Building Systems Design

Date	**29/10/2024**		
To	**Nicole Thompson**		
Company	**Wraight and Associates**		
Project	**Frank Kitts Park upgrade**	Job No.	**W23026**
From	**David Riddle**	Reference	**DN - 1**
Service	**Electrical**	Total Pages	**3**

DN - 1 Lighting design statement

DESIGN NOTE

Attached: nil

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1 Introduction

The project is an opportunity to modernise the current lighting in the area. The present lighting is considered insufficient and is to be altered with improved lighting levels using new LED lighting to suit the new parks layout. The modernised lighting scheme is to be sympathetic to its surroundings and is to have minimal environmental impact. The lighting is to be arranged to not create a visual nuisance and to improve public safety in the area.

The Playground, Arena shared path and new Fale building are not covered in this lighting statement. The playground has had a lighting upgrade in February 2024 and the new Fale building is covered by other consultants. The Arena shared path lighting upgrade is a separate WCC project.

The lighting for the this project follows the strategy's developed in the WCC waterfront lighting upgrade 2024 project.

The main lighting elements for the project are the lighting of the parks main paths and landscape feature lighting.

2 Existing Lighting Assessment

The current lighting system in the park has sphere top light poles and wall mounted recessed grille lights, these are over 30 years years old well maintained but need modernising due to their age, inefficiency and use of old technology. The lighting levels in the parks paths are poor with levels varying from 0 to 7 lux. The new light fittings are to increase the lighting levels and energy efficiency, reduce glare, and reduce the upward light component.

The light poles used in the park have clusters of sphere lights that provide a light glow effect. The light distribution from these fittings is not controlled with light emitting in all directions.

Environmental issues with these types of lights are:

- Stray light - Wasted light is directed sideways and upwards and provides no contribution to the ground, this also wastes energy. The upward light contributes to the "skyglow" effect.
- Glare – the brightness of the sphere's in contrast to the dark area background distracts people's vision causing a visual nuisance. Views when walking along pathways, or looking into the park or through the park to further afield are impaired.
- Light quality – this is poor as the lamp type is old technology mercury vapour, compact fluorescent or retrofit LED.

3 Lighting Design Criteria

3.1 Illumination levels

3.1a Waterfront Lighting Strategy

The Wellington City Council have recently revised the waterfront lighting requirements with revised lighting levels compared to the Wellington Waterfront Lighting Strategy 2006 document and District Plan requirements. This has introduced a revised lighting level requirement using the public activity area category. A recent resource consent SR 544891 for the waterfront lighting upgrade is based on these lighting levels which are as per the Lighting of Roads and Public Spaces standard AS/NZS 1158.3.1 : 2020.

The lighting categories are as follows:

The public activity category PA1 - Horizontal illuminance 21 lux average and 7 lux minimum, Vertical illuminance 7

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lux minimum.

Pedestrian and cycle paths category PP1 for paths outside large public activity areas - Horizontal illuminance 10 lux average and 2 lux minimum, Vertical illuminance 1 lux minimum).

The waterfront lighting upgrade 2024 project has also developed a new strategy for lighting poles and types of luminaires for the waterfront areas which this project is to use. The main features are as follows,

- Lighting colour temperature of 3000K.
- New light pole design with heights of 10 or 12 metres with multiple luminaires per pole.
- Include options for additional colour change lighting on poles for orientation/flag highlighting.
- Light system to be controllable to be able to lower light levels (or turn off) for events, as well as boosting light levels for PA1.

3.1b District Plan

The district plan rules require any activity which requires outdoor areas to be lit shall ensure that direct or indirect

illumination does not exceed 8 lux at the windows of residential buildings in any residential area.

Also pedestrian routes and carparks available for public use during hours of darkness shall be lit at a minimum of 10

lux, measured in accordance with AS/NZS 1158.3.1:2005 and amendments. Note this standard has been superseded by a new 2020 version with revised lighting categories.

There is slight difference to the new waterfront strategy where the lighting level for category PA1 is 7 lux minimum verses the district plan 10 lux. Our opinion is as long as the light levels are uniform that this a negligible difference and won't be noticeable as the areas to be illuminated are in lower light conditions away from the higher illuminated CBD.

3.1c Frank Kitts Park Development

This project is to follow the same lighting strategy as per the 2024 waterfront lighting upgrade project based on the AS/NZS 1158.3.1 : 2020 standard, using the categories for public activity spaces PA1 and pathways PP1.

Ramps and stairs illumination levels are to be also inaccordance with AS/NZS 1158.3.1 : 2020 under the category PE2, where lighting levels are to match the adjacent path category levels.

The Garden of Beneficence is not considered a public activity space area, the lighting is to be low level feature lighting with not uniform pools of light 1 - 2 lux.

3.4 CPTED

The CPTED report recommendations for lighting and controls are to be incorporated into the lighting design.

3.5 Avoidance of Spill Lighting

The district plan rules for spill light are to be complied with which require any activity that requires outdoor areas to be lit shall ensure that direct or indirect illumination does not exceed 8 lux at the windows of residential buildings in any residential area.

Spill lighting is to be restricted to ensure the lighting does not cause a visual nuisance, avoids lighting areas unnecessarily and wasting energy. Spill lighting continuing past the park edge onto the adjacent road or into the harbour is to be avoided with luminaires using concentrated optics. Any lights that are to be used to enhance the garden or building structure elements are to be tightly focused onto the subject with no stray light. Path lighting is to have some spill lighting onto the park edges to add surveillance beyond the path.

3.6 Avoidance of glare

To limit glare all luminaires are to comply with the ASNZS 11583.1:2020 requirements for luminous intensity and discomfort glare DG1 .

3.7 Skyglow

Skyglow is at its most apparent when humidity is high. The effect is difficult to control, as it is the light that reflects off humidity and water particles in the air and can vary depending on weather conditions. Spill and stray light are the greatest contributors to the effect. To limit skyglow the same techniques as discussed with spill lighting are to be used.

4 Proposed Illumination Plan

The proposed areas of lighting and illumination levels are shown on the WALA lighting drawing L114.

The lighting levels for the paths are stated as category PA1 and PP1 and are inaccordance with ASNZS1158.3.1:2020.

The waterfront lighting upgrade 2024 project resource consent SR 544891 shows new lighting poles for the Harbour and Whairepo Promenades with different pole placement to the WALA lighting drawing L114 drawing. The final placement of the poles is to be resolved during the design phase, either of two scenarios will illuminate the paths to the required levels.

Harbour and Whairepo Promenades, Jervois Quay Footpath

Public activity space

Category PA1 with Horizontal illuminance 21 lux average and 7 lux minimum, Vertical illuminance 7 lux minimum.

New lighting poles 12m high with LED lights are to be used to illuminate the main paths. The poles are to allow for the integration of future features such as event power, CCTV cameras, speakers, banners, people counters and data connections.

Internal linking paths City to Sea and Park Promenades

Public activity space

Category PA1 with Horizontal illuminance 21 lux average and 7 lux minimum, Vertical illuminance 7 lux minimum.

New lower more human scale lighting poles at 7m with LED lights are to be used to illuminate these 2 paths. The poles are to allow for the integration of future features such as event power, CCTV cameras, speakers, banners, people counters and data connections.

Paths around new Fale building

Public activity space

Category PA1 with Horizontal illuminance 21 lux average and 7 lux minimum, Vertical illuminance 7 lux minimum.

Luminaires are planned to be mounted on the building to light the paths that surround the new building.

Minor paths

Pedestrian path

Path south edge of childrens playground.

A departure from the main paths lighting level is to light this minor path at a lower lighting level using Category PP1 (pedestrian and cyclist path category) with Horizontal illuminance 10 lux average and 2 lux minimum, Vertical illuminance 1 lux minimum.

Garden of Beneficence

The garden areas are to have subtle lighting in sympathy with the landscape design. Lighting is to be used to highlight the canopies features and surrounding walls, principle pathways with pools of light, accent of selected plants and landscape elements. Lighting where placed is to be 1 - 2 lux.

Feature lighting

Lighting of landscape features - low lighting level accent lighting of the Wahine mast memorial, Pai Lau and Ruakura sculptures. The Albatross sculpture is to retain its existing colour change lighting.

Lighting control

Lighting control of the promenades and paths is to be an automated system to principally switch the lighting on from dusk to dawn with over ride dimming control and possible colour change for events etc.

Feature lighting is to turn on at dusk and then off at a set time. The Garden of Beneficence is to have similar control with the addition of movement sensors to be used at the gardens entry points.

END