Before the Hearings Panel
At Porirua City Council

Under	Clause 14, Schedule 1 of the Resource Management Act 1991
In the matter of	the Proposed Porirua District Plan
Between	**Various**
	Submitters
And	**Porirua City Council**
	Respondent

Statement of evidence of Glen Wright on behalf of Porirua City Council (Signs Evidence)

Date: 25 November 2021

INTRODUCTION:

1 My full name is Glen Andrew Wright. I am employed as a Principal at Stephenson & Turner New Zealand Limited, in Wellington.

2 I have prepared this statement of evidence on behalf of the Porirua City Council (**Council**) in respect of technical related matters arising from the submissions and further submissions on the Proposed Porirua District Plan (**PDP**).

3 Specifically, this statement of evidence relates to the matters in the Sign Chapter.

4 I am authorised to provide this evidence on behalf of the Council.

QUALIFICATIONS AND EXPERIENCE

5 I hold the qualifications of Registered Engineering Associate.

6 I have worked for Stephenson & Turner New Zealand Limited, an architecture and engineering consultancy for 30 years and have 35 years of experience in lighting.

7 I am a member of Engineering New Zealand and Associate Member of the Illuminating Engineering Society of Australia and New Zealand.

Code of conduct

8 I have read the Code of Conduct for Expert Witnesses set out in the Environment Court's Practice Note 2014. I have complied with the Code of Conduct in preparing my evidence and will continue to comply with it while giving oral evidence before the Environment Court. My qualifications as an expert are set out above. Except where I state I rely on the evidence of another person, I confirm that the issues addressed in this statement of evidence are within my area of expertise, and I have

not omitted to consider material facts known to me that might alter or detract from my expressed opinions.

SUMMARY

9 My name is Glen Wright.

10 I have been asked by the Council to provide lighting evidence in relation to submissions on the Signs Chapter, which primarily relates to general district wide matters on artificial lighting.

11 My statement of evidence addresses submitter comments on the Signs Chapter in the PDP.

INVOLVEMENT WITH THE PROPOSED PLAN

12 I have been involved in the PDP since early 2018 and provided the following services:

- Advice and review of new sign standards to manage the effects of illuminated signs for each of the proposed seven environmental zones.
- An analysis of the effectiveness and appropriateness of current operative lighting standards in managing nuisance effects of light spill and glare.
- An evaluation of the lighting requirements of key institutions in Porirua.
- Recommendations for new lighting standards to manage light spill and glare for each of the proposed seven environmental zones.

- Recommendations for managing nuisance light overspill and glare effects at the interface between the City Centre zone, Local Business Centre zone and General Industrial zone with more sensitive environments.

- Author of Report on Porirua City Council District Plan Lighting Provisions dated 12 November 2018.

- Author of Porirua City District Plan Lighting Provisions - Draft Lighting Section dated 12 November 2018

SCOPE OF EVIDENCE

13 My statement of evidence addresses matters raised by Waka Kotahi NZ Transport Authority – Submission Number – 82.

14 My statement of evidence only addresses those submission points to which I have been directed by council officers.

SUBMISSIONS

SIGN-P4 – Sign reflectance – WAKA KOTAHI NZ TRANSPORT AUTHORITY

15 In submission from Waka Kotahi, they seek the addition of standards that would control sign reflectivity, with the objective of avoiding an increase in distraction for users of the transport network (and therefore the safety). No appropriate standards were proposed.

Response

16 The Sign chapter does not control reflectivity.

17 If a standard was to be included to control reflectivity, as all materials have a level of reflectivity the standard would need to reference the associated effects on road users that standard is looking to control. A suitable standard would be like the following standard taken from both

the Auckland Unitary Plan and Hamilton City Council District Plan Sign chapters.

Signs must not display any image that contains reflective, fluorescent, or phosphorescent materials that will reflect headlights or distract or interfere with a road user's vision.

SIGN-S13 – Signs with internally or externally illuminated displays – WAKA KOTAHI NZ TRANSPORT AUTHORITY

18 In the submission from Waka Kotahi, they support controlling the luminance of signs. But they seek that *Illuminated signs should meet all standards for the Light chapter rather than just light spill standards. Illuminated signs can have the same effects as any other source of lighting and as such needs to be appropriately controlled and align with those standards outlined in the Light chapter*.

Response

19 Firstly it is important to understand the difference between "Luminance" and "Illuminance".

- Luminance is the brightness of a surface or sign, the unit for luminance is candela/m^2 (cd/m^2)

- Illuminance is the spill light projected in the direction of a window or observer, the unit for illuminance is lux.

20 It is my opinion that it is not appropriate to require illuminated signs to meet all standards for the Light chapter and I provide my comments on each of the Light chapter standards:

20.1 LIGHT-S2 Light spill, the luminance standards within the Sign chapter control the brightness of illuminated signs, but this alone is not sufficient to control the spill light from signs. The

appropriate control for the spill light is LIGHT-S2. This aligns with the recommendations of AS/NZ 42822019 section 3.3.5 Lit surfaces; 3.3.5.5 Calculation procedures includes requirement (last paragraph) *The illuminance shall be calculated at the window of the habitable dwelling in accordance with Clause 3.3.1*

I believe it is important to repeat in the Signs Chapter itself that the Light Spill standards in the Light Chapter need to be complied with. For example, when I provided a lighting AEE for a digital billboard in Willis St, Wellington City I had to consider the sign maximum luminance (brightness) at night and the illuminance (spill light) projected onto the windows of student accommodation opposite.

20.2 LIGHT-S3 Glare, as glare is the brightness of a luminaire or illuminated sign in the direction of an observer the luminance standards within the Sign chapter which control sign brightness are an appropriate control for illuminated sign glare, with calculation of sign luminance simpler than calculations for glare. The sign luminance standards will control glare effects on road users to acceptable levels.

20.3 LIGHT-S4 Effects on road users, the effects on road user's standard is threshold increment which considers the brightness of a light source when it is in the road users field of view. The luminance standards within the Sign chapter which control sign brightness are an appropriate control for illuminated sign brightness when in a road users' field of view, with calculation of sign luminance simpler than calculations for threshold increment. The sign luminance standards will control sign brightness effects on road users to acceptable levels.

20.4 LIGHT-S5 Sky glow, the skyglow standard is upward light ratio which is the percentage of total light emitted that is permitted to be projected above the horizontal (1, 2 or 3% depending on the zone). As an illuminated sign typically emits 50% of its light above the horizontal this standard is not appropriate. Instead the luminance standard within the Sign chapter provides an appropriate control of skyglow

20.5 LIGHT-S6 Externally illuminated surfaces, this standard is for the control of the brightness of externally illuminated surfaces of building facades, whereas the Signs chapter luminance standards are controlling the brightness of signs. For signs to be legible at night they need a higher permitted luminance than that of a building façade. Unfortunately, in AS/NZS 4282:2019 they have in my opinion wrongly combined the limits/rules for 3.3.5.1 Signs, facades, and artworks and in doing so have applied the higher limits required for signs. This conflicts with other international obtrusive lighting guides such as CIE 150:2017 (which is where my recommendations for façade luminance were taken from).

The Auckland Unitary Plan has similar standards with standards for facade luminance in their E24 Lighting Chapter and separate higher limits for sign luminance in their E23 Signs Chapter.

Recommendation

21 I do not recommend the adoption of the Waka Kotahi request that illuminated signs should meet all standards for the Light chapter rather than just light spill standards.

Glen Wright

Principal

Stephenson & Turner New Zealand Limited

Date: 25 November 2021

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