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APN Outdoor

13 January 2016
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LIGHTING IMPACT ASSESSMENT

OUTDOOR SIGNAGE AT PARRAMATTA ROAD, LEWISHAM (INBOUND)

# Lighting Impact Assessment

# Outdoor Signage at Parramatta Road, Lewisham (Inbound)

| DATE | REV | COMMENT | PREPARED BY | CHECKED BY |
|---|---|---|---|---|
| 10/12/15 | A | Issued for Information | RA | DS |
| 13/01/16 | B | Issued for Information | RA | DS |

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# 1. INTRODUCTION

Electrolight have been appointed by APN Outdoor to undertake a Lighting Impact Assessment on the proposed digital signage to be installed at Parramatta Road, Lewisham (inbound direction). The objective of the assessment is to report on compliance with the State Environmental Planning Policy No. 64 – Advertising and Signage (SEPP 64), AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting and NSW Transport Corridor Outdoor Advertising and Signage Guidelines (December 2015 Draft Document).

# 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 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.

## 2.5 Threshold Increment

The measure of disability glare expressed as the percentage increase in contrast required between a standard object and its background (the carriageway) for it to be seen equally as well with the source of glare present as with it absent, derived in the specified manner. This metric is directly related to Veiling Luminance.

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

## 2.6 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 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.

## 3. SITE DESCRIPTION AND SCOPE

The location of the proposed self illuminated digital sign is onto the western façade of the Inner West Overpass above Parramatta Road, Lewisham (inbound direction) and will replace the existing static sign. The total display area of the sign is approximately 16.26 m2 -refer Appendix A for signage plan and elevations.

The digital signage is illuminated using LEDs installed within the face of the sign. The brightness of the LEDs can be controlled to provide upper and lower thresholds as required as well as automatically via a local light sensor to adjust to ambient lighting conditions.

For the purpose of this report the proposed manufacturer of the digital signage is noted as Prismatronic (8mm pitch model), with performance parameters as outlined in Appendix B. Alternative digital signage manufacturers may be used for this installation as long as they have equivalent lighting and performance characteristics and are commissioned as described in this report.

## 4. DESIGN GUIDELINES AND STANDARDS

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

- State Environmental Planning Policy No. 64 – Advertising & Signage SEPP 64 (Refer Appendix C)
- Transport Corridor Outdoor Advertising & Signage Guidelines 2015 Draft Document *
- AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting. **

* The draft Transport Corridor Outdoor Advertising and Signage Guideline (2015) reflects the latest position for roadside digital media in NSW as jointly agreed by Outdoor Media Association (OMA) and Transport for NSW (TfNSW).

Preparation of the guidelines were led by Transport for NSW (TfNSW) which consulted with a variety of interested stakeholders including the OMA, TfNSW, Roads and Maritime Services (RMS) and Department of Planning and Environment (DPE).

** Although AS 4282-1997 specifically excludes internally illuminated advertising signs in Section 1.1 Scope (b) the requirements have been considered as if the Standard's requirements had to be met.

## 5. LUMINANCE ASSESSMENT

Based on an assessment of the surrounding area, the sign is classified as being within a Zone 3 Area under the draft Transport Corridor Outdoor Advertising & Signage Guidelines. Zone 3 is described as an area with generally medium off street ambient lighting eg small and medium shopping or commercial centres.

The proposed digital signage has a maximum brightness capacity of 7500 cd/m2, meaning the maximum allowable day time and night time dimming levels to comply with the guideline's luminance requirements for Zone 3 are:

| LUMINANCE LEVELS FOR DIGITAL ADVERTISEMENTS | | | |
|---|---|---|---|
| Lighting Condition | Max Dimming Level to achieve compliance # | Max Permissible Luminance (cd/m2) | Compliant |
| Full Sun on face of Signage | 100% | 7500 | ✓ |
| Day Time Luminance | 80% | 6000 | ✓ |
| Morning and Evening Twilight and Inclement Weather | 9.3 % | 700 | ✓ |
| Night Time | 4.6% | 350 | ✓ |

# For the basis of this Report, it is assumed that the dimming level is directly related to the luminance level via a linear relationship.

It is our opinion that a digital advertising sign that is illuminated to the maximum luminances outlined above would be visually consistent with the existing ambient lighting and suitable for the local area. A more detailed night time lighting assessment is provided in Section 6.0.

The operator of the screen must not exceed the maximum dimming levels above to comply with the draft Transport Corridor Outdoor Advertising & Signage Guidelines. To maintain constant visibility of the signage, the dimming value may increase to the maximum level at certain times of the day (such as in direct sunlight as noted above). This is to compensate for high levels of light striking the front the face of the sign, which would otherwise dull the image and make it difficult to view.

# 6. AS4282 ASSESSMENT

The proposed digital sign has been assessed against AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting as outlined in Section 4.

As it is intended that the sign be illuminated after 11pm, the requirements for curfewed operation under the standard will be applied. The sign is located in a mixed residential and commercial area, therefore the maximum illuminance in the vertical plane of habitable rooms for adjacent residential properties is limited to 4 lux (as outlined in Table 2.1 of AS4282 for curfewed operation). Under the standard, a value of less than 4 lux is deemed to not affect the visual amenity of local residents.

Photometric data for the screen was based on a diffused light panel (approximating a lambertian emitter) with a luminance corresponding to the night time limit outlined in Section 5. Appendix D shows the 3D lighting model as well as the results of the calculations.

Utilising a Luminance value of 350 cd/m2 (representing a maximum 4.6% of full dimming power) across the viewable sign area, the theoretical zone where visual impact exceeds 4 lux is located in Appendix D. It can be seen that no residential developments fall within the affected zone.

The Threshold Increment was also calculated for outbound traffic on Pacific Highway. The calculation grid was located at 1.5m above ground level, with an approach viewing distance of between 2 m to 200 m from the sign. The calculation results show that the Threshold Increment does not exceed 5.2% along the approach (the allowable maximum under the standard is 20%).

The luminous intensity limits nominated in the standard are only applicable to point sources such as floodlights and are therefore not relevant for illuminated signage.

It can therefore be seen that the proposed illuminated signage complies with all relevant requirements of AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting.

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

## 7. SUMMARY

- The proposed sign to be installed at Parramatta Road, Lewisham (inbound direction) has been assessed as being located in a Zone 3 area under the Transport Corridor Outdoor Advertising & Signage Guidelines 2015 Draft Document
- The maximum luminance and dimming levels of the lighting to the proposed sign are as follows:

| LUMINANCE LEVELS FOR DIGITAL ADVERTISEMENTS | | | |
|---|---|---|---|
| Lighting Condition | Max Dimming Level to achieve compliance # | Max Permissible Luminance (cd/m2) | Compliant |
| Full Sun on face of Signage | 100% | 7500 | ✓ |
| Day Time Luminance | 80% | 6000 | ✓ |
| Morning and Evening Twilight and Inclement Weather | 9.3% | 700 | ✓ |
| Night Time | 4.6% | 350 | ✓ |

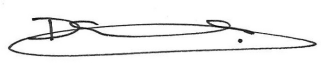
# For the basis of this Report, it is assumed that the dimming level is directly related to the luminance level via a linear relationship.

- When commissioned to the maximum dimming levels above, the illuminated signage will comply with the Transport Corridor Outdoor Advertising & Signage Guidelines 2015 Draft Document
- The proposed illuminated signage complies with all relevant requirements of AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting. In complying with these requirements, the proposed signage will not result in unacceptable glare nor will it adversely impact the safety of pedestrians, residents or vehicular traffic. The proposed signage will also not cause any reduction in visual amenity to nearby residences or accommodation.

## 8. DESIGN CERTIFICATION

The proposed digital sign to be installed at Parramatta Road, Lewisham (inbound direction) if commissioned according to this report, will comply with the following criteria, guidelines and standards:

- State Environmental Planning Policy No. 64 – Advertising & Signage SEPP 64 (Refer Appendix C)
- Transport Corridor Outdoor Advertising & Signage Guidelines December 2015 Draft Document
- Relevant Sections of AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting.



Donn Salisbury MIES

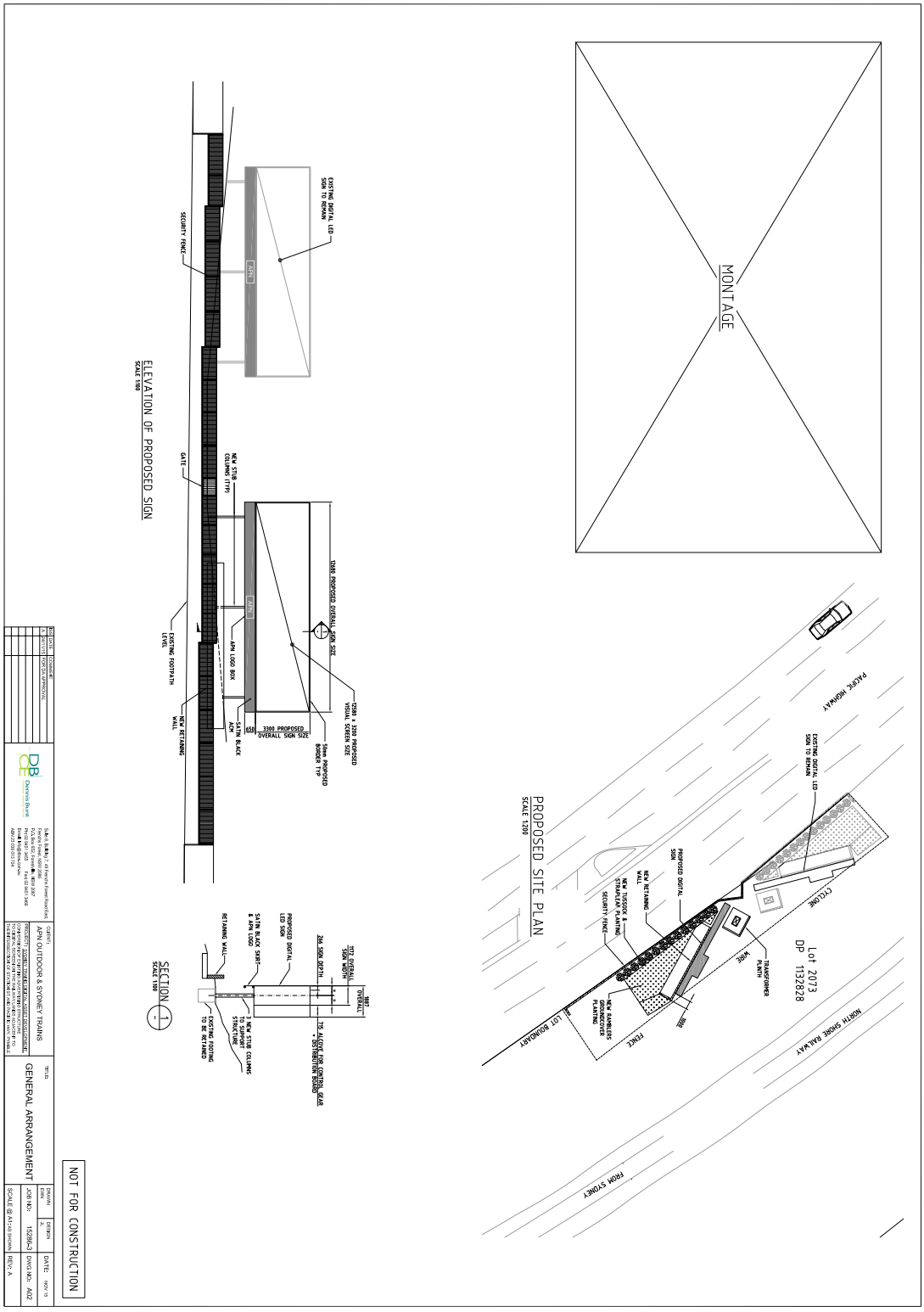
Director

Electrolight

13/01/16

# APPENDIX A

# SIGNAGE PLAN AND ELEVATION



APPENDIX B

DIGITAL SIGNAGE SPECIFICATION


## TECHNICAL SPECIFICATIONS

| | |
|---|---|
| Pitch (mm) | 8 mm |
| LED supplier /Type/Code | CREE |
| LED technology | SMD 2828 |
| LED configuration | 3 in 1- 1R1G1B |
| Pixel density / sqm | 15 625 |
| Colours | 281 trillion |
| Led Brightness after calibration with white balance (max cd) | 7 500 |
| Contrast | 6000:01 |
| Max Power consumption ( W/sqm) | 710 |
| Average Power consumption (W/sqm) | 302 |
| Lifespan, 50% brightness at end | 100 000 hours |
| Viewing angle horizontal | 140° |
| Viewing angle vertical | 140° |
| Luminosity | Light sensor included |
| Connectivity | LAN or 3G Cellular Router |
| Outdoor | IP 65 front, IP 54 back |
| Control system | BBM |

Please see product specifications relevant to all this range in the next pages

APPENDIX C

# State Environmental Planning Policy No. 64 - Advertising and Signage

**Schedule 1 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 D

# OBSTRUSIVE LIGHTING &THRESHOLD INCREMENT CALCULATIONS

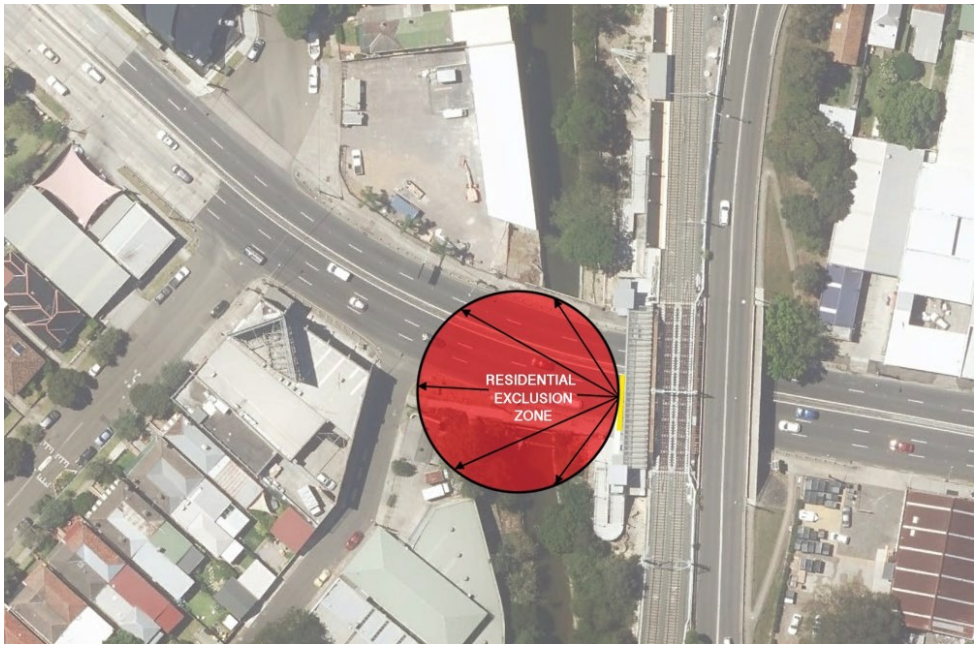



Image: Light Model – Plan showing residential exclusion zone.


| Calculation Summary | | | | |
|---|---|---|---|---|
| Label | Max | CalcType | Units | Description |
| ObtrusiveLight_TI_1 | 5.2 | Obtrusive Light - TI | % | Parramatta Road |

Image: Light Model – Threshold Increment Calculation.