

13-23 GIBBONS STREET, REDFERN

Reflectivity Assessment

Prepared for:

The Trust Company (Australia) Limited ATF WH Gibbons Trust
c/-Allen Jack + Cottier
79 Myrtle Street
CHIPPENDALE 2008

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with The Trust Company (Australia) Limited ATF WH Gibbons Trust (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
610.18313-R04-v1.0	13 December 2018	James Cleary	Neihad Al-Khalidy	Neihad Al-Khalidy

EXECUTIVE SUMMARY

SLR Consulting Pty Ltd (SLR) has been engaged The Trust Company (Australia) Limited ATF WH Gibbons Trust (Gibbons Trust) to assess the environmental impact of a proposed development at 13-23 Gibbons Street, Redfern with regard to the reflectivity impact on the surrounding roads, railway corridors and pedestrian pathways. This assessment will form part of the Development Application to Sydney City Council.

Initial calculations showed that with an uninterrupted glazed façades there were no instances of glare being calculated.

Further analysis assumes that as the design is progressed a combination of factors outlined in **Section 3** will improve reflectivity conditions. It has been recommended that glazing have a reflectivity coefficient of less than 20%.

In summary, analysis of the initial design shows that there were no adverse glare conditions recorded. Through a combination of choice of glazing, other façade materials and façade design, it is likely that adverse glare conditions should not be experienced as a result of the proposed development.

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1 Introduction

SLR Consulting Pty Ltd (SLR) has been engaged The Trust Company (Australia) Limited ATF WH Gibbons Trust (Gibbons Trust) to assess the environmental impact of a proposed development at 13-23 Gibbons Street, Redfern with regard to the reflectivity impact on the surrounding roads, railway corridors and pedestrian pathways. This assessment will form part of the Development Application to Sydney City Council.

1.1 Site and Surrounds

Figure 1 Aerial Image of Site Location



The proposed site is bounded to the east by William Lane, to the south by Margaret Street and to the west by Gibbons Street, with a future development proposed to the north. Surrounds of the site are predominantly low level buildings, with there being some higher level development close to the site to the north and west.

1.2 Proposed Development Description

The proposed design consists of the following features:

- Basement with proposed hydroponics farming;
- Ground Level with common area, retail unit, bike shop and office space;
- Level 2 with internal and external common areas;
- Level 4 with internal and external common areas; and
- Building tower with approximately 500 student units.

Figure 2 Site Plan (Ground Floor)



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°), 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° 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° to have the potential to produce a traffic disability glare event.
- Pedestrian discomfort glare can occur when the sun altitude is greater than 25°. However, in most such instances, a pedestrian has the ability to adjust their 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 30°, 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 (for pedestrians)	Glare Pedestrian Crossings	2
	Other Footpath Locations	3

2.3 Reflectivity Methodology

Reflectivity TI calculations have been carried out 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 Assessment

3.1 Traffic Disability Glare

The proposed development has frontages along Margaret Street to the south and Gibbons Street to the west. It is assumed that there will be glazed areas on all these facades. The lower level facades to the west will receive shielding from existing and proposed landscaping along Gibbons Street. The built environment surrounding the site is predominantly low-level with some higher level development from the north clockwise around to the west. **Figure 3** and **Figure 4** show possible reflection conditions.

For the purposes of this analysis it is assumed that the development's glazing will have a reflectivity coefficient of less than 20 percent.

For this report Wyndham Street, Gibbons Street and Regent Street can be considered major roads, therefore the TI value will be required to be less than 10. All other roads in question can be considered as minor roads, which require a calculated TI value to be less than 20.

Figure 3 Possible Reflection Conditions – Ground and Lower Levels



Figure 4 Possible Reflection Conditions – Upper Levels



3.1.1 Reflectivity Impact Summary

Table 2 summarises potentially adverse reflectivity conditions for the proposed site, inclusive of impacted traffic and associated building facades. Referenced reflectivity conditions are illustrated in **Figure 3** and **Figure 4**.

Table 2 Potentially Adverse Reflectivity Conditions

Street	Traffic Direction	Time	Facades
Boundary Street	- East bound	- Afternoon rays - Morning rays	- South - West
Cope Street	- North bound	- Afternoon rays - Morning rays	- East - South
Gibbons Street	- North bound	- Afternoon rays - Morning rays	- South - West
Locomotive Street	- East bound	- Afternoon rays - Morning rays	- South - West

Street	Traffic Direction	Time	Facades
Margaret Street	- East bound - West bound	- Afternoon rays - Morning rays	- East - South
Phillip Street	- West bound	- Morning rays	- East
Regent Street	- South bound	- Morning rays	- East
Wyndham Street	- North bound	- Afternoon rays - Morning rays	- South - West

3.1.2 Initial Calculations

Table 3 details preliminary reflectivity calculations and any exceedances of the associated acceptable TI value for motorists and general traffic. Preliminary calculations assume uninterrupted glazing flush with the building façade.

Table 3 Initial Reflectivity Calculations Assuming Uninterrupted Glazing

Street	Acceptable TI Value Limit	Max Traffic TI Calculation
Boundary Street	20	No Value Occurrence
Cope Street	20	No Value Occurrence
Gibbons Street	10	No Value Occurrence
Locomotive Street	20	No Value Occurrence
Margaret Street	20	No Value Occurrence
Phillip Street	20	No Value Occurrence
Regent Street	10	No Value Occurrence
Wyndham Street	10	No Value Occurrence

3.1.3 Further Analysis

Upon further refinement of the current scheme, it is evident the building exterior will not be 100 percent glazing and will contain a number of features that should reduce the solar reflectivity off the façades. These include:

- Materials other than glazing used. There will be areas of the façade that are not glazed.
- There will be articulations and setbacks in the building façade which will provide further shading to glazed areas.
- Planned and existing vegetation around the site and neighboring streets.
- The model used assumed that there were no surrounding buildings. In reality it can be seen that there is significant building density around the site to the north, east, south and west. It is likely that these buildings will provide shielding at certain times of the year, particularly to lower levels. As seen in Figure 10.

These will help to reduce the amount of glare experienced by motorists.

3.2 Pedestrian Discomfort Glare

The initial calculations did not indicate that there will be glare for pedestrians around the proposed development. Further, reflectivity conditions will be improved due to reasons highlighted in **Section 4.1**.

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

4 Conclusion

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