Putney Hill

600 Victoria Road, Ryde

Proposed amended Concept Plan Stage 2

Certification of Accuracy of Block Montages

Report prepared for Fraser Property Australia Pty Ltd
by Dr. Richard Lamb
Date: 19 December, 2012

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19 December, 2012

Mr Warwick Dowler
Project Director
Fraser Property Australia Pty Ltd
Suite 11, Lumiere Commercial
Level 12, 101 Bathurst Street
Sydney NSW 2000

Dear Sir,

Response to request to prepare and certify accuracy of block model montages received from the Department of Planning and Infrastructure
Major Project MP05_0001
Proposed Buildings in Stage 2, Putney Hill, 600 Victoria Road, Ryde

1 The reason for this response

Richard Lamb and Associates (RLA) have been appointed by Frasers Property Australia Pty Ltd, the Applicant, to assist with a request from the Department of Planning and Infrastructure that block model montages be prepared to accurately show the potential massing, bulk and scale of proposed buildings in Stage 2 on the subject site.

Montages were requested to be prepared to demonstrate the effects of proposed building envelopes on views from the public domain at the intersection of Morrison Road and Princes Street and to depict a representative view from the residential environment to the north of the site.

RLA specialise in visual impacts assessment and the supervision and certification of the accuracy of photomontages.

2 Preparation of Block Model Montages

So as to provide a higher level of certainty with regard to the effects of the amended Concept Plan on views from the adjacent public domain, the Department of Planning and Infrastructure requested that representative block model montages be prepared independently and verified for accuracy.

RLA in consultation with Frasers Property Australia Pty Ltd and Cox Richardson appointed an independent architectural illustration firm, DigitalLine, to prepare block model montages representing the views from the three locations.

Dr Richard Lamb (RL) initially visited the Putney Hill Stage 2 site to determine the most appropriate locations from which photographs would be taken for preparation of the montages. Three initial locations were chosen (the corner of Morrison Road and Princes Street, Fernleigh Close and a location in Linley Way. The latter was rejected after close consideration as there was minimal visibility of fixed features on the subject site that would be likely to be present on the existing survey plans. Fixed features such as light poles, existing buildings etc. would customarily be used to establish accurate 3D references to the existing survey plan and 3D model of existing approved buildings, which in turn are referenced to the 3D model of the proposed new buildings.

Surveyors from Linker Barker attended each of the camera locations with RL on 12 November for initial inspection and photographs were taken to assist with the full survey. Initial photographs were taken for analysis to assist in accurate survey work. Surveyors attended the site with RL on 26 November, 2013 on which day the final photographs for montage preparation were taken. At each place from which photographs were taken, the camera location and height of the lens above natural ground level was surveyed (see survey data attached to this report). At each of the locations, a minimum number of five 3D reference mark objects were identified by RL and the surveyors and marked on photographs taken on 12 November, 2013. The surveyors also took photographs for their own use and reference, but these have not been used to prepare montages. The 3D reference mark objects identified and marked on the photographs were later surveyed accurately and added to the electronic survey files by Linker Barker along with the location and RLs of the camera. The DWG files of the survey with the extra 3D reference markers were then provided to DigitalLine.

For the locations in Linley Way, there were insufficient 3D reference marks visible on the site for the accuracy of the digital model of the proposed building massing and envelopes to be certified.

High definition photographic images were taken by RL using a Canon Eos 5D Mark 2 full-frame Digital Single Lens Reflex (DSLR) camera, using a tripod to standardise the eye height at the conventional 1.55m height and a self levelling head to ensure that the camera was horizontal in both horizontal and vertical planes. The images at 22.2 mega pixels provide a very high resolution image in which the 3D reference mark features identified for survey can be easily discerned.

Because of the distance and height of the buildings relative to the camera positions, it is necessary to use a wide angle lens. A standard 50mm focal length lens which is recommended for general landscape and more distance views would not be able to encompass enough of the vertical field of view for the buildings to be visible in their context. In the case of Morrison Road for example, a 50mm lens image would not encompass enough of either the horizontal or vertical field of view to be useful as an urban design tool. The building would in other words would have been cut off on all sides. The lens was therefore standardised at 24mm focal length for all of the images for which montages were prepared. This is a common focal length used for architectural photography for the reasons set out above.

After the images were downloaded from the camera and the best images chosen to be send to DigitalLine, the images were imported into Corel Draw X5, a vector based drawing program, and the 3D reference markers were located in the images. Linker Barker also marked up photographs with the reference points they had surveyed (examples are attached). The marked up photographs were also supplied to DigitalLine. In this way DigitalLine could refer the reference points to the DWG and plot configuration files of the survey that includes the extra reference marks, provided by Linker Barker.

DigitalLine was provided with a 3D computer model of the proposed amended Master Plan by Cox, in the form of a Sketchup model of each of the proposed massing and the envelopes, including the location of notional vegetation.

DigitalLine prepared an independent 3D block model of the envelopes and the massing of the proposed buildings. The models do not contain features such as windows and doors, articulating elements, etc. They do however contain everything that is necessary to establish the effect of the building on the composition of views from the specific viewing places required to be modelled.

The two models (both the envelopes and the massing models) were then merged into one image, so the comparison can be made between the envelope control and the likely final appearance of the massing of the proposed buildings. This is a significant issue for the site, which slopes upward from north to south toward Morrison Road. As a result of the slope, the envelope control produces a theoretical height for the buildings that is significantly higher than the massing proposed. The height of the building mass is shown by a hatched line on the block montages, while the envelope is shown by a solid line.

Notional vegetation was rendered over the model by Cox Richardson at the direction of RL, to give an impression of the likely future visibility of the buildings.

A statement prepared by DigitalLine, describing the process of preparing the montages and how to establish the accuracy of location of the 3D model with respect to the photographic image, is attached this response. A certification as to the accuracy of the survey work by Linker Barker is also attached.

The 3D models were then merged by DigitalLine with the images provided by RL.

The accuracy of the locations of the 3D model of the buildings with respect to the photographic images was checked in three ways:

1. The model was checked for alignment and height with respect to the the 3D reference markers which are visible in the images taken by RL and which were identified on the images send to DigitalLine.
2. The location of the camera was checked using the Camera Match utility in the 3D Studio Max program, which uses five or more match coordinates to back-check the location, the RL of the camera and the focal length of the lens used.
3. Each of the images has five or more 3D reference marks visible. As a result, there are more than the necessary numbers of reference points for cross-checking accuracy in every image.
4. The physical location of the camera and its RL is also independently known. There is therefore a further cross-check that can be performed in the event that the predicted camera location does not match the location calculated by the Camera Match utility in 3D Studio Max. This proved unnecessary, because there was a close match.
5. No significant discrepancies were found between the known camera locations and those predicted by the computer software of the Camera Match utility.
6. This is the most accurate method of aligning a 3D model that is currently used in preparing photomontages of these kinds of developments, as it has three formal and other informal cross-checks.

I can therefore certify on the basis of my supervision of the work, my knowledge of the methods used and the cross-checking that has been carried out, that the montages are as accurate as is possible in the circumstances.

I hope this analysis will assist in providing the information requested by the Department of Planning and Infrastructure and in demonstrating and certifying the accuracy of the block montages.

If you have any questions or require any clarifications, please do not hesitate to call me,


Yours sincerely

Dr Richard Lamb
Richard Lamb & Associates

Method Statement by DigitalLine

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Richard Lamb and Associates
Suite 1/134 Military Road
Neutral Bay NSW 2089

Re: Project 600 Putney Hill Stage 2,

19/12/2013

Dear Dr Lamb,

The photomontages provided for the buildings proposed at the property Putney Hill Stage 2, were prepared utilizing the latest technology and the following methodology:

1. Digital Line Pty Ltd was created in Sydney, NSW in November 1998. The company creates 3D computer generated graphics, including photomontages for the analysis of visual impacts of Development Applications..

2. Photomontages created by Digital Line have been successfully used by our clients in Randwick, Woollahra, Waverley and other NSW councils. In 2009 and 2013, Digital Line was announced as a winner of the tender for the preferred supplier of DA photomontages for Randwick City Council.

3. For creating photomontages Digital Line Pty Ltd uses specialized software 3DStudio MAX 2012, created by Autodesk®. Software is licensed and registered with Autodesk®, S/N 391-03075907.

4. We use the “Camera Match utility” for creating the photomontages:
   - 4.1. The following input information was required for creating the photomontages:
     - High resolution digital photograph of the site, taken from each viewing place.
     - Architectural plans and elevations in DWG format.
     - Certified survey plans.
   - 4.2. The Camera Match utility uses a bitmap background photo and five or more special "CamPoint" objects to create or modify a camera match so that its position, orientation, and field-of-view matches that of the camera that originally created the photo.
   - 4.3. An accurate 3d model is created from the architectural drawings and this is then superimposed on the original photograph
   - 4.4. After determining the position of the camera match we check accuracy by comparing the photograph and 3d model with existing objects (such as height poles, buildings, trees, light rail poles and other objects, the locations and heights of which can be derived from survey data)
   - 4.5. For a detailed explanation of the processes involved, please call Digital Line Pty Ltd

5. The “Camera Match utility” currently is the most accurate system for creating images used in the preparation of photomontages.

Sincerely yours,

Leonid Medvedskiy
Director

Surveying Certification by Denny Linker & Co.

CONSULTING SURVEYORS

DENNY LINKER & CO.

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19 December 2013
Our Ref: 110316.07.13

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Attn: Warwick Dowler

Email: warwick.dowler@fraserspropery.com.au

Re: Putney Hill Stage 2
Morrison Street, Ryde

Dear Warwick

I hereby certify that the information documented on our "Putney Hill Stage 2 - Photo Montage Control Coordinate Schedule dated 5th December 2013" together with the Photo Location Camera Shots 1, 2 and 3 is a true and accurate representation of the survey work undertaken by my site surveyor Adam Richardson. The subsequent autocad file called Photo Control.dwg created by myself and issued on the 10th December 2013 is the correct cad representation of the coordinate file noted above.

Adam Richardson is a graduate surveyor and has been employed by Denny Linker & Co for 18 months. Adam Richardson works under my supervision.

Yours sincerely

Tasy Moraitis

TASY MORAITIS
Director
Denny Linker & Co

Original Photo by RLA view south from Fernleigh Close

Original Photo by RLA view north east from the corner of Morrison Road and Princes Street

Block Montage by DigitalLine with render of vegetation

KEY

Maximum Envelope

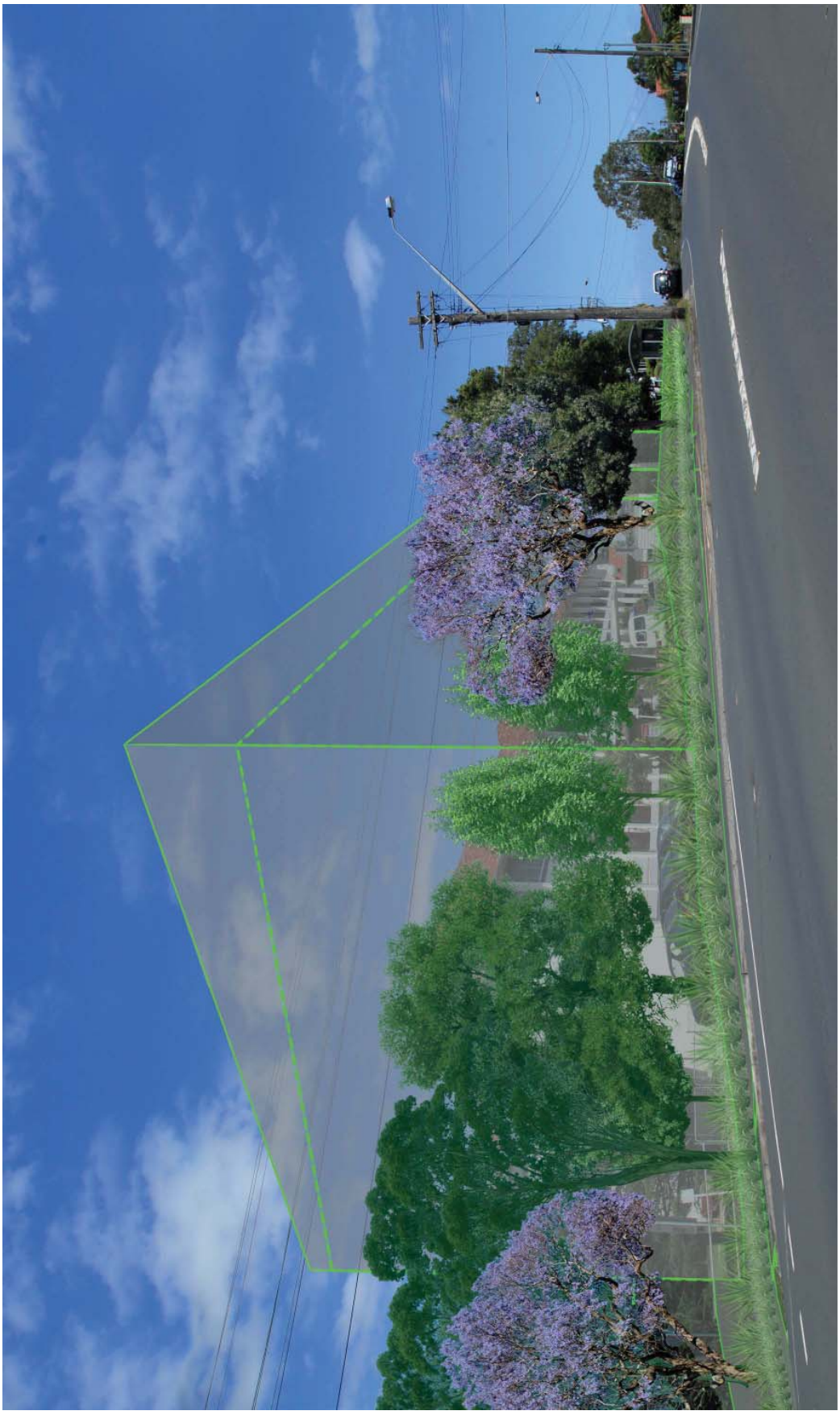
Indicative Building Height

Putney Hill - View from Fernleigh Close

Modification MP05_0001

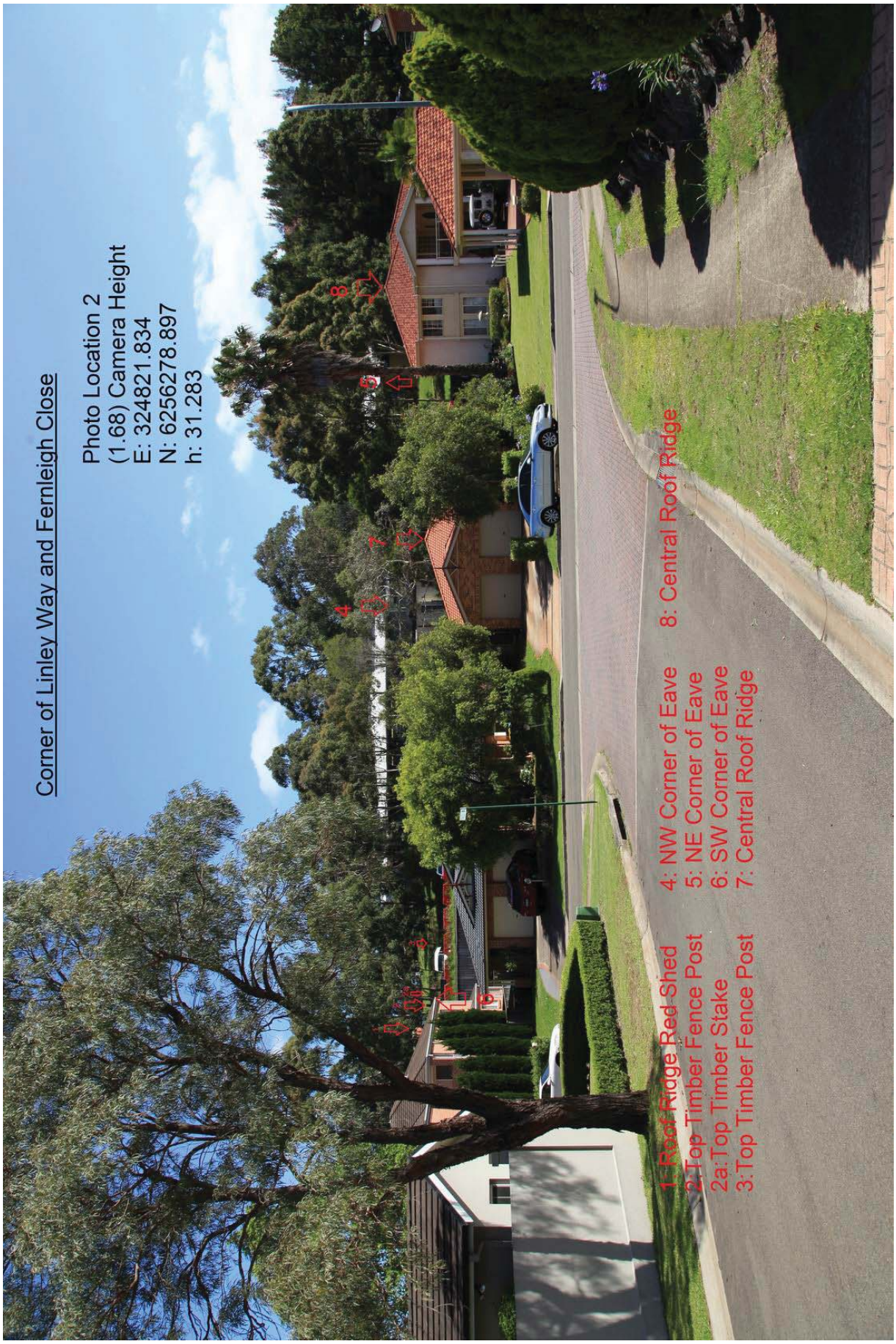
COX

Block Montage by DigitalLine with render of vegetation



Putney Hill - View from Morrison Rd & Princes St Modification MP05_0001 COX

Required features and points to be surveyed - Fernleigh Close



Required features and points to be surveyed- Morrison Road

Table showing co ordinates of all required locations surveyed.

Putney Hill Stage 2 -Photo Montage Control

05.12.2013

Camera Location 1 (Height of Camera 1.63)				
	Easting	Northing	Height	Target
Camera Location 1	324587.46	6256137.34	57.38	
Target 1	324632.19	6256132.71	67.16	SW EAVE EDGE
Target 2	324647.32	6256133.62	73.42	ROOF RIDGE
Target 3	324670.30	6256112.40	73.78	ROOF RIDGE
Target 4	324692.49	6256090.35	75.43	TURRET
Target 5	324639.86	6256112.85	62.07	SW CORNER OF BUS SHELTER
Target 6	324613.32	6256114.62	67.74	TOP POWER POLE
Target 7	324613.64	6256119.39	62.62	TOP OF SIGN

Camera Location 2 (Height of Camera 1.68)				
	Easting	Northing	Height	Target
Camera Location 2	324821.83	6256278.90	31.28	
Target 1	324818.61	6256161.02	41.35	ROOF RIDGE RED SHED
Target 2	324815.47	6256159.32	39.81	TOP FENCE POST
Target 2a	324813.40	6266143.26	41.12	TIMBER STAKE
Target 3	324809.51	6256168.43	39.19	TOP OF FENCE POST
Target 4	324773.60	6256177.32	43.69	NW CORNER OF EAVE
Target 5	324750.19	6256188.45	43.83	NE CORNER OF EAVE
Target 6	324817.71	6256210.42	36.34	SW CORNER OF EAVE
Target 7	324793.52	6256228.84	36.08	CENTRAL ROOF RIDGE
Target 8	324775.49	6256229.98	38.76	CENTRAL ROOF RIDGE

Summary Curriculum Vitae: Dr Richard Lamb

Summary

- Professional consultant specialising in visual and herittage impacts assessment and the principal of Richard Lamb and Associates (RLA)
- Senior lecturer in Architecture and Heritage Conservation in the Faculty of Architecture, Design and Planning at the University of Sydne, 1980-2007
- Director of Master of Heritage Conservation Program, University of Sydney, 1998-2004.
- 30 years experinence in teaching and research in environmental impact, heritage and visual impact assessment.
- Teaching and research expertise in interpretation of heritage items and places, cultural transformations of environments, conservation methods and practices.
- Teaching and research experience in visual perception and cognition, aesthetic assessment and landscape assessment,.
- Supervision of Master and PhD students postgraduate students in heritage conservation and environment/behaviour studies..
- Experience in academic empirical research into human aspects of the built environment, in particular aspects of aesthetic assessment, visual perception, landscape preference and environmental psychology.
- Richard Lamb and Associates provides:
    - professional services, expert advice and landscape and aesthetic assessments in many different contexts
    - Strategic planning studies to protect and enhance scenic quality and landscape heritage values
    - Scenic and aesthetic assessments in all contexts, from rural to urban, provide advice on view loss, view sharing and landscape heritage studies.
- Dr Lamb provides:
    - Expert advice, testimony and evidence to the Land and Environment Court of NSW and Planning and Environment Court of Queensland in various classes of litigation.
    - Specialisation in mattes of heritage landscapes, visual impacts, and urban design
    - Appearances in over 150 cases and submissions to several Commissions of Inquiry and the principal consultant for over 400 consultancies.
- Qualifications
    - Bachelor of Science - First Class Honours, University of New England
    - Doctor of Philosophy, University of New England in 1975
    - Accredited Administrator and Assessor, Myers Briggs Psychological Type Indicator
- International Journals for which Publications are Refereed
    - Landscape & Urban Planning
    - Journal of Architectural & Planning Research
    - Architectural Science Review
    - People and Physical Environment Research
    - Journal of Environmental Psychology
    - Australasian Journal of Environmental Management
    - Ecological Management & Restoration
    - Urban Design Review International