



2 July 2021

Mr David Green
Wollongong City Council
Via email

Level 4
25 Atchison Street
Wollongong NSW 2500
Phone: 02 4228 4401
Web: www.makereng.com.au
Email: info@makereng.com.au
ABN: 50 628 452 719 ACN: 628 452 719

Attention: Mr David Green

Dear David,

CLEVELAND ROAD NORTH PLANNING PROPOSAL – LAND REPRESENTED BY BROWN AND ARAPALI

Updated Lot Layout Preliminary Flood Analysis

BACKGROUND

Maker ENG Pty Ltd (Maker) has been engaged by AIXA (represented by Mr Matt Brown) and DDA (represented by Mr David Arapali) to undertake a preliminary flood impact assessment to prove the development potential of Lot 1 and Lot 2 of DP730326, Lot 1 of DP1125379, Lot 1 of DP532391 and Lot 401 and Lot 402 of DP1254873 which are located north of Cleveland Road, within the West Dapto urban release area.

The preferred concept plan for the lots is shown in Maker ENG plan ISCO0116-00-SK011 and UrbanCo plan 031.CL.016.04 and is the subject of a current planning proposal.

Rienco has prepared a flood study which supports the current planning proposal that covers a number of lots north of Cleveland Road, including all of the lots referenced above. The Rienco flood model was made available to Maker for the purpose of this investigation with the scope broadly being:

- Adopt Rienco flood model for analysis to undertake separate flood modelling for the AIXA sites and DAA sites.
- Incorporate preliminary design surface of latest Maker and UrbanCo proposals into the Rienco flood model.
- Review flood impacts of the proposed development extents of each development
- Provide summary of analysis and results.

ANALYSIS AND FINDINGS

Maker has undertaken an analysis of the AIXA and DAA sites and has prepared a preliminary design surface of the preferred concept development plan, based on providing lots above the flood planning level. The volume of floodplain fill was then calculated, and compensatory floodplain excavation was designed to match this volume within the areas deemed suitable for this purpose. The excavation areas have been designed to grade out to surrounding low points with a minimum 1.5% fall and maximum batters of 1v:4h.



Following a number of iterations, Maker has found that there is sufficient compensatory cut area within the proposed non-development areas to offset the proposed floodplain fill and these cut areas can be designed to sufficiently minimise the impacts to flood levels. It is noted that the impacts assessed for the DAA lands are the combined impact of the UrbanCo layout along with the rezoning proposal as it currently stands in the Rienco model for the remainder of the rezoning area. The impacts presented for the AIXA lands are independent of development occurring downstream, i.e. the impacts of the AIXA development potentially occurring ahead of the DAA lands.

IMPACTS OF THE PROPOSALS ON THE AIXA LAND AND DAA LAND

DAA Land:

Flood maps attached to this letter for the DAA land show that the combined effect of the UrbanCo layout and the current rezoning proposal is a reduction in 100-year ARI flood levels within the Council owned and private property adjacent to the rezoning area. The reductions in flood levels are primarily due to the works proposed within the floodplain upstream of lot 402 along with the floodplain excavation designed with lots 401 and 402.

AIXA Land:

Flood maps attached to this letter for the AIXA land show that the proposed development extents are appropriate in relation to acceptable flood impacts on adjacent properties and non-developable land.

In the Probable Maximum Flood (PMF), flood levels within the adjacent residential area are not impacted, however, an increase in flood levels is predicted on Fairwater Drive as a result of the development. At this location, the maximum depth of flooding on the road is predicted to increase by up to 30mm from 1.11m to 1.14m. Maker has reviewed the temporal results of the flood modelling and found that the duration that the road is trafficable is not decreased in the PMF event. This means that the useability of the road for evacuation and emergency access is not reduced so the changes to flooding on Fairwater Drive are not considered adverse. We note that this impact could be further refined during subsequent design stages to reduce impacts on Fairwater Drive if deemed necessary.

FLOODPLAIN STORAGE

We have found that the proposed development sites, represented by the preliminary Maker design surfaces will result in a nett loss of flood storage in the 100-year ARI event, however, the design includes areas of compensatory cut to offset any loss of floodplain storage in the 100-year ARI event. It is noted that there will likely be further loss of floodplain storage in the PMF event, however, Council has recently revised its DCP to state that filling in the floodplain above the 100-year ARI event may be permitted if it can be demonstrated that there are no adverse impacts in rare events.

We consider the impacts of the proposal are not adverse in the PMF event, so we are of the view that fill beyond the 100 year ARI extent aligns with the guidelines provided in the Wollongong City Council DCP.

We trust that the information provided is suitable to support inclusion of the proposed development extents identified on the attached Concept Development plans prepared by Maker and UrbanCo (attached below).

Please contact me should you require further information on this flood analysis.



Yours faithfully,

Maker ENG.



Ryhan Thomson

Director

FIEAust, B Eng (Hons), B App Sci (Env)

LOT MIX TABLE

RANGE	COUNT	%
300-349	406	29.0%
350-449	545	38.9%
450-549	359	25.6%
550-749	76	5.4%
750-8000	16	1.1%

TOTAL LOT COUNT = 1402

NOTE

NO GROUND SURVEY HAS BEEN UNDERTAKEN
FINAL DIMENSIONS AND AREA SUBJECT TO FORMAL BOUNDARY DEFINITION BY REGISTERED SURVEYOR.
FURTHER EASEMENTS AND RESTRICTIONS MAY APPLY

(A) - Easement for transmission line 60.96 wide (vide DP532391 & Gov. Gaz. 15-7-1965 Fol. 2253, 14-7-1965 / 2253 & 13-5-1966 / 1917)

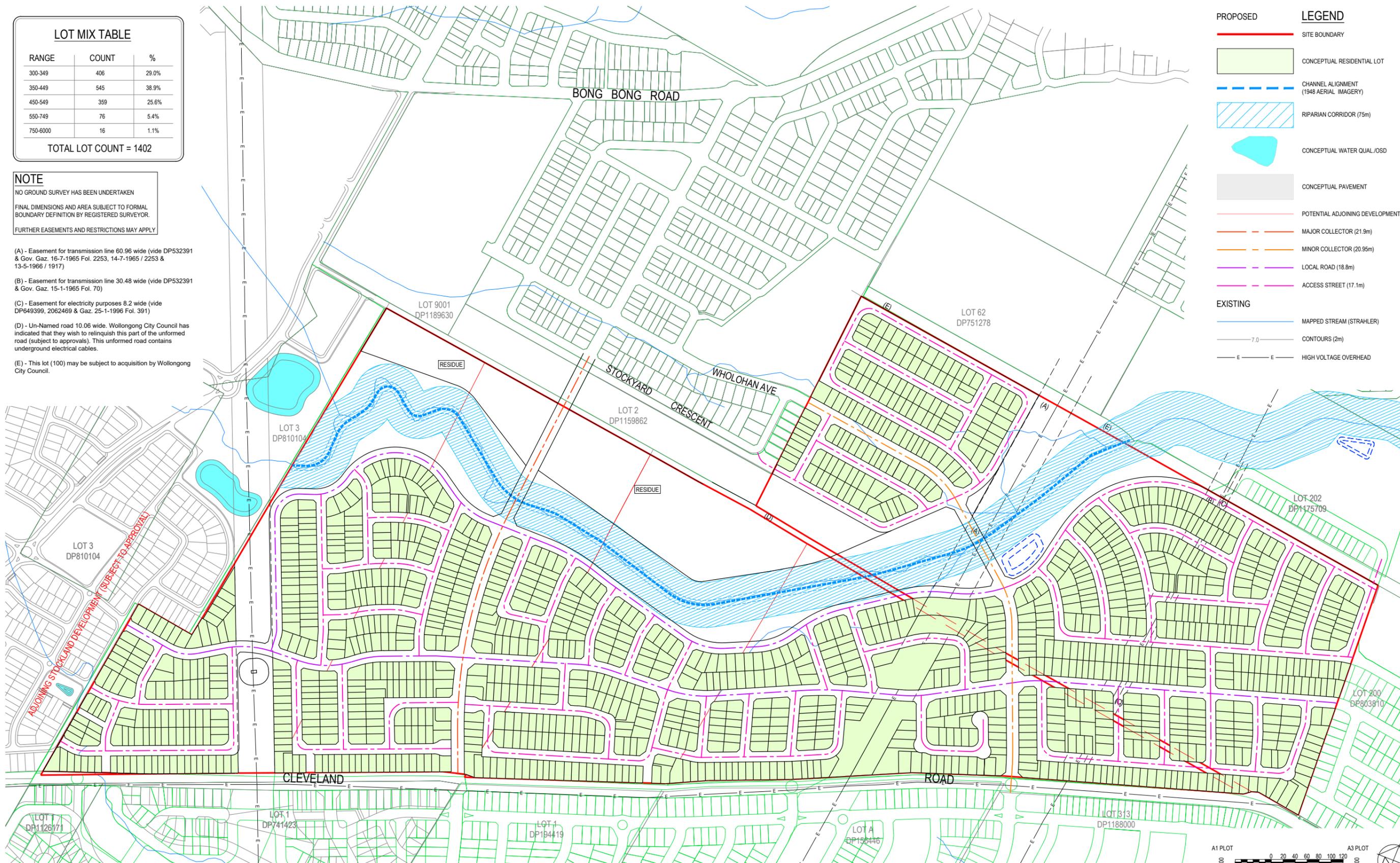
(B) - Easement for transmission line 30.48 wide (vide DP532391 & Gov. Gaz. 15-1-1965 Fol. 70)

(C) - Easement for electricity purposes 8.2 wide (vide DP649399, 2062469 & Gaz. 25-1-1996 Fol. 391)

(D) - Un-Named road 10.06 wide. Wollongong City Council has indicated that they wish to relinquish this part of the unformed road (subject to approvals). This unformed road contains underground electrical cables.

(E) - This lot (100) may be subject to acquisition by Wollongong City Council.

PROPOSED	LEGEND
	SITE BOUNDARY
	CONCEPTUAL RESIDENTIAL LOT
	CHANNEL ALIGNMENT (1948 AERIAL IMAGERY)
	RIPARIAN CORRIDOR (75m)
	CONCEPTUAL WATER QUAL./OSD
	CONCEPTUAL PAVEMENT
	POTENTIAL ADJOINING DEVELOPMENT
	MAJOR COLLECTOR (21.9m)
	MINOR COLLECTOR (20.95m)
	LOCAL ROAD (18.8m)
	ACCESS STREET (17.1m)
EXISTING	
	MAPPED STREAM (STRAHLER)
	CONTOURS (2m)
	HIGH VOLTAGE OVERHEAD



No.	AMENDMENT	APPROVED	DATE	DESIGNED BY
P1	PRELIMINARY ISSUE FOR DISCUSSION	R.X.T.	07.06.21	F.K.

FOR DISCUSSION

CLIENT



APPROVED	R.X.T.	DATE	07.06.21
CHECKED		DATE	
DESIGNED BY	F.K.		
DRAWN BY	F.K.		
CAD FILE	G:\ISCO0116 148 & 196 Cleveland Road\Acad\Civil00 - Sheet\sheet\ISCO0116-00-SK011.dwg		
SCALE	1:2000	SHEET No.	

PROJECT

PLANNING PROPOSAL
LOTS 1 & 2 DP730326, 1 IN DP53229,
1 IN DP156208 & 59 IN DP1125379
290, 334, 148 & 196 CLEVELAND ROAD
CLEVELAND

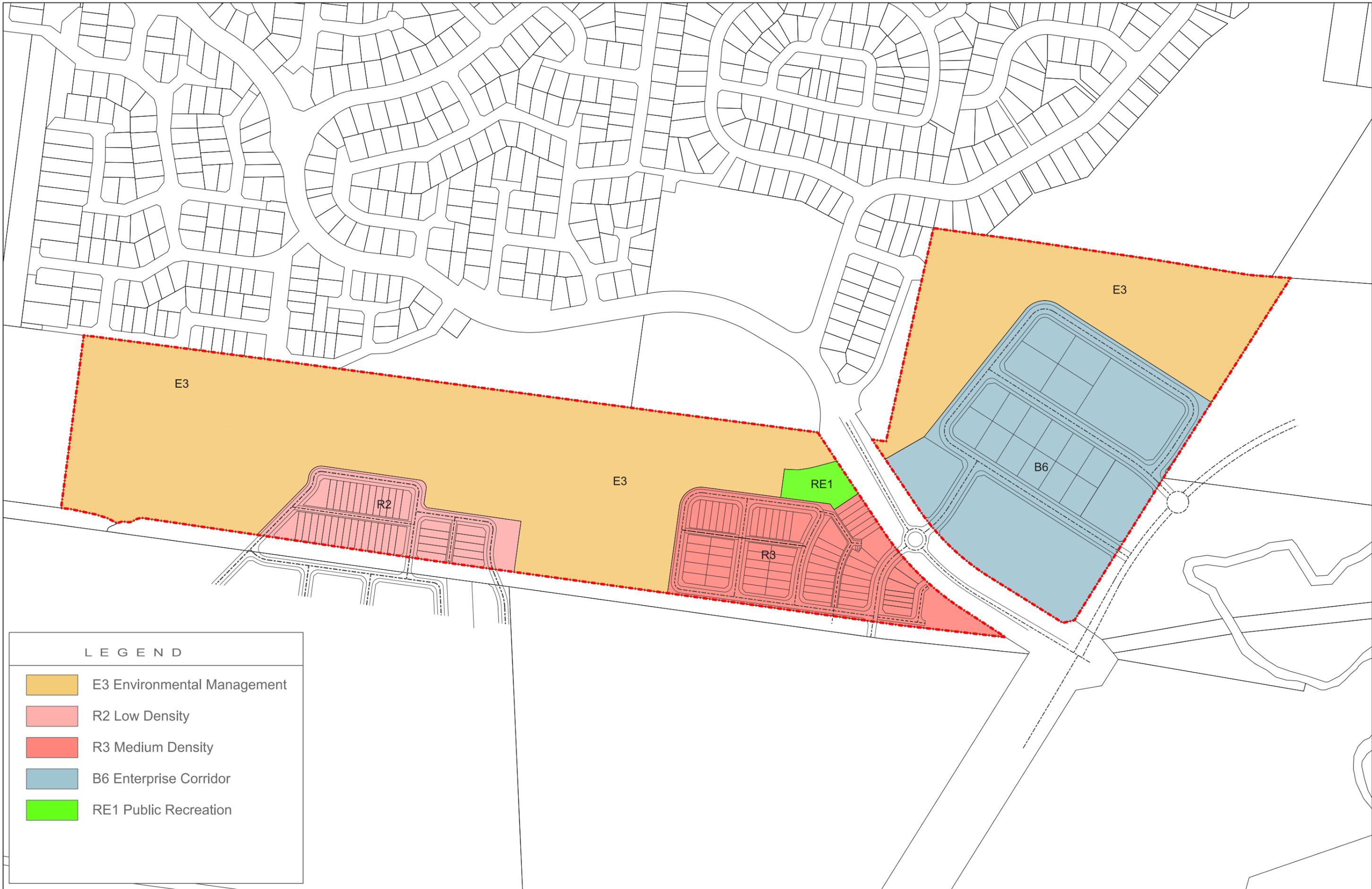
DRAWING TITLE

CONCEPTUAL LAYOUT PLAN

PROJECT No.
ISCO0116-00

DRAWING No.
SK011

AMDT
P1



LEGEND

- E3 Environmental Management
- R2 Low Density
- R3 Medium Density
- B6 Enterprise Corridor
- RE1 Public Recreation

NOTES

Base data supplied by NSW LPI
 Projection MGA Zone 56
 Areas and dimensions shown are subject to final survey calculations.
 All cartageways are shown for illustrative purposes only and are subject to detailed engineering design.
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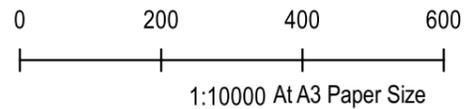
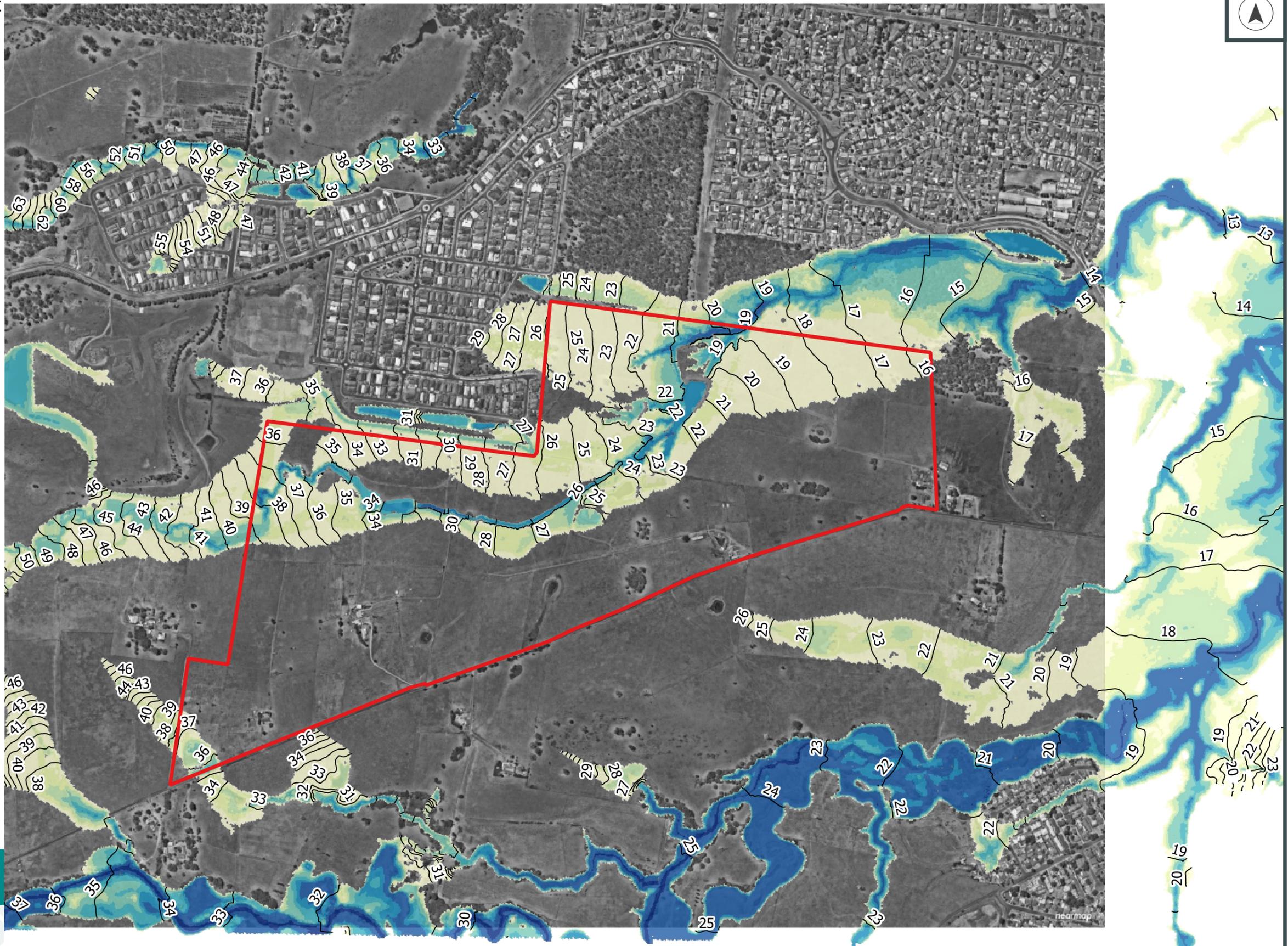


CLIENT : DAA
 SCALE : A1 @ 1:2,000
 DATE : 24/03/2021
 PLAN No : 031.CL.016
 REVISION : 04

Existing 100 year ARI Flood Extent Cleveland Road ISC00116

Legend

-  Subject Site
-  Water Level (m)
- Water Depth (m)**
 -  <= 0.15
 -  0.15 - 0.3
 -  0.3 - 0.5
 -  0.5 - 1
 -  1 - 1.5
 -  1.5 - 2
 -  2 - 4
 -  > 4



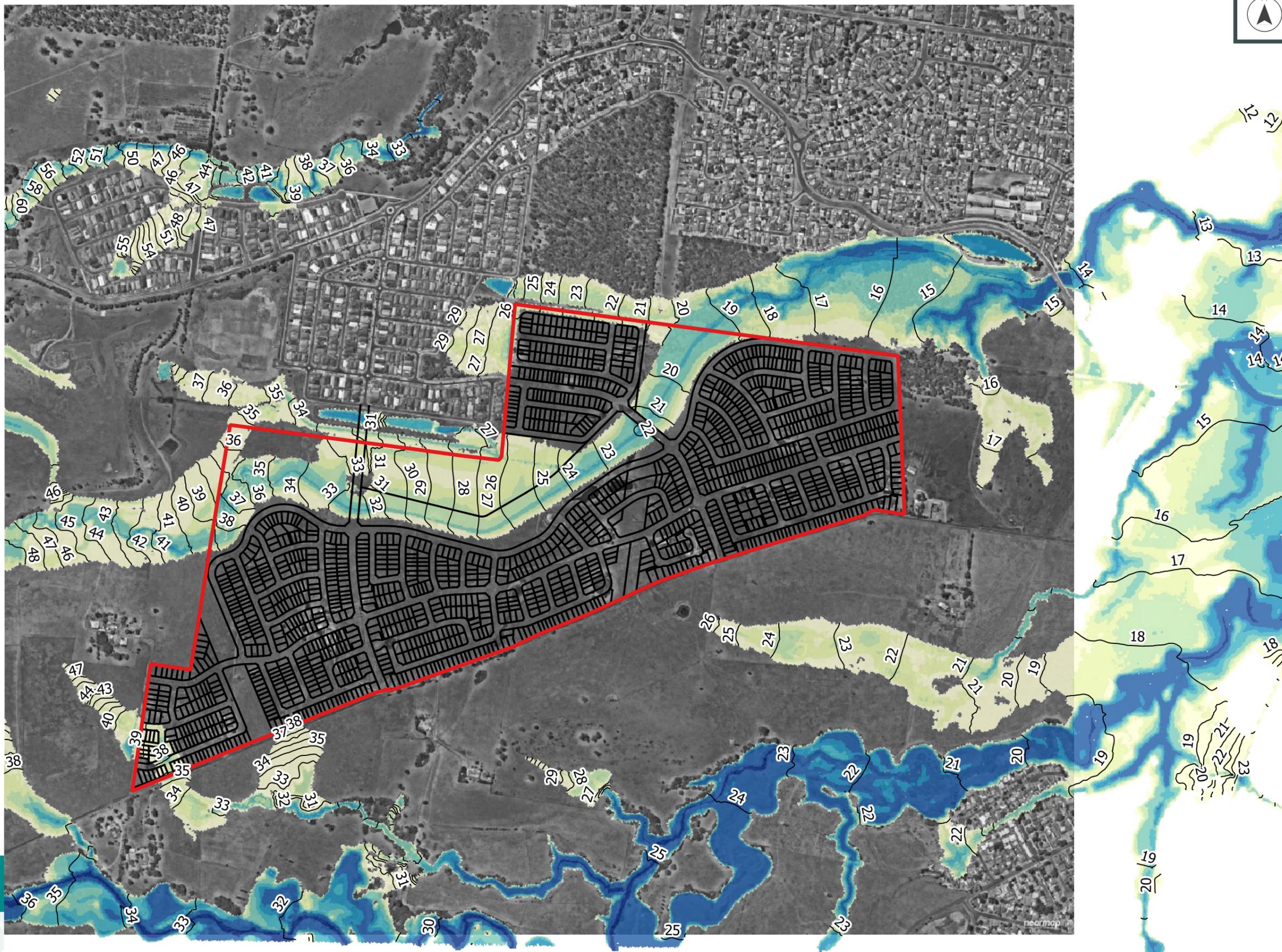
ISC00116-M006
Revision 1
Sheet 1 of 1

Proposed 100 year ARI Flood
Extent
Cleveland Road ISC00116

Legend

-  Subject Site
-  Water Level (m)

- Water Depth (m)**
-  ≤ 0.15
-  0.15 - 0.3
-  0.3 - 0.5
-  0.5 - 1
-  1 - 1.5
-  1.5 - 2
-  2 - 4
-  > 4



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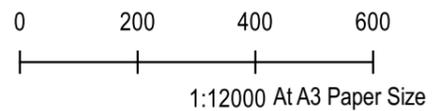
ISC00116-M106
Revision 1
Sheet 1 of 1

Change in 100 year ARI Water Level
Cleveland Road ISC00116



Legend

-  Subject Site
- Change in Water Level (m)
-  No Longer Flooded
-  ≤ -0.1
-  -0.1 - -0.05
-  -0.05 - -0.02
-  -0.02 - -0.01
-  -0.01 - 0.01
-  0.01 - 0.02
-  0.02 - 0.05
-  0.05 - 0.1
-  >0.1
-  Newly Flooded



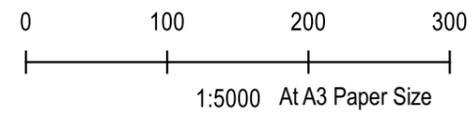
ISC00116-M176
Revision 1
Sheet 1 of 1

Existing 100 year ARI Flood Extent
Cleveland Road North DAA

Legend

- Subject Site
- Water Level (m)

- Water Depth (m)
- <= 0.15
- 0.15 - 0.3
- 0.3 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 4
- > 4



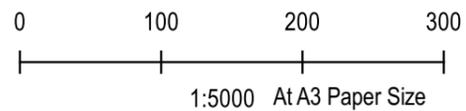
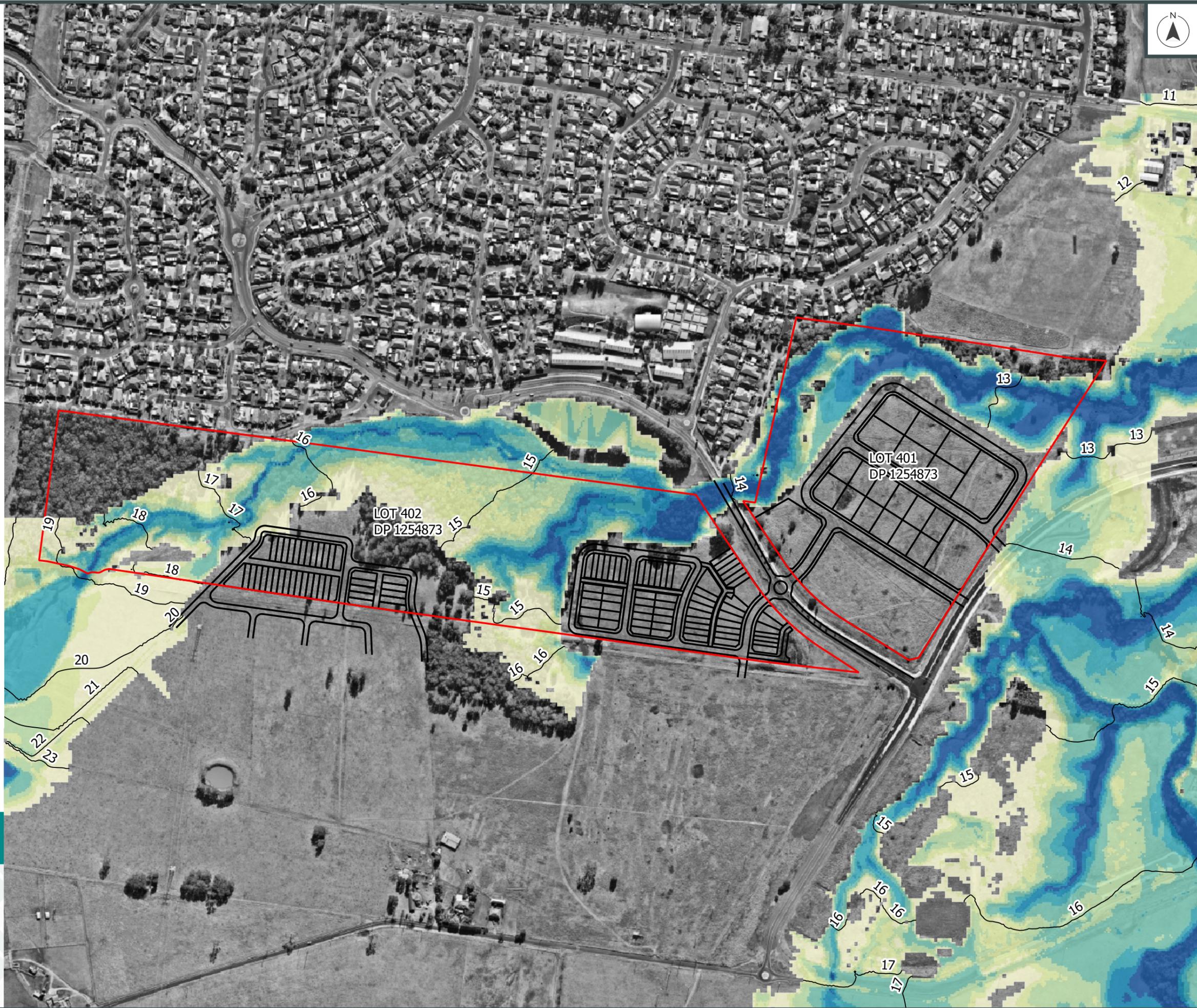
ISC00292-M006
Revision 2
Sheet 1 of 1

Proposed 100 year ARI Flood
Extent
Cleveland Road North DAA

Legend

- Subject Site
- Water Level (m)

- Water Depth (m)
- <= 0.15
- 0.15 - 0.3
- 0.3 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 4
- > 4



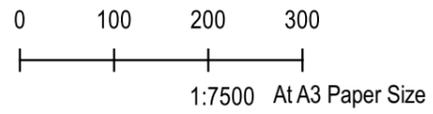
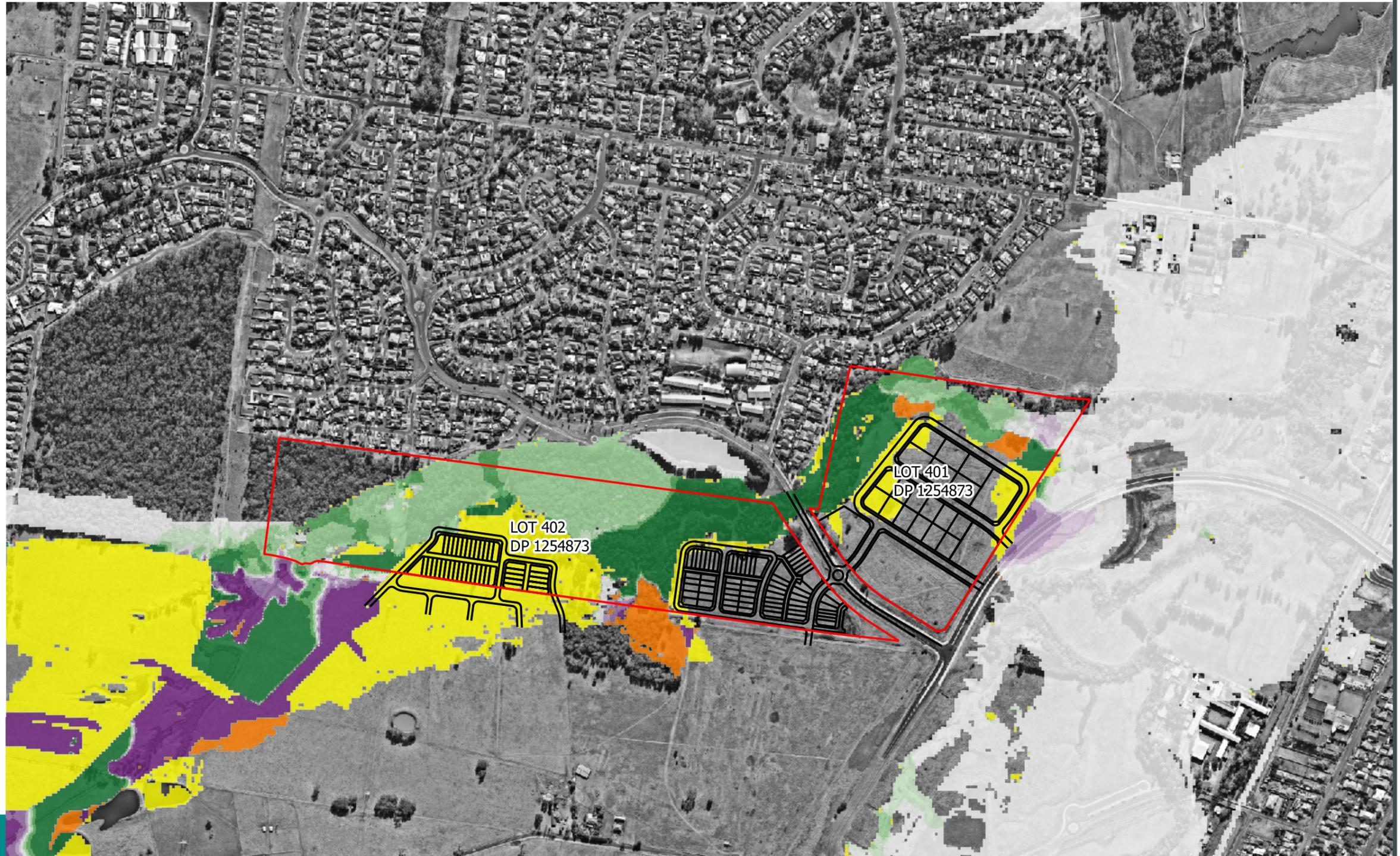
ISC00292-M106
Revision 2
Sheet 1 of 1

Change in 100 year ARI Water Level
Cleveland Road North DAA



Legend

- Subject Site
- Change in Water Level (m)
- No Longer Flooded
- <=-0.1
- 0.1 - -0.05
- 0.05 - -0.02
- 0.02 - -0.01
- 0.01 - 0.01
- 0.01 - 0.02
- 0.02 - 0.05
- 0.05 - 0.1
- >0.1
- Newly Flooded



ISC00292-M176
Revision 2
Sheet 1 of 1