Visual Impact Assessment Report

Cronulla Sharks Redevelopment

For: Bluestone Capital Ventures No 1 P/L

Visual Impact Photomontage Methodology

BACKGROUND

This document was prepared by Virtual Ideas to describe the processes used to create the visual impact photomontages and illustrate the accuracy of the results.

Virtual Ideas is a highly experienced 3D visualisation company which commonly prepares material for both application and court use, and is familiar with requirements to provide 3D visualisation media that will communicate the visual impact of proposed developments. Our methodologies and results have been inspected by various court appointed experts in a variety of cases and have always been found to be accurate and acceptable.

OVERVIEW

The process of creating accurate photomontage renderings begins with the creation of an accurate, real world scale digital 3D model. We then take site photographs from known locations and place cameras in the digital 3D model that match the real world position of the site photography.

By matching the lens properties of the cameras in the digital 3D software, to that of the real world photography, and rotating the cameras in the software so that surveyed points in 3D space align with the corresponding points on the photograph, we can create a rendering that is correct in terms of position, scale, rotation, and perspective. Time and data information is also recorded during the site photography so that accurate lighting conditions can be reproduced in the 3D rendering.

A digital image is then rendered from the camera in the 3D software application that is then superimposed into the real world photo to generate an image that represents accurate form and visual impact.

DESCRIPTION OF COLLECTED DATA

To create the 3D model and establish accurate reference points for alignment to the photography, a variety of information was collected. This includes the following:

1) 3D Sketchup model of the residential development
   - Created by: Turner and Associates
   - Supplied by: Turner and Associates
   - Format: SKP file
   - Content: Initial 3D model that was then modified by Virtual Ideas to show the latest design

2) 3D Autocad model of the commercial development
   - Created by: Scott Carver & Associates
   - Supplied by: Scott Carver & Associates
   - Format: DWG file
   - Content: Initial 3D model that was then modified by Virtual Ideas to show the latest design

3) Ortho-corrected aerial photography of the site and surrounds
   - Created by: Department of Lands
   - Supplied by: Department of Lands
   - Format: ecw
   - Content: Ortho-corrected aerial photography

4) 3D model of the site and surrounding terrain
   - Created by: Department of Lands
   - Supplied by: Department of Lands
   - Format: DWG
   - Content: 3D model of topography at 2m intervals

5) Digital survey of the current site conditions and built form
   - Created by: TBC
   - Supplied by: TBC
   - Format: DWG
   - Content: Extensive location and levels of current site and built form.

6) GPS Data from site photo location (used for water and bridge photos only)
   - Created by: Richie Cohen of Virtual Ideas (VI Photos)
   - GPS: Garmin GPS Map 62s

7) Site photography
   - Created by: Richie Cohen and Grant Kolln of Virtual Ideas (VI Photos)
   - Camera: Canon 5D (full frame sensor)
   - Lens: 17-40mm
   - Format: JEPG & CR2 file
   - Content: High resolution photo

CREATION OF THE DIGITAL 3D MODEL

Creating the surrounding terrain model

Using our software application (3D Studio Max) we imported the Lands 3D topographical CAD data and created a three dimensional terrain model at real world scale. This model was referenced back to MGA co-ordinates using a common reference point that all further models and drawings were referenced to. The ortho-corrected aerial photography was then placed in scene to match this model giving us an accurate source for referencing unsurveyed camera positions in both position and height.

Creating the new development 3D model

The 3D models supplied by the architects were imported into our software and positioned to match the survey and the design R.L.s. Changes to the design were then made and Virtual Ideas modified the 3D model to suit the new design. The latest models have been reviewed and signed off by the design team.

Creating the Survey Alignment points

The survey drawing was also imported into the scene and once again moved the to MGA reference point. (centre of the existing roundabout)
As this survey was only in 2D, and points that were visible in the photo and suitable to use for alignment were detached from the survey drawing and moved up to their annotated RL. Only points that were surveyed have been extracted from this drawing and at no time have Virtual Ideas guessed or extrapolated to create these alignment lines.

SITE PHOTOGRAPHY

Site photography was taken from the positions agreed with Bluestone Capital Ventures No 1 P/L. The positions were selected to fulfil the Director General Requirements provided by the Department of Planning and Infrastructure, and additional locations were selected by Bluestone Capital Ventures No 1 P/L to illustrate impact from points they felt necessary.

The lens selection for each shot was based on the following criteria:

- The on-site location for the photograph should be as close as possible to the instructed location.
- The entirety of the proposed buildings should be in view in each photo where possible.
- Surrounding existing buildings and features should also be visible in each photomontage to allow for fair and accurate comparison to existing built form.

The lens size selected for each shot ranges from 17-40mm. For further explanation of digital photography and the human eye refer to Appendix A.

In most cases we consider that a 17-24mm lens is a fair representation of the focal length of the human eye. It is difficult to define the exact focal length of the eye as we have to consider the distance to the subject and peripheral vision. There are many studies to support that 17mm is acceptable. Also many scientists consider 20-24mm acceptable when looking at a specific item in the distance. - Please see appendix A.

CREATION OF PHOTOMONTAGES

The positions of the real world photography were located in the 3D scene using survey data, lands data and GPS data.

Cameras were then created in the 3D scene to match the locations and height of where the photographs were taken from and the lens data stored in the metadata of the photograph. The cameras was then aligned in rotation so that the points of the 3D model aligned with their corresponding objects that are visible in the photograph.

A realistic sun & skylight light system was then created in the 3D scene and matched to the precise time and date of when each photograph was taken.

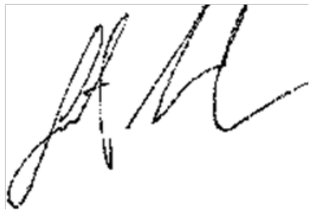
3D renderings of the new buildings were then created from the selected cameras, at the exact pixel dimensions and aspect ration of the original digital photograph. (4368 x 2912 pixels)

The 3D renderings were then place into the digital photography, and masked out where existing form appeared in front of the buildings.

In conclusion, it is my opinion as an experienced 3D architectural visualisation professional that the images provided accurately portray the level of visibility and impact of the built form with respect to the surrounds.

Yours sincerely

Grant Kolln,
Director Virtual Ideas



MAP SHOWING CAMERA LOCATIONS

VIEW 1 - Captain Cook Drive (Looking East)
Photo taken from surveyed point on kerb.

VIEW 2 - Captain Cook Drive (Looking West)
Photo taken from surveyed point on kerb.

VIEW 3 - Captain Cook Drive (Looking East)
Photo taken from surveyed point on kerb.

VIEW 4 - Wooloware Drive (Looking North)
Photo taken on kerb line perpendicular to residential boundary of two homes.

VIEW 5 - Bate Bay Road (Looking West)
Photo taken on kerb line perpendicular to the end of a residential wall.

VIEW 6 - Captain Cook Bridge (Looking South East)
Photo taken on pedestrian crossing at high point of bridge

VIEW 7 - Dolls Point (Looking South)
Photo taken from edge of picnic shelter

VIEW 8 - Water (Looking South)
Closest accessible point by boat (oyster leases)

VIEW 9 - Water (Looking South)
Location that site could be viewed from Towra Point

VIEW 10 - Water (Looking South)
Location close to beach at Towra Point reserve

VIEW 11 & 11A - Castlewood Ave (Looking North)
Location from 2nd level balcony of residence

View 1 - Captain Cook Drive (Looking East)

Original photo

Image showing alignment of the camera to the photograph with the 3D survey lines shown in red.

Photographic data

Location:	Captain Cook Drive - Surveyed point on kerb
Camera R.L.	4.0 m
Lens:	17mm
Dimensions:	4368 x 2912
Date:	05/07/2011 1:37 PM
Camera:	Canon EOS 5D

Rationale for lens selection

The rationale for using a 17mm lens was to capture show the building in it location with respect to the existing vegetation..

Photomontage showing future development

View 2 - Captain Cook Drive (Looking West)

Original photo

Image showing alignment of the camera to the photograph with the 3D survey lines shown in red.

Photographic data

Location:	Captain Cook Drive - Surveyed point on kerb
Camera R.L.	4.0 m
Lens:	22mm
Dimensions:	4368 x 2912
Date:	09/07/2011 9:52 AM
Camera:	Canon EOS 5D

Rationale for lens selection

The rationale for using a 22mm lens was to capture show the building in it location with respect to the existing stadium wall and vegetation..

Photomontage showing future development

View 3 - Captain Cook Drive (Looking East)

Original photo

Image showing alignment of the camera to the photograph with the 3D survey lines shown in red.

Photographic data

Location:	Captain Cook Drive - Surveyed point on footpath
Camera R.L.	4.18 m
Lens:	21mm
Dimensions:	4368 x 2912
Date:	05/07/2011 12:01 PM
Camera:	Canon EOS 5D

Rationale for lens selection

The rationale for using a 21mm lens was to show the path vanishing and also capture a significate amount of the retail facade.

Photomontage showing future development

Original photo

Image showing alignment of the camera to the photograph with the 3D suvey lines shown in red.

Photographic data

Location:	On edge of kerb in line with residential boundary
Camera R.L.	8.0 m
Lens:	22mm
Dimensions:	4368 x 2912
Date:	05/07/2011 11:27 AM
Camera:	Canon EOS 5D

Rationale for lens selection

The rationale for using a 22mm lens was to capture show the building in it location with respect to the existing vegetation..

Photomontage showing future development

Original photo

Image showing alignment of the camera to the photograph with the 3D suvey lines shown in red.

Photographic data

Location:	On edge of kerb in line with residential wall opposite
Camera R.L.	24.4 m
Lens:	40mm
Dimensions:	4368 x 2912
Date:	09/07/2011 10:04 AM
Camera:	Canon EOS 5D

Rationale for lens selection

The rationale for using a 40mm lens was to show as much of the development as possible from this far location, without appearing like an unnaturally zoomed in view.

Photomontage showing future development

Original photo

Image showing alignment of the camera to the photograph with the 3D suvey lines shown in red.

Photographic data

Location:	On pedestrian path at high point of bridge
Camera R.L.	10.0 m
Lens:	40mm
Dimensions:	4368 x 2912
Date:	05/07/2011 2:26 PM
Camera:	Canon EOS 5D

Rationale for lens selection

The rationale for using a 40mm lens was to show as much of the development as possible from this far location, without appearing like an unnaturally zoomed in view.

Photomontage showing future development

Original photo

Image showing alignment of the camera to the photograph with the 3D suvey lines shown in red.

Photographic data

Location:	From edge of picnic shelter
Camera R.L.	8.0 m
Lens:	40mm
Dimensions:	4368 x 2912
Date:	04/07/2011 12:49 PM
Camera:	Canon EOS 5D

Rationale for lens selection

The rationale for using a 40mm lens was to show as much of the development as possible from this far location, without appearing like an unnaturally zoomed in view.

Photomontage showing future development

Original photo

Image showing alignment of the camera to the photograph with the 3D suvey lines shown in red.

Photographic data

Location:	Closest accessible point to site by boat (Oyster leases)
Camera R.L.	2.0 m
Lens:	40mm
Dimensions:	4368 x 2912
Date:	04/07/2011 1:36 PM
Camera:	Canon EOS 5D

Rationale for lens selection

The rationale for using a 40mm lens was to show as much of the development as possible from this far location, without appearing like an unnaturally zoomed in view.