



**HEGGIES**

REPORT 10-7707-R1

Revision 0

**Garvan St Vincent's Campus  
Cancer Centre  
Glare Impact Report**

PREPARED FOR

Capital Insight Pty Ltd  
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29 APRIL 2009

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# Garvan St Vincent's Campus Cancer Centre Glare Impact Report

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DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
10-7707-R1	Revision 0	29 April 2009	Disa Oqvist	Dr Peter Georgiou	Dr Neihad Al-Khalidy



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# 1 INTRODUCTION

Heggies Pty Ltd (Heggies) has been engaged by Capital Insight Pty Ltd to conduct a reflectivity study of the proposed Garvan St Vincent's Campus Cancer Centre in Darlinghurst, Sydney.

## 1.1 Development Site

An aerial view of the development site is shown in **Figure 1**. The proposed development site is bounded by Victoria Street on the west, Burton Street on the south and Liverpool Street on the north. It will be located south of the Green Park Hotel and linked to the existing Garvan Institute. The premises comprise of:

- An 11 storey campus cancer centre and
- An underground carpark

**Figure 1 Aerial View of Proposed Development Site**



Image Courtesy of Google Maps

Primary facade materials for the proposed development include the following:

- The glazing is assumed to have a reflectivity coefficient of *less than 15%*.
- The other main facade materials will be precast concrete, metal mesh panels and metal artworks panels with minimal reflectivity.
- Some facade designs include metal louvers.



## 1.2 Development Description

The 11 level proposed development includes:

- Basement – 5 levels of Underground Car Park
- Level 3 – Laboratories
- Level 4 – Retail Area
- Level 5 – Reception, Administration and Consultation Areas
- Level 6 – Clinical Data Management
- Level 7 to 14 – Research Laboratories

## 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 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°, 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

Heggies 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 many CBD 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, ie the incoming reflection is from “behind” the motorist.

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

### 3.1 Traffic Disability Glare

#### 3.1.1 Reflections Impacting on Victoria Street

It is firstly noted that the development's glazing will have a reflectivity coefficient of *less than 15%*.

The potential risk of disability glare for motorists will only be considered for southbound traffic since Victoria Street is one way.

The height of the proposed development means that only southbound traffic within 85 m of the facades has the potential for adverse glare.

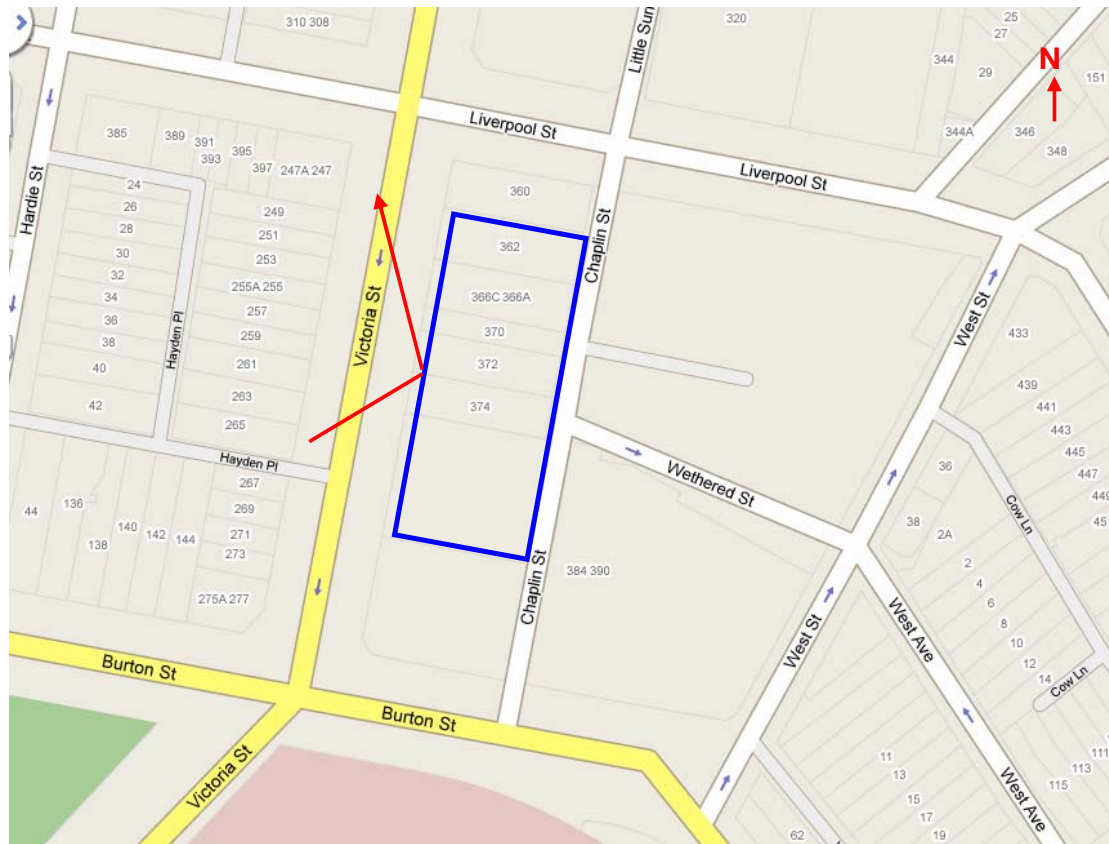
#### Western Facade

Reflection conditions associated with the development's western facade that have been examined are (refer **Figure 2**):

- Low altitude late afternoon rays in the summer striking the facade from the west-southwest to with reflections towards the north along Victoria Street.



Figure 2 Potential Reflective Glare Conditions for Western Facade



In relation to the late afternoon reflections, the baseline TI screening calculations (ie assuming uninterrupted glazing flush with building faced perimeter) indicated no glare potential for motorists travelling southbound. Further detailed calculations are therefore not carried out.

### Northern Facade

The northern facade of the development will be fitted with metal mesh panels limiting the potential for the facade to cause glare.

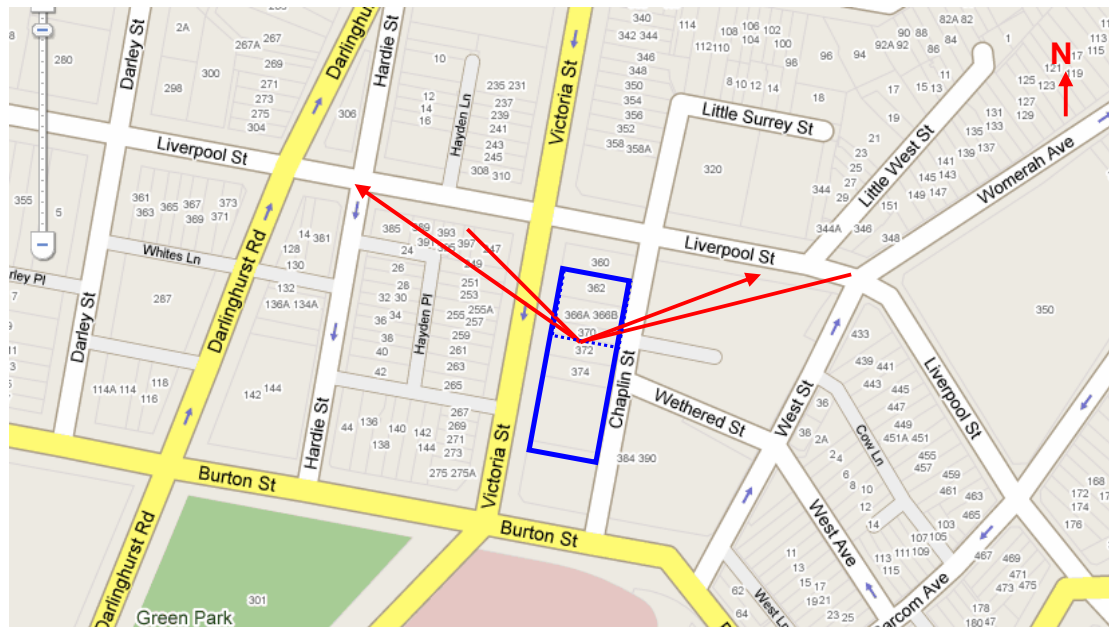
The Green Park Hotel is located in front of the northern facade and only the upper part of the facade will thus have potential to cause adverse glare.

Reflection conditions associated with the development's northern facade that have been examined are (refer **Figure 3**):

- Low altitude morning rays in the winter striking the facade from the east-northeast with reflections towards the west-northwest.



Figure 3 Potential Reflective Glare Conditions for Northern Facade



In relation to the early morning reflections, the baseline TI screening calculations (ie assuming uninterrupted glazing flush with building faced perimeter) indicated that motorists travelling southbound on Victoria Street experience limited glare. The calculated TI values are well below the limit for what is acceptable.

Calculations at all relevant locations yield negligible or non-existent TI values for reflections onto Victoria Street and detailed calculations are therefore not carried for the northern facade.

### 3.1.2 Reflections Impacting on Liverpool Street

It is firstly noted that the development's glazing will have a reflectivity coefficient of *less than 15%*.

The height of the development presents a potential for adverse glare for traffic within 85 m of the facades.

#### Western Facade

Reflection conditions associated with the building's western facade that have been examined are (refer **Figure 2**):

- Low altitude late afternoon rays in the summer striking the facade from the west-southwest to with reflections towards the north.

In relation to the late afternoon reflections, the baseline TI screening calculations indicated no glare potential for motorists travelling westbound. Further detailed calculations are therefore not carried out.

#### Northern Facade

The Green Park Hotel is located in front of the northern facade and only the upper part of the facade will thus have potential to cause adverse glare.



Reflection conditions associated with the development's northern facade that have been examined are (refer **Figure 3**):

- Low altitude morning rays in the winter striking the facade northeast with reflections towards the northwest along Liverpool Street.
- Low altitude mid afternoon rays in the winter striking the facade from the northwest with reflections towards the northeast along Liverpool Street.

In relation to the morning reflections, calculations show that motorists travelling eastbound will experience no glare from the northern facade of the development.

In relation to the mid afternoon reflections, the baseline TI screening calculations (ie assuming uninterrupted glazing flush with building faced perimeter) indicated that motorists travelling westward on Liverpool Street experience limited glare. The calculated TI values are however well below the limit for what is acceptable.

Calculations at all relevant locations yield negligible or non-existent TI values for reflections onto Liverpool Street and detailed calculations are therefore not carried out for the northern facade.

### 3.1.3 Reflections Impacting on Burton Street

It is firstly noted that the development's glazing will have a reflectivity coefficient of *less than 15%*.

The height of the development presents a potential for adverse glare for traffic within 85 m of the facades.

Only the upper part of the southern and eastern facades have the possibility to cause adverse glare on Burton Street, since the lower parts of the facades are blocked by the existing Garvan Institute.

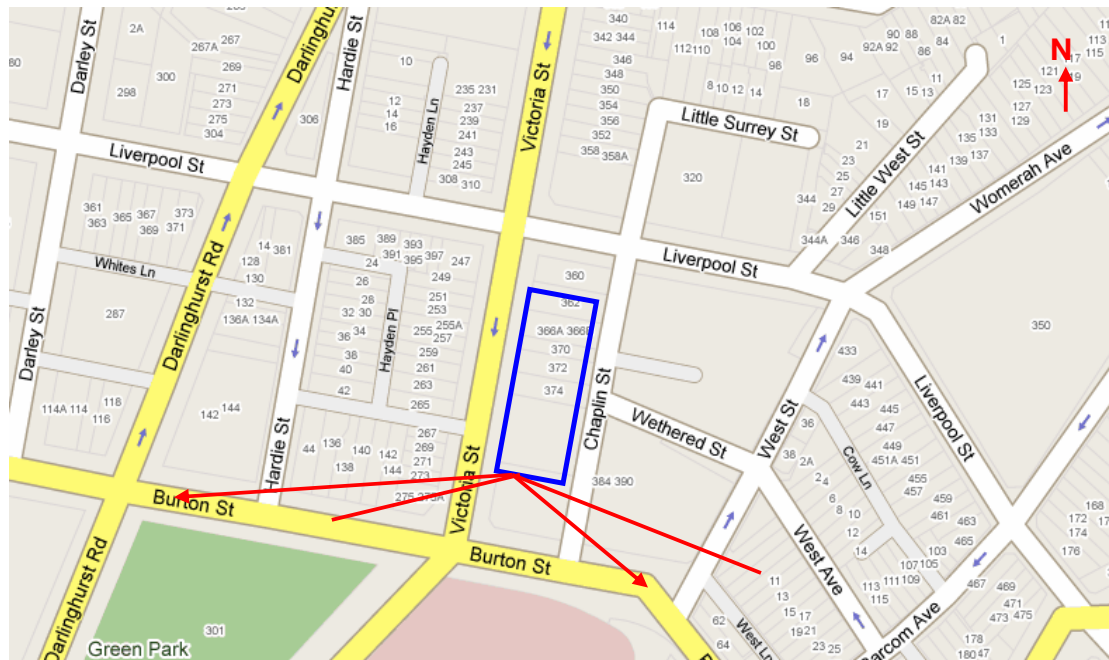
#### Southern Facade

Reflection conditions associated with the development's southern facade that have been examined are (refer **Figure 4**):

- Low altitude early morning rays in the summer striking the facade from southeast with reflections towards the southwest along Burton Street.
- Low altitude late afternoon rays in the summer striking the facade from the southwest with reflections towards the southeast along Burton Street.



Figure 4 Potential Reflective Glare Conditions for Southern Facade



In relation to the early morning reflections, the baseline TI screening calculations (ie assuming uninterrupted glazing flush with building faced perimeter) indicated that motorists travelling eastbound on Burton Street will experience no glare from the southern facade of the building.

In relation to the late afternoon reflections, calculations show that motorists travelling westbound experience no glare from the southern facade of the building.

Calculations at all relevant locations yield negligible or non-existent TI values for reflections onto Burton Street and detailed calculations are therefore not carried out for the southern facade.

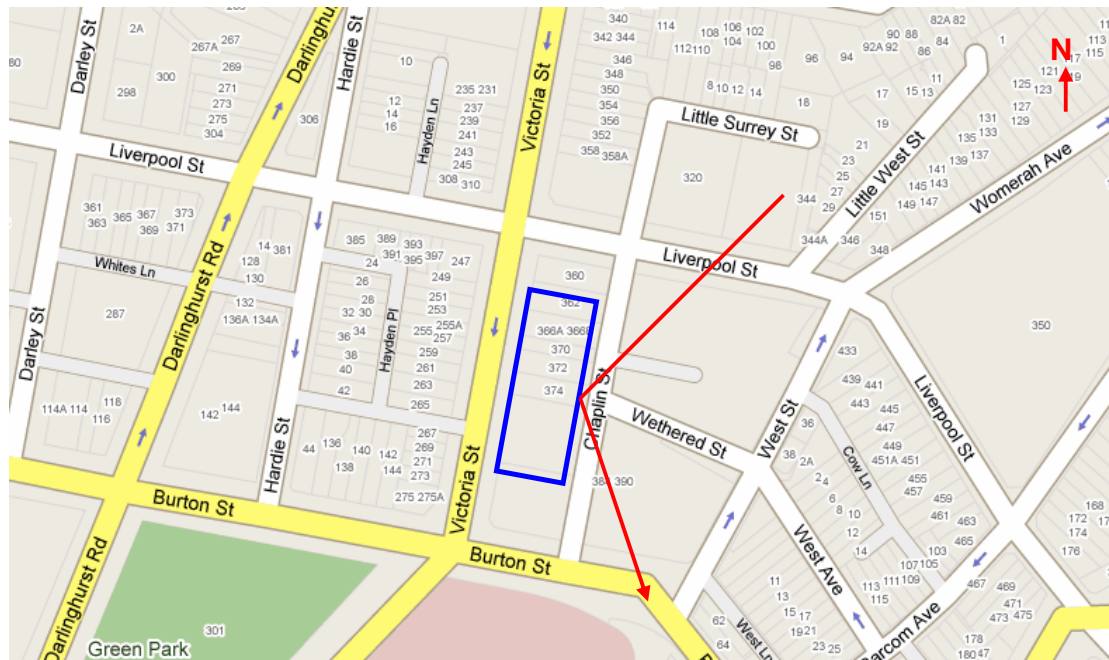
### Eastern Facade

Reflection conditions associated with the development's eastern facade that have been examined are (refer Figure 5):

- Low altitude early morning rays in the winter striking the facade from northeast with reflections towards the southeast towards Burton Street.



Figure 5 Potential Reflective Glare Conditions for Eastern Facade



In relation to the early morning reflections, the baseline TI screening calculations indicated that motorists travelling eastbound on Burton Street will experience limited glare from the eastern facade of the building. The calculated TI values are below the limit for what is acceptable.

Calculations at all relevant locations yield negligible or non-existent TI values for reflections onto Burton Street and detailed calculations are therefore not carried out.

### 3.2 Pedestrian Discomfort Glare

The above calculations were repeated to examine glare conditions affecting pedestrian locations, especially at nearby traffic intersections.

Preliminary calculations (facade consisting of only reflective glazing) showed potential risk of pedestrian discomfort glare from the north facade of the development for pedestrians facing south at the Liverpool Street-Victoria Street pedestrian crossing. The potential for discomfort glare exist pre noon in the winter. Pedestrians are however expected to be able to adjust there line of sight.

The potential for discomfort glare also exist for the western facade for pedestrians crossing Burton Street at the Burton Street-Victoria Street pedestrian crossing. Reflections occur in the winter at noon for a period of 5 minutes and pedestrians are expected to adjust their line of site for this short period.

The potential for discomfort glare for pedestrians is therefore considered limited.

### 3.3 Glare Intensity

The calculations undertaken to investigate TI values around the site show that the local glare intensity, expressed as  $Cd/m^2$ , in surrounding public areas is well below the Sydney City Council limiting criterion of  $500 Cd/m^2$ .



## 4 REFLECTIVITY - CONCLUSIONS

The Reflectivity Analysis of the development 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 facades will have a reflectivity coefficient of *less than 15%*.
- The proposed buildings dimensions and limited number of streets affected.
- The facade design of the development involves a mix of materials which limit the potential to generate significant glare, including:
  - Other facade materials which cannot create glare, eg precast concrete, metal mesh panels and metal artwork panels.
  - Metal louvers covering several sections of the facades.

*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.*