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Flood Report

IRT Woonona – 4-6 Popes Road, Woonona NSW 2517

Prepared for: The Project Co.



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Revisions

Revision	Description	Date	Prepared by	Approved by	Signature
01	SSDA	02/05/25	KU	GL	
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Review Panel

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Table of Contents

1	Introduction	5
1.1	Purpose and Scope of Report.....	5
1.2	Project Description	5
1.3	Approving Authority.....	5
1.4	Available Data	5
2	Site	6
2.1	Property Description	6
2.2	Existing Flow Paths.....	6
2.3	Topography	7
2.4	Existing Land Use and Vegetation	7
2.5	External Catchments	8
3	Existing Development Conditions Flood Assessment.....	9
3.1	Existing Flood Studies	9
3.2	Updates to Existing Development Conditions Flood Model.....	9
3.3	Discussion of Results for Simulated Flood Events	9
3.3.1	1% AEP and 1% AEP (Climate Change).....	9
	Collins Creek (southern portion of site)	9
	Stormwater line (northern portion of site)	9
3.3.2	Probable Maximum Flood (PMF).....	10
	Collins Creek (southern portion of site)	10
	Stormwater line (northern portion of site)	10
4	Proposed Development Conditions Flood Assessment.....	11
4.1	Proposed Development in Vicinity of Flow Paths.....	11
4.1.1	Proposed Development near Collins Creek (southern portion of site).....	11
4.1.2	Proposed Development near Stormwater line (northern portion of site)	11
4.2	Proposed Development Conditions Flood Mitigation	11
4.2.1	Collins Creek (southern portion of site)	11
4.2.2	Stormwater line (northern portion of site).....	11
4.3	Discussion of Results for Simulated Flood Events	12
4.3.1	1% AEP and 1% AEP (Climate Change).....	12
	Collins Creek (southern portion of site)	12
	Stormwater line (northern portion of site)	12
4.3.2	Probable Maximum Flood (PMF).....	13
	Collins Creek (southern portion of site)	13
	Stormwater line (northern portion of site)	13
4.4	Assessment of Proposed Building Levels.....	13
5	Flood Impact Assessment	14
5.1	Introduction.....	14
5.2	Collins Creek (southern portion of site)	14
5.3	Stormwater line (northern portion of site).....	14

6	Flood Emergency Response Plan	16
7	Conclusion	16
8	References	17
	Appendix A Site Survey	18
	Appendix B Existing Development Conditions Flood Maps	19
	Appendix C Proposed Development Conditions Flood Maps	20
	Appendix D Flood Level Difference Maps	21

List of Figures

Figure 2-1	Site extents (Courtesy of Mecone)	6
Figure 2-2	Existing topography (Courtesy of Mecone)	7
Figure 2-3	Collins Creek catchment boundary and site location (extracted from Catchment Simulation Solutions (2019))	8
Figure 4-1	Proposed area of excavation and spillway at the stormwater line and overland flow diversion channel around Building E	12

List of Tables

Table 4-1	Flood Planning Levels (FPL) and Finished Floor Levels of Proposed Buildings	13
Table 5-1	Assessment of impacts due to development	15

1 Introduction

1.1 Purpose and Scope of Report

ACOR Consultants P/L (ACOR) has been engaged by The Illawarra Retirement Trust (IRT) to undertake a flood assessment for the SSDA phase for the proposed re-development of the existing senior living and residential aged care facility located at 4-6 Popes Road, Woonona. This site will herein after be referred to as *IRT Woonona*. This flood report will support the DA submission for IRT Woonona, providing an assessment of the proposed development with respect to flooding management.

Catchment Simulation Solutions prepared the Collins Creek Flood Study (2019) for Wollongong City Council, which encompasses the site location. ACOR engaged Catchment Simulation Solutions to undertake flood model simulations and prepare flood maps for existing and proposed development conditions at the site.

This report documents the methodology and results of the flood assessment.

1.2 Project Description

The project comprises the redevelopment of the existing Senior Living and Residential Aged Care Facility (RACF) facilities on site.

The proposed works include the demolition of several existing buildings and the construction of 5 new 3-4 storey Residential Independent Living Unit buildings (Buildings A, B, C, D, E). All buildings will be connected by a basement level that is proposed to be accessed from Popes Road.

1.3 Approving Authority

The approving authority for this project is the NSW Department of Planning, Housing and Infrastructure. The proposed developed should be assessed against the provisions of Wollongong City Council's Development Control Plan (DCP) and Local Environment Plan (LEP). Controls for floodplain management are covered in chapter E13 Floodplain Management of the DCP.

1.4 Available Data

The following available information was utilised in the preparation of this report:

- Wollongong DCP 2009
- Australian Rainfall and Runoff 2019
- NSW Government spatial information exchange (SIX) topographic maps
- Collins Creek Flood Study Final Report Volume 1 of 2: Report & Appendices. Revision 4 September 2019. Catchment Simulation Solutions.
- Collins Creek TUFLOW model. Catchment Simulation Solutions.
- Flood model simulation results and maps by Catchment Simulation Solutions.

2 Site

2.1 Property Description

The 2.92 ha site is located at 4-6 Popes Road, Woonona (Lot 71 DP 1160947), with frontages on Popes Road and Princes Highway. Vehicular access is currently from Popes Road. The site, situated within the Wollongong City Council LGA, is currently zoned as R2 Low Density Residential and E3 Enterprise Corridor under the provisions of the Wollongong LEP 2009.



Figure 2-1 Site extents (Courtesy of Mecone)

2.2 Existing Flow Paths

There are two key flow paths traversing the site. The following descriptions are generally as described in Biosis (2023):

- Collins Creek, a perennial 3rd (Strahler) order urban watercourse, traverses the southern portion of the study area. The watercourse length within the study area is approximately 200 metres, flowing west to east towards the south-east corner of the study area. The channel is well defined for large portions of the reach length, with an existing creek bed and steep banks (particularly the northern bank).
- Stormwater line, mapped by Wollongong LEP, is situated in the northern section of the study area and is approximately 70 metres in length. Three stormwater outlets were recorded within the channel. The stormwater line flows from west to east.

It is noted that the stormwater line in the north has not been mapped on the Hydro Line Spatial Data Map (DPIE, 2018) and is therefore not defined as a riparian corridor.

2.3 Topography

Falling generally from west to east, the site has moderate grades throughout with grades of trafficable areas ranging between 2-15%. Steeper grades of up to 30-40% are found adjacent the watercourses that traverse the property. As illustrated in Figure 2-2, the site can be defined into two sub catchments by a rough ridge line that runs through the centre of the property east-west. The southern portion of the site falls towards Collins Creek and the northern portion of the site falls towards a stormwater line and overland flow channel (refer to previous section).



Figure 2-2 Existing topography (Courtesy of Mecone)

2.4 Existing Land Use and Vegetation

The site currently contains several residential flat buildings as well as townhouses, sheds, a cottage, and a church. In addition to buildings, there is an internal road network and associated hardstand areas to provide parking for the facility.

In the southern portion of the site is a significant area occupied by a vegetated riparian corridor defined by the alignment of Collins Creek. There is a similar vegetated area in the northern portion of the site defined by the existing stormwater line.

2.5 External Catchments

The following figure shows the catchment boundary of Collins Creek and the site location.

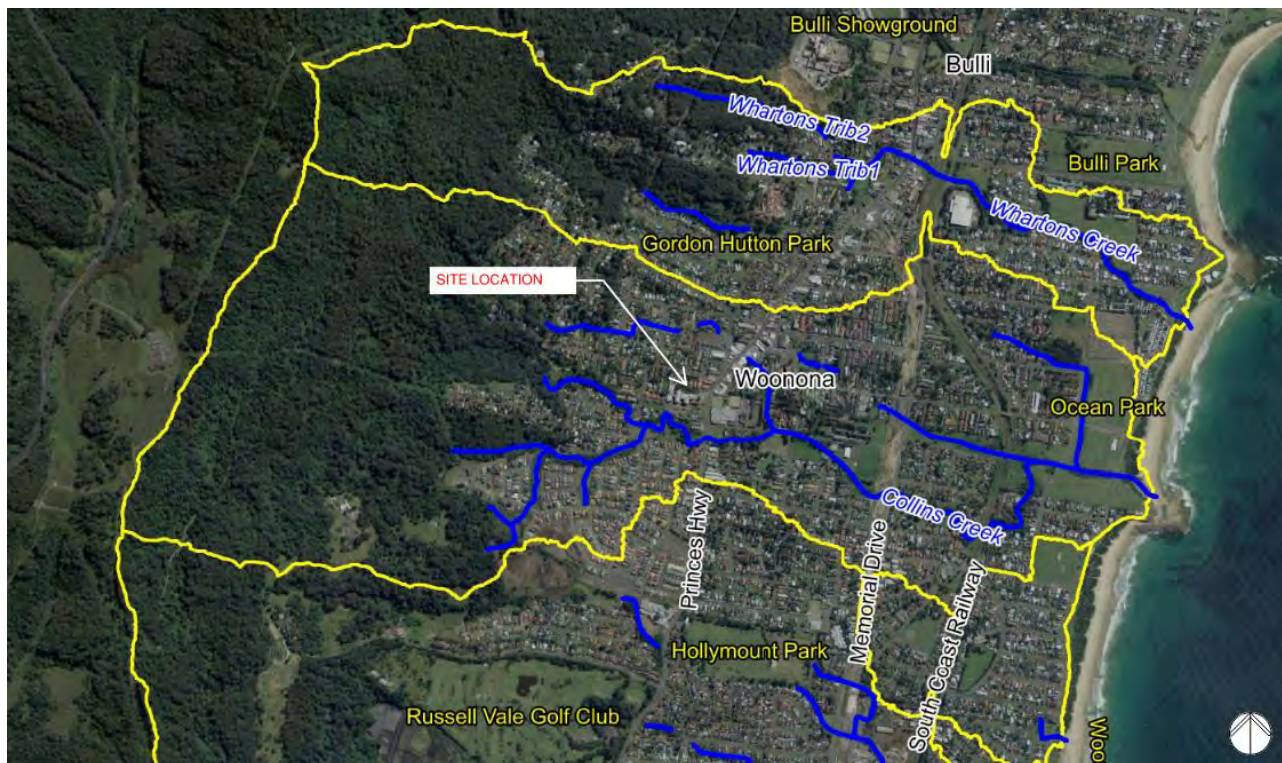


Figure 2-3 Collins Creek catchment boundary and site location (extracted from Catchment Simulation Solutions (2019))

3 Existing Development Conditions Flood Assessment

3.1 Existing Flood Studies

The latest flood study for the Collins Creek catchment is the Collins Creek Flood Study that was undertaken by Catchment Simulation Solutions (2019) for Wollongong City Council and documented in the Collins Creek Flood Study Final Report Volume 1 of 2: Report & Appendices.

For more information regarding the Collins Creek Flood Study, refer to the report by Catchment Simulation Solutions (2019).

3.2 Updates to Existing Development Conditions Flood Model

The TUFLOW model associated with the Collins Creek Flood Study by Catchment Simulation Solutions (2019) is a combined model incorporating catchments of Whartons Creek, Collins Creek and Farrahars Creek as well as Bellambi Gully and Bellambi Lake.

Catchment Simulation Solutions updated the existing development conditions TUFLOW model to incorporate the site survey digital elevation model and any amendments to trunk drainage infrastructure as recorded by the survey.

3.3 Discussion of Results for Simulated Flood Events

The 20%, 10%, 5%, 1%, 0.5%, 0.2% AEP, Probable Maximum Flood (PMF) and 1% AEP (Climate Change) design flood events were simulated for existing development conditions. Results for the 1% AEP, 1% AEP (Climate Change) and PMF events are presented in Appendix B Existing Development Conditions Flood Maps. Existing development conditions flood characteristics for the 1% AEP and PMF design floods within the site and the local vicinity are discussed below.

3.3.1 1% AEP and 1% AEP (Climate Change)

Collins Creek (southern portion of site)

For the 1% AEP design flood event for existing development conditions, TUFLOW simulation results show the following:

- Flood water in Collins Creek does not encroach across the site's existing building footprint on the northern side of Collins Creek
- Flood water from Collins Creek overtops Princes Highway and joins flood water on Princes Highway from the north
- Flood water on Princes Highway continues to the east along Collins Creek and Nicholson Road
- Flood hazard categories within the site range from H1 to H6.

For the 1% AEP Climate Change design flood event for existing development conditions, TUFLOW simulation results show the following:

- Passage of flood water in Collins Creek is similar to current climate conditions
- Flood levels in Collins Creek are approximately 0.1 m higher than for current climate conditions
- Flood hazard categories within the site range are similar to current climate conditions.

Stormwater line (northern portion of site)

For the 1% AEP design flood event for existing development conditions, TUFLOW simulation results show the following:

- Flood water enters the site at the western boundary at the rear of the existing Ribbonwood Lodge building and passes around the northern side of the building through the existing carpark

- Flood water crosses the internal site access road to the north-east of the existing Ribbonwood Lodge building and enters the existing open stormwater line and existing building area on the northern side of the open stormwater line
- Flood water in the existing open stormwater line continues in an easterly direction through the site where it overtops the ground beyond the end of the existing open stormwater line and flows overland and onto Princes Highway
- Flood water on Princes Highway crosses the highway to the eastern side and also flows to the south along Princes Highway, where it joins with flood water from Collins Creek, to flow east along Collins Creek and Nicholson Road
- Flood hazard categories within the site range from H1 to H5.

For the 1% AEP Climate Change design flood event for existing development conditions, TUFLOW simulation results show the following:

- Passage of flood water is similar to current climate conditions
- Flood levels are approximately 0.2 m higher than for current climate conditions
- Flood hazard categories within the site range from H1 to H5.

3.3.2 Probable Maximum Flood (PMF)

Collins Creek (southern portion of site)

For the PMF design flood event for existing development conditions, TUFLOW simulation results show similar results, in terms of flood water distribution and passage, however higher flood levels and wider extents when compared to the 1% AEP event.

Stormwater line (northern portion of site)

For the PMF design flood event for existing development conditions, TUFLOW simulation results show similar results, in terms of flood water distribution and passage, however higher flood levels and wider extents when compared to the 1% AEP event.

Flood water that overtops Princes Highway in the PMF is joined by flood water from the north along Princes Highway, which is not shown to occur in the 1% AEP event.

4 Proposed Development Conditions Flood Assessment

4.1 Proposed Development in Vicinity of Flow Paths

4.1.1 Proposed Development near Collins Creek (southern portion of site)

Proposed Buildings B, C and D and the vehicle turning loop are to be located on the northern side of Collins Creek and set further back from Collins Creek than the existing Blueberry Ash Apartments. Proposed Buildings B, C and D will be positioned outside the extent of the outer riparian zone of Collins Creek.

Proposed building structures are outside the extents of the Probable Maximum Flood event in Collins Creek. earthworks and

Refer to section 4.3 for assessment of proposed floor levels against proposed development conditions Flood Planning Levels.

4.1.2 Proposed Development near Stormwater line (northern portion of site)

The existing Ribbonwood Lodge building at the north-west corner of the site is to be demolished. Proposed Building A is to be located here. The northern end of Building A is located adjacent to the existing overland flow path (stormwater line) described in section 2.2. Building B is located south of Building A. Building B is proposed to have a basement with the top of the basement ramp located at the northern side corner of the building. Refer to section 4.3 for assessment of proposed floor level and basement crest level against proposed development conditions Flood Planning Levels.

Proposed Building E is to be located at the north-east corner of the site (east of the existing Flametree building and north-east of the existing Blue Gum Sanctuary building). The position of proposed Building E is in the existing overland flow path of the stormwater line. Refer to section 4.2 for description of proposed flood mitigation measures for proposed Building E.

4.2 Proposed Development Conditions Flood Mitigation

4.2.1 Collins Creek (southern portion of site)

The proposed civil design surface at the southern portion of the site in the vicinity of Collins Creek was embedded into the TUFLOW model for proposed development conditions simulations. It is noted that the area of works (earthworks and building structures) is outside the extents of the Probable Maximum Flood event in Collins Creek.

4.2.2 Stormwater line (northern portion of site)

The proposed civil design surface incorporating the existing floor level of Flametree building, proposed floor level of Buildings A and B, and internal road were embedded into the TUFLOW model for proposed development conditions simulations.

The proposed site design intends to compensate for the loss of flood storage caused by proposed Building E by increasing the flood storage volume within the existing open stormwater line (described in section 2.2) by excavation. A retaining wall along the southern bank of the open stormwater line is required due to the excavation. A concrete overflow spillway at the downstream (eastern) end of the open stormwater line is proposed with crest level 24.53 m AHD. An overland flow diversion channel from the spillway will be provided to convey overland flow beyond the spillway around proposed Building E to the site boundary at Princes Highway. The proposed civil design surface incorporating the proposed floor level of Building E, excavation of the existing open stormwater line, spillway and overland flow diversion channel around Building E was embedded into the TUFLOW model for proposed development conditions simulations. The figure below illustrates these proposed features.

Refer to section 4.3 for a description of proposed development conditions flood simulation results.



Figure 4-1 Proposed area of excavation and spillway at the stormwater line and overland flow diversion channel around Building E

4.3 Discussion of Results for Simulated Flood Events

The 20%, 10%, 5%, 1%, 1% AEP (Climate Change), 0.5%, 0.2% AEP, and Probable Maximum Flood (PMF) design flood events were simulated for proposed development conditions. Proposed development conditions flood characteristics for the 1% AEP and PMF design floods within the site and the local vicinity are discussed below.

4.3.1 1% AEP and 1% AEP (Climate Change)

Collins Creek (southern portion of site)

Refer to section 5.2 for a description of the changes to flood characteristics in this area.

Stormwater line (northern portion of site)

For the 1% AEP and 1% AEP (Climate Change) design flood events for proposed development conditions, TUFLOW simulation results show the following:

- Flood water enters the site at the western boundary at the rear of proposed Building A and passes around the northern side of the building
- Flood water crosses the internal site access road to the north-east of proposed Building A and enters the existing open stormwater line and existing building area on the northern side of the open stormwater line
- Flood water is contained within the excavated open stormwater line, with flow in excess of the outlet pipe capacity overtopping the proposed spillway at the eastern end (downstream) of the open stormwater line and entering the proposed overland flow diversion channel on the northern side of proposed Building E
- Flood water exits the proposed overland flow diversion channel at the eastern site boundary at Princes Highway.

4.3.2 Probable Maximum Flood (PMF)

Collins Creek (southern portion of site)

For the PMF design flood event for proposed development conditions, TUFLOW simulation results show similar results to existing development conditions, in terms of flood water distribution and characteristics.

Stormwater line (northern portion of site)

For the PMF design flood event for proposed development conditions, TUFLOW simulation results show similar results to the 1% AEP event for proposed development conditions, in terms of flood water distribution.

4.4 Assessment of Proposed Building Levels

The Wollongong Development Control Plan 2009 requires that all proposed floor levels must at least be set to the Probable Maximum Flood level plus 0.5 metres freeboard.

The Flood Planning Level (FPL) is equivalent to the Probable Maximum Flood level plus 0.5 metres freeboard, which is the minimum floor level required for proposed buildings part of an aged care facility.

The table below presents the applicable Flood Planning Level (FPL) and the finished floor level for each proposed building.

All proposed buildings meet the requirement for minimum floor level.

Table 4-1 Flood Planning Levels (FPL) and Finished Floor Levels of Proposed Buildings

Proposed Building	Flood Planning Level (FPL) (Probable Maximum Flood level + 0.5 m freeboard)	Finished Floor Level
Building A	27.75 m AHD	27.75 m AHD
Building B	Not affected by flood water. Closest flooding is Collins Creek with FPL = 25.2 m AHD.	26.80 m AHD
Building C	Not affected by flood water. Closest flooding is Collins Creek with FPL = 25.1 m AHD.	26.20 m AHD
Building D	Closest flooding is on Princes Highway with FPL = 24.50 m AHD.	24.50 m AHD
Building E	Closest flooding is on the northern side of the building in the proposed diversion channel with FPL = 24.60 m AHD immediately after the weir. Freeboard has then been added to the flooding which allows for the 25.1 m AHD flood level.	25.10 m AHD
Existing Flametree Building	Closest flooding is on the northern side of the building in the stormwater line with FPL = 25.8 m AHD.	26.63 m AHD

The Wollongong Development Control Plan 2009 requires that basements are to be protected from inundation during a 1% AEP flood, ensuring all vehicular access, doors and ventilation points are a minimum of 0.2 metres above the 1 % AEP flood level. The minimum access road crest level to the north of the basement entry to Building B is 27.76 m AHD, which is 0.36 m above the 1% AEP flood level on the northern side of the crest.

5 Flood Impact Assessment

5.1 Introduction

Flood impact maps have been prepared to illustrate any changes in flood level and extent caused by the proposed development. Maps for the 20% AEP, 10% AEP, 5% AEP, 1% AEP and 1% AEP (Climate Change) are presented in Appendix D Flood Level Difference Maps.

5.2 Collins Creek (southern portion of site)

Flood impact maps show:

- There are no changes to water levels or flood extents for the 1% AEP, 1% AEP Climate Change and 5% AEP flood events
- nominal decrease in flood extents for the 10% AEP event
- nominal increase in water levels (up to 15 mm) within Collins Creek just upstream of Princes Highway for the 20% AEP event, which is not considered to be an actionable nuisance.

5.3 Stormwater line (northern portion of site)

The flood level difference map for the 1% AEP event shows:

- small area of nominal increase (up to 40 mm) within the stormwater line on the adjacent property on the western side of the site boundary near proposed Building A
- general decrease in water levels on the northern side of proposed Building A
- general decrease in flood extent and a small area of nominal increase (up to 20 mm) on the adjacent property on the northern side of the open stormwater line
- increase in water levels on the site within the open stormwater line (already inundated in existing development conditions)
- elimination of flood extent at the location of proposed Building E due to the proposed overland flow diversion channel on the northern side of Building E
- isolated area of water level increase where the proposed overland flow diversion channel discharges flow at the eastern site boundary
- decrease in water levels on Princes Highway and on the eastern side of Princes Highway.

The flood level difference maps for the 5% AEP and 10% AEP events show similar results to the 1% AEP event listed above.

The flood level difference map for the 20% AEP event shows:

- no worsening on the adjacent property on the western side of the site boundary near proposed Building A
- increase in water levels on the site within the open stormwater line (already inundated in existing development conditions)
- elimination of flood extent at the location of proposed Building E due to the proposed overland flow diversion channel on the northern side of Building E
- no worsening where the proposed overland flow diversion channel discharges flow at the eastern site boundary
- decrease in water levels on Princes Highway and on the eastern side of Princes Highway.

Table 5-1 Assessment of impacts due to development

Key considerations	Reasons for considering	Assessment
Flood level change	<ul style="list-style-type: none"> ▪ Increase of inundation extent and damage to existing development. ▪ Inundation of additional existing development ▪ New or larger floodways or flowpaths ▪ Isolation of new areas 	<ul style="list-style-type: none"> ▪ Changes in inundation extents are not likely to damage existing development ▪ Changes in inundation extents are not likely to affect additional existing development ▪ New overland flow diversion channel on northern side of proposed Building E is a redistribution of overland flow ▪ No new areas will be isolated
Velocity change	<ul style="list-style-type: none"> ▪ May increase scour potential and/or damage to structures 	<ul style="list-style-type: none"> ▪ Velocity within stormwater line and overland flow diversion channel will be mitigated in detailed design.
Hazard categorisation change	<ul style="list-style-type: none"> ▪ May reduce safety to vehicles, people or buildings 	<ul style="list-style-type: none"> ▪

6 Flood Emergency Response Plan

Refer to document provided by Water Technology for the development.

7 Conclusion

This flood report describes the flood assessment for the proposed re-development of the existing senior living and residential aged care facility located at 4-6 Popes Road, Woonona. Catchment Simulation Solutions were engaged by ACOR Consultants to undertake flood model simulations for existing and proposed development conditions at the site.

To mitigate the loss of flood storage due to proposed Building E, excavation of the open stormwater line in the northern portion of the site is proposed to reinstate the flood storage volume. A spillway at the downstream end of the open stormwater line and overland flow diversion channel on the northern side of proposed Building E is proposed. These flood mitigation measures are demonstrated in flood model simulations to successfully manage overland flow through the site such that changes to flood levels are nominal and no actionable nuisance is caused.

Proposed buildings are demonstrated to provide floor levels that meet the required Flood Planning Levels, providing 0.5 m freeboard above the Probable Maximum Flood level.

The proposed development does not involve changes within the floodplain of the Collins Creek flow path in the southern portion of the site. Results of the flood impact assessment demonstrate no material change or actionable nuisance to flood characteristics in the Collins Creek flow path for the range of simulated flood events.

8 References

Biosis (2023). IRT Woonona Riparian Assessment and Management Plan. Report for Illawarra Retirement Trust. Gray, R, Biosis Pty Ltd. Wollongong, NSW. Project no. 39400.

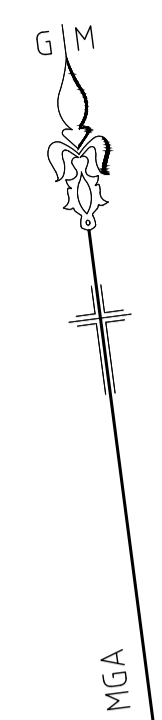
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Appendix A Site Survey



TOP OF BANK ASSESSMENT

- TOP OF BANK
- UNIDENTIFIED DRAINAGE LINE TOP OF BANK
- NO GO ZONE

LEGEND

- TOP OF
- BOTTOM OF
- FENCE
- 10 CONTOUR
- 9.5 CONTOUR
- * STOP VALVE
- * HYDRANT
- * WATER METER
- o TAP
- PIT
- SEWER MANHOLE
- TELECOMMUNICATION PIT
- POWER POLE
- * LIGHT POLE
- * TL TRAFFIC LIGHTS
- BOLLARD
- = SIGN
- FLAG POLE
- DENOTES WINDOW CODE
- W1 DENOTES ROOF RIDGE
- R33.52 DENOTES ROOF
- RF29.00 DENOTES GUTTER
- G29.38 DENOTES TOP WINDOW
- TW28.19 DENOTES BOTTOM WINDOW
- BW26.39 DENOTES UNDERSIDE OF 125mm CONCRETE RAMP
- UR

SURVEY CONTROL MARKS SCHEDULE

DESCRIPTION	EASTING	NORTHING	LEVEL
SSM 13133	307 251.646	6 197 767.951	22.79
DH03 DHTK	307 145.265	6 197 758.353	26.16
DH FLAG POLE	307 107.484	6 197 755.875	27.045



CAUTION

- THIS DETAIL SURVEY IS NOT A "SURVEY" AS DEFINED BY THE SURVEYING AND SPATIAL INFORMATION ACT, 2002. (SURVEYED IN ACCORDANCE WITH SURVEYING AND SPATIAL REGULATION 2017). IF ANY CONSTRUCTION AND/OR BUILDING LOCATION/ AREA COMPUTATIONS ARE PLANNED, IT WOULD BE ADVISABLE TO CARRY OUT FURTHER SURVEY WORK TO DETERMINE THE BOUNDARY DIMENSIONS.
- BEARINGS & DISTANCES OF BOUNDARIES & AREAS ARE BY TITLE AND/OR DEED ONLY.
- RELATIONSHIP OF IMPROVEMENTS TO BOUNDARIES IS DIAGRAMMATIC ONLY.
- WHERE OFFSETS ARE CRITICAL, THEY SHOULD BE CONFIRMED BY FURTHER SURVEY.
- CONTOURS ARE INTERPOLATED FROM ACCURATE SPOT LEVELS AS SHOWN AND SHOULD BE USED AS A GUIDE ONLY. DO NOT REINTERPOLATE CONTOURS.
- CLIENT HAS PROVIDED A DRAWING FILE OF THE POSITION AND EXISTENCE OF UNDERGROUND SERVICES. ORION HAS NOT INVESTIGATED THE ACCURACY OF THE DATA PROVIDED, AND DOES NOT ACCEPT LIABILITY FOR ANY ERRORS OR OMISSIONS IN THE UNDERGROUND SERVICES DATA CONTAINED WITHIN THE DRAWING.

- (A) RESTRICTION ON THE USE OF LAND (DP 1052498)
- (B) EASEMENT TO DRAIN WATER 3 WIDE (DP 1087459)
- (C) EASEMENT TO DRAIN WATER 1 WIDE (DP 1052310) (AE502739)
- (D) EASEMENT TO DRAIN WATER OVER EXISTING LINE OF PIPES (DP 642638)
- (F) EASEMENT FOR UNDERGROUND CABLES 1.5 WIDE (DP 1109952)
- (G) EASEMENT FOR PADMOUNT SUBSTATION 2.75 WIDE (DP 1109952)
- (H) RESTRICTION ON THE USE OF LAND 7.37 WIDE (DP 1109952)
- (J) RESTRICTION ON THE USE OF LAND 12.75 WIDE (DP 1109952)
- (K) RESTRICTION ON THE USE OF LAND 10.94 WIDE (DP 1109952)
- (M) BENEFITED BY EASEMENT TO DRAIN WATER OVER EXISTING LINE OF PIPES - DP 642638

Rev	Drawn	Check	Appd.	Date	Revision Description
02	PS	GL	CJ	11.09.23	EXTRA DETAIL
01	PS	GL	CJ	29.05.23	TOP OF BANK ASSESSMENT
00	ND	GL	CJ	22.10.21	INITIAL ISSUE

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Scale: 0 6 12 18 24 30 36 42 48 54 60
 SCALE 1:600 (A1) SCALE 1:1200 (A3)

Surveyor	GL	Date of Survey	13.10.2021
Height Datum	AHD	Horizontal Datum	MGA GDA2020
Origin	SSM 13133 RL 22.79	Origin	SSM 13133 E 307251.646 N 6197767.951

By: **ORION**
 For: **JAS-ANZ**
 SUSTAINABLE SERVICES
 www.jas-anz.com/register

Project: **I.R.T. WOONONA VILLAGE
 POPES ROAD, WOONONA**
 Title: **CONTOUR & DETAIL SURVEY
 LOT 1 DP 1160947**
 Project No: 23-0173
 Drawing No: SV-01
 Milestone: -
 Sheet: 1 of 7
 Revision: 02

ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E: info@theonirgroup.au



PHOTO 15 - SP 96287



PHOTO 14 - SP 96287



PHOTO 13 - SP 96287



PHOTO 12 - SP 96287

SCHEDULE OF WINDOW & DOOR HEIGHTS		
No.	HEAD	SILL
W9	28.19	26.39
W10	31.01	30.40
W11	31.40	30.78
W12	31.22	30.60
W13	28.73	26.90
W14	31.57	30.93
W18	33.07	32.13
W19	33.08	31.62
W20	33.02	32.18
W21	33.03	32.17
W22	30.12	29.57
W23	33.07	30.95
W24	32.86	31.99
W25	29.85	29.24
W26	32.88	-
W27	32.88	31.41
W28	34.52	33.91
W29	34.48	33.58
W30	34.48	33.63
W31	31.46	30.86
W32	34.55	-
W33	34.53	33.07
W34	36.24	35.62
W35	36.17	35.32
W36	33.16	32.56
W37	36.23	-
W38	36.20	35.60
W39	36.14	35.27
W40	33.47	32.52
W41	36.20	35.25



PHOTO 17 - SP 96287



PHOTO 16 - SP 96287

Rev	Drawn	Check	Appd.	Date	Revision Description
02	PS	GL	CJ	11.09.23	EXTRA DETAIL
01	PS	GL	CJ	29.05.23	TOP OF BANK ASSESSMENT
00	ND	GL	CJ	22.10.21	INITIAL ISSUE

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Scale:	0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0	For:
	SCALE 1:200 (A1)	SCALE 1:400 (A3)
Surveyor	GL	Date of Survey
		13.10.2021
Height Datum	AHD	Horizontal Datum
		MGA GDA2020
Origin	SSM 13133 RL 22.79	Origin
		SSM 13133 E 307251.646 N 6197767.951

By: **ORION** SUSTAINABLE ENGINEERS
 For: **JAS-ANZ** SUSTAINABLE ENGINEERS

Project: **I.R.T. WOONONA VILLAGE
 POPES ROAD, WOONONA**

Title: **CONTOUR & DETAIL SURVEY
 LOT 1 DP 1160947**

Project No.	Drawing No.	Milestone	Sheet	Revision
23-0173	SV-01	-	2 of 7	02

POPES

ROAD

D. P. 7 4 5 1 6 6



PHOTO 1 - UNIT 1 SP 75762



PHOTO 2 - UNIT 2 SP 75762



PHOTO 3 - UNIT 3 SP 75762



PHOTO 4 - UNIT 10 SP 75762

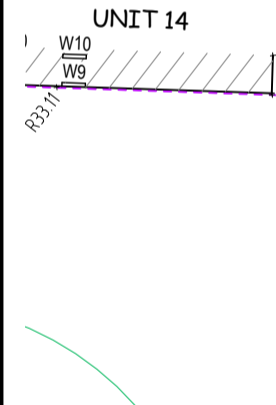


PHOTO 5 - UNIT 11 SP 75762

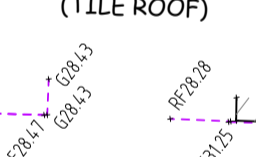
SCHEDULE OF WINDOW & DOOR HEIGHTS		
No.	HEAD	SILL
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W2	30.35	28.52
W3	30.15	28.96
W4	27.49	25.68
W5	30.66	28.85
W6	27.83	26.02
W7	30.79	29.39
W8	31.03	30.42
W9	28.19	26.39
W10	31.01	30.40

S. P. 7 5 7 6 2

BRICK UNITS (TILE ROOF) UNIT 14



BRICK UNITS (TILE ROOF)



BRICK UNITS (TILE ROOF)

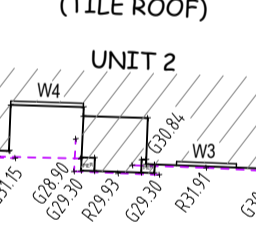


PHOTO 5

PHOTO 4

PHOTO 3

PHOTO 2

PHOTO 1

PRINCES HIGHWAY

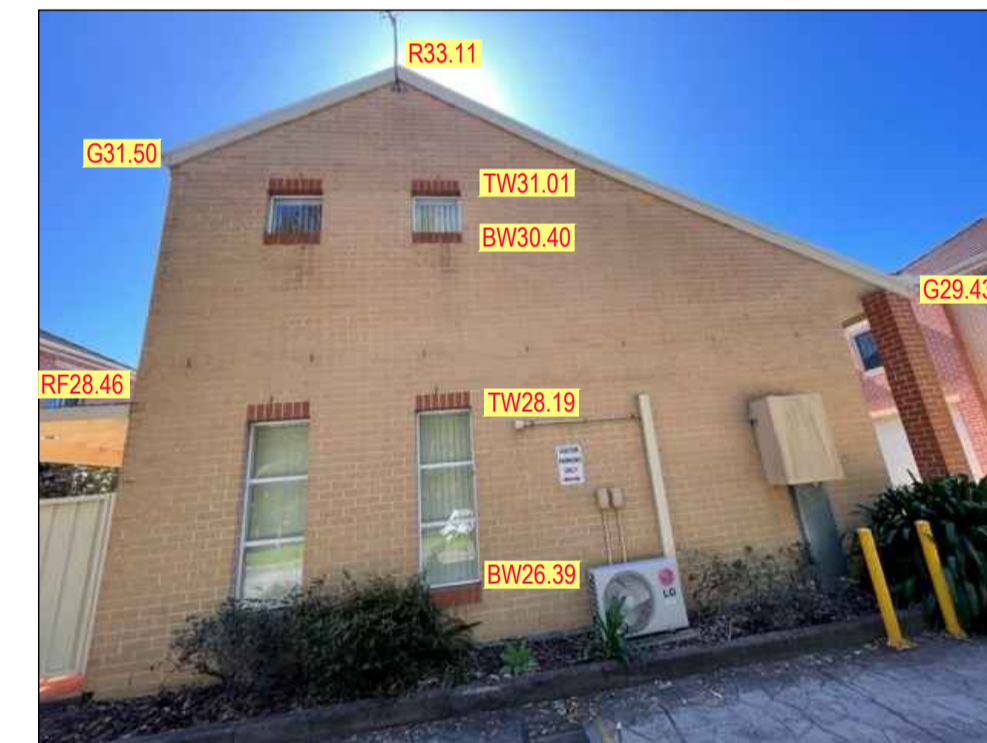


PHOTO 6 - UNIT 14 SP 75762



PHOTO 7 - UNIT 15 SP 75762



PHOTO 8 - UNIT 17 SP 75762



PHOTO 9 - UNIT 17 SP 75762

Rev	Drawn	Check	Appd.	Date	Revision Description
02	PS	GL	CJ	11.09.23	EXTRA DETAIL
01	PS	GL	CJ	29.05.23	TOP OF BANK ASSESSMENT
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	SCALE 1:200 (A1)	SCALE 1:400 (A3)
Surveyor	GL	Date of Survey
		13.10.2021
Height Datum	AHD	Horizontal Datum
		MGA GDA2020
Origin	SSM 13133 RL 22.79	Origin
		SSM 13133 E 307251.646 N 6197767.951

By: **ORION**  

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Project: I.R.T. WOONONA VILLAGE
POPES ROAD, WOONONA

Title:	CONTOUR & DETAIL SURVEY LOT 1 DP 1160947			
Project No.	Drawing No.	Milestone	Sheet	Revision
23-0173	SV-01	-	3 of 7	02

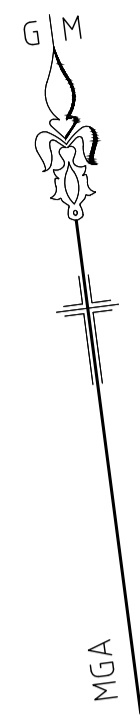
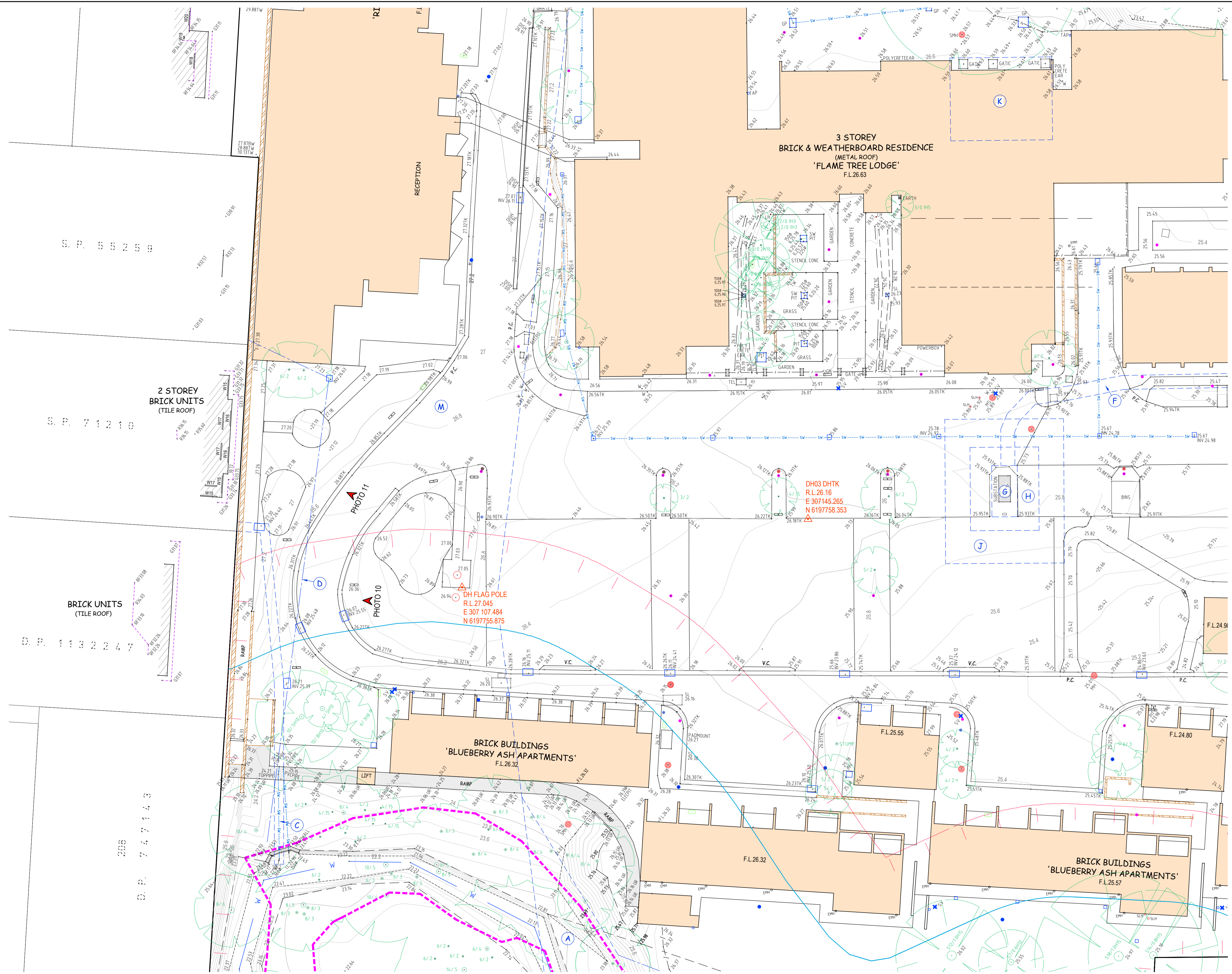


PHOTO 11 - SP 71210



PHOTO 10 - DP 1132247

SCHEDULE OF WINDOW & DOOR HEIGHTS		
No.	HEAD	SILL
W15	30.75	-
W16	30.71	-
W17	33.55	32.36
W18	33.07	32.13
W19	33.08	31.62
W20	33.02	32.18



Rev	Drawn	Check	Appd.	Date	Revision Description
02	PS	GL	CJ	11.09.23	EXTRA DETAIL
01	PS	GL	CJ	29.05.23	TOP OF BANK ASSESSMENT
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	SCALE 1:200 (A1)	SCALE 1:400 (A3)
Surveyor	GL	Date of Survey
		13.10.2021
Height Datum	AHD	Horizontal Datum
		MGA GDA2020
Origin	SSM 13133 RL 22.79	Origin
		SSM 13133 E 307251.646 N 6197767.951

By: **ORION**
 SUSTAINABLE
 ENGINEERING
 GROUP
 A B N : 25 604 069 981 P O B o x : 7936, B A U L K H A M H I L L S N S W 2153 T : (02) 8660 0035 E : info@theoriongroup.au

Project: **I.R.T. WOONONA VILLAGE
 POPES ROAD, WOONONA**

Title: **CONTOUR & DETAIL SURVEY
 LOT 1 DP 1160947**

Project No.	Drawing No.	Milestone	Sheet	Revision
23-0173	SV-01	-	4 of 7	02



SSM 13133
R.L. 22.79
E 307251.646
N 6197767.951

Rev	Drawn	Check	Appd.	Date	Revision Description
02	PS	GL	CJ	11.09.23	EXTRA DETAIL
01	PS	GL	CJ	29.05.23	TOP OF BANK ASSESSMENT
00	ND	GL	CJ	22.10.21	INITIAL ISSUE

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	SCALE 1:200 (A1)	SCALE 1:400 (A3)
Surveyor	GL	Date of Survey
Height Datum	AHD	Horizontal Datum
Origin	SSM 13133 R.L. 22.79	Origin
		SSM 13133 E 307251.646 N 6197767.951

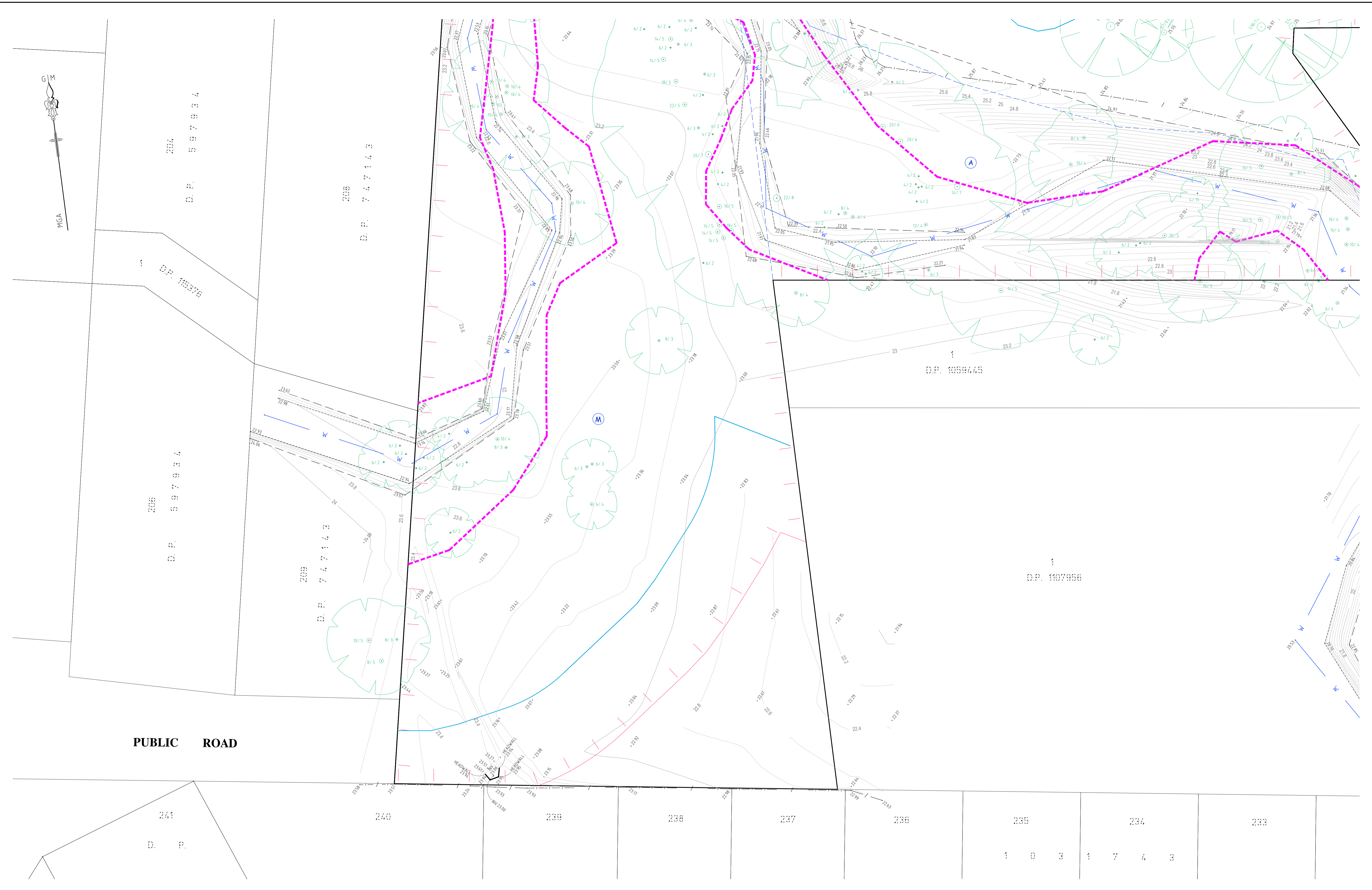
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Project: I.R.T. WOONONA VILLAGE
POPES ROAD, WOONONA

Project No. 23-0173 Drawing No. SV-01 Milestone - Sheet 5 of 7 Revision 02

Title: CONTOUR & DETAIL SURVEY LOT 1 DP 1160947				
Project No.	Drawing No.	Milestone	Sheet	Revision
23-0173	SV-01	-	5 of 7	02



Rev	Drawn	Check	Appd.	Date	Revision Description
02	PS	GL	CJ	11.09.23	EXTRA DETAIL
01	PS	GL	CJ	29.05.23	TOP OF BANK ASSESSMENT
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	SCALE 1:200 (A1)	SCALE 1:400 (A3)
Surveyor	GL	Date of Survey 13.10.2021
Height Datum	AHD	Horizontal Datum MGA GDA2020
Origin	SSM 13133 RL 22.79	Origin SSM 13133 E 307251.646 N 6197767.951

For:
 By:
 For:

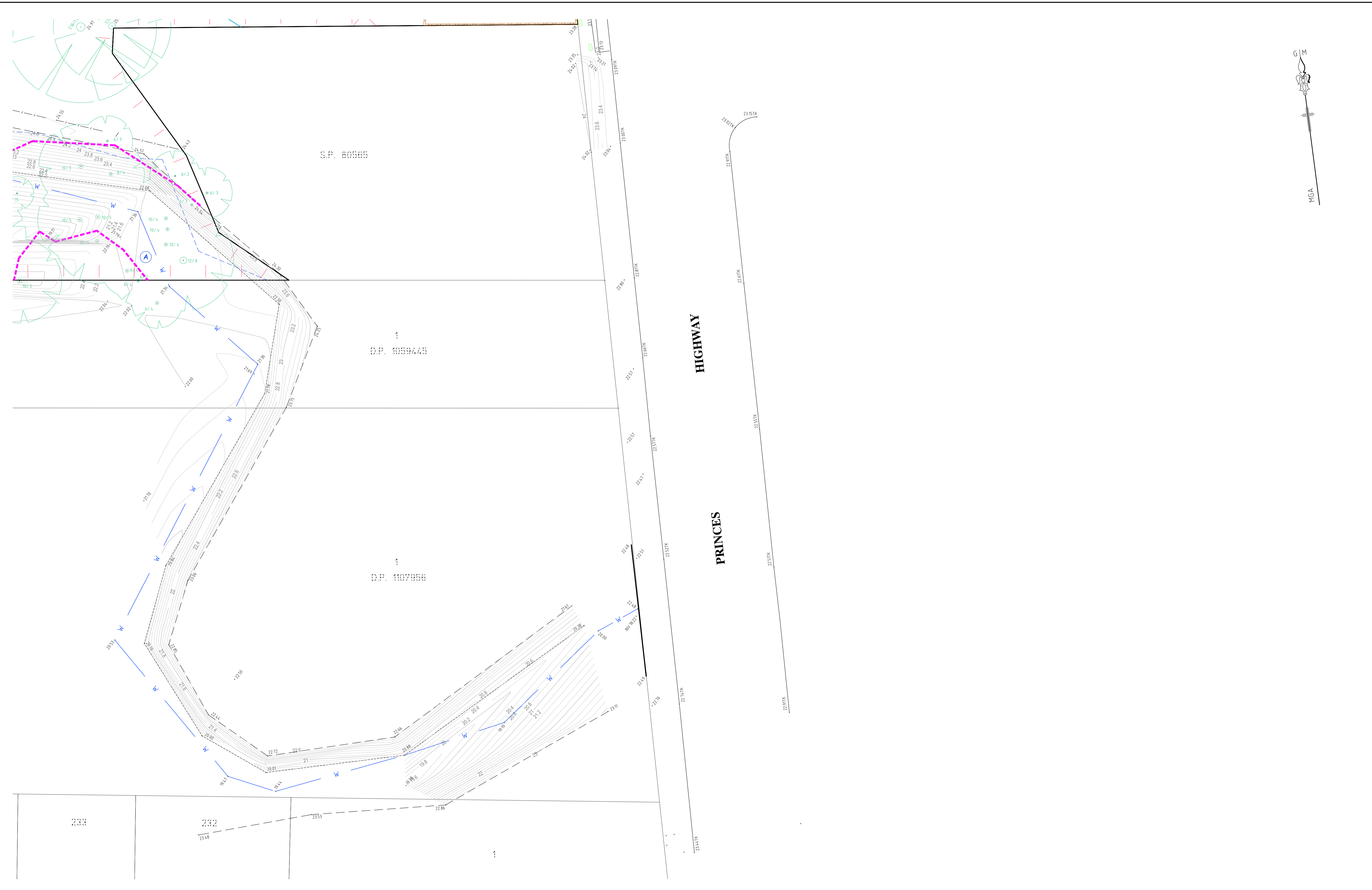
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 SURVEILLANCE

Project:
**I.R.T. WOONONA VILLAGE
 POPES ROAD, WOONONA**

Title: CONTOUR & DETAIL SURVEY LOT 1 DP 1160947				
Project No. 23-0173	Drawing No. SV-01	Milestone -	Sheet 6 of 7	Revision 02



Rev	Drawn	Check	Appd.	Date	Revision Description
02	PS	GL	CJ	11.09.23	EXTRA DETAIL
01	PS	GL	CJ	29.05.23	TOP OF BANK ASSESSMENT
00	ND	GL	CJ	22.10.21	INITIAL ISSUE

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Scale:	0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0	
	SCALE 1:200 (A1)	SCALE 1:400 (A3)
Surveyor	GL	Date of Survey 13.10.2021
Height Datum	AHD	Horizontal Datum MGA GDA2020
Origin	SSM 13133 RL 22.79	Origin SSM 13133 E 307251.646 N 6197767.951

For:

By:





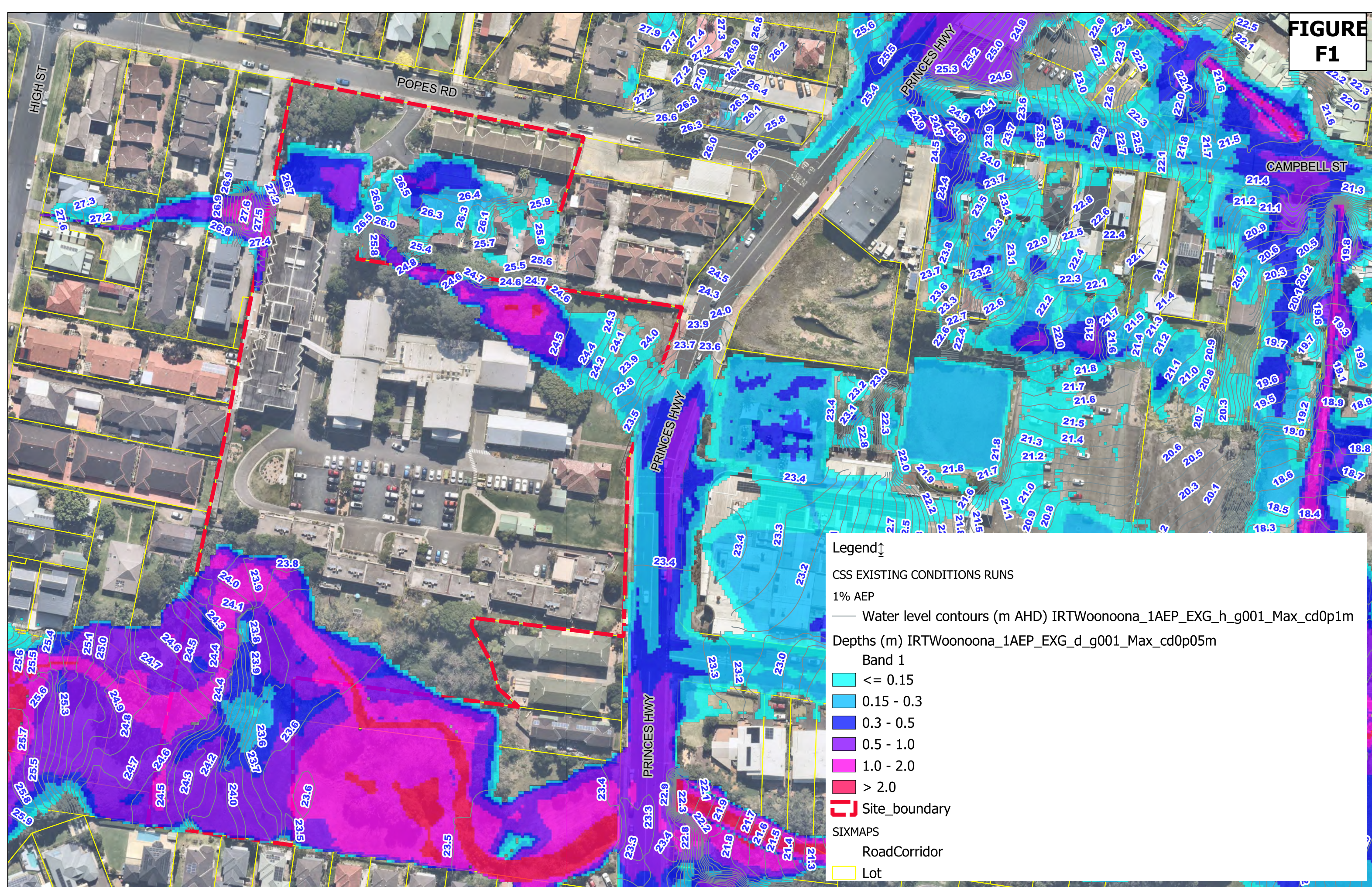
ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E: info@theoriongroup.au

Project:
 I.R.T. WOONONA VILLAGE
 POPES ROAD, WOONONA

Title: CONTOUR & DETAIL SURVEY LOT 1 DP 1160947				
Project No. 23-0173	Drawing No. SV-01	Milestone -	Sheet 7 of 7	Revision 02

Appendix B Existing Development Conditions Flood Maps

FIGURE F1



Legend ↓

CSS EXISTING CONDITIONS RUNS
1% AEP

— Water level contours (m AHD) IRTWoonoona_1AEP_EXG_h_g001_Max_cd0p1m

Depths (m) IRTWoonoona_1AEP_EXG_d_g001_Max_cd0p05m

Band 1

- <= 0.15
- 0.15 - 0.3
- 0.3 - 0.5
- 0.5 - 1.0
- 1.0 - 2.0
- > 2.0

Site_boundary

SIXMAPS

- RoadCorridor
- Lot

REV B
DATE: 17.04.2025
DRAWN: KU
APPROVED: GL

CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE

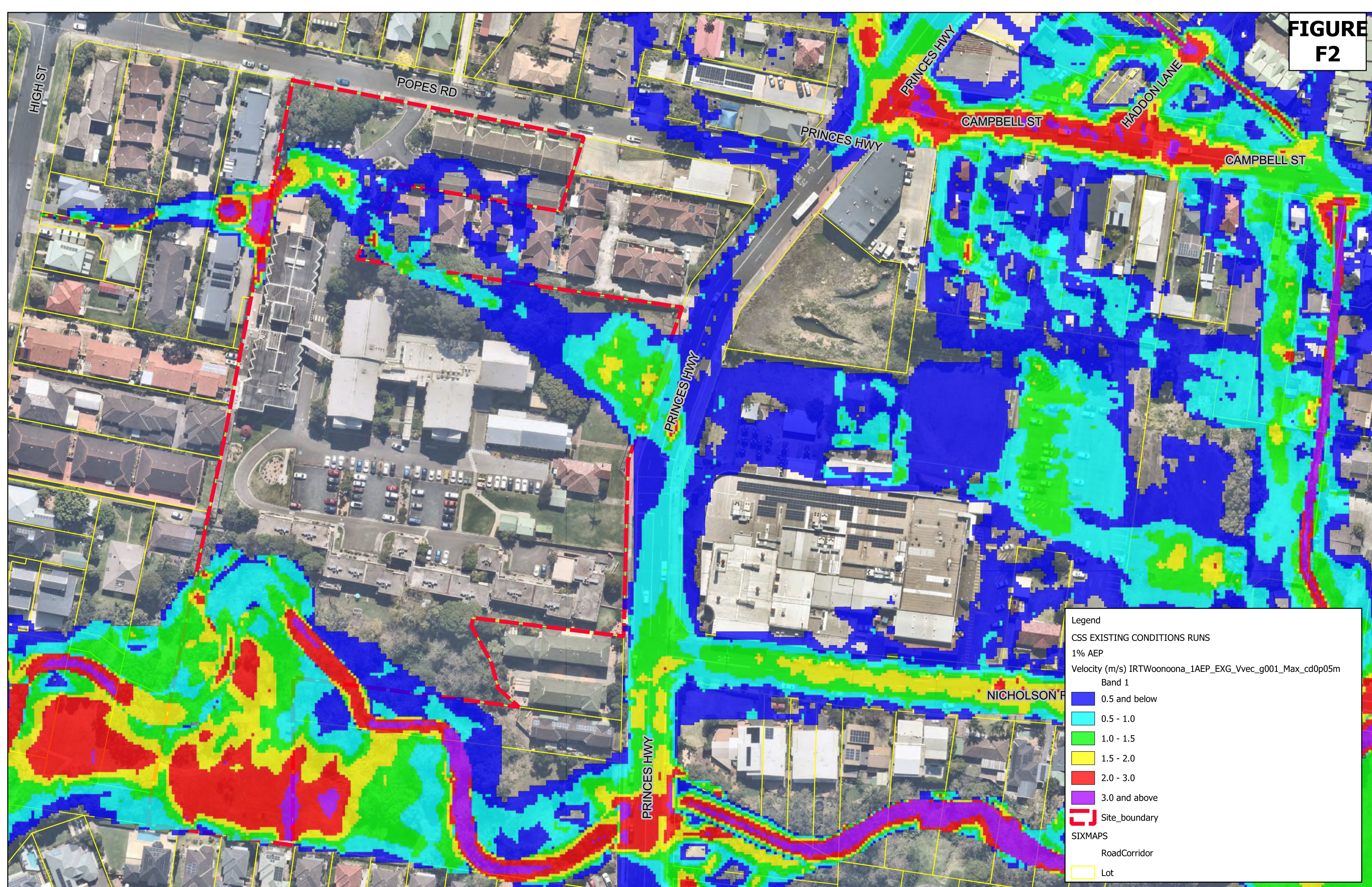


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PROPOSED DEVELOPMENT
FLOOD IMPACT ASSESSMENT
2-8 POPES ROAD, WOONOONA,
WOLLONGONG

**1% AEP MAXIMUM FLOOD DEPTHS
PRE DEVELOPMENT SCENARIO**

FIGURE F2



Legend

CSS EXISTING CONDITIONS RUNS
1% AEP
Velocity (m/s) IRTWoonona_1AEP_EXG_Vvec_g001_Max_cd0p05m
Band 1

- 0.5 and below
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 3.0
- 3.0 and above

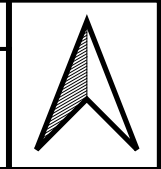
Site_boundary

SIXMAPS

- RoadCorridor
- Lot

REV B
DATE: 17.04.2025
DRAWN: KU
APPROVED: GL

CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE

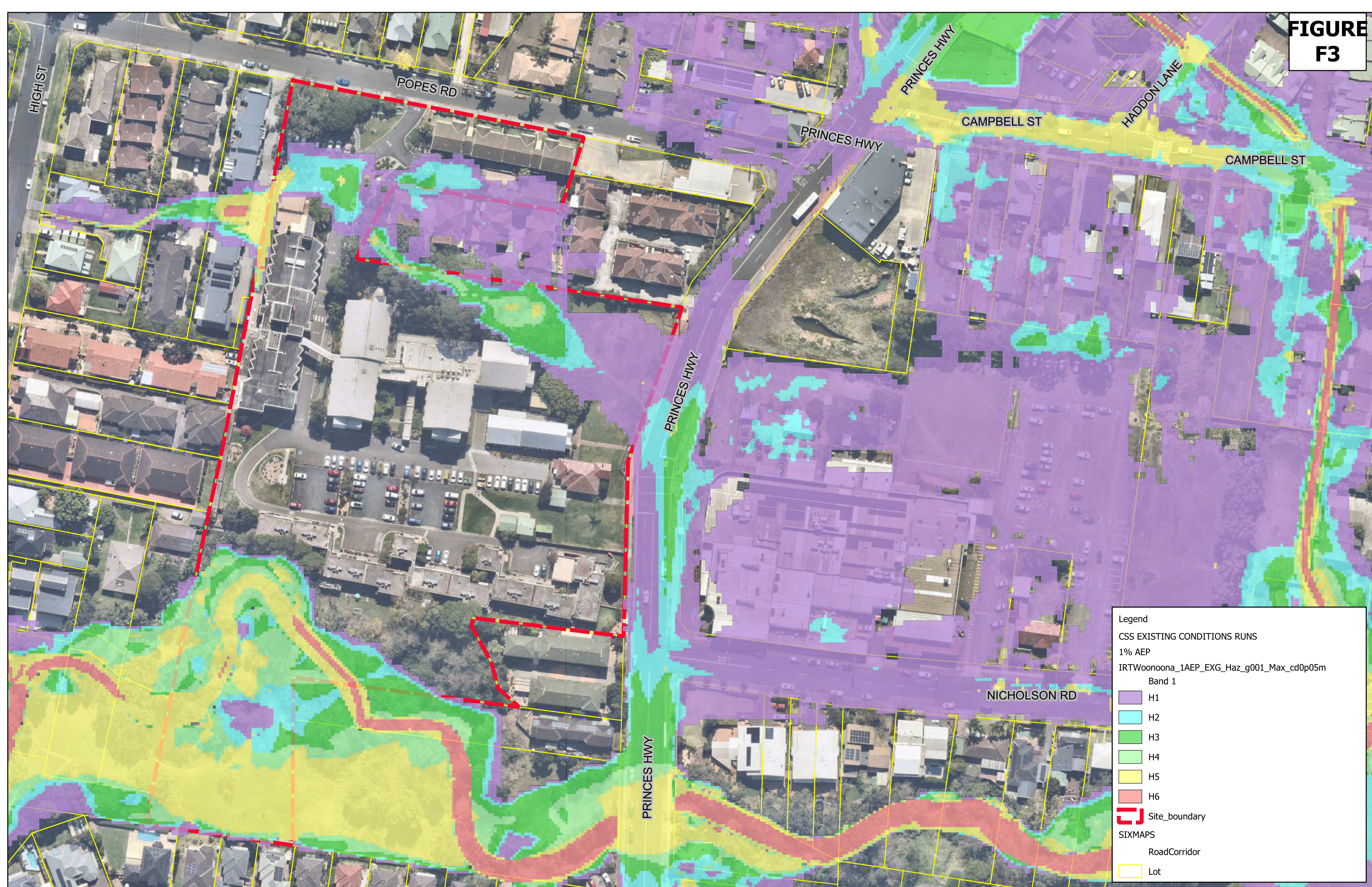


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PROPOSED DEVELOPMENT
FLOOD IMPACT ASSESSMENT
2-8 POPES ROAD, WOONONA,
WOLLONGONG

**1% AEP MAXIMUM FLOOD VELOCITY
PRE DEVELOPMENT SCENARIO**

FIGURE F3



Legend

CSS EXISTING CONDITIONS RUNS
1% AEP
IRTWoonoona_1AEP_EXG_Haz_g001_Max_cd0p05m

Band 1

- H1
- H2
- H3
- H4
- H5
- H6

Site_boundary

SIXMAPS

- RoadCorridor
- Lot

REV B
DATE: 17.04.2025
DRAWN: KU
APPROVED: GL

CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE



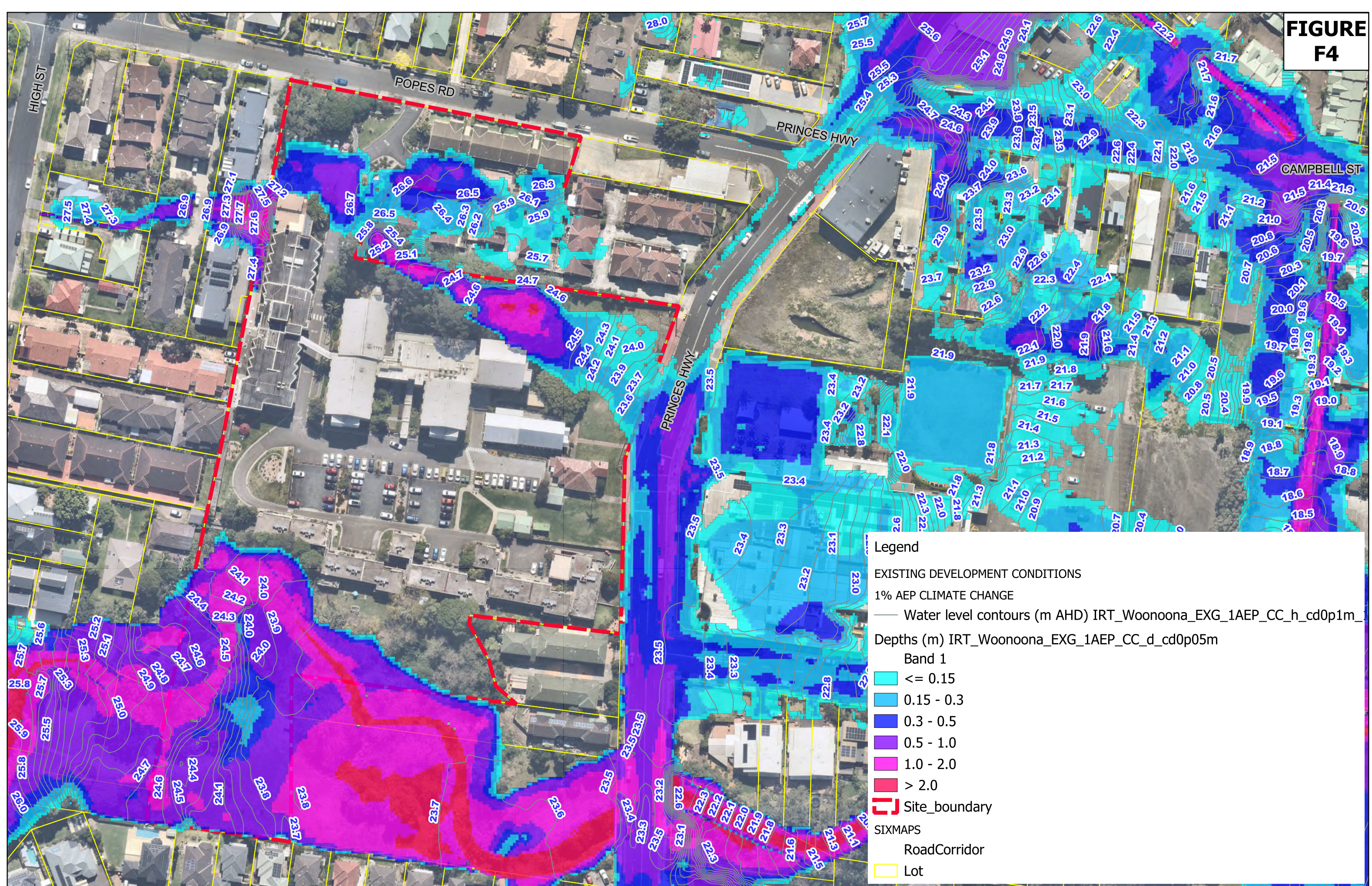
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PROPOSED DEVELOPMENT
FLOOD IMPACT ASSESSMENT
2-8 POPES ROAD, WOONONA,
WOLLONGONG

**1% AEP MAXIMUM FLOOD HAZARD
PRE DEVELOPMENT SCENARIO**

0 30 60 90 m

FIGURE F4



REV A
 DATE: 29.04.2025
 DRAWN: KU
 APPROVED: GL

CLIENT / ARCHITECT
**CALDER FLOWER
 ARCHITECTURE**

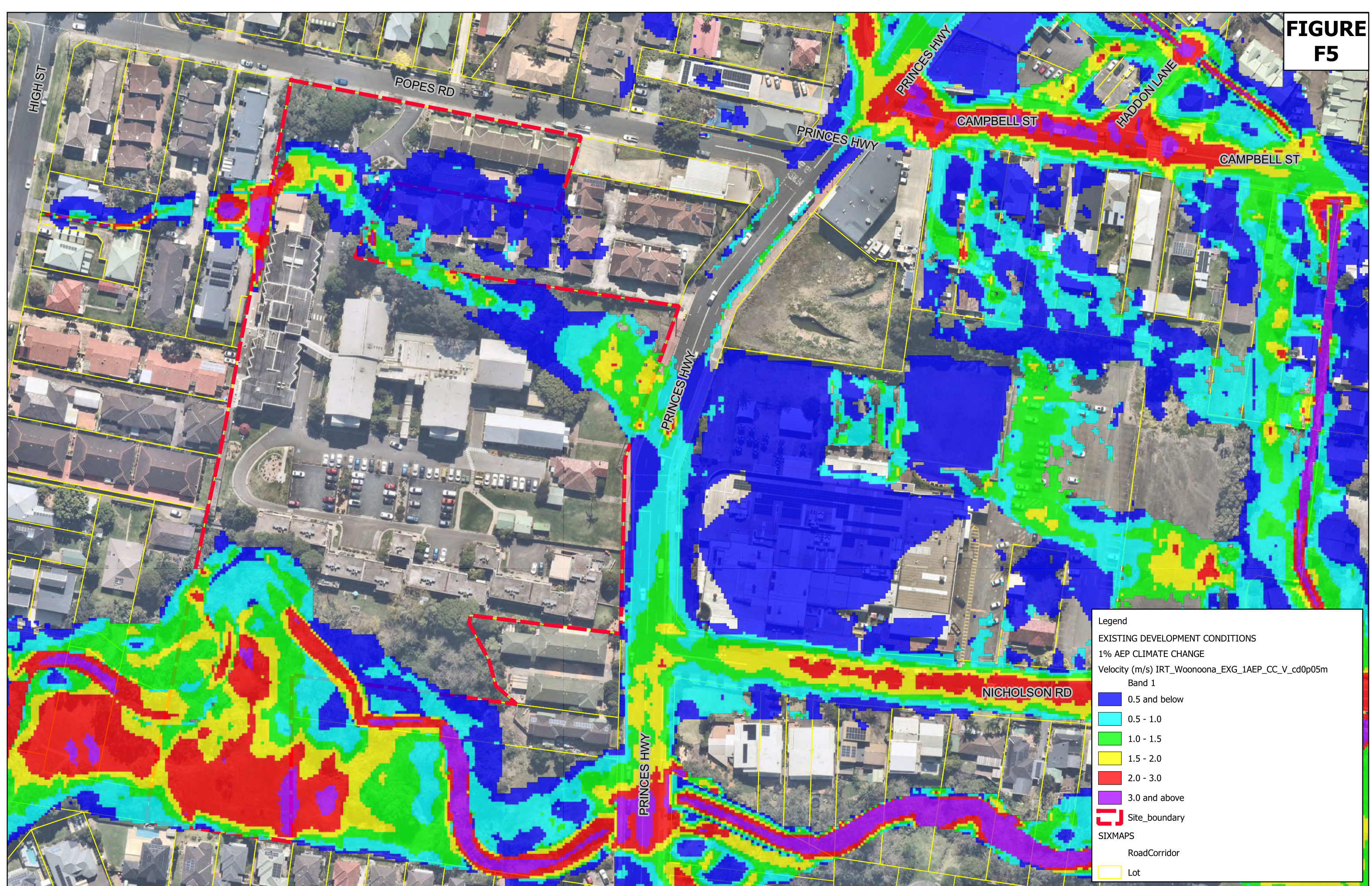
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PROPOSED DEVELOPMENT
 FLOOD IMPACT ASSESSMENT
 2-8 POPES ROAD, WOONOONA,
 WOLLONGONG

**1% AEP CLIMATE CHANGE
 MAXIMUM FLOOD DEPTHS & LEVELS
 PRE DEVELOPMENT SCENARIO**

0 30 60 90 m

FIGURE F5



Legend

EXISTING DEVELOPMENT CONDITIONS
1% AEP CLIMATE CHANGE
Velocity (m/s) IRT_Woonoona_EXG_1AEP_CC_V_cd0p05m
Band 1

- 0.5 and below
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 3.0
- 3.0 and above

Site_boundary

SIXMAPS
RoadCorridor

Lot

REV A
DATE: 29.04.2025
DRAWN: KU
APPROVED: GL

CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE

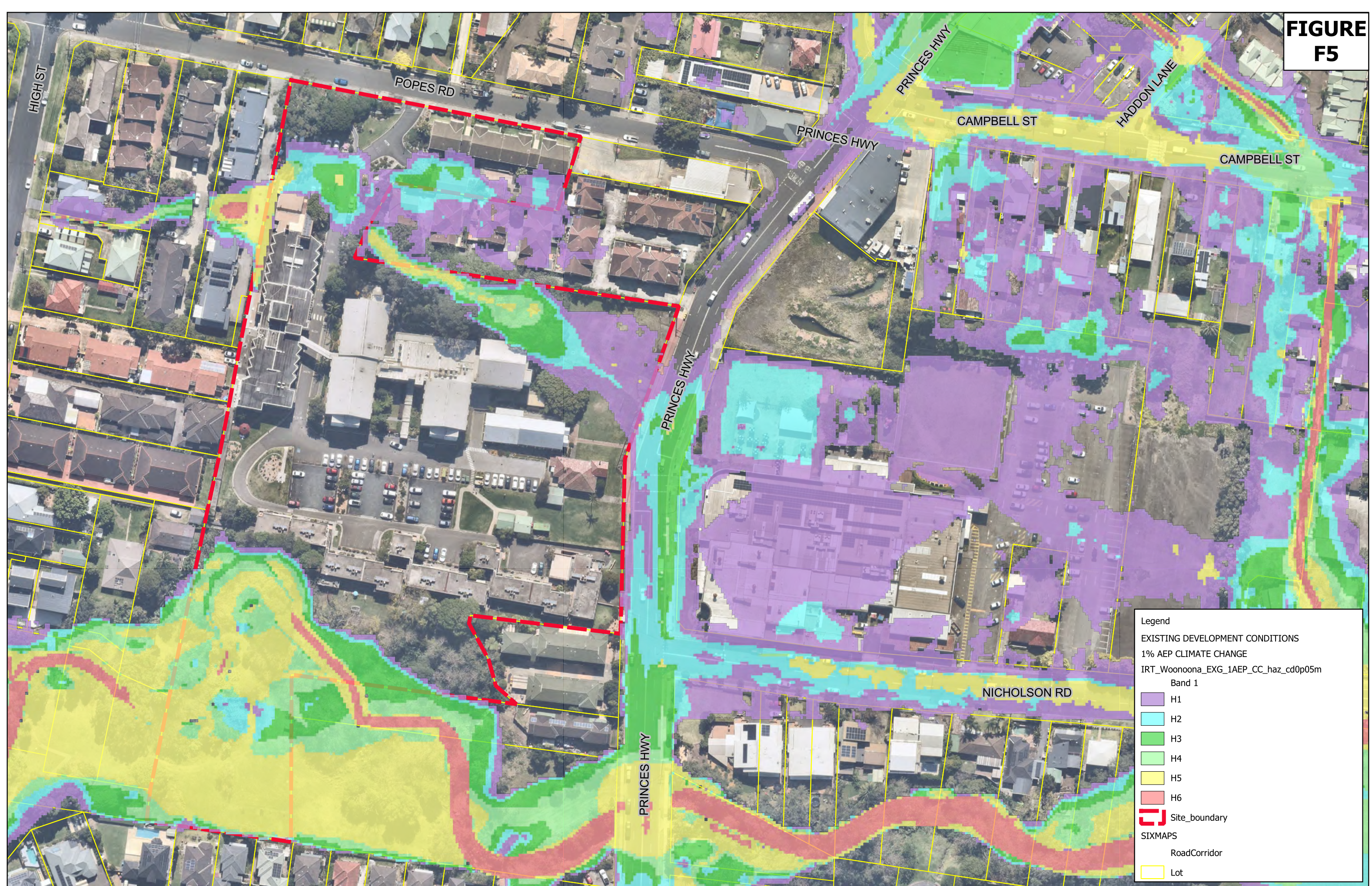
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PROPOSED DEVELOPMENT
FLOOD IMPACT ASSESSMENT
2-8 POPES ROAD, WOONOONA,
WOLLONGONG

**1% AEP CLIMATE CHANGE
MAXIMUM FLOOD VELOCITY
PRE DEVELOPMENT SCENARIO**

0 30 60 90 m

FIGURE F5



REV A
 DATE: 29.04.2025
 DRAWN: KU
 APPROVED: GL

CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE



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PROPOSED DEVELOPMENT
 FLOOD IMPACT ASSESSMENT
 2-8 POPES ROAD, WOONOONA,
 WOLLONGONG

**1% AEP CLIMATE CHANGE
 MAXIMUM FLOOD HAZARD
 PRE DEVELOPMENT SCENARIO**

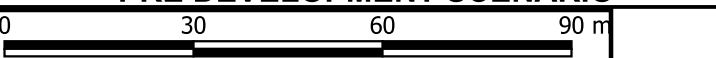
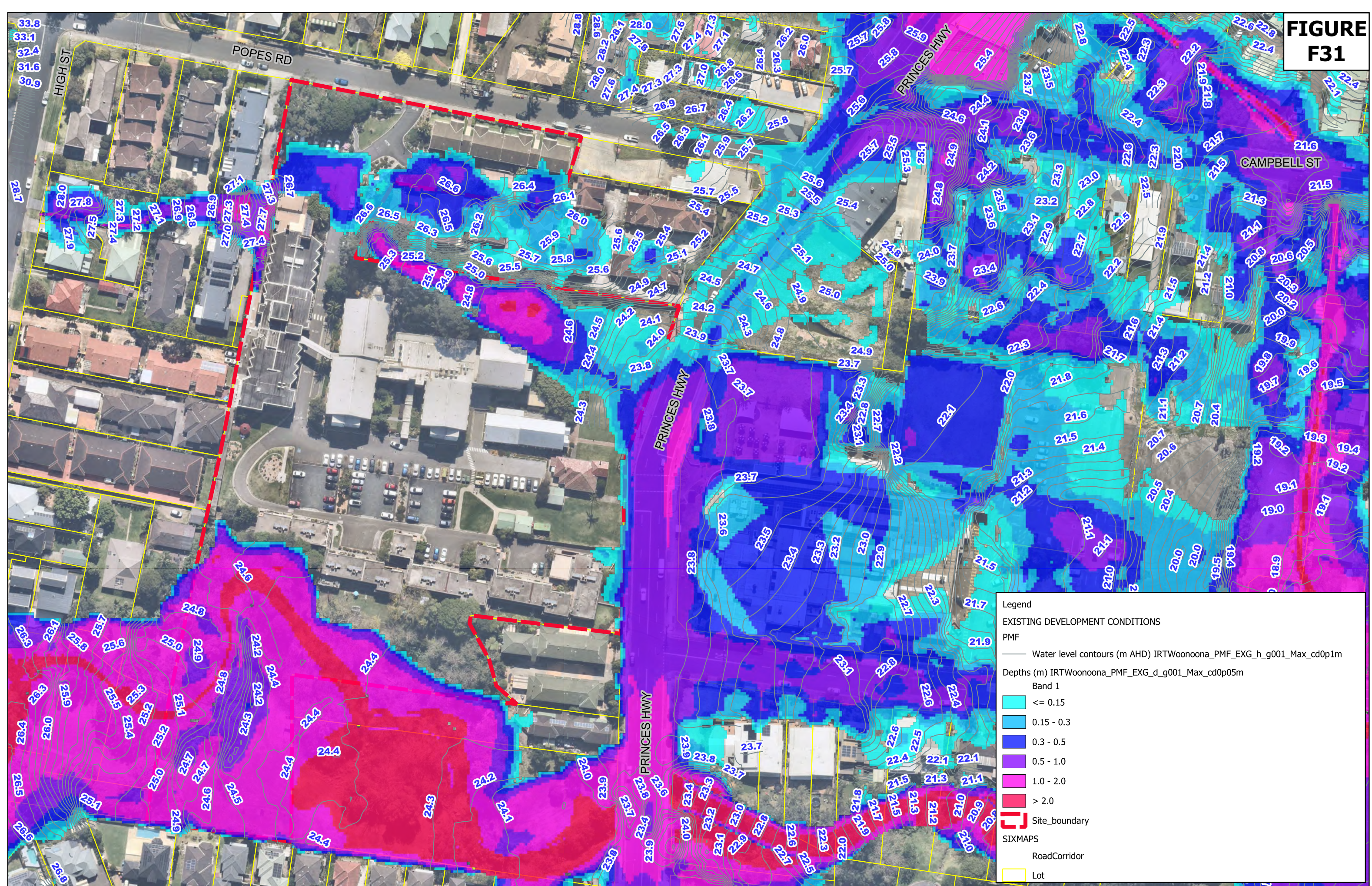
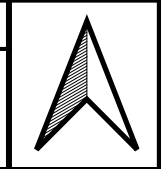


FIGURE F31



REV B
 DATE: 29.04.2025
 DRAWN: KU
 APPROVED: GL

CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE



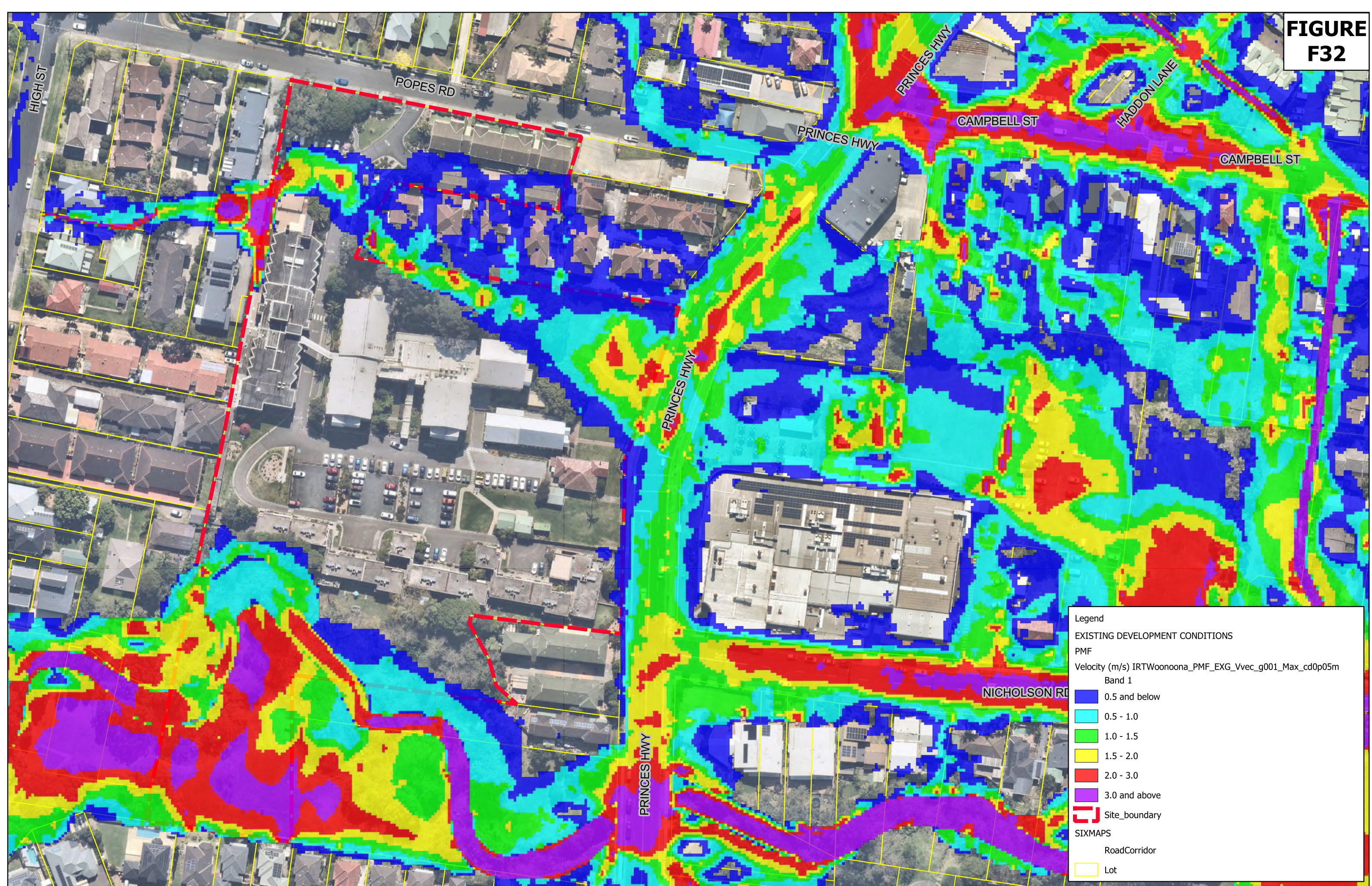
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PROPOSED DEVELOPMENT
 FLOOD IMPACT ASSESSMENT
 2-8 POPES ROAD, WOONONA,
 WOLLONGONG

**PMF MAXIMUM FLOOD DEPTHS
 PRE DEVELOPMENT SCENARIO**

0 30 60 90 m

FIGURE F32



Legend

EXISTING DEVELOPMENT CONDITIONS

PMF

Velocity (m/s) IRTWoonona_PMF_EXG_Vvec_g001_Max_cd0p05m

Band 1

- 0.5 and below
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 3.0
- 3.0 and above

Site_boundary

SIXMAPS

- RoadCorridor
- Lot

REV B
 DATE: 29.04.2025
 DRAWN: KU
 APPROVED: GL

CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE



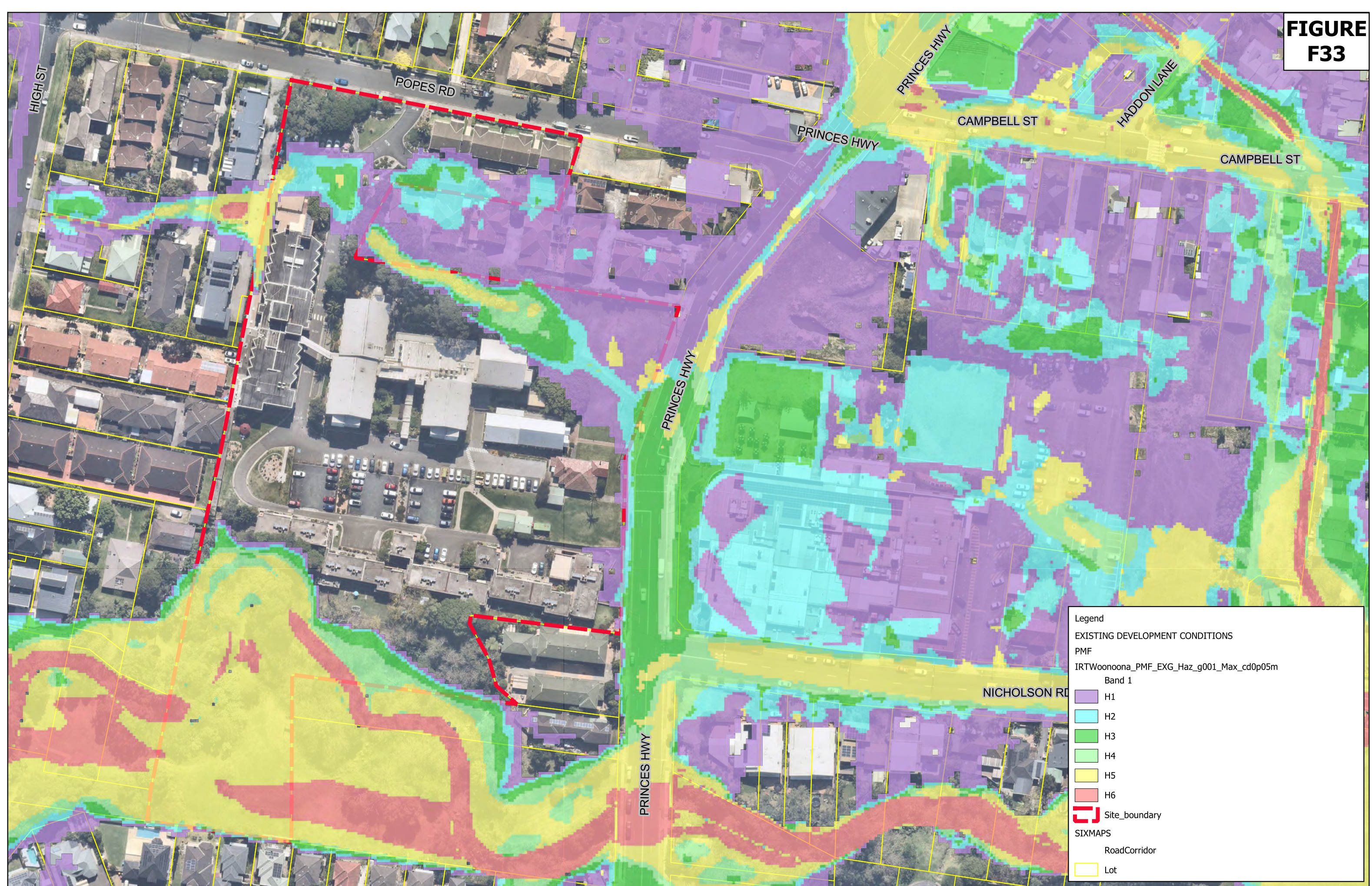
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PROPOSED DEVELOPMENT
 FLOOD IMPACT ASSESSMENT
 2-8 POPES ROAD, WOONONA,
 WOLLONGONG

**PMF MAXIMUM FLOOD VELOCITY
 PRE DEVELOPMENT SCENARIO**

0 30 60 90 m

FIGURE F33



Legend

EXISTING DEVELOPMENT CONDITIONS

PMF
IRTWoonona_PMF_EXG_Haz_g001_Max_cd0p05m

Band 1

- H1
- H2
- H3
- H4
- H5
- H6

Site_boundary

SIXMAPS

- RoadCorridor
- Lot

REV B
DATE: 29.04.2025
DRAWN: KU
APPROVED: GL

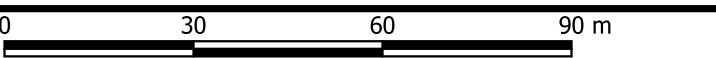
CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE



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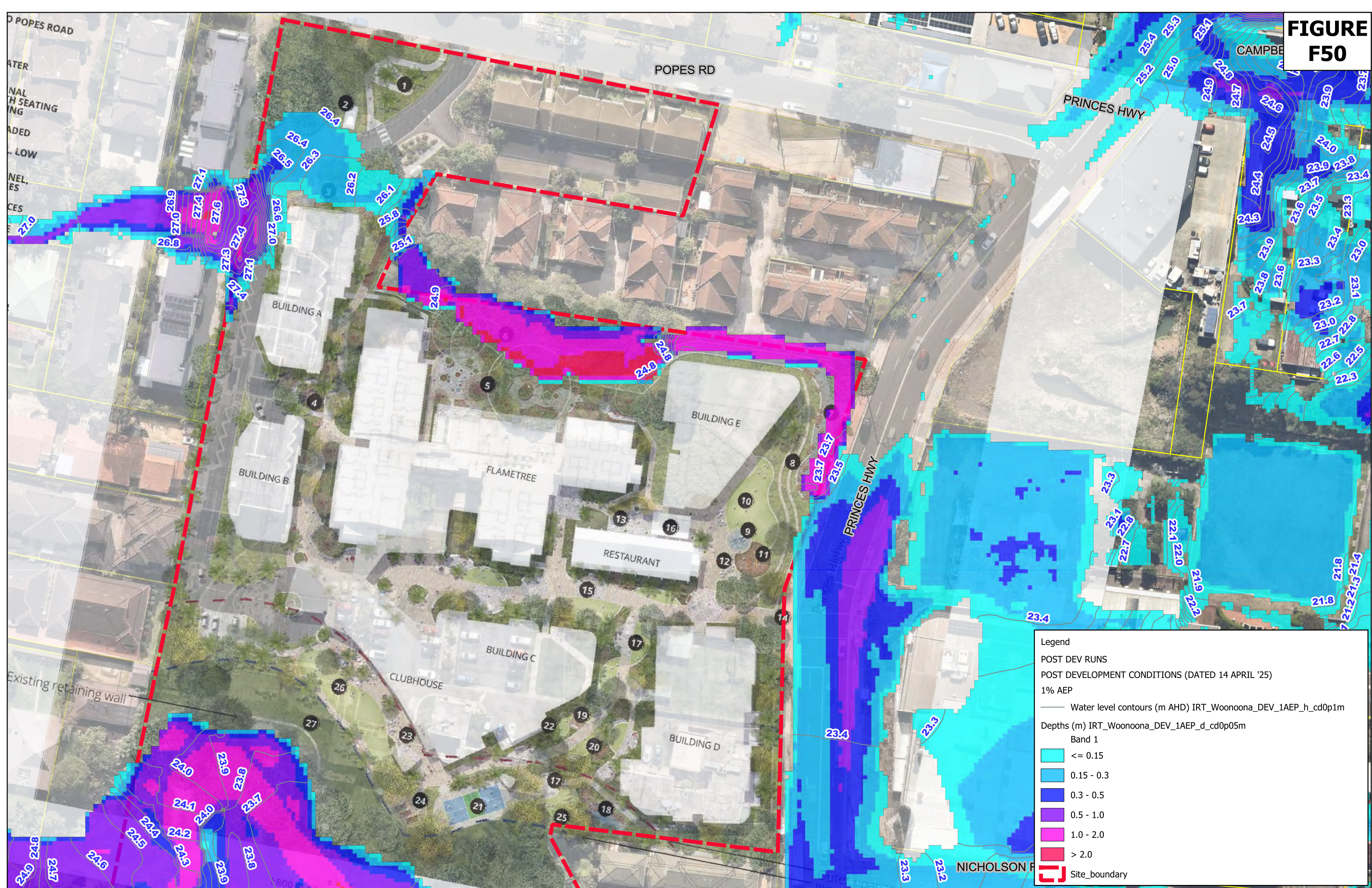
PROPOSED DEVELOPMENT
FLOOD IMPACT ASSESSMENT
2-8 POPES ROAD, WOONONA,
WOLLONGONG

PMF MAXIMUM FLOOD HAZARD PRE DEVELOPMENT SCENARIO



Appendix C Proposed Development Conditions Flood Maps

FIGURE F50



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CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE



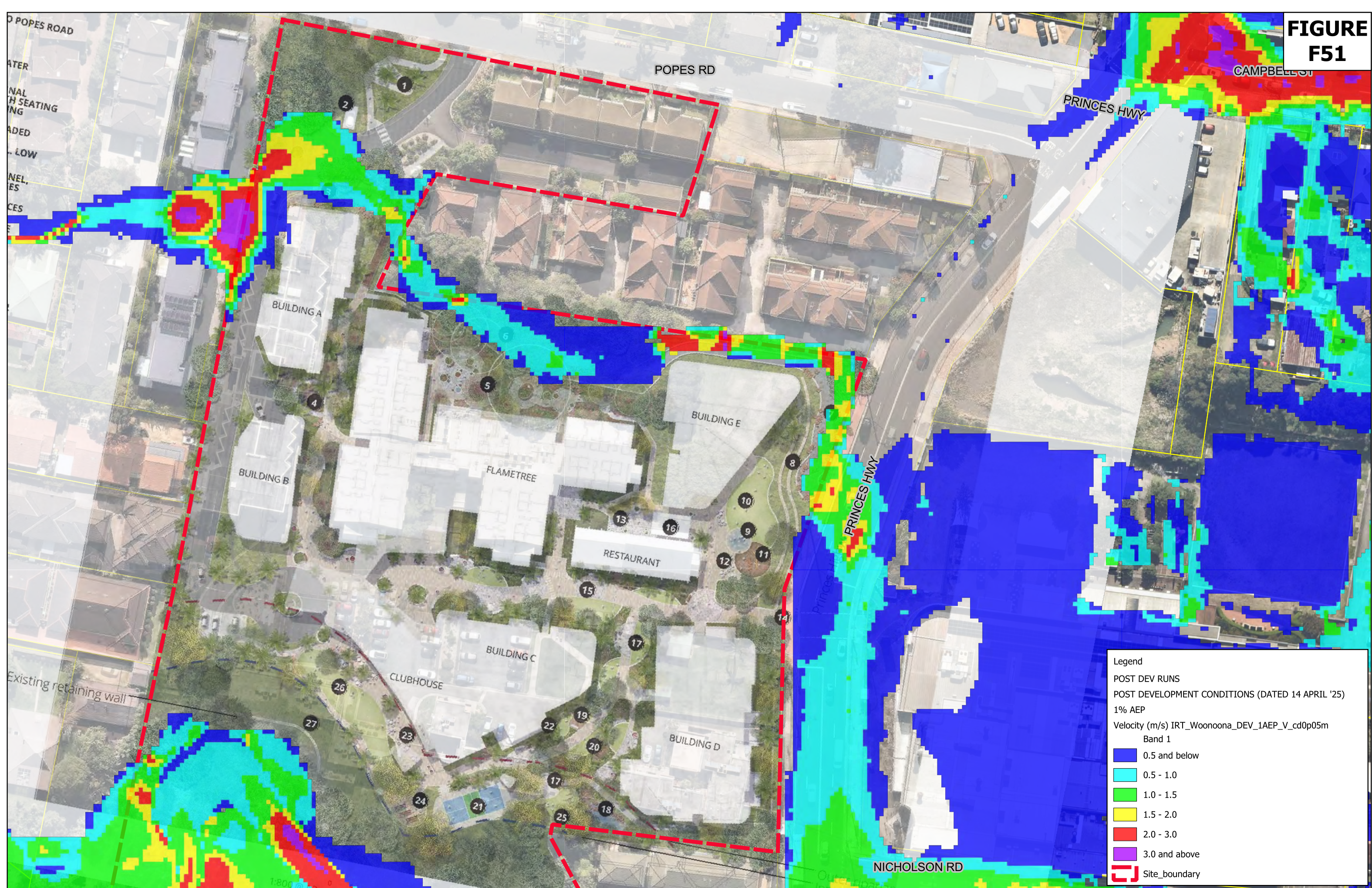
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PROPOSED DEVELOPMENT
 FLOOD IMPACT ASSESSMENT
 2-8 POPES ROAD
 WOONONA, NSW, 2517

**1% AEP MAXIMUM FLOOD LEVELS/DEPTHS
 POST DEVELOPMENT SCENARIO**

0 20 40 60 m

FIGURE F51



Legend

POST DEV RUNS
 POST DEVELOPMENT CONDITIONS (DATED 14 APRIL '25)
 1% AEP
 Velocity (m/s) IRT_Woonona_DEV_1AEP_V_cd0p05m
 Band 1

- 0.5 and below
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 3.0
- 3.0 and above
- Site_boundary

REV B
 DATE: 29.04.2025
 DRAWN: KU
 APPROVED: GL

CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE



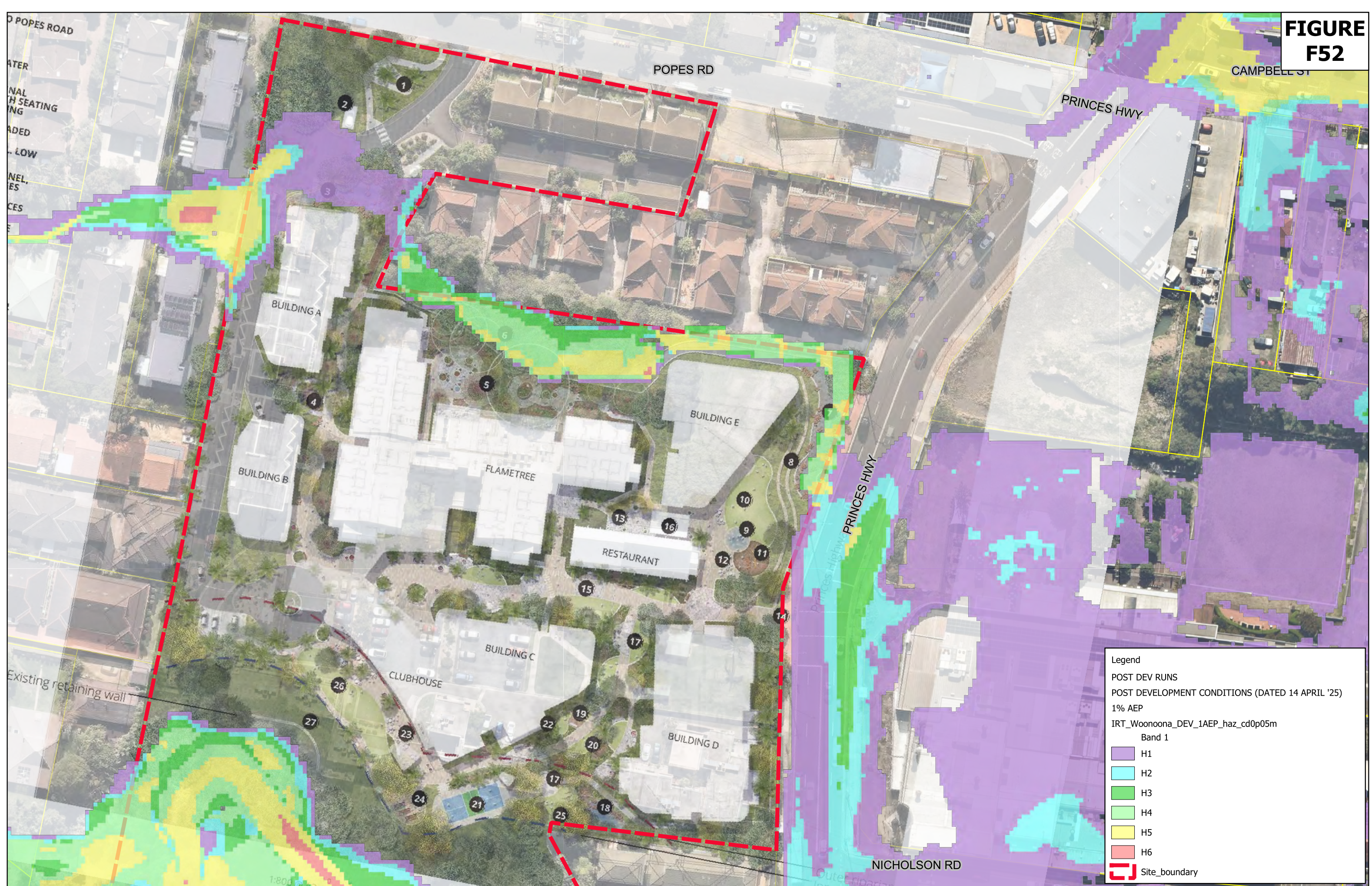
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PROPOSED DEVELOPMENT
 FLOOD IMPACT ASSESSMENT
 2-8 POPES ROAD
 WOONONA, NSW, 2517

**1% AEP MAXIMUM FLOOD VELOCITY
 POST DEVELOPMENT SCENARIO**

0 20 40 60 m

FIGURE F52



Legend

POST DEV RUNS
 POST DEVELOPMENT CONDITIONS (DATED 14 APRIL '25)
 1% AEP
 IRT_Woonona_DEV_1AEP_haz_cd0p05m
 Band 1

- H1
- H2
- H3
- H4
- H5
- H6
- Site_boundary

REV B
 DATE: 29.04.2025
 DRAWN: KU
 APPROVED: GL

CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE

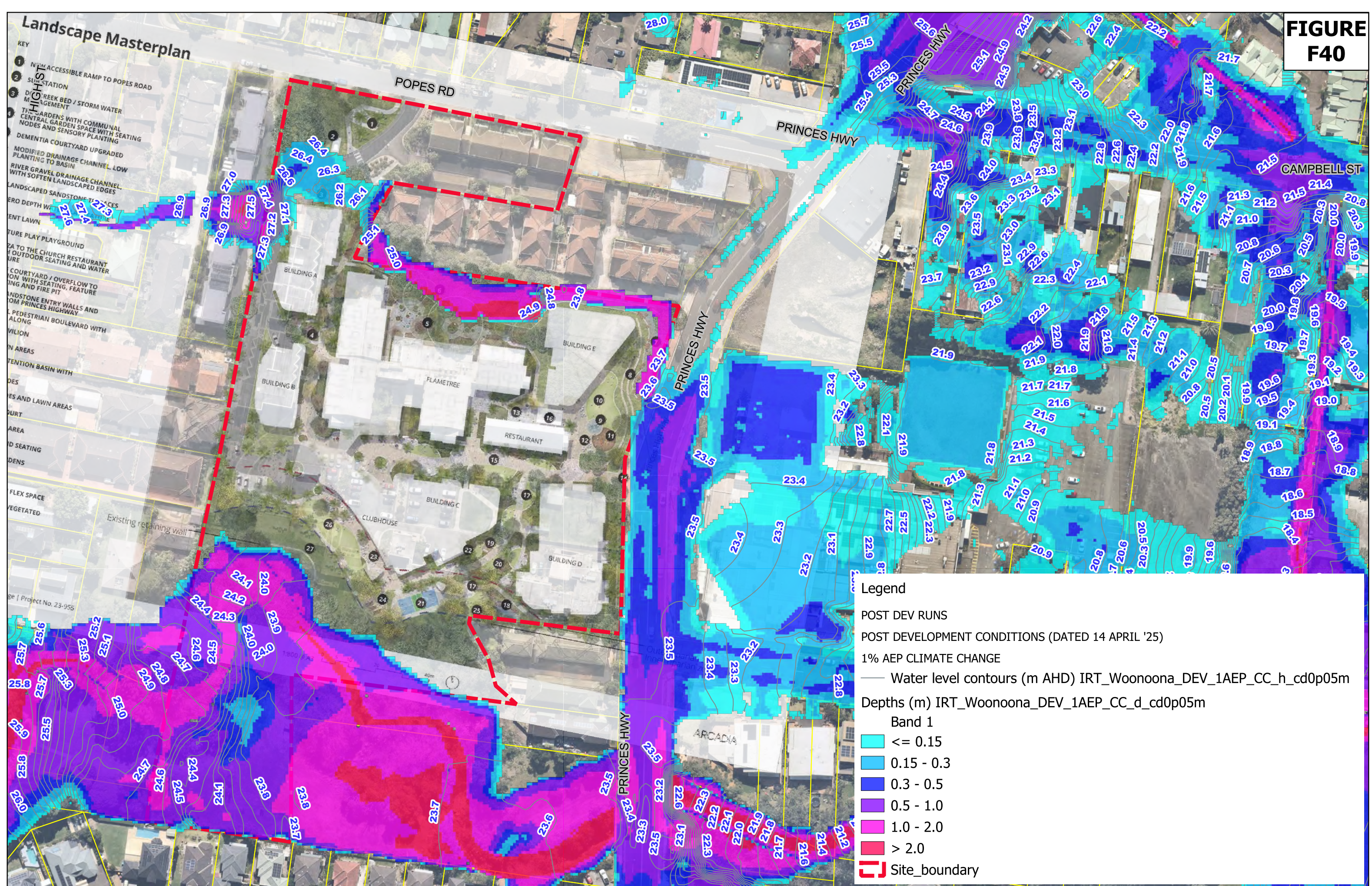


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PROPOSED DEVELOPMENT
 FLOOD IMPACT ASSESSMENT
 2-8 POPES ROAD
 WOONONA, NSW, 2517

1% AEP MAXIMUM FLOOD HAZARD POST DEVELOPMENT SCENARIO

FIGURE F40



REV A
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CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE



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PROPOSED DEVELOPMENT
 FLOOD IMPACT ASSESSMENT
 2-8 POPES ROAD, WOONOONA,
 WOLLONGONG

**1% AEP CLIMATE CHANGE
 MAXIMUM FLOOD DEPTHS & LEVELS
 POST DEVELOPMENT SCENARIO**

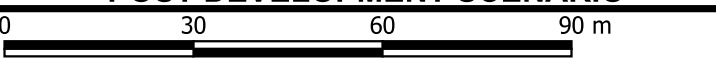
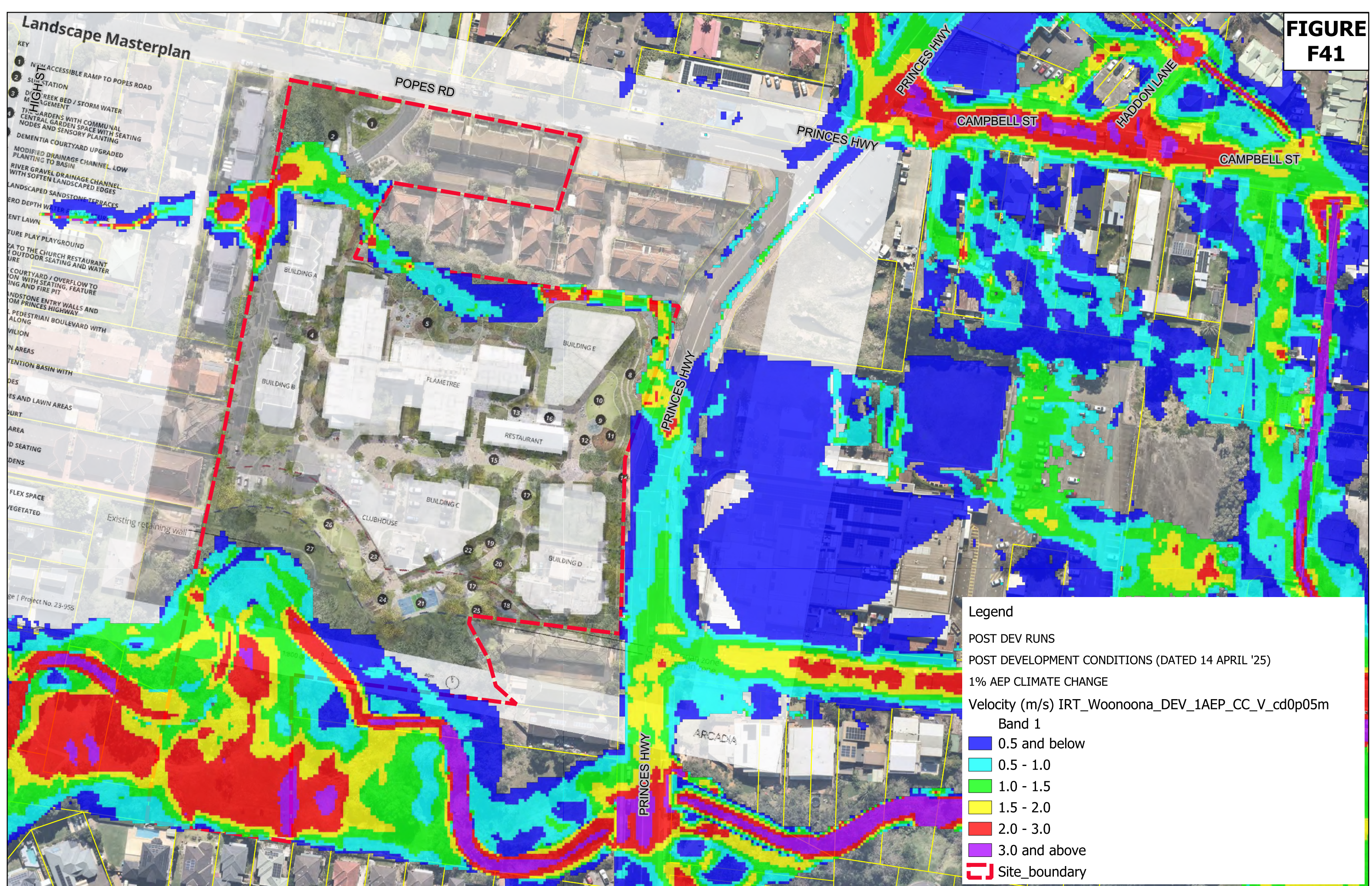


FIGURE F41



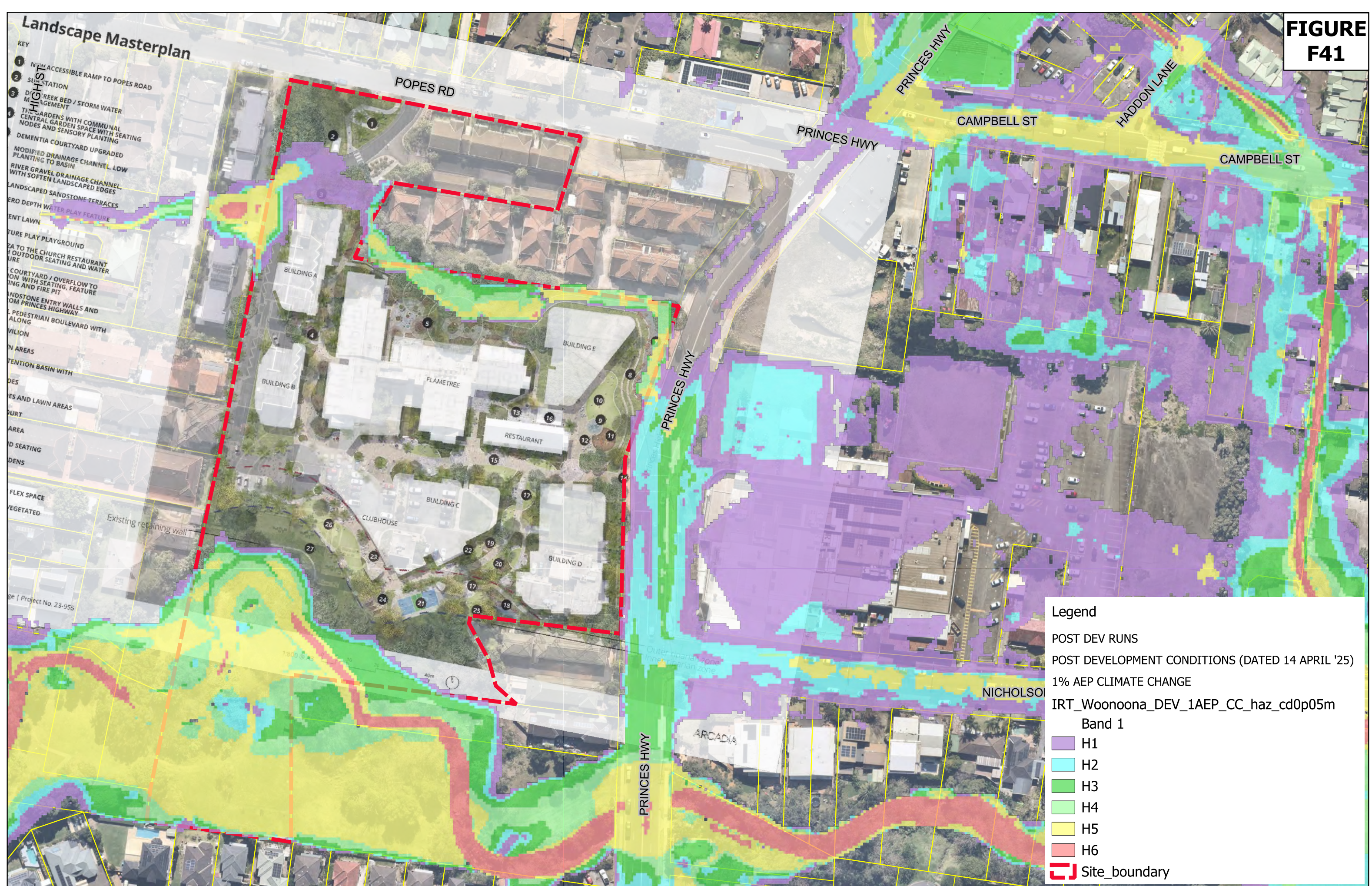
- Landscape Masterplan**
- KEY**
1. 1.5m ACCESSIBLE RAMP TO POPES ROAD
 2. SUCCINATION
 3. DRAINAGE CREEK BED / STORM WATER MANAGEMENT
 4. TREES AND GARDENS WITH COMMUNAL CENTRAL GARDEN SPACE WITH SEATING NODES AND SENSORY PLANTING
 5. DEMENTIA COURTYARD UPGRADED
 6. MODIFIED DRAINAGE CHANNEL. LOW PLANTING TO BASIN
 7. RIVER GRAVEL DRAINAGE CHANNEL WITH SOFTEN LANDSCAPED EDGES
 8. LANDSCAPED SANDSTONE TERRACES
 9. ZERO DEPTH WATER
 10. EXISTING LAWN
 11. FUTURE PLAY PLAYGROUND
 12. PATH TO THE CHURCH RESTAURANT WITH OUTDOOR SEATING AND WATER
 13. COURTYARD / OVERFLOW TO BASIN WITH SEATING, FEATURE PLANTING AND FIRE PIT
 14. SANDSTONE ENTRY WALLS AND OVERLOOK FROM PRINCES HIGHWAY
 15. PEDESTRIAN BOULEVARD WITH PLANTING
 16. CIVILION
 17. OPEN AREAS
 18. RETENTION BASIN WITH PLANTING
 19. TREES AND LAWN AREAS
 20. SPORTS AREA
 21. OUTDOOR SEATING
 22. TERRACES
 23. FLEX SPACE
 24. VEGETATED
 25. Existing retaining wall
 26. 40m
 27. 40m
 28. 40m
 29. 40m
 30. 40m
 31. 40m
 32. 40m
 33. 40m
 34. 40m
 35. 40m
 36. 40m
 37. 40m
 38. 40m
 39. 40m
 40. 40m
 41. 40m
 42. 40m
 43. 40m
 44. 40m
 45. 40m
 46. 40m
 47. 40m
 48. 40m
 49. 40m
 50. 40m

Legend

POST DEV RUNS
 POST DEVELOPMENT CONDITIONS (DATED 14 APRIL '25)
 1% AEP CLIMATE CHANGE
 Velocity (m/s) IRT_Woonoona_DEV_1AEP_CC_V_cd0p05m
 Band 1

- 0.5 and below
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 3.0
- 3.0 and above
- Site_boundary

FIGURE F41



Landscape Masterplan

- KEY**
- 1 N/A ACCESSIBLE RAMP TO POPES ROAD
 - 2 SUCCINATION
 - 3 DRAINAGE CREEK BED / STORM WATER MANAGEMENT
 - 4 TREES / GARDENS WITH COMMUNAL CENTRAL GARDEN SPACE WITH SEATING NODES AND SENSORY PLANTING
 - 5 DEMENTIA COURTYARD UPGRADED
 - 6 MODIFIED DRAINAGE CHANNEL. LOW PLANTING TO BASIN
 - 7 RIVER GRAVEL DRAINAGE CHANNEL WITH SOFTEN LANDSCAPED EDGES
 - 8 LANDSCAPED SANDSTONE TERRACES
 - 9 DEPTH WATER PLAY FEATURE
 - 10 ENT LAWN
 - 11 NATURE PLAY PLAYGROUND
 - 12 PATH TO THE CHURCH RESTAURANT / OUTDOOR SEATING AND WATER FEATURE
 - 13 COURTYARD / OVERFLOW TO LAWN WITH SEATING, FEATURE PLANTING AND FIRE PIT
 - 14 SANDSTONE ENTRY WALLS AND FORM PRINCES HIGHWAY
 - 15 PEDESTRIAN BOULEVARD WITH PLANTING
 - 16 DIVISION
 - 17 OPEN AREAS
 - 18 RETENTION BASIN WITH PLANTING
 - 19 TREES AND LAWN AREAS
 - 20 COURT AREA
 - 21 D SEATING
 - 22 DENS
 - 23 FLEX SPACE
 - 24 VEGETATED
 - 25
 - 26
 - 27

Legend

POST DEV RUNS
 POST DEVELOPMENT CONDITIONS (DATED 14 APRIL '25)
 1% AEP CLIMATE CHANGE
 IRT_Woonoona_DEV_1AEP_CC_haz_cd0p05m

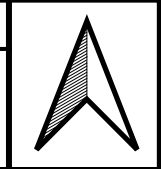
Band 1

- H1
- H2
- H3
- H4
- H5
- H6

Site_boundary

REV A
 DATE: 29.04.2025
 DRAWN: KU
 APPROVED: GL

CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE



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PROPOSED DEVELOPMENT
 FLOOD IMPACT ASSESSMENT
 2-8 POPES ROAD, WOONOONA,
 WOLLONGONG

**1% AEP CLIMATE CHANGE
 MAXIMUM FLOOD HAZARD
 POST DEVELOPMENT SCENARIO**

0 30 60 90 m

FIGURE F60

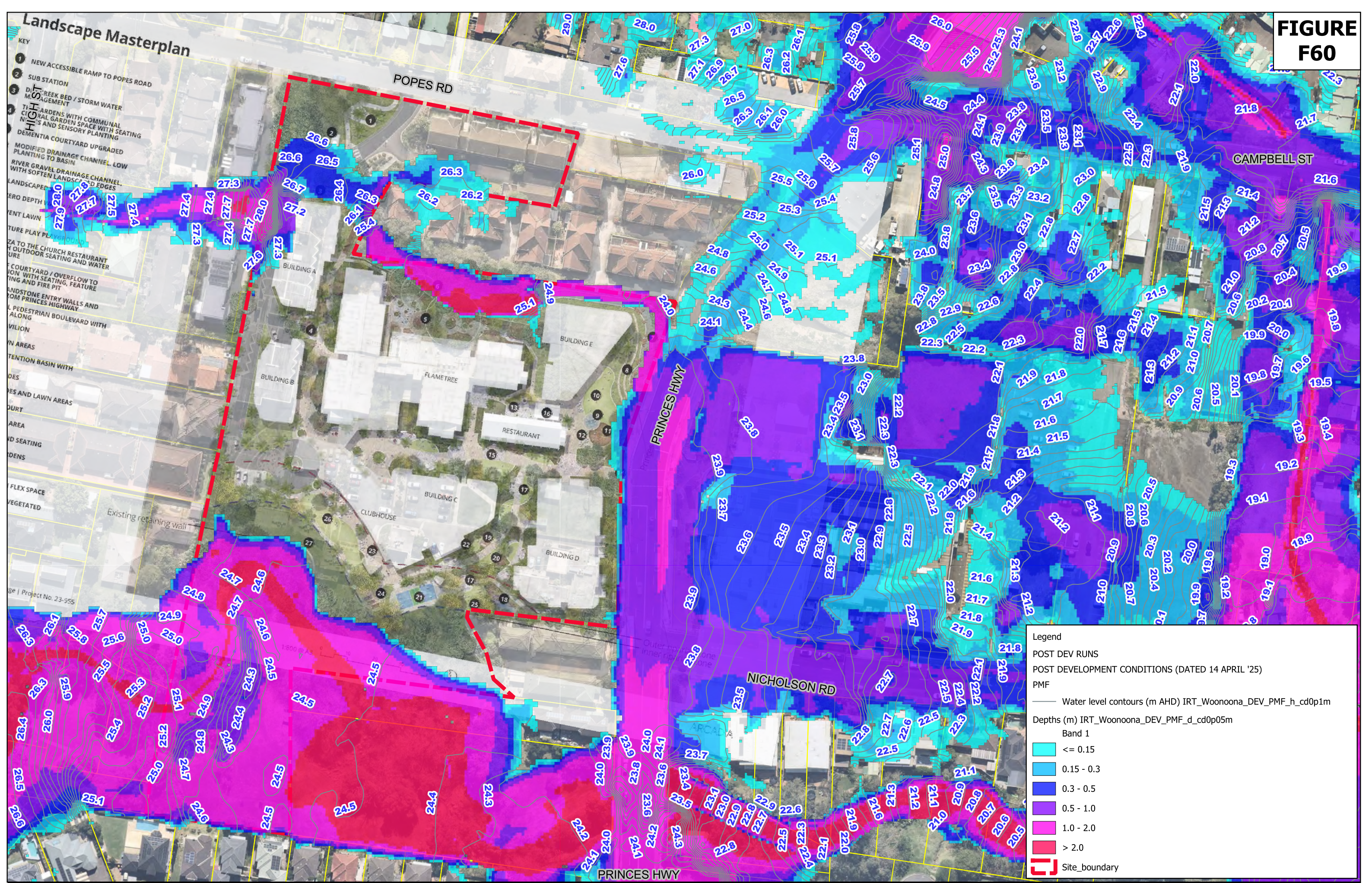
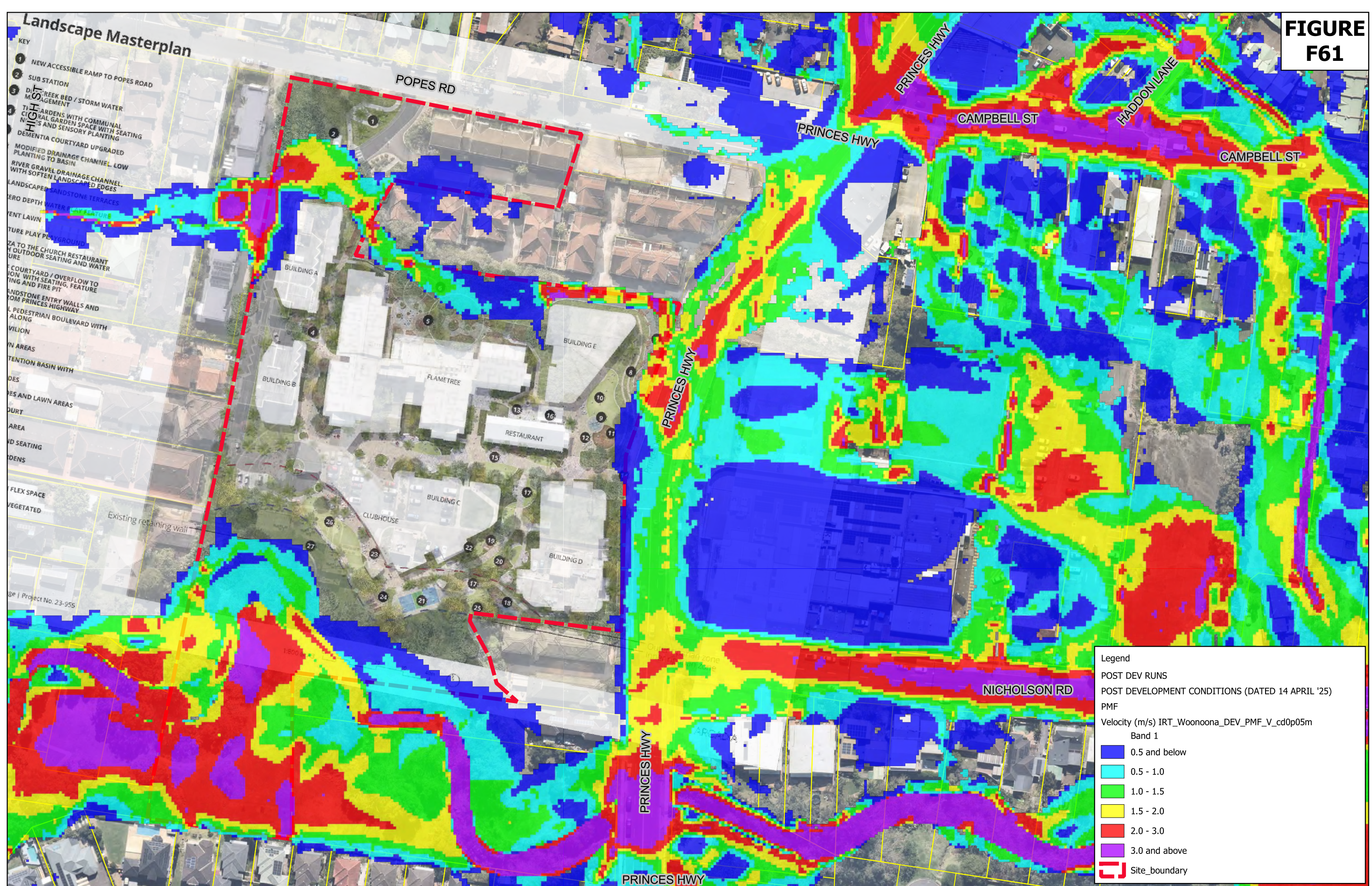


FIGURE F61



Landscape Masterplan

- KEY**
- 1 NEW ACCESSIBLE RAMP TO POPES ROAD
 - 2 SUB STATION
 - 3 DRAINAGE BED / STORM WATER MANAGEMENT
 - 4 TERRACES WITH COMMUNAL GARDENS WITH SEATING AND SENSORY PLANTING
 - 5 DEMENTIA COURTYARD UPGRADED
 - 6 MODIFIED DRAINAGE CHANNEL, LOW PLANTING TO BASIN
 - 7 RIVER GRAVEL DRAINAGE CHANNEL, WITH SOFTENED LANDSCAPED EDGES
 - 8 LANDSCAPED SANDSTONE TERRACES
 - 9 ZERO DEPTH WATER FEATURE
 - 10 PERMEABLE PLAYGROUND
 - 11 ACCESS TO THE CHURCH RESTAURANT AND OUTDOOR SEATING AND WATER
 - 12 COURTYARD / OVERFLOW TO GARDEN WITH SEATING, FEATURE WALL AND FIRE PIT
 - 13 SANDSTONE ENTRY WALLS AND PERMEABLE PEDESTRIAN BOULEVARD WITH PLANTING
 - 14 CIVILION
 - 15 OPEN AREAS
 - 16 RETENTION BASIN WITH PLANTING
 - 17 DECKS AND LAWN AREAS
 - 18 COURTYARD
 - 19 AREA
 - 20 AND SEATING
 - 21 TERRACES
 - 22 FLEX SPACE
 - 23 VEGETATED
 - 24 Existing retaining wall
 - 25
 - 26
 - 27
 - 28
 - 29
 - 30
 - 31
 - 32
 - 33
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 - 48
 - 49
 - 50

Legend

POST DEV RUNS
 POST DEVELOPMENT CONDITIONS (DATED 14 APRIL '25)
 PMF
 Velocity (m/s) IRT_Woonona_DEV_PMF_V_cd0p05m
 Band 1

- 0.5 and below
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 3.0
- 3.0 and above
- Site_boundary

REV B
 DATE: 29.04.2025
 DRAWN: KU
 APPROVED: GL

CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE



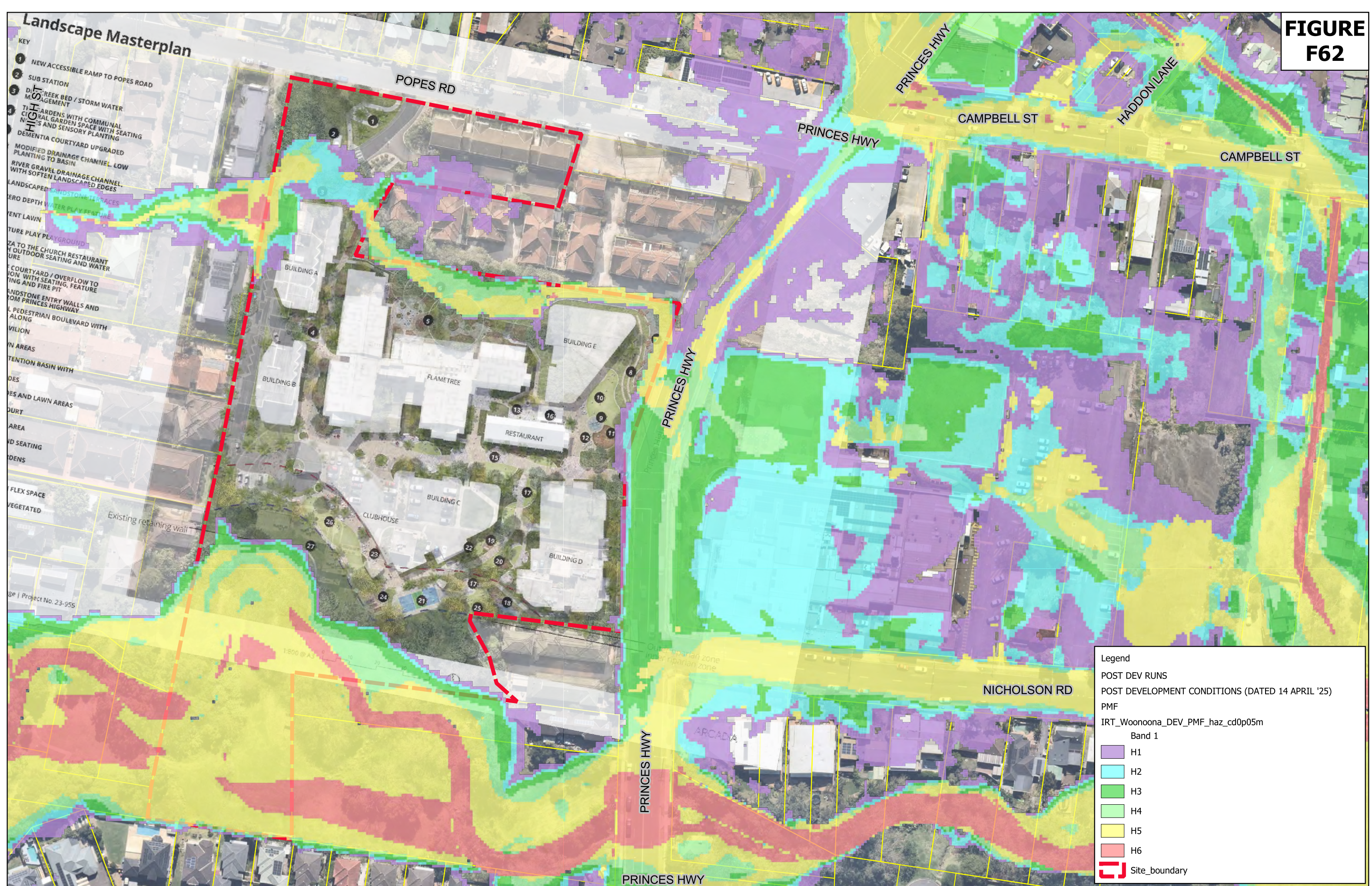
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PROPOSED DEVELOPMENT
 FLOOD IMPACT ASSESSMENT
 2-8 POPES ROAD
 WOONONA, NSW, 2517

**PMF MAXIMUM FLOOD VELOCITY
 POST DEVELOPMENT SCENARIO**

0 30 60 90 m

FIGURE F62



Landscape Masterplan

- KEY**
- 1 NEW ACCESSIBLE RAMP TO POPES ROAD
 - 2 SUB STATION
 - 3 DRAINAGE BED / STORM WATER MANAGEMENT
 - 4 TERRACE GARDENS WITH COMMUNAL SEATING AND SENSORY PLANTING
 - 5 DEMENTIA COURTYARD UPGRADED
 - 6 MODIFIED DRAINAGE CHANNEL, LOW PLANTING TO BASIN
 - 7 RIVER GRAVEL DRAINAGE CHANNEL, WITH SOFTENED LANDSCAPED EDGES
 - 8 LANDSCAPED SANDSTONE TERRACES
 - 9 ZERO DEPTH WATER PLAY FEATURE
 - 10 CENT LAWN
 - 11 FUTURE PLAY PLAYGROUND
 - 12 ACCESS TO THE CHURCH RESTAURANT AND OUTDOOR SEATING AND WATER
 - 13 F COURTYARD / OVERFLOW TO GARDEN WITH SEATING, FEATURE WALL AND FIRE PIT
 - 14 SANDSTONE ENTRY WALLS AND TERRACE FROM PRINCES HIGHWAY
 - 15 PEDESTRIAN BOULEVARD WITH PLANTING
 - 16 VILION
 - 17 PLAY AREAS
 - 18 RETENTION BASIN WITH PLANTING
 - 19 DECKS
 - 20 DECKS AND LAWN AREAS
 - 21 COURTYARD
 - 22 AREA
 - 23 OUTDOOR SEATING
 - 24 TERRACES
 - 25 FLEX SPACE
 - 26 VEGETATED
 - 27
 - 28
 - 29
 - 30
 - 31
 - 32
 - 33
 - 34
 - 35
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 - 37
 - 38
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 - 40
 - 41
 - 42
 - 43
 - 44
 - 45
 - 46
 - 47
 - 48
 - 49
 - 50

Legend

POST DEV RUNS
 POST DEVELOPMENT CONDITIONS (DATED 14 APRIL '25)
 PMF
 IRT_Woonoona_DEV_PMF_haz_cd0p05m

Band 1

- H1
- H2
- H3
- H4
- H5
- H6

Site_boundary

REV A
 DATE: 29.04.2025
 DRAWN: KU
 APPROVED: GL

CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE



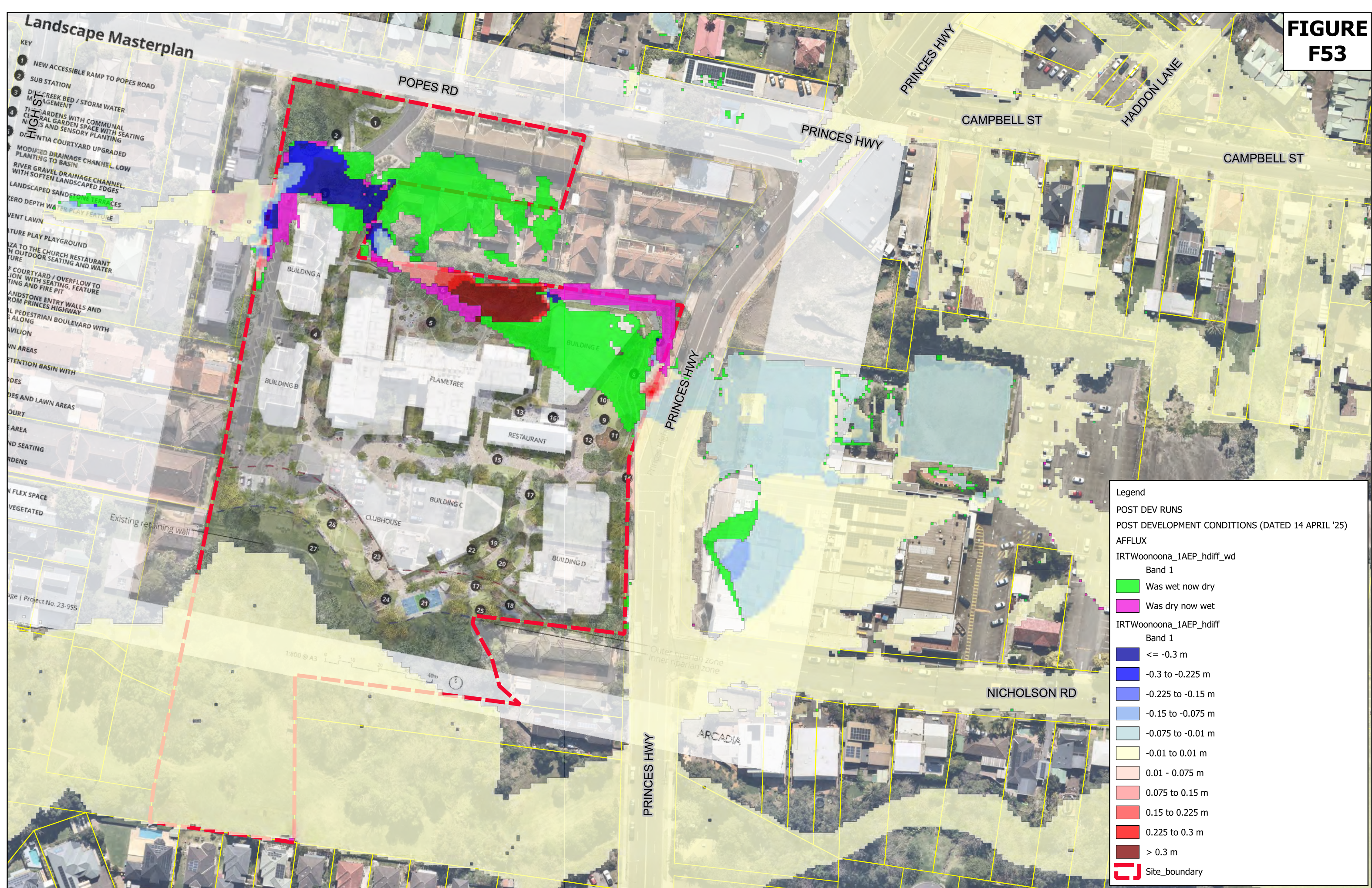
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PROPOSED DEVELOPMENT
 FLOOD IMPACT ASSESSMENT
 2-8 POPES ROAD
 WOONONA, NSW, 2517

PMF MAXIMUM FLOOD HAZARD POST DEVELOPMENT SCENARIO

Appendix D Flood Level Difference Maps

FIGURE F53



Landscape Masterplan

- 1 NEW ACCESSIBLE RAMP TO POPES ROAD
- 2 SUB STATION
- 3 CREEK BED / STORM WATER MANAGEMENT
- 4 GARDENS WITH COMMUNAL SEATING AND SENSORY PLANTING
- 5 DIFFERENTIAL COURTYARD UPGRADED
- 6 MODIFIED DRAINAGE CHANNEL. LOW PLANTING TO BASIN
- 7 RIVER GRAVEL DRAINAGE CHANNEL, WITH SOFTEN LANDSCAPED EDGES
- 8 LANDSCAPED SANDSTONE TERRACES
- 9 ZERO DEPTH WATER PLAY FEATURE
- 10 EVENT LAWN
- 11 STRUCTURE PLAY PLAYGROUND
- 12 TERRAZA TO THE CHURCH RESTAURANT WITH OUTDOOR SEATING AND WATER FEATURE
- 13 OFF COURTYARD / OVERFLOW TO BASIN WITH SEATING, FEATURE LIGHTING AND FIRE PIT
- 14 SANDSTONE ENTRY WALLS AND TERRACES FROM PRINCES HIGHWAY
- 15 FULL PEDESTRIAN BOULEVARD WITH LIGHTING ALONG
- 16 AVILION
- 17 LAWN AREAS
- 18 RETENTION BASIN WITH PLANTINGS
- 19 PAVES AND LAWN AREAS
- 20 COURT
- 21 TERRACE AREA
- 22 OUTDOOR SEATING
- 23 GARDENS
- 24 FLEX SPACE
- 25 VEGETATED

Legend

POST DEV RUNS
POST DEVELOPMENT CONDITIONS (DATED 14 APRIL '25)
AFFLUX

IRTWoonoona_1AEP_hdiff_wd
Band 1

- Was wet now dry
- Was dry now wet

IRTWoonoona_1AEP_hdiff
Band 1

- <= -0.3 m
- -0.3 to -0.225 m
- -0.225 to -0.15 m
- -0.15 to -0.075 m
- -0.075 to -0.01 m
- -0.01 to 0.01 m
- 0.01 - 0.075 m
- 0.075 to 0.15 m
- 0.15 to 0.225 m
- 0.225 to 0.3 m
- > 0.3 m

 Site_boundary

REV B
DATE: 29.04.2025
DRAWN: KU
APPROVED: GL

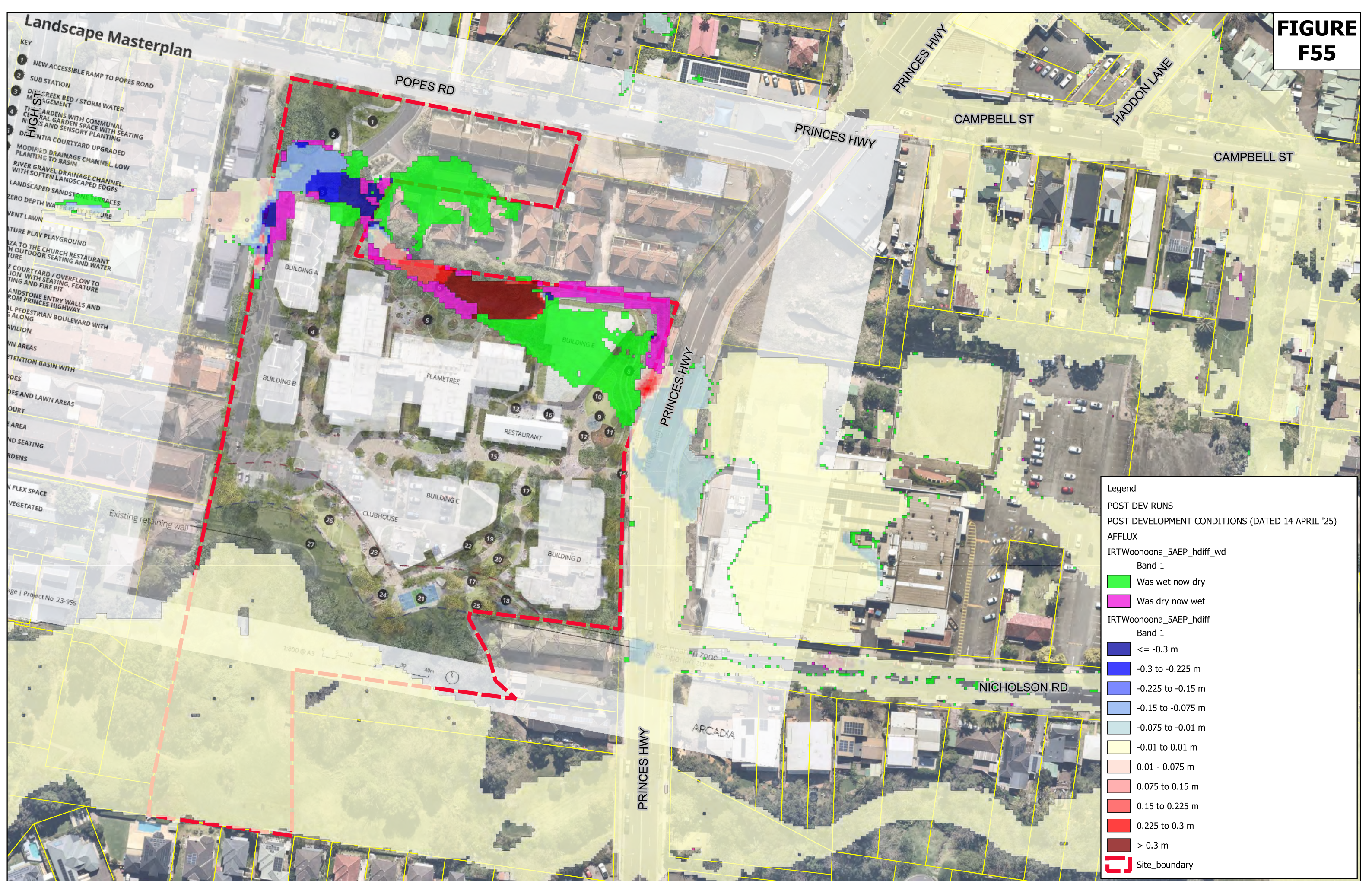
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PROPOSED DEVELOPMENT
FLOOD IMPACT ASSESSMENT
2-8 POPES ROAD
WOONONA, NSW, 2517

**1% AEP AFFLUX (WATER LEVEL)
POST DEVELOPMENT SCENARIO**



Landscape Masterplan

- KEY**
- 1 NEW ACCESSIBLE RAMP TO POPES ROAD
 - 2 SUB STATION
 - 3 CREEK BED / STORM WATER MANAGEMENT
 - 4 GARDENS WITH COMMUNAL SEATING AND SENSORY PLANTING
 - 5 DIFFERENTIAL COURTYARD UPGRADED
 - 6 MODIFIED DRAINAGE CHANNEL. LOW PLANTING TO BASIN
 - 7 RIVER GRAVEL DRAINAGE CHANNEL, WITH SOFTEN LANDSCAPED EDGES
 - 8 LANDSCAPED SANDSTONE TERRACES
 - 9 ZERO DEPTH WATER FEATURE
 - 10 EVENT LAWN
 - 11 STRUCTURE PLAY PLAYGROUND
 - 12 PLAZA TO THE CHURCH RESTAURANT WITH OUTDOOR SEATING AND WATER FEATURE
 - 13 F COURTYARD / OVERFLOW TO PLAZA WITH SEATING, FEATURE LIGHTING AND FIRE PIT
 - 14 SANDSTONE ENTRY WALLS AND STAIRS FROM PRINCES HIGHWAY
 - 15 FULL PEDESTRIAN BOULEVARD WITH SEATING ALONG
 - 16 AVILION
 - 17 OPEN AREAS
 - 18 RETENTION BASIN WITH PLANTINGS
 - 19 PAVES AND LAWN AREAS
 - 20 COURT
 - 21 SEATING AREA
 - 22 LAND SEATING
 - 23 GARDENS
 - 24 FLEX SPACE
 - 25 VEGETATED

Legend

POST DEV RUNS
POST DEVELOPMENT CONDITIONS (DATED 14 APRIL '25)
AFFLUX

IRTWoonoona_5AEP_hdiff_wd
Band 1

- Was wet now dry
- Was dry now wet

IRTWoonoona_5AEP_hdiff
Band 1

- <= -0.3 m
- 0.3 to -0.225 m
- 0.225 to -0.15 m
- 0.15 to -0.075 m
- 0.075 to -0.01 m
- 0.01 to 0.01 m
- 0.01 - 0.075 m
- 0.075 to 0.15 m
- 0.15 to 0.225 m
- 0.225 to 0.3 m
- > 0.3 m

Site_boundary

REV A
DATE: 29.04.2025
DRAWN: KU
APPROVED: GL

CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE



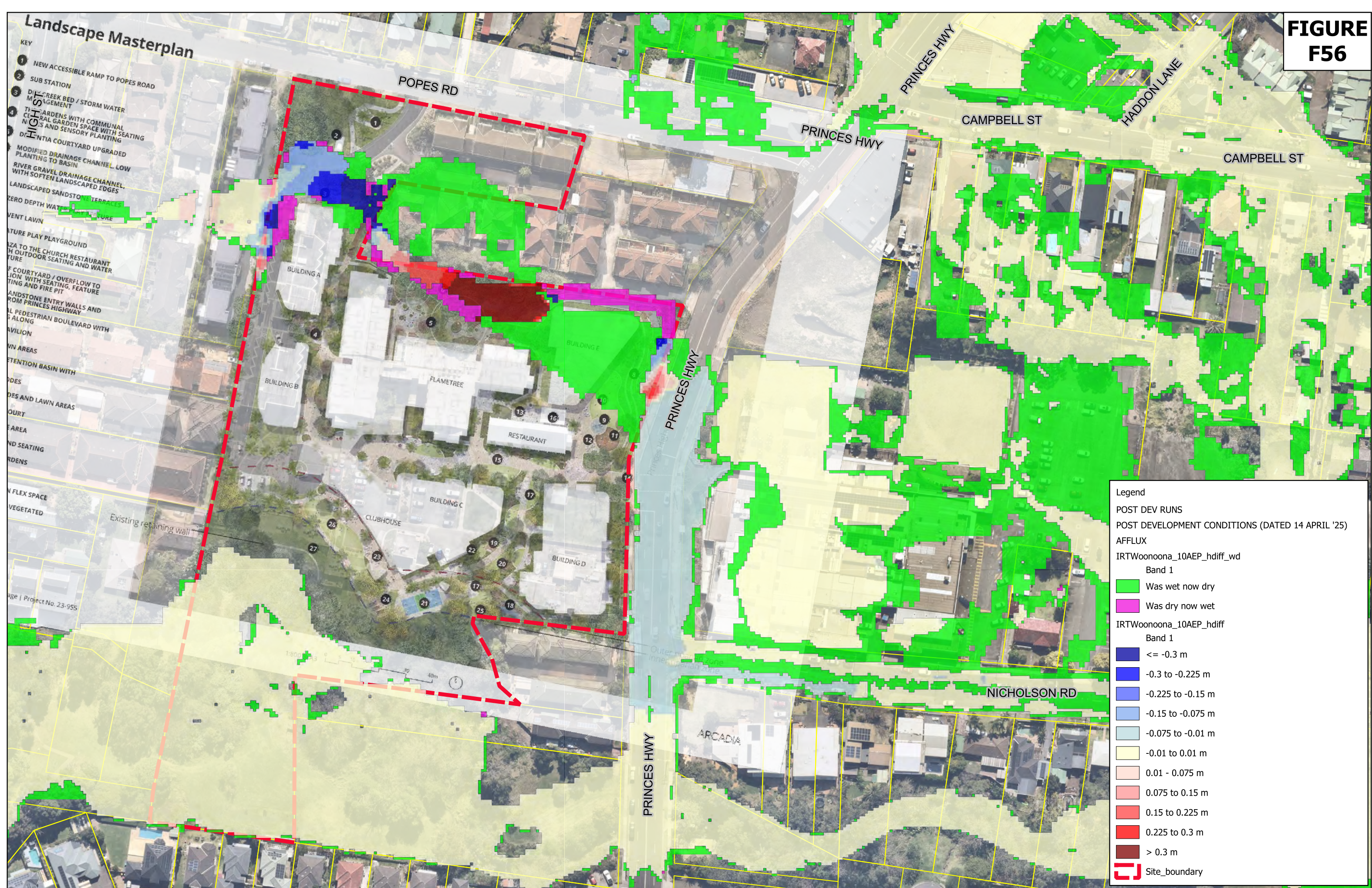
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PROPOSED DEVELOPMENT
FLOOD IMPACT ASSESSMENT
2-8 POPES ROAD
WOONONA, NSW, 2517

**5% AEP AFFLUX (WATER LEVEL)
POST DEVELOPMENT SCENARIO**

0 30 60 90 m

FIGURE F56



REV A
DATE: 29.04.2025
DRAWN: KU
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CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE

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FLOOD IMPACT ASSESSMENT
2-8 POPES ROAD
WOONONA, NSW, 2517

**10% AEP AFFLUX (WATER LEVEL)
POST DEVELOPMENT SCENARIO**

0 30 60 90 m

FIGURE F57

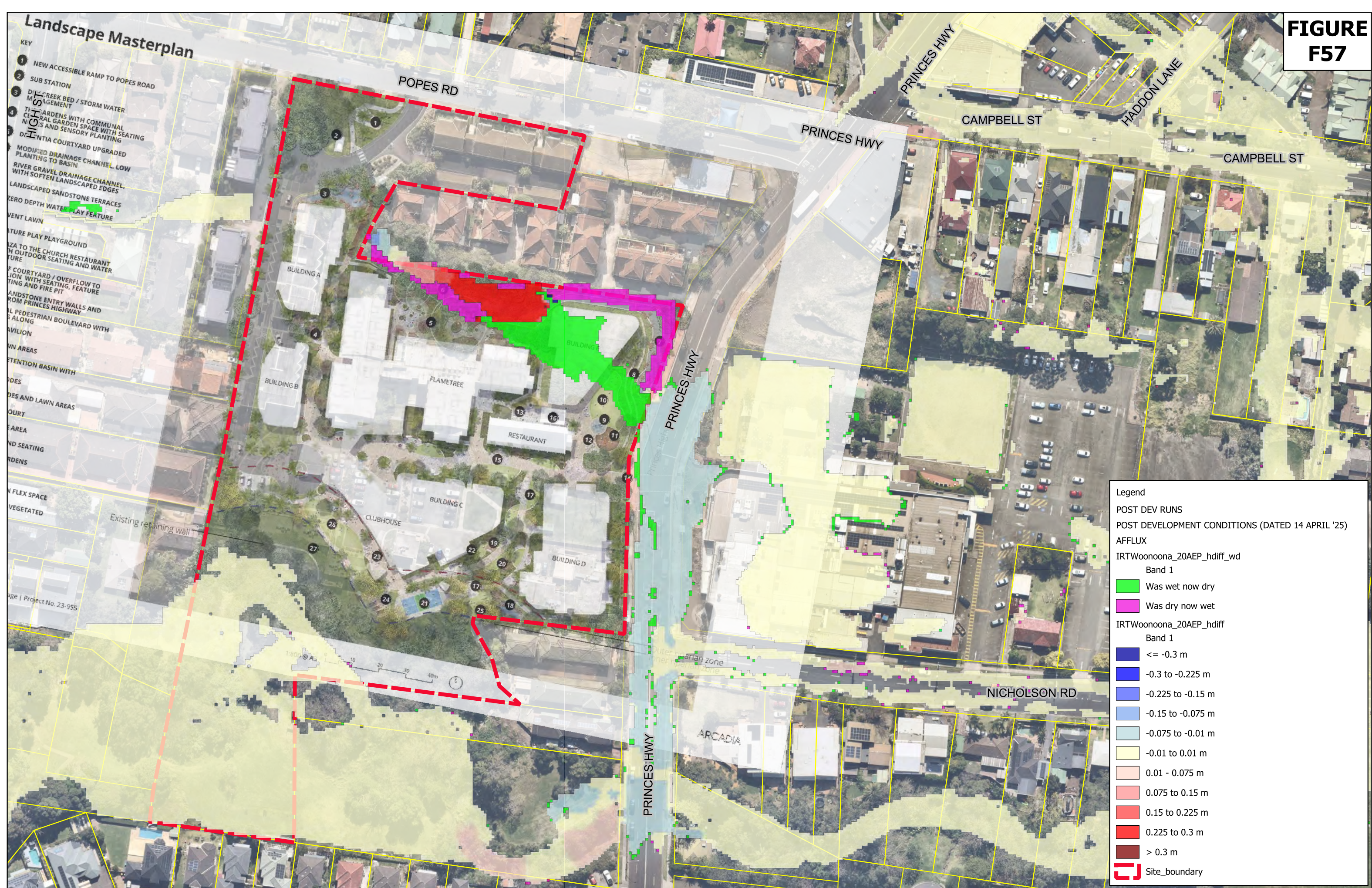
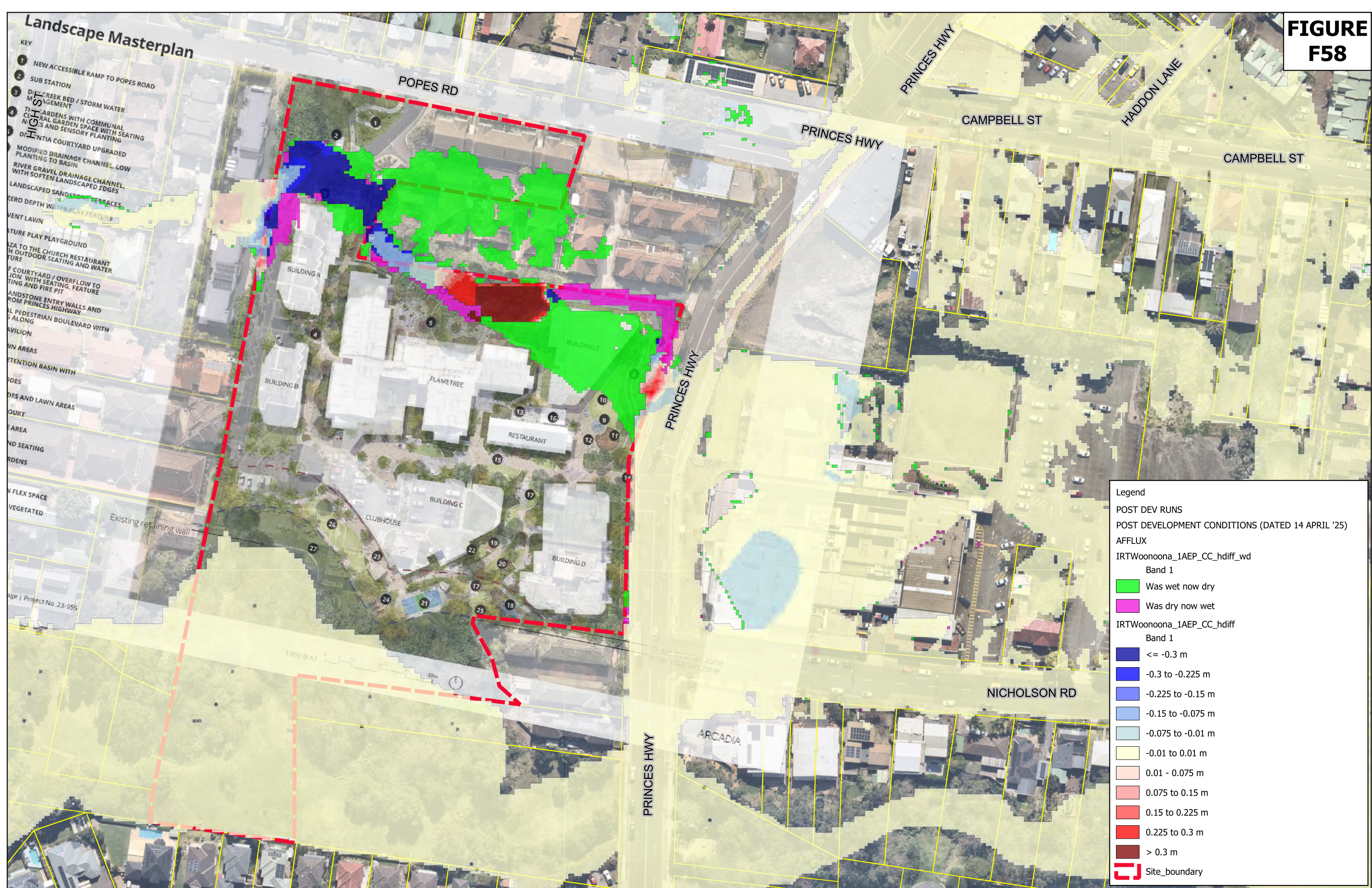


FIGURE F58



Landscape Masterplan

- 1 NEW ACCESSIBLE RAMP TO POPES ROAD
- 2 SUB STATION
- 3 DRAINAGE CREEK BED / STORM WATER MANAGEMENT
- 4 TERRACE GARDENS WITH COMMUNAL PLANTINGS AND SENSORY PLANTING
- 5 DIVERGENTIA COURTYARD UPGRADED
- 6 MODIFIED DRAINAGE CHANNEL. LOW PLANTING TO BASIN
- 7 RIVER GRAVEL DRAINAGE CHANNEL, WITH SOFTEN LANDSCAPED EDGES
- 8 LANDSCAPED SANDSTONE TERRACES
- 9 ZERO DEPTH WATER PLAY FEATURE
- 10 EVENT LAWN
- 11 STRUCTURE PLAY PLAYGROUND
- 12 TERRACE TO THE CHURCH RESTAURANT WITH OUTDOOR SEATING AND WATER FEATURE
- 13 F COURTYARD / OVERFLOW TO TERRACE WITH SEATING, FEATURE LIGHTING AND FIRE PIT
- 14 SANDSTONE ENTRY WALLS AND TERRACE FROM PRINCES HIGHWAY
- 15 ALL PEDESTRIAN BOULEVARD WITH LIGHTING ALONG
- 16 AVILION
- 17 OPEN AREAS
- 18 RETENTION BASIN WITH PLANTINGS
- 19 PAVES AND LAWN AREAS
- 20 COURT
- 21 TERRACE AREA
- 22 OUTDOOR SEATING
- 23 GARDENS
- 24 FLEX SPACE
- 25 VEGETATED

Legend

POST DEV RUNS
POST DEVELOPMENT CONDITIONS (DATED 14 APRIL '25)
AFFLUX

IRTWoonoona_1AEP_CC_hdiff_wd
Band 1

- Was wet now dry
- Was dry now wet

IRTWoonoona_1AEP_CC_hdiff
Band 1

- <= -0.3 m
- 0.3 to -0.225 m
- 0.225 to -0.15 m
- 0.15 to -0.075 m
- 0.075 to -0.01 m
- 0.01 to 0.01 m
- 0.01 - 0.075 m
- 0.075 to 0.15 m
- 0.15 to 0.225 m
- 0.225 to 0.3 m
- > 0.3 m

Site_boundary

REV A
DATE: 29.04.2025
DRAWN: KU
APPROVED: GL

CLIENT / ARCHITECT
CALDER FLOWER ARCHITECTURE



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PROPOSED DEVELOPMENT
FLOOD IMPACT ASSESSMENT
2-8 POPES ROAD
WOONONA, NSW, 2517

**1% AEP CLIMATE CHANGE
AFFLUX (WATER LEVEL)
POST DEVELOPMENT SCENARIO**

0 30 60 90 m