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330 Church, Parramatta

"Waterfront Apartments"

Reflectivity Assessment

Report Number 610.12667-R3

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Reflectivity Assessment

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1 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR) has been engaged Meriton Apartments Pty Ltd (Meriton) to assess the environmental impact of a proposed new development at 330 Church Street, Parramatta also known as the “Riverfront Apartments” with respect to reflectivity of the development façades.

Solar reflectivity is covered by Section 5.3 of the Parramatta City Centre Development Control Plan (2007) and also by Part 03 of the State Environmental Planning Policy (SEPP65) which is known as the Residential Flat Design Code, they state:

- Visible light reflectivity from building used on the facades of new buildings should not exceed 20%

- Furthermore, new buildings and façades should not result in glare that causes discomfort or threatens safety of pedestrians or drivers

1.1 Development Site

The site is bounded on the west by Church Street and on the north by the Parramatta River. The surrounding area contains a mixture of low to high rise buildings

Figure 1 Site Location

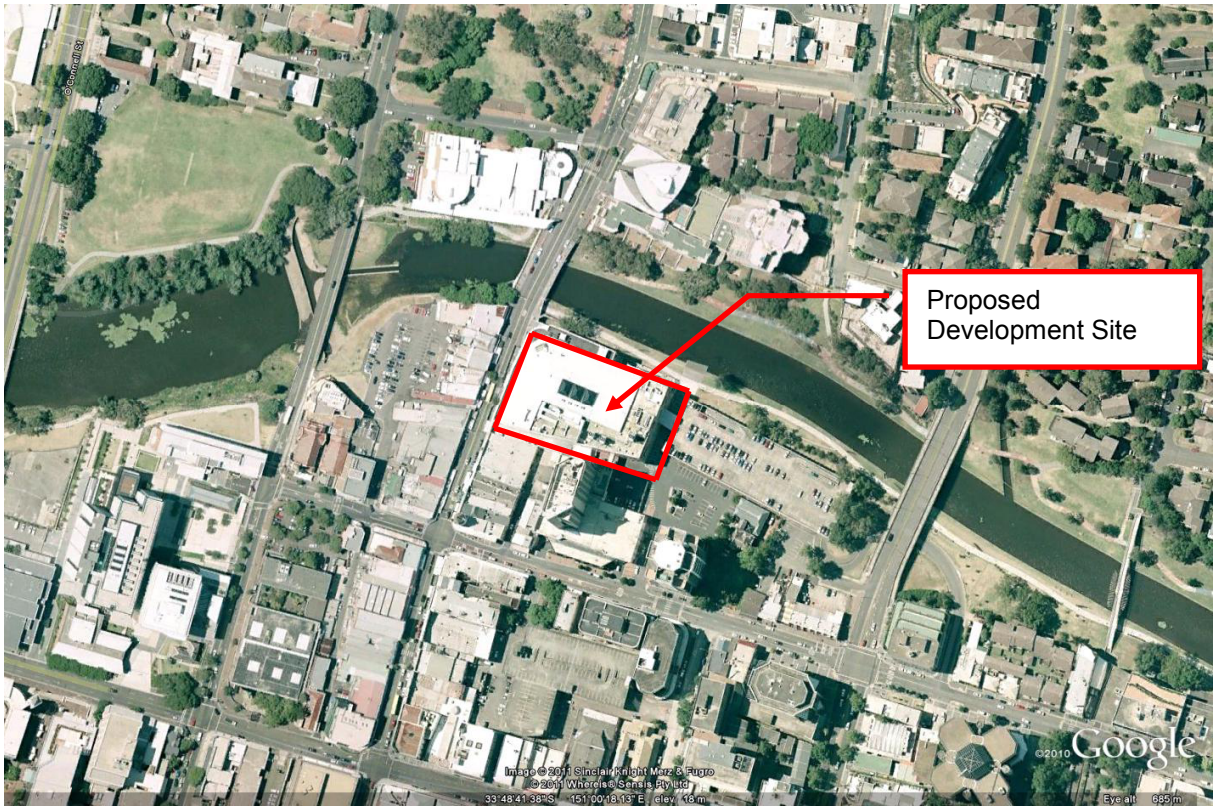

Image: Google

1.2 Proposed Development Description

The proposed development consists of 378 residential apartments which are accessible from the western core. The other 266 serviced apartments are accessible from the eastern core.

The apartments to be assessed in this study are the 378 residential apartments spaced over 53 floors in the western tower. Levels 1-27 have eight apartments per level, levels 28-33 have seven apartments per level and levels 34-53 have six apartments per level.

The exteriors of the towers are shown in Figure 2

Figure 2 Exterior view of the facades from the north side of the river

2 REFLECTIVITY IMPACT METHODOLOGY AND CRITERIA

2.1 Glare Characteristics

With respect to the reflectivity impact of the proposed development, the following issues are relevant:

- At large incident angles (typically greater than 70^{o}), the reflectivity of all glazing types *increases dramatically*. Thus, regardless of the glazing type, the potential for glare increases significantly when incoming solar rays can impact on a building close to parallel to the plane of the glazing.
- On a practical level, incoming solar rays with an altitude angle greater than 20^{o} are intersected and obstructed by a typical windscreen roof-line. In this Report, it is assumed that the sun altitude angle must be less than 25^{o} to have the potential to produce a traffic disability glare event.
- Pedestrian discomfort glare can occur when the sun altitude is greater than 25^{o}. However, in most such instances, a pedestrian has the ability to adjust his/her line of sight to a more horizontal view away from the glare source.
- It is assumed that glare events can only occur when the solar altitude is greater than about 3^{o}, enabling the entire solar disc to be visible.

2.2 Glare Acceptability Criteria

The criteria used within this report to assess the acceptability or otherwise of glare events are the limiting values of the so-called *"Threshold Increment Value"*, or *TI Value,* of the reflection condition, as shown in **Table 1**.

Table 1 Threshold Increment (TI) Criteria

Glare Category	Classification	TI Acceptable Limit
Disability Glare (for motorists)	Major Roads	10
	Minor Roads	20
Discomfort Glare (for pedestrians)	Pedestrian Crossings	2
	Other Footpath Locations	3

2.3 Reflectivity Methodology

SLR Consulting carries out reflectivity TI calculations using a three-stage screening process:

In the first stage, road traffic conditions are examined to exclude reflection conditions which are *"not possible"*.

- For example, traffic along streets can be one-way. Thus, it may not be possible for drivers to be impacted by solar reflections in certain instances if the reflected ray off a building of interest is in the same direction as the direction of travel of the motorist, i.e. the incoming reflection is from "behind" the motorist.
- The orientation of a building may mean that certain situations are not possible.

In the second stage, the potential for reflections is established by carrying out a "baseline" screening calculation.

- In the "baseline" analysis, the facade of interest is assumed to consist totally of reflection-producing glazing. The reflectivity coefficient of the glazing to be used is however taken into account in these baseline screening calculations.

If a reflection potential is established, accurate TI values are calculated in the third stage:

- Detailed TI calculations utilise the actual details of the facade geometry, taking into account recessing of glazing, blockage produced by horizontal and vertical shading elements, sections of masonry facade, etc.

3 GLARE IMPACT ANALYSIS

The first assumption is that all glazing will have a reflectivity coefficient of less than 20%.

3.1.1 Reflections impacting on Church Street

Due to the design traffic heading north approaching the development along Church Street has the potential for adverse glare.

Western façades

Reflection conditions associated with the development's northeast facade that have been examined are:

There is the possibility for reflections off the western side of the western tower and the western side of the

3.1.2 Reflections impacting on Phillip Street

Due to the design traffic moving west along Phillip Street has the potential for adverse glare.

Southern façades

Reflection conditions associated with the development's western facade that have been examined are:

There is the possibility for adverse reflections off the southern side of the eastern tower.

3.2 Initial Calculations

3.2.1 Church Street

Preliminary calculations show that (assuming uninterrupted glazing flush with podium and tower perimeters) that there will be no glare for motorists travelling north on Church Street.

3.2.2 Phillip Street

Preliminary calculations show that (assuming uninterrupted glazing flush with tower perimeter) that there will be no glare for motorists travelling west on Phillip Street.

3.2.3 Further Analysis

From the plans provided and Figure 2 it can be seen that the building exterior is not 100% glazing and is broken up in a number of ways:

- Recessed areas in the building facades (balconies)
- Towers are setback from the road
- Blades, screens and shielding elements on the facades
- Other materials used on the facades have low reflectivity

These factors contribute further to a lack of disability glare around the development.

3.3 Pedestrian Discomfort Glare

SLR has also assessed the pedestrian areas around the site and it has been concluded that there will be no discomfort glare for pedestrians at road crossings surrounding the site.

Again by taking into account the facade designs, actual materials used and the low reflectivity coefficient of the glazing any glare will be further reduced.

Pedestrians are also able to adjust their line of sight to reduce the effects of discomfort glare.

3.4 Glare Intensity

The calculations undertaken to investigate TI values around the site show that the local glare intensity, expressed as Cd/m^2, for the calculated areas is below the council limiting criterion of 500 Cd/m^2.

4 CONCLUSIONS

SLR has been engaged Meriton to assess the environmental impact of a proposed new development at 330 Church Street, Parramatta also known as the “Riverfront Apartments” with respect to reflectivity of the development façades.

The reflectivity assessment of the site shows that there will be no elements within the development facades that are capable of causing adverse glare events at surrounding locations for motorists (disability glare) or pedestrians (discomfort glare) under any reflection condition. This is due to the following factors:

- The development's glazing will have a reflectivity coefficient of *less than 20%*.
- Use of low reflectivity materials reduces the surface area available to reflect solar rays
- The building design provides shielding from high angle solar rays on many parts of the residential façade through the features mentioned in Section 3.2.3.

In summary, through a combination of choice of glazing, facade design, facade orientation and surrounding thoroughfare orientation, no facades of the development will produce reflections causing either disability glare for passing motorists or unacceptable discomfort glare for passing pedestrians