial street. It is important to use light intensity and luminaire type to establish a legible night time environment that assists in passive wayfinding and identity for the precinct.

Tier 1 Elements

General Street: MFP, Pedestrian Crossing Luminaire, Cycleway Treatment

Village/ Commercial Street: MFP (with integrated amenity lighting as applicable), Pedestrian Pole, Pedestrian Crossing Luminaire, Cycleway Treatment. Refer to 6.5 for Tier 2 Amenity Lighting Applicable to this street type.

Neighbourhood Street: Ausgrid Pole.

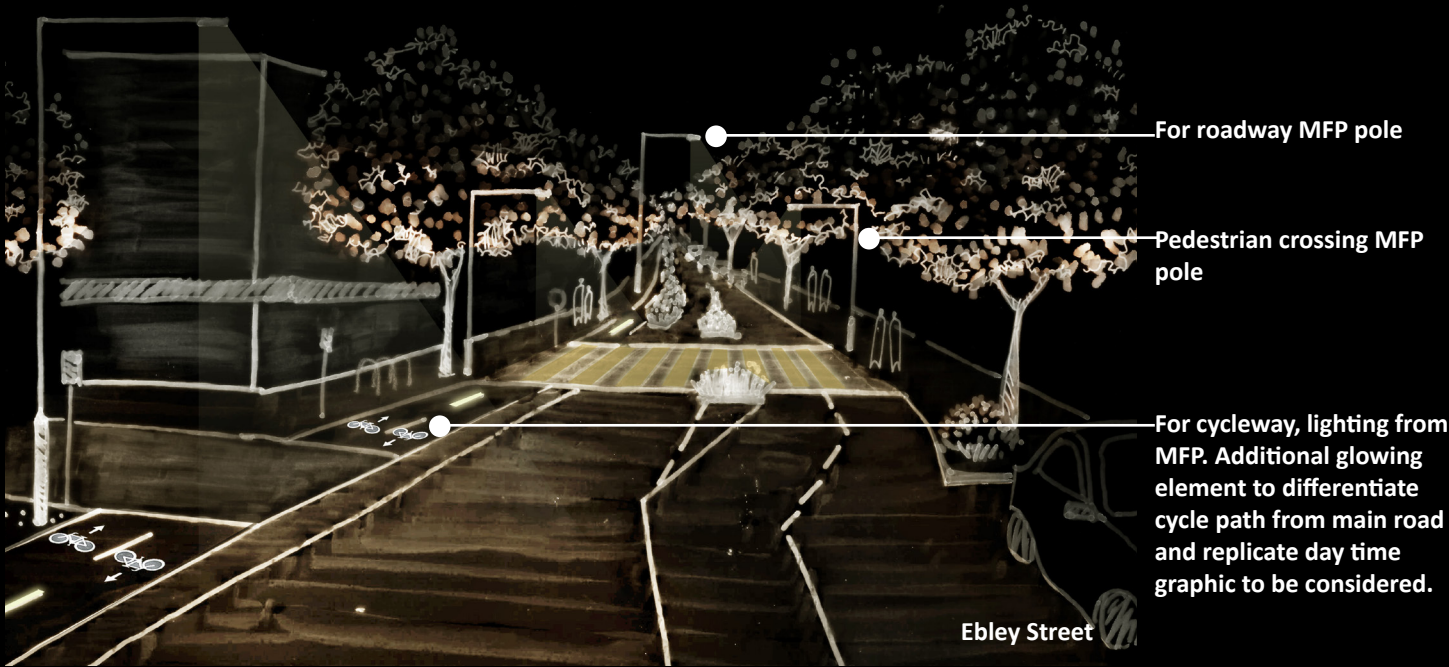
Major Park Pathways: Pedestrian Pole.

Lighting Timing

Typically the base lighting elements should be on from dusk to dawn. Outside of peak hours of use the lighting level in certain streets or laneways may be reduced to provide a lower level of light for safe passage reducing the overall energy consumption.

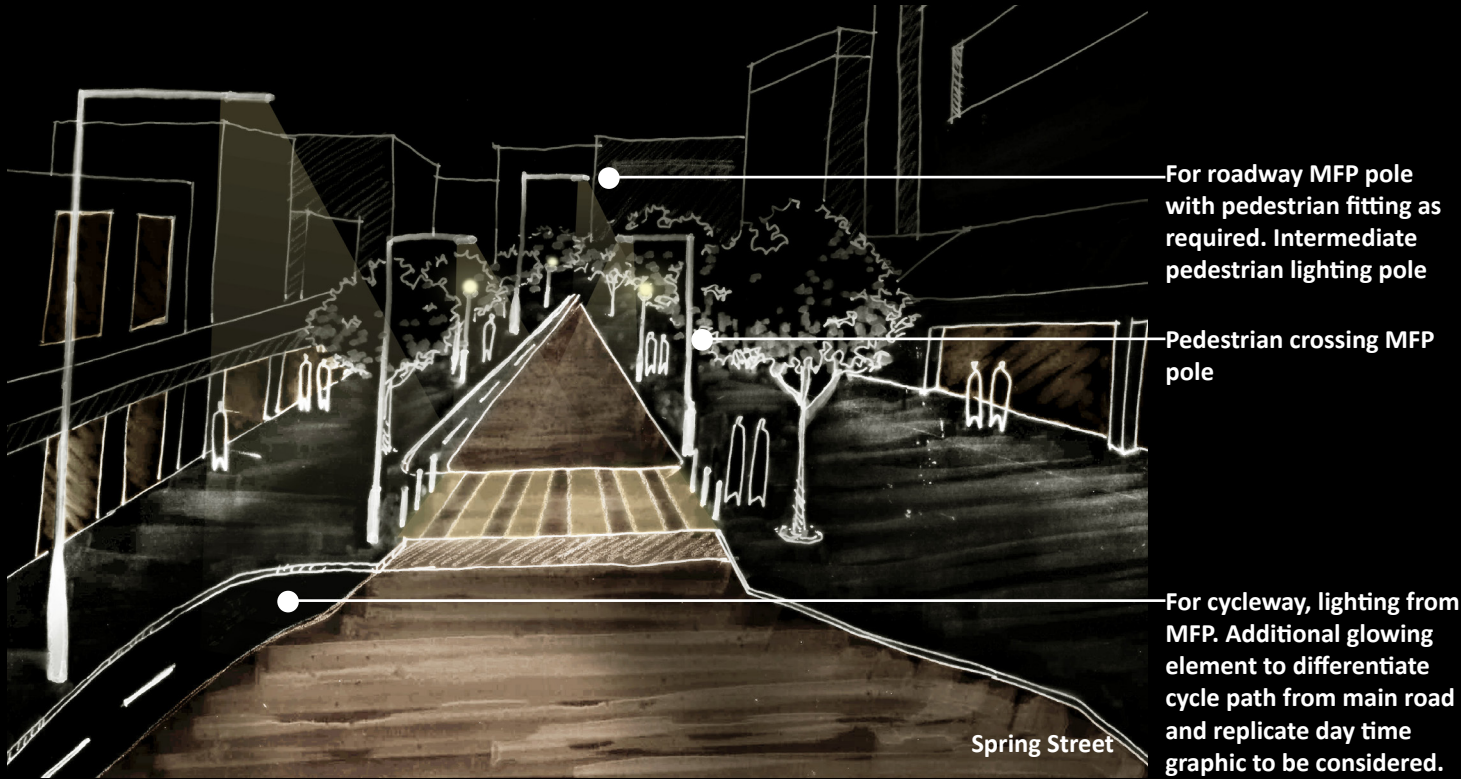


6.4.1 Typical General Street



Cycleway: P2 – P4 range
General Street: P1- P3 range
Pedestrian Crossing: AS1158.4

6.4.2 Typical Village/ Commercial Street



Cycleway: P2 – P4 range
Village/ Commercial Street: P1- P3 range
Pedestrian Crossing: AS1158.4

Also refer to Tier 2 for Village/ Commercial Street enhancement amenity lighting.

6.4.3 Typical Neighbourhood Street
and Major Park Pathway



Neighbourhood Street: P2- P5 range
Major Park Pathway: P3 - P4 range

6.5 Tier 2: Amenity Lighting.

The Enhanced Streetscape and Parks

Objective

To re-orient the streetscape focus to a more human and pedestrian scale, increase passive surveillance, provide passive wayfinding and activate the night environment.

Design Approach

This lighting tier aims to improve the public domain urban lighting environment through pedestrian scale typologies and encouraging businesses to improve their façade and alfresco lighting and retail frontage lighting and extend their trading hours or hours of lighting operation to support an active and lively night time. The lighting typologies may be applied throughout the LGA. The locations identified in this section of the report demonstrate the application of these elements in key streets that have been identified as a precursor for after hours trading and key parks. The intent of park lighting within the Junction is to increase pedestrian comfort on perimeter footpaths and increase passive surveillance in these areas, rather than encourage active use after dark. By reducing the extent of darkness, the adjacent streetscape and sense of pedestrian comfort is enhanced.

Tier 2 Elements

General Street: Retail frontage, under awning lighting, connecting element lighting, wayfinding signage, bus shelter lighting.

Village/ Commercial Street: Facade and alfresco, retail frontages, under awning lighting, connecting element lighting, wayfinding signage, bus shelter lighting, catenary lighting, seating and urban structures, tree and plant lighting, lighting of artworks and sculpture.

Park: Seating and urban structures, tree and planting, artwork and sculpture lighting.

Key Pedestrian Amenity Areas

1. Spring Street/ Brisbane Street/ Oxford Street
2. Bronte Road
3. Fingleton Reserve
4. Clementson Park
5. Eora Reserve and connection to Waverley Plaza

Lighting Timing

Typically Tier 2 lighting should be on from dusk until 2am to support late night trading. Where lighting is located in close proximity to residential properties, it may be suitable for some elements to be turned off at midnight.



6.5.1 Spring Street/ Brisbane Street/ Oxford Street

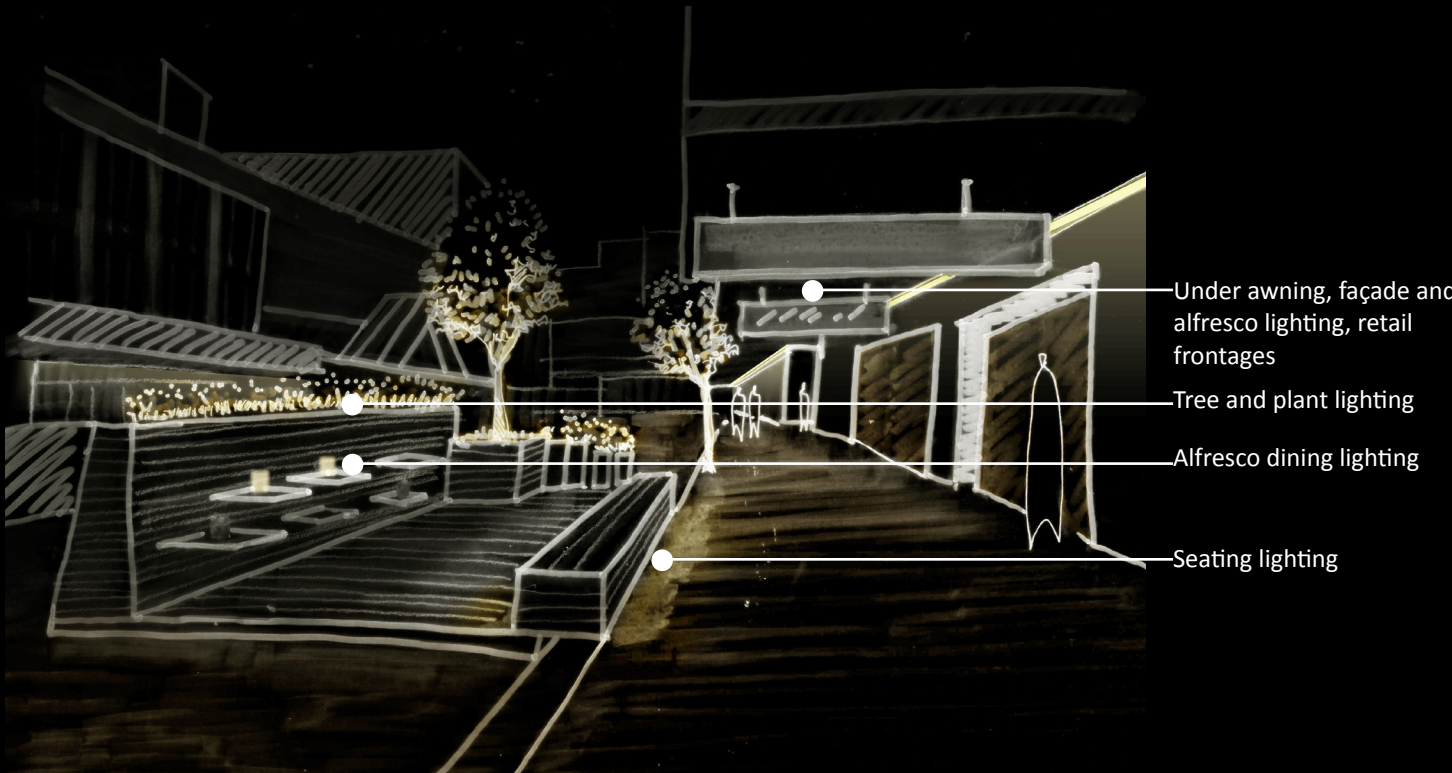
Objective: To support a positive ambiance in the Spring Street food and beverage precinct with a consistent under awning lighting and expression of urban structures and trees. Enhance key pedestrian connections between transport hubs and food and beverage precincts.

Pop-up parklet installations have been a successful tool in activating food and beverage areas in the day time. These may be used as a short term strategy to encourage activation in the evening at key locations.

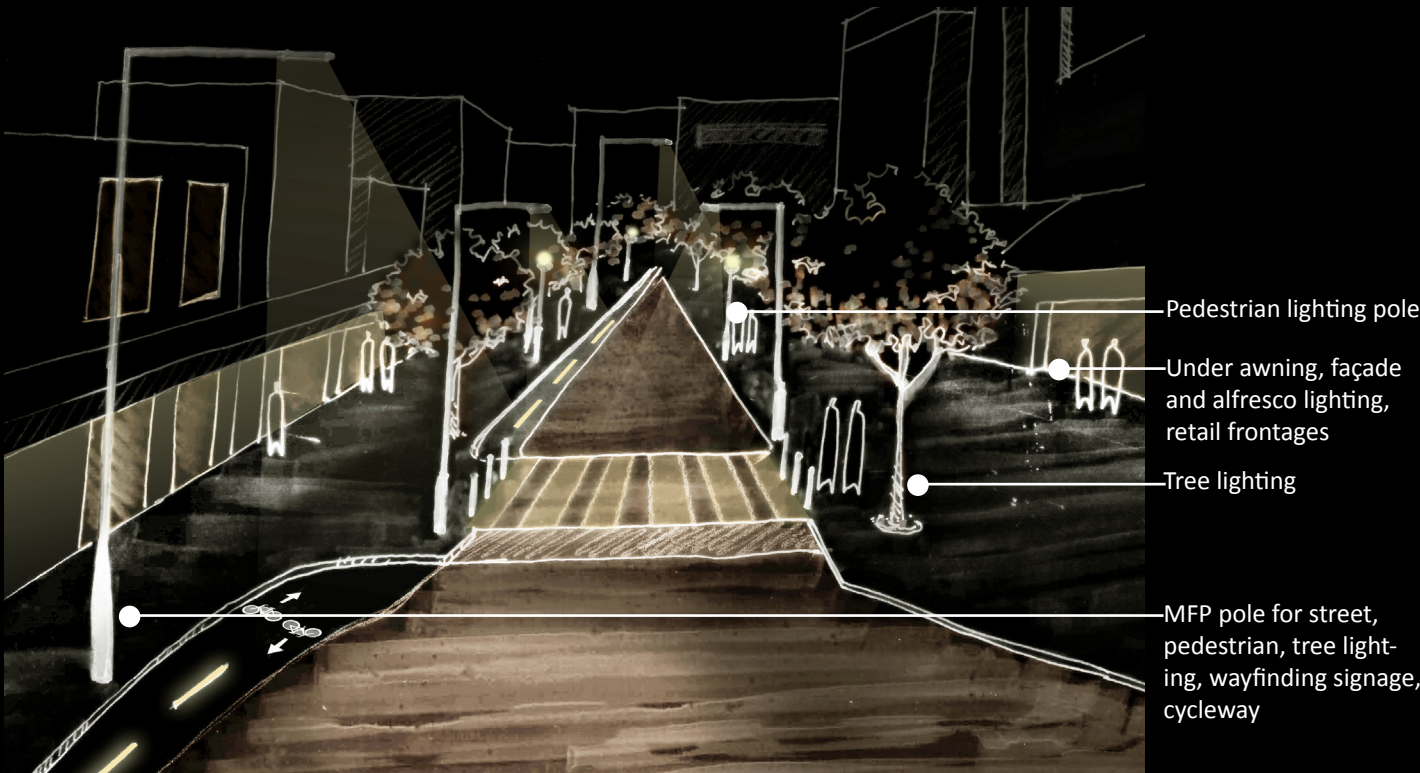
In the longer term, similar lighting typologies are recommended to be implemented within the general streetscape enhancing seating areas and alfresco dining.

Tier 1: MFP , pedestrian pole, pedestrian crossing, cycleway treatment

Tier 2: Façade and alfresco dining, retail frontages, seating and urban structures lighting, tree and plant lighting. Amenity lighting may be integrated into MFP as applicable.



Short term solution for Spring Street



Medium term solution for Spring Street

Cycleway: P2- P4 range
Village/ Commercial Street: P2 - P4 range

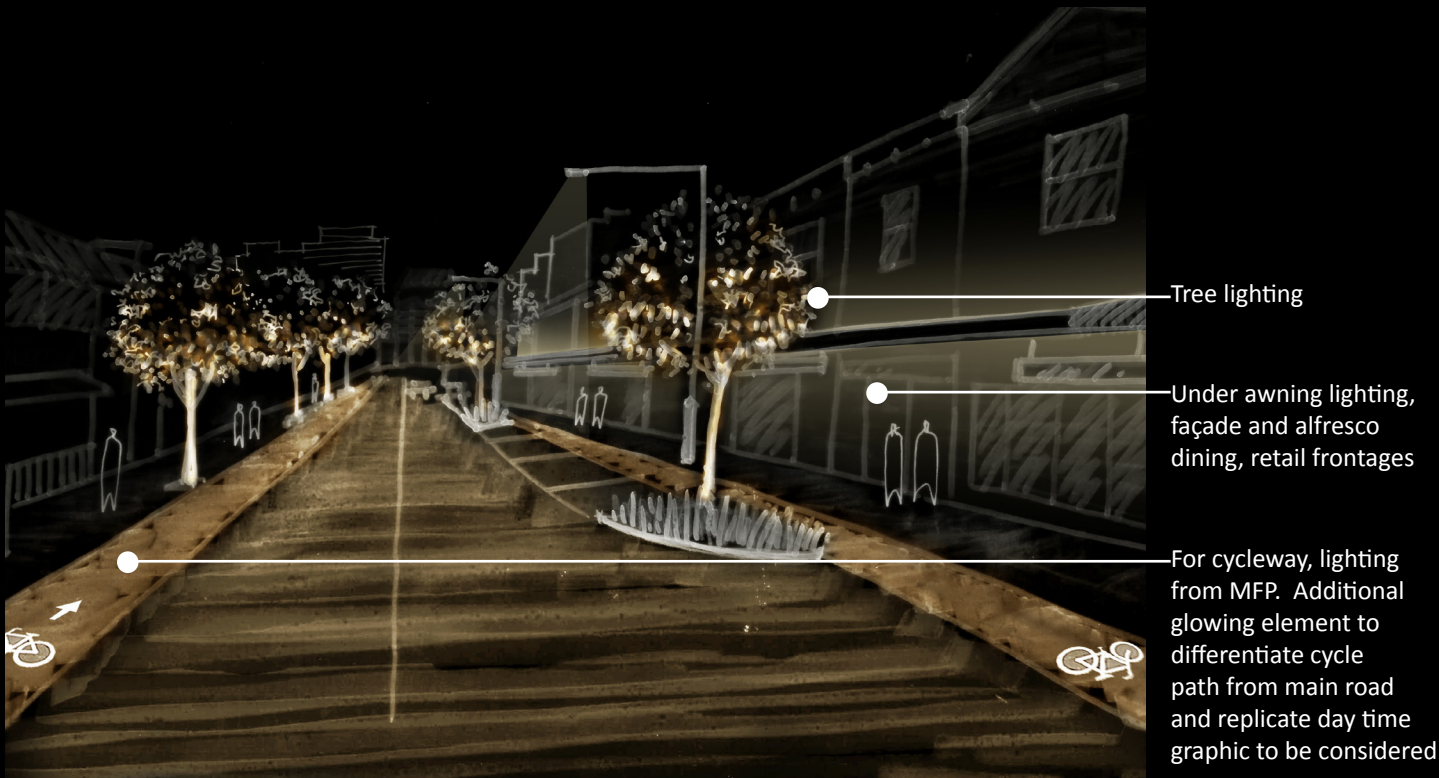
6.5.2 Bronte Road

Objective: To support evening food offers on Bronte Road highlighting landscaping and urban elements to support those trading out. It is important to work with traders to create quality under and above awning lighting to indicate the area as an evening destination. Enhance key pedestrian connections between transport hubs and food and beverage precincts.

Tier 1: MFP, pedestrian pole, pedestrian crossing, cycleway treatment

Tier 2: Façade and alfresco dining, retail frontages, seating and urban structures lighting, tree and plant lighting. Amenity lighting may be

integrated into MFP as applicable. Lighting may be provided to future art works that are planned as part of the Public Art Strategy.



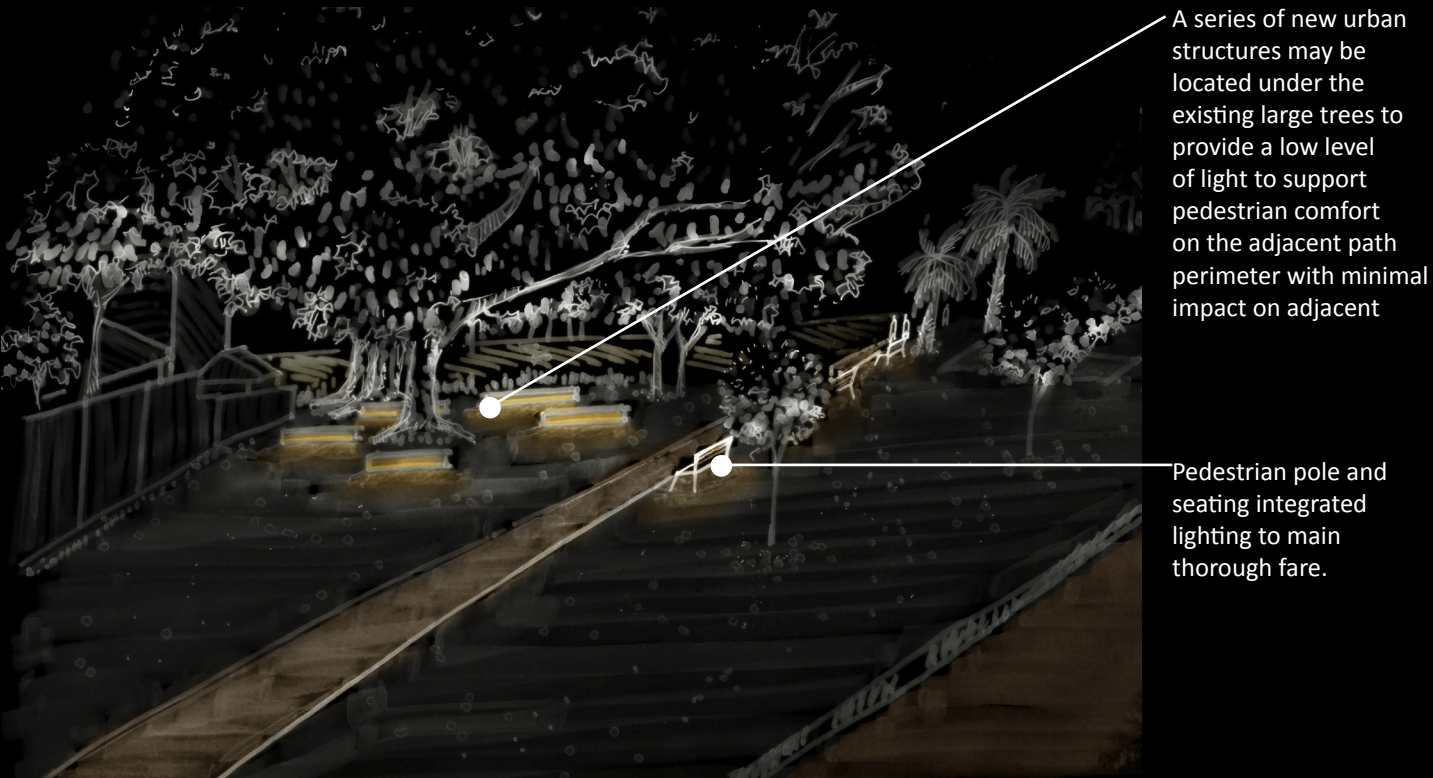
Cycleway: P2 – P4 range
Commercial Street: P2- P4 range

6.5.3 Fingleton Reserve

Objective: To treat parks positively allowing safe passage and pedestrian comfort. As a corner marker of Bondi Junction Fingleton Reserve has also been identified as an intervention to mark the precinct gateway.

Tier 1: Pedestrian pole to pathway

Tier 2: Seating and urban structure lighting in close proximity to pedestrian thorough fare or perimeter footpaths. Lighting of trees and plants is not advised due to the impact on adjacent residential properties.



Major Park Pathway: P3 – P4 range

6.5.4 Clementson Park

Objective: To treat parks positively and treating the park perimeter edge to increase the sense of pedestrian comfort from the neighbouring streetscape. This may be further enhanced with a future installation of interactive or sculptural public art as identified in the public art Strategy. This may form a separate intervention project and may assist in the perimeter treatment of the park.

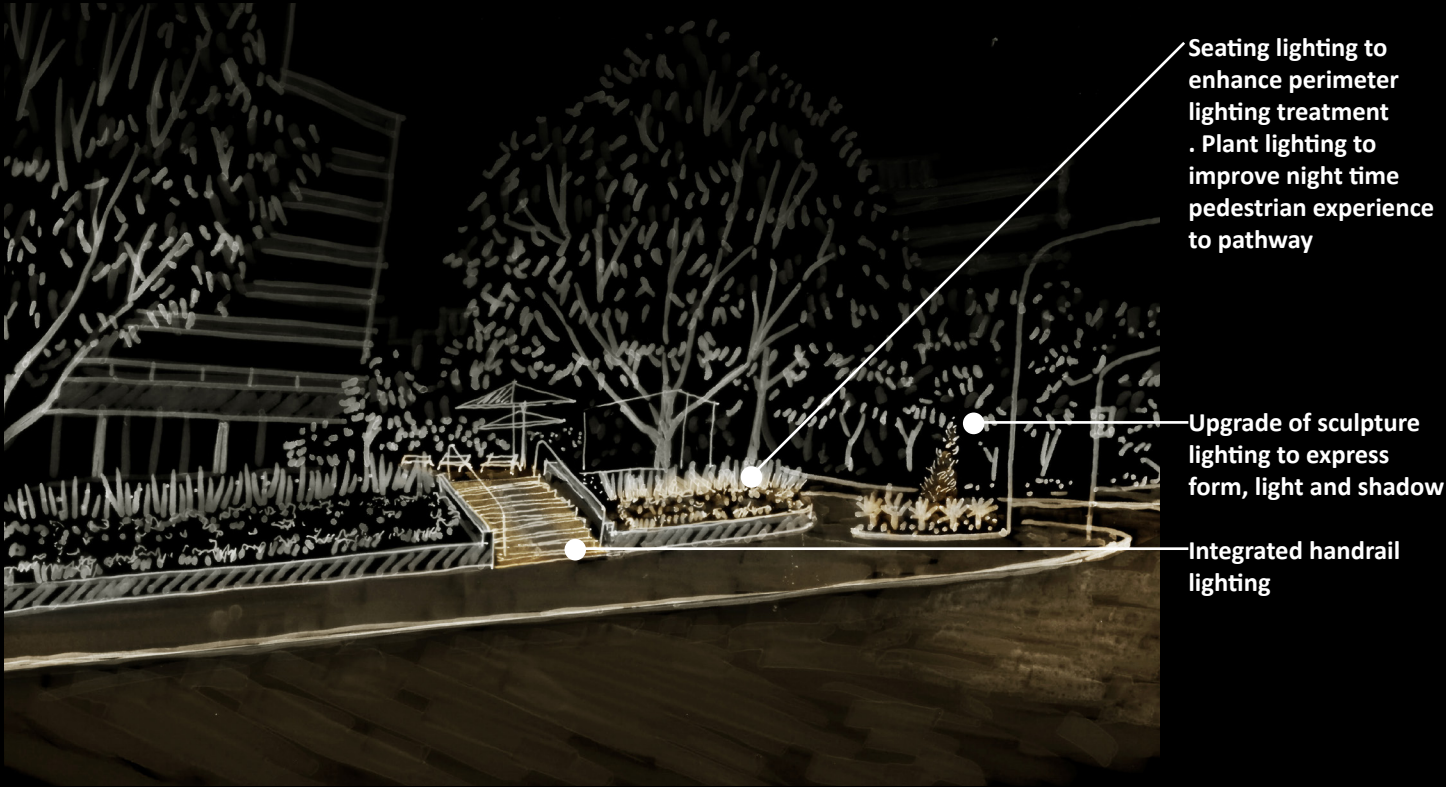
Tier 2: Seating and urban structure lighting, tree and plant lighting, monuments, artworks, sculpture lighting.



6.5.5 Eora Reserve and connection to Waverley Plaza

Objective: To treat parks positively increasing the sense of pedestrian comfort from the neighbouring streetscape. The existing artwork lighting and adjacent pedestrian path lighting may be improved to support the night time experience.

Tier 2: Seating and urban structure lighting, tree and plant lighting, sculpture lighting



6.6 Tier 3: Lighting Interventions

Objective

To respond to site specific locations as identified in the place strategy that provide an opportunity to amplify the vibrancy of the Junction, contribute to an engaging and memorable night time journey and express the unique identity of Bondi Junction.

Design Approach

Tier 3 lighting should encourage locals and visitors to linger and gather by creating a pause in the user journey through human scale engaging, interactive and dynamic lighting interventions. In this way the night time environment is activated with lighting acting as a catalyst for after hours trade and improved pedestrian access within the Junction. The lighting interventions should connect visitors and locals to place through creative and interpretive lighting as well as assist in wayfinding and orientation.

Locations

- 1. Oxford Street Mall and connection to Bondi Junction train station
- 2. Grosvener Lane
- 3. Connections under Syd Einfeld Drive to the North
- 4. Waverley Library and Forecourt
- 5. Norman Lee Place & the Boot Factory
- 6. Gateway Arrival Statements
- 7. Waverley Street Plaza
- 8. Gray Street
- 9. Brisbane Street Plaza (Complete)

Lighting Timing

Typically lighting interventions within the Junction should operate from dusk until 2am to assist in encouraging after hours activity and movement. After this time certain elements of the lighting interventions may turn off to conserve energy.





Precedent Image: Asbjørn Skou, Denmark

6.6.1 Oxford Street Mall and Connection to Bondi Junction Train Station

Objective: To create an arrival statement and focal point within Oxford Street mall that encourages the mall as a meeting place and assists in strengthening the connection to Bondi Junction train station over the bridge. The intervention is to be respectful of existing public artwork and support future public art installation outlined in the Public Art Strategy.

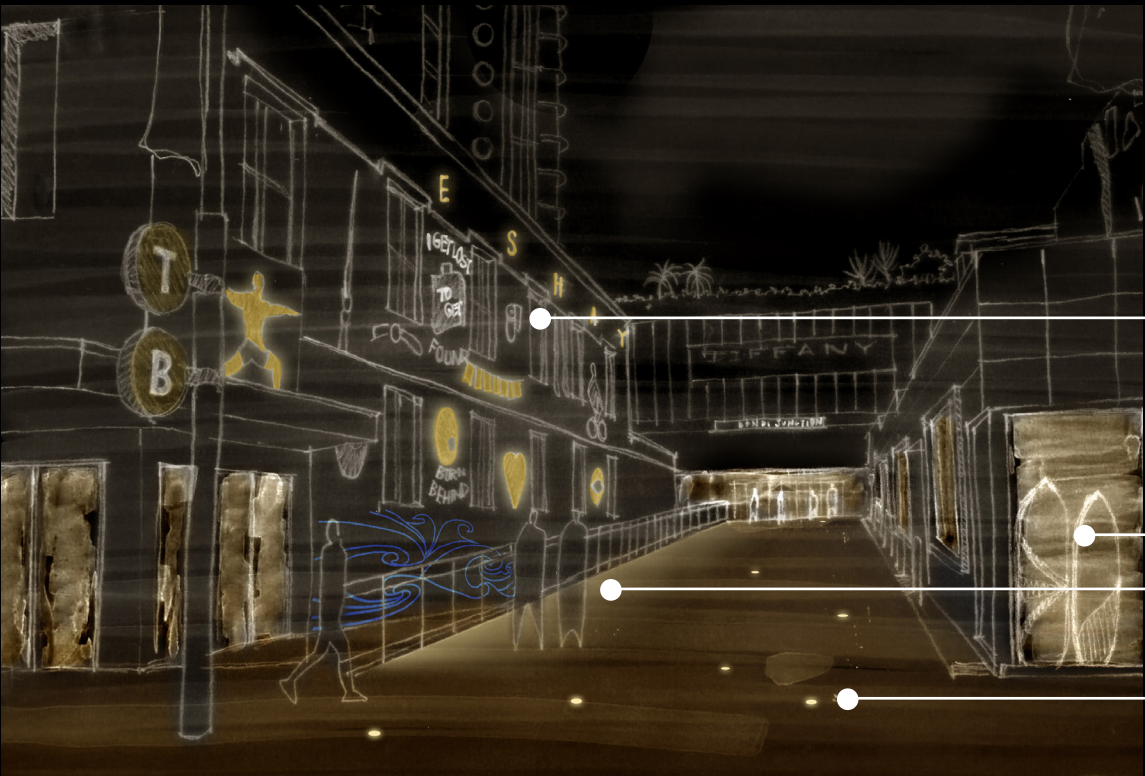
Lighting Design Direction: Consistent Tier 1 pedestrian pole and Tier 2 under awning lighting, façade and alfresco dining, retail frontages, wayfinding signage, seating lighting and tree lighting are to form the foundation of the lighting treatment elevating the mall from a through passage to a vibrant and active 'plaza room'. Quality façade, under awning and retail lighting

at the pedestrian level is critical in improving the night experience and encouraging after hours trade. The catenary lighting typology is to ground the plaza at a human scale whilst providing a connection and visibility to the night sky. The layout of catenary elements should assist in passive wayfinding with clusters located at key entry/ exit/ connection points for the plaza. These locations are to be co-ordinated with shade structures. A dynamic dimming programming of the catenary lit elements is encouraged with clusters subtly dimming up and down to respond to the active, moving, connecting nature of the mall and transit hub. The program may respond to weekday/ weekend variances or provide a seasonal response through rhythm or pattern. The murals flanking the entry to the train are to be highlighted either through lighting of the wall or a glowing painted element

providing a connection to Bondi Beach graffiti wall. A projected element may be considered over the top of the murals to provide a changing, topical and dynamic connection with Grosvenor Lane below whilst marker lighting is to provide passive wayfinding directing patrons to the bridge.



Mall: P3 - P5 category

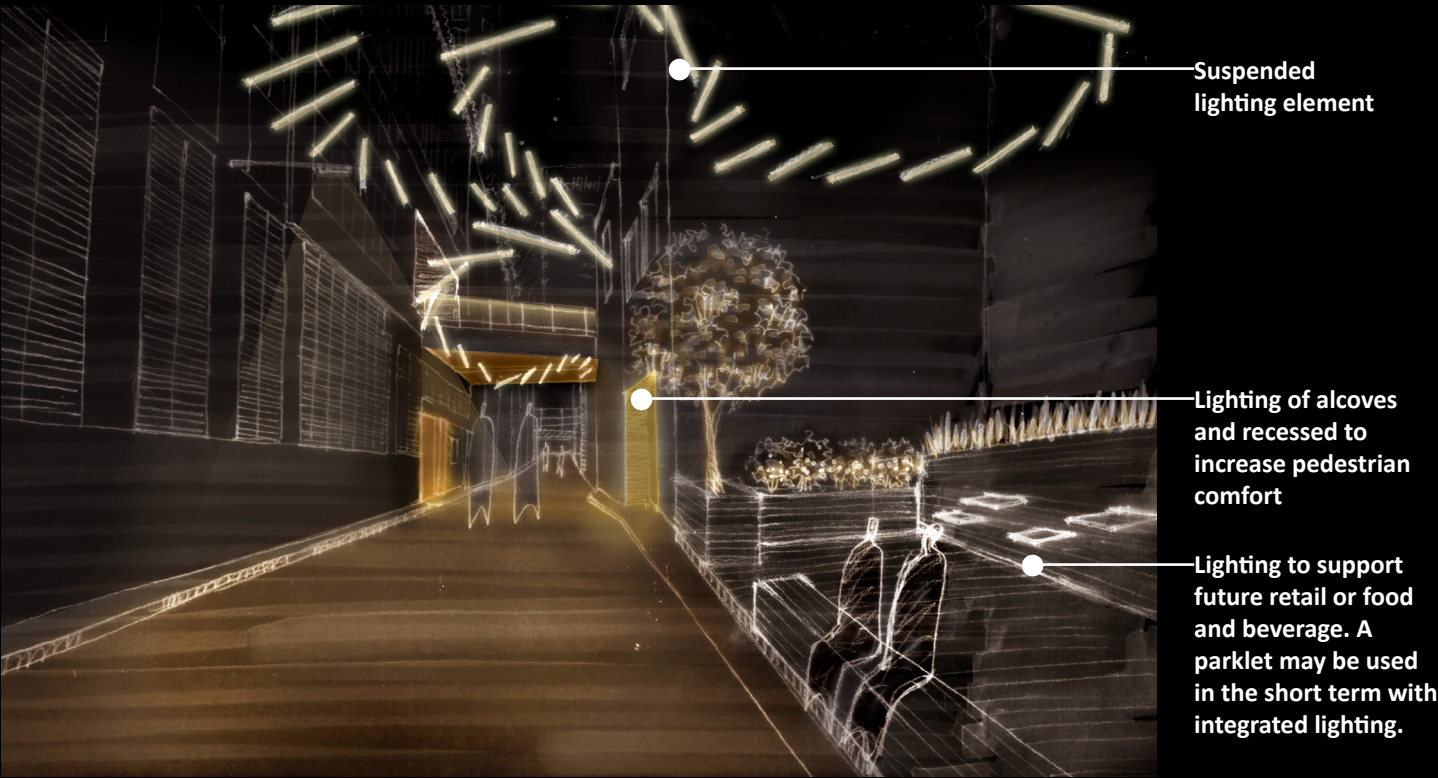


- Projection or light art connecting to Grosvenor lane and future access to train station below. Lit element to mural wall
- Retail lighting
- Integrated handrail lighting for the path
- Marker lighting for passive wayfinding

6.6.2 Grosvenor Lane

Objective: The activation of Grosvenor Lane below the connecting bridge to the train station from Oxford Street mall is to act as a precursor for future laneway retail offers and ground level connection to the train station from Oxford Street Mall.

Lighting Design Direction: A suspended lighting element should run through Grosvenor lane representing the Junction as a place of movement and connection. The height of the element is crucial in the success of the intervention in preparing the laneway for future retail offers and should be at a human scale. This element is to provide the functional lighting to the laneway; no lighting poles are suitable for this application. Wall mounted luminaires may be provided if required. Lighting of dark recesses and alcoves is encouraged to increase visual access for pedestrian comfort. Use of colour may be applicable in this area.





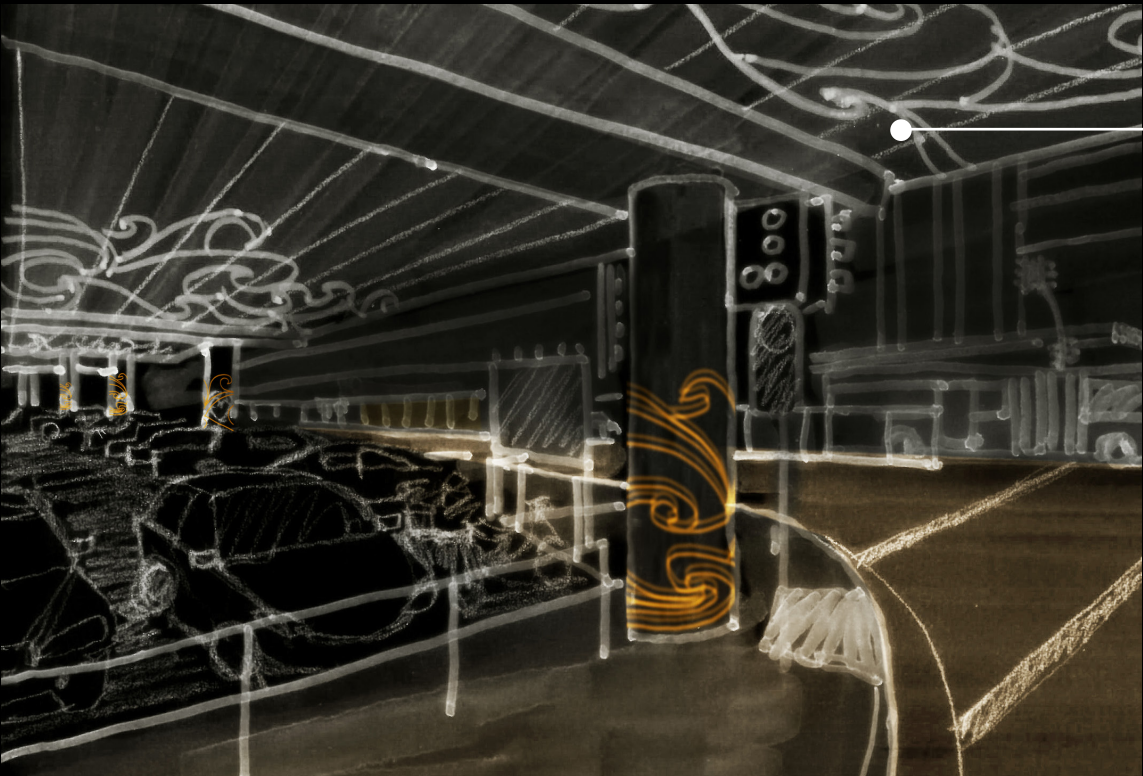
Bondi Junction Grosvenor Lane Lighting Concept Image

6.6.3 Connections under Syd Einfeld Drive to the North

Objective: To support improved connections under Syd Einfeld Drive to the north through a new and unexpected experience that is an attractor in itself to support passive surveillance and encourage use of these gateways to residential areas.

Lighting Design Direction: Lighting is to be applied to the surfaces of the columns and ceiling, to increase the perceived brightness, rather than focusing top down on the pathway in order to transform the space from a dark, uninspiring space to a vibrant destination that supports the pedestrian connection to the residential area beyond. The underpass is to become a canvas for local artists mirroring the Bondi Beach graffiti wall but using light as a medium.

community with their daily commute. For daily operation or between artist displays, the light art may consist of waves crashing on columns and the ceiling reflecting on beach culture of the area.



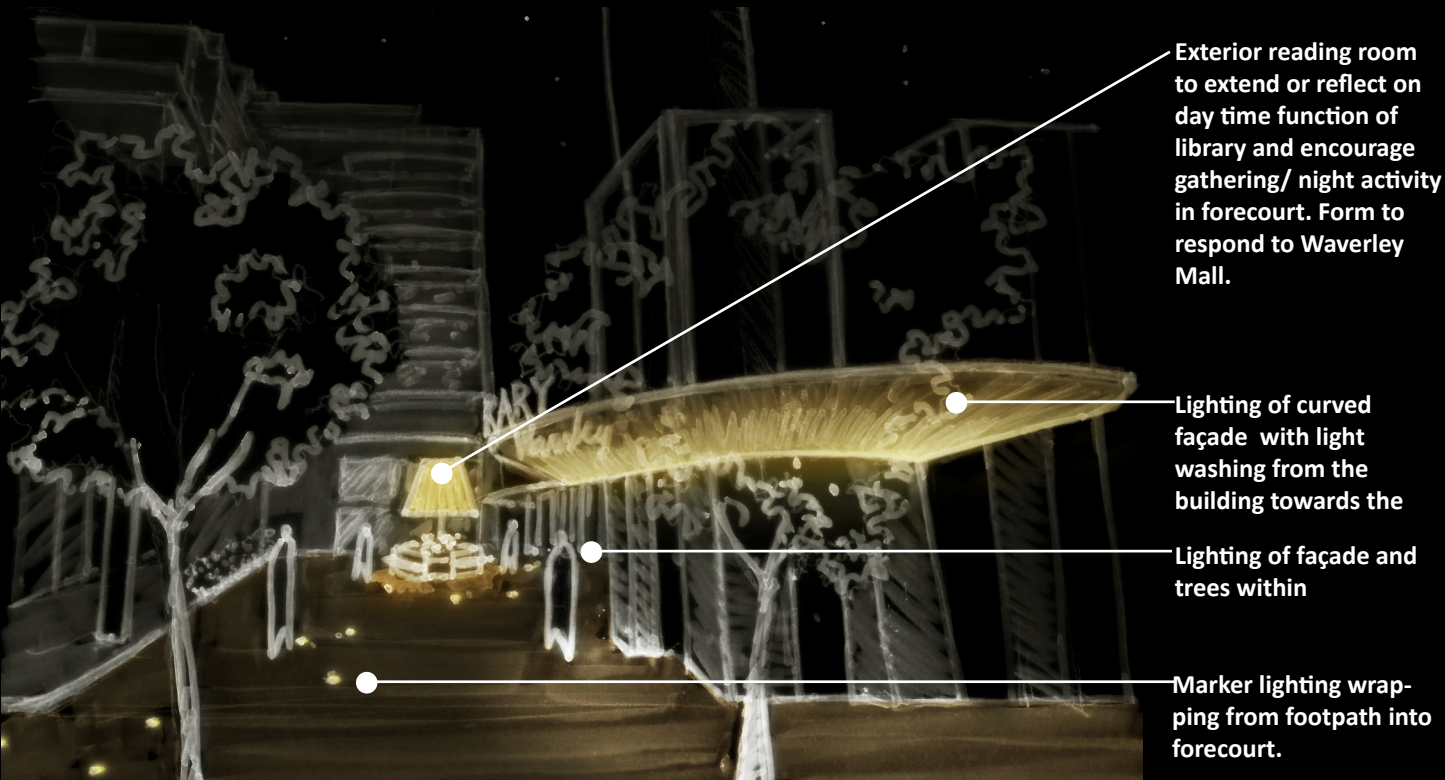
Light art to ceiling and columns of underpass

6.6.4 Waverley Library and Forecourt

Objective: To encourage civic activations in the forecourt of Waverley Library.

lighting intervention may alternatively consider luminous furniture to support gathering and flexibility to adapt the configuration to suit the night time activity use.

Lighting Design Direction: The lighting of the curved façade signifies the gateway drawings the patrons from the street into the library forecourt. This is supported by clusters of marker lights wrapping from the footpath to the rear of the forecourt. Ambient lighting from façade and tree lighting in the forecourt is to support night time activities. The exterior reading room intervention is a central beacon visible from the street that supports gathering after hours whilst extending the day time function of the library. The large scale lamp design is to relate to the proposed Waverley Mall intervention to provide a consistent visual language. The



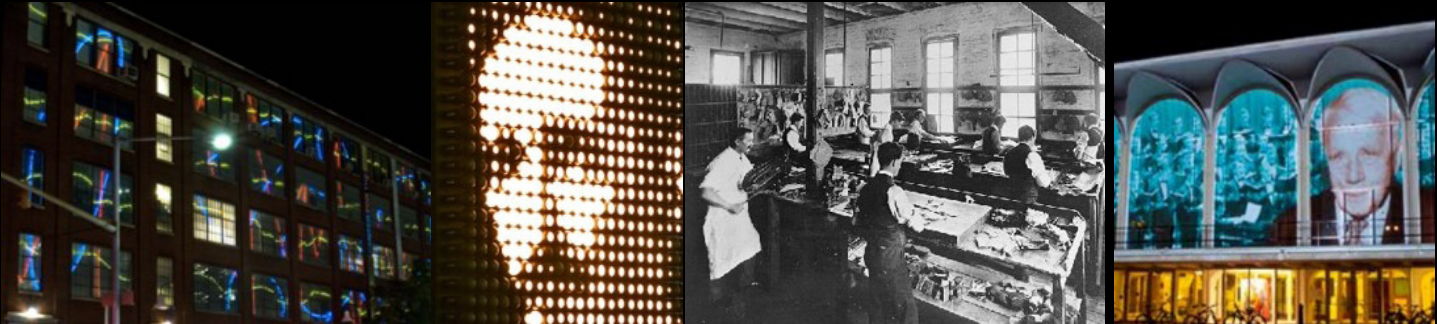
6.6.5 Norman Lee Place & the Boot Factory

Objective: To showcase the history of the Boot Factory to support the future activation of Norman Lee Place.

Lighting Design Direction:

As a significant heritage building in the Waverley LGA the lighting installation should be respectful of the building structure and respond to the history of the building. Historical photographs may be re-interpreted and used as the basis of a window lighting installation symbolising the notion of ‘looking into the past’. Projection may be used with the benefit of altering the image throughout the year. Alternatively if transparency is required for future use, a lighting grid within the window frame may be used to create pixelated representations of people who inhabited or tools once used within the building.

Additional lighting is to be provided to the forecourt and surrounding area to increase pedestrian amenity. Tier 2 lighting elements including lighting of trees and benches would be considered suitable.



Projection of pixel light grid within building windows

Tree and bench lighting to surrounding area.

6.6.6 Gateway Arrival Statements

Objective: To create arrival statements for Bondi Junction at Fingleton Reserve, Oxford Street and Bronte Road gateways that signals the entrance to the Junction as a destination.

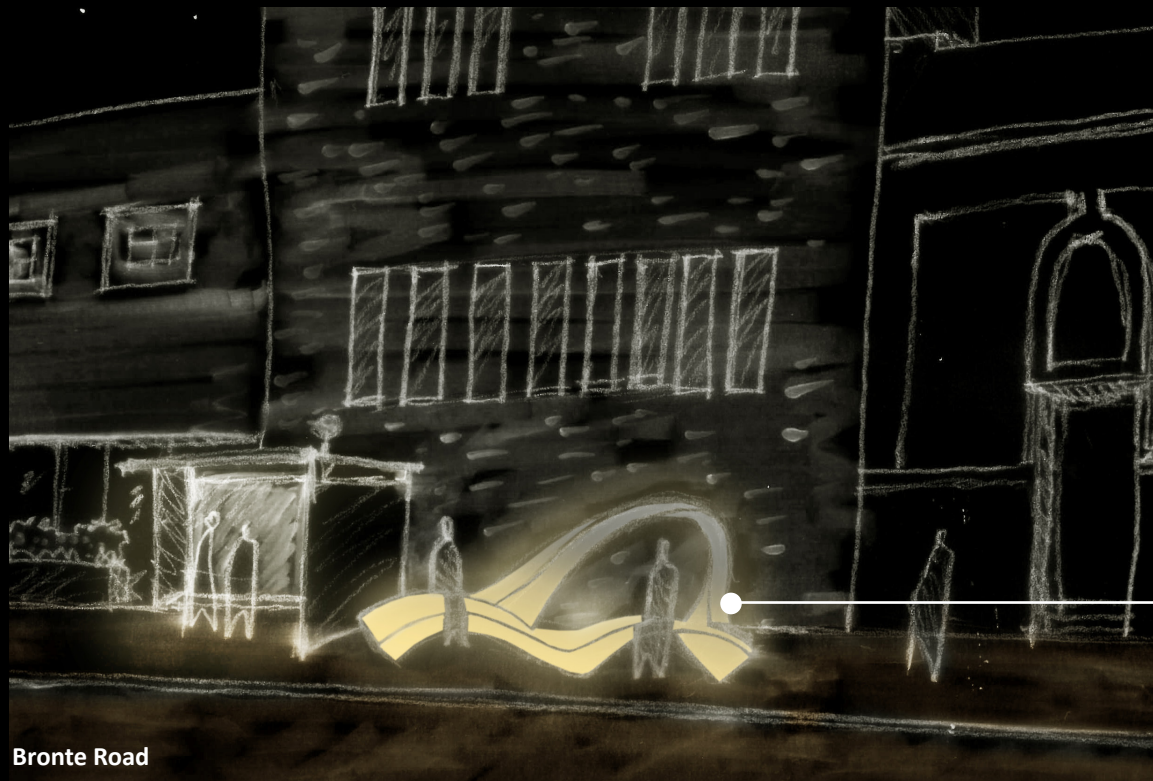
Lighting Design Direction:

These three key corners acts as the gateways into the Junction that is vibrant centre of Bondi. The gateway installation is to be of a suitable scale to create a visual impact and be legible for vehicles, cyclists and pedestrians alike. The installation at all three locations should be a similar in form for visual consistency but may be altered to suit the site conditions and adjacent location functions. The form of the installation should be representative of the character of the Junction and should be lit with warm white lighting for the sculptural element and cooler white to blue lighting in adjacent trees reminiscent of the daytime branding image. Where located on Bronte Road

the sculptural element may be scaled to allow patrons to sit within the form extending the exiting bus stop. Lighting of the sculpture should express form and have an ephemeral nature rather than being evenly lit.



Oxford Street



Bronte Road

Integrated lighting for sculpture to express form rather than being uniform and evenly lit. Warm white lighting is suitable

6.6.7 Waverley Street Plaza

Objective: To create a distinct night experience in Waverley Street Plaza to encourage after hours trading and connect the plaza with the evening cinema trade.

Lighting Design Direction:

The lighting basis and lighting typologies of integrated lighting of new seating elements, tree lighting, under awning lighting, retail and alfresco lighting provide the basis of the lighting solution. The lighting intervention provides an additional layer of light that reflects upon the history of Waverley Street being the site of the first house built in Waverley in 1827. As such the lighting intervention creates draws focus and enhances the seating areas to encourage people to gather, linger and relax as an extension of their own terrace or living space. New seating elements and tree lighting may support this concept in the longer term with the perforation design responding to the year of 1827 with a potential pattern developed from Morse code.



Concept design

- Tree lighting for in-crease sense of bright-ness
- Under awning light-ing, retail and alfresco lighting
- Exterior lamp installa-tion of varying scales for ‘exterior living room’
- New seating elements within integrated lighting



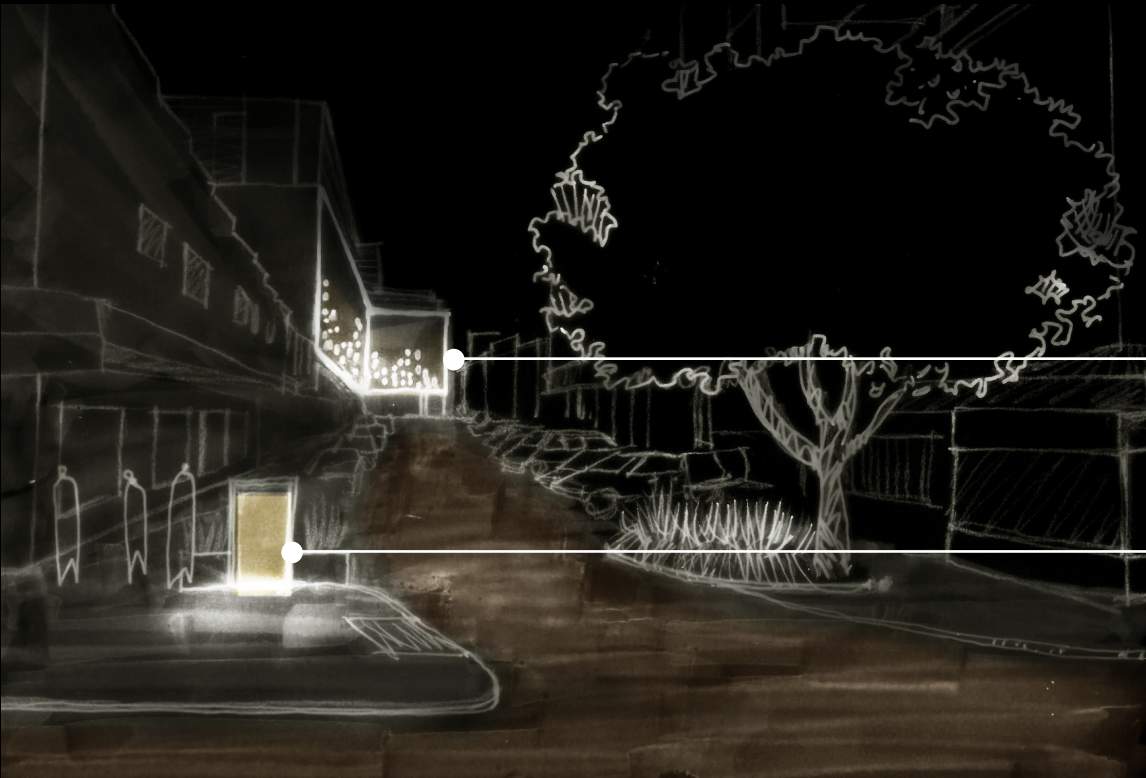
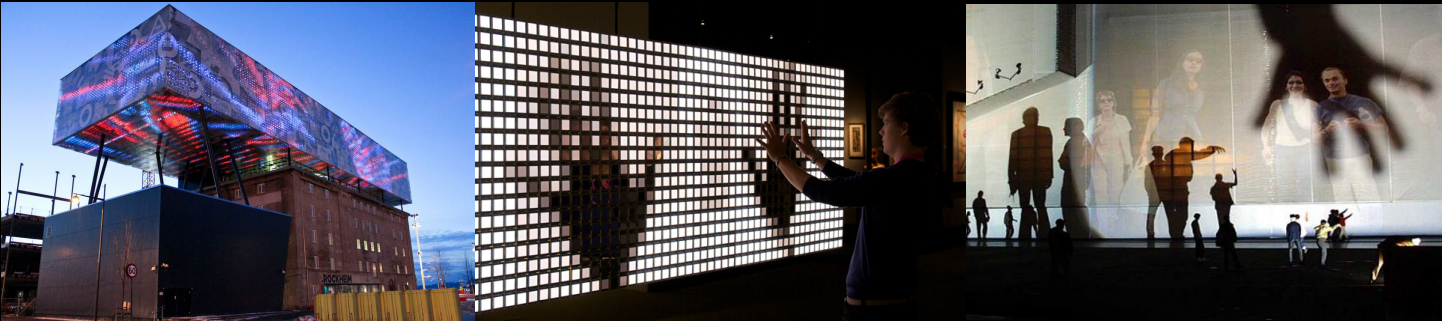
Proposed lighting art installation

6.6.8 Gray Street

Objective: To explore the opportunity for a large scale public art work and lighting installation in Gray Street to bring life and personality into this area of the precinct

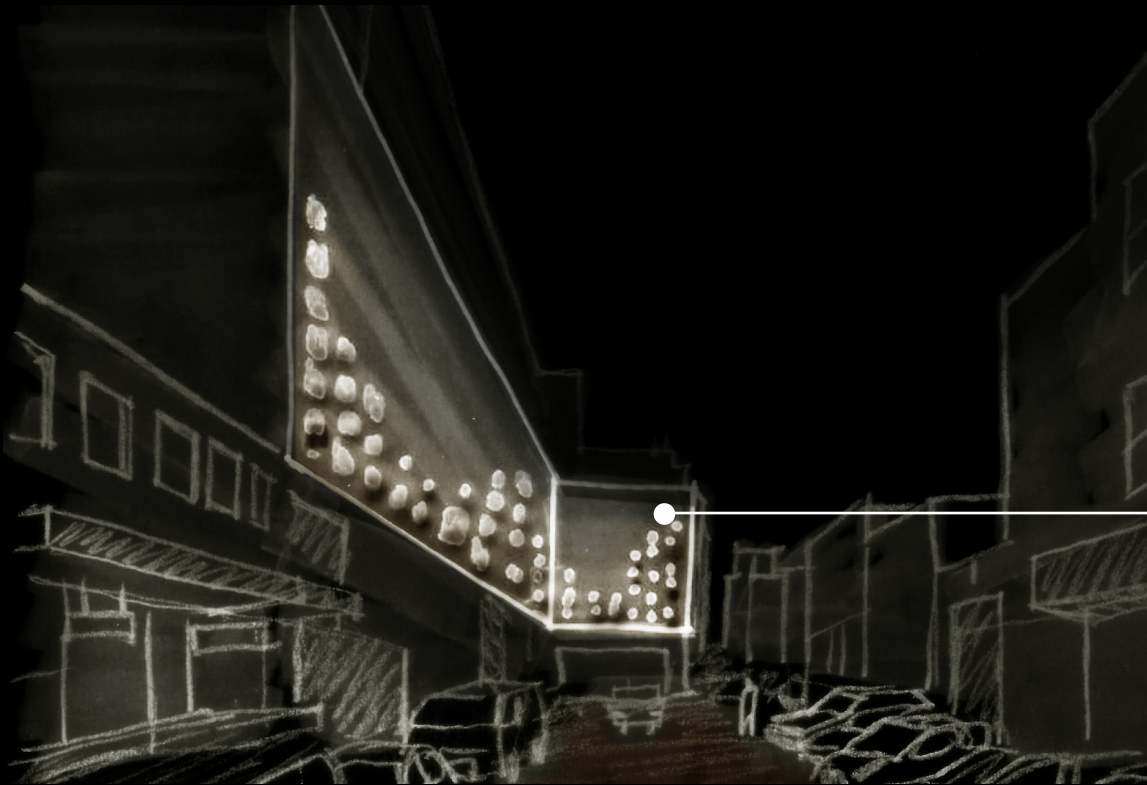
Lighting Design Direction:

The lighting basis of MFP and pedestrian pole lighting is to provide the basis of the lighting for the general streetscape. A large format interactive lighting installation is proposed to the blank façade of Westfield Bondi Junction. The installation is to be of a scale visible from Bronte Road connecting the desired night time trading in Spring Street and Bronte Road. The installation is to visually express the pulsing and rhythmic nature of the character of the Junction in an abstract form through light. There is the potential for the installation to have an interactive component during certain times where patrons are able to log into an app or use a kiosk to connect with the installation.



Large scale interactive lighting artwork

Potential kiosk point



Large scale interactive lighting artwork

6.7 Three Phase Power

Objective

Three phase power locations to be provide opportunities for temporary events.

Locations

- Oxford Street Mall at both ends to support markets or events;
- Oxford Street adjacent to Oxford Street Mall;
- Grosvenor Lane to support future retail or food and beverage installations;
- Waverley Plaza for potential night time activation and events;
- Connections under Syd Einfeld Drive for potential markets, concerts to encourage activation;
- Waverley Library and Forecourt;
- Norman Lee Place & Boot Factory.

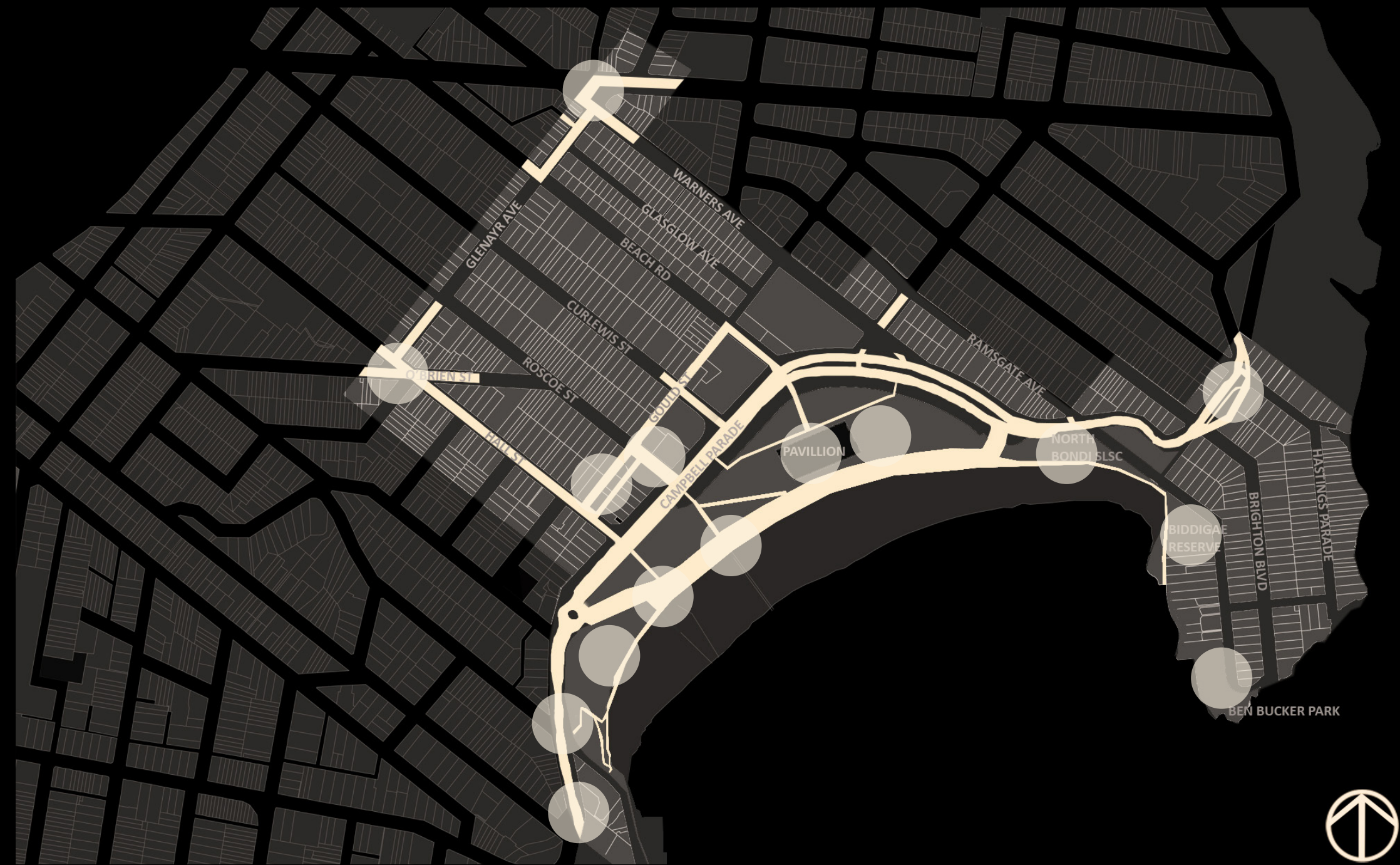


BØNDi BEACH

7.1 The Vision

An iconic and energetic central spine of a diverse cultural landscape.

Light expresses the playful and artistic character of Bondi Beach building upon and bringing to life existing artistic expression. Lighting welcomes residents and visitors and connects the user journey from the bustling food and beverage area of Campbell Parade to the reflective and transitional edge of the beach promenade.



7.2 Key Character Drivers Bondi Beach

At Bondi (Beach) layers of history coexist in harmony with the contemporary

Bondi (Beach) Showcases the legacy of our beach culture, artistic and creative talent and our diverse community.

Coastal life and a locals backyard; With strong community ownership Bondi Beach is a place for **shared experiences** from the **humble** BBQ, or a day at the beach through to large events.

Iconic; A **dramatic** place that many feel is iconic in its representation of **contemporary** Australian culture.

An artistic mosaic; A place of artistic expression where many parts come together to create the overall experience. **Intricate** and **colourful** mosaics of tiles and shells complimented by graffiti walls that are consistently **changing** and **evolving** overtime.

High energy; Bustling with visitors to night clubs or bars, or pumping iron, running and swimming, it is a place for the **energetic, playful** and **youthful**

7.3 Key Strategies Bondi Beach

1. Marking key gateways to the Bondi Beach area including 5 ways, 7 ways, Military road and Bondi road.

2. Create unique experiences in key locations- Bondi Park, The Promenade, Campbell Parade that are memorable and celebrate site and scenic qualities as well as expressing the cultural landscape.

3. Support retail, food and beverage stores that trade out onto the street on Campbell Parade through lighting of buildings, street infrastructure and trees.

4. Create a strong connection between Campbell Parade and the Promenade.

5. Create a distinct lighting experience for Roscoe Street Mall and Gould Place to indicate a destination for gathering events and programs.

6. Treat Gould Laneway as an artistic installation opportunity.

7. Consistent lighting treatments in Gould street, Hall street and Beach Road for under awning lighting, urban structures, seating, trees and building facades.

8. Highlight the historic Bondi Pavilion & Bondi Beach SLSC. This area is undergoing a separate design process. Lighting should be used to showcase these landmark buildings in a way that is respectful of these heritage buildings. Lighting is recommended to all sides of the facade and immediate surrounding area for safe passage and to highlight the Pavilion as the gateway to the beach.

9. Highlight the contemporary North Bondi SLSC & outdoor gym.

10. Enhance mosaic artworks at Biddigal Reserve Children’s pool with integrated lighting or lit element for subtle highlight without encouraging swimming after dark.

11. Activate Biddigal Reserve Play Areas.

12. Enhance Ben Buckler Park interpretations in the early evening and morning.

13. Activate Bondi Park, play areas and picnic shelters in winter in the early evenings to support outdoor play and recreation.

14. Extend hours of use and make Bondi Skate Park a feature.

15. Reinforce the Bondi Stairs, connecting Bondi Park and Icebergs/ public amenities as a gateway to the Coastal Walk.

16. Create a transitional edge condition along the promenade creating a transition from Campbell Parade to the beach that connect to two places and moves away from a floodlit approach.

17. Highlight seating along the Promenade to support early evening activation.

18. The promenade and graffiti wall; short term encourage artists to include lit elements in their work/ long term; apply permanent lighting.

19. QED & Parks Drive carpark lighting to be upgraded to support night time activities/ businesses at the Pavilion & Bondi Surfclub as well as extended hours of use of Bondi Park.

20. Provide lighting to footpaths that connected the Pavilion and Surf Club to the carparks.

7.4 Tier 1: Base Lighting. The Streetscape and Pedestrian Paths

Objective

Provide a consistent base layer of lighting to the streetscape that is visually integrated, provides a legible family of luminaires and activates the street at a human scale.

Design Approach

The base layer of light is to improve the night time environment providing the functional requirements for safe movement of all users. The solution will vary pending the street type, scale, function and level of use. The street types have been defined as **Campbell Parade, village/ commercial streets** and **neighbourhood streets**. In addition to commercial streets, there are a series of commercial urban laneways that are to have a similar approach to a commercial street. Within these areas are large carparking zones that are to be treated in the same language of the adjacent street. It is important to use light intensity and luminaire type to establish a legible night time environment that assists in passive wayfinding and identity for the precinct.

Tier 1 Elements

Campbell Parade: MFP, Pedestrian Crossing Luminaire, Pedestrian Pole, Cycleway Treatment. Refer to Tier 2 Amenity Lighting and Tier 3 Lighting Interventions Applicable to this street type.

Village/ Commercial Street: MFP (with integrated amenity lighting as applicable), Pedestrian Pole, Pedestrian Crossing Luminaire, Cycleway Treatment. Refer to Tier 2 Amenity Lighting Applicable to this street type.

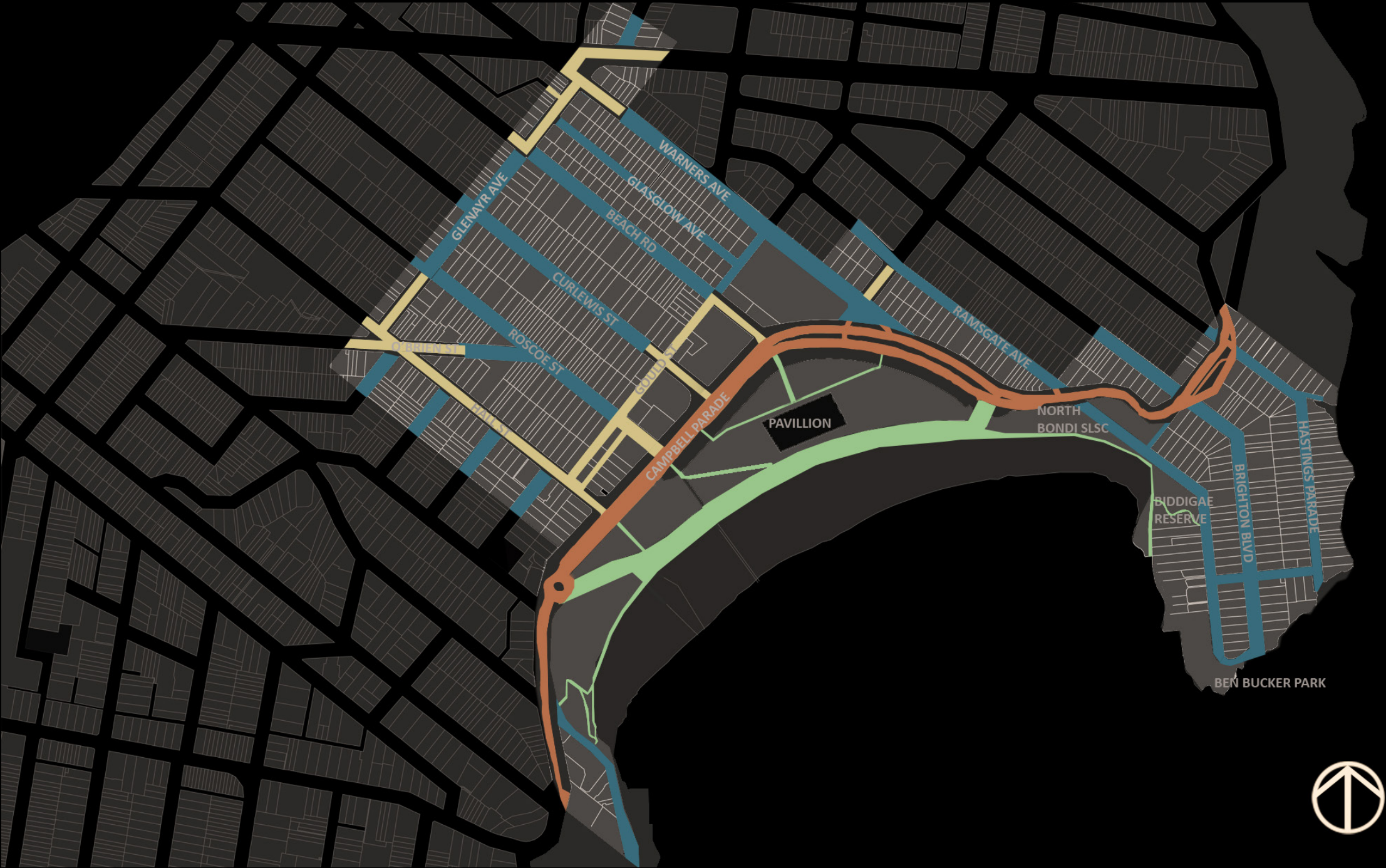
Neighbourhood Street: Ausgrid Pole.

Major Park Pathways: Pedestrian Pole. Refer to Tier 2 Amenity Lighting and Tier 3 Lighting Interventions Applicable to this area.

Carpark: MFP

Lighting Timing

Typically the base lighting elements should be on from dusk to dawn. Outside of peak hours of use the lighting level in certain streets or laneways and Bondi Park may be reduced to provide a lower level of light for safe passage reducing the overall energy consumption.



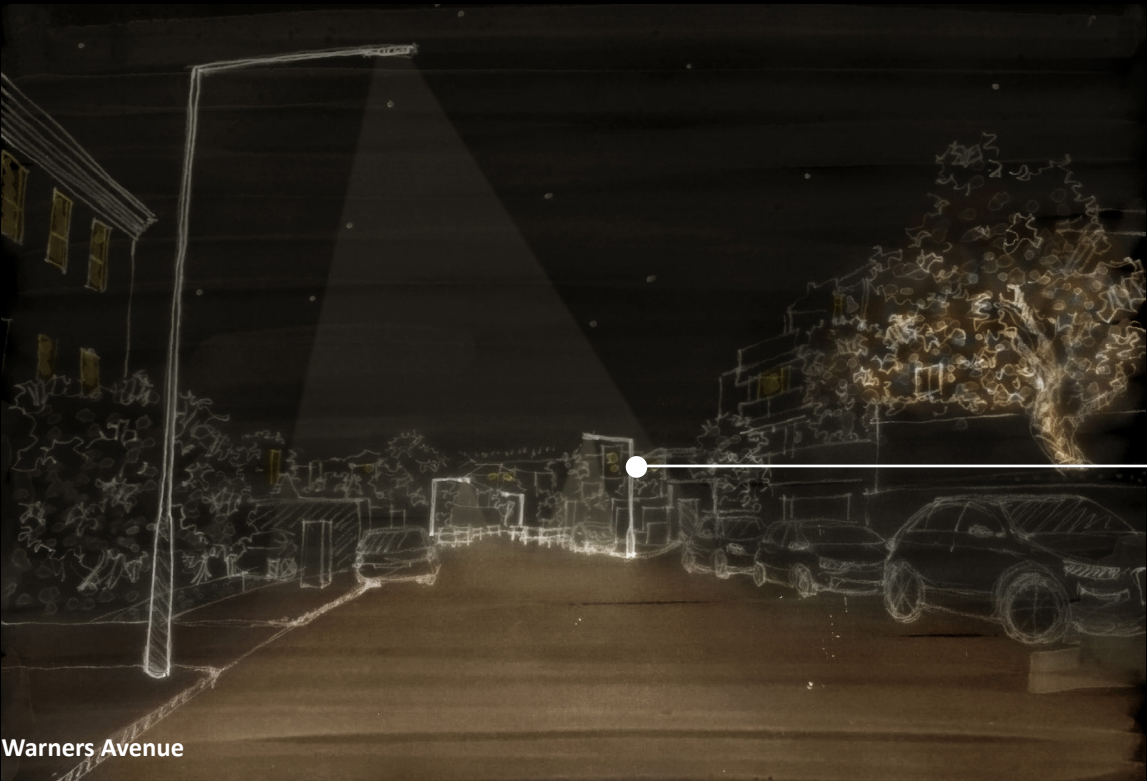
7.4.1 Typical Village/ Commercial Street



Hall Street

Village/ Commercial Street: P2- P4 range

7.4.2 Typical Neighbourhood Street



Warners Avenue

Neighbourhood Street: P2 - P5 range

7.5 Tier 2: Amenity Lighting. The Enhanced Streetscape and Parks

Objective

To re-orient the streetscape focus to a more human and pedestrian scale, increase passive surveillance, provide passive wayfinding and activate the night environment.

Design Approach

This lighting tier aims to improve the public domain urban lighting environment through a combination of pedestrian scale typologies and upgrades to lighting of the private domain. Businesses are encouraged to improve their facade, alfresco and retail lighting and extend their night time trading hours. These elements aim to support an active and lively night time atmosphere. The lighting typologies may be applied throughout the LGA. The locations identified in this section of the report demonstrate the application of these elements in key streets that have been identified as a precursor for after hours trading. Additionally, key parks and public spaces have been identified as playing a critical role in the pedestrian night time experience.

Tier 2 Elements

Campbell Parade: MFP with integrated tier 2 amenity elements, facade and alfresco lighting, retail frontages, under awning lighting, wayfinding signage, bus shelter lighting, seating and urban structures lighting (including shade structures), tree and plant lighting, monument, artwork and sculpture lighting.

Village/ Commercial Street: Facade and alfresco, retail frontages, under awning lighting, connecting element lighting, wayfinding signage, bus shelter lighting, catenary lighting, seating and urban structures, tree and plant lighting, lighting of artworks and sculpture. Amenity lighting may be integrated into the MFP as applicable.

Parks: Seating and urban structures, tree and planting, lighting of natural features, artwork and sculpture lighting, marker lighting.
Refer to Tier 3.

Beach Promenade: Connecting element lighting, seating and urban structures, lighting of natural features, marker lighting, artwork and sculpture lighting.
Refer to Tier 3.

Key Pedestrian Amenity Areas

1. Campbell Parade
2. Hall Street, Gould Street, sections of Roscoe and Curlewis street, 5 ways, 7 ways
3. Residential parklets
4. Pedestrian connections; Bondi Park, Bondi promenade, Bondi Pavilion and Surf Club

Lighting Timing

Campbell Parade and Commercial District: Typically tier 2 lighting should operate from dusk until 2am to assist in encouraging after hours activity and movement. After this time only functional lighting is to remain on until dawn.

Bondi Park: Lighting times to be staggered across the park.

Typically tier 2 lighting elements to the skate park and playground areas should be limited from dusk to 9pm in consideration of residential amenity and the natural wildlife habitat whilst supporting night-time use equivalent to daylight savings times.

Key thoroughfares through the park and tier 2 elements that support night time activity should remain on from dusk until 11pm.

Functional lighting that supports night-time activities and businesses of the Pavilion and Bondi Surf Clubs including pedestrian connections to carparks and public transport should remain on from dusk until 2am.

Park: Typically tier 2 lighting should operate from dusk until 11pm. After this time only functional lighting is to remain on.

Bondi Promenade: Typically tier 2 lighting should operate from dusk to 11pm. After this time, only lighting to key stairs and marker lighting is to remain on until dawn.



7.5.1 Campbell Parade

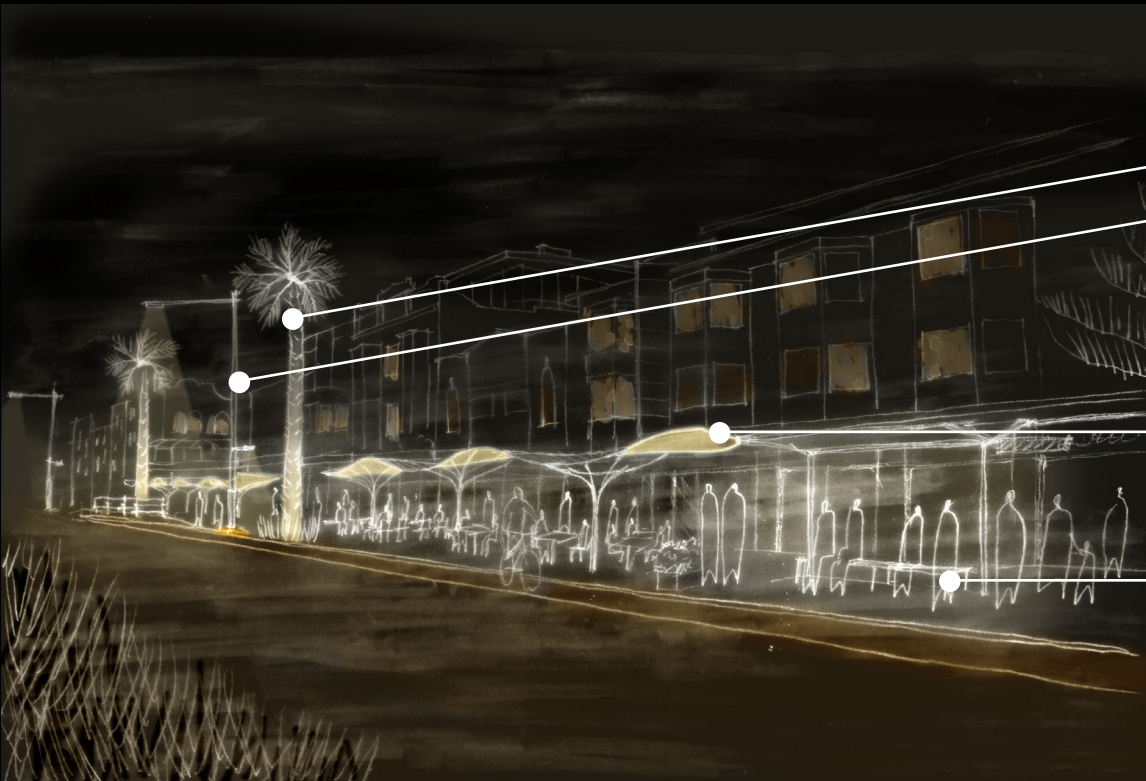
Objective: Lighting is to be used to express the unique identity of Campbell Parade providing a consistent and pedestrian scale street scape that supports evening trading out. At the street level, lighting is to provide a sense of arrival and distinct character of Campbell Parade which may be achieved by a luminous cladding to the MFP from each arrival end of this corridor and lighting of the central line of palm trees.

At the pedestrian level, tier 2 lighting treatments are to be used in a layered manner to assist in re-connecting the shops and beachfront promenade in the evening. Lighting is to be provided to new shades structures and seating providing a consistent visual language. This is to be supported by under awning lighting, facade lighting and alfresco dining to re-engage with pedestrians.

A gradient of light should gradiate out from the bustling Campbell Parade towards the beach to assist in enhancing the visual connection. Lighting is to be provided to

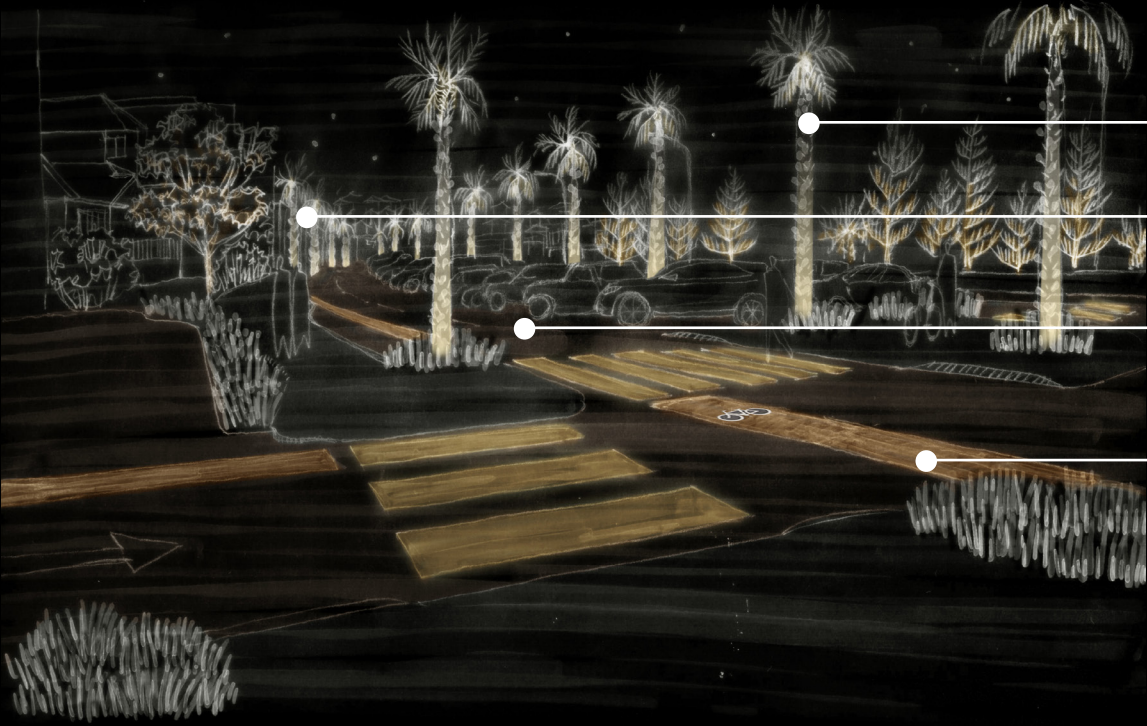
pedestrian connections to facilitate movement across Campbell Parade and reduce the perceived street scale.

Tier 2: Facade and alfresco lighting, retail frontages, under awning lighting, connecting light elements, wayfinding signage, bus shelter lighting, seating and urban structures, tree and plant lighting, monument, artwork, sculpture lighting . A tier 2 layer of light may be applied to the MFP with a luminous cladding for Campbell Parade to be considered. Amenity lighting may be integrated into MFP as applicable.



- Tree and plant lighting
- MFP with wayfinding and luminous cladding. Pedestrian pole.
- Shade structure lighting, alfresco dining, facade and under awning lighting
- Bus shelter lighting and surrounds

Campbell Parade: V1 - P1 range



- Tree and plant lighting
- MFP with wayfinding and luminous cladding. Pedestrian pole.
- Pedestrian Crossing MFP
- Consideration to be given to cycleway glowing treatment to length of Campbell Parade

Campbell Parade: V1 - P1 range
Pedestrian Crossing: AS1158.4

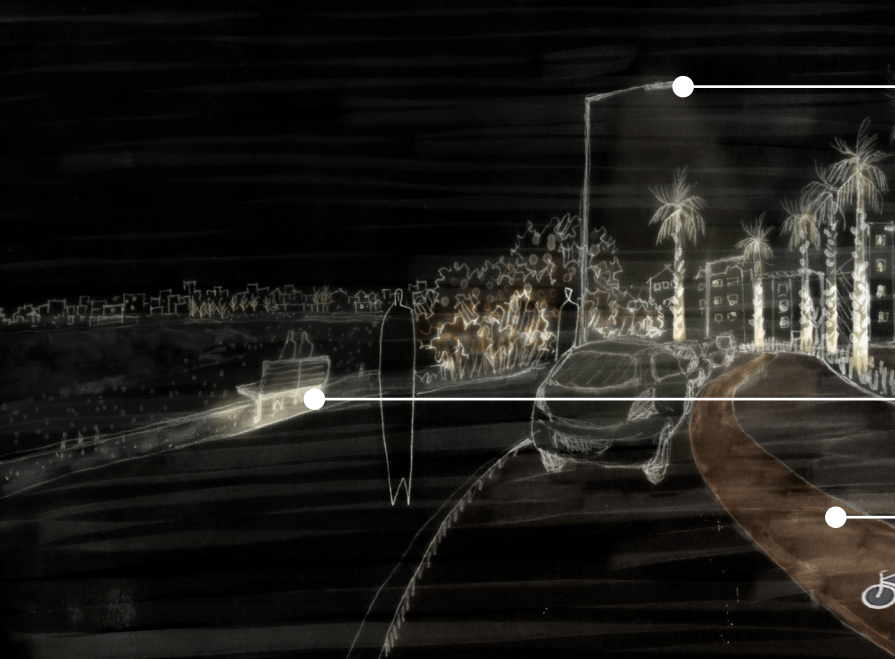
7.5.1 North Campbell Parade

Objective: Lighting treatments to Campbell Parade are to extend up to North Bondi continuing the identity of the streetscape. Key looking out areas may incorporate bench lighting to define the area from the general streetscape. Lighting is also to provide a pedestrian scale to the wide transport hub. Under awning lighting, alfresco dining, tree lighting and integrated bench lighting to parklet locations will assist in grounding the space at a human level. A tier 1 pedestrian pole is also suitable in this location to assist in providing a village feel. Pedestrian zones may be enhanced with urban treatments to the paving for both day and night time differentiation.

Bus shelter lighting is to be enhanced with amenity lighting to the surrounding area to assist in promoting improved public transport accessibility within the greater Bondi Beach area.

Lighting should be provided to the staircase connecting North Bondi to the North Bondi RSL below assisting in connecting pedestrians with the beach.

Tier 2: Facade and alfresco lighting, retail frontages, under awning lighting, connecting light elements, wayfinding signage, bus shelter lighting, seating and urban structures, tree and plant lighting, monument, artwork, sculpture lighting . A tier 2 layer of light may be applied to the MFP with a luminous cladding for Campbell Parade to be considered. Amenity lighting may be integrated into MFP as applicable.

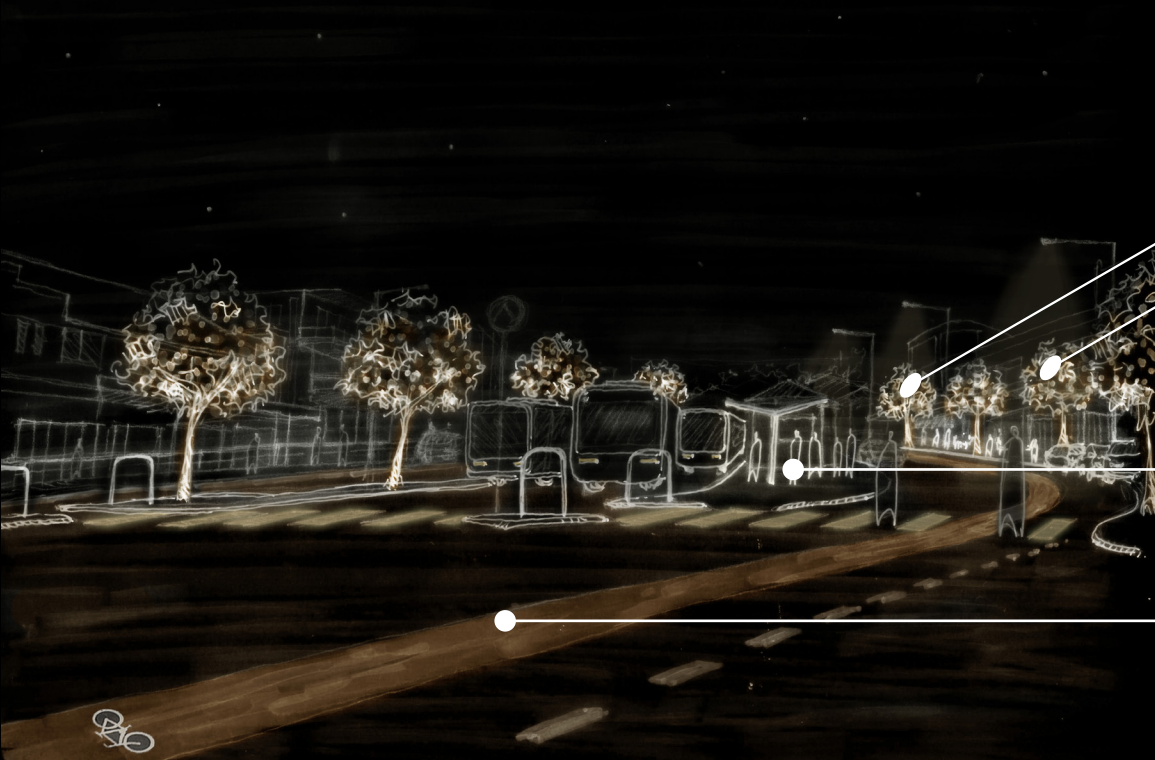


Campbell Parade: V1 - P1 range

MFP with wayfinding and luminous cladding. Pedestrian pole.

Seating lighting

Consideration to be given to cycleway glowing treatment to length of Campbell



Tree and plant lighting

MFP, pedestrian pole, alfresco dining, retail frontages, under awning lighting

Bus shelter and surrounds lighting

Consideration to be given to cycleway glowing treatment to length of Campbell Parade

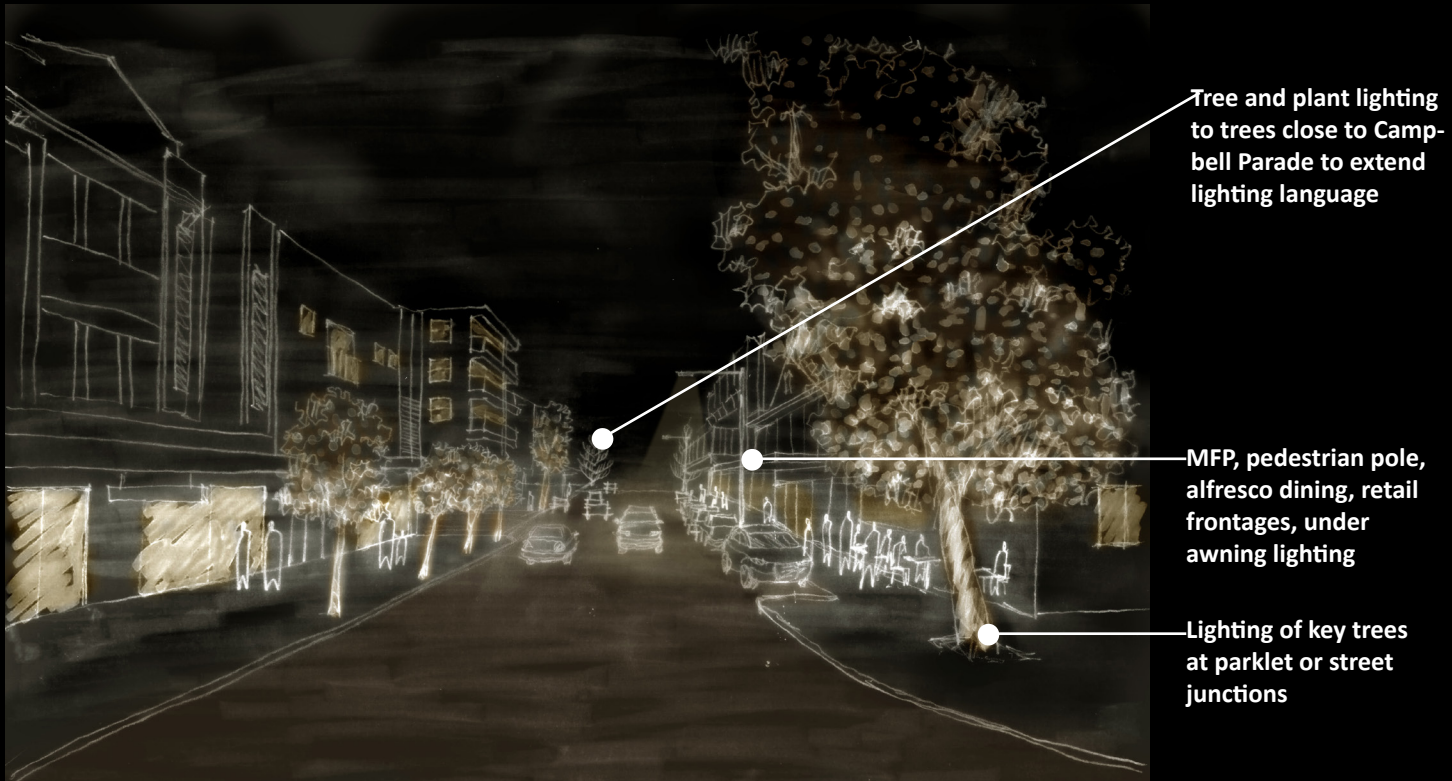
7.5.2 Hall Street, Gould Street, sections of Roscoe and Curlewis street, 5 ways, 7 ways (Typical Approach)

Objective: Provide a consistent and pedestrian focused street scape approach to support the commercial district. Tier 2 lighting elements are to be layered to enhance the night scape that peels off from the main spine of Campbell Parade. Under awning lighting, facade and alfresco lighting are encouraged.

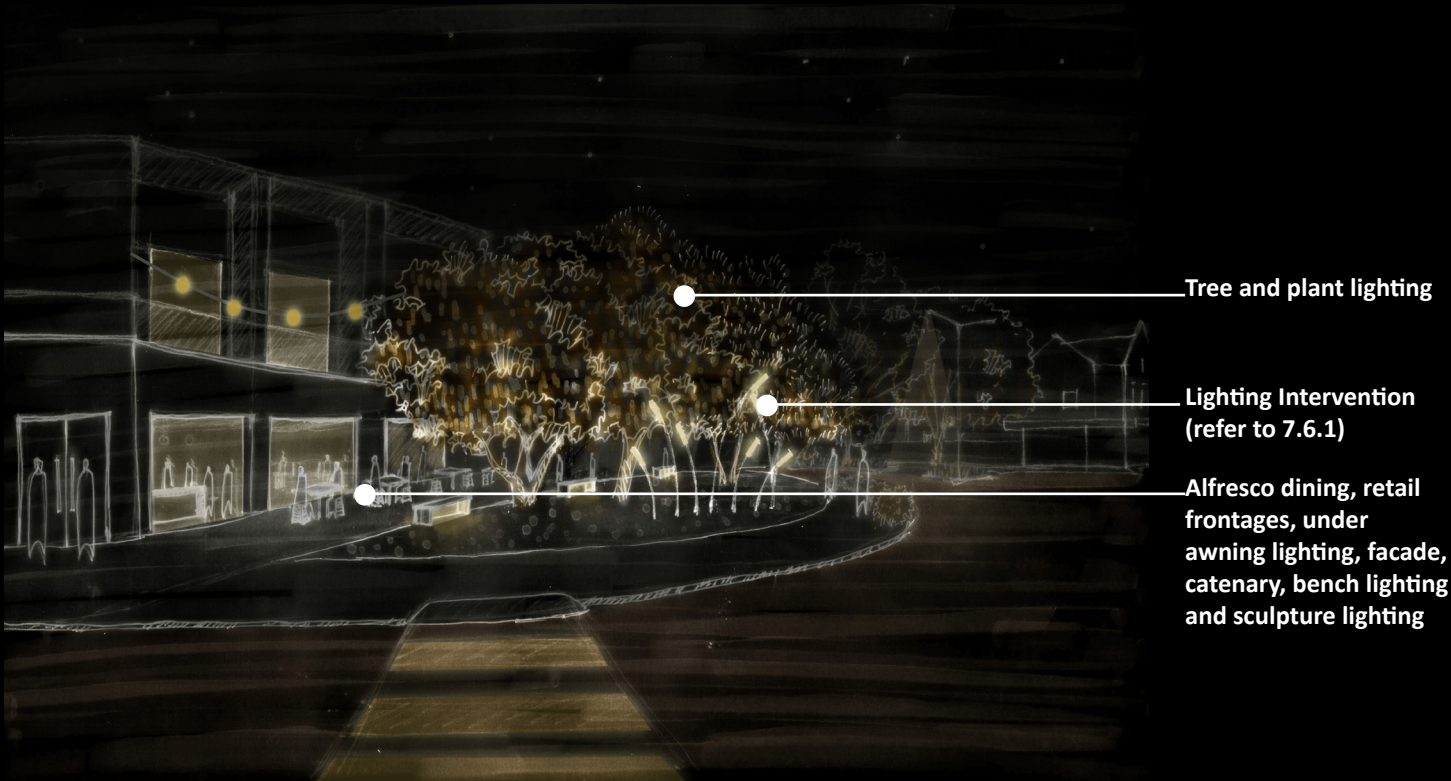
Where parklets are located at key corners or street junctions, lighting may be applied to selected trees or seating elements as a wayfinding tool and to provide rhythm and structure to the night environment.

At 7 ways pedestrianised evening dining area additional lighting elements may be applicable to create an outdoor room. The lighting approach is to be similar to a plaza or mall where catenary lighting may provide a transparent ceiling to provide an active and inviting atmosphere.

Tier 2: Facade and alfresco lighting, retail frontages, under awning lighting, connecting light elements, wayfinding signage, bus shelter lighting, seating and urban structures, tree and plant lighting, monument, artwork, sculpture lighting . Amenity lighting may be integrated into MFP as applicable.



Village/ Commercial Street: P2 - P4 range

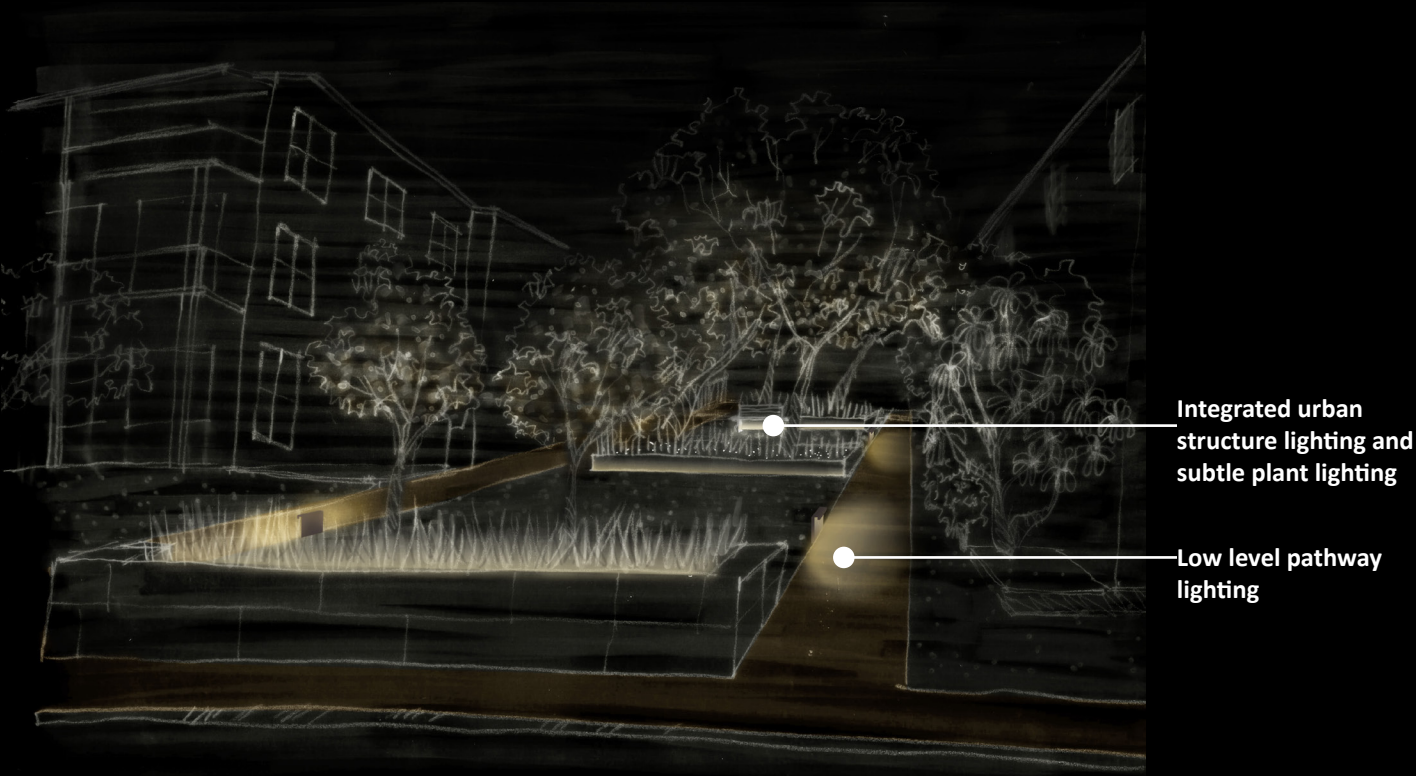


Village/ Commercial Street: P2 - P4 range
Pedestrian Crossing: AS1158.4

7.5.3 Residential Pocket Parks

Objective: Provide lighting for safe passage that is considerate of neighbouring properties. Lighting should only be applied to residential pocket parks if there is a through path. Tier 2 lighting elements may be layered to provide entry, perimeter and through path lighting. Low level lighting is required to reduce impact on adjacent residents. Low level lighting may also be applied in areas adjacent to the path to increase visual depth and provide pedestrian comfort. Residential parklet lighting may dim or turn off after 2am.

Tier 2: Integrated bench lighting or urban structure lighting to mark pathway, pedestrian pole may be located at main entry, subtle planter lighting may be applicable in certain areas.



Parklet: P5 for pathway

7.5.4 Pedestrian connections; Bondi Park, Bondi Promenade, Bondi Pavilion and Surf Club

Objective: Support and extend use of the park after dark by increasing access to key thoroughfares, night time amenity and night time activities at the Pavilion and Surf Clubs.

Tier 2: Pedestrian pole, integrated bench lighting, low level wall lighting.

Refer to Tier 3 for additional treatments to these areas.



Major Park Pathway: P3 - P4

7.6 Tier 3: Lighting Interventions

Objective

To respond to site specific locations as identified in the place strategy that provide an opportunity to amplify the vibrancy of the Beach area, contribute to an engaging and memorable night time journey and express the unique identity of Bondi Beach.

Design Approach

Tier 3 lighting should encourage locals and visitors to linger and gather by creating a pause in the user journey through human scale engaging, interactive and dynamic lighting interventions. In this way the night time environment is activated with lighting acting as a catalyst for after hours trade and improved pedestrian access within the commercial districts of the Bondi Beach. The lighting interventions should connect visitors and locals to place through creative and interpretive lighting as well as assist in wayfinding and orientation.

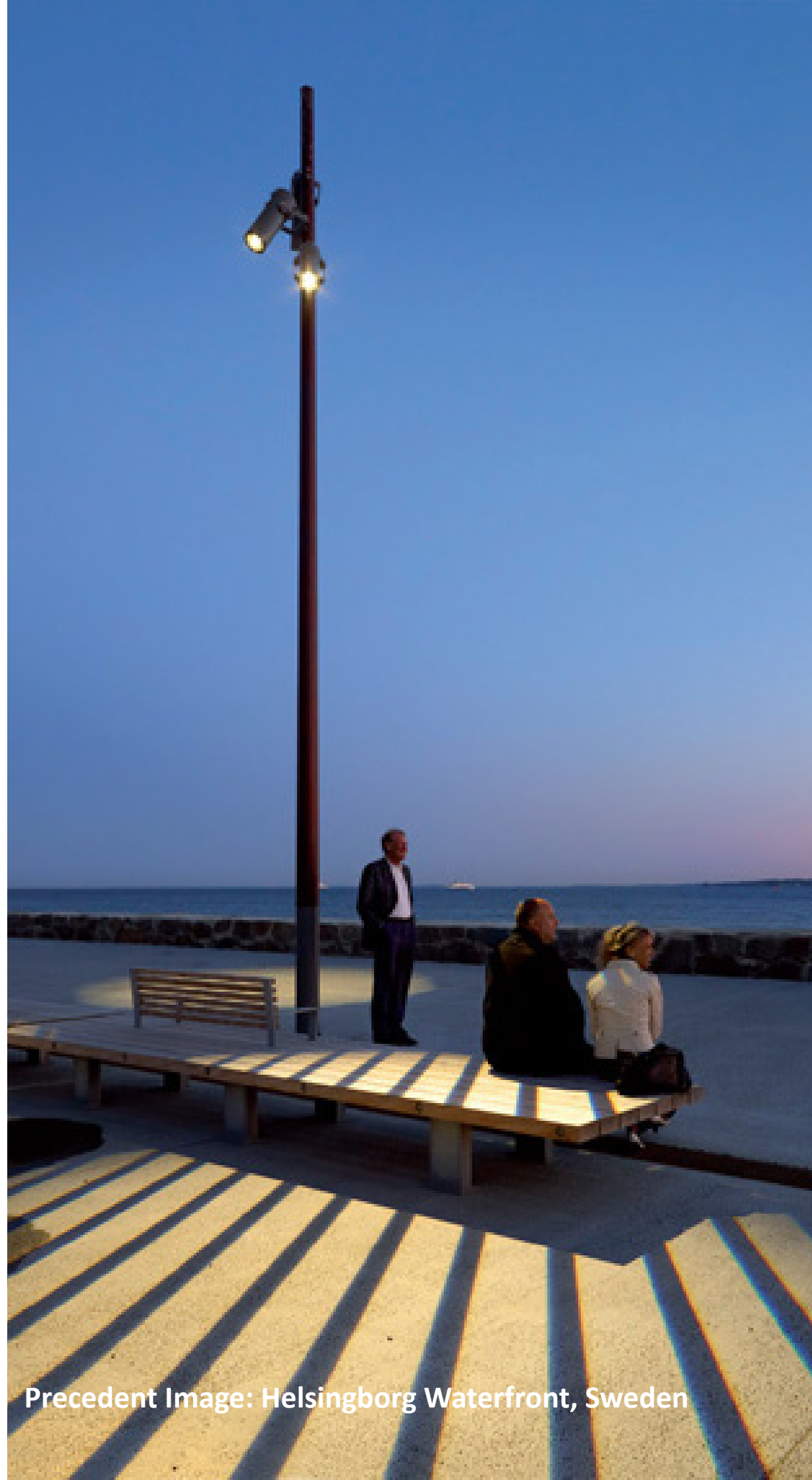
Locations

1. Gateway Arrival Statements 5 ways, 7 ways, Bondi Reserve, Military Road, Bondi Beach and Bondi Road;
2. Roscoe Street Mall and Gould Street Place;
3. Gould Lane;
4. Bondi Pavilion & Bondi SLSC
5. Bondi Park, Bondi Skate Park, amenities and gateway stair towards the Coastal Walk, Bondi Beach Promenade;
6. North Bondi SLSC (Completed);
7. Biddigal Reserve and Pools;
8. Ben Buckler Park.

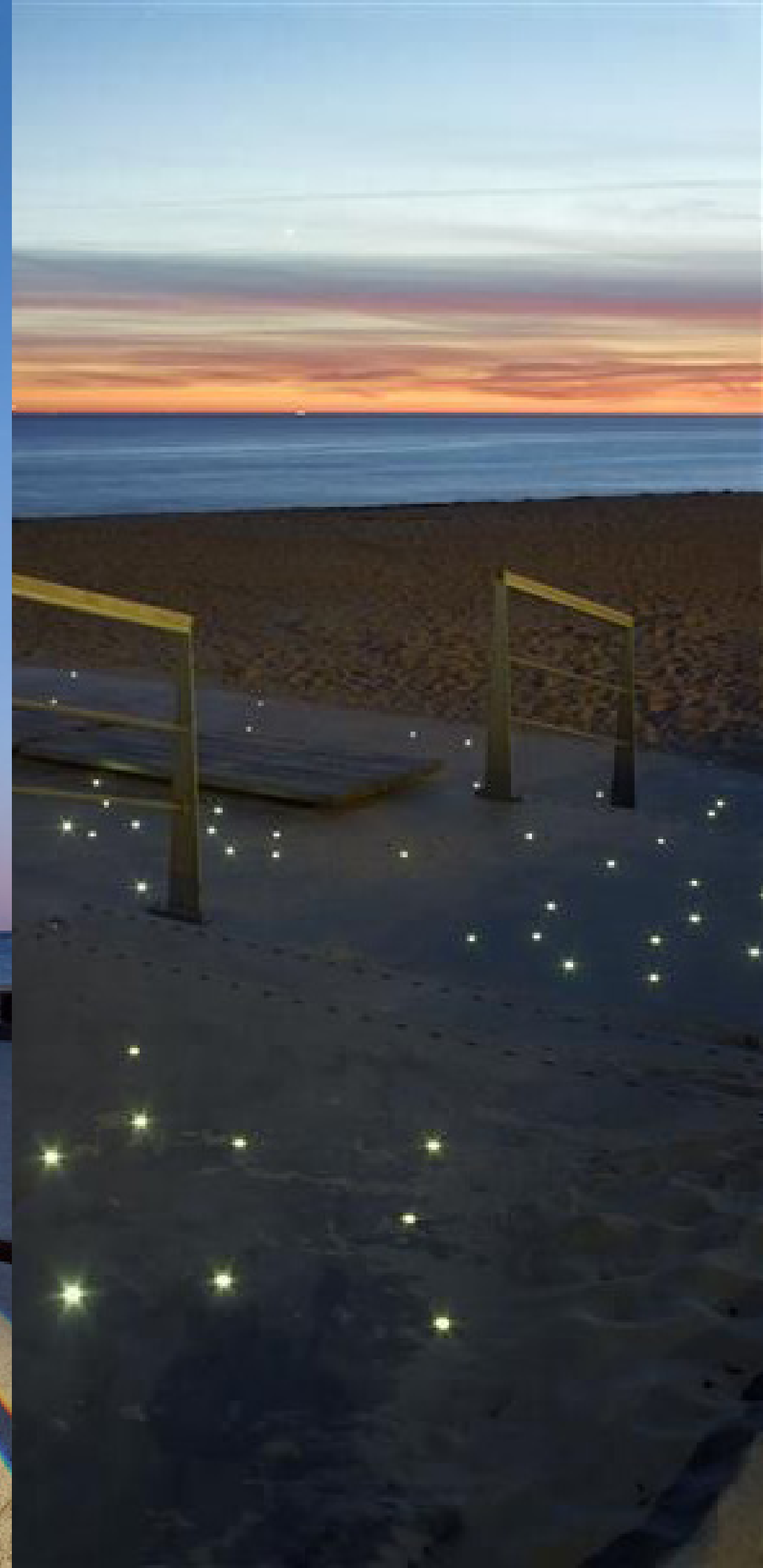
Lighting Timing

Typically lighting interventions within the Bondi Beach Area should operate from dusk until 2am to assist in encouraging after hours activity and movement. After this time certain elements of the lighting interventions may turn off to conserve energy. Refer to 7.5 for additional timing information relating to Bondi Park.





Precedent Image: Helsingborg Waterfront, Sweden

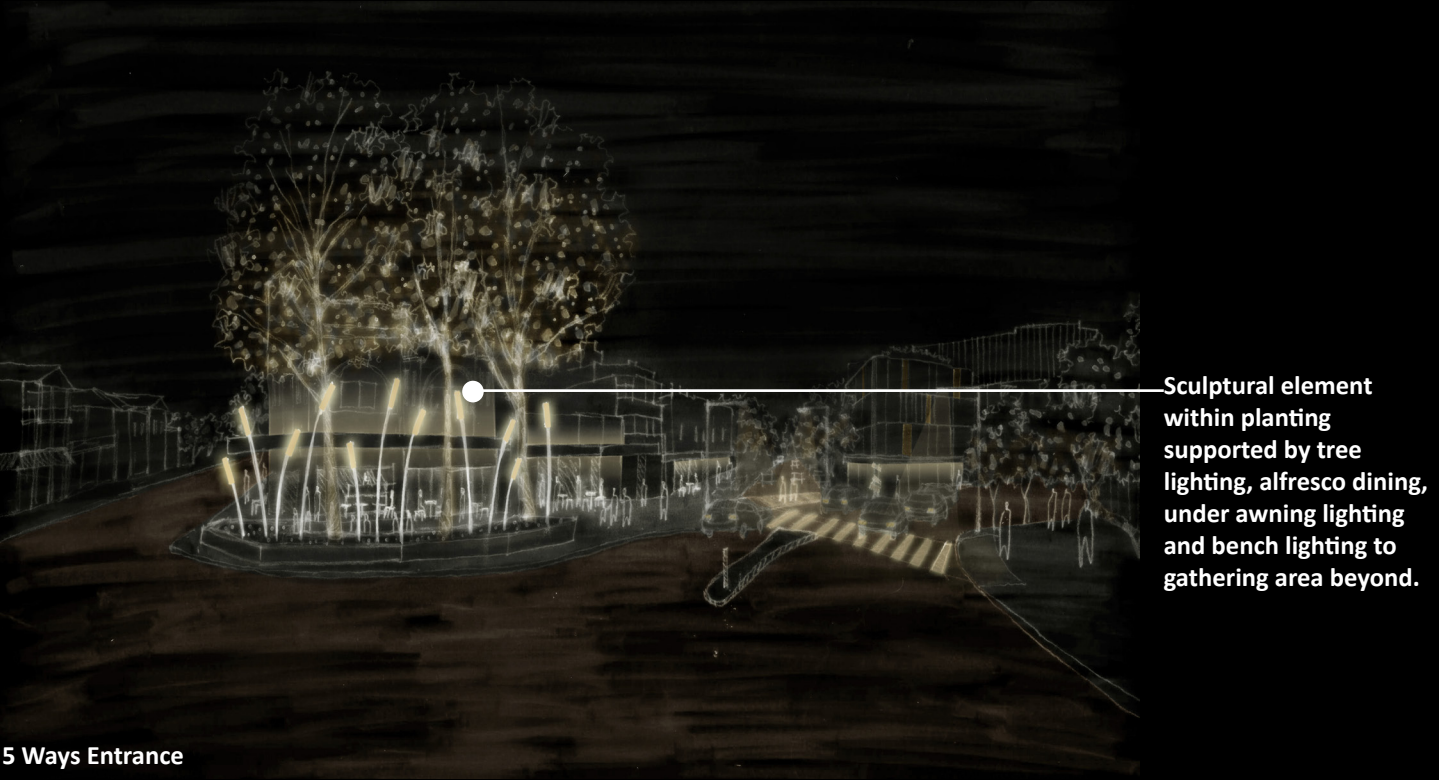
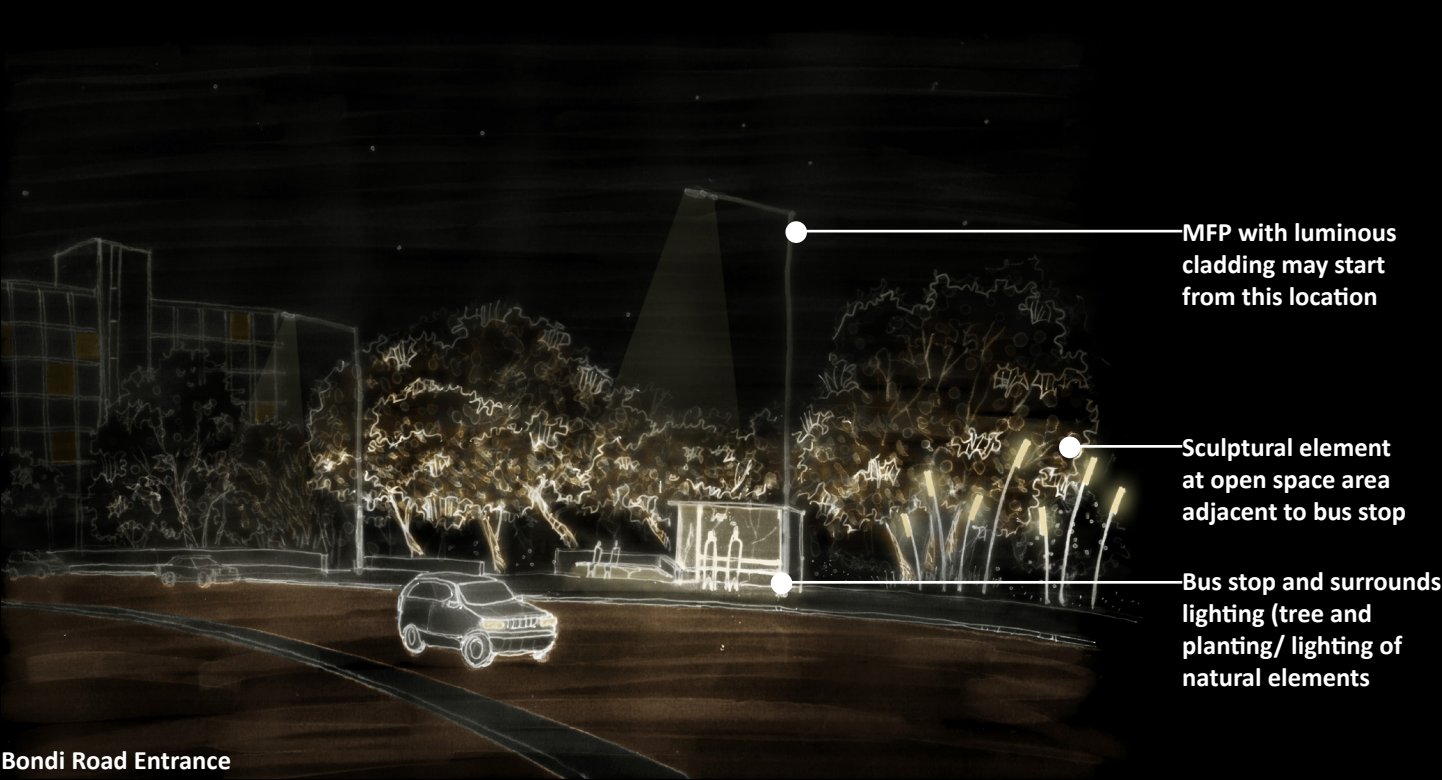


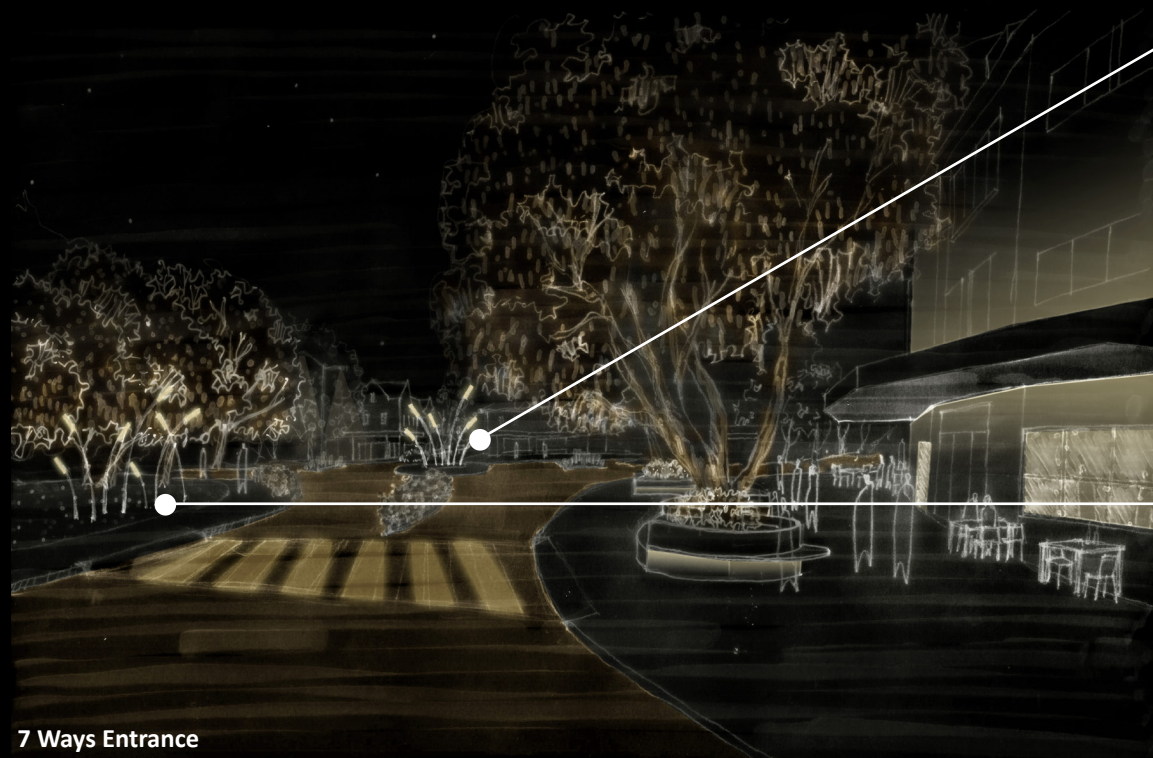
7.6.1 Gateway Arrival Statements

Objective: To create arrival statements for Bondi Beach at 5 ways, 7 ways, Bondi Reserve, Military Rd, Bondi Beach and Bondi Road gateways that signals the entrance to the iconic beach area that considers a daytime and night time statement.

Lighting Design Direction:

These four key corners acts as the gateways to the Beach. The gateway installation is to be of a suitable scale to create a visual impact and be legible for vehicles, cyclists and pedestrians alike. The installation at all four locations should be a similar in form for visual consistency but may be altered to suit the site conditions and adjacent location functions. The form of the installation should consider a sculptural element for the day time experience and an integral luminous element for the evening experience. The sculptural element may take inspiration from Indigenous Song Lines and should be developed in collaboration with the local indigenous community.

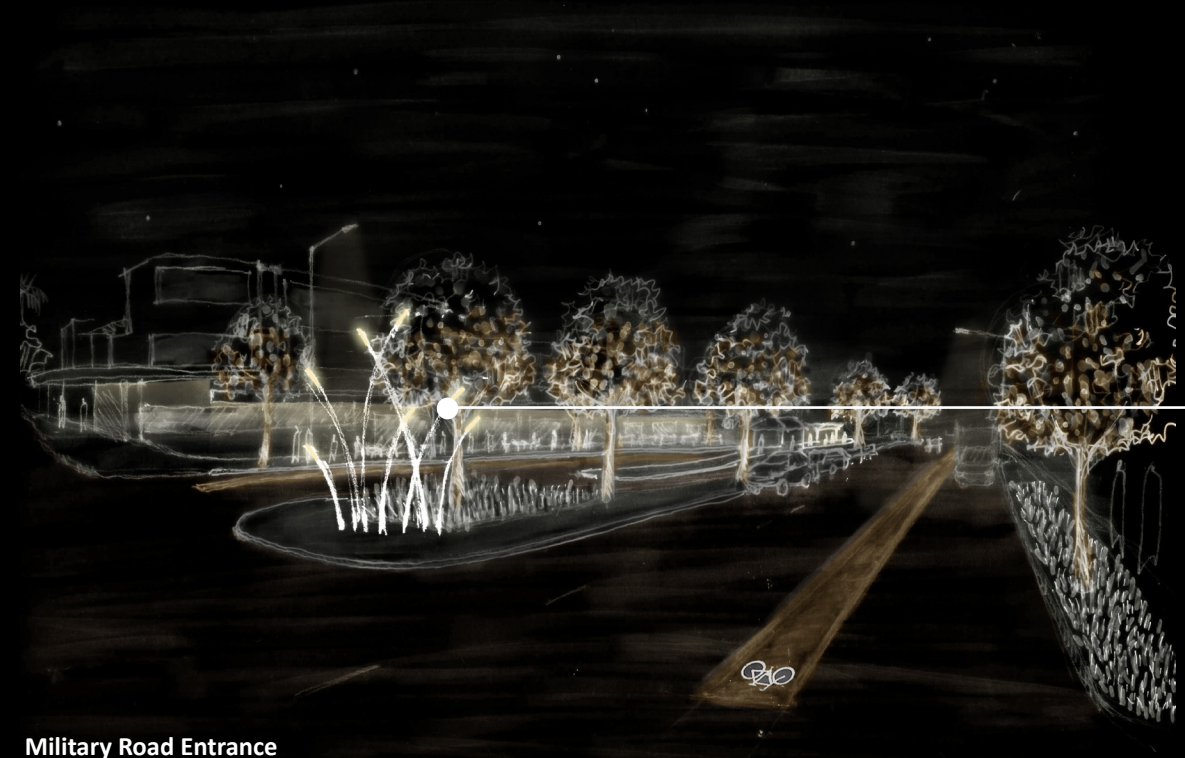




7 Ways Entrance

Sculptural element to extend from central round about fading out down each key street to provide a gateway experience.

Sculptural element within planting supported by tree lighting, alfresco dining, under awning lighting and bench lighting to gathering area and dining area.



Military Road Entrance

Sculptural element within planting supported by tree lighting, alfresco dining, under awning lighting and bench lighting to area beyond.

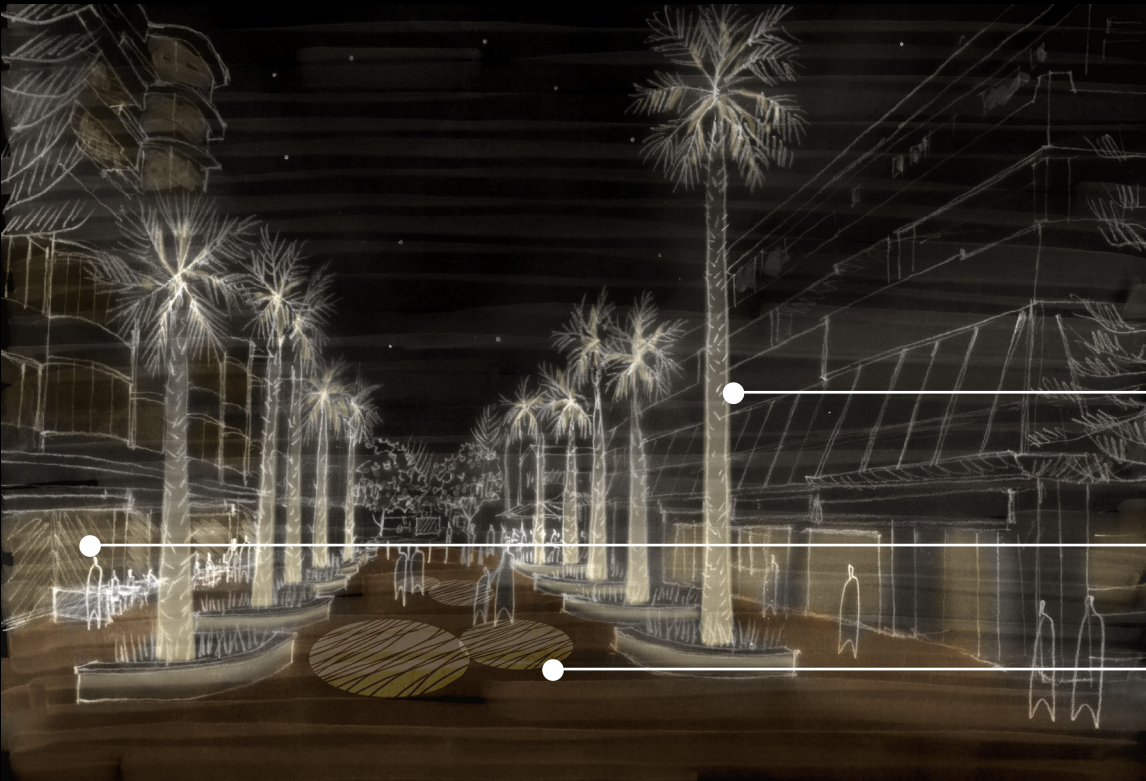
7.6.2 Roscoe Street Mall and Gould Street Place

Objective: Create a distinct lighting experience to differentiate the mall from the surrounding streetscape to indicate this area is a destination for gathering events and programmed activities.

Lighting Design Direction:

Tier 2 lighting elements are to form the basis of the lighting installation including retail facades, alfresco dining, under awning lighting, tree and plant lighting, lighting of urban structures. Lighting of the palms trees is to continue from Campbell Parade into the mall to continue the visual language and provide a vertical lighting element defining the height of the space. A lighting overlay of projected light is to be used to differentiate the mall as a pedestrian area. Using light and shade, dappled, projected light gives an ephemeral quality to the pedestrian zone.

The projected pattern may continue the story of Gould Lane as a location of a previous coastal lagoon. As per Gould lane, colour may alter for a seasonal or weather based adjustment. Warm white integrated lighting to the planters encourages gathering drawing people from the general street. A bustling and lively atmosphere is to be supported through alfresco dining.



- Integrated planter lighting and tree lighting
- Alfresco dining encouraged to enhance plaza atmosphere
- Projected light

7.6.3 Gould Lane

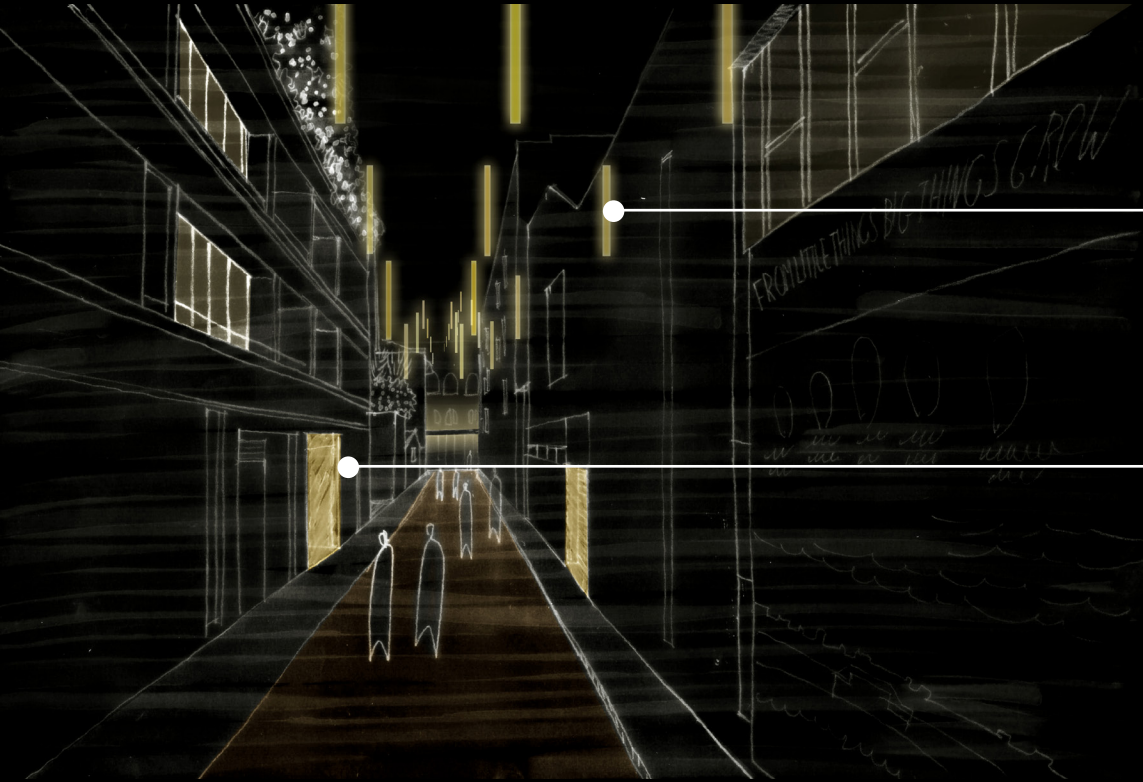
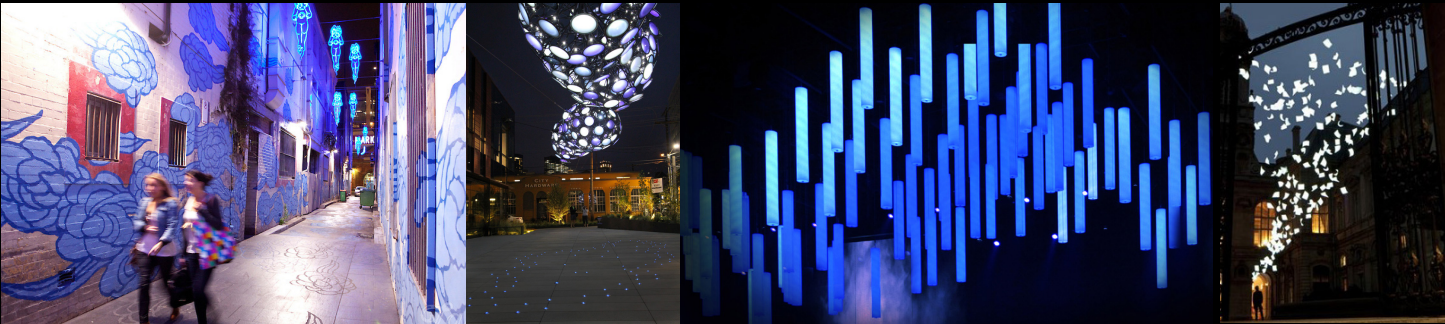
Objective: Celebrate the visual connection between Roscoe Street Mall and Hall Street with an artistic installation that interprets the site history.

Lighting Design Direction:

Whilst there is no immediate plan to activate this laneway, the following design intent is provided in the event this is desired in the future. This style of lighting intervention is appropriate for laneway treatments and may considered for implementation elsewhere if suitable for future planning.

A suspended lighting element should run through Gould Lane representing the history of the site as a previous coastal lagoon. The height of the element is crucial in the success of the intervention in providing a pedestrian layer that celebrates the visual connection between Roscoe Street Mall and Hall Street. This element is to

provide the functional lighting to the laneway; no lighting poles are suitable for this application. Wall mounted luminaires may be provided if required. Lighting of dark recesses and alcoves is encouraged to increase visual access for pedestrian comfort. The lighting installation may have a dynamic colour and dimming component with light ‘flowing’ slowly up and down the laneway symbolising the rise and fall of a tidal coastal lagoon. Colour may be used as a seasonal or weather based adjustment responding to the seasonal changes of the natural environment.



Suspended lighting form with dynamic lighting control to symbolise the previous coastal lagoon

Lighting to dark recesses or alcoves

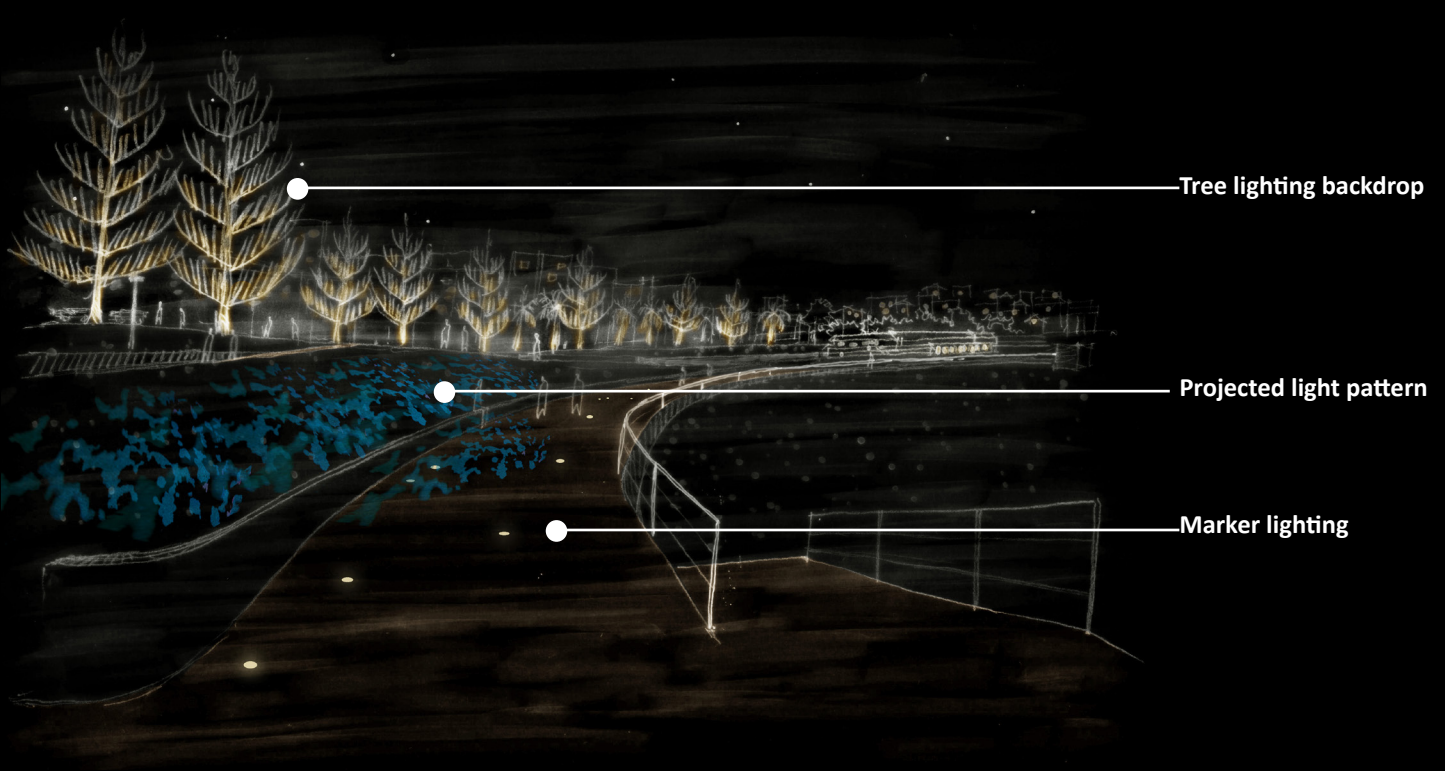
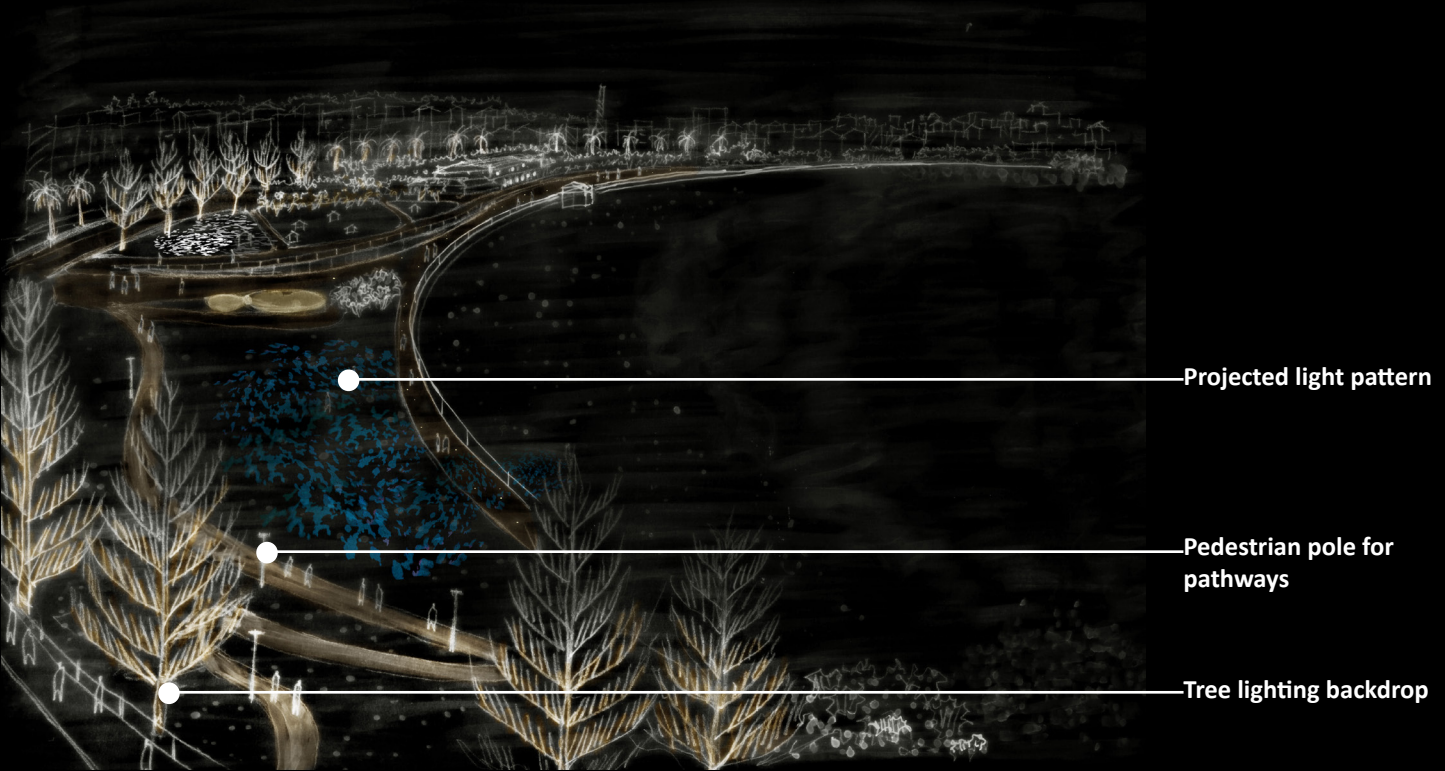
7.6.4 Bondi Park, Bondi Skate Park, Amenities, Gateway stair to Coastal Walk, The Promenade

Objective: Create a lighting transition from Campbell Parade to the beach that connects the two places as a journey and celebrates the artistic cultural landscape of Bondi Park and extends it’s iconic daytime image into the evening as a memorable tourist and visitor destination.

Lighting Design Direction: Campbell Parade and vertical lighting of the rear park trees provides a backdrop to the pedestrian experience with the lighting intensity gradating down to the promenade edge. The lighting approach is to provide a human scale and is to move away from a floodlight approach. Local lighting to key pedestrian

pathways is to increase access. Integrated lighting to stone walls along pathways is also encouraged to express the contours of the natural exterior amphitheatre. A lighting overlay of projected light supports this approach, provides a sense of ambiance and reflects upon the artistic culture of Bondi. Movement, pattern and colour may change throughout the evening or across the seasons reflecting the tidal waves ebbing and flowing and constantly changing. A dappled lighting approach and low level promenade lighting maintains key vistas and provides a connection to the night sky. Any artwork installation must also be respectful of the heritage site. Lighting upgrades incorporating the MFP are to be undertaken in the short term to

QED and Parks carparks. The projected lighting element may be extended in this area supporting future urban upgrades. Lighting is to be provided to key pedestrian connections to support night time activities and business at the Pavilion.



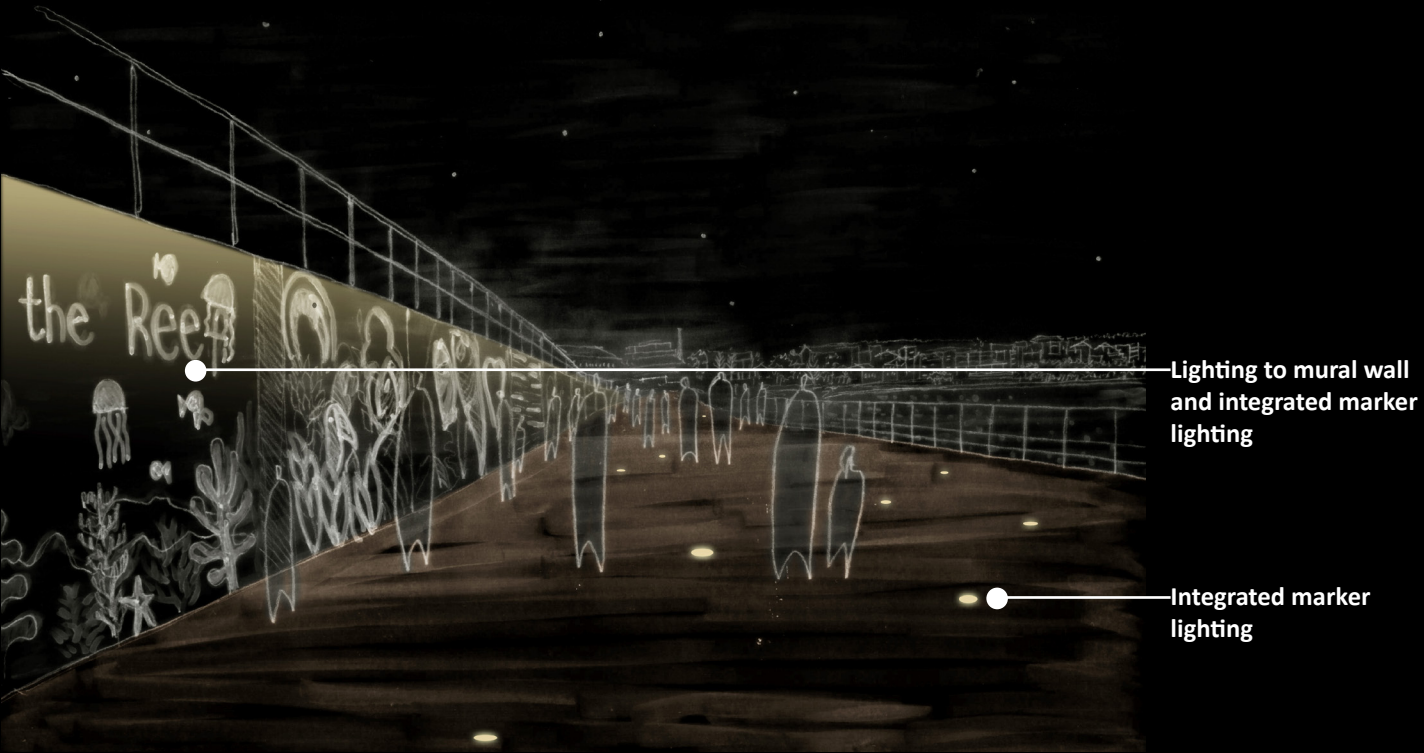
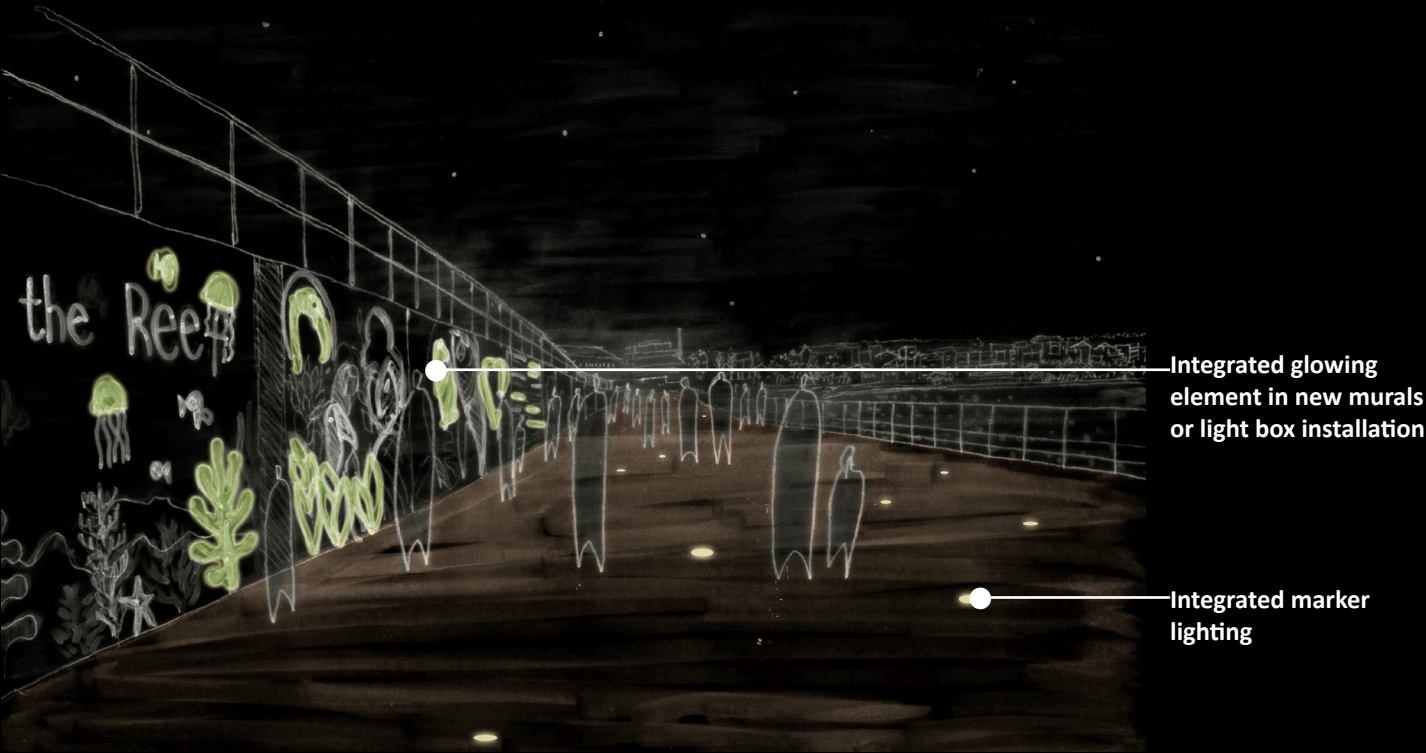
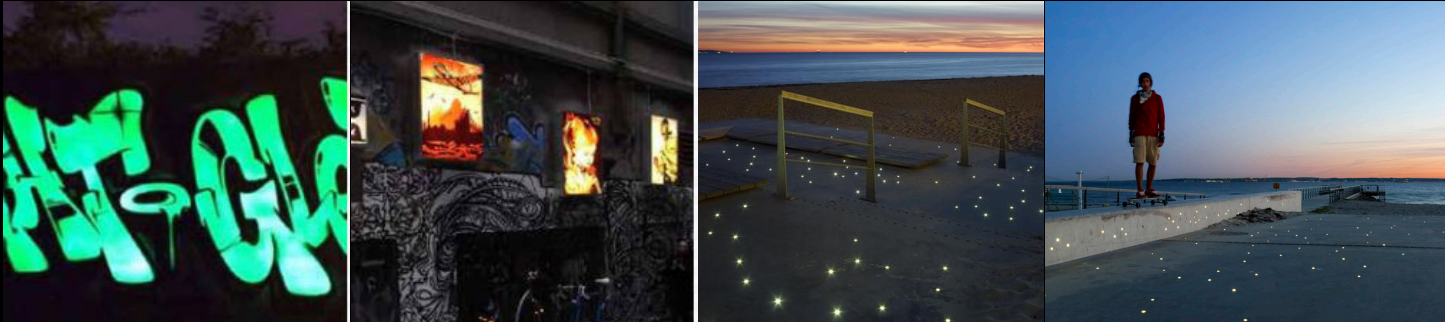


Bondi Park, Promenade and Skate Park Lighting Concept Image

7.6.4 Bondi Park, Bondi Skate Park, Amenities, Gateway stair to Coastal Walk, The Promenade

Lighting Design Direction:

The lighting solution to the promenade is to preserve and enhance the night time views, be appropriate for the atmosphere and environment, and enhance the artistic endeavors that are an integral part of the community values. Where the mural wall forms part of the pathway, lighting of this surface may provide both experiential and functional lighting. The addition of the marker light provides a soft edge to the water and acts as a wayfinding tool with the pattern being more concentrated at entry points. In the short term murals with a glowing component are encouraged in conjunction with a portable light art pop up installation of glowing light boxes as a tool to encourage winter use and activation. In the longer term, lighting should be installed as part of the Bondi Park upgrades to provide lighting to the mural wall. Along the pathway integrated bench lighting is encouraged.





Bondi Promenade Concept Image

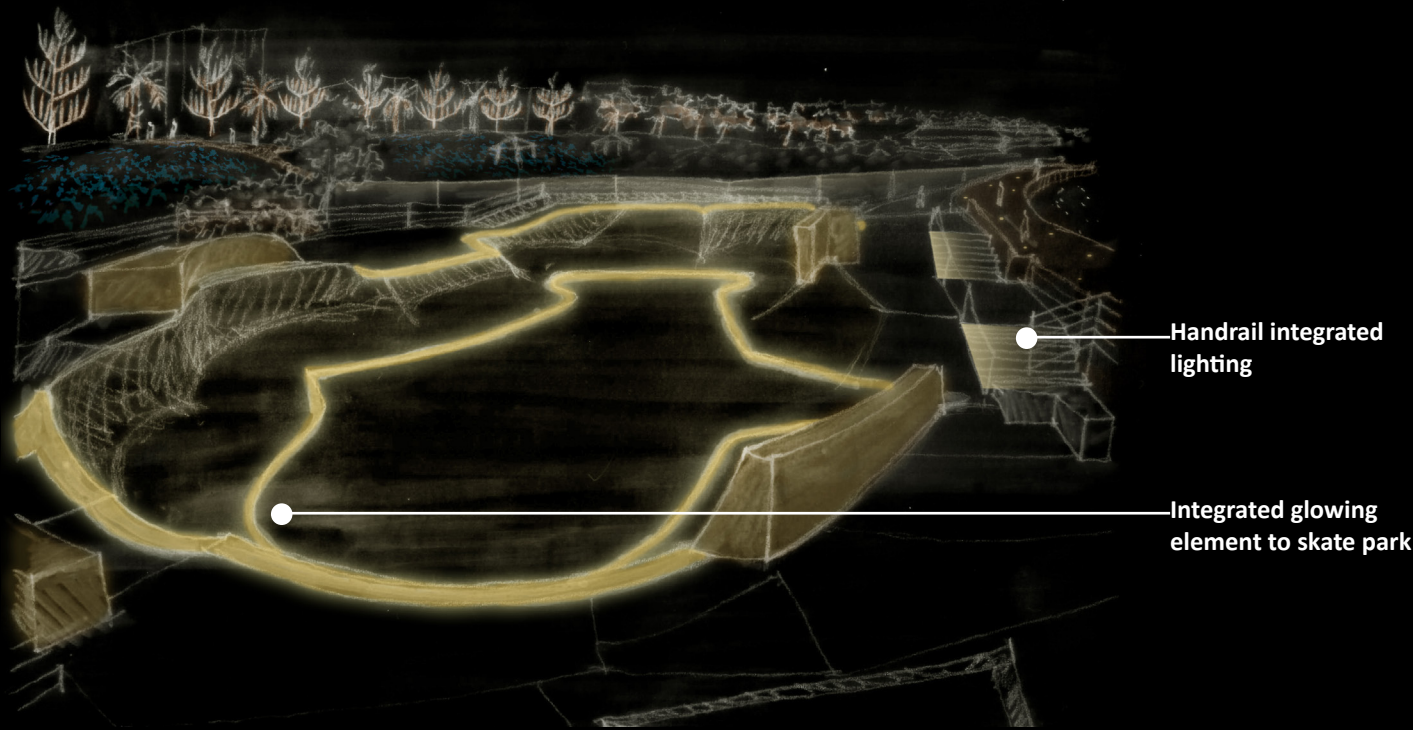
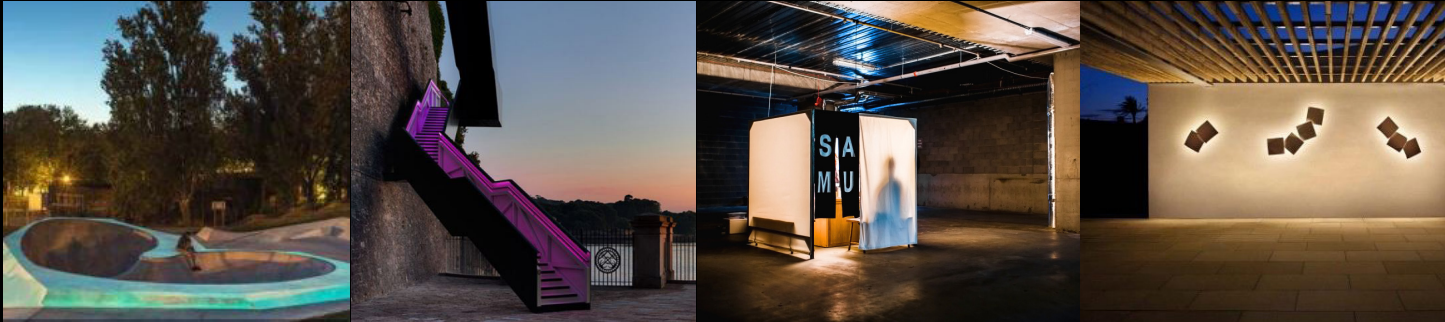
7.6.4 Bondi Park, Bondi Skate Park, Amenities, Gateway stair to Coastal Walk, The Promenade

Lighting Design Direction:

Lighting is to be provided to facilitate extended use of the skate park and picnic areas to provide a usable and activated environment into the early evening particularly in winter months with integrated picnic shelter and skate park lighting turning off at around 9pm. After hours the skate park is to remain a feature with the introduction of a glowing surface or lit elements within the skate park.

In addition to lighting to main pathways within Bondi Park, lighting is to be applied to the main park entry points with specific focus on including Bondi stairs providing access to Notts Avenue and the heritage bridges linking Campbell Parade. Integrated lighting to the Bondi stairs may consider colour and should provide a sense of safety to morning/ evening walkers and joggers.

Upgrades to the heritage bridge lighting should be carried out in consultation with a heritage consultant. Activation of the underpasses of these bridges in the short term may consider lighting art of a night time pop up to prepare the area for future activation with the upgrades to the Bondi Pavilion.



7.6.5 North Bondi Life Saving Club



North Bondi Life Saving Club- Completed

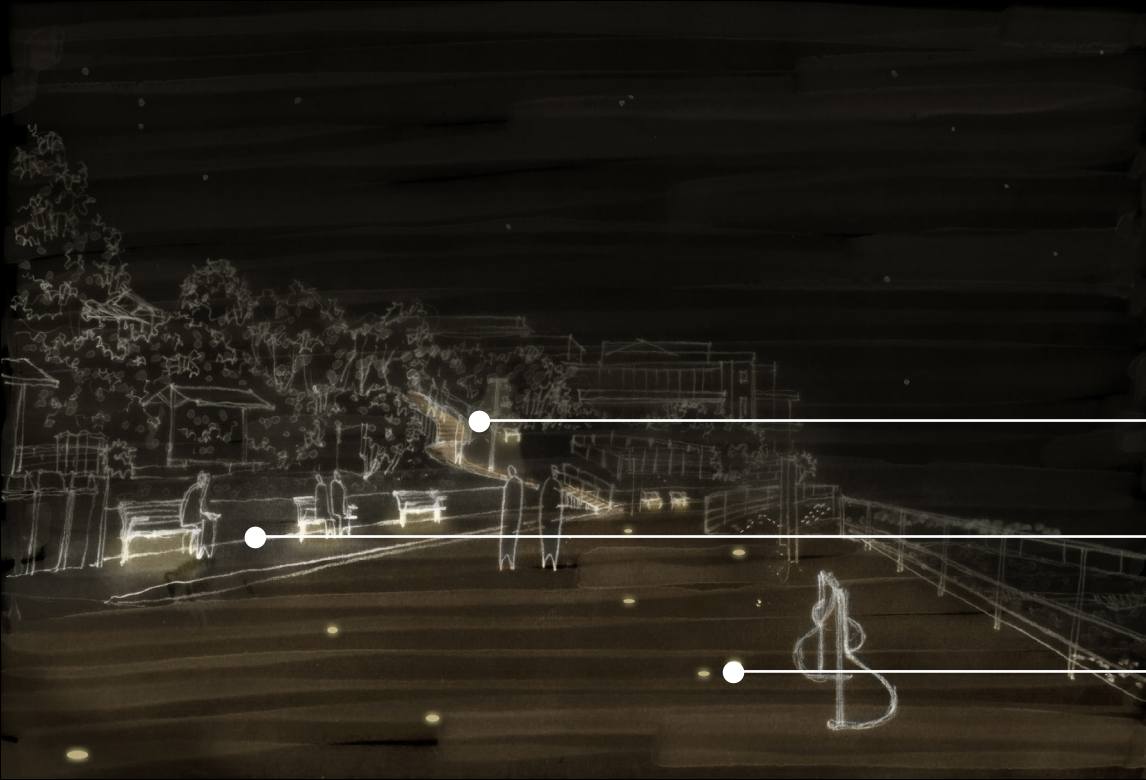
7.6.6 Biddigal Reserve and Pool

Objective: Enhance mosaic artwork at Biddigal Reserve Children’s pool and provide safe passage through Biddigal Reserve.

Lighting Design Direction:

Lighting to Biddigal Reserve is to continue a similar language as the promenade with low level integrated marker lighting and seating lighting. Uplighting of park walls at the promenade level may be integrated to provide a backdrop. Lighting to the key path through Biddigal reserve should consist of the pedestrian pole to facilitate safe passage.

As repairs to the mural at the children’s pool are made, integration of a glowing mosaic element may be incorporated for subtle highlighting without encouraging swimming after dark.



Pathway Lighting

Bench and low level wall lighting

Marker lighting



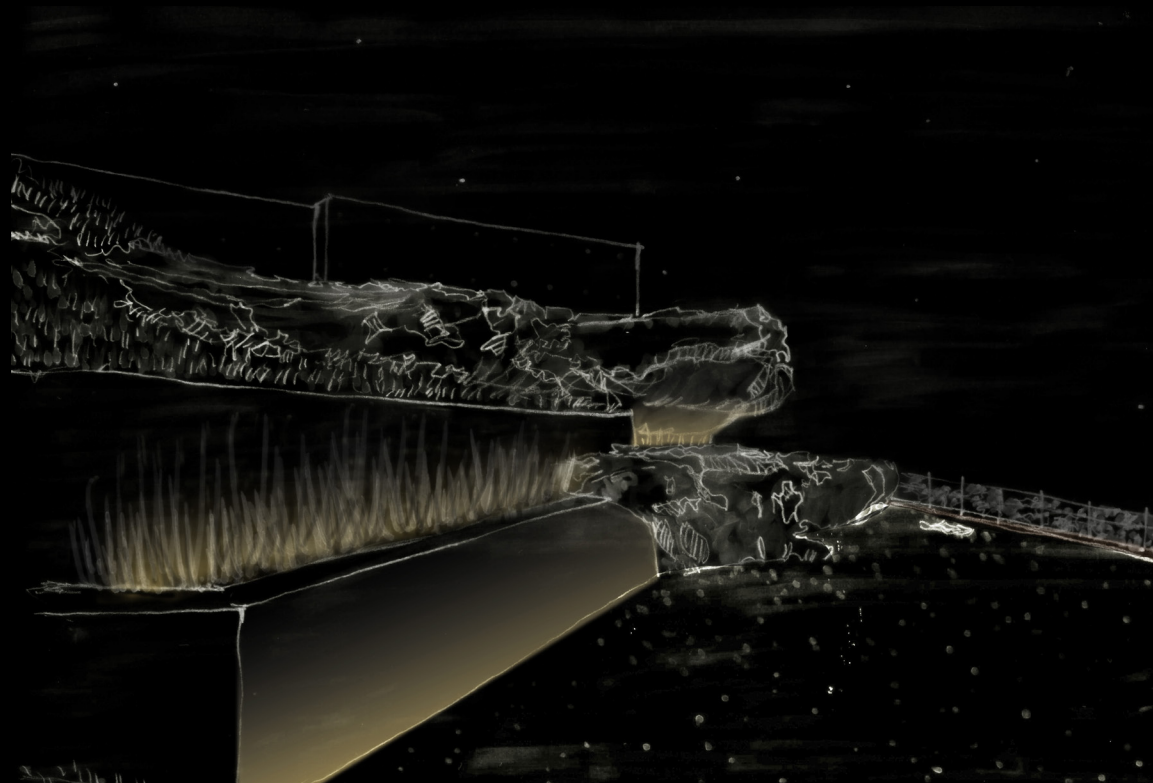
Integrated glowing element

7.6.7 Ben Buckler Park

Objective: Highlight existing interpretive elements in the early evening and mornings.

Lighting Design Direction:

Subtle lighting to rock formations adjacent to lookouts and low level integrated lighting to the new concrete planters is to be provided to support the pedestrian experience adjacent to lookouts. Lighting must be considerate and low impact on the biodiversity of local fauna.



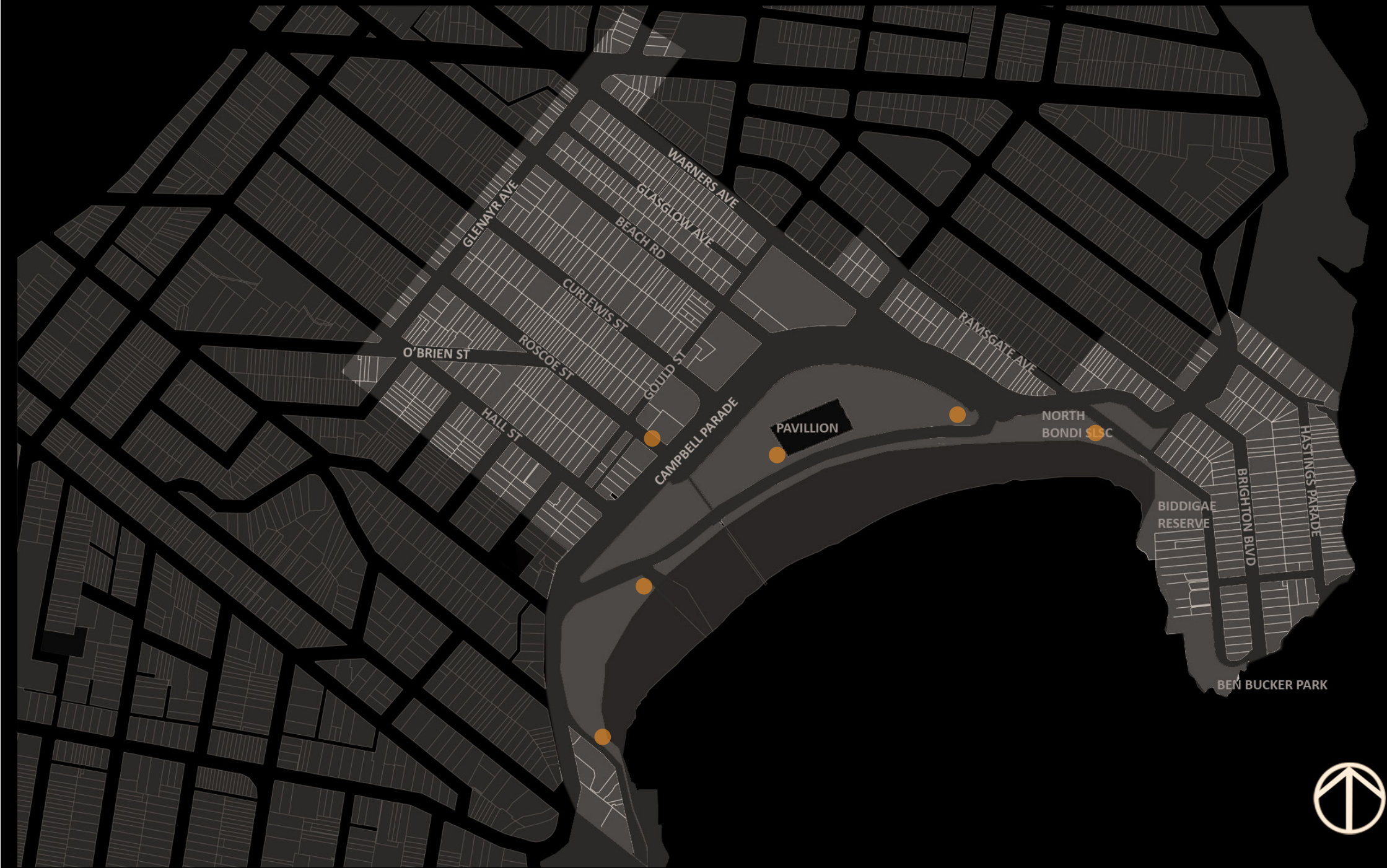
7.7 Three Phase Power

Objective

Three phase power locations to be provide opportunities for temporary events.

Locations

- Various locations through-out Bondi Beach Park to support events at Bondi Pavilion, Bondi Pavilion Carpark, North Bondi SLSC, Bondi Park at Coastal Walk end. These are to support existing 3-phase bollards within the park area;
- Various locations along Campbell Parade to support events and
- Roscoe Street Mall.



COASTAL WALK

8. The Coastal Walk

8.1 The Vision

A considered journey connected by a series of special moments that tells the history of the site and preserves the night environment.

Light creates an identifiable personality to the coastal walk that is human in scale. Light should not be continuous, but should rather consider light and dark in a way that both respects the natural environment and allows for safe passage. Lighting should be subtle and integrated with periodic highlights acting as beacons along the way.



8.2 Key Character Drivers The Coastal Walk

Enhance the coastal walk and celebrate ‘special’ spots like the cemetery, whale watching platforms, lighthouse, and recreation spaces.

Create a “string of pearls” along the walk. Lighting the walk at night for safety.

Coastal life and a locals backyard; With strong community ownership Bondi Beach is a place for **shared experiences**, from the **humble** BBQ, or a day at the beach through to large events.

Iconic; A **dramatic** place that many feel is iconic in its representation of **contemporary** Australian culture.

An artistic mosaic; A place of artistic expression where many parts come together to create the overall experience. **Intricate** and **colourful** mosaics of tiles and shells complimented by graffiti walls that are consistently **changing** and **evolving** overtime.

High energy; Bustling with visitors to night clubs or bars, or pumping iron, running and swimming, it is a place for the **energetic, playful** and **youthful**.

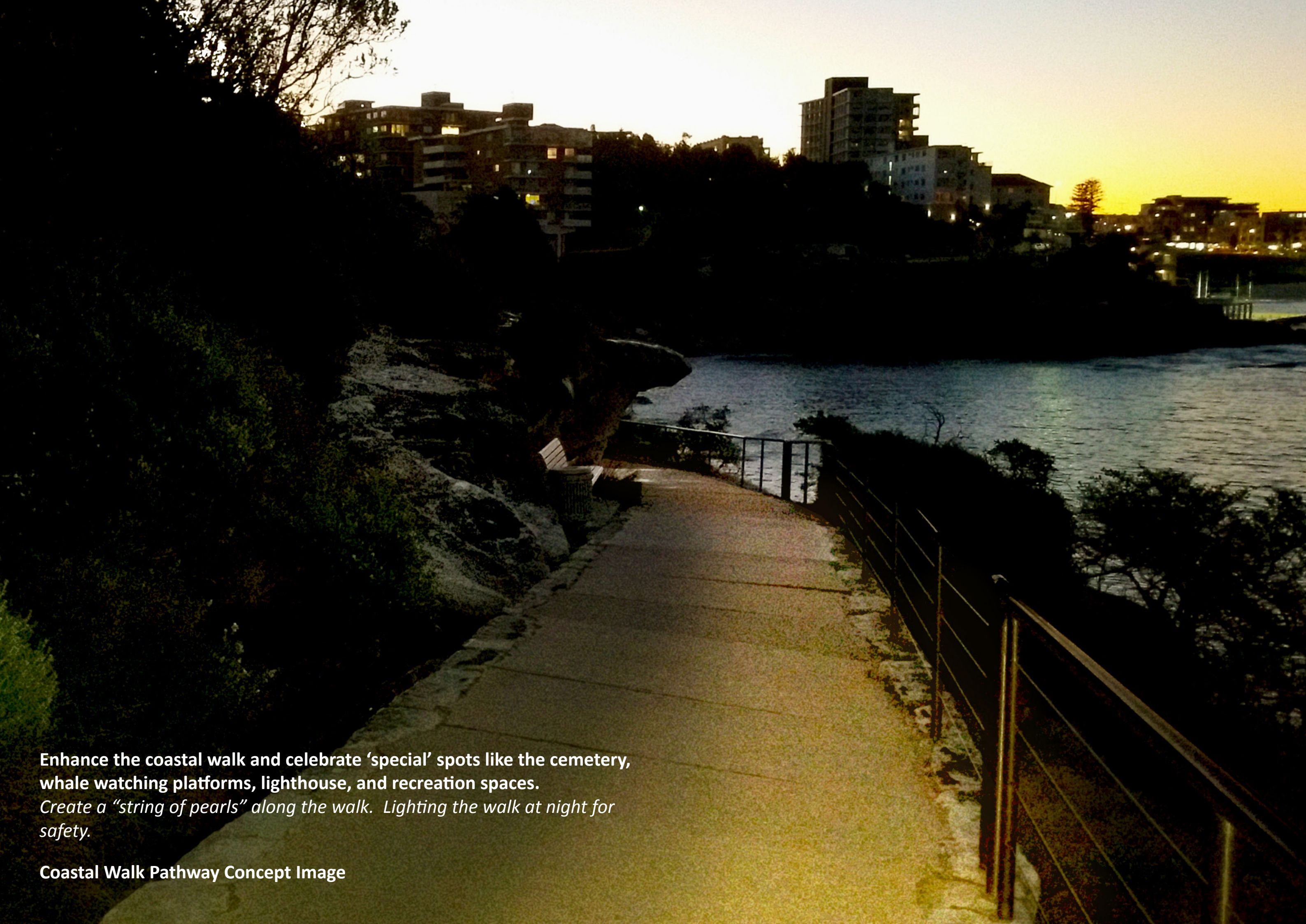
Natural; The Coastal Walk is a place that respects that **natural** environment and **exposure** to **the elements**.

A revealer of stories; It is a place of connection, that **subtly reveals** histories and through respectful creative expression that **celebrates** the **rawness** of the coastline.

A string of pearls; The rhythm of the coastal walk **varies** along its length, from **seclusion** and quiet contemplation through to **social** gathering places of community activity.

8.3 Key Strategies The Coastal Walk

1. Lighting of key features including Bondi Icebergs Pool without glare and without interfering with visual comfort.
2. Highlight the south Bondi gateway stairs that connect to the Coastal Walk reflecting the experience created at South Bondi.
3. Hunter Sculpture Park (not within the scope of lighting Strategy); consider as a future project.
4. Reinforce Mackenzie Point and Marks Parks role as a place of contemplation and for whale watching.
5. Safe guarding the Sculpture by the Sea pathway using light to mark the edge condition. Identify key sites for power for future events.
6. Interpret the indigenous history of the Coastal walk at Mackenzies Bay due to raw elements of environment.
7. Highlight Tamarama SLSC.
8. Interpret the stories of Tamarama Beach and Park and Bronte SLSC, Park and Beach through lighting. Mark the park entry points and use light to improve park atmosphere to support use as a gathering space.
9. Highlight the Bronte Pool and stairs to create an attractor and encourage passive surveillance.
10. Amplify the coastal character by lighting key sections of coastal rock formations.
11. Respect Waverley Cemetery atmosphere and views using light in subtle ways. Provision for power for event based installations may be considered.
12. Identify the departure point from Waverley Council at the Clovelly/ Waverley transition
13. Lighting approach to be subtle with ephemeral characteristics to compliment the natural environment.
14. Ensure that lighting does not negatively impact local fauna.



Enhance the coastal walk and celebrate ‘special’ spots like the cemetery, whale watching platforms, lighthouse, and recreation spaces. Create a “string of pearls” along the walk. Lighting the walk at night for safety.

Coastal Walk Pathway Concept Image

8.4 Tier 2: Amenity Lighting

Objective

Use of light in a cohesive, integrated and subtle manner, to provide a safe route for pedestrians in consideration of visibility from adjacent residential properties and the impact on the natural landscape.

Design Approach

Coastal Walk

The Coastal Walk lighting should use tier 2 lighting elements to provide a safe route for users. The solutions will vary along the pathway to respond to the geographical and residential nature of the environment. When applying tier 2 lighting elements it is important that these are not combined in a way that overwhelms the night time experience but support safe passage with selected lighting of key natural or urban features. In the first instance lighting should focus on lighting the path through handrail integrated lighting or lighting integrated into low level walls. If these elements are not available, lighting may be integrated to define the path edge washing light onto the natural adjacent forms. This tool is to be limited to specific areas and is to be agreed with Council.

Marker lighting is to be used to define key entry nodes or act as a visual marker to guide pedestrians on their journey where the walk is disjointed. Concealed bench lighting is to be used to define key seating areas and lighting within the landscape is to be used in a subtle manner to enhance textures.

Environmental considerations will be of vital importance to a successful coastal walkway. It is important to be mindful of the effect light has on the natural flora and fauna. To minimise this effect, the light distribution needs to be highly controlled, the light spectrum needs to be considered and placement of luminaires will be of utmost importance, avoiding any known breeding areas with a light intensity and spectrum that will impact upon breeding, feeding or natural diurnal life cycles. A limitation on the hours of operation will not only assist with environmental harm minimisation but also reduce any impact upon the residential enjoyment of the dark nightscape and sea as lit by cloud reflectance and moonlight.

It is important that the combined lighting solution is effective in infusing the coastal walk with a sense of physical and personal safety but not over-light any part of the pathway, and that each section of the walkway flows

into the next so as not visually conflict with any other lit element.

Coastal Parks

As per the typical park approach, lighting for parks is to focus on lighting the main entry points and key pedestrian pathways and pathway surrounds. In Coastal areas where a main park pathway is also a promenade, the lighting approach is to support a more integrated and low level solution with the lighting transitioning to the promenade edge.

A Strategy for Safety

Due to the nature of the coastal walk and its connection to the night sky and ocean, achieving a high level of vertical light is not suitable. The lighting approach will focus on the quality of light, colour of light, contrast ratio, reduction of glare and the creation of an atmosphere that is warm and welcoming. The lighting approach aims to encourage increased passive surveillance.

Integrated low level lighting is to be used to light the pathway or path edge. Lighting is to be provided to all stairs for safe movement.

Tier 2 Elements

Handrail integrated lighting, low level integrated lighting to define path edge, low level wall lighting to wash light across pathway, marker luminaire at key entry nodes, bench lighting to define key seating areas, lighting within landscape to enhance textures, light and shade and foliage, lighting within landscape to enhance natural forms, textures, light and shade and key rock formations, signage lighting. In coastal parks Tier 1 pedestrian pole element may be applicable.



Locations

1. Entry to walk from Notts Avenue
2. General Path; Low Level Wall
3. Stair and seating bench below Mackenzie Point
4. General Path; Low Level Wall
5. Seating integrated lighting (Typical for seating areas)
6. General Path; Exposed Coastal Areas
7. Tamarama Beach Park
8. General Path; Adjacent to streets
9. Bronte Beach Promenade
10. Lookout seating
11. General Path; Waverley Cemetery
12. Signage lighting

Lighting Timing

Typically lighting typologies that contribute to the pathway lighting of the Coastal walk are to be on from dusk to dawn. After 11pm pathway lighting is to be dimmed to reduce the lighting level to provide a minimal level for safe passage. Other lighting typologies that are not critical for safe movement may turn off at 11pm in consideration of residents and wildlife.

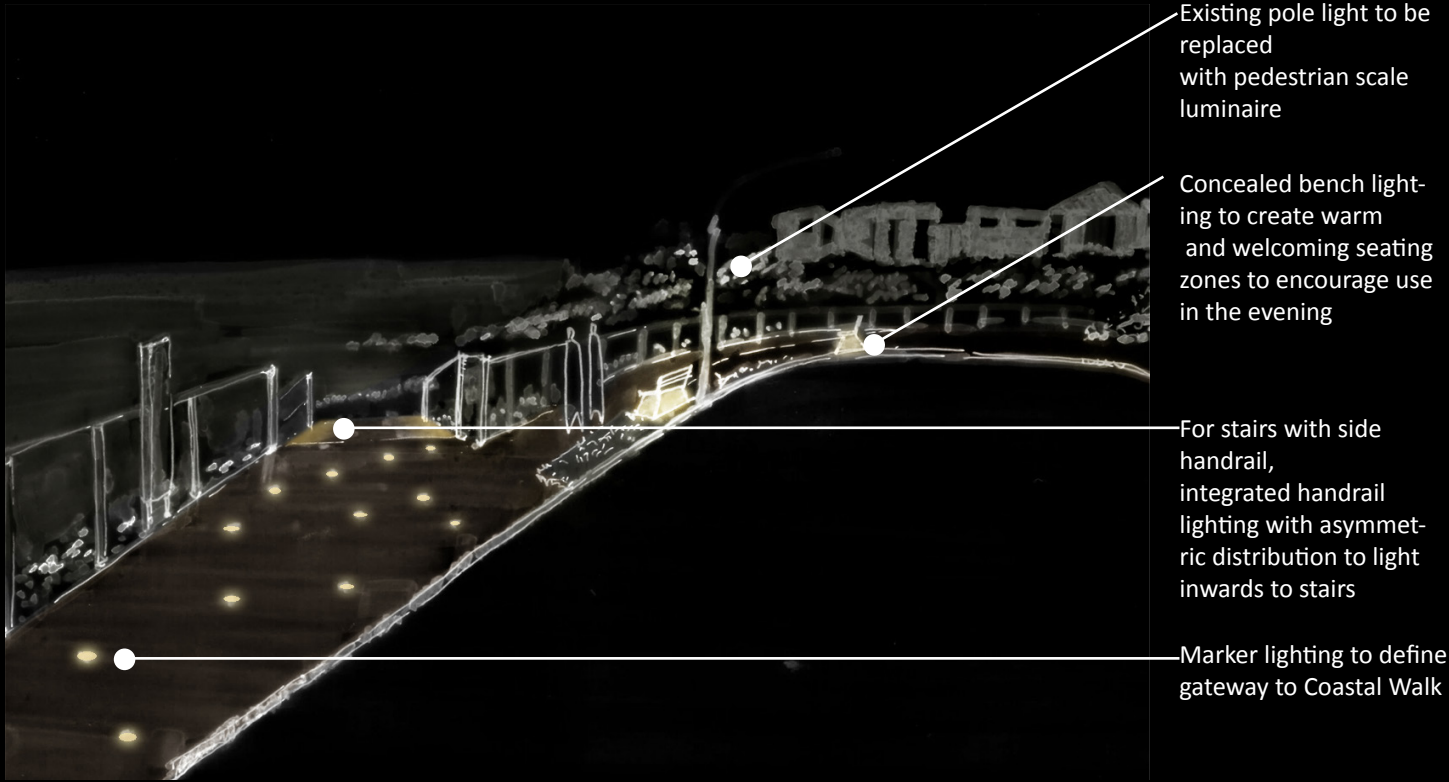


Coastal Walk Pathway Concept Image

8.4.1 Entry to walk from Notts Avenue

Objective: Highlight the south Bondi gateway stairs that connect to the Coastal Walk reflecting the experience created at South Bondi

Tier 2: Connecting elements handrail lighting, Integrated marker luminaire at key entry nodes, concealed bench lighting to define key seating areas. Tier 1 pedestrian pole lighting element may also be integrated into the design.

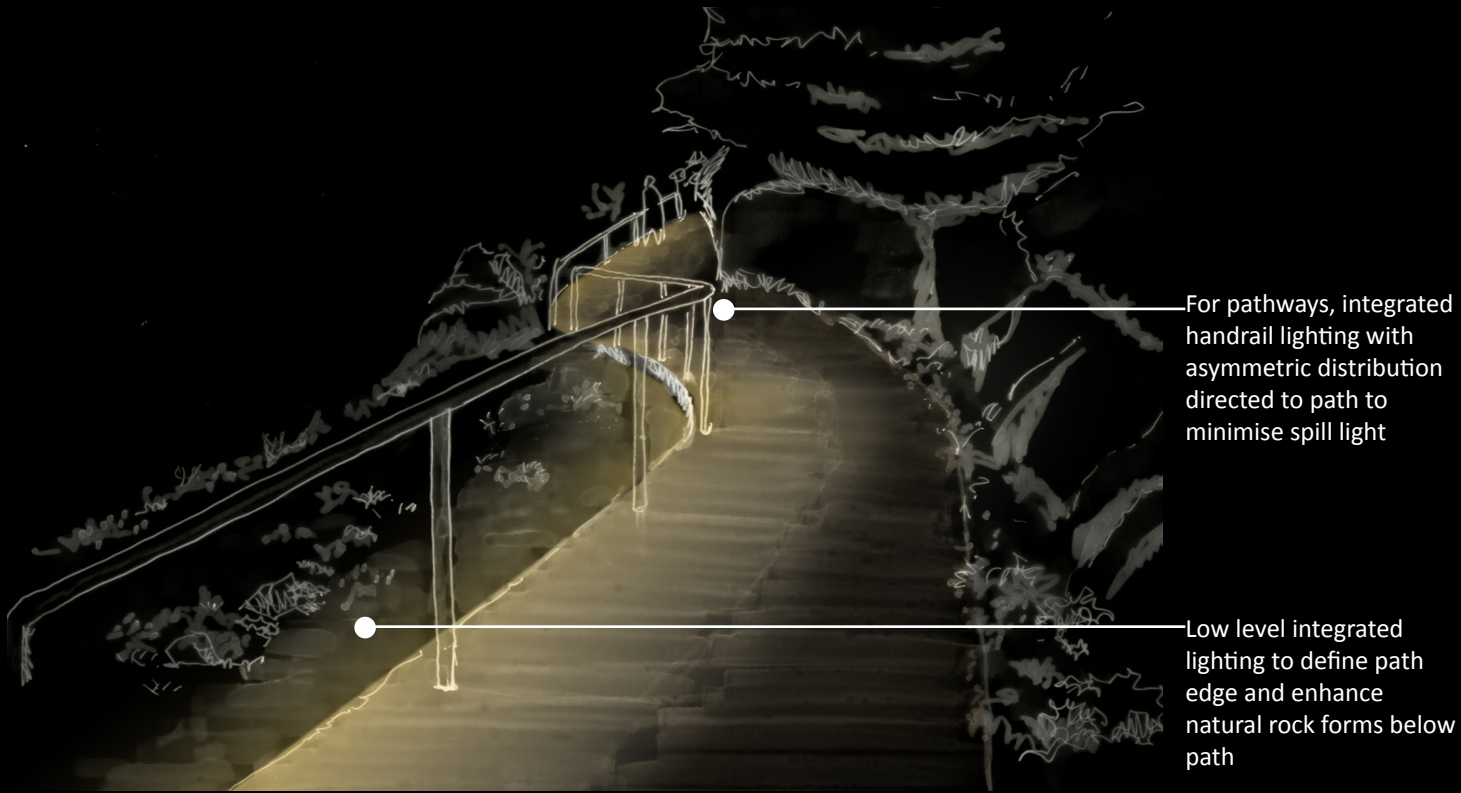


Stair: Dusk to sunrise P9/ P8 category
Pedestrian Path: Dusk to Sunrise P4 category
Road: Dusk to sunrise P3 category

8.4.2 General Path; Low Level Wall

Objective: To provide functional lighting to the general path that is subtle with ephemeral and varied characteristics, using both light and dark to compliment the natural environment and urban structures.

Tier 2: Connecting elements handrail lighting and Low level integrated lighting to define path edge

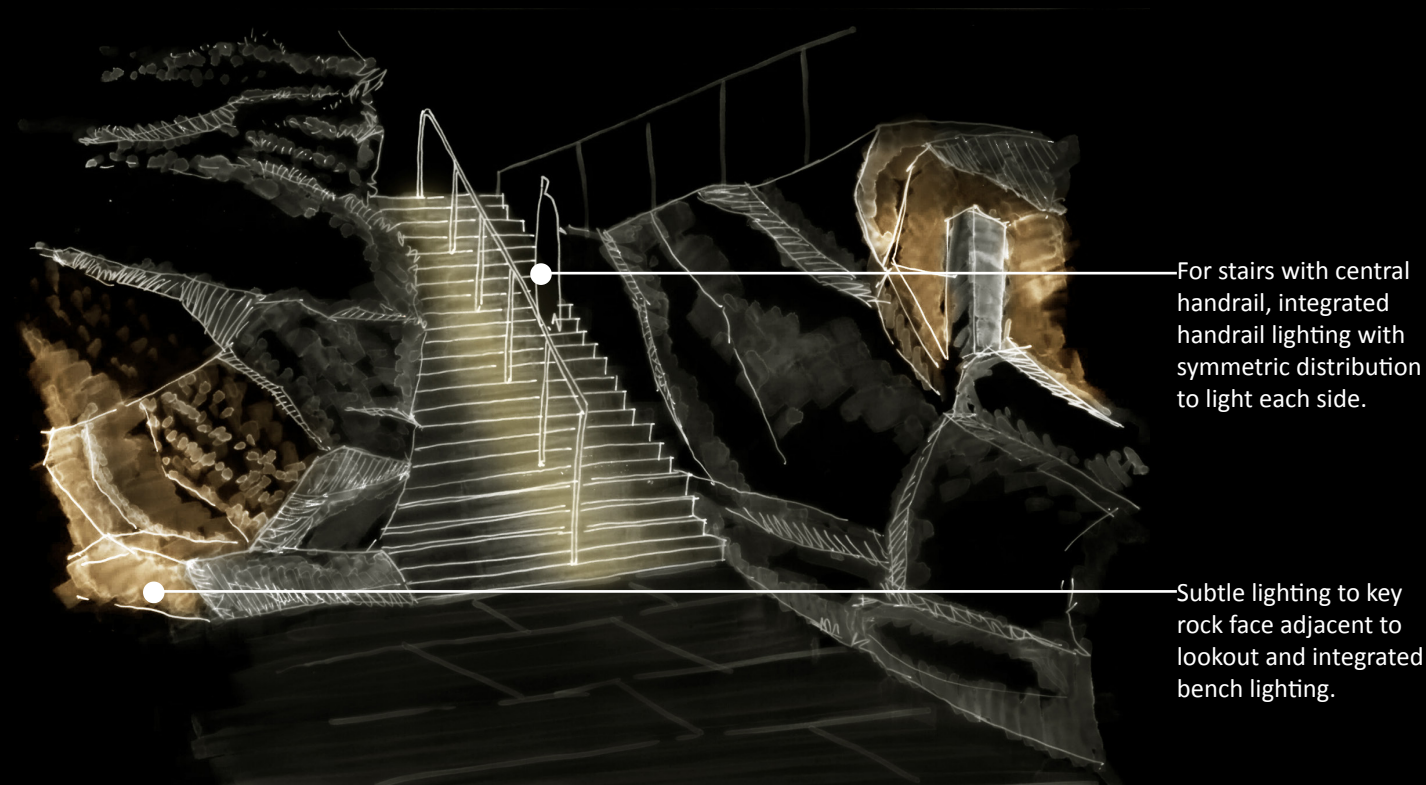


Dusk to 11pm P4 category to path edge
11pm to sunrise P5 category to path edge

8.4.3 Stair and Seating bench below Mackenzie Point

Objective: To provide functional lighting to the staircase and enhance the lookout experience with subtle lighting of the rock formations and bench lighting.

Tier 2: Connecting elements handrail lighting, lighting of natural features, bench lighting



Dusk to sunrise P9/ P8 category

8.4.4 General Path; Low Level Wall

Objective: To provide functional lighting to the general path that is subtle with ephemeral and varied characteristics, using both light and dark to compliment the natural environment and urban structures.

Tier 2: Low level integrated lighting to define path edge, low level wall integrated lighting to wash light across pathway.

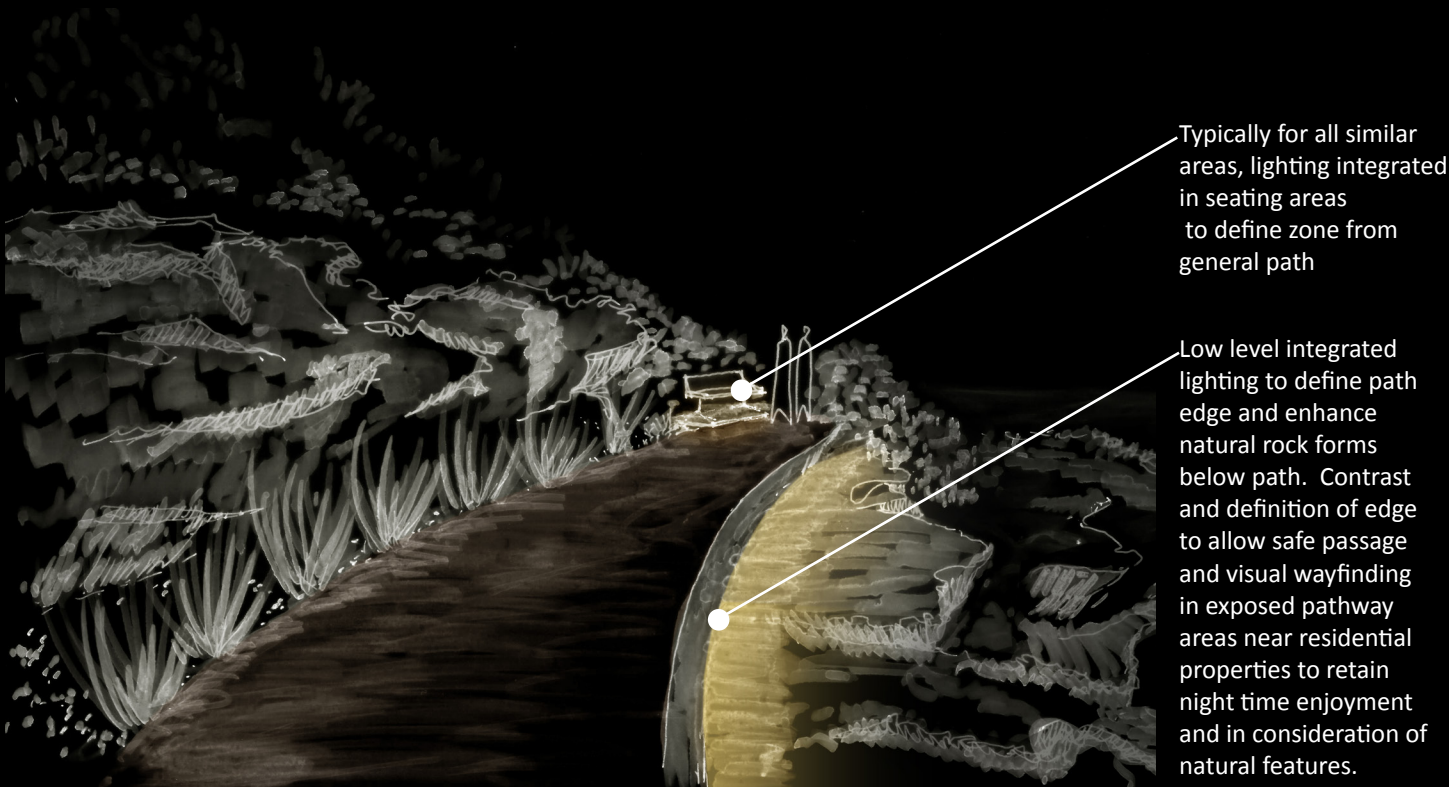


Dusk to 11pm P4 category to path edge
11pm to sunrise P5 category to path edge

8.4.5 Seating Integrated Lighting

Objective: Creation of warm and inviting seating areas to encourage use in the evening and differentiate from the general path. Seating may act as a beacon element on the user journey of the walk and a destination in its own right.

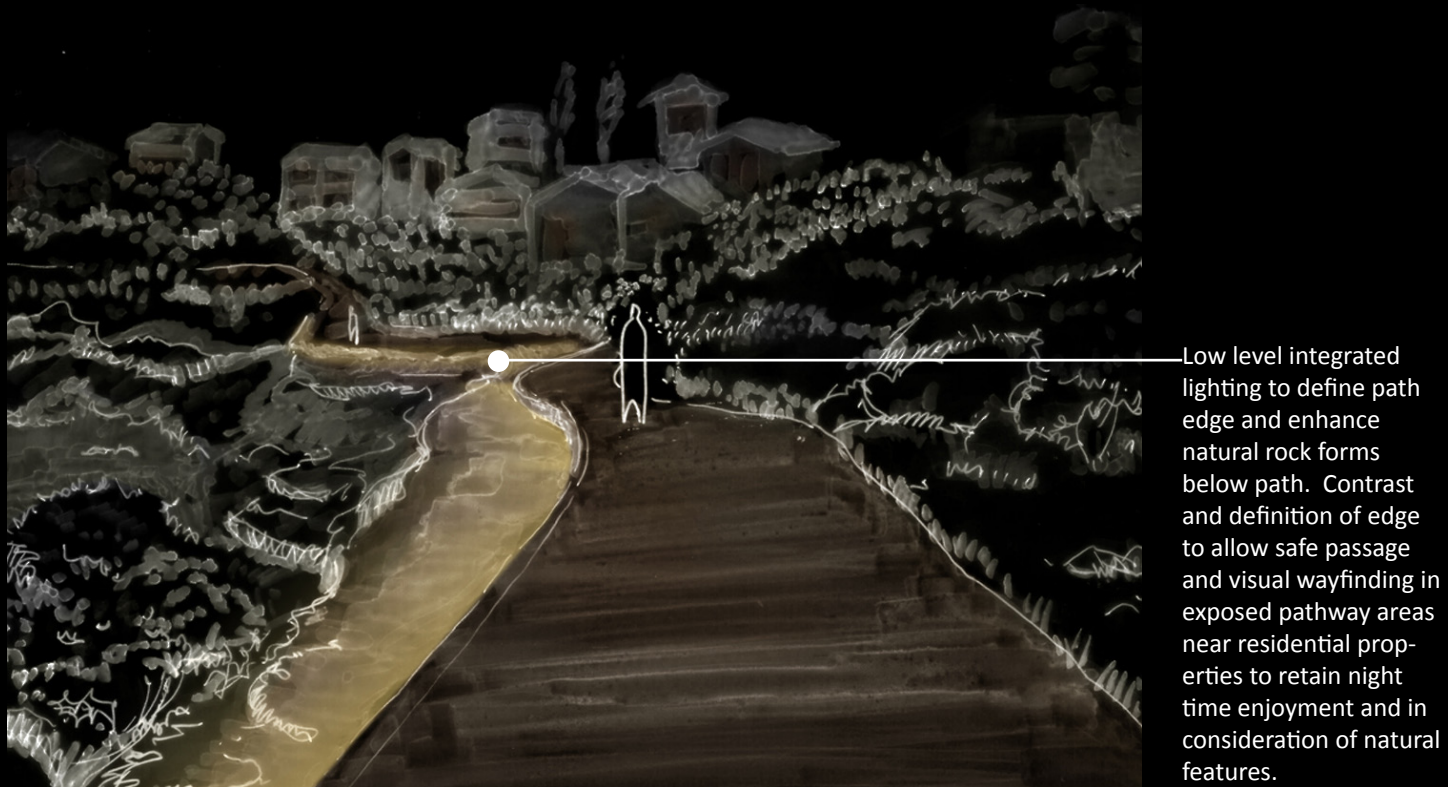
Tier 2: Seating integrated lighting, low level wall lighting to define path edge.



8.4.6 General Path; Exposed Coastal Areas

Objective: For exposed coastal areas, lighting to define the path edge to allow safe passage through contrast and wayfinding without impeding on vistas.

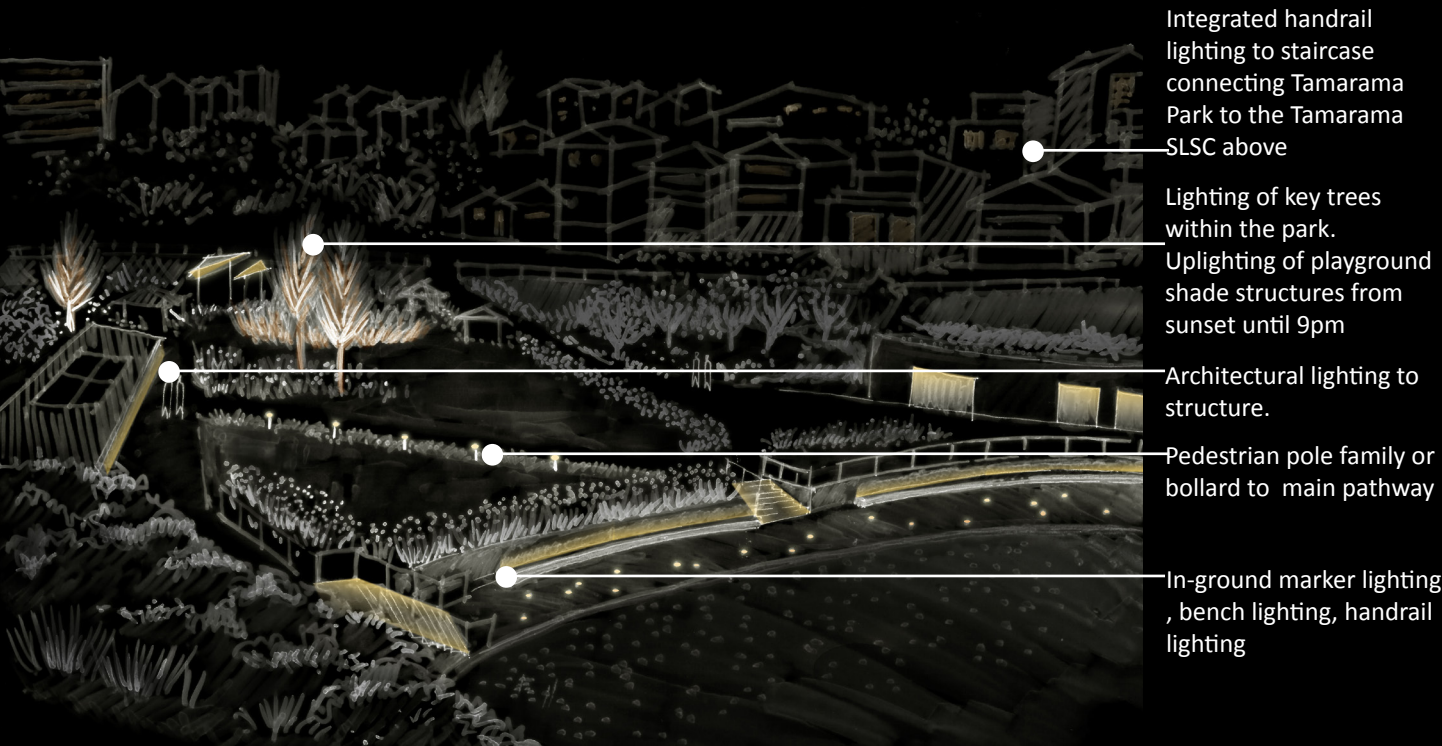
Tier 2 Low level integrated lighting to define path edge



8.4.7 Tamarama Beach Park

Objective: Improve the park use and atmosphere in the early evening through integrated lighting to urban structures and furniture.

Tier 2: Connecting elements handrail lighting, marker lighting along promenade to create a transitional edge condition and mark key transition areas, lighting of key trees for ambient vertical lighting and perceived brightness, pedestrian scale pole or bollard to mark pathways, considered and integrated lighting to urban structures, lighting to playground sails. Tier 1 pedestrian pole lighting element may be integrated into the solution to major park pathways. The stairway connecting Tamarama SLSC and Tamarama Park offers the opportunity to implement the tier 2 handrail lighting connecting the beach and park to the SLSC above.



Major park pathways: Dusk to 11pm P3 category/ 11pm to sunrise P4 category
Stair: Dusk to sunrise P9/ P8 category
Promenade at waters edge: Dusk to 11pm P4 category/ 11pm to sunrise P5 category

8.4.8 General Path; Adjacent to streets

Objective: For pathways adjacent to streets, lighting to provide a human scale to differentiate pedestrian and vehicular zones continuing the lighting language of the Coastal Walk.

Tier 2: Integrated marker luminaire to provide pedestrian scale



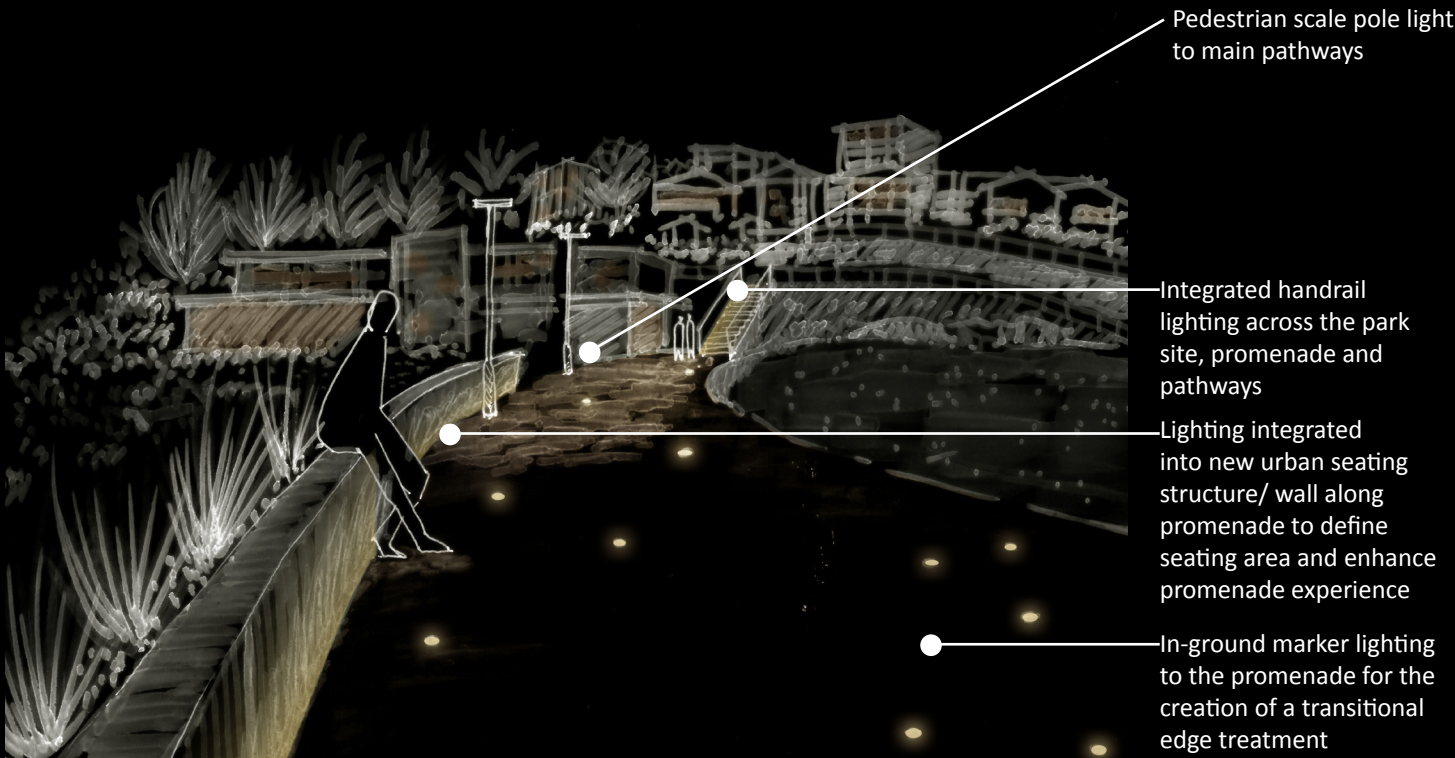
Path: P3 category (From adjacent street lighting)

8.4.9 Bronte Beach Promenade

Objective: Provide safe passage at night time along the promenade and through the park to main pathways and cycle routes for access to the Bronte Village bus.

Tier 2: Connecting elements handrail lighting, marker lighting along promenade to create a transitional edge condition and mark key transition areas, pedestrian scale pole or bollard to mark pathways, lighting integrated into promenade urban seating structures, lighting of key trees within park for ambient vertical lighting and perceived brightness, considered and integrated lighting to urban structures. Tier 1 pedestrian pole lighting element may be integrated into the lighting solution for key park pathways.

- Typical park lighting typologies to be applied to Bronte Beach Park including:
- Lighting of key trees within the park to increase perceived brightness through lighting the vertical plane and increasing visual depth for pedestrian comfort.
 - Pedestrian pole family or bollard to main pathway
 - Integrated handrail lighting across the park site, promenade and pathways
 - Lighting integrated into architectural structures.
 - Lighting to picnic structures not considered appropriate.



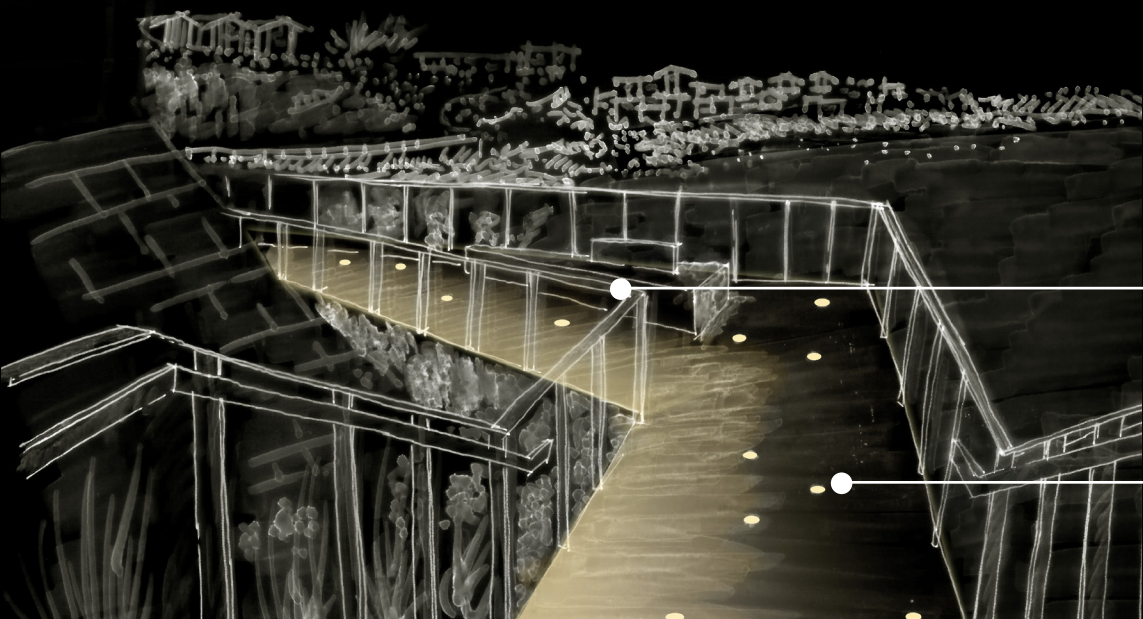
Major park pathways: Dusk to 11pm P3 category/ 11pm to sunrise P4 category
Promenade at waters edge: Dusk to 11pm P4 category/ 11pm to sunrise P5 category
Stair: Dusk to sunrise P9/ P8 category



8.4.10 Seating Lookout

Objective: To provide safe passage to walkway and differentiate seating areas from the general path.

Tier 2: Connecting elements handrail lighting, marker lighting within boardwalk at seating zones.



For pathways, integrated handrail lighting with asymmetric distribution directed to path to minimise spill light

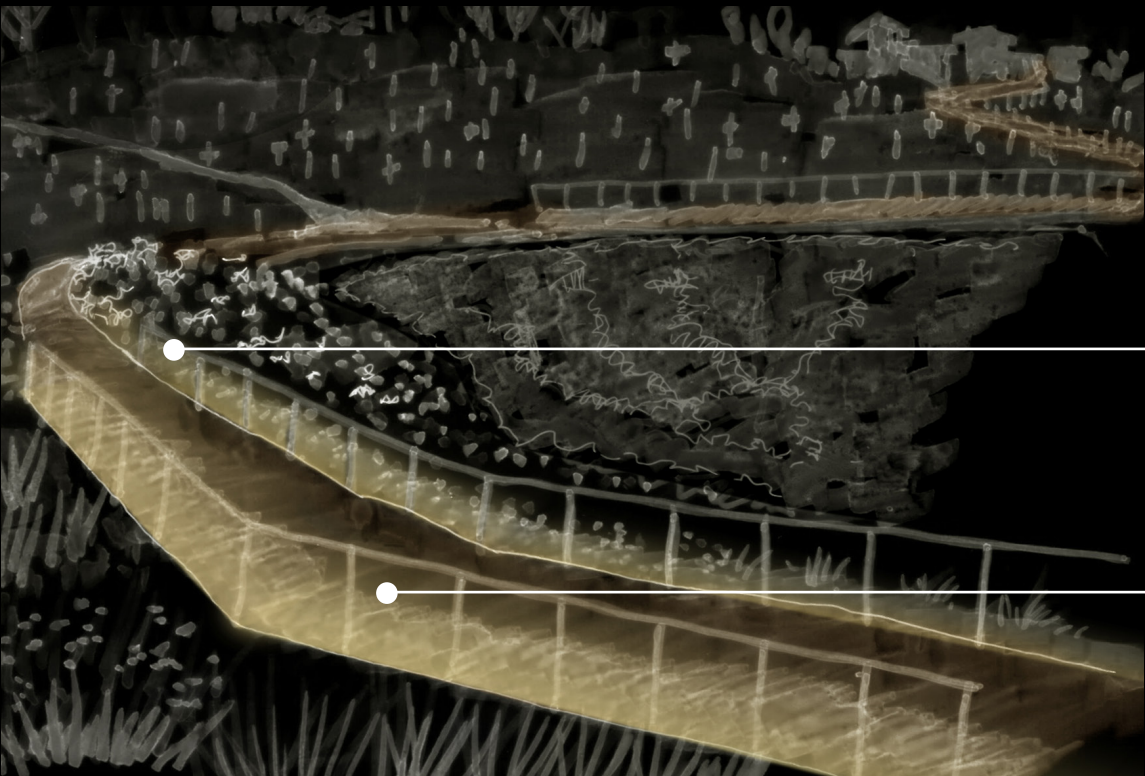
Integrated marker luminaire within timber boardwalk to define seating zone and preserve vistas.

Dusk to 11pm P4 category to path edge
11pm to sunrise P5 category to path edge

8.4.11 General Path; Waverley Cemetery

Objective: Respect Waverley Cemetery atmosphere and views using light in subtle ways to define the path and seating zones, enhancing the experience at sunset and into the early evening.

Tier 2: Connecting elements handrail lighting, low level integrated lighting to define path edge



Low level integrated lighting to define path edge and enhance natural plant and rock forms below path

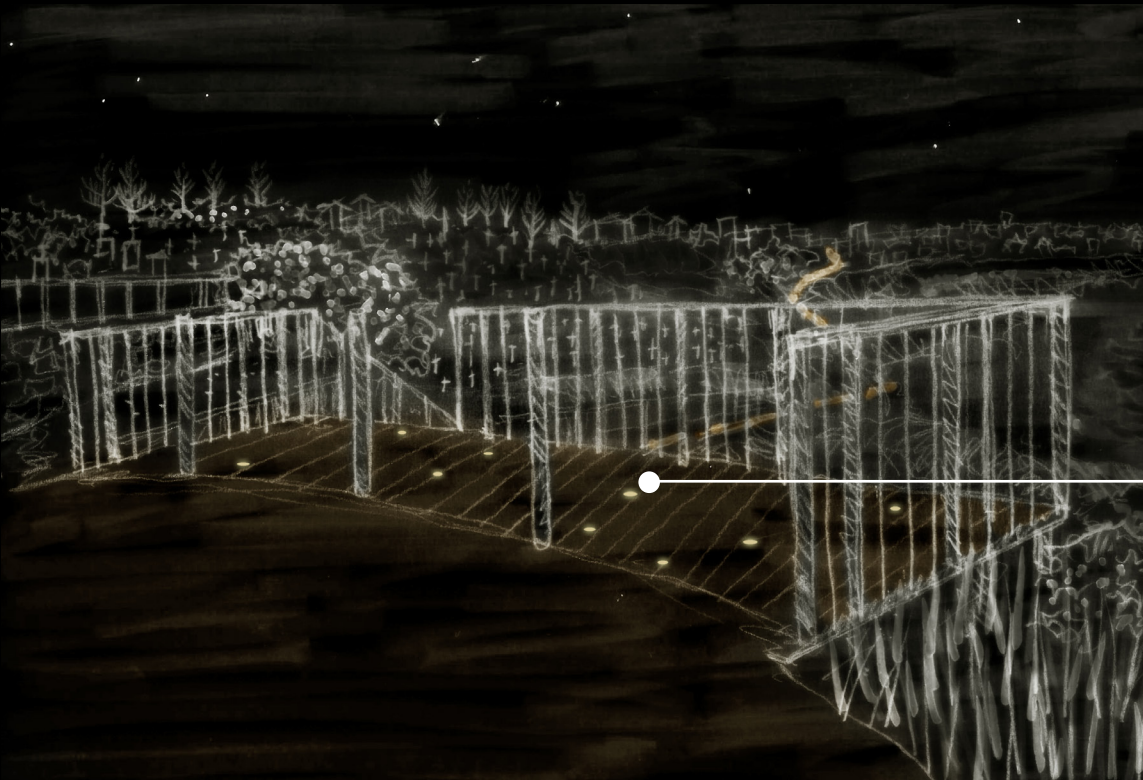
For pathways, integrated handrail lighting with asymmetric distribution directed to path to minimise spill light

Dusk to 11pm P4 category to path edge
11pm to sunrise P5 category to path edge

8.4.12 Signage Lighting

Objective: Identify the departure point from Waverley Council at the Clovelly/ Waverley transition with a lighting language that is consistent with the approach for other signs of a similar nature.

Tier 2: Integrated letter lighting, linear wash lighting, marker lighting



Integrated marker luminaire within timber boardwalk Marker lighting to define gateway to Coastal Walk



In-ground luminaire to graze up stone structure. Lighting integrated into letters to backlit signage elements

8.5 Tier 3: Lighting Interventions

Objective

To respond to site specific locations as identified in the place strategy as a key destination suitable for intervention that have the opportunity to reflect on a story, provide activation or provide a unique response to enhance the site identity.

Such as a string of pearls, the lighting interventions offer highlights, moments of surprise and expression of varied scale on the pedestrian journey.

Design Approach

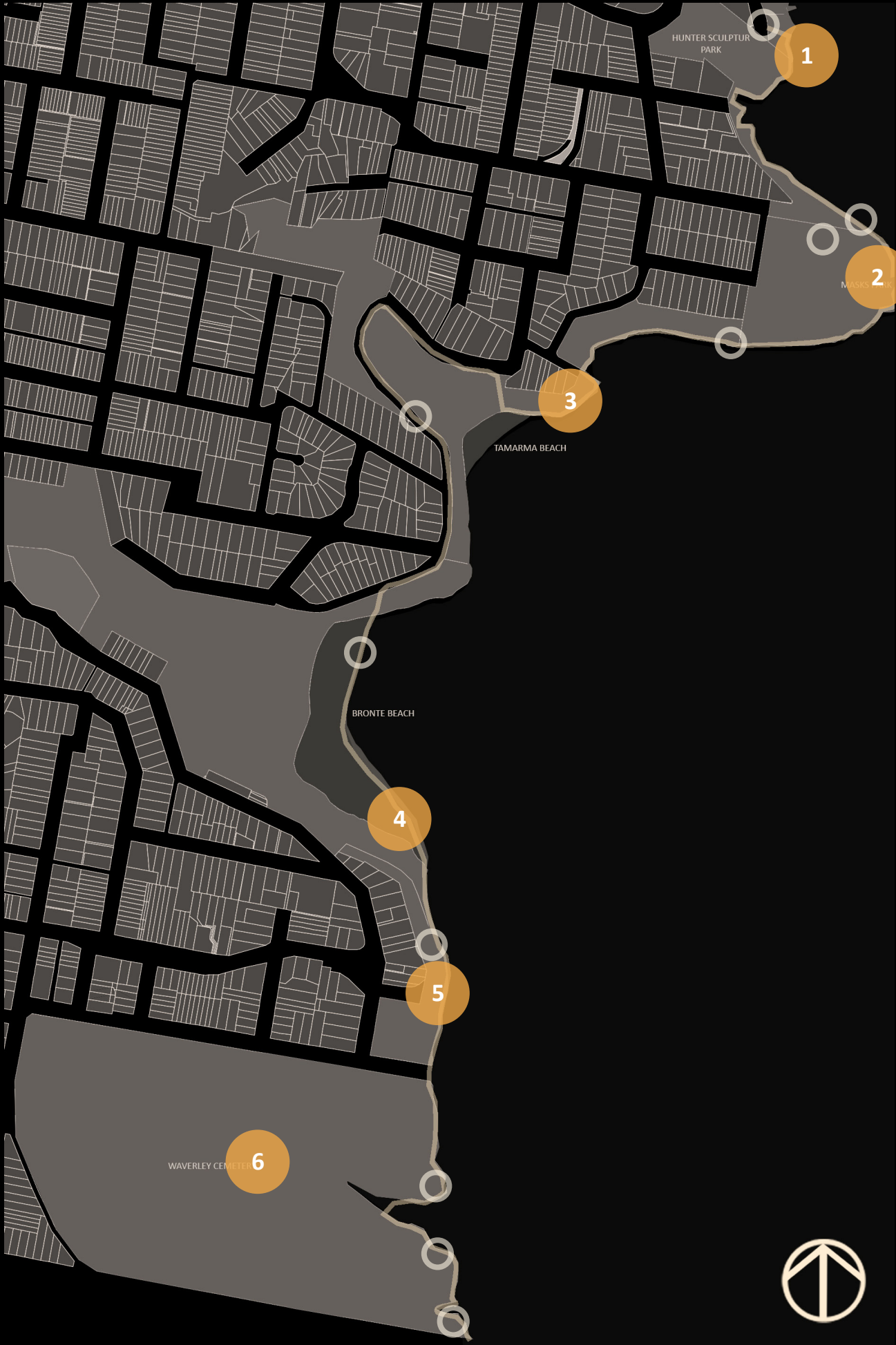
Lighting interventions should identify important geographical features or express a sense of place of a significant location through a dignified and elegant lighting design. Through this strategy the walkway should gently interact with its users not only in terms of a sensitive visually undulating response to its environment but will also interact with its community and visitors in a more direct literal manner. Lighting interventions are at key nodes along the coastal walk, communicating important social and historical stories or natural features in the landscape.

Locations

1. Entry path below Notts Avenue
2. Mackenzie Point
3. Tamarama SLSC
4. Bronte Pool and Stair
5. Bronte Cutting
6. Waverley Cemetery

Lighting Timing

Typically lighting elements of a lighting intervention that contribute to the pathway lighting of the Coastal walk are to be on from dusk to dawn. After 11pm pathway lighting is to be dimmed to reduce the lighting level to provide a minimal level for safe passage. Other elements of an intervention that are not critical for safe movement may turn off at 11pm in consideration of residents and wildlife.





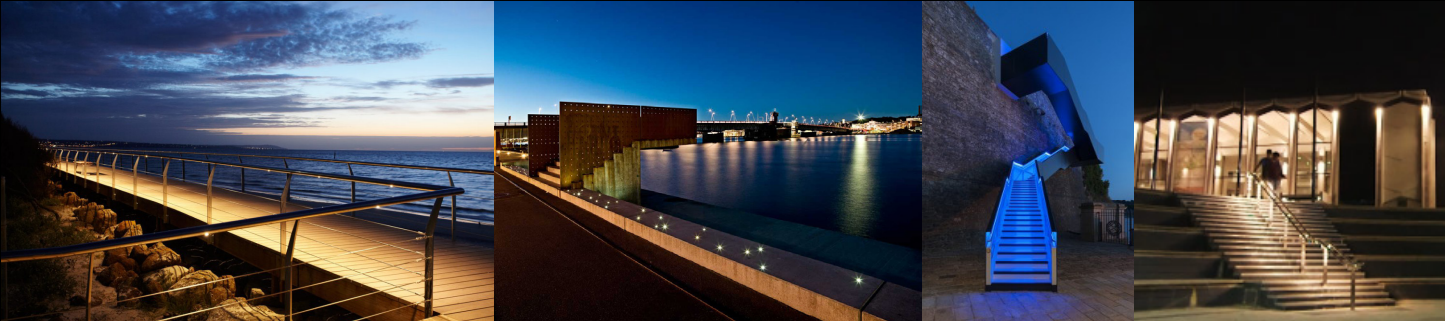
Precedent Image: Klik Systems

8.5.1 Entry path below Notts Avenue

Objective: Highlight the south Bondi gateway stairs that connect to the Coastal Walk reflecting the experience created at South Bondi, identifying this point as a key gateway

Lighting Design Direction:

Tier 2 lighting elements of integrated handrail lighting and low level wall lighting are to form the foundation of the lighting treatment. The marker lighting typology may be used in a unique way within the pathway floor responding to the site use in an ephemeral manner, ‘twinkling’ when people pass by via sensors located in the staircase handrails at each side.



Path: Dusk to 11pm P3 category to path edge/ 11pm to sunrise P4 category to path edge
Stair: Dusk to sunrise P9/ P8 category

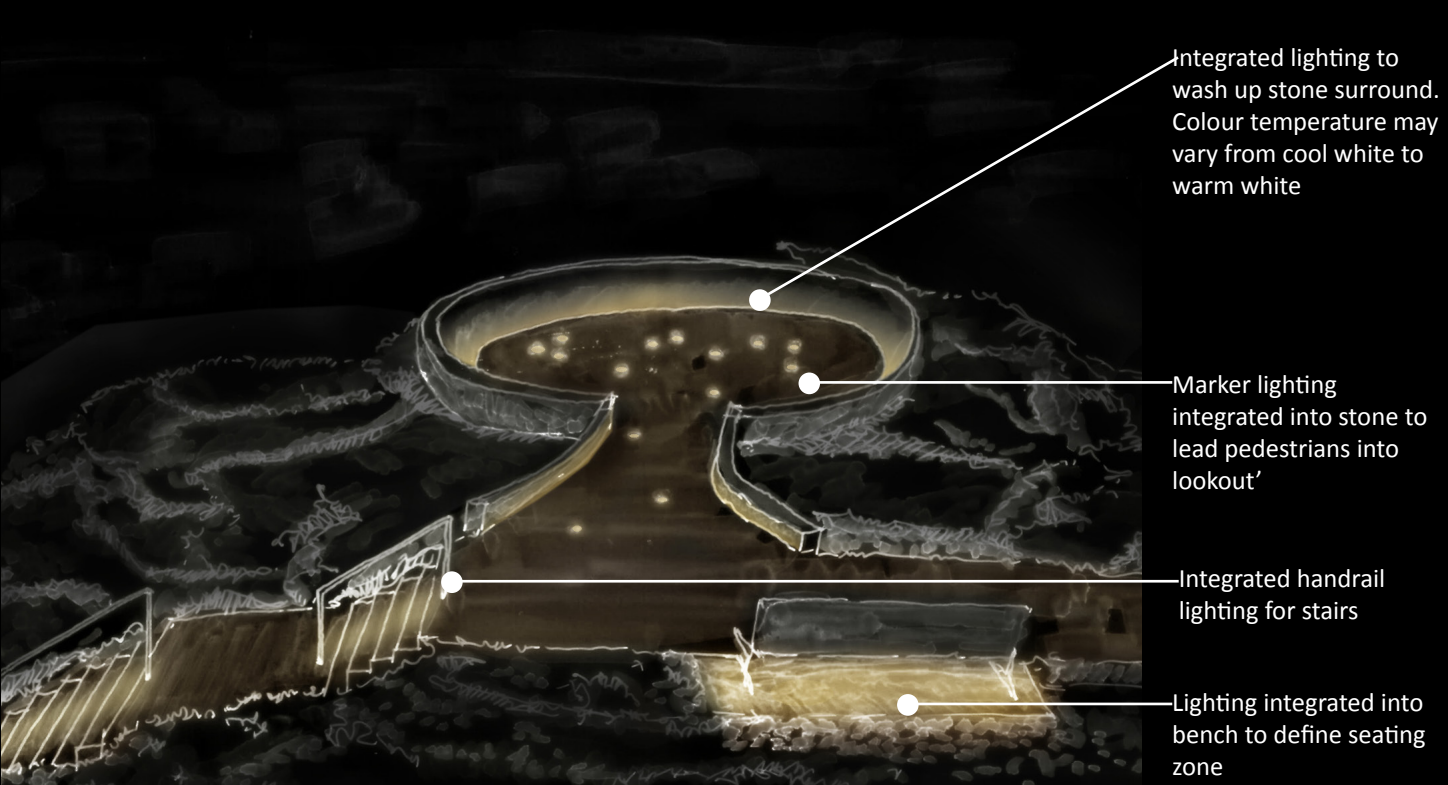
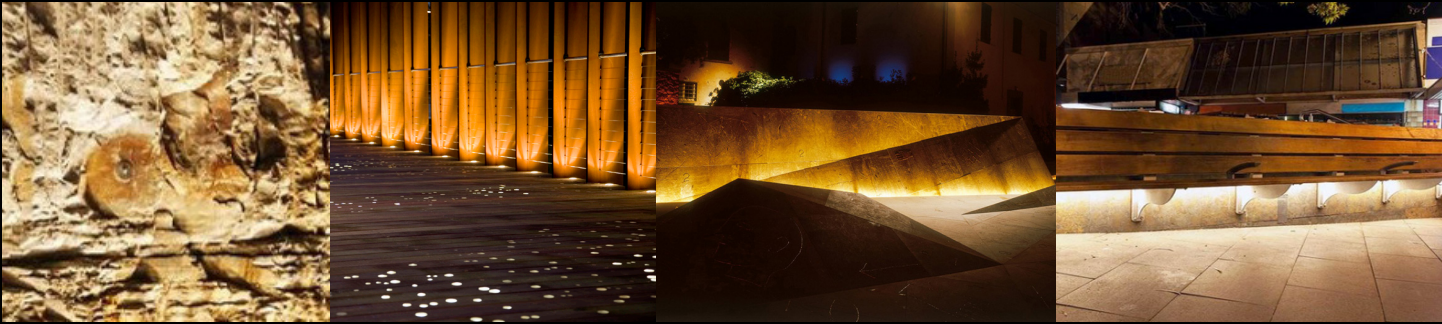
8.5.2 Mackenzie Point

Objective: Reinforce Mackenzie Point and Marks Parks role as a place of contemplation and for whale watching. The lighting scheme is to maintain unobstructed views to the water and provide safety for those watching the sunrise. There are opportunities to interpret the indigenous history of the Coastal walk at Mackenzies Bay with natural elements featured throughout the area. This could be amplified by lighting key sections of coastal rock formations, expressing coastal character.

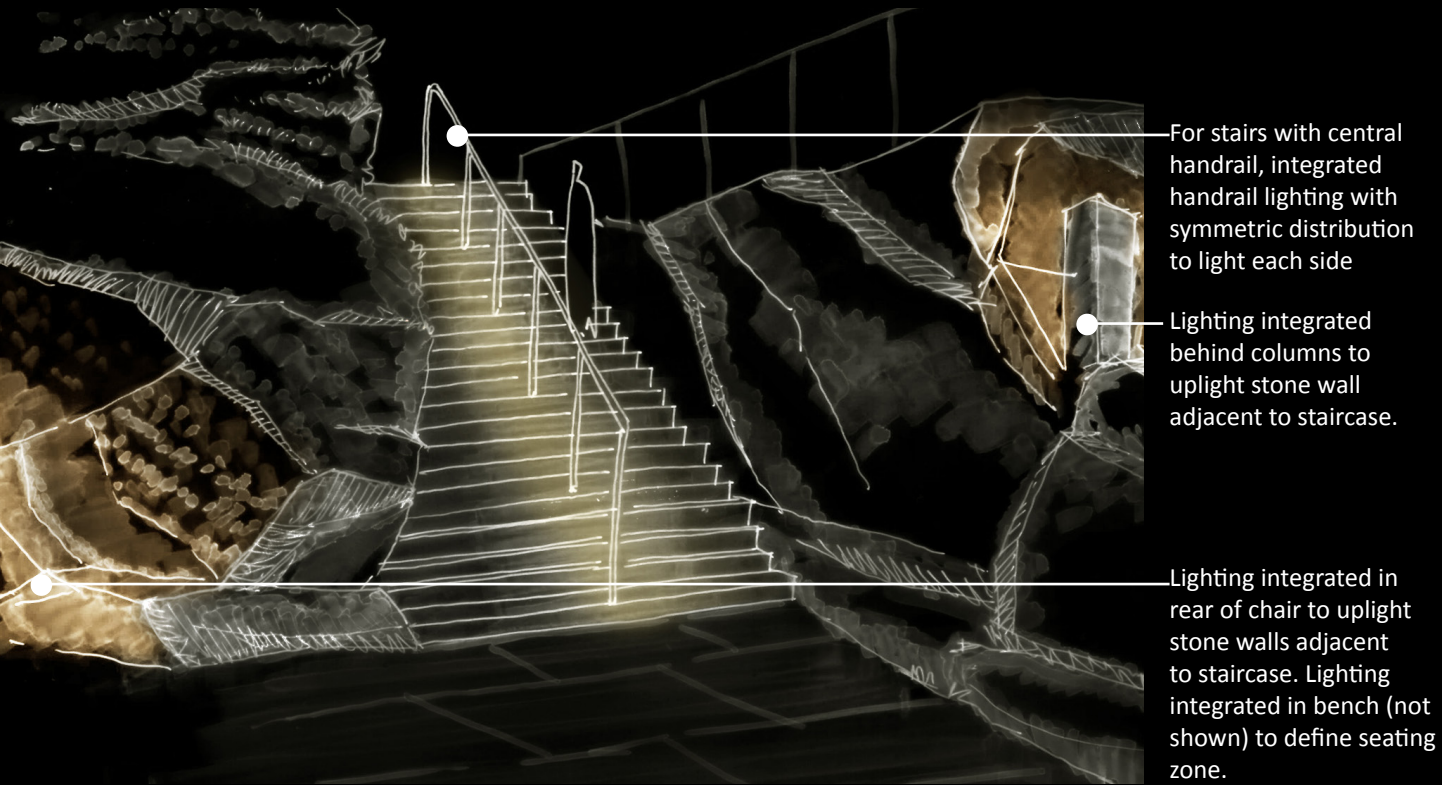
Lighting Design Direction:

Tier 2 lighting elements of integrated handrail lighting for stairs and integrated bench lighting for the seating zones are to form the foundation of the lighting treatment. The marker lighting typology cluster arrangement is to lead pedestrians into the lookout and be representative of Aboriginal star constellations. Stakeholder engagement is required to develop a suitable and subtle reference.

Integrated lighting is to wash up the stone surround highlighting the nature stone material and texture and encasing the lookout. The colour temperature of the lighting may vary from cool white to warm white responding to the natural daylight transition. The natural rock formations on the path leading to the lookout may be expressed with light to enhance the texture and provide a backdrop of light.



Stair: Dusk to sunrise P9/ P8 category





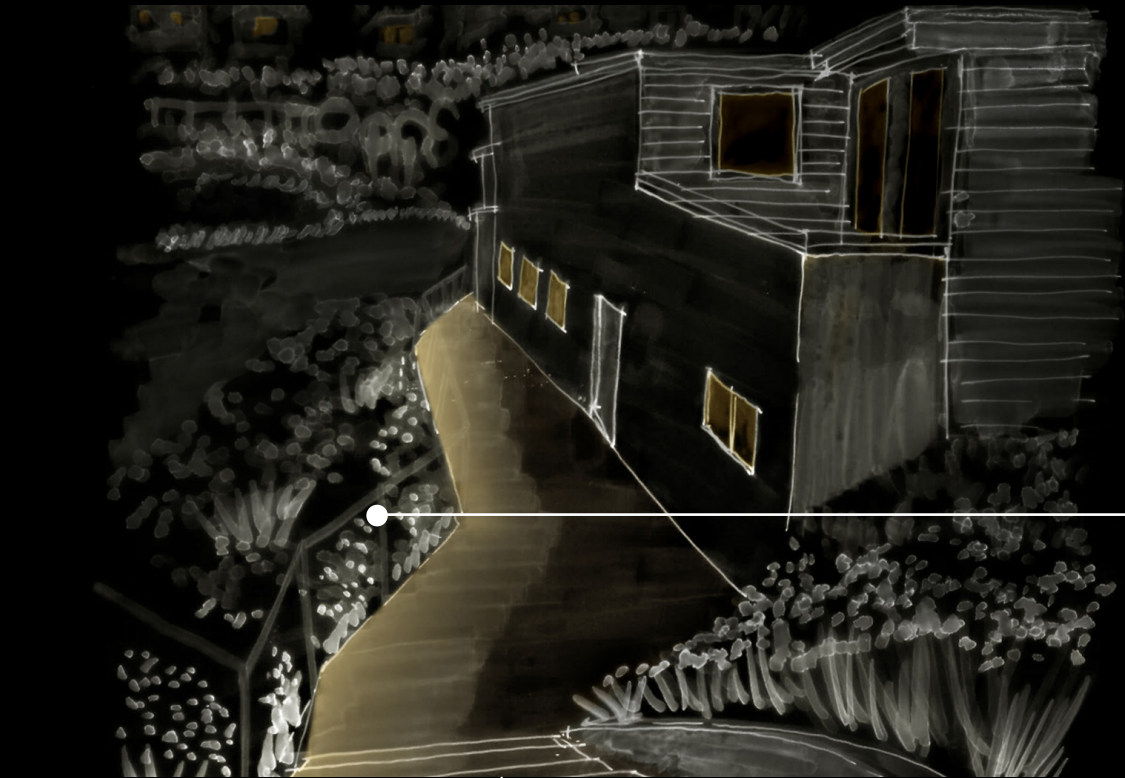
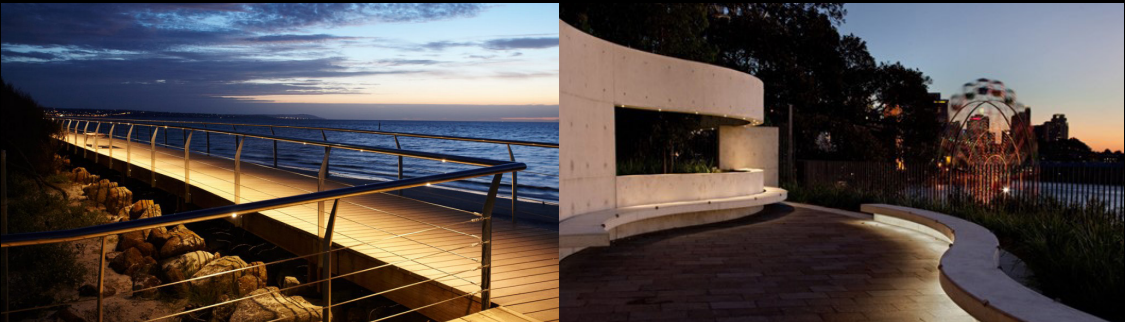
Mackenzie Point Concept Image

8.5.3 Tamarama Surf Life Saving Club

Objective: Highlight Tamarama Surf Lifesaving Club re-enforcing the image of the iconic building and responding to the building as a key intersection point for surfers and dog walkers in the evening from the coastal walk, beach and main roadways beyond.

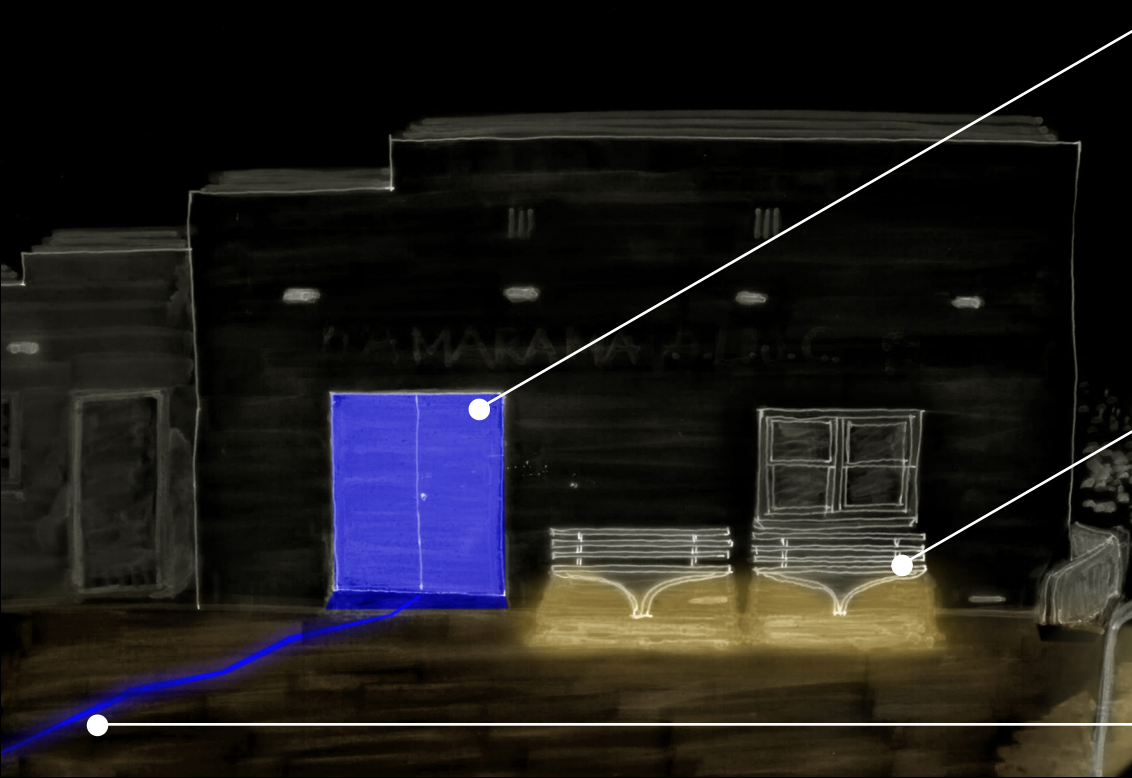
Lighting Design Direction:

Consistent tier 2 element of integrated handrail lighting for stairs is to form the foundation of the lighting treatment. The lighting design is a playful installation that highlights the existing iconic blue door on the West side of the building with amber lighting within the benches to express the yellow of the building and provide a consistent language with other seating areas. From the blue door a subtle 'line of light' running out to the beach stair is to symbolise the Tamarama SLSC insistence of a 'life line' that was the catalyst for a 'reel' to be used on the beach.



Path: Dusk to 11pm P4 category to path edge/ 11pm to sunrise P5 category to path edge
Stair: Dusk to sunrise P9/ P8 category

For stairs with side handrail, integrated handrail lighting with asymmetric distribution to light inwards to reduce spill light. Handrail lighting to continue around to front of SLSC.



Lighting to existing blue door

Integrated amber bench lighting

Subtle 'line of light' running out to the beach stair is to symbolise the Tamarama SLSC insistence of a 'life line' that was the catalyst for a 'reel' to be used on the beach



Tamarama Surf Life Saving Club Concept Image

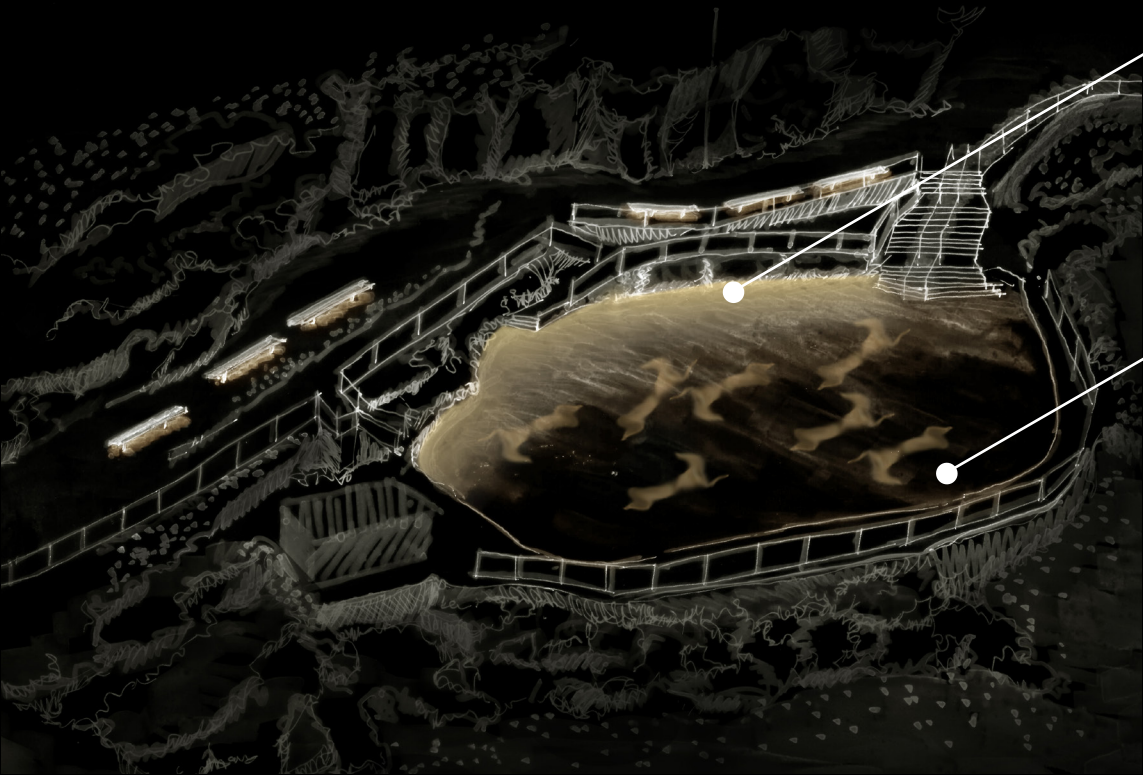
8.5.4 Bronte Pool and Stair

Objective: Highlight the Bronte Pool and stairs to create an attractor in the evening and encourage passive surveillance. The lighting approach to be subtle with ephemeral characteristics to compliment the natural environment.

Lighting Design Direction:

The lighting installation is to have a ephemeral quality rather than a floodlit approach, with a subtle projected dappled light element to the pool that moves and fades in a transient manner. The imagery may be developed to evoke the memory of Mina Wylie who was taught to swim in Bronte Baths by her father Harry A. Wylie, a champion distance diver, who took a lease of the Baths in 1895. Mina went on to international fame. Additional lighting maybe integrated within the pool to light across the pool floor providing a warm glow and allowing a function level of light for swimmers in the early evening

of the winter. Warm white light integrated into the adjacent seating benches is to enhance experience and atmosphere whilst providing a consistent language with other seating areas..



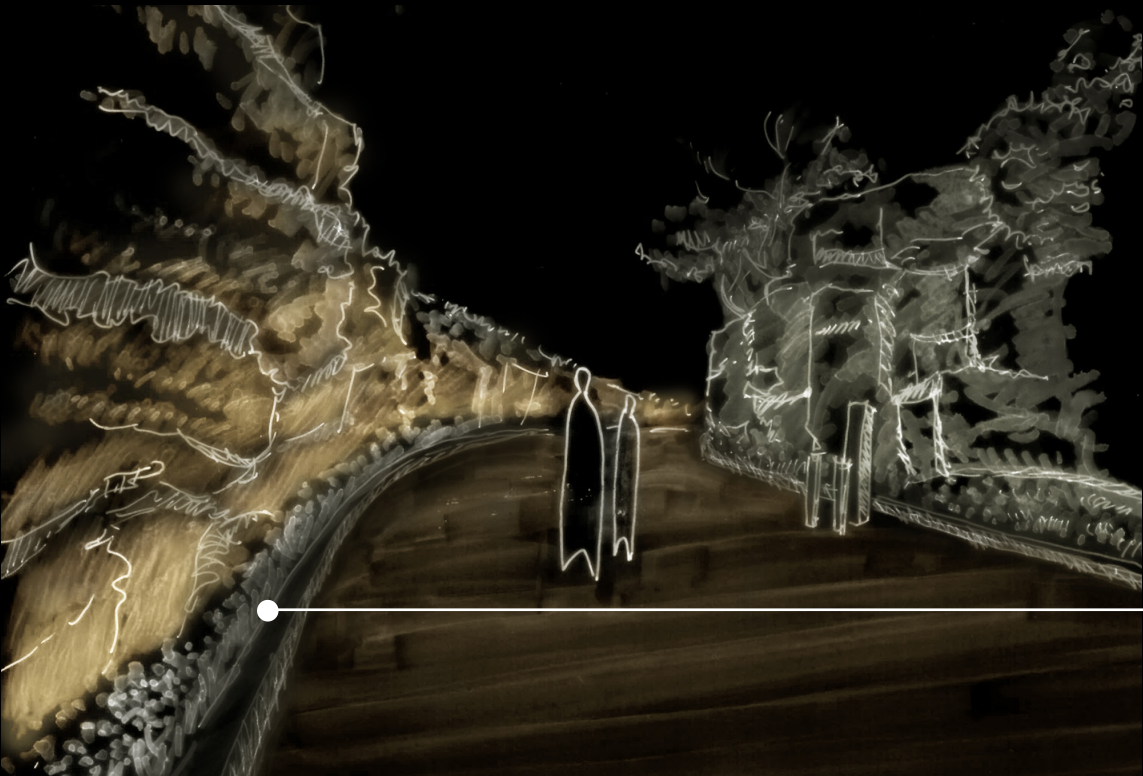
Lighting integrated into pool edge washing along pool floor out towards the sea. Lighting to not cause glare to swimmers within the water or from pedestrians viewing from above.

Potential projection to path and pool with ephemeral and fading nature such as fading footprints on the concrete or swimmers within the pool. Colour may be used.

8.5.5 Bronte Cutting

Objective: Light to provide a visual connection for the user journey through this section of the Coastal Walk, assisting in wayfinding, providing safe passage and providing a consistent language with other areas amplifying the coastal character by lighting key sections of coastal rock formations.

Lighting Design Direction:
Lighting integrated between curve and rock face to uplight rock surface expressing texture and form whilst also providing a visual cue to pedestrians as to where the Coastal walk continues. Lighting to one side of the path is to indicate the pedestrian zone to vehicles. Luminaire selection to consider optical control to direct light to rock surface rather than straight upward to night sky and to reduce glare to residential properties above and vehicles passing by. Additional pole lighting is to be provided for the shared roadway for a neighbourhood road.



Path edge and Neighbourhood road P3 – P5 category

Lighting integrated between curb and wall to uplight stone wall.



Bronte Cutting Concept Image

8.5.6 Temporary Installation at Waverley Cemetery

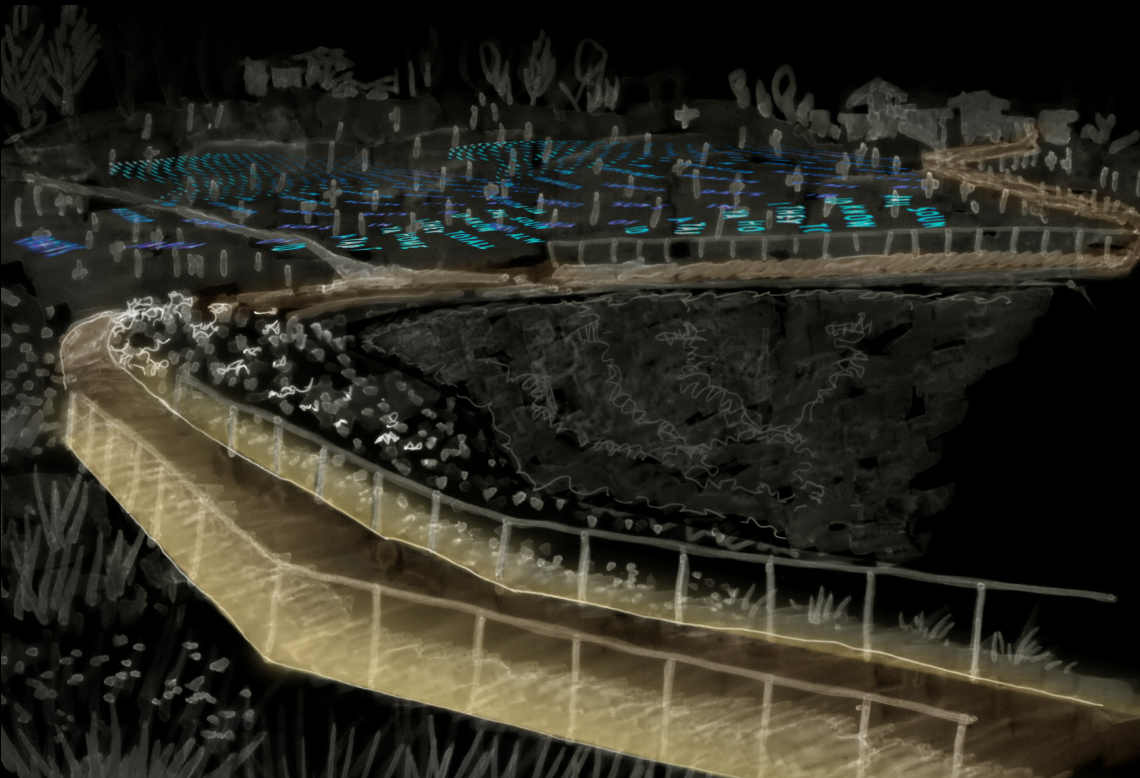
Objective: Temporary Lighting installation to reflect the history of the cemetery respecting the atmosphere and views using light in subtle ways with ephemeral characteristics to compliment the natural environment. The temporary installation may be undertaken to celebrate an anniversary of a figure who is buried within the cemetery or may be installed for a particular event such as Halloween or Heritage Week.

Lighting Design Direction:

The lighting installation is to be temporary and subtle and may only be operational for certain hours of the evening during the installation period. The temporary projected wave of words or imagery is to subtly wash over the grave stones telling the stories of those who lie within and responding to the natural environment. The Cemetery contains the graves of many people who

shaped Australian literature including Henry Lawson. Henry Lawson’s poem ‘The Cliffs’ could be appropriate in this locations to provide inspiration to the projected words. Other imagery may also be considered to suit the event the installation is celebrating such as projected poppies for ANZAC Day. Use of colour is to be minimal and should be subtly used to assist in the visual creation of waves. The extent of the projection may be limited to a smaller section. Event based installations may also be suitable in this area i.e. Halloween events. 3 Phase power is required to facilitate this.

The temporary lighting installation is to be supported by permanent lighting to the stairs and pathways as per 8.4.10, 8.4.11 and 8.4.12 in the longer term. Temporary lighting may be provided to key viewing points in the short term.





Temporary Projected Light Installation to Waverley Cemetery

**They sing of the grandeur of cliffs inland, But the cliffs
of the ocean are truly grand; And I long to wander and
dream and doubt Where the cliffs by the ocean run
out and out.**

- The Cliffs (extract), Henry Lawson 1903

8.6 Three Phase Power

Objective

Three phase power locations to be provide opportunities for temporary events.

Locations

- Mackenzies point;
- Location between Mackenzies point and Tamarama to support Sculptures by the Sea;
- Tamarama Park;
- Bronte Park;
- Waverley Cemetery.



A CONNECTED NETWORK

9. A Connected Network

9.1 Lighting Control

Lighting is an important Council asset in providing a legible and functional night time environment. A local lighting infrastructure system is often difficult to manage with intensive operational requirements. Globally many cities are moving towards a connected network lighting solution for a ‘smart city’ lighting solution. As Waverley Council transitions ownership of the street lighting assets from Ausgrid and upgrades the infrastructure to the MFP in key areas the installation of a connected network is recommended.

A connected network provides many benefits including:

- A solution that can be remotely managed and monitored providing alerts when a luminaire fails. This allows faulty fittings to be quickly located and replaced resulting in reduced maintenance costs and a safer street environment;
- Reduced energy consumption for street lighting infrastructure through managed and automated switching and dimming of luminaires. Fittings can be programmed to turn on at a certain time and off at a certain time. A networked solution can also automate dimming reducing overall light levels in the later evening when higher lighting levels may no longer be required;
- Networked adjustment of lighting including colour tuning of selected fittings such as the MFP pole integrated wayfinding lighting ring. Colour may be altered across the network for a special event and then return to the every day setting once the event is over. This may also offer the ability to tune lighting for weekday and weekend use where the function of certain public spaces may change;
- Seasonal or weather predictive lighting control may be implemented in the future for a dynamic and responsive night environment;
- Remote programming and adjustment of the Coastal Walk and Coastal Perimeter areas may be undertaken to reduce light levels outside of peak use and turn certain elements off when not required;
- An open source network solution can expand as the Council takes on greater ownership of lighting infrastructure across different upgrades;
- An open source solution allows different manufacturers to be connected to the same network without limitations of luminaire selection;
- Networked solutions can be capable of supporting many applications in addition to street lighting for a complete solution from a central location.

The system should be capable of;

- Fault detection;
- Central Management;
- Future information transfer, connection to the Internet of Things and extension of public wi-fi;
- Technology to enable future integration of weather adaptive lighting solutions, tuneable white colour control, dynamic RGBW colour control;
- Open source;
- Dynamic dimming;
- Programmed settings with time clock;
- Lumen maintenance adjustments;
- Integration with road management systems.

TECHNICAL GUIDANCE



10. Technical Guidance

10.1 Light Quality

Light quality is an important consideration in the perception of the public domain at night. This includes consideration of the correlated colour temperature of light sources, its consistency, colour rendering and light direction. White light (in hues between 2500K and 4500K), compared to previous traditional yellow light of sodium lamps and bluish tones of mercury vapor lamps, is the preferred light colour for urban lighting applications due to it providing a more natural ambiance and improved visibility. Colour Rendering is a key consideration in regards to legibility, comfort and safety. The direction of lighting in relation to the activity and background environment impacts on the night-time environment and needs to be considered as part of the design.

10.2 Minimisation of Adverse Lighting Impacts

If used inappropriately, lighting can cause adverse impacts on the environment and spatial quality of an area. Luminaires can cause light pollution and spill light which can affect local biodiversity and clarity of astronomical observations. Luminaires can also cause discomfort glare if not used correctly, which can affect adjacent residences, reduce visibility and cause distractions to both pedestrians and vehicles. Techniques to minimise adverse impacts of light:

- Luminaires should be directed to focus light as required for specific applications.
- Luminaires should only be turned on when required to conserve energy and minimise the unnecessary emission of greenhouse gases.
- Masking techniques are to be used where required to minimise stay light into the sky including baffles and glare shields.
- Lens selection should also be considered when selecting luminaires. Where possible, luminaires are to be full cut off fittings.
- Uplight floodlighting of buildings is not recommended.
- Consideration is to be given to reduce the impacts on local biodiversity through programming of lighting scenes, dimming levels and turning certain fittings off at certain times of the evening.

10.3 Lighting Distribution

A cohesive lighting night time structure is to be implemented to ensure that darker spaces of the streetscape do not appear unsafe or dimly lit when contrasted with adjacent brightly lit areas. Over-lit spaces can create high contrast with others and is to be avoided.

Awnings, verandas and trees may block street lighting and cast shadows. Lighting to these elements should be considered in the overall design and lighting scheme.

10.4 Luminaires and vandalism

Vandalism is a key consideration in the selection and mounting of a luminaire. Considerations for luminaire selection include:

- IK Rating: The IK rating of a luminaire refers to the degree of protection by enclosures for electrical equipment against external mechanical impacts in accordance with IEC 62262:2002 and IEC 60068-2-75:1997.
- The IK Rating ranges from IK00 for luminaires not protected to a rating of IK10 that protects a luminaire against 20 joules impact.
- Materiality and design of luminaires and brackets should be able to withstand environmental conditions of the site
- Fixings to be concealed and tamper proof where required.
- Mounting height to be considered for public access.

SUMMARY OF IDEAS

11. Summary of Ideas

11.1 Introduction

The Creative Lighting Strategy spans a 10 year period from 2017 to 2027. The summary table includes project ideas for both Operational Works and Capital Works.

Operational works address internal actions required to implement the lighting strategies. These relate to the private domain through policy review and integration of lighting strategies in other Council documents.

Capital works identify the project ideas outlined in the Creative Lighting Strategy document and provide information on key stakeholders, funding and next steps.

Implementation of the MFP pole and lighting control network, whilst addressed in the Creative Lighting Strategy, forms a separate Council project thus has been costed and programmed elsewhere.

Disclaimer Order of Cost:

Figures outlined within this document are order of cost estimates only and are provided to assist Waverley Council in cost planning and project funding. Waverley Council needs to make their own judgment and employ a professional cost planner to ascertain actual costs for each project as the design is developed.

The costs presented are high level figures based on the concepts proposed to date. Costs exclude:

- GST
- Latent Conditions
- Removal and diversions of existing site services
- Project design fees
- Temporary lighting required during upgrade works
- Builders works including trenching, back filling, making good
- Central lighting control system implementation
- MFP, pedestrian pole and pedestrian crossing lighting. These works are to be carried out as a separate project. Additions of lighting to the standard MFP including luminous cladding and tree lighting have been addressed within this report and require input from the MFP manufacturer.
- All temporary builders works including scaffolding, hoarding etc.
- Consultation with key local business stakeholders
- Urban design upgrade works
- Artwork works
- Private domain works
- Typically electrical works are excluded including cabling, conduits, switchboards, connections to street power (require Level 3 designer), due to unknown conditions. An allowance has been provided in specific projects for local cabling requirements only.




An escalation of the price has been allowed if the lighting works are undertaken at a later stage and has been incorporated into the figures shown below.

11.2 Operational Works


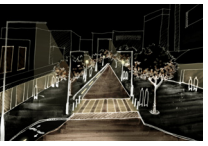

ACTIONS	DESCRIPTION
1	Review of Capital Works Schedule and integrate Creative Lighting Strategy recommendations into project scopes.
2	Identify and future-proof sites in current capital works program and where possible provide base infrastructure for lighting.
3	<div>Review Waverley DCP and draft controls for the following:</div> <div><div>- 5.3.2 Façade Lighting and Alfresco Dining Lighting</div><div>- 5.3.3 Retail Frontages Lighting (Internal Lighting)</div><div>- 5.3.4 Under Awning Walkway Lighting</div></div> <div>An engagement programme is to be developed with property owners and retail tenants in key retail corridors to encourage upgrades of existing lighting treatment and discuss presentation of their assets after hours. This should be facilitated by Shaping Waverley.</div>
4	Amend the Waverley Public Domain Technical Manual to include Lighting Principles and Application specifications as per the Waverley Creative Lighting Strategy.
5	Integrate lighting specifications into scope of works for Public Art Strategy commissions and subsequent public domain upgrades.



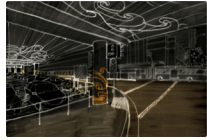

11.3 Capital Works - Project Ideas List

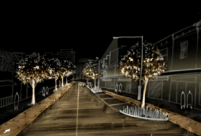



11.3.1 Pilot Projects 2017 – 2018 (Funded by 2017/18 capital works budget)

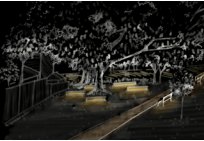


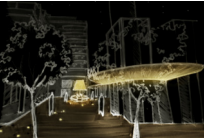

Project No	Description	Key Stakeholders	Funding	Immediate Next Steps	Lead
6.6.1 	Temporary projection Oxford Street Mall A projected element may be considered connecting Oxford Street Mall and Bondi Junction Train Station to provide a changing, topical and dynamic connection with Grosvenor Lane below. Link to public wi-fi and HelloBondi projects.	Adjacent retailers Oxford St Mall Traders Local Residents	Pilot Project funded by 2017/2018 Capital Works budget \$ 40,000 and matched by NSW Government Tourism Grant.	<ul style="list-style-type: none"> Engage with adjacent retailers re. installation. Develop brief and call for EOI by digital artists. Explore physical infrastructure required for temporary install. 	Shaping Waverley Enriching Waverley Sustainable Waverley
7.6.4 	Temporary light element in Bondi Beach art wall New murals to the art wall with a glowing component are to be encouraged.	Graffiti artists WCC Arts and Culture Team	Within existing program budget. Artist encouraged to use glowing medium in murals.	<ul style="list-style-type: none"> Integrate lighting component to new graffiti artwork briefs. Review after 6 months and introduce into the seawall guidelines if appropriate. 	Enriching Waverley
8.4.7/ 7.6.4 	Trial of Tier 2 lighting Handrail integrated lighting to be trialled either on the Coastal Walk stair from Tamarama SLSC to Tamarama Beach or along Bondi Beach promenade walk.	Local Residents Coastal Walk Users SLSCs Internal WCC	Pilot Tier 2 lighting funded by 2017/2018 Capital Works Budget \$60,000	<ul style="list-style-type: none"> Explore physical infrastructure required for lighting trial Engage with local residents and Coastal Walk users to receive feedback on impacts of trialled designs. 	Shaping Waverley Creating Waverley Sustainable Waverley Waverley

11.3.2 Bondi Junction Project Opportunities


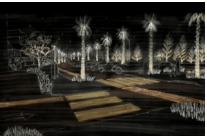


Project No	Description	Key Stakeholders	Funding	Immediate Next Steps	Lead
6.5.1/ 6.6.2 	Urban Lounges and Waverley's movable parklets Existing parklet refurbished with lighting to encourage activation in the evening at key locations in village/ commercial streets. The Village Parklet may be moved to different locations on within Bondi Junction to increase activity in these areas.	Adjacent retailers Transport NSW Local Residents	Council Capital works schedule Lighting Estimate: \$15,000 Consideration must be given to the lifespan of the parklets and the scale of investment.	<ul style="list-style-type: none"> Explore infrastructure requirements for temporary lighting of pop up parklets. Consult with local businesses in these streets to encourage facade, alfresco dining, retail frontage and under awning lighting upgrades to improve the street quality. Undergo existing processes for parklet re-location. 	Shaping Waverley
6.5.1 	Complete Streets Lighting As Spring Street and Oxford Street are upgraded as part of the MFP and/or complete streets works, the permanent lighting elements including pedestrian pole lighting, tree lighting, seating lighting and urban structure lighting should also be upgraded to suit the allocated project budget.	Adjacent retailers WCC Parks and Maintenance Local Residents	RMS Funding - Designs and cost estimates to guide design brief and scope of works for Complete Streets upgrades 2017/18 and future capital works upgrades. \$6,000 - \$10,000 per tree in-ground \$5,000 - \$7,000 per tree from MFP \$3,000 - \$5,000 per bench	<ul style="list-style-type: none"> Detailed design to provide quantity of lighting elements and installation. Community engagement as per council construction processes. 	Project Waverley
6.5.5 	Waverley Street Mall A lighting upgrade is recommended in the short term to encourage increased use and safe passage.	Adjacent retailers Local Residents	Lighting installation included in scope of works for Public Art installation. Other lighting upgrades are to be undertaken as a medium term recommendation.	<ul style="list-style-type: none"> Art installation and lighting works proposed for 2017/18 financial year. Consider future-proofing of the site to allow for long term recommendations. 	Enriching Waverley

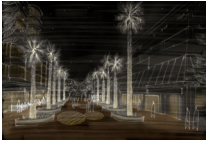
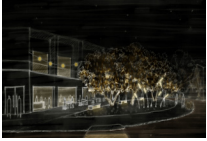



Project No	Description	Key Stakeholders	Funding	Immediate Next Steps	Lead
6.6.6 	Bondi Junction Gateway Arrival Statements Installation of sculptural elements and tree lighting to the three main gateways to Bondi Junction at Fingleton Reserve, Oxford Street and Bronte Road.	Adjacent retailers RTA WCC Parks and Maintenance Local Residents	Delivery through Development Applications and Voluntary Planning Agreements. Lighting is included in the scope for RMS Funding for the cycleway project. SEEK CO-FUNDING Lighting Estimate: \$100,000 per site \$6,000 - \$10,000 per tree lighting \$50,000 Artwork lighting \$10,000 Lighting control and general electrical works	<ul style="list-style-type: none"> Incorporate the CLM into VPA information. 	Enriching Waverley Building Waverley
6.6.1 	Oxford Street Mall Lighting upgrades to the mall and implementation of key lighting strategies may act as a catalyst for increased after hours trade.	Oxford St Mall Traders Original artists of Oxford St Mall artworks Local Residents	To be integrated into Council capital works schedule Lighting Estimate: \$660,000 - \$760,000 \$300,000 catenary lighting \$6,000 - \$10,000 per tree lighting \$3,000 - \$5,000 per bench lighting \$80,000 Lighting control and general electrical works	<ul style="list-style-type: none"> Engage with traders regarding the impact of installation works. Consult with artists re. impact on artworks by lighting installations. 	Building Waverley
6.6.3 	Temporary projection under Syd Einfeld Drive Projected light is to be applied to the surfaces of the columns and ceiling to increase the perceived brightness within the space and generate interest to encourage increased use at night time.	Transport NSW RTA Local Residents	Urban Interventions Project Business Case 2018/19 Lighting Estimate: \$45,000 Investigate co-funding with Woollahra Council	<ul style="list-style-type: none"> Engage with RTA and Transport NSW re. pilot project Consult with Woollahra Council as this will affect residents in their LGA and there might be an opportunity for establishing co-funding from both Councils. Develop brief and call for EOI by digital artists (may be connected with Oxford St Mall projection) Explore physical infrastructure required for temporary install including power sources from the Waverley Depot 	Shaping Waverley
6.6.5 	Boot Factory Lighting to the Boot Factory Building and supporting area is to showcase this significant heritage building and support the future activation of Norman Lee Place.	Local Residents Senior Centre Neighbouring Businesses	Scope within any future upgrades to the Boot Factory as a part of Civic Heart Project. Lighting estimate: \$90,000 - \$110,000 (including \$70,000 - \$90,000 Lighting, \$20,000 General electrical works)	<ul style="list-style-type: none"> Consult with local studies librarian on key stories to tell and how these stories may be presented. 	Shaping Waverley
	Norman Lee Place lighting	Local Residents Senior Centre Neighbouring Businesses	Funded through Complete Streets upgrades to the space Lighting estimate: \$7,700 - \$12,800 per tree \$3,800 - \$6,400 per bench	<ul style="list-style-type: none"> Install in line with heritage interpretive lighting to the Boot Factory 	Project Waverley


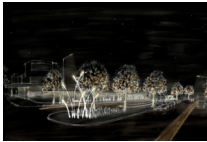

Project No	Description	Key Stakeholders	Funding	Immediate Next Steps	Lead
6.5.2 	Bronte Road lighting As Bronte Road is upgraded as part of the MFP and/ or complete streets strategy, the permanent lighting elements including pedestrian pole lighting, tree lighting, seating lighting and urban structure lighting should also be upgraded to suit the allocated project budget.	Adjacent retailers Local Residents	Funded through Complete Streets upgrades; to be incorporated into project scope. Lighting Estimate: \$7,700 - \$12,800 per tree in-ground \$6,400 - \$9,000 per tree from MFP \$3,800 - \$6,400 per bench	<ul style="list-style-type: none"> Confirm the final extent and quantity of lighting elements installed. Consult with local businesses with regard to installation impacts. 	Project Waverley
6.5.2	Public artworks Lighting may also be provided to any artworks/ sculptures that are installed as part of the Public Art Plan. Costing is determined based on artwork/ sculpture requirements.	Arts and Culture Team Adjacent retailers Artists Local Residents	Lighting to be included in the project brief or as part of the capital works for the site. Project estimate to be developed to suit public art design.	<ul style="list-style-type: none"> WCLM to be provided as a part of artists briefs and project scopes. 	Enriching Waverley
6.5.4 	Clementson Park Lighting treatments to the park perimeter including tree and bench lighting is to be installed to increase sense of pedestrian comfort in the streetscape.	WCC Parks and maintenance team Local Residents	Scoped in Capital Works Schedule for park upgrades. Lighting estimate: \$280,000 - \$340,000 \$7,700 - \$12,800 per tree \$3,800 - \$6,400 per bench \$30,000 Lighting control and general electrical works Lighting to future art works implemented as part of the Public Art Strategy to be scoped as part of project.	<ul style="list-style-type: none"> Waverley Creative Lighting Strategy to inform scope of works for upgrades to the park. 	Creating Waverley
6.6.8 	Gray Street A large scale public art work and lighting installation may be installed at Gray street to the Westfield Bondi Facade to bring life and personality to this area.	Westfield Local Residents	Joint funding with Westfield. Potential VPA funding through Planning Proposal negotiations Lighting estimate: \$250,000 - \$300,000 (pending art work/ lighting installation design) \$210,000 - \$240,000 lighting \$40,000 - \$60,000 general electrical works	<ul style="list-style-type: none"> Develop brief for EOI call for artists/designs for the installation. Consult with Westfield regarding potential for joint funding and structural requirements on façade. 	Shaping Waverley Building Waverley Enriching Waverley
6.5.5 	Waverley Mall Following the implementation of the Public Art installation, other lighting strategies including tree and bench lighting to be implemented to enhance the mall.	Adjacent retailers Local Residents	Scoped in Capital Works Schedule. Lighting Estimate: \$12,800 - \$15,500 per tree \$12,800 - \$15,500 per bench \$30,000 - \$40,000 general electrical works	<ul style="list-style-type: none"> Waverley Creative Lighting Strategy to inform scope of works for upgrades to the mall 	Enriching Waverley


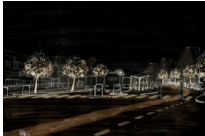
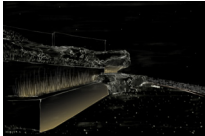



Project No	Description	Key Stakeholders	Funding	Immediate Next Steps	Lead
6.5.3 	Fingleton Reserve Lighting to Fingleton Reserve is to provide increased pedestrian comfort through lighting of the key pathway and pathway perimeter increasing visual access.	Internal WCC Adjacent property owners Local Residents	Scoped in Capital Works Schedule for park upgrades Lighting estimate: \$130,00 - \$160,00 \$6,000 Pedestrian Pole \$3,800 - \$6,400 per bench \$40,000 General electrical and Lighting control	<ul style="list-style-type: none"> Community engagement as per existing park upgrade process 	Creating Waverley
6.5.4 	Clementson Park Lighting treatments to the park perimeter including tree and bench lighting is to be installed to increase sense of pedestrian comfort in the streetscape.	WCC Parks and maintenance team Local Residents	Any lighting around the playground will be integrated into the scope for Playground upgrades. Lighting Estimate: \$8,500 - \$14,000 per tree \$6,600 per pole	<ul style="list-style-type: none"> Waverley Creative Lighting Strategy to inform scope of works for upgrades to the park. 	Creating Waverley
6.5.5 	Eora Reserve and Connection to Waverley Mall Lighting for Eora Reserve is to provide increased pedestrian comfort to perimeter pathways on the neighbouring streetscape.	Internal WCC Adjacent property owners Local Residents	Scoped in Capital Works Schedule for park upgrades Lighting Estimate: \$7,700 - \$12,800 per Tree in-ground \$6,400 - \$9,000 per Tree from MFP \$3,800 - \$6,400per bench \$25,000 perimeter planting lighting \$20,000 handrail lighting \$25,000 artwork lighting \$40,000 - \$60,000 General electrical works	<ul style="list-style-type: none"> Community engagement as per existing park upgrade process Consider maintenance funding for improvements to artwork lighting 	Creating Waverley
6.4.4 	Waverley Library and Forecourt Lighting to the Waverley Library and Forecourt is to encourage civic activations with lighting of key trees, marker lighting and an exterior reading room.	Waverley Library Strata managers - owners of the space Local Residents	Potential funding partnership with strata management to improve the public space. Lighting estimate: \$8,500 - \$14,000 per tree \$20,000 - \$25,000 marker lighting total \$60,000 - \$70,000 Reading Room Installation \$40,000 - \$70,000 general electrical works	<ul style="list-style-type: none"> Consult with Library re. Reading Room Installation 	Enriching Waverley
6.6.2 	Grosvenor Lane Lighting Installation of permanent lighting treatments to act as a precursor for future laneway retail offers and ground level connection to the train station to Oxford Street Mall.	Adjacent retail offers Transport NSW Adjacent property owners Internal WCC Local Residents	Business Case 2021/25 Consider funding through NSW safety grant or partnership with Transport for NSW. Lighting Estimate: \$240,000 - \$260,000 \$190,000 - \$200,000 Lighting \$50,000 - \$60,000 General electrical works	<ul style="list-style-type: none"> Consult with adjacent property owners re. permanent lighting installations. 	Project Waverley

11.3.3 Bondi Beach Project Opportunities



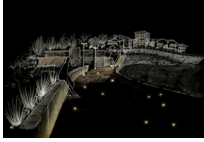

Project No	Description	Key Stakeholders	Funding	Immediate Next Steps	Lead
7.5.1 	Shade Structure Pilot Project In the short term, lighting should be integrated into the Campbell Parade pilot project with lighting being integrated into the new shade structures.	Adjacent retailers Local Residents	Included in the costs of the Campbell parade footpath seating trial.	<ul style="list-style-type: none"> Explore infrastructure required for temporary installation. 	Shaping Waverley Project Waverley
7.5.1 	Palm Tree Lighting Lighting to existing palm trees in the central median strip Upgraded and led roll-out to align with new planting schedule.	RTA Local Residents	Lighting is included in scope of works for Campbell Parade Streetscape Upgrades. Scale and number of installations to reflect existing project budget. Lighting estimate: \$8,000 - \$10,000 per tree	<ul style="list-style-type: none"> Consult with RTA re. installation. 	Project Waverley
	MFP luminous cladding Cladding is to be integrated for poles from Francis Street to North Bondi Commercial Precinct, to express the unique identity of Campbell Parade.	RTA Adjacent retailers Local Residents	Lighting is included in scope of works for Campbell Parade Streetscape Upgrades Lighting estimate: \$8,000 - \$10,000 per pole luminous cladding	<ul style="list-style-type: none"> Consult with adjacent retailers re. the treatment from Francis St North Bondi. 	Project Waverley
7.6.4 	Lighting of Pine Trees - Lighting to pine trees on Campbell Parade should be rolled out to all perimeter trees and existing park vegetation.	Internal WCC Local Residents	Funding through existing Capital Works program. Scope of works to include lighting specifications from the WCLM. Lighting estimate: \$8,000 - \$10,000 per tree \$4,500 - \$6,000 per shrub	<ul style="list-style-type: none"> Using the design guidelines of the WCLA, conduct site specific lighting concept plan and developed designs for the entire park including Biddigal Reserve with capital works to follow. 	Creating Waverley
	Pedestrian scale lighting Pedestrian lighting pole may be installed extending the language of the existing treatment elsewhere within the park signaling the lighting scale change. Lighting may also be integrated to light key low level walls.	Internal WCC	Funding through existing Capital Works program. Scope of works to include lighting specifications from the WCLM. Lighting estimate: \$5,000 per pole \$2000/m - \$2500/m Low level wall lighting	<ul style="list-style-type: none"> Implementation planning as pedestrian pathways are defined and upgraded. 	Creating Waverley
	Bench seating lighting Lighting is to be integrated into the existing bench lighting to the promenade.	Internal WCC	Build into scope of upgrades. 2018/19 Capital works funding. Lighting estimate: \$3,000 - \$5,000 per bench	<ul style="list-style-type: none"> Schedule for implementation. As additional seating elements are rolled out, lighting integration may be extended. 	Creating Waverley
7.5.1 	North Campbell Parade Extension of Campbell Parade, lighting is to be applied to this area to continue the identity of the streetscape and provide a more pedestrian scale to the wide transport hub.	Nth Campbell Parade retailers Local Residents	Funding through Campbell Parade Streetscape Upgrades Lighting estimate: \$7,700 - \$12,800 per tree (pending tree type) \$3,800 - \$6,400 per bench \$10,200 - \$12,800 per pole luminous cladding	<ul style="list-style-type: none"> Consultation with local business owners is required to encourage facade, alfresco, retail frontage and under awning lighting upgrades 	Project Waverley Shaping Waverley


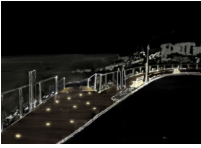


Project No	Description	Key Stakeholders	Funding	Immediate Next Steps	Lead
7.6.2 	Roscoe Street Mall and Gould Street Place Create a distinct experience signaling potential use for gathering events and programmed night time experience	Adjacent retailers Local Residents	Capital works integrated with public artwork installation. VPAs Private development improvements through DCP controls Lighting estimate: \$60,000 - \$80,000 projected lighting \$10,200 - \$12,800 per tree \$9,000 - \$12,000 per planter	<ul style="list-style-type: none"> Consultation with local business owners is required to encourage facade, alfresco, retail frontage and under awning lighting upgrades in the future. Install integrated planter, tree lighting and projected light is to support trading out and the dining experience. Develop brief and EOI for projection content. 	Artwork installation and lighting Enriching Waverley Project Waverley Additional lighting Shaping Waverley Creating Waverley
7.5.2 	7 Ways Similar design approach to other typical village/ commercial streets wit the addition of catenary and sculpture lighting to support the urban design aspirations for the new food and beverage offerings.	Adjacent retailers/property owners Local Residents	Local Villages Improvements as per Capital Works program. Include in scope of works. Lighting estimate: \$7,700 - \$10,200 per tree \$3,800 - \$6,400 per bench \$80,000 - \$150,000 catenary lighting pending final extent Artwork lighting to be assessed with artwork design proposal	<ul style="list-style-type: none"> Consult with property owners to support catenary lighting where applicable. Confirm extent of catenary lighting. 	Creating Waverley
7.6.4 	Temporary Projection at Bondi Park A temporary installation of projected lighting may be undertaken at the Southern end of Bondi beach.	Potentially indigenous elders Local Residents SLSCs Heritage Office	Business Case 2019/20 Potential to incorporate into existing program such as Winter Magic or Bondi Feast Lighting Estimate: \$50,000	<ul style="list-style-type: none"> Develop brief and call for EOI by digital artists. Explore physical infrastructure required for temporary install. <p>Note: Following the Creative Lighting MP Council will be engaging a Lighting Designer to undertake a more detailed Lighting Plan for Bondi Park. Pilot projects may follow after this process is complete and after the replacement of the highmast lighting.</p>	
7.6.4 	Seawall lighting treatments Lighting treatments to the mural wall are to build upon the pilot project with a permanent continuous lighting treatment to full extent of the wall.	Internal WCC Graffiti artists Local Residents	Funding through existing Capital Works program. Scope of works to include lighting specifications from the WCLM. Lighting estimate: \$500,000 - \$700,000 \$2500/m - \$3,000/m Continuous wall lighting treatment	<ul style="list-style-type: none"> Consult/inform graffiti artists on permanent lighting approach. Implementation in line with replacement of mural wall. 	Shaping Waverley Enriching Waverley Sustainable Waverley Creating Waverley
7.6.6 	Biddigal Reserve and Pool Uplighting of park walls at the promenade level and lighting integration into benches along the wall.	Internal WCC Local Residents	Scoped in existing capital works program. Lighting estimate: \$330,000 - \$420,000 \$2500/m - \$3,000/m wall lighting \$3,000 - \$5,000 per bench \$30,000 - \$60,000 general electrical works	<ul style="list-style-type: none"> Up lighting to be installed in the short term to coincide with urban upgrades to the existing walls. 	Creating Waverley 2018/19

Project No	Description	Key Stakeholders	Funding	Immediate Next Steps	Lead
7.6.4	Bench seating lighting Lighting is to be integrated into the existing bench lighting to the promenade.	Internal WCC Local Residents	Build into scope of upgrades. 2018/19 Capital works funding. Lighting estimate: \$3,000 - \$5,000 per bench	<ul style="list-style-type: none"> Schedule for implementation. As additional seating elements are rolled out, lighting integration may be extended. 	Creating Waverley
	Bondi Park Carpark A pop-up installation may be carried out under the existing pedestrian bridges connecting the beach and Campbell Parade to signal the upcoming change of the longer term urban changes to the park removing the carpark and pedestrianising the area.	Internal WCC Local Bondi community Bondi SBLSC Bondi Pavilion operators Local Residents	Build into scope of upgrades. 2018/19 Capital works funding. Lighting estimate: \$45,000 - \$50,000 \$30,000 - \$35,000 lighting \$15,000 general electrical works	<ul style="list-style-type: none"> Engage with adjacent stakeholders regarding the pop up and future works. Develop brief and EOI for pop up installation. Confirm timing of pop up installation for impact/awareness. 	Creating Waverley
7.5.1 	Shade Structure extensions Shade structure lighting should be extended to additional new structures following the review of the pilot project undertaken.	Campbell Parade retailers Local Residents	Funding mechanisms identified following trial of Campbell Parade shade structures. Lighting estimate: \$9,000 per structure lighting	<ul style="list-style-type: none"> On-going consultation with local business owners is required to continue to encourage facade, alfresco, retail frontage and under awning lighting upgrades. 	Project Waverley Shaping Waverley
	Continue and extend palm tree lighting New lighting is to be provided to new palm trees with works coinciding with planting and urban upgrades.	Campbell Parade retailers RTA Local Residents	Funded included in Campbell Parade Streetscape Upgrades project. Lighting estimate: \$10,200 - \$12,800 per tree	<ul style="list-style-type: none"> Palm tree lighting should be provided on Campbell Parade from Francis Street in the South to North Bondi commercial precinct. 	Project Waverley Shaping Waverley
	MFP luminous cladding As the MFP network is extended North and South, luminous cladding is to be integrated to poles from Francis Street to North Bondi Commercial Precinct to express the unique identity of Campbell Parade.	Campbell Parade retailers RTA Local Residents	Funding through Campbell Parade Streetscape Upgrades Lighting estimate: \$10,200 - \$12,800 per pole luminous cladding	<ul style="list-style-type: none"> Consult with adjacent retailers re. the treatment 	Project Waverley Shaping Waverley
7.6.4	QED and Parks Drive Carparks lighting upgrade QED and Parks Drive carparks lighting upgrade to meet Australian Standards and support night time activities and business at the Pavilion. Subject to carpark feasibility study outcomes	Internal WCC Local Bondi community Bondi SBLSC Bondi Pavilion operators Local Residents	Funding through Bondi Park Upgrades Lighting estimate: \$6,400 - \$10,200 per pole	<ul style="list-style-type: none"> Implementation planning with proposed carpark upgrades. 	Project Waverley Shaping Waverley Creating Waverley
7.6.1 	Gateway Arrival Statements - Installation of sculptural light art elements that provide both a day time and night time arrival statement for Bondi Beach at 5 ways, 7 ways (short term), Bondi Beach, Military Road and Bondi Road.	Adjacent retailers RTA WCC Parks and Maintenance Local Residents Potentially indigenous elders	Funding through VPAs and DAs. Lighting Estimate: \$100,000 - \$150,000 per site \$6,000 - \$10,000 per tree lighting \$60,000 - \$90,000 Light Art \$15,000 Lighting control and general electrical works	<ul style="list-style-type: none"> Incorporate the CLM into VPA information. 	Enriching Waverley Building Waverley
7.6.4 	Bondi Park Projected light installed at the Southern end of the beach may be extended to the central and northern end of the beach.	Potentially indigenous elders Local Residents SLSCs Heritage Office	Bondi Park Upgrades - include in scope of works Lighting estimate: \$7,700 - \$10,200 per tree \$6,000 - \$8,000 per shrub \$6,000 per pole \$2500/m - \$3,000/m low level wall lighting \$3,800 - \$6,400 per bench \$600,000 - \$740,000 Projected lighting \$50,000 - \$60,000 each bridge	Confirm extent and number of elements to be lit. Determine level of investment in projected lighting based on success of pilot projects.	Creating Waverley

Project No	Description	Key Stakeholders	Funding	Immediate Next Steps	Lead
7.6.6 	Biddigal Reserve and Pool	Mosaic artist	Consider in scope for pool upgrades 2018/19 Estimate: \$40,000 - \$50,000	<ul style="list-style-type: none"> As repairs to the mural at the Children's pool are made, integration of a glowing mosaic element may be incorporated for subtle highlighting without encouraging swimming after dark 	Creating Waverley
7.5.1 	North Bondi Bus Depot - A new bus shelter structure has been recommended with integrated lighting. This is to be supported by previously installed lighting treatments in this area.	Transport NSW	Included in scope for North Bondi Capital Works Upgrades 2018/19 Project estimate: \$50,000 - \$70,000	<ul style="list-style-type: none"> Consult with Transport NSW to provide bus shelter structure 	Project Waverley
	Staircase from North Bondi to RSL - Lighting should be provided to the staircase connecting North Bondi to the North Bondi RSL below assisting in connecting pedestrians with the beach. Lighting may be integrated in the wall or handrail.	North Bondi RSL	Include in Bondi Park improvements Project estimate: \$45,000 - \$55,000	<ul style="list-style-type: none"> Consult with North Bondi RSL re. stair lighting installation. Potential for co-funding. 	Creating Waverley
7.5.3 	Ben Buckler Park Lighting may be integrated to existing urban structures at Ben Buckler Park to enhance the experience in the early morning and early evening.	Local historians Local Residents	Include in scope of works for future park upgrades. Project estimate: \$200,000 - \$400,000	<ul style="list-style-type: none"> Consult with local historians re. lighting additions. 	Creating Waverley
7.6.4 	Bondi Beach Promenade - Marker lighting integrated into the promenade prides a soft edge to the water and acts as a wayfinding tool with the pattern being more concentrated at entry points.	Internal WCC	Include in scope of works for Bondi Beach upgrades 2018/19 Project estimate: \$1,100,000 - \$1,200,000 \$510 per marker light \$40,000 lighting control (Works may be staged)	<ul style="list-style-type: none"> Marker lighting installation is to be staged so as to not close the entire promenade and where applicable should coincide with urban upgrades outlined in the Bondi Plan of Management. Confirm budget and number of markers. 	Creating Waverley
7.5.2 	Hall Street, Gould Street, sections of Roscoe Street, sections of Curlewis Street and 5 ways Lighting of key village/ commercial streets that peel off from Campbell Parade including MFP, pedestrian pole, street tree lighting, lighting of trees at key street corner parklets, bench lighting and artwork lighting where appropriate.	Adjacent retailers RTA Local Residents	Village centre capital works programs Private Development VPAs Lighting estimate: \$7,700 - \$10,200 per tree \$3,800 - \$6,400 per bench Artwork lighting to be assessed with artwork design	<ul style="list-style-type: none"> Lighting upgrades of MFP pole and pedestrian pole should be carried out to align with street upgrade works including street tree lighting, lighting of trees at key street corner parklets, bench lighting, and artwork lighting where appropriate. Consultation with local business owners is required to encourage facade, alfresco, retail frontage and under awning lighting upgrades in the future. 	Project Waverley
7.6.3 	Gould Lane Whilst activation of this laneway is not currently planned, if this opportunity is presented in the future then lighting may be integrated to celebrate the visual connection between Roscoe Street Mall and Hall Street.	Adjacent property owners	Subject to a business case Project estimate: \$120,000 - \$150,000	<ul style="list-style-type: none"> Develop creative brief for lighting installation. 	Shaping Waverley

11.3.4 Coastal Walk Project Opportunities

Project No	Description	Key Stakeholders	Funding	Immediate Next Steps	Lead
8.5.2 	Mackenzie Point intervention Intervention to Mackenzie point provides an opportunity to introduce and explore lighting applications to the Coastal walk in consultation with the community.	Coastal walk users Indigenous elders Local Residents Coastal Walk users	Investigate and scope the works within the 2018 Marks Park Capital Works Upgrade. Project estimate: \$220,000 - \$240, 000 \$3,000 - \$5,000 bench \$600/m - \$650/m handrail light \$700 - \$800 per marker light \$2,700/m - \$3,300/m uplighting \$10,000 lighting of rocks \$10,000 lighting control	<ul style="list-style-type: none"> Project opportunity to install permanent lighting as part of upcoming Marks Park Upgrade. Consultation with the Local Aboriginal Land Council in regards to sensitivity surrounding development and in consideration of previous development. Site specific risk assessments and environmental impact assessments to be carried out during design development. 	Creating Waverley
8.4.4/ 8.4.5/ 8.4.6 	Pathway connecting Mackenzie Point to Tamarama SLSC	Adjacent residents Tamarama SLSC Coastal Walk users	Future business case 2021/25 Project estimate: \$600,000 - \$730,000 pathway lighting \$1,000/m - \$1,200/m linear lighting and cabling \$15,000 electrical DB per approx 400m pending design \$6,381 per bench	<ul style="list-style-type: none"> Where existing metal handrails exist and are in proper working condition, handrail integrated lighting may be retro-fitted with potential modifications required to the stanchion for cable reticulation. Where seating elements exist lighting to be integrated. Site specific risk assessments and environmental impact assessments to be carried out during design development including risk evaluation for pedestrian safety. 	Creating Waverley
8.4.9 	Bronte Beach Promenade As a key pedestrian connection to late night buses and cycle routes, lighting to Bronte Promenade is aimed to increase pedestrian amenity and enhance safe passage.	Bronte SLSC Local Residents	Include in Bronte POM scope of works Project estimate: \$550,000 - \$650,000 \$850 - \$1,000 per marker light \$6,600 per pole \$730/m - \$790/m handrail lighting	<ul style="list-style-type: none"> Park lighting is not critical for safe passage thus is proposed to be carried out at a later stage. Site specific risk assessments and environmental impact assessments to be carried out during design development including risk evaluation for pedestrian safety. 	Creating Waverley
8.5.4 	Bronte Pool and stair A new lighting installation to the Bronte Pool is to move away from a floodlit approach to a subtle projected dappled light to create an attractor in the evening and encourage passive surveillance.	Bronte SLSC Historians Local Residents	Include in Bronte POM scope of works Project estimate: \$180,000 - \$200,000 \$3,800 - \$6,400 per bench \$2,500 - \$3000/m linear lighting \$10,000 projected lighting	<ul style="list-style-type: none"> Consult historians to confirm stories to tell as referenced in Place Strategy. Site specific risk assessments and environmental impact assessments to be carried out during design development including risk evaluation for pedestrian safety. 	Project Waverley Creating Waverley

Project No	Description	Key Stakeholders	Funding	Immediate Next Steps	Lead
8.5.5 	Bronte Cutting trial of lighting installation to the rock wall and neighbourhood road lighting to align with trial footpath as per Bronte POM recommendation.	RTA Internal WCC Local Residents Coastal Walk users	Project estimate; \$100,000	<ul style="list-style-type: none"> Consultation with RTA regarding installation of road lighting and rock wall lighting 	Creating Waverley
	Rock wall lighting; Following trial period Lighting of the rock wall to provide a visual cue for the pedestrian zone whilst also enhancing the character of the coastal walk.	RTA Internal WCC Local Residents Coastal Walk users	Project estimate: \$410,000 - \$520,000 \$2,500/m - \$3,000/m uplighting	<ul style="list-style-type: none"> Consultation with RTA regarding installation of road lighting and rock wall lighting Site specific risk assessments and environmental impact assessments to be carried out during design development. Installation as soon as possible for safety of pedestrians. 	Creating Waverley
	Neighbourhood road lighting; Following trial period Additional pole lighting is required for the shared neighbourhood road. This installation is important to achieve in the short term to address current safe passage concerns.	RTA Internal WCC Local Residents Coastal Walk users	Project estimate: \$110,000 \$6,000 - \$8,000 per pole	<ul style="list-style-type: none"> Consultation with RTA regarding installation of road lighting and rock wall lighting Site specific risk assessments and environmental impact assessments to be carried out during design development. Installation as soon as possible for safety of pedestrians. 	Creating Waverley
8.4.1 	Entry to walk from Notts Avenue Enhancing this pedestrian experience is an important step in allowing greater use in the evening.	Internal WCC Bondi Icebergs Local Residents	Project estimate: \$120,000 - \$150,000 \$3,800 - \$6,400 per bench \$850 - \$1,000 per marker light \$730/m - \$790/m handrail light	<ul style="list-style-type: none"> Inform/consult Bondi Icebergs regarding the installation Inform the broader public regarding timing of works Site specific risk assessments and environmental impact assessments to be carried out during design development. Turn on in line with installation of the entry path below Notts Avenue (not before) 	Creating Waverley
8.5.1 	Entry path below Notts Avenue Following the installation of lighting to the entry at the top of the stairs lighting may be extended to the stair and pathway below.	Internal WCC Local Residents	Project estimate: \$180,000 - \$220,000 \$850 - \$1,000 per marker light \$1,000/m - \$1,200/m linear lighting and cabling \$40,000 lighting control and general electrical	<ul style="list-style-type: none"> Site specific risk assessments and environmental impact assessments to be carried out during design development. Install interactive element in line with Pathway connecting entry to walk from Notts Avenue to Mackenzie Point. 	Creating Waverley
8.4.2	Pathway connecting entry to walk from Notts Avenue to Mackenzie Point Following the lighting installations at the beginning of the walk and Mackenzie point, it is critical that lighting is provided to the path connecting these elements to provide safe passage and ensure patrons are not lead to a dark pathway.	Internal WCC Adjacent residents Coastal Walk users	Project estimate: \$600,000 - \$680,000 \$1,000/m - \$1,200/m linear lighting and cabling \$15,000 electrical DB per approx 400m pending design	<ul style="list-style-type: none"> Identify where existing metal handrails exist and are in proper working condition and investigate potential to retro-fit with modifications to the stanchion for cable reticulation. Site specific risk assessments and environmental impact assessments to be carried out during design development. Install hand rails where lighting cannot be retro-fitted (a different lighting typology may be applied or a new handrail installed). Schedule and inform stakeholders when works will take place. 	Creating Waverley
8.5.3 	Tamarama Surf Life Saving Club Lighting to the Tamarama SLSC is to re-enforce the image of the iconic building with a playful lighting installation highlighting the existing blue door and telling the story of the site.	Tamarama SLSC	Implemented by Tamarama Surf Club. Potential to investigate grant funding. Project estimate: \$100,000 - \$150,000	<ul style="list-style-type: none"> Consult with Tamarama SLSC re. installation and ongoing maintenance. 	Creating Waverley Enriching Waverley Shaping Waverley


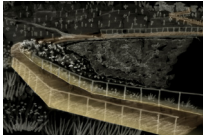




Project No	Description	Key Stakeholders	Funding	Immediate Next Steps	Lead
8.5.6 	Temporary Waverley Cemetery projected light installation Temporary projected lighting installation may be installed to celebrate an important anniversary of a figure buried within the Cemetery or as a celebration of a key event such as Heritage Week or projection or red poppies over the cemetery for ANZAC Day.	Local historians Waverley Cemetery managers Local Residents	Future business case Project estimate: \$80,000 - \$100,000 (pending scale of projection)	<ul style="list-style-type: none"> Consult with local historians regarding key stories to be represented. Develop brief and EOI for projection art. Explore equipment required i.e. temporary projectors and identify storage for future events Site specific risk assessments and environmental impact assessments to be carried out during design development. 	Creating Waverley
8.4.10/ 8.4.11 	Pathway from Calga Place Bronte Cutting to the end of Waverley Cemetery Lighting to the pedestrian pathway is to be provided to the end of the Cemetery to extend the pedestrian night time experience and passage lighting.	Waverley Cemetery RTA Local Residents	Project estimate: \$700,000 - \$750,000 \$1,000/m - \$1,200/m linear lighting and cabling \$15,000 electrical DB per approx 400m pending design \$	<ul style="list-style-type: none"> Lighting may be retro-fitted into existing handrail where possible and within the timber decking where applicable. Handrails may be required to be upgraded in certain sections Site specific risk assessments and environmental impact assessments to be carried out during design development including risk evaluation for pedestrian safety. 	Creating Waverley
8.4.12 	Waverley Cemetery Lookout and Signage To signal the start/ end of the Coastal Walk within Waverley Council area at the Southern end, lighting is to be integrated into the lookout and existing signage.	Waverley Cemetery City of Randwick Local Residents	Project estimate: \$50,000 - \$65,000 \$45,000 signage \$940 - \$1100 per marker light	<ul style="list-style-type: none"> Consult with Randwick City Council for potential connections at the end of the Coastal walk LGA boundary. Site specific risk assessments and environmental impact assessments to be carried out during design development including risk evaluation for pedestrian safety. 	Creating Waverley
8.4.7 	Tamarama Beach Park Park lighting and promenade lighting.	Tamarama SLSC Local Residents	Scoped in Capital Works Schedule for park upgrades Project estimate: \$8,500 - \$14,00 per tree \$4,200 - \$7,000 per bench \$30,000 playground structures \$80,000 lighting of existing architecture \$940 - \$1,100 per marker light \$800/m - \$870/m handrail lighting \$6,600 per pole \$4,200 - \$7,000 per bench	<ul style="list-style-type: none"> Longer term strategy to improve park use and atmosphere in the early evening. Site specific risk assessments and environmental impact assessments to be carried out during design development including risk evaluation for pedestrian safety. 	Creating Waverley
8.4.8 	Path between Tamarama and Bronte	Adjacent property owners	Project estimate: \$780,000 - \$900,000 \$940 - \$1,100 per marker light	<ul style="list-style-type: none"> Marker lighting may be integrated in future pathway upgrades to provide a human scale to differentiate pedestrian and vehicular zones continuing the lighting language of the Coastal Walk. Site specific risk assessments and environmental impact assessments to be carried out during design development including risk evaluation for pedestrian safety. 	Creating Waverley
8.4.9 	Bronte Beach Park	Bronte SLSC	Include in scope of works for Bronte POM upgrades Project estimate: \$8,500 - \$14,000 per tree \$6,600 per pole	<ul style="list-style-type: none"> Lighting of Bronte Beach park is support previously installed lighting to the Promenade. Lighting is to be provided to key trees and main pathways. Site specific risk assessments and environmental impact assessments to be carried out during design development including risk evaluation for pedestrian safety. 	Creating Waverley

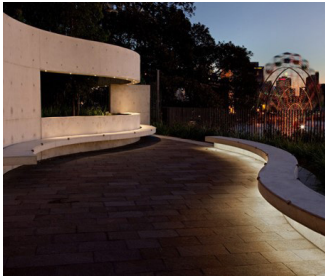
Image Appendix



Project : Fort Street, Auckland, New Zealand
Architect : mpm projects
Lighting Designer : Lighting Design Practice LDP
Photographer : Claire Hamilton Photograph
Year : 2011
Reference : <http://www.mpm.co.nz/projects/infrastructure/fort-street/>



Project : Winery Cheval Blanc, France
Architect : Christian de portzamparc
Lighting Designer : Captain Spot – Jean-Bernard Favero-Longo Aartill
Photographer : christiandeportzamparc.com
Year : 2006-2011
Reference : <http://www.christiandeportzamparc.com/en/projects/winery-cheval-blanc/>



Project : Harry's Park
Architect : Harry Seidler & Associates
Lighting Designer : Steensen Varming
Photographer : Mardini Constructions
Year : 2011
Reference : <http://mardiniconstructions.com.au/portfolio/harrys-park-2011/>



Project : Bondi Park Lighting Upgrade
Photographer : Steensen Varming



Project : Coast Path Staircase, Royal William Yard, Plymouth, UK
Architect : Gillespie Yunnie Architects
Reference : <https://www.dezeen.com/2013/07/12/coast-path-staircase-at-royal-william-yard-by-gillespie-yunnie-architects/>



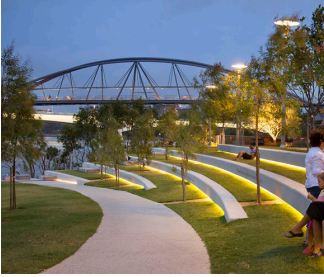
Project : Bourrasque, Lyon, France
Artist : Paul Cocksedg
Photographer : Mark Cocksedg
Reference : <https://www.dezeen.com/2011/12/26/bourrasque-by-paul-cocksedg/>



Project : UTS Alumni Green
Landscape Architect : Aspect Studios
Lighting Designer : Steensen Varming
Photographer : Simon Wood Photography
Year : 2015



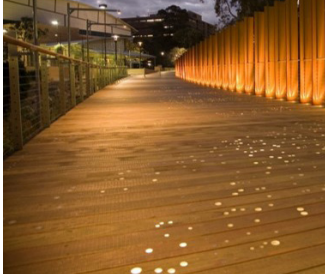
Project : Fogarty Park, Cairns
Electrical Contractor : Raylinc
Photographer : We-ef Lighting
Reference : http://www.weef.de/archive/?section=projects&view=prj_entry&id=547&lang=09_uk



Project : River Quay on South Bank in Parklands, Brisbane
Architect : cardno s.p.l.a.t. & arkhefield
Photographer : john gollings
Reference : <http://landscapeaustralia.com/articles/2013-queenland-landscape-architecture-awards/>



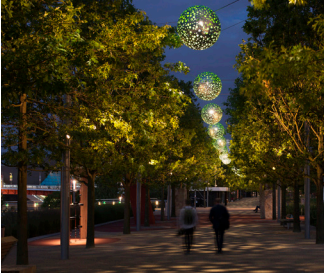
Project : 'Breathe', Singapore
Artist : Edwin Cheong
Photographer : EdwinCheongStudio
Reference : <https://daily-dose-of-art.com/2013/10/04/singapores-super-trees-5-tremendous-sculptures/>



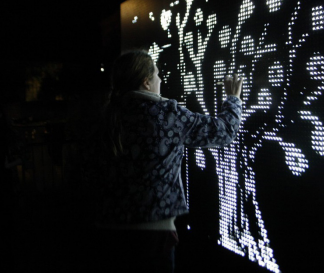
Project : Public Domain Lighting , University of Sydney
Landscape Architect : Turf Design/ T.C.L
Lighting Designer : Steensen Varming
Photographer : Cavanagh
Year : 2007



Unknown



Project : Queen Elizabeth Olympic Park
Architect : Make
Landscape Architect : James Corner Field Operations
Lighting Designer : Spiers and Major , Michael Grubb Studio
Photographer : James Newton Photography
Reference : http://www.archlighting.com/design-awards/2015-al-design-awards-queen-elizabeth-olympic-park-london_o



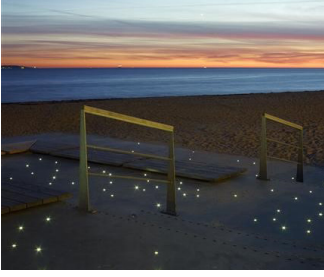
Project : Waterlight Graffiti
Artist : Antonin Fourneau
Reference : <http://www.waterlightgraffiti.com/>



Project : Auckland CBD streetscapes
Designer : Architectus
Year : 2009
Reference : <http://www.architectus.com.au/en/projects/auckland-cbd-streetscapes>



Project : Van Gogh Cycle Path , Netherland
Designer : Daan Roosegaarde / Studio Roosegaarde
Reference : <https://www.dezeen.com/2014/11/12/daan-roosegaarde-van-gogh-bicycle-path-glowing-patterns-nunen-netherlands/>



Project : Helsingborg Waterfront, Sweden
Architect : Brandt Landscape
Lighting Designer : ÅF Lighting Hansen & Hennenberg
Year : 2010
Reference : <https://au.pinterest.com/source/iald.org/>



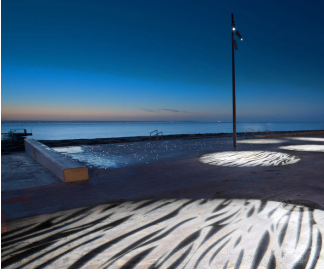
Project : Wall of Dreams
Lighting Designer : Ramboll Lighting
Year : 2015
Reference : <http://lightingdesign.ramboll.com/Projects/rdk/the-gable-of-dreams>



Project : West End Ferry Terminal, Brisbane , Australia
Architect : Cox Rayner Architects
Photographer : Christopher Frederick Jones, Ross Pottinger
Year : 2010
Reference : <http://www.archdaily.com/397358/west-end-ferry-terminal-cox-rayner-architects>



Project : Sydney Cycle Way Upgrades
Reference : <http://www.sydneycycleways.net/projects/bourke-connector/>



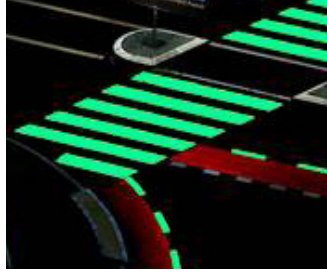
Project : Helsingborg Waterfront, Sweden
Architect : Brandt Landscape
Lighting Designer : ÅF Lighting Hansen & Hennenberg
Photographer : Martin Kristiansen and Ulf Celander
Year : 2010
Reference: <http://af-lighting.com/?project=helsingborg-waterfront-3>



Project : Points, Brooklyn, New York
Designer : Breakfast, NY
Photographer : Breakfast, NY
Year : 2013
Reference : <https://pointssign.com/>



Unknown



Project : Luna Road Glo solar powered paint
Reference : http://www.solarsnob.com/archives/2009_09.php

Image Appendix



Project : TraxEye ,Smart Highway, Netherland
Designer : Daan Roosegaarde/
studioroosegaarde
Reference : <https://www.studioroosegaarde.net/projects/#icon-afsluitdijk>



Project : The Metropolitan Museum of Art, Fifth Avenue façade and plaza, New York
Architect : Olin
Lighting Designer : L’Observatoire International
Photographer : Matthew Carbone
Year : 2015
Reference : http://www.archlighting.com/projects/classically-deep-a-new-lighting-scheme-for-the-metropolitan-museum-of-arts-plaza_o



Project : Hurricane’s Grill and Bar Bondi Beach
Reference : <https://www.hurricanesgrillandbar.com.au/hurricanes-management/>



Project : Apple Store, Scottsdale
Architect : Bohlin Cywinski Jackson
Year : 2009
Reference : <http://www.loopinsight.com/2009/06/11/scottsdale-apple-store-showcases-updated-retail-design/>



Project : Bondi Trattoria
Reference : <http://www.bonditrattoria.com.au/gallery-media/>



Project : Wesley Quarter, Perth, Western Australia
Landscape Architect : HASSELL
Photographer : Peter Bennetts
Year : 2009
Reference : <http://www.landezine.com/index.php/2011/11/hassell-landscape-architecture/>



Project : Carrum Foreshore Precinct, Melbourne, Australia
Photographer : Andrew Lloyd Photography
Year : 2013
Reference : <http://www.kliksystems.com.au/portfolio/exterior/carrum-foreshore>



Project : Bankstown Civic Plaza Staircase
Architect : Francis-Jones Morehen Thorp (fjmt)
Lighting Designer: Steensen Varming
Photographer : Steensen Varming



Project : The Iconic Bridge Punggol , Singapore
Lighting Designer : Surbana International Consultants
Reference : <http://www.kliksystems.com.au/portfolio/infrastructure/iconic-bridge-punggol-singapore>



Project : Seven17 Bourke Street signage
Designer : Pidgeon
Reference : <https://au.pinterest.com/pin/233905774368862324/>



Project : Hotbeam MFP Lighting Ring
Reference : http://www.spec-net.com.au/press/1006/hot_111006.htm



Project : Trimet LED Bus Stop Shelter, Portland-Milwaukie, Oregon Light Rail Transit Project
Architect : Brasco International
Reference : <http://www.archello.com/en/product/trimet-led-bus-stop-shelter>



Project : Trimet Transit system signage
Designer : Mayer/Reed
Photographer : Bruce Forster
Year : 2010
Reference : <https://segd.org/trimet-transit-system-signage>



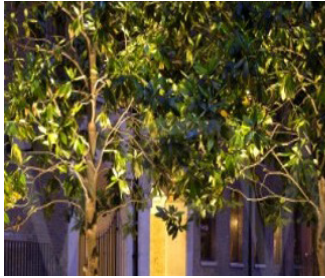
Project : St Martin’s Courtyard, Slingsby Place London
Reference : <https://au.pinterest.com/pin/387098530447003622/>



Project : Lanecove Plaza
Architect : BN Group
Lighting Designer: Steensen Varming
Electrical Contractor : Twin Connect
Reference : <http://twinconnect.com.au/portfolio-items/>



Project : Tasmanian Museum Art Gallery
Architect : Francis-Jones Morehen Thorp (fjmt)
Lighting Designer: Steensen Varming



Project : Cutlers Gardens Warehouses , Devonshire Square , London
Architect : Fletcher Priest Architects
Lighting Designer : Speirs + Major
Year : 2008



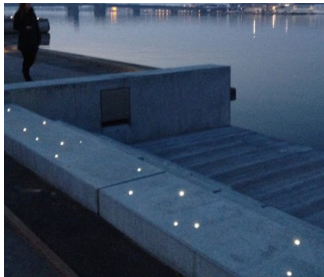
Project : The High Line , New York
Architect : Diller Scofidio + Renfro
Landscape Architect : James Corner Field Operations and Piet Oudolf
Photographer : Locke Hughes
Reference : <http://guestofaguest.com/new-york/chelsea/nyc-neighborhood-guide-12-hours-in-chelsea>



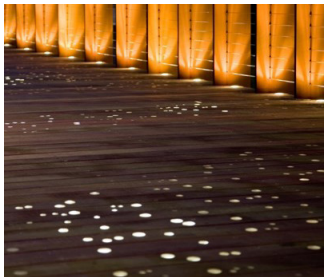
Project : Sydney Grammer School Assembly
Architect : PTW Architects
Lighting Designer : Steensen Varming
Photographer : Michael Yip



Unknown



Project : Aalborg Waterfront, Denmark
Architect : C. F. Moller
Lighting Designer: ÁF Hansen & Henneberg
Reference : <http://www.cfmoller.com/p/-en/aalborg-waterfront-i2005.html>



Project : Public Domain Lighting , University of Sydney
Landscape Architect : Turf Design/ T.C.L
Lighting Designer : Steensen Varming
Photographer : Cavanagh
Year : 2007



Project : Brisbane Street Square Waverley Council
Photographer : Brickfields



Project : Phoenix Sculpture
Artist : Susan Milne
Lighting Designer : Steensen Varming

Image Appendix



Project : Bondi Junction Westfield
Reference : <http://www.sydney.com/destinations/sydney/sydney-east/bondi/attractions/westfield-bondi-junction>



Project : Asbjørn Skou, Denmark
Artist : Asbjorn Skou
Year : 2010
Reference : <http://inhabitat.com/artist-asbjorn-skous-temporary-light-murals-enliven-the-streets-of-copenhagen/asbjorn-skou3/>



Project : 'This Way' Brooklyn Bridge Underpass, New York, USA
Lighting Designer : Tillet Lighting Design
Photographer : James D'Addio/ Emphasis design
Reference : <http://architizer.com/projects/this-way-brooklyn-bridge-underpass/>



Project : Asbjørn Skou, Denmark
Artist : Asbjorn Skou
Year : 2010
Reference : <http://www.thisiscolossal.com/2012/10/temporary-light-etchings-on-the-streets-of-copenhagen-by-asbjorn-skou/>



Project : Asbjørn Skou, Denmark
Artist : Asbjorn Skou
Year : 2010
Reference : <http://www.thisiscolossal.com/2012/10/temporary-light-etchings-on-the-streets-of-copenhagen-by-asbjorn-skou/>



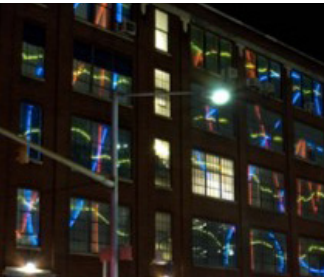
Project : Citroën DS3 Design Driver, Milan, Italy
Designer : Fabio Rotella
Year : 2010
Reference : <https://urbanartprojects.wordpress.com/2010/04/page/2/>



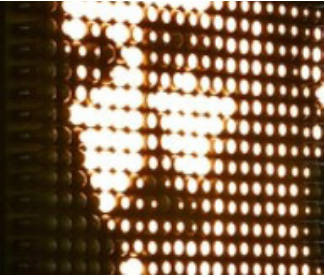
Project : Surry Hills Library
Architect : Francis-Jones Morehen Thorp (fjmt)
Lighting Designer : Steensen Varming
Photographer: Gollings



Project : Glowing Places, Film Festival, Park City, Utah
Designer : Philips
Reference : <http://www.ledsmagazine.com/articles/2005/01/philips-brings-light-to-seating-with-glowing-places.html>



Project : The GoogleWorks Center for the Arts in Reading/USA
Architect : Olsen Design Group Architects
Artist : Lyn Godley
Photographer : Kevin Brett, Lyn Godley
Reference : <https://pld-m.com/en/das-goggleworks-center-for-the-arts-in-readingusa/>



Unknown



Reference : http://www.waverley.nsw.gov.au/_data/assets/pdf_file/0009/8676/Boot_Factory.pdf



Project : Window projections at Hopkins Centre Dartmouth College
Artist : Ross Ashton
Photographer : Ross Ashton
Reference : <https://www.behance.net/gallery/5774689/Five-Windows-Dartmouth-College-New-Hampshire-USA>



Project : The Upper House Hong Kong
Reference : <https://experfly.co.uk/hong-kong/hotel-resort/the-upper-house>



Project : 67 Albert Ave
Architect : HDR Rice Daubney
Lighting Designer: Steensen Varming
Photographer : Tyrone Branigan
Year : 2016



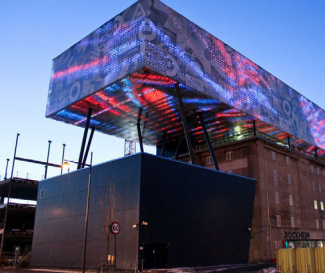
Project : OECD headquarter in Paris by Griven
Lighting Designer : Dominique Doulain
Photographer : Griven
Year : 2011
Reference : <http://www.enlightermagazine.com/market-news/oecd-headquarter-paris-griven>



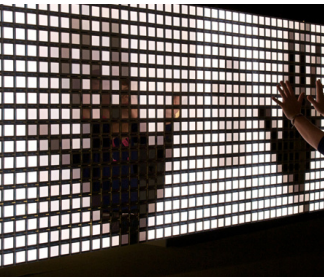
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Project : Waverley Street Wall concept design for art installation



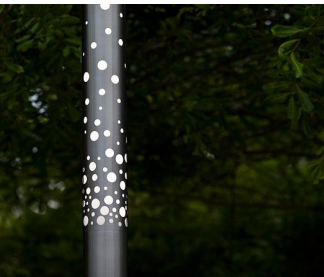
Project : Rockheim, Norway
Architect : Pir II
Designer: Stacey Spiegel / Parallel World Labs
Reference : <https://www.flickr.com/photos/watz/6837841651>



Project : 'You Fade To Light'
Artist : rAndom International
Reference : <http://www.enlightermagazine.com/projects/fade-light-random-international>



Project : Newcastle Regional Museum
Architect : Francis-Jones Morehen Thorp (fjmt)
Lighting Designer : Steensen Varming



Project : Light Column Pedestrian Lighting
Designer : forms-surfaces
Reference : <https://www.forms-surfaces.com/light-column-pedestrian-lighting>



Unknown



Project : Bankstown Civiv Precinct, Paul Keating Park
Lighting Designer : Steensen Varming



Project : Harmonisation of Zaragoza Expo, Spain
Lighting Designer : Architectural Lighting Solutions
Year : 2008
Reference : <http://www.enlightermagazine.com/projects/harmonization-zaragoza-expo>

Image Appendix



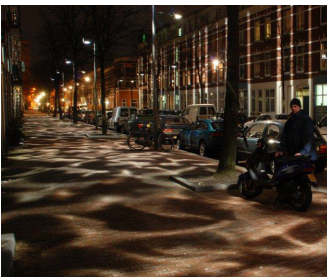
Project : Nepenthes Paisley
Artist : Dan Corson
Reference : <http://dancorson.com/nepenthes-paisleyi>



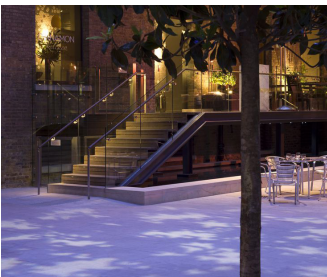
Project : Constellation
Architect : LIKEarchitects
Photographer : Fernando Guerra
Reference : <https://www.dezeen.com/2014/03/14/constell-ation-luminous-red-arches-likearchitects/>



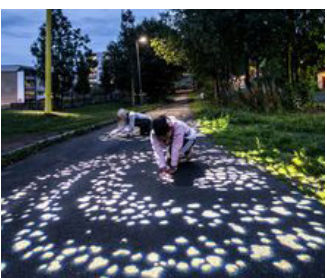
Project : WOW Lights, Washington
Artist : Tim Glover
Year : 2012
Reference : <https://au.pinterest.com/ambiantaffinity/alice/>



Project : Broken Light, Rotterdam, Netherlands
Lighting Designer : Rudolf Teunissen/ Daglich & Vorm
Year : 2010
Reference : <http://www.urbanlightsapes.net/broken-light-atjehstaat-rotterdam/>



Project : Cutlers Gardens Warehouses , Devonshire Square , London
Architect : Fletcher Priest Architects
Lighting Artist : Speirs + Major
Photographer: James Newtown
Year : 2008
Reference : <http://www.gsmagazine.co.uk/>



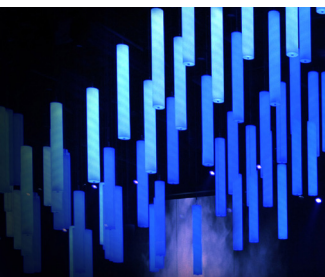
Project : Verdensparken , Furuset, Oslo, Norway
Lighting Designer : ÅF Lighting, Norway
Photographer : Tomasz Majewski
Reference : <http://af-lighting.com/?project=347>



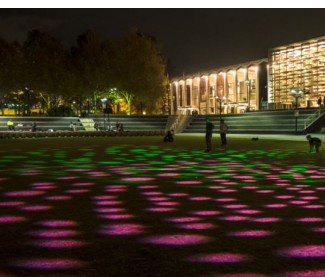
Project : Kimber Lane China Town, Sydney
Lighting Artist : Jason Wing
Photographer : James Horan Photography
Year : 2011
Reference : <http://jameshoran.photoshelter.com/image/I0000e5UD7UKBIA8>



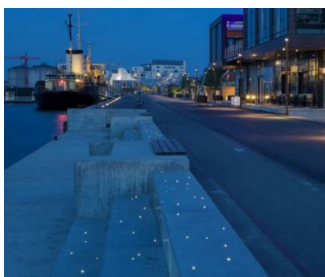
Project : Nebulous
Artist : Dan Corson
Reference : <http://dancorson.com>



Project : VW Group Show, Frankfurt 2011
Lighting Artist : WhiteVoid
Reference : <https://www.kinetic-lights.com/>



Project : Bankstown Civic Precinct Paul Keating Park
Lighting Designer: Steensen Varming
Photographer : Steensen Varming



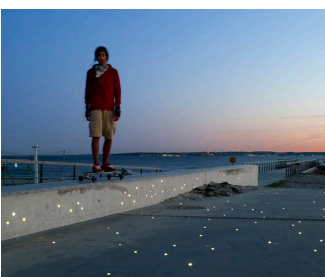
Project : Aalborg Waterfront, Denmark
Architect : C. F. Moller
Lighting Designer: ÅF Hansen & Henneberg
Reference : <http://www.cfmoller.com/p/-en/aalborg-waterfront-i2005.html>



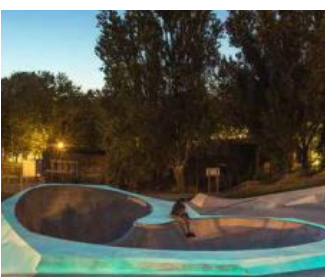
Project : NightGlow
Artist : ATOMONE
Reference : <http://www.montana-cans.blog/montana-nightglow-test/>



Project : Light boxes street art - Hosier Lane
Reference : https://commons.wikimedia.org/wiki/File:Hosier_Lane_Installations_Melbourne.jpg



Project : Helsingborg Waterfront, Sweden
Architect : Brandt Landscape
Lighting Designer : ÅF Lighting Hansen & Hennenberg
Photographer : Martin Kristiansen and Ulf Celander
Year : 2010
Reference : <http://af-lighting.com/?project=helsingborg-waterfront-3>



Project : Evertro
Artist : Koo Jeong A
Reference : <http://www.biennial.com/collaborations/wheels-park>



Project : Samu: A Tiny Teahouse in a City Car Park
Artist : Adam Wojcinski
Photographer : Gareth Sobey
Year : 2016
Reference : <https://www.broadsheet.com.au/melbourne/food-and-drink/article/melbourne-teahouse-tiny-cube-city-car-park>



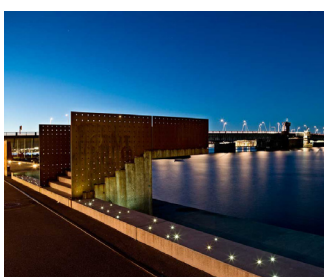
Project : Origami Wall Luminaire
Luminaire Designer : Vibia
Reference : <https://www.architonic.com/en/product/vibia-origami-wall-luminaire/1143376>



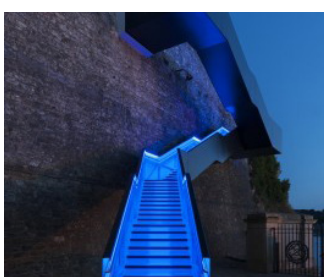
Project : North Bondi Life Saving Club
Architect : Durbach Block Jagers
Photographer : Peter Miller
Reference : <https://www.flickr.com/photos/64210496@N02/10108674665>



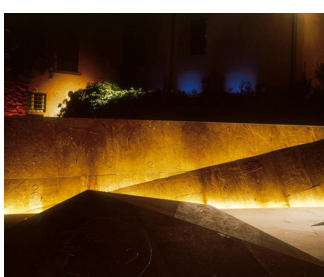
Project : The 16th Avenue Tiled Steps Project, San Francisco
Artist : Aileen Barr and Colette Crutcher
Photographer : imgur
Year : 2003
Reference : <http://www.boredpanda.com/glowing-16th-avenue-tiled-steps-san-francisco-night-view/>



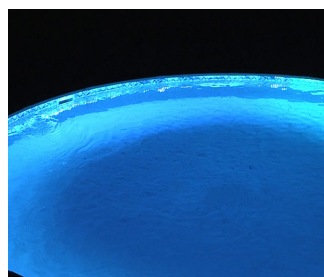
Project : Aalborg Waterfront, Denmark
Architect : C. F. Moller
Lighting Designer: ÅF Hansen & Henneberg
Reference : <http://www.cfmoller.com/p/-en/aalborg-waterfront-i2005.html>



Project : Coast Path Staircase, Royal William Yard, Plymouth, UK
Architect : Gillespie Yunnies Architects
Reference : <https://www.dezeen.com/2013/07/12/coast-path-staircase-at-royal-william-yard-by-gillespie-yunnies-architects/>



Project : Place Conti Guidi, Vinci , Italy
Architect : Mimmo Paladino
Lighting Artist : N. Fiorillo, C. Masone
Photographer : Pasquale Palmieri
Year : 2006
Reference : <http://www.cannatallight.it/fr/list-de-projets/publique/place-conti-guidi-vinci-florence.html>



Unknown



Project : Stroke , Edingburgh, England
Artist : Michael Pinsky
Year : 2009
Reference : <http://tablet.lwbproject.com/news/arts-new-cultural-journeys/12-di-luci-spazi/?locale=en#sthash.V31qi2NJ.dpbs>

Image Appendix



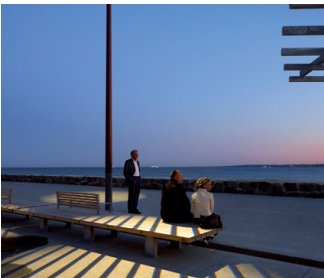
Project : Federation Square, Melbourne
Designer : Studio505
Reference : <http://www.studio505.com.au/about-us-/advisory#content-federation-square>



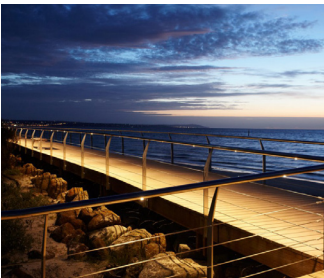
Project : 'Body Movies', Netherlands
Artist : Rafael Lozano- Hemmer
Year : 2001
Reference : http://www.lozano-hemmer.com/body_movies.php/



Project : Green Places Community Clubhouse
Arhitect : Chain 10 Urban Space Design
Photographer : Kuo-Min Lee
Year : 2015
Reference : <http://www.illumni.co/green-places-community-clubhouse-by-chain-10-urban-space-design/>



Project : Aalborg Waterfront, Denmark
Architect : C. F. Moller
Lighting Designer: ÅF Hansen & Henneberg
Reference : <http://www.af-lighting.com>



Project : Carrum Foreshore