

17 September 2018
Our Ref: DMS

General Manager
Northern Beaches Council
725 Pittwater Council
Dee Why NSW 2099

Dear Sir/Madam,

**Re: Trunk Drainage & Watercourse Study -
60 Binalong Avenue, Allambie Heights**

With reference to the development application for the above property this report seeks to evaluate the characteristics of the 1 in 100 year catchment stormwater flow regime associated within the context of the proposed development of the site.

This report also contains information regarding appropriate development of the site to demonstrate that it is able to convey the 1 in 100 year design flow whilst maintaining the safety of occupants and integrity of the various structural elements.

SITE DESCRIPTION

The corner site is situated in the Allambie Heights precinct of the Northern Beaches Shire Shire and has an area of **1708 m²**.

The existing site contains a single residential dwelling with outbuildings and concrete hardstand areas although the block remains largely undeveloped.

A 600mm diameter Council drainage line drains from a sag-pit located in Nargong Avenue immediately to the east of the site. This sag pit discharges into a heavily vegetated watercourse which flows along the eastern boundary of the site.

A locality map and detail survey of the site is contained within Appendix A of this report.

PROPOSED DEVELOPMENT

It is proposed to demolish the existing site **dwelling**s and provide a 2 level new residential unit building with a basement carpark accessible off Nargong Road to the northern boundary of the site.

This report refers to the proposed residential unit building plans by Walsh Architects and these plans are contained within Appendix B.

CATCHMENT FLOWS

The total catchment draining to the subject site is **7.04 Ha**. A catchment area map showing the schematic layout of the Council piped drainage system is contained within Appendix C.



Total peak flows generated from the catchment for the 100yr ARI critical storm event were calculated by DRAINS to be **3.1 m³/s** and the input parameters for the determination of this flowrate are contained within Appendix D.

COUNCIL DRAINAGE SYSTEM

An existing 600mm diameter reinforced concrete pipe drains flows from the upper catchment to the Nargong road drainage system at the front of the site.

Flows in excess of the piped system capacity surcharge in the Nargong Roadway sag-point and eventually build to a depth that enables a weir-style overland flow regime across the footpath area and into the watercourse immediately at the culvert headwall just downstream.

50% INLET CAPACITY BLOCKAGE

In accordance with Council policy, a 50% blockage factor was applied to the pipe draining into the watercourse. As the capacity for a 600mm diameter pipe at 1% is approx. **0.95m³/s** then it follows that the weir flow rate across the footpath is **2.65m³/s**.

WEIR FLOWS ACROSS NARGONG ROAD FOOTPATH

The Nargong Road kerb and gutter adjacent to the sag-pit can be idealised as a multi-stage weir and this was done to determine the 1 in 100 year flood level in the roadway of R.L. 2.65 A.H.D.

The weir arrangement is shown on the flood extents plan contained within Appendix F.

WATERCOURSE FLOWS

The 1 in 100 year watercourse flow rate is of course the total 1 in 100 year flowrate of **3.1 m³/s**.

HEC-RAS

The existing watercourse was surveyed and subsequently a HEC-RAS analysis was conducted to determine the extent of the 1 in 100 flows.

The HEC-RAS cross-section and output data for the 1 in 100 year flow event is contained within Appendix E.

RESULTS

The HEC-RAS analysis shows that the 1 in 100 year flows in the watercourse are largely contained within the upper banks and do not significantly inundate the subject site.

The water surface profile of the 1 in 100 year event was used to design the basement access driveway and to ensure 500mm freeboard was provided to the driveway crest

A site plan showing the extent of the 1 in 100 year flow regime is contained within Appendix F. The basement driveway plan is also contained within Appendix G.

SUMMARY

It is proposed to develop the site such that the objectives of Council's DCP Flood Risk Management Policy are met.

This report has determined the scale and extent of the 1 in 100 year flow event in the trunk drainage system adjacent to the site.

The report shows that the proposed development is compatible with the existing flow regime and does not adversely affect neighbouring properties by interfering with the flow.

The report also demonstrates that the driveway access to the basement has adequate freeboard (see Appendix F) and hence protection to the 1 in 100 year flood event in accordance with Council policy.

Should you require any further information please contact the undersigned

Yours faithfully,

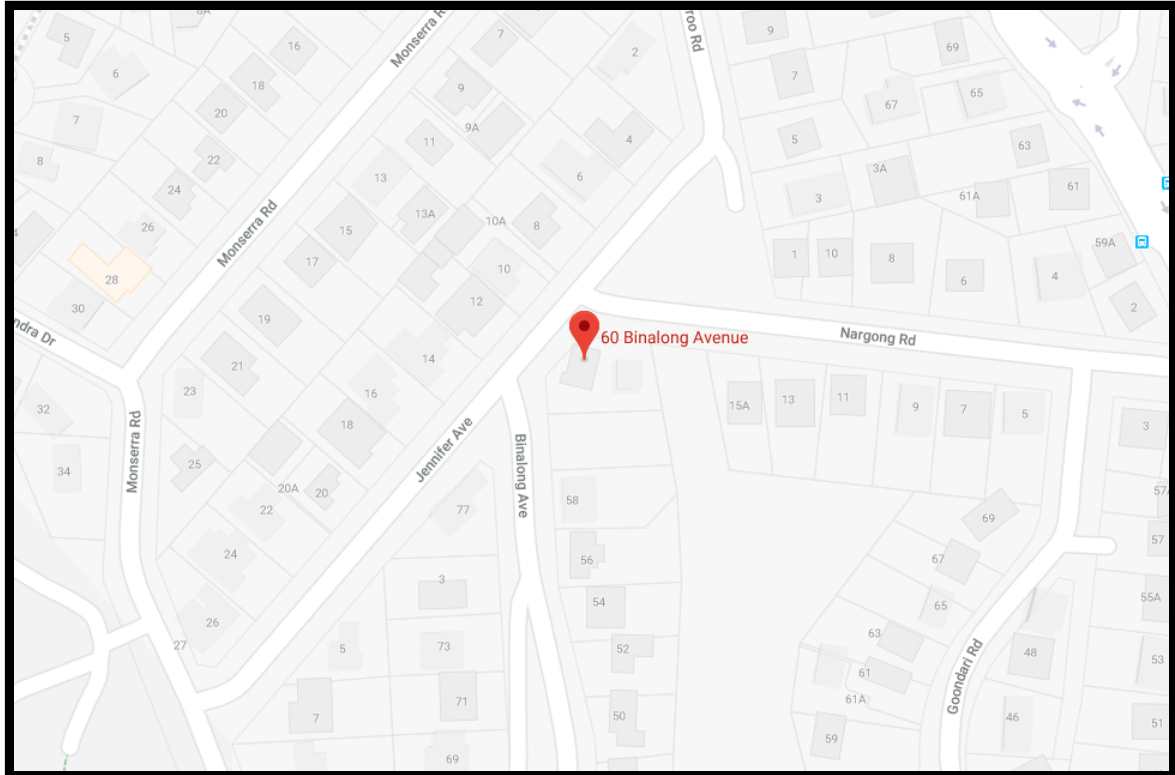
TAYLOR CONSULTING

A handwritten signature in black ink, appearing to read 'D. Schaefer', written over the company name.

DAMIEN SCHAEFER – Director

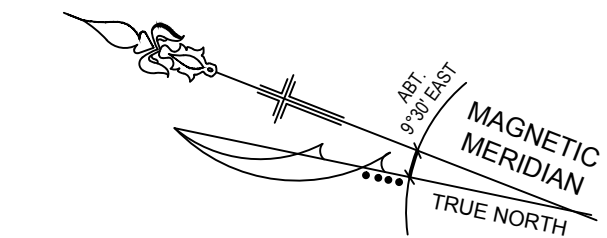
B.E. Civil (Hons) M.I.E. Aust.

APPENDIX A



Locality Map – 60 BINALONG AVENUE, ALLAMBIE HEIGHTS

APPENDIX B



NOTES:

- 1) CAUTION: SHOULD ANY DEVELOPMENT OR CONSTRUCTION BE PLANNED ON OR NEAR THE BOUNDARIES, THE BOUNDARIES SHOULD BE CLEARLY MARKED ON SITE.
- 2) ALL AREAS AND DIMENSIONS HAVE BEEN COMPILED FROM PLANS MADE AVAILABLE AT THE LAND TITLES OFFICE.
- 3) ORIGIN OF LEVELS ON A.H.D. IS TAKEN FROM P.M. 2150 RL 83.234 A.H.D.
- 4) CONTOUR INTERVAL 0.5 METRE.
- 5) CONTOURS ARE INDICATIVE OF GROUND FORM ONLY. ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION.
- 6) TREE SPREADS ARE DIAGRAMMATIC ONLY AND ARE NOT SYMMETRICAL.
- 7) UNDERGROUND (NON VISIBLE) SERVICE LINES HAVE BEEN SHOWN FROM "DIAL BEFORE YOU DIG" SERVICE AUTHORITY RECORDS & ARE DIAGRAMMATIC ONLY IN REGARD TO THEIR POSITION & WIDTH UNLESS STATED OTHERWISE.
- 8) SPOT LEVELS ARE ACCURATE.
- 9) BEARINGS SHOWN ARE ON MAGNETIC MERIDIAN.

INVESTIGATION OF "DIAL BEFORE YOU DIG" UNDERGROUND SERVICES HAS BEEN MADE. DETECTION OF UNDERGROUND SERVICES IS NOT AN INTEGRAL PART OF THIS SURVEY. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE.

DEVELOPERS & EXCAVATORS MAY BE HELD FINANCIALLY RESPONSIBLE BY THE ASSET OWNER SHOULD THEY DAMAGE UNDERGROUND NETWORKS.

- CARELESS DIGGING CAN:
- CAUSE DEATH OR SERIOUS INJURY TO WORKERS AND THE GENERAL PUBLIC
 - INCONVENIENCE USERS OF ELECTRICITY, GAS, WATER AND COMMUNICATIONS
 - LEAD TO CRIMINAL PROSECUTION AND DAMAGES CLAIMS
 - CAUSE EXPENSIVE FINANCIAL LOSSES TO BUSINESS
 - CUT OFF EMERGENCY SERVICES
 - DELAY PROJECT COMPLETION TIMES WHILE THE DAMAGE IS REPAIRED

MINIMISE YOUR RISK AND DIAL BEFORE YOU DIG.

TEL 1100



Bee & Lethbridge
Quality Surveying & Development Solutions

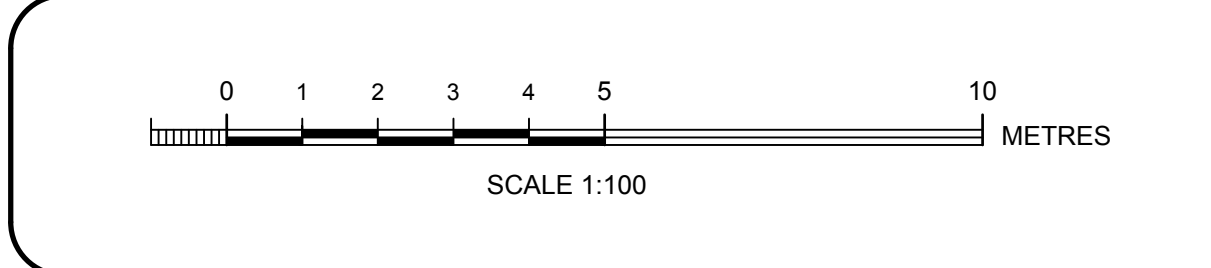
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LEGEND

TREE
DENOTES APPROX. 0.16m DIAMETER OF TREE
DENOTES APPROX. 5m HEIGHT OF TREE
DENOTES APPROX. 4m SPREAD OF TREE

GUTTER
DENOTES CENTRE LINE OF ROAD
DENOTES TOP OF GUTTER

O/HEAD ELECTRIC LINES
BOARDS SEWER
TELSTRA LINES
GAS LINES



PLAN SHOWING BOUNDARIES, RELATIVE HEIGHTS & PHYSICAL FEATURES OVER LOTS 2211 & 2223 IN D.P. 752038 KNOWN AS No. 60 BINALONG AVENUE, ALLAMBIE HEIGHTS.

L.G.A.: NORTHERN BEACHES

CLIENT	GANNET DEVELOPMENTS	REF No.	20818
PROPERTY	No. 60 BINALONG AVENUE, ALLAMBIE HEIGHTS	SHEET No.	1 of 2
DATUM	A.H.D.	SCALE	1:100 @ B1
SURVEYED	B.W.	DATE	22/01/2018
		DRAWN	H.H./R.M.
		DWG No.	20818
		REV No.	00



60 BINALONG AVENUE ALLAMBIE HEIGHTS



LOCATION PLAN

SITE INFORMATION				
ADDRESS	60 Binalong Avenue, Allambie Heights			
SITE AREA	1708m ²			
LOT	Lots 2211 & 2223 of DP 752038			
ZONING	R2 - Low Density Residential			
YIELD	36 x Affordable Accommodation Rooms (1 utilised by a Manager)			
If the development complies with the below standards, they cannot be used as a means to refuse consent				
Control	Location of Control	Control	Proposed	Complies or Not
HEIGHT	Warringah LEP	8.5m	6.5 - 8.5m	Complies
PARKING	SEPP ARH	0.5 cars Per room 1 per Employee 0.2 motorbikes per room 0.2 bicycles per room	0.5*35 = 17.5 Cars 1 Car for Manager 0.2*35 = 7 Motorbikes 0.2*35 = 7 Bicycle	Complies
SOLAR ACCESS	SEPP ARH	3 hours 9-3 to communal area	6 Hours	Complies
PRIVATE OPEN SPACE	SEPP ARH	20m ² communal	>20m ²	Complies
ACCOMMODATION SIZE	SEPP ARH	12m ² single lodger 16m ² in all other cases	Typical 19m ²	Complies
The below controls are not required as SEPP AHR overrides the DCP; however, we are included the below to show we have also made every effort to meet local guidelines				
FRONT SETBACK	Warringah DCP	6.5m	6.55m	Complies
SECONDARY FRONT SETBACK	Warringah DCP	3.5m	3.5m	Complies
SIDE SETBACK 1 (Waterway)	Warringah DCP	0.9m	4.8 - 7.8m	Complies
SIDE SETBACK 2 (28 Binalong)	Warringah DCP	0.9m	2.2m	Complies
SIDE ENVELOPE	Warringah DCP	4m	N/A	Complies
NUMBER OF STORIES	Warringah DCP	2	2	Complies
LANDSCAPED OPEN SPACE	Warringah DCP	40% of Site	44.8% of Site	Complies

LIST OF CHANGES TO PLANS WITHOUT PREJUDICE

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10. Tiled area off managers room due to carpark change
11. Perspectives updated to include planting from landscape architect

Project: 60 BINALONG AVENUE
ALLAMBIE HEIGHTS

Client: Gannet Developments



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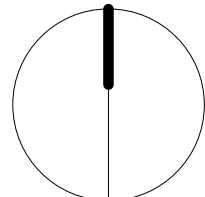
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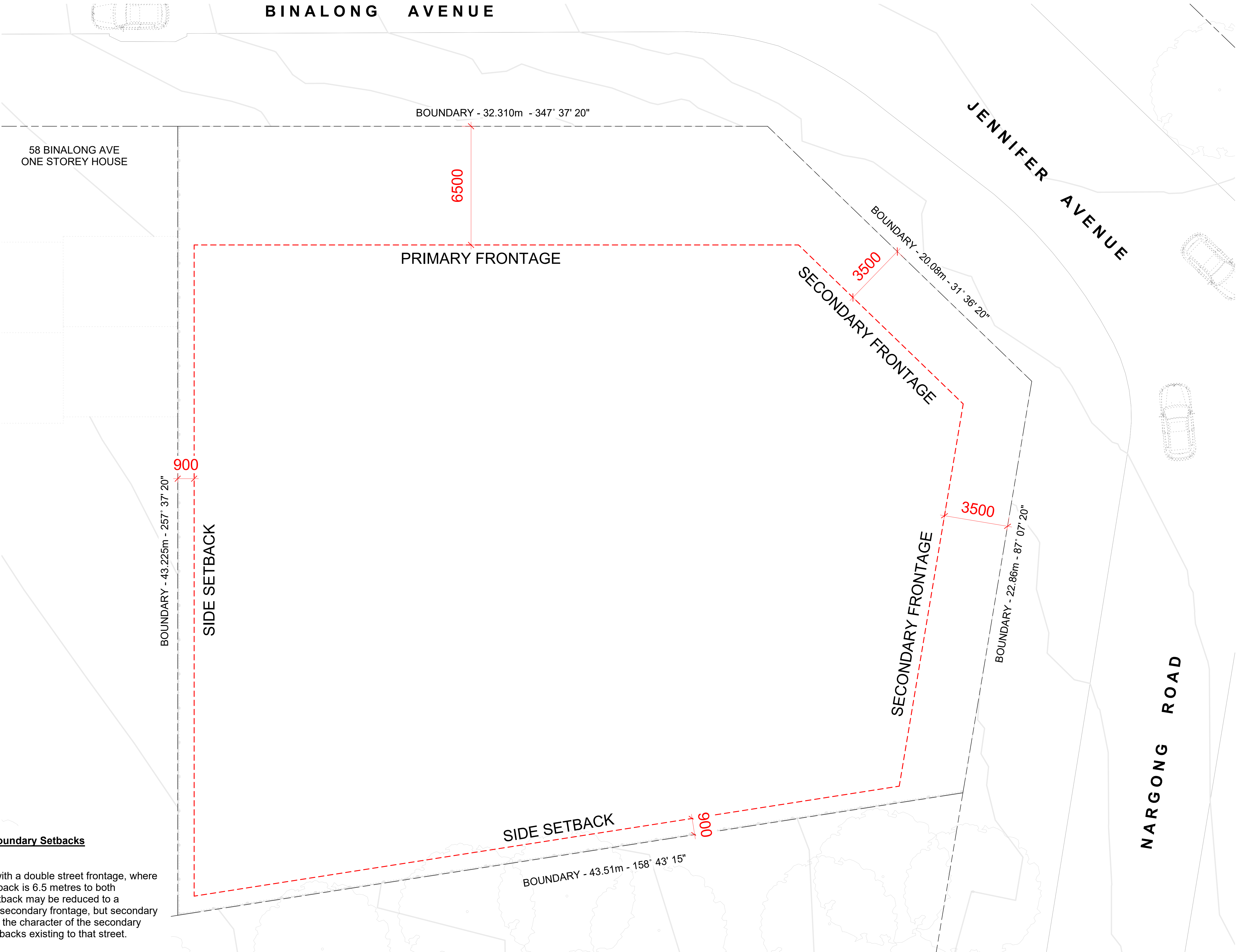
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A FOR DEVELOPMENT APPLICATION APPROVAL
B DRAFT PLANS WITHOUT PREJUDICE

Description

Date
21.01.18
05.06.18

Rev.
B





Warringah DCP B7 - Front Boundary Setbacks

Land Zoned R2 or R3
On corner allotments or sites with a double street frontage, where the minimum front building setback is 6.5 metres to both frontages, the front building setback may be reduced to a minimum of 3.5 metres for the secondary frontage, but secondary street variations must consider the character of the secondary street and the predominant setbacks existing to that street.

Project: 60 BINALONG AVENUE
ALLAMBIE HEIGHTS
Client: Gannet Developments



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DA SETBACK ANALYSIS

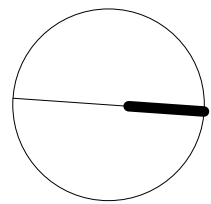
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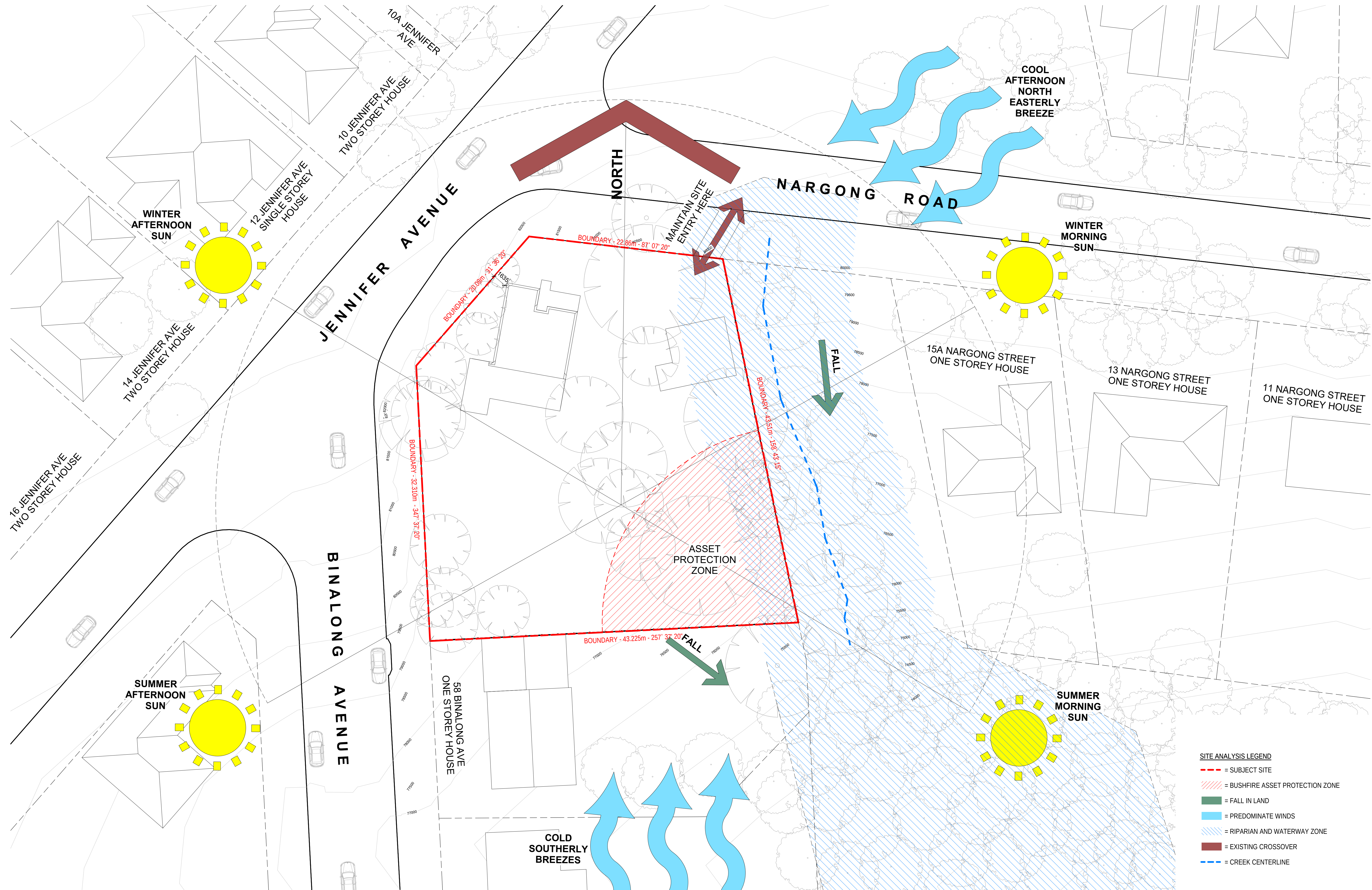
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Description
FOR DEVELOPMENT APPLICATION APPROVAL

Date
21.01.18

Rev.
A





- SITE ANALYSIS LEGEND**
- = SUBJECT SITE
 - //// = BUSHFIRE ASSET PROTECTION ZONE
 - = FALL IN LAND
 - = PREDOMINATE WINDS
 - //// = RIPARIAN AND WATERWAY ZONE
 - = EXISTING CROSSOVER
 - - - = CREEK CENTERLINE

Project: **60 BINALONG AVENUE**
ALLAMBIE HEIGHTS

Client: Gannet Developments



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SITE ANALYSIS

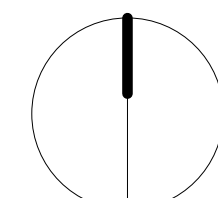
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A





18 JENNIFER AVENUE

LOCAL CHARACTER ANALYSIS

THIS HOUSE STANDS AS ONE OF THE MOST MODERN IN THE STREET. THE ROOF PLANE IS SIMPLE YET CREATES A DIALOGUE OF ARTICULATED AND EXPRESSED ROOFS. THIS IS FURTHER EMPHASISED BY THE USE OF COLOUR CONTRAST BETWEEN DIFFERENT ELEMENTS. FURTHER TO THAT, BALCONIES ARE EXPRESSED TO CREATE A SENSE OF DEPTH, WITH TIMBER COLUMNS USED AS A FEATURE THAT EXPRESSES THEIR VERTICALITY.

DESIGN PRINCIPLES REFERENCED

SIMPLE ROOF PLANES
USE OF TIMBER TO EXPRESS VERTICALITY
EXPRESSED BALCONIES TO CREATE DEPTH
CONTRASTING COLOURS



16 JENNIFER AVENUE

LOCAL CHARACTER ANALYSIS

THIS TWO-TO-THREE STOREY DWELLING HAS A TRADITIONAL SANDSTONE BASE, WITH RENDERED WALLS ABOVE FOLLOWED BY LIGHT WEIGHT DETAILED CLADDING AT ITS TOP. THIS EXPRESSES THE WEIGHT OF MATERIALS BY HAVING HEAVIEST AT THE BASE AND LIGHTEST AT THE ROOF

DESIGN PRINCIPLES REFERENCED

WEIGHT TO MATERIALS (BRICKS AT BASE WITH LIGHTWEIGHT MATERIAL ABOVE).



14 JENNIFER AVENUE

LOCAL CHARACTER ANALYSIS

BUILDING DEPTH IS CREATED BY USING BALCONIES IN MULTIPLE LOCATIONS. THIS DEPTH AND ARTICULATION IS ENHANCED THROUGH THE ROOF OVERHANG, CLEANLY WRAPPING THE BUILDING FOOTPRINT AND EXTENDING TO BEYOND THE BALCONIES.

DESIGN PRINCIPLES REFERENCED

EXPRESSED BALCONIES TO CREATE DEPTH
LARGER OVERHANGS FOR DEPTH



12 JENNIFER AVENUE

LOCAL CHARACTER ANALYSIS

THIS HOUSE REPRESENTS ONE OF THE MORE TYPICAL OLDER DWELLINGS IN THE IMMEDIATE CONTEXT OF SITE. BRICK IS A CONSISTENT MATERIAL UTILISED, WITH DEEP EAVES AND EXPRESSED ROOF SLOPES ARTICULATING THE BUILDING FORM.

DESIGN PRINCIPLES REFERENCED

USE OF BRICK AS A FACADE ELEMENT



6 JENNIFER AVENUE

LOCAL CHARACTER ANALYSIS

WHILST EXPANSIVE IN FOOTPRINT, ITS MASS AND EFFECTIVE VISUAL 'BULK' IS ABLE TO BE REDUCED THROUGH ARTICULATION. THE BUILDING'S RENDERED BASE 'GROUNDS' THE BUILDING TO SITE, WITH ITS LIGHT-WEIGHT TOPMOST LEVEL FURTHER ALLEVIATING ITS HEAVINESS AND THEREFORE VISUAL MASS.

DESIGN PRINCIPLES REFERENCED

CONTRASTING COLOURS AND MATERIALS
WEIGHTED MATERIALS (LIGHTWEIGHT VS RENDERED BRICKS)



4 NARGONG ROAD

LOCAL CHARACTER ANALYSIS

THIS DWELLING, WHILST MODERN IN DESIGN, REFERENCES TO ITS OLDER AND MORE ESTABLISHED SURROUNDING PROPERTIES THROUGH THE IMPLEMENTATION OF BRICK THROUGHOUT THE FACADE.

DESIGN PRINCIPLES REFERENCED

USE OF BRICK AS A FACADE ELEMENT



5 NARGONG ROAD

LOCAL CHARACTER ANALYSIS

THIS HOUSE IS SIMPLE IN FORM AND MATERIALITY, UTILISING A PALETTE WHICH REFERENCES THE OLDER HOUSES IN ITS VICINITY. THE ROOF AND FENESTRATIONS THEREFORE BECOME THE FOCUS

DESIGN PRINCIPLES REFERENCED

NIL



6 NARGONG ROAD

LOCAL CHARACTER ANALYSIS

THIS LIGHT-WEIGHT DWELLING IS FAR MORE MODERN IN EXPRESSIO THAN MANY OTHER SURROUNDING BUILDINGS. ITS SIMPLE ROOPLINE CREATES A STRIKING IMPACT TO THE STREETSCAPE, HOWEVER ITS SLOPE ENSURES IT STILL MELTS WITH THE SURROUNDING CONTEXT. ITS LIGHT, WEIGHT FACADE CONTRASTS IN MATERIAL AND COLOUR EXPRESSION TO ARTICULATE WHAT COULD OTHERWISE BE AN OVERLY SIMPLIFIED AND FLAT FACADE.

DESIGN PRINCIPLES REFERENCED

SIMPLE ROOF PLANE
BREAKING FACADE WITH COLOUR VARIATIONS



6A NARGONG ROAD

LOCAL CHARACTER ANALYSIS

THIS HOUSE EXPRESSES THE TRANSITION OF THIS NEIGHBOURHOOD BETWEEN 'TRADITIONAL' DWELLINGS AND THEIR MORE MODERN COUNTERPARTS. SIMPLE NEW ROOF PLANES ARTICULATE THE BUILDING'S MASS, WHILST CONTRASTING MATERIALS AND COLOURS FURTHER BREAK DOWN THE APPARENT VISUAL SCALE OF THE BUILDING

DESIGN PRINCIPLES REFERENCED

SIMPLE ROOF PLANES
CONTRASTING COLOURS



10 NARGONG ROAD

LOCAL CHARACTER ANALYSIS

THIS HOUSE, AS WITH MANY OF ITS MODERN COUNTERPARTS, USES BALCONIES AND EXPRESSIVE ROOF PLANES TO BREAK DOWN BULK AND APPARENT VISUAL SCALE

DESIGN PRINCIPLES REFERENCED

NIL



3 MANEROO STREET

LOCAL CHARACTER ANALYSIS

THIS DWELLING IS MORE TRADITIONAL IN DESIGN, MAKING USE OF BRICK TO EFFECTIVELY REFERENCE ITS SURROUNDS

DESIGN PRINCIPLES REFERENCED

USE OF BRICK AS A FACADE ELEMENT



73 BINALONG AVENUE

LOCAL CHARACTER ANALYSIS

THIS HOUSE, AS WITH MANY OF ITS MODERN COUNTERPARTS, IS QUITE MASSIVE AND BULKY TO THE STREET. WHILST SOME ARTICULATION BREAKS DOWN THE MASS, SLIGHTLY, ITS MAIN REFERENCE TO ITS SURROUNDS COMES THROUGH ITS UTILISATION OF BRICK AS A PRIMARY FACADE ELEMENT.

DESIGN PRINCIPLES REFERENCED

USE OF BRICK AS A FACADE ELEMENT

Project: 60 BINALONG AVENUE
ALLAMBIE HEIGHTS

Client: Gannet Developments



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Number
DA015

No. A Description
FOR DEVELOPMENT APPLICATION APPROVAL

Date
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1 3D VIEW - VIEW FROM BINALONG AVENUE
DA050



2 3D VIEW - VIEW FROM NARGONG ROAD
DA050



3 3D VIEW - VIEW UP BINALONG AVENUE SLOPE
DA050



4 3D VIEW - VIEW ALONG NARGONG ROAD
DA050

LIST OF CHANGES TO PLANS WITHOUT PREJUDICE

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11. Perspectives updated to include planting from landscape architect

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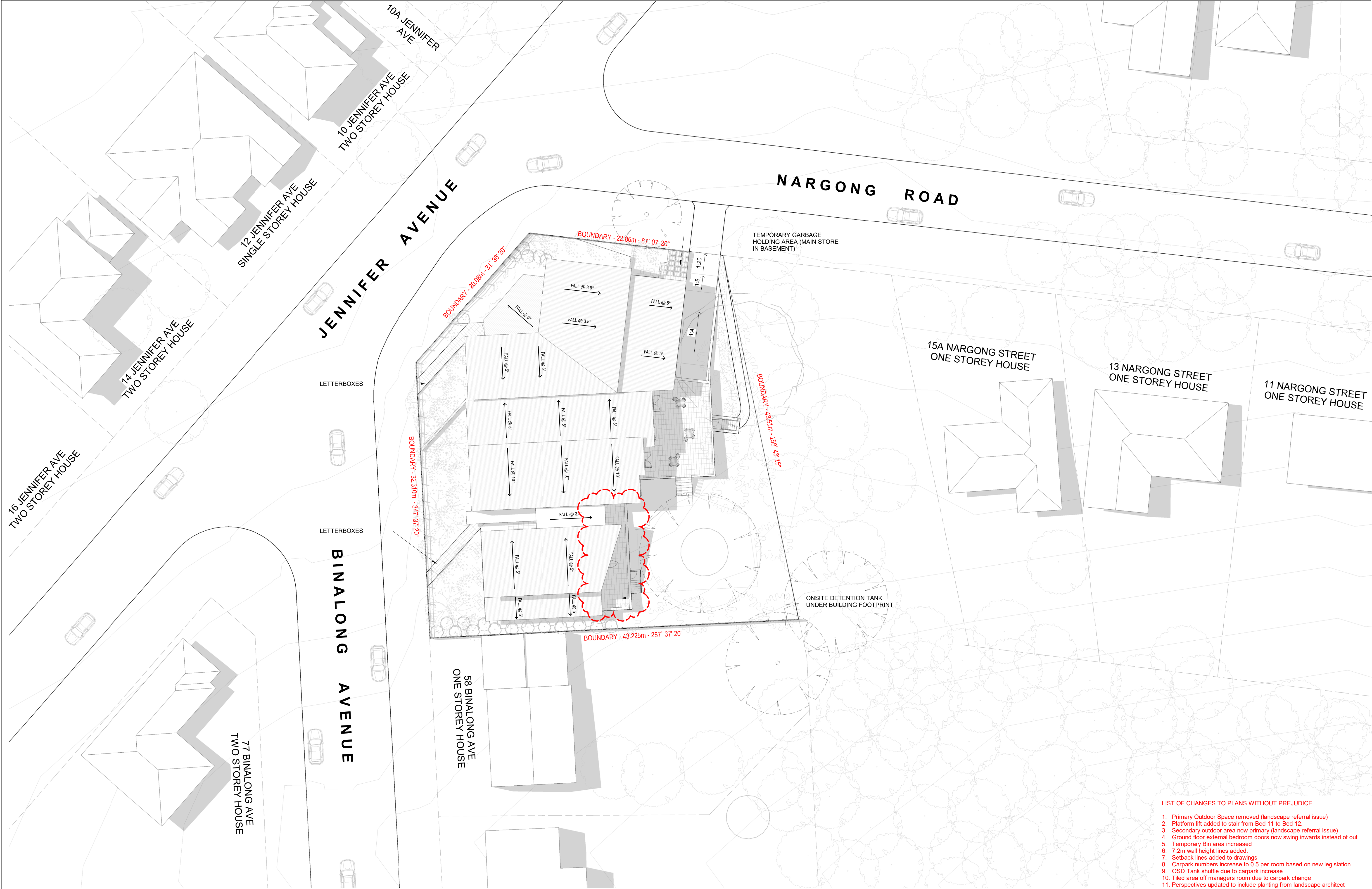
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A FOR DEVELOPMENT APPLICATION APPROVAL 21.01.18
B DRAFT PLANS WITHOUT PREJUDICE 05.06.18

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- LIST OF CHANGES TO PLANS WITHOUT PREJUDICE
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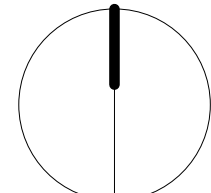
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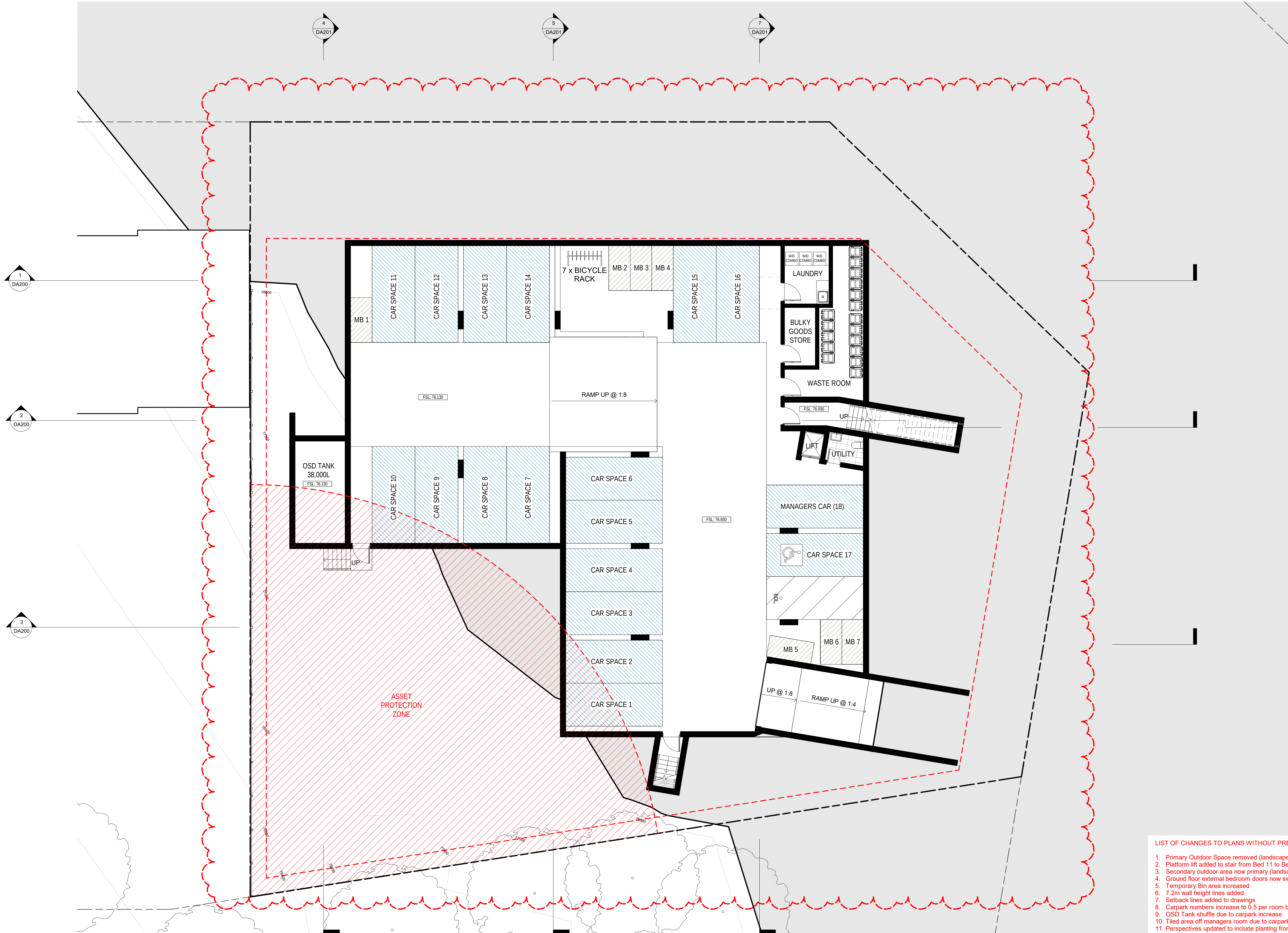
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DA100

No.	Description	Date
A	FOR DEVELOPMENT APPLICATION APPROVAL	21.01.18
B	AMENDED TO COMPLY WITH SCHEDULE A FOR LAND & ENVIRONMENT COURT SUBMISSION	01.04.18
C	DRAFT PLANS WITHOUT PREJUDICE	05.06.18

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C





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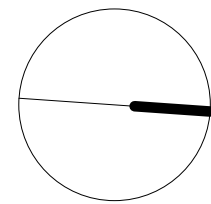
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BASEMENT PLAN

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DA101

No.	Description	Date
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B	AMENDED TO COMPLY WITH SCHEDULE A FOR LAND & ENVIRONMENT COURT SUBMISSION	01.04.18
C	DRAFT PLANS WITHOUT PREJUDICE	05.06.18

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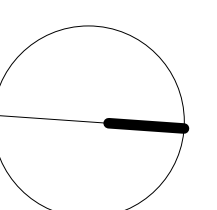
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GROUND PLAN

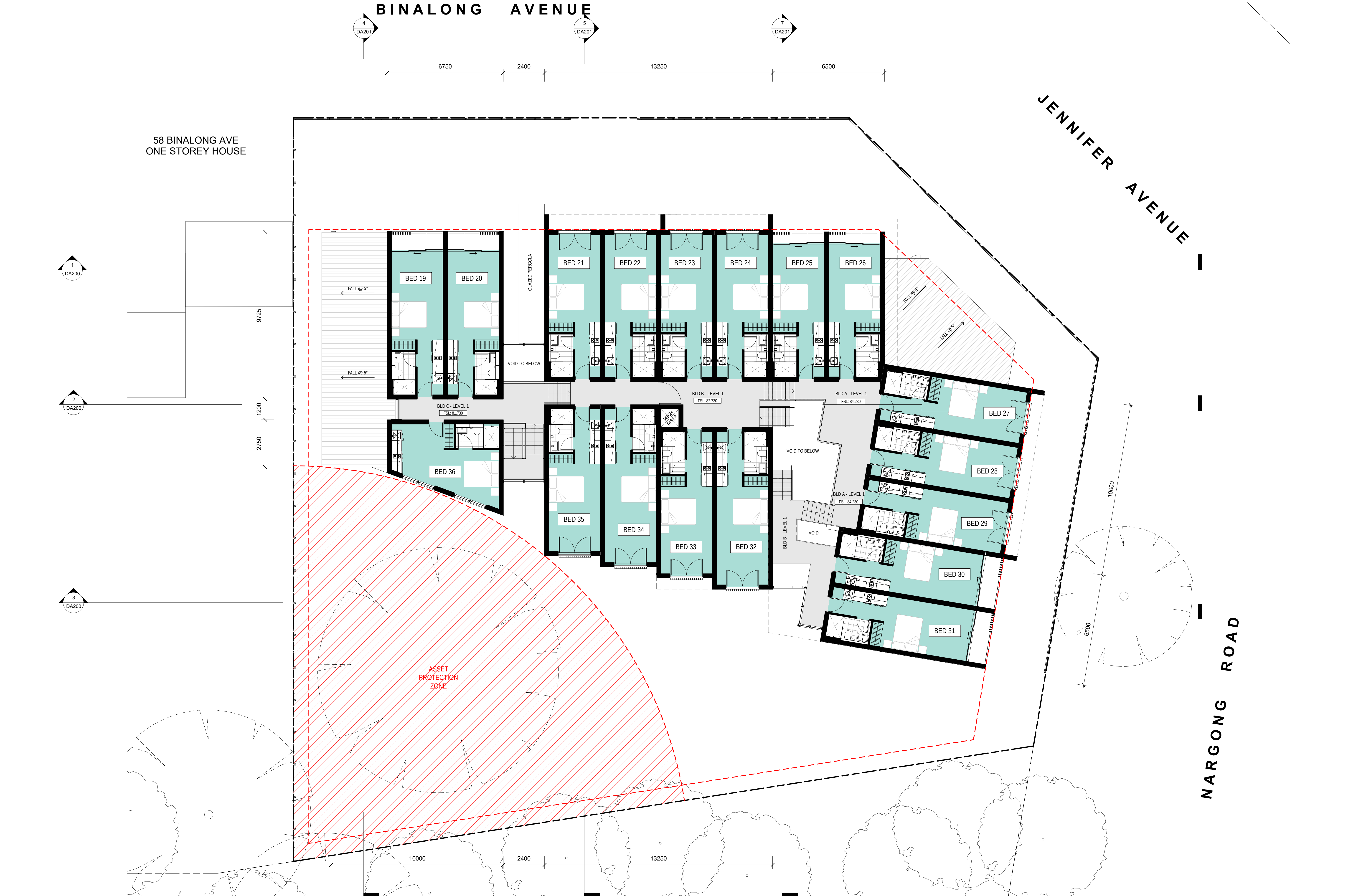
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Number
DA102

No.	Description	Date
A	AMENDED TO COMPLY WITH SCHEDULE A FOR LAND & ENVIRONMENT COURT SUBMISSION	01.04.18
B	DRAFT PLANS WITHOUT PREJUDICE	05.06.18

Rev.
B





Project: 60 BINALONG AVENUE
ALLAMBIE HEIGHTS
Client: Gannet Developments



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Scale
1 : 100 @ A1
1 : 200 @ A3

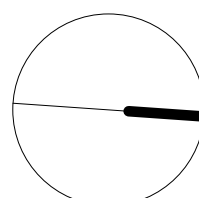
Sheet Name
LEVEL 1 PLAN

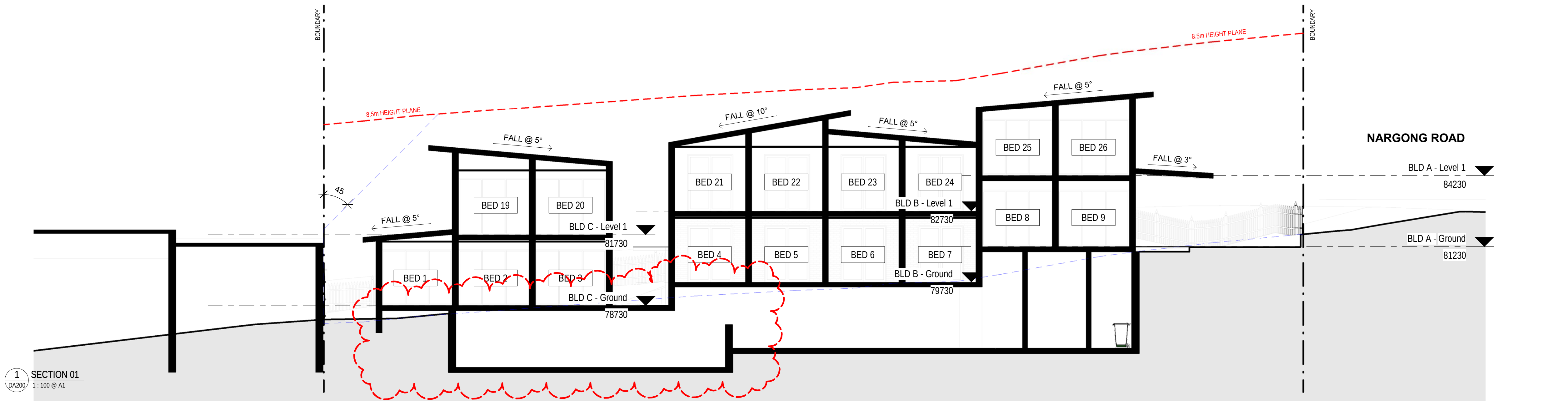
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Number
DA103

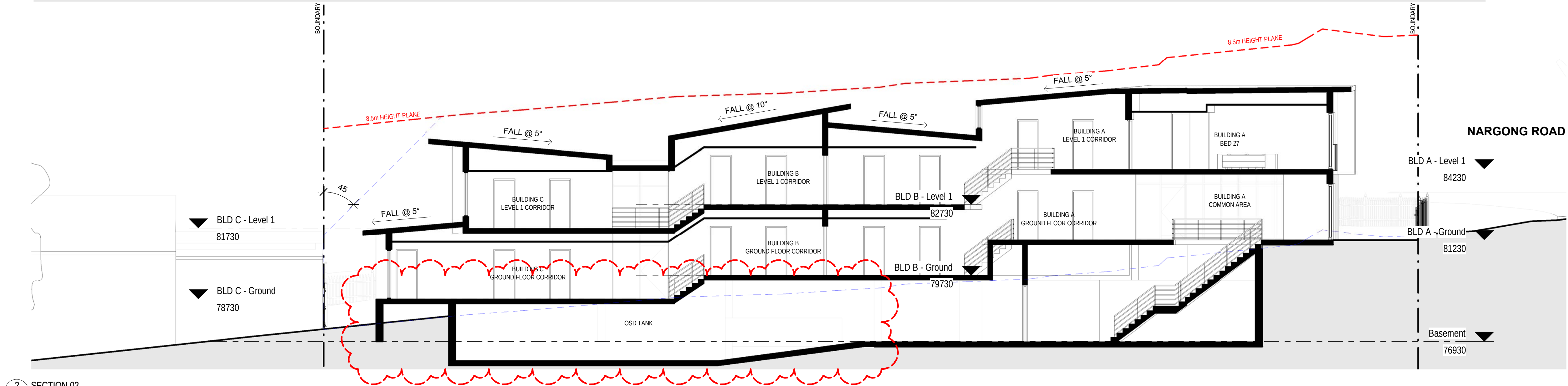
No.	Description	Date
A	FOR DEVELOPMENT APPLICATION APPROVAL	21.01.18
B	AMENDED TO COMPLY WITH SCHEDULE A FOR LAND & ENVIRONMENT COURT SUBMISSION	01.04.18

Rev.
B

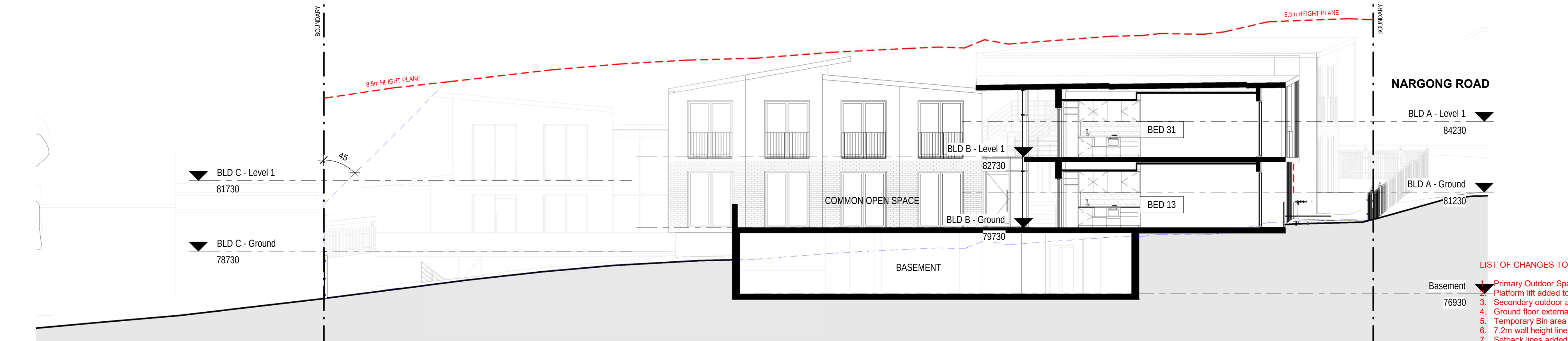




1 SECTION 01
DA200 1:100 @ A1



2 SECTION 02
DA200 1:100 @ A1



3 SECTION 03
DA200 1:100 @ A1

- LIST OF CHANGES TO PLANS WITHOUT PREJUDICE
1. Primary Outdoor Space removed (landscape referral issue)
 2. Platform lift added to stair from Bed 11 to Bed 12.
 3. Secondary outdoor area now primary (landscape referral issue)
 4. Ground floor external bedroom doors now swing inwards instead of out
 5. Temporary Bin area increased
 6. 7.2m wall height lines added.
 7. Setback lines added to drawings
 8. Carpark numbers increase to 0.5 per room based on new legislation
 9. OSD Tank shuffle due to carpark increase
 10. Tiled area off managers room due to carpark change
 11. Perspectives updated to include planting from landscape architect

Project: 60 BINALONG AVENUE
ALLAMBIE HEIGHTS
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Scale
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1 : 200 @ A3

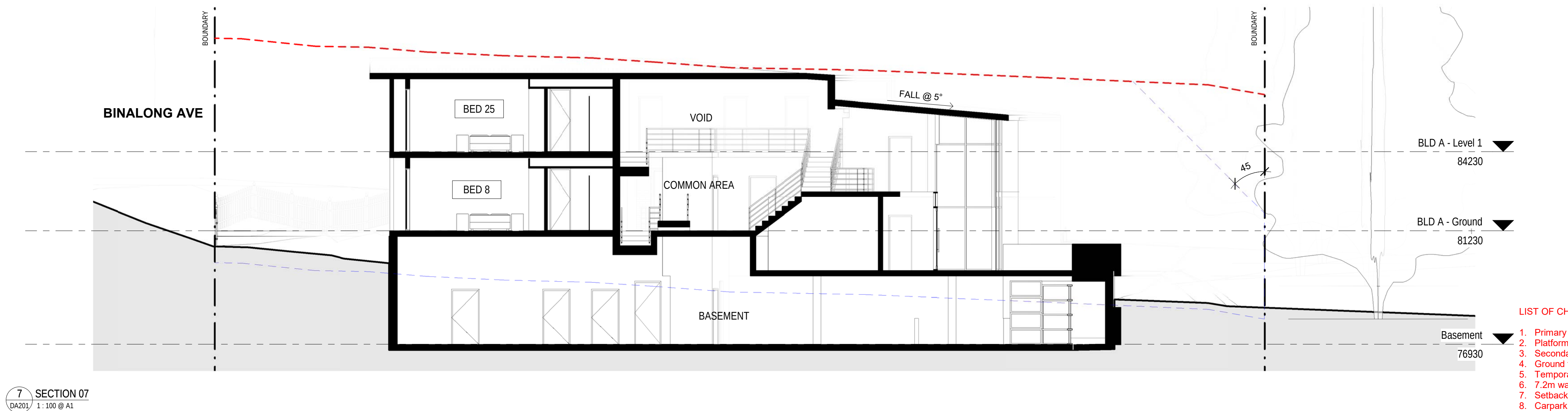
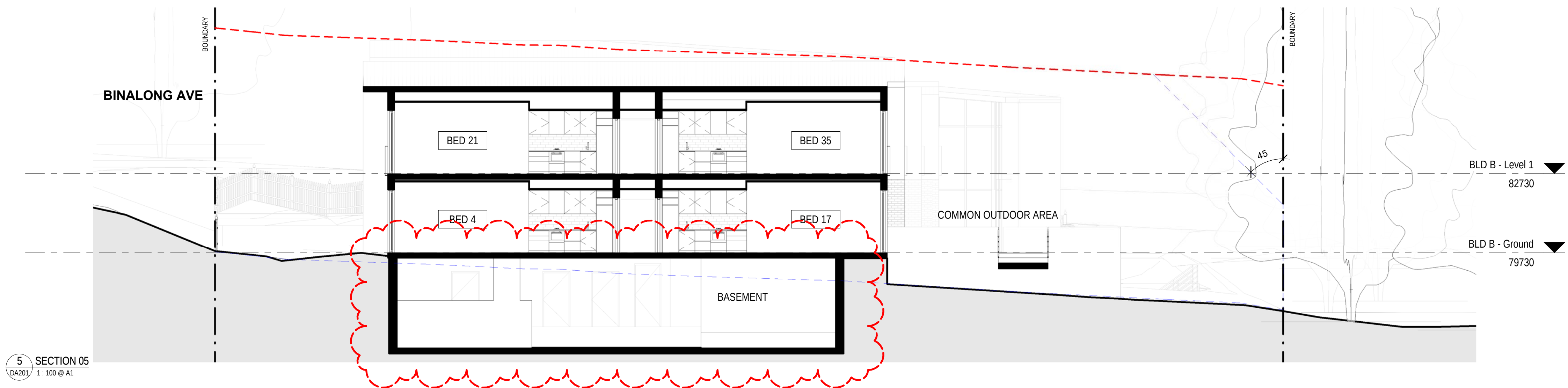
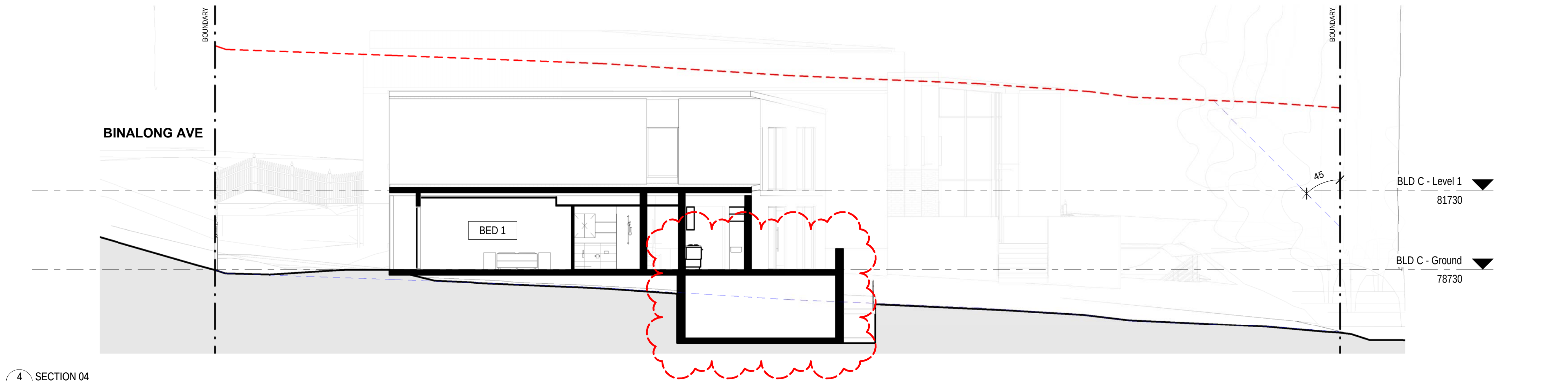
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Number
DA200

No. A FOR DEVELOPMENT APPLICATION APPROVAL
B DRAFT PLANS WITHOUT PREJUDICE

Date
21.01.18
05.06.18

Rev.
B



- LIST OF CHANGES TO PLANS WITHOUT PREJUDICE
1. Primary Outdoor Space removed (landscape referral issue)
 2. Platform lift added to stair from Bed 11 to Bed 12.
 3. Secondary outdoor area now primary (landscape referral issue)
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Project: 60 BINALONG AVENUE
ALLAMBIE HEIGHTS

Client: Gannet Developments



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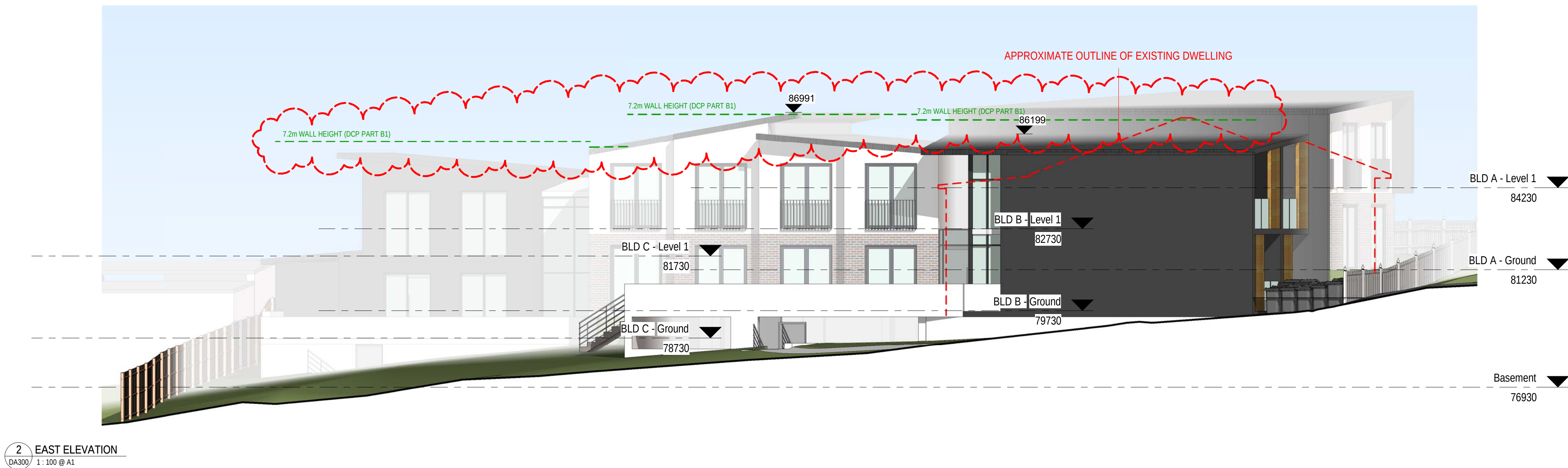
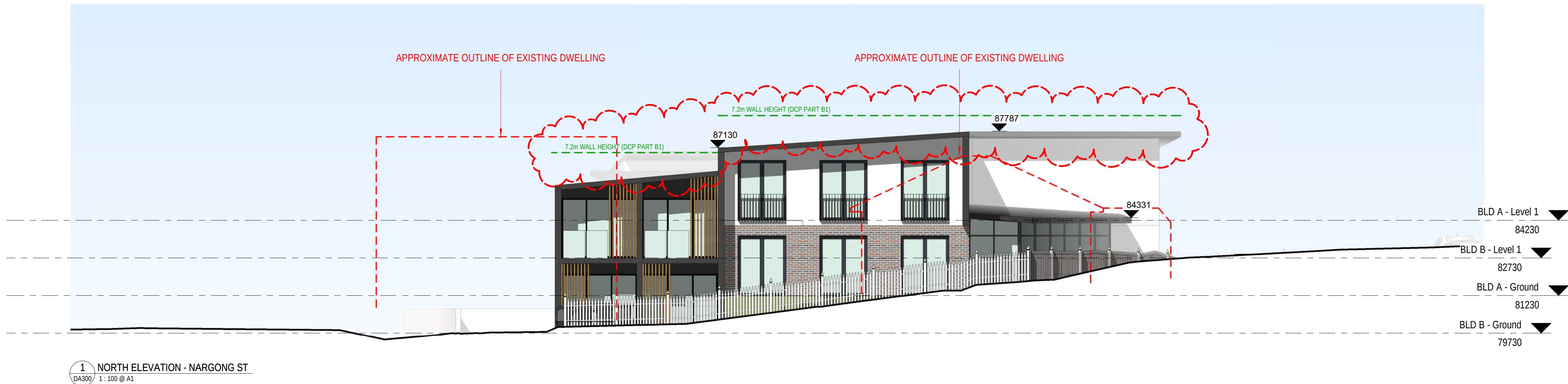
Scale
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1 : 200 @ A3

Sheet Name
SECTIONS

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Number
DA201

No.	Description	Date	Rev.
A	FOR DEVELOPMENT APPLICATION APPROVAL	21.01.18	
B	DRAFT PLANS WITHOUT PREJUDICE	05.06.18	
			B



- LIST OF CHANGES TO PLANS WITHOUT PREJUDICE
1. Primary Outdoor Space removed (landscape referral issue)
 2. Platform lift added to stair from Bed 11 to Bed 12.
 3. Secondary outdoor area now primary (landscape referral issue)
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 11. Perspectives updated to include planting from landscape architect

Project: 60 BINALONG AVENUE
ALLAMBIE HEIGHTS
Client: Gannet Developments



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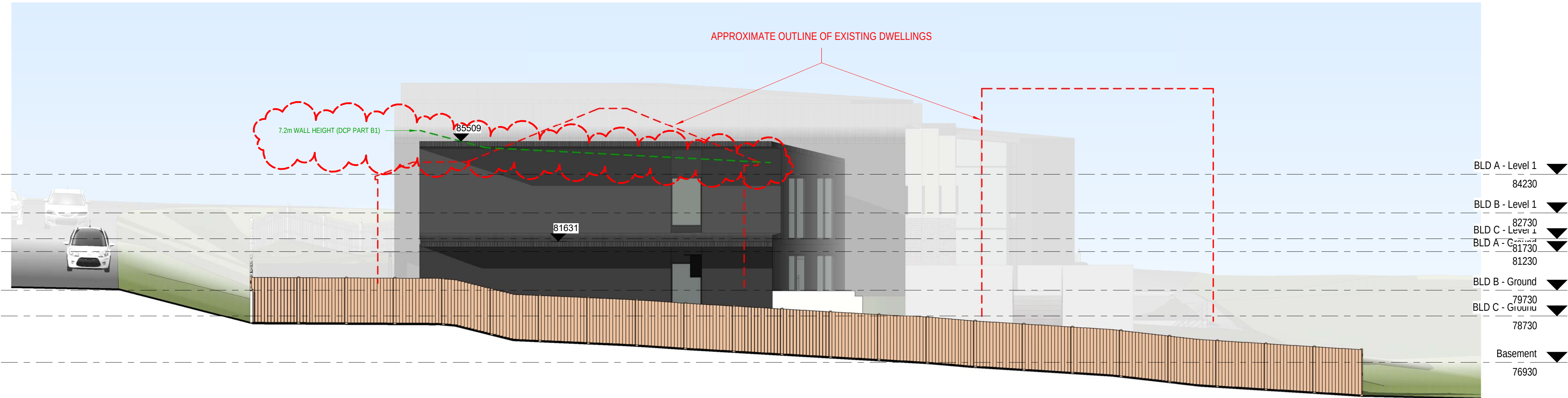
Scale
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1 : 200 @ A3

Sheet Name
ELEVATIONS

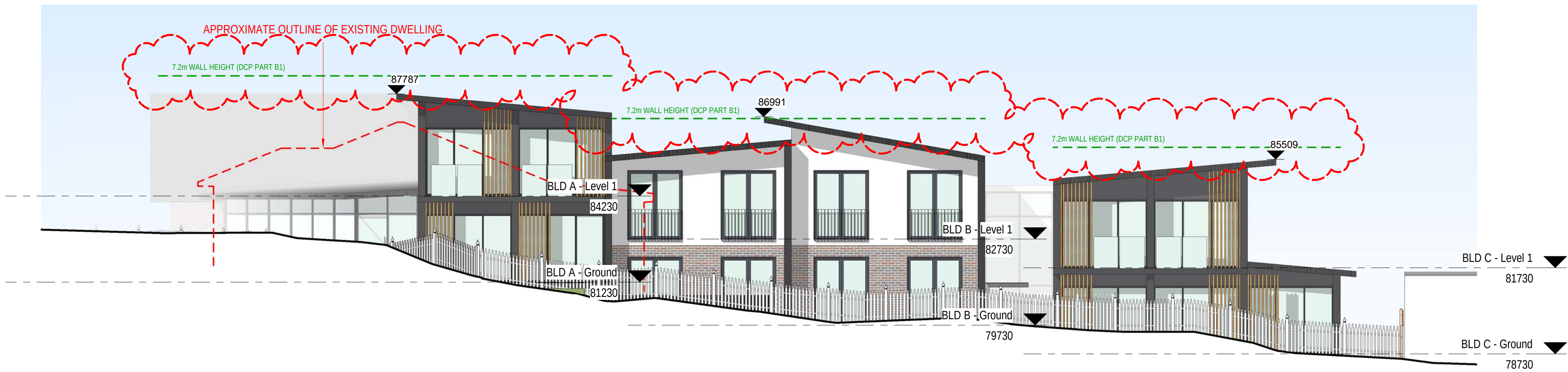
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Number
DA300

No.	Description	Date	Rev.
A	FOR DEVELOPMENT APPLICATION APPROVAL	21.01.18	
B	AMENDED TO COMPLY WITH SCHEDULE A FOR LAND & ENVIRONMENT COURT SUBMISSION	01.04.18	
C	DRAFT PLANS WITHOUT PREJUDICE	05.06.18	C



1 SOUTH ELEVATION
DA301/ 1:100 @ A1



2 WEST ELEVATION - BINALONG AVE
DA301/ 1:100 @ A1

LIST OF CHANGES TO PLANS WITHOUT PREJUDICE

1. Primary Outdoor Space removed (landscape referral issue)
2. Platform lift added to stair from Bed 11 to Bed 12.
3. Secondary outdoor area now primary (landscape referral issue)
4. Ground floor external bedroom doors now swing inwards instead of out
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11. Perspectives updated to include planting from landscape architect

Project: 60 BINALONG AVENUE
ALLAMBIE HEIGHTS
Client: Gannet Developments



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Scale
1 : 100 @ A1
1 : 200 @ A3

Sheet Name
ELEVATIONS

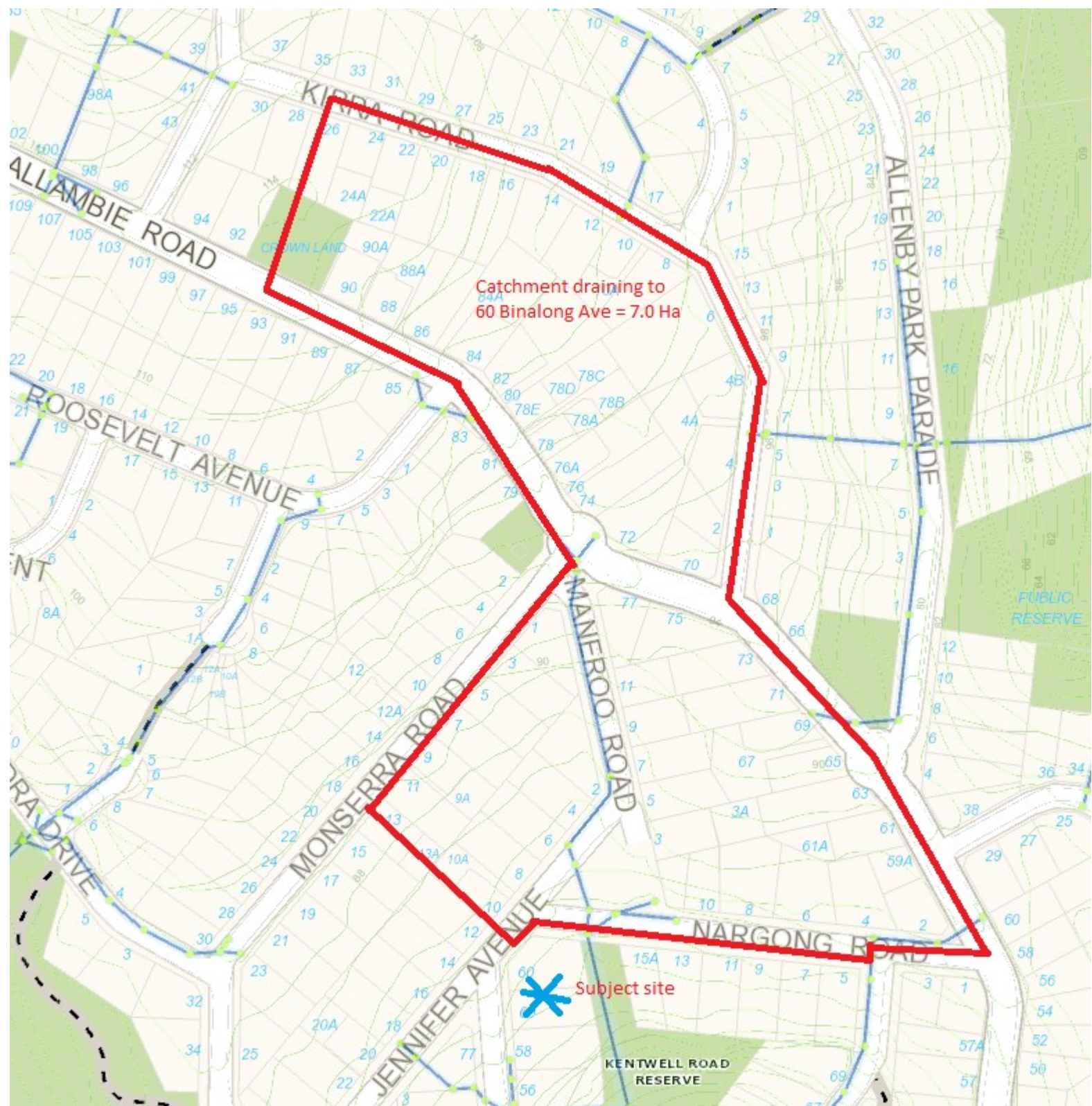
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Number
DA301

No.	Description	Date
A	FOR DEVELOPMENT APPLICATION APPROVAL	21.01.18
B	AMENDED TO COMPLY WITH SCHEDULE A FOR LAND & ENVIRONMENT COURT SUBMISSION	01.04.18
C	DRAFT PLANS WITHOUT PREJUDICE	05.06.18

Rev.
C

APPENDIX C



APPENDIX D

• FLOOD STUDY

60 BUNDARA AVE
 ALLAMBE HEIGHTS
 13 SEPT 2018



• CATCHMENT AREA

$$\begin{aligned}
 &= \frac{1}{2} \times b \times h & + & b \times w \\
 &= (0.5 \times 380 \times 200) & + & 120 \times 270 \\
 &= 38,000 & + & 32,400 \\
 &= 7 \text{ HA}
 \end{aligned}$$

• TIME OF CONCENTRATION (CHART A45363)

Property time	=	Summs
catchment	400m @ 5%.	4 mins
	200m @ 5%.	2.5 mins
	200m @ 2.5%.	3.5 mins
	$\Sigma =$	<u>15 mins</u>

• RAINFALL INTENSITY

from chart A45366

$$100 \text{ mm} \text{ in } 15 = 186 \text{ mm/hr}$$

- COEFFICIENT OF LOSS

FROM CURT AA 5317

FOR I = 186 mm/k.

$$\therefore C = \frac{2.3}{2.7} = 0.85$$

- RATIONAL METHOD

$$= \frac{CIA}{360}$$

$$= \frac{(0.85 \times 186 \times 7)}{360}$$

$$= 3.1 \text{ m}^3/\text{sec}$$

- DISCHARGE INTO WETLANDS VIA PIPE

$$\begin{aligned} &\approx \text{CAPACITY OF } \phi 600 \text{ RCD AT 11.} \\ &\quad \text{(NOT UNDER PRESSURE)} \\ &= 0.9 \text{ m}^3/\text{s} \end{aligned}$$

- 50% PIPE BLOCKAGE

$$\begin{aligned} &= 0.5 \times 9 \\ &= 450 \text{ L/s} \approx \text{PIPE CAPACITY} \end{aligned}$$

- WEIR FLOW MARCHON RD INTO

EXISTING WATERCOURSE

$$\begin{aligned}
 &= \text{TOTAL FLOW} - \text{PIPED FLOW} \\
 &= 3.1 \text{ m}^3/\text{s} - 0.45 \\
 &= 2.65 \text{ m}^3/\text{s}
 \end{aligned}$$

- MULTI-STAGE WEIR CALCULATION TO

DETERMINE FLOW SEPTH ODEL KERR

IF INFO EXISTING WATERCOURSE

$$\text{USING WEIR FORM} = 1.67 L H^{3/2}$$

WEIR NO	WEIR 'L'	WEIR 'H'	WEIR 'Q'
1	2.8m	0.28m	80.34
2	5	0.24	80.38
3	4.6	0.15	80.47
4	5.0	0.17	80.45

NOTE: REFER DWG NO 11518-6 FOR

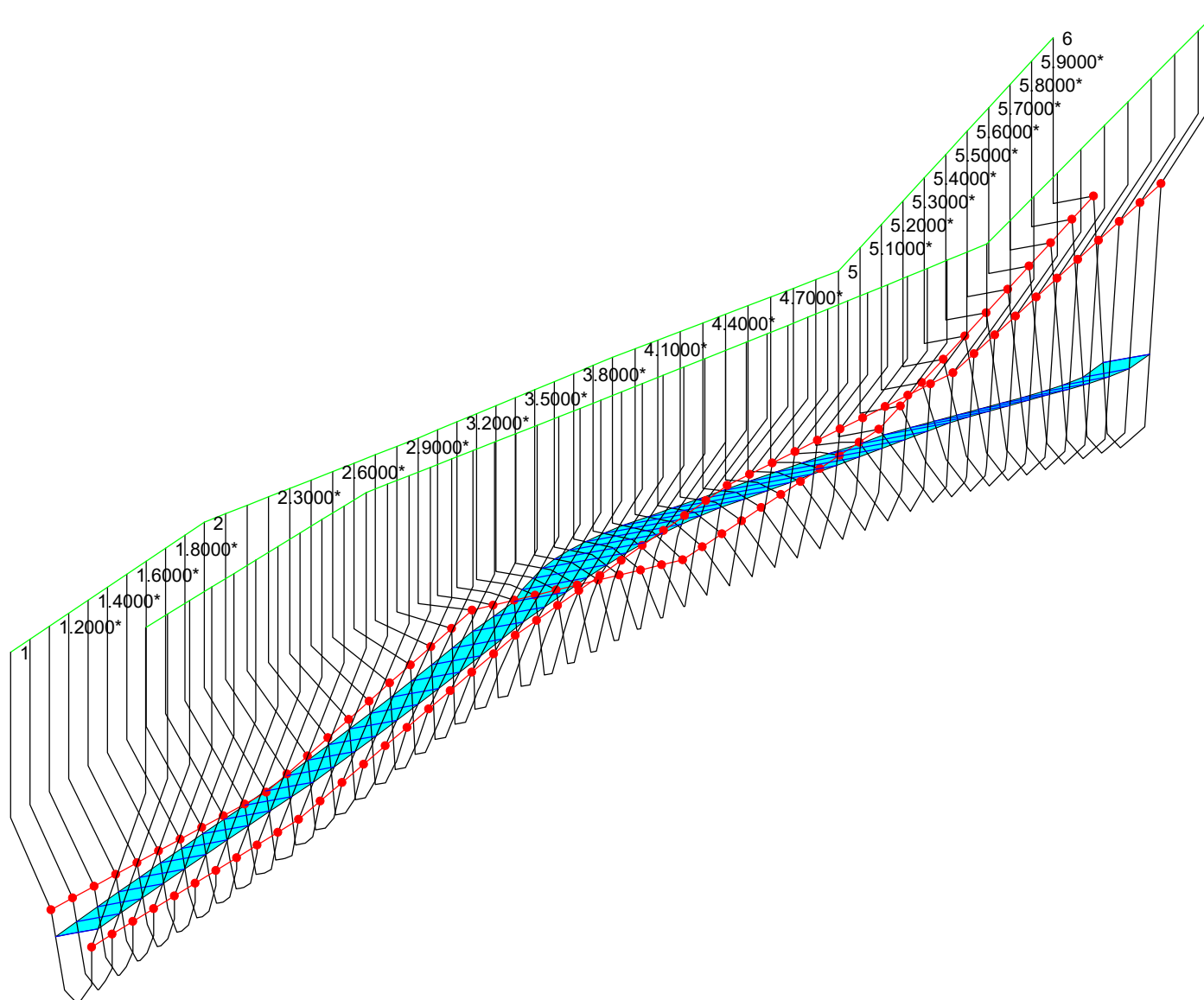
WEIR LOCATIONS & ORIENTATION

- FOR $Q = 2.7 \text{ m}^3/\text{s}$, GIVES WATER LEVEL IN ROADWAY AS E.L. 80.62m A.M.D.

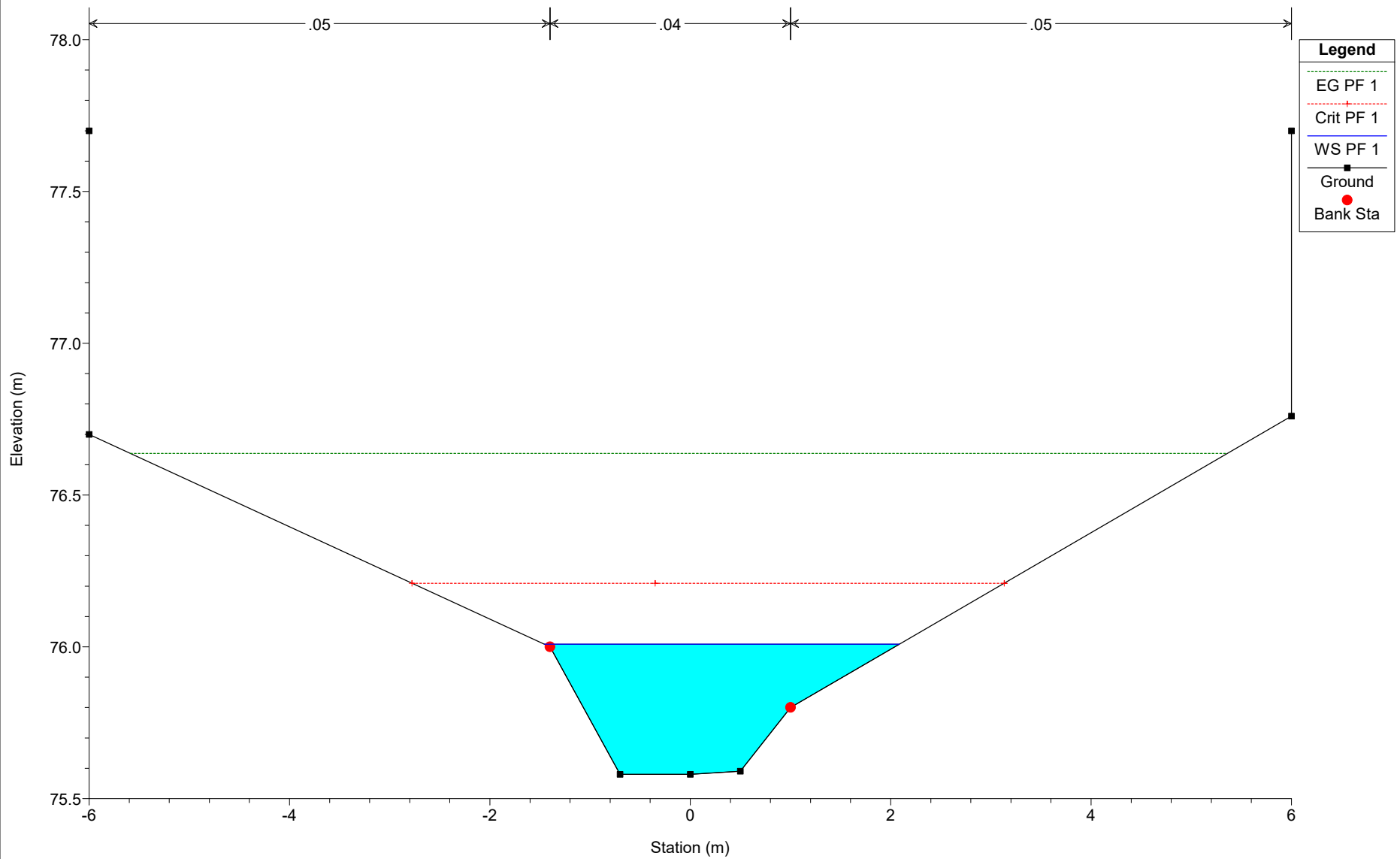
APPENDIX E

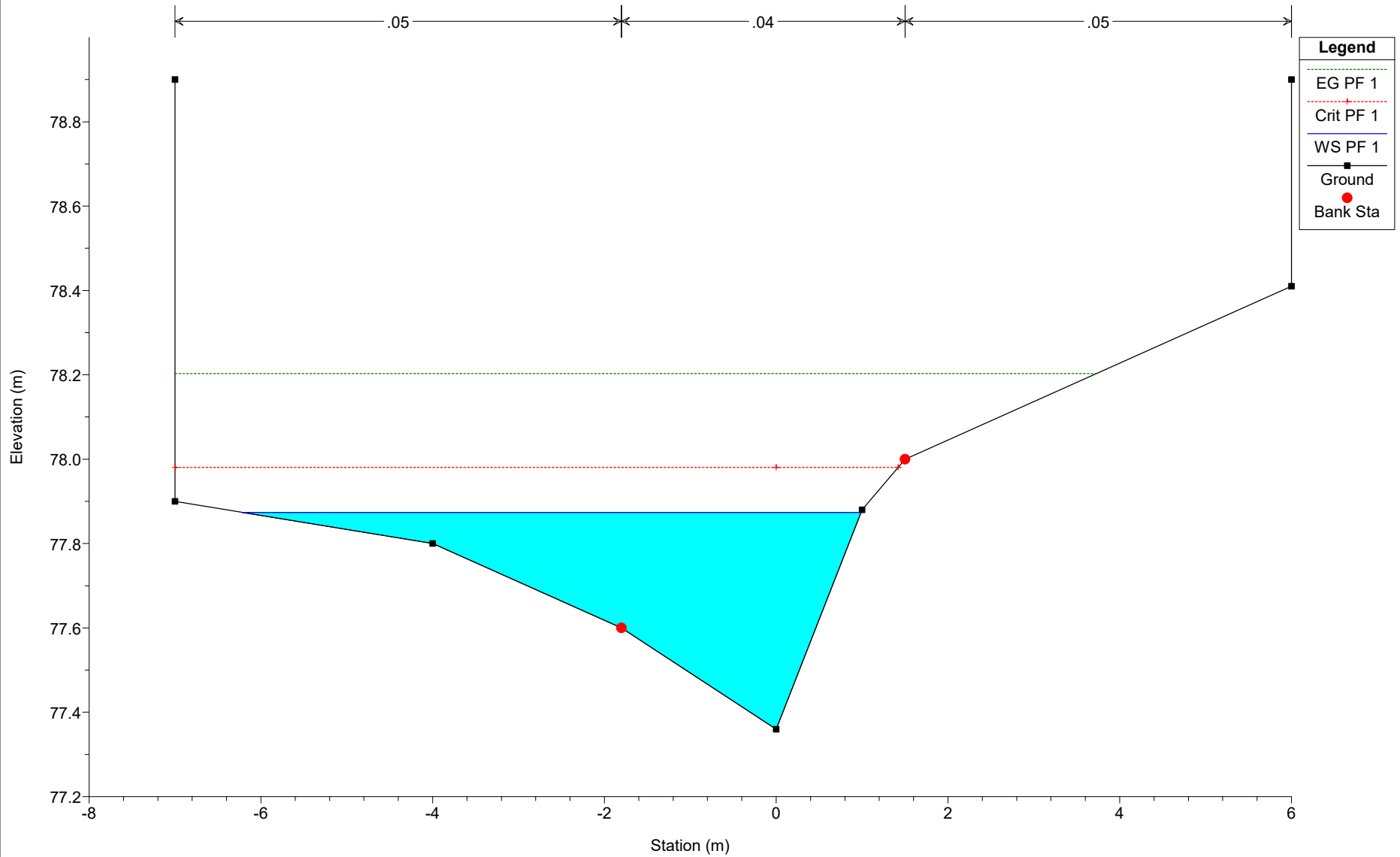
60 Binalong Ave Allambie Hts July 2018

Plan: Plan 01 10/07/2018



Legend	
WS PF 1	
Ground	
Bank Sta	
Ground	

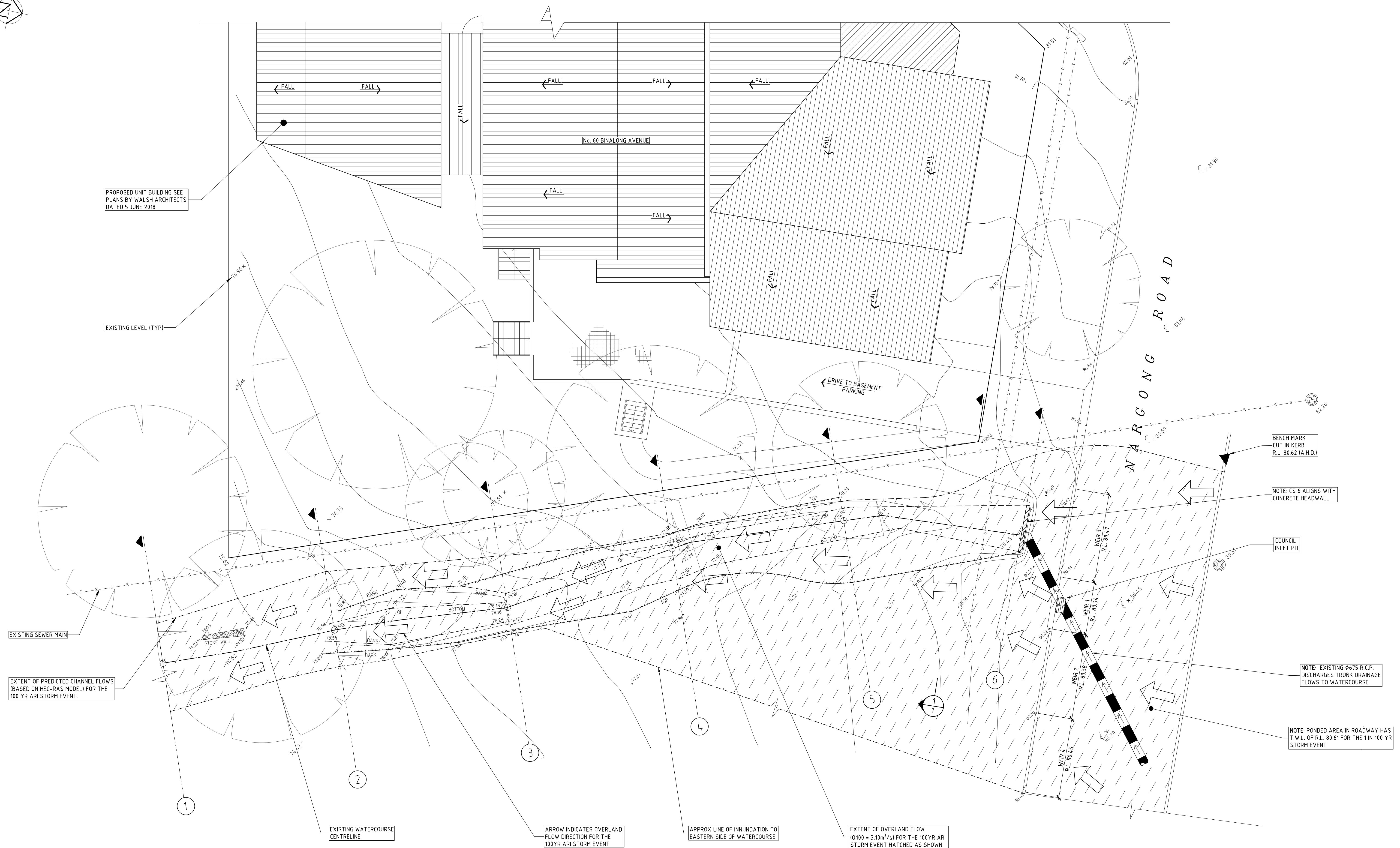
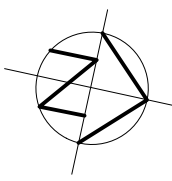




HEC-RAS Plan: Plan 01 River: binalong Reach: 1 Profile: PF 1

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
1	6	PF 1	3.10	78.45	78.98	78.98	79.20	0.024706	2.07	1.49	3.46	1.01
1	5.9000*	PF 1	3.10	78.40	78.88	78.94	79.17	0.036149	2.35	1.32	3.44	1.21
1	5.8000*	PF 1	3.10	78.36	78.83	78.89	79.13	0.040034	2.42	1.28	3.48	1.28
1	5.7000*	PF 1	3.10	78.32	78.78	78.85	79.08	0.042454	2.46	1.26	3.54	1.31
1	5.6000*	PF 1	3.10	78.27	78.73	78.81	79.04	0.043454	2.46	1.26	3.61	1.33
1	5.5000*	PF 1	3.10	78.23	78.69	78.76	78.99	0.043583	2.44	1.27	3.70	1.33
1	5.4000*	PF 1	3.10	78.18	78.64	78.72	78.94	0.044104	2.43	1.28	3.82	1.34
1	5.3000*	PF 1	3.10	78.13	78.60	78.68	78.90	0.045143	2.41	1.28	3.96	1.35
1	5.2000*	PF 1	3.10	78.09	78.55	78.63	78.85	0.047001	2.40	1.29	4.15	1.38
1	5.1000*	PF 1	3.10	78.04	78.51	78.59	78.80	0.049458	2.38	1.30	4.44	1.40
1	5	PF 1	3.10	78.00	78.46	78.56	78.74	0.054128	2.34	1.33	4.97	1.45
1	4.9000*	PF 1	3.10	77.94	78.40	78.50	78.68	0.055381	2.36	1.32	4.99	1.47
1	4.8000*	PF 1	3.10	77.87	78.34	78.44	78.63	0.054021	2.37	1.32	5.66	1.46
1	4.7000*	PF 1	3.10	77.81	78.28	78.38	78.58	0.052752	2.40	1.32	5.97	1.45
1	4.6000*	PF 1	3.10	77.74	78.22	78.32	78.52	0.052044	2.43	1.33	6.22	1.45
1	4.5000*	PF 1	3.10	77.68	78.16	78.26	78.47	0.051606	2.47	1.34	6.66	1.45
1	4.4000*	PF 1	3.10	77.62	78.11	78.21	78.42	0.051635	2.52	1.36	6.79	1.46
1	4.3000*	PF 1	3.10	77.55	78.05	78.15	78.37	0.051926	2.57	1.37	6.96	1.47
1	4.2000*	PF 1	3.10	77.49	77.99	78.09	78.31	0.052443	2.62	1.39	7.09	1.48
1	4.1000*	PF 1	3.10	77.42	77.93	78.04	78.26	0.053040	2.68	1.40	7.16	1.49
1	4	PF 1	3.10	77.36	77.87	77.98	78.20	0.052449	2.73	1.43	7.21	1.48
1	3.9000*	PF 1	3.10	77.28	77.81	77.91	78.15	0.054067	2.73	1.40	7.19	1.50
1	3.8000*	PF 1	3.10	77.21	77.75	77.86	78.09	0.055733	2.73	1.38	7.12	1.52
1	3.7000*	PF 1	3.10	77.13	77.68	77.80	78.04	0.057081	2.73	1.34	6.92	1.54
1	3.6000*	PF 1	3.10	77.06	77.62	77.74	77.98	0.057010	2.74	1.30	6.65	1.53
1	3.5000*	PF 1	3.10	76.98	77.54	77.67	77.91	0.056663	2.76	1.25	6.21	1.53
1	3.4000*	PF 1	3.10	76.90	77.46	77.60	77.85	0.059234	2.82	1.18	5.51	1.56
1	3.3000*	PF 1	3.10	76.83	77.37	77.52	77.79	0.063654	2.89	1.11	4.80	1.60
1	3.2000*	PF 1	3.10	76.75	77.27	77.45	77.72	0.070287	2.97	1.06	3.82	1.66
1	3.1000*	PF 1	3.10	76.68	77.17	77.36	77.64	0.076685	3.04	1.04	3.76	1.72
1	3	PF 1	3.10	76.60	77.07	77.24	77.56	0.083222	3.10	1.02	3.74	1.76
1	2.9000*	PF 1	3.10	76.50	76.96	77.14	77.47	0.086370	3.18	0.99	3.68	1.81
1	2.8000*	PF 1	3.10	76.40	76.85	77.03	77.38	0.088352	3.24	0.98	3.63	1.84
1	2.7000*	PF 1	3.10	76.29	76.74	76.93	77.29	0.089622	3.30	0.97	3.59	1.86
1	2.6000*	PF 1	3.10	76.19	76.63	76.82	77.20	0.091168	3.36	0.95	3.56	1.89
1	2.5000*	PF 1	3.10	76.09	76.53	76.72	77.11	0.091971	3.41	0.94	3.53	1.90
1	2.4000*	PF 1	3.10	75.99	76.42	76.62	77.02	0.091710	3.45	0.94	3.52	1.91
1	2.3000*	PF 1	3.10	75.89	76.32	76.52	76.92	0.091813	3.48	0.94	3.50	1.92
1	2.2000*	PF 1	3.10	75.78	76.21	76.41	76.83	0.092268	3.52	0.94	3.50	1.93
1	2.1000*	PF 1	3.10	75.68	76.11	76.31	76.73	0.093102	3.55	0.94	3.50	1.95
1	2	PF 1	3.10	75.58	76.01	76.21	76.64	0.093589	3.59	0.94	3.54	1.96
1	1.9000*	PF 1	3.10	75.48	75.91	76.11	76.54	0.095517	3.59	0.93	3.48	1.97
1	1.8000*	PF 1	3.10	75.38	75.82	76.02	76.44	0.094988	3.56	0.93	3.46	1.96
1	1.7000*	PF 1	3.10	75.29	75.72	75.92	76.35	0.096081	3.56	0.92	3.43	1.97
1	1.6000*	PF 1	3.10	75.19	75.62	75.82	76.25	0.096892	3.56	0.92	3.39	1.97
1	1.5000*	PF 1	3.10	75.09	75.53	75.72	76.15	0.096777	3.54	0.92	3.36	1.96
1	1.4000*	PF 1	3.10	74.99	75.43	75.63	76.06	0.097803	3.54	0.91	3.32	1.96
1	1.3000*	PF 1	3.10	74.89	75.33	75.53	75.95	0.097611	3.52	0.91	3.28	1.95
1	1.2000*	PF 1	3.10	74.80	75.23	75.43	75.86	0.098872	3.52	0.91	3.24	1.95
1	1.1000*	PF 1	3.10	74.70	75.13	75.33	75.76	0.099892	3.51	0.91	3.19	1.95
1	1	PF 1	3.10	74.60	75.03	75.23	75.66	0.100781	3.51	0.90	3.14	1.95

APPENDIX F



100 YEAR FLOOD EXTENTS PLAN

SCALE 1:100
NOTE: PLAN SHOWING THE INUNDATION AND OVERLAND
FLOW REGIME DUE THE PROPOSED ROAD RESERVE WORKS
NOTE: PLAN TO BE READ IN CONJUNCTION
WITH DWG 11518-7

[illegible]

TITLE
100 YEAR FLOOD EXTENTS
60 BINALONG AVENUE, ALLAMBIE HEIGHTS

DRAWN JBK	DATE 10 JULY 2018	CHECKED  BE Civil (Hons) MIE Aust.	SCALE @ A1 1:200
------------------	--------------------------	---	-------------------------



DRAWING NO
11518-6



	CHAINAGE	EXISTING SURFACE LEVEL	PROPOSED SURFACE LEVEL	DATUM E.L.75.00
	-7.00	77.92		
	-5.96	77.93		
	-3.84	77.92		
	-3.39	77.85		
	-2.95	77.95		
	-2.36	77.96		
	-1.81	77.60		
	-0.99	77.57		
	0.00	77.39		
	0.25	77.36		
	0.81	77.89		
	5.50	78.26		
	5.82	78.32		
	7.00	78.32		

CROSS SECTION 4

	CHAINAGE	EXISTING SURFACE LEVEL	PROPOSED SURFACE LEVEL	DATUM E.L. 75.00
	-188	75.93		
	-128	75.95		
	-96.0	75.60		
	0.00	75.60		
	0.43	75.59		
	1.07	75.82		
	4.05	76.02		
	4.36	76.03		
	6.22	76.59		
	7.00	76.63		

CROSS SECTION 2

DATUM E.L. 75.00										
PROPOSED SURFACE LEVEL										
EXISTING SURFACE LEVEL	78.56	78.55	78.61	78.34	78.19	78.17	78.13	78.05	78.74	79.06
CHAINAGE	-7.00	-4.33	-3.71	-2.26	-1.02	-0.32	0.00	0.72	1.39	4.19

CROSS SECTION 5

	SECTION 1												
	The diagram shows a cross-section of a road or embankment. The ground surface is shown with a hatched area on the left and a solid line on the right. A vertical line marks the 'GREEK CENTRE LINE'. A horizontal line at the top is labeled 'D.A.TUM E.L. 75.00'. A vertical line on the right is labeled '60 BINALONG AVENUE'. A horizontal line at the bottom is labeled 'CHAINAGE'. The ground surface level is shown as a solid line, and the datum is shown as a dashed line. The chainage values are: -7.00, -2.96, -1.49, -1.37, -1.01, 0.00, 0.37, 1.00, 1.92, 2.65, 4.05, 6.41, 7.00. The ground surface level values are: 77.11, 77.25, 77.26, 77.13, 76.57, 76.27, 76.19, 76.79, 76.95, 77.00, 77.17, 77.36, 77.39. A vertical line at chainage 0.00 is labeled 'T.W.L. 77.87'.												
DATUM E.L. 75.00													
PROPOSED SURFACE LEVEL													
EXISTING SURFACE LEVEL	77.11	77.25	77.26	77.13	76.57	76.27	76.19	76.79	76.95	77.00	77.17	77.36	77.39
CHAINAGE	-7.00	-2.96	-1.49	-1.37	-1.01	0.00	0.37	1.00	1.92	2.65	4.05	6.41	7.00

CROSS SECTION 3

	-5.00	81.00	81.00	81.00	7.50
DATUM E.L. 75.00					
PROPOSED SURFACE LEVEL					
EXISTING SURFACE LEVEL					
CHAINAGE					

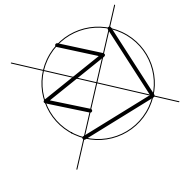
CROSS SECTION 6

CHAINAGE	EXISTING SURFACE LEVEL	PROPOSED DRIVE LEVEL	GRADE %
-10.00	78.90	78.90	
-9.00	78.95	78.95	
-8.00	79.00	79.00	
-7.00	79.10	79.10	
-6.00	79.20	79.20	
-5.00	79.30	79.30	
-4.00	79.35	79.35	
-3.00	79.40	79.40	
-2.00	79.20	79.20	
-1.00	78.45	78.45	
0.00	78.45	78.45	
1.00	78.45	78.45	
2.00	79.00	79.00	
3.00	79.50	79.50	
5.00	79.75	79.75	
9.00	79.80	80.00	
12.00	80.00	80.00	

SECTION

DRAWING NO
SHEET-7

APPENDIX G



BASEMENT CARPARK
R.L. 76.93

CH.20.60

CH.18.60

NOTE: DASHED LINE INDICATES
CHANGE OF GRADE

CH.5.90

CH.3.50

CH.1.80

'EXTRA LOW' CROSSING PROFILE
TO COUNCIL STANDARD

80.84

80.65

BOUNDARY

BOUNDARY

NARGONG ROAD

DRIVEWAY PLAN

SCALE 1:100

EXISTING SURFACE LEVEL

PROPOSED DRIVEWAY PROFILE

BOUNDARY

NARGONG ROAD

BASEMENT CARPARK

R.L. 76.93

GRADE %

12.5%

22.5%

EXTRA LOW CROSSING TO COUNCIL
STANDARD

DATUM 75.00

PROPOSED
DRIVE LEVEL

76.93

77.18

79.79

80.53

80.65

80.50

EXISTING SURFACE
LEVEL

778.0

79.10

79.90

80.20

80.50

CHAINAGE

20.60

18.60

5.9

3.5

1.8

0.0

DRIVEWAY LONG-SECTION

SCALE 1:50 NATURAL

TITLE
DRIVEWAY PLAN & LONG-SECTION
60 BINALONG AVENUE, ALLAMBIE HEIGHTS

DRAWN

JBK

DATE

17 JULY 2018

CHECKED

[Signature]

BE Civil (Hons) MIE Aust

SCALE © A2

1:100
1:50

TAYLOR
CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING NO
SHEET-5