APPENDIX 19B

VISUAL SIMULATION INFORMATION

MBIE – Shipyard Project, Marsden Point

Virtual View

Visual Simulation Information

VIRTUALVIEW
3D VISUALISATION SPECIALISTS

INTRODUCTION

Qualifications and experience

1. My name is Jason Michael Blair.
2. I am a 3D Visualisation Specialist for Virtual View Limited. The company specialises in computer simulation.
3. I hold a Diploma in Architectural Draughting from Otago Polytechnic, awarded in 2001. I have worked for Virtual View since the beginning of 2007.
4. I have been involved in the field of 3D visualisation for a total of 19 years, mostly specialising in photo simulations for visual assessment work. This has included working on numerous development proposals throughout New Zealand and presenting expert evidence at council and Environment Court hearings.
5. Virtual View's role includes working with planners, engineers, surveyors, architects, landscape architects and interior designers. The company uses photo simulations through to full computer-generated 3D video simulations to illustrate the concept of any proposed development – all of which are to virtual scale and location as would be viewed in the real world.

Involvement in project

6. Virtual View was engaged by MBIE to produce visual simulations of the proposed Northland Dry Dock Project. I worked on and oversaw the production of these photo simulations. I was assisted by other Virtual View staff, all of whom have extensive training and experience in 3D modelling and the production of photo simulations.

Expert Witness Code of Conduct

7. I confirm that I have read the Expert Witness Code of Conduct set out in the Environment Court's Practice Note 2014. I have complied with the Code of Conduct in preparing this evidence and agree to comply with it while giving oral evidence before the Hearings Panel. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

INFORMATION FOR THE PREPARATION OF THE VISUAL SIMULATIONS

8. To create the 3D model for the simulations, Virtual View used the following information and data:
   A. Viewpoint locations were chosen by Stephen Brown of Brown NZ Limited.
   B. All photos were taken by Jason Blair of Virtual View Ltd.
   C. Viewpoint locations were surveyed by Virtual View Ltd using a hand-held Leica Zeno FLX100 GPS. The recorded positions had an accuracy of 2 cm.
   D. Terrain data of the Whangārei area was downloaded from Land Information New Zealand. The terrain data included 1m Lidar Digital Elevation Model (DEM), 1m Lidar Digital Surface Model (DSM), and the New Zealand 8m DEM. Aerial photographs were also downloaded from Land Information New Zealand.
   E. The above terrain data was used to create a 0.25m DEM terrain model for the site and surrounding area. A 0.25m DSM terrain model was also created to assist with camera alignment and foreground vegetation identification.
   F. A 3D model of the dock design was supplied by Beca.
   G. Indicative buildings, noise barrier fences, light poles, trees and a public fishing jetty were modelled and positioned on the dock in accordance with the supplied 2D plans.
   H. Various arrangements of 3D ship models and cranes were created to represent different operational scenarios.

METHODOLOGY FOR THE PREPARATION OF PHOTO SIMULATIONS

September 2024

1.0 Overview

The main objective of a photo simulation is to provide an image that, as realistically as possible, conveys the modification or change caused by a proposed activity. The most appropriate technical methodology has been applied to ensure the accuracy of what is depicted, in terms of its relative position, elevation, scale, and appearance. Photo simulations can never replace the real experience of being at a location, but they are a useful tool to assist in the decision making process. To achieve a photo simulation, a 3D model is rendered into a series of two-dimensional photographs.

2.0 On-Site Photography and Reference Points

On Site photography - survey marked camera location.

A series of photographs are taken from a specified location using a full-frame Digital SLR Camera with a 50mm lens. The camera is mounted to a tripod with a panoramic head to ensure a consistent overlap of approximately 40%.

Reference Points are also identified during the site visit. Reference points are fixed objects that are selected from within the captured photos. Reference points can include, but are not limited to, objects such as fences, buildings, trees and road signs. These objects help to accurately align the 3D model within the simulation software.

The reference points and photo position (or camera location) is accurately survey marked by using a professional surveyor or using professional survey equipment.

Reference points identified and surveyed which are used for camera alignment.

3.0 Creating the Photo Panoramic

The photos captured from the site visit are then selected. Five photos from each viewpoint are used. The selected photos are colour matched to ensure consistency throughout the image and manually stitched together to form a photo panoramic. The panoramic image is then cropped to create the 124° wide panorama.

The photos are colour matched and stitched together to form a panoramic image

The completed panoramic image

4.0 The Photo Simulation Process

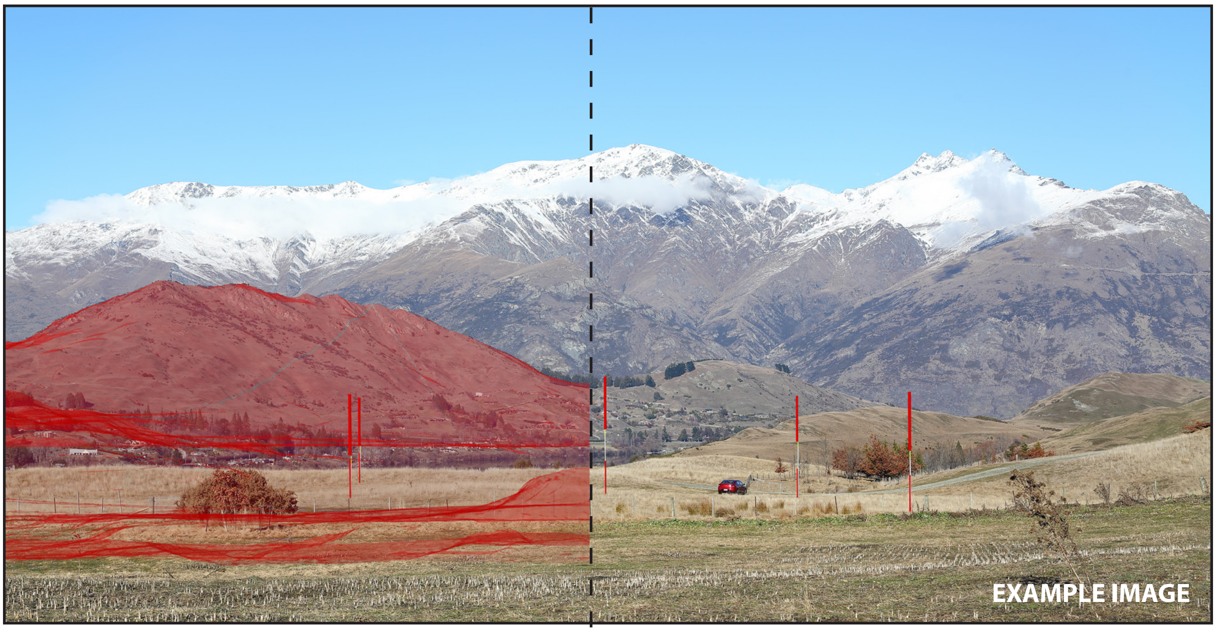
Within the simulation software the next step is to create the 3D computer model.

A series of 3D computer cameras are created. These cameras are positioned accurately to the corresponding survey marked photo position from where the photos were taken on the site visit. The computer camera depicts a real world camera, including matching the focal length of the 50mm lens.

Reference points surveyed from the site visit are then imported. Reference points within the simulation software will generally be represented as extruded cylinders.

Digital Elevation Model (DEM), Lidar data and contour data is used to created a digital terrain model of the site and surrounding area.

To replicate the 3D view through the real world camera, it is necessary to match the digital terrain model and reference points to the respective land-form and physical objects in the photo - thus ensuring an accurate horizontal and vertical alignment.



Digital terrain model and reference points used for camera alignment.

5.0 Adding The Proposed Development

The digital 3D model of the proposed development and associated design surfaces such as roads are accurately created. 3D landscaping and vegetation are created to the correct specifications.

A sunlight system is created which follows the geographically correct angle and movement of the sun over the earth at a given location. Location, date, time and compass orientation are matched to the on-site photography which allows the simulated model to reflect actual lighting conditions.

Within the 3D software, the new image is rendered containing the accurately positioned 3D model over top of the original photograph.

3D model rendered and accurately positioned in photograph

6.0 Photo Editing

Photo editing software is used to composite the proposed development. Using a combination of the digital terrain model and aerial photography the proposed development is masked into the original photo so that it appears behind any existing landforms and foreground vegetation. Proposed landscaping and vegetation is added to the photos using the same process.

Rendered model is masked within the image to appear behind existing landforms and vegetation.

Proposed vegetation and landscaping is created in 3D, rendered and added.

The masked renders of the proposed development, landforms and landscaping are combined into the original panoramic image to complete the photo simulation.

Section of rendered development within full panorama.

The completed photo Simulation

7.0 Viewing The Photo Simulation

All photo simulations comply with the New Zealand Institute of Landscape Architects' document: Visual Simulations Best Practice Guide 10.2.

For the resulting photo simulations, the viewing scale is 50 centimeters from the eye when printed at full scale A3. This scale produces an image that is 240mm high and is a comfortable viewing distance to hold at approximately an arm's length, to appreciate what the view would be in real life. (Refer to Figure 1.0 below for viewing guide).

Viewing on a digital screen should be done tentatively as there are numerous variables such as screen size, zoom level and the application being used, that can affect the scale of what would be seen by the naked eye.

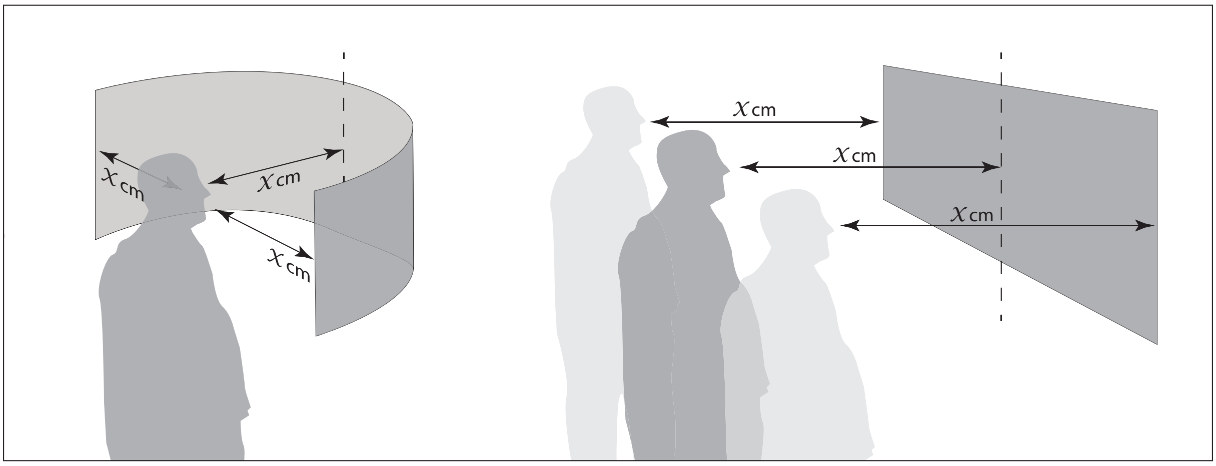


Fig 1.0 Viewing guide for printed photo simulations