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PLEASE NOTE: The plan/s that are being provided to you may not reflect what is ultimately approved by Council however they are the most recent version as at the date shown below:

Date Plans Provided: 27/01/2022

Maple Media Pty Ltd

LIGHTING IMPACT ASSESSMENT - OUTDOOR SIGNAGE AT

ADDRESS: 12–14 RAYMOND ROAD, LAVERTON NORTH, VICTORIA

DATE	REVISION	COMN	
05/10/2021	A		Town Planning
			Advertised Documents
			Plan: 1 of 7

Calculations Obtrusive Light - Concents	PLEASE NOTE: The plan/s that are being provided to you
	they are the most recent version as at the date shown below:
Calculations based on Obtrusive Light according to methods set forth by one o	f three standards: Date Plans Provided: 27/01/2022
<ul> <li>Standards Association of Australia in: AS/NZS 4282:2019 and AS428.</li> </ul>	2-1997

- IDA/IES Model Lighting Ordinance (MLO) 2011
- LEED version 4

Obtrusive light may be defined simply as unwanted light. More specifically, it may include light that falls onto the property of others, sometimes called spill light or light trespass, and glare, or excessive light from luminaires that hinders vision.

AS4282 further defines Obtrusive Light: "Spill light which, because of quantitative, directional or spectral attributes in a given context, gives rise to annoyance, discomfort, distraction or a reduction in the ability to see essential information, e.g. signal lights."

The user may place appropriate calculation points (in grids or lines) as defined by either of these standards, calculate, and then run a Compliance Test to determine whether the lighting design passes or fails, according to the standard selected.

#### Definitions

The following definitions are from AS4282-2019:

**Obtrusive Light:** Spill light which, because of quantitative, directional or spectral attributes in a given context, gives rise to annoyance, discomfort, distraction or a reduction in the ability to see essential information, e.g., signal lights.

Spill Light (stray light): Light emitted by a lighting installation which falls outside the boundaries of the property on which the installation is sited.

**Threshold Increment (TI):** The measure of disability glare expressed as the percentage increase in contrast required between an object and its background for it to be seen equally well with a source of glare present. Note: Higher values of TI correspond to greater disability glare.

**Upward Waste Light Ratio (UWLR):** The proportion of the luminous flux emitted by the luminaire above the horizontal in the installed position. Note: UWLR also meets the LEED version 4 definition of percent uplight.

**Glare:** Lighting entering the eye directly from luminaires or indirectly from reflective surfaces that causes visual discomfort or reduced visibility.

Initial Luminaire Lumens: Calculated as the sum of the initial luminaire lumens for all luminaires.

Light Pollution: Any adverse effect of artificial light including, but not limited to, glare, light trespass, sky-glow, energy waste, compromised safety and security, and impacts on the nocturnal environment.

Lighting Zone: An overlay zoning system establishing legal limits for lighting for particular parcels, areas, or districts in a community.

Property Line: The edges of the legally defined extent of privately owned property.

Uplight: For an exterior luminaire, flux radiated in the hemisphere at or above the horizontal plane.

Vertical Illuminance: Illuminance measured or calculated in a plane perpendicular to the site boundary or property line.



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Overview	PLEASE NOTE: The plan/s that are being provided to you
This report investigates the compliance of the proposed signage, which is to be Obtrusive Effects of Outdoor Lighting" specifically the relevant requirements doc 4282 (refer to APPENDIX 1).	they are the most recent version as at the date shown below: pole mounted, with Australian Standard AS4282 "Control of the umented in Table 20 atm@Eats @200vid@ds27/20152002ards AS
The site is located at 12-14 Raymond Road, Laverton North.	

The relevant local authority is Wyndham City Council - Victoria.

## Design Guidelines and Standards

The Lighting Impact Assessment will review the proposed digital signage against the following Criteria, Design Guidelines and Standards.

- VicRoads Advertising Policy for Advertising On, Over and Adjacent to VicRoads declared Road Reserves.
- AS 4282-2019 Control of the Obtrusive Effects of Outdoor Lighting.
- Transport Corridor Outdoor Advertising & Signage Guidelines 2017 \*

\* The Transport Corridor Outdoor Advertising & Signage Guidelines apply to installations within New South Wales only, as such this is not a strict requirement for the installation but has been provided for information as a basis for comparison.

#### Luminance Assessment

The maximum permissible night time luminance of the signage is determined by the existing lighting environment of its surroundings. AS4282 outlines maximum average luminances for different Environmental Zones as shown in Table 1 below:

## TABLE 1 – MAXIMUM NIGHT TIME AVERAGE LUMINANCE FOR SIGNAGE

ENVIRONMENTAL ZONE	DESCRIPTION	MAX AVERAGE LUMINANCE (cd/m2)		
Α4	High district brightness e.g. Town and city Centers, commercial areas, and residential areas abutting commercial areas	350		
A3	Medium district brightness e.g. suburban areas in towns and cities	250		
A2	Low district brightness e.g. sparsely inhabited rural and semi-rural areas	150		
Al	Dark e.g. relatively uninhabited rural areas. No Road Lighting	0.1		
AO	Intrinsically Dark e.g. Major Optical Observatories. No Road Lighting			

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Plan: 3 of 7

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Based on an assessment of the surrounding environment, the proposed signage permissible night time luminance of the signage is 350cd/ m2. AS4282 does not include limits for daytime operation of illuminated signage. How Guidelines in NSW outlines maximum permissible luminance limits for various lignassessment purposes.	PLEASE NOTE: The plan's that are being provided to you is located within Environmental Zone A4. Hence, the maximum may not reflect what is ultimately approved by Council however they are the most recent version as at the date shown below: vever, the Transport Corridor Outdoor Advertising & Signage shting conditions, including davine, and hence shall be used for Date Plans Frovided: 27/01/2022

Table 2 outlines the maximum luminance levels to comply with AS4282 and the Transport Corridor Outdoor Advertising & Signage Guidelines for the various lighting conditions listed below:

TABLE 2 -LUMINANCE LEVELS FOR DIGITAL ADVERTISMENTS			
LIGHTING CONDITION	MAX PERMISSIBLE LUMINANCE (cd.m2) #	COMPLIANT	
Full Sun on face of Signage	No Limit	√	
Day Time Luminance (typical sunny day)	6000	✓	
Morning and Evening Twilight and Overcast Weather	700	√	
Night Time	140*	✓	

# The signage is to be dimmed on site to ensure the maximum luminance nominated above is not exceeded.

\* The maximum permissible luminance allowable under AS4282 and the Transport Corridor Outdoor Advertising & Signage Guidelines is actually 350 cd/m2. The luminance limit shown above was derived as a result of the calculation and assessment in Section 5 and 6, to ensure compliance with other criteria of AS4282 and any additional lighting requirements as described in this report.

The proposed digital signage has a maximum brightness (luminance) of 7000 cd/m2. The screen shall be commissioned on site to yield a maximum screen luminance of 7000 cd/m2 when full sun strikes the face of the sign (maximum brightness), 6000 cd/m2 during normal daytime operation, 700 cd/m2 during twilight and inclement weather, and 140cd/m2 during night time.

#### AS 4282 Assessment

The proposed digital signage has been assessed against AS 4282-2019 Control of the Obtrusive Effects of Outdoor Lighting.

AS4282 provides limits for different obtrusive factors associated with dark hours (night time) operation of outdoor lighting systems. Two sets of limiting values for spill light are given based on whether the lighting is operating before a curfew (known as "pre-curfew" operation) or operating after a curfew (known as post-curfew or curfewed operation). Pre-curfew spill lighting limits are higher than post-curfew values, on the understanding that spill light is more obtrusive late at night when residents are trying to sleep. Under AS4282, the post-curfew period is taken to be between 11pm and 6am daily. As it is intended that the digital signage be illuminated all night, the assessment will review the proposed signage under the more stringent post-curfew limits.

Electronic signs are highly technical pieces of equipment that have the ability to control the intensity both automatically and manually, between 100 and 8,500cd. The maximum intensity for the proposed sign, for pre-curfew operating hours, with level 1 control, for a medium sized site is 7500 cd (candelas). Refer to AS 4282 Table 2.2.

AS 4282 Table 2.1 recommends a maximum pre-curfew value of 10 lux for residential areas and 25 lux for commercial areas or at the boundary of commercial and residential areas (refer to APPENDIX 1).

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The acceptable level of illuminance will in part be determined by the night time lighting environment around the dwellings. AS4282 categorises the night time environment into different zones with maximum lighting limits as shown in table 3 below they are the most recent version as at the date shown below:

	TABLE 3 – MAXIM	UM VALUES OF LIGH <sup></sup> TECH	NICAL PARAMETERS Provided: 27/01/2022
ENVIRONMENTAL	MAX VERTICAL	MAX VERTICAL	DESCRIPTION
ZONE	ILLUMINANCE (Ix) PRE	ILLUMINANCE (Ix) POST	
	CURFEW	CURFEW	
AO	AO O		Intrinsically Dark e.g. Major Optical Observatories.
			No Road Lighting
A1	2	0.1	Dark e.g. relatively uninhabited rural areas. No
	L		Road Lighting
A2	5	1	Low district brightness e.g. sparsely inhabited
	C C		rural and semi-rural areas
A3	10	2	Medium district brightness e.g. suburban areas in
	10		towns and cities
A4		5	High district brightness e.g. Town and city centres,
	25		commercial areas, and residential areas abutting
			commercial areas

Based on an assessment of the surrounding areas, the nearest dwellings with potential views to the signage are at the following locations: A





Fig 1: View of sample panel within viewing cone (coloured diodes shown active)

Fig 2: View of sample panel from the oblique (coloured diodes shown active, but not visible behind sheath DHAM CITY COUNCIL

The restriction in light spill is demonstrated by existing digital signage currently in operation within the metropolitan area. From oblique angles, the imagery of the sign is not able to be discerned during the day, at evening twilight or at night time

**Advertised Documents** 

From oblique angles, the imagery of the sign is not able to be discerned after dark.

A similar sign to the proposed is in operation along the Citylink corridor in North Melbourne. May not reflect what is ultimately approved by Council however Visual inspection of that site from Langford Street during the day, twilight and eventine destruction of that site from Langford Street during the day, twilight and eventine destruction of the site similar angles to the interface of the objector properties to the proposed sign) diminishes significantly as the viewing angle to the sign changes.

Date Plans Provided: 27/01/2022



Fig 3: Citylink sign, viewed from middle distance at 12:35pm on Monday, 28 November 2016.

Fig 4: Citylink sign, viewed from the oblique at 12:35pm on Monday, 28 November 2016.



Fig 5: Citylink sign, viewed from the oblique at 12:35pm on Monday, 28 November 2016.



Fig 6: Citylink sign, viewed from the middle distance at 8:57pm on Monday, 28 November 2016.



Fig 7: Citylink sign, viewed from the oblique at 8:57pm on Monday, 28 November 2016.



Fig 8: Citylink sign, viewed from the oblique at 8:57pm on Monday, 28 November 2016.



Fig 9: Citylink sign, viewed from the middle distance at 9:56pm on Monday, 28 November 2016.



WYNDHAM CHY COUNCIL Fig 10: Citylink sign, viewed from the oblique at Planning 9:57pm on Monday, 28 November 2016 OWN Planning

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Luminous Intensity	PLEASE NOTE: The plan/s that are being provided to you may not reflect what is ultimately approved by Council however
	they are the most recent version as at the date shown below:
The luminous intensity limits nominated in the standard are not applicable for in	ternally illuminated signage. Date Plans Provided: 27/01/2022

## Additional Requirements

The signage operator must ensure that the average luminance difference between successive images does not exceed 30% to ensure compliance with AS4282. The dwell time shall be at minimum 10 seconds or greater.

# Summary

The proposed signage to be installed shall be commissioned on site to yield the following maximum luminances:

LUMINANCE LEVELS FOR DIGITAL ADVERTISMENTS				
LIGHTING CONDITION	MAX PERMISSIBLE LUMINANCE (cd.m2) #	COMPLIANT		
Full Sun on face of Signage	No Limit	✓		
Day Time Luminance (typical sunny day)	6000	$\checkmark$		
Morning and Evening Twilight and Overcast Weather	700	$\checkmark$		
Night Time	140	$\checkmark$		

The signage operator must ensure that the average luminance difference between successive images does not exceed 30% to ensure compliance with AS4282. The dwell time shall be 10 seconds or greater to comply with AS4282.

The proposed signage to be installed has been assessed and complies with the maximum veiling luminance of 0.25 cd/m2 as described in VicRoads Advertising Policy for Advertising On, Over and Adjacent to VicRoads declared Road Reserves (when commissioned to the maximum luminance levels above).

The proposed signage has been found to comply with all relevant requirements of AS 4282-2019 Control of the Obtrusive Effects of Outdoor Lighting

In complying with the above requirements, the proposed signage should not result in unacceptable glare nor should it adversely impact the safety of pedestrians, residents or vehicular traffic. Additionally, the proposed signage should not cause any reduction in visual amenity to nearby residences or accommodation.

Based upon the calculated values, and within the limitations noted within this document, compliance with the relevant recommendations of AS4282 Table 2.1 and Table 2.2 is demonstrated.

It can therefore be seen that the proposed digital signage complies with all relevant requirements of AS 4282-2019 Control or the Obtrusive Effects of Outdoor Lighting.

Town Planning Advertised Documents