REPORT

# LAVENDER BAY

64-66 LAVENDER ST & 3-7 MIDDLEMISS ST,
LAVENDER BAY, NSW

**SSDA SOLAR REFLECTIVITY STUDY**

RWDI #2512833

11 March 2026

**SUBMITTED TO**

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<table>
<tr><th colspan="3">Declaration</th></tr>
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<tr><td colspan="3">The undersigned declares that this SSDA Solar Reflectivity Study has been prepared in response to the following SEARs requirements issued for the Project on 30 June 2025 (EIS) and 2 July 2025 (Rezoning Report) for SSD-86797708:</td></tr>
<tr><td>SEARs item no.</td><td>SEARs Issue and Assessment Requirements</td><td>Relevant Section of this Report that addresses SEARs Requirement</td></tr>
<tr><td>7</td><td>Assess amenity impacts on the surrounding locality, including solar access, visual privacy, view loss and view sharing, as well as wind, lighting and reflectivity impacts. A high level of environmental amenity for any surrounding residential or other sensitive land uses must be demonstrated.</td><td>Section 3: Results and Discussion</td></tr>
<tr><td>Signed</td><td colspan="2"></td></tr>
<tr><td>Dated</td><td colspan="2">11 March 2026</td></tr>
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# EXECUTIVE SUMMARY

RWDI Australia Pty Ltd. (RWDI) has been engaged by CE Project Ventures Pty Ltd to investigate the impact of solar reflections emanating from the proposed development at 64-66 Lavender Street & 3-7 Middlemiss Street, Lavender Bay, NSW ("the Project") in support of a State Significant Development Application (SSDA) (SSD-86797708). The results and conclusions of the study are summarised as follows:

**Visual Glare Impact on Drivers**

As with any glazed building, drivers and train drivers travelling in the vicinity of the Project (i.e. along Lavender Street, Alfred Street South, Middlemiss Street, Warringah Freeway/Bradfield Highway/Cahill Expressway, Arthur Lane, the elevated North Sydney Line and the Lavender Bay Line) were predicted to experience reflections emanating from it. Based on the detailed analysis results, the predicted reflections falling on these receptors,

- **D2: Drivers travelling east on Lavender Street, at Walker Street Intersection**
- **D9: Drivers travelling north on Warringah Freeway, turning left onto Alfred Street South, and**
- **D13: Drivers travelling west on High Street, off ramping to Cahill Expressway**

were above the veiling luminance threshold of 500 cd/m$^2$ in the morning and evening times. Mitigation suggestions have been provided in this report. All remaining receptors were predicted to experience reflections below the veiling luminance threshold of 500 cd/m$^2$.

Additional details on when reflections were predicted to occur at the receptors, as well as predicted durations and intensities, can be found in Appendix B.

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# 1 INTRODUCTION

RWDI Australia Pty Ltd (RWDI) has been engaged by CE Project Ventures Pty Ltd to investigate the impact of solar reflections emanating from the proposed development at 64-66 Lavender Street & 3-7 Middlemiss Street, Lavender Bay, NSW ("the Project") in support of a State Significant Development Application (SSDA). This report provides the computer modelling results of reflected sunlight from the Project, as shown in Figure 1 below**Error! Reference source not found.**. It is RWDI's understanding that the development will be surrounded by typical urban spaces such as busy roadways, train tracks and other buildings.

This Solar Reflectivity Study has been prepared to address the following relevant Secretary's Environmental Assessment Requirements (SEARs) for SSD-86797708, summarised in Table 1 below.

**Table 1: SEARs Compliance Table**

| SEAR | | Response / Location Address in Report |
|---|---|---|
| **7. Environment Amenity** | Assess amenity impacts on the surrounding locality, including solar access, visual privacy, view loss and view sharing, as well as wind, lighting and **reflectivity** impacts. A high level of environmental amenity for any surrounding residential or other sensitive land uses must be demonstrated. | Section 3 |

This analysis was conducted in two parts. First, a 'screening' simulation estimated the frequency of occurrence of reflections which may cause glare for a broad area around the development. This was done in order to understand the potential for visual impacts on people due to the reflections. Note that the screening analysis intentionally assumed a very conservative direction in which the viewer is facing (horizontal, but directly towards the building).

Since reflections were predicted on sensitive spaces, the 'detailed' analysis phase was undertaken. This investigated the potential for glare at select locations in greater temporal detail and also included the effect of the direction viewers are likely to be facing.

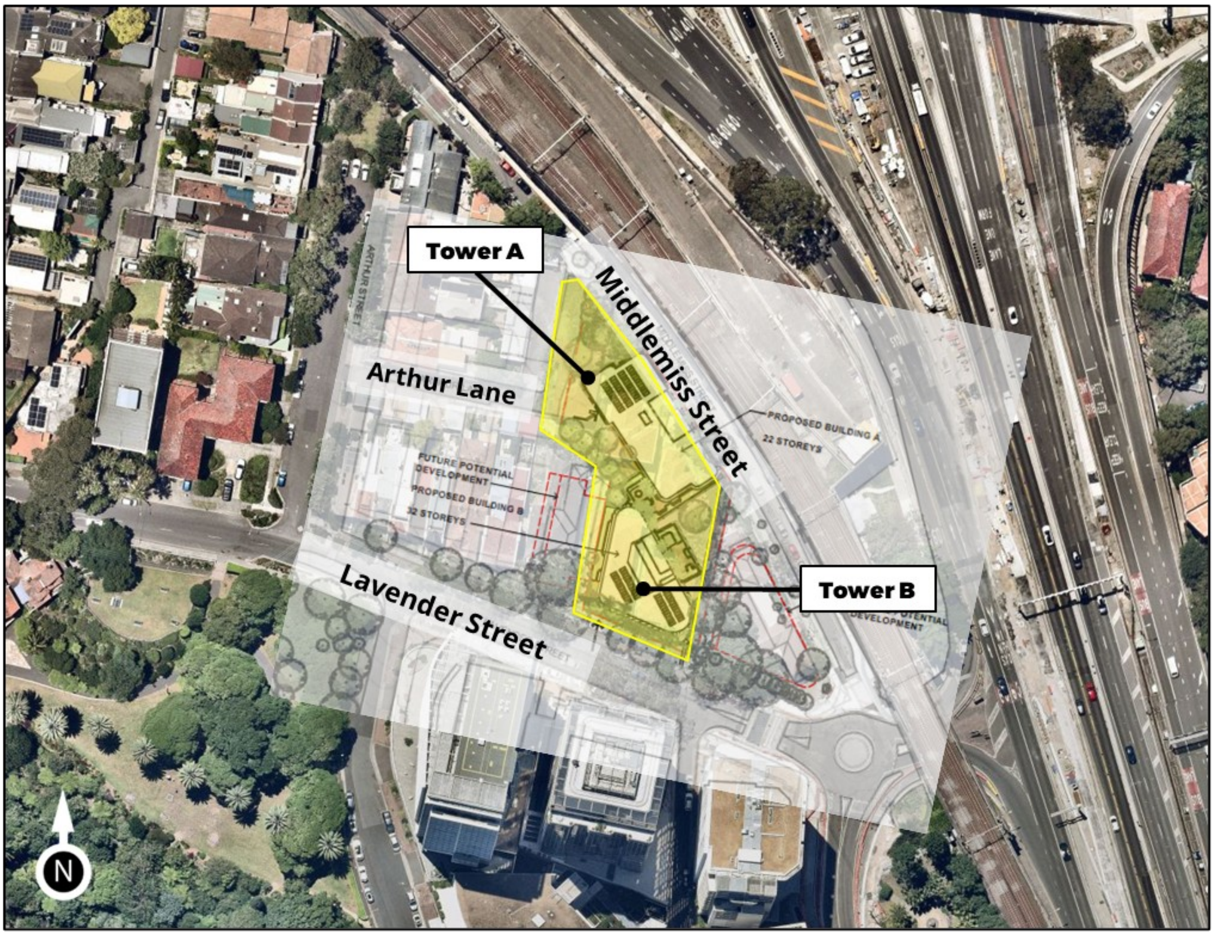


**Figure 1: Project Location in Yellow and Surrounding Context**
**(Map Credit: Nearmap)**
**(Image Overlay Credit: *"SITE PLAN- PROPOSED CONTEXT: Drawing No. DA-0202/4"*)**

## 1.1 Project Descriptions

The proposed development seeks approval for the rezoning of the site and development consent for the construction of a residential development. The SSDA specifically involves the following works:

- Demolition of the existing buildings on site;
- Site excavation, and other preparatory site works;
- Construction of a 32 and 23-storey residential flat building including 3% designated affordable housing consisting of approximately a total of 160 dwellings,
- Five levels of basement parking,
- Vehicular access from Lavender Street and loading access from Middlemiss Street,
- A new public accessible open space, including through-site link and site landscaping and
- Site amalgamation,
- Utility and services augmentation as required.

To accommodate the proposed SSDA, a concurrent rezoning is sought to increase the site's maximum building height.

# 2 BACKGROUND

## 2.1 Understanding Urban Reflections

While a common occurrence, solar reflections from buildings can lead to numerous visual issues, including:

- Impair the vision of motorists and others who cannot easily look away from the source;
- Cause nuisance to pedestrians or occupants of nearby buildings; and
- Create undesirable patterns of light throughout the urban fabric.

However, the level of impact of these issues on people will be influenced by many other factors that are unique to the reflecting surface(s), the individual(s)/object(s) exposed to reflections and the environment around them. In a complex urban space, these factors are often difficult to reasonably predict, if they can be predicted at all.

As such, it must be acknowledged that there is an element of uncertainty and subjectivity to any reflection analysis, particularly when it comes to visual glare which is inherently a subjective experience and lacks a universally agreed upon quantifiable definition. The metric and threshold used by RWDI (detailed in Appendix A) are based on industry standard approaches in Australia, but as noted above, are subject to a degree of uncertainty/subjectivity. This means that the possibility of reflection impacts from a building can never be completely ruled out through simulation.

RWDI's approach is to instead provide a suitably conservative analysis of the potential effects of reflected sunlight and contextualise how the Project's reflections compare to other projects studied by RWDI, and if any predicted impacts would be considered atypical given the Project's context. Regulation and enforcement of performance requirements is the responsibility of others.

## 2.2 Methodology

The analysis was conducted using RWDI's in-house proprietary *Eclipse* simulation engine. The first phase was a 'Screening Analysis' which predicted the maximum intensity and frequency of occurrence of reflections from the Project for every hour of a full calendar year. These values were computed on 'presentation surfaces' located approximately 1.5 m above grade-level at least approximately 500 m radius from the Project (FigureFigure 2). Note that this analysis included the existing surrounding context and excluded proposed developments that are currently under assessment or approved (i.e. not yet under construction). Note that the screening analysis intentionally assumed a very conservative direction in which the viewer is facing (horizontal, but directly towards the building).

Should the potential for glare exist on roadways or other sensitive spaces, multiple 'receptor points' are selected to undergo the second 'Detailed Analysis' phase. This analysis works similarly to the screening simulation, except glare is tested at one-minute increments and a direction of view is explicitly prescribed. This yielded detailed predictions at specific locations of when reflections can occur, how long they can occur for and the locations of problematic glare sources. The detailed study also provides the level of reflectivity reduction required to comply with local criteria.

As reflections were predicted on sensitive spaces, the detailed assessment was undertaken for this Project. Note that the detailed analysis was not intended to be an exhaustive investigation of all locations where reflections are possible. It was instead intended to provide an understanding of the range of possible reflection characteristics from the Project.

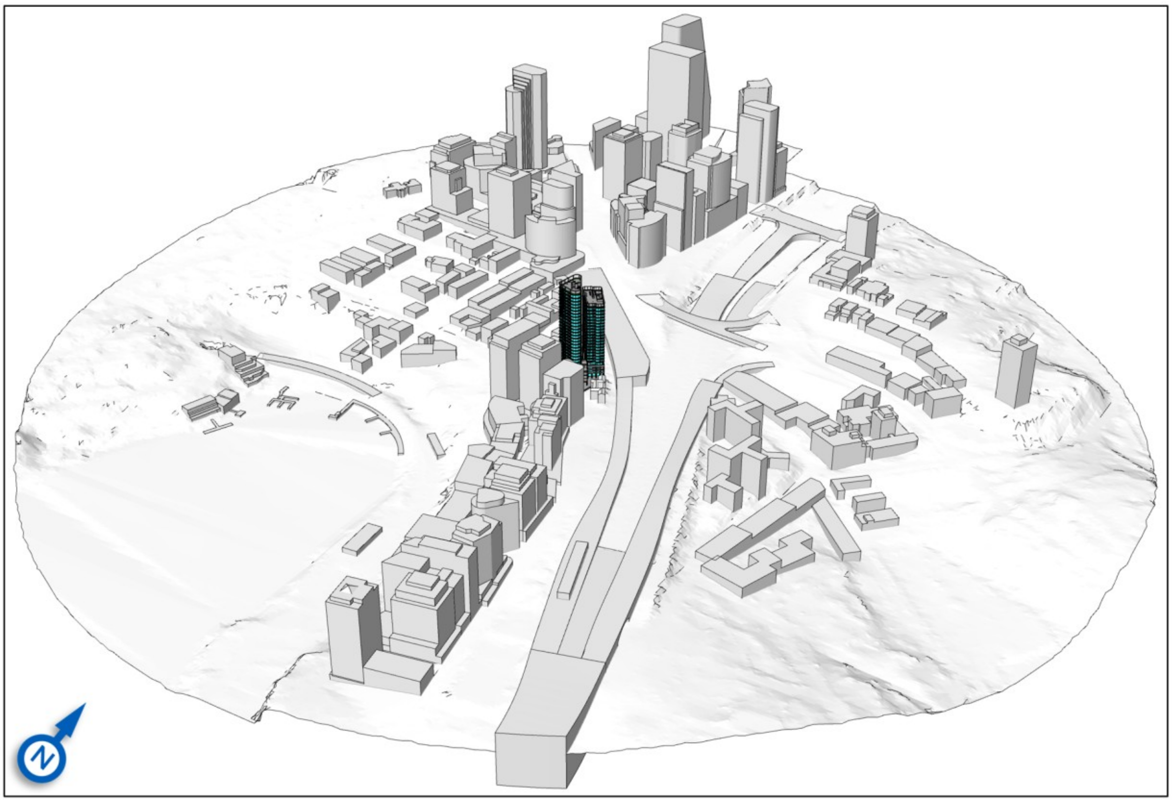

**Figure 2: 3D Computer Model of the Project and Surrounding Context**

## 2.3 Assumptions and Limitations

### 2.3.1 Meteorological Data

This analysis used 'clear sky' solar data computed at the location of Sydney Observatory Hill using the method promulgated by the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE). This approach used mathematical algorithms to derive solar intensity at a given location, ignoring the localised effects of cloud cover. This provides a 'worst case' scenario showing the full extent of when and where glare could ever occur.

### 2.3.2 Radiation Model

RWDI's analysis is only applicable to the visual impacts of solar radiation (i.e. visible wavelengths only) on people, including drivers in the vicinity of the development. It did not consider the impact of the building related to any other forms of radiation, such as thermal energy, cellular telephone signals, RADAR arrays, etc.

### 2.3.3 Study and Surrounds Models

The analysis was conducted based on 3D models and 2D drawings of Project provided by CE Project Ventures Pty Ltd to RWDI up to 12 January 2026.

The surrounding model was generated based on publicly available data and previous RWDI projects in the area. This analysis included the existing surroundings and excluded buildings currently under construction or approved (i.e. not yet under construction), as this would be conservative on the reflections falling on the public realm. All data sources were cross-checked against LiDAR data published by the NSW Department of Finance, Services, and Innovation. This dataset was also used to generate the ground surface and has a stated vertical and horizontal accuracy of 0.3m and 0.8m, respectively (both at a 95% confidence interval).

Potential reductions of solar reflections due to the presence of vegetation or other non-architectural obstructions were not included, nor were reflections from other buildings, per standard industry practice. Light that has reflected off several surfaces was assumed to have a negligible impact. As such, only a single reflection from the Project was included in the analysis.

This analysis assumed that all reflective elements are in their as-designed condition, (i.e. clean, free from damage, degradation, distortion, etc.) and that the building envelopes of all buildings are complete and uncompromised (i.e. any elements of the walls/roofs that are not designed to be exposed to sun, are shielded).

The results presented in this report are highly dependent on both the form and materiality of the Project. Should there be any changes to the design, it is recommended that RWDI be contacted and requested to review any potential effects on the findings of this report.

### 2.3.4 Facade Material Reflectance

All glazing including glass balustrades has been assumed to have a nominal 20% reflectivity for visible light approaching perpendicular to the surface, which increases with the angle of incidence. While the nominal reflectivity values of the IGUs are noted above, the reflectivity of glass will increase exponentially as light strikes it at increasingly glancing angles. This effect was included in the simulations. We have also omitted the railings in the model for conservatism.

RWDI also notes that only the glazing panels specified through the 3D models and 2D drawings received up to 12 January 2026 have been studied, and all other buildings/facade elements have negligible specular reflectivity and, therefore, were assumed to be non-reflective.

The locations of the reflective materials on the facades are illustrated in Figure 3.

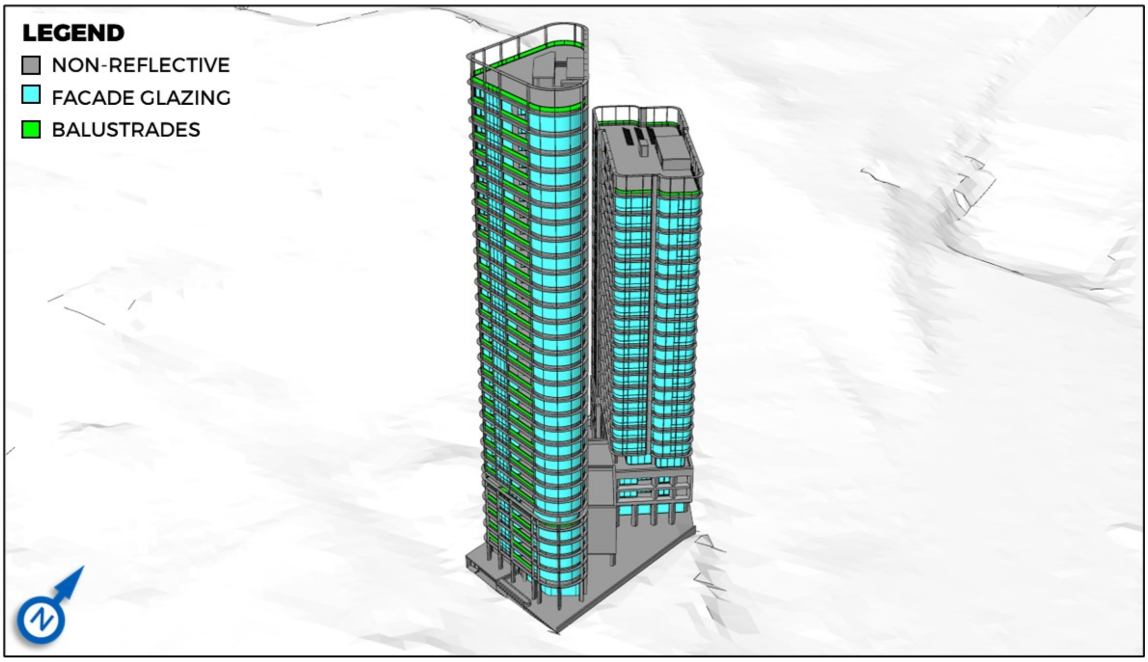


**Figure 3: Locations of Reflective Building Elements (Surrounding Context removed for Clarity)**

### 2.3.5 Human Factors

This analysis also assumes reasonable and responsible behaviour on the part of people in the vicinity of the development. A reasonable and responsible person would not purposely look towards a bright reflection, purposely prolong their exposure to reflected light, or otherwise intentionally try to cause discomfort/harm to themselves or others and/or damage to the property.

# 3 RESULTS AND DISCUSSION

## 3.1 Screening-Level Analysis

### 3.1.1 Results

This section presents the screening results pertaining to the solar impacts of the Project on the surrounding urban area.

**The Percentage of Time Above the Veiling Luminance Threshold plot (Figure 4: Frequency (% of Daylit Hours) Where Veiling Luminance Above Threshold were Predicted at Pedestrian Height for an 80th Percentile Resident (Age 62)**

) identifies the percentage of day-time hours where the veiling luminance was predicted to exceed the 500 cd/m² limit proposed by Hassall[1]. *Note that, as a conservative assumption, at each location, it is assumed that the viewer is always facing horizontally towards the source of any reflection that can reach them.*

The veiling luminance-based results present predictions for a 62-year-old viewer. This represents approximately the 80$^{th}$ percentile age of the residents of New South Wales, which means that veiling luminance will be lower than these predictions for 80% of the population.

It is important to understand that the figures do not show a specific moment in time, but rather present aggregated reflection predictions for an entire year.

In order to attain a complete understanding of the impact that reflections may have on people, other factors must be considered, including the duration of the reflections, when they occur and where the viewer is looking. The following plot serves to illustrate the general characteristics of reflections from the Project and informed the locations of the receptor points selected for the detailed phase of work, which analysed these factors in greater detail.

[1] *Hassall, D., "Reflectivity: Dealing with Rogue Solar Reflections" University of New South Wales, 1991.*

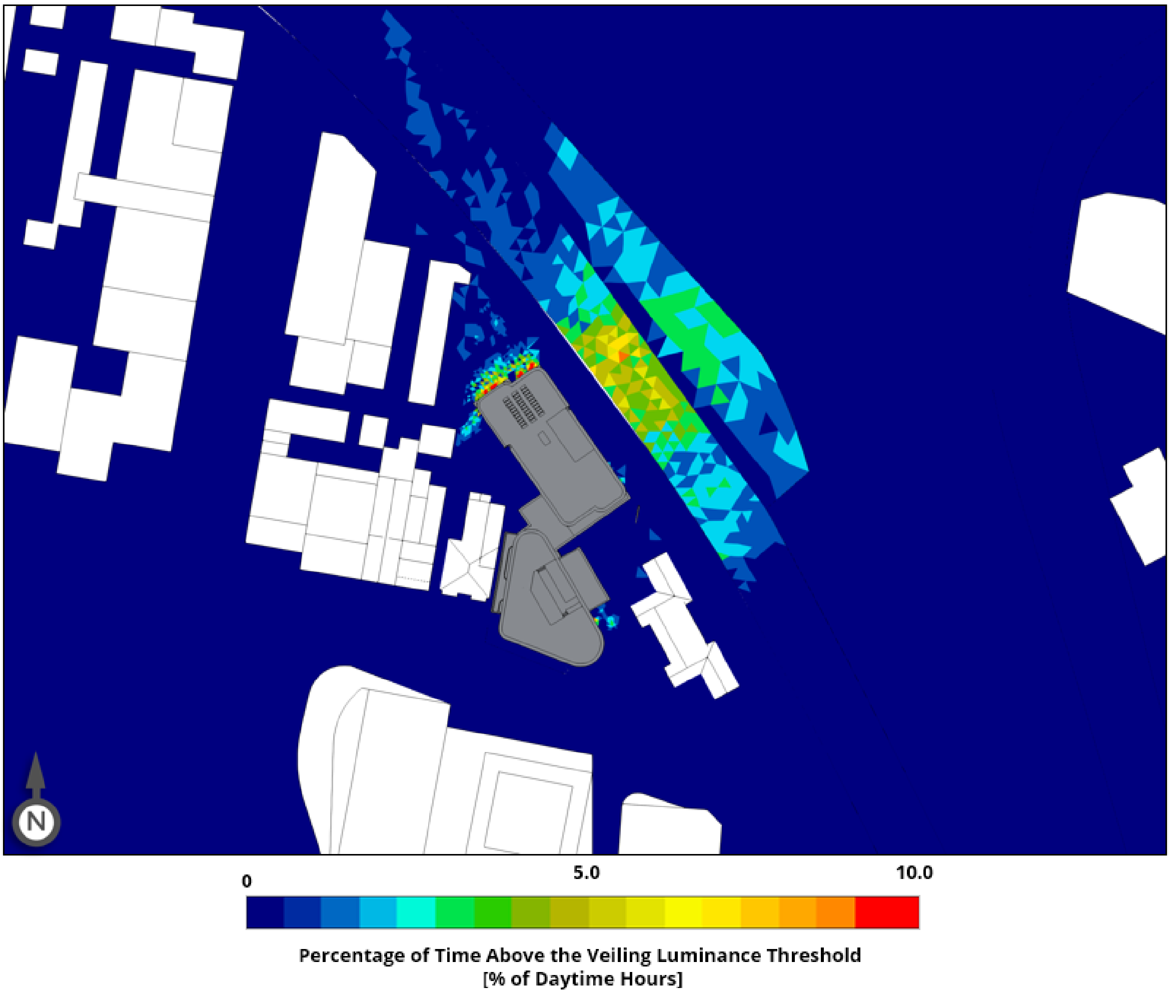


**Figure 4: Frequency (% of Daylit Hours) Where Veiling Luminance Above Threshold were Predicted at Pedestrian Height for an 80th Percentile Resident (Age 62)**

## 3.2 Detailed Analysis

### 3.2.1 Receptor Locations

Based on the findings of the Screening Analysis, 13 representative points were selected for the Detailed Analysis. These points are described in Table 2 and illustrated in Figure 5. Unless otherwise indicated, all points are located at a height of 1.5m above local grade.

**Table 2: Receptor Descriptions**

| Receptor Number | Receptor Description |
|---|---|
| **D1*** | Eastbound train drivers along the Lavender Bay Line |
| **D2** | Eastbound drivers on Lavender Street at the Walker Street intersection |
| **D3** | Eastbound drivers on Arthur Lane at the Arthur Street intersection |
| **D4** | Northbound drivers on Harbourview Crescent at the Lavender Street intersection |
| **D5*** | Southbound train drivers along the North Sydney Line, approaching Milsons Point Station |
| **D6** | Southbound drivers on Middlemiss Street, approaching the Arthur Lane pedestrian exit |
| **D7** | Northbound drivers on Cliff Street at the Lavender Street intersection |
| **D8** | Northbound drivers on Alfred Street South at the Lavender Street roundabout |
| **D9** | Northbound drivers on Warringah Freeway, off ramp to Alfred Street South |
| **D10** | Southbound drivers on Bradfield Highway |
| **D11*** | Northbound train drivers along the North Sydney Line, approaching Milsons Point Station |
| **D12** | Northbound drivers on Warringah Freeway |
| **D13** | Westbound drivers on High Street, off ramp to the Cahill Expressway |

*The train drivers are located at a height of 2.5m above local grade.


**Figure 5: Driver Receptor Locations**
**(Map Underlay Credit: Vexcel Imaging)**

### 3.2.2 Presentation of Results

Table 3 below summarises the level of visual impact predicted at each of the studied receptors based on the simulation results. The minute-by-minute results for each point are presented as 'Annual Reflection Impact Diagrams' which distil an entire year's worth of data into a single diagram. The diagrams for each receptor, as well as an explanation for how to read the diagrams, are provided in Appendix B.
Additional details of RWDI's criteria are found in Appendix A.

**Table 3: Summary of Overall Predicted Impacts on Receptors**

| Receptor Number | Receptor Type | Max Veiling Luminance ($cd/m^2$) | Duration / Total Number of Minutes with High Impact Reflection (Veiling Luminance > 500 $cd/m^2$) | % of High Impacts Where the Sun Is Also Visible |
|---|---|---|---|---|
| D1 | Train Driver | 63 | N/A | N/A |
| D2 | Driver | 822* | Average Duration: 5 minutes<br>Total: 75 minutes/year<br>(<0.03% of the daytime) | N/A |
| D3 | Driver | 283 | N/A | N/A |
| D4 | Driver | 193 | N/A | N/A |
| D5 | Train Driver | 154 | N/A | N/A |
| D6 | Driver | 291 | N/A | N/A |
| D7 | Driver | 298 | N/A | N/A |
| D8 | Driver | 193 | N/A | N/A |
| D9 | Driver | 786* | Average Duration: 3 minutes<br>Total: 43 minutes/year<br>(<0.02% of the daytime) | N/A |
| D10 | Driver | 34 | N/A | N/A |
| D11 | Train Driver | 209 | N/A | N/A |
| D12 | Driver | 207 | N/A | N/A |
| D13 | Driver | 517* | Average Duration: 1 minute<br>Total: 4 minutes/year<br>(<0.01% of the daytime) | N/A |

*The predicted high impact reflections are very infrequent (<0.03% of the daytime)

## 3.3 Overall Observations and Conclusions

1. Like any contemporary building, the reflective surfaces of the Project are naturally causing solar reflections in the surrounding area.
2. The screening analysis predicted a low potential for glare, even with its highly conservative assumption that the viewer would always be looking horizontally towards the source of the reflection. The most frequent reflections were predicted to be confined to the area north of the Project, along the off ramp from Warringah Freeway to Pacific Highway and along the North Sydney Line, where glare was predicted to occur for at most 9% of the daytime hours annually. It is noted that the results are based on a conservative viewing assumption; this frequency of glare potential would only be possible if drivers were unsafely looking towards the source of the reflection (i.e., at the Project) rather than the road ahead.
3. The screening analysis did not predict any potential high impact reflections on the scenic Lavender Bay Line.
4. The detailed analysis, which accounted for more realistic view directions and operated at one-minute increments, predicted that,
   - Drivers travelling east on Lavender Street, at Walker Street Intersection (D2),
   - Drivers travelling north on Warringah Freeway, off ramp to Alfred Street South (D9), and;
   - Drivers travelling west on High Street, off ramping to Cahill Expressway (D13)

   have a risk of glare during early mornings (D13) or evenings (D2 and D9) at specific times of the year as they approach the Project. That said, the frequency at which glare was predicted to be possible was very small (ranging from less than 0.01% to 0.03% of daytime) and of short duration (on average lasted 1 to 5 minutes).
5. If mitigations are desired for receptors above, the highlighted areas in Figures 6 to 8 on the next pages illustrate the sources of the reflections and suggest the means of mitigating the impact.
6. The remaining studied driver receptors (D1, D3-D8, and D10-D12) were predicted to have the potential to be exposed to reflections emanating from the Project. However, none of these reflections was predicted to exceed the veiling luminance threshold of 500 cd/$m^2$.
7. For further details, refer to the visual impact diagrams for all receptors (D1-D13) as shown in Appendix B.
8. Given the safety risks associated with glare impacts on drivers, RWDI's analysis is intentionally conservative. It assumed clear skies for all daytime hours and ignored the effects of any landscaping, the use of sunglasses, as well as obstructions to reflected light due to the car body.
9. The results presented in this report are highly dependent on both the form and materiality of the Project. Should there be any changes to the design, including the design of future roads, it is recommended that RWDI be contacted and requested to review their potential effects on the findings of this report.

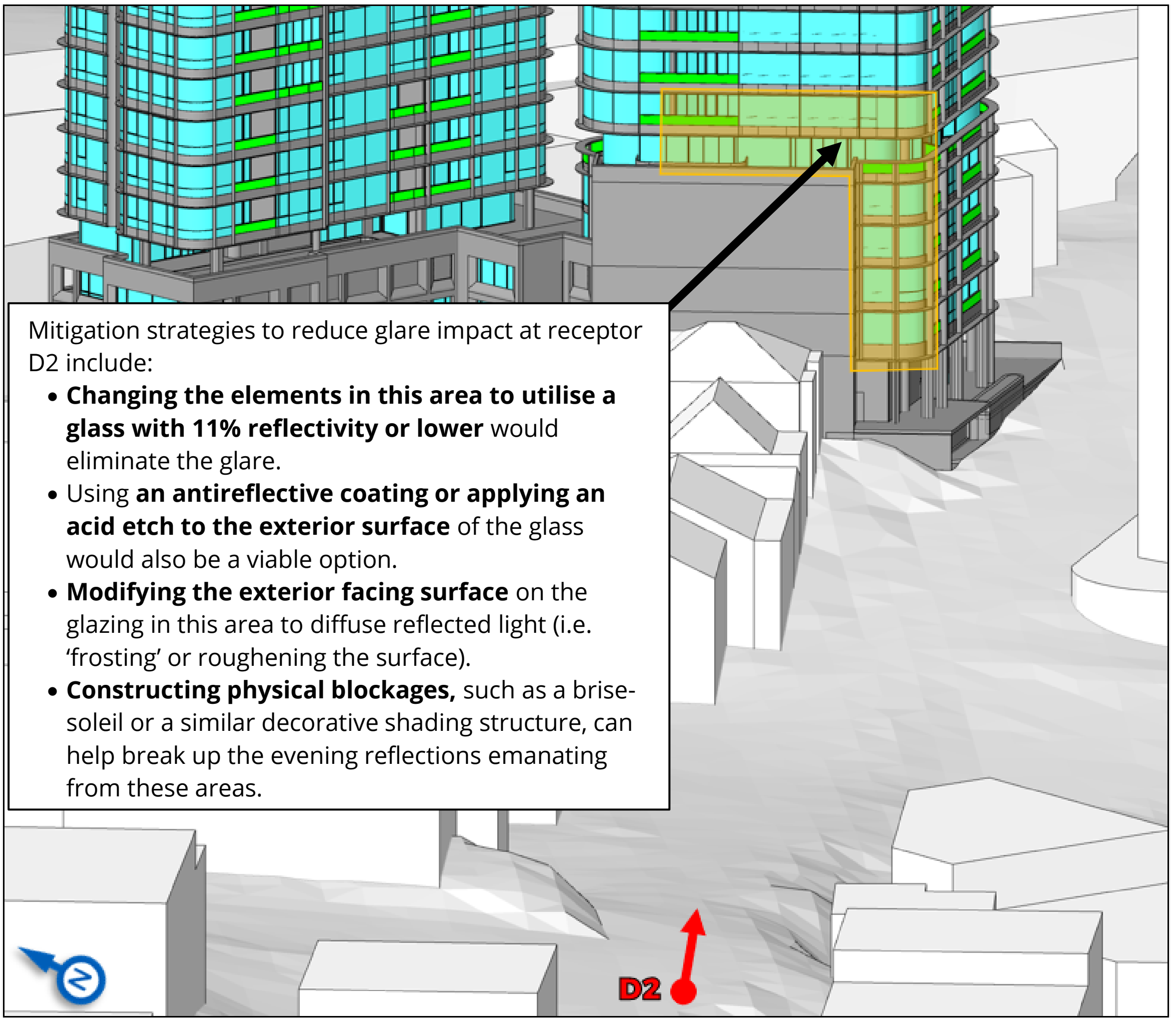


**Figure 6: Markup of Facade Locations for Glare Source at Receptor D2**

Mitigation strategies to reduce glare impact at receptor D9 include:

- **Employing vertical mullion fins** on this area would act to mitigate the glare impacts. The required fin depth would need to be approximately 8% of their horizontal spacing (e.g. fins placed 1m apart would need to be 8cm deep) to eliminate glare risk. Insetting the windows by the same amount would achieve the same effect.
- **Constructing physical blockages,** such as a brise-soleil or a similar decorative shading structure, can help break up the evening reflections emanating from these areas.
- **Changing the elements in this area to be non-reflective** would eliminate the glare.

It is noted that the existing landscaping along Lavender Street (south of the Project) would likely reduce, though not fully eliminate, the glare impacts predicted at D9.

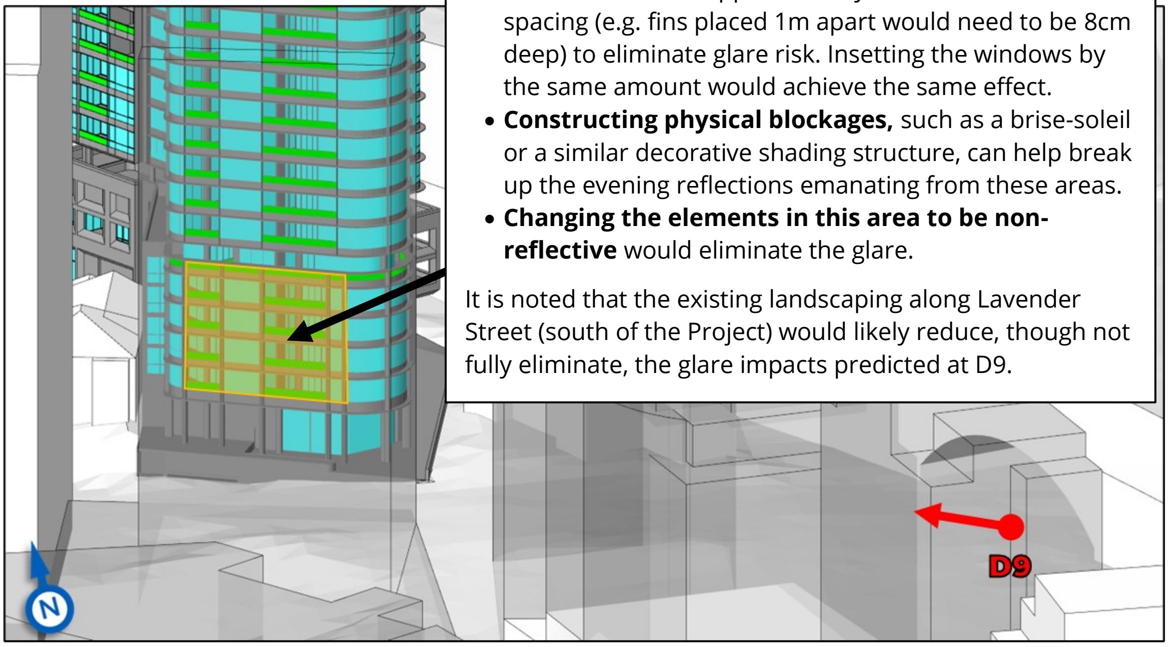


**Figure 7: Markup of Facade Locations for Glare Source at Receptor D9**

Mitigation strategies to reduce glare impact at receptor D13 include:

- **Changing the elements in this area to utilise a glass with 18% reflectivity or lower** would eliminate the glare.
- Using **an antireflective coating or applying an acid etch to the exterior surface** of the glass would also be a viable option.
- **Modifying the exterior facing surface** on the glazing in this area to diffuse reflected light (i.e. 'frosting' or roughening the surface).
- **Constructing physical blockages,** such as a brise-soleil or a similar decorative shading structure, can help break up the morning reflections emanating from these areas.

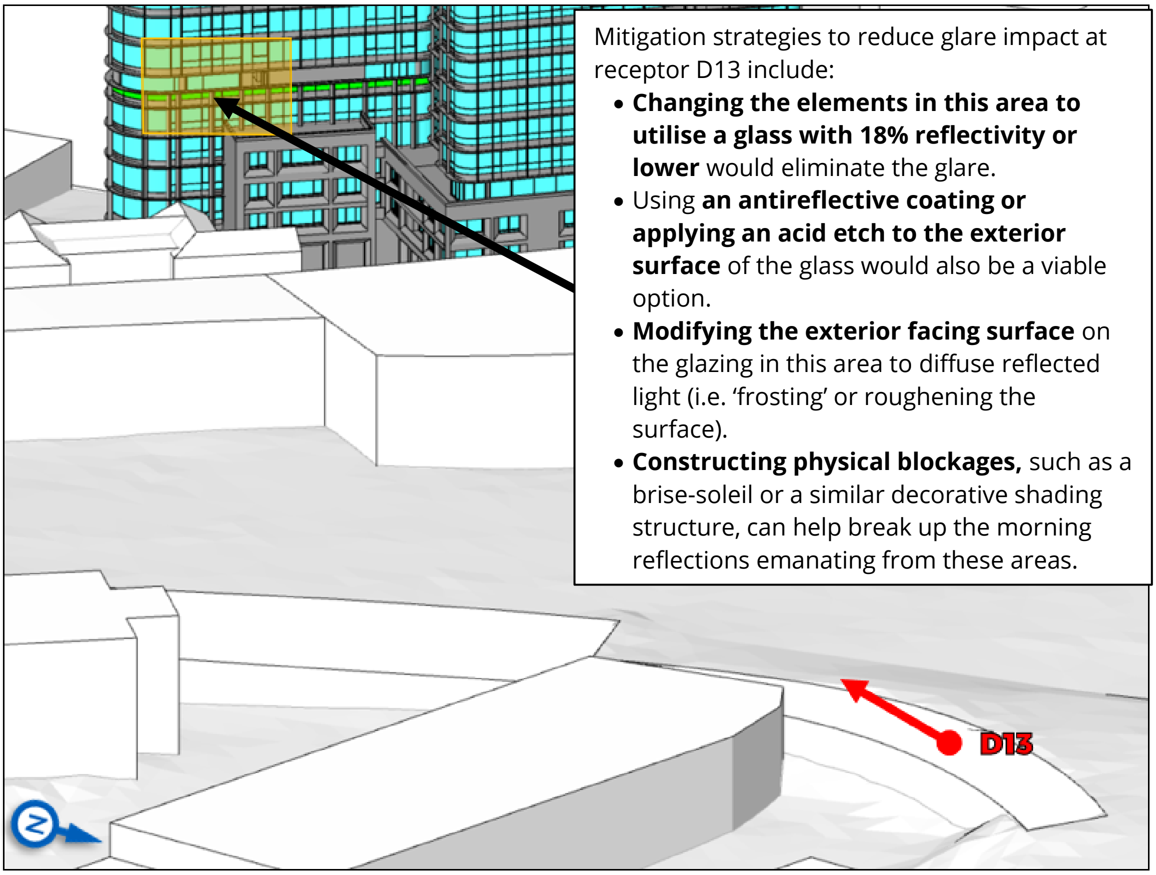


**Figure 8: Markup of Facade Locations for Glare Source at Receptor D13**

# 4 CUMULATIVE IMPACT ASSESSMENT

With regards to solar reflectivity, the future developments located immediately to the east and west of the Project (Figure 9) are expected to further reduce the extent of glazed surfaces that will be in the immediate line-of-sight for drivers. As a result, the reflection impacts on nearby drivers, especially for eastbound drivers along Lavender Street and those navigating the roundabout, are likely to be reduced. The position and height (6-storeys) of the future developments will likely reduce the risk of glare predicted at D2 and D13 by either blocking the incoming sunlight or intercepting the reflected sunlight. However, these future developments are not expected to significantly alter the risk of glare predicted for the D9, as the glare was predicted to be emanating from the south facade of the proposed Building B.


**Figure 9: Nearby Future Development markup in Magenta**
**(Image Overlay Credit: “SITE PLAN- PROPOSED CONTEXT: Drawing No. DA-0202/4”)**

# 5 GENERAL STATEMENT OF LIMITATIONS

This report, entitled "*64-66 Lavender Street & 3-7 Middlemiss Street, Lavender Street – Solar Reflectivity Study",* dated 11 *March 2026*, was prepared by RWDI Australia Pty Ltd ("RWDI") for CE Project Ventures Pty Ltd ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared.

Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilise the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

# APPENDIX A

RWDI REFLECTION CRITERIA

# APPENDIX A: RWDI REFLECTION CRITERIA

## Visual Glare

RWDI has extensive experience in the analysis and assessment of the impacts of sunlight and solar energy reflected from buildings[1].

This assessment was conducted in response to the requirements outlined in the Secretary's Environmental Assessment Requirements (SEARs) under Environmental Amenity as reproduced below:

"*Assess amenity impacts on the surrounding locality, including solar access, visual privacy, view loss and view sharing, as well as wind, lighting and reflectivity impacts. A high level of environmental amenity for any surrounding residential or other sensitive land uses must be demonstrated.* "

However, the SEARs does not provide a description around what constitutes a reflectivity impact or what would be considered a dangerous level of glare from the Project.

In light of the context described above, we have adopted the typical Australian criteria put forth by Hassall[2], which defines glare as occurring when the veiling luminance of a reflection exceeds 500 cd/m².

Veiling luminance was computed using the CIE General Disability Glare Equation[3]. This equation is a more robust formulation of the classical Stiles-Holladay glare equation that accounts for the effects of age and eye colour when predicting veiling luminance. This formulation remains valid for light sources between 0.1° and 100° away from the direction of view.

RWDI conservatively assumed a light-blue eye colour (pigmentation factor of 1.2) and an observer age of 62 years old for this work. Based on the most recent Australian Census, this age represents approximately the 80th percentile age for the residents of New South Wales. This means that in reality, veiling luminance would be lower than these predictions for 80% of the population.

It should be noted that the 500 cd/m² limit assumes an adaptation luminance corresponding to a dawn or dusk time frame and may be overly conservative during brighter parts of the day.

## References


1. Danks, R., Good, J., & Sinclair, R., "Assessing reflected sunlight from building facades: A literature review and proposed criteria." *Building and Environment*, 103, 193-202, 2016.

2. Hassall, D., "Reflectivity: Dealing with Rogue Solar Reflections" *University of New South Wales, 1991*.

3. Vos, J., et al. "CIE equations for disability glare." *CIE TC Report CIE 146* (2002): 2002.

# APPENDIX B

ANNUAL REFLECTION IMPACT DIAGRAMS

# APPENDIX B: ANNUAL REFLECTION IMPACT DIAGRAMS

## Presentation of Results

Results are illustrated using “annual impact diagrams”. These plots condense the minute-by-minute annual dataset into a single image. The vertical axis represents the time of the day, and the horizontal axis indicates the day of the year. A sample of such a diagram is shown in Figure B1.

Please note that the referenced times are in local standard time. When Daylight Saving Time is observed, the time should be shifted by an hour when appropriate.

The colours on this plot indicate when all reflections falling on a specific point were predicted and if the predicted veiling luminance exceeds the disability glare threshold (500 cd/m²) for an 80th percentile resident (62 years old) for New South Wales. Hatching (i.e., dark green areas) indicates when the sun would be within 30° of a motorist’s direction of view.

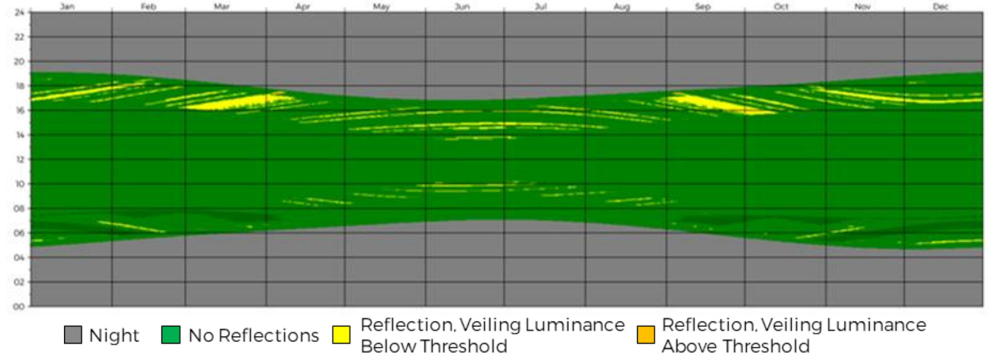


Figure B1: Annual Reflection Impact Diagram for Driver Receptor D2

## Receptor D1

Receptor D1 was chosen to assess the visual impact associated with solar reflections affecting eastbound train drivers north of Lavender Bay heading towards Lavender Bay Station.

The simulations indicated that intermittent reflections could fall on this point from April through September, primarily between 2:30PM-4:30PM AEST, and again between 8:00AM-10:00AM AEST.

The maximum veiling luminance predicted was 63 cd/m².

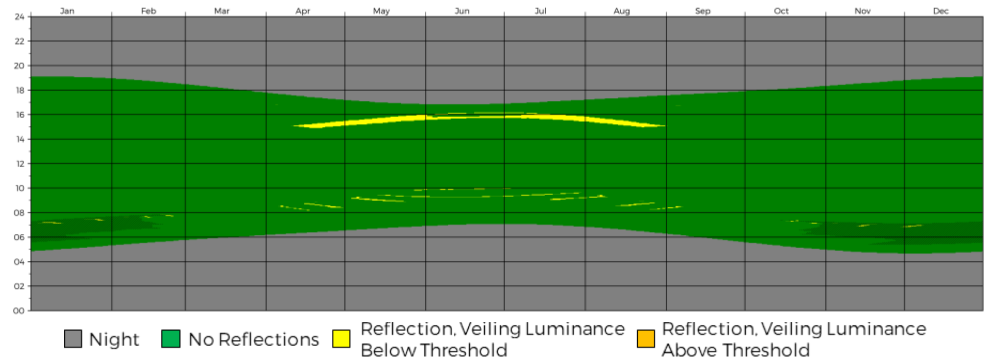


Figure B2: Annual Reflection Impact Diagram for Driver Receptor D1

## Receptor D2

Receptor D2 was chosen to assess the visual impact associated with solar reflections affecting eastbound drivers north of Lavender Bay heading towards Lavender Bay Station.

The simulations indicated that intermittent reflections could fall on this point throughout the entire year, primarily between 1:30PM-7:00PM AEST, and again between 5:00AM-10:30AM AEST.

Brief instances where veiling luminance exceeded 500 cd/m² (maximum predicted value was 822 cd/m²) were predicted in April and September between 5:00PM-5:30PM AEST. On average, these reflections lasted 5 minutes, totalling 75 minutes per year of potential glare, or 0.03% of the daytime.

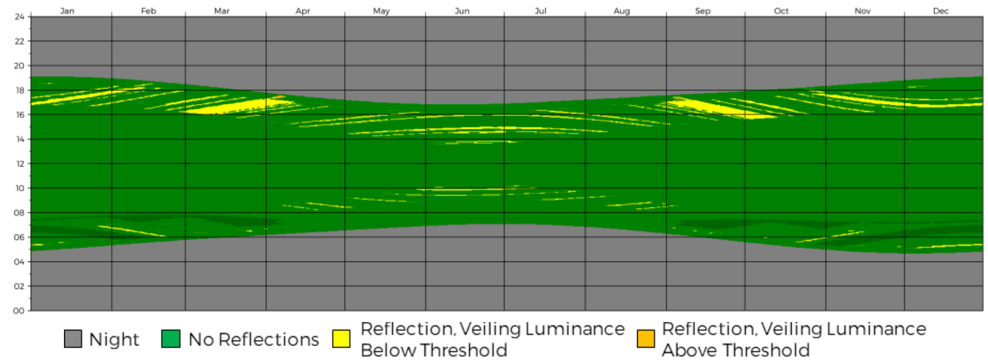


Figure B3: Annual Reflection Impact Diagram for Driver Receptor D2

## Receptor D3

Receptor D3 was chosen to assess the visual impact associated with solar reflections affecting eastbound drivers on Arthur Lane at Arthur Street intersection.

The simulations indicated that intermittent reflections could fall on this point throughout the entire year, primarily between 10:00AM-5:30PM AEST.

The maximum veiling luminance predicted was 283 cd/m².

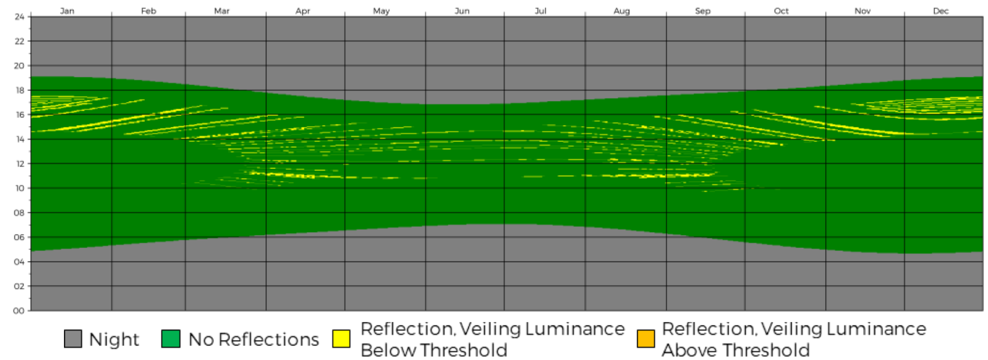


Figure B4: Annual Reflection Impact Diagram for Driver Receptor D3

## Receptor D4

Receptor D4 was chosen to assess the visual impact associated with solar reflections affecting northbound drivers on Harbourview Crescent at the Lavender Street intersection.

The simulations indicated that intermittent reflections could fall on this point throughout the entire year, primarily between 12:00PM-6:00PM AEST.

The maximum veiling luminance predicted was 193 cd/m².

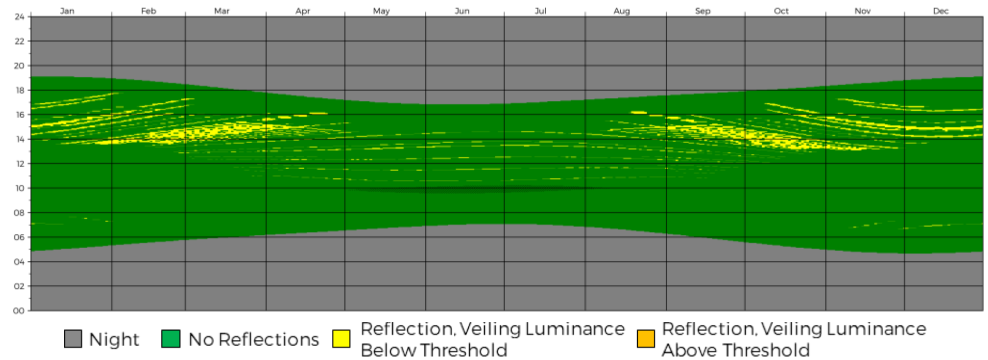


Figure B5: Annual Reflection Impact Diagram for Driver Receptor D4

## Receptor D5

Receptor D5 was chosen to assess the visual impact associated with solar reflections affecting southbound train drivers heading towards Milsons Point Station.

The simulations indicated that intermittent reflections could fall on this point throughout the entire year, with more frequent reflections predicted between 2:00PM-4:00PM AEST.

The maximum veiling luminance predicted was 154 cd/m².

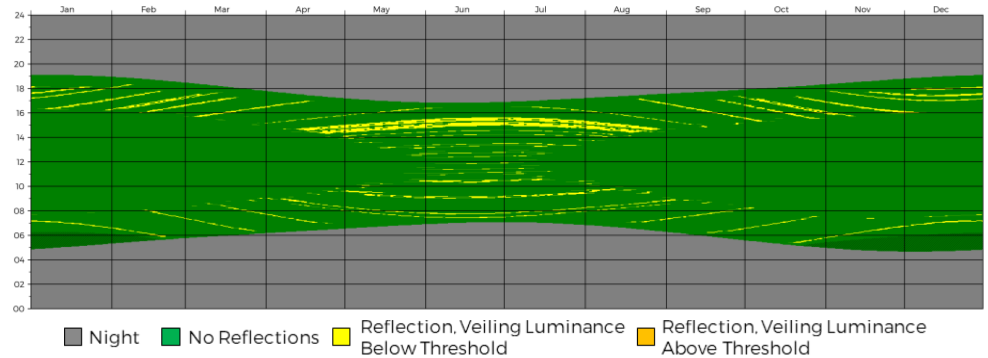


Figure B6: Annual Reflection Impact Diagram for Driver Receptor D5

## Receptor D6

Receptor D6 was chosen to assess the visual impact associated with solar reflections affecting southbound drivers on Middlemiss Street at Arthur Lane pedestrian exit.

The simulations indicated that intermittent reflections could fall on this point throughout the entire year, with more frequent reflections predicted between 3:00PM-5:00PM AEST.

The maximum veiling luminance predicted was 291 cd/m².

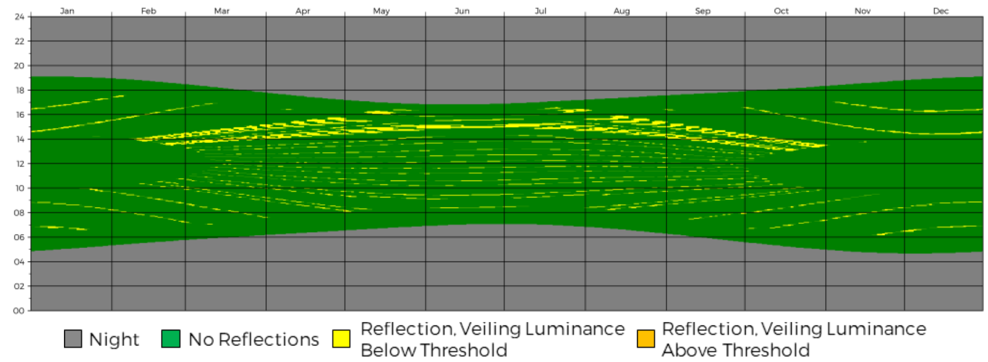


Figure B7: Annual Reflection Impact Diagram for Driver Receptor D6

## Receptor D7

Receptor D7 was chosen to assess the visual impact associated with solar reflections affecting northbound drivers on Cliff Street at Lavender Street intersection.

The simulations indicated that intermittent reflections could primarily fall on this point through the entire year between the hours of 5:30AM-11:30AM AEST and again between 4:30PM-6:30PM AEST from October through February.

The maximum veiling luminance predicted was 298 cd/m².

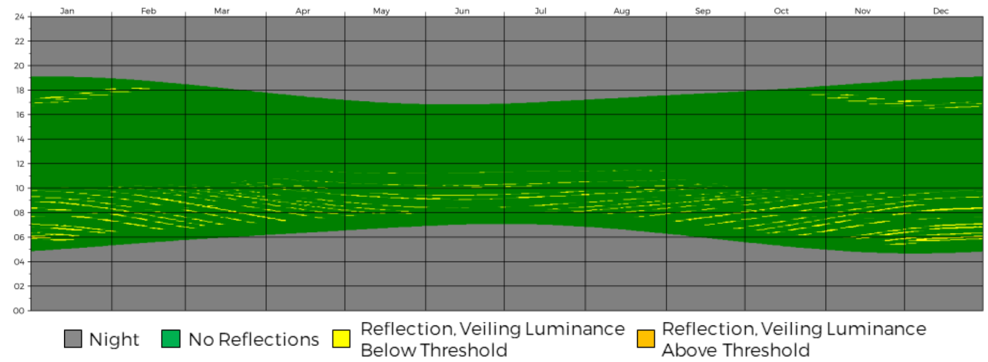


Figure B8: Annual Reflection Impact Diagram for Driver Receptor D7

## Receptor D8

Receptor D8 was chosen to assess the visual impact associated with solar reflections affecting northbound drivers on Alfred Street South at Lavender Street roundabout.

The simulations indicated that intermittent reflections could primarily fall on this point throughout the entire year, between 5:00AM-12:00PM AEST, and again between 3:00PM-6:30PM AEST from September through March.

The maximum veiling luminance predicted was 193 cd/m².

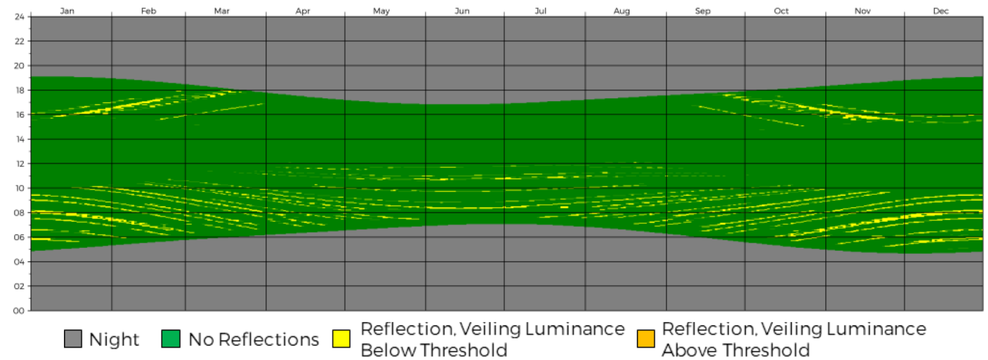


Figure B9: Annual Reflection Impact Diagram for Driver Receptor D8

## Receptor D9

Receptor D9 was chosen to assess the visual impact associated with solar reflections affecting northbound drivers on the Warringah Freeway, off ramp to Lavender Street.

The simulations indicated that intermittent reflections could primarily fall on this point throughout the entire year between 5:00AM-1:00PM AEST, and again between 3:00PM-6:00PM AEST from August through April.

Brief instances where veiling luminance exceeded 500 cd/m² (maximum predicted value was 786 cd/m²) were predicted in April and from August through September between 4:45PM-5:30PM AEST. On average, these reflections lasted 3 minutes, totalling 43 minutes per year of potential glare, or 0.02% of the daytime.

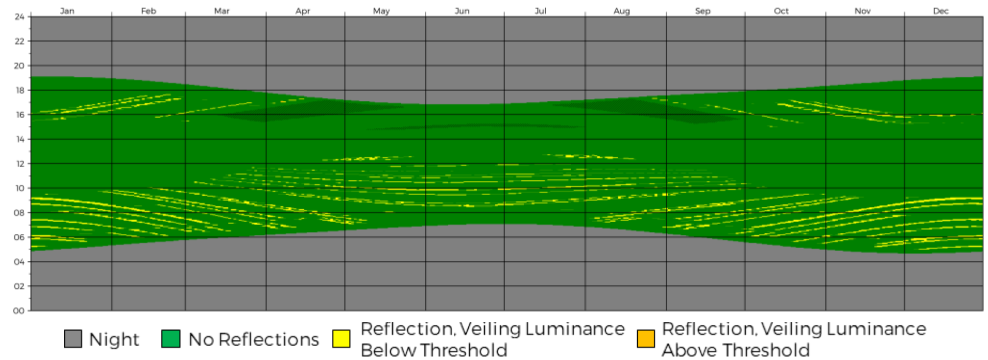


Figure B10: Annual Reflection Impact Diagram for Driver Receptor D9

## Receptor D10

Receptor D10 was chosen to assess the visual impact associated with solar reflections affecting southbound drivers on Warringah Freeway.

The simulations indicated that intermittent reflections could primarily fall on this point from January through April and again from August through December between 5:30AM-9:00AM AEST.

The maximum veiling luminance predicted was 34 cd/m².

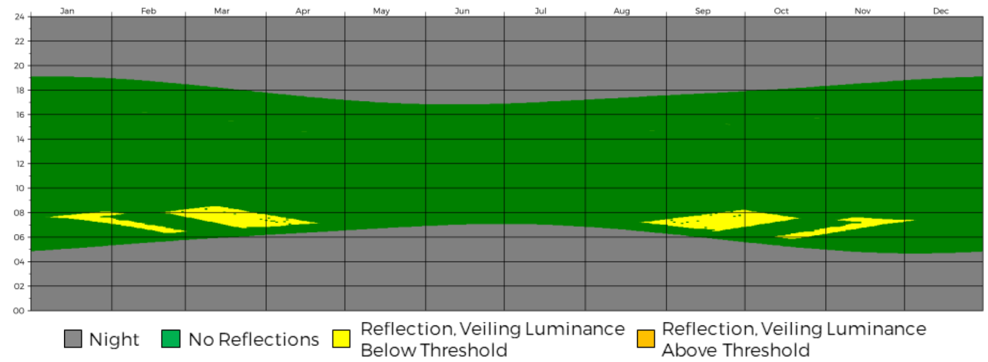


Figure B11: Annual Reflection Impact Diagram for Driver Receptor D10

## Receptor D11

Receptor D11 was chosen to assess the visual impact associated with solar reflections affecting northbound train drivers heading towards Milsons Point Station.

The simulations indicated that intermittent reflections could primarily fall on this point throughout the entire year between 5:00AM-12:00PM AEST, and again between 3:00PM-6:00PM AEST from September through early April.

The maximum veiling luminance predicted was 209 cd/m².

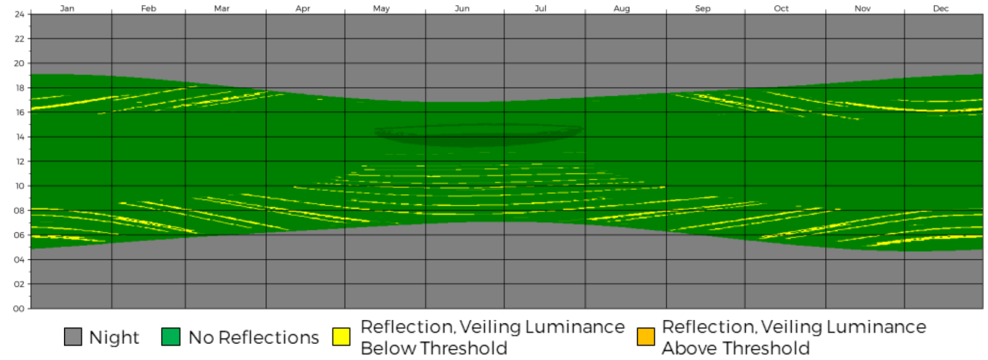


Figure B12: Annual Reflection Impact Diagram for Driver Receptor D11

## Receptor D12

Receptor D12 was chosen to assess the visual impact associated with solar reflections affecting northbound drivers on the Warringah Freeway.

The simulations indicated that intermittent reflections could primarily fall on this point throughout the entire year between the hours of 6:00AM-2:00PM AEST, and again between 3:00PM-5:00PM AEST from September through March.

The maximum veiling luminance predicted was 207 cd/m².

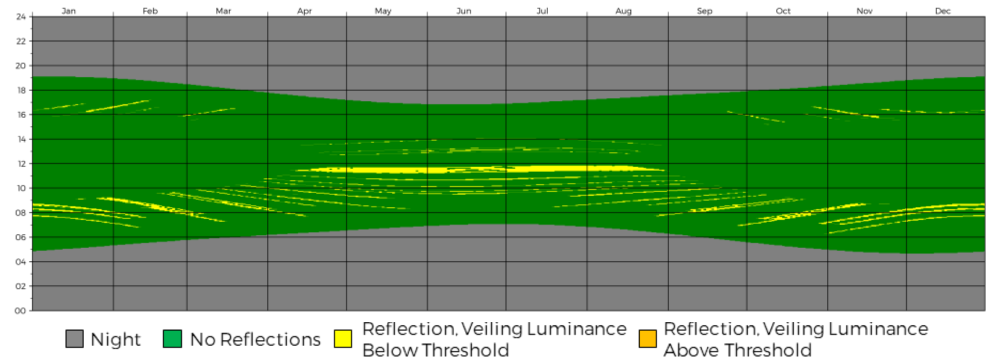


Figure B13: Annual Reflection Impact Diagram for Driver Receptor D12

## Receptor D13

Receptor D13 was chosen to assess the visual impact associated with solar reflections affecting westbound drivers on the High Street, off ramp to Cahill Expressway.

The simulations indicated that intermittent reflections could primarily fall on this point throughout the entire year, with more frequent reflections predicted between 5:00AM-10:00AM AEST.

Brief instances where veiling luminance exceeded 500 cd/m² (maximum predicted value was 517 cd/m²) were predicted in August between 6:45AM-7:00AM AEST. On average, these reflections lasted 1 minute, totalling 4 minutes per year of potential glare, or less than 0.01% of the daytime.

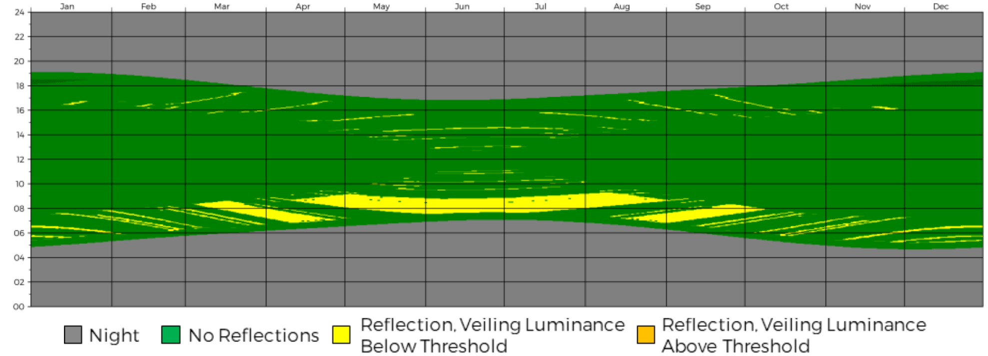


Figure B14: Annual Reflection Impact Diagram for Driver Receptor D13