Barangaroo Public Realm, Phase 1B
Public Realm Lighting
Development Application Report
26/01/17

lendlease

grant associates

SPEIRS + MAJOR

Executive Summary

This report has been prepared for Lend Lease by Speirs + Major. The document summarises the principles and concepts for the lighting of the public domain for Phase 1B, Barangaroo South including Hickson Park. It is based on the public domain design and landscape scheme for the project, as developed by Grant Associates. It is intended that the lighting should form part of an integrated approach to the design of the public domain both by day and night.

Vision

The lighting concept follows the vision as set out in the overall Barangaroo Lighting Masterplan developed by Speirs + Major as part of Phase 1A Barangaroo South. This in turn is specifically based on the masterplan developed by Rogers Stirk Harbour + Partnership for the overall development.

The masterplan indicates a diverse range of usages and characteristics across various spaces and topologies of the site, ranging from high density commercial and residential centres to the more open and natural spaces such as the water front and urban park.

In a wider context, the development is adjacent to the Barangaroo Reserve Nawi Cove and the Central Barangaroo Precinct to the north. These areas require a sensitive approach to lighting to avoid undesirable impacts such as over illumination and light pollution.

On the eastern site, Barangaroo faces the more historic urban neighbourhoods of Sydney. Streets such as Barangaroo Avenue and Waterman's Quay aim to blend in with the wider Sydney streetscape. In contrast with the more ecological and natural areas, these streets and avenues require a higher level of illumination to help create a safe environment after dark and merge seamlessly with the existing pattern of street lighting in Sydney.

As part of the masterplan the public domain development of Barangaroo South has been divided into two work stages; Stage 1A and Stage 1B with the construction of Stage 1A being targeted for completion in 2017. The lighting concepts described in this report aim to ensure a coherent appearance between the two phases once completed. Not only will the illumination levels and visual appearance of the lighting be similar, but also the physical appearance too including the fixture palette.

The wide variety of types of usage on the site results in a series of design challenges. These include the need to provide lighting to keep people safe and secure whilst at the same time minimising the amount of light employed to reduce energy use and avoid light pollution. The vision and strategy for the lighting design aims to balance these various requirements through a holistic approach.

Approach + Concept

As described above the lighting concept aims to balance a series of sometimes conflicting requirements. Barangaroo offers a very unique combination of various urban and natural spaces, each with very distinct characteristics. The lighting concept aims to respond to the various character areas and the varying functions of each of the spaces whilst trying to ensure the delivery of a great experience after dark for residents, workers, shoppers, tourists and anyone else that may enjoy the public domain.

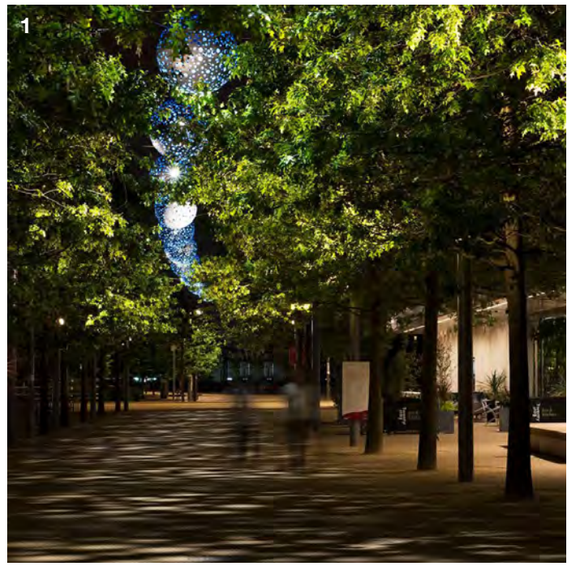
The edge of the Waterfront and Hickson Park are seen as having intrinsically 'dark' characteristics in response to the character of the spaces and will be therefore lit to lower levels of illumination. The more urban areas will be lit to a higher level of illumination to ensure safety and security is maintained at all times, particularly with respect to the potential conflict between pedestrians and vehicles. As per the original lighting masterplan for Barangaroo South the lighting levels progressively step down from the more urban retail and commercial districts towards the water's edge thereby allowing adaptation to take place and promotes connections to the water and views.

Executive Summary

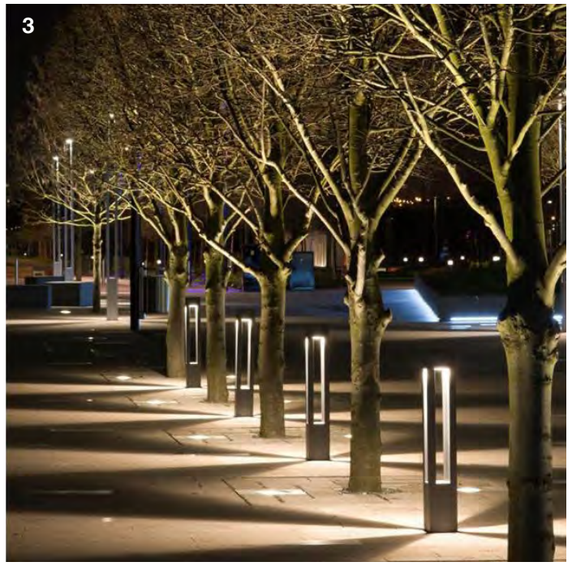
The concept aims to achieve the following key objectives for the lighting design:

Provide a consistent approach with respect to the installed lighting for Phase 1A.

1. Develop a specific identity and character for Barangaroo South ‘after dark’ to help provide a memorable experience for all those that use the site.
2. Create a safe, secure and accessible environment after dark.
3. Contribute to creating a legible environment at night to encourage the positive movement of pedestrians through the various spaces.
4. Support the night-time economy by creating an inviting atmosphere after dark and to support the Sydney waterfront as a destination.
5. Create a sense of intimacy and familiarity for visitors, workers and residents of Barangaroo South.
6. Develop a flexible lighting scheme to suit the dynamic nature of the development and provide support for various opportunities for hosting events, activities and festivals e.g. ‘Vivid’.
7. Limit light pollution and help minimise viewing obstructions for the nearby Sydney Observatory.
8. Provide a natural transition between Phase 1B with the Barangaroo Reserve and Nawi Cove in respect to the ecological and


1

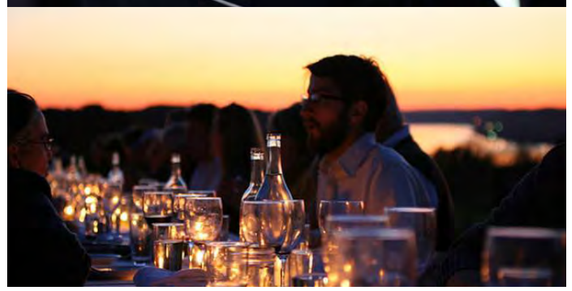

2


3


4


5


6




7


8

Executive Summary

cultural significance of these sites.

Considerations

A successful lighting design is generally achieved by carefully balancing a number of lighting design considerations. Among other things the following key factors should be observed in respect of the design:

1. Safety + Security

The lighting has been designed to help maintain a safe and secure environment at all times. This includes positively defining potential hazards such as steps and ramps that provide access to spaces such as the waterfront and by illuminating areas where pedestrians encounter moving vehicles e.g.on Waterman's Quay and Barangaroo Avenue. These areas have been defined 'after dark' through passive techniques such as the use of landscaping materials with appropriately contrasting reflectances as well as through active illumination. The lighting has also been designed to provide an overall sense of security through supporting active surveillance (CCTV) and promoting passive surveillance from the surrounding residences, office and retail spaces. Adequate recognition and modelling of people and surfaces has been provided. It should be noted that perceptions of security are not necessarily dependant on providing high intensities of light.

2. Accessibility

The lighting aims to support accessibility for all throughout the public domain by creating a legible environment, assisting with way-finding and by supporting people with disabilities – in particular those with visual impairments. This is especially important for the boardwalk along the waterfront as thelighting is also to be employed to help reduce accidents by the subtle demarcating of the water's edge

Lighting levels between the different spaces will be balanced to avoid excessive high levels of contrast. Large differentiations in illumination levels between different areas can result in spaces being perceived ether too dark or too bright due to eye adaptation. The concept aims to balance the higher illumination levels of mainly Barangaroo Avenue and Waterman's Quay with the lower illumination levels at the waterfront and the park.

3. Scale

At the heart of Barangaroo are a series of high rise towers with relatively narrow streets and avenues between them. After dark this could potentially create a challenging urban context for pedestrians. The appropriate scale of the lighting can help to create a more human and intimate environment at night. Consideration has therefore been given to both mounting heights and intensity.

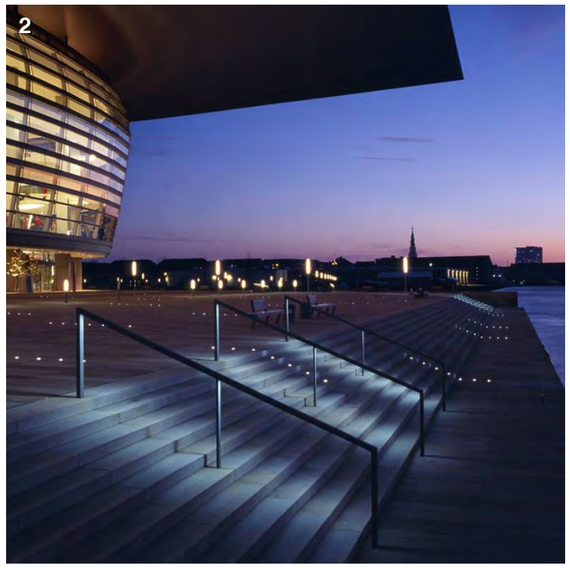
4. Flexibility

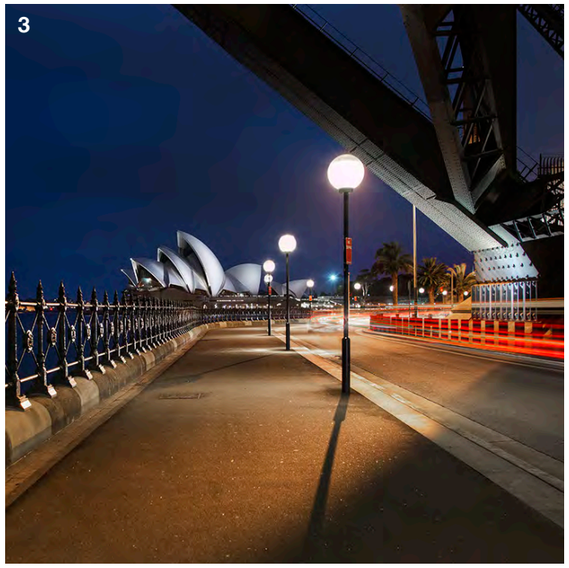
The site provides a series of opportunities to host temporary events, activities and festivals including Sydney's popular annual lighting festival 'Vivid'. The design should allow for a power and data infrastructure to cater for these events to provide a range of different temporary lighting responses.

5. Ecology, Light Pollution and Sustainability

The original lighting masterplan recommended a sustainable approach to lighting development. This was not only reflected in a considered use of energy but also the direction and distribution of light itself. The lighting must make appropriate balance between the social and economic benefits provided through the illumination of the site and the potential resulting environmental impacts. This balance is especially important to the adjacent of the waterfront and nearby the nature reserve. Views from the Sydney Observatory have also beenconsideredand the lighting design has therefore aimed to minimise


1


2


3


4


5

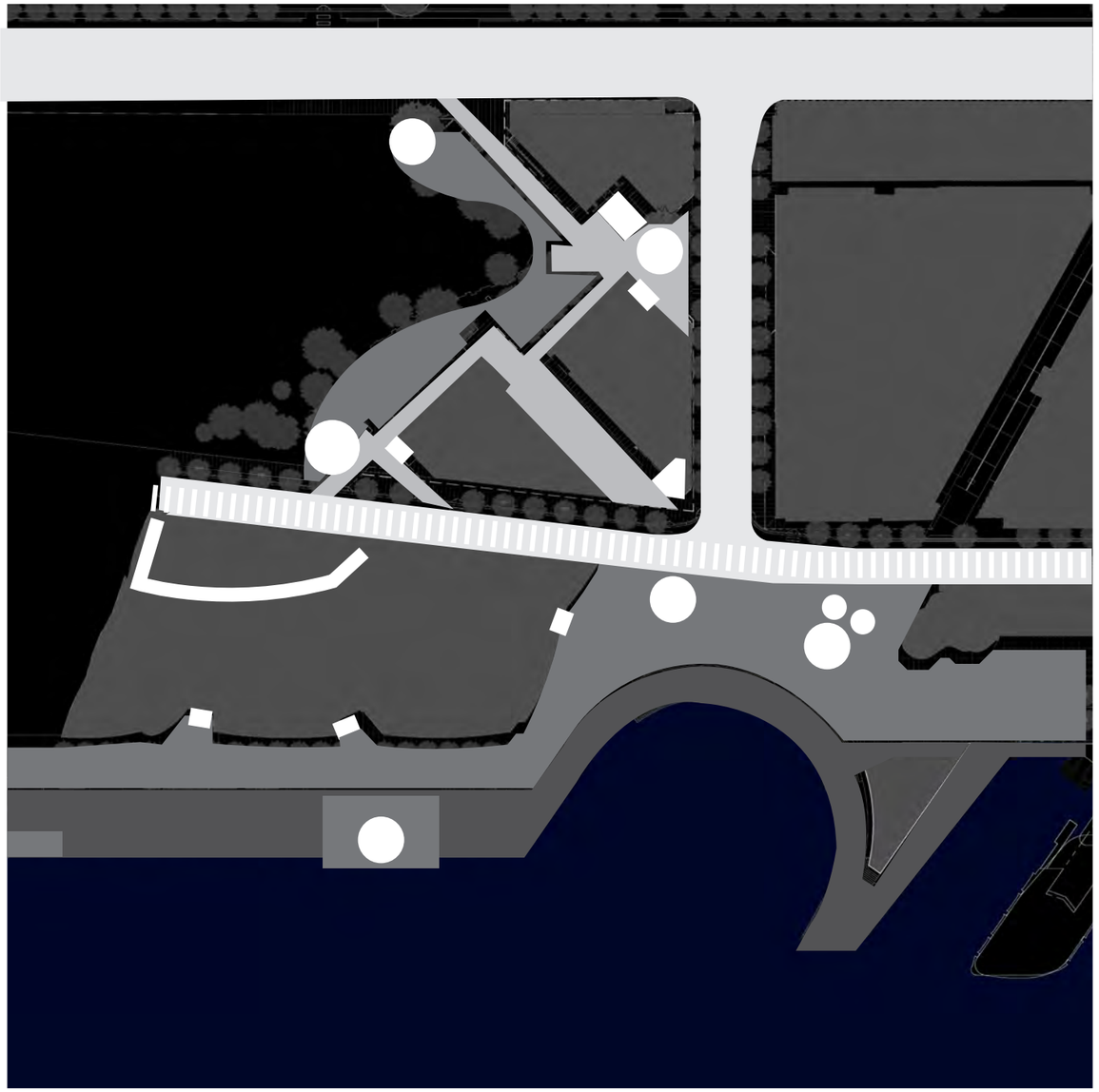
Executive Summary

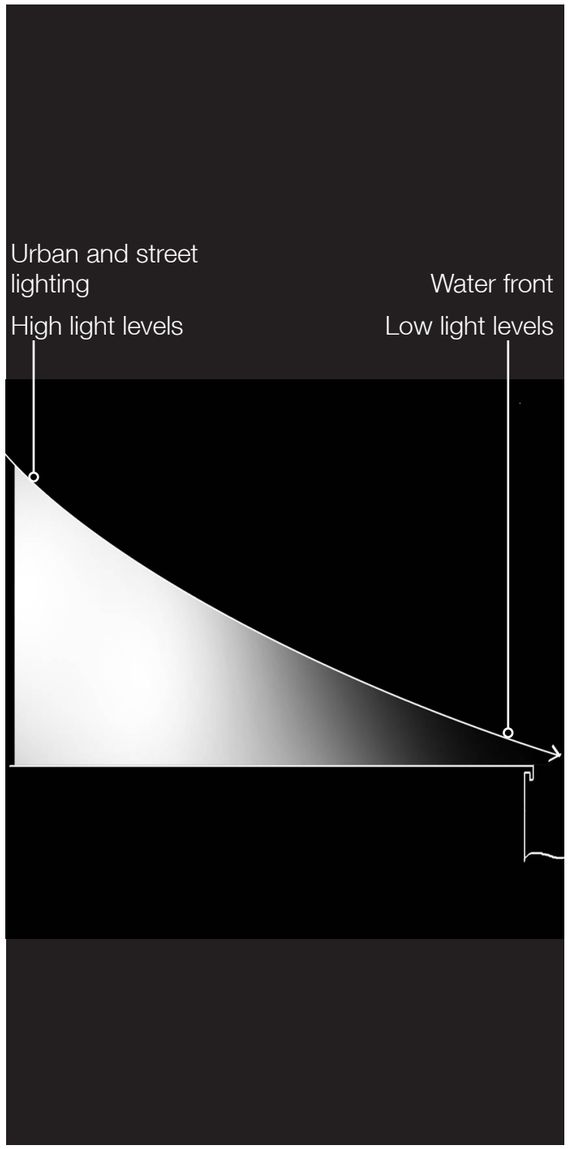
light pollution and trespass as much as possible.

Illumination Levels and Lighting Standards

All the proposed illumination levels are based on the Australian standard: ‘Lighting for Roads and Public Spaces AS/NZS 1158.6’. The illuminance values have been taken from both the Barangaroo South Lighting Masterplan and the approved lighting strategy for Phase 1A. These have been discussed and approved previously by the BDA.

As described the large streets are connecting the site with the wider Sydney streetscape. The equipment for both Barangaroo Avenue and Waterman’s Quay shall therefore follow the City of Sydney specifications. The illumination levels of the streets will also generally meet the city’s requirements. The diagram to the right is indicating all the proposed light intensities.





>15lx

P7: 14lx ave., 4lx min.

V3: 0.75cd/m^2 ave.,0.33 Uo

P8: 7 lx ave., 2lx min.

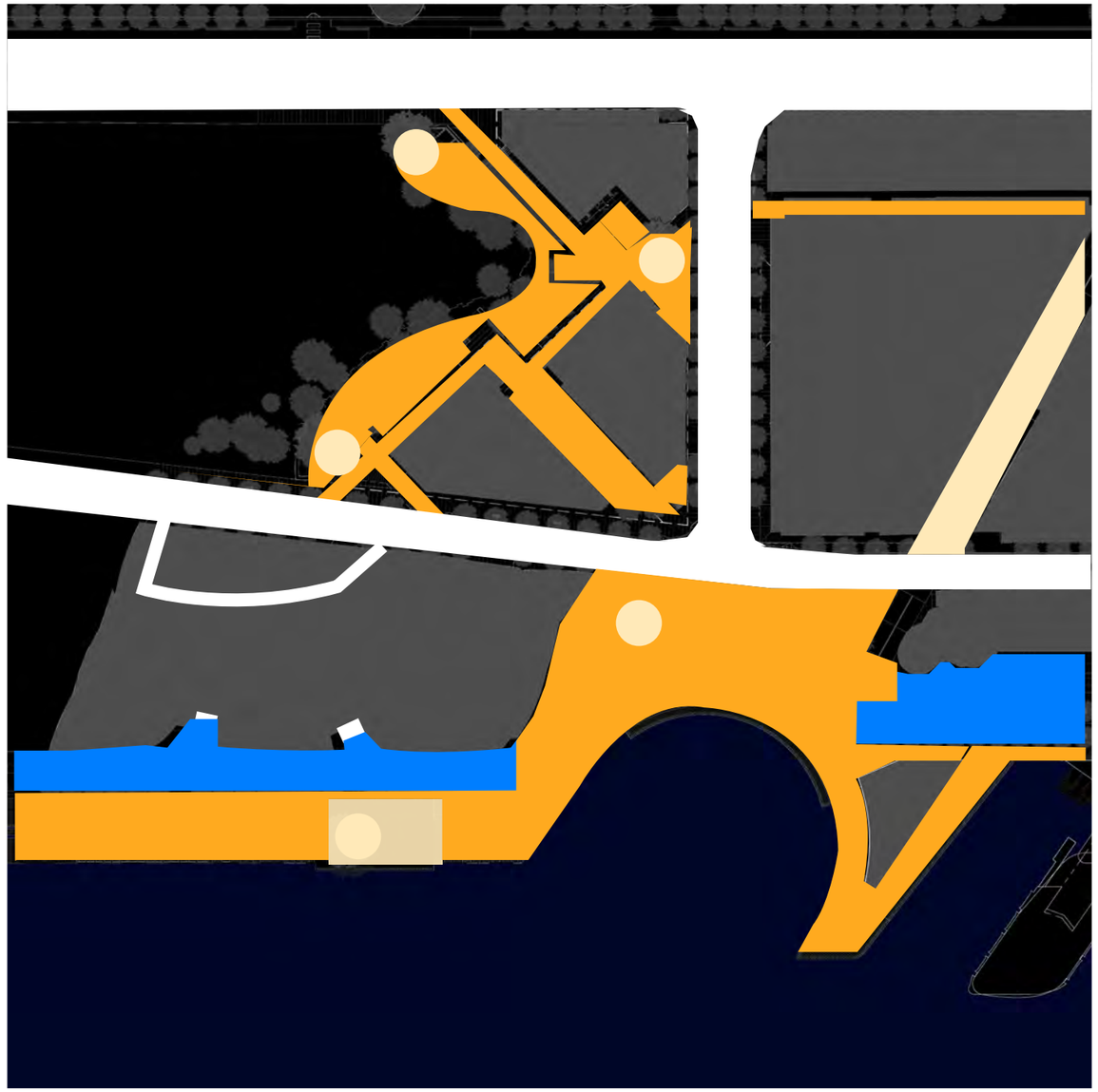
P3: 1.75 lx ave., 0.3lx min

P5: 0.75 lx ave., 0.05lx min

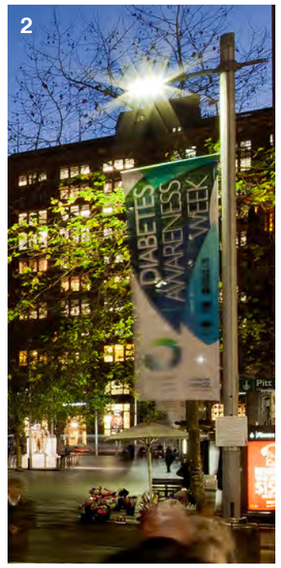
Executive Summary

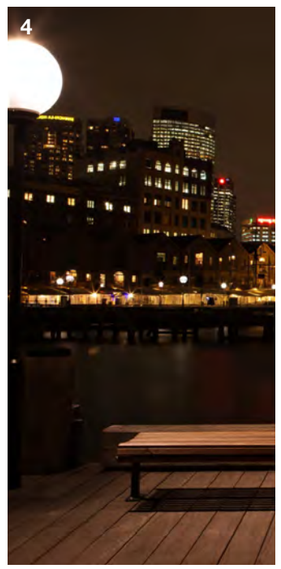
Colour Temperature Strategy

A variety of colour temperatures shall be utilised to enhance the differing characters of the Barangaroo public realm.



1. Cool >4000K/ Blue
2. Neutral White >4000K
3. Warm white 3000K
4. Very warm white 2400K-2700K





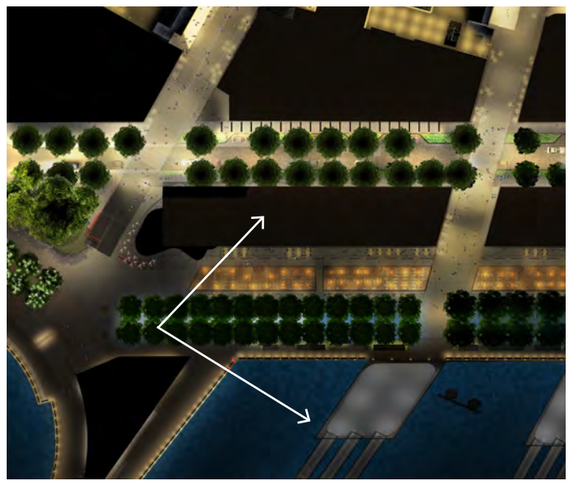
Barangaroo Masterplan

Barangaroo Masterplan / Phase 1B

Stage 1B Public Realm

1. Lighting to feature trees helps create a unique character for the Barangaroo public realm.
2. Create a sense of intimacy to promote night-time activity.
3. Illuminate Strada connecting Park and Harbour creating a distinct character.
4. Emphasise the landscape character of the Avenue/Quay by gentle illuminating trees with spotlights mounted on the smart poles.
5. Support way-finding and orientation by highlighting nodes, thresholds and meeting points.
6. Illuminate informal routes to support pedestrian movement.
7. Continue character of Phase 1A Waterfront to harmonise the district.
8. Create a dynamic interface between the Crown Hotel and embankment.
9. Provide a safe but welcoming ambience on the boardwalk jetty after dark.
10. Reinforce the character of Wulugul Walk to encourages users to dwell and wonder.
11. Provide gentle lighting to sandstone seating terraces to provide a safe but intimate ambience.
12. Enhance views out over the water.
13. Provide a smooth transition between Central Barangaroo and the Phase 1B waterfront.
14. Adequate horizontal and vertical Illumination to ensure good facial recognition and secure environment.
15. Hoarding at Hickson Park perimeter illuminated by bulkheads
16. Illumination to the boardwalk edge and timber baulks to help make the embankment more legible and perceivable for vessels navigating in the bay
17. Functional illumination to Hickson Park to provide safe environment.

Currently Installed Phase 1A Site Measurements Wulugul Walk



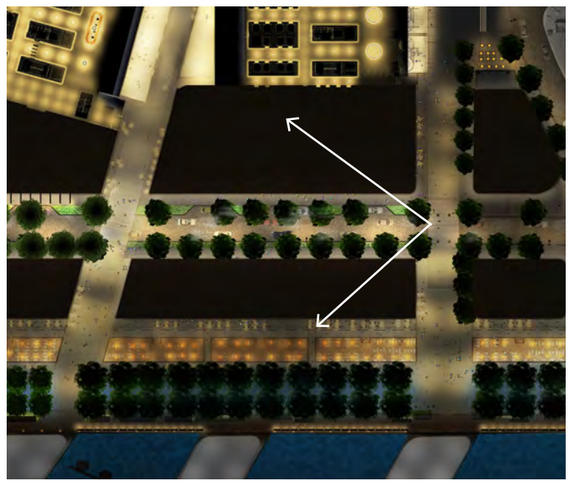
4.000K
Horizontal Illuminance
E 37lx

Vertical Illumination
(facial recognition)
E 12.5lx

14.000K
Horizontal Illuminance
E 20lx

3.000K
Horizontal Illuminance
E 8.5lx

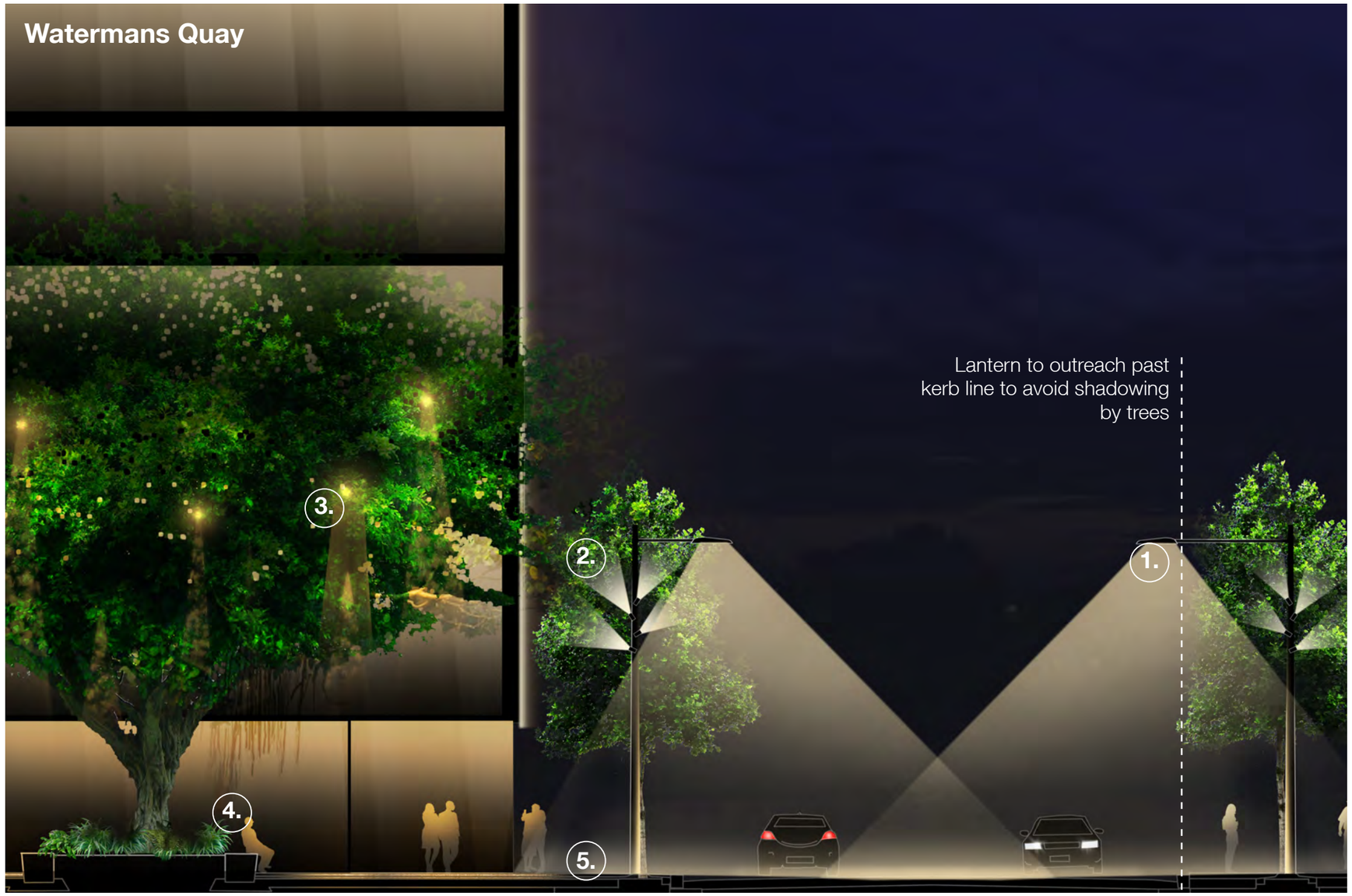
Currently Installed Phase 1A Site Measurements Barangaroo Avenue



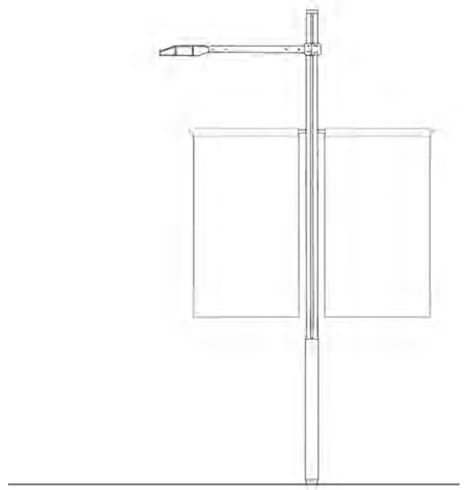
Horizontal Illuminance
E 106.8lx

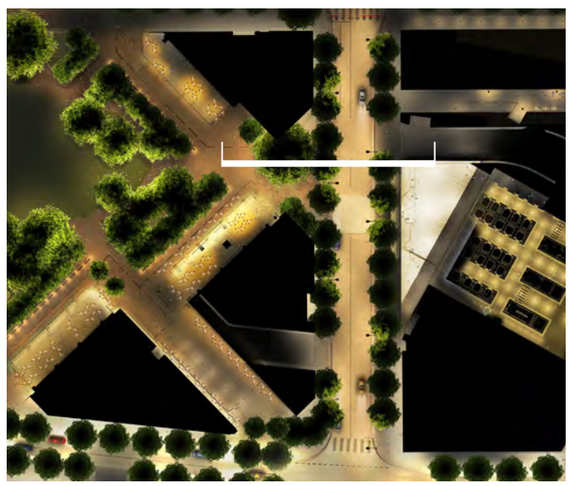
Horizontal Illuminance
E 46.5lx

Horizontal Illuminance
E 13lx



6.

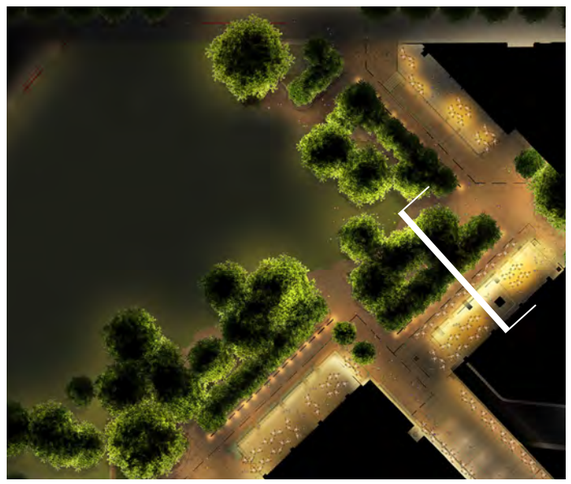




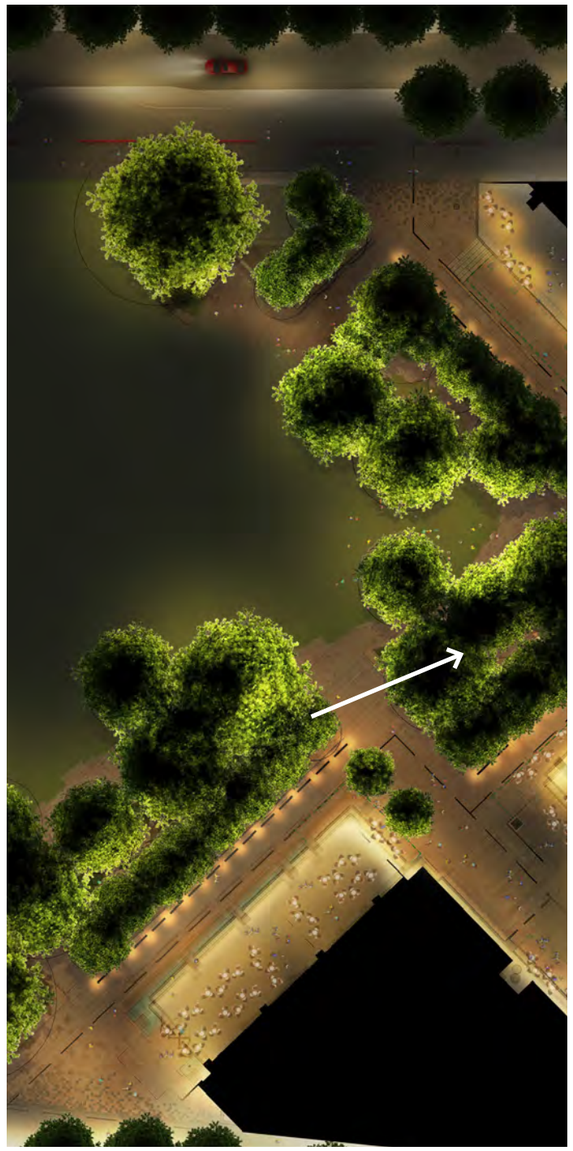
1. Street lighting provides a safe after-dark environment for both cars and pedestrians.
2. The lighting of trees creates a sense of enclosure along Watermans Quay and frames views towards the waterfront.
3. Lighting of the fig tree at the entrance to Hickson Park helps providing legibility of the public realm.
4. Integrated lighting to the bench not only illuminates the tree, but also creates an intimate atmosphere allowing passers-by to dwell.
5. Spill light from the smart poles provides gentle illumination for the pavements.
6. Proprietary standard Smart Pole flag attachment to be supplied as part of system. Size and design of flag to be by others.

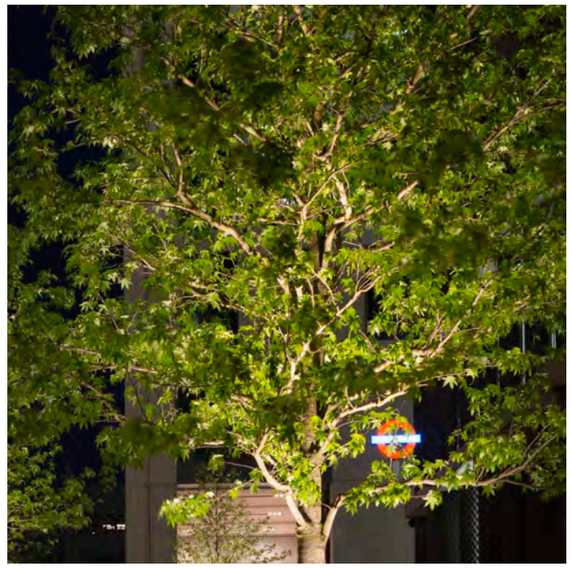
Barangaroo Avenue

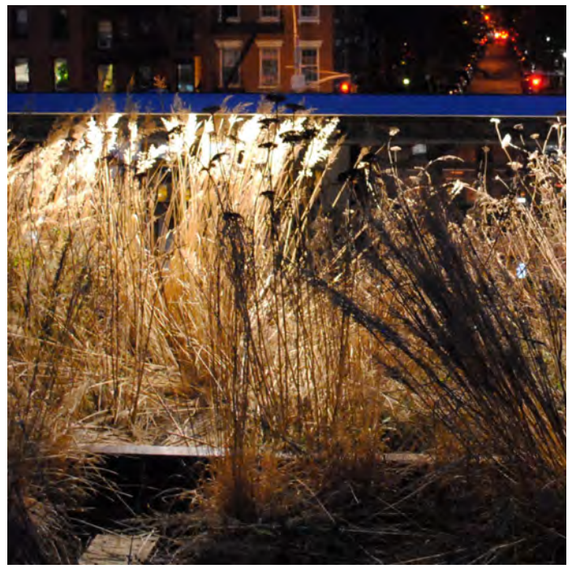
1. Street lighting provides a safe after-dark environment for both cars and pedestrians.
2. Spill light from the smart poles provides gentle illumination for the pavements.
3. It is suggested to integrate lighting into the canopies of the buildings to contribute additional light the public realm streetlight and reduce the amount of required columns The lighting integrated into the canopies are not public and so can only augment the streetlighting on the avenue



1. Lighting of the large trees along Hickson Park will create a vista when viewed from adjacent high-rise apartments.
2. Lighting integrated into the Barangaroo bench will not only illuminate the tree, but also create an intimate atmosphere allowing passers-by to dwell.
3. Lighting in the bench provides vertical illumination, this will improve facial recognition and enhance the perception of safety after-dark.
4. Indicative lighting indicated into the canopies note this lighting is not publicly owned and so can only augment the illumination of the park. The illumination of the park does not rely on this lighting
5. Post Top Luminaires to provide gentle illumination of Hickson Park and to enhance the perception of safety after-dark.
6. Integrated lighting into the stone wall will provide a gentle lighting to the pathway at low level

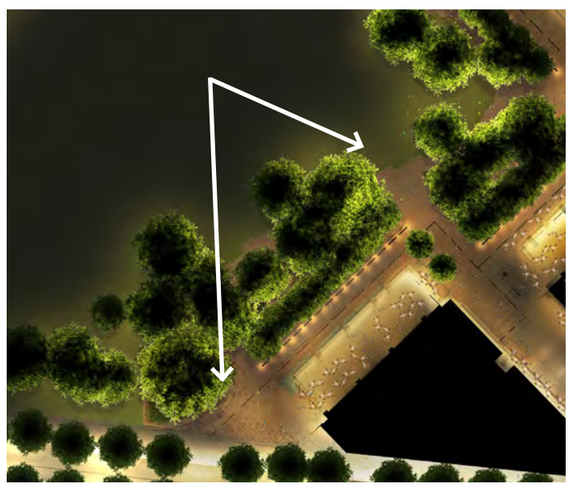






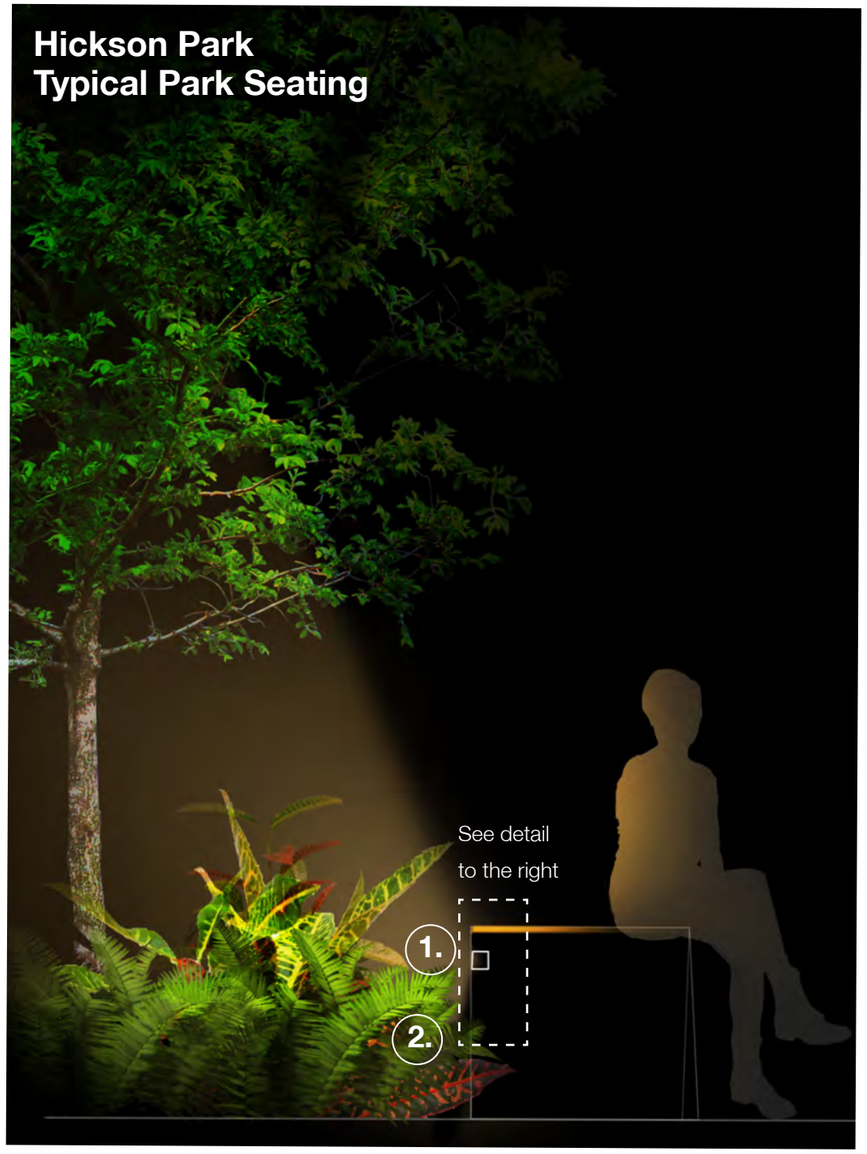
1. Lighting integrated into the Barangaroo bench will not only illuminate the tree, but also create an intimate atmosphere allowing passers-by to dwell.
2. Lighting in the bench provides vertical illumination, this will improve facial recognition and enhance the perception of safety after-dark.
3. Directional lighting mounted into the trees will illuminate the table to express the colour and veins of the sandstone material after dark.

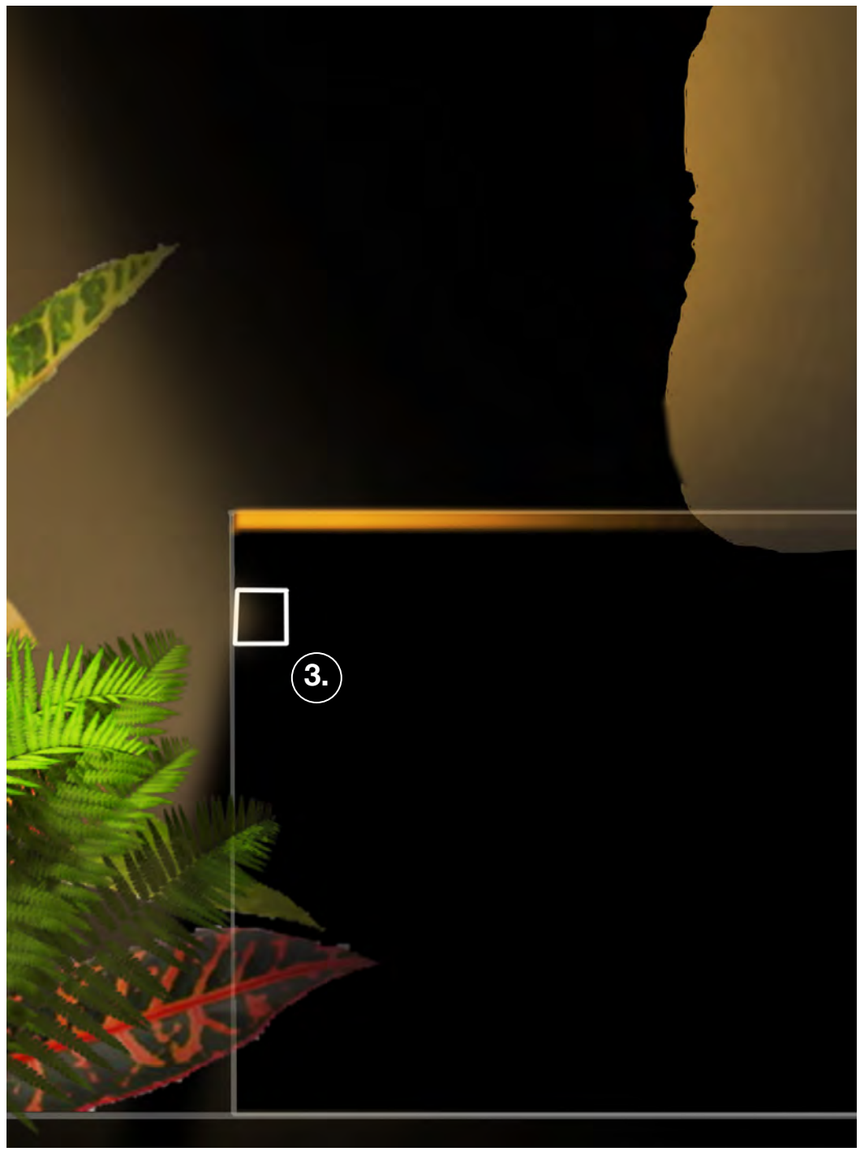
Hickson Park
Typical Park Seating

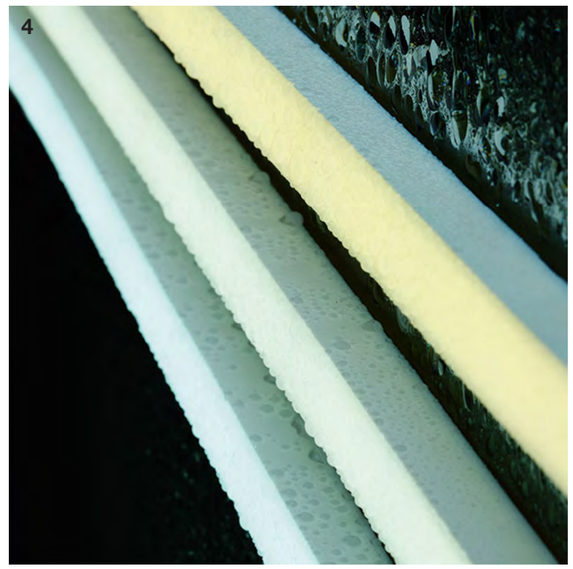


1. Uplighting to trees will not only illuminate the tree, but also create an intimate atmosphere allowing passers-by to dwell.
2. Lighting integrated at low level provides gentle illumination to the planting that creates a positive and interesting vista for visitors of the park

Hickson Park
Typical Park Seating

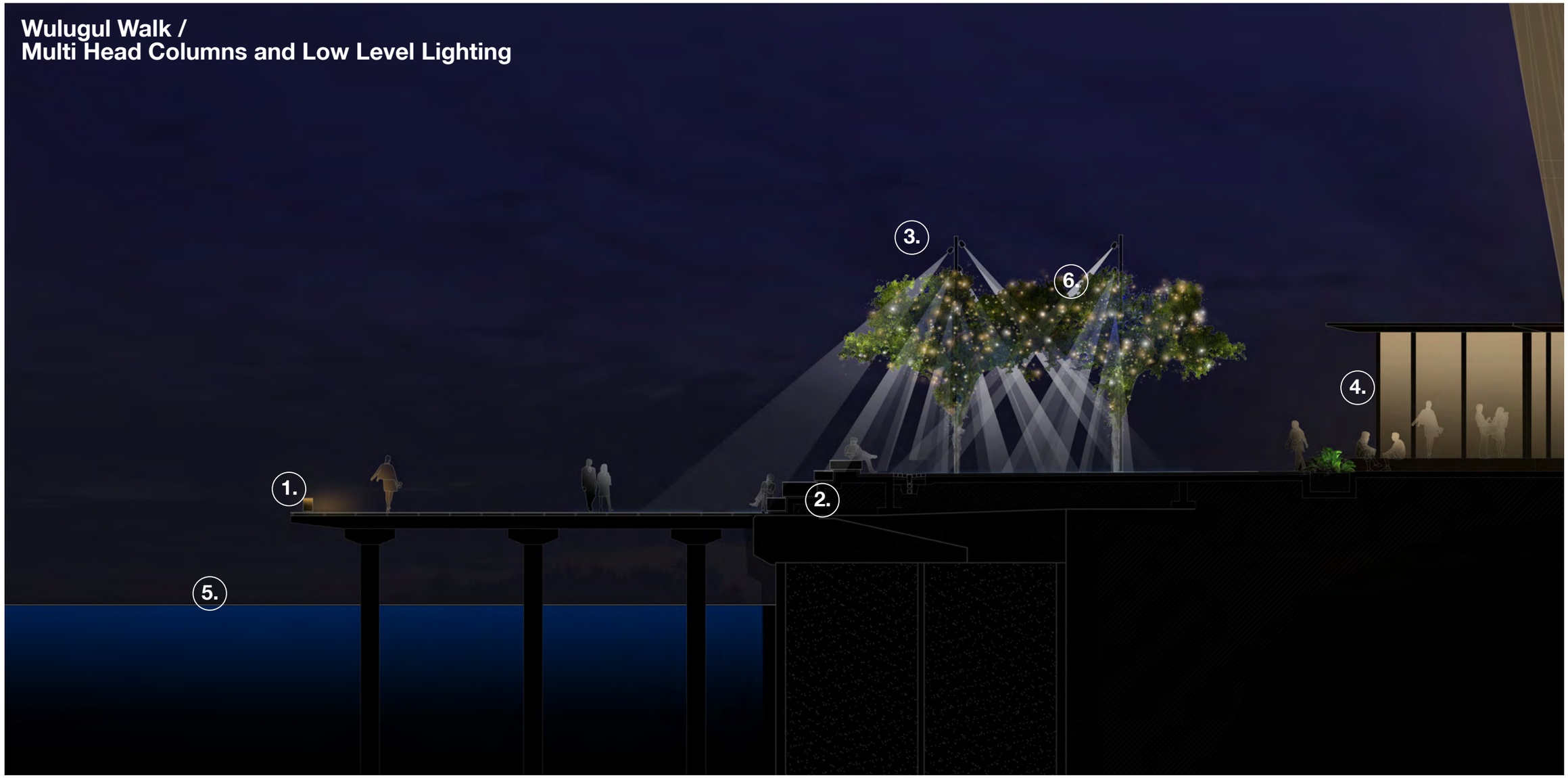


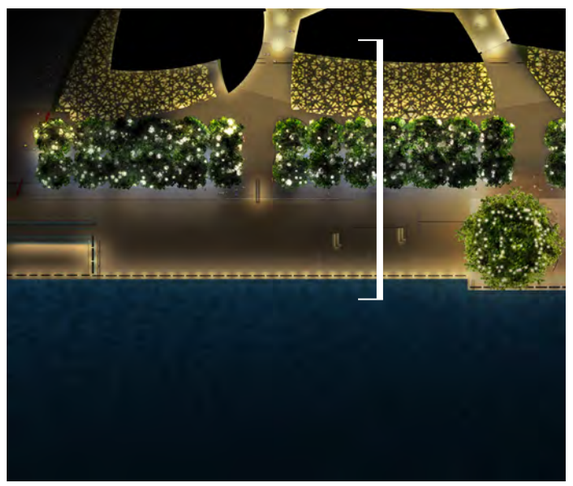




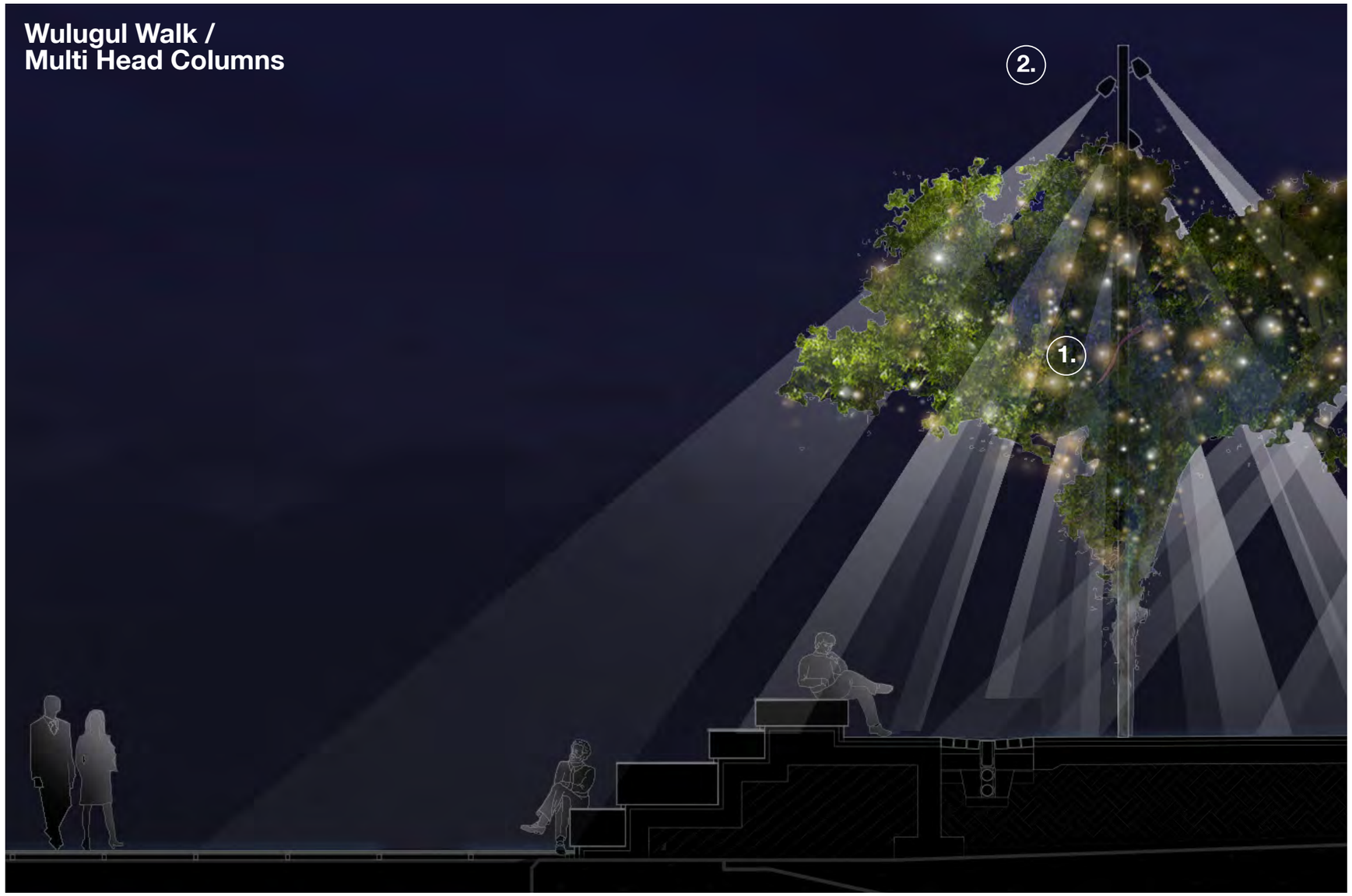
1. Lighting integrated into seating will not only illuminate the tree, but also create an intimate atmosphere allowing passers-by to dwell. The fixtures shall be neatly integrated with the planting on the bench.
2. Lighting integrated at low level provides gentle illumination to the planting that creates a positive and interesting vista for visitors of the park.
3. A linear light fixture with a very soft and diffused light distribution is recessed vertically in the seating providing lighting to the low level planting. Lighting to be flush to avoid dirt build up and potential issues with draining.
4. Indicative equipment.

Wulugul Walk /
Multi Head Columns and Low Level Lighting

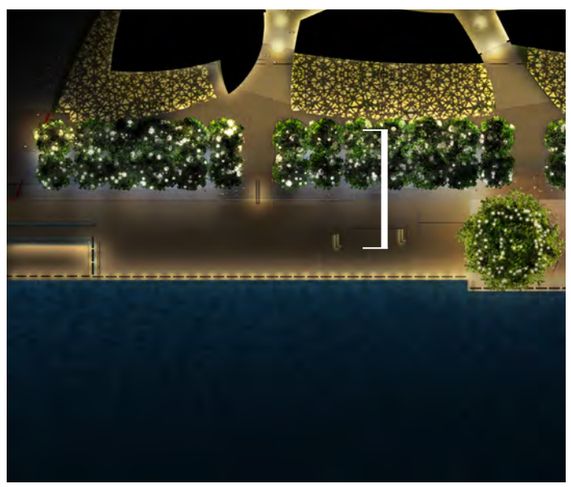




1. Warm, low level marker lighting defines the water's edge for safety and creates a visual link to the lit promenade, whilst protecting views out across the water.
2. Gentle illumination of stone steps creates an inviting area to dwell and socialise.
3. Cool moonlighting through the promenade trees provides dappled light and contrasts with the adjacent warmly-lit interiors and seating areas.
4. Occupancy lighting from The Crown Hotel at street level contributes vertical illumination and boosts perceptions of security.
5. Light spill into the water will be minimised as far as possible.
6. Festoon lights to the trees animates the waterfront and creates a twinkling canopy overhead. Festoon lighting for Crown Hotel subject to agreement by Crown and BDA

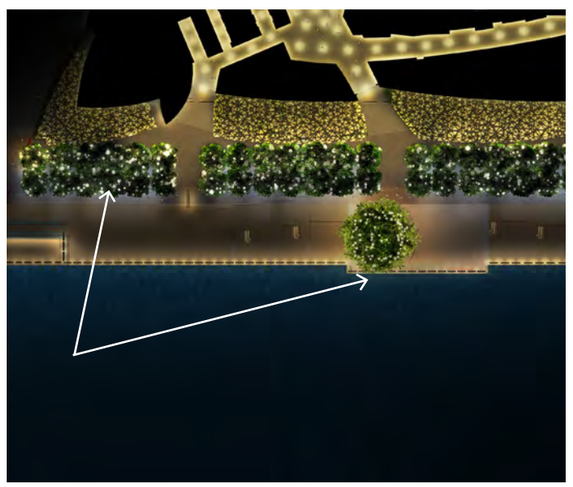


3



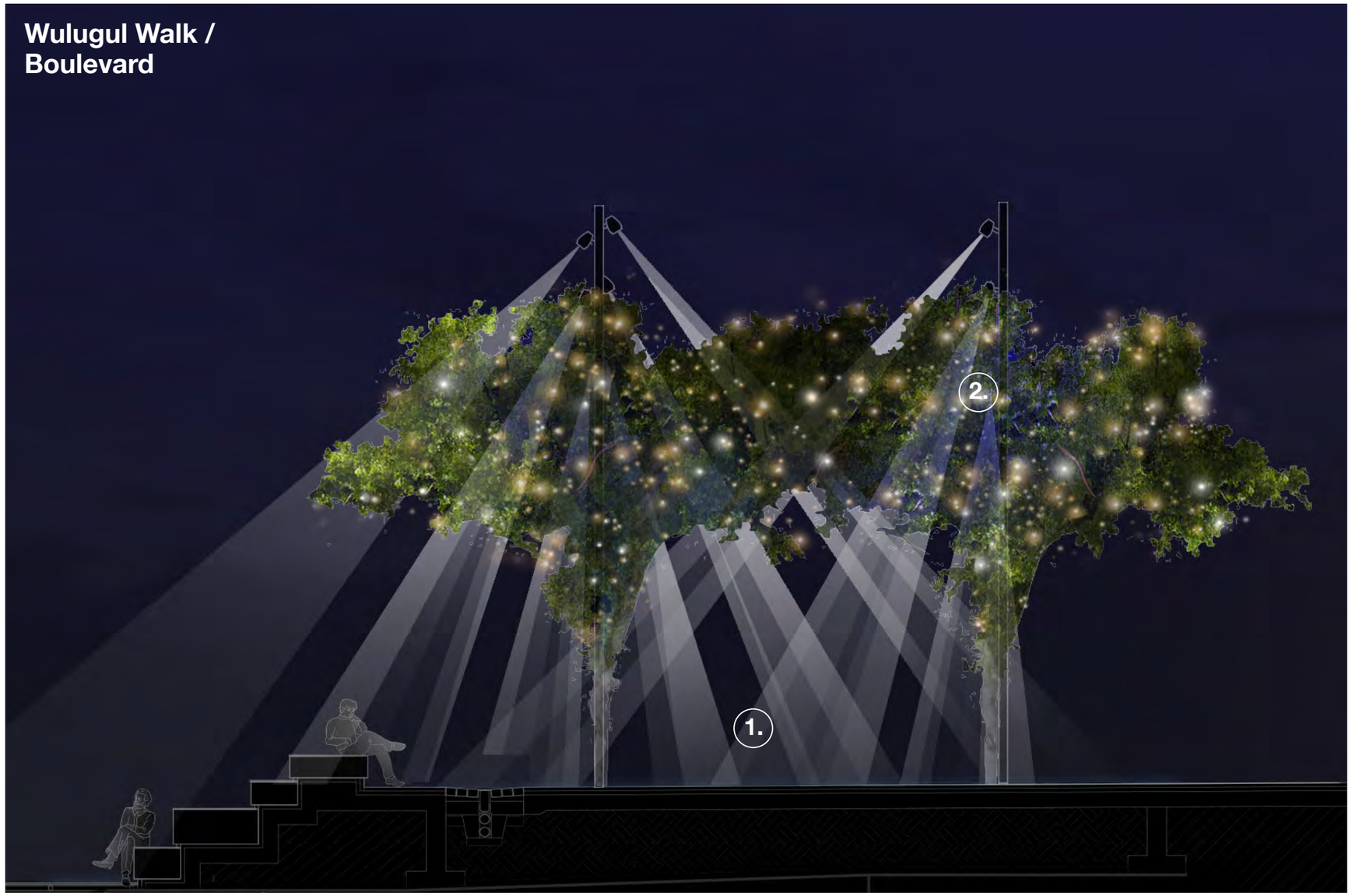
1. Cool moonlighting in contrasts to the adjacent warmly-lit interiors and seating areas.
2. To maintain unobstructed views along the promenade towards to the water from The Crown Hotel, the board walk will be lit from projectors mounted on columns.
3. Indicative equipment.

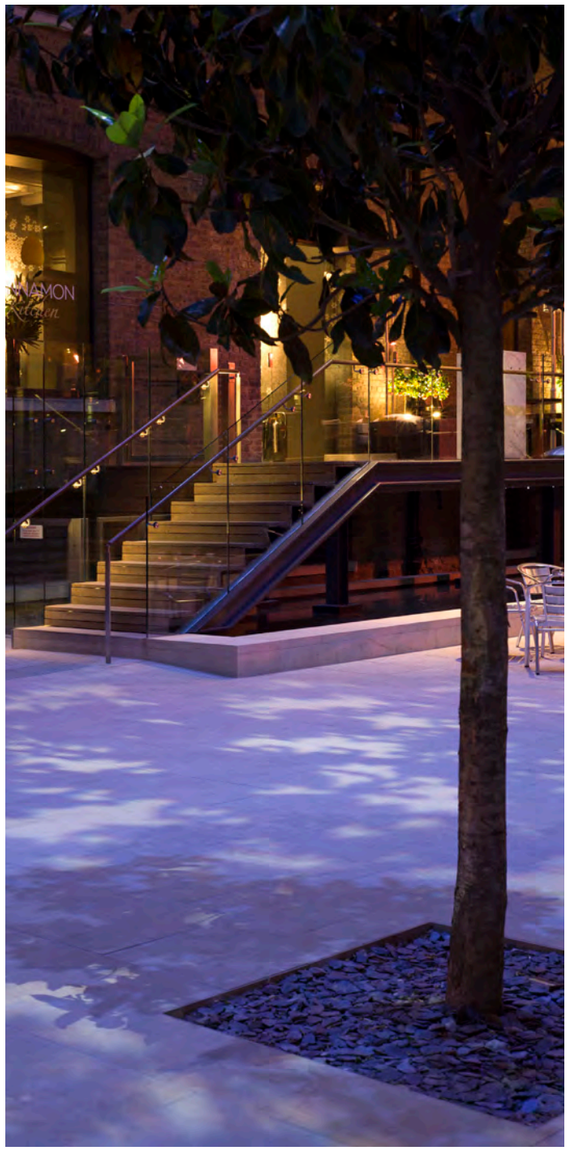
Wulugul Walk and Pope's Landing / Sketch View

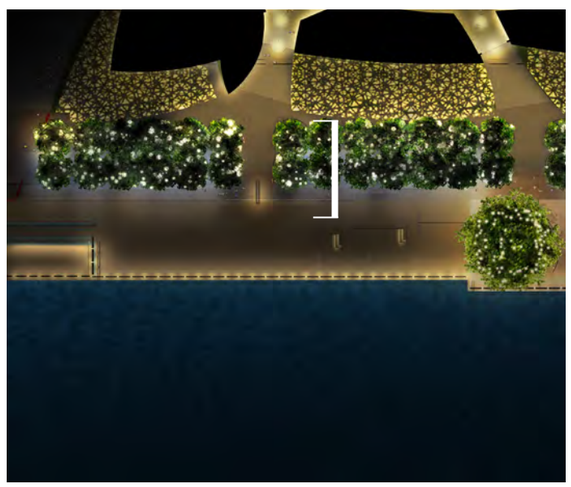


1. Warm, low level marker lighting defines the water's edge for safety and creates a visual link to the lit promenade, whilst protecting views out across the water.
2. Integrated concealed warm washlighting to steps highlights changes of level.
3. Seating areas below the fig tree are lit with warm shafts of light through its foliage providing naturally animated, dappled textures; while uplighting to the tree creates a lit canopy overhead.
4. Gentle Illumination of stone steps create an inviting area to dwell and socialise.
5. Cool moonlighting through the promenade trees provides dappled light and contrasts with the adjacent warmly-lit interiors and seating areas.
6. Lighting integrated into handrails illuminates the steps.
7. Light spill into the water will be minimised as far as possible.
8. Festoon lights to the trees animates the waterfront and creates a twinkling canopy overhead.
9. Illumination to the boardwalk edge and timber baulks to help make the embankment more legible and perceivable for vessels navigating in the bay

Wulugul Walk / Boulevard

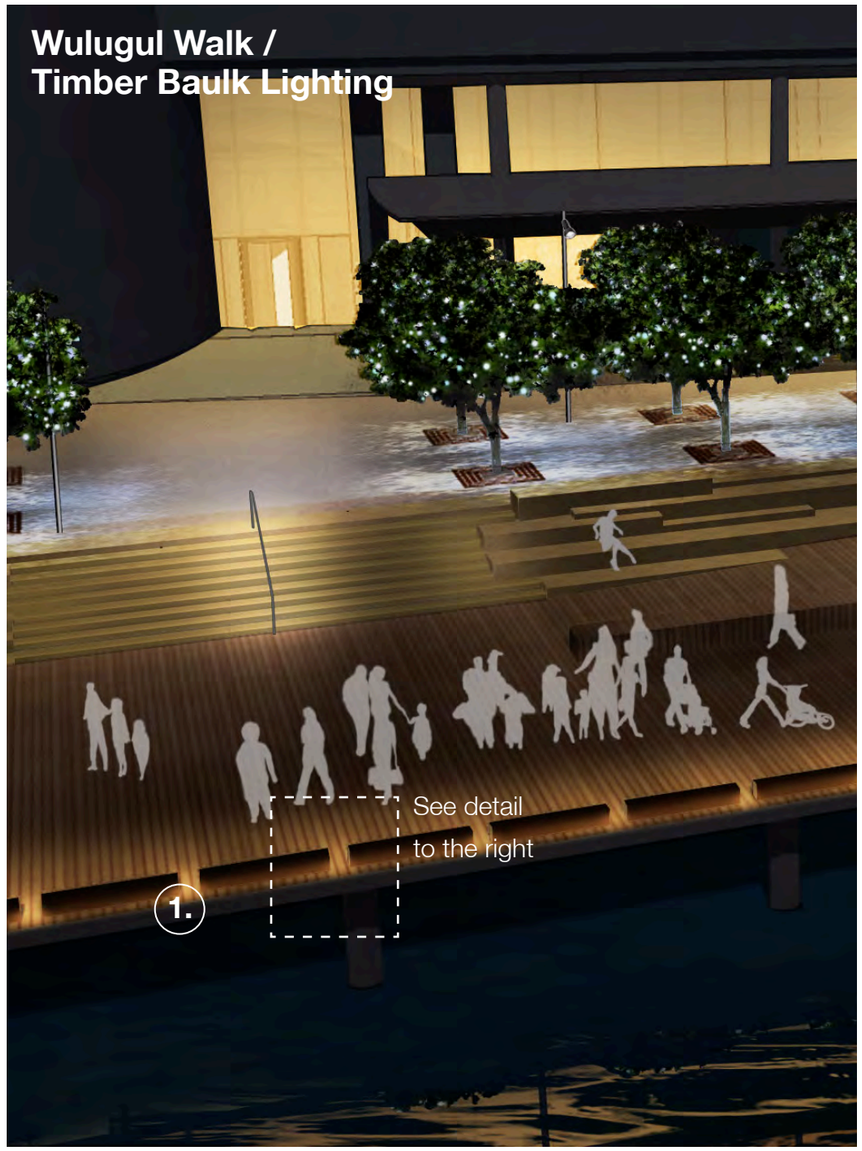




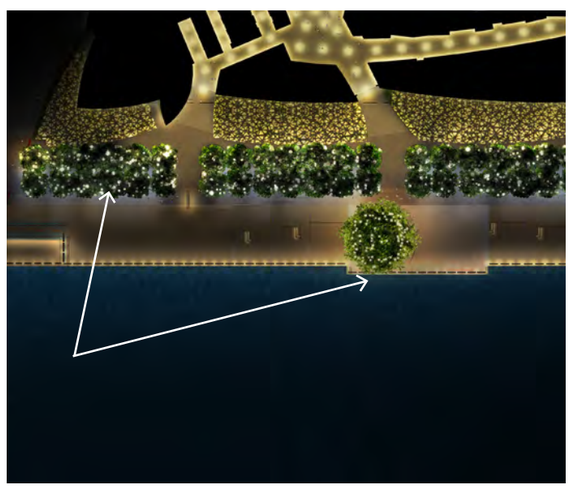


1. Cool moonlighting through the promenade trees provides dappled light and contrasts with the adjacent warmly-lit interiors and seating areas.
2. Festoon lights to the trees animates the waterfront and creates a twinkling canopy overhead. Festoon lighting for Crown Hotel subject to agreement by Crown and BDA

Wulugul Walk / Timber Baulk Lighting

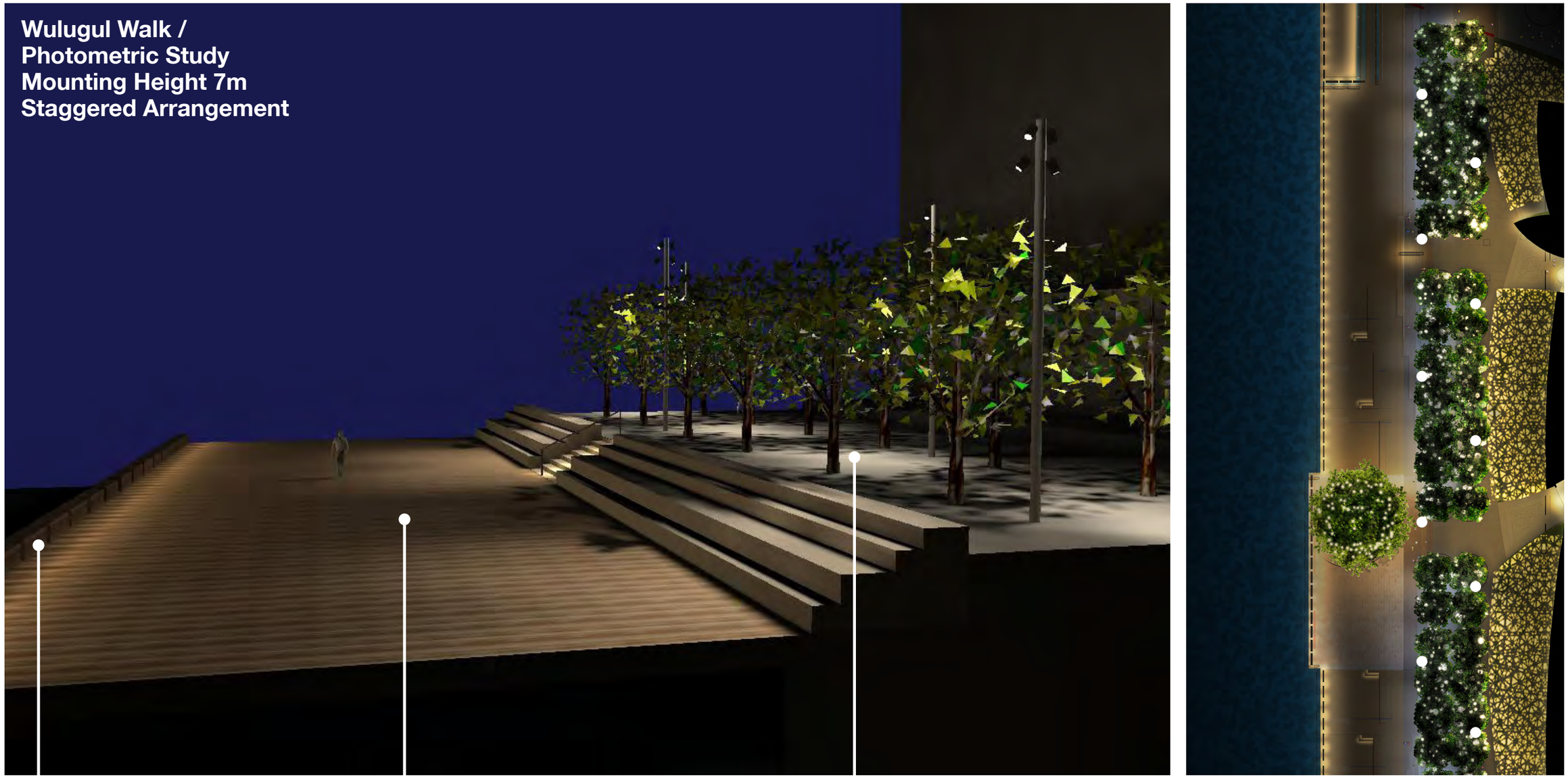


3



1. Warm, low level marker lighting defines the water's edge for safety and creates a visual link to the lit promenade, whilst protecting views out across the water
2. Barrier blocks to have integrated fixtures with fully concealed light sources.
3. Indicative equipment.
4. Illumination to the boardwalk edge and timber baulks to help make the embankment more legible and perceivable for vessels navigating in the bay

Wulugul Walk /
Photometric Study
Mounting Height 7m
Staggered Arrangement



Wooden Bulbs
Horizontal Illuminance E

Eav	13.2lx
Min.	3.6lx
Uniformity	Uo 0.27

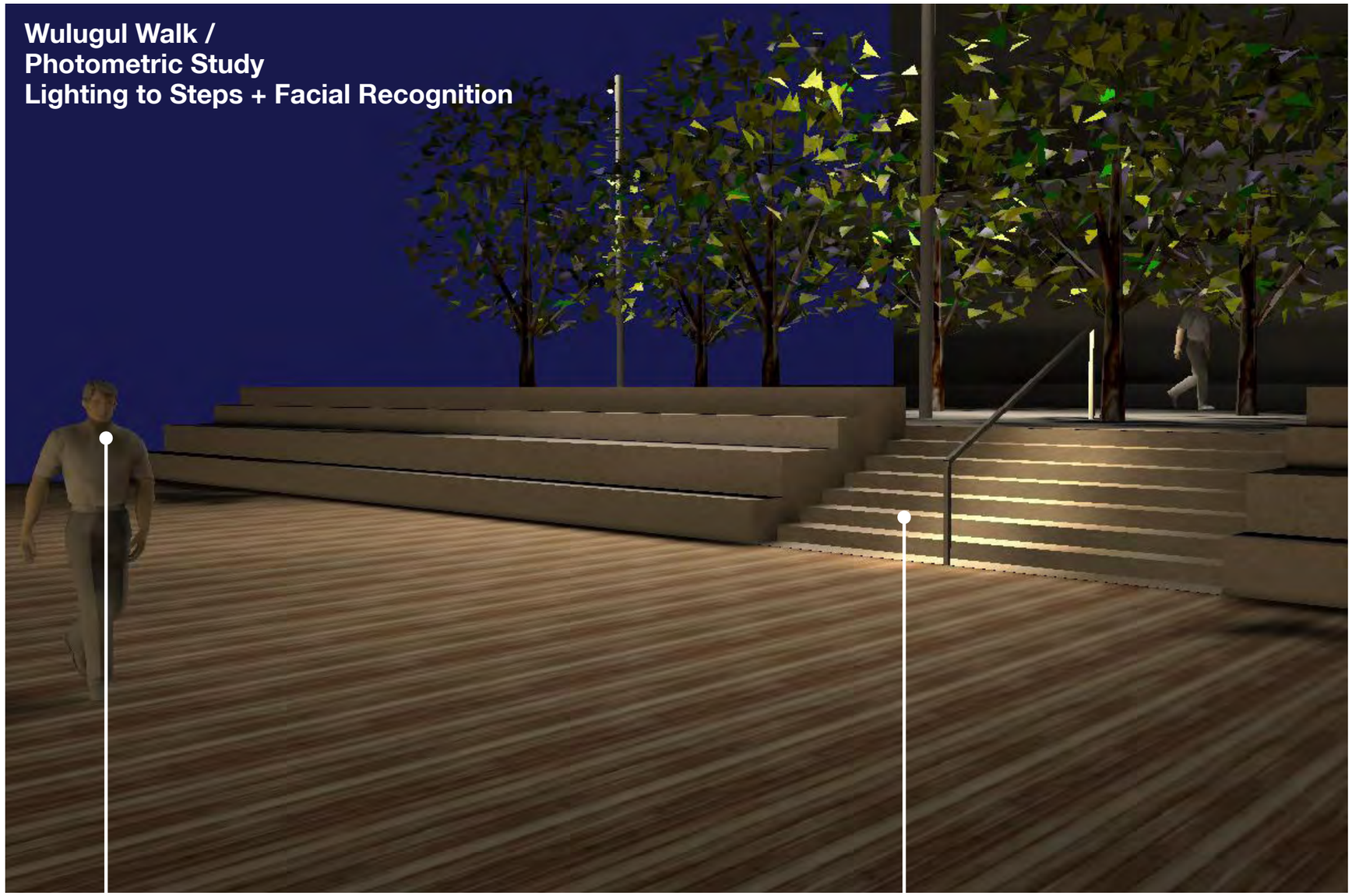
Waterfront Boardwalk
Horizontal Illuminance E
(Tree shadow estimation included)

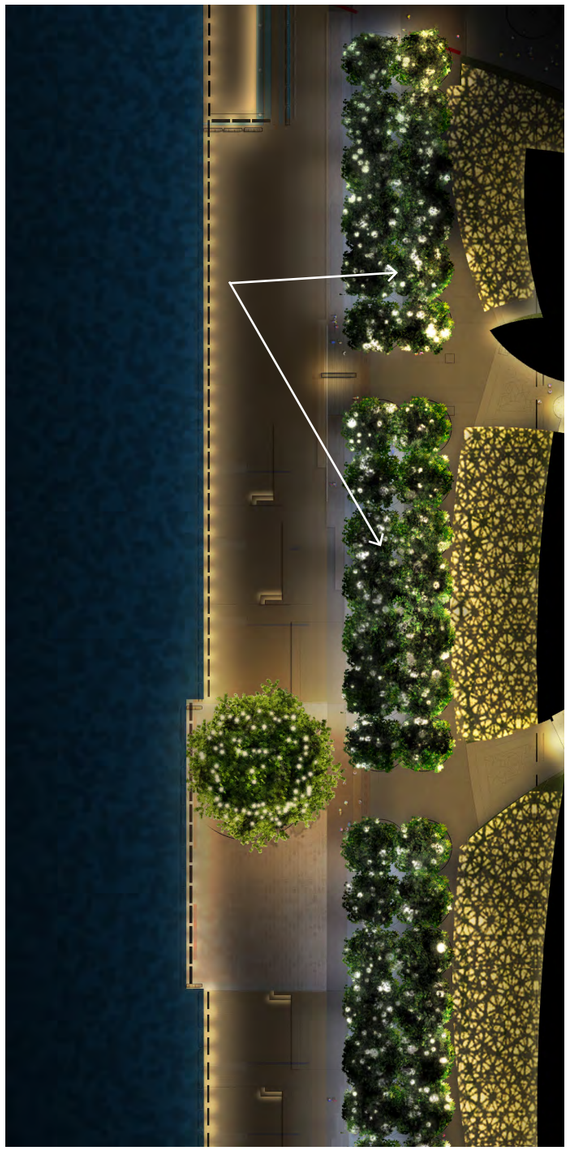
Eav	12lx
Min.	1lx
Uniformity	Uo 0.1

Promenade
Horizontal Illuminance E
(Tree shadow estimation included)

Eav	20x
Min.	2.7lx
Uniformity	Uo 0.1

Indicative Column Location
similar to Phase 1A





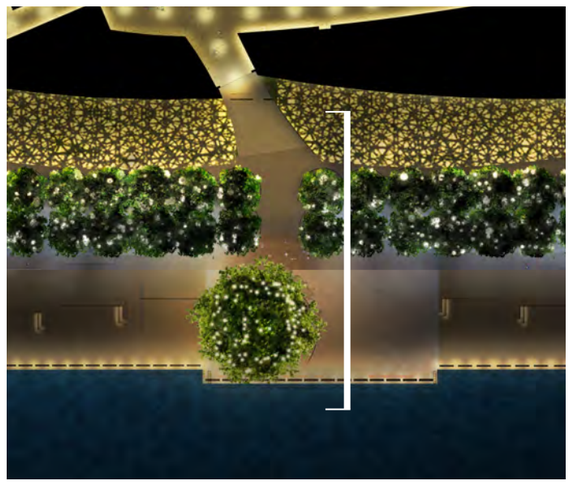
Waterfront Boardwalk
Cylindrical Illumination
(facial recognition)

Eav	7.6lx
Min.	1.2lx
Uniformity	Uo 0.16

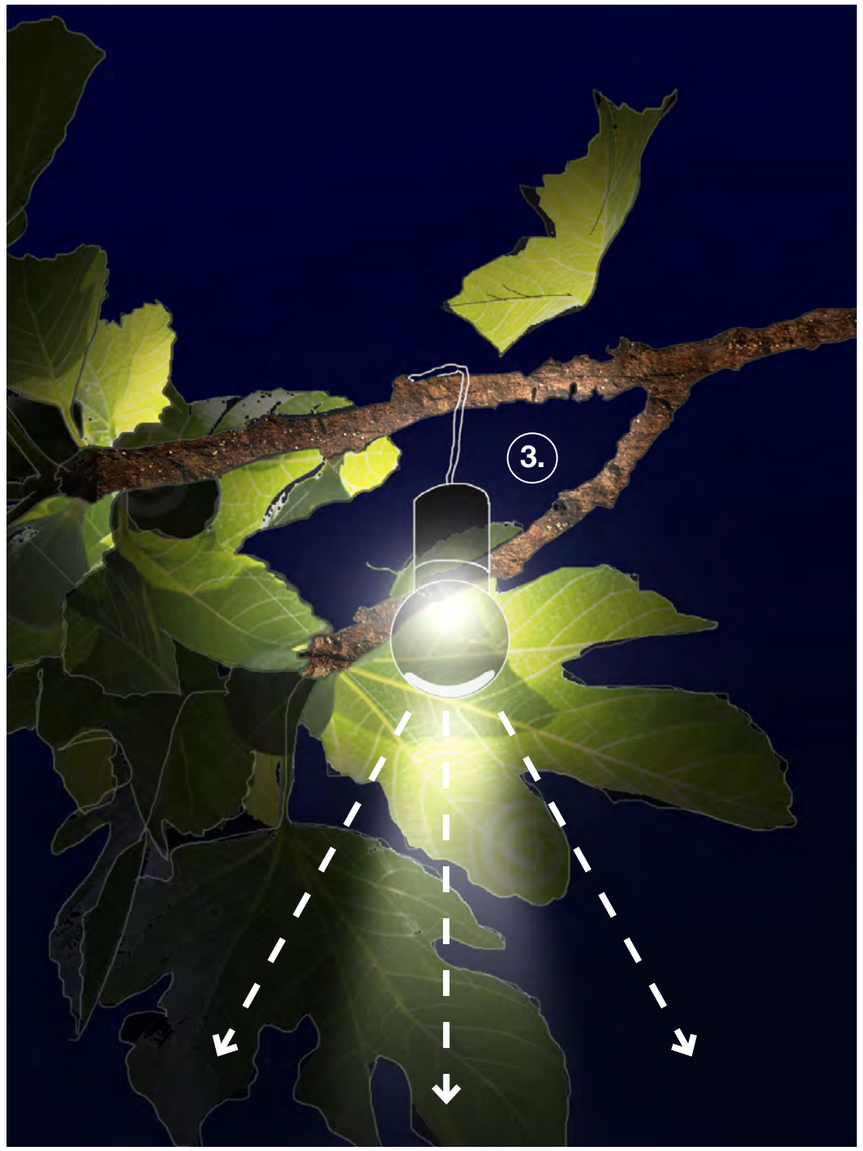
Stair
Horizontal Illuminance E

Eav	37lx
Min.	1lx
Uniformity	Uo 0.02

Pope's Landing

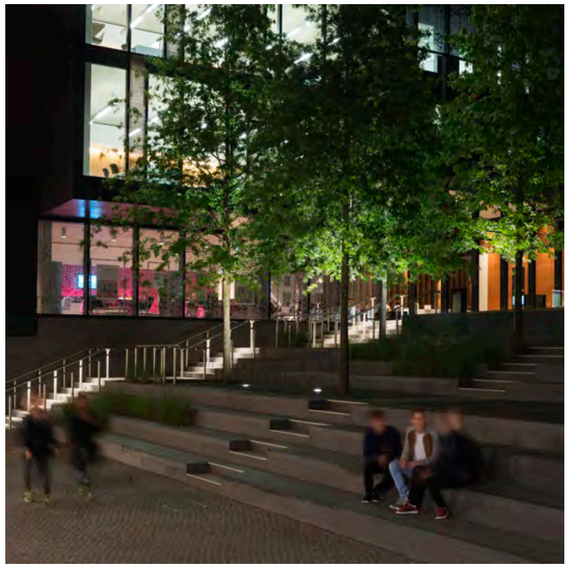


1. Warm, low level marker lighting defines the water's edge for safety and creates a visual link to the lit promenade, whilst protecting views out across the water.
2. Warm shafts of light through tree foliage provides naturally animated, dappled textures to the seating area below.
3. Warm uplighting to the tree reveals its form and creates a lit canopy above the seating.
4. Cool moonlighting through the promenade trees provides dappled light and contrasts with the adjacent warmly-lit interiors and seating areas.
5. Illumination to the boardwalk edge and timber baulks to help make the embankment more legible and perceivable for vessels navigating in the bay



1. Warm shafts of light through the tree foliage provide naturally animated, dappled textures to the seating area below.
2. Warm uplighting to the tree reveals its form and creates a lit canopy above the seating.
3. Discrete LED luminaires strapped to the tree branches project light downwards.
4. Indicative equipment.

Watermans Cove

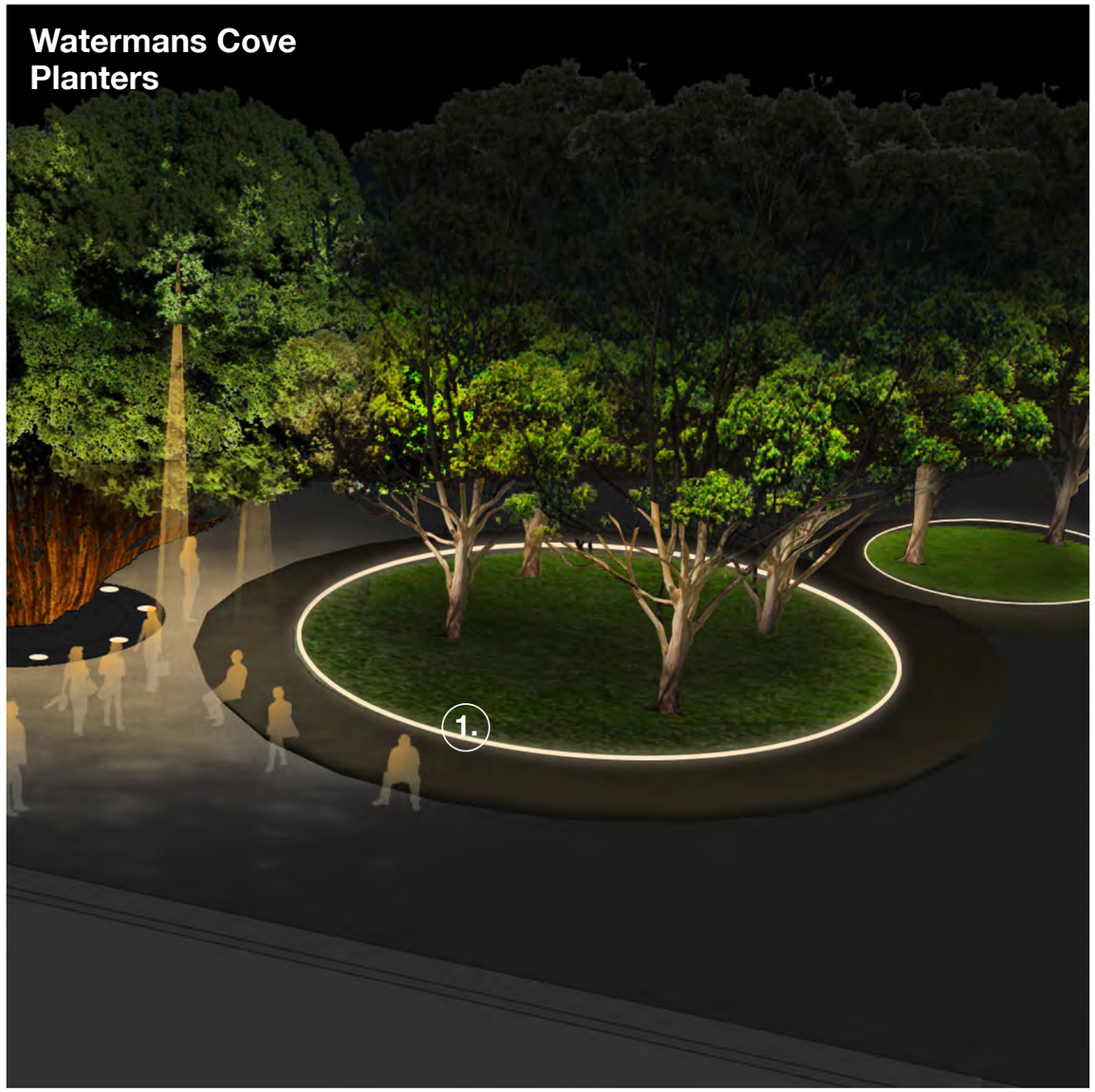


1. Spill light from the Crown Hotel.
2. Warm handrail lighting to provide secure pathway at steps.
3. Warm, low level marker lighting defines the water's edge for safety and creates a visual link to the lit promenade, whilst protecting views out across the water.
4. Festoon lights to the trees animates the waterfront and creates a twinkling canopy overhead.

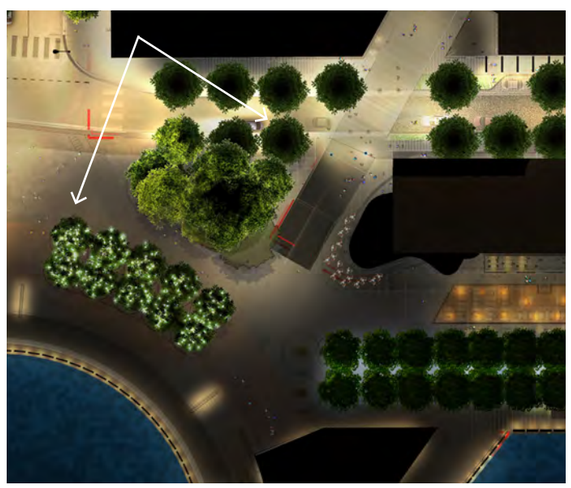
Watermans Cove
Sketch View

1. Warm occupancy lighting at street level contributes vertical illumination and boosts perceptions of security.
2. Warm Festoon lighting in the trees will help to create a sense of place and provide a visual interest when viewed from the opposite embankment.
3. Warm, low level marker lighting defines the water's edge for safety and creates a visual link to the lit promenade, whilst protecting views out across the water.

Watermans Cove Planters



2



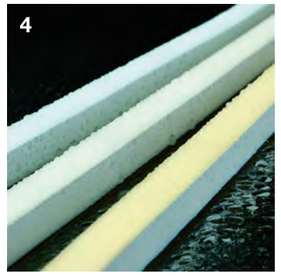
1. Light fixture is integrated into bench around raised planter to gentle illuminate planting and create an intimate ambience around the planter.
2. Indicative equipment.

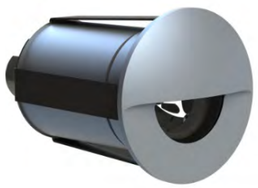
Indicative Equipment

1


2


3

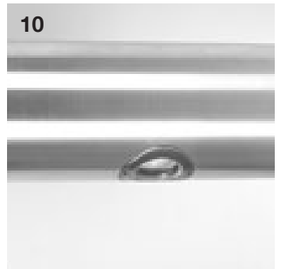

4


5


6


8


9


10


11


1. Linear lighting integrated into benches
2. Projectors mounted onto columns
3. Festoon lighting mounted into trees
4. Linear lighting integrated into benches and steps
5. Lighting recessed into timber baulks
6. Post Top Luminaire
7. Spike Mounted Uplight to Trees
8. Multi head fixtures on high columns
9. Sydney smart Pole with streetlight lantern
10. Integrated lighting to jetty handrail
11. Lighting to Hoarding and Hickson Park amenities building

Indicative Equipment
Scale and Mounting Height

Barangaroo Avenue

Lighting to street

Watermans Quay

Lighting to street and trees

Watermans Quay

proprietary standard Smart Pole with flag

Watermans Cove

Lighting to open space

Watermans Cove

Festoon lighting to trees

Watermans Cove

Lighting to Steps integrated into Handrail

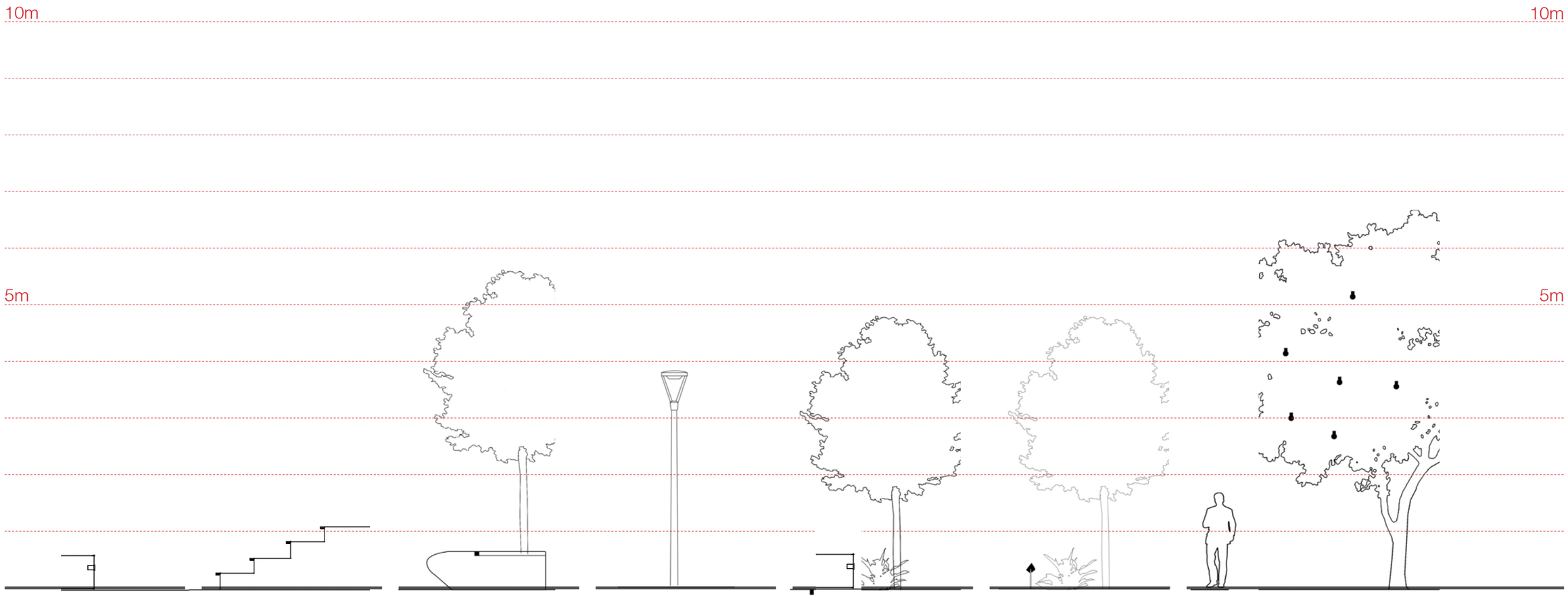
Wulugul Walk Boulevard

Dappled lighting to boulevard

Hickson Park

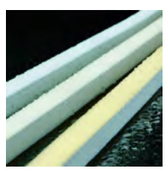
Lighting to Hoarding

Indicative Equipment
Scale and Mounting Height



Wulugul Walk Timber Baulks

Integrated lighting



Pope's Landing Steps

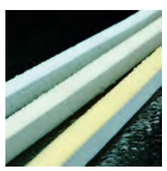
Integrated lighting to steps

Large Fig Trees with Circular Planting Bed

Uplighting integrated into bench

Hickson Park

Post Top Luminaire



Hickson Park Seating

Uplighting integrated into bench

Hickson Park

Uplighting to Trees

Large Fig Trees

Directional Festoon Lighting