

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 the 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:

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| <p>1) Approved Concept plan (Mod 8) drawings</p> <ul style="list-style-type: none"> • Created by: RHSP Architects • Supplied by: Lend Lease • Format: DWG file • Content: Plan and elevation of approved concept plan with RL's indicated <p>2) Ortho-corrected aerial photography of the city of Sydney and surrounds</p> <ul style="list-style-type: none"> • Created by: Department of Lands • Supplied by: Department of Lands • Format: ecw • Content: Ortho-corrected aerial photography <p>3) Digital terrain model of the city of Sydney and surrounding suburbs</p> <ul style="list-style-type: none"> • Created by: Department of Lands • Supplied by: Department of Lands • Format: DWG • Content: 3D contours of the ground plane only (no buildings) <p>4) Surveyed 3D model of the city of Sydney buildings and ground plane</p> <ul style="list-style-type: none"> • Created by: AAM Hatch • Supplied by: Lend Lease • Format: DWG • Content: 3D model of the city of Sydney buildings and ground plane <p>5) 3D model of the Approved Concept Plan</p> <ul style="list-style-type: none"> • Created by: RHSP Architects • Supplied by: Lend Lease • Format: DWG • Content: 3D model of the Barangaroo buildings | <p>5) 3D model of the Approved Crown Sydney Hotel Resort Design</p> <ul style="list-style-type: none"> • Created by: Wilkinson Eyre Architects • Supplied by: Wilkinson Eyre Architects • Format: Rhino • Content: 3D model of the Crown Sydney Hotel Resort <p>6) Site photography</p> <ul style="list-style-type: none"> • Created by: Luke Kolln and Rick Mansfield of Virtual Ideas (VI Photos) • Format: JPEG file • Content: High resolution photo <p>7) 3D model of the Approved Barangaroo South Buildings</p> <ul style="list-style-type: none"> • Created by: RHSP Architects • Supplied by: RHSP Architects • Format: DWG • Content: 3D model of the Barangaroo buildings <p>8) 3D model of the Proposed Residential Tower Buildings</p> <ul style="list-style-type: none"> • Created by: Renzo Piano Building Workshop • Supplied by: Renzo Piano Building Workshop • Format: DWG • Content: 3D model of the Residential Towers buildings |
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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 project drawings are being referenced to. The ortho-corrected aerial photography was then mapped to this model giving us a relatively accurate source for referencing camera positions in both position and height.

Creating the Sydney city buildings 3D model

To have sufficient survey data that would allow us to accurately align the 3D model to the photography, a surveyed 3D model was purchased from AAM hatch and positioned into the 3D scene using the common MGA reference point as the origin. In addition, a surveyed ground plane from AAM Hatch was also purchased and positioned under the buildings.

The building survey was created by AAM Hatch using photogrammetric mapping equipment and techniques.

Creating the Barangaroo buildings 3D model

The Barangaroo building models were created with information supplied by RHSP, Lend Lease and the Barangaroo Delivery Authority (BDA). At all points in the creation of these models, careful attention was taken to ensure that the footprint and heights of the buildings were correct.

SITE PHOTOGRAPHY

Site photography was selected to fulfil the Secretary’s Environmental Assessment Requirements (SEARs) provided by the Department of Planning and Environment.

The SEARs requirements for photomontage photography have been defined as follows: “using human eye focal lengths (50mm at 35mm FX format and 46 angle of view) from long range, medium range and short range positions so that they can be assessed with respect to visibility, visual absorption capacity and visual impact rating, as well as a comparison analysis with ‘before’, ‘MOD 8’ and ‘proposed’”.

This request was reviewed during the Mod 4 application and it was determined that due to the scale of the Barangaroo buildings and the specific locations of the DGR photomontages, it was not effective to use 50mm lenses in all circumstances as this would not produce a result where the buildings could be evaluated in respect to the surroundings. In addition in most cases it was not possible to take medium range and long range options for each view as the topography vegetation, and surrounding built form did not accomodate.

The specific requirment for the lens selection for each shot was based on the following criteria that was agreed to with Lend Lease and the Department of Planning and Environment, and was deemed acceptable by the Department of Planning for all previous Barangaroo Concept Plan Modifications and detailed building applications.

- All photographs should be taken with a Canon 5D, which is 35mm FX format.
- The on-site location for the photograph should be as close as possible to the instructed location.
- The entirety of the proposed buildings, including the approved concept plan envelope should be in view in each photo where possible.
- Surrounding existing buildings 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, and in additon crop markes have been added to the photographs to illustrate the extents of longer lens sizes.

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 the lands and AAM Hatch 3D models, and the orthorectified photography.

Cameras were then created in the 3D scene to match the locations and height of where the photographs were taken from. The lens data stored in the metadata of the photograph was also used for accuracy. The cameras were 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.

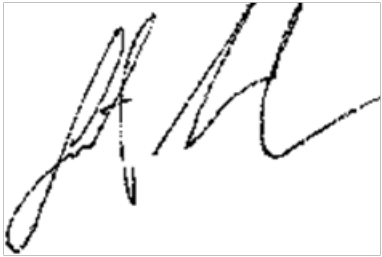
3D renderings of the new buildings were then created from the selected cameras at the exact pixel dimensions and aspect ratio of the original digital photograph (4368 x 2912 pixels and 5616 x 3744 pixels).

The 3D renderings were then placed 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 included in this assessment accurately portray the level of visibility and impact of the built form with respect to the surrounds.

Yours sincerely

Grant Kolln,
Director - Virtual Ideas



CV OF GRANT KOLLN, DIRECTOR OF VIRTUAL IDEAS

Personal Details

Name:

Grant Kolln

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Suite 71, 61 Marlborough St, Surry Hills, NSW, 2010

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Relevant Experience

2003 - Present	Director of 3D visualisation studio Virtual Ideas. During this time I have worked on many visual impact studies for legal proceedings in various different types of industries including architectural, industrial, mining, landscaping, and several large public works projects. This experience has enables us to create highly accurate methodologies for the creation of our visual impact media and report creation.
1999 - 2001	Project manager for global SAP infrastructure implementation - Ericsson, Sweden
1999 - 1999	IT consultant - Sci-Fi Channel, London
1994 - 1999	Architectural Technician, Thomson Adsett Architect, Brisbane QLD.

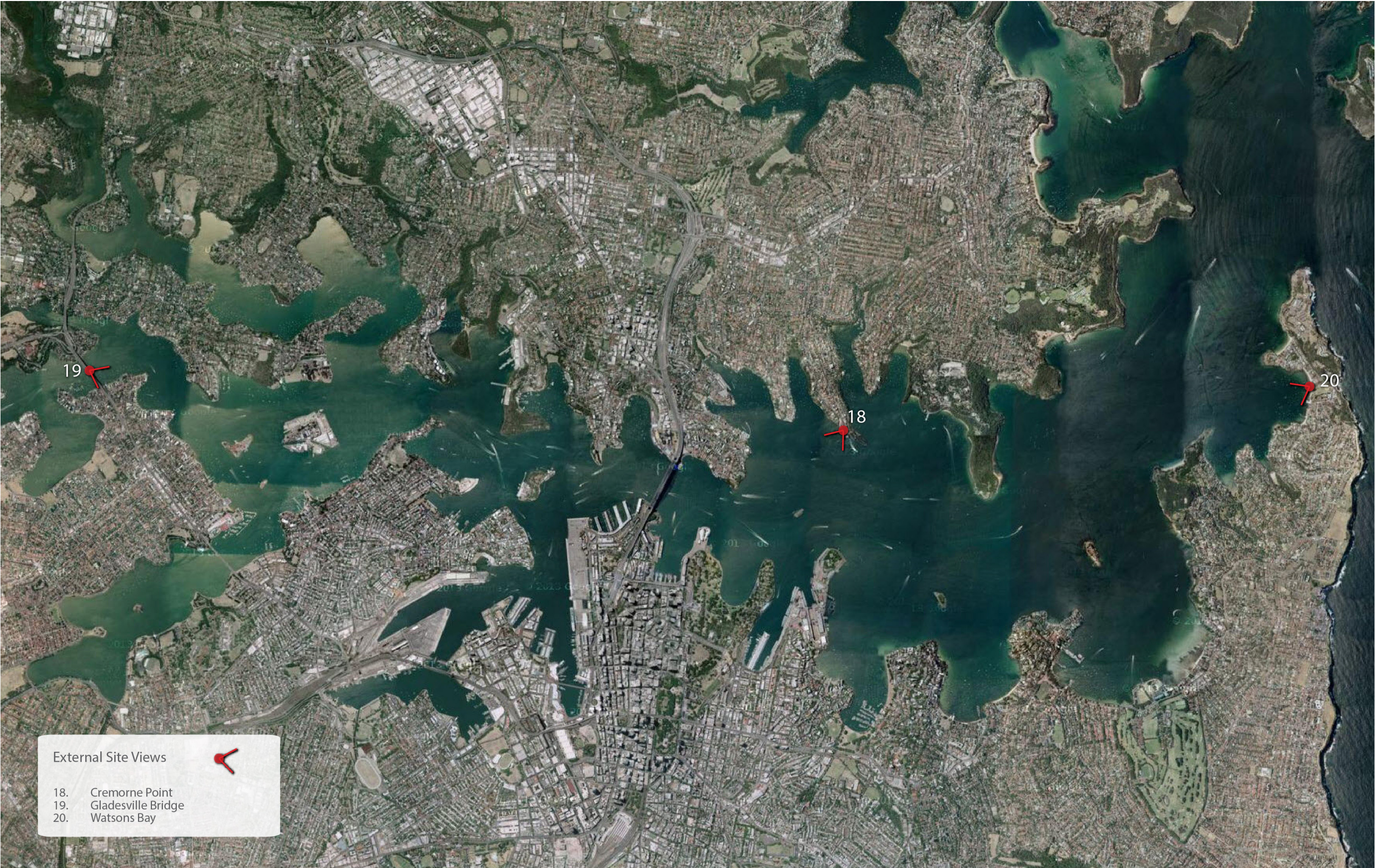
Relevant Education / Qualifications

1997	Advanced Diploma in Architectural Technology. Southbank TAFE, Brisbane, QLD
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MAP SHOWING CAMERA LOCATIONS



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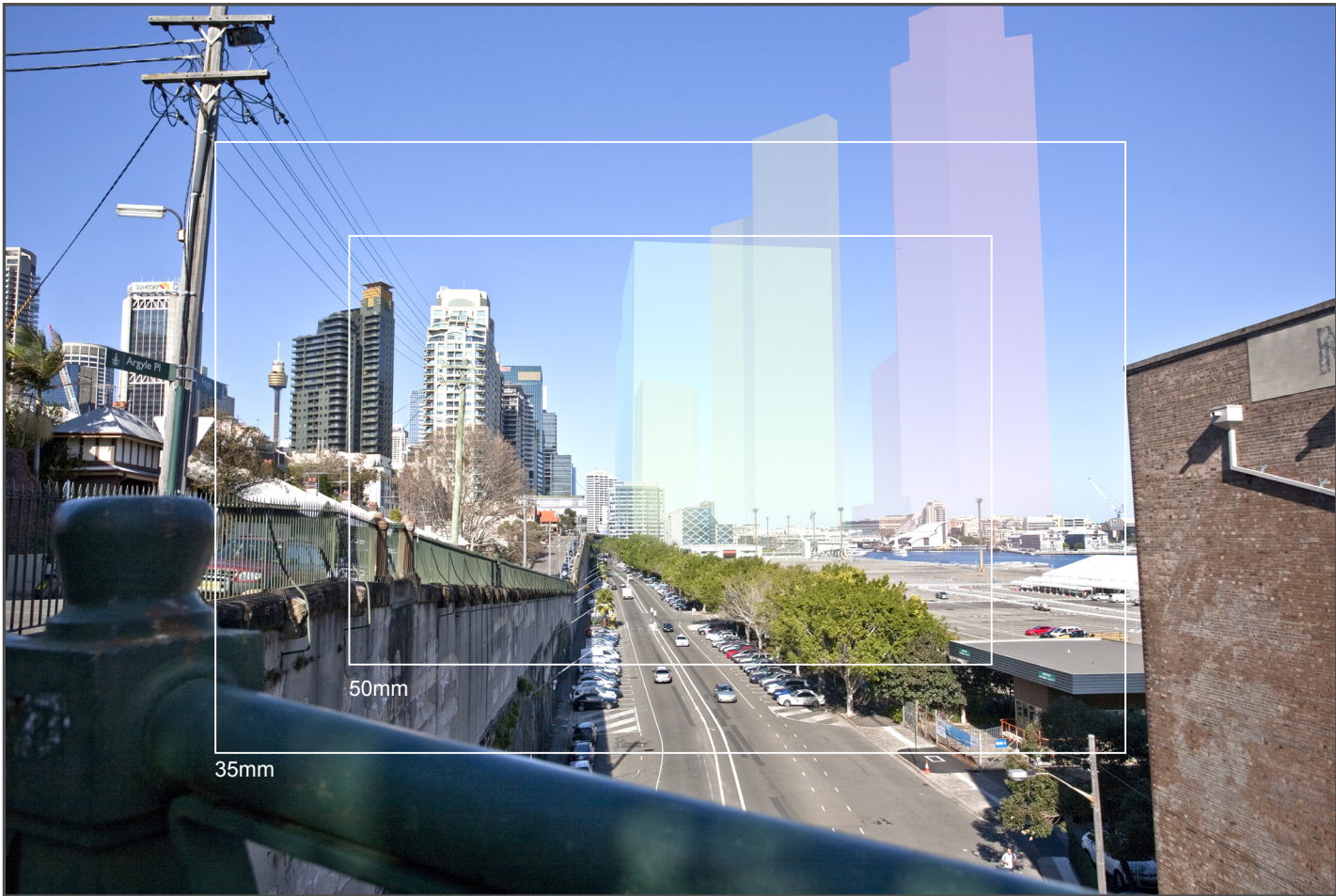


Image showing massing of the Mod 8 Concept Plan

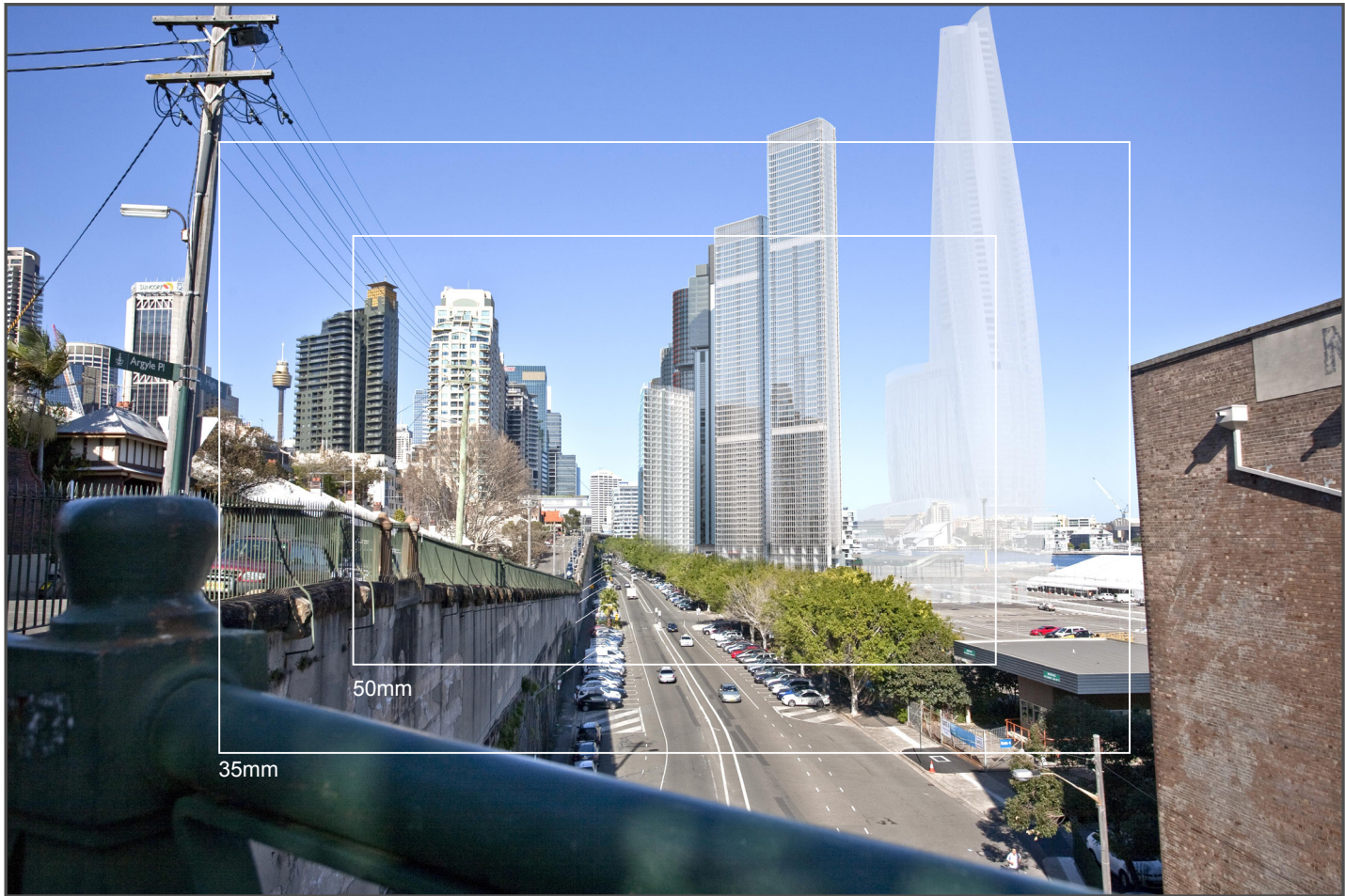


Image showing Proposed design.

Photographic data

Location: HICKSON ROAD
Camera R.L. 17.5m
MGA coords: X: 333734.347, Y: 6252097.407
Lens: 24mm
Dimensions: 4368 x 2912
Date: 18/06/2010 12:30 PM
Camera: Canon EOS 5D

Rationale for lens selection

The rationale for using a 24mm lens was to capture the heights of several existing city buildings to the left of the image, and also show the building immediately to the right of the viewer. Including the handrail in this image also visually describes that the viewer is standing on the bridge.

Overlays showing longer lenses have been included to illustrate the effect of a longer lens. Note that using a longer lens from the same location will have the same effect as cropping the wider image.