

It is recommended that the users of the each facility are registered to able to receive flood warning messages via SMS from the NSW SES.

Lastly, the evacuation framework, including the evacuation route, contained in this report must be understood and adapted to each specific facility. It is recommended that a copy or copies of this route and plan are kept at several locations on site such as the maintenance manager, and office administrator.

### 5.3 Flood Response

#### Start of Response Operations

The response operations by the SES will begin once a trigger is prompted.

- On receipt of the first of a Bureau of Meteorology Flood Watch, Preliminary Flood Warning or Flood Warning for the Nepean River;
- When other evidence leads to an expectation of flooding within the Penrith local government area.

First triggers by SES will be when the flood gauge on Victoria Bridge Reaches RL 22.0m AHD.

#### Response Strategies

Following the reception of a warning message, the response operations should commence. This normally begins with necessary property protection for the site. This could include sandbagging, moving any furniture, machinery or stock that may be affected by flood levels greater than flood planning levels allow for. As noted all developed land has been sited at the 0.5% AEP flood level plus 500mm freeboard or higher, so this step may not be necessary and individual plans should be made for the facility to ensure damage to property is minimised.

As shown in Figure F17 it is recommended that evacuation of the site be directed through the proposed access driveway to the north to Andrews Road. Once on Andrews Road, evacuees should be directed to the east and onwards to the Northern Road. The recommended evacuation route would be 'cut' initially when floodwaters overtop the access driveway and Andrews Road to the north. ALS survey indicates that evacuation would be cut when floodwaters build up to a level of approximately 24.20m AHD.

**Table F4** provides information relating to differing AEP storm events, SES warnings and the status of the vehicular evacuation route. It is noted that there is no direct correlation data published between AEP events and the SES flood warning levels within the Penrith City Council.

<b>Design Flood (AEP)</b>	<b>Flood Warning (SES)</b>	<b>Victoria Bridge Gauge Level (m)</b>	<b>Predicted Flood Level at Site^ (m)</b>	<b>Status of Evacuation Route</b>
-	Minor	18.0	-	Not Impacted
20%		20.1	-	Not Impacted
10%		21.6	-	Not Impacted
-	Moderate/ Level 1	22	-	Potentially Impacted ^^
5%	-	23.4	-	Potentially Impacted ^^
-	Major/ Level 2-	24.5	-	Potentially Impacted ^^
2%	-	24.9	-	Potentially Impacted ^^
1%	-	26.1	25.3	Cut
0.5%	-	27.1	25.8	Cut

**Table F4. Flood Route Evacuation Status**

^^: Note evacuation route likely to impacted by increased traffic due to evacuation of lower lying areas.

Other potential evacuation routes, such as through the existing facility to the south-west and out to Castlereagh Road, would also be expected to be inundated and potentially hazardous during the 0.5% AEP event. These routes are not recommended to be utilised during major storm events, however are available for use during smaller events.

The final route to an Emergency Refuge Centre would need to be assessed in more detail as part of a site-specific plan. This analysis has sought only to confirm that sufficient flood evacuation routes would be available for the site



**Figure F5. Potential Flood Evacuation Route**

The transport by which the affected occupants travel along the evacuation route is private vehicle. If one does not own a private vehicle, then alternate transport for evacuation should be sought. However, in the event that flood waters have encroached the flood evacuation route, it is important that under no circumstances should flood waters be driven through, noting vehicles can be swept away by flood water at depths of only 200mm. On-site refuge is available for flooding events up to the 0.5% AEP. For events exceeding this, no refuge is available and emergency evacuation will be required.

End of Response Operations

Once the flood levels recede below the trigger level and the danger posed by flooding has passed, the NSW SES Liverpool Local Controller will issue an “all clear” message which will be conveyed in the same format as the warning message, via SMS. Building occupiers can then return to the precinct.

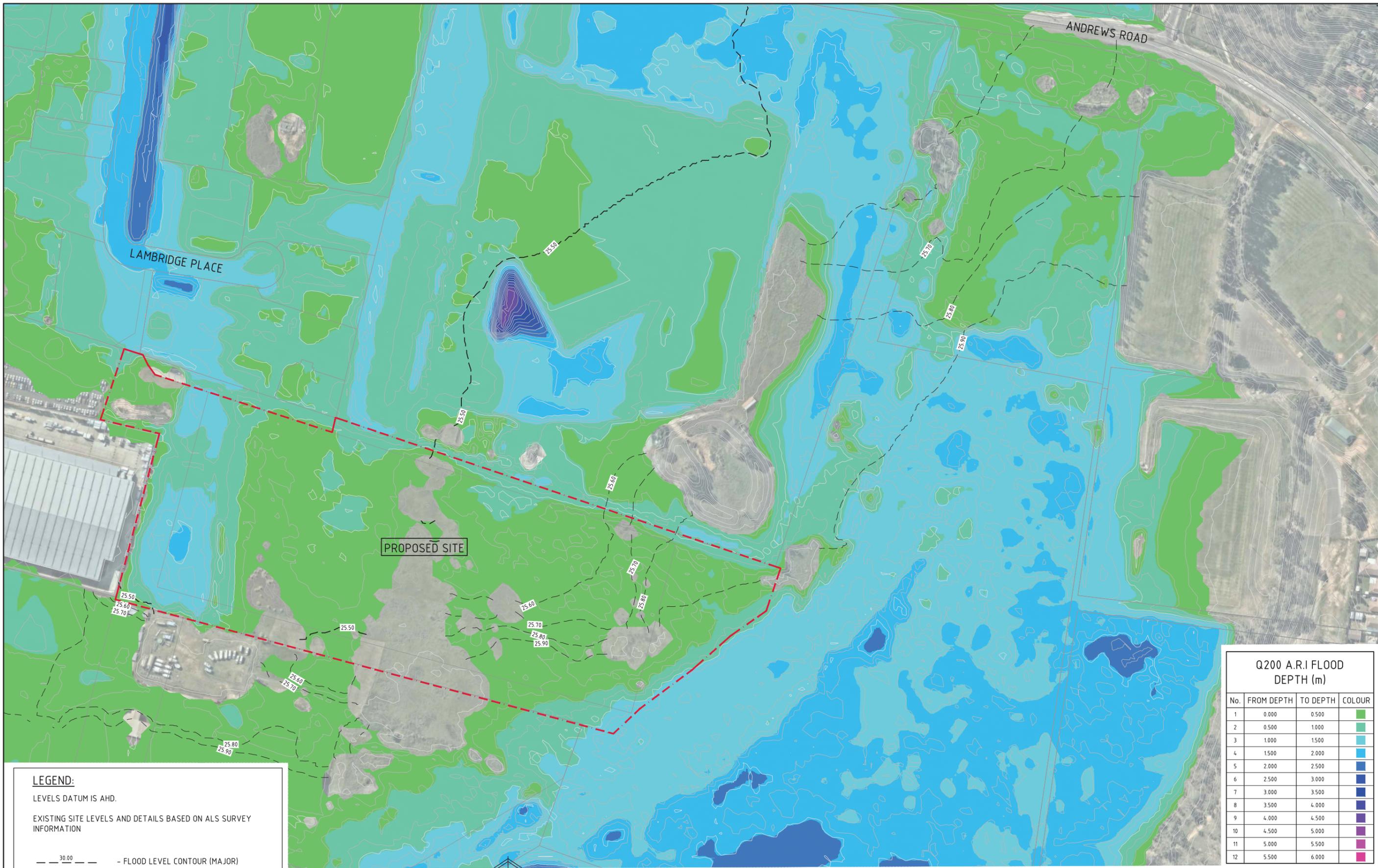
## **F.6 FLOOD ASSESSMENT CONCLUSION**

This Appendix to the Civil Engineering Report for Lot 128 Andrews road Penrith, has been prepared to assess the effect of flooding on the proposed development, and also to confirm no affectation on upstream downstream or adjoining properties. Further the assessment was also completed to ensure that sufficient flood-ways are available, post development, during the 0.5% AEP flood event.

A TUFLOW hydrodynamic flood model has been completed and the pre and post development flood events assessed for flooding as a result of the Nepean River banks overtopping during a regional flood event. Peak flows were assessed for the critical duration associated with flooding from the Nepean River.

The flood assessment confirms the 1% AEP level of RL25.30m AHD and 0.5% AEP level of 25.80m, and that the proposed development (being sited at RL 26.30m AHD) meets flood planning requirement of the 1% AEP plus 0.5m. Further noting the proposed building development is above the 0.5% AEP event.

The assessment of the 0.5% AEP event confirms that floodway paths are available to the west, north and north-west of the building. There is negligible effect on flood water local to the development and no off-site affectation.



Q200 A.R.I FLOOD DEPTH (m)			
No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.000	0.500	Light Green
2	0.500	1.000	Light Blue
3	1.000	1.500	Medium Blue
4	1.500	2.000	Dark Blue
5	2.000	2.500	Very Dark Blue
6	2.500	3.000	Dark Purple
7	3.000	3.500	Dark Blue
8	3.500	4.000	Dark Purple
9	4.000	4.500	Very Dark Purple
10	4.500	5.000	Dark Purple
11	5.000	5.500	Dark Purple
12	5.500	6.000	Dark Purple

**LEGEND:**  
 LEVELS DATUM IS AHD.  
 EXISTING SITE LEVELS AND DETAILS BASED ON ALS SURVEY INFORMATION

--- 30.00 --- - FLOOD LEVEL CONTOUR (MAJOR)  
0.5m INTERVALS

--- 30.20 --- - FLOOD LEVEL CONTOUR (MINOR)  
0.1m INTERVALS

**Q200 A.R.I FLOOD LEVELS & DEPTHS - PRE DEVELOPMENT**  
 1:1500 SCALE



**FOR INFORMATION ONLY**

DRAWING SCALE ADJUSTED	31.01.19	B
ISSUED FOR INFORMATION	30.10.18	A
AMENDMENTS	DATE	ISSUE

CLIENT  
**CADENCE**  
 SUITE 2.02 785 TOORAK ROAD  
 HAWTHORN EAST VIC 3123  
 P: 03 9038 8686 F: 03 9888 1118

PROJECT  
**PROPOSED DEVELOPMENT**  
 128 ANDREWS ROAD  
 PENRITH, NSW



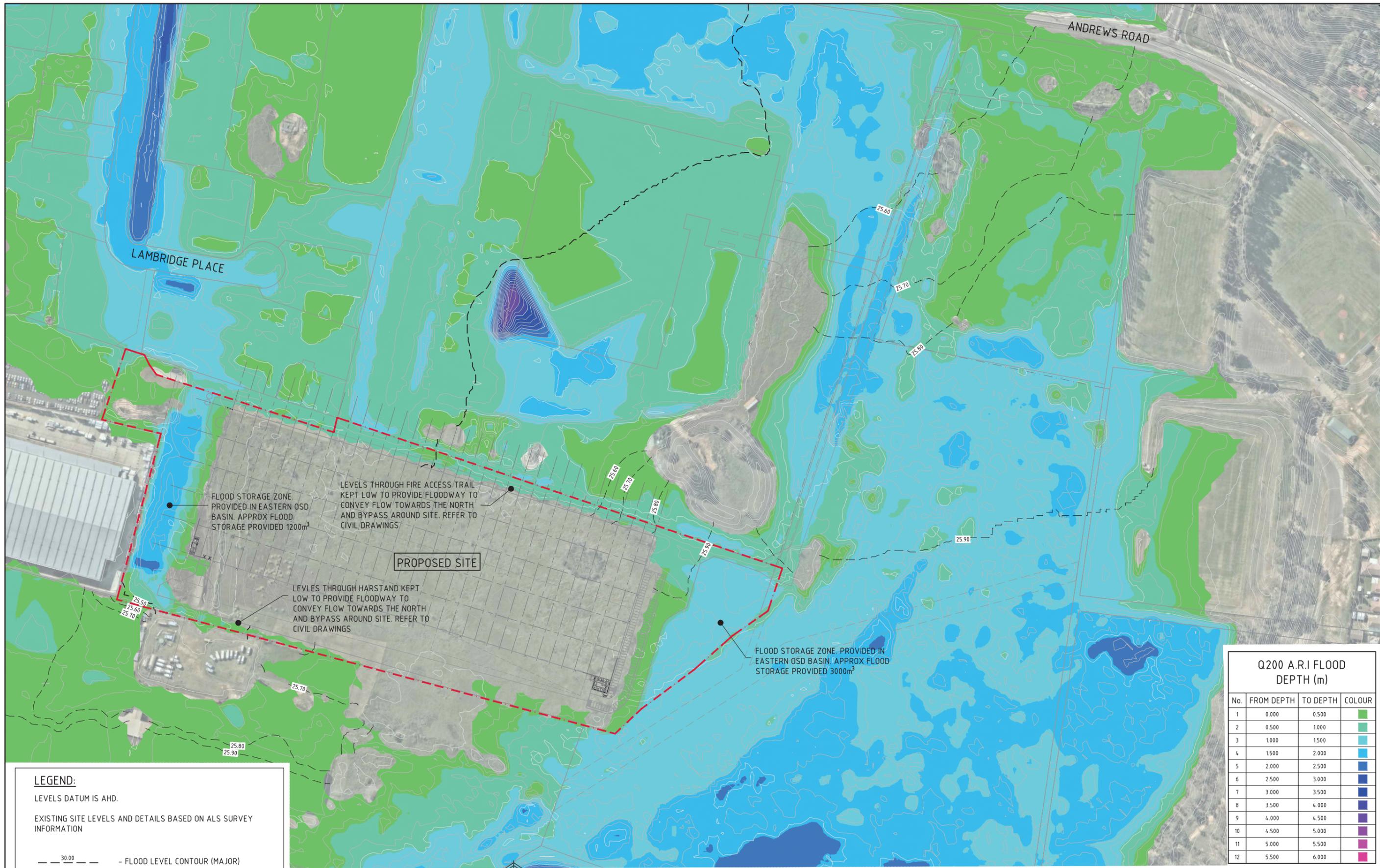
Costin Roe Consulting Pty Ltd.  
**Consulting Engineers** A20 00 000 000  
 Level 1, 8 Windmill Street  
 Walsh Bay, Sydney NSW 2000  
 Tel: (02) 9251-7099 Fax: (02) 9241-3731  
 email: mail@costinroe.com.au ©

**Costin Roe Consulting**

PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE  
**Q200 A.R.I FLOOD LEVELS & DEPTHS PRE DEVELOPMENT**

DRAWING No **C013620.00-F01** ISSUE **B**



**Q200 A.R.I FLOOD DEPTH (m)**

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.000	0.500	Light Green
2	0.500	1.000	Light Blue
3	1.000	1.500	Medium Blue
4	1.500	2.000	Dark Blue
5	2.000	2.500	Very Dark Blue
6	2.500	3.000	Dark Purple
7	3.000	3.500	Dark Blue-Black
8	3.500	4.000	Black
9	4.000	4.500	Dark Purple
10	4.500	5.000	Black
11	5.000	5.500	Dark Purple
12	5.500	6.000	Black

**LEGEND:**  
 LEVELS DATUM IS AHD.  
 EXISTING SITE LEVELS AND DETAILS BASED ON ALS SURVEY INFORMATION

--- 30.00 --- - FLOOD LEVEL CONTOUR (MAJOR)  
 0.5m INTERVALS

--- 30.20 --- - FLOOD LEVEL CONTOUR (MINOR)  
 0.1m INTERVALS

**Q200 A.R.I FLOOD LEVELS & DEPTHS - POST DEVELOPMENT**  
 1:1500 SCALE

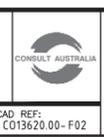


**FOR INFORMATION ONLY**

AMENDMENTS	DATE	ISSUE	AMENDMENTS	DATE	ISSUE
DRAWING SCALE REVISED	31.01.19	B			
ISSUED FOR INFORMATION	30.10.18	A			

CLIENT  
**CADENCE**  
 SUITE 2.02 785 TOORAK ROAD  
 HAWTHORN EAST VIC 3123  
 P: 03 9038 8686 F: 03 9888 1118

PROJECT  
**PROPOSED DEVELOPMENT**  
 128 ANDREWS ROAD  
 PENRITH, NSW



Costin Roe Consulting Pty Ltd.  
**Consulting Engineers** ACN 003 006 448  
 Level 1, 8 Windmill Street  
 Walsh Bay, Sydney NSW 2000  
 Tel: (02) 9251-7899 Fax: (02) 9241-3731  
 email: mail@costinroe.com.au ©

**Costin Roe Consulting**

PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE  
**Q200 A.R.I FLOOD LEVELS & DEPTHS POST DEVELOPMENT**

DRAWING No. **C013620.00-F02** ISSUE **B**



**NOTE:**  
 FLOOD LEVEL DIFFERENCE PROVIDED FOR THE PRE DEVELOPED SCENARIO VS THE POST DEVELOPMENT SCENARIO  
 ORIGINAL SURFACE - PRE-DEVELOPMENT Q200 FLOOD LEVEL  
 COMPARISON SURFACE - POST-DEVELOPMENT SCENARIO Q200 FLOOD LEVEL

Q200 A.R.I FLOOD LEVEL DIFFERENCE (m)			
No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.010	0.025	Green
2	0.025	0.050	Light Blue
3	0.050	0.075	Medium Blue
4	0.075	0.100	Dark Blue
5	0.100	0.200	Red



**Q200 A.R.I FLOOD AFFLUX - POST DEVELOPMENT**

1:1500 SCALE

**FOR INFORMATION ONLY**



AMENDMENTS	DATE	ISSUE	AMENDMENTS	DATE	ISSUE
DRAWING SCALE REVISED	31.01.19	B			
ISSUED FOR INFORMATION	30.10.18	A			

CLIENT  
**CADENCE**  
 SUITE 2.02 785 TOORAK ROAD  
 HAWTHORN EAST VIC 3123  
 P: 03 9038 8686 F: 03 9888 1118

PROJECT  
**PROPOSED DEVELOPMENT**  
 128 ANDREWS ROAD  
 PENRITH, NSW



Costin Roe Consulting Pty Ltd.  
**Consulting Engineers** ACT 002 006 048  
 Level 1, 8 Windmill Street  
 Walsh Bay, Sydney NSW 2000  
 Tel: (02) 9251-7699 Fax: (02) 9241-3731  
 email: mail@costinroe.com.au ©

**Costin Roe Consulting**

PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE  
**Q200 A.R.I FLOOD AFFLUX POST DEVELOPMENT**

DRAWING No **C013620.00-F03** ISSUE **B**