Memorandum

To	Brenda O'Shaughnessy
From	Luke Steggles, Team Leader Lighting Design
Office	Whanganui
Date	9 August 2021
File/Ref	5-WT696.P1
Subject	Marton Rail Hub - Lighting Impact Statement

1.1 Background and Limitations

As part of the Marton Rail hub development project, WSP has been asked to comment on the potential impact of artificial lighting associated with proposed business activities on the existing adjacent residential properties, sensitive land uses and State Highway 1 during the hours of darkness.

In order to assess spill and glare effects of lighting against relevant rules and industry guidance, the normal process is to prove compliance by way of computer simulation. In this instance, no lighting design has been undertaken for the site, as a result, any comments and recommendations should be considered high level and are based on previous experience of similar projects.

1.2 Relevant Exterior Lighting Design Standards

Specific business and potential future operators may have different lighting requirements, however, typically we would expect lighting levels to be selected from (or be similar to) the following standards:

1. For Private Access Roads and Car Parking – AS/NZS 1158.3.1:2020 – Lighting for Roads and Public Places Part 3.1: Pedestrian Area (Category P) Lighting – Performance and Design Requirements.
2. For Outdoor Work Activities – AS/NZS 1680.5:2012 – Interior and Workplace Lighting Part 5: Outdoor Workplace Lighting.

Exterior lighting levels are typically much lower than those used in buildings, for context, the lighting levels listed within the standards above would typically have an average illuminance level of between 3.5 and 80 lux dependent on the task selected.

1.3 Relevant District Plan Criteria, Industry Guidelines and Best Practice

1.3.1 Rangitikei District Plan

Part B1 – General Rules and Standards, Section B1.2 Light, provides the following guidance:

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150 YEARS IN AOTEAROA

B1.2-1

Activities must not emit light that results in an added luminance over and above the measured ambient level in excess of 8 lux spill of light, as measured in the vertical plane at the windows of any residential dwelling unit in the Residential Zone.*

B1.2-2

Light must not impede the vision of motorists or train drivers.

B1.2-3

Within any Comprehensive Development Area (CDA)

a) external artificial lighting will be designed so that its use does not result in an added luminance over and above the measured ambient level, in excess of 8 lux. This is measured in the vertical plane at the windows of any residential buildings in any residentially zoned site and 20 lux in other zones.

b) artificial lighting will also be designed, installed and maintained so that it is shielded from or directed away from any road, state highway, or railway

1.3.2 AS/NZS 4282:2019 – Control of the Obtrusive Effects of Outdoor Lighting

This document is the industry standard guideline for controlling spill and glare from exterior lighting installations. Where district plans are silent on specific criteria for obtrusive light or outdated, it is recommended that this document is used.

1.3.3 Protection of the Night-time Sky

Increasingly, lighting designers are becoming aware of the negative effects of upwards waste light into the night-time sky environment. Such waste creates the effect of 'sky glow' which is typically observed over major cities and sports stadia. The known consequence of this effect is the reduction or inability to observe stars, there is also increasing research into the effects of artificial light on native wildlife. The limiting of upward waste light coincides with the reduction of obtrusive light and complements the general principles of lighting design which seeks to place light only where it is required.

1.4 Conclusion

The Rangitikei District Plan has basic guidelines for limiting spill lighting at adjacent boundaries, however, it does not provide numerical luminous intensity limits which should be considered more of a concern to the adjacent residential properties and Roads.

Obtrusive light associated with the relevant Exterior Lighting standards listed above can be managed by the selection of appropriate lighting equipment and by way of professional lighting design. In general terms, this is achieved by the following:

1. Use of Appropriate Luminaire Mounting Heights for the space.
2. Placement of Luminaires so they are not directed towards areas of concern.
3. Use of asymmetric luminaire optics with minimal (max of 5 degrees) horizontal tilts
4. Switching off or Dimming of Luminaires when activities are not occurring.

The distance of residential dwellings from the proposed site is unlikely to create issues with spill lighting should the above principles be utilised.

In the event that these practices are not followed, it could be possible that an exterior lighting installation be compliant with the Rangitikei District Plan in terms of boundary illuminance limits, whilst potentially creating a glare concern for the closer residential properties and adjacent roads. As luminous intensity limits are not defined in the plan, such a situation has the potential to become subjective.

The use of planting and other screening measures to physically block light exiting the site boundary would be advantageous in reducing the impact of obtrusive light.

1.5 Recommended Mitigation Measures

1) Any exterior lighting associated with the site shall be designed to meet the requirements of the current version of AS/NZS 4282 and shall require review and approval from council prior to installation.

2) Any exterior lighting installation constructed on the site shall be reviewed 30 days after completion by an independent and suitably qualified lighting designer to confirm that the approved lighting design intent has been met. The results shall be presented by way of report to council for review and approval.