JCDecaux

LIGHTING IMPACT ASSESSMENT - OUTDOOR SIGNAGE AT
PARRAMATTA RD OVERPASS BRIDGE AUBURN, NSW

28nd November, 2023
Ref: 1096.134

Lighting Impact Assessment
Outdoor Signage at
Parramatta Rd Pedestrian Overpass Bridge, Auburn, NSW

DATE	REV	COMMENT	PREPARED BY	CHECKED BY
28/11/23	REV C	For Information	CB	RS

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CONTENTS

1. INTRODUCTION

Electrolight have been appointed by JCDecaux to undertake a Lighting Impact Assessment on the proposed permit extension of the existing double sided internally illuminated signage at Parramatta Rd Overpass Bridge Auburn, NSW. The objective of the assessment is to report on compliance with the State Environmental Planning Policy (Industry and Employment) 2021, NSW Transport Corridor Outdoor Advertising and Signage Guidelines, and AS/NZS 4282:2023 Control of the Obtrusive Effects of Outdoor Lighting.

2. DEFINITIONS

2.1 Illuminance

The physical measure of illumination is illuminance. It is the luminous flux arriving at a surface divided by the area of the illuminated surface. Unit: lux (lx); 1 lx = 1 lm/m2.

(a) Horizontal illuminance (Eh) The value of illuminance on a designated horizontal plane

(b) Vertical illuminance (Ev) The value of illuminance on a designated vertical plane

Where the vertical illuminance is considered in the situation of potentially obtrusive light at a property boundary it is referred to as environmental vertical illuminance (Eve).

2.2 Luminance

The physical quantity corresponding to the brightness of a surface (e.g. a lamp, luminaire or reflecting material such as the road surface) when viewed from a specified direction. SI Unit: candela per square metre (cd/m2) – also referred to as “nits”.

2.3 Luminous Intensity

The concentration of luminous flux emitted in a specified direction. Unit: candela (cd).

2.4 Dynamic content

Where the luminous image, pattern, colour or direction of light changes over an interval of less than 60 seconds

2.5 Obtrusive Light

Spill light which, because of quantitative or directional attributes, gives rise to annoyance, discomfort, distraction, or a reduction in ability to see essential information such as transport signals

Note 1 to entry: Obtrusive light includes the impact on humans and environmental receivers.

2.6 Threshold Increment

The measure of disability glare expressed as the percentage increase in luminance contrast threshold required between an object and its background for it to be seen equally well with a source of glare present

NOTE: The required value is a maximum for compliance of the lighting scheme.

2.7 Environmentally Sensitive Area (ESA)

Area of ecological value including, bushland, waterways and marine and coastal areas

2.8 AGI32 Light Simulation Software

AGI32 (by U.S. company Lighting Analysts) is an industry standard lighting simulation software package that can accurately model and predict the amount of light reaching a designated surface or workplane. AGi32 is a has been independently tested against the International Commission On Illumination (CIE) benchmark, CIE 171:2006, Test Cases to Assess the Accuracy of Lighting Computer Programs.

2.9 Upward Light Ratio Luminaire (ULR_L)

The ratio of the luminous flux of a luminaire that is emitted, at and above the horizontal, divided by the total luminaire flux when the luminaire is mounted in its designed position, and excluding reflected light from surfaces or obstructions.

3. SITE DESCRIPTION AND SCOPE

The existing double sided signage is located on the pedestrian overpass bridge over Parramatta Rd Auburn, NSW. The signage consists of two signs, Face A and Face B. Face A is oriented towards the eastbound direction of traffic on Parramatta Rd, and Face B is oriented towards the westbound direction of traffic on Parramatta Rd. The total illuminated area of Face A and Face B of the signage is 36m2 each. Refer to Appendix A for the signage location plan, elevations and photomontages.

The existing signage is internally illuminated using non-dimmable light sources. The signage has an Upward Light Ratio (ULR_L) or not more than 0.50. The signage will be in operation all night and be switched off during the day. The signage is static and does not include dynamic content.

Environmental impact assessments, including the management of artificial light for the protection of specific entities protected by environmental legislation, is beyond the scope of this assessment.

4. DESIGN GUIDELINES AND STANDARDS

The Lighting Impact Assessment will review the existing internally illuminated signage against the following Criteria, Design Guidelines and Standards.

- State Environmental Planning Policy (Industry and Employment) 2021 (Refer Appendix C) (**SEPP Industry and Employment**)
- Transport Corridor Outdoor Advertising & Signage Guidelines 2017 (**Transport Guidelines**)
- AS/NZS 4282:2023 Control of the Obtrusive Effects of Outdoor Lighting (**AS4282)**

5. LUMINANCE ASSESSMENT

Luminance Assessment - Face A

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 AVERAGE NIGHT TIME LUMINANCE FOR SIGNAGE		
	Description	Max Average Luminance (cd/m2)
A4	High district brightness e.g. Town and city centres and other commercial areas, residential areas abutting commercial areas, industrial and Port areas and Transport Interchanges	350
A3	Medium district brightness e.g. Suburban areas in towns and cities, generally roadways with streetlighting through suburban, rural or semi-rural areas	250
A2	Low district brightness e.g. Sparsely inhabited rural and semi-rural areas, generally roadways without streetlighting through suburban, rural or semi-rural areas other than intersections	150
A1	Dark e.g. Relatively uninhabited rural areas (including terrestrial, marine, aquatic and coastal areas), generally roadways without streetlighting through rural areas	50
A0	Intrinsically Dark e.g. UNESCO Starlight Reserve, IDA: Dark Sky Parks, Reserves or Sanctuaries, major optical observatories, other accreditations for dark sky places for example astrotourism, heritage value, astronomical importance, wildlife/ ecosystem protection, lighting for safe access may be required	0.1

Based on an assessment of the surrounding environment, the existing signage is located within Environmental Zone A4 under AS4282, therefore, the maximum night time luminance is 350cd/m2.

AS4282 does not include limits for daytime operation of illuminated signage. However, the Transport Guidelines outlines maximum permissible luminance limits for various lighting conditions, including daytime. Under the Transport Guidelines, the proposed signage is classified as being within Zone 3, which is described as an area with generally medium off-street ambient lighting e.g. small to medium shopping/ commercial centres. The maximum night time luminance of internally illuminated signage within Zone 3 with an area over 10m2 is 200cd/m2 (taken to be 25% of the maximum daytime limit as outlined in the previous revision of the Guidelines). The luminance limits for operation of the signage during the daytime are not applicable as the signage is switched off during the day.

Luminance Assessment Summary - Face A

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

TABLE 2 - COMPLYING LUMINANCE LEVELS FOR INTERNALLY ILLUMINATED ADVERTISEMENTS (FACE A)		
Lighting Condition	Max Permissible Luminance (cd/m2)	Compliant
Daytime	N/A - OFF	✓
Night Time	52*	✓

* The maximum permissible Night time luminance allowable to comply with the Transport Guidelines and AS4282 is actually 200 cd/m2. The lower luminance limit shown is based on the existing operating luminance limit of the signage, which was measured by Electrolight - refer Measurement Report in Appendix D. It is intended that the night time luminance of the signage remain unchanged for the permit extension.

Luminance Assessment - Face B

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 AVERAGE NIGHT TIME LUMINANCE FOR SIGNAGE		
	Description	Max Average Luminance (cd/m2)
A4	High district brightness e.g. Town and city centres and other commercial areas, residential areas abutting commercial areas, industrial and Port areas and Transport Interchanges	350
A3	Medium district brightness e.g. Suburban areas in towns and cities, generally roadways with streetlighting through suburban, rural or semi-rural areas	250
A2	Low district brightness e.g. Sparsely inhabited rural and semi-rural areas, generally roadways without streetlighting through suburban, rural or semi-rural areas other than intersections	150
A1	Dark e.g. Relatively uninhabited rural areas (including terrestrial, marine, aquatic and coastal areas), generally roadways without streetlighting through rural areas	50
A0	Intrinsically Dark e.g. UNESCO Starlight Reserve, IDA: Dark Sky Parks, Reserves or Sanctuaries, major optical observatories, other accreditations for dark sky places for example astrotourism, heritage value, astronomical importance, wildlife/ ecosystem protection, lighting for safe access may be required	0.1

Based on an assessment of the surrounding environment, the existing signage is located within Environmental Zone A4 under AS4282, therefore, the maximum night time luminance is 350cd/m2.

AS4282 does not include limits for daytime operation of illuminated signage. However, the Transport Guidelines outlines maximum permissible luminance limits for various lighting conditions, including daytime. Under the Transport Guidelines, the proposed signage is classified as being within Zone 3, which is described as an area with generally medium off-street ambient lighting e.g. small to medium shopping/ commercial centres. The maximum night time luminance of internally illuminated signage within Zone 3 with an area over 10m2 is 200cd/m2 (taken to be 25% of the maximum daytime limit as outlined in the previous revision of the Guidelines). The luminance limits for operation of the signage during the daytime are not applicable as the signage is switched off during the day.

Luminance Assessment Summary - Face B

Table 3 outlines the maximum luminance levels to comply with AS4282 and the Transport Guidelines for the various lighting conditions listed below:

TABLE 3 - COMPLYING LUMINANCE LEVELS FOR INTERNALLY ILLUMINATED ADVERTISEMENTS (FACE B)		
Lighting Condition	Max Permissible Luminance (cd/m2)	Compliant
Daytime	N/A - OFF	✓
Night Time	52*	✓

* The maximum permissible Night time luminance allowable to comply with the Transport Guidelines and AS4282 is actually 200 cd/m2. The lower luminance limit shown is based on the existing operating luminance limit of the signage, which was measured by Electrolight - refer Measurement Report in Appendix D. It is intended that the night time luminance of the signage remain unchanged for the permit extension.

6. ILLUMINANCE, THRESHOLD INCREMENT & UPWARD LIGHT ASSESSMENT

The existing signage (Face A and Face B) has been assessed against the lighting criteria and requirements outlined in AS4282.

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 the signage operates all night, the signage will be assessed against the more stringent post-curfew limits.

Illuminance Assessment

The AS4282 assessment includes a review of nearby residential dwellings and calculation of the amount of illuminance (measured in Lux) that the properties are likely to receive from the signage during night time operation.

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 4 below:

TABLE 4 - MAXIMUM VALUES OF LIGHT TECHNICAL PARAMETERS

	Max Vertical Illuminance (lx)		Description
	Pre-curfew	Post-curfew	
A4	25	5	High district brightness e.g. Town and city centres and other commercial areas, residential areas abutting commercial areas, industrial and Port areas and Transport Interchanges
A3	10	2	Medium district brightness e.g. Suburban areas in towns and cities, generally roadways with streetlighting through suburban, rural or semi-rural areas
A2	5	1	Low district brightness e.g. Sparsely inhabited rural and semi-rural areas, generally roadways without streetlighting through suburban, rural or semi-rural areas other than intersections
A1	2	0.1	Dark e.g. Relatively uninhabited rural areas (including terrestrial, marine, aquatic and coastal areas), generally roadways without streetlighting through rural areas
A0	0	0	Intrinsically Dark e.g. UNESCO Starlight Reserve, IDA: Dark Sky Parks, Reserves or Sanctuaries, major optical observatories, other accreditations for dark sky places for example astrotourism, heritage value, astronomical importance, wildlife/ ecosystem protection, lighting for safe access may be required

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

Address	Zone
204 Parramatta Rd	A4
196-198 Parramatta Rd	A4
163 Parramatta Rd	A4
19-21 Hunter St	A3
23-27 Hunter St	A4
68-72 Macquarie Rd	A3

Address	Zone
74-82 Macquarie Rd	A4
99 Northumberland Rd	A3
101 Northumberland Rd	A4
104 Northumberland Rd	A4
92-96 Adderley St West	A4

As such, the dwellings above will form the focus of the illuminance assessment.

The existing signage (and surrounding environment) was modeled in lighting calculation program AGI32 to determine the effect (if any) of the light spill from the signage. Photometric data for the signage was based on a diffused light panel (approximating a lambertian emitter) with the maximum luminance corresponding to the night time limits outlined in Section 5. Appendix C shows the lighting model and the results of the calculations.

It should be noted that some of the houses are shielded by retaining walls, fences or mature vegetation, which effectively obstructs the spill light of the signage. However calculations were undertaken assuming that there were no obstructions present.

Under the Standard, the maximum allowable illuminance to residential properties is 5 Lux for Zone A4 and 2 Lux for Zone A3 (as outlined in Table 4). It can be seen from the lighting model that the maximum illuminance for Zone A3 properties is 0.05 lux at 19-21 Hunter St, and the maximum illuminance for Zone A4 properties is 0.26 lux at 104 Northumberland Rd.

The existing signage (Face A and Face B) therefore complies with the relevant illuminance limits for nearby residential dwellings.

Threshold Increment Assessment - Face A and Face B

The Threshold Increment was also calculated for the eastbound traffic approaches on Parramatta Rd, westbound traffic approaches on Parramatta Rd, Macquarie Rd right turn to Parramatta Rd eastbound, and Northumberland left turn to Parramatta Rd westbound. The calculation grids were located at 1.5m above ground level with a viewing distance of between 10m to 200m from the signage and a windscreen cutoff angle of 20 degrees (as outlined in AS1158). The calculation results show that the Threshold Increment does not exceed 2.14% for any traffic approach (the allowable maximum under the standard is 20%).

Upward Waste Light Assessment

In order to reduce light pollution and associated environmental impacts, AS4282 includes requirements that limit upward waste light into the night sky from signage. Clause 3.3.3.a) of AS4282 states that internally illuminated signage and other internally illuminated objects shall have an Upward Waste Light Ratio (ULR_L) of not more than 0.50. The ULR_L of the specified signage is not more than 0.50. The signage therefore complies with this requirement.

Luminous Intensity

The luminous intensity limits nominated in the standard are not applicable for internally illuminated signage.

Summary - Face A and Face B

It can therefore be seen that the existing internally illuminated signage (Face A and Face B) complies with all relevant requirements of AS4282.

7. SEPP ASSESSMENT

Table 5 below outlines the illumination assessment criteria from the SEPP Industry and Employment Schedule 5 - Clause 7 Illumination. While the SEPP only applies to sites located on classified roads, our assessment references the guidelines as a best practice document in NSW. In addition to the criteria, responses have been included demonstrating that the existing signage is in compliance.

TABLE 5
7. ILLUMINATION ASSESSMENT CRITERIA

Assessment Criteria	Response	Compliant?
Would illumination result in unacceptable glare?	The proposed signage complies with the Threshold Increment limits of AS4282, demonstrating that the illumination will not cause unacceptable glare.	✓
Would illumination affect safety for pedestrians, vehicles or aircraft?	The proposed signage complies with the Threshold Increment limits of AS4282, demonstrating that the illumination will not cause unacceptable glare. The small size of the signage and its relatively low intensity limits the risk to pedestrians, vehicles or aircraft.	✓
Would illumination detract from the amenity of any residence or other form of accommodation?	The proposed signage, when installed according to this report, complies with the illuminance (spill lighting) limits of AS4282, demonstrating that the illumination will not detract form the amenity of any residence or other form of accommodation	✓
Can the intensity of the illumination be adjusted, if necessary?	The dimming level of the floodlights cannot be adjusted, however the luminance level is less than half the allowable maximum. As such, it is deemed unnecessary to dim the signage from its current level.	N/A
Is the illumination subject to a curfew?	The proposed advertising signage, when installed according to this report, complies with the limits required during curfewed operation under AS4282 (nominally between the hours of 11pm and 6am). This means that a curfew is not required.	N/A

8. SUMMARY

- The “Face A” existing internally illuminated signage at Parramatta Rd Overpass Bridge Auburn, NSW, shall operate at the following maximum luminances:

COMPLYING LUMINANCE LEVELS FOR INTERNALLY ILLUMINATED ADVERTISEMENTS - FACE A		
Lighting Condition	Max Permissible Luminance (cd/m2)	Compliant
Daytime	N/A - OFF	✓
Night Time	52	✓

- The “Face B” existing internally illuminated signage at Parramatta Rd Overpass Bridge Auburn, NSW, shall operate at the following maximum luminances:

COMPLYING LUMINANCE LEVELS FOR INTERNALLY ILLUMINATED ADVERTISEMENTS - FACE B		
Lighting Condition	Max Permissible Luminance (cd/m2)	Compliant
Daytime	N/A - OFF	✓
Night Time	52	✓

- The existing internally illuminated signage has been found to comply with all relevant requirements of AS4282, the Transport Guidelines and SEPP Industry and Employment.
- In complying with the above requirements, the existing signage shall not result in unacceptable glare nor shall it adversely impact the safety of pedestrians, residents or vehicular traffic. Additionally, the signage shall not cause any unacceptable amenity impacts to nearby residential dwellings or accommodation.

9. DESIGN CERTIFICATION

The existing internally illuminated signage (Face A and Face B) at Parramatta Rd Overpass Bridge Auburn, NSW, if commissioned according to this report, complies with the following criteria, guidelines and standards:

- State Environmental Planning Policy (Industry and Employment) 2021
- Transport Corridor Outdoor Advertising & Signage Guidelines 2017
- AS/NZS 4282:2023 Control of the Obtrusive Effects of Outdoor Lighting

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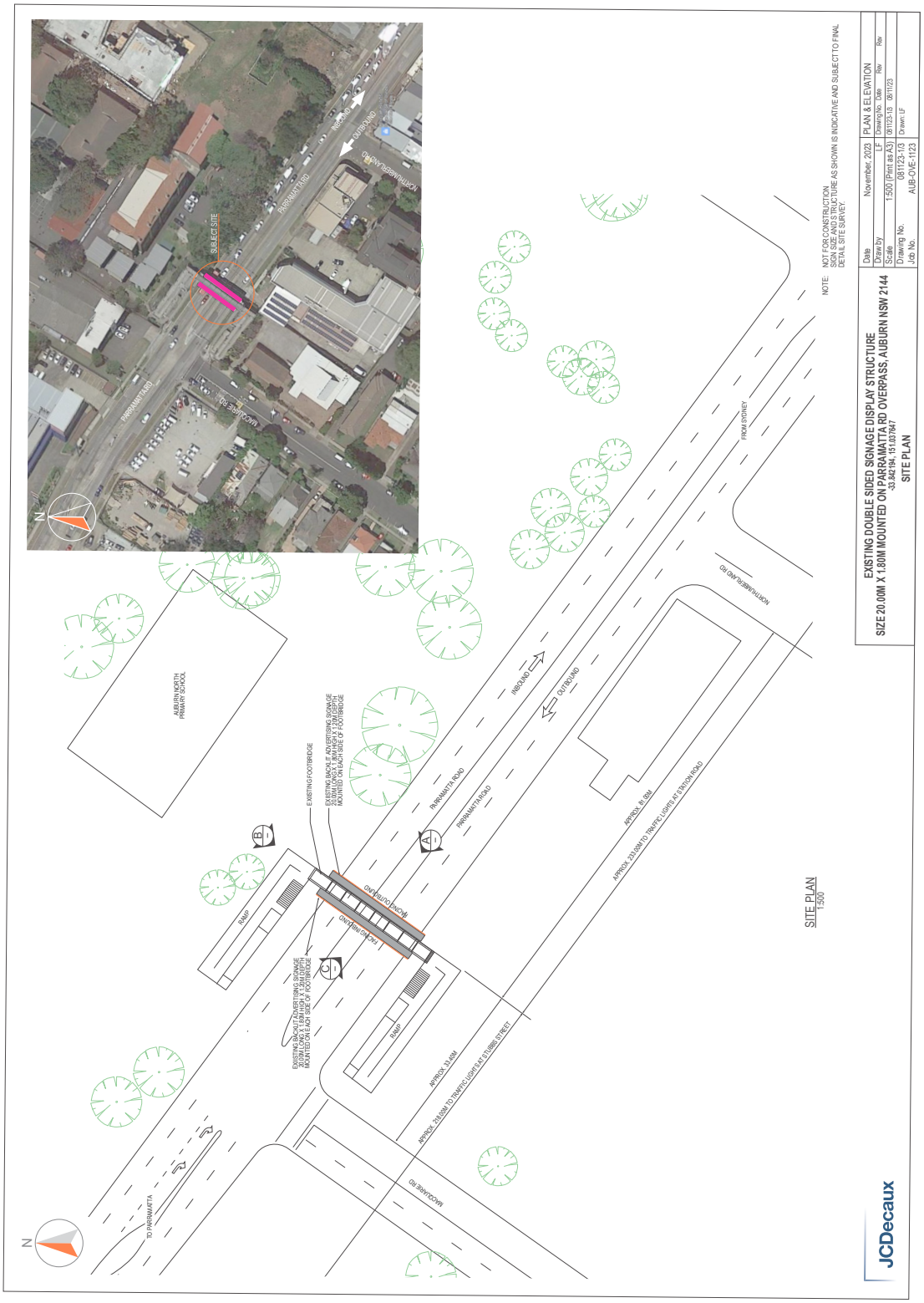
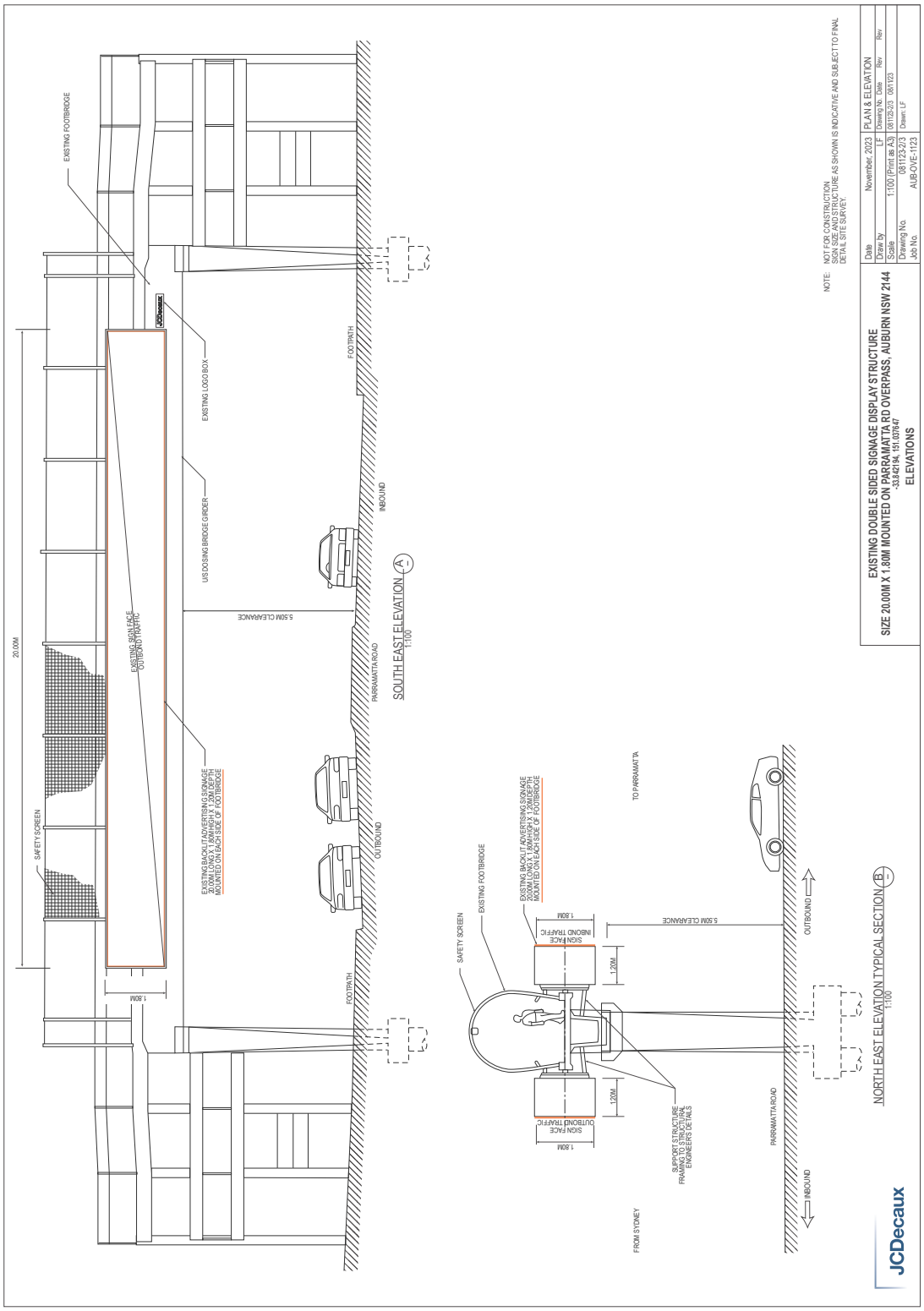
Registered Professional Engineer - New South Wales (PRE0000868)

Senior Lighting Designer
Electrolight Sydney
28/11/23

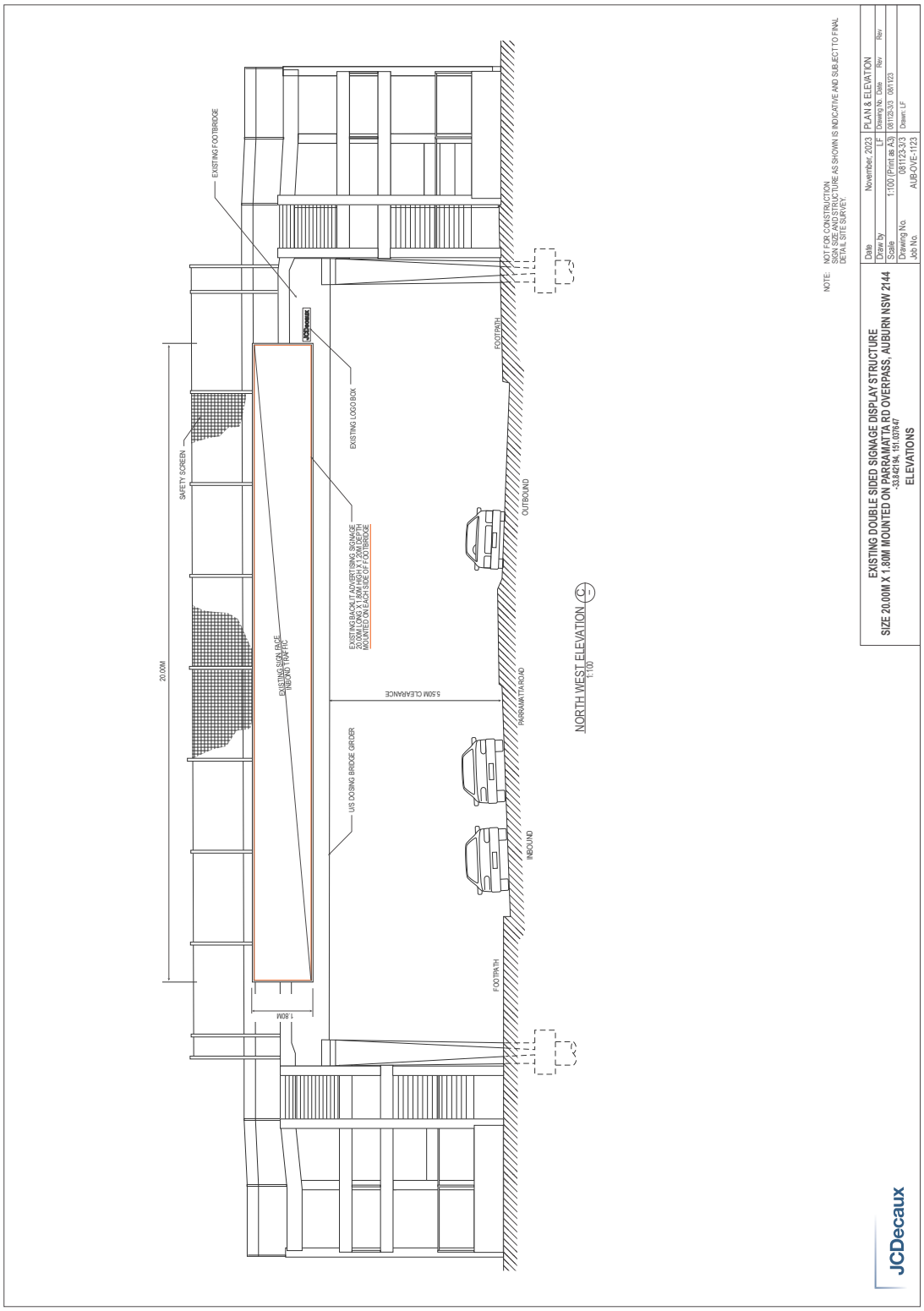
APPENDIX A
EXISTING SIGNAGE LOCATION, ELEVATIONS & PHOTOMONTAGES



APPENDIX A
EXISTING SIGNAGE LOCATION, ELEVATIONS & PHOTOMONTAGES



APPENDIX A
EXISTING SIGNAGE LOCATION, ELEVATIONS & PHOTOMONTAGES



APPENDIX A

EXISTING SIGNAGE LOCATION, ELEVATIONS & PHOTOMONTAGES

APPENDIX B

State Environmental Planning Policy (Industry and Employment) 2021

Schedule 5 Assessment criteria

(Clauses 8, 13 and 17)

1. Character of the area

- Is the proposal compatible with the existing or desired future character of the area or locality in which it is proposed to be located?
- Is the proposal consistent with a particular theme for outdoor advertising in the area or locality?

2. Special areas

- Does the proposal detract from the amenity or visual quality of any environmentally sensitive areas, heritage areas, natural or other conservation areas, open space areas, waterways, rural landscapes or residential areas?

3. Views and vistas

- Does the proposal obscure or compromise important views?
- Does the proposal dominate the skyline and reduce the quality of vistas?
- Does the proposal respect the viewing rights of other advertisers?

4. Streetscape, setting or landscape

- Is the scale, proportion and form of the proposal appropriate for the streetscape, setting or landscape?
- Does the proposal contribute to the visual interest of the streetscape, setting or landscape?
- Does the proposal reduce clutter by rationalising and simplifying existing advertising?
- Does the proposal screen unsightliness?
- Does the proposal protrude above buildings, structures or tree canopies in the area or locality?
- Does the proposal require ongoing vegetation management?

5. Site and building

- Is the proposal compatible with the scale, proportion and other characteristics of the site or building, or both, on which the proposed signage is to be located?
- Does the proposal respect important features of the site or building, or both?
- Does the proposal show innovation and imagination in its relationship to the site or building, or both?

6. Associated devices and logos with advertisements and advertising structures

- Have any safety devices, platforms, lighting devices or logos been designed as an integral part of the signage or structure on which it is to be displayed?

7. Illumination

- Would illumination result in unacceptable glare?
- Would illumination affect safety for pedestrians, vehicles or aircraft?
- Would illumination detract from the amenity of any residence or other form of accommodation?
- Can the intensity of the illumination be adjusted, if necessary?
- Is the illumination subject to a curfew?

8. Safety

- Would the proposal reduce the safety for any public road?
- Would the proposal reduce the safety for pedestrians or bicyclists?
- Would the proposal reduce the safety for pedestrians, particularly children, by obscuring sightlines from public areas?

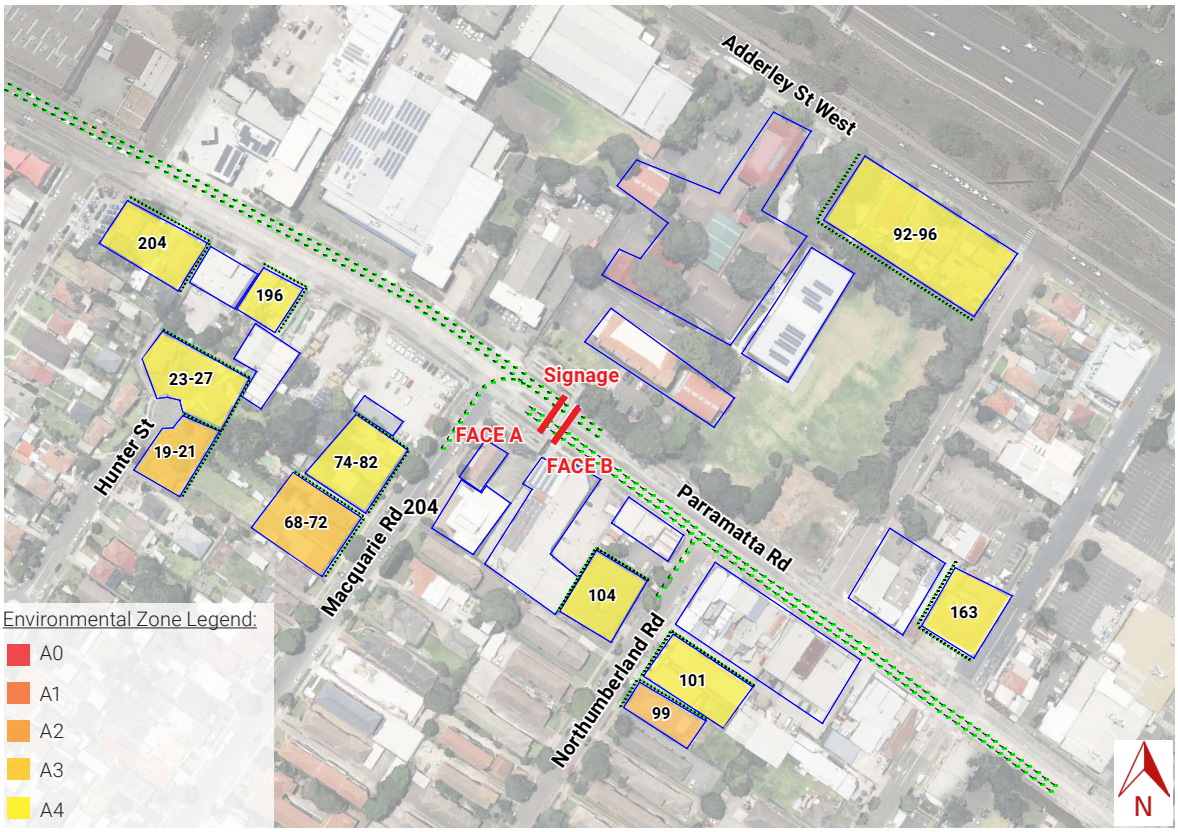
APPENDIX C
OBTRUSIVE LIGHT AND THRESHOLD INCREMENT CALCULATIONS

Calculation Summary			
Project: TI			
Label	CalcType	Units	Max
Macquarie right to Parramatta E	Obtrusive - TI	%	1.56
Northumberland left Parramatta W	Obtrusive - TI	%	0.12
Parramatta Rd Eastbound	Obtrusive - TI	%	1.98
Parramatta Rd Westbound	Obtrusive - TI	%	2.14

Calculation Summary			
Project: A3			
Label	CalcType	Units	Max
19-21 Hunter St_Ill_Seg1	Obtrusive - Ill	Lux	0.05
19-21 Hunter St_Ill_Seg2	Obtrusive - Ill	Lux	0.03
19-21 Hunter St_Ill_Seg3	Obtrusive - Ill	Lux	0.00
768-72 Macquarie Rd_Ill_Seg1	Obtrusive - Ill	Lux	0.00
768-72 Macquarie Rd_Ill_Seg2	Obtrusive - Ill	Lux	0.00
99 Northumberland Rd_Ill_Seg1	Obtrusive - Ill	Lux	0.00
99 Northumberland Rd_Ill_Seg2	Obtrusive - Ill	Lux	0.00

Calculation Summary			
Project: A4			
Label	CalcType	Units	Max
101 Northumberland Rd_Ill_Seg1	Obtrusive - Ill	Lux	0.03
101 Northumberland Rd_Ill_Seg2	Obtrusive - Ill	Lux	0.02
104 Northumberland Rd_Ill_Seg1	Obtrusive - Ill	Lux	0.26
104 Northumberland Rd_Ill_Seg2	Obtrusive - Ill	Lux	0.26
163 Parramatta Rd_Ill_Seg1	Obtrusive - Ill	Lux	0.00
163 Parramatta Rd_Ill_Seg2	Obtrusive - Ill	Lux	0.05
196-198 Parramatta Rd_Ill_Seg1	Obtrusive - Ill	Lux	0.00
196-198 Parramatta Rd_Ill_Seg2	Obtrusive - Ill	Lux	0.11
204-208 Parramatta Rd_Ill_Seg1	Obtrusive - Ill	Lux	0.00
204-208 Parramatta Rd_Ill_Seg2	Obtrusive - Ill	Lux	0.01
23-27 Hunter St_Ill_Seg1	Obtrusive - Ill	Lux	0.06
23-27 Hunter St_Ill_Seg2	Obtrusive - Ill	Lux	0.00
74-82 Macquarie Rd_Ill_Seg1	Obtrusive - Ill	Lux	0.18
74-82 Macquarie Rd_Ill_Seg2	Obtrusive - Ill	Lux	0.16
92-96 Adderley St W_Ill_Seg1	Obtrusive - Ill	Lux	0.00
92-96 Adderley St W_Ill_Seg2	Obtrusive - Ill	Lux	0.00

APPENDIX C
OBTRUSIVE LIGHT AND THRESHOLD INCREMENT CALCULATIONS



APPENDIX C

OBTRUSIVE LIGHTING AND THRESHOLD INCREMENT CALCULATIONS

Obtrusive Light - Compliance Report

AS/NZS 4282:2023 A3 - Medium District Brightness, Curfew
Filename: 1096.134 Parramatta Rd Overpass Auburn
15/11/2023 2:39:54 PM

Illuminance

Maximum Allowable Value: 2 Lux

Calculations Tested (7):

Calculation Label	Test Results	Max. Illum.
99 Northumberland Rd_Ill_Seg1	**PASS**	0.00
99 Northumberland Rd_Ill_Seg2	**PASS**	0.00
768-72 Macquarie Rd_Ill_Seg1	**PASS**	0.00
768-72 Macquarie Rd_Ill_Seg2	**PASS**	0.00
19-21 Hunter St_Ill_Seg1	**PASS**	0.05
19-21 Hunter St_Ill_Seg2	**PASS**	0.03
19-21 Hunter St_Ill_Seg3	**PASS**	0.00

Obtrusive Light - Compliance Report

AS/NZS 4282:2023, A4 - High District Brightness, Curfew
Filename: 1096.134 Parramatta Rd Overpass Auburn
15/11/2023 2:37:25 PM

Illuminance

Maximum Allowable Value: 5 Lux

Calculations Tested (16):

Calculation Label	Test Results	Max. Illum.
104 Northumberland Rd_Ill_Seg1	**PASS**	0.26
104 Northumberland Rd_Ill_Seg2	**PASS**	0.26
101 Northumberland Rd_Ill_Seg1	**PASS**	0.03
101 Northumberland Rd_Ill_Seg2	**PASS**	0.02
163 Parramatta Rd_Ill_Seg1	**PASS**	0.00
163 Parramatta Rd_Ill_Seg2	**PASS**	0.05
92-96 Adderley St W_Ill_Seg1	**PASS**	0.00
92-96 Adderley St W_Ill_Seg2	**PASS**	0.00
74-82 Macquarie Rd_Ill_Seg1	**PASS**	0.18
74-82 Macquarie Rd_Ill_Seg2	**PASS**	0.16
196-198 Parramatta Rd_Ill_Seg1	**PASS**	0.00
196-198 Parramatta Rd_Ill_Seg2	**PASS**	0.11
204-208 Parramatta Rd_Ill_Seg1	**PASS**	0.00
204-208 Parramatta Rd_Ill_Seg2	**PASS**	0.01
23-27 Hunter St_Ill_Seg1	**PASS**	0.06
23-27 Hunter St_Ill_Seg2	**PASS**	0.00

Threshold Increment (TI)

Maximum Allowable Value: 20 %

Calculations Tested (4):

Calculation Label	Adaptation Luminance	Test Results
Parramatta Rd Westbound	5	**PASS**
Parramatta Rd Eastbound	5	**PASS**
Macquarie right to Parramatta E	5	**PASS**
Northumberland left Parramatta W	5	**PASS**

APPENDIX D

JCDecaux

LUMINANCE MEASUREMENT REPORT

OUTDOOR ILLUMINATED SIGNAGE AT PARRAMATTA RD PEDESTRIAN OVERPASS, AUBURN

14 November 2023
Ref: 1096.134

Luminance Measurement Report
Existing Illuminated Signage at
Parramatta Rd Pedestrian Overpass, Auburn

DATE	REV	COMMENT	PREPARED BY	CHECKED BY
14/11/23	A	Issued for Information	RMS	DHS

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CONTENTS

1. INTRODUCTION

Electrolight was engaged by JCDecaux to provide a Luminance Measurement Report for the existing internally illuminated signage installed at Parramatta Road Pedestrian Overpass, Auburn.

The signage is double sided and is comprised of internally illuminated ("backlit") signage panels mounted on opposites sites of the overpass structure. One sign faces the inbound direction of traffic on Parramatta Rd and one sign faces the outbound direction of traffic on Parramatta Rd.

As both signs are identical in design, age, and lighting specification*, measuring the luminance of the inbound facing sign has been taken to be representative of the luminance of both signs.

Further details are provided in Section 2 below.

2. LUMINANCE MEASUREMENTS

Luminance Measurements were undertaken on Monday 13th November 2023 at 8:30pm using a Gossen Mavo-Spot 2 luminance meter (Serial Number 7C41314). The meter was calibrated on 29th November 2022 by UNSW (Report #22298.2).

The luminance measurement methodology was as follows:

A 100% "full white" canvas skin was installed on the inbound signage face for the measurement process, representing the worst case/maximum luminance the signage is capable of emitting – see Figure 1 below.

Figure 1: Existing Signage with 100% white skin applied

* The assumption that these signs are identical is based on the existing DA and information provided by JCDecaux. Electrolight take no responsibility for the accuracy of this information.

A minimum of 10 equally spaced measurements were taken across the face to provide a representative estimate of the average luminance level of the signage. Measurements were taken at approximately 80m from the signage in a viewing direction approximately normal to the signage and at a height of 1.5m above the ground.

Using the methodology and processes outlined in this report, the average measured luminance is as follows:

SIGN TYPE	SKY CONDITION	AVERAGE LUMINANCE (CD/M2)
Internally Illuminated LED Signage	Night time	52

It can be seen from the table above that the average luminance of the signage is 52 cd/m2.

Note:

No lumen depreciation factors were applied to the luminance readings in this report.

The detailed results of the luminance measurements are shown in Appendix A.

Report and Measurements undertaken by:

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14/11/23

APPENDIX A – SIGNAGE LUMINANCE MEASUREMENTS

Elevation view of the existing signage with measuring points and corresponding luminance values (image not to scale and point locations indicative only).