ARUP

Holdmark NSW

10 Valentine Avenue

Flood Impact and Risk Assessment, and Draft Flood Emergency Response Plan

Reference: 313025-RPT-C-000002

02 | 18 December 2025

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 313025

Arup Australia Pty Ltd | ABN 76 625 912 665

Arup Australia Pty Ltd
Gadigal Country
Level 5, 151 Clarence Street
Sydney, NSW, 2000
Australia
arup.com

ARUP

Document Verification

Project title	10 Valentine Avenue
Document title	Flood Impact and Risk Assessment, and Draft Flood Emergency Response Plan
Job number	313025
Document ref	313025-RPT-C-000002
File reference	313025-RPT-C-000002

Revision	Date				
01	17/12/25	**Description**	Draft Flood Impact and Risk Assessment, and Draft Flood Emergency Response Plan		
			Prepared by	**Checked by**	**Approved by**
		Name	Cecile Peille	Melanie Gostelow	Melanie Gostelow
		Signature			
02	18/12/25	**Filename**	Flood Impact and Risk Assessment, and Draft Flood Emergency Response Plan		
		Description			
			Prepared by	**Checked by**	**Approved by**
		Name	Cecile Peille	Melanie Gostelow	Melanie Gostelow
		Signature			
		Filename			
		Description			
			Prepared by	**Checked by**	**Approved by**
		Name			
		Signature			

Issue Document Verification with Document ☑

Executive Summary

This Flood Impact and Risk Assessment and Draft Flood Emergency Response Plan has been prepared to support a State Significant Development Application (SSDA) (SSD-90243456) and concurrent Rezoning Application (RA) for the site at 10 Valentine Avenue, Parramatta. The assessment has been prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) dated 12 September 2025.

The flood impact and risk assessment has utilised the Parramatta River Flood Study (Stantec, 2024) hydraulic models as provided by City of Parramatta Council. The Clay Cliff TUFLOW model has formed the basis of the hydraulic assessment, with hydrology inflows adjusted to reflect the Australian Rainfall and Runoff 2019 Version 4.2 guidance for the consideration of climate change. Local terrain and existing development in the vicinity of the site have been refined based on recently obtained survey information.

The proposed redevelopment has been represented within the flood model based on the current architectural design. The flood modelling has assessed existing and proposed development conditions for present-day (2030) and future (2100) scenarios adopting the SSP3-7.0 climate change projections. The flood model setup and representation are considered reasonable and appropriate for the purpose of the SSDA submissions. Further refinement of the design representation will be undertaken as the design progresses to ensure consistency between the built form and flood modelling outcomes.

This assessment has demonstrated that the proposed redevelopment does not result in any significant material worsening of flood behaviour for the 20%, 5% and 1% AEP events under the SSP3-7.0 2030 scenario, nor for the 1% AEP SSP3-7.0 2100 event. The proposed development achieves applicable flood planning level requirements for the 1% AEP SSP3-7.0 2030 event and incorporates appropriate flood mitigation measures to manage flood risk up to the Probable Maximum Flood (PMF).

The design of the proposed redevelopment has appropriately considered the site-specific flood risk and has addressed this through ground level design, internal accessibility provisions, and the protection of basement areas via flood gates.

A draft Flood Emergency Response Plan has been prepared to outline the overarching flood emergency management strategy for the site. The primary emergency response strategy is evacuation, consistent with the State Emergency Service (SES) Parramatta Local Government Area Flood Emergency Response Sub Plan. The assessment has demonstrated that safe evacuation from the site can be achieved during flood events up to and including the PMF. As such the proposed redevelopment would not result in any significant increase in required government spending related to flood emergency management services or flood mitigation.

Overall, this assessment has demonstrated that the proposed redevelopment is appropriate within the flood context of the site and is consistent with the requirements of the SEARs.

Contents

Summary

1.	Introduction	2
1.1	Project Description	2
1.2	The Site	3
2.	Legislative Framework	5
2.1	Additional SEARs Comments	5
2.2	Ministerial Directions	7
2.3	City of Parramatta Planning Instrument	8
2.4	NSW Flood Prone Land Policy	8
2.5	Definitions	9
2.6	Additional Provisions	9
3.	Existing Flood Information	10
3.1	Flood Level and Depth	10
3.2	Hydraulic Category	12
3.3	Probability of Coincident Mainstream and Overland Flow Flooding	12
4.	Development of Flood Model	13
4.1	Provided Flood Models	13
4.2	Source of Flooding and Dominant Mechanism	13
4.3	Updates to Clay Cliff Flood Model	14
4.4	Incorporation of ARR Version 4.2	15
5.	Existing Conditions Flood Behaviour	17
5.1	Flood Behaviour	17
5.2	Peak Flood Levels	19
6.	Post Development Flood Behaviour	20
6.1	Design Representation	20
6.2	Peak Flood Levels	20
6.3	Flood Impact Assessment	21
6.4	Flood Mitigation Measures	21
7.	Flood Emergency Response Plan	23
7.1	City of Parramatta Flood Emergency Response	23
7.2	Consultation with NSW State Emergency Services	23
7.3	Existing Monitoring Tools	23
7.4	Site Analysis	24
7.5	Emergency Response Strategy	25
8.	Design Compliance	27
8.1	Flood Planning Level	27
8.2	PMF Basement Protection	27
8.3	Flood Afflux	27

9. Conclusion 28
10. Reliance Statement 29
11. References 30

Tables

Table 1-1: SEARs Compliance Table 2
Table 2-1: City of Parramatta Response to SEARs 5
Table 2-2: CPHR Response to SEARs 6
Table 2-3: Ministerial Direction 4.1 Flooding 7
Table 3-1: Flood Enquiry Peak Flood Levels (Flood Enquiry Information, City of Parramatta, 2025) 10
Table 5-1: Existing Peak Flood Levels at Reporting Points (m AHD) 19
Table 6-1: Design Peak Flood Levels at Reporting Points (m AHD) 21

Figures

Figure 1-1: Site Plan 4
Figure 3-1: Site Hydrological Context 10
Figure 3-2: FFA 1% AEP Peak Depth (Parramatta River Flood Study, Stantec, 2024) 11
Figure 3-3: PMF Peak Depth and Level Contours (Parramatta River Flood Study, Stantec, 2024) 11
Figure 3-4: PMF Flood Function (Parramatta River Flood Study, Stantec, 2024) 12
Figure 4-1: Clay Cliff Creek TUFLOW Hydraulic Model 13
Figure 4-2: Site Survey and DEM Extent 14
Figure 4-3: Projected Temperature Increases Associated with SSPs 15
Figure 5-1: Existing Flood Hazard Category, 1% AEP 'Present Day' 17
Figure 5-2: Flood Hazard Category (NSW Department of Planning and Environment, 2023) 18
Figure 5-3: Existing Flood Hazard Category and Floodway Zone, PMF 'Present Day' 18
Figure 5-4: Flood Levels Reporting Points (with PMF flood extent) 19
Figure 6-1: Proposed Design Building Extent 20
Figure 7-1: Pedestrian Evacuation Routes 26

Appendices

Appendix A A-1
Existing Case Flood Mapping A-1

Appendix B B-1
Proposed Case Flood Mapping B-1

Appendix C C-2
2100 Climate Change Flood Mapping C-2

Appendix D D-3
Flood Enquiry Application D-3

Appendix E E-4
SES Correspondence E-4

Appendix F F-5
Structural Engineering Correspondence F-5

Appendix G G-6
Parramatta River Flood Study (Stantec, 2024) Mapping Extracts G-6

List of Abbreviations

Abbreviations	Description
AEP	Annual Exceedance Probability
ARI	Average Recurrence Interval
ARR	Australian Rainfall and Runoff
DCP	Development Control Plan
DPHI	Department of Planning, Housing and Infrastructure
FERP	Flood Emergency Response Plan
FFA	Flood Frequency Analysis
FIRA	Flood Impact and Risk Assessment
FPA	Flood Planning Area
FPL	Flood Planning Level
LEP	Local Environmental Plan
LGA	Local Government Area
PMF	Probable Maximum Flood
SEAR	Secretary's Environmental Assessment Requirements
SES	State Emergency Services
SLR	Sea Level Rise
SSDA	State Significant Development Application
SSP	Shared Socioeconomic Pathways

1. Introduction

This Flood Impact and Risk Assessment and Draft Flood Emergency Response Plan has been prepared to support a State Significant Development Application (SSDA) SSD- 90243456 and concurrent Rezoning Application (RA) for the site at 10 Valentine Avenue Parramatta.

The Minister for Planning, or their delegate, is the consent authority for the SSDA and this application is lodged with the NSW Department of Planning, Housing and Infrastructure (DPHI) for assessment.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 12 September 2025 (SSD- 90243456). Specifically, this report has been prepared to respond to the following SEARs set out in Table 1-1.

Table 1-1: SEARs Compliance Table

SEARs Request	Response/ Location in Report
20. Water Management	
• Identify the flood planning area and level as set out in the relevant EPI and other supporting documents to determine; - The flood extent and velocity up to the Probable Maximum Flood and risk on-site having regard to adopted flood studies and, floodplain risk management studies and plans - The site access and egress routes - the potential effects of climate change, - any relevant provisions of the NSW Flood Risk Management Manual, and any other relevant guidelines.	Section 6, 7 and 8
• Where the development is occurring on flood prone land a flood impact and risk assessment (FIRA) must be prepared having regard to the *Flood Impact and Risk Assessment – Flood Risk Management Guide LU01.* When determining the scope and category of the FIRA the requirements outlined in the FIRA guide must be considered.	This report
• Detail any flood risk management measures that are to be incorporated as part of the development having regard to relevant guidelines (including any design solutions, flood modification measures, property modification measures, operational procedures or Flood Emergency Response Plan).	Section 7 and 8
• Address all flooding comments raised by Council and CPHR in Appendix A and B.	Note: these are additional advice on SEARS which are detailed in Sections 2.1

1.1 Project Description

The application seeks development consent for the redevelopment of the site for a mixed-use development comprising residential accommodation (shop top housing and co-living housing) and retail uses.

Specifically, this application seeks approval for the following:

- Demolition of the existing multi-deck car park.
- Demolition of existing internal fit-out within the commercial building.
- Site preparation works including:
  - Removal of trees as outlined in the Arborist Report.
  - Excavation on the southern portion of the site to a maximum depth of six basement levels.
- Construction of a 72-storey shop-top housing development, which will accommodate:
  - Six levels of basement with 144 car parking, bicycle parking, services, waste storage.

  - Lobby, retail premises and loading dock at ground level.
  - 479 residential apartments on Levels 1-70.
  - Communal open space and resident amenities on level 5 and level 71.
  - Rooftop plant on level 72.
  - Vehicular access provided via Valentine Avenue.
  - Dedication of 3% of dwellings as affordable housing.
- Change of use of from commercial premises to co-living housing and ancillary retail.
- Alterations and additions to the existing commercial premises to accommodate co-living housing including:
  - Upgrade to existing internal lift access.
  - Alterations to the basement with amenity, laundry, jam space, manager's office and 17 co-living housing spaces.
  - Ground level retail premises and communal internal facilities including a gym, yoga room and wellness lounge.
  - Upper levels: Co-living housing providing 608 beds across 440 units in private rooms, and 2-, 3- and 4-room configurations, communal internal facilities on each level and communal open spaces on level 7 and level 14.
  - Alterations to the building façade.
- Hard and soft landscaping and public domain works along Valentine Avenue and Parkes Street.
- Building identification signage on the shop-top housing building and co-living housing building.
- Stratum subdivision into two lots.
- Extension and augmentation of physical infrastructure and utilities as required.

Refer to Architectural Plans prepared by Buchan collaborating with Furtado Sullivan and Curzon + Partners appended to the Environmental Impact Statement.

A concurrent RA is proposed under the SSDA. The RA seeks to amend the Parramatta Local Environmental Plan 2023 to amend the zoning, height, permissibility and FSR controls for the site.

Refer to the EIS for a full description of the proposed amendments under the RA.

1.2 The Site

The site at 10 Valentine Avenue, Parramatta, is located within the City of Parramatta Local Government Area (LGA), approximately 19 km northwest of Sydney CBD and 16 km northeast of Liverpool CBD, as shown in Figure 1-1. The site covers 3,937 m² and is legally described as Lot 2 in DP 1119257.

The southern part of the site is currently occupied by six-level above ground carpark with 286 spaces. The northern portion of the site is occupied by 13-storey commercial office building with basement levels. Vehicular access into the site is available via the combined entry in the existing commercial building at 10 Valentine Avenue. An additional egress point from the above ground carpark is located to the south of the entry and provides exit only access onto Valentine Avenue.

The site is positioned within the Parramatta CBD, which is approximately 19 km north west of the Sydney CBD and 16 km north east of the Liverpool CBD. The site is located just southeast of Parramatta Railway Station, approximately 440 metres from the planned Parramatta Metro Station. It is also approximately 2 kilometres southeast of the future Westmead Metro Station on the eastern side of Hawkesbury Road.



Figure 1-1: Site Plan

2. Legislative Framework

This section outlines the legislative framework and applicable planning instruments for the 10 Valentine Avenue development in addition to the SEARs as outlined in Table 1-1.

2.1 Additional SEARs Comments

2.1.1 City of Parramatta

In response to the SEARs, the City of Parramatta Council requested the following flood planning items be considered in the SSDA as outlined in Table 2-1.

Table 2-1: City of Parramatta Response to SEARs

Item	Supporting Information	Response/ Location in Report
Flood Planning	The southern end of the site is subject to a 1:20, 1:100 and Probable Maximum Flood (PMF) flood risk from the Parramatta River. These flows are identified as high hazard. A 'Flood Information Enquiry" should be made with Council which will provide the basis of Flood Assessment. https://www.cityofparramatta.nsw.gov.au/environment/flooding-and-emergencies/floodsmart-parramatta/know-your-flood-risk	Appendix D
	A Flood Assessment should be undertaken: - Provide flood levels for the 5%, 1% AEP, and PMF events, flood extents, flow rates, depths, velocities and hazard conditions for mainstream and overland flow. - Modelled hydraulic hazard levels (H1-H6) extent and behaviour for 1% AEP mainstream and overland flow floods. - Warning times and duration of flood. - Characteristics and vulnerabilities of future occupants. - Horizontal evacuation pathways including accessibility considerations. - Vertical evacuation opportunities and shelter in place facilities above PMF. - Emergency services access availability - The full architectural plans should reference the relevant RLs. - A full assessment against Clause 7.11 of the Parramatta LEP 2023	Section 6, 7 and 8 Appendix A Appendix B
	A Structural Engineer's certification is required to confirm that the building is capable of withstanding flooding, including the effects of water-borne debris, scour, and flotation forces, up to the Probable Maximum Flood (PMF) level.	Appendix F
	A draft Flood Emergency Response Plan should be submitted as part of the Flood Assessment which details a risk assessment, defined roles and responsibilities and a comprehensive response strategy.	Section 8
Emergency Management	- The application should address the evacuation strategy in the event of fire or flood. - Consultation with Emergencies Services prior to lodgement of the EIS.	Section 7 Appendix E

2.1.2 Conservation Programs, Heritage and Regulation

In response to the SEARs, the Conservation Programs, Heritage and Regulation (CPHR) Group of the NSW Department of Climate Change, Energy, the Environment and Water recommended the following requirements be addressed in relation to flood risk management as outlined in Table 2-2.

Table 2-2: CPHR Response to SEARs

Item	Supporting Information	Response/ Location in Report

Flood Risk Management	9. The EIS must include a flood impact and risk assessment (FIRA) prepared in accordance with the Flood Risk Management Guideline LU01 Flood impact and risk assessment. The FIRA is to be prepared by suitably qualified engineers with a high level of expertise in flood risk management in NSW. As a minimum the FIRA must:
	- Consider the NSW Flood Prone Land Policy.
	- Address the relevant provisions of the NSW Flood Risk Management Manual (2023) and toolkit, and existing Council flood mapping, planning controls, government studies, information and requirements.
	- Identify and describe existing flood behaviour, constraints and risk on the site and its surrounding areas for the full range of events, including the 20% Annual Exceedance Probability (AEP), 5% AEP, 1% AEP, 0.5% AEP or 0.2% AEP floods and Probable Maximum Flood (PMF), as well as the 1% AEP flood and PMF under climate change. The hydrological and hydraulic models developed by the consultant must be generally compatible with the Parramatta River Flood Study 2024 and be upgraded to the latest Australian Rainfall and Runoff methodologies. The consultant should verify their models against this study for the full range of flooding.
	- Assess climate change impacts on flood behaviour in accordance with Flood Risk Management Guideline FB01 Understanding and managing flood risk.
	- Identify and describe post development scenario(s) for flood behaviour, constraints and risk on the site and its surrounding areas for the full range of abovementioned events. Details of the development must be included in the verified models.
	- Provide mapping of flood behaviour for existing conditions and post development scenarios for both mainstream flooding and local overland flooding for the 20%, 5%, 1%, and 0.5% or 0.2% AEP floods and PMF, as well as the 1% AEP flood and PMF under climate change.
	- Identify and describe the flood constraints on the land (floodways, flood storage, flood hazard and emergency response issues) for the full range of abovementioned events, for both mainstream flooding and local overland flooding.
	- Identify the impacts of the development on flood behaviour and risk for the abovementioned flood events.
	- Assess the appropriateness of the development or development types for the location based on the flood constraints on the land.
	- Ensure that the rezoning is commensurate with flood behaviour.
	- Address consistency of the emergency response strategy with the existing NSW State Emergency Service strategy.
	- Address flood-related emergency response issues and site access arrangements without relying on a Flood Emergency Response Plan to inform the development assessment, and in accordance with Flood Risk Management Guideline EM01 Support for Emergency Management Planning, including locating carparks above ground, where sheltering in place is proposed.
	- If sheltering in place is proposed, assess consistency with the Shelter-in-Place guideline for flash flooding and provide details on structural adequacy.
	- Identify and assess the adequacy of management measures and controls to:
	  - effectively address flood constraints to ensure the flood risks to the proposed development and its users are acceptable, and
	  - manage flood and associated emergency management impacts due to the development on existing communities and individual property owners and occupiers.
	- Demonstrate that the rezoning would not cause a significantly increased requirement for government spending on emergency management services, flood mitigation and emergency response measures.
		Section 6, 7 and 8
		Appendix A
		Appendix B
		Appendix C
		Appendix E

Item	Supporting Information	Response/ Location in Report
	- Note: - Flood modelling is to be undertaken by suitably qualified engineers consistent with Council's requirements and Australian Rainfall and Runoff. - Flood behaviour includes flood volume, extent, depth, level, velocity, duration, rate of rise, flood function and hazard. - Flood risk is a function of flood behaviour, exposure and vulnerability for each element at risk. - Impacts of flooding include changes to flood behaviour and risks to the community including emergency management response for the community.	

2.2 Ministerial Directions

As part of the rezoning application, the SSDA must comply with a list of Directions issued by the Minister for Planning to relevant planning authorities under section 9.1(2) of the Environmental Planning and Assessment Act 1979. With respect to flooding, the Directions are provided in Section 4.1 as follows, with reference to the NSW Government's Floodplain Development Manual 2005:

Table 2-3: Ministerial Direction 4.1 Flooding

Item / Clause	Supporting Information	Response/ Location in Report
(1)	A planning proposal must include provisions that give effect to and are consistent with: (a) the NSW Flood Prone Land Policy, (b) the principles of the Floodplain Development Manual 2005, (c) the Considering flooding in land use planning guideline 2021, and (d) any adopted flood study and/or floodplain risk management plan prepared in accordance with the principles of the Floodplain Development Manual 2005 and adopted by the relevant council.	This report
(2)	A planning proposal must not rezone land within the flood planning area from Recreation, Rural, Special Purpose or Conservation Zones to a Residential, Employment, Mixed Use, W4 Working Waterfront or Special Purpose Zones.	Not applicable
(3)	A planning proposal must not contain provisions that apply to the flood planning area which: (a) permit development in floodway areas, (b) permit development that will result in significant flood impacts to other properties, (c) permit development for the purposes of residential accommodation in high hazard areas, (d) permit a significant increase in the development and/or dwelling density of that land, (e) permit development for the purpose of centre-based childcare facilities, hostels, boarding houses, group homes, hospitals, residential care facilities, respite day care centres and seniors housing in areas where the occupants of the development cannot effectively evacuate, (f) permit development to be carried out without development consent except for the purposes of exempt development or agriculture. Dams, drainage canals, levees, still require development consent, (g) are likely to result in a significantly increased requirement for government spending on emergency management services, flood mitigation and emergency response measures, which can include but are not limited to the provision of road infrastructure, flood mitigation infrastructure and utilities, or (h) permit hazardous industries or hazardous storage establishments where hazardous materials cannot be effectively contained during the occurrence of a flood event.	Section 5, 6 and 8 Appendix A Appendix B

Item / Clause	Supporting Information	Response/ Location in Report
(4)	A planning proposal must not contain provisions that apply to areas between the flood planning area and probable maximum flood to which Special Flood Considerations apply which: (a) permit development in floodway areas, (b) permit development that will result in significant flood impacts to other properties, (c) permit a significant increase in the dwelling density of that land, (d) permit the development of centre-based childcare facilities, hostels, boarding houses, group homes, hospitals, residential care facilities, respite day care centres and seniors housing in areas where the occupants of the development cannot effectively evacuate, (e) are likely to affect the safe occupation of and efficient evacuation of the lot, or (f) are likely to result in a significantly increased requirement for government spending on emergency management services, and flood mitigation and emergency response measures, which can include but not limited to road infrastructure, flood mitigation infrastructure and utilities.	Not applicable, Special Flood Considerations not adopted by Parramatta Local Environment Plan 2023, Section 5.22
(5)	For the purposes of preparing a planning proposal, the flood planning area must be consistent with the principles of the Floodplain Development Manual 2005 or as otherwise determined by a Floodplain Risk Management Study or Plan adopted by the relevant council	This report

2.3 City of Parramatta Planning Instrument

2.3.1 Local Environmental Plan 2023

The City of Parramatta Local Environmental Plan (LEP) is the statutory planning instrument applying to land within the City of Parramatta LGA. Flood planning provisions are provided in Section 5.21 and 7.11 of the LEP.

The LEP provisions have been considered in the development of this proposal. Additionally, full assessment against Clause 7.11 of the Parramatta LEP 2023 has been performed in line with the advice on SEARs.

2.3.2 Parramatta Development Control Plan 2023

The Parramatta Development Control Plan 2023 (the DCP) forms a guide to development within the City of Parramatta LGA. The Parramatta DCP 2023 contains flood planning controls applicable to the entire LGA in Section 5. As the 10 Valentine Avenue redevelopment constitutes a State Significant Development, the provisions of the DCP do not apply.

The key floodplain management controls from the DCP have been considered in the design of the proposed development and this assessment.

2.4 NSW Flood Prone Land Policy

The NSW Government's Flood Prone Land Policy provides the overarching framework for flood risk management in New South Wales and supports the resilient and orderly development of flood prone land. The primary objective of the policy is to reduce flood risk to life and property, and to minimise private and public losses resulting from flooding, while recognising the social, economic and environmental value of floodplains.

The policy adopts a merit-based, risk-informed approach to land use planning and development, with flood risk management primarily administered at the local level. Local councils are responsible for managing flood risk within their local government areas, supported by State Government policy, technical guidance and funding.

The NSW Flood Risk Management Manual (2023), which has replaced the former Floodplain Development Manual, provides guidance to councils and practitioners on the identification, assessment and management of flood risk. The Manual promotes a comprehensive approach to floodplain risk management that considers flood behaviour, exposure, vulnerability and emergency response across the full range of flood events, including climate change.

This Flood Impact and Risk Assessment and Draft Flood Emergency Response Pla has been prepared in a manner consistent with the NSW Flood Prone Land Policy and the Flood Risk Management Manual, and supports Council and State decision-making by demonstrating that flood risks associated with the proposed development can be appropriately managed.

2.5 Definitions

2.5.1 Flood Planning Level

The Flood Planning Level (FPL) is an important tool in defining the ground level at which a development should be located. In relation to the site, the Parramatta DCP 2023 applies and defines the FPL as:

> *The Flood Planning Level under normal circumstances shall be the higher of the 1% AEP riverine flood level or the 1% AEP overland flow flood level, as accepted by Council, plus a minimum 500mm freeboard safety factor. Council may require additional freeboard to manage risk in exceptional circumstances.*

As the 10 Valentine Avenue redevelopment is a State Significant Development (SSD), the provisions of the DCP do not strictly apply. However, in the absence of any other applicable guideline or instrument specifying a Flood Planning Level (FPL) for the site, the DCP's FPL requirements have been adopted for the purposes of this assessment. This means the FPL is the 1% AEP flood level plus 0.5m freeboard.

The 1% AEP has been adopted as the 1% AEP based on SSP3-7.0 for 2030 as outlined in Section 4.4.2.

2.5.2 Flood Planning Area

The Flood Planning Area (FPA) is the land below the Flood Planning Level (FPL).

2.5.3 Probable Maximum Flood

In accordance with the SEARs, the flood risk assessment must consider flood events up to the Probable Maximum Flood (PMF). It is important to note that the PMF does not relate to the FPL. It is defined as:

> *The largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation (PMP), and where applicable, snow melt, coupled with the worst flood-producing catchment conditions.*

The PMF represents an extremely rare, hypothetical upper-bound flood event. It is not assigned an AEP or return interval but is generally considered to be significantly rarer than a 1% AEP event in the order of 1 in 10,000,000 year, or 0.00001% probability of occurrence.

2.6 Additional Provisions

The following guidelines and statutory provisions have been considered in this assessment:

- Parramatta River Flood Study, Stantec, 13 June 2024 (Flood Study)
- Flood Risk Management Manual, NSW Department of Planning and Environment, 2023
- Flood Impact and Risk Assessment Guideline - LU01, NSW Department of Planning and Environment, 2023
- Flood Function Flood Risk Management Guideline FB02, NSW Department of Planning and Environment, 2023

3. Existing Flood Information

The proposed site is subject to overland flow flooding from Clay Cliff Creek and backwater inundation from the Parramatta River. The local topography is illustrated in Figure 3-1. The following sections provide information that has been extracted from the Parramatta River Flood Study (Stantec, 2024) provided by the City of Parramatta Council, noting that the flood mapping presented in the Council Flood Study combines these sources and represents an envelope of all flooding mechanisms. A more detailed assessment against each individual source of flooding has been performed as part of this assessment and is further described in Section 4.2.

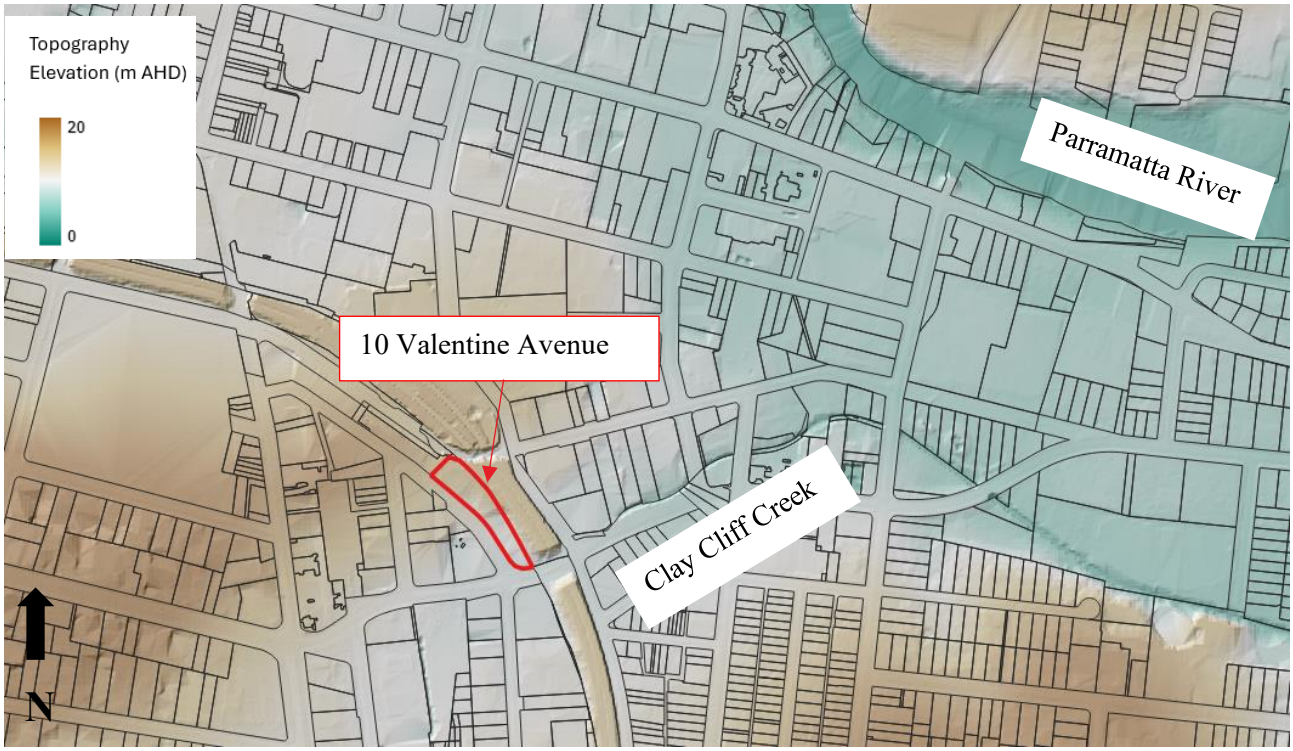


Figure 3-1: Site Hydrological Context

3.1 Flood Level and Depth

The peak flood level at the site in a 1% Annual Exceedance Probability (AEP) flood and a Probable Maximum Flood (PMF) are shown in Figure 3-2 and Figure 3-3 respectively. These figures show that the southern corner of the site is affected by flooding, with inundation depths of up to 3 m occurring in a PMF event. It should be noted that the modelling approach represents all buildings as fully blocked, which is a conservative methodology to evaluate flood levels. In reality, buildings are not fully sealed and typically contribute to some storage, which reduces ponding levels. As a result of the modelling approach, the flood extent within the site is limited by the extend of the modelled existing building.

A flood enquiry application for the site was made to the City of Parramatta Council in 2025, provided as Appendix D. This provided peak flood level information from the Parramatta River Flood Study (Stantec, 2024) for the site as outlined in Table 3-1.

Table 3-1: Flood Enquiry Peak Flood Levels (Flood Enquiry Information, City of Parramatta, 2025)

Event	Flood Level (m AHD)
5% AEP	9.0
1% AEP	9.5
PMF	12.1

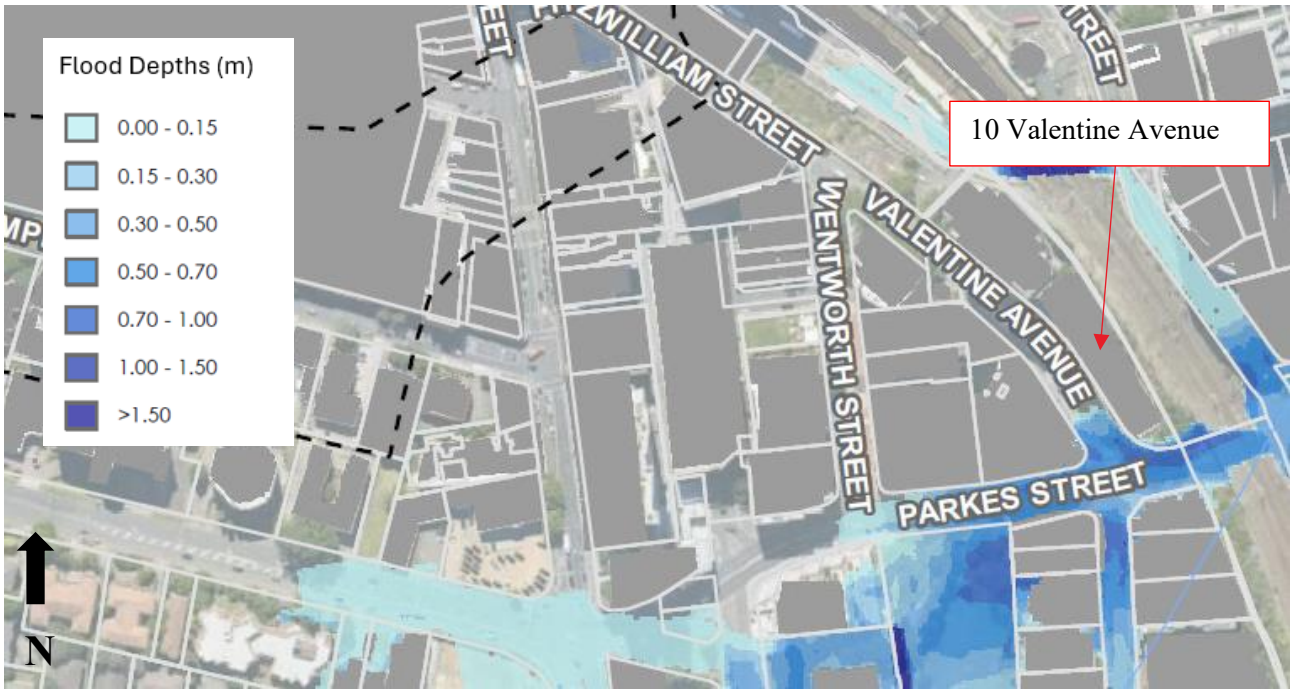


Figure 3-2: FFA 1% AEP Peak Depth (Parramatta River Flood Study, Stantec, 2024)

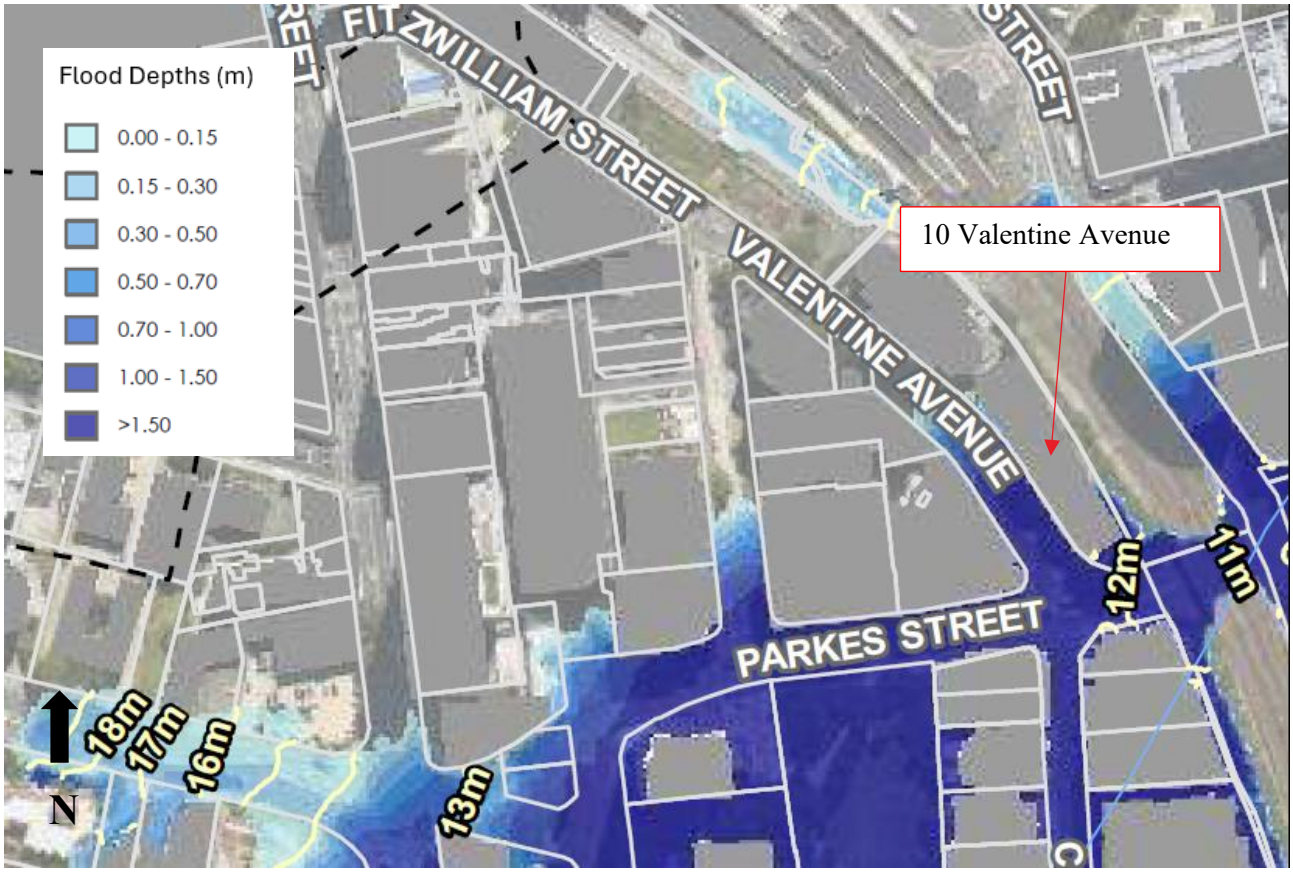


Figure 3-3: PMF Peak Depth and Level Contours (Parramatta River Flood Study, Stantec, 2024)

3.2 Hydraulic Category

Hydraulic category (or flood function) mapping is used to identify areas where obstruction, blockage or encroachment has a likelihood of resulting in an increase to flood levels. The procedure for preparing the hydraulic categories and mapping them is outlined in the guideline *Flood Function Flood Risk Management Guideline FB02* (Department of Planning and Environment, 2023). This guideline identifies three key areas within the floodplain:

- ***Floodways*** *are generally areas which convey a significant portion of water during floods and are particularly sensitive to changes that impact flow conveyance. They often align with naturally defined channels*
- ***Flood storage areas****, which are areas outside of floodways, are generally areas that store a significant proportion of the volume of water and where flood behaviour is sensitive to changes that impact on the storage of water during a flood*
- ***Flood fringe areas*** *are areas within the extent of flooding for the event but which are outside floodways and flood storage areas. Flood fringe areas are not sensitive to changes in either flow conveyance or storage.*

Encroachment into the floodway, or removal of flood storage is often associated with an adverse impact to flood behaviour such as an increase to flood level. The flood function for the PMF is shown in Figure 3-4. It can be seen that even during this extreme event, only a small portion of the site, estimated to about a 5m corridor is located within the edge of the floodway category. It can be anticipated that the southern edge of the proposed redevelopment would account for the majority of any afflux.



Figure 3-4: PMF Flood Function (Parramatta River Flood Study, Stantec, 2024)

3.3 Probability of Coincident Mainstream and Overland Flow Flooding

The site may be exposed to flood risks from both long duration Parramatta River flooding and short duration local catchment overland flow. The Parramatta River flooding typically occurs due to prolonged rainfall over a period of about 12 hours. The catchment area of the Parramatta River to the site is in the order of 100 km^2. The urban catchment upstream of the site is relatively small in comparison and in the order of 2 km^2 (so about 0.02% of the Parramatta River catchment). Due to the differing catchment sizes and therefore varying critical rainfall durations, the probability of coincident flooding in both the Parramatta River and the local catchment is low. While it is statistically possible for a 1% AEP Parramatta River flood to occur at exactly the same time as a local catchment 1% AEP flood, the probability of this outcome is rarer than a 1% AEP.

The inter-dependence of these flood sources has been accounted for in the Parramatta River Flood Study, where lower-order statistical events were correlated to the Parramatta River tailwater for boundary condition application. This approach is considered appropriate and has been retained for the purpose of this assessment. It is also noted that the typical ground levels at the site (~10 m AHD) are well above the 1% AEP riverine flood levels in the vicinity (approximately 4 m AHD at the closest point of the Parramatta River).

4. Development of Flood Model

4.1 Provided Flood Models

Flood models developed to inform the Parramatta River Flood Study (2024) were provided by Council in October 2025 for the purpose of this SSDA. Of the seven hydraulic TUFLOW models developed for the Parramatta River Flood Study, the models applicable to the proposed redevelopment are:

- Parramatta River (Mainstream)
- Clay Cliff Creek (Tributary and Overland Flow)

Whilst Council provided the TUFLOW models complete with hydrology inflows, no flood model results or mapping files were provided.

The extent of the Clay Cliff TUFLOW model is illustrated below in Figure 4-1. Appendix G provides mapping extracts from the Flood Study which illustrate the extent of both TUFLOW models.

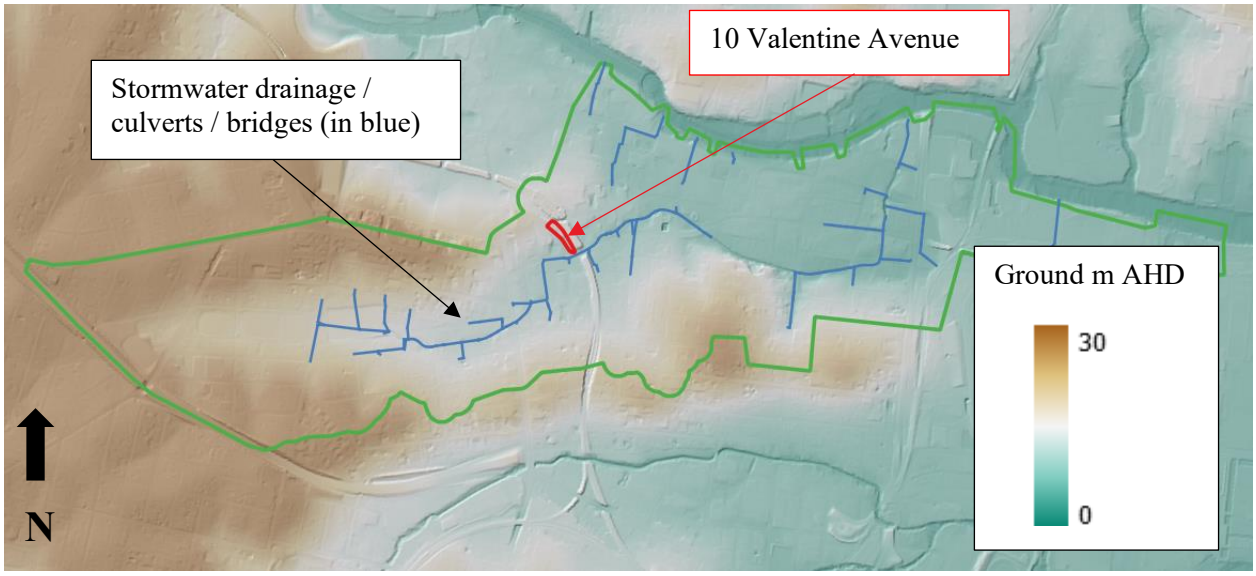


Figure 4-1: Clay Cliff Creek TUFLOW Hydraulic Model

4.2 Source of Flooding and Dominant Mechanism

The Council Flood Study reporting identified the critical storm durations however, it did not explicitly state the dominant source of flooding. On running the provided models, a review of the model results indicates the following:

- **1% AEP event:** The site is not affected by backwater inundation from the Parramatta River regional model (storm durations tested up to 12 hours). Flooding at the site is instead generated by the local catchment overland flow (i.e. the Clay Cliff model dominates).
- **PMF event:** Similarly, the site is not affected by the Parramatta River regional model in the PMF (storm durations tested up to 6 hours). Flooding is again driven by local overland flow from the Clay Cliff catchment.

In summary, for all events up to and including the PMF, the dominant source of flooding at the site is the Clay Cliff local catchment overland flow. It is noted that the regional model was only configured for storm durations up to 6 hours for the PMF, and this assessment has been limited to the hydrology events provided by Council. Given the clear dominance of local overland flooding, it is not anticipated that longer-duration regional storms would produce higher flood levels at the site.

For the remainder of this assessment, the Clay Cliff flood model has therefore been adopted as the primary model for defining flood behaviour at the site.

4.3 Updates to Clay Cliff Flood Model

4.3.1 Base Model Refinement

The Council modelling approach treated all buildings as fully blocked, which is a conservative way to assess flood behaviour and peak flood levels. This approach has been maintained and the existing building extents on the site have been revised to reflect the ground floor extent based on the survey data provided (dated 28/02/2019).

4.3.2 Mannings Roughness

The Council flood model had inadvertently applied a high-density development manning's n roughness value to road surfaces, particularly in the upstream portion of the catchment. Based on Nearmap 2025 aerial imagery the roughness values have been revised.

4.3.3 Survey Information

Existing survey data provided (dared 28/02/2019) was utilised for the representation of the existing ground surface levels. The topographical information, provided as a point cloud, was processed into a Digital Elevation Model (DEM) and input directly into the hydraulic model to ensure the most accurate ground representation. The extent of the DEM is illustrated below in Figure 4-2.

A comparison between the survey-derived DEM and the model's existing base topography showed only marginal differences. This provides confidence in the consistency and reliability of the underlying LiDAR and topographic layers used in the hydraulic modelling.

Some drainage pits were identified in the survey along the existing building frontage; however, no corresponding information was available regarding the underground pipe network or its connectivity. In the absence of reliable data, these assets were not incorporated into the hydraulic model to avoid introducing assumptions that could be incorrect. This approach is deemed adequate for this assessment as being conservative as excluding potential underground drainage typically results in higher modelled flood levels.

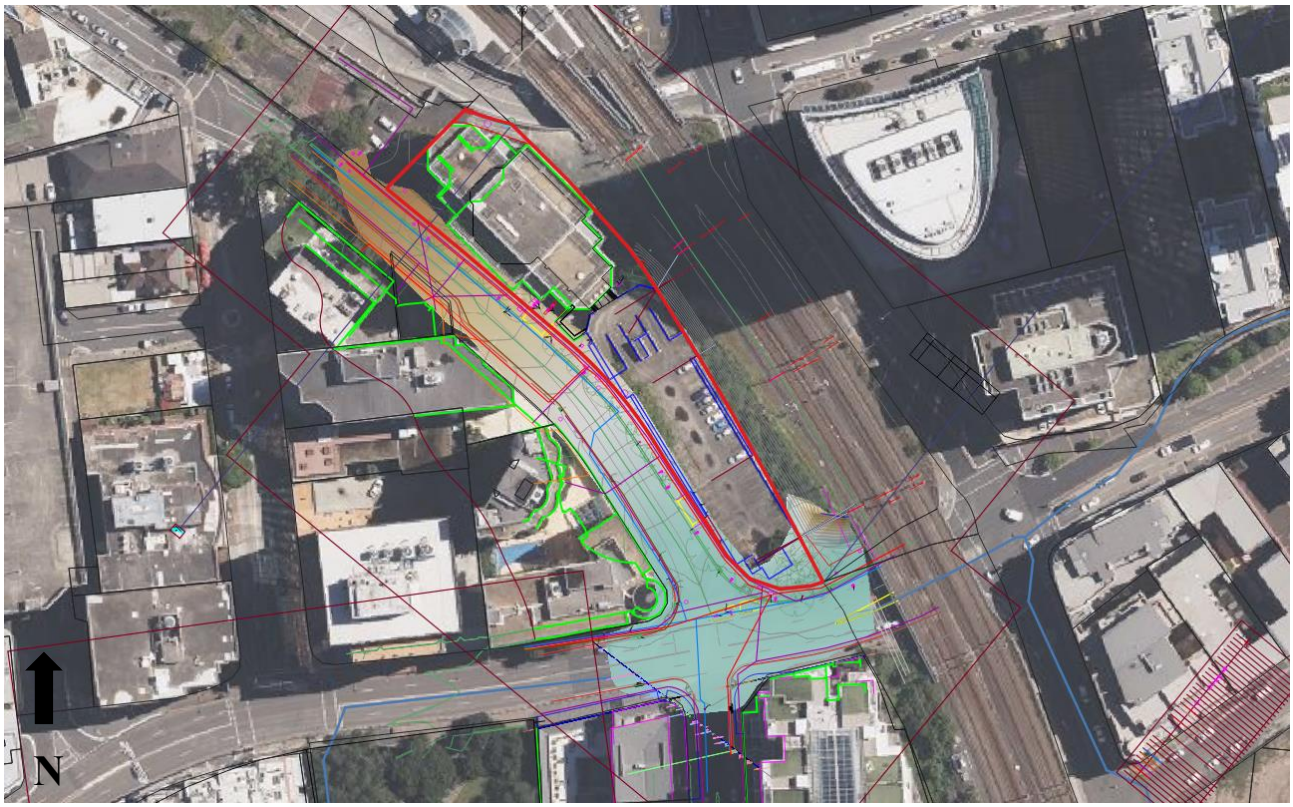


Figure 4-2: Site Survey and DEM Extent

4.3.4 Hydrology Approach

The Council Flood Study is based on an XP-RAFTS hydrological model based on Australian Rainfall and Runoff (ARR) 2019 Version 4.1 IFD data. The Flood Study calibrated the 12 hour 1% AEP flood event for the mainstream Parramatta River flood model based on a Flood Frequency Analysis (FFA) developed from the analysis of historical flood records. This calibration required a significant increase to the hydrology model inflows applied to the hydraulic TUFLOW model. This increase was similarly applied to the local tributary models, including the Clay Cliff model used for this assessment.

As a result of this approach the 1% AEP FFA 12 hour event produces critical peak water level results as the site, despite a shorter duration being typical for urban catchments of this size. This FFA-calibrated 1% AEP 12 hour event has been adopted as critical for the site to remain consistent with Council's flood model approach.

For the very rare and extreme events, the full range of PMF flood durations up to the 6 hours, as provided in the Council model, were simulated with the 1 hour design storm producing the critical peak flood depths. The 1 hour duration has been adopted for the PMF event as well as the 0.5% and 0.2% AEP design event analysed in this assessment.

No changes have been made to the hydrology model with this assessment based on the hydrology inflows supplied in the Council model. The only adjustments made to the hydrology inflows have been to account for ARR Version 4.2 as outlined below in Section 4.4.

4.4 Incorporation of ARR Version 4.2

4.4.1 Shared Socioeconomic Pathways

The Australian Rainfall and Runoff (ARR) 2019 Version 4.2 requires design rainfall intensities be increased to account for climate change. Adjustments are made to both 'present day' taken as 2030, and future time horizons based on Shared Socioeconomic Pathways (SSPs). The SSP framework provides a set of global development and emissions trajectories to represent a wide range of possible future climate outcomes. The pathways commonly adopted for flood assessments are as follows as illustrated in Figure 4-3.

- SSP1-2.6 | Low emissions,
- SSP2-4.5 | Medium emissions,
- SSP3-7.0 | High emissions, and
- SSP5-8.5 | Very high emissions.

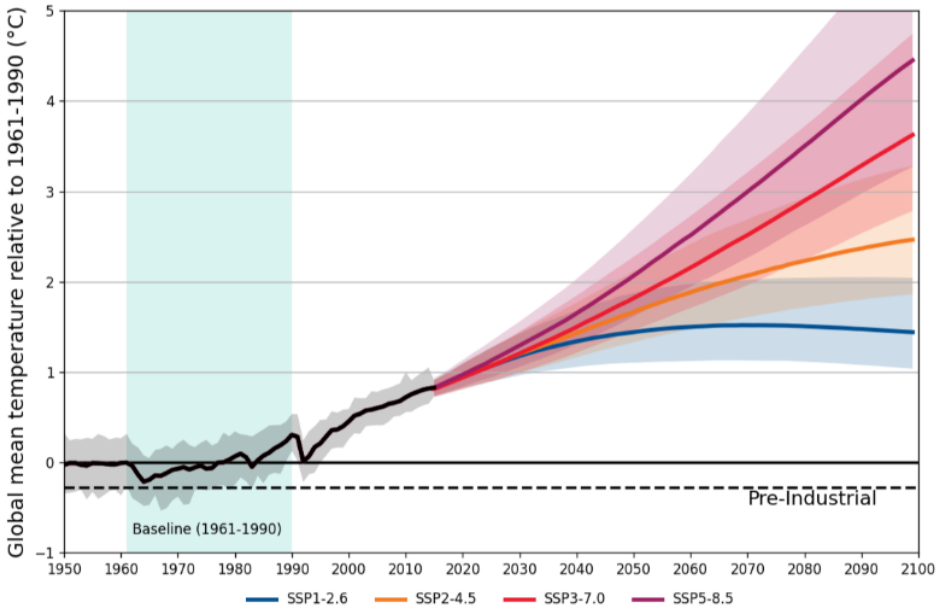


Figure 4-3: Projected Temperature Increases Associated with SSPs

ARR therefore provides a continuous range of rainfall projections over the coming century for each of the four SSP scenarios. This results in a broad set of possible rainfall uplifts, depending on global emissions, economic development, land use, technology, and population trends.

For this assessment, a high-emissions scenario (SSP3-7.0) has been adopted for the assessment of 'present-day' (2030) and 2100 design rainfall events.

4.4.2 Increase in Rainfall Intensity

The increases in design rainfall intensities were obtained from the ARR Data Hub and are summarised as follows:

- **'Present Day' Year 2030, SSP3-7.0**: approximately **+17%** rainfall increase
- **Year 2100, SSP3-7.0**: approximately **+65%** rainfall increase

It is noted that the precise uplift varies with storm duration and AEP, with short-duration storms generally exhibiting higher uplift. Sensitivity testing has been undertaken across a range of durations. Rainfall uplifts have been applied in a conservative manner, adopting the upper end of the projected range for the relevant critical durations.

Given the complexity and challenges associated with making modifications to the Council supplied hydrology models, the rainfall uplifts have been applied as multipliers to the hydrology inflows to the TUFLOW model. This is considered a conservative approach, particularly as ARR Version 4.2 notes that both initial and continuing storm losses are predicted to increase as a result of climate change which are not directly addressed with this approach.

4.4.3 Increase in Parramatta River Levels

The adoption of latest Climate Change guidelines ARR 2019 Revision 4.2 will not only impact the local catchment but also the broader Parramatta River system, from which the Clay Cliff Creek model applies its downstream boundary condition. Sensitivity testing has been undertaken on the regional Parramatta River model, incorporating increases to hydrology inflows (as a result of rainfall intensity increases) as well as projected Sea Level Rise (SLR). These tests demonstrated that Climate Change effects within the Parramatta River have no influence on flood levels at the site. Even under an extreme PMF SSP3-7.0 for 2100, the site remains unaffected by regional flooding. The overall analysis confirms that coincident flooding from the Parramatta River is negligible, and that flooding at the site is entirely dominated by local overland flow from the Clay Cliff Creek catchment.

5. Existing Conditions Flood Behaviour

5.1 Flood Behaviour

5.1.1 Site Analysis

Flood mapping for the existing site conditions is provided in Appendix A. The results show that local overland flow travels along Valentine Avenue, with floodwater backing up along the southern building façade due to elevated water levels within the main flowpath at Parkes Street.

Across all events up to and including the PMF, the northern building is not impacted by flooding and remains flood-free. Only the southern portion of the site is potentially affected by overland flow.

Along the southern building façade, predicted ponding depths are in the order of 0.4 m in the 1% AEP event, increasing to approximately 3 m in the PMF. It should be noted that the flood model represents all buildings as fully blocked, consistent with the methodology adopted in the Council Flood Study. This provides a conservative basis for assessing flood levels. Under this approach, buildings appear flood-free on the mapping; however, in reality the structures are not watertight and would provide additional storage during flooding. Consequently, water would enter parts of the building and actual ponding depths along the façade may be less than those shown. The results therefore represent a conservative assessment of flood behaviour.

Flood hazard classification for the 1% AEP flood has been mapped in accordance with the Flood Risk Management Guideline FB03 (Department of Planning and Environment, 2023) and is shown in Figure 5-1. The hazard category adjacent to the existing building is predominantly “Generally safe for people, vehicles and buildings”, representing the lowest hazard classification (refer Figure 5-2 for classification).

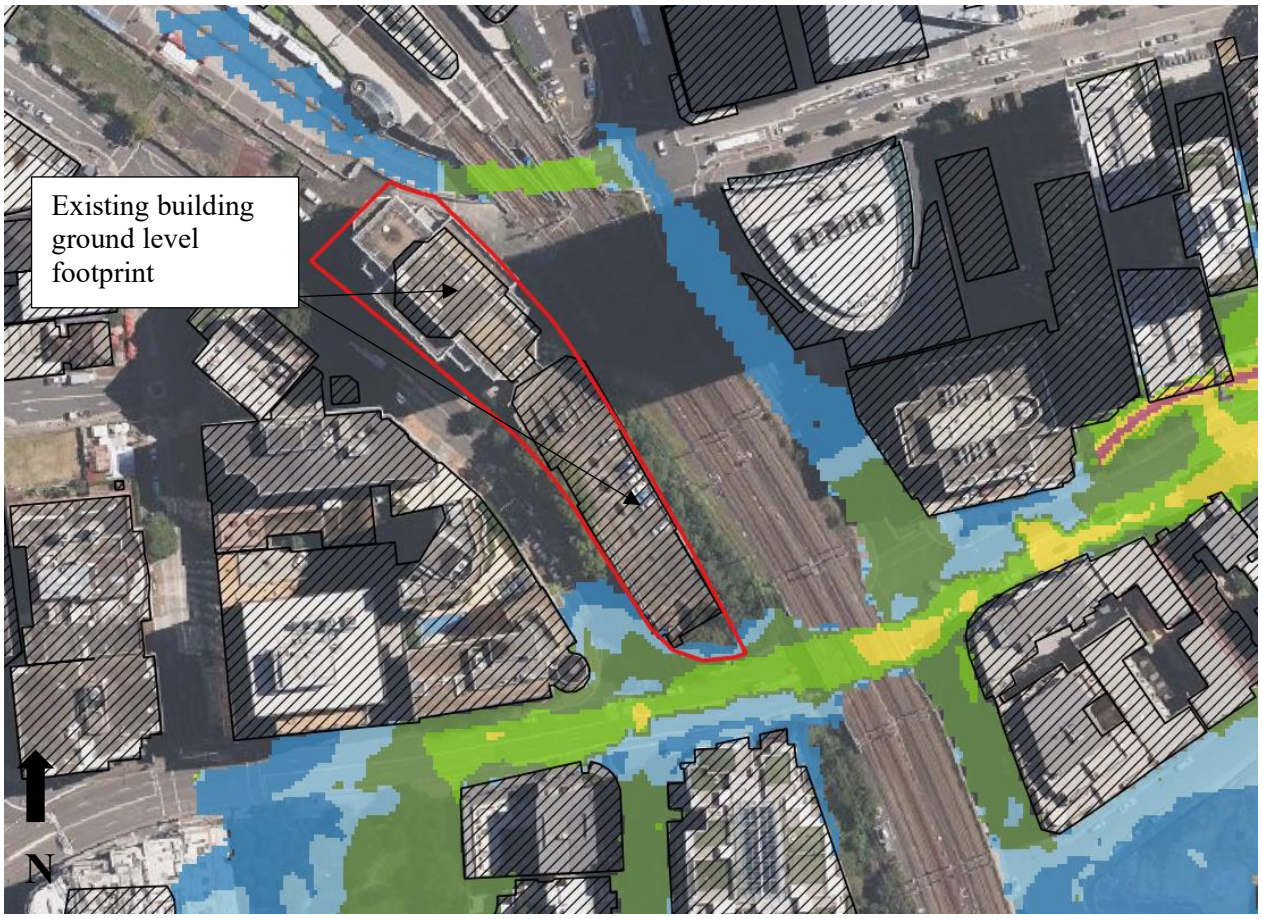


Figure 5-1: Existing Flood Hazard Category, 1% AEP ‘Present Day’

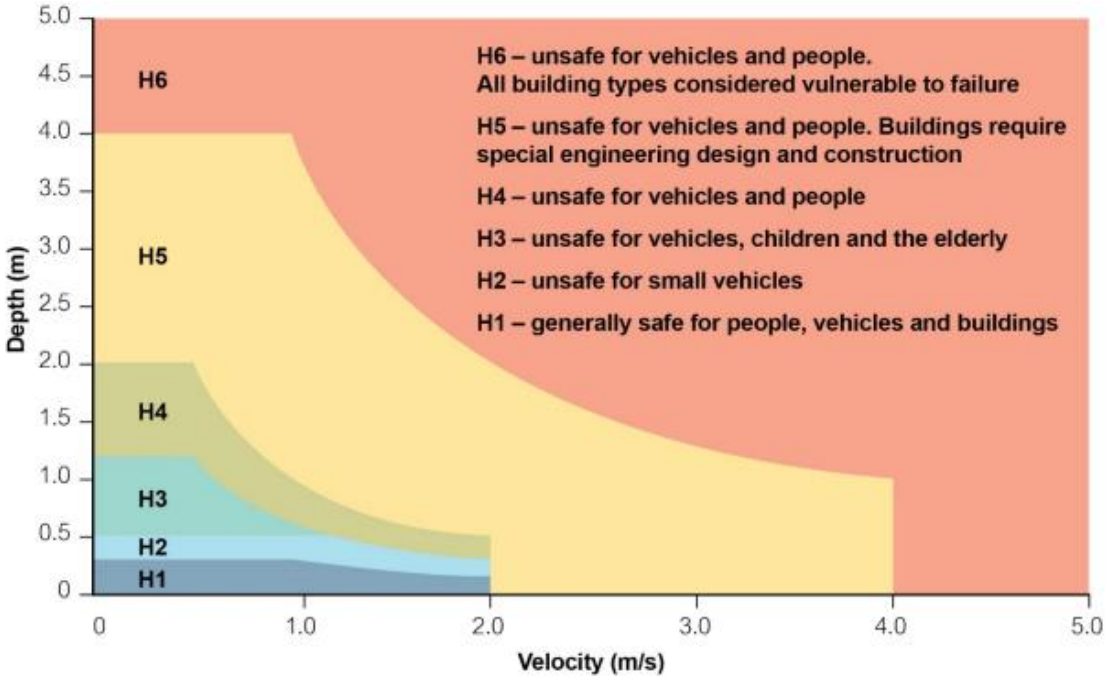


Figure 5-2: Flood Hazard Category (NSW Department of Planning and Environment, 2023)

The PMF 'floodway zone' was also assessed to confirm whether the southern portion of the site (where the building is proposed to be demolished / replaced) is subject to high flood risk. The 'floodway zone' represents the highest-ranked hydraulic category and identifies areas where obstruction, encroachment or blockage would likely cause an increase in flood levels. The delineation of the PMF floodway has been undertaken as part of this assessment in accordance with the Flood Function Flood Risk Management Guideline FB02 (Department of Planning and Environment, 2023), specifically using the cumulative conveyance method described in Appendix A ("Conveyance Technique").

The resulting PMF hazard mapping and floodway zone are presented in Figure 5-3.

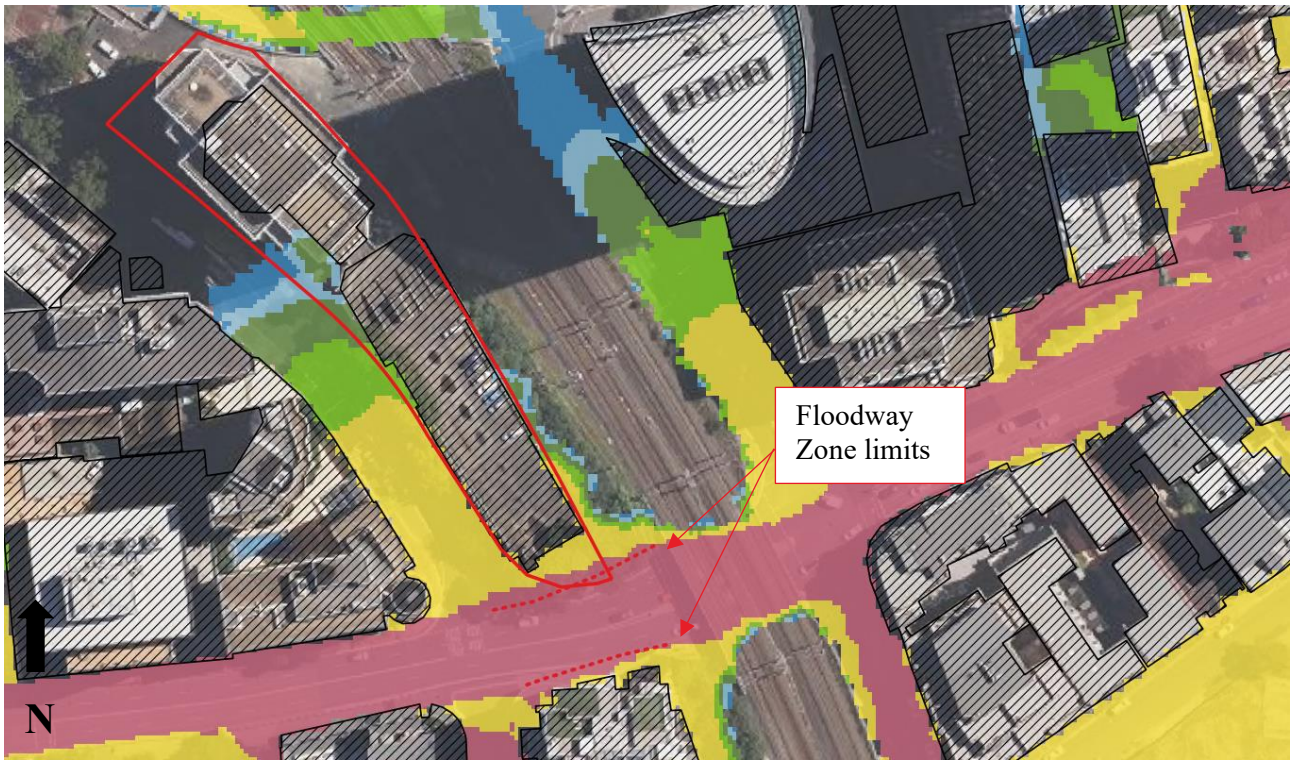


Figure 5-3: Existing Flood Hazard Category and Floodway Zone, PMF 'Present Day'

5.2 Peak Flood Levels

Flood mapping is provided in Appendix A for the existing site conditions (SSP3-7.0, 2030) for the 20%, 5%, FFA 1%, 0.5%, 0.2% AEP and PMF flood events illustrating the peak flood depths and level contours and flood hazard categories. Appendix C also provides the existing site conditions (SSP3-7.0, 2100) for the FFA 1% AEP and PMF flood events illustrating the peak flood depths and level contours and flood hazard categories.

The peak flood levels at five reporting locations surrounding the site are presented in Table 5-1 and Figure 5-4, for the 2030 'Present Day' and 2100 under SSP3-7.0.



Figure 5-4: Flood Levels Reporting Points (with PMF flood extent)

Table 5-1: Existing Peak Flood Levels at Reporting Points (m AHD)

Reporting Point	5% AEP		1% AEP		PMF	
	Present Day (2030)	2100	Present Day (2030)	2100	Present Day (2030)	2100
A	Flood free	Flood free	Flood free	Flood free	Flood free	Flood free
B	Flood free	Flood free	Flood free	Flood free	11.9	12.7
C	9.1	9.2	9.5	9.8	11.9	12.7
D	9.1	9.2	9.5	9.8	11.9	12.7
E	Flood free	Flood free	Flood free	Flood free	11.9	12.7

6. Post Development Flood Behaviour

6.1 Design Representation

The proposed building footprint was represented as fully blocked in the hydraulic model, consistent with the methodology adopted in the Council Flood Study. This approach provides a conservative basis for assessing flood behaviour and peak flood levels. The proposed ground floor building extent represented in the TUFLOW model is illustrated in Figure 6-1.

The design representation of the proposed redevelopment will be revised as the design progresses to ensure flood results remain representative.

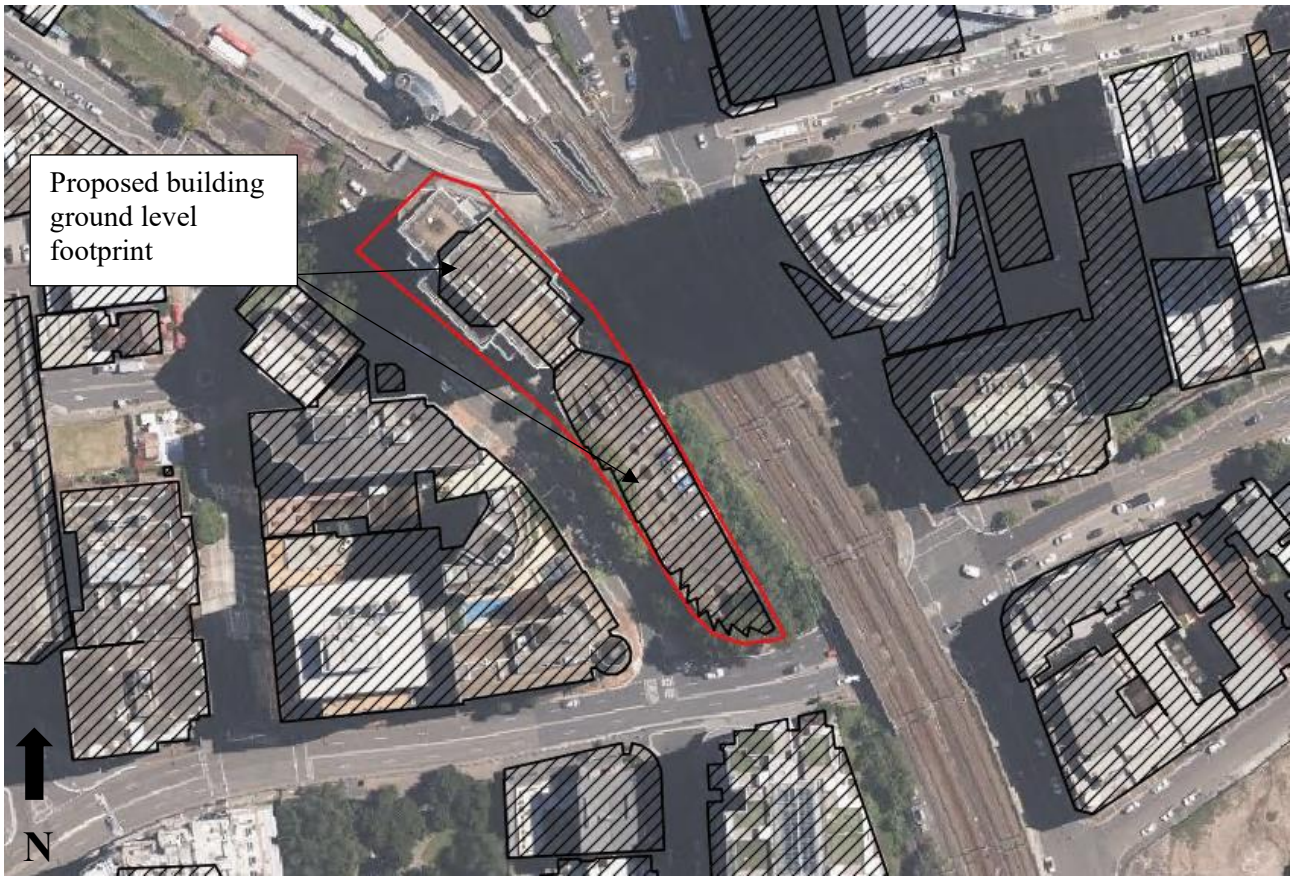


Figure 6-1: Proposed Design Building Extent

6.2 Peak Flood Levels

Flood mapping is provided in Appendix B for the proposed site conditions (SSP3-7.0, 2030) for the 20%, 5%, FFA 1%, 0.5%, 0.2% AEP and PMF flood events illustrating the peak flood depths and level contours and flood hazard categories.

Appendix C also provides the proposed site conditions (SSP3-7.0, 2100) for the FFA 1% AEP and PMF flood events illustrating the peak flood depths and level contours and flood hazard categories.

Appendix B and C also include afflux (peak water level difference) mapping comparing the peak water level results between the existing and proposed site conditions.

The peak flood levels at five reporting locations along the development are presented in and illustrated in Figure 5-4. The results are materially similar to the existing case scenario, with no visible change in flood behaviour or level results.

Table 6-1: Design Peak Flood Levels at Reporting Points (m AHD)

Reporting Point	5% AEP		1% AEP		PMF	
	Present Day	Climate Change SSP3 year 2100	Present Day	Climate Change SSP3 year 2100	Present Day	Climate Change SSP3 year 2100
A	Flood free	Flood free	Flood free	Flood free	Flood free	Flood free
B	Flood free	Flood free	Flood free	Flood free	11.9	12.7
C	9.1	9.2	9.5	9.8	11.9	12.7
D	9.1	9.2	9.5	9.8	11.9	12.7
E	Flood free	Flood free	Flood free	Flood free	11.9	12.7

6.3 Flood Impact Assessment

The afflux mapping (i.e. the change in flood levels resulting from the proposed 10 Valentine Avenue redevelopment) is provided in Appendix B and C.

For all events up to and including the 0.5% AEP events, the modelled afflux remains below 10 mm. A small, localised increase of approximately 20 mm is observed at Kendall Street in a 1% AEP however it reflects modelling instabilities occurring in the underground drainage network; this should not be interpreted as impact from the proposed redevelopment.

An increase of approximately 20 mm is observed in a 0.2% AEP flood event and in the PMF event, with further propagation occurring in the PMF SSP3-7.0 2100 event (refer Appendix C) with up to 40 mm increase in flood levels observed at Valentine Road.

Overall, the proposed development results in no significant worsening of flood behaviour and is considered compliant with the project SEARs and broader requirements relating to adverse impact.

6.4 Flood Mitigation Measures

In response to the proposed flood conditions a number of mitigation measures have been included in the design to minimise flood risk, these include:

1) Floor levels
    a. ground floor levels have been elevated above the 1% AEP SSP3-7.0 2030 peak flood levels with 500 mm freeboard, as discussed in Section 8.1. Where practicable ground floor levels have been elevated further in the retail spaces and loading dock to increase resilience.
    b. To offer protection during rare flood events, threshold levels for stairwells along the building frontage have been elevated above the PMF SSP3-7.0 2030 peak flood level. This offers further protection to the stairwell and the basement levels.
2) Flood gates – to offer additional protect during rare extreme flood events up to the PMF SSP3-7.0 2030, flood gates are proposed to be installed at the loading dock entrance and the internal lift location, as outlined in Section 8.2. In addition to offering protection to the basement levels, they also offer protection for additional pedestrian flood evacuation routes which form part of the flood emergency response strategy outlined in Section 7.5.
3) Evacuation routes – to support the flood emergency response strategy of evacuation during rare extreme flood events, the architectural design includes provision for pedestrian movement through the building to access levels above the PMF SSP3-7.0 2030 peak flood level, from which further evacuation from the site is possible, as outlined in Section 7.5.

6.4.1 Climate Change Impacts

As the climate continues to change, flood levels are predicted to increase over time. Estimated peak flood levels for reporting locations along the development are summarised in Table 6-1. The modelling indicates that under the SSP3-7.0 high-emissions pathway, increases in peak flood levels of approximately 300 mm for the 1% AEP event and up to 800 mm for the PMF may occur from 2030 and 2100.

Minimum ground floor levels for the proposed development have been set in accordance with the adopted flood planning level, defined as the 1% AEP SSP3-7.0 2030 event plus 500 mm freeboard, as discussed in Section 8.1. While climate change is expected to erode this freeboard over time, the modelling indicates that approximately 200 mm of freeboard would remain in 2100. This reduction would affect only the ground floor lobby area and substation location, with all other ground floor levels remaining above the original 500 mm freeboard allowance.

With respect to basement flood protection during rarer extreme flood events, additional mitigation measures may be required in the future to maintain flood immunity as peak flood levels increase. Potential future measures could include the installation of additional flood gates, increasing the height of existing flood gates, or raising threshold levels at basement-accessible stairwells and doorways that are currently set relative to the present-day PMF. Similar considerations would apply to other openings to the loading dock that are located below the PMF.

For rarer extreme flood events, the emergency response strategy is outlined in Section 7.5. Based on the estimated peak flood levels for the PMF SSP3-7.0 2100 event, pedestrian evacuation to Level 1 and onward via the retained building to the north and exiting to Valentine Avenue remains viable, as this route remains above peak flood levels.

Under these extreme future conditions, pedestrian evacuation directly from the basement and ground-floor retail areas to Valentine Avenue via the northern retail frontage would no longer be feasible. In such circumstances, an alternative vertical evacuation pathway to Level 1 would be required. This could be achieved in the future through retrofitting of back-of-house areas or the provision of additional stairwells, if required.

The detailed design should acknowledge the potential impacts of climate change and, where reasonably practicable, incorporate measures that enhance the resilience and adaptability of the building. This may include facilitating future upgrades to flood protection and evacuation infrastructure without requiring fundamental changes to the building form.

7. Flood Emergency Response Plan

The following outlines the draft Flood Emergency Response Plan (FERP) for the proposed re-development. This aims to provide the overarching strategy for the flood emergency response. As the design of the proposed works progresses, this plan will be expanded to form a comprehensive FERP as a stand-alone document further detailing the design elements, operational requirements and responsibilities.

7.1 City of Parramatta Flood Emergency Response

Flood emergency response mapping is provided in the Parramatta River Flood Study Report (Stantec, 2024). The site is not located in a 'Significant Areas' in accordance with the OEH guideline: *Flood Emergency Response Planning Classification of Communities* (OEH, 2016), see Appendix G. As such, there is no specific emergency response measures applicable to the site from the Parramatta Local Emergency Management Plan (Council, 2022) and the Parramatta LGA Flood Emergency Sub Plan (Council/SES, 2021).

7.2 Consultation with NSW State Emergency Services

The NSW State Emergency Services (SES) has provided advice on the scoping report for the proposed redevelopment as provided in Appendix E. They have noted the site is impacted by overland flooding with particularly hazardous conditions along Parkes Street, and note the following:

- Recommend the proposal considers the NSW Government's Flood Prone Land Policy and supporting guidelines
- Recommend the proponent submit a robust Flood Impact and Risk Assessment
- Emphasise that according to the Parramatta LGA Flood Emergency Response Sub Plan, evacuation is the primary response strategy.
- Note the area is prone to flash flooding, there are no Bureau of Meteorology quantitative flood warnings available. Severe Weather Warnings and Thunderstorm Warnings will be the most likely form of advice about the potential for flood producing storms and rainfall, which will not provide the community time to respond to a flood threat in an appropriate manner.

This Flood Impact and Risk Assessment and Draft Flood Emergency Response Plan responds to and considers the key items noted by the SES. This includes adopting evacuation from site as the primary emergency response in line with SES Parramatta LGA Flood Emergency Sub Plan.

7.3 Existing Monitoring Tools

The Flood Emergency Response Plan is to incorporate the following tools for monitoring conditions. Wherever feasible, automated monitoring, communications and operational triggers should be incorporated given that flood events could happen at any time of the day or night.

7.3.1 FloodSmart Parramatta

FloodSmart Parramatta is a service operated by Council that assists with understanding the flood risk of the area and provides warnings via SMS, email, mobile and/or landline. The operators, tenants and residents of the site should be encouraged to sign up for warnings via the Council website:

https://www.cityofparramatta.nsw.gov.au/environment/flooding-and-emergencies/floodsmart-parramatta/flood-warning-service

The site is located within Flood Warning Area Zone 8: Harris Park and Clay Cliff Creek.

The flood warning messages will outline the expected level of flood severity. The FloodSmart tool provides a valuable catchment specific warning system to be incorporated into the flood emergency response plan.

7.3.2 Bureau of Meteorology (BoM)

BoM have several services available to warn of flooding or hazardous storm conditions. These include:

- Severe Thunderstorm Warning Services to alert communities of more dangerous thunderstorms which may result in flooding.
- Severe Weather Warning Services provide notification when severe weather is occurring in an area or expected to move into an area. Severe Weather Warnings include notification of very heavy rain that may lead to flash flooding.
- Flood Watch to provide early advice of a developing situation that may lead to flooding.

Flood Warnings are provided by BoM to advice that flooding is occurring or expected to occur in an area based on defined criteria.

7.3.3 State Emergency Services (SES)

The SES operates several tools for monitoring and notifying flood risks. These include:

- SES website – Warnings available through the SES website
- NSW SES social media channels
- Hazard Watch – an online platform for accessing weather warnings
- ABC radio reporting of weather warnings.

7.4 Site Analysis

7.4.1 Characteristics and Vulnerabilities of Future Occupants

The assessment of occupant characteristics and vulnerabilities considers both the nature of future occupancy and the rapid-onset flood hazard at the site. The proposed redevelopment will include high-density residential accommodation, ground-floor retail premises, and associated visitor and service populations, resulting in a significant number of both permanent and transient occupants within the building. Residential occupants will primarily be located above potential flood extents, which reduces direct exposure to flood hazard for higher floors. However, the presence of families, visitors and retail customers introduces a broad range of mobility and familiarity with the environment that can influence evacuation behaviour.

Ground-floor retail occupants and customers may have limited awareness of site-specific flood behaviour, reducing the time available to make safe evacuation decisions during rapid-onset events.

NSW emergency management planning guidance emphasises that flood risk to people arises when populations are exposed to hazardous flood behaviour (depth, velocity, isolation, rate of rise) and that emergency response planning must consider how quickly hazards develop and how people can safely evacuate or take refuge given these characteristics. These factors have informed the emergency response strategy for the proposed redevelopment, including conservative assumptions about warning time, clear identification of flood-free evacuation routes, and integration of vertical evacuation options where necessary as outlined in Section 7.5.

7.4.2 Flood Warning Time and Duration of Inundation

Flood warning times vary depending on the nature of each event. Slow-rising regional floods can provide many hours of warning prior to peak levels; however, this is not applicable to the subject site. The site is dominated by local overland flow from an urban catchment, and the critical storm duration is in the order of one hour, meaning that floodwaters respond rapidly to intense local rainfall. The duration of inundation is similarly short. It is reasonable to assume that practical warning time at the site would be less than one hour, and potentially only a matter of minutes in the case of fast-developing storms.

7.4.3 Site Access and Egress

The site is an area with rising road access where the Valentine Avenue rises steadily uphill and away from rising floodwaters. The occupants will not be completely isolated before inundation reaches its maximum extent, even in the PMF.

Pedestrian and vehicle access and egress are available through Valentine Avenue, from Fitzwilliam Street (i.e. from the North). Parkes Street would be inaccessible during a significant flood. Refer to the Emergency Response Strategy in Section 7.5 for further details. The basement will be protected from flood events as outlined in Section 8.2.

7.5 Emergency Response Strategy

Given of the local overland flow nature of the catchment, the evacuation strategy for the development should assume minimal or no effective warning time, with reliance on pre-emptive triggers appropriate for rapid-onset flooding. Evacuation from site will be the primary emergency response in line with SES Parramatta LGA Flood Emergency Sub Plan. The pedestrian evacuation routes are illustrated in Figure 7-1.

Residents and tenants of the building should be regularly informed about the flood risk at the site, the operational flood mitigation measures in place (such as flood gates), and the designated flood-free evacuation routes. These evacuation routes should be clearly marked and communicated, particularly in areas that do not follow the usual pedestrian circulation paths. Given that the ground floor retail customers may have limited awareness of site-specific flood behaviour, the majority of these areas have been located above the PMF to minimise the risk of evacuation being required.

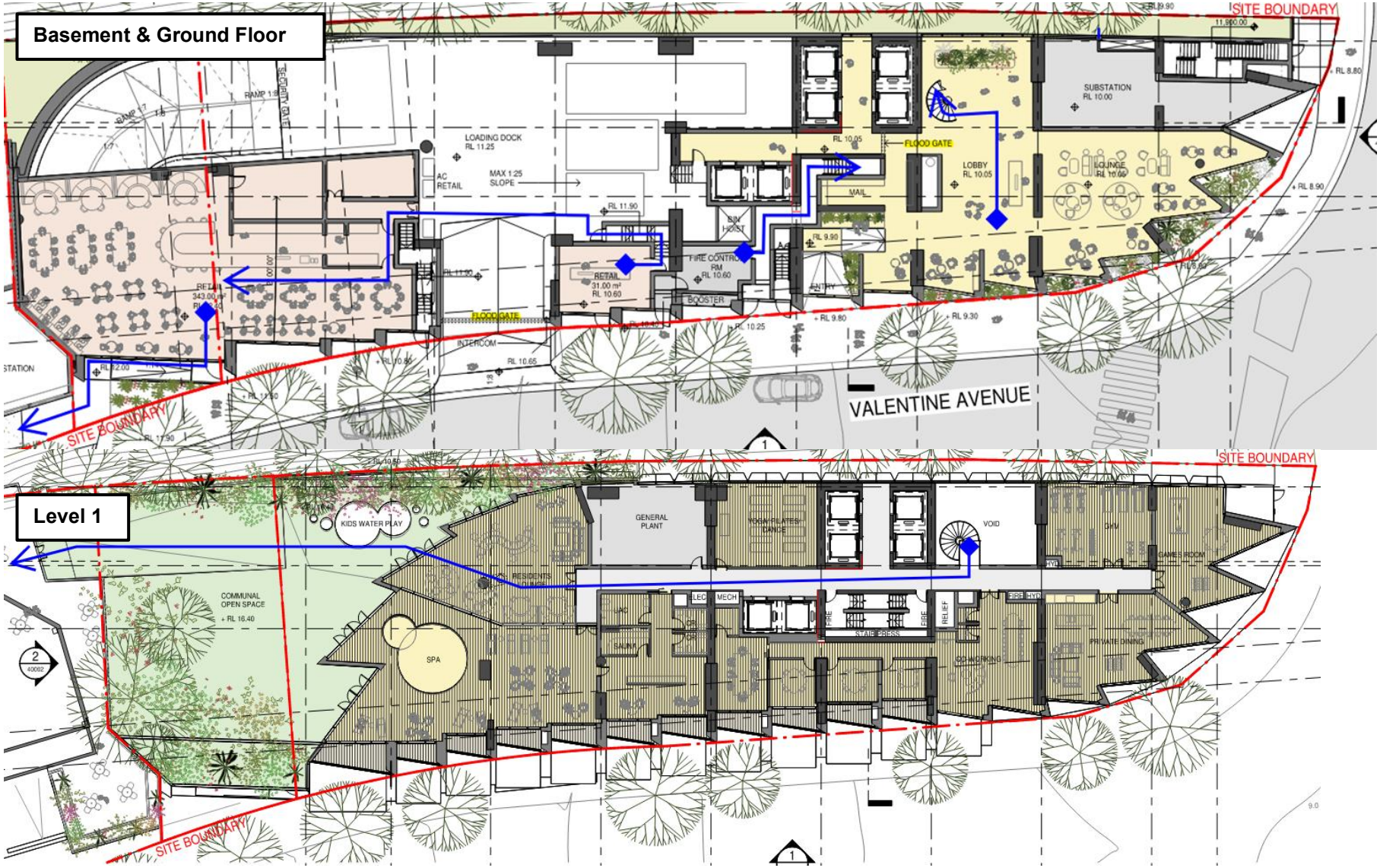
During flood events up to and including the estimated 1% AEP SSP3-7.0 2100 magnitude, the regular pedestrian and vehicle entry locations will be flood free. Evacuation from the building can be made north along either the Valentine Avenue roadway or footpath and can continue on to Parramatta Station or surrounding local roadways. Evacuation to the south towards Parkes Street is discouraged due to anticipated inundation, with rising floodwaters entering Valentine Avenue and extending across the entirety of Parkes Street.

During a PMF SSP3-7.0 2030 event, the flood extent from Parkes Street encroaches further north along Valentine Avenue preventing the evacuation of vehicles from the proposed redevelopment. Pedestrian evacuation from the ground floor lobby area to Level 1 will be made via the internal stairs. All higher floor levels can also evacuate to Level 1 via the fire stairs. From Level 1 evacuation can be made through the communal open space podium to the retained building in the north of the site. Vehicle access to the retained building remains accessible during a PMF event. From the retained building evacuation can continue north along Valentine Avenue to Parramatta Station or surrounding local roadways.

Pedestrian evacuation from the basement and ground floor retail areas will be via freely accessible internal corridors and stairwells editing via the northern retail frontage to Valentine Avenue. This area of Valentine Avenue remains flood free at this location. From this location evacuation can continue north along Valentine Avenue to Parramatta Station or surrounding local roadways.

Notwithstanding the above, detailed design should ensure that pedestrian flood evacuation routes are clear, direct and intuitive, and do not rely on lifts or other electrically powered systems to enable safe egress. Evacuation pathways should be freely accessible at all times, avoid locked doors or complex back-of-house circulation, and be supported by clear wayfinding and flood emergency signage that remains effective during power outages. The detailed design should also consider the needs of occupants with reduced mobility to the extent practicable, consistent with relevant Australian Standards and emergency management guidance, recognising that emergency evacuation routes may differ from day-to-day accessible paths of travel.

Figure 7-1: Pedestrian Evacuation Routes



8. Design Compliance

8.1 Flood Planning Level

The Flood Planning Level (FPL) is defined as "*the higher of the 1% AEP riverine flood level or the 1% AEP overland-flow flood level, as accepted by Council, plus a minimum freeboard of 500 mm*." Based on the modelled flood levels for the site, the FPL has been calculated from the 1% AEP SSP3-7.0 2030 flood event as 9.5 m AHD + 0.5 m freeboard = 10 m AHD.

All internal floor levels within the proposed building are at or above 10 m AHD, achieving the floor level requirement.

8.2 PMF Basement Protection

In accordance with Council's DCP, the basement car park is required to be protected to the PMF. Basement protection is currently proposed via flood gates for events up to the PMF SSP3-7.0 2030.

Given the rapid-onset, local overland flow regime and the short critical storm duration (approximately one hour), effective warning time at the site is expected to be less than one hour and may be limited to minutes during intense storms. As such, reliance on manual deployment of floodgates in response to external flood warnings is not considered appropriate and automated gates are recommended.

Flood gates are proposed to be located at the vehicle entrance to the basement, as well as at the internal lift location to prevent flood waters from entering the basement. Threshold levels will be set at the PMF level for internal stairs to avoid water entering the basement.

At detailed design stage, the flood gate arrangement will need to be developed to ensure that life safety is not compromised. In particular, any automated floodgates:

- must not obstruct primary pedestrian egress routes from the basement,
- should incorporate fail-safe operation, clear alarms and signage, and
- should be integrated with access control, such that once a gate is triggered to activate, no further entry to the basement is possible.

In all cases, the design must prioritise safe and timely evacuation of occupants over the protection of basement assets.

8.3 Flood Afflux

Overall, the proposed development does materially worsen the flood behaviour and is considered compliant with the project SEARs and broader requirements relating to adverse impact as outlined in Section 6.3.

9. Conclusion

Based on the flood impact and risk assessment undertaken, the proposed redevelopment at 10 Valentine Avenue, Parramatta does not result in any significant material worsening of flood behaviour. The flood modelling undertaken is considered reasonable and appropriate for the purpose of the State Significant Development Application.

The design of the proposed redevelopment has appropriately considered the flood risk specific to the site and has addressed this through ground level design, internal accessibility provisions, and the protection of basement areas via flood gates. The proposed development has achieved compliance with applicable flood planning level requirements and has incorporated measures to manage flood risk up to the Probable Maximum Flood (PMF).

The prepared draft Flood Emergency Response Plan has demonstrated that safe evacuation from the site can be achieved during flood events up to and including the PMF, consistent with the primary emergency response strategy for the area. As such the proposed redevelopment would not result in any significant increase in required government spending related to flood emergency management services or flood mitigation.

Overall, this assessment has responded to the Secretary's Environmental Assessment Requirements (SEARs) and is consistent with the State Emergency Service (SES) Parramatta LGA Flood Emergency Response Sub Plan.

10. Reliance Statement

The sole purpose of this flood impact and risk assessment and draft flood emergency response plan and the associated services performed by Arup is to assess the flooding compliance of the proposed redevelopment in accordance with the scope of services set out in the contract between Arup and Holdmark.

In preparing this report and flood models, Arup has relied upon, and presumed accurate, information (or confirmation of the absence thereof) provided by Holdmark, City of Parramatta Council and other sources. Except as otherwise stated in the report, Arup has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Arup derived the data from information sourced from the above parties and/or available in the public domain at the time or times outlined in the report.

The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in the report. Arup has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report and flood models. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in the report, to the extent permitted by law.

All flood models, whether numerical, analytical or physical, rely on a set of assumptions and requirements to accurately simulate the flow conditions. As no model will provide an exact representation of the complexity of the actual flow, it is important for engineers to understand these assumptions, as they form the limitations of that method. Ignoring or violating these assumptions and limitations or failing to critically analyse the model will produce inaccurate results.

No responsibility is accepted by Arup for use of any part of this report in any other context. This modelling data has been prepared on behalf of, and for the exclusive use of Holdmark, and is subject to, and issued in accordance with, the provisions of the contract between Arup and Holdmark. Arup accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

11. References

City of Parramatta, 2022, *Parramatta Local Emergency Management Plan*

City of Parramatta/NSW SES, 2021, *Parramatta LGA Flood Emergency Sub Plan*

Department of Planning and Environment, 2023, *Flood Risk Management Manual – The Management of Flood Liable Land*

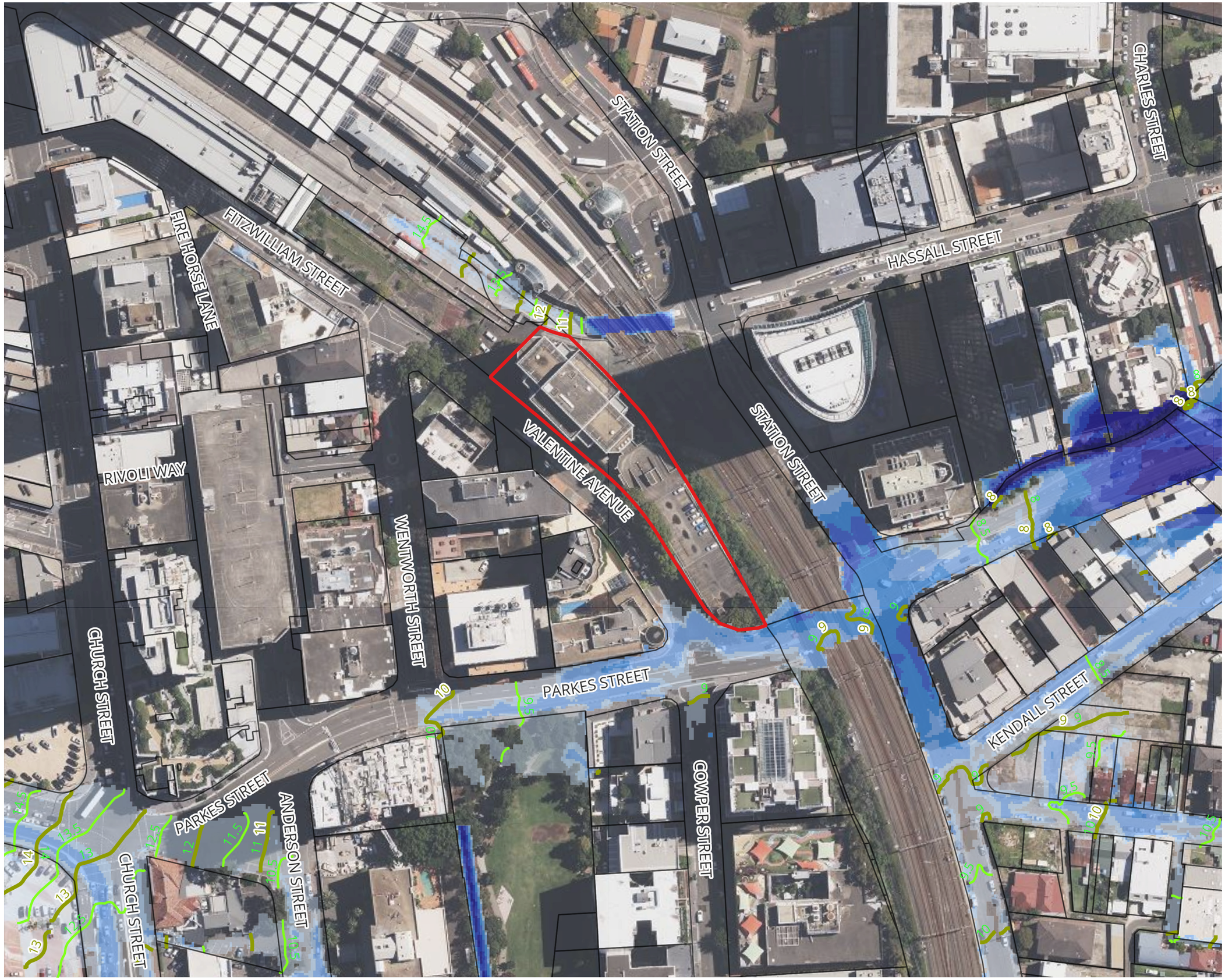
Department of Planning and Environment, 2023, *Flood Function - Flood Risk Management Guideline FB02*

Department of Planning and Environment, 2023, *Flood Impact and Risk Assessment: Flood Risk Management Guide LU01*,

Stantec, 2024, *Parramatta River Flood Study*, prepared for City of Parramatta Council

Appendix A

Existing Case Flood Mapping



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

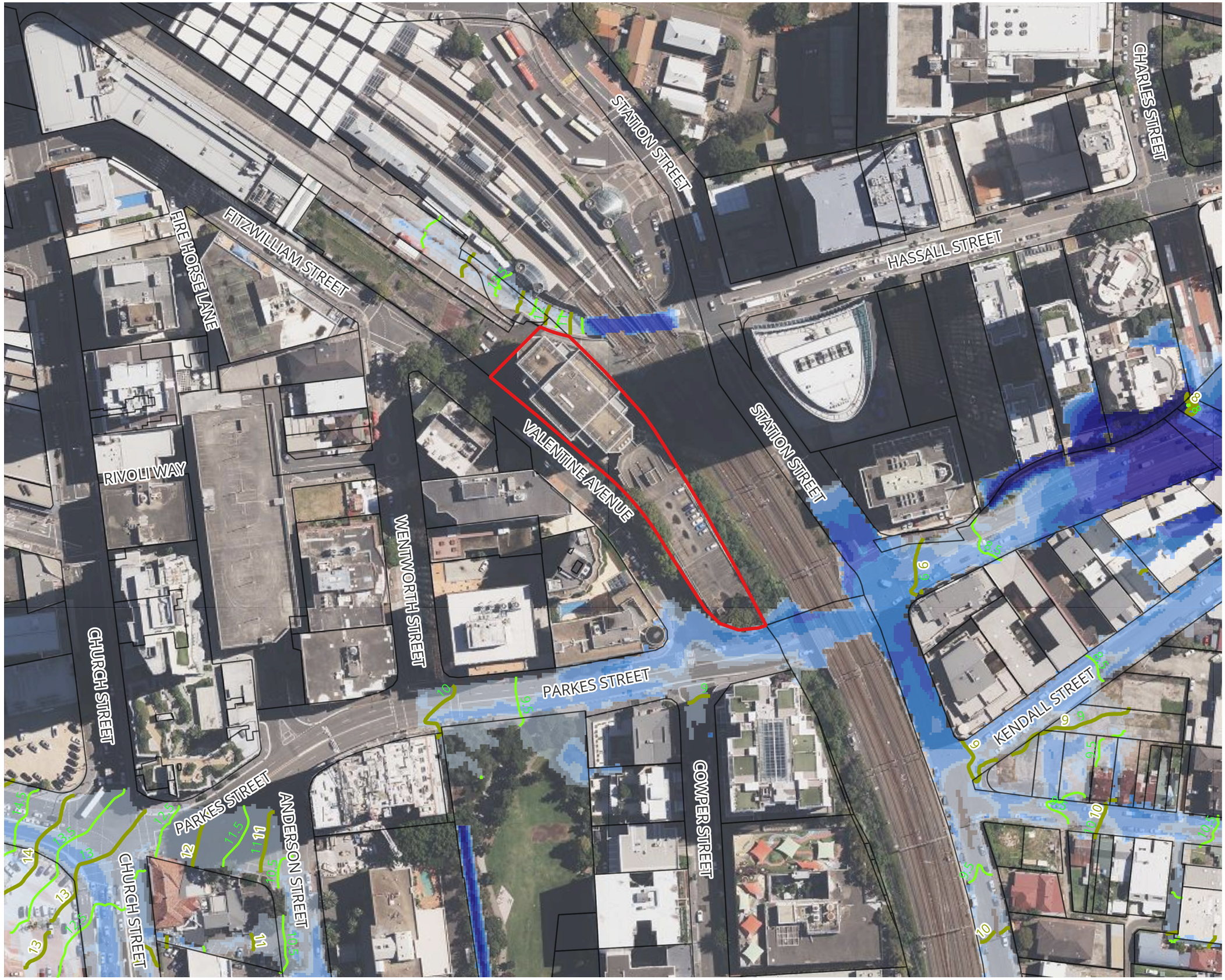
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. A1
EXISTING CASE SCENARIO
20% AEP FLOOD EVENT
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. A2
EXISTING CASE SCENARIO
5% AEP FLOOD EVENT
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

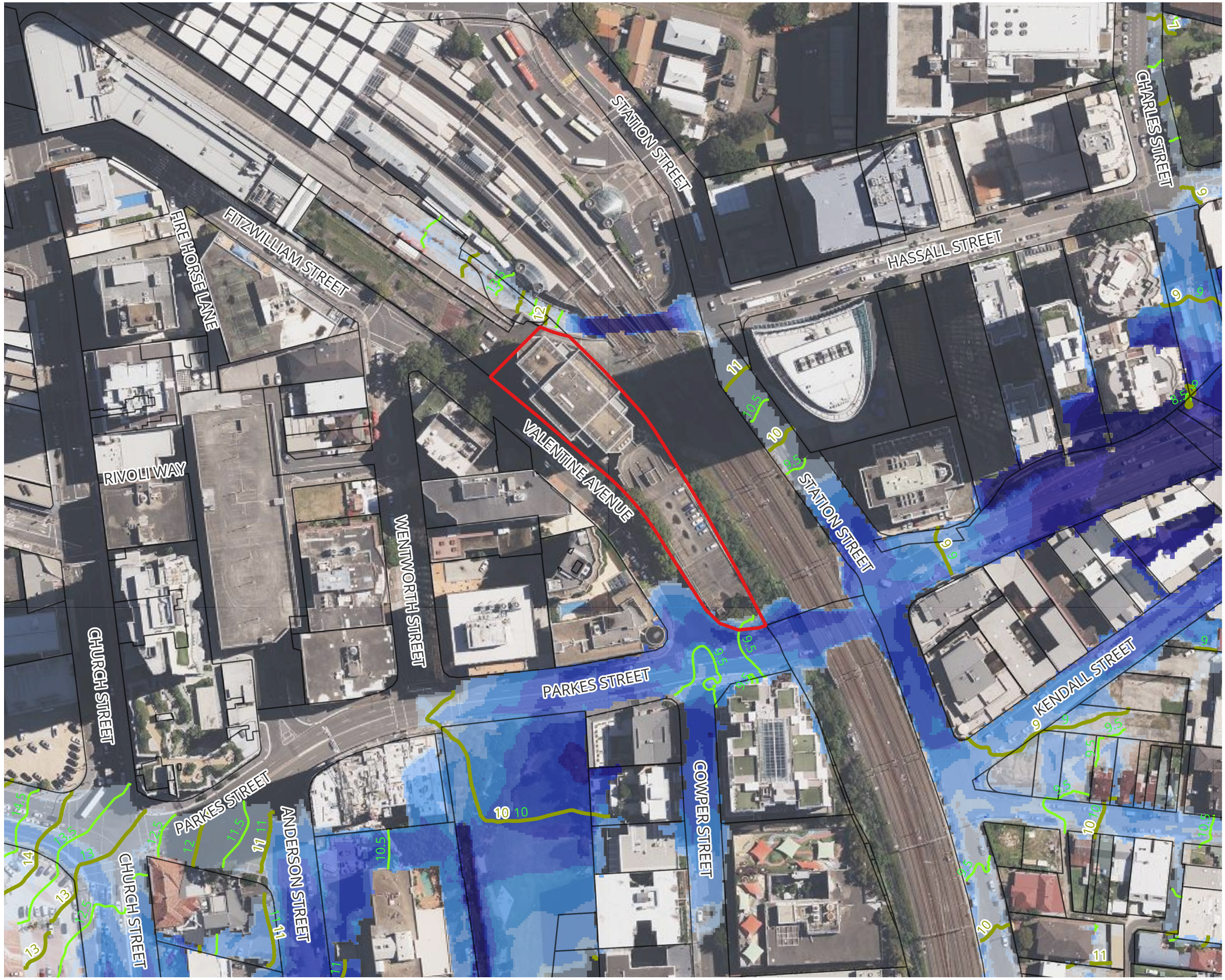
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. A3
EXISTING CASE SCENARIO
FFA 1% AEP FLOOD EVENT
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

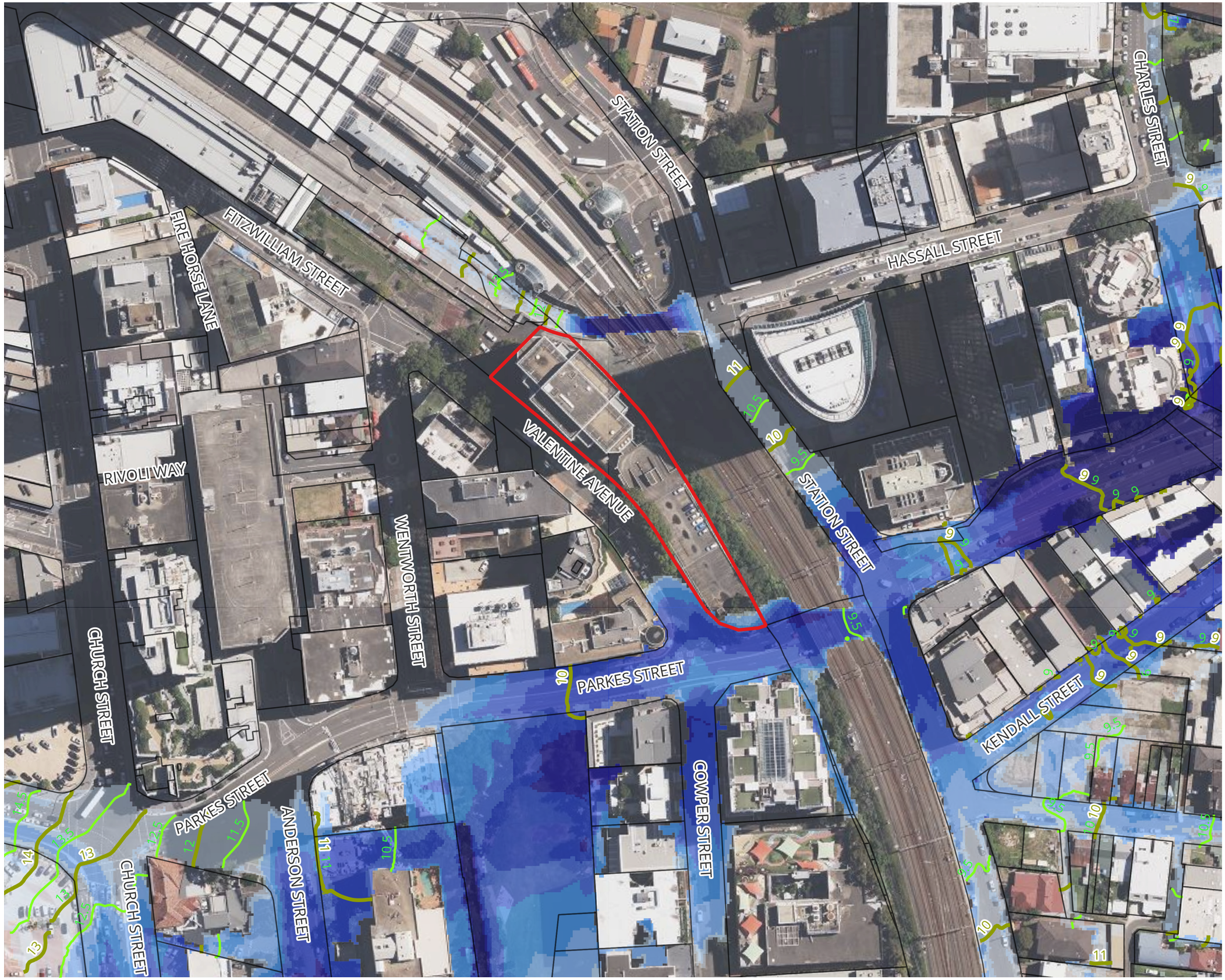
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. A4
EXISTING CASE SCENARIO
0.5% AEP FLOOD EVENT
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

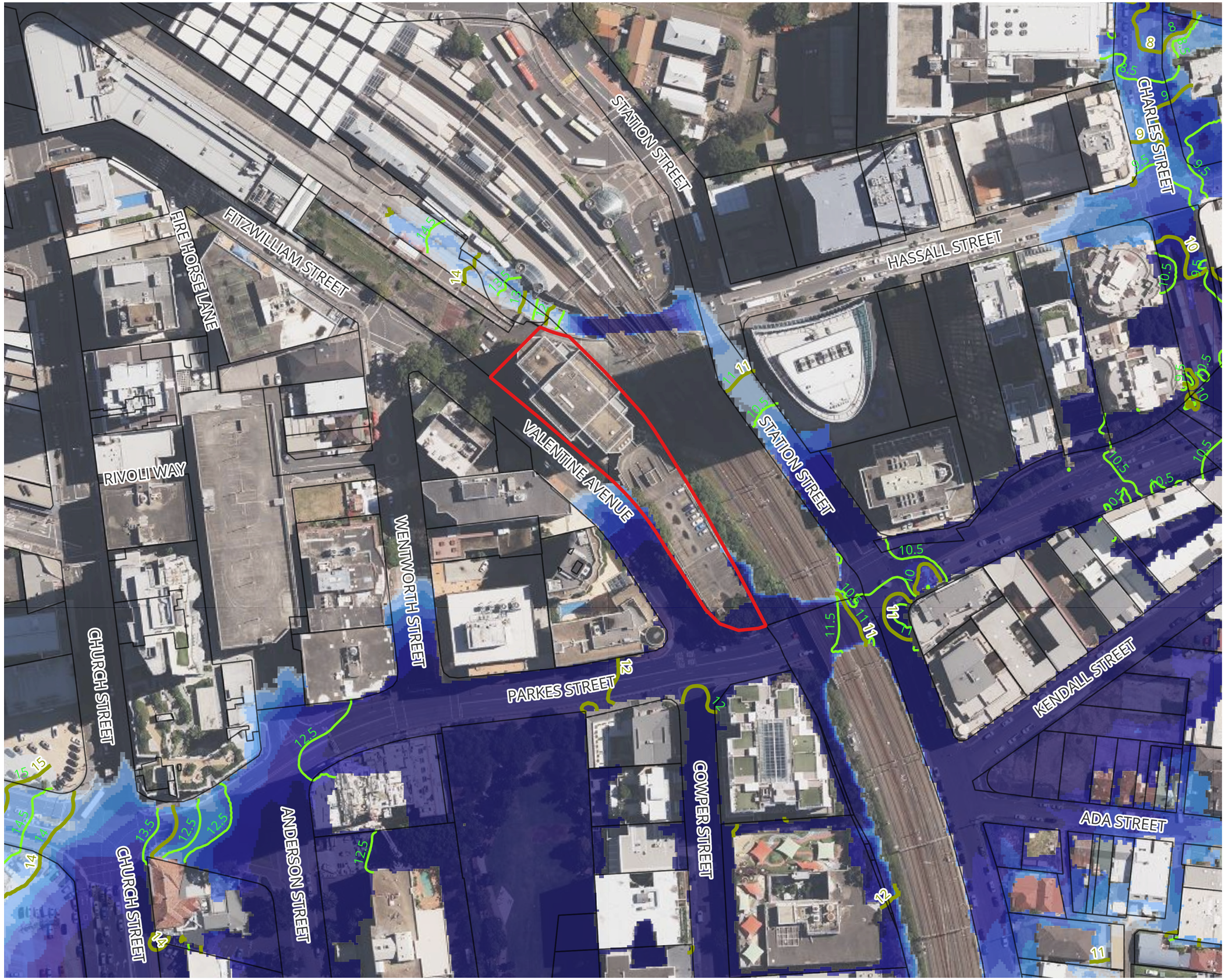
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. A5
EXISTING CASE SCENARIO
0.2% AEP FLOOD EVENT
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

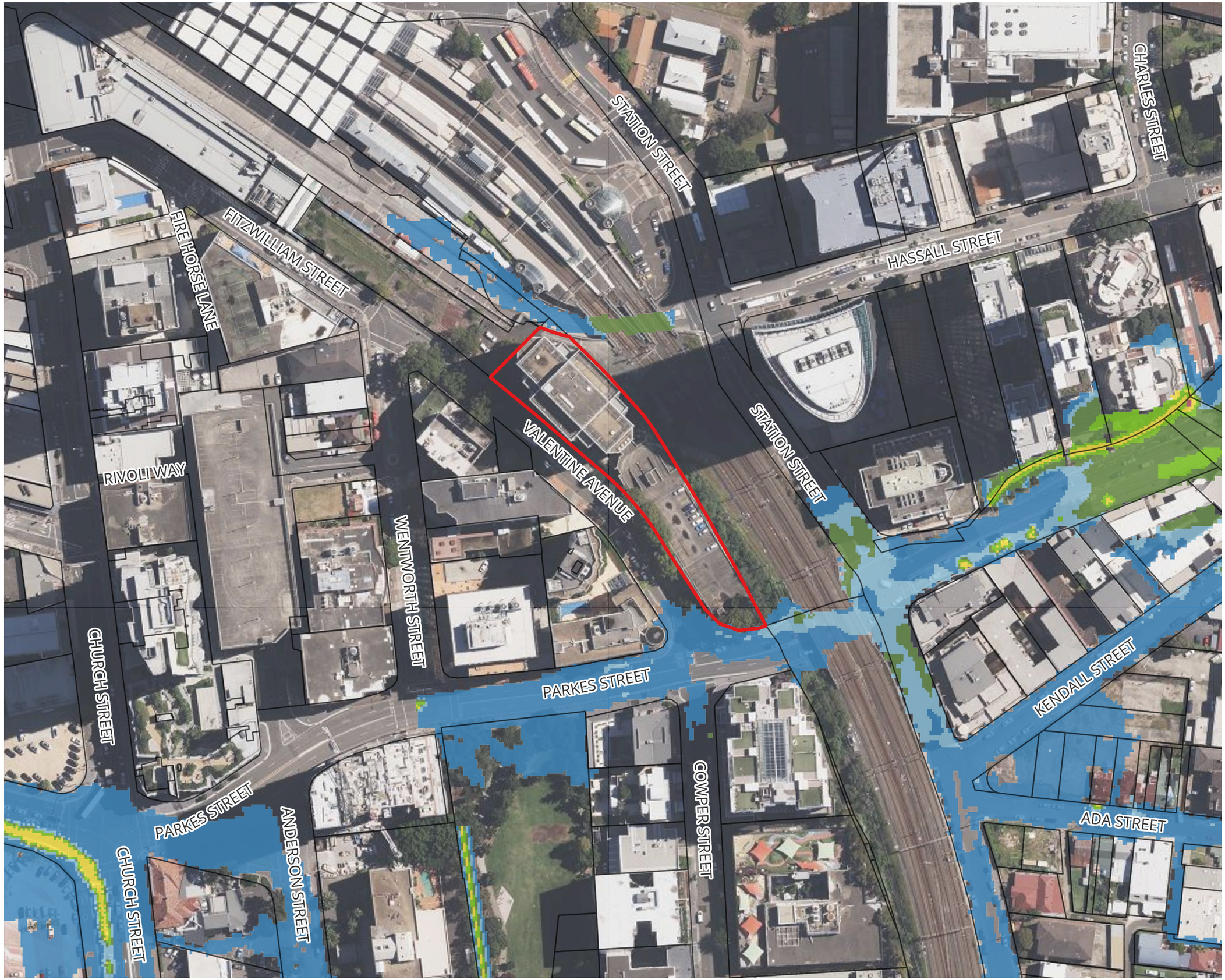
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. A6
EXISTING CASE SCENARIO
PMF FLOOD EVENT
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

Project Boundary

Cadastre

Flood Hazard Category

H1 – generally safe for people, vehicles and buildings

H2 – unsafe for small vehicles

H3 – unsafe for vehicles, children and the elderly

H4 – unsafe for vehicles and people

H5 – unsafe for vehicles and people. Buildings require special engineering design and construction

H6 – unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

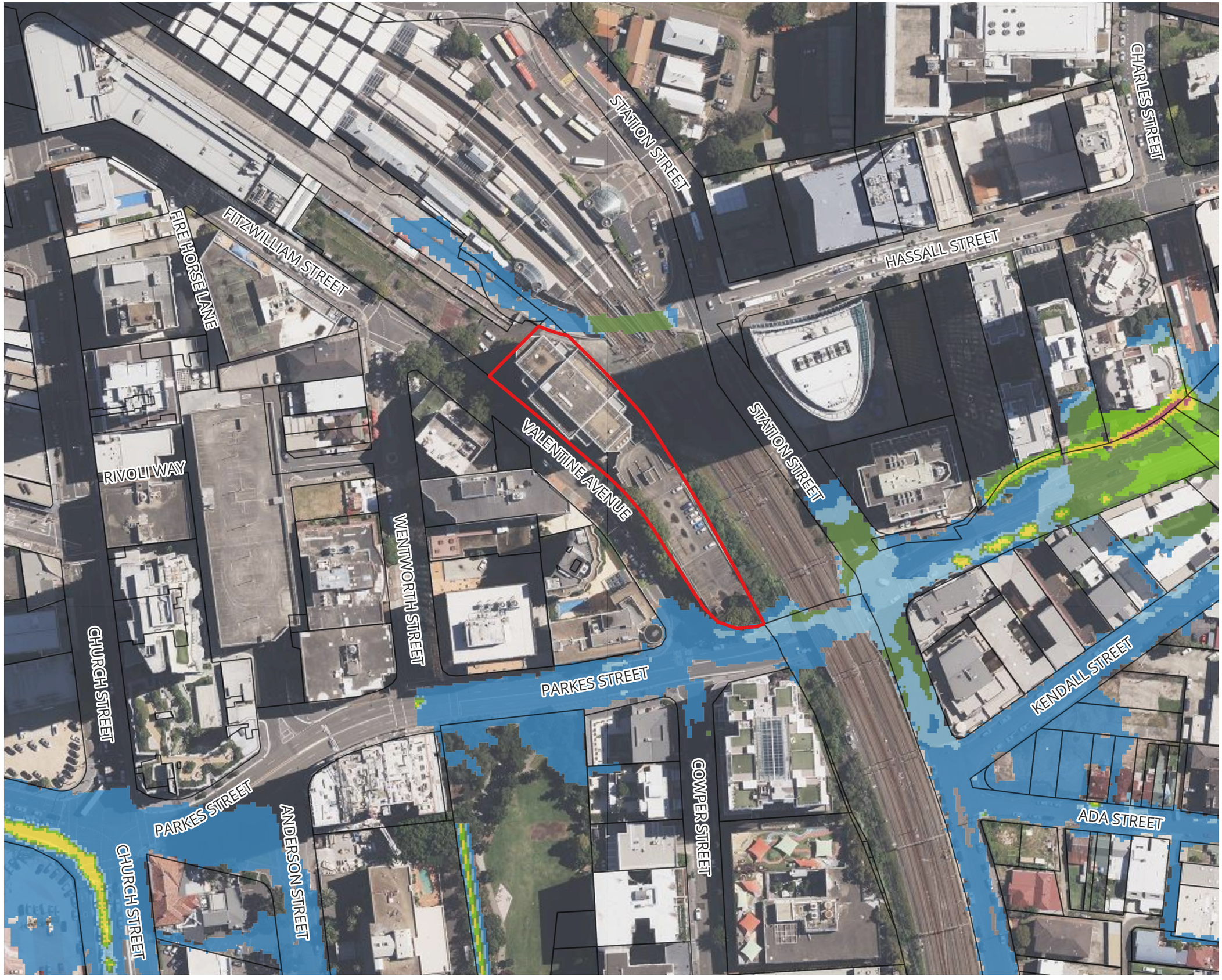
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. A7
EXISTING CASE SCENARIO
20% AEP FLOOD EVENT
FLOOD HAZARD CATEGORY

Job No.	Figure Status
313025	**DRAFT**



Legend

Project Boundary

Cadastre

Flood Hazard Category

H1 – generally safe for people, vehicles and buildings

H2 – unsafe for small vehicles

H3 – unsafe for vehicles, children and the elderly

H4 – unsafe for vehicles and people

H5 – unsafe for vehicles and people. Buildings require special engineering design and construction

H6 – unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client

Holdmark NSW Pty Ltd

Job Title

2-10 Valentine Avenue

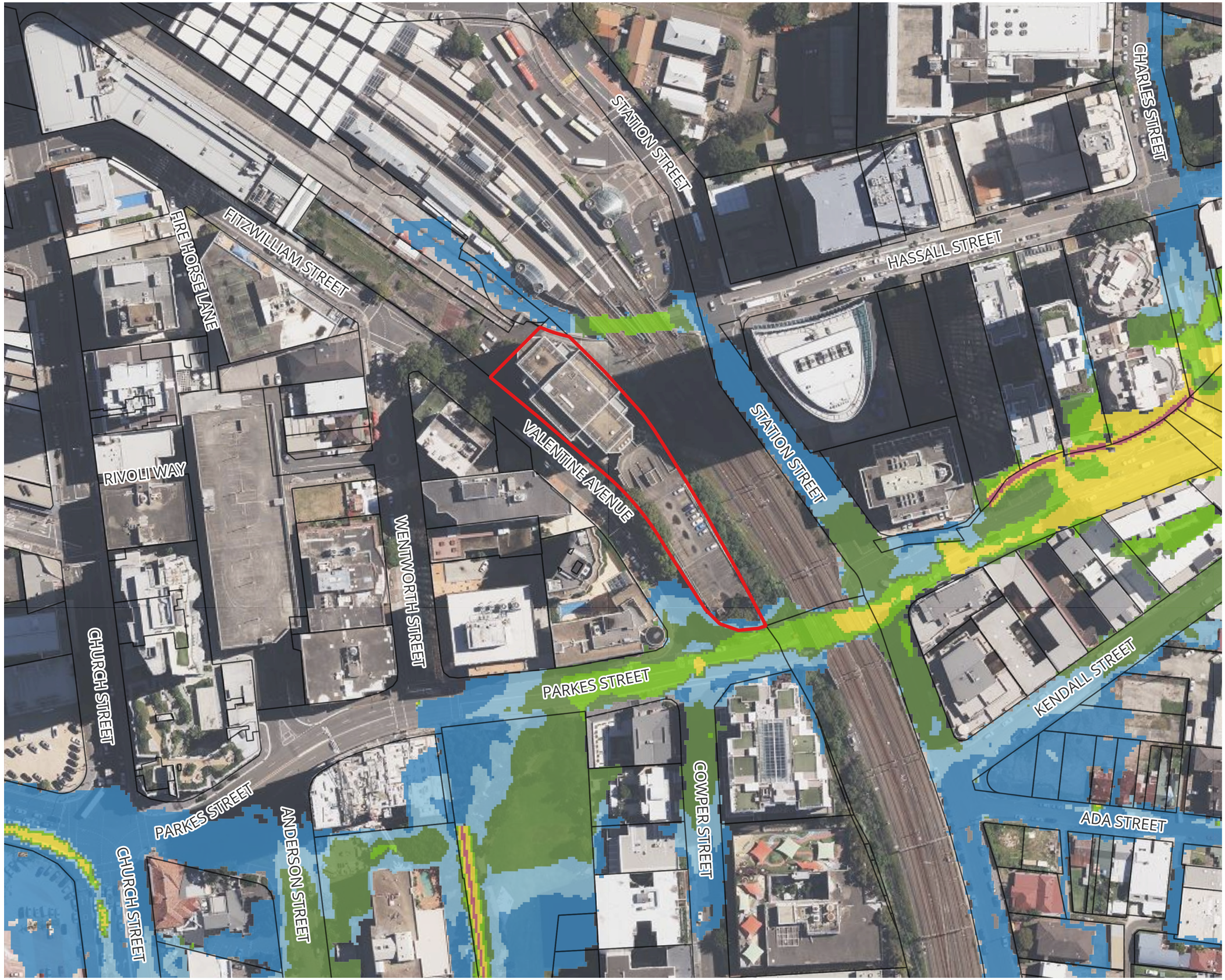
0 25 50 m

Scale at A3 1:1,500

Figure No. A8

EXISTING CASE SCENARIO
5% AEP FLOOD EVENT
FLOOD HAZARD CATEGORY

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre

Flood Hazard Category

- **H1 –** generally safe for people, vehicles and buildings
- **H2 –** unsafe for small vehicles
- **H3 –** unsafe for vehicles, children and the elderly
- **H4 –** unsafe for vehicles and people
- **H5 –** unsafe for vehicles and people. Buildings require special engineering design and construction
- **H6 –** unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. A9
EXISTING CASE SCENARIO
FFA 1% AEP FLOOD EVENT
FLOOD HAZARD CATEGORY

Job No.	Figure Status
313025	**DRAFT**



Legend

Project Boundary

Cadastre

Flood Hazard Category

H1 – generally safe for people, vehicles and buildings

H2 – unsafe for small vehicles

H3 – unsafe for vehicles, children and the elderly

H4 – unsafe for vehicles and people

H5 – unsafe for vehicles and people. Buildings require special engineering design and construction

H6 – unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. A10
EXISTING CASE SCENARIO
0.5% AEP FLOOD EVENT
FLOOD HAZARD CATEGORY

Job No.	Figure Status
313025	**DRAFT**



Legend

Project Boundary

Cadastre

Flood Hazard Category

H1 – generally safe for people, vehicles and buildings

H2 – unsafe for small vehicles

H3 – unsafe for vehicles, children and the elderly

H4 – unsafe for vehicles and people

H5 – unsafe for vehicles and people. Buildings require special engineering design and construction

H6 – unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. A11
EXISTING CASE SCENARIO
0.2% AEP FLOOD EVENT
FLOOD HAZARD CATEGORY

Job No.
313025

Figure Status
DRAFT



Legend

Project Boundary

Cadastre

Flood Hazard Category

H1 – generally safe for people, vehicles and buildings

H2 – unsafe for small vehicles

H3 – unsafe for vehicles, children and the elderly

H4 – unsafe for vehicles and people

H5 – unsafe for vehicles and people. Buildings require special engineering design and construction

H6 – unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

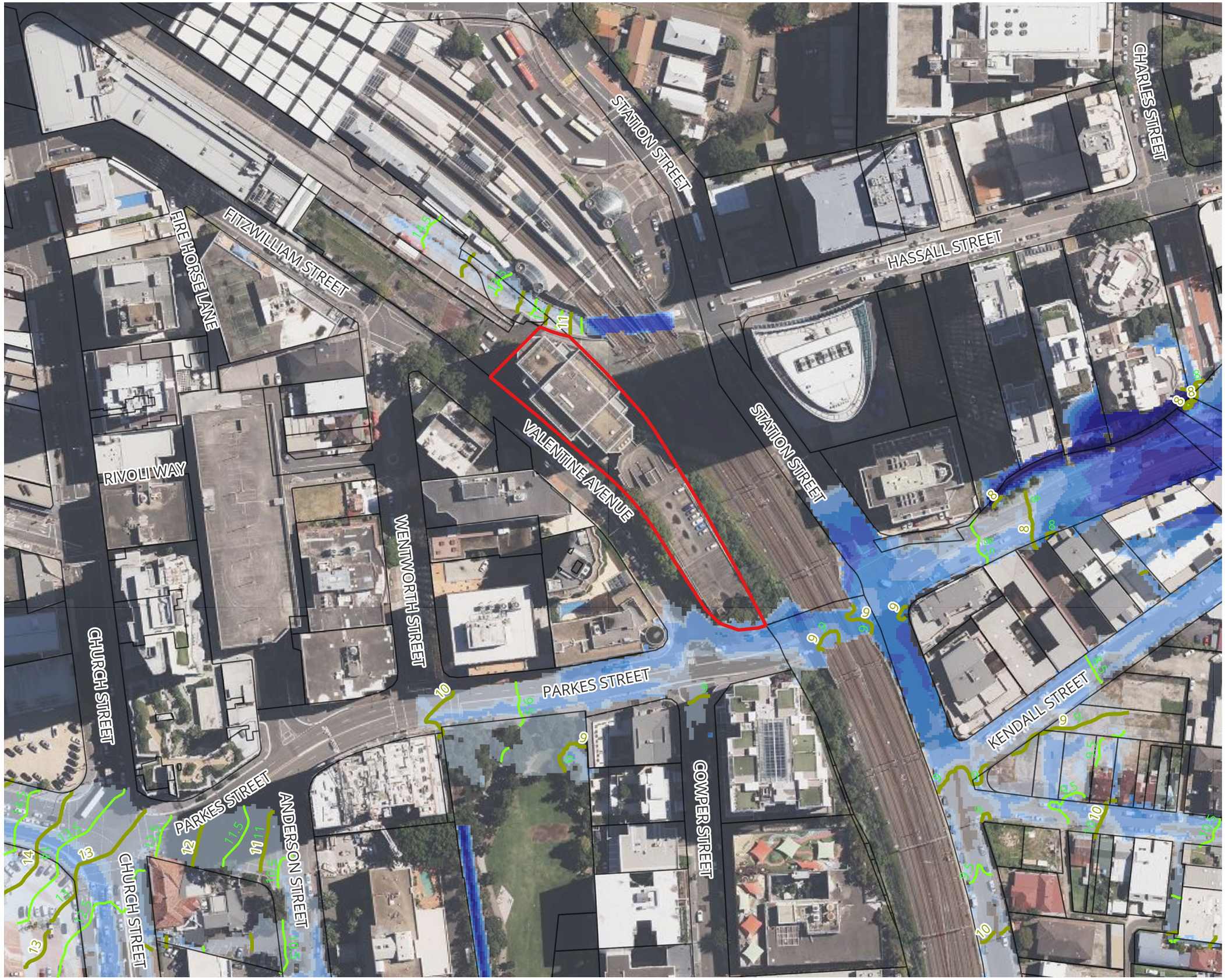
Scale at A3 1:1,500

Figure No. A12
EXISTING CASE SCENARIO
PMF FLOOD EVENT
FLOOD HAZARD CATEGORY

Job No.	Figure Status
313025	**DRAFT**

Appendix B

Proposed Case Flood Mapping



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

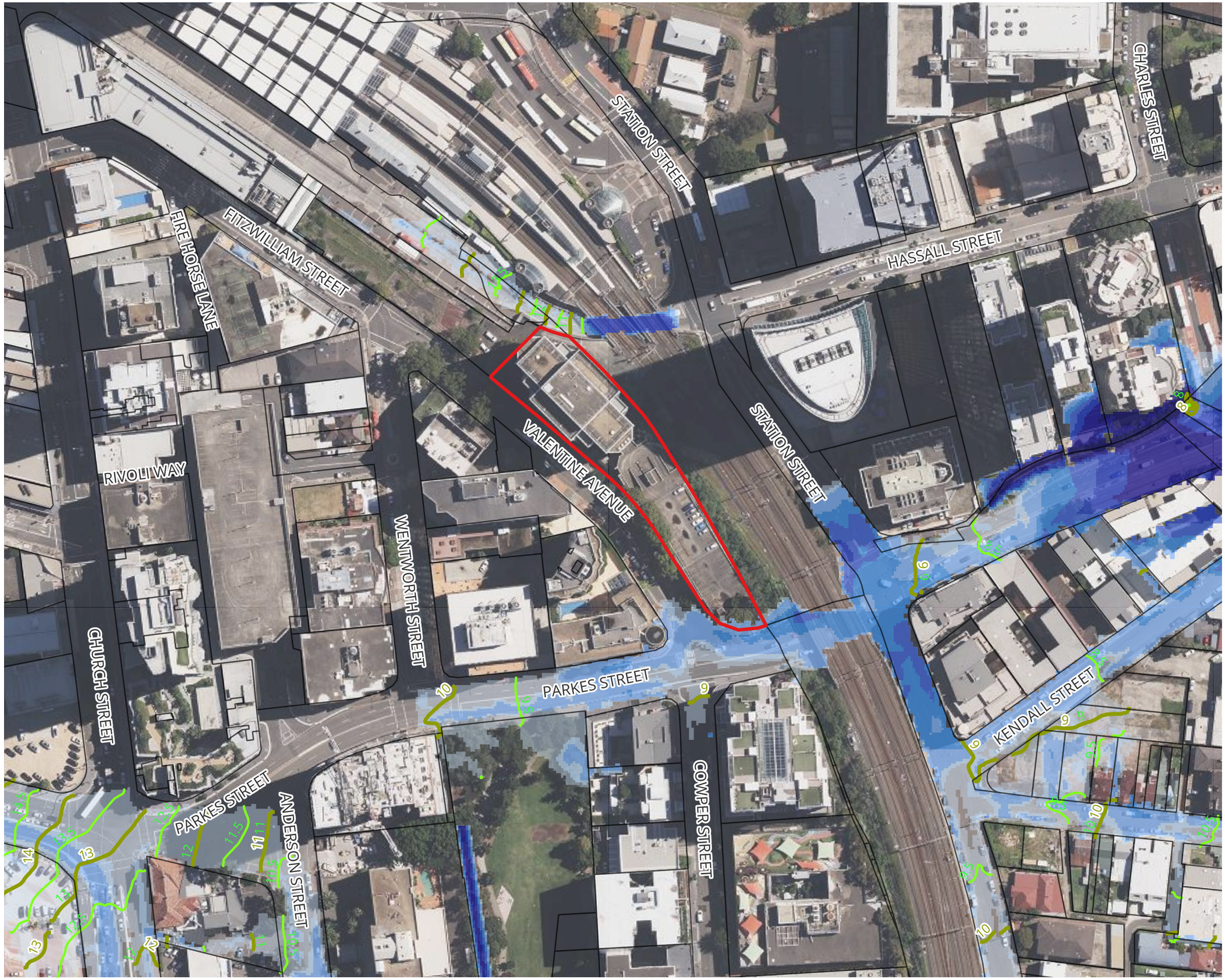
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B1
PROPOSED CASE SCENARIO
20% AEP FLOOD EVENT
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

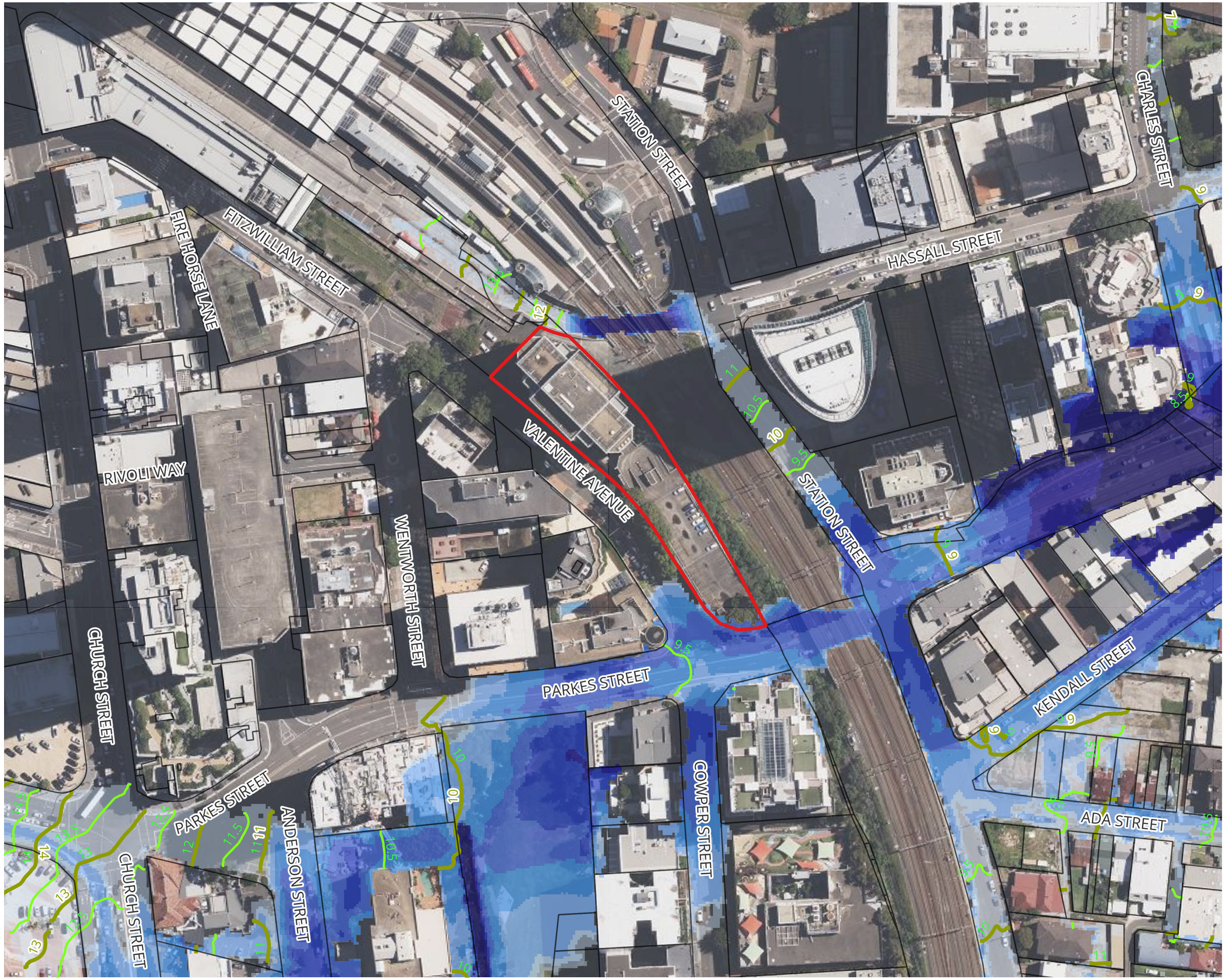
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B2
PROPOSED CASE SCENARIO
5% AEP FLOOD EVENT
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

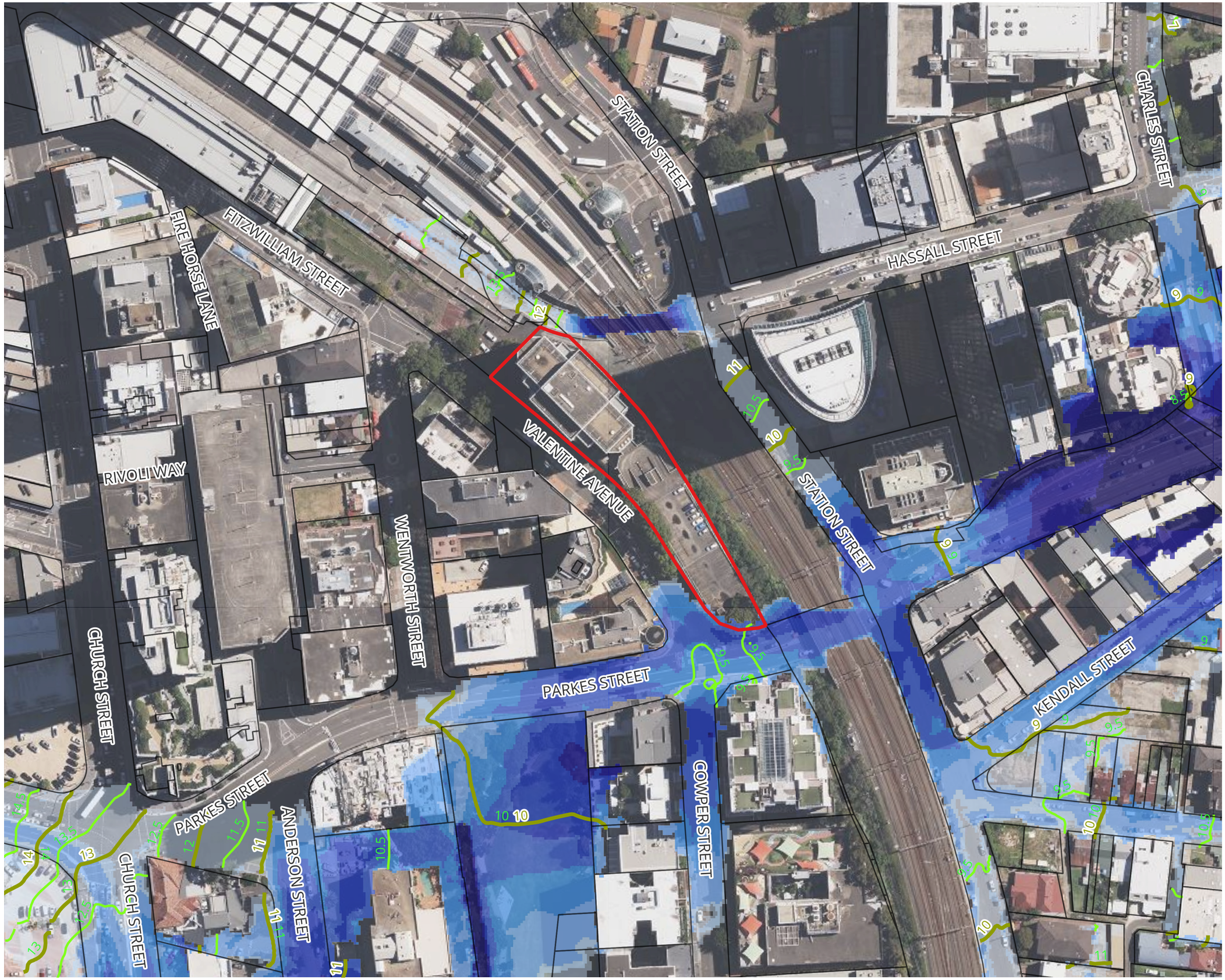
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B3
PROPOSED CASE SCENARIO
FFA 1% AEP FLOOD EVENT
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

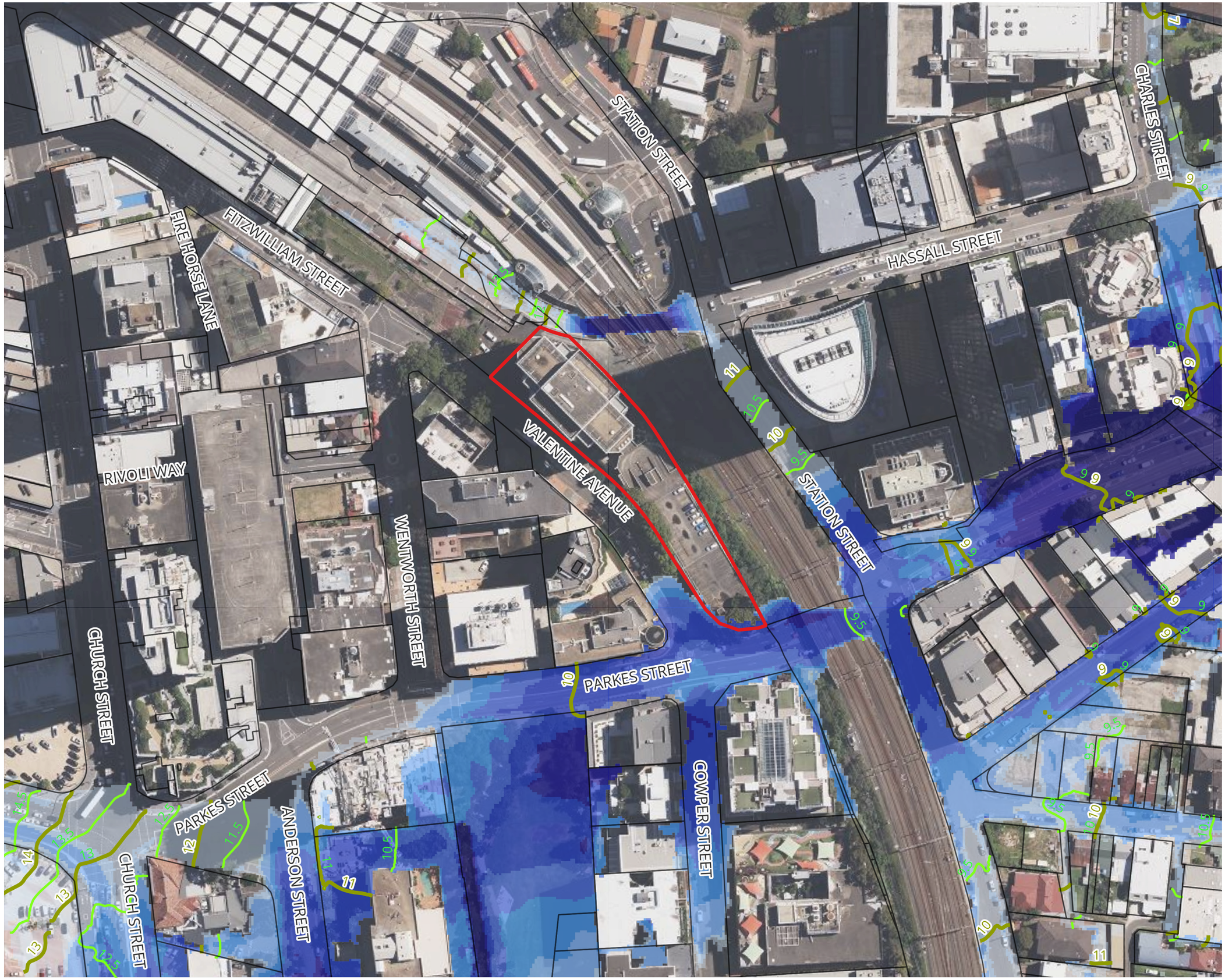
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B4
PROPOSED CASE SCENARIO
0.5% AEP FLOOD EVENT
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

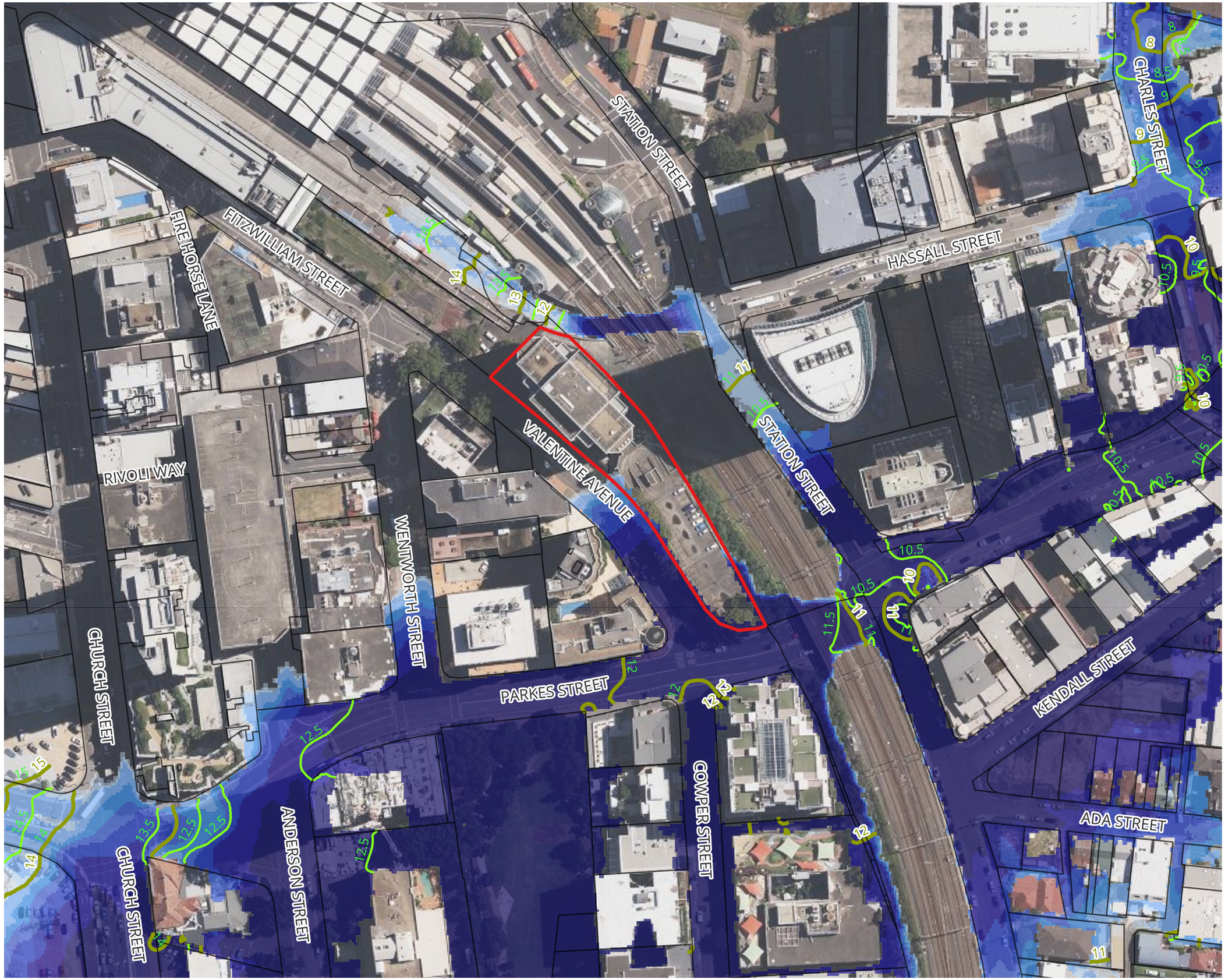
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B5
PROPOSED CASE SCENARIO
0.2% AEP FLOOD EVENT
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

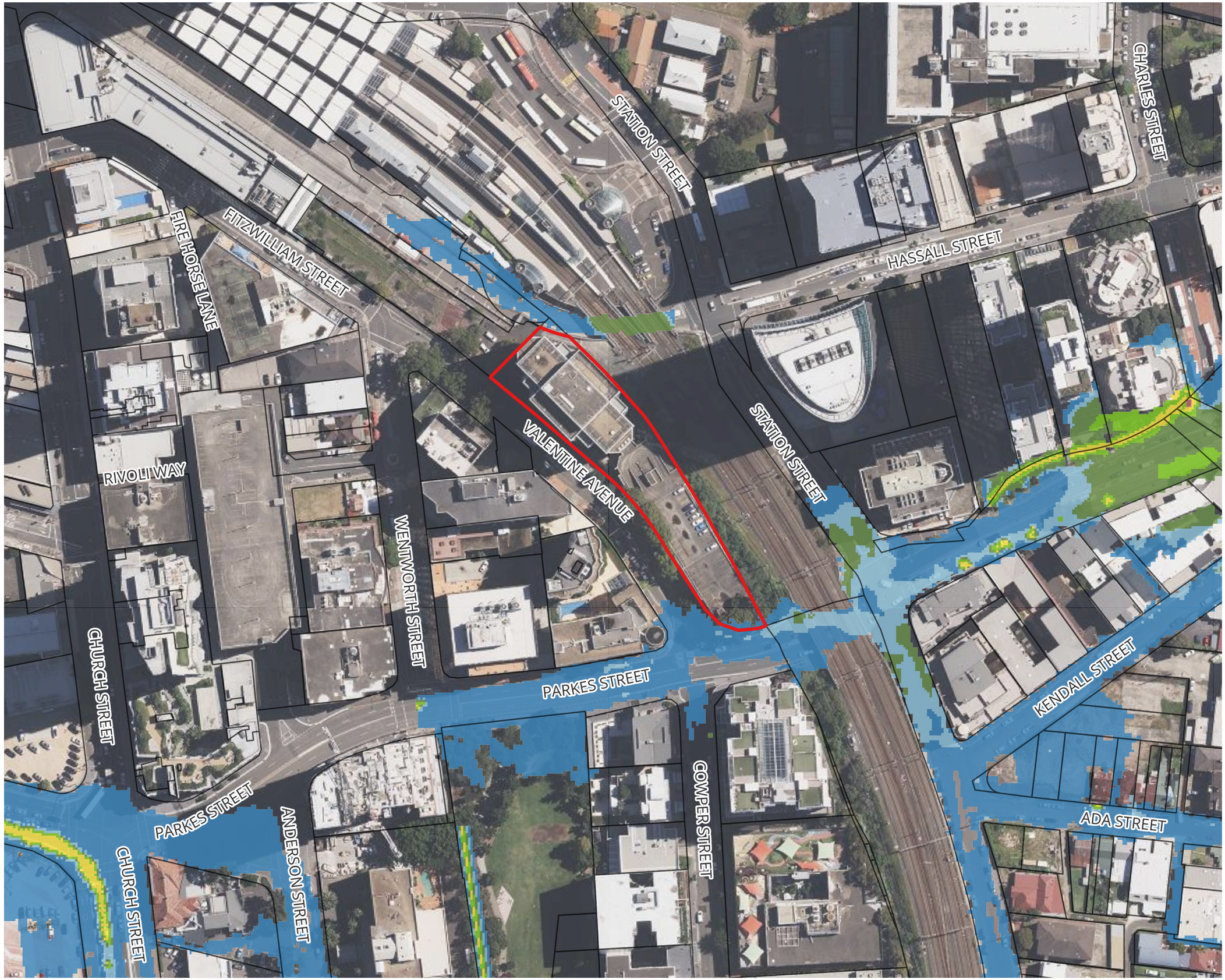
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B6
PROPOSED SCENARIO
PMF FLOOD EVENT
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

Project Boundary

Cadastre

Flood Hazard Category

H1 – generally safe for people, vehicles and buildings

H2 – unsafe for small vehicles

H3 – unsafe for vehicles, children and the elderly

H4 – unsafe for vehicles and people

H5 – unsafe for vehicles and people. Buildings require special engineering design and construction

H6 – unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

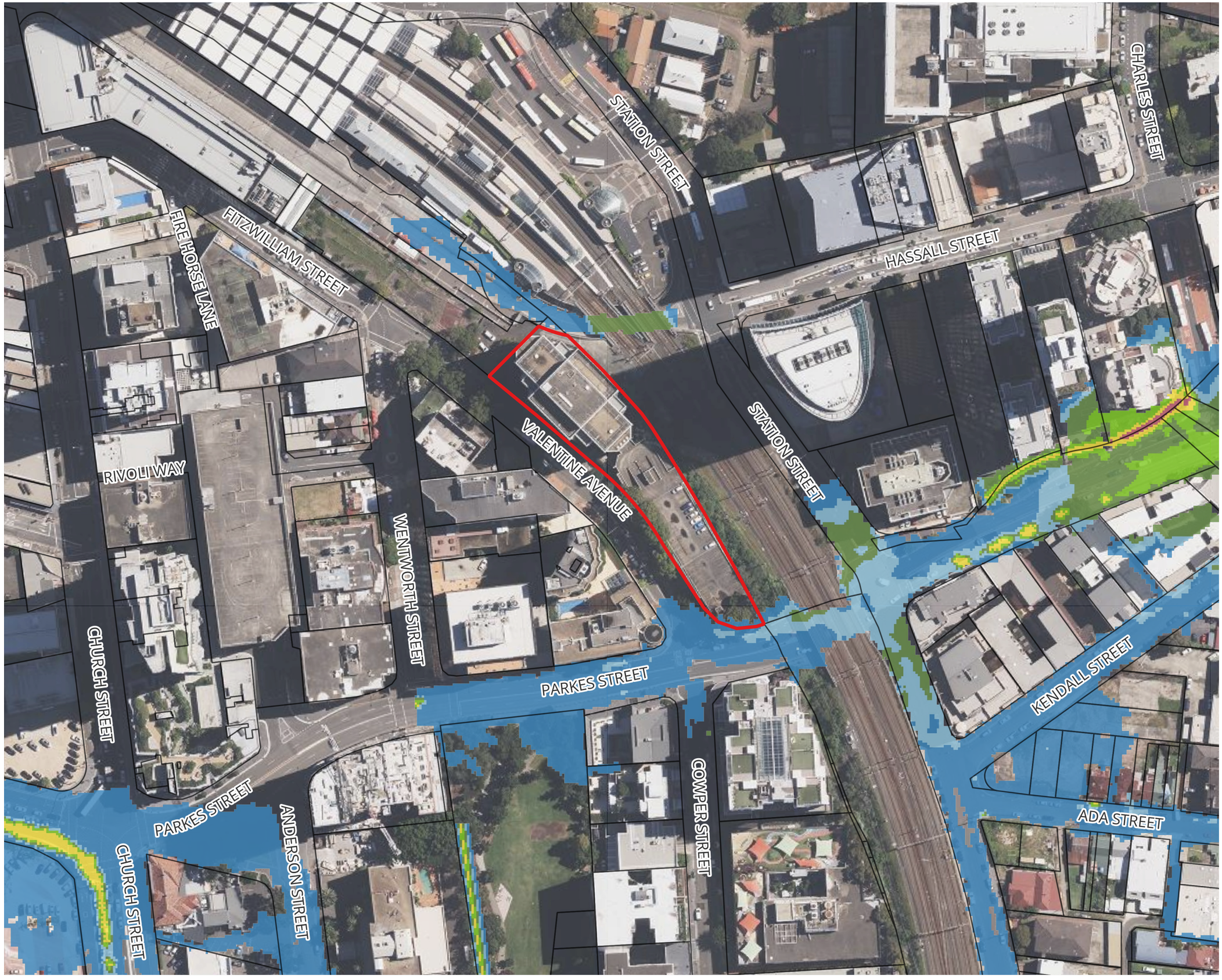
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B7
PROPOSED CASE SCENARIO
20% AEP FLOOD EVENT
FLOOD HAZARD CATEGORY

Job No.	Figure Status
313025	**DRAFT**



Legend

Project Boundary

Cadastre

Flood Hazard Category

H1 – generally safe for people, vehicles and buildings

H2 – unsafe for small vehicles

H3 – unsafe for vehicles, children and the elderly

H4 – unsafe for vehicles and people

H5 – unsafe for vehicles and people. Buildings require special engineering design and construction

H6 – unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client

Holdmark NSW Pty Ltd

Job Title

2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B8

PROPOSED CASE SCENARIO
5% AEP FLOOD EVENT
FLOOD HAZARD CATEGORY

Job No.	Figure Status
313025	**DRAFT**



Legend

Project Boundary

Cadastre

Flood Hazard Category

H1 – generally safe for people, vehicles and buildings

H2 – unsafe for small vehicles

H3 – unsafe for vehicles, children and the elderly

H4 – unsafe for vehicles and people

H5 – unsafe for vehicles and people. Buildings require special engineering design and construction

H6 – unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B9
PROPOSED CASE SCENARIO
FFA 1% AEP FLOOD EVENT
FLOOD HAZARD CATEGORY

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre

Flood Hazard Category

- **H1 –** generally safe for people, vehicles and buildings
- **H2 –** unsafe for small vehicles
- **H3 –** unsafe for vehicles, children and the elderly
- **H4 –** unsafe for vehicles and people
- **H5 –** unsafe for vehicles and people. Buildings require special engineering design and construction
- **H6 –** unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B10
PROPOSED CASE SCENARIO
0.5% AEP FLOOD EVENT
FLOOD HAZARD CATEGORY

Job No.	Figure Status
313025	**DRAFT**



Legend

Project Boundary

Cadastre

Flood Hazard Category

H1 – generally safe for people, vehicles and buildings

H2 – unsafe for small vehicles

H3 – unsafe for vehicles, children and the elderly

H4 – unsafe for vehicles and people

H5 – unsafe for vehicles and people. Buildings require special engineering design and construction

H6 – unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B11
PROPOSED CASE SCENARIO
0.2% AEP FLOOD EVENT
FLOOD HAZARD CATEGORY

Job No.	Figure Status
313025	**DRAFT**



Legend

Project Boundary

Cadastre

Flood Hazard Category

H1 – generally safe for people, vehicles and buildings

H2 – unsafe for small vehicles

H3 – unsafe for vehicles, children and the elderly

H4 – unsafe for vehicles and people

H5 – unsafe for vehicles and people. Buildings require special engineering design and construction

H6 – unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B12
PROPOSED CASE SCENARIO
PMF FLOOD EVENT
FLOOD HAZARD CATEGORY

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre

Afflux

Difference in Water Levels (m)

Improvement
- < -0.5
- -0.5 to -0.3
- -0.3 to -0.1
- -0.1 to -0.05
- -0.05 to -0.03
- -0.03 to -0.01
- -0.01 to 0.01

Worsening
- 0.01 to 0.03
- 0.03 to 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- > 0.5

Change in Flood Extent
- Was dry now wet
- Was wet now dry

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B13
PROPOSED CASE SCENARIO
20% AEP FLOOD EVENT
AFFLUX

Job No.	Figure Status
313025	**DRAFT**



Legend

Project Boundary

Cadastre

Afflux

Difference in Water Levels (m)

Improvement

< -0.5

-0.5 to -0.3

-0.3 to -0.1

-0.1 to -0.05

-0.05 to -0.03

-0.03 to -0.01

-0.01 to 0.01

Worsening

0.01 to 0.03

0.03 to 0.05

0.05 to 0.1

0.1 to 0.3

0.3 to 0.5

> 0.5

Change in Flood Extent

Was dry now wet

Was wet now dry

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client

Holdmark NSW Pty Ltd

Job Title

2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B14

PROPOSED CASE SCENARIO
5% AEP FLOOD EVENT
AFFLUX

Job No.	Figure Status
313025	**DRAFT**



Legend

Project Boundary

Cadastre

Afflux

Difference in Water Levels (m)

Improvement

< -0.5

-0.5 to -0.3

-0.3 to -0.1

-0.1 to -0.05

-0.05 to -0.03

-0.03 to -0.01

-0.01 to 0.01

Worsening

0.01 to 0.03

0.03 to 0.05

0.05 to 0.1

0.1 to 0.3

0.3 to 0.5

> 0.5

Change in Flood Extent

Was dry now wet

Was wet now dry

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B15
PROPOSED CASE SCENARIO
FFA 1% AEP FLOOD EVENT
AFFLUX

Job No.
313025

Figure Status
DRAFT



Legend

Project Boundary

Cadastre

Afflux

Difference in Water Levels (m)

Improvement

< -0.5

-0.5 to -0.3

-0.3 to -0.1

-0.1 to -0.05

-0.05 to -0.03

-0.03 to -0.01

-0.01 to 0.01

Worsening

0.01 to 0.03

0.03 to 0.05

0.05 to 0.1

0.1 to 0.3

0.3 to 0.5

> 0.5

Change in Flood Extent

Was dry now wet

Was wet now dry

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B16
PROPOSED CASE SCENARIO
0.5% AEP FLOOD EVENT
AFFLUX

Job No.
313025

Figure Status
DRAFT



Legend

Project Boundary

Cadastre

Afflux

Difference in Water Levels (m)

Improvement

< -0.5

-0.5 to -0.3

-0.3 to -0.1

-0.1 to -0.05

-0.05 to -0.03

-0.03 to -0.01

-0.01 to 0.01

Worsening

0.01 to 0.03

0.03 to 0.05

0.05 to 0.1

0.1 to 0.3

0.3 to 0.5

> 0.5

Change in Flood Extent

Was dry now wet

Was wet now dry

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. B17
PROPOSED CASE SCENARIO
0.2% AEP FLOOD EVENT
AFFLUX

Job No.
313025

Figure Status
DRAFT



Legend

Project Boundary

Cadastre

Afflux

Difference in Water Levels (m)

Improvement

< -0.5

-0.5 to -0.3

-0.3 to -0.1

-0.1 to -0.05

-0.05 to -0.03

-0.03 to -0.01

-0.01 to 0.01

Worsening

0.01 to 0.03

0.03 to 0.05

0.05 to 0.1

0.1 to 0.3

0.3 to 0.5

> 0.5

Change in Flood Extent

Was dry now wet

Was wet now dry

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

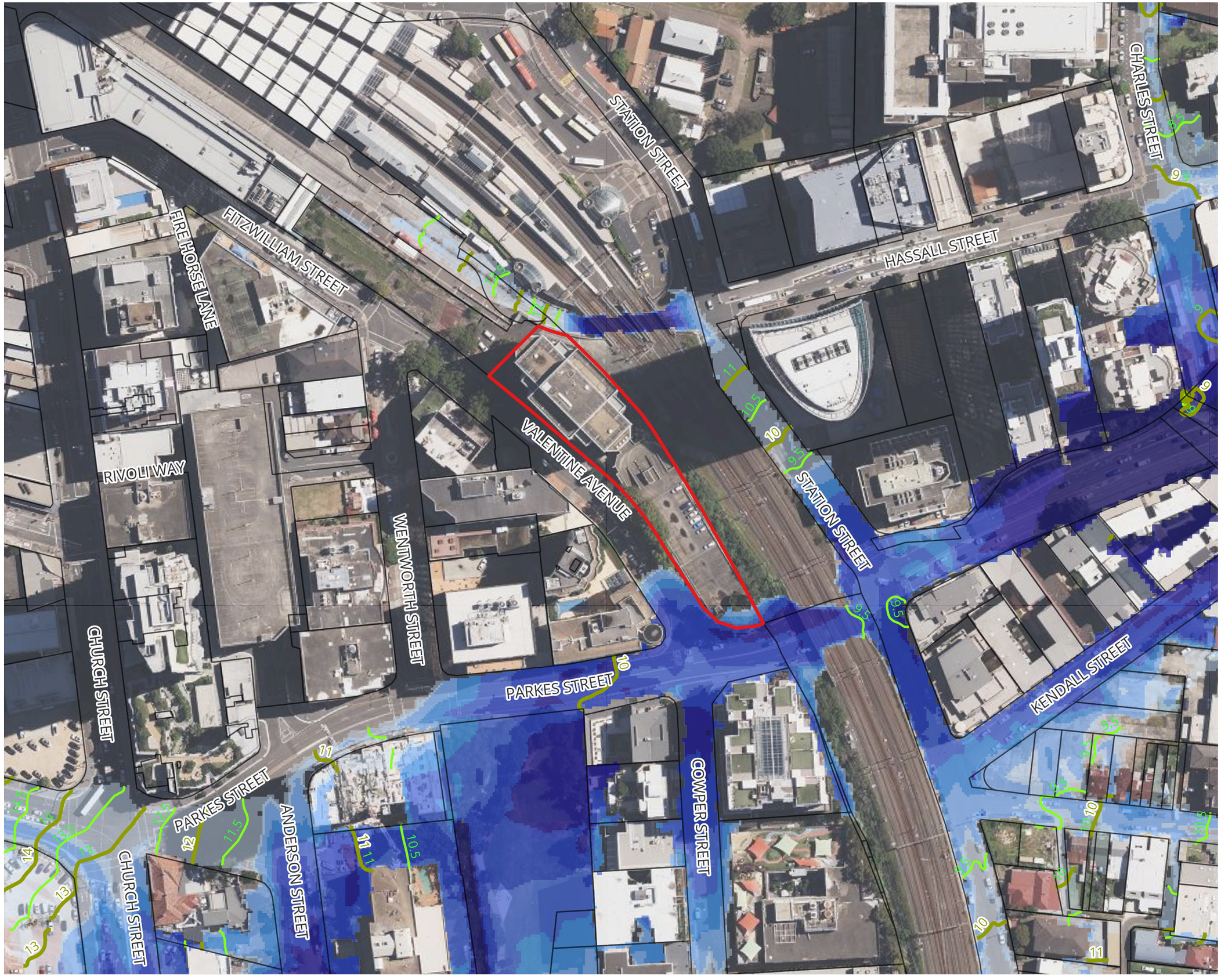
Scale at A3 1:1,500

Figure No. B18
PROPOSED CASE SCENARIO
PMF FLOOD EVENT
AFFLUX

Job No.	Figure Status
313025	**DRAFT**

Appendix C

2100 Climate Change Flood Mapping



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

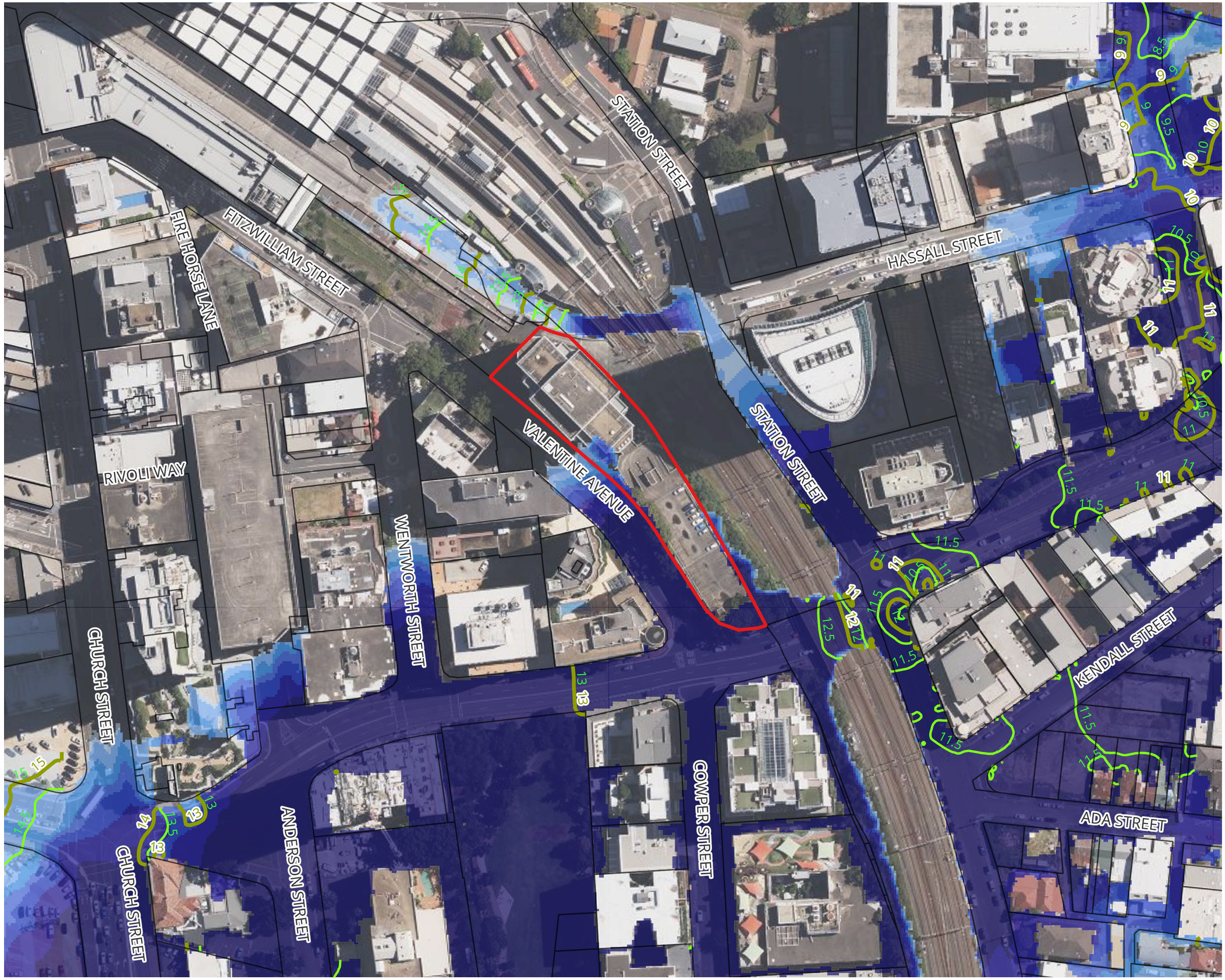
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. C1
EXISTING CASE SCENARIO
1% AEP + CLIMATE CHANGE
SSP3-7.0 AT YEAR-2100
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. C2
EXISTING CASE SCENARIO
PMF + CLIMATE CHANGE
SSP3-7.0 AT YEAR-2100
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre

Flood Hazard Category

- **H1 –** generally safe for people, vehicles and buildings
- **H2 –** unsafe for small vehicles
- **H3 –** unsafe for vehicles, children and the elderly
- **H4 –** unsafe for vehicles and people
- **H5 –** unsafe for vehicles and people. Buildings require special engineering design and construction
- **H6 –** unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. C3
EXISTING CASE SCENARIO
1% AEP + CLIMATE CHANGE
SSP3-7.0 AT YEAR-2100
FLOOD HAZARD CATEGORY

Job No.
313025

Figure Status
DRAFT



Legend

- Project Boundary
- Cadastre

Flood Hazard Category

- **H1 –** generally safe for people, vehicles and buildings
- **H2 –** unsafe for small vehicles
- **H3 –** unsafe for vehicles, children and the elderly
- **H4 –** unsafe for vehicles and people
- **H5 –** unsafe for vehicles and people. Buildings require special engineering design and construction
- **H6 –** unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

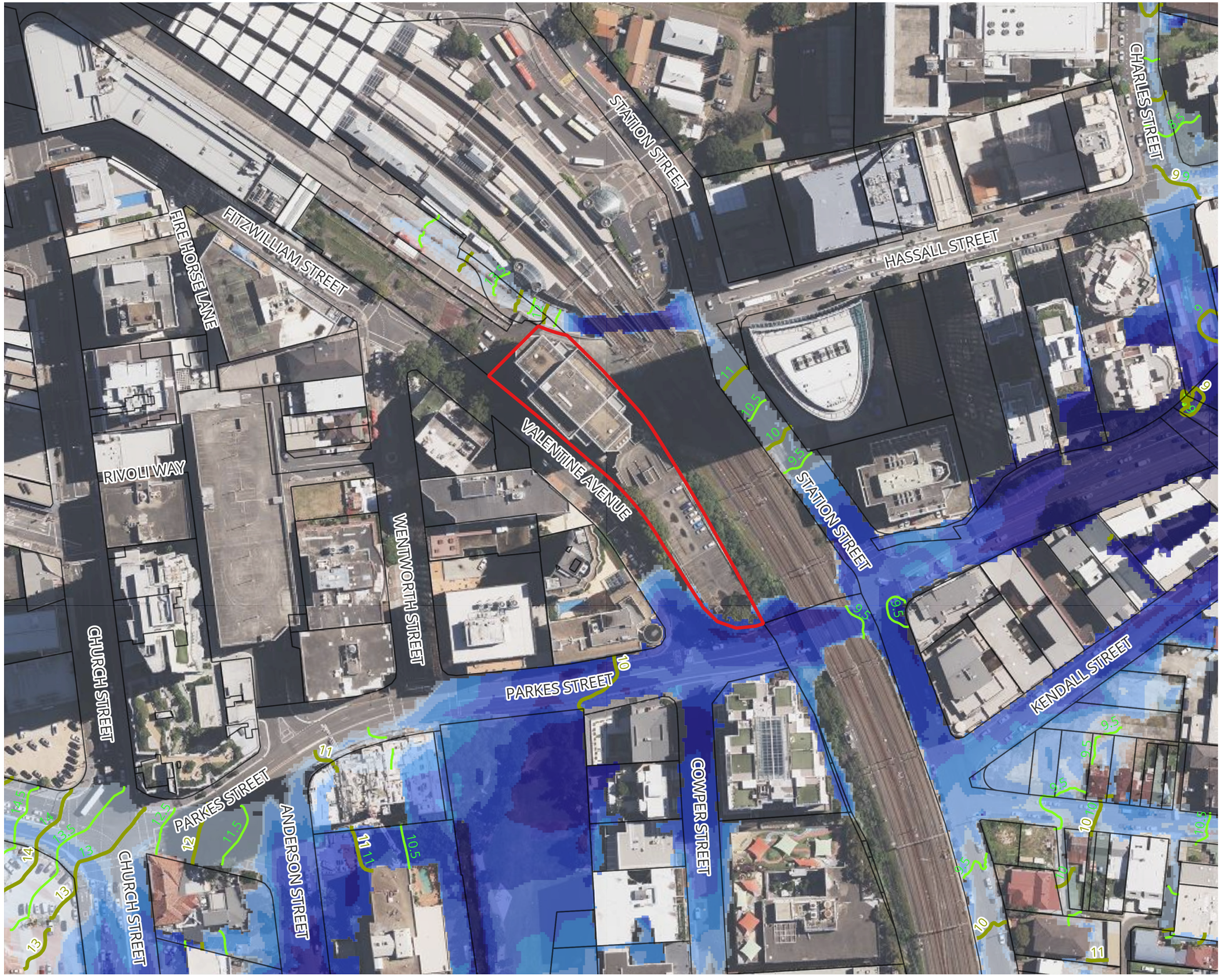
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. C4
EXISTING CASE SCENARIO
PMF + CLIMATE CHANGE
SSP3-7.0 AT YEAR-2100
FLOOD HAZARD CATEGORY

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

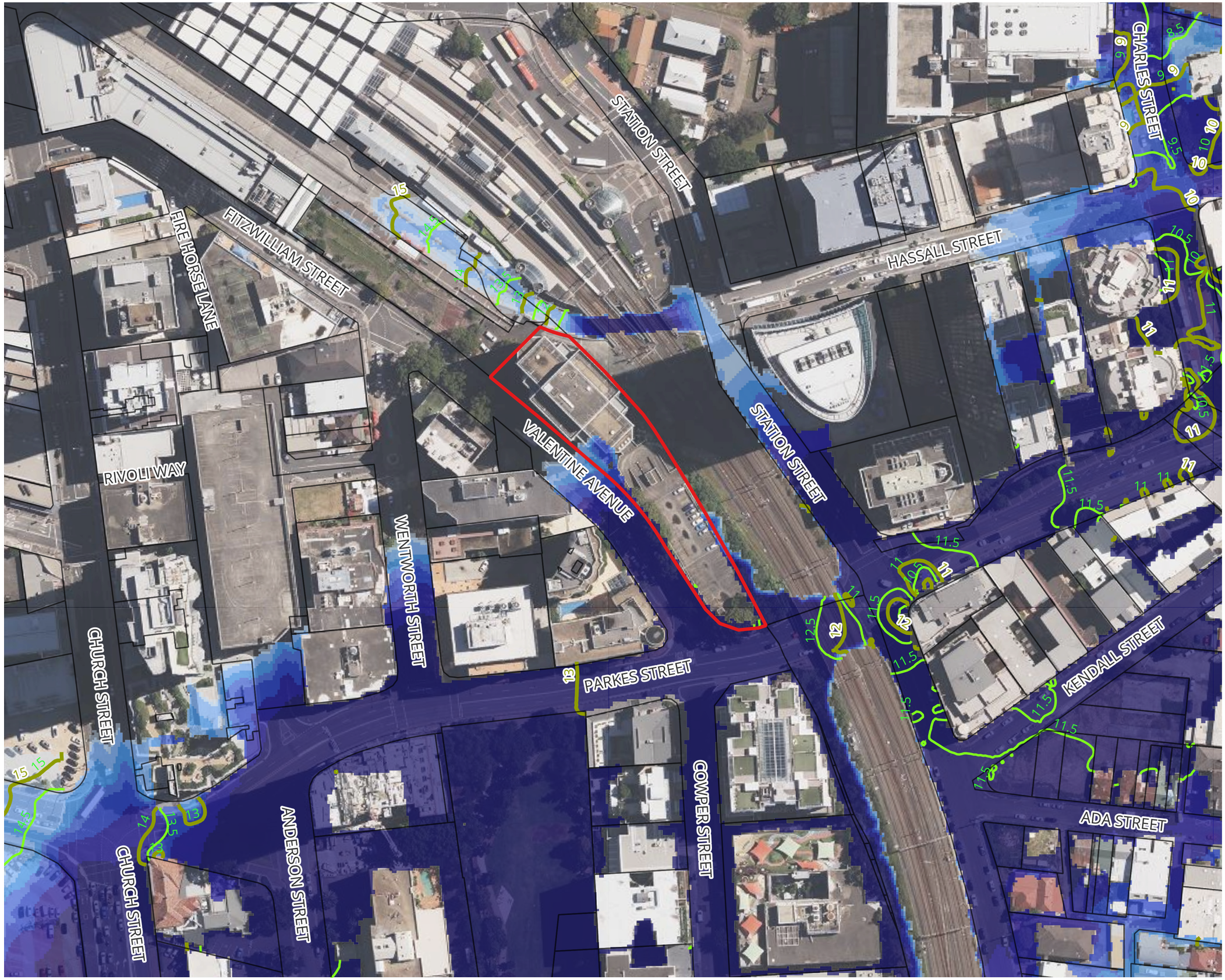
Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. C5
PROPOSED CASE SCENARIO
1% AEP + CLIMATE CHANGE
SSP3-7.0 AT YEAR-2100
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre
- Flood Level - 1.0m Interval (m AHD)
- Flood Level - 0.5m Interval (m AHD)

Peak Flood Depth (m)

- <= 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- 0.5 to 0.7
- 0.7 to 1
- 1 to 1.5
- >1.5

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. C6
PROPOSED CASE SCENARIO
PMF + CLIMATE CHANGE
SSP3-7.0 AT YEAR-2100
DEPTHS AND LEVEL CONTOURS

Job No.	Figure Status
313025	**DRAFT**



Legend

Project Boundary

Cadastre

Flood Hazard Category

H1 – generally safe for people, vehicles and buildings

H2 – unsafe for small vehicles

H3 – unsafe for vehicles, children and the elderly

H4 – unsafe for vehicles and people

H5 – unsafe for vehicles and people. Buildings require special engineering design and construction

H6 – unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. C7
PROPOSED CASE SCENARIO
1% AEP + CLIMATE CHANGE
SSP3-7.0 AT YEAR-2100
FLOOD HAZARD CATEGORY

Job No.
313025

Figure Status
DRAFT



Legend

- Project Boundary
- Cadastre

Flood Hazard Category

- **H1 –** generally safe for people, vehicles and buildings
- **H2 –** unsafe for small vehicles
- **H3 –** unsafe for vehicles, children and the elderly
- **H4 –** unsafe for vehicles and people
- **H5 –** unsafe for vehicles and people. Buildings require special engineering design and construction
- **H6 –** unsafe for vehicles and people. All building types considered vulnerable to failure

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. C8
PROPOSED CASE SCENARIO
PMF + CLIMATE CHANGE
SSP3-7.0 AT YEAR-2100
FLOOD HAZARD CATEGORY

Job No.	Figure Status
313025	**DRAFT**



Legend

Project Boundary

Cadastre

Afflux

Difference in Water Levels (m)

Improvement

< -0.5
-0.5 to -0.3
-0.3 to -0.1
-0.1 to -0.05
-0.05 to -0.03
-0.03 to -0.01
-0.01 to 0.01

Worsening

0.01 to 0.03
0.03 to 0.05
0.05 to 0.1
0.1 to 0.3
0.3 to 0.5
> 0.5

Change in Flood Extent

Was dry now wet

Was wet now dry

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. C9
PROPOSED CASE SCENARIO
1% AEP + CLIMATE CHANGE
SSP3-7.0 AT YEAR-2100
AFFLUX

Job No.	Figure Status
313025	**DRAFT**



Legend

- Project Boundary
- Cadastre

Afflux

Difference in Water Levels (m)

Improvement
- < -0.5
- -0.5 to -0.3
- -0.3 to -0.1
- -0.1 to -0.05
- -0.05 to -0.03
- -0.03 to -0.01
- -0.01 to 0.01

Worsening
- 0.01 to 0.03
- 0.03 to 0.05
- 0.05 to 0.1
- 0.1 to 0.3
- 0.3 to 0.5
- > 0.5

Change in Flood Extent
- Was dry now wet
- Was wet now dry

©Copyright Information

Issue	Date	By	Chkd	Appd
1	10/12/2025	AT	CP	

ARUP

Level 5, Barrack Place
151 Clarence Street
Sydney NSW 2000
Tel +61 (2) 9320 9320
www.arup.com

Client
Holdmark NSW Pty Ltd

Job Title
2-10 Valentine Avenue

0 25 50 m

Scale at A3 1:1,500

Figure No. C10
PROPOSED CASE SCENARIO
PMF + CLIMATE CHANGE
SSP3-7.0 AT YEAR-2100
AFFLUX

Job No.	Figure Status
313025	**DRAFT**

Appendix D

Flood Enquiry Application

Our Reference: FL/334/2025
Contact: Peter Sirianni
Telephone: 02 9806 8254
Fax: 02 9806 5906

Arup
151 Clarence ST
Sydney NSW 2000

9 December 2025

FLOOD ENQUIRY APPLICATION

Property Details

Address	**10 Valentine Avenue, PARRAMATTA NSW 2150**
	This form applies for up to three adjoining sites relating to the same development. A separate Flood Enquiry form and fee will be required for more than 3 or separate lots.

Delivery Preference

Karen.seeto@arup.com

Reason for Enquiry

Property Type

***** GST not applicable from 1 July 2013*****

Flooding Application – Commercial	$660.40

Disclaimer: Flood levels and flood extent lines are based on current information held by Council. Council does not accept responsibility for the accuracy of this information. Any pipe sizes and location of pits and pipe lines should be confirmed by site investigation.
The flood levels shown on the back of this form are only an approximate guide and have been derived using the current computer simulated model.
The information provided in this document is presented in good faith to assist the public in understanding Council's drainage requirements that apply within the Parramatta Local Government Area. It is the responsibility of each individual using this information to undertake their own checks and confirm this information prior to its use.
City of Parramatta Council, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement, or advice referred to above.

Refer to back of this form for level information issued

Flood Enquiry Information Issued - 9 December 2025

Mainstream Flooding

Is this property affected by mainstream flooding? **10 Valentine Avenue, PARRAMATTA**			☒ Yes ☐ No
Flood Levels	Closest Cross Sections: *(Please refer to Flood Study):*		
5% AEP	RL 9m AHD	**Comments**: **See Note on Flood/Hazard Maps**	
1% AEP	RL 9.5m AHD		
PMF	RL 12.1m AHD		
☒ Refer to flood maps provided for detailed flood levels.			
Flood information is obtained from the following flood study report: **Parramatta River Flood Study, 2024 (Stantec)**			

Note: Flood inundation can be verified by detail survey to AHD undertaken by a Registered Surveyor.

Local Flooding

Is the property located within a Hatched Grey Area? *Properties located within a **Hatched Grey Area** are subjected to flooding from the local catchment.*		☐ Yes ☒ No
Is the property located within a Grey Area? *Properties located within a **Grey Area** are subjected to additional site drainage controls to manage flooding in the local catchment.*		☐ Yes ☒ No
Is the property likely to be affected by overland stormwater run-off from the local catchment?	☒ Detailed Investigation Required	
***Note:** You are required to contact Council's Development Service Engineer for any details and requirements relating to development that is affected by local flooding.*		

Additional Recommended Actions

☒	The Applicant should arrange a pre-lodgement meeting to discuss any proposal to develop this site with council's Town Planner and Development Services Engineer. Pre-lodgement meetings can be booked via this link Pre-lodgement meetings | City of Parramatta
☒	The Applicant needs to refer to Council's Local Floodplain Risk Management policy for details relating to developing a land affected by flooding.

Definitions: (As per NSW Floodplain Development Manual dated April 2005)

1. **AHD** – a common national surface level datum approximately corresponding to mean sea level.
2. **ARI** – the long term average number of years between the occurrences of a flood as big as or larger than, the selected event.
3. **PMF** – is the largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation.
4. **AEP** – Annual Exceedance Probability is the chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage.

NOTE:

1. Council regularly reviews flood information. Flood levels may change.

2. Some white (unshaded) areas fully enclosed by the flood inundation extent indicates buildings situated on properties and that the buildings have been set as impervious for modelling purposes.
Ground level beneath the buildings is not necessarily above the flood level and may still be inundated in a flood.

N

1:4,000

City of Parramatta Council Flood Map - 5% AEP

DISCLAIMER: Flood levels and flood extent lines are based on current information held by Council. Council does not accept responsibility for the accuracy of this information. Any pipe sizes and location of pits and pipe lines should be confirmed by site investigation.
The flood levels provided are only an approximate guide and have been derived using this current computer simulated model.
The information provided on this document is presented in good faith. It is the responsibility of each individual using this information to undertake their own checks and confirm this information prior to its use.
City of Parramatta Council, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement, or advice referred to above.

Legend

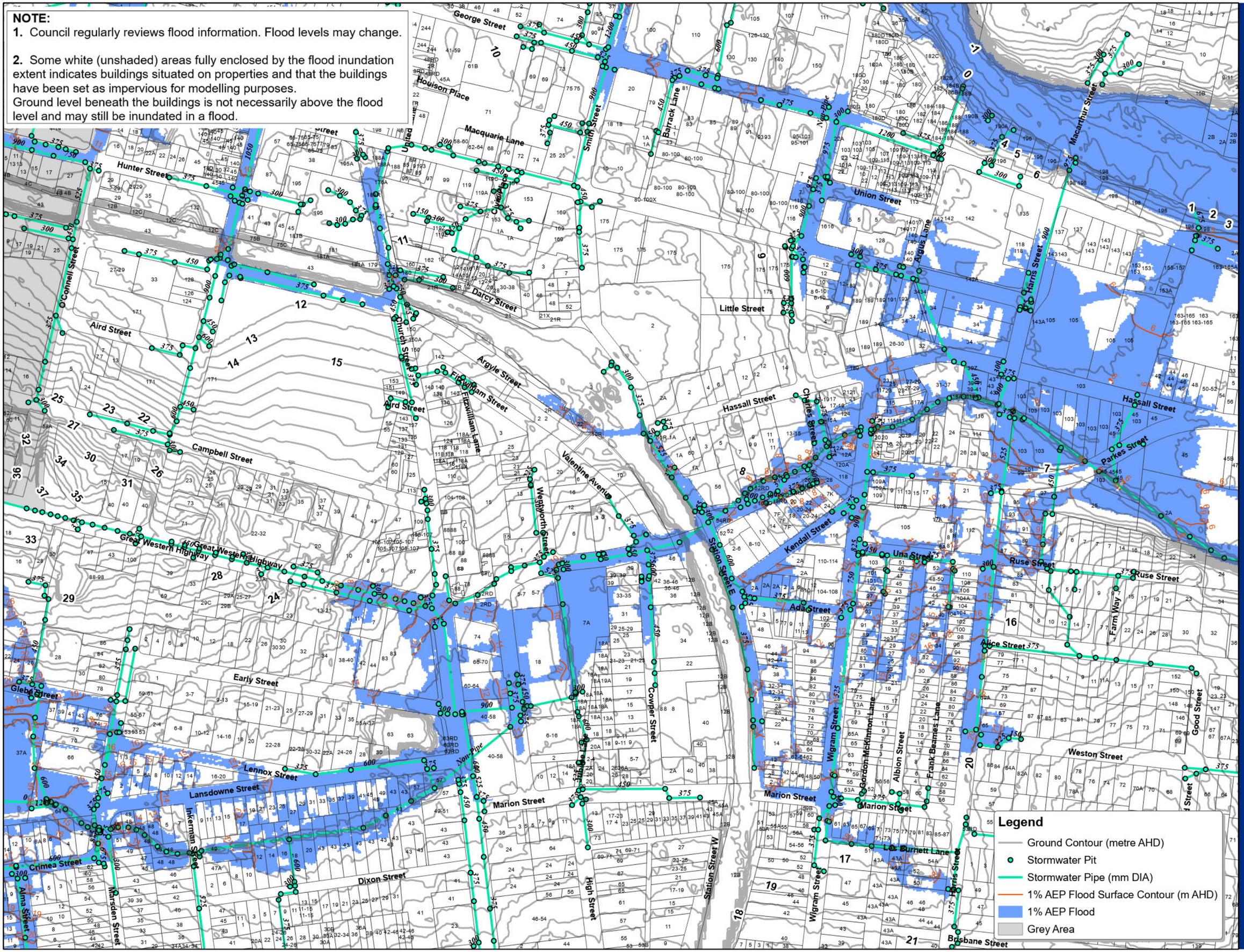
- Ground Contour (metre AHD)
- Stormwater Pit
- Stormwater Pipe (mm DIA)
- 5% AEP Flood Surface Contour (m AHD)
- 5% AEP Flood
- Grey Area

Printed
4/12/2025

NOTE:

1. Council regularly reviews flood information. Flood levels may change.

2. Some white (unshaded) areas fully enclosed by the flood inundation extent indicates buildings situated on properties and that the buildings have been set as impervious for modelling purposes.
Ground level beneath the buildings is not necessarily above the flood level and may still be inundated in a flood.



City of Parramatta Council Flood Map - 1% AEP

N

1:4,000

DISCLAIMER: Flood levels and flood extent lines are based on current information held by Council. Council does not accept responsibility for the accuracy of this information. Any pipe sizes and location of pits and pipe lines should be confirmed by site investigation.
The flood levels provided are only an approximate guide and have been derived using the information held by Council using this current computer simulated model.
The information provided on this document is presented in good faith. It is the responsibility of each individual using this information to undertake their own checks and confirm this information prior to its use.
City of Parramatta Council, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement, or advice referred to above.

Legend

- Ground Contour (metre AHD)
- Stormwater Pit
- Stormwater Pipe (mm DIA)
- 1% AEP Flood Surface Contour (m AHD)
- 1% AEP Flood
- Grey Area

Printed
4/12/2025

NOTE:

1. Council regularly reviews flood information. Flood levels may change.

2. Some white (unshaded) areas fully enclosed by the flood inundation extent indicates buildings situated on properties and that the buildings have been set as impervious for modelling purposes.
Ground level beneath the buildings is not necessarily above the flood level and may still be inundated in a flood.

City of Parramatta Council Flood Map - PMF

N

1:4,000

DISCLAIMER: Flood levels and flood extent lines are based on current information held by Council. Council does not accept responsibility for the accuracy of this Information. Any pipes sizes and location of pits and pipe lines should be confirmed by site investigation.
The flood levels provided are only an approximate guide and have been derived using the current computer simulated model.
The information provided on this document is presented in good faith. It is the responsibility of each individual using this information to undertake their own checks and confirm this information prior to its use.
City of Parramatta Council, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement, or advice referred to above.

Legend

- Ground Contour (metre AHD)
- Stormwater Pit
- Stormwater Pipe (mm DIA)
- PMF Flood Surface Contour (m AHD)
- PMF
- Grey Area

Printed
4/12/2025

NOTE:

1. Council regularly reviews flood information. Hazard extents may change.

2. Some white (unshaded) areas fully enclosed by the hazard extent indicates buildings situated on properties and that the buildings have been set as impervious for modelling purposes.
These white areas may still be hazardous however, this may not necessarily be to the same extent as the immediate building surrounds.

City of Parramatta Council Flood Hazard Map - 1% AEP

N

1:4,000

DISCLAIMER: Flood levels and flood extent lines are based on current information held by Council. Council does not accept responsibility for the accuracy of this Information. Any pipe sizes and location of pits and pipe lines should be confirmed by site investigation.
The flood levels provided are only an approximate guide and have been derived using this current computer simulated model.
The information provided on this document is presented in good faith. It is the responsibility of each individual using this information to undertake their own checks and confirm this information prior to its use.
City of Parramatta Council, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement, or advice referred to above.

Legend

- Ground Contour (metre AHD)
- Stormwater Pit
- Stormwater Pipe (mm DIA)

Hazard - 1% AEP

H1 H2 H3 H4 H5 H6

Grey Area

Printed
4/12/2025

NOTE:

1. Council regularly reviews flood information. Hazard extents may change.

2. Some white (unshaded) areas fully enclosed by the hazard extent indicates buildings situated on properties and that the buildings have been set as impervious for modelling purposes.
These white areas may still be hazardous however, this may not necessarily be to the same extent as the immediate building surrounds.

City of Parramatta Council Flood Hazard Map - PMF

N

1:4,000

DISCLAIMER: Flood levels and flood extent lines are based on current information held by Council. Council does not accept responsibility for the accuracy of this Information. Any pipe sizes and location of pits and pipe lines should be confirmed by site investigation.
The flood levels provided are only an approximate guide and have been derived using this current computer simulated model.
The information provided on this document is presented in good faith. It is the responsibility of each individual using this information to undertake their own checks and confirm this information prior to its use.
City of Parramatta Council, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement, or advice referred to above.

Legend

- Ground Contour (metre AHD)
- Stormwater Pit
- Stormwater Pipe (mm DIA)

Hazard - PMF

H1 H2 H3 H4 H5 H6

Grey Area

Printed 4/12/2025

Appendix E

SES Correspondence

Our Ref: ID 3528
Your Ref: SSD-90243456

10 December 2025

Melanie Gostelow
Holdmark Property Group
Suite 2/2-4 Giffnock Avenue
Macquarie Park NSW 2113

email: Melanie.Gostelow@arup.com
CC: claire.flashman@ses.nsw.gov.au
Via email

Dear Melanie,

Scoping Report State Significant Development Valentine Avenue, Parramatta

Thank you for the opportunity to provide advice on the Scoping Report for State Significant Development Application for residential development at 2-10 Valentine Avenue, Parramatta. It is understood that the proposal is for construction of a shop top housing development incorporating affordable housing and the change of use and alterations and additions to an existing commercial office building for the purposes of co-living housing.

In accordance with the Housing Delivery Authority (HDA) program, a concurrent Rezoning Proposal is also proposed, seeking to enable shop top housing and co-living as additional permitted land uses at the site under Schedule 1 of the *Parramatta Local Environmental Plan 2023* (PLEP 2023) and amend the site-specific provision under clause 7.40 of the PLEP 2023 to enable use of the existing commercial gross floor area for co-living housing.[1] The SSDA will seek approval for the following works:

- Demolition of the existing multi-deck car park at the southeastern portion of site.
- Site preparation and excavation works.
- Construction of **a 72-storey** shop-top housing development, which will accommodate:
    - Lobby and ancillary retail stores at Ground level
    - Mix of residential and communal areas on level 1 and 2
    - Mix of residential and plant rooms on Level 3 and 4
    - Approximately 600 residential apartments including affordable housing units on Levels 1-70.
    - Rooftop amenity on level 71 and plant on level 72.
    - Car parking facilities accommodated in the basement.
    - Loading Docks at Ground Level
    - Building identification signage

[1] Urbis. 2025. Scoping Report 2-10 Valentine Avenue, Parramatta, page 1

- Alterations and additions of the existing commercial building to the north to accommodate a **674-bed co-living housing**.[2]
- Change of use of existing building from commercial premises to co-living housing and ancillary retail.

The NSW State Emergency Service (NSW SES) is the agency responsible for dealing with floods, storms and tsunami in NSW. This role includes planning for, responding to and coordinating the initial recovery from floods. As such, the NSW SES has an interest in the public safety aspects of the development of flood prone land, particularly the potential for changes to land use to either exacerbate existing flood risk or create new flood risk for communities in NSW.

The site is impacted by overland flooding as identified in the Parramatta River Flood Study 2024 and noted in the Scoping Report,[3] with flooding also affecting a significant part of Valentine Avenue, Parkes Street and the broader road network both south and north of the site. In a Probable Maximum Flood (PMF) event, flood depths can exceed 1.5 metres[4] and the hydraulic hazard at the site and adjacent roads (Valentine Avenue and Parkes Street) peaks at H5 – H6 hazard level.[5] A H5 hazard category is unsafe for all people and all vehicles, with all buildings vulnerable to structural damage, while an H6 category is considered unsafe for all people and vehicles and all building types are considered vulnerable to failure.[6] With the Flood Study describing H6 as *"unconditionally dangerous. Not suitable for any type of development or evacuation access."*[7]

In summary, we:

- **Note** the Scoping Report makes reference to the NSW Floodplain Development Manual 2005,[8] which has been superseded. We **recommend** the proposal considers flooding issues in accordance with the requirements of NSW Government's Flood Prone Land Policy as set out in the **Flood Risk Management Manual 2023** (the Manual) and supporting guidelines, including the Support for Emergency Management Planning and relevant planning circulars and directions under the *Environmental Planning and Assessment Act, 1979*, including 4.1 Flooding and PS24-001.
- **Recommend** the proponent to submit a robust Flood Impact and Risk Assessment (FIRA) that examines flooding constraints posed to and by the proposal, and to inform any appropriate flood risk mitigation measures, as applicable. The FIRA should be consistent with the NSW Government Guidelines[9] and include:

[2] Urbis. 2025. Scoping Report 2-10 Valentine Avenue, Parramatta, page 13
[3] Urbis. 2025. Scoping Report 2-10 Valentine Avenue, Parramatta, page 31
[4] Stantec. 2024. Parramatta River Flood Study, Appendix F, Figure F6.28
[5] Stantec. 2024. Parramatta River Flood Study, Appendix H, Figure H6.28
[6] Department of Planning and Environment. 2023. Flood risk management guideline FB03, Flood Hazard - Figure 1 General flood hazard vulnerability curve, page 3
[7] Stantec. 2024. Parramatta River Flood Study, Appendix H, Figure H6.28
[8] Urbis. 2025. Scoping Report 2-10 Valentine Avenue, Parramatta, page 31
[9] LU01 Flood Risk Management Guideline: Flood Risk and Impact Assessment

- consideration of flooding from any source and for the full range of flooding events, up to and including the PMF event;
- flooding impacts on access/egress roads, including any new proposed road connections and any risk of isolation;
- time to onset, duration of inundation, depth, velocity and hydraulic hazard of any flooding;
- impacts of the development on flood behaviour at the site, neighbouring and downstream properties (pre- and post-development conditions);
- consideration of climate change impacts, in line with NSW Government guidelines.

- **Emphasise** that according to the Parramatta LGA Flood Emergency Sub Plan, evacuation is the primary response strategy for people impacted by flooding.[10] As this area is prone to **flash flooding**, there are no Bureau of Meteorology quantitative flood warnings available. Severe Weather Warnings and Thunderstorm Warnings will be the most likely form of advice about the potential for flood producing storms and rainfall, which will not provide the community time to respond to a flood threat in an appropriate manner.

You may also find the following Guidelines on the NSW SES website useful:

- Reducing Vulnerability of Buildings to Flood Damage
- Designing Safer Subdivisions
- Managing Flood Risk Through Planning Opportunities

Please feel free to contact Ana Chitu via email at rra@ses.nsw.gov.au should you wish to discuss any of the matters raised in this correspondence. The NSW SES would also be interested in receiving future correspondence regarding the outcome of this referral via this email address.

Yours sincerely,

Peter Cinque
Senior Manager, Emergency Risk Management
NSW State Emergency Service

[10] NSW SES. 2021. Parramatta LGA Flood Emergency Sub Plan, Section 1.6.2, page 7

ATTACHMENT A: Principles Outlined in the Support for Emergency Management Planning Guideline[11]

Principle 1 Any proposed Emergency Management strategy should be compatible with any existing community Emergency Management strategy.

Any proposed Emergency Management strategy for an area should be compatible with the strategies identified in the NSW State Flood Plan [12] and the Parramatta LGA Flood Emergency Sub Plan,[13] where evacuation is the preferred emergency management strategy for people impacted by flooding.

Principle 2 Decisions should be informed by understanding the full range of risks to the community.

Decisions relating to future development should be risk-based and ensure Emergency Management risks to the community of the full range of floods are effectively understood and managed.

Risk assessment should consider the full range of flooding, including events up to the Probable Maximum Flood (PMF) and not focus only on the 1% Annual Exceedance Probability flood event. Climate change should also be considered, in line with NSW Government guidelines.

Principle 3 Development of the floodplain does not impact on the ability of the existing community to safely and effectively respond to a flood.

The ability of the existing community to effectively respond (including self-evacuating) within the available timeframe on available infrastructure is to be maintained. It is not to be impacted on by the cumulative impact of new development.

Risk assessment should have regard to flood warning and evacuation demand on existing and future access/egress routes. Consideration should also be given to the impacts of localised flooding on evacuation routes. Evacuation must not require people to drive or walk through flood water.

Development strategies relying on an assumption that mass rescue may be possible where evacuation either fails or is not implemented are not acceptable to the NSW SES.

Principle 4 Decisions on development within the floodplain does not increase risk to life from flooding.

---

[11] NSW Government. 2023. Principles Outlined in the Support for Emergency Management Planning Guideline

[12] NSW Government. 2024. NSW State Flood Plan. Section 5.1.7, page 34

[13] NSW SES. 2021. Parramatta LGA Flood Emergency Sub Plan, Section 1.6.2, page 7

Managing flood risks requires careful consideration of development type, likely users, and their ability respond to minimise their risks. This includes consideration of:

- **Isolation** – There is no known safe period of isolation in a flood, the longer the period of isolation the greater the risk to occupants who are isolated.
- **Secondary risks** – This includes fire and medical emergencies that can impact on the safety of people isolated by floodwater. The potential risk to occupants needs to be considered and managed in decision-making.
- **Consideration of human behaviour** – The behaviour of individuals such as choosing not to remain isolated from their family or social network in a building on a floor above the PMF for an extended flood duration or attempting to return to a building during a flood, needs to be considered.

Principle 5 Risks faced by the itinerant population need to be managed.

Any Emergency Management strategy needs to consider people visiting the area or using a development.

Principle 6 Recognise the need for effective flood warning and associated limitations.

An effective flood warning strategy with clear and concise messaging understood by the community is key to providing the community an opportunity to respond to a flood threat in an appropriate and timely manner.

Principle 7 Ongoing community awareness of flooding is critical to assist effective emergency response.

Development within a floodplain will necessitate ongoing involvement from the NSW State Emergency Service (SES) in community awareness, preparedness, and response activities.

Importantly, a private flood management plans is insufficient to address flood risk on this site.

Appendix F

Structural Engineering Correspondence

ARUP

Level 5
151 Clarence Street
Sydney
NSW, 2000
Australia

t +612 9320 9320

arup.com

By email
26 November 2025

Beau Bartlett
Future Place Projects

Our ref 313025

Dear Beau,

2-10 Valentine Avenue, Parramatta

Structural Adequacy for Flooding

This design statement is to confirm that the proposed building structure at 2-10 Valentine Avenue, Parramatta will be designed to withstand flooding, including the effects of water-borne debris, scour, and flotation forces, up to the Probable Maximum Flood (PMF) level.

Yours sincerely,



Andrew Johnson
Principal | Structures Leader NSW & ACT
BE(Hons) FIEAust CP Eng NER APEC Engineer IntPE(Aus)

e andrew.johnson@arup.com

Appendix G

Parramatta River Flood Study (Stantec, 2024) Mapping Extracts

TUFLOW Model Extents

Parramatta River Flood Study

Project Code: 59916074
Drawn By: AS, Checked By: TB
Map: 59916074-GS-018-TUFLOWModelExtents.mxd
Rev: 05
Date: 2023-05-18

Legend

- Study Area
- Model Extent
- Watercourse
- Parramatta River
- Claycliff Creek
- Darling Mills, The Ponds, Subiaco, Vineyard and Brickfield Creeks
- Finlaysons and Coopers Creeks
- Pendle Hill Creek
- Terrys and Devlins Creek
- Quarry Creek

Figure 15.16

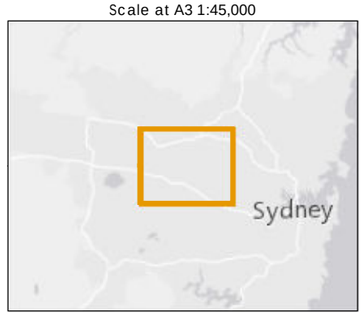
Notes:
1. Coordinate System: GDA 1994 MGA Zone 56

References:
1. Base data supplied by NSW SS and Esri
2. Aerial imagery supplied by MetroMap

Stantec

0 1 2 km

Scale at A3 1:45,000



This document has been prepared based on information provided by others as cited in the data sources. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

1% AEP Flood Emergency Response Classification Parramatta CBD

Parramatta River Flood Study

Project Code: 59916074
Drawn By: AS
Map: 59916074-GS-048-100y_EmergencyResponse.mxd
Rev: 04
Date: 2023-06-13

Legend

- Area of Significance
- Flood Depth Points
- Watercourse
- Evacuation Routes
- Cadastre

1% Flood Planning Risk Identification

- High Flood Perimeter
- Area with Overland Escape Route
- High Flood Island
- High Trapped Perimeter
- Low Flood Island
- Low Trapped Perimeter
- Rising Road Access Area
- Not Flood Affected

Figure O5.2

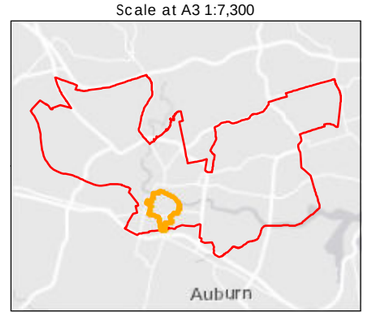
Notes:
1. Coordinate System: GDA 1994 MGA Zone 56

References:
1. Base data supplied by NSW SS and Esri
2. Aerial imagery supplied by MetroMap
3. Cadastre (2015) supplied by PCC

Stantec

0 75 150 225 300 Meters

Scale at A3 1:7,300



This document has been prepared based on information provided by others as cited in the data sources. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.