Glenaeon Renewal Retirement Village Precinct and Residential Care Precinct

BACKGROUND

This document was prepared by Virtual Ideas to demonstrate the visual impact of the proposed development within the surrounding context. It also describes the methodology used to create the visual impact photomontages and illustrates the accuracy of the results.

Virtual Ideas is a highly experienced 3D visualisation company, who commonly prepares visual impact assessment material for both development 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 from survey data. 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 accurate 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 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) Proposed Architectural drawings for 207 Forestway
   - Created by: PTW Architects
   - Supplied by: Lend Lease
   - Format: DWG & PDF files
   - Content: Plans and elevations of proposed site and building including relevant RL's

2) Proposed 3D model for 207 Forestway
   - Created by: PTW Architects
   - Supplied by: Lend Lease
   - Format: Revit file
   - Content: 3D model used for built form of 207 Forestway

3) Proposed Architectural drawings for 199 Forestway
   - Created by: Calder Flower Architects
   - Supplied by: Lend Lease
   - Format: DWG & PDF files
   - Content: Plans and elevations of proposed site and building including relevant RL's

4) Proposed 3D model for 199 Forestway
   - Created by: Calder Flower Architects
   - Supplied by: Lend Lease
   - Format: Sketchup file
   - Content: 3D model used for built form of 199 Forestway

5) Digital terrain model of the city of Sydney and surrounding suburbs
   - Created by: Spatial Services NSW
   - Supplied by: Spatial Services NSW
   - Format: DWG
   - Content: 3D contours of the ground plane only (no buildings)

6) Proposed Landscape drawings for 207 Forestway
   - Created by: Scape Design Landscape Architecture
   - Supplied by: Lend Lease
   - Format: DWG & PDF files
   - Content: Plans of proposed future landscaping, including trees to be removed and retained

7) Proposed Landscape drawings for 199 Forestway
   - Created by: Aspect Studios Landscape Architecture
   - Supplied by: Lend Lease
   - Format: DWG files
   - Content: Plans of proposed future landscaping, including trees to be removed and retained

8) Tree Survey (refer Appendix B)
   - Created by: Cardno
   - Supplied by: Lend Lease
   - Format: DWG & PDF files
   - Content: Referenced for existing tree identification

9) Site Survey (refer Appendix C)
   - Created by: Cardno
   - Supplied by: Lend Lease
   - Format: DWG & PDF files
   - Content: Referenced for RL's of identifiable landmarks

10) Camera Position Survey (refer Appendix D)
   - Created by: CMS Surveyors
   - Supplied by: CMS Surveyors
   - Format: DWG & PDF files
   - Content: Referenced for MGA coordinates of camera positions and RL's of identifiable landmarks visible in each photograph

11) Site photography
   - Created by: Martin Siegner
   - Supplied by: Frmez
   - Format: JPEG file
   - Content: High resolution photos

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.

Creating the survey points for alignment

To have sufficient survey data that would allow us to accurately align the 3D model to the photography, several surveyed 3D drawings containing existing survey points were also imported into the 3D model. These drawings were referenced to the common MGA reference point so that they align with the topographical model.

Creating the buildings 3D model

The buildings were imported from Revit and Autocad and using site boundaries as references, moved to match the location of the survey. Heights were not changed as we deemed that the height data in the building files was correct.

SITE PHOTOGRAPHY

Site photography positions were agreed with Lend Lease and were subsequently photographed.

The lens size selected for each shot ranges from 25-50mm, and in addition crop marks 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.

CREATION OF PHOTOMONTAGES

The positions of the real-world photography were located in the 3D scene using the lands topography data and relevant survey information.

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 surveyed points of the 3D model aligned with their corresponding objects that are visible in the photograph.

A realistic sun and 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 indicative new buildings were then created from the selected cameras at the exact pixel dimensions and aspect ratio of the original digital photograph.

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

CREATION OF PHOTOMONTAGES

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 indicative built form with respect to the surrounds.

Yours sincerely

Grant Kolln,
Director - Virtual Ideas

MAP SHOWING CAMERA LOCATIONS

Original photograph

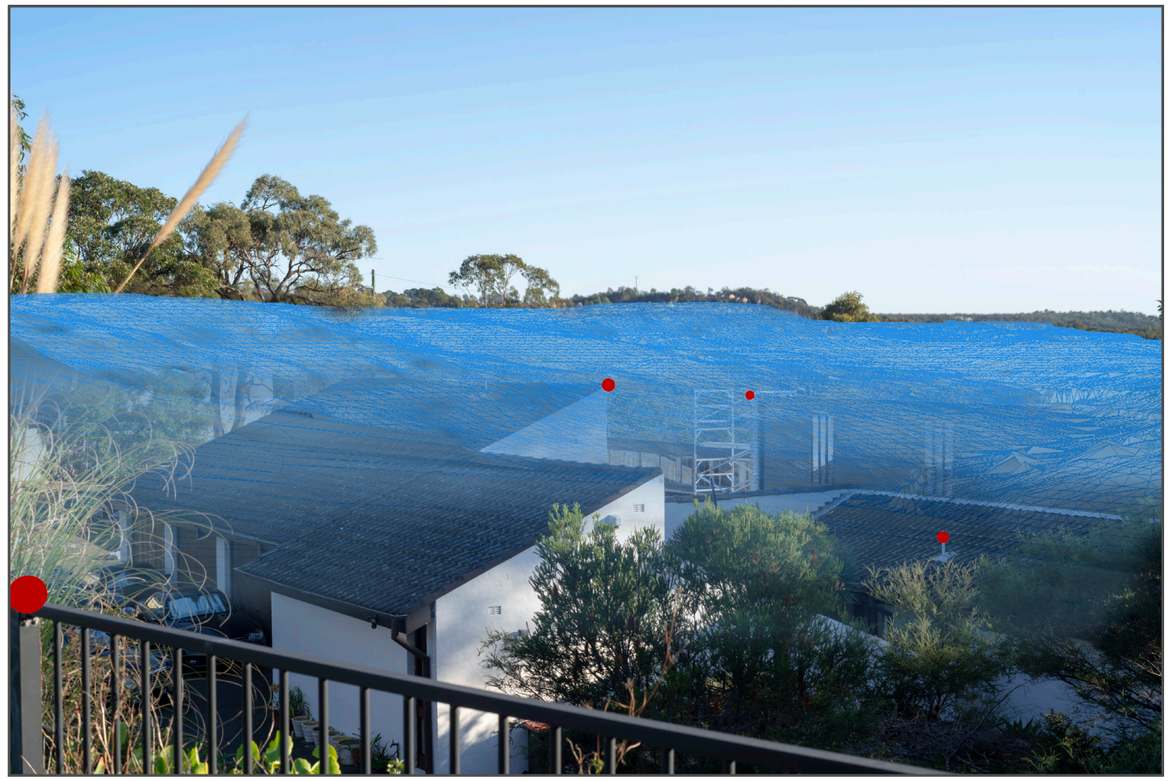
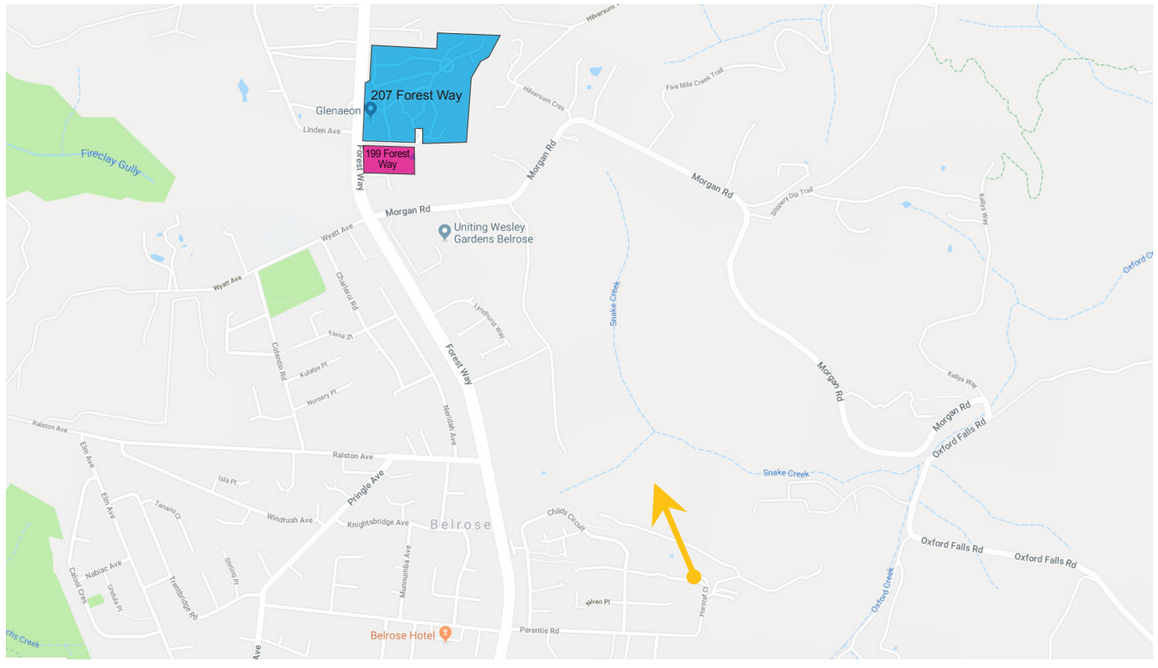


Image showing alignment of topographical model (in blue) and survey points (in red) over original photograph



Photographic data

Location:	Harstaf Close
Lens:	50mm
Date:	25/07/2018 08:18 AM
Camera:	Sony A7iii

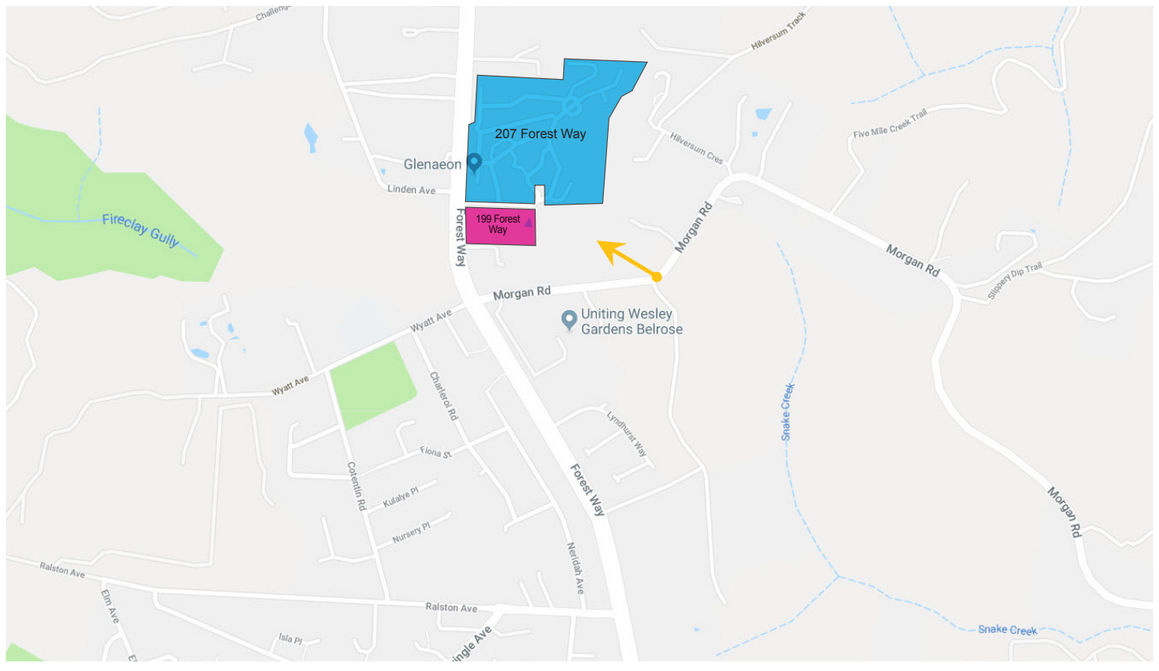
Original photograph

Image showing future built form montaged into the photograph with extents of new built form that is not visible shown in oranged dashed.

Final photomontage

Original photograph

Image showing alignment of topographical model (in blue) and survey points (in red) over original photograph



Photographic data

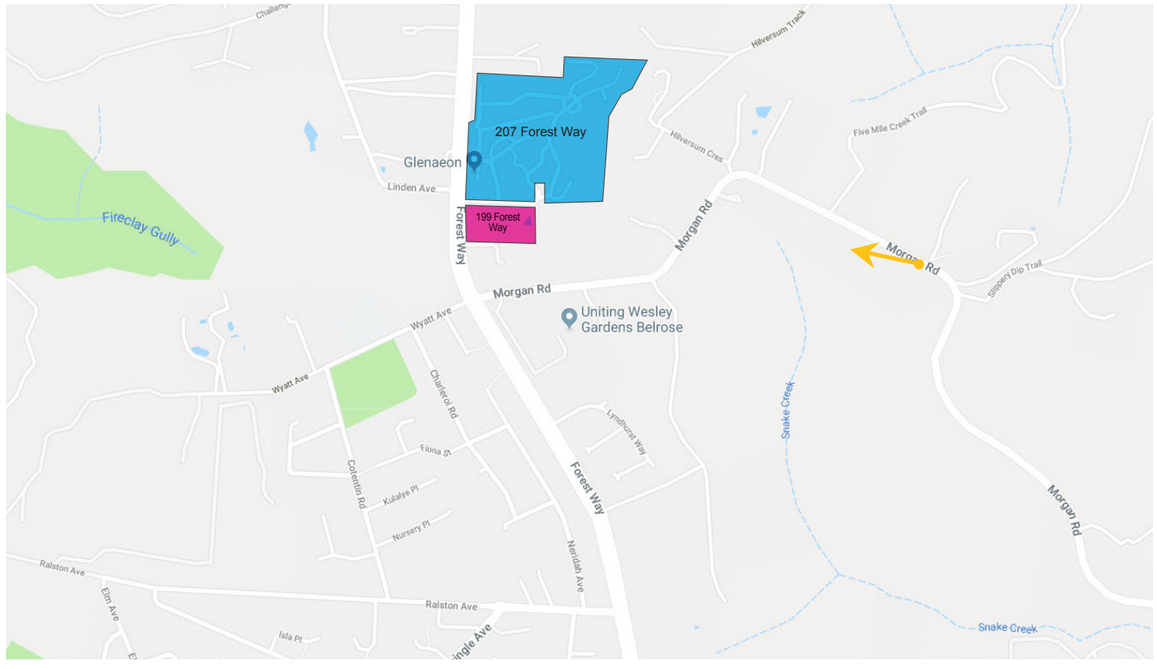
Location:	Morgan Road
Lens:	25mm
Date:	25/07/2018 08:39 AM
Camera:	Sony A7iii

Original photograph

Image showing outline of built form beyond - not visible from this location

Original photograph

Image showing alignment of topographical model (in blue) and survey points (in red) over original photograph



Photographic data

Location:	Morgan Road West
Lens:	25mm
Date:	25/07/2018 08:55 AM
Camera:	Sony A7iii

Original photograph

Image showing future built form montaged into the photograph with extents of new built form that is not visible shown in oranged dashed.

Final photomontage

Original photograph

Image showing alignment of topographical model (in blue) and survey points (in red) over original photograph

Photographic data

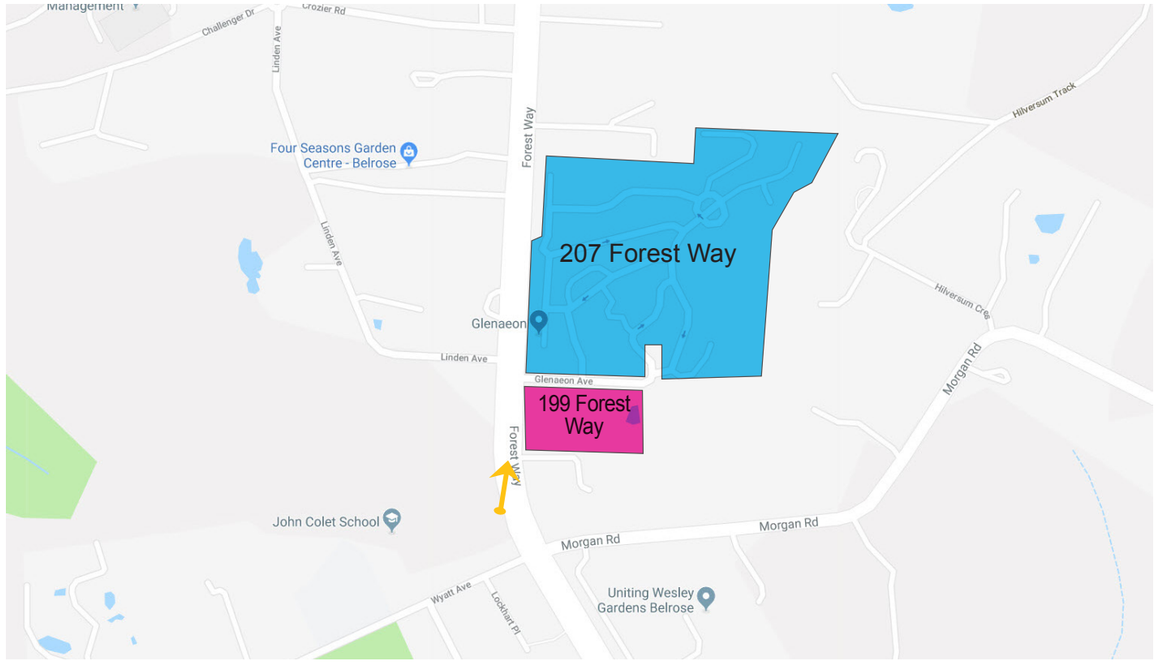
Location:	Hilversum Cresent
Lens:	25mm
Date:	25/07/2018 08:55 AM
Camera:	Sony A7iii

Original photograph

Image showing outline of built form beyond - not visible from this location

Original photograph

Image showing alignment of topographical model (in blue) and survey points (in red) over original photograph

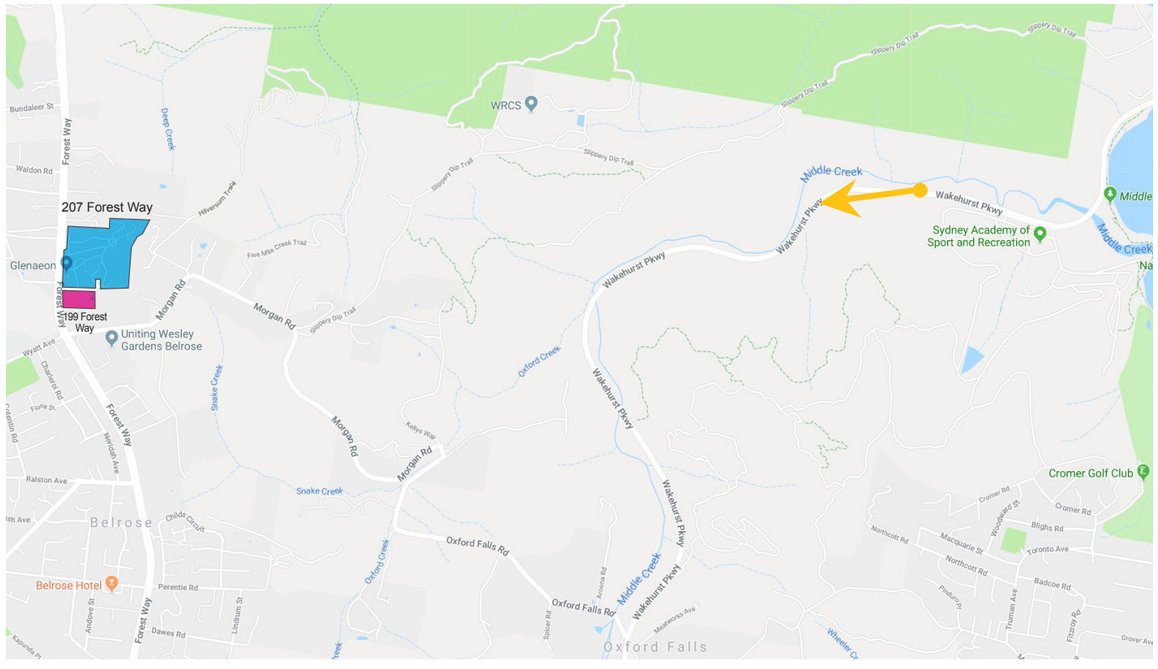


Photographic data

Location:	Forest Way South
Lens:	25mm
Date:	25/07/2018 09:30 AM
Camera:	Sony A7iii

Original photograph

Image showing alignment of topographical model (in blue) and survey points (in red) over original photograph



Photographic data

Location:	Wakehurst Parkway
Lens:	25mm
Date:	25/07/2018 09:58 AM
Camera:	Sony A7iii

Original photograph

Image showing outline of built form beyond - not visible from this location

Original photograph

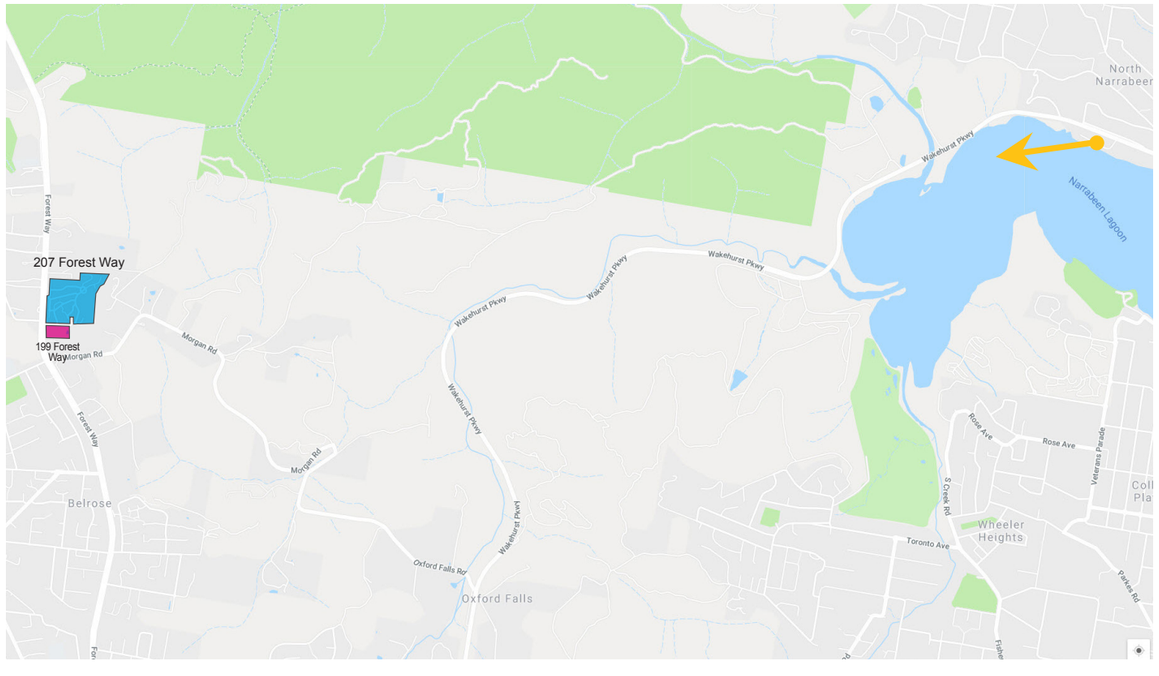


Image showing alignment of topographical model (in blue) and survey points (in red) over original photograph

Photographic data

Location:	Bilarong Reserve
Lens:	25mm
Date:	25/07/2018 08:18 AM
Camera:	Sony A7iii

Original photograph

Image showing outline of built form beyond - not visible from this location

DIGITAL CAMERA LENSES FOR PHOTOMONTAGES AND VISUAL IMPACT ASSESSMENTS

The intention of a photomontage rendering is to visually communicate how proposed built form sits in respect to its surroundings. To achieve this, a digitally rendered image from a digital 3D model is accurately superimposed into a digital photograph to provide an accurate representation in terms of light, material, scale, and form.
Camera lens selection also plays an important part in creating a photomontage that communicates visual impact. There are several things to consider with respect to lens selection.

Field of View of the Human Eye

The field of view of the human eye is a topic that varies depending on the source of information. In many cases the field of view of the eye is stated to be 17mm. Other sources claim a smaller field around 22-24mm. Whichever the case, it is clear that the human eye has quite a wide field of view and when we stand close to a subject - or instance a building - our vision can potentially see all of the top, sides and bottom of the building at one glance. In addition to this, the human eye can change focus and target direction extremely quickly, allowing us to view a large structure in a very short period of time, effectively making our perceived field of view even larger.

The Perspective of the human eye

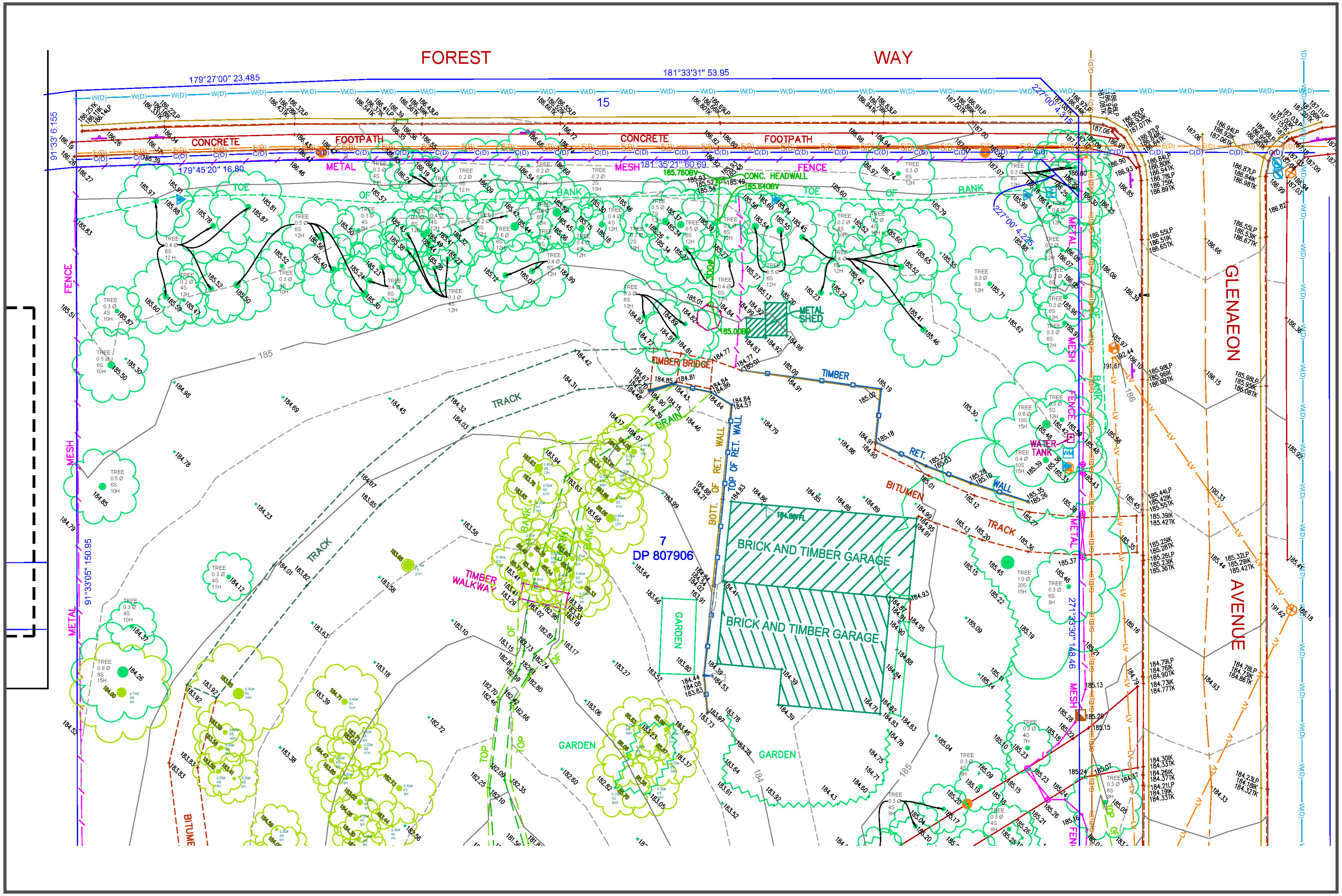
It is difficult to accurately reproduce what the human eye sees by the means of a printed image. As the back of the human eye is curved and the sensors on cameras are flat, the perspective of a photograph can look quite different to how we see things in the real world, especially with a larger field of view, or wider lens.
In digital photography circles it is commonly stated that using a longer lens (approx 50mm) reduces the amount of perspective in an image and therefore looks more like the human eye would see in reality, but this is talking about perspective only, and does not consider the field of view of the eye. If you take a photo using a 50mm lens, print the photo, and hold the print out against the actual view in the same location as the photo was taken, it becomes very clear that the human eye can see much more of the surrounding information than what is shown on the print out.

Changing the FOV on a digital camera

The main difference in using a longer lens vs. a wider lens is the amount of information that is displayed at the edges of the subject. Changing the lens to a smaller FOV produces the same result as cropping in on the wide angle image, providing that the position and the angle of the camera remains constant while taking the photographs. In short, a lens with a wider FOV does not create an image that has incorrect perspective, it simply means that the perspective is extended at the edges of the image showing more of the surrounds in the images.

What all of this means for visual assessment, is that there is no definitive solution for lens selection. If we follow the opinion that a longer lens produces images that are closer to the perspective of the human eye, we will inevitably be in the situation where we cannot show the entirety of our subject and enough of the surrounds in which the subject resides. Also, if we strictly stick to a 17mm lens, we will have situations where the subject is far away and looks very small in the image, again making it difficult to assess visual impact. For these reasons, we have taken the view that we can never totally represent what the human eye will see on a piece of paper, and for visual impact photomontages we should select lenses that strike a balance between the two and can accurately display the built form in its surroundings.

The most effective way to accurately gauge visual impact and get a real world feeling for scale would be to take prints of the photomontages to the exact site photography locations and compare the prints with the scale of the existing built form.


FOREST
WAY
179°27'00" 23.485
181°33'31" 53.95
15
CONCRETE
FOOTPATH
METAL
MESH
181°35'21" 60.69
179°45'20" 16.80
91°33' 6.155
FENCE
TOE
BANK
CONC. HEADWALL
227°00' 4.315
METAL SHED
TIMBER BRIDGE
TIMBER
RET.
WALL
TRACK
DRAIN
TOP OF RET. WALL
BOTT. OF RET. WALL
7
DP 807906
BRICK AND TIMBER GARAGE
BRICK AND TIMBER GARAGE
GARDEN
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BITUMEN
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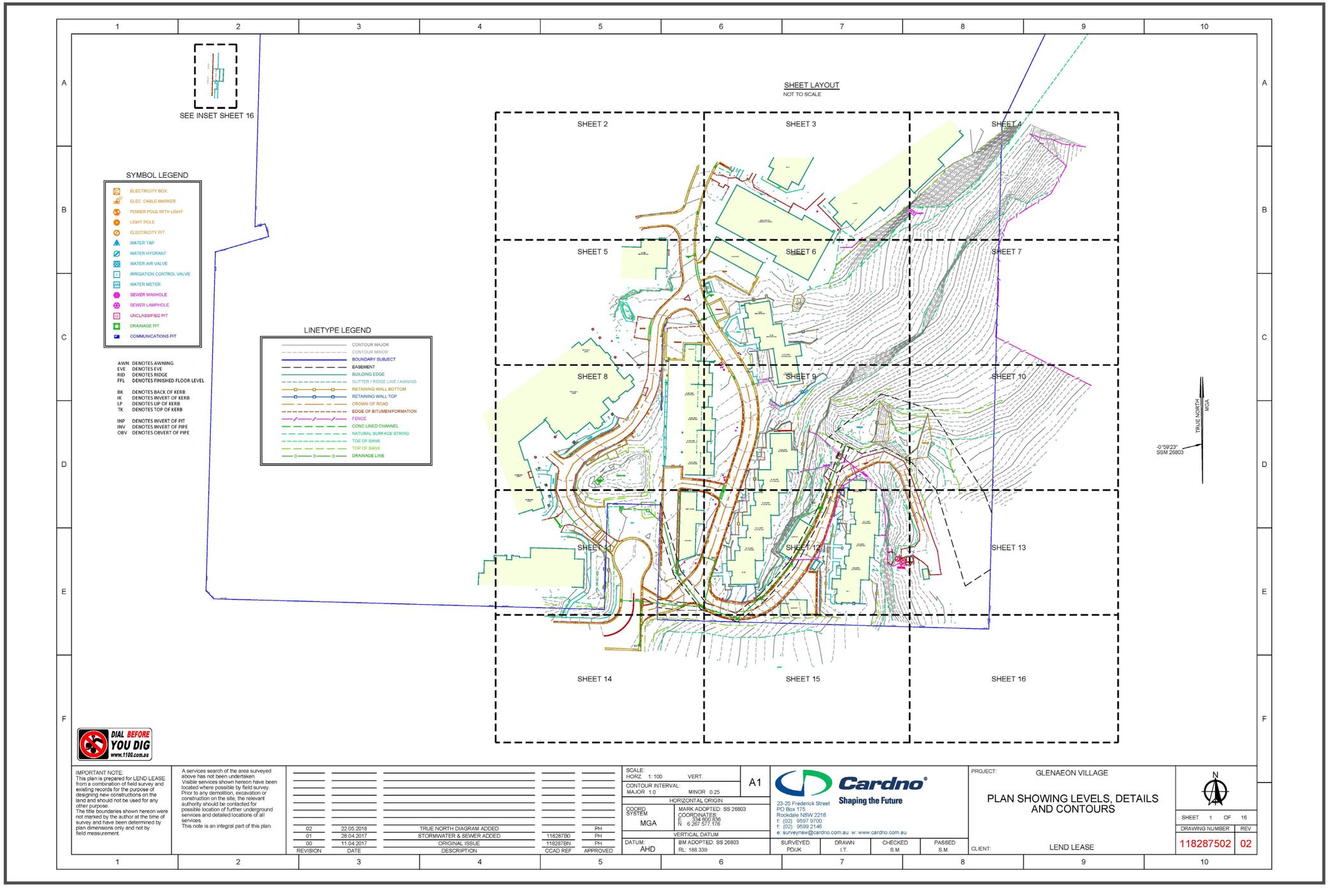
GLENAEON
AVENUE


SEE INSET SHEET 16
SHEET LAYOUT
NOT TO SCALE
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SHEET 15
SHEET 16
SYMBOL LEGEND
ELECTRICITY BOX
ELEC. CABLE MARKER
POWER POLE WITH LIGHT
LIGHT POLE
ELECTRICITY PIT
WATER TAP
WATER HYDRANT
WATER AIR VALVE
IRRIGATION CONTROL VALVE
WATER METER
SEWER MANHOLE
SEWER LAMPHOLE
UNCLASSIFIED PIT
DRAINAGE PIT
COMMUNICATIONS PIT
AWN DENOTES AWNING
EVE DENOTES EVE
RID DENOTES RIDGE
FFL DENOTES FINISHED FLOOR LEVEL
BK DENOTES BACK OF KERB
IK DENOTES INVERT OF KERB
LP DENOTES LIP OF KERB
TK DENOTES TOP OF KERB
INP DENOTES INVERT OF PIT
INV DENOTES INVERT OF PIPE
OBV DENOTES OBVERT OF PIPE
LINETYPE LEGEND
CONTOUR MAJOR
CONTOUR MINOR
BOUNDARY SUBJECT
EASEMENT
BUILDING EDGE
GUTTER / RIDGE LINE / AWNING
RETAINING WALL BOTTOM
RETAINING WALL TOP
CROWN OF ROAD
EDGE OF BITUMEN/FORMATION
FENCE
CONC LINED CHANNEL
NATURAL SURFACE STRING
TOE OF BANK
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DRAINAGE LINE
TRUE NORTH
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-0°59'23"
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IMPORTANT NOTE:
This plan is prepared for LEND LEASE from a combination of field survey and existing records for the purpose of designing new constructions on the land and should not be used for any other purpose.
The title boundaries shown hereon were not marked by the author at the time of survey and have been determined by plan dimensions only and not by field measurement.
A services search of the area surveyed above has not been undertaken.
Visible services shown hereon have been located where possible by field survey.
Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services.
This note is an integral part of this plan.
02 22.05.2018 TRUE NORTH DIAGRAM ADDED PH
01 28.04.2017 STORMWATER & SEWER ADDED 118287B0 PH
00 11.04.2017 ORIGINAL ISSUE 118287BN PH
REVISION DATE DESCRIPTION CCAD REF APPROVED
SCALE: HORZ 1: 100 VERT.
A1
CONTOUR INTERVAL: MAJOR 1.0 MINOR 0.25
HORIZONTAL ORIGIN
COORD. SYSTEM MGA
MARK ADOPTED: SS 26803
COORDINATES: E 334 800.536 N 6 267 577.176
VERTICAL DATUM
DATUM: AHD
BM ADOPTED: SS 26803
RL: 188.339
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Shaping the Future
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e: surveynsw@cardno.com.au w: www.cardno.com.au
SURVEYED PD/JK
DRAWN I.T.
CHECKED S.M.
PASSED S.M.
PROJECT: GLENAEON VILLAGE
PLAN SHOWING LEVELS, DETAILS AND CONTOURS
CLIENT: LEND LEASE
N
SHEET 1 OF 16
DRAWING NUMBER 118287502
REV 02

CMS Surveyors Pty Limited
A.B.N. 79 096 240 201
LAND SURVEYING, PLANNING & DEVELOPMENT CONSULTANTS

Date: 25-07- 2018
Our Ref: 17949 Photo Locations

Studio 71/161 Marlborough Street
Surry Hills
NSW 2010

Dear Mr Rick Mansfield.

As requested we have attended site and measured the Co-ordinates and Elevation of the photo locations for 199 & 207 Forest Way, Belrose, NSW, 2085. Co-ordinate's are MGA 56 and elevation to Australian Height datum (AHD).
Measurements were taken by GNSS observations Smartnet.
DWG of locations has also been supplied.

RE: 199 & 207 Forest Way, Belrose, Photo Locations

Point Number	Easting	Northing	Level	Photo Point
3001	335781.371	6266207.954	149.609	Location #1
3003	335779.0573	6266212.481	150.7667	
3004	335765.2265	6266239.201	150.4498	
3005	335764.958	6266246.806	150.0292	
3006	335771.7091	6266241.187	147.4621	
10	335193.534	6267263.456	152.671	Location #2
12	335165.065	6267275.835	157.5743	
13	335140.3441	6267269.933	166.7147	
14	335173.0902	6267269.867	155.8129	
20	335815.177	6267320.548	142.283	Location #3
22	335765.2078	6267332.804	149.9881	
23	335725.0549	6267352.801	145.8716	
24	335802.2569	6267328.11	141.9476	
30	335358.858	6267747.597	154.364	Location #4
32	335354.2721	6267723.096	152.786	
33	335311.4302	6267702.97	159.8391	
34	335345.724	6267708.866	154.0898	
40	334769.953	6267450.356	187.959	Location #5
42	334795.9896	6267384.986	189.4591	
43	334796.9754	6267420.304	189.5629	
44	334801.3379	6267433.181	189.5906	
45	334793.2308	6267422.234	197.3616	
50	334776.03	6267281.157	186.028	Location #7
52	334794.6905	6267317.404	196.2969	
53	334804.5953	6267296.266	185.5193	
54	334797.8507	6267348.695	188.2989	
60	338766.945	6267961.527	3.643	Location #8
62	338670.8199	6267943.235	5.2507	
63	338683.5677	6267961.028	5.7771	
64	338736.766	6267944.21	8.8862	
70	341316.964	6268584.701	0.94	Location #9
72	341285.4406	6268588.654	1.9756	
73	340863.9957	6268442.503	1.5449	
74	341289.1998	6268594.239	1.2914	

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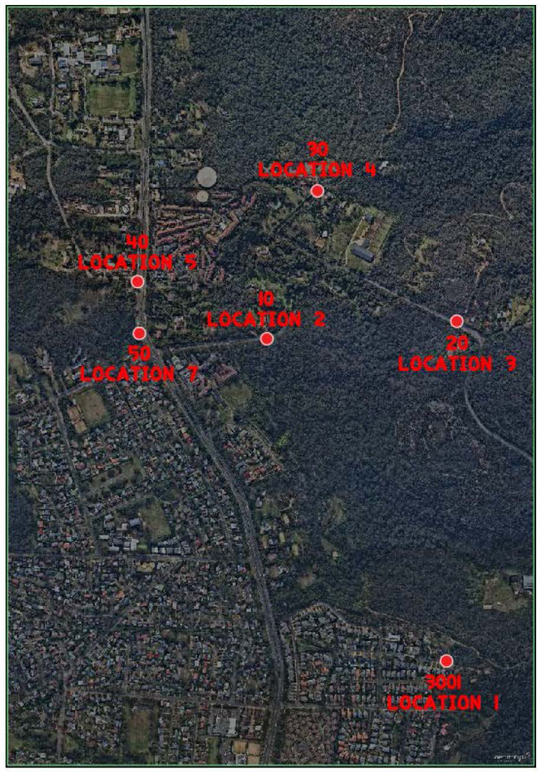
INCORPORATING
A.C.GILBERT & Co.
(Roseville)
MBS GREEN & ASSOCIATES
(Mona Vale)

COOTAMUNDRA
Incorporating PENGELLY & GRAY
90 Wallendoon St, COOTAMUNDRA NSW 2590
Ph: 02 6942 3395 Fax: 02 6942 4046
Email: coota@cmssurveyors.com.au

The height of camera is 1.6m.
Note: This should be added to the supplied RL of each corresponding location.



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Yours faithfully,
CMS Surveyors Pty Limited

Damon Roach

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