Dark Sky Lighting Plan

Station Beach Boat House Wharf

1191 Barrenjoey Rd Palm Beach

May 2021

About this document

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Statement of Authorship

This study and report was undertaken by Ecological Consultants Australia at Studio 1/33 Avalon Parade, Avalon. The author of the report is Geraldene Dalby-Ball with qualifications BSc. majoring in Ecology and Botany with over 20 years' experience in this field, Jack Hastings with qualifications BSc. Majoring in Ecology.

Limitations Statement

Information presented in this report is based on an objective study undertaken in response to the brief provided by the client. Any opinions expressed in this report are the professional, objective opinions of the authors and are not intended to advocate any particular proposal or pre-determined position.

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Executive Summary

Introduction

- This Dark Sky Lighting Plan was prepared for London Lakes Pty Ltd for the proposed development at Station Beach Boat House Wharf, 1191 Barrenjoey Rd Palm Beach.
- Proposed actions at the site include; the demolition of the existing "Boathouse" and associated structures and construction of a replacement 2 storey structure and ancillary structure for use as a café, boar hire and seaplane office. This include lighting of the new premises inside and out.
- Palm Beach is an official 'Urban Night Sky Place' and lightening has been assessed for the usual impacts on fauna and has been designed to minimise upward escaping light leaving the sky as dark as practical.
- *An Urban Night Sky Place (Place) is a park or similar property near large urban development that is planned and designed to promote an authentic night time experience in the midst of significant artificial light.*
- *The Place aims to educate people on the benefits of proper outdoor lighting that ensures public safety while minimising the potential harm to the natural night time environment.*

Methods

- All Dark Sky recommendations have been included particularly with light placement and lighting type. Lighting proposed and the 'culture' of lightening is in alignment with current best practice as per:
    - Australasian Dark Sky Alliance (ADSA) approved lighting
      https://www.australasiandarkskyalliance.org/adsa-approved
    - Urban Nigh Sky Place – exhibition on Palm Beach as an UNSP
      https://yoursay.northernbeaches.nsw.gov.au/urban-night-sky-place
    - NSW Department of Planning, Industry and Environment
      https://www.planning.nsw.gov.au/About-Us/Our-Programs/Dark-Sky
      including reference to the*: Dark Sky Planning Guideline Protecting the observing conditions at Siding Spring* was reviewed and relevant principles applied.
    - International Dark Sky in particular the guidelines and information within:
      https://www.darksky.org/our-work/conservation/idsp/
      https://www.darksky.org/our-work/lighting/public-policy/
    - Dark Sky Friendly Developments of Distinction
      https://www.darksky.org/our-work/conservation/idsp/dsdod/

  - Australian Department of the Environment and Energy draft document "National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds"

- Cross-discipline input has included landscape, risk (safety re lighting), planning and ecology.

Results

- Dark Sky appropriate lighting is available that will result in the required 'safe-lighting' for public use of the spaces while greatly reducing upward escaping light. Lighting proposed is in accordance with International Dark-sky Association (IDA) recommendations. Specifics of lights and locations have been provided on plans in this report.

Dark Sky Management and Mitigation Measures

Design:

- Dark sky approved lighting plan
- Dark sky approved lighting fixtures

After completion of works:

- On-going light management
- Education about dark sky
- Promotion of the Venue being in a Dark Sky location

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1 Introduction

The award-winning International Dark Sky Places (IDSP) Program was founded in 2001 to encourage communities, parks and protected areas around the world to preserve and protect dark sites through responsible lighting policies and public education. https://www.darksky.org/our-work/conservation/idsp/

Palm Beach is an official Urban Dark Sky Place and has a committee assisting with projects in this area.

The development application at Station Beach Boat House Wharf, 1191 Barrenjoey Rd Palm Beach is within the Dark Sky's area and in the Northern Beaches Local Government Area (LGA).

1.1 Site information and general description

The Subject Site (the "Site") is the area of direct and likely indirect impacts and is defined as the whole of the property at 1191 Barrenjoey Rd Palm Beach (I.e. "boathouse, associated structures and gardens"). The Study Area includes the Subject Site, as well as any additional surrounding land traversed during the field survey. See below.

Study area. NB Jetty is outside of the DA however has been considered in this plan with regards to lightening.

The proposed study area is within Lot 298/ DP 721522, in the local government area of the Northern Beaches Council.

Table 1 - Site Administrative Information

Category	Details
Title Reference (Lot/DP)	The site is subject to split zoning as detailed below; – -Lot 298 DP721522 - the land below MHWM containing the Boathouse café zoned E2 Environmental Conservation. – -Lot 7005 DP 1117451 comprising the licensed area extending from the MHWM easterly for approximately 25 metres, generally in line with Barrenjoey Beach and the foreshore is zoned RE1 Public Recreation. – -Lot 7002 DP1117592 is the most eastern portion of the site and generally covers the street frontage and the adjacent access road car park is zoned RE1 Public Recreation.
Street Address	1191 Barrenjoey Rd Palm Beach, NSW, 2108.
LGA	Northern Beaches
Land Zoning	E2: Environmental Conservation RE1 Public Recreation.

1.2 People, Place and Context as it relates to night lighting

Night use (after dark) is associated with functions and people come here due to it's remoteness.
Dark Sky lighting has been used for all areas such that the ambiance of the location celebrates being in a Dark Sky location and the keeping the sky dark is a priority of the facility and it's functions.

Other areas with night lighting are not yet in accordance with Dark Sky and these include the Dunes and the lighting of the public toilet block at North Palm Beach Surf-club Café.

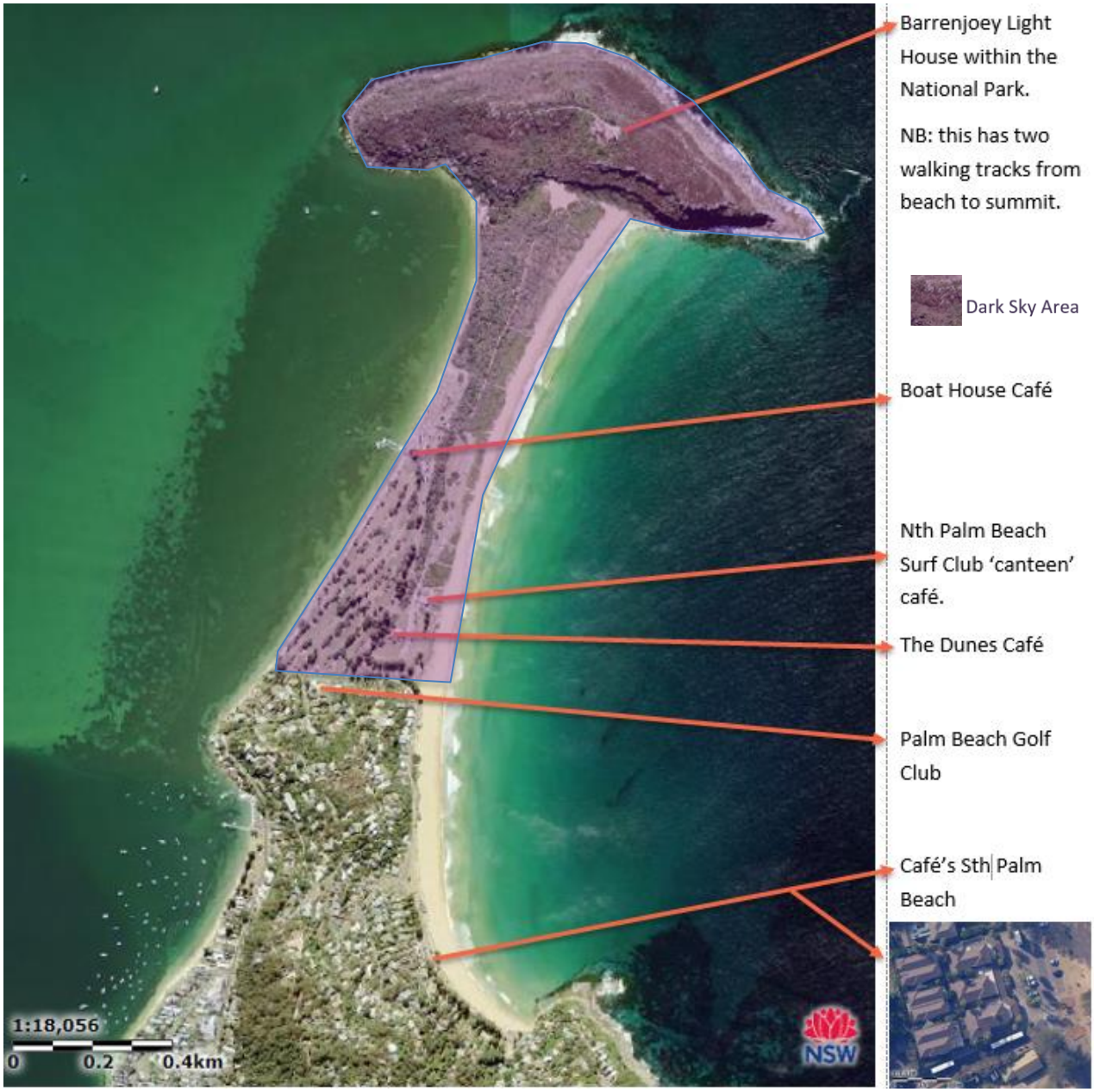


Figure 1.2 Area of the Dark Sky, Boat House and other 'eateries': SixMaps 2020

1.3 The Proposal

The proposal involves the demolition of the existing building and construction of a replacement 2 story structure and ancillary structure for use as a café, boat hire and seaplane office. Proposed works are detailed in the development application package including the set of drawings DA00-DA19 Feb 2021 by Roslyn Miller of Canvas Architecture & Design. Figures 1.3 and 1.4 are extracts from the drawing package showing the planned lighting locations.

1.4 Sources of information used in the lightening plan

The following sources of information were used for this assessment:

- Australasian Dark Sky Alliance (ADSA) approved lighting https://www.australasiandarkskyalliance.org/adsa-approved
- NSW Department of Planning, Industry and Environment https://www.planning.nsw.gov.au/About-Us/Our-Programs/Dark-Sky inc: Dark Sky Planning Guideline Protecting the observing conditions at Siding Spring was reviewed and relevant principles applied.
- International Dark Sky in particular the guidelines and information within: https://www.darksky.org/our-work/conservation/idsp/ and https://www.darksky.org/our-work/lighting/public-policy/
- Dark Sky Friendly Developments of Distinction https://www.darksky.org/our-work/conservation/idsp/dsdod/
- Australian Department of the Environment and Energy draft document "National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds"

  https://www.environment.gov.au/biodiversity/publications/national-light-pollution-guidelines-wildlife
- NSW Public Lighting Code Published by NSW Division of Energy, Water and Portfolio Strategy, NSW Department of Planning and Environment 2018 https://energy.nsw.gov.au/sites/default/files/2018-10/Final%20-%20Public%20Lighting%20Code%20-%20Clean.PDF
- Hydroline spatial data 1.0. NSW Department of Finance, Services & Innovation.
- *Site Plans Canvas Architecture & Design 05/08/2020* and updates Feb 2021
- Aquatic Ecology Report Boat House, Palm Beach. 10th September 2020. Cardno
- Arboricultural Impact Assessment, Station Beach Boat House Wharf 1191 Barrenjoey Rd Palm Beach. March 2020 and update Feb 2021 by Urban Forestry Australia.
- Landscape Plan LP01-C. Boat Shed Palm Beach 04.02.2021. Selena Hannan Landscape Design.

1.5 Legislative context and statutory requirements

NSW

NSW Public Lighting Code Published by NSW Division of Energy, Water and Portfolio Strategy, NSW Department of Planning and Environment 2018

The NSW *Environmental Planning and Assessment Act 1979* and the *Environmental Planning and Assessment Regulation 2000* institutes and sets out a system for environmental planning and assessment in NSW, and includes Part 4 which deals with development applications on private land.

1.5.1 Coastal Management SEPP 2018

Cl. 13 Development on land within the coastal environment area.

Dark Sky implementation benefits coastal environmental values, natural processes and aquatic life.

1.5.2 Section D Locality Specific Development Controls Palm Beach and Waterways

D15.11 Waterfront Lighting

Any likely adverse visual impact when the viewed from the Pittwater waterway, any adjoining public land, and adjoining residences. Reflection of the water should be eliminated where possible.

Compliant: All lighting is 'Dark Sky' recommended and will be angled down so that light spillage is minimise. Reflective light will be minimized by situating and angling lights such that light spill over the water is minimise with the aim for it to be not perceptibly present.

A culture of light awareness is being created with a focus to turn off unnecessary indoor lighting. Dimmers, motion sensors and timers will be used to reduce the illumination levels.
Outdoor lighting fixtures will be 'Dark Sky Friendly' and in accordance with the recommendations of the IDA. Acceptable light fixtures are as per https://imgur.com/a/x84vq this includes having shields over the light source to minimize glare and light trespass.

Adequate lighting is to be provided for safe access to waterfront development and safe navigation in an out of commercial and recreational waterfront development, and private facilities associated with the dwelling where appropriate.

Compliant: proposed lighting plan provides safe access to in an out of commercial waterfront development. This proposal doesn't include the jetty and no lighting has been proposed here as part of this DA.

Lighting is designed to minimise electricity consumption.

Compliant (will be LED and or warm lights with low energy use and complying with the following form Dark Sky:
Use of "warm" or filtered LEDs (CCT < 3,000 K; S/P ratio < 1.2) to minimize blue emission. Warm-coloured compact fluorescents (CFLs) can also be used. LED lighting allows for reduced illuminance without compromising visibility. International Dark Sky Association (IDA) recommends that only warm light sources be used for outdoor lighting and this includes Low-pressure Sodium (LPS), High-pressure Sodium (HPS) and low-colour-temperature LEDs. Outdoor lighting with strong blue content not be used.

Floodlighting of marine facilities is not permitted.

Compliant: No flood lighting will be present

2 Lighting Plan

The Australasian Dark Sky Alliance (ADSA) is dedicated to reducing light pollution.
The ADSA Approved light fittings listed on https://www.australasiandarkskyalliance.org/adsa-approved as these conform with dark sky principles specific to Australasian standards and guidelines including AS/NZS 4282:2019 and the Australian Federal Draft National Light Pollution Guidelines for Wildlife.

All light fixtures for the proposed redevelopment is from the adsa approve list. That is the list of luminaire delivering appropriate levels of performance for use in a dark sky friendly lighting designs and all will be:

- Upward Waste Light of 0%
- ≤3000K CCT
- On/ Off control
- Both Front and Back Very High Uplight (FVH & BVH) ≤2.0 %. *

** Acceptable control includes dimmable control gear, NEMA/ANSI C136.41 7-pin receptacle or Zhaga Book 18 Luminaire Extension Module enabled with dimming capabilities, built in motion sensors, bi-level switching/ variable forward current.*

All will be angled down so that light spillage is minimise. Reflective light will be minimized by situating and angling lights such that light spill over the water is minimised with the aim for it to be not perceptibly present.

A culture of light awareness is being created with a focus to turn off unnecessary indoor lighting. Dimmers, motion sensors and timers will be used to reduce the illumination levels.
Outdoor lighting fixtures will be 'Dark Sky Friendly' and in accordance with the recommendations of the IDA. Acceptable light fixtures are as per https://imgur.com/a/x84vq this includes having shields over the light source to minimize glare and light trespass.

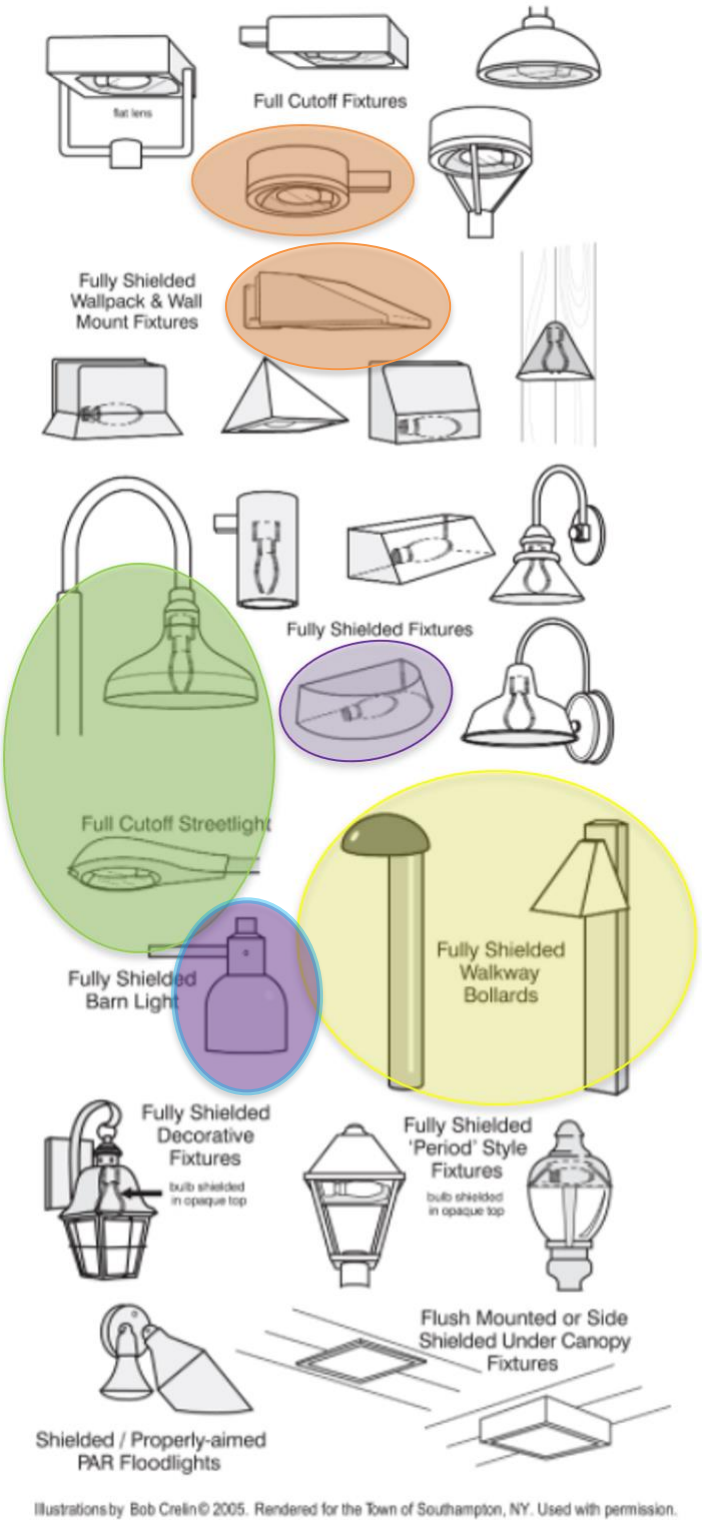
The following principle applies to all lightening (including the inside areas).

- Only be on when needed
- Only light the area that needs it
- Be no brighter than necessary
- Minimize blue light emissions
- Be fully shielded (pointing downward)

Examples shown here Source: https://www.darksky.org/our-work/lighting/lighting-for-citizens/lighting-basics/

2.1 Lighting types and locations

Figures 2.1, 2.2 and 2.3 show the plan and elevation views of the development area with lighting types and locations proposed (for key see next page).



Areas under cover will also have Dark Sky approved lightening with warm light mounted in the ceiling and where needed Shielded Under Canopy Fixtures such as under the covered walkways.

For details on internals see final plans. LPS, HPS are preferable to low-colour-temperature LEDs for outside use. Low-colour-temperature LEDs may be used in internal lightening. See next page for specific lightening examples.

Lights will be sensor lights (and used for security purposes) in all areas away from the core use areas.

Hand-rail strip lighting – low voltage under the rail and warm-colour globes.

 Full cut-off and fully shielded wall mount fixtures

 As above but on separate switch

 Fully Shielded beam light (over stairs)

Fully shielded lights next to doors (not shown on elevations) see Fig 2.2

Key of lighting types shown in Figures 2.1-2.3

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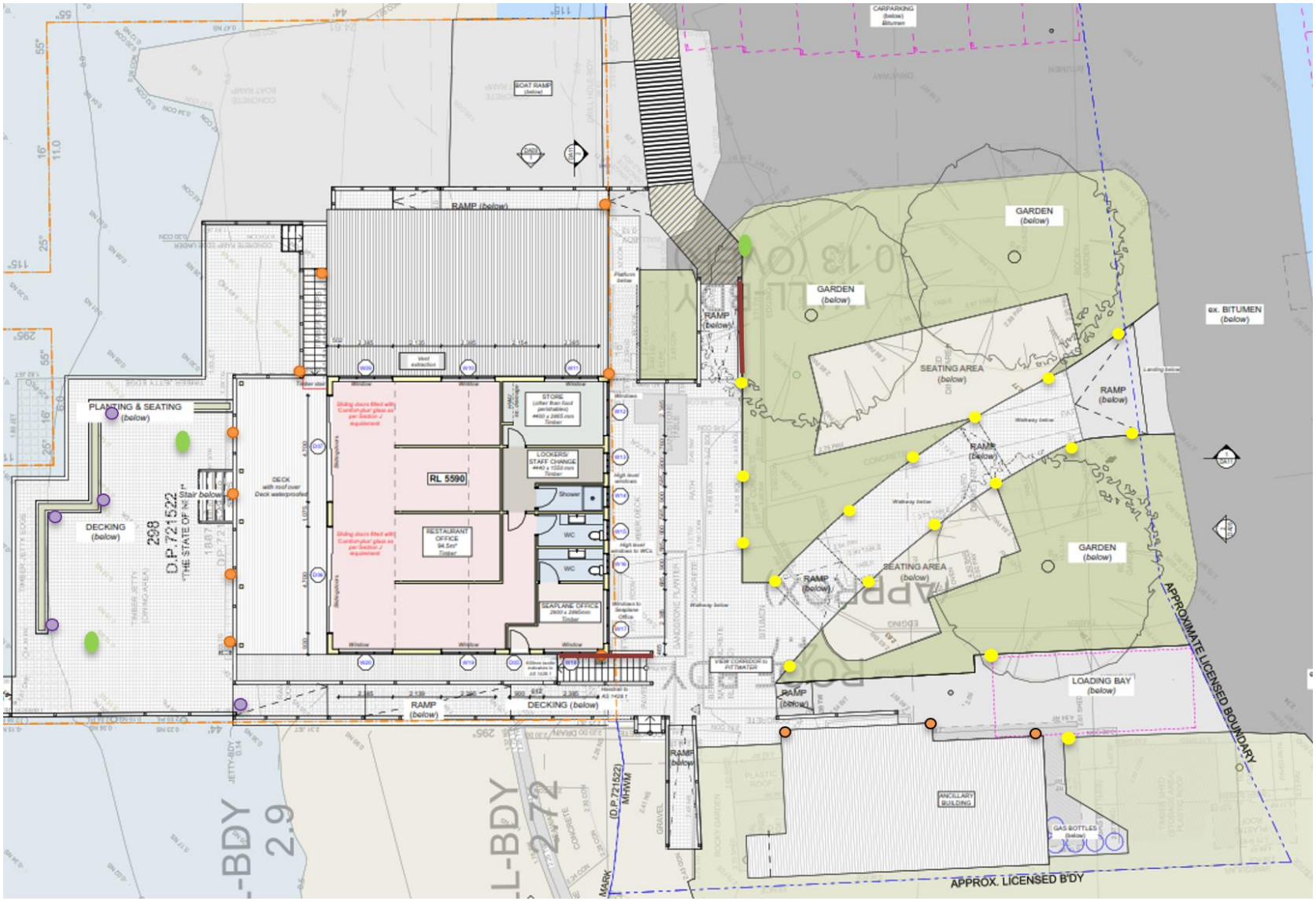


Figure 2.1 Plan view of lighting layout. NB See Figures 2.2 and 2.3 for elevations.

Figure 2.2 North / East elevations Lighting P. Base plan: Canvas Architecture & Design DA07

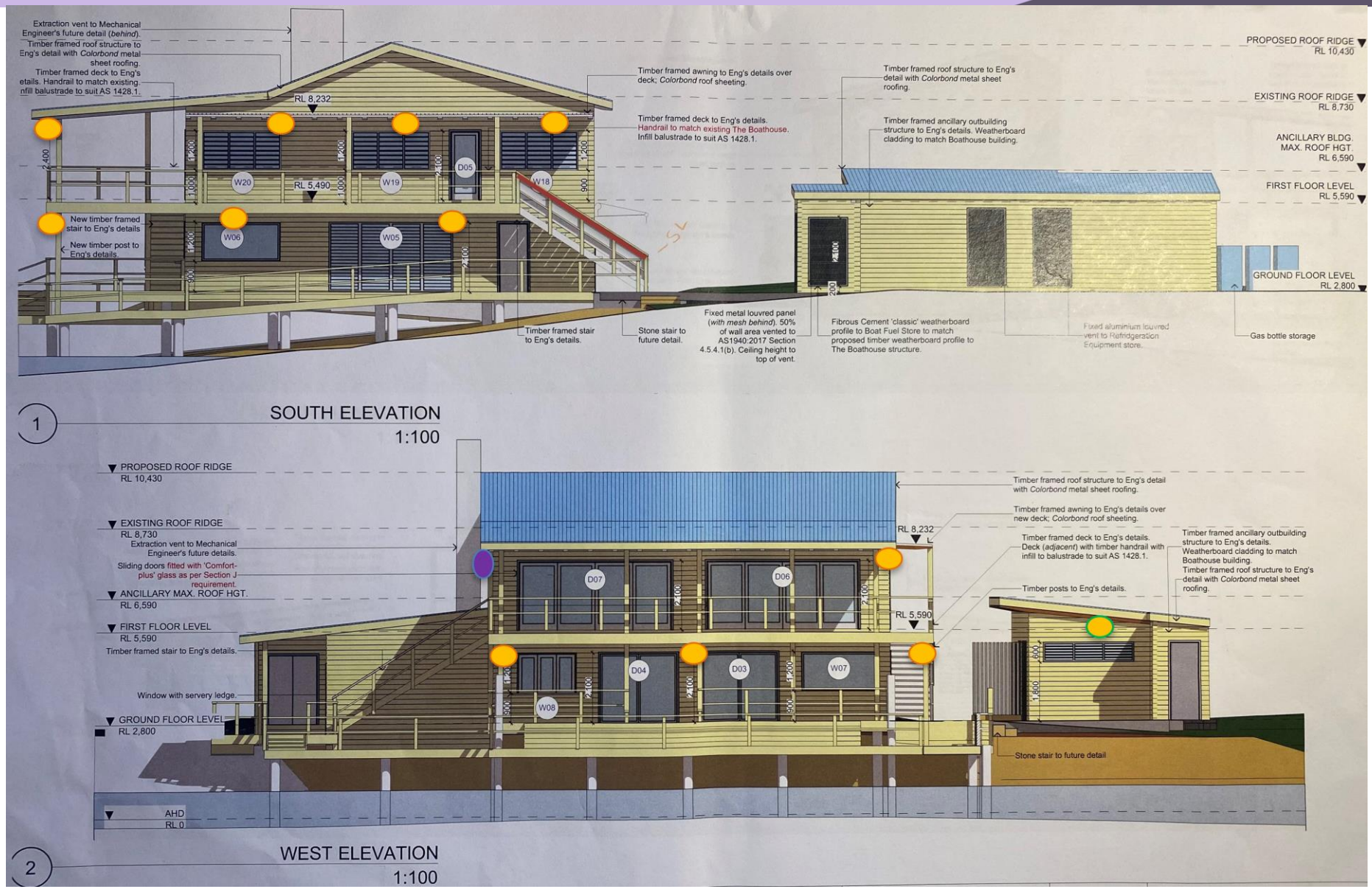


Figure 2.3 South and West elevations

3 Appendix I Images of current Boat house – similar to new and give concept for lighting

Existing path in.

Proposed:

Bollard lighting along new path.

All is low voltage and safely installed under the proposed new walkway (that will be above the existing ground level) no digging needed near tree roots.

 d	Existing Front Entrance with spotlights. Proposed: All Lighting dark sky friredndly and under eves as far as practical. Railing of walkway coming in from the right will have under hand rail lighting. Far right (out of photo near carparking) will have a dark sky friendly lamp on a post (~2m height). Proposed areas such as the gas bottle storage, on the concrete platform, will have a separate switch to ensure the external light is only on when required. The light will be a fully shielded wall mounted type.

Existing: Southside Spotlights will be removed.

Spotlights will be replaced with fully shielded wallpack mount fixtures next doors.

All lighting and associated wiring in this area will be higher than 1.4 metres.

Any covered areas will have low voltage warm colour (Dark Sky friendly) LED lighting. Lights will be placed and angled to minimise reflection over the water.

Existing North side

Proposed: spotlights will only be Dark Sky friendly and angled down. Both up lighting and reflection on water will be managed through proper light type and placement.

Lighting on this North side will all be sensor light to reduce the duration of lighting.

Areas requiring access for maintenance will have a fully shielded wool Mount light with a separate switch so that it can be turned on when required and then turned off.

Existing Southside leading to West side open deck area.

Lighting in this area will come from fully shielded wall Mount fixtures extending from the roof height.

Lighting in the western open deck area will be from fully shielded lights on polls with four proposed along the western edge of the eating area with location correlated with the planter beds. Option of two additional fully shielded lamps if required for placement within this area. It is expected these will not be required as there will be fully shielded Mount fixtures above the western stairs that enter on to the open location.

Jetty lighting, if any, will be minimal and Dark-Sky.

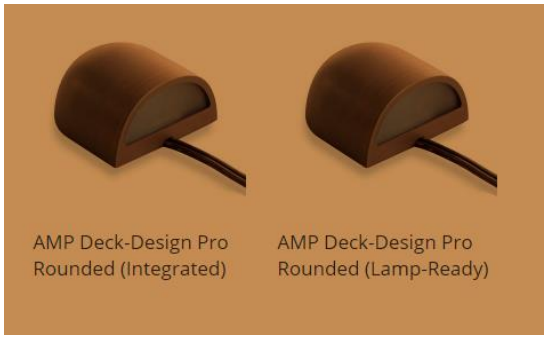
Existing toilets on southern side (rely on roof lighting)

New: Fully shielded wall mounted lights on the wall (above 2m) at each door entrance (toilets and any other door). Light will be on the site that the door opens so the door does not shadow the interior upon opening.

3.1 Appendix II – examples lights

Wall Mounted

Pathways (low in height)



Stairs where there is a wall to mount on. Next to doors such as bathrooms and entrance ways

Lightening on posts (back deck)